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OFFICIAL GAZETTE

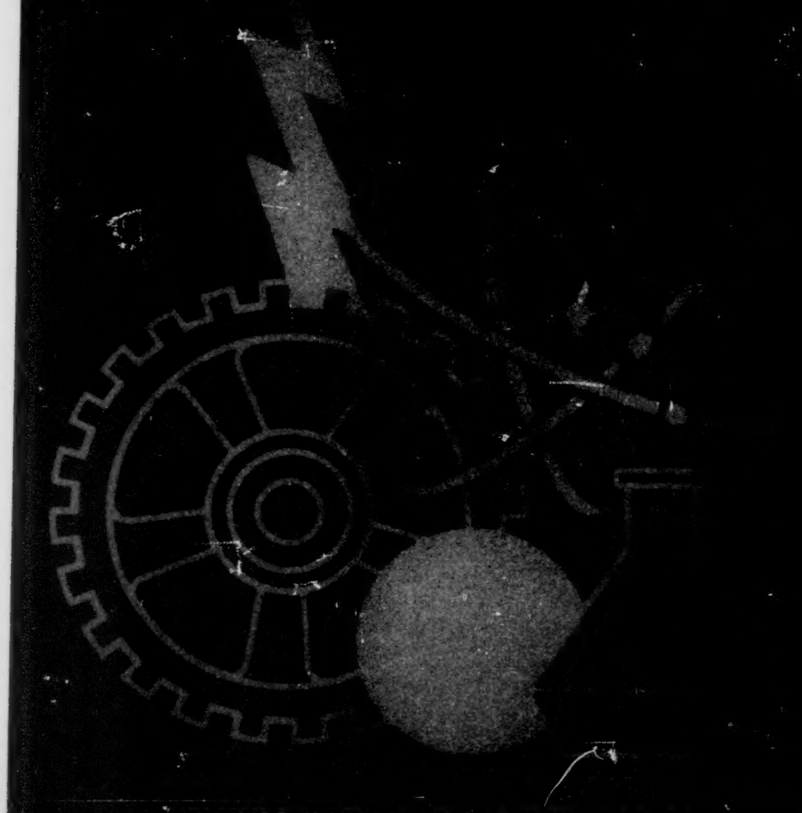
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UNITED STATES PATENT AND TRADEMARK OFFICE

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February 5, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
February 5, 1991 Volume 1123 Number 1

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.
[26] In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 14 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17,1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 566 on Jan 1, 1991.

International fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 6, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 2, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,722,098 through 4,723,321
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 31, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,428,079 through 4,429,418
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 25, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,359,790	06/215,887	11/23/82
4,359,801	06/260,333	11/23/82
4,359,803	06/224,690	11/23/82
4,359,817	06/268,090	11/23/82
4,359,834	06/230,436	11/23/82
4,359,837	06/219,403	11/23/82
4,359,840	06/222,868	11/23/82
4,359,841	06/255,288	11/23/82
4,359,867	06/240,039	11/23/82
4,359,868	06/272,342	11/23/82
4,359,893	06/234,930	11/23/82
4,359,923	06/306,266	11/23/82
4,359,924	06/306,264	11/23/82
4,359,930	06/260,312	11/23/82
4,359,932	06/276,555	11/23/82
4,359,933	06/217,996	11/23/82
4,359,949	06/311,573	11/23/82
4,359,955	06/283,888	11/23/82
4,359,964	06/265,634	11/23/82
4,360,017	06/244,865	11/23/82
4,360,032	06/239,052	11/23/82
4,360,033	06/240,551	11/23/82
4,360,044	06/250,988	11/23/82
4,360,057	06/232,349	11/23/82
4,360,072	06/256,546	11/23/82
4,360,103	06/250,822	11/23/82
4,360,122	06/291,535	11/23/82
4,360,133	06/229,855	11/23/82
4,360,139	06/222,058	11/23/82
4,360,150	06/274,970	11/23/82
4,360,200	06/327,419	11/23/82
4,360,206	06/246,686	11/23/82
4,360,252	06/292,891	11/23/82
4,360,258	06/289,084	11/23/82
4,360,267	06/339,461	11/23/82
4,360,276	06/246,556	11/23/82
4,360,298	06/224,979	11/23/82
4,360,331	06/262,028	11/23/82
4,360,341	06/243,873	11/23/82
4,360,357	06/275,028	11/23/82
4,360,361	06/257,088	11/23/82
4,360,369	06/241,826	11/23/82
4,360,370	06/242,089	11/23/82
4,360,392	06/227,896	11/23/82
4,360,398	06/241,799	11/23/82
4,360,414	06/322,887	11/23/82
4,360,423	06/252,054	11/23/82
4,360,434	06/225,324	11/23/82
4,360,444	06/239,571	11/23/82
4,360,445	06/274,117	11/23/82
4,360,479	06/276,774	11/23/82
4,360,483	06/291,159	11/23/82
4,360,491	06/242,007	11/23/82
4,360,505	06/279,883	11/23/82
4,360,538	06/245,299	11/23/82
4,360,541	06/237,216	11/23/82
4,360,554	06/278,833	11/23/82
4,360,562	06/266,092	11/23/82
4,360,574	06/258,037	11/23/82
4,360,578	06/228,002	11/23/82
4,360,583	06/216,341	11/23/82
4,360,587	06/291,659	11/23/82
4,360,588	06/291,698	11/23/82
4,360,594	06/274,567	11/23/82
4,360,600	06/278,899	11/23/82
4,360,614	06/229,495	11/23/82
4,360,619	06/238,299	11/23/82
4,360,637	06/330,425	11/23/82
4,360,639	06/328,093	11/23/82
4,360,640	06/274,588	11/23/82
4,360,641	06/274,590	11/23/82
4,360,642	06/275,000	11/23/82
4,360,644	06/221,731	11/23/82
4,360,655	06/268,922	11/23/82
4,360,661	06/219,041	11/23/82
4,360,669	06/286,601	11/23/82
4,360,678	06/286,733	11/23/82
4,360,690	06/272,863	11/23/82
4,360,694	06/251,364	11/23/82
4,360,697	06/252,609	11/23/82
4,360,720	06/228,172	11/23/82
4,360,731	06/227,943	11/23/82
4,360,734	06/254,060	11/23/82
4,360,735	06/232,194	11/23/82

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Patent Number	Serial Number	Issue Date
4,360,738	06/260,232	11/23/82
4,360,794	06/262,128	11/23/82
4,360,796	06/242,131	11/23/82
4,360,802	06/240,250	11/23/82
4,360,826	06/230,894	11/23/82
4,360,853	06/294,147	11/23/82
4,360,856	06/223,415	11/23/82
4,360,909	06/220,530	11/23/82
4,624,015	06/644,458	11/25/86
4,624,022	06/733,500	11/25/86
4,624,023	06/656,504	11/25/86
4,624,029	06/787,506	11/25/86
4,624,039	06/769,687	11/25/86
4,624,049	06/737,111	11/25/86
4,624,056	06/704,492	11/25/86
4,624,058	06/673,132	11/25/86
4,624,062	06/745,709	11/25/86
4,624,063	06/670,904	11/25/86
4,624,066	06/730,895	11/25/86
4,624,068	06/804,568	11/25/86
4,624,071	06/747,865	11/25/86
4,624,076	06/744,577	11/25/86
4,624,077	06/602,182	11/25/86
4,624,079	06/728,339	11/25/86
4,624,080	06/653,249	11/25/86
4,624,081	06/693,753	11/25/86
4,624,083	06/558,202	11/25/86
4,624,085	06/739,160	11/25/86
4,624,092	06/663,297	11/25/86
4,624,097	06/714,323	11/25/86
4,624,104	06/610,507	11/25/86
4,624,107	06/776,267	11/25/86
4,624,109	06/522,847	11/25/86
4,624,124	06/682,148	11/25/86
4,624,126	06/780,639	11/25/86
4,624,135	06/681,616	11/25/86
4,624,144	06/613,359	11/25/86
4,624,149	06/702,683	11/23/86
4,624,154	06/563,640	11/25/86
4,624,155	06/747,686	11/25/86
4,624,161	06/736,109	11/25/86
4,624,174	06/601,392	11/25/86
4,624,178	06/783,168	11/25/86
4,624,185	06/762,469	11/28/86
4,624,190	06/699,370	11/25/86
4,624,192	06/841,784	11/25/86
4,624,193	06/766,080	11/25/86
4,624,195	06/632,968	11/25/86
4,624,206	06/721,452	11/25/86
4,624,208	06/718,421	11/25/86
4,624,213	06/769,695	11/25/86
4,624,215	06/657,037	11/25/86
4,624,235	06/599,967	11/25/82
4,624,239	06/804,446	11/25/86
4,624,258	06/649,504	11/25/86
4,624,259	06/689,912	11/25/86
4,624,262	06/674,922	11/25/86
4,624,264	06/330,501	11/28/86
4,624,270	06/660,073	11/25/86
4,624,272	06/800,989	11/25/86
4,624,273	06/670,922	11/25/86
4,624,274	06/747,896	11/25/86
4,624,279	06/642,673	11/25/86
4,624,280	06/712,423	11/25/86
4,624,286	06/719,755	11/25/86
4,624,287	06/624,731	11/25/86
4,624,292	06/713,335	11/25/86
4,624,294	06/759,754	11/25/86
4,624,306	06/719,892	11/25/86
4,624,311	06/780,447	11/25/86
4,624,314	06/740,243	11/25/86
4,624,321	06/657,374	11/25/86
4,624,337	06/782,991	11/25/86
4,624,339	06/667,735	11/25/86
4,624,341	06/771,760	11/25/86
4,624,351	06/679,636	11/25/86
4,624,355	06/614,549	11/25/86
4,624,364		
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4,624,375		
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06/751,440		11/25/86
06/716,640		11/25/86
06/771,518		11/25/86
06/755,422		11/25/86
06/648,949		11/25/86
06/746,440		11/25/86
06/610,534		11/25/86
06/734,181		11/25/86
06/613,862		11/25/86
06/808,963		11/25/86
06/783,310		11/25/86
06/231,667		11/25/86
06/711,614		11/25/86
06/754,654		11/25/86
06/818,701		11/25/86
06/737,674		11/25/86
06/779,607		11/25/86
06/568,352		11/25/86
06/810,976		11/25/86
06/762,074		11/25/86
06/742,212		11/25/86
06/572,099		11/25/86
06/751,234		11/25/86
06/673,669		11/25/86
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06/692,910		11/25/86
06/724,237		11/25/86
06/716,903		11/25/86
06/705,902		11/25/86
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06/482,695		11/25/86
06/463,249		11/25/86
06/723,816		11/25/86
06/738,484		11/25/86
06/646,147		11/25/86
06/790,764		11/25/86
06/549,818		11/25/86
06/594,001		11/25/86
06/715,462		11/25/86
06/709,564		11/25/86
06/704,164		11/25/86
06/795,665		11/25/86
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06/676,086		11/25/86
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06/678,292		11/25/86
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06/726,881		11/25/86
06/661,466		11/25/86
06/667,997		11/25/86
06/730,434		11/25/86
06/483,207		11/25/86
06/573,082		11/25/86
06/624,354		11/25/86
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06/544,666		11/25/86
06/617,548		11/25/86
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06/598,437		11/25/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in theindicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,724,032, Re. S. N. 07/619,199, Filed Nov. 27, 1990, Cl. 156/344, SHEET SEPARATING MACHINE AND METHOD, Thomas Kay, Owner of Record: *Wand Tool Co., Wheeling, Ill.*, Attorney or Agent: Howard B. Rockman, Ex. Gp.: 131

4,781,078, Re. S. N. 07/608,001, Filed Nov. 1, 1990, Cl. 74/71, LOCKING DIFFERENTIAL WITH ELECTROMAGNETIC ACTUATED CLUTCH, Martin G. Blessing, et al., Owner of Record: *Dana Corp.*, Attorney or Agent: Richard S. MacMillian, Ex. Gp.: 352

4,787,904, Re. S. N. 07/621,277, Filed Nov. 29, 1990, Cl. 623/6, HYDROPHILIC INTRAOCULAR LENS, Sanford L. Severin, et al., Owner of Record: *Inventor*, Attorney or Agent: John J. Leavitt, Ex. Gp.: 338

4,804,363, Re. S. N. 07/627,405, Filed Dec. 14, 1990, Cl. 604/6, APPARATUS AND METHOD FOR STORING AND PROCESSING BLOOD, Cesare R. Valeri, Owner of Record: *Autologous Blood Corp.*, Attorney or Agent: Donald J. Brott, Ex. Gp.: 338

4,855,511, Re. S. N. 07/619,362, Filed Nov. 28, 1990, Cl. 568/683, PROCESS FOR PREPARING $CHF_2OCHFCH_2$ AND $CHF_2OCHClCF_3$ AND NOVEL INTERMEDIATE COMPOUNDS EMPLOYED THEREIN, Donald F. Halpern, et al., Owner of Record: *Anaquest, Inc., New Providence, N.J.*, Attorney or Agent: R. Hain Swoope, Ex. Gp.: 126

4,857,336, Re. S. N. 07/619,160, Filed Nov. 28, 1990, Cl. 424/473, ORAL THERAPEUTIC SYSTEM HAVING SYSTEMIC ACTION, Satish C. Khanna, et al., Owner of Record: *Ciba-Geigy Corp., Ardsley, N.Y.*, Attorney or Agent: Irving M. Fishman, Ex. Gp.: 152

4,879,584, Re. S. N. 07/620,536, Filed Nov. 28, 1990, Cl. 357/43, SEMICONDUCTOR DEVICE WITH ISOLATION BETWEEN MOSFET AND CONTROL CIRCUIT, Yosuke Takagi, et al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Bruce G. Chapman, Ex. Gp.: 258

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,286,957, Reexam. No. 90/002,232, Requested Dec. 13, 1990, Cl. 008/471, PROCESS OF INTEGRATING A PHOTOCHROMIC SUBSTANCE INTO A OPTHALMIC LENS AND A PHOTOCHROMIC LENS OF ORGANIC MATERIAL, Lyliane Le Naour-Sene, Owner of Record: *Essilor International "Cei Generale D'Optique" Creteil. France*, Attorney or Agent: Charles E. Brown, Arlington, Va., Ex. Gp.: 115, Requester: Irwin M. Stein, PPG Industries, Pittsburgh, Pa.

4,621,712, Reexam. No. 90/002,224, Requested Dec. 7, 1990, Cl. 088/004, ANTI-SKID UNIT FOR MOTOR VEHICLES, Ragnar Hardmark, Owner of Record: *Voest-Alpine, Aktiengesellschaft, Muldestrasse, Austria*, Attorney or Agent: H. Ross Workman, Workman, Nydegger & Jensen, Salt Lake City, Utah, Ex. Gp.: 131, Requester: Anonymous

4,779,394, Reexam. No. 90/002,225, Requested Dec. 11, 1990, Cl. 052/667, CONNECTOR FOR SUSPENSION CEILING GRID, Richard Shirey, et al., Owner of Record: *Donn, Inc., Chicago. Ill.*, Attorney or Agent: W.A. Gail, Pearne, Gordon, McCoy & Granger, Cleveland, Ohio, Ex. Gp.: 354, Requester: USG Interiors, Inc., Chicago, Ill.

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4,888,229, Reexam. No. 90/002,235, Requested Dec. 19, 1990, Cl. 428/192, WIPERS FOR CLEANROOM USE, Steven J. Paley, et al., Owner of Record: *Steven J. Paley, Aberdeen, N.J.*, Attorney or Agent: John A. Krause, Fitzpatrick, Cella, Harper & Scinto, New York, N.Y., Ex. Gp.: 158, Requester: Texwipe Co., Upper Saddle River, N.J.

4,918,608, Reexam. No. 90/002,234, Requested Dec. 18, 1990, CL. 364/424.70, METHOD FOR AUTOMATIC DEPTH CONTROL FOR EARTH MOVING AND GRADING, Christopher O. Middleton, et al., Owner of Record: *Christopher O. Middleton, Capitola, Calif.*, Attorney or Agent: Irell & Manella, Menlo Park, Calif., Ex. Gp.: 234, Requester: Agtek Corp., Livermore, Calif.

4,924,374, Reexam. No. 90/002,233, Requested Dec. 18, 1990, Cl. 364/167.01, METHOD FOR AUTOMATIC POSITION CONTROL OF A TOOL, Christopher O. Middleton, Owner of Record: *Spectra Physics, San Jose, Calif.*, Attorney or Agent: Matthew C. Rainey, Irell & Manella, Menlo Park, Calif., Ex. Gp.: 236, Requester: Agtek Development, Livermore, Calif.

4,959,101, Reexam. No. 90/002,231, Requested Dec. 12, 1990, Cl. 075/685, PROCESS FOR DEGASSING ALUMINIUM MELTS WITH SULPHUR HEXAFLUORIDE, James R. MacNeal, et al., Owner of Record: *AGA AB, Lindingo, Sweden*, Attorney or Agent: William N. Hogg. Calfee, Halter & Griswold, Cleveland, Ohio, Ex. Gp.: 111, Requester: Owner

Erratum

"All reference to Patent No. 4,972,715 to Masahiro Ohno of Japan for `ULTRASONIC IMAGING WITHOUT PHASE DISTORATION' appearing in the *Official Gazette* of Nov. 27, 1990 should be deleted since no patent was granted."

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, eithical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before March 15, 1991.

King, George R., 801 Marjorie Ln., Vienna, Va. 22180
Lithgow, Thomas M., 14999 Carlsbad Rd., Woodbridge, Va. 22193
O'Shea, Kevin D., 7222 Oriole Ave., Springfield, Va. 22150
Prater, Penny L., 5210 Linda, Beaumont, Tex. 77708
Stotland, Danyl M., 273C Craig Henry Dr., Nepean, Ont., K2G 4C7, CANADA

Jan. 11, 1991 CAMERON WEIFFENBACH, *Director, Office of Enrollment and Discipline*

PATENT NOTICES

Certificates of Correction For Week of February 5, 1991

D. 305,438	4,857,716	4,880,144	4,894,395
PP. 7,024	4,860,227	4,880,481	4,894,397
4,462,945	4,863,512	4,880,614	4,894,547
4,535,061	4,865,428	4,881,558	4,895,284
4,692,418	4,866,091	4,882,004	4,896,523
4,705,846	4,867,323	4,882,140	4,897,532
4,781,751	4,867,655	4,882,573	4,897,672
4,787,211	4,869,677	4,883,055	4,898,365
4,805,492	4,870,686	4,883,203	4,898,708
4,808,504	4,870,690	4,884,231	4,899,325
4,814,016	4,871,544	4,885,575	4,899,741
4,820,732	4,871,554	4,885,997	4,900,209
4,820,815	4,872,883	4,886,790	4,900,493
4,829,258	4,873,112	4,886,810	4,902,528
4,835,110	4,873,201	4,887,729	4,902,836
4,837,185	4,873,825	4,887,905	4,903,187
4,839,255	4,874,646	4,887,924	4,903,222
4,841,659	4,874,679	4,888,495	4,903,956
4,846,064	4,875,546	4,890,703	4,907,120
4,849,366	4,876,708	4,891,141	4,907,936
4,849,414	4,877,539	4,891,284	4,910,026
4,849,432	4,877,570	4,891,689	4,950,350
4,850,332	4,877,661	4,892,335	4,953,616
4,850,355	4,878,722	4,892,607	4,959,842
4,850,699	4,878,840	4,892,782	4,968,294
4,853,012	4,878,957	4,892,826	
4,857,446	4,879,411	4,893,849	

Disclaimers

Des.308,143.—*Hartmut Lohmeyer*, Munich, Fed. Rep. of Germany. CHAIR. Patent dated May 29, 1990. Disclaimer filed July 6, 1990, by the assignee, Krueger International, Inc.

Hereby enters this disclaimer to the claim of said patent.

3,976,059.—*Robert Lonardo*, North Providence, R.I. THERAPEUTIC LEG AND FOOT DEVICE. Patent dated August 24, 1976. Disclaimer filed August 2, 1990, by the assignee, L'Nard Associates, Inc.

The term of this patent subsequent to May 24, 1992, has been disclaimed.

4,697,019.—*Francis D. King*, Newport, England. AZABICYCLO COMPOUNDS, USEFUL AS INTERMEDIATES. Patent dated September 29, 1987. Disclaimer filed November 13, 1990, by the assignee, Beecham Group, p.l.c.

Hereby enters this disclaimer to claims 1-8 of said patent.

4,782,178.—*James P. Godschalx; Daniel J. Murray; Abel Mendoza*, all of Midland, Mich. HALOGENATED PHENYL CYANATES. Patent dated Nov. 1, 1988. Disclaimer filed Feb. 12, 1990, by the assignee, The Dow Chemical Company.

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 5 of said patent.

4,926,952.—*Jeffrey Farnam*, Minneapolis, Minn. FOUR-WHEEL DRIVE WHEELCHAIR WITH COMPOUND WHEELS. Patent dated May 22, 1990. Disclaimer filed October 29, 1990, by the inventor.

The term of this patent subsequent to April 25, 2006, has been disclaimed.

4,954,394.—*Francois Boinot*, Lievin; *Michel Cousin*, Loison-sous-Lens; *Andre Hochin*, Bruay-en-Antois; *Nicolas Meyer*, Lens, all of France. PHENOLIC RESIN COMPOSITIONS. Patent dated September 4, 1990. Disclaimer filed June 18, 1990, by the assignee, Norsolor.

The term of this patent subsequent to March 27, 2007, has been disclaimed.

4,961,530.—*Joseph P. Wagner*, Knoxville, Tenn. ENGINE COOLING SYSTEM, STRUCTURE THEREFOR AND METHODS OF MAKING THE SAME. Patent dated October 9, 1990. Disclaimer filed July 30, 1990, by the assignee, Robertshaw Controls Company.

The term of this patent subsequent to January 2, 2007, has been disclaimed.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 29, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	12-4-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	4-24-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	2-27-89
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-31-89
BIOTECHNOLOGY, GROUP 180—EDWARD E. KUBASIEWICZ, Director	3-21-88
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INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	3-28-89
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COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	1-30-89
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	7-1-87
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	12-7-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Director	5-11-89
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	7-24-89
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	7-6-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	1-2-90

Expiration of patents: The patents within the range of numbers indicated below expire during December 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,775,774 to 3,778,913 inclusive
Plant Patents ..... none

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REEXAMINATIONS

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,143,760 (1413th)

RECIPROCATING CONVEYOR

Olof A. Hallstrom, 1350 Hallstrom Rd., Tillamook, Oreg. 97141

Reexamination Request No. 90/001,907, Dec. 13, 1989.
Reexamination Certificate for Patent No. 4,143,760, issued Mar. 13, 1979, Ser. No. 707,877, Jul. 22, 1976.
Continuation of Ser. No. 540,281, Jan. 10, 1975, abandoned.
Int. Cl.[5] B65G *25/04*
U.S. Cl. 198—750

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **4** is confirmed.

Claims **1** and **2** are determined to be patentable as amended.

Claim **3** dependent on an amended claim, is determined to be patentable.

1. A reciprocation conveyor, comprising:
(a) a frame,
(b) at least three elongated slat members mounted adjacent each other on the frame for independent longitudinal reciprocation in a single plane between start and advanced positions,
(c) a plurality of reversible hydraulic drive means one for each slat member, the plurality of drive means interconnecting the frame and the associated slat members for moving all of the slat members from the start position simultaneously in a conveying direction to the advanced position and returning the slat members one at a time back from the advanced position to said start position, [and]
(d) drive control means engaging the plurality of drive means and operable when all of the slat members reach their limit of advanced position to effect reversing the plurality of drive means one at a time for returning the slat members one at a time back to said start position and operable when all of the slat members reach their limit of retraction to said start position to effect reversing the drive means for moving all of the slat members simultaneously in said conveying direction, *and*
(e) abutments operatively interengaging the plurality of drive means in said start position and during movement to said advanced position for insuring said simultaneous movement of all slat members in the conveying direction.

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STATUTORY INVENTION REGISTRATIONS

PUBLISHED FEBRUARY 5, 1991

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H883
PROTECTIVE MASK

Malcolm E. Little; Robert P. Wagner, both of Fallston, and William W. McCullough, Edgewood, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 16, 1990, Ser. No. 465,819
Int. Cl.[5] A62B *18/08*
U.S. Cl. 128—201.17 **16 Claims**

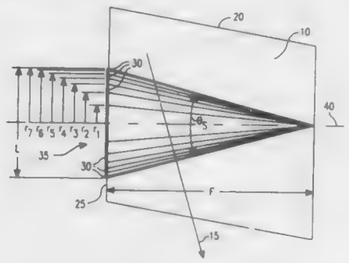


1. A protective mask comprising: an elastomeric face piece designed to enclose the eyes, nose and mouth of a wearer, a plurality of openings for lens, inhalation filter, exhalation, and voice transmission wherein the lens protrude so as to provide increased peripheral vision.

H884
METHOD AND APPARATUS FOR INCREASING THE ANGULAR APERTURE OF AN ACOUSTO-OPTIC DEVICE

Milton S. Gottlieb, Churchill, and Nathan T. Melamed, Pittsburgh, both of Pa., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 240,293, Aug. 6, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 469,801
Int. Cl.[5] G02F *1/11*
U.S. Cl. 350—358 **4 Claims**

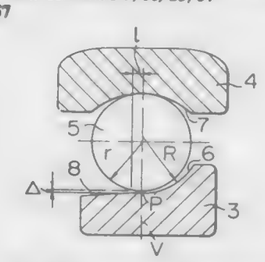


1. An acousto-optic device comprising:
(a) a crystal having an optic axis, an optic input face and an acoustic input face; and
(b) a plurality of spaced apart acoustic transducers positioned on the acoustic input face such that light incident to the optic input face at various angles with respect to said optic axis is diffracted along said optic axis as a corresponding output light beam in response to acoustic input to said transducers.

H885
BEARING DEVICE FOR A CRANKSHAFT

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Mitaka, Japan

Continuation of Ser. No. 634,631, Jul. 26, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 797,199
Claims priority, application Japan, Aug. 1, 1983, 58-140711
Int. Cl.[5] F16C *9/00, 23/04*
U.S. Cl. 384—457 **4 Claims**



1. A bearing device for a crankshaft comprising an outer race having a ball rolling groove fitted to a bearing section of a crankcase dividable into two parts to the axial direction of a crankshaft and having rolling balls retained on the outer race, and an inner race having a ball rolling groove and forcibly fitted onto said crankshaft independently from said outer race, wherein the cross sectional configuration of said ball-rolling grooves of said outer and said inner races is formed so as to permit each said ball-rolling groove to have a radius of curvature greater than the radius of said rolling ball and said inner race having a downwardly inclined flat surface extending outwardly toward the outer end of said crankshaft from outward of a central vertical line of the ball-rolling groove of the inner race to the edge of the inner race, thereby to provide clearance between said rolling ball and said ball-rolling groove of the inner race permitting said rolling ball to be moved from one side to the other side of said central vertical line.

H886
REINFORCED POLYMER

Eric R. George, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 137,688, Dec. 24, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,157
Int. Cl.[5] C08J *3/20*; C08K *3/40*; C08L *29/12*
U.S. Cl. 524—612 **9 Claims**

1. A polymeric composition comprising an amount of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon with an amount of glass fiber reinforcement, wherein the glass fibers have a diameter from about 2×10^{-4} inch to about 8×10^{-4} inch and a length from about 0.1 inch to about 0.5 inch.

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H887

DISPERSION STRENGTHENED TRI-TITANIUM ALUMINUM ALLOY

Ganapathy Venkataraman, Trichy, India, and Francis H. Froes, Moscow, Id., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 7, 1990, Ser. No. 476,074
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—420 5 Claims

1. A titanium alloy comprising about 15 to 25 atomic percent aluminum, about 0.05 to 12 atomic percent of at least one beta eutectoid stabilizing element selected from the group consisting of Cu, Ni, Cr, Er, Y, Ce, Si, B and C, and about 4 to 12 a/o of at least one beta isomorphous stabilizing element selected from the group consisting of Nb or a mixture of Nb with Ta, Mo or V, balance titanium.

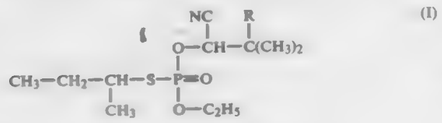
H888

ORGANOPHOSPHORUS ESTER COMPOUNDS OF CYANOHYDRINS AS INSECTICIDES AND NEMATICIDES

David T. Chou; Gail S. Powell, both of Raleigh, and Philip R. Timmons, Durham, all of N.C., assignors to Rhone-Poulenc Ag Company, Research Triangle Park, N.C.

Filed Mar. 15, 1989, Ser. No. 324,225
Int. Cl.[5] C07F *9/40*; A01N *57/02*
U.S. Cl. 514—112 27 Claims

8. A method for the control of insects, nematodes or both which comprises applying to plants, plant seeds, plant roots or the medium in which the plants, plant seeds or plant roots grow an effective amount of a compound of formula (I)



(I)

wherein R is a hydrogen atom or a methyl group.

H889

STABILIZED COMPOSITIONS

Robert Q. Kluttz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 7, 1989, Ser. No. 389,933
Int. Cl.[5] C08K *5/353*
U.S. Cl. 524—96 16 Claims

1. A stabilized composition comprising:
a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, wherein the linear alternating polymer is represented by the repeating formula

$$-CO-CH_2-CH_2)]_x[CO-G)]_y$$

wherein G is a moiety of an ethylenically unsaturated hydrocarbon of at least 3 carbon atoms polymerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0:5; and
a quantity of an oxygen-containing organic stable free radical effective to stabilize the polymer against exposure to elevated temperature.

H890

HERBICIDAL HETEROCYCLICBENZYLSULFONAMIDES

Morris P. Rorer, 64 Lower Valley La., Green Valley, Newark, Del. 19711

Division of Ser. No. 69,236, Jul. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 618,731, Jun. 8, 1984, abandoned. This application Feb. 21, 1989, Ser. No. 312,654
Int. Cl.[5] C07C *303/00, 315/00, 321/00, 315/00*
U.S. Cl. 560—12 1 Claim

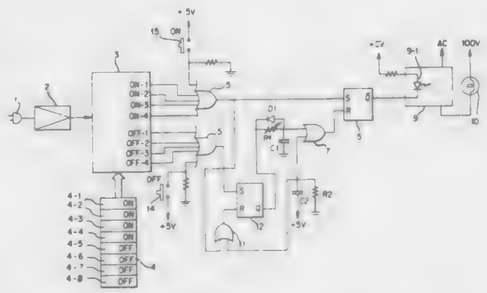
1. The compound methyl 2-[(aminosulfonyl)methyl]-benzoate.

H891

AUTOMATIC ILLUMINATION SWITCHING DEVICE

Kazuo Hashimoto, 28-2 Komazawa, 2-chome, Setagaya-ku, Tokyo 154, Japan

Filed Sep. 20, 1989, Ser. No. 409,668
Claims priority, application Japan, Sep. 20, 1988, 63-236096
Int. Cl.[5] G10L *5/06*; H03G *3/20*
U.S. Cl. 381—43 12 Claims



1. An automatic illuminator switching circuit comprising:
a voice recognizer for detecting a spoken command to turn the illuminator on and a spoken command to turn the illuminator off;
an illuminator switch for turning an illuminator on and off; wherein
said voice recognizer is connected to control said illuminator switch to turn the illuminator on instantly in response to the command to turn the illuminator on, and to turn the illuminator off a predetermined period of time after detecting the command to turn the illuminator off.

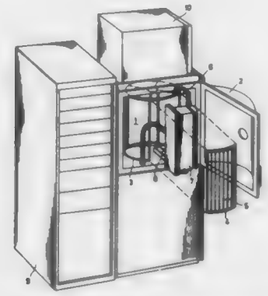
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,530

PROCESS AND APPARATUS FOR THE COATING OF SHAPED ARTICLES BY CATHODE SPUTTERING

Wolf-Dieter Münz, Somborn, and Gerhard Hessberger, Karlstein, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Original No. 4,426,267, dated Jan. 17, 1984, Ser. No. 351,730, Feb. 24, 1982. Application for reissue Jan. 16, 1986, Ser. No. 819,544
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107914
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.12 13 Claims



3. A method of coating a part by cathodic atomization of target material, the part having a three-dimensional surface to be coated, comprising:
providing two, facing cathodic atomization devices for receiving the part to be coated in a discharge space therebetween, each cathodic atomization device having a target of the same material with a surface delimiting the discharge space, a cathode arrangement for producing a plasma cloud of the target material in the discharge space, and magnetic means producing a magnetic field which closes on the target for concentrating the plasma cloud of the target material in a zone at the target surface delimiting the discharge space; and
applying a voltage which is negative with respect to the ground to the part to be coated in the discharge space sufficient to facilitate at least touching of the plasma clouds of the target material from the cathodic atomization devices at the part to be coated in the discharge space.

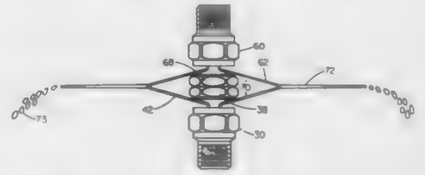
Re. 33,531

LIQUID MIXING EMPLOYING EXPANDING THINNING LIQUID SHEETS

Robert J. Demyanovich, 269 Hanover #301, Oakland, Calif. 94606

Original No. 4,735,359, dated Apr. 5, 1988, Ser. No. 832,853, Feb. 24, 1986. Application for reissue Jul. 3, 1989, Ser. No. 375,189
Int. Cl.[5] B05B *1/26*
U.S. Cl. 239—1 19 Claims

1. A method of rapidly forming an intimate mixture of a plurality of liquids, comprising the following steps:
(a) causing each of said plurality of liquids to form *in a free-space environment* a continuous sheet of liquid which expands in width and decreases in thickness,
(b) causing the resulting plurality of sheets of liquid to contact each other *in said free-space environment* at an acute angle and thereupon combine to form a resultant



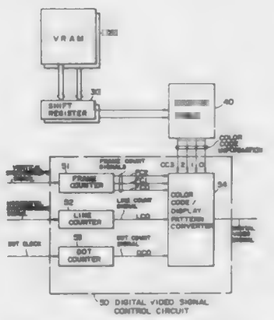
mixed sheet of said liquids, whereby said plurality of liquids will admix with uniformity, rapidity, and intimacy.

Re. 33,532

DISPLAY CONTROL SYSTEM WHICH PRODUCES VARYING PATTERNS TO REDUCE FLICKERING

Takatoshi Ishii, Tokyo, Japan, assignor to Ascii Corporation, Tokyo, Japan

Original No. 4,827,255, dated May 2, 1989, Ser. No. 868,673, May 30, 1986. Application for reissue Feb. 15, 1990, Ser. No. 480,611
Claims priority, application Japan, May 31, 1985, 60-118096; Jul. 15, 1985, 60-156705; Jul. 15, 1985, 60-156706
Int. Cl.[5] G09G *1/14*
U.S. Cl. 340—793 19 Claims



6. A display control system which uses a single frame of color code information to display a plurality of frames of gray scale information on pixel positions of a [monochrome] display screen, comprising:
means for receiving a pixel of color code information for a pixel of said display screen;
means for determining a dot position on said display screen, and a current gray scale frame count indicative of which of a plurality of frames of gray scale information is being displayed; and
a plurality of digital video signal conversion means, each for converting each said pixel of color code information into a plurality of monochrome digital video signals, said plurality being indicative of a color with a gray scale value dependent on said color code information, the value of said monochrome digital video signals being based on both of said gray scale frame count, and said dot position on said display screen.

Re. 33,533

POLYCYCLIC HETEROCYCLIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN HUMAN AND VETERINARY MEDICINE

Braham Shroot, Antibes; Jacques Eustache, Grasse; Jean-Michel Bernardon, Nice, and Philippe Nedoncelle, Grasse, all of France, assignors to Centre International de Recherches Dermatologiques (CIRD), Valbonne, France

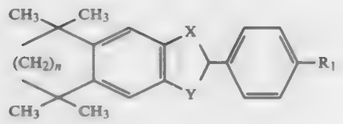
Original No. 4,874,747, dated Oct. 17, 1989, Ser. No. 188,547, Apr. 29, 1988. Application for reissue Apr. 24, 1990, Ser. No. 513,970

Claims priority, application France, Apr. 30, 1987, 87 06152

Int. Cl.[5] A61K *31/42, 31/535;* **C07D** *413/10*

U.S. Cl. 514—23 **12 Claims**

1. A polycyclic heterocyclic compound having the formula



(I)

wherein

n is 1 or 2,

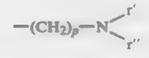
R_1 represents (i) [hydrogen] *lower alkyl*,(ii) $-CH_2OH$ or (iii)



R_2 represents (a) hydrogen, (b)



or (c) —OR_3 wherein R_3 represents hydrogen, alkyl having 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl, phenyl, phenyl substituted by halogen, hydroxy, nitro or lower alkyl, benzyl, phenethyl, a sugar radical selected from the group consisting of glucose, mannose, erythrose and galactose, or



wherein p is 1, 2 or 3 and r′ and r″ represents hydrogen, lower alkyl, monohydroxyalkyl, polyhydroxyalkyl, phenyl, phenyl substituted by halogen, hydroxy, nitro or lower alkyl, aminated sugar radical selected from the group consisting of glucosamine, galactosamine and mannosamine, or r′ and r″ taken together form a heterocycle selected from the group consisting of piperidino, piperazino, morpholino, pyrrolidino and 4-(2′-hydroxyethyl) piperazino,

X represents oxygen,

Y represents a nitrogen atom, or a salt of said polycyclic heterocyclic compound of formula I.

PLANT PATENTS

GRANTED FEBRUARY 5, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,436

RASPBERRY PLANT NAMED PSI 79

Stephen M. Ackerman, Salinas, Calif., assignor to Plant Sciences, Inc., Watsonville, Calif.

Filed Aug. 25, 1989, Ser. No. 398,432

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—46 **1 Claim**

1. A new distinct variety of red raspberry plant named PSI 79, as herein described and illustrated.

7,437

RASPBERRY PLANT NAMED PSI 127

Stephen M. Ackerman, Salinas, Calif., assignor to Plant Sciences, Inc., Watsonville, Calif.

Filed Aug. 25, 1989, Ser. No. 398,440

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—46 **1 Claim**

1. A new distinct variety of red raspberry plant named PSI 127, as herein described and illustrated.

7,438

GAZANIA PLANT CALLED *GAZANIA RIGENS* "B"

Janet N. Egger, Ventura, Calif., assignor to Mitsuwa Nursery, Inc., Moorpark, Calif.

Filed Jan. 29, 1990, Ser. No. 471,512

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Gazania as described and illustrated, particularly characterized by its floriferous showy Multicolor flowers, green foliage, vigorous growth, and trailing habit.

7,439

VERBENA PLANT CALLED VERBENA "B"

Janet N. Egger, Ventura, Calif., assignor to Mitsuwa Nursery, Inc., Moorpark, Calif.

Filed Dec. 11, 1989, Ser. No. 448,650

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—87 **1 Claim**

1. A new and distinct cultivar of Verbena plant as described and illustrated, particularly characterized by its floriferous showy deep rose red flowers, deep green foliage, vigorous growth, and trailing habit.

7,440

AGLAONEMA PLANT NAMED REMBRANDT

B. Frank Brown, Palm Bay, Fla., assignor to Hartman Plant Laboratories, Inc., Sebring, Fla.

Filed Jul. 5, 1989, Ser. No. 375,602

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of Aglaonema plant named 'Rembrandt', as described and illustrated.

7,441

ANTHURIUM PLANT NAMED PINK ARISTOCRAT

Hiroshi Tagami, Kaneohe, Hi., assignor to Hartman Plant Laboratories, Inc., Sebring, Fla.

Filed Dec. 21, 1989, Ser. No. 454,741

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of Anthurium plant named Pink Aristocrat, as illustrated and described.

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PATENTS

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ERRATA

For CLASS	See PATENT NO.
030-034	4,989,328
353-027	4,989,330
070-380	4,989,430
297-391	4,989,836
356-121	4,989,949
148-306	4,990,182
424-089	4,990,367
521-163	4,990,548
523-456	4,990,578
562-041	4,990,637
558-390	4,990,683
392-386	4,990,745
392-435	4,990,747
392-485	4,990,748
250-493	4,990,804
361-093	4,991,042
360-084	4,991,211

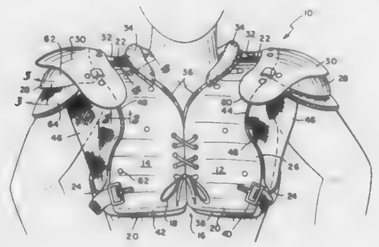
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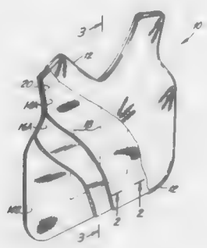
GENERAL AND MECHANICAL

4,989,265
PROTECTIVE ATHLETIC EQUIPMENT
Leonard O. Nipper, and Donald E. Ettinger, both of Cookeville, Tenn., assignors to Cassemco, Inc., Cookeville, Tenn.
Filed Nov. 17, 1989, Ser. No. 437,597
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 19 Claims



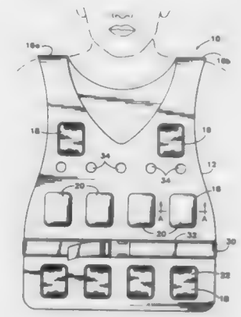
9. An article of protective athletic equipment adapted to be worn by a person comprising: a layer of closed cell, elastomeric foam having a regularly bi-directionally convoluted generally sinusoidal first surface, and means for coupling the layer to the person for protection during athletic activity so that the first surface is confronting the person.

4,989,266
BODY ARMOR INSERT
Anthony J. Borgese, Lynbrook; Gaeton J. Dragone, Croton Falls, and David R. Hand, Kings Park, all of N.Y., assignors to Point Blank Body Armor, Inc., Amityville, N.Y.
Filed Oct. 13, 1989, Ser. No. 421,077
Int. Cl.[5] F41H *1/02*
U.S. Cl. 2—2.5 11 Claims



1. A body armor set of ballistic material plies consisting essentially of:
a first subset of aramid plies,
a second subset of aramid plies,
a subset of polyethylene plies,
said subset of polyethylene plies being sandwiched between said first and second subsets of aramid plies,
each of said subsets of aramid plies consisting of multiple plies of ballistic material made from aramid fiber,
said subset of polyethylene plies consisting of multiple plies of ballistic material made from polyethylene,
a first one of said plies of said first subset and a first one of said plies of said second subset constituting the outer surface plies of said set of plies,
each of the rest of said plies of each of said subsets having both first and second faces in full surface contact with a face of an adjacent ply,
ballistic resistance being provided by a set of plies in face-to-face contact with each other in sequence from a first surface aramid ply through aramid plies, polyethylene plies and aramid plies to a second surface aramid ply.

4,989,267
WEIGHTED TRAINING VEST FOR ATHLETIC ACTIVITIES
Douglas E. Watson, No. 6, 3665 SE. Monroe St., Milwaukie, Oreg. 97222, assignor to Douglas E. Watson and Forrest Bennett, both of Gladstone, Oreg.
Filed Dec. 26, 1989, Ser. No. 456,456
Int. Cl.[5] A41D *1/04*; A63B *21/12*
U.S. Cl. 2—102 14 Claims



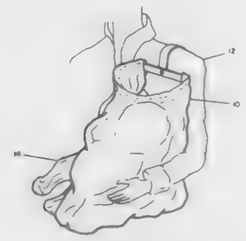
1. An athletic training vest device adapted to be worn upon an athlete's person while engaged in an athletic activity comprising:
(a) respective front and rear flexible panels adapted to fit against the wearer's back and chest respectively, said panels including a plurality of recessed areas forming pockets therein;
(b) interconnecting means extending between said front and rear panels;
(c) fastening material disposed in each of said recessed areas; and
(d) a plurality of weights each having a shape to fit inside one of said recessed areas and including cooperatively mating coupling means for fastening said weights to said fastening material.

4,989,268
PRIVACY SHIELD FOR NURSING MOTHERS
Andria J. Stolhand, 213 C Amherst Ct., Bloomingdale, Ill. 60108
Filed Mar. 28, 1990, Ser. No. 500,700
Int. Cl.[5] A41D *1/20, 1/22*
U.S. Cl. 2—104 3 Claims

1. A nursing privacy shield for concealing a mother's breast region while nursing her child comprising:
(a) a hooklike member having a first curved portion and a second elongated portion, said first curved portion flexibly fitting over and being supported on a nursing mother's shoulder, and said second elongated portion extending downward over the mother's upper front chest area;
(b) means for concealing the nursing mother's upper front chest area, said concealing means comprising a flexible opaque material;

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(c) means for supporting the concealing means in front of the nursing mother's upper front chest area, with the supporting means maintaining the concealing means a preselected distance from the nursing mother's chest area so that the nursing baby's head may be disposed between the concealing means and the nursing mother's chest area and so that



the nursing mother may view the baby's head while the baby is nursing; and

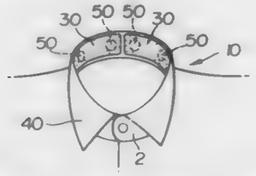
(d) means for pivotally attaching the second portion of said hooklike member to the supporting means so that the hooklike member and the supporting means may be moved relative to each other.

4,989,269

SHIRT COLLAR

Hiroshi Takasugi, 62-19, Aza Mukaihara,, Ooaza Sakasagawa, Tanagura-machi, Higashishirakawa-gun, Fukushima-ken, Japan

Filed Oct. 31, 1989, Ser. No. 429,407
Claims priority, application Japan, May 17, 1989, 1-56912
Int. Cl.[5] A41B 3/00, 3/18
U.S. Cl. 2—116 15 Claims



1. In shirt collars having neckbands of arcuate length to encircle at least partially the wearer's neck, an improved shirt collar comprises more than one soft layer disposed on the inside of the neckband, each soft layer being arcuately shorter than the neckband length, at least a pair of said layers having an arcuate space therebetween, whereby the soft layers reduce pressure on the neck of a wearer and give the shirt collar durability.

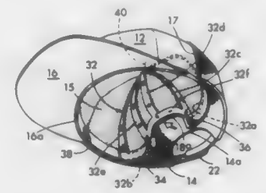
4,989,270

CONVERTIBLE CAP

Larry R. Boughten, 13680 N. Lynch Rd., Hugo, Minn. 55038

Filed Jul. 24, 1989, Ser. No. 384,558
Int. Cl.[5] A42C 5/04
U.S. Cl. 2—171.7 12 Claims

1. A convertible cap comprising, a dome-shaped crown having a front portion formed from cloth and a rear portion formed from flexible open-woven mesh to facilitate air transfer through the cap, a visor attached to the crown and extending outwardly therefrom, a movable divider formed from flexible sheet material positioned inside the cap and joined to the inside of the crown along an arcuate transversely extending line of attachment, the divider being adapted to be deflected rearwardly to a position conforming to the inside of the mesh during cool or inclement weather, a pliant headband portion at the lower edge of said divider formed from soft, supple material adapted to conform to the head contours to serve as a comfortable band for engagement with the forehead when the divider is deflected to a forward position and for engagement



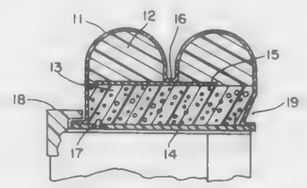
with the rear of the head when the divider is deflected to a rearward position in contact with the mesh, the divider then resting on a portion of the head that would otherwise be exposed through the mesh.

4,989,271

HEADPHONE CUSHIONING

Roman Sapiejewski, Boston, and John J. Breen, Southboro, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Aug. 24, 1989, Ser. No. 398,132
Int. Cl.[5] A42B 1/06; H04R 5/33
U.S. Cl. 2—209 5 Claims



1. An improved cushion having an inner edge and an outer edge for use on a headset with earcups comprising:

a thin flexible front skin having a circumferential groove,

a thin flexible ring of a first width attached to said circumferential groove,

a flexible rear skin,

a foam ring which rests on said rear skin,

said front skin sealed to said rear skin so as to form a sealed region of a fifth width having a gel space with said flexible ring and said foam ring between said front and rear skins to define inner and outer gel rings of a second and a third widths respectively,

gel in said gel space, and

structure for attaching said cushion to a headset.

4,989,272

TROUSER CONSTRUCTION

Yitzhak Wagner, 13 Zerubavel Street, Haifa, Israel

Filed May 14, 1990, Ser. No. 523,227
Claims priority, application Israel, Mar. 18, 1990, 093784
Int. Cl.[5] A41D 1/06
U.S. Cl. 2—227 11 Claims

1. A pair of anatomically fitted trousers serving to prevent friction or pressure onto the genitals while presenting the image of long legs of the wearer, comprising:

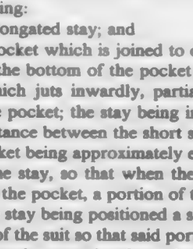
a waistband;

two rear leg portions interconnected along the buttocks by a central seam;

a substantially rectangular abdominal belt portion connected along the top thereof to said waistband and connected along sides thereof to said rear leg portions;

a substantially triangular crotch panel having a horizontal top side adjacent the bottom side of said abdominal belt portion and extending with a bottom apex thereof to the perineum region;

two front leg portions each having a top portion including a horizontal edge and a downwardly angled inner side edge portion, said inner side edge portion of said top portion being connected to a respective side edge of said triangular crotch panel by a seam substantially coexistent with a



respective hip joint of the wearer, and a seam connecting said horizontal edge to said belt portion, the vertical sides of each said front leg portion being connected to the vertical sides of the respective said rear leg portion, along the leg outside and the leg inside respectively; and

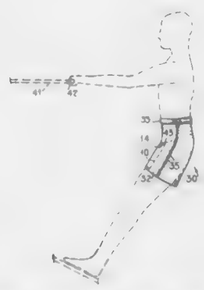
pockets extending from openings in any of the seams connecting the front leg portions with any of the other components of said trousers.

4,989,273

SWIMWEAR STAY FOR WATER SKIERS

Hendrick L. Cromartie, 2 Ridgewood Rd., Rome, Ga. 30161

Filed Oct. 23, 1989, Ser. No. 424,928
Int. Cl.[5] A41D 7/00, 27/20
U.S. Cl. 2—231 7 Claims



1. In a boxer-type bathing suit with a pair of legs, the improvement comprising:

(a) at least one elongated stay; and

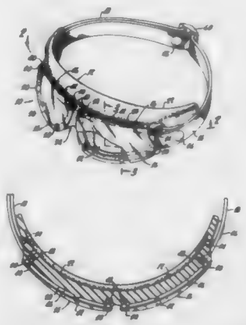
(b) at least one pocket which is joined to one of the legs of the suit along the bottom of the pocket and which has a short seam which juts inwardly, partially blocking the entrance to the pocket; the stay being insertable into the pocket; the distance between the short seam and the bottom of the pocket being approximately equal to the overall length of the stay, so that when the stay is disposed entirely within the pocket, a portion of the stay abuts the short seam; the stay being positioned a sufficient distance below the top of the suit so that said portion is adapted to lie below a natural crease that forms between a wearer's torso and his thigh proximate the stay when his body is bent forward at the hips.

4,989,274

SPORTS GOGGLES

Kazimir J. Pateiski, III, Costa Mesa, Calif., assignor to Sport Eyes Enterprises, Inc., Costa Mesa, Calif.

Filed Nov. 13, 1989, Ser. No. 435,711
Int. Cl.[5] A61F 9/04
U.S. Cl. 2—436 6 Claims



1. A sports goggle for water sports, downhill skiing and other sports, said sports goggle comprising:

a. a frame having left and right vision openings and having an anterior surface and a posterior surface, said frame being constructed of a resilient and flexible material so as to enable said posterior surface to fit relatively closely to a wearer's face when the goggles are worn with the left and right vision openings in front of the wearer's respective left and right eyes;

b. at least one lens contoured and sized for covering said vision openings in said frame, said at least one lens including left and right individual lenses sized and contoured to cover a corresponding one of said left and right vision openings in the frame;

c. combination lens attaching and primary lens spacing means for detachably attaching said at least one lens to the anterior surface of the frame in a spaced apart relationship in order that said at least one lens covers said left and right vision openings, said combination lens attaching and primary lens spacing means include at least four mounting bosses for each of said lenses, said mounting bosses extending forwardly from said frame anterior surface around each of said vision openings, each of said mounting bosses being formed with a forwardly-opening recess, said combination lens attaching and primary lens spacing means further including rearwardly projecting attachment pins mounted to each of said left and right lenses in locations corresponding to said mounting bosses, said lenses being attached to said frame by the forced insertion of said pins into said recesses; and

d. secondary lens spacing means for enabling said at least one lens to maintain said spaced apart relationship with the anterior surface of the frame after the attachment of said at least one lens thereto, thereby assuring an air gap between said at least one lens and underlying regions of said anterior surface of the frame.

4,989,275

FLUSHABLE VEHICLE SPITTOON

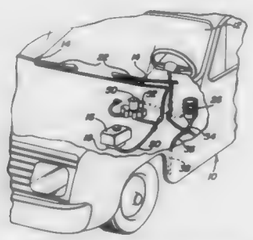
Dan L. Fain, Rte. 1, Box 82, Chancellor, Ala. 36316

Filed Apr. 8, 1986, Ser. No. 849,304
Int. Cl.[5] A61J 19/04
U.S. Cl. 4—262 11 Claims

1. In combination with a motor vehicle including a passenger compartment having a stationary component therein, a flushing liquid reservoir, a flushable spittoon, said spittoon including an upwardly opening receptacle incorporating a

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lower closure structure defining a gravity-type drain outlet opening therethrough toward which at least major portions of the upper surface of said lower closure structure are downwardly inclined, said receptacle and component including coacting support means supporting said receptacle in predetermined stationary position from said component within said compartment for ready manual release of said receptacle from said component and also subsequent ready re-support of said receptacle from said component through usage of single arms and hand movements independent of the use of tools, a flexible tubular drain line having one end operatively connected to said drain outlet for receiving liquid draining from said receptacle



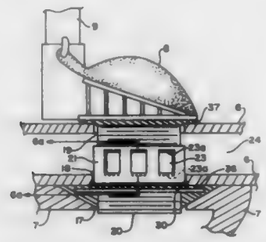
through said outlet, and flushing liquid delivery means operatively associated with said receptacle and reservoir for selectively pressure discharging flushing liquid from said reservoir into said receptacle, said coacting support means and flexible tubular drain line enabling single handed manual release of said receptacle from said component, manual displacement of the receptacle from an area adjacent said component to an area adjacent the head of the operator of the vehicle and subsequent manual return of the receptacle to said area adjacent said component and re-support of said receptacle from said component without requiring direct vision on the part of the operator of the vehicle.

4,989,276

VENTILATED TOILET

Henry H. Martens, #209-33095 Old Yale Rd., Abbotsford, B.C., Canada V2S 6C7

Continuation of Ser. No. 155,820, Feb. 16, 1988, abandoned. This application Feb. 17, 1989, Ser. No. 313,284
Int. Cl.[5] E03D *9/05*
U.S. Cl. 4—349 6 Claims



1. A ventilating system for eliminating odiferous air from a commode of the type including a toilet bowl connected to a water tank via a bracket extension having an open port where the open port of the bracket extension communicates with the water discharge opening of the tank, and where the water tank includes a base portion, rear portion and an overflow flush valve, the ventilating system comprising:

a base vent channel integrally formed along the interior of the base portion of the water tank, said base vent channel forming an air and water tight enclosure between the water tank discharge opening and the remainder of the water tank, said base vent channel having an upper water discharge opening on its top surface;

an exhaust port aperture formed through the rear portion of the water tank;

a rear vent channel integrally formed along the interior of the rear portion of the water tank and communicating with said base vent channel to form a continuous air and water tight passageway for ventilating flow, said rear vent channel separating said exhaust port aperture located in the rear portion of the water tank from the remainder of the water tank;

a vent adapter comprising an elongated tubular body inserted perpendicularly through said base vent channel and extending upwardly through said upper water discharge opening to connect to the overflow flush valve pipe of the water tank in an air and water tight manner, and extending downwardly through the water tank discharge opening and the open port of the bracket extension to connect to the bracket extension in an air and water tight manner, and further comprising vent apertures located radially upon the portion of said tubular body of said vent adapter that resides within said base vent channel said vent apertures having beveled upper and lower edges along the longitudinal axis of said vent adapter, said upper and lower edges beveled upward and radially outward so as to channel downward flow of flushwater thereby minimizing diversion of flushwater through said apertures; and

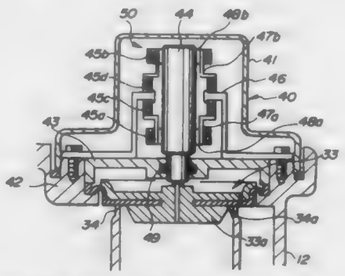
a ventilating pipe connected in an air and water tight manner to said exhaust port and adapted to be connected to a remote exhaust fan means.

4,989,277

TOILET BOWL FLUSHING DEVICE

Osamu Tsutsui; Hisato Haraga; Atsuo Makita, and Hirofumi Takeuchi, all of Kanagawa, Japan, assignors to Toto Ltd., Fukuika, Japan

Filed Mar. 2, 1989, Ser. No. 317,929
Claims priority, application Japan, Mar. 2, 1988, 63-49993; May 13, 1988, 63-117460; May 27, 1988, 63-130949
Int. Cl.[5] E03D *5/10, 1/36*
U.S. Cl. 4—367 11 Claims



1. A toilet bowl flushing device comprising:

water supply means for supplying flushing water to a toilet bowl, said water supply means including flow rate control valve means for controlling a rate of flow of flushing water to be supplied to the toilet bowl;

actuator means for actuating said flow rate control valve means through a reciprocally movable plunger, said actuator means being operable in an inching manner so that the plunger is axially moved in increments or decrements of minute distance; and

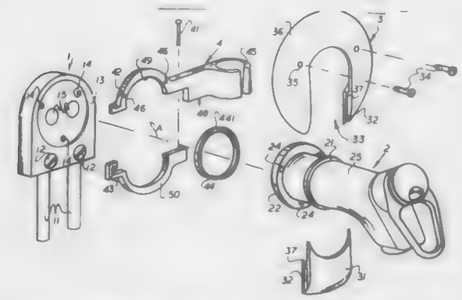
control means operable according to a predetermined flow rate pattern program for controlling operation of said actuator means to vary the rate of flow of flushing water by moving the plunger in a stepwise manner in one flushing cycle with respect to time from a time to start flushing the toilet bowl to a time to finish flushing the toilet bowl.

4,989,278

WALL-MOUNT FAUCET WITH ACCESSORY-HOLDING BRACKET

Jan R. Kostorz, Menden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Mar. 1, 1990, Ser. No. 487,429
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1989, 3907587
Int. Cl.[5] A47K *4/00*
U.S. Cl. 4—570 12 Claims



12. The wall-mount faucet assembly comprising:

a mounting fitting adapted to be fixed in the wall and connected to incoming hot- and cold-water lines, the fitting being formed with an outwardly directed seat provided with hot- and cold-water ports;

a mixing faucet having a substantially cylindrical body centered on an axis and having an end complementarily fittable with the seat;

fastening means for securing the faucet to the fitting with the end fitted tightly in the seat;

a holder having an annular mounting bracket including two parts engageable complementarily around the faucet body adjacent the base and against the wall and provided with a radially projecting arm;

locking means for securing the two bracket parts together and thereby clamping the bracket to the faucet body;

an annular cover plate engageable around the faucet body and axially over the bracket and against the wall, the cover plate including

an annular inner ring snugly engaged around the faucet body and having an outwardly convex outer surface, and

an annular outer ring snugly engaged around the inner ring and having an inner surface complementarily engageable with and slidable on the outer surface of the inner ring; and

means for securing the cover plate to the bracket.

4,989,279

MODULAR BATHING FACILITY

Samuel O. Powell, 1115 Oak Hill Ave., Hagerstown, Md. 21740

Filed Mar. 20, 1989, Ser. No. 325,433
Int. Cl.[5] A47K *3/22, 3/23*
U.S. Cl. 4—612 3 Claims

1. A modular bathing facility in portable kit form for site erection and for personal use during a temporary period of on-site activities, comprising:

(a) at least one personal privacy compartment of disposable water resistant materials, comprising:

(1) a shallow water holding tub that also serves as a floor for said compartment;

(2) first and second wall panels for attachment to opposing sides of said tub;

(3) a cap for bridging the tops of said wall panels; and

(4) a means for entry and exit from said privacy compartment; said

(b) a manually activated plumbing subsystem comprising:

(1) a first flexible hose for connection of said bathing facility to an external supply of pressurized water;

(2) a timer valve for connection to the output of said first hose responsive to manual adjustment by an attending bather for controlling the flow and automatic shut-off of said pressurized water supply;

(3) a "Tee" coupler having a receiving port communicating with the output of said timer valve, and first and second exit ports;

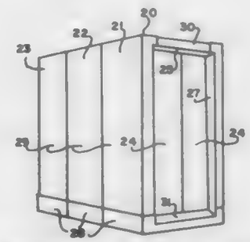
(4) a shower bathing subassembly comprising a shower head, a manually operable valve for regulation of said shower, and a flexible hose and wand linking said first exit port of said "Tee" coupler to said shower valve;

(5) a waste water filter and evacuation pump subassembly connected to the second exit port of said "Tee" coupler, operative by the flow of said pressurized water in response to manual adjustment of said timer valve, said pump and filter subassembly adapted for communicating with said tub floor for filtering and evacuation of substantially all of the waste fluids of bathing, for recovery of hazardous particles and contaminants of bathing, and for discharge of filtered residual water, said subassembly comprising:

an evacuation pump comprising a three port venturi chamber;

means for connecting the input pressure port of said venturi chamber to said second exit port of said "Tee" coupler;

means for connecting the suction port of said venturi chamber to said waste water filter;



means for connecting the discharge port of said venturi chamber to an external drainage disposal site;

a waste water filter, responsive to the action of said pump, comprising:

a semi-rigid thin wall tubular base comprising a first end opening adapted for contact with said tub floor with the surface perimeter of said first end opening comprising a multiplicity of substantially uniformly distributed openings for suction pickup of waste water, said tubular base extending upward to form a cavity therein before terminating in a second end opening;

a first replaceable prefilter for coarse particles for placement in multiple layers completely filling a first portion of said tubular base cavity adjacent to and in contact with said tub floor;

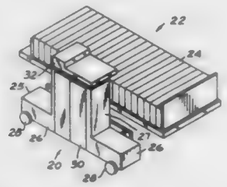
a second replaceable prefilter for medium size particles for placement in multiple layers completely filling a second portion of said tubular base cavity superimposed upon said first prefilter for coarse particles;

a transparent cartridge type filter case comprising an internal cavity; a top opening into said internal cavity; a multiplicity of inlet ports distributed in substantial uniformity in the bottom of said filter case for directing prefiltered waste fluids to the input zone of said filter cavity, said filter case and inlet ports adapted for secured assembly within said second end opening of said tubular base;

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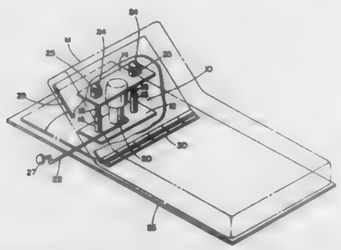
a replaceable polishing filter for insertion through said top opening of said transparent filter case;
a detachable cap for enclosing said top opening of said transparent filter case;
an exit passageway for filtered waste water within said detachable cap;
means for sealing said detachable cap, said filter case and said polishing filter to force said waste fluids through said polishing filter; and
means for connecting said cap exit passageway to said suction port of said evacuation pump.

4,989,280
AUTOMATICALLY ACTUATED INVALID BED TOILET SYSTEM
Richard M. Bair, 902 Roselawn, Rochester, Mich. 48063
Filed Feb. 6, 1990, Ser. No. 475,837
Int. Cl.[5] A61G *7/02*
U.S. Cl. 5—90 **26 Claims**



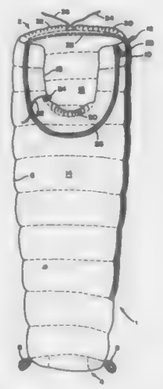
1. A combination comprising:
an air inflatable hospital bed having a plurality of air inflatable sacks at the head, foot and center of the bed;
a toilet unit comprising an outer cabinet placed alongside said hospital bed near said center, said toilet unit including said outer cabinet receiving a seat bedpan assembly in an unactuated first position; and
means for moving said seat bedpan assembly to a position overlying said center of said hospital bed.

4,989,281
ADJUSTABLE BED FOR A TRUCK-TRAILER SYSTEM
Daniel L. Christensen, 2 Central Dr., Port Deposit, Md. 21904
Filed May 16, 1990, Ser. No. 524,454
Int. Cl.[5] B62D *25/00*; **A61G** *7/015*; **B60N** *2/02*
U.S. Cl. 5—118 **4 Claims**



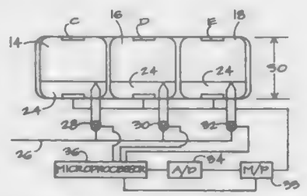
1. In combination with a truck-trailer system, an adjustable bed arrangement for use in the limited confinement of a truck-trailer system, comprising, two base members, one of which is fixed and the other movable, means for pivotally coupling said base members together so that one member thereof can be angularly elevated, a pair of vertically arranged spaced members positioned below said base member that can be angularly elevated, the upper of said pair of vertically arranged members having spaced roller members in contact with the undersurface of said member that can be angularly elevated, means positioned between said pair of spaced members for elevating the upper spaced member, and means for applying pressure to said spaced members to cause said rollers to elevate the angularly elevated member.

4,989,282
EXTENDABLE SLEEPING BAG
Mark Goldstein, 2696 Troy Rd., Schenectady, N.Y. 12309
Filed May 17, 1990, Ser. No. 525,350
Int. Cl.[5] A47G *9/06*
U.S. Cl. 5—413 **16 Claims**



12. An improved type of sleeping bag, said sleeping bag comprising a tubular body made from an insulating material, a cavity within said body and a closed bottom end, the improvement comprising:
an opening on a top portion of said bodY whereby a person can lay within said bag and have his or her face located in said opening and thereby be completely exposed to the environment exterior to the sleeping bag;
a panel member sized to completely cover said opening and means for attaching said panel member to said body about said opening; and
a hood member and means for attaching said hood member to said body whereby the addition of said hood member and said panel member to said sleeping bag body allows the sleeping bag to comfortably house in mummy fashion a person that is longer than could be comfortably housed in mummy fashion within said sleeping bag prior to the addition of said panel member and hood member.

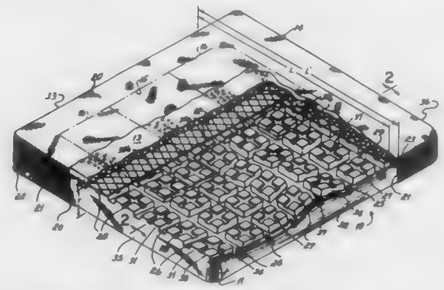
4,989,283
INFLATION CONTROL FOR AIR SUPPORTS
Thomas A. Krouskop, Stafford, Tex., assignor to Research Development Foundation, Carson City, Nev.
Filed Jun. 12, 1989, Ser. No. 364,776
Int. Cl.[5] A61G *7/04*
U.S. Cl. 5—453 **14 Claims**



1. A method of controlling the inflation of a mattress having a plurality of air cells comprising,

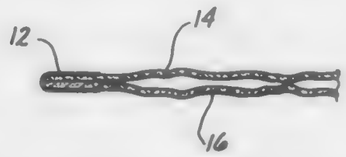
placing a user on the mattress in a first position,
inflating the air cells to provide the desired support of the user,
measuring the height distance of each of the air cells at plural paints,
storing the location and measurement of the plural height distances of all of the cells,
monitoring the height distance of the air cells and determining the position of the user on the mattress, and
controlling the inflation of the air cells when the user is in the first position to adjust the height distance of the air cells to the stored measurements.

4,989,284
CUSHION
Paul B. Gamm, Cincinnati, Ohio, assignor to The Kendall Company, Boston, Mass.
Filed Oct. 12, 1989, Ser. No. 420,272
Int. Cl.[5] A47C *27/00*
U.S. Cl. 5—468 **19 Claims**



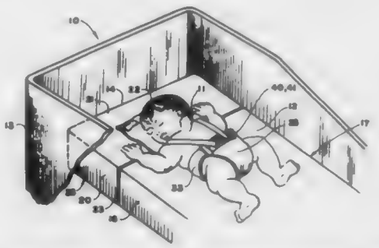
1. A cushion comprising
a series of pods connected in a matrix configuration, said pods being deformable in response to a person seated on said cushion, said pods cooperating to define primary airflow channels through said cushion edges from side edge to side edge and from front edge to back edge of said cushion, and
a series of recesses defined in said pods' top surfaces, said recesses cooperating to define secondary airflow channels through said pod edges from side edge to side edge and from front edge to back edge of each pod, and said recesses each being of a generally cruciform configuration.

4,989,285
SECURITY BLANKET WITH TACTILE CHARACTERISTICS SIMULATIVE OF THE AMNION AND AMNIOTIC FLUID WITHIN THE SAME
Jeanelle N. Troncone, and Gregory A. Troncone, both of 10839 Eldora Ave., Sunland, Calif. 91040
Filed Jun. 19, 1989, Ser. No. 367,988
Int. Cl.[5] A47G *9/02*
U.S. Cl. 5—482 **12 Claims**



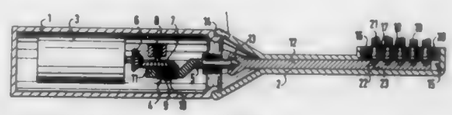
1. An apparatus for providing pacification to an infant by tactile simulation of an amniotic environment comprising:
a first textile sheet having a first type of tactile characteristic and having a peripheral boundary;
a second textile sheet having a second type of tactile characteristic and having a peripheral boundary, said first and second sheets selectively coupled together to allow slipping of said first and second sheets with respect to each other when manually manipulated by said infant, so that said apparatus is tactilely simulative of said amniotic environment,
wherein said first and second sheets, have a common peripheral boundary and are connected together only at their common peripheral boundaries.

4,989,286
BEDDING ARTICLE FOR SUPPORTING INFANTS WITH GASTROESOPHAGEAL REFLUX CONDITION
Ann Tucker, P.O. Box 641378, Kenner, La. 70064
Continuation-in-part of Ser. No. 118,635, Nov. 9, 1987. This application Nov. 7, 1989, Ser. No. 432,920
Int. Cl.[5] A47G *9/04*
U.S. Cl. 5—482 **6 Claims**



1. A bedding article for supporting reflux babies upon an underlying crib mattress in an inclined position comprising:
(a) a band of bedding material defining a partial covering for the crib mattress and forming a tensile load carrying connection therewith, the band having a lower end portion positioned during use at the middle area of the mattress;
(b) an infant support sling, connected to the band of bedding material at the lower end portion thereof and including a central panel portion, a left panel portion, and a right panel portion that can connect to define a diaper that covers the infant's groin and pelvic area, with leg apertures accommodating the infant's legs, the leg apertures being pointed generally away from the tensile load carrying connection so that when the mattress is inclined, the diaper supports the infant and the band carries the infant's weight to prevent a sliding of the infant down the mattress during use.

4,989,287
ELECTRIC TOOTHBRUSHES
Benjamin Scherer, Zürich, Switzerland, assignor to Gimelli & Co. AG, Zollikofen, Switzerland
Filed Aug. 18, 1989, Ser. No. 395,533
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830649; European Pat. Off., Feb. 8, 1989, 89102098
Int. Cl.[5] A46B *13/02*
U.S. Cl. 15—22.1 **17 Claims**

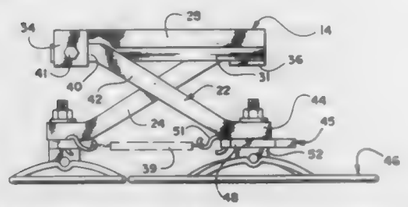


1. An electric toothbrush comprising:

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a handle;
a brush member connected to the handle and including a brush head having a plurality of cylindrical and axially rotatable bristle holders, wherein each bristle holder comprises a cam eccentrically extending from a bottom portion of the bristle holder;
a connecting rod extending along the brush member for oscillating said bristle holders, said connecting rod having a plurality of substantially transverse grooves engaged with the cams of the bristle holders; and
driving means located within the handle and connected to the connecting rod for moving the connecting rod in a reciprocating manner along a longitudinal direction of the brush member,
wherein the brush member is connected to the handle such that the brush member is rotatable about its longitudinal axis, and the connecting rod is fixed within the brush member such that the connecting rod is not axially rotatable independent of the brush member, said driving means producing an oscillatory rotation of the connecting rod about its longitudinal axis, in addition to moving the connecting rod in a reciprocating manner along the longitudinal direction of the brush member.

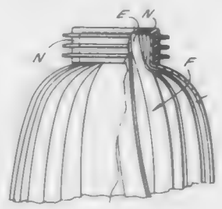
4,989,288
SWEEPING AND DUSTING APPARATUS
Terry D. Moore, 2415 Hinton Rd., Dacula, Ga. 30211
Continuation-in-part of Ser. No. 381,014, Jul. 17, 1989. This application Feb. 1, 1990, Ser. No. 473,348
Int. Cl.[5] A47L *1/02*
U.S. Cl. 15—98 10 Claims



6. In combination, a fork lift comprising an industrial truck, and a pair of forks extending forwardly therefrom, and sweeping apparatus, said sweeping apparatus comprising a carrier and a plurality of dust mops mounted on said carrier, said carrier including sleeve means for receiving said forks, and means for mounting said plurality of dust mops with respect to said carrier, said plurality of dust mops including a first dust mop disposed transversely of said industrial truck, a second dust mop forward of said first dust mop and angularly disposed with respect thereto, and a third dust mop forward of said first dust mop and angularly disposed with respect thereto, said second dust mop and said third dust mop being at opposite sides of said forks, the inner adjacent ends of said second dust mop and said third dust mop being adjacent to the forward side of said first dust mop, the outer ends of said second dust mop and said third dust mop being forward of said inner ends.

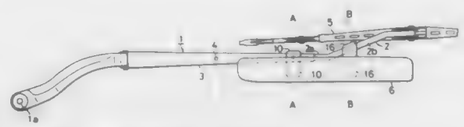
4,989,289
CLEANING EQUIPMENT SUCH AS A MOP, MADE OF STRIPS OF ABSORBING MATERIAL
Andrea Bargellini, Via Parigi No. 15, 50065 Pontassieve, Firenze, Italy
Filed Aug. 17, 1987, Ser. No. 86,493
Claims priority, application Italy, Sep. 2, 1986, 9468 A/86
Int. Cl.[5] A47L *13/20*
U.S. Cl. 15—229.1 5 Claims

1. A cleaning implement comprising:
a lengthwise arrangement of a bunch of strips made of absorbing material, one end of said lengthwise bunch of strips being compressed together with the opposite end of said bunch remaining free, and
an injection-molded core of thermoplastic resin material peripherally surrounding said compressed end of strips,
said core of thermoplastic resin material being produced by injection molding while an end of said bunch of strips is compressed peripherally by clenching means (1,



3, 5) cooperatively associated with an injection mold, said mold including a plurality of orifices (10) distributed about said compressed strips, such that the resin injected under pressure from the orifices penetrates throughout the compressed ends of said bunch of strips and also forms a core which peripherally surrounds and anchors said compressed strips together while the opposite end of said bunch of strips remain freely extending.

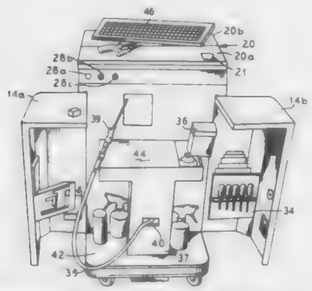
4,989,290
WIPER ARM EQUIPMENT
Takashi Hoshino, Isesaki, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan
Filed Aug. 7, 1989, Ser. No. 390,659
Claims priority, application Japan, Aug. 9, 1988, 63-105162[U]
Int. Cl.[5] A47L *1/02*
U.S. Cl. 15—250.42 8 Claims



1. Wiper arm equipment, comprising:
a wiper shank; a wiper blade; an arm piece connecting said wiper shank to said wiper blade; a wing to be mounted on and to be fixed to said arm piece; a pair of insert plates joined to said wing as respective integral parts of said wing; and a pair of screw holes bored in each insert plate a predetermined distance from each other, one of said screw holes being arranged to confrontingly align with said arm piece when said wing is mounted on the arm piece, and the other of said screw holes being arranged out of confronting alignment with the arm piece, when said wing is mounted on the arm piece.

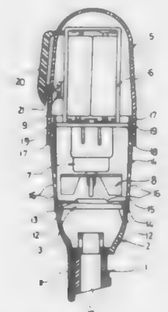
4,989,291
COMPUTER SERVICING CART
Richard Parent, Lake Bluff, Ill., assignor to Alternative Resources Corporation, Lincolnshire, Ill.
Filed Mar. 8, 1990, Ser. No. 491,570
Int. Cl.[5] A47L *5/00*
U.S. Cl. 15—315 6 Claims

1. A portable cart for use in cleaning computer systems at remote locations which includes:
a housing mounted on wheels for movability wherein said housing includes a rear compartment and a front compartment, said rear compartment storing vacuum means, compressed gas means and compressed gas distribution hose means associated with the compressed gas means and an electric power means;
said compressed gas means being stored on one side of the housing, said vacuum means being stored on the other side of said housing; said compressed gas distribution hose



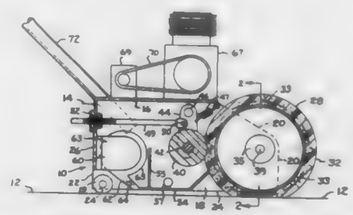
means including a reel on which said hose means is stored positioned between the compressed gas means and vacuum means, said hose being extendable from said reel;
said housing having a floor and said floor defining a well therein which is aligned with the hose reel and at least a portion of the hose reel fits into the well so as to minimize the height of the hose reel relative to a support surface.

4,989,292
SMALL DUST CATCHER
Chin-Lin Hwang, 5Fl., No. 1-3 Lane 178, Chuang Ching Rd., Taipei, Taiwan
Filed Dec. 1, 1989, Ser. No. 444,826
Int. Cl.[5] A47L *5/24*
U.S. Cl. 15—344 10 Claims



1. A small dust catcher, comprising:
a main tube which includes a lower end, an upper end, a partition wall and an outlet vent, the partition wall being located near the lower end, the partition wall including a central opening;
an inlet section which is releasably connected to the main tube, the inlet section including an inlet opening and an upper opening;
a filter assembly which includes a filter and an upright positioning piece, the filter assembly being removably supported within the upper opening of the inlet section, the upright positioning piece of the filter assembly being located within the central opening of the partition wall;
a one piece assembly which is releasably connected to the main tube, the one piece assembly including:
(a) a fan for drawing air through the inlet opening of the inlet section, through the filter and through the outlet vent of the main tube, the fan being located within the main tube;
(b) a motor for rotating the fan; and
(c) a battery case for supplying power to the motor;
a cover which covers the battery case, the cover being releasably connected to the main tube; and
a switch for turning the motor on and off.

4,989,293
TENNIS COURT DRYING MACHINE
Murali Bashyam, 1417 Elberon Pl., Raleigh, N.C. 27609
Filed May 15, 1989, Ser. No. 351,931
Int. Cl.[5] A47L *11/292*
U.S. Cl. 15—383 2 Claims



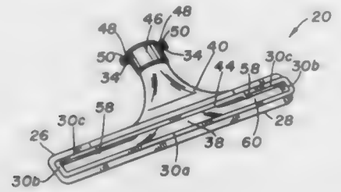
1. Mechanism for removing water from tennis courts, comprising:
a carriage that includes a horizontal platform (16) and two downwardly extending skirt side walls (18);
a first axially elongated relatively large diameter roller rotatably mounted on said carriage between said skirt side walls for rolling movement along a tennis court surface; ssid first roller having a sponge sleeve thereon adapted to absorb water as it contacts the court surface;
a second relatively small diameter roller mounted on said carriage between on skirt side walls and directly behind the relatively large diameter roller;
spring means biassing said small diameter roller into pressure contact with the surface of the sponge sleeve on the large diameter roller, whereby water is squeezed out of the sponge sleeve;
a water collection tank mounted on said carriage directly below the small diameter roller for collecting water that has been squeezed out of the sponge sleeve;
a horizontal axis blower mounted on the carriage below said platform and directly behind said water tank, said blower having a downwardly directed slot-like discharge nozzle (62) extending transversely between the skirt side walls; the transverse dimension of the nozzle being substantially the same as the axial dimension of the sponge sleeve on the relatively large diameter roller; and
an engine mounted atop said platform for supplying power required to run said blower.

4,989,294
FLOOR CLEANING TOOL FOR VACUUM CLEANER
Ernest J. Fischer, Skokie, Ill., assignor to Breuer Electric Mfg. Co., Chicago, Ill.
Filed Jul. 28, 1989, Ser. No. 386,959
Int. Cl.[5] A47L *9/02*
U.S. Cl. 15—415.1 14 Claims

1. An improved floor tool for vacuum cleaning surfaces, comprising first and second injection molded plastic housings each configured to define portions of an air inlet to, an air outlet from and an interior air flow chamber of said floor tool, said first and second housings initially being formed as separate housings; and means for integrally joining said first and second housings to form said floor tool, said floor tool having said air inlet thereto, said air outlet therefrom and said interior air flow chamber between said air inlet and outlet, said interior air flow chamber having surfaces defining a smoothly contoured flow

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path for air between said air inlet and outlet, wherein said first and second housings each have flange portions which, when



said housings are integrally joined, define an accessory supporting flange surrounding said air inlet to said floor tool.

4,989,295

TELESCOPIC GUIDE WAND FOR FLOOR-CLEANING APPLIANCES

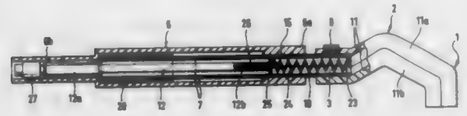
Wieland Gühne, Remscheid; Peter Hannemann; Hans-Joachim Birr, both of Wuppertal, and Jürgen Jäger, Witten, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed May 7, 1990, Ser. No. 520,019

Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914840

Int. Cl.[5] **A47L** *9/32*

U.S. Cl. 15—410 **4 Claims**



1. A guide wand for floor-cleaning apparatus having an electric motor such as a vacuum cleaner, the guide wand comprising:

an elongated upper member including a handle and an electric cable extending through said handle;

an upper tube connected to said handle and defining a cable stowing cavity for accommodating and stacking a first segment of said cable;

an elongated lower member including a lower tube for telescopically receiving said upper tube therein so as to permit said upper tube to be drawn upwardly to cause said tubes to be in a telescopically extended position and to be telescopically collapsed to be in a telescopically collapsed position;

said tubes being concentric and defining a common longitudinal axis;

electrical connecting means mounted in said lower tube for connecting to the electric motor of the apparatus; and, said cable having a lower end connected to said electrical connecting means;

a cable guide disposed in said lower tube for holding a second segment of said cable, said cable guide being connected to said upper tube so as to move therewith as said upper tube is moved relative to said lower tube between said positions;

a guide sleeve mounted in said lower tube concentric with said cable guide and so as to be movable along said axis;

stop means formed in said lower tube to limit the movement of said guide sleeve and prevent said upper tube from being pulled out of said lower tube;

catch means formed on said cable guide for catching said guide sleeve as said upper tube is drawn upwardly thereby moving said guide sleeve into abutting engagement with said stop means; and,

bracing means for bracing said guide sleeve between said tubes when said tubes are in said telescopically extended position.

4,989,296

ADJUSTABLE BRACKET FOR SLIDING DOORS

Walter G. Alderson, Sydney, Australia, assignor to Clive Investments Pty. Limited, New South Wales, Australia

Filed Sep. 26, 1989, Ser. No. 412,484

Claims priority, application Australia, Oct. 6, 1988, 23499/88

Int. Cl.[5] **A47H** *15/00*; **E05D** *15/06*

U.S. Cl. 16—105 **10 Claims**



1. An adjustable support bracket for sliding doors, comprising:

a frame having an elongate slot;

an adjusting lever pivotably connected to said frame and extending across said slot;

an axle extending through said slot and said lever so as to be movable by said lever along said slot and said axle having a central longitudinal axis;

a support roller rotatably mounted to said axle; and

securing means for selectively securing said lever in preselected locations with respect to said frame, and said securing means including means for varying compression of said lever against said frame such that said securing means is adapted to provide a first compression level wherein said lever is in an adjustment mode and a second higher compression level wherein said lever is secured in one of said preselected locations.

4,989,297

TREATMENT OF COTTON

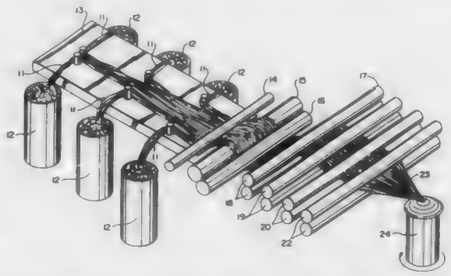
Herzel B. Yecheskel, Bat Yam; Gan Alon, Herzlia, and Eliezer Beck, Rishon Lezion, all of Israel, assignors to Shenkar College of Textile Technology and Fashion, Ramat Gan, Israel

Division of Ser. No. 132,790, Dec. 10, 1987, Pat. No. 4,888,856, and a continuation of Ser. No. 833,987, Feb. 26, 1986, Pat. No. 4,796,334. This application Jun. 15, 1988, Ser. No. 207,252

Claims priority, application Israel, Feb. 28, 1985, 74469

Int. Cl.[5] **D01B** *1/48, 3/04*

U.S. Cl. 19—27 **12 Claims**



7. A device for processing cotton, comprising:

a heat source having a predeterminate temperature;

means for exposing the cotton to said heat source having said predeterminate temperature, for heating the cotton to a preselected maximum temperature;

said means for exposing the cotton to said heat source for heating the cotton to said preselected maximum temperature, exposing the cotton to said heat source for a predetermined period of time sufficient for heating the cotton to the preselected maximum temperature and thereby transforming honeydew, which is adhered to the cotton, to a hard and brittle, readily removable material;

said heat source containing at least one rotatable and heatable roller;

said at least one rotatable and heatable roller possessing at least one circumferential roller surface constituting said means for exposing the cotton to said heat source;

said at least one circumferential roller surface being heatable by said at least one rotatable and heatable roller to said predeterminate temperature; and

means for moving the cotton relative to and in contact with the at least one circumferential roller surface of said at least one rotatable and heatable roller within said predetermined period of time sufficient for heating the cotton to said preselected maximum temperature and transforming said honeydew, which is adhered to the cotton, to said hard and brittle, readily removable material.

[redacted]

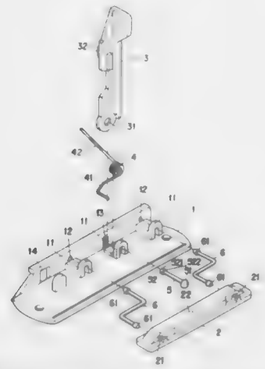
STRUCTURE OF FILE CLIP

Bor-Jou Wang, 3/F No. 740, Ching Chen Road, Yung-Ho, Taipei Hsien, Taiwan

Filed Jun. 5, 1990, Ser. No. 533,316

Int. Cl.[5] **B42F** *1/02*

U.S. Cl. 24—67 R **2 Claims**



1. A file clip, comprising:

a base plate having made thereon three unitary seats, two fixing holes, a fixing notch, and a locking hole;

a clamp plate having made thereon two positioning holes and a guide hole;

a pressure bar having made thereon an axle hole and a lock bolt;

a torsional spring comprising an unitary straight guide rod portion at one end and an unitary driving rod portion at an opposite end;

a mounting axle having an unitary semi-spherical portion at one end and made in an extended size and a conical portion at an opposite end and made in an extended size, said conical portion having a smaller diameter disposed at the outer side and a larger diameter at the inner side; and

two crank levers having each two conical portions at two opposite ends and respectively made in an extended size;

wherein said base plate, said clamp plate, said pressure bar, said mounting axle and said crank levers are respectively made of plastic material through injection molding process and said torsional spring is made of metal material.

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FASTENER MEANS UTILIZING ATTRACTION OF PERMANENT MAGNET

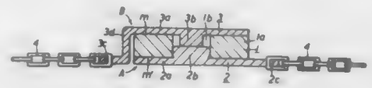
Tamao Morita, 47-1, Arakawa 6 chome, Arakawa ku, Tokyo, Japan

Filed Nov. 14, 1989, Ser. No. 435,930

Claims priority, application Japan, Nov. 15, 1988, 63-286846

Int. Cl.[5] **A44B** *21/00*; **E05C** *17/56*

U.S. Cl. 24—303 **4 Claims**



1. A fastener means utilizing the magnetic attraction of a permanent magnet, which provides an improved magnetic circuit so as to minimize magnetic flux leakage and increase magnetic attraction, comprising:

a member to be attracted which includes a plate made of a ferromagnetic material;

an attraction member which includes a permanent magnet with a through hole in line with its magnetic pole and a ferromagnetic plate with a projection, wherein said attraction member is constructed by forcibly inserting said projection on the ferromagnetic plate in the hole of the magnet in such a manner that the principal surface of the ferromagnetic attractor plate come in close contact with one of the magnetic poles of the magnet to thereby firmly fix the projection inside the hole of the magnet, and that said attracted member's ferromagnetic plate is attracted by and contacts the other magnetic pole of the permanent magnet of said attraction member and contacts said projection erected inside said hole of the said permanent magnet.

4,989,300

COUPLING ELEMENT FOR SLIDE FASTENER

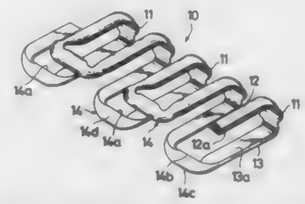
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Dec. 26, 1989, Ser. No. 456,377

Claims priority, application Japan, Dec. 28, 1988, 63-331938

Int. Cl.[5] **A44B** *19/40*

U.S. Cl. 24—391 **8 Claims**



1. A coupling element for a slide fastener which is formed from a substantially cross-sectionally semi-circular monofilamentary material into a continuous meandering structure mounted on a stringer tape, said element having a coupling head, an upper leg and a lower leg respectively extending from opposite ends of said head and a heel interconnecting said legs, at least a portion of said heel protruding beyond the outer surfaces of each of said legs.

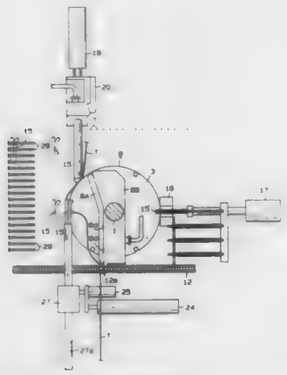
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4,989,301

DRAWING DEVICE

Tomihisa Ishii; Satoshi Horibe; Tadashi Fujii, all of Gifu, and Tetsuji Ohashi, Ichinomiya, all of Japan, assignors to Gifu Prefecture, Gifu, Japan

Filed Oct. 10, 1989, Ser. No. 418,864
Int. Cl.[5] D03J *1/14*
U.S. Cl. 28—206 16 Claims



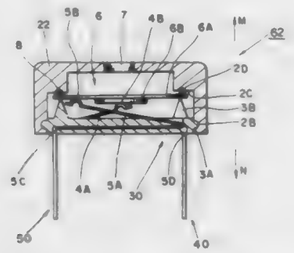
1. A drawing device comprising:
an air guide including an air passage having an entrance and an exit;
air stream generating means operationally connected with said air passage for generating an air stream running from said entrance toward said exit in said air passage;
oppositely arranging means adjacent to said air guide for arranging said entrance opposite to a heald hole of a heald and for arranging said exit opposite to an interval between reed dents of a reed.

4,989,302

METHOD FOR MANUFACTURING PIEZOELECTRIC BUZZER

Toshio Abe; Seiichi Takahashi; Masaharu Kamihara; Hitoshi Saito; Seizo Tanaka, and Yasuyuki Suzuki, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 322,580, Mar. 13, 1989. This application Nov. 1, 1989, Ser. No. 430,565
Claims priority, application Japan, Mar. 17, 1988, 63-35949; Jul. 8, 1988, 63-91091; Jul. 8, 1988, 63-171574; Sep. 9, 1988, 63-119141; Oct. 13, 1988, 63-134274
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—25.35 5 Claims



1. Method for manufacturing a piezoelectric buzzer including a cylindrical case having a closed bottom and an open upper end; a piezoelectric diaphragm supported within said case in spaced parallel relationship with the bottom, the said diaphragm consisting of a circular metal plate having a piezoelectric element of smaller area than the plate adhesively secured to the surface of the plate which faces the open end of the case; a cover plate fitted in the open end of the case and including means on the interior surface thereof for fixing the piezoelectric diaphragm within the case; and first and second terminals each comprising an elongate elastic metal strip bent at first and second spaced apart places to have a substantially straight intermediate portion, a leg angularly extending from one end of the intermediate portion at a first angle with respect thereto and an elastic tongue angularly extending from the other end of the intermediate portion at an acute angle with respect thereto, the intermediate portion of both terminals being integrally molded within said cover plate and disposed in a common plane parallel to the interior surface thereof and parallel to and equally spaced a selected distance from opposite sides of an imaginary line lying on a diameter of the cover plate, with said legs respectively projecting outwardly from the cover plates at points near opposite ends of said imaginary line, and with said elastic tongues projecting diagonally inward from the interior surface of the cover plate and respectively contacting the piezoelectric element and the metal plate, comprising the steps of:
forming in one side surface of each of first and second elongated metal strips a plurality of sets of first and second transverse notches spaced from each other a distance substantially corresponding to the length of the intermediate portion of said terminals, said sets of notches being spaced from each other along the length dimension of the strips by selected intervals;
arranging said strips parallel to each other in a mold so as to extend across a like plurality of circular mold cavities spaced from each other by the spacing between sets of notches, each cavity being dimensioned to form a cover plate, said strips being respectively spaced said selected distance from opposite sides of an imaginary line lying on a diameter of said cavities that is parallel to said strips;
injecting a resin into said cavities for simultaneously integrally molding said metal strips into a like plurality of cover plates;
cutting the metal strips at positions substantially equidistant from adjacent cover plates for separating the cover plates from each other;
bending, at the transverse notches, the strips projecting from a cover plate to form terminal legs which respectively project from the exterior surface of the cover plate at points near opposite ends of said imaginary line, and to form elastic tongues which respectively project diagonally inward from the interior surface of the cover plate;
forming cylindrical cases each having a closed bottom and an open top dimensioned to receive a cover plate;
placing within each case a piezoelectric diaphragm consisting of a circular metal plate having a piezoelectric element of smaller area than the plate secured thereto; and
assembling a cover plate into the open end of a cylindrical case with said tongues elastically contacting said piezoelectric element and said metal plate, respectively.

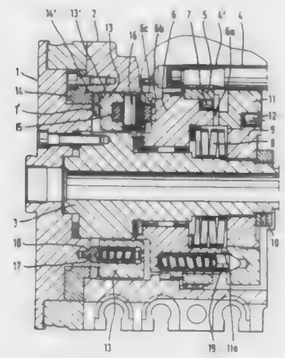
4,989,303

TOOL TURRET

Willy Sauter, Reutlingen; Helmut Thumm, Metzingen; Günther Schips, Metzingen, and Alfred E. Müller, Metzingen, all of Fed. Rep. of Germany, assignors to Sauter Feinmechanik GmbH, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,518
Claims priority, application Fed. Rep. of Germany, May 26, 1988, 3817893
Int. Cl.[5] B23B *29/32;* B23Q *17/00*
U.S. Cl. 29—48.5 A 5 Claims

1. A tool turret, comprising:
a housing;
a turret head coupled to said housing and rotatable relative to said housing by a motor about a rotational axis;
first and second face gears arranged coaxial to said rotational axis, said first face gear being nonrotatably coupled to said turret head, said second face gear being nonrotatably coupled to said housing, said face gears having flanks lying beyond an automatic locking range;
a locking part axially slidable relative to said turret head between locked and unlocked positions, and having a third face gear engaging said first and second face gears in said locked position;
compression spring means for biasing said locking part into said locked position with said third face gear engaging said first and second face gears, axial sliding movement of said locking part to said unlocked position and compressibility of said compression spring means permitting said third face gear to disengage from at least one of said first and second face gears in said unlocked position, said compression spring means exerting a force on said locking part greater than forces exerted thereon in the direction of said unlocked position by said turret head during collision free operation, but smaller than forces exerted thereon in the direction of said unlocked position by said turret head upon a collision exerting a stress upon said tool turret exceeding a predetermined limit; and
a control number coupled to and controlling positioning of said locking part.

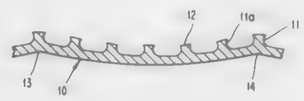


4,989,304

TOOL PLATE FOR ABRASIVE SURFACE SMOOTHING

Yngve Sonefors, Bollnäs, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 192,478, May 11, 1988, abandoned.
This application May 29, 1990, Ser. No. 529,735
Claims priority, application Sweden, May 15, 1987, 8702003
Int. Cl.[5] B24D *11/00;* B23D *71/00*
U.S. Cl. 29—78 3 Claims



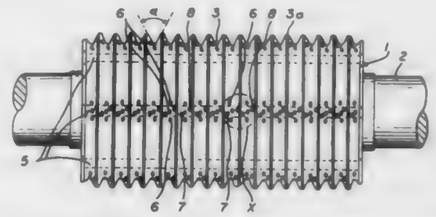
1. Etched tool plate for abrasive surface smoothing of soft materials, comprising a thin metal plate, one side of said metal plate being partly recessed by etching such that non-etched portions of said plate constitute protruding cutting elements having flat tops, said metal plate being slightly deformed from a planar state to define a system of parallel intersecting ridges therein, the deformation of said plate being asymmetric about a mean plane of said plate such that said ridges are relatively sharp in section and delineate valleys which are relatively smooth therebetween a first plurality of said cutting elements being disposed on crests of said ridges with flat tops thereof disposed substantially parallel to said mean plane and a second plurality of said cutting elements being spaced from said crests with the flat tops thereof inclined so as to form acute angles with said mean plane.

4,989,305

SUGAR CANE MILL ROLLER

Kishor M. Pole, and Bhagawan S. Dhavlikar, both of Maharashtra, India, assignors to Walchandnagar Industries Limited, Bombay, India

Filed May 3, 1989, Ser. No. 347,169
Int. Cl.[5] B02C *4/00*
U.S. Cl. 29—121.7 9 Claims



1. An improved sugar cane mill roller for extracting sugar cane juice from sugar cane and bagasse comprising:
a generally cylindrical roller body having a first end and a second end located opposite of said first end, said roller body defining peripheral V-grooves therein, said V-grooves having a first and second flank joined at a bottom, and being formed circumferentially around said roller body and forming a roller surface;
a roller shaft;
an axial bore formed through said roller body, said roller body mounted on said roller shaft;
a plurality of channels defined in said roller body, said channels having two ends and positioned in a spaced apart relationship lying below said roller surface and substantially parallel to said axial bore of said roller body, said channels being open at least at one end;
circumferentially spaced apart holes defined in the bottom of each of the V-grooves, said holes extending from the bottom of the V-grooves to a channel nearest said holes;
circumferentially spaced apart first ports defined in said first flank of each of the V-grooves and extending to a channel nearest said first ports;
circumferentially spaced apart second ports defined in said second flank of each of the V-grooves and extending to a channel nearest said second ports, each of said holes, first ports and second ports being formed with a step therein and having an insert located against each respective step, said inserts being provided with an axial orifice; and
a vacuum system connected to said at least one open end of said channels.

4,989,306

ROLL FOR DIRECTLY CONTACTING A WEB

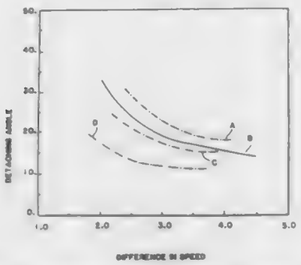
Jorma Leino; Jukka Salo; Veijo Miihkinen, and Ari Talama, all of Jyväskylä, Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Apr. 28, 1989, Ser. No. 345,353
Claims priority, application Finland, Apr. 28, 1988, 882006
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—132 16 Claims

1. A roll for directly contacting a web and from which the web is detached, comprising
a coating formed onto a mantle of said roll,

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said coating partially formed of metal and also including a ceramic material,



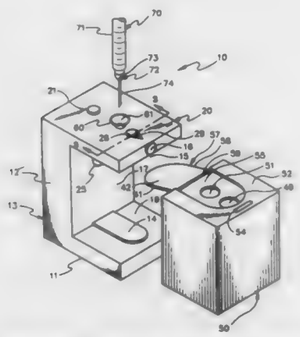
wherein an outer face of said coating is formed of carbide-rich areas composed of metal and ceramic and of metallic matrix areas formed between said carbide-rich areas and which is used in the manufacture of paper.

4,989,307

APPARATUS FOR FACILITATING OF THE REMOVAL AND DISPOSAL OF MEDICAL NEEDLES

Kenneth M. Sharpe, 14791 E. Colgate Dr., Aurora, Colo. 80014, and Mary A. Sharpe, 1116 W. 7th, Columbia, Tenn. 38401

Filed May 11, 1989, Ser. No. 350,501
Int. Cl.[5] B65D *25/00*
U.S. Cl. 29—240 24 Claims



1. An apparatus for removing and disposing of needle assemblies used in combination with medical devices wherein each needle assembly includes a needle portion with a sharp end and a base end, the base end including a hub of generally cylindrical shape, each said hub adapted for cooperative engagement with the medical device to attach the respective needle assembly to the respective medical device for use in combination with the medical device as a medical unit, the apparatus operative to remove needle assemblies having different sized hubs and comprising:

hub rotating means including a rotating member having an outer surface surrounding an axis of rotation adapted for coupling with and rotating hubs of varying diameter at varying distances from said axis of rotation about the longitudinal axis of each respective said hub to cause the respective needle assembly to become detached from the medical device of the medical unit;

hub locator means for maintaining the hub of the needle assembly of the medical unit in a fixed spacial location and orientation in which said hub is coupled with the outer surface of said rotating member to cause the needle assembly to rotate and become detached from the medical device of the medical unit; and

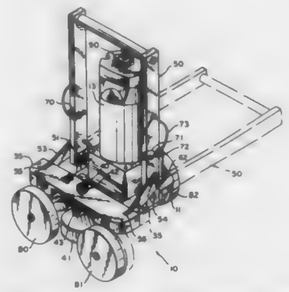
enclosure means for receiving and protectively enclosing the needle assembly after it is detached from the medical device.

4,989,308

BIDIRECTIONAL ROOF SEAMING MACHINE

William J. Sanders, Kansas City, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jun. 20, 1988, Ser. No. 209,331
Int. Cl.[5] B23P *11/00*; B21D *39/02*
U.S. Cl. 29—243.5 5 Claims



1. In a roof seaming machine for forming a seam between adjacent edges of roof panels, wherein said machine has at least one forming roll and an opposed drive wheel, driven by a reversible electric motor, for propelling the machine in either a forward or a reverse direction along the seam and for forming a seam between the forming roll and drive wheel, the improvement comprising:

a directional switch mounted on the machine, in an electric circuit with the reversible electric motor, said switch having a center "off" position and two opposed "on" positions; and

a multi-position directional switch safety guard mounted over the switch, the guard being movable between first and second positions, and comprising means for enabling the switch to be moved between its "off" position and only one of its "on" positions only when the guard is in said first position and for enabling the switch to be moved between its "off" position and only the other of its "on" positions only when the guard is in said second position.

4,989,309

BLADE BINDING CORD GUIDING ARRANGEMENT FOR VENETIAN BLIND MAKING MACHINE

Lin C. Pang, No. 301, Kuang Fu Rd., Chu Nan Village, Miaoli County, Taiwan

Filed May 2, 1990, Ser. No. 518,506
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—24.5 1 Claim

1. A blade binding cord guiding arrangement for venetian blind making machine, comprising:

a housing having a larger chamber and a smaller chamber;

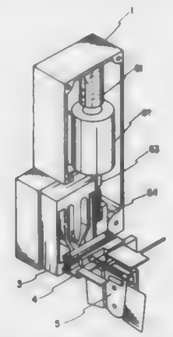
a cover covering the larger chamber of said housing;

a slotted selector assembly being set in the smaller chamber of said housing and including a selector block, a support, a supporting stand, springs, a "Y" shaped sliding way, and a "Y" shaped notch, said selector block having a bottom end connected with a top end of said support and movably disposed in the middle of the "Y" shaped notch, said selector block also comprising a screw bolt mounted on the selector block for connection with said supporting stand by means of a spring, and said support being connected to the middle part of said screw bolt by means of another spring;

a sliding assembly comprising a slide block, a sliding way a sliding rod, a control rod, two platforms and two positioning rods, said slide block comprising pulleys arranged to slide along said sliding way, said sliding rod being slidable in said "Y" shaped sliding way of said slotted selector assembly and to positioned be therein at the left or right position;

an expander mounted on the machine frame set below said sliding assembly; and

a lifter comprising a cushion block, a linear motor, a lifting rod and a guide block, said cushion block being fixedly mounted on an inner top wall surface of the larger chamber of said housing, said linear motor being set in the bigger chamber of said housing below said cushion block, said lifting rod being insertable through said linear motor to freely move upward and downward and having a bottom end connected with said guide block, said guide block



comprising a notch for receiving of said control rod of said sliding assembly;

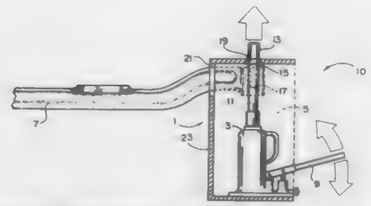
characterized in that when the machine is started, said lifter carries said sliding assembly to lift and to let said slide block be alternatively positioned at the left or right position by means of the motion of said sliding rod in said "Y" shaped sliding way, and to concomitantly drive a ladder-like blade binding cord to move to the predetermined position and to be bilaterally expanded by said expander for smooth insertion of blind blades, and to further let the transverse lines of the ladder-like blade binding cord be intermittently arranged at both lateral sides of the venetian blind control rope, so as to let the blades and the blade binding cord of a finished venetian blind be smoothly piled up together when the venetian blind is collapsed.

4,989,310

KING PIN PRESSING TOOL

Gary Chost, Box 267, Calumet, Okla. 73014

Filed Oct. 25, 1989, Ser. No. 426,437
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—252 4 Claims



1. An improved king pin pressing tool comprising:

(a) a bottom support means adapted to support a jacking means;

(b) a pair of opposed side plates;

(c) a back plate having an opening therein for receiving a king pin containing portion of a vehicle suspension means, said back side plate opening being configured to receive both an I-beam suspension means having a vertically rectangular configuration and an I-beam suspension means and spindle combination having a cross-shaped configuration;

(d) a top plate having an opening therein for receiving a king pin as said king pin is removed from said vehicle suspension means by said jacking means;

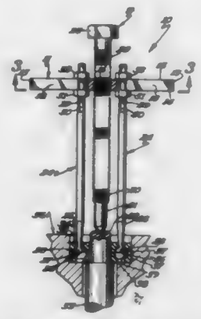
(e) wherein said back plate, said pair of opposed side plates and said top plate form a chamber, said chamber adapted to receive said jacking means.

4,989,311

BEARING PULLER

Leonard L. Rosin, 202 N. Cass, Oberlin, Kans. 67749

Filed Feb. 12, 1990, Ser. No. 478,969
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—259 5 Claims



1. A bearing puller tool for pulling ball bearings from a structure including a housing having a shaft therein journaled in the ball bearing, the ball bearing including an inner and outer race having balls therebetween, comprising:

an elongate rectangular support plate having a centrally located threaded opening therein and a plurality of spaced apart outwardly opening elongate slots therein, each slot extending inwardly from one end of said support plate,

an elongate threaded force applying member threadedly engaging the threaded opening in said support plate and projecting therethrough, one end portion of said force applying member being constructed for engagement with the shaft journaled in the ball bearing to be removed, means on the other end portion of said force applying member for engagement with a device for rotating said force applying member,

a plurality of elongate bearing puller members, each having an anchoring element at one end thereof, said anchoring element being shaped for insertion into the space between the inner and outer races of the bearing to be removed when said associated bearing puller member is oriented into an insertion position, each anchor element being retained by the bearing races when the associated bearing puller member is rotated through an arc of predetermined magnitude from the insertion position to the retention position,

the other end portion of each bearing puller member being threaded and being inserted into one of the slots of said support plate, said other end portion of each bearing puller member having opposed planar confronting surfaces cooperating with an adjacent slot surface to prevent rotation of the bearing puller member,

a pair of nuts threadedly engaging the threaded end portion of each bearing puller member said nuts of one pair being positioned on opposite sides of the support plate for

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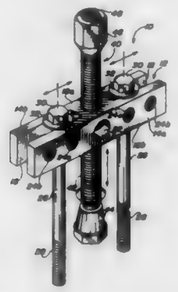
clamping each bearing puller member to the plate whereby, when said force applying member is rotated, the ball bearings engaged by said bearing puller member will be progressively pulled from the associated structure.

4,989,312

UNIVERSAL WHEEL PULLER AND LOCK PLATE COMPRESSOR TOOL

Kris L. Maddalena, 3544 W. Georgia Ave., Phoenix, Ariz. 85019

Filed Feb. 20, 1990, Ser. No. 481,900
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—259 **4 Claims**



1. A tool for pulling steering wheels and compressing lock plates of steering columns in vehicles provided with a steering shaft comprising a frame, said frame having: two pairs of opposed sides, a first threaded opening extending through the approximate center of said frame and between a first pair of opposed sides thereof, a second opening extending through the approximate center of said frame and between a second pair of opposed sides thereof, a channel positioned on both sides of said first opening and extending through said frame and generally parallel to said first opening, third and fourth openings positioned on each side of said second opening and extending a distance into said frame; a threaded center bolt having a head at one end thereof and a threaded socket at the other end thereof, said center bolt being sized such that it may be screwed into and through said first opening and may pass without substantial restriction through said second opening; and a pair of side bolts each having a head end and a threaded end and loosely supportable in each channel by means of said head end; and wherein when said tool is used to pull steering wheels said center bolt is screwed into said first opening of said frame, one of said side bolts is placed in each of said channels and the tool is aligned with said steering shaft in a manner such that the head of said center bolt can contact the end of said steering shaft, and the threaded end of said side bolts can be secured into openings in said steering wheel; and when said tool is used to compress a lock plate, said center bolt is positioned in said second opening of said frame with a nut secured to an end thereof, one of said side bolts is secured into each of said third and fourth openings and the tool is aligned with the steering shaft in a manner such that the internally threaded socket of said center bolt can be secured on the end of said steering shaft and the head end of said side bolts can contact the surface of the lock plate.

4,989,313

MAGNETIC ALIGNMENT FIXTURE

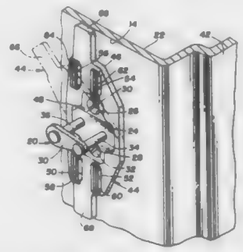
Thomas A. Dzurko, Mt. Clemens; Anthony Foster, Southfield, and Eugene W. Lang, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 28, 1989, Ser. No. 458,272
Int. Cl.[5] B25B *11/00*
U.S. Cl. 29—281.4 **3 Claims**

1. A magnetic alignment fixture for temporarily holding a striker in a position relative to a door jamb, the magnetic alignment fixture comprising:

a base plate of flexible material having an aperture sized to snugly receive the striker and positioning the striker in the plane parallel to the base plate; and

magnet means holding the base plate to the door jamb with the base plate parallel to the door jamb thereby positioning the striker on the door jamb and restricting motion of the striker in the plane of the surface of the door jamb, and the magnet means allowing the base plate to move with



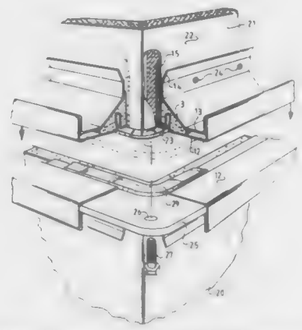
the striker when sufficient force is applied against the striker in the plane parallel to the door jamb to overcome the magnet means holding the base plate so that the base plate is moved by the striker whereby the position of the striker may be adjusted to a desired position where the magnetic alignment fixture holds the striker, and the magnet means further allowing the base plate to be flexibly peeled away from the door jamb and the striker in a direction perpendicular to the door jamb after the striker is secured in the desired position.

4,989,314

METHOD FOR PREPARING A CORNER PROFILE FIT FOR BUTTING CONNECTION OF CLOSED CHANNELS

Casparus W. De Waal, Leembaan 21, 5753 CW Deurne, Netherlands

Filed Oct. 11, 1989, Ser. No. 419,711
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—527.2 **4 Claims**



1. A method for making a profile for the coupling of adjoining channel members, said adjoining channel members forming a substantially rectangular passage through which a gaseous medium is conveyed, wherein each of said adjoining channel members comprises a channel wall, said profile comprising a first wall for extending perpendicularly from the channel wall of one of the channel members, a second wall extending at least partially parallel to said first wall, a first flange for placement adjacent said channel wall of said one of the channel members, said first flange being connected to an edge of said first wall and extending substantially perpendicularly from said edge of said first wall, and a second flange extending from said second wall, said first flange and said second flange forming a space therebetween for receiving the channel wall of said one of the channel members, said method comprising:

(a) providing a bendable and malleable sheet of profile material, said sheet comprising a first substantially rectangular planar section, a second substantially rectangular planar section, and a fold ridge connecting an edge of each of said first and second rectangular planar sections and projecting from each of said first and second substantially rectangular planar sections, the portion of said sheet corresponding to the first wall being adjacent to the folded ridge;

(b) applying a deformable sealing material to said profile material to surround said folded ridge;

(c) folding said first substantially rectangular planar section along a plurality of fold lines in said first substantially rectangular planar section which are each parallel to said folded ridge to define surfaces of said second wall and said second flange; and

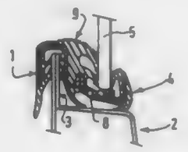
(d) folding said first substantially rectangular planar section toward said folded ridge along a fold line in said first substantially rectangular planar section parallel to said folded ridge so that said second wall is at least partially parallel to said first wall, and folding said second substantially rectangular planar section toward said folded ridge along a fold line separating said first flange and said first wall and parallel to said folded ridge so that said first flange extends substantially perpendicular from an edge of said first wall, thereby deforming said sealing material to fill a substantial portion of a space between the first wall, the second wall, the first flange and the second flange.

4,989,315

METHOD OF MANUFACTURING A SEALING AND GUIDING ELEMENT

Gerard Mesnel, Carrieres-sur-Seine, and Francois Mesnel, Neuilly-sur-Seince, both of France, assignors to Mesnel S.A., Carrieres-sur-Seine, France

Division of Ser. No. 225,161, Jul. 28, 1988, Pat. No. 4,947,586, which is a continuation-in-part of Ser. No. 24,527, Mar. 11, 1987, Pat. No. 4,843,763, which is a continuation-in-part of Ser. No. 885,731, Jul. 21, 1986, which is a continuation of Ser. No. 612,178, May 21, 1984, abandoned. This application Aug. 1, 1989, Ser. No. 388,057
Claims priority, application France, Nov. 25, 1987, 87 16334
Int. Cl.[5] B21B *1/46*
U.S. Cl. 29—527.2 **2 Claims**



1. A manufacturing process for a sealing and guiding element comprising:

shaping a metal strip to form a backing having a first generally U-shaped portion for holding said sealing and guiding element in place on a flange, and a second generally U-shaped portion for guiding a window, said second generally U-shaped portion having a base;

cutting said metal strip longitudinally in two fractions in said base at a location corresponding to a desired flexible resilient hinge; and

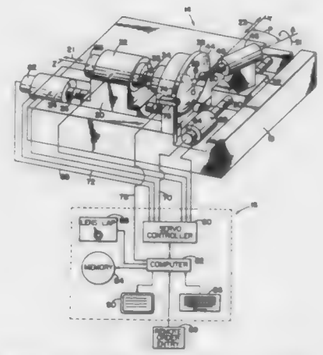
extruding a elastomer simultaneously onto the two fractions of the strip such that the elastomer joins one fraction to the other, thereby forming a hinge at said location.

4,989,316

METHOD AND APPARATUS FOR MAKING PRESCRIPTION EYEGLASS LENSES

David J. Logan, Glastonbury, and Leonard G. Rich, West Hartford, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Mar. 9, 1987, Ser. No. 23,473
Int. Cl.[5] B23C *3/04;* **B24B** *13/06*
U.S. Cl. 29—527.3 **51 Claims**



1. A machine for machining a blank to produce a surface thereon related to a given eyeglass prescription, said machine comprising:

(a) a blank holder,

(b) a rotary tool for cutting a blank held by said holder and having an axis of tool rotation,

(c) means for driving said tool about said axis of tool rotation,

(d) θ coordinate drive means for continuously moving said tool and said holder, and any blank attached to said holder, relative to one another in a θ coordinate direction about a Z axis,

(e) Y coordinate drive means for continuously moving said tool and said holder, and any blank attached to said holder, relative to one another in a y coordinate direction along a Y axis intersecting said Z axis,

(f) Z coordinate drive means for moving said tool and said holder, and any blank attached to said holder relative to one another in a z coordinate direction along said Z axis, and

(g) control means for controlling said Z coordinate drive means in response to data corresponding to a given eyeglass prescription and in response to the instantaneous θ coordinate position of said holder relative to said tool about said Z coordinate axis and the instantaneous y coordinate position of said holder relative to said tool along said Y coordinate axis so that said tool cuts a surface related to said prescription on any blank attached to said holder.

4,989,317

METHOD FOR MAKING TAB CIRCUIT ELECTRICAL CONNECTOR SUPPORTING MULTIPLE COMPONENTS THEREON

Gerold Firl, Poway, and Stuart D. Asakawa, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

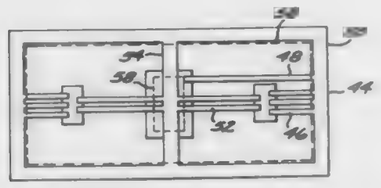
Filed Nov. 21, 1988, Ser. No. 274,534
Int. Cl.[5] H05K *3/02*
U.S. Cl. 29—840 **12 Claims**

1. A method for preparing a flexible electrical connector material having conductive traces supported on a nonconductive support, at least some of the traces having no continuous

connection to the periphery of the support, comprising the steps of:

providing a composite of an electrical conductor material on a nonconductive support;

removing a portion of the electrical conductor material to form a pattern of traces and plating bus connections, the bus connections providing an electrically continuous path from each trace to the periphery of the support;



electrodepositing a metallic coating over the electrical conductor material, utilizing as one electrodeposition contact the plating bus at the periphery of the support;

removing the plating bus connections at the periphery of the support; and

removing by mechanically interrupting at least some portion of the electrical bus connections extending from the periphery of the support to those traces having no continuous connection to the periphery.

4,989,318

PROCESS OF ASSEMBLING TERMINAL STRUCTURE

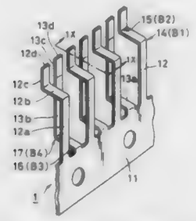
Jiro Utsunomiya; Saburo Iida; Hitoei Sibuya; Kazunori Kusaba, and Isao Narumi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 361,658, Jun. 2, 1989. This application Feb. 28, 1990, Ser. No. 486,611

Claims priority, application Japan, Jun. 9, 1988, 63-140552; Jun. 9, 1988, 63-140553

Int. Cl.[5] H01R *9/16*

U.S. Cl. 29—843 **3 Claims**



1. A process of fabricating an hybrid IC device provided with a multiple of terminals on a substrate, comprising the steps of:

providing a multiple-terminal unit comprising:

a band-shaped connecting part;

a first and a second group of teeth extending from one edge of the connecting part;

said first group consisting of teeth provided at alternate positions and said second group consisting of teeth provided at intervening positions;

each tooth in said first group having a stem part having one end continuous with the connecting part and extending in the major plane of the connecting part, a lateral part having one end continuous with the other end of the stem part, and extending at an angle with the stem part, and an end part having one end continuous with the lateral part and extending in parallel with the stem part;

each tooth in said second group having a lateral part having one end continuous with the connecting part and extending at an angle with the connecting part, a stem part having one end continuous with the other end of the lateral part and extending in parallel with the connecting part, and an end part having one end continuous with the stem part and extending in the same plane as the stem part;

said end parts of said teeth in said first group and said second group being aligned with each other;

said stem parts of said teeth in said first group being aligned with each other;

said stem parts of said teeth in said second group being aligned with each other;

said stem parts of said teeth in said first group being spaced relative to said stem parts of said teeth in said second group in a direction transverse to the major plane of the connecting part and also in the direction of the rows of the teeth of said first and second groups;

providing a substrate with soldering paste printed in pad regions on the substrate;

soldering the end parts of said teeth of said multiple-terminal unit with the printed soldering paste in the pad regions on the substrate;

removing the connecting part of the multiple-terminal unit.

4,989,319

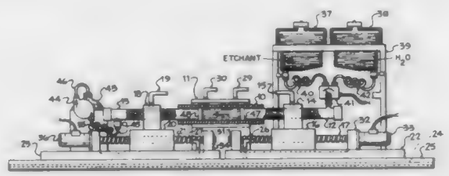
METHOD OF FABRICATING A GRADED-GROOVE HEAT PIPE

Michael R. Kapolnek, Sunnyvale; Alexander R. Feild, Mt. View; Robert T. Hartle, Cupertino, and Hillard R. Holmes, Menlo Park, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 389,238, Aug. 3, 1989. This application Jul. 9, 1990, Ser. No. 549,997

Int. Cl.[5] B23P *15/26*

U.S. Cl. 29—890.032 **4 Claims**



1. A method of fabricating a heat pipe having a longitudinally extending capillary groove on an interior surface portion thereof, said capillary groove having a transverse cross-sectional dimension that varies continuously with length of said heat pipe in accordance with a predetermined profile, said method comprising the steps of:

(a) forming a capillary groove of generally constant initial transverse cross-sectional dimension on said interior surface portion of said heat pipe, and

(b) exposing different surface portions of said capillary groove of generally constant initial transverse cross-sectional dimension to a chemical etchant for correspondingly different lengths of time according to a predetermined program so that different surface portions of said capillary groove acquire correspondingly different transverse cross-sectional dimensions in accordance with a predetermined profile for said capillary groove.

4,989,320

KNIFE

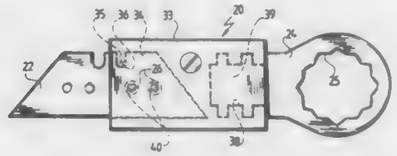
Rudolf Borkott, Solingen; Gert Flachenecker, Leonberg; Gustav Schuhmacher, Stuttgart; Fritz Gramm, Stuttgart, and Heinz Schueler, Stuttgart, all of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,369

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814554

Int. Cl.[5] B26B *7/00, 3/07, 3/00*

U.S. Cl. 30—272.1 **34 Claims**



1. Knife for a cutting tool with a pivotally oscillating drive, in particular for severing joint seals or insulations on glass panes, said knife comprising a holding part for attachment to a dive shaft and a blade part, wherein said blade part is exchangeably coupled to said holding part.

4,989,321

ROTATABLY DRIVEN CUTTERHEAD FOR A VEGETATION CUTTING APPARATUS

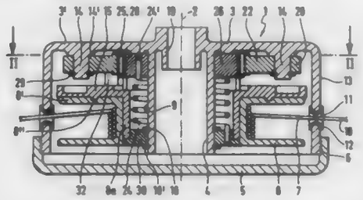
Joachim Hoffmann, Aichwald, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 541,951

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922339

Int. Cl.[5] B26B *7/00*

U.S. Cl. 30—276 **8 Claims**



1. A cutterhead for a rotatably-driven vegetation cutter apparatus defining a drive axis about which the cutterhead is rotatably driven, the cutterhead comprising:

a housing adapted to be rotatively driven by the vegetation cutter apparatus about said axis;

said housing having a hub formed thereon so as to extend along said axis;

a spool rotatably journalled on said hub for carrying a flexible cutting filament wound thereon;

indexing means for permitting an incremental rotation of said spool relative to said housing to pay out incremental lengths of the cutting filament, said indexing means including:

a plurality of cams connected to said spool so as to be rotatable therewith;

a latching lever having a latching arm and being pivotally journalled in said housing so as to be pivotally movable between a radially inner latching position wherein said latching arm is in contact engagement with one of said cams so as to prevent a rotational movement of said spool with respect to said housing and a radially outer release position into which said lever is moved in dependence on centrifugal force to release said spool for movement relative to said housing to pay out an incremental length of the filament;

resilient biasing means for applying a biasing force to said latching lever sufficient to move said latching lever into said latching position after the incremental length of filament has been payed out; and,

guideway means defining a curved guideway extending inwardly with respect to said drive axis for positively guiding said latching lever from said release position into said latching position.

4,989,322

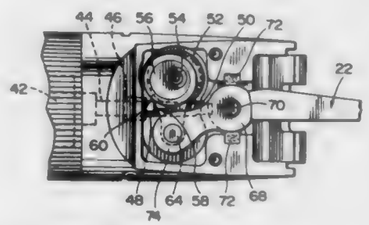
HAIR SHEARING DEVICE

Duke Clayton, 5520 Johnston St., Lafayette, La. 70503

Filed Jun. 8, 1989, Ser. No. 363,140

Int. Cl.[5] B26B *15/00*

U.S. Cl. 30—228 **8 Claims**



1. A hair shearing device comprising:

a housing,

a fixed scissor blade mounted on said housing,

a movable scissor blade pivotably mounted on said housing,

drive means mounted in said housing for driving said movable blade to cross over said fixed blade to duplicate a manual scissor cutting action,

said drive means including an electric motor,

said drive means including a linkage between said motor and said movable blade,

said linkage including a crank arm interconnecting one end of said movable blade and said motor for reciprocating movement of said movable blade by a pivoting movement of said movable blade about a pivot pin located between the ends of said movable blade, and

said crank arm including an annular ring-portion at one end and a pin at an opposite end, said pin engaging said one end of said movable blade.

4,989,323

PORTABLE POWER UNIT FOR VARIOUS POWER TOOLS

Kim P. Casper; Rolf Wustrau, and J. David Meister, all of Austin, Tex., assignors to Caspro Mechanical Technologies, Inc., Austin, Tex.

Filed Jun. 5, 1989, Ser. No. 361,279

Int. Cl.[5] B26B *27/00, 7/00;* **F16C** *1/00*

U.S. Cl. 30—296.1 **20 Claims**

1. Portable apparatus carried on the back of an operator for operating quickly attachable and detachable power tools, comprising:

a backpack;

a power unit mounted on said backpack;

a flexible shaft connected at one end to said power unit;

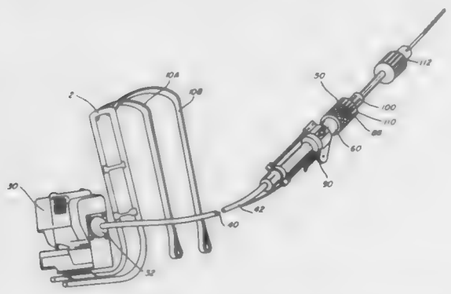
a quick attach and detach drive coupling means at the other end of said flexible shaft from said power unit;

said drive coupling means including driving engagement means driven by said flexible shaft;

a driven device including a quick attach and detach driven coupling means; said driven coupling means including an engaging means adapted for interlocking with said driving engagement means and for driving said driven device;

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said drive coupling means and said driven coupling means including a male attachment and detachment means and a female attachment and detachment means, wherein one of said attachment and detachment means is located on said drive coupling means and the other is located on said



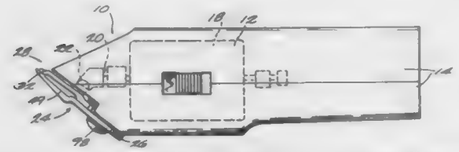
driven coupling means, and including at least one spring loaded locking ball located in one of said attachment and detachment means for attachment to and detachment from a groove located on the other of said attachment and detachment means.

4,989,324

HAIR CLIPPER BLADE SET

Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Filed May 11, 1989, Ser. No. 350,158
Int. Cl.[5] B26B *19/02, 19/04, 19/00, 19/12*
U.S. Cl. 30—216 5 Claims



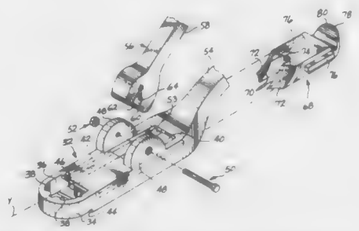
1. A hair clipper blade set comprising a lower blade including a forward edge with a series of teeth extending therealong, upper and lower surfaces extending from said forward edge, and a threaded bore extending between said upper and lower surfaces, a movable upper blade including a forward edge with a series of teeth extending therealong, an upper surface, and a lower surface supported by said upper surface of said lower blade, and means for supporting and biasing said upper blade against said lower blade for linear movement of said forward edge of said upper blade parallel to said forward edge of said lower blade, said supporting means including a spring member comprising a forward portion including a forward end positionable against said upper surface of said movable blade, a rear portion parallel to said upper surface of said lower blade, and an intermediate portion extending between said forward portion and said rear portion and parallel to and spaced apart from said upper surface of said lower blade behind said movable upper blade and having therein an aperture, means for fixing said rear portion to said lower blade, and a tension adjustment screw extending through said aperture, having an enlarged head engaging said spring member, and having an outer end releasably secured in said threaded bore, and further including, in said outer end, means facilitating rotation of said screw in said bore by manipulating a tool removably extending into said bore from said lower surface of said lower blade.

4,989,325

HAND TOOL FOR REMOVING COLLAR FROM LOCK BOLT

John E. Durkin, Everett; K. Peter Kenney, Bothell, and Dean F. Hobart, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 6, 1989, Ser. No. 447,008
Int. Cl.[5] B26B *29/00, 17/00, 13/00*
U.S. Cl. 30—287 21 Claims



1. A tool for removing a collar from a shaft portion of a lock bolt type fastener, said tool comprising:

a body having a forward end portion that defines a cradle; said cradle having an opening extending vertically therethrough, said opening being dimensioned to surroundingly receive the collar;

a slider slidably mounted in said body and having two vertically and rearwardly extending cutting edges separated by a slot extending vertically through said slider, said slot being dimensioned to closely receive said shaft portion; and

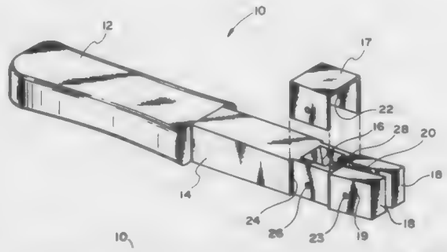
a lever pivotally attached to said body and positioned to engage said slider to thrust said slider horizontally forward, when said cradle has been positioned around said collar, to urge said cutting edge gradually into cutting engagement with said collar.

4,989,326

QUILTING TOOL FOR MAKING THE LOCATION OF STITCHES ALONG A SEAM

Lorraine J. O'Malley, 25338 W. Lake Shore Dr., Barrington, Ill. 60010

Filed Apr. 22, 1987, Ser. No. 41,857
Int. Cl.[5] B41K *1/22;* B41G *3/00*
U.S. Cl. 33—36 17 Claims



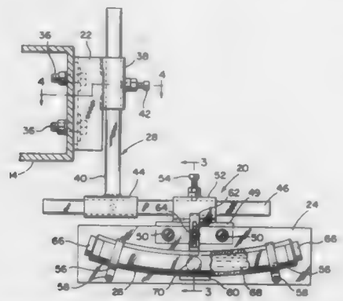
1. Apparatus for locating and marking a seam on a material and for locating and marking the placement of individual stitches along the seam comprising a handle having formed thereon an elongated member said member having a means for locating a seam and a means for premarking a seam on said material, said means for locating the seam comprising a spacer bar having a select width and a select length and a means for mounting the seam premarking means therein, said spacer bar formed adjacent the elongated member at an angle thereto; a means for containing a marking medium housed in said tool and a marking medium deposited therein; said means for premarking a seam comprising a wheel and an axis extending through said wheel, said wheel rotatably mounted at said axle to said spacer bar at the mounting means such that said wheel does not project below the spacer bar, said mounting means comprising an opening in the spacer bar to receive the axis, said wheel having extending therefrom and therearound a series of spaced, elongated points, said points arranged such that as the wheel is rotated with respect to the spacer bar each point individually communicates with the marking medium and the marking medium is thereby deposited on each of the points; said points projecting below the spacer bar so as to mark the material with the marking medium as the spacer bar is moved over the material, such that the spacer bar cooperates with the wheel to locate the position of a seam on the material and the wheel points individually mark the location for placement of individual stitches along the seam.

4,989,327

ADJUSTABLE SIDE DRAFT INDICATOR

John R. Morton, Rte. 2, Box 265, Gleawood, Minn. 56334

Filed Nov. 13, 1987, Ser. No. 120,382
Int. Cl.[5] G01C *9/10*
U.S. Cl. 33—365 11 Claims



1. In combination with a draft vehicle subject to varying crop row cultivator equipment drag forces while traversing a slope, an adjustable side draft indicator, said indicator including a mount stationarily supported from said vehicle, support structure, mounting means mounting said support structure from said mount, a shape retentive and flexibly resilient elongated, arcuate transparent tubular member mounted from said support structure with said tubular member generally horizontally disposed and at least substantially disposed in an upstanding plane extending transversely of said vehicle, gravity responsive indicator means disposed in said tubular member and movable therein along the length thereof toward a central position within said tubular member responsive to gravity forces when said vehicle is laterally horizontally disposed and movable, proportionally along said tubular member from said central position toward opposite ends of said tubular member, responsive to lateral tilting of said support member in opposite directions about a horizontal axis extending longitudinally of said vehicle, and means operative to adjustably vary the radius of curvature of said arcuate tubular member.

4,989,328

DUAL HEADED RAZOR ASSEMBLY

Daniel Sokoloff, 1000 45th St., Suite #1, West Palm Beach, Fla. 33407

Filed Mar. 16, 1990, Ser. No. 494,982
Int. Cl.[5] B26B *19/06*
U.S. Cl. 30—34.1 25 Claims

12. A removable razor head support comprising:

a body having attachment means for removably attaching in a first direction said removable head support to a razor;

a stub protruding from the body and adapted to hold a razor head at a distal end of said stub;



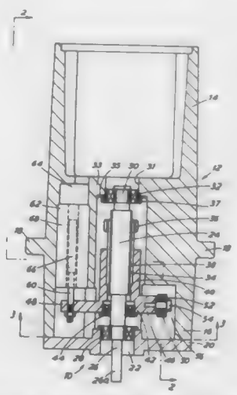
a razor head attached to said distal end extending in a second direction opposite to said first direction and adapted to hold a razor blade having a cutting edge.

4,989,329

ROTARY DISPLACEMENT TRANSDUCERS

Roger J. Pullen, Nyetimber, England, assignor to Schlumberger Industries Limited, Farnborough, England

Filed Mar. 22, 1989, Ser. No. 327,290
Claims priority, application United Kingdom, Mar. 31, 1988, 8807671
Int. Cl.[5] G01B *5/24;* G01D *5/04*
U.S. Cl. 33—1 PT 10 Claims



1. A rotary displacement transducer comprising:

a housing;

a rotary member rotatably supported in the housing, the rotary member being rotatable in dependence upon the rotary displacement to be sensed but axially fixed, and having a precision screw thread formed thereon;

a threaded member mounted in threaded engagement with the precision screw thread;

means for preventing the threaded member from rotating during rotation of the rotary member, whereby the threaded member moves axially of the rotary member as the rotary member rotates; and

a linear displacement transducer coupled to said threaded member to sense the axial displacement thereof;

wherein said preventing means comprises a protection extending radially of said threaded member and having at its outer end a roller running in a slot in the housing.

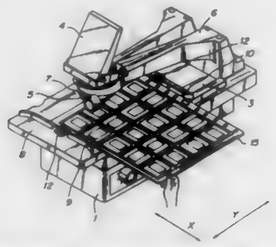
VOL 1123 ISS 1 FE 5 1991 5 UMI

4,989,330

OVERHEAD TYPE FILE SHEET PROJECTORS, AND FILE SHEETS AND JACKET HOLDERS FOR USE IN SUCH PROJECTORS

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,391
Int. Cl.[5] G03B 21/14
U.S. Cl. 353—27 R 7 Claims



1. An overhead type file sheet projector comprising
a projector body with a cover provided at an upper face opening thereof,
a light source and a projecting condenser lens placed in the projector body,
a support arm extending from one side of the projector body to above said projecting condenser lens,
a reflecting mirror and a projecting lens system held by the support arm,
a single stage movably fitted to guide rails provided at opposite sides of an upper portion of the projector body,
guide members fixed on opposite sides of the stage, said guide members being adapted to allow manual movement of a file sheet therebetween in a direction orthogonal to the guide rails along the guide members in a direction orthogonal to the moving direction of the stage,
said guide members including planar members tapering inwardly towards a central portion for guiding the file sheet towards the central portion and sandwiching opposite sides of the file sheet at the central portion, and
means located centrally of the central portion of said guide members for maintaining the position of a file sheet.

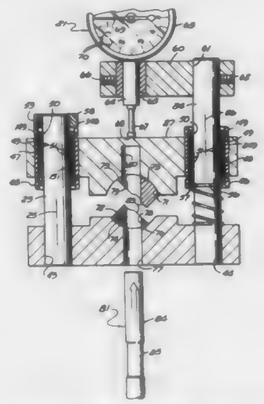
4,989,331

GAGE

Robert G. Dodge, 6634 San Fernando Rd., Glendale, Calif. 91201

Filed Nov. 6, 1989, Ser. No. 432,222
Int. Cl.[5] G01B 3/14
U.S. Cl. 33—199 R 40 Claims

1. A gage comprising:
two relatively movable gaging elements;
structures carrying said two gaging elements respectively and which are relatively movable with the gaging elements along an axis to move the gaging elements into contact with a part at different locations to measure the part;
a first of said structures including a guide rod extending along said axis;
a bushing carried by the second structure and disposed about and movable along said rod to guide said structures for said relative movement along said axis;
a spring exerting force in opposite axial directions against said bushing and said first structure to yieldingly urge said two structures relative to one another in a predetermined direction moving said gaging elements against said part;
said bushing being shiftable along said axis relative to said second structure to vary the force exerted by said spring; and



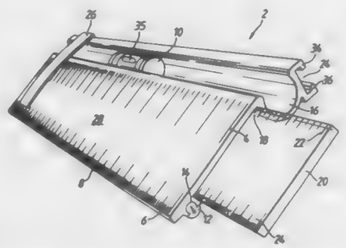
locking means for releasably retaining said bushing in any of different axial settings relative to said second structure.

4,989,332

MEASURING APPARATUS

Anthony C. Worrallo, 77 Beaconsfield Road, Blackheath, London SE3 7LG, England

Filed May 23, 1989, Ser. No. 355,501
Claims priority, application United Kingdom, May 25, 1988, 8812407
Int. Cl.[5] G01B 19/62
U.S. Cl. 33—342 8 Claims



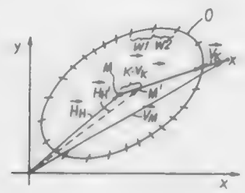
1. Measuring apparatus comprising in combination:
(a) a first side from which measurements are effected;
(b) a second side for engaging a surface to be measured;
(c) at least one measuring scale which is provided on the first side and which is for effecting measurements;
(d) a straight edge for marking lines;
(e) a first channel which is open along the second side and which extends the entire length of the measuring apparatus;
(f) a friction-creating strip of resilient material which is positioned in the first channel and which is for providing a grip for the measuring apparatus on the surface to be measured;
(g) a second channel which is open along the first side and which extends the entire length of the measuring apparatus; and
(h) a spirit level which is provided in the second channel and which is for testing for horizontality, the spirit level being substantially shorter than the length of the second channel so that the second channel is also available for accepting writing instruments.

4,989,333

NAVIGATION METHOD FOR VEHICLES WITH ELECTRONIC COMPASS

Reinhard Helldörfer, Igelsdorf; Ulrich Kanzler, Stein, and Hans Rauch, Fürth, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00477, § 371 Date Apr. 21, 1989, § 102(e) Date Apr. 21, 1989, PCT Pub. No. WO88/05153, PCT Pub. Date Jul. 14, 1988
PCT Filed Oct. 22, 1987, Ser. No. 347,774
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644681
Int. Cl.[5] G01C 17/38
U.S. Cl. 33—356 4 Claims



1. In a method for determining the direction of the earth magnetic field, the north direction and the travelling direction of a vehicle by means of a magnetometer fixedly mounted in said vehicle to measure components of a magnetic field effective at the magnetometer and by means of an evaluation circuit which cyclically evaluates and stores the measured components as electric measurement values defining parameters of an elliptical locus diagram of the magnetic field, inclusive of the magnitude and direction of hard-magnetic and soft-magnetic interfering fields, and calculates the direction of the earth magnetic field with respect to the travelling direction, an improvement comprising the steps of
(a) cyclically determining a nominal vector ($\bar{v}_B$) which on the elliptical locus diagram is associated with a vector ($\bar{v}_M$) of the magnetic field effective at a magnetometer;
(b) determining from the nominal vector ($\bar{v}_B$), a current hard-magnetic interfering field vector ($\bar{H}_H$) and the magnetic field vector ($\bar{v}_M$) a resultant vector ($\bar{v}_K$) which indicates a change of the hard-magnetic interfering field;
(c) weighting the resultant vector ($\bar{v}_K$) with a factor $k<1$,
(d) adding the weighted resultant vector ($k.\bar{v}_K$) to the current hard-magnetic interfering vector ($\bar{H}_H$) to form a new hard-magnetic interfering field vector ($\bar{H}_{H_1}$), and
(e) for dynamically compensating changes of the hard-magnetic interfering field, calculating the direction of the earth magnetic field with respect to the travelling direction by using the new hard-magnetic interfering field vector ($\bar{H}_{H_1}$)
(f) selecting the factor k in dependence on the cycle time (T) of the measurement value acquisition, in such a manner that the interfering field changes (v_K) occurring for a short time over a few seconds are almost suppressed.

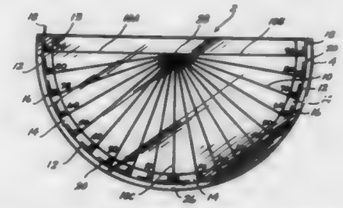
4,989,334

TILT INDICATOR

Thomas L. V. DuBose, Jr., 112 Riviera Dr., Hendersonville, Tenn. 37075

Filed Mar. 30, 1989, Ser. No. 331,904
Int. Cl.[5] G01C 9/10
U.S. Cl. 33—365 14 Claims

1. A tilt indicator comprising:
(a) a container having an arcuate shape;
(b) a plurality of compartments formed in said container and arranged in a semicircular pattern adjacent the periphery of said container, each spaced from an adjoining compartment a fixed number of degrees;
(c) indicating means normally positioned within at least some of said compartments;
(d) each compartment having an opening whereby when said container is tilted from a normal orientation said indicator means will exit from one or more compartments through one of said openings to provide an indication of the amount of tilt;



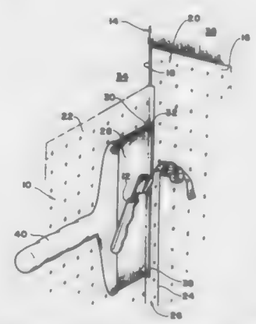
(e) dividers within said container and forming, in part, said compartments and wherein a first divider extends at a right angle between the center of said container and the periphery of said container to designate zero degrees of tilt; and
(f) a removable locking strip extending over each opening to prevent exiting of said indicating means until the tilt indicator is put into use.

4,989,335

WALLPAPER KNIFE GUIDE

Nathan M. Day, 14638 Wexhall Ter., Burtonsville, Md. 20866

Filed Jan. 12, 1990, Ser. No. 464,217
Int. Cl.[5] B43L 7/00
U.S. Cl. 33—403 5 Claims



5. A guide for guiding a wallpaper knife in proximity to a room corner to cut one of two adjacent sheets of wallpaper, each having a side edge portion, and the sheet being cut having its side edge portion narrowly overlapping the side edge portion of the other sheet, the guide comprising:
a planar member having forward and rearward portions;
a right-angled lip formed on the forward portion of the planar member, the planar member and the right-angled lip forming a press for pressing the overlapping side edge portion of the sheet into the corner; and
a handle provided on the rearward portion of the planar member for holding and moving the guide along the corner, the right-angled lip having a linear edge for guiding the wallpaper knife along a linear path substantially parallel to the corner,
wherein the right-angled lip comprises a forward edge of the planar member and a rectangular rubber pad connected to the forward end portion of the planar member on a surface thereof which faces inwardly, the forward edge of the planar member and a forward surface of the rubber pad being coplanar.

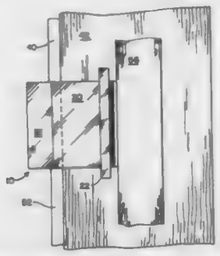
VOL 1123 ISS 1 FEB 5 1991 UMI

4,989,336

TRIM POSITIONING DEVICE

William A. Waltrip, Jr., and Raynette A. Waltrip, both of 341 Raymond Ave., San Jose, Calif. 95128

Filed Jul. 28, 1989, Ser. No. 386,488
Int. Cl.[5] G01B *1/00*
U.S. Cl. 33—526 15 Claims



1. A tool for positioning a selected workpiece at a consistent distance from an edge, comprising:

a workpiece guide portion including a rigid member having a cross section in the shape of an inverted "U", a right leg portion and a left leg portion of said inverted "U" being separated by a span slightly greater than the width of the selected workpiece such that the selected workpiece fits within the guide portion, the selected workpiece being a segment of door trim as used in he building construction trades;

an edge guide including a rigid protruding member affixed to said workpiece guide portion such that said protruding member is arrayed outwardly from and in a plane parallel to that of an inner surface of said left leg portion, said protruding member extending beyond the selected workpiece when the workpiece is positioned within the guide portion, said protruding member further being positioned such that it is displaced from said interior edge of said left leg portion by a standard setback distance for said door trim from the edge of a door frame as used in the building construction trade; and

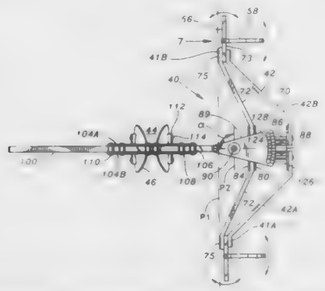
means for positioning said protruding member at a desired distance from said inner surface of said left leg portion."

4,989,337

LEG MEASURING DEVICE

Jeffrey T. Mason, 2142 Beartrap, Escondido, Calif. 97027; Charles A. Bastyr, 12476 Rue Fountainbeau, San Diego, Calif. 92131, and Bradley R. Mason, 1205 Caminito Carolina, Olivenhain, Calif. 92024

Filed Feb. 8, 1989, Ser. No. 308,259
Int. Cl.[5] A61B *5/103*
U.S. Cl. 33—512 19 Claims



1. A device for measuring a leg about the knee for the fitting of a knee brace comprising:

a. a caliper means adapted to be detachably attached to the medial and lateral sides of the knee about the knee's X-axis which extends from one side of the knee to the other side of the knee about the knee's condyles;

b. support means adapted to be detachably attached to the lateral side of the upper leg above the knee and to the lateral side of the lower leg below the knee;

c. means for pivotally attaching the caliper means to the support means on a horizontal axis perpendicular to the X-axis;

d. measurement means on said caliper means for measuring the width of the knee about the X-axis;

e. second measurement means on said caliper means for measuring the offset of the leg; and

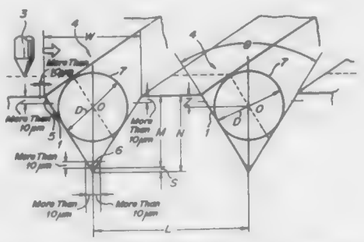
f. means on the support means for measuring the external contour of at least a portion of the leg at a predetermined distance from the X-axis.

4,989,338

V-SHAPED GROOVE INSPECTING AND WORKING METHOD

Hiroyuki Tsuji; Susumu Nomoto, both of Nagoya, and Takashi Ota, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 28, 1989, Ser. No. 413,683
Claims priority, application Japan, Oct. 1, 1988, 63-248797
Int. Cl.[5] G01B *5/20, 7/28*
U.S. Cl. 33—554 1 Claim



1. A method of inspecting and working V-shaped grooves formed in a substrate, comprising the steps of:

(a) measuring coordinates for more than 20 points per V-shaped groove on surfaces of the substrate by moving a stylus of a contacting type shape tester in directions perpendicular to a longitudinal direction of the V-shaped grooves;

(b) removing measured data obtained within at least 10 μm from each edge and the bottom of each of the V-shaped grooved from all data obtained from the step (a) so as to obtain effective measuring segments between each edge and the bottom of each of the V-shaped grooves;

(c) calculating shapes formed by straight lines on the basis of the remaining measured data using the effective measuring segments by using only those effective measuring segments which have a length of more than 40 μm;

(d) drawing a circle having a diameter substantially equal to that of an element to be supported in the V-shaped groove such that the circle is inscribed in an interior of the V-shaped groove having coordinates calculated in the steps (a)–(c); and

(e) working the V-shaped grooves while feeding back errors in center position of the circle into a working process to compensate for changes in depth and pitch of the V-shaped grooves being worked;

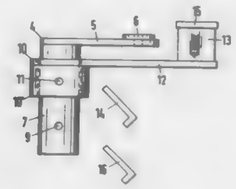
wherein a relative position between a tool for working the V-shaped grooves and the substrate is determined by signals representing the fed-back errors in the center position of the circle into the working process.

4,989,339

APPARATUS FOR USE ON AN ALIGNMENT BENCH FOR ALIGNING AND RESTORING DAMAGED VEHICLES

Germain Celette, Vienne, France, assignor to Celette GmbH, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,125
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835270
Int. Cl.[5] G01D *21/00*
U.S. Cl. 33—608 6 Claims



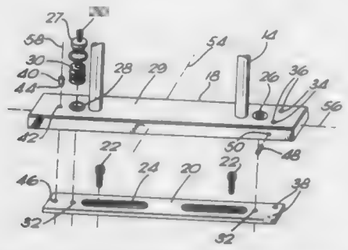
1. In a vehicle repair system for verifying and securing the correct location of components of a damaged vehicle wherein the vehicle is secured to a checking bench having a plurality of spaced fastening holes formed therein for mounting locating devices to verify and secure the correct position of vehicle components during a repair process, the locating devices including a single tower base secured to the checking bench through the spaced fastening holes and having an opening therein for receiving a portion of a first end piece configured in accordance with the location of a first datum point relative to the damaged vehicle secured to the checking bench, the first end piece being securable to the single tower base in an orientation to position the first end piece at the location of said first datum point relative to the damaged vehicle, the improvement comprising a second end piece mounted directly to said first end piece when said first end piece is mounted upon said single tower base for locating a second datum point relative to the damaged vehicle wherein said first and second datum points are located off of said single tower base.

4,989,340

ALIGNMENT ADJUSTING MECHANISM

Christopher M. Dawson, Thornbury, United Kingdom, assignor to Renishaw plc, England

Filed Apr. 18, 1990, Ser. No. 510,828
Claims priority, application United Kingdom, Apr. 22, 1989, #909216
Int. Cl.[5] G01B *7/28*
U.S. Cl. 33—645 8 Claims



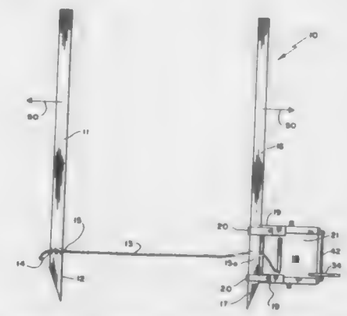
1. An alignment adjusting mechanism for adjusting the alignment of a magazine which retains a plurality of sensing elements within the working area of a coordinate positioning machine, the mechanism comprising a plate mountable rigidly to the bed of the machine; a base for supporting the magazine; securing means for securing the base to the bed of the machine; and adjusting means provided on one of plate and the base for applying an adjusting force to the other of the plate and the base, thereby to adjust the relative position of the base and the plate.

4,989,341

RETRACTABLE FOOTBALL YARDAGE MEASURING APPARATUS

Joseph A. Scotese, 50 Main St., Apt. C-5, Binghamton, N.Y. 13905

Filed Jan. 8, 1990, Ser. No. 461,866
Int. Cl.[5] G01B *3/10*
U.S. Cl. 33—759 15 Claims



1. A retractable yardage measuring apparatus for use in football games, comprising:

a first pole for establishing a football position on a playing field;

a second pole for referencing a yardline relative to said football;

a tether disposed between said first and second poles, said tether anchored to said first pole by a screw eye and link and passing through a hole disposed in said first pole, said tether being dispensed through a hole disposed in said second pole;

dispensing means attached to said second pole for dispensing a given amount of said tether between said first and second poles equal to the distance between said yardline and said football, said dispensing means including a rotatable rotor for rotatively storing and dispensing said tether;

a housing for rotatively mounting said rotatable rotor;

biasing means connected between said housing and said rotatable rotor for urging the winding of said tether upon said rotatable rotor; and

a ratchet and pawl disposed between said rotatable rotor and said housing for locking said rotatable rotor in a rotative position defining a dispensed length of tether, whereby an accurate measurement is established and maintained of the distance between said football and said yardline after any football play.

4,989,342

ACTUATOR FOR A COUNTER ON A DISTANCE MEASURING DEVICE

Frank J. Nosek, 1236 Whitingham Cir., Naperville, Ill. 60540

Filed Oct. 17, 1989, Ser. No. 422,637
Int. Cl.[5] G01B *3/12, 7/04*
U.S. Cl. 33—780 15 Claims

1. A distance measuring device comprising:

a frame;

a wheel mounted to the frame for rotation in opposite directions about an axis and having a peripheral surface to be rolled against a surface to be measured;

a distance counter;

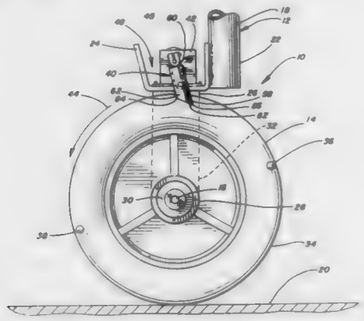
a lever arm mounted to said counter for pivoting movement about an axis between a first position and a second position;

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means on said counter for indicating a predetermined increment of distance as an incident of said lever arm moving from said first position to said second position;

means for normally biasing the lever arm to said first position;

means on said wheel for engaging for the lever arm and moving the lever arm from its first position to its second position as an incident of said wheel rotating about its pivot axis in a first direction; and



flexible means on the lever arm pivotable about the lever arm axis for intercepting the arm-engaging means and deforming as the arm-engaging means moves against the intercepting means with the wheel rotating oppositely to said first direction to thereby allow said arm-engaging means to pass by the lever arm with the wheel rotated oppositely to said first direction without a detrimental torque being exerted by said arm-engaging means on the lever arm and counter,

said means on the lever arm comprising a piece of flexible hollow tubing.

4,989,343

DRYING SECTION PROVIDED WITH UV-LIGHT GENERATING DEVICES

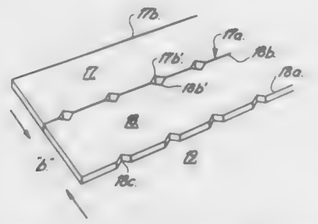
Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Jan. 28, 1989, Ser. No. 372,752

Claims priority, application Sweden, Jan. 28, 1988, 8802431

Int. Cl.[5] F26B *3/28*

U.S. Cl. 34—4 **19 Claims**



1. A drying section which includes UV-light generating devices for drying a coloring substance applied to print material in a silk screen printer, a conveyer arrangement for conveying the material past at least one of the UV-light generating devices, means for cooling the UV-light generating devices, and a light and gas permeable grid located between the material and the UV-light generating device, wherein the grid is a glass plate structure of two or more mutually adjacent and contiguous glass plates; and a plurality of apertures are provided in the glass plate structure along edge margins of respective plates.

4,989,344

PARTICULATE REMOVAL FOR A SLUDGE TREATMENT PROCESS

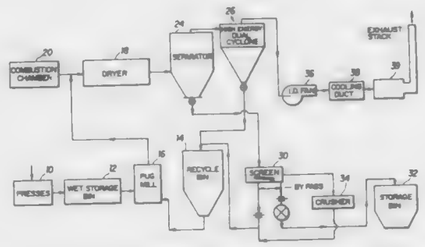
John D. Glorioso, Clearwater, Fla., assignor to Enviro-Gro Technologies, Baltimore, Md.

Continuation-in-part of Ser. No. 924,630, Oct. 29, 1986, Pat. No. 4,761,893, and a continuation-in-part of Ser. No. 220,207, Jul. 18, 1988, Pat. No. 4,860,671. This application Aug. 4, 1988, Ser. No. 228,864

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[5] F26B *3/24*

U.S. Cl. 34—11 **15 Claims**



1. A process for drying mechanically dewatered sewage sludge to produce pellets of a predetermined small and uniform size comprising the steps of:

mixing said sludge with recycled, previously dried sludge particles and pellets;

drying said mixture in a thermal drier to form pellets and particles thereof;

conveying the dried pellets and particles and dryer off-gas to a low velocity gas/solids separator and separating and collecting the pellets and a substantial portion of the particles;

clarifying the collected pellets and particles and separating and collecting the pellets of a predetermined size, the undersized pellets and particles, and the oversize pellets;

mechanically crushing the oversized pellets and collecting the crushed pellets and undersized pellets and particles;

recycling the collected undersized pellets and particles and crushed pellets by mixing said recycled materials with said incoming sludge to the dryer;

providing a two stage high pressure cyclone system;

collecting the off-gas from the gas/solids separator and removing substantially all of the fines therefrom by routing said gas successively through said high pressure cyclones.

4,989,345

CENTRIFUGAL SPIN DRYER FOR SEMICONDUCTOR WAFER

Gerald L. Gill, Jr., 3502 E. Atlanta Ave., Phoenix, Ariz. 85040

Filed Dec. 18, 1989, Ser. No. 451,950

Int. Cl.[5] F26B *17/24*

U.S. Cl. 34—58 **5 Claims**

4. Apparatus for spin drying a semiconductor wafer by centrifugal force, said wafer having an upper surface and a lower surface, said apparatus comprising

(a) a base rotatable about a first selected axis at variable RPM's including a first RPM and a second RPM greater than the first RPM;

(b) control arm means spaced away from said axis and connected to and outwardly extending from said base;

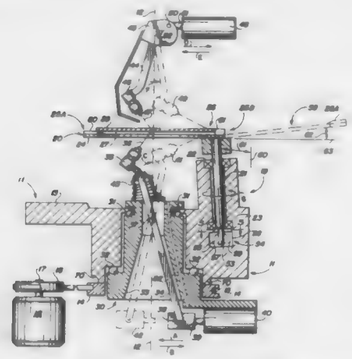
(c) a carrier spaced away from said base for supporting said semiconductor wafer,

(d) means for pivotally connecting said semiconductor wafer carrier to said control arm means to pivot said carrier about a second selected axis different from said first selected axis;

said semiconductor wafer carrier moving between at least two operative positions,

(e) a first operative position with said wafer in said carrier spaced away from said base in a first orientation with respect to said control arm means and intersected by said first selected axis, and

(f) a second operative position with said wafer pivoted by centrifugal force about said second axis away from said first operative position and from intersection with said first selected axis to a second orientation with respect to said control arm means;



(g) said semiconductor wafer carrier, and

(h) said semiconductor wafer comprising a pair, at least one of said pair, being weighted such that when said base is rotated at

(i) said first RPM said semiconductor wafer carrier is in said first operative position rotating at said first RPM with said base, and

(j) said second RPM said semiconductor wafer carrier is in said second operative position rotating at said second RPM with said base.

4,989,346

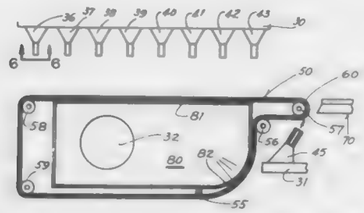
DRYER FOR PIECES OF FOOD

Leslie E. Wilken, Kewaunee, Wis., assignor to Frank Hamachek Machine Company, Kewaunee, Wis.

Filed Jun. 5, 1989, Ser. No. 361,477

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—71 **18 Claims**



1. A device for removing liquids from the outer layers of the exposed surfaces of workpieces comprising:

at least one liquid absorbent workpiece moving means;

a plurality of means capable of delivering a stream of gas with sufficient force whereby said liquid on or in said outer layers of said workpieces is removed by said stream of gas delivered from at least one of said means capable of delivering a stream of gas;

a plurality of plenums;

a plurality of means capable of directing said gas toward said workpieces;

said liquid removed from said workpieces being absorbed by and passing through said liquid absorbent means;

said liquid in said liquid absorbent means being removed from said liquid absorbent means and removed from said device by at least one of the said means capable of delivering a stream of gas through at least one opening;

whereby the outer surfaces of the wet workpieces are free from liquids to the extent desired.

4,989,347

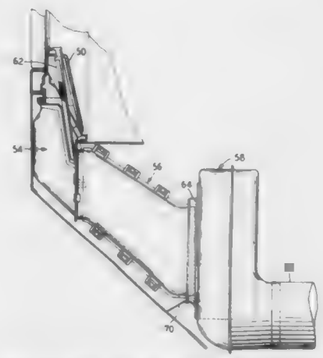
DRYER TRANSITION DUCT

Gerald L. Kretchman, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 22, 1989, Ser. No. 354,748

Int. Cl.[5] D06F *58/00*

U.S. Cl. 34—133 **17 Claims**



12. A clothes drying machine according to claim **11** further comprising at least one spring clip, and wherein said dryer outlet channel comprises a mating surface panel, and said spring clip is attached to said mating surface panel, and said collar and said sealing ring are guided into assembled position with said mating surface panel by said at least one spring clip; and once in assembled position, clearance between said transition duct assembly and said mating surface panel is fixed by an engagement of said collar with said at least one spring clip, and said sealing ring presses against said mating surface panel to form a sealing connection.

4,989,348

CONTINUOUS-FLOW DRYER FOR MATERIAL WEBS, IN PARTICULAR OFFSET DRYER PROCESS FOR THE THERMAL OPERATION OF A CONTINUOUS-FLOW DRYER

Hilmar Vits, Huschelrath 16, 5653 Leichlingen, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,594

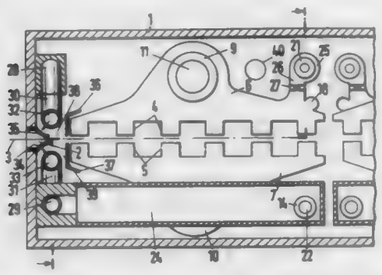
Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—155 **10 Claims**

1. A continuous-flow dryer for a material web comprising within a dryer casing one or more blowing nozzles for applying heated air to one or both sides of the material web, with at least one blower feeding the blowing nozzle with recirculated air within the interior of the dryer casing, at least one gas-fired heating device for the recirculated air and an after-burning device, as well as an inlet slit through said casing and an outlet slit through said casing for the material web, mixing chambers being provided adjacent to at least one of said slits above and below the material web, an outlet of the after-burning device being connected to a discharge device at the inlet slit for mixing the hot gases of the after-burning device with fresh air streaming in via the inlet slit and which have the outlets to the

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dryer interior, wherein each heating device and after-burning device fed with gas and said recirculated air is combined into



a unit and has a closed combustion chamber in the dryer casing.

4,989,349

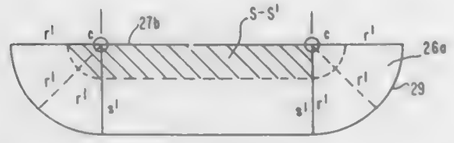
SHOE WITH CONTOURED SOLE

Frampton E. Ellis, III, 2895 S. Abingdon St., Suite B-2, Arlington, Va. 22206

Continuation of Ser. No. 219,387, Jul. 15, 1988, abandoned. This application Mar. 9, 1990, Ser. No. 492,360

Int. Cl.[5] A43B *13/14*

U.S. Cl. 36—25 R **54 Claims**



1. A shoe sole construction for a shoe, such as a street or athletic shoe, comprising:

a sole having a sole portion and a contoured side portion;

said sole portion including a substantially flat foot support surface and defined by a substantially constant frontal plane thickness;

said side portion being defined at least in part by a frontal plane arc of a substantially circular surface having a radius equal to the thickness of said sole portion and having the center of said radius lying at a point on a plane defined by an upper surface of said sole;

said thickness of said sole portion varying in a sagittal plane and being greater in the heel area than in the forefoot area;

said radius defining the arc of said side portion correspondingly varying directly and equally with the thickness of said sole portion; and

said contoured side portion extending along at least a lateral or medial heel portion of said sole portion.

4,989,350

ATHLETIC SHOE WITH CONTROL STRUTS

Richard P. Bunch, Reading; Steven S. Chapman, North Attleboro, both of Mass., and Theodore S. Gross, Stony Brook, N.Y., assignors to Converse Inc., North Reading, Mass.

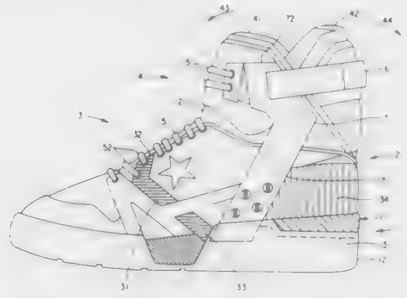
Filed Feb. 8, 1989, Ser. No. 308,062

Int. Cl.[5] A43B *7/14, 7/20*

U.S. Cl. 36—89 **14 Claims**

1. An improved athletic shoe of the type having a sole and an upper, wherein the upper is formed with lateral and medial side sheet portions having adjacent edges, each side portion having a counter portion, and sheet fastening means for fastening the lateral and medial side portions along a portion of the adjacent edges thereof together, and a structure, having first and second sheet springs each having an upper portion and a lower portion, the upper portion having an upper end, the structure being made of material which is resistant to both bending and twisting out of its plane and which is relatively unstretchable and incompressible in such plane, wherein each spring extends upward from the region of the sole and is attached thereto below the region of the ankle, each spring having fore and rear attachment points proximate to its upper end, and restraint fastening means for fastening under tension the corresponding pairs of fore and rear attachment points so as to form a structure for inhibiting displacement of the ankle,

wherein the improvement comprises:



each spring being integrally formed and being generally contoured to the anatomy of the wearer's ankle, and the lower portion of the spring being conformably and rigidly fixed along substantially the entire perimeter of the spring that lies below the ankle to the counter portion of the lateral and medial sheet portions of the upper respectively, such that the upper portion of each spring above the ankle is unaffixed to the lateral and medial sheet portions of the upper allowing the upper portion of the spring to stand free of the side of the shoe.

4,989,351

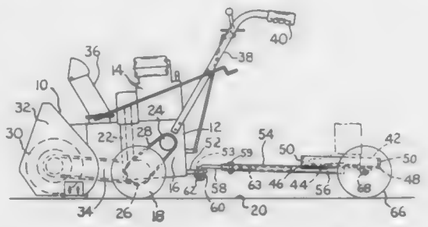
SNOWTHROWER PLATFORM

Walter J. Shear, 1430 McClellan St., Schenectady, N.Y. 12309

Filed Mar. 26, 1990, Ser. No. 498,428

Int. Cl.[5] E01H *5/09*

U.S. Cl. 37—242 **7 Claims**



1. In combination, a snowthrower of the walk-behind type, said snowthrower having a front end and a rear end spaced apart to form a longitudinal motion axis for the snowthrower, an engine, an engine-driven auger at the front end of the snowthrower, two engine-driven traction wheels located behind the auger, and two laterally-spaced elevated hand grips at the rear end of the snowthrower;

a towing connector extending from the rear end of the snowthrower on the snowthrower longitudinal axis;

a wheeled platform located directly behind the snowthrower;

and a towbar extending forwardly from the wheeled platform for rotary articulated attachment to said towing connector;

said wheeled platform comprising an essentially flat panel adapted to have a person stand thereon while operating the snowthrower; said flat panel having a front end and a rear end spaced apart to form a longitudinal motion axis normally in direct alignment with the snowthrower motion axis; said platform further comprising two laterally spaced ground wheels rotatably attached to said panel for motion around an axis transverse to the platform longitudinal axis; the ground wheel rotational axis being located relatively close to the rear end of the panel and relatively far away from the front end of the panel, so that the person is forced to stand with his weight displaced forwardly from the ground wheel rotational axis, whereby the person's weight produces a downward force on the traction wheels of the snowthrower.

4,989,352

BASEPLATE

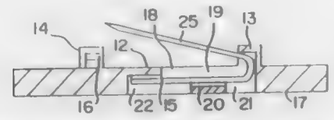
Tauno Seppanen, Solnantie 35 A, 00330 Helsinki, Finland

Filed Feb. 7, 1990, Ser. No. 476,359

Claims priority, application Finland, Feb. 7, 1989, 890565

Int. Cl.[5] A44C *3/00*

U.S. Cl. 40—1.5 **12 Claims**



1. A name tag comprising a baseplate, a U-shaped pin, said baseplate having a front and a back and four edges and being substantially longer than it is Wide and defining a longitudinal recess, said baseplate defining a first longitudinal opening on the back of said baseplate at an end of said recess, said first opening being coincident with and shorter in length than said recess, said baseplate also having a first stop member on said back at the end of the recess near said first opening, said baseplate having a second stop member on said back near the opposite end of said recess from said first stop member but beyond the end of said recess, said second stop member having a notch for locking a free end of said pin in a closed position, said baseplate also having a step adjacent into said recess on the front of said baseplate, said baseplate defining a second longitudinal opening on the front of said baseplate at the end of said recess between said stop members and closer to said second stop member, said second opening on said front being coincident with and substantially shorter in length than said recess, said second opening overlapping said first opening such that a first hole is formed through said baseplate, said U-shaped pin having a first branch and a second branch and being fixable to said baseplate without extrinsic fastening means, said first branch locking into said recess when said pin is fixed to said baseplate, and said second branch being slightly longer than said first branch such that said second branch extends into said notch on said second stop member when the pin is in the closed position.

4,989,353

TABLE-TOP PICTURE FRAME WITH TWO DETACHABLE SECTIONS

Pietro Astolfi, Bologna, Italy, assignor to Pico-Glass, S.p.A., Cadriano, Italy

Filed Mar. 22, 1989, Ser. No. 327,330

Claims priority, application Italy, Oct. 4, 1988, 22177 A/88

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—152.1 **4 Claims**

1. A table-top picture frame comprising:

front and rear frame portions, each having a picture-viewing opening and including means for retaining said picture in said opening;

complementary means concealed within said front and rear frame portions for retaining said front and rear frame portions in a joined relationship when they are pressed together in superimposed alignment;

means on said front and rear frame portions for forming a groove between said portions in the periphery of said frame when said portions are joined together to form said frame;

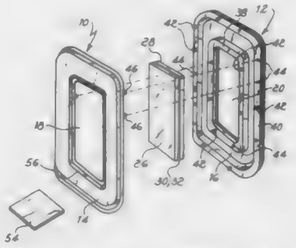


plate means dimensioned to be received within said groove and being constructed for use in prying apart said front and rear portions by being twisted within said groove, and means on independent bath said front and rear frame portions for receiving and retaining said plate in a position in which said plate forms a supporting leg for said frame.

4,989,354

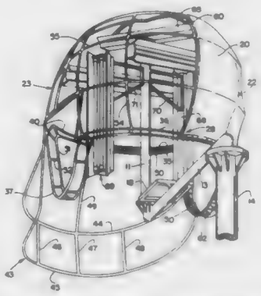
SPORTS OR TRADE EMBLEM

Jerry W. Selby, 3863 Sourek Rd. Ext., Akron, Ohio 44313

Filed Apr. 7, 1989, Ser. No. 334,334

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—160 **24 Claims**



14. A three dimensional emblem comprising separate frames, separate fabrics covering the exterior of said frames, coextensive frame members on each frame closely adjacent yet slightly gap spaced from each other, said frame members each including tie rods generally uniformly upwardly spaced therefrom whereby said separate fabrics may be stretched over the exterior of each frame and drawn through the slight gap spacing between said coextensive frame members to be secured to the respective tie rod.

4,989,355

DISPLAY CARD

Robb Thomas, 655 W. Irving Park, Chicago, Ill. 60613

Filed May 22, 1989, Ser. No. 354,927

Int. Cl.[5] B44F *1/00*

U.S. Cl. 40—427 **7 Claims**

1. A display card comprising a pair of panels hingedly connected for movement between open and closed positions;

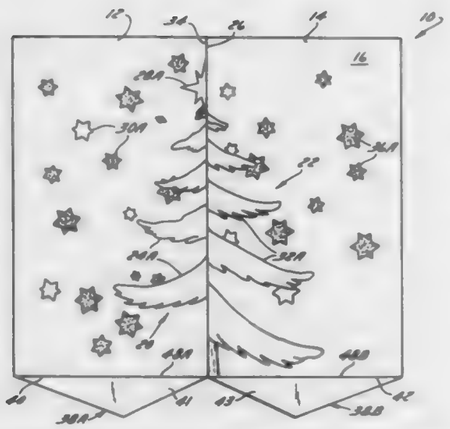
each panel has a surface,

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a reflective metallized sheet laminated to the surface of one of said panels;

a reflective indicia secured to the surface of the other of said panels, said indicia being in a face-to-face relationship with said reflective metallized surface when said panels are in the closed position; and

gusset means connected to the edges of said panels for limiting the opening of said panels to a predetermined angular relationship wherein said indicia appear as a virtual image in the reflective surface of said one panel.



4,989,356

WIND SOCK AMUSEMENT DEVICE

Marvin Combs, 2327 Mayhew Dr., Indianapolis, Ind. 46227

Filed Mar. 25, 1985, Ser. No. 715,977
Int. Cl.[5] G09F 7/00
U.S. Cl. 40—584 10 Claims



1. An amusement device for enabling a display of one's allegiance to a particular team or entity comprises:

a hoop member;

an air-extendable, flexible, hollow sleeve securely attached to said hoop member;

a rotational joint cooperatively arranged with said hoop member; and

a handle member cooperatively arranged with said rotational joint for enabling rotation of said hoop member relative to said handle member.

4,989,357

MUZZLELOADER SAFETY

John W. Norman, 8029 Golden Oak Rd., Oklahoma City, Okla. 73127, and Charles W. Rowell, 513 Jean Marie Dr., Norman, Okla. 73069

Filed Jan. 17, 1989, Ser. No. 297,991
Int. Cl.[5] F41A 17/74
U.S. Cl. 42—70.08 11 Claims

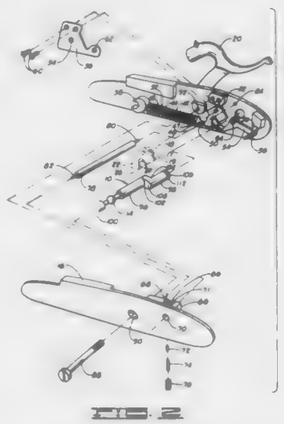


FIG. 2

1. A firing weapon comprising:

a hammer pivotally secured on the firing weapon for selective movement between a fired position and a firing position;

means for biasing the hammer towards the fired position;

means for selectively retaining the hammer in the firing position; and

means for selectively preventing the hammer from pivoting from the firing position to the fired position when the hammer is released from the firing position, comprising:

a safety assembly slidably secured on the firing weapon for movement between an on position and an off position such that, when the safety assembly is in the on position, the hammer is prevented from pivoting from the firing position to the fired position and, when the safety assembly is in the off position, the hammer is permitted to pivot from the firing position to the fired position, comprising:

a first bar portion having a first and second end;

a first second bar portion having a first and second end; until

means for securing the first bar portion to the second bar portion such that the center lines of the first and second bar portions are offset.

4,989,358

HAND GUN BRACE FOR CONVERTING A SIDE HANDLE BATON TO HAND GUN STOCK

Martin J. Aronson, and Penny L. Aronson, both of 1479 Hwy. 2, West, Kalispell, Mont. 59901

Filed Dec. 14, 1989, Ser. No. 450,449
Int. Cl.[5] F41A 21/00
U.S. Cl. 42—72 8 Claims



1. Adapter brace device for handguns having a hand grip with a back edge to be used with a side handle baton, comprising:

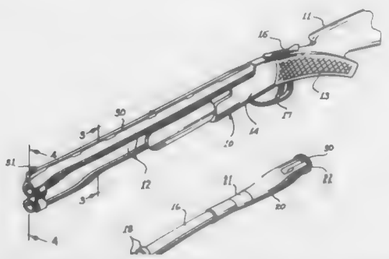
a plastic body of predetermined length adapted to be removably attached to one end of a side handle baton means and including an inner end an outer end, said body at its inner end having a recess opening of a predetermined size extending into said body a predetermined depth to form a mounting portion having a predetermined cross sectional shape of predetermined dimensions so that said body can be adapted to slip securely onto the end of said side handle baton means for non-rotational movement for bracing a gun held by an individual using said side handle baton as a stock, the outer end of said body having an angled cradle portion to be engaged by the back edge of the gun's hand grip, said cradle portion when said body is in position extending generally upwardly and outwardly at a predetermined angle and forming a generally straight concave depression, said body being adapted to slip off the end of said baton when not in use.

4,989,359

SHOTGUN HAVING INTERCHANGEABLE BARRELS

Bruce E. Kinkner, Phoenix, and Alan R. Peck, Scottsdale, both of Ariz., assignors to Southwest Shooters Supply, Inc., Phoenix, Ariz.

Filed Dec. 1, 1989, Ser. No. 444,320
Int. Cl.[5] F41A 21/06
U.S. Cl. 42—77 7 Claims



1. In a shotgun having an action, the improvement comprising: a cylindrical barrel support member pivotally secured to said action; a plurality of barrels, each having the same predetermined weight and each having a different gauge or bore, each of said barrels having an external diameter selected to fit within said support member in operative position with respect to said action to thereby permit the selective utilization of one of said barrels in said cylindrical barrel support of said shotgun.

4,989,360

SELECTIVELY ADJUSTABLE AND DETACHABLE APPARATUS FOR CONNECTING ARTIFICIAL AND LIVE BAIT TO A FISHING LINE

Roger C. Lewis, Rte. 2, Box 202-A, Ladd Rd., Brimley, Mich. 49715

Filed May 1, 1989, Ser. No. 345,961
Int. Cl.[5] A01K 83/00, 91/04
U.S. Cl. 43—42.49 18 Claims



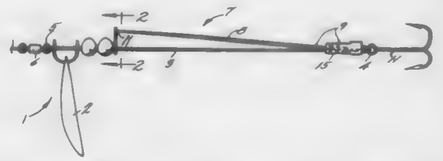
1. Apparatus for detachable connection to an associated fishing line, comprising guide structure means, said guide structure means comprising a first generally coiled guide portion, a second generally coiled guide portion, a longitudinally extending shank-like body, wherein said first coiled guide portion is carried by said shank-like body at a first end thereof, wherein said second coiled guide portion is carried by said shank-like body at a second end thereof opposite to said first end, wherein said shank-like body is continuous and generally straight throughout its longitudinal length from said first end to said second end, and a relatively flexible coiled element axially mounted around said shank-like body and axially contained between said first and second coiled guide portions, the axis of said flexible coiled element is substantially parallel to the axes of said guide portions, and wherein said apparatus is detachably securable to said associated fishing line by winding said fishing line through said first coiled guide portion winding said fishing line against said relatively flexible coiled element and against said shank-like body about which said coiled element is situated and winding said fishing line through said second guide portion.

4,989,361

BAIT HOLDER FOR ATTACHMENT TO A FISHING LURE

Charles E. Peterson, 273 Shore Dr., St. Helens, Oreg. 97051

Filed Mar. 5, 1990, Ser. No. 488,266
Int. Cl.[5] A01K 83/06
U.S. Cl. 43—44.2 4 Claims



1. A bait holder for attachment to a fishing lure assembly having an elongate main member, said bait holder comprising in combination,

an elongate retainer for lengthwise engagement with a bait and having an end segment,

clip means formed at the remaining end of said retainer for

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retentive engagement with the elongate main member of the lure assembly, and

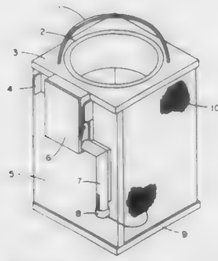
a sleeve for placement on said elongate main member of the fishing lure assembly for engagement and having an open end for inserted reception of the end segment of said elongate retainer.

4,989,362

CRICKET DISPENSING AND HOOKING DEVICE

Ronald D. Joyner, 7821 Coronet La., Pensacola, Fla. 32514

Filed Jun. 5, 1989, Ser. No. 361,992
Int. Cl.[5] A01K *97/04*
U.S. Cl. 43—55 1 Claim



1. A live bait dispenser, comprising:

a container equipped for receiving and retaining a plurality of crickets or other live fish bait with a rough surface on one or more of the interior surfaces of said container allowing bait to crawl from the bottom to the top of said container, and also equipped with at least one hole by which bait may exit said container and enter a detention box;

a sliding door which will block and unblock the opening between the container and the detention box and can be operated by the user of the dispenser by sliding it back and forth;

at least one detention box attached to the outside of said container, said detention box being smooth on all interior surfaces and equipped with a hole allowing bait to enter from aforementioned container and also equipped with a hole by which bait may exit said detention box;

at least one conduit having a smooth interior surface attached to said detention box at said exit hole in a horizontal position which, after traversing in a horizontal position, makes a 90 degree bend to a vertical position and extends downward to an opening which is closed off with a removable cap, said vertical section having a slot through the side which will allow a hook to be placed through said slot to impale bait;

a removable cap placed on the end of said conduit to prevent bait from exiting said conduit and when removed will allow bait to be removed from said conduit.

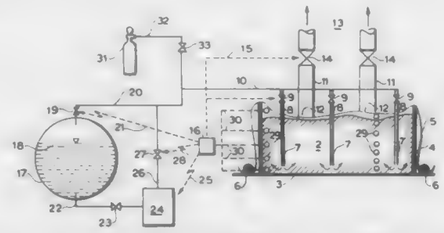
4,989,363

BULK MATERIAL TREATMENT AND APPARATUS

Manfred Doernemann, Frankfurt, Fed. Rep. of Germany, assignor to Degesch GmbH, Frankfurt, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 280,850
Claims priority, application South Africa, Dec. 11, 1987, 87/9319
Int. Cl.[5] A01M *13/00*
U.S. Cl. 43—124 26 Claims

1. In a process for eradicating or controlling pests in bulk commodities, respectively for protecting or preserving stored commodities, against deterioration by pest action, comprising the introduction into and maintenance in the commodity in a substantially gas-tight enclosure of a pesticidal atmosphere comprising carbon dioxide, the improvement which comprises introducing and releasing a gas comprising carbon dioxide in a pesticidal concentration in excess of about 50% by volume to the bottom region of an enclosed space containing the commodity at a rate slow enough as to substantially avoid turbulence and thereby progressively filling the space with such gas from the bottom upwards, whilst displacing gas previously contained in the space upwardly towards the top of the space and from there discharging the displaced gas.



4,989,364

FUMIGATION METHOD

James J. Chaudoin, Norco, and Michael R. Linford, Villa Park, both of Calif., assignors to Isothermics Incorporated, Long Beach, Calif.

Filed Apr. 27, 1990, Ser. No. 515,725
Int. Cl.[5] A01M *13/00*
U.S. Cl. 43—125 3 Claims

1. A method of fumigating a building structure comprising the steps of:

(a) placing at least one expandable bladder inside the building in at least one substantially open space defined by the building structure or the contents thereof;

(b) inflating the bladder with inert gas to cause the bladder substantially to fill and occupy said substantially open space;

(c) enclosing the building structure in a substantially gas-impermeable barrier;

(d) introducing insect-eradicating gas into the building while the bladder occupies said open space therein;

(e) removing the insect-eradicating gas from the building;

(f) opening the gas-impermeable barrier; and

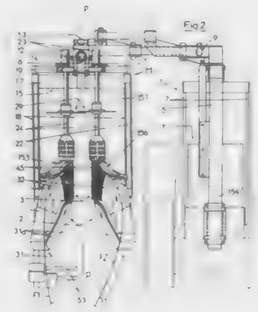
(g) deflating and removing the bladder from the open space.

4,989,365

MACHINES FOR TRAINING PLANTS

Pellenc Roger, Pertuis, France, assignor to Etablissements Pellenc Et Motte s.a., Pertuis, France

Filed Dec. 12, 1988, Ser. No. 283,354
Int. Cl.[5] A01G *17/08*
U.S. Cl. 47—1.01 20 Claims



1. A machine for training plants to be supported between two lifting wires positioned one to each side of a row of such plants by repositioning the lifting wires from a relaxed position at or near the ground one on each side of the row to a level position generally parallel to the ground at a predetermined height above the ground thus to raise and support the plant vegetation between the lifting wires at the predetermined height and by connecting the raised lifting wires together at selected intervals to support the plant vegetation between the wires and to tend to support the lifting wires on the trained plants; the plant training machine being mounted on a prime mover for movement along a row in an intended direction and including

(a) a plant training head comprising:

(1) first and second lifting means for raising from relaxed position the aforesaid lifting wires and the plant vegetation to be supported therebetween, and

(2) first and second guide means positioned behind the lifting means in the intended direction of travel of the machine for guiding and drawing together the raised lifting wires; and

(b) connection means positioned behind the guide means in the intended direction of travel of the machine for interconnecting the raised lifting wires;

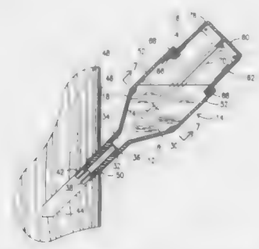
(c) the arrangement being such that, in operation of the plant training machine said first lifting means and said first guide means are positioned on one side of said row of plants and said second lifting means and said second guide means are positioned on the other side of said row of plants.

4,989,366

TREE INJECTING DEVICE

Terry A. DeVlieger, 2006 6th Pl., SW., Largo, Fla. 34640

Filed Jul. 10, 1990, Ser. No. 550,865
Int. Cl.[5] A01G *7/06;* A11G *29/00*
U.S. Cl. 47—57.5 17 Claims



9. A hand held disposable device for injecting liquids directly into the live tissue of a tree comprising

(a) a funnel housing, a compression housing and a plunger housing in cooperating engagement to form a sealed container,

(b) a quantity of liquid within the sealed container,

(c) the funnel housing having an upper funnel portion and a lower tube portion, the funnel portion having an annular recessed upwardly projecting flange integral with a top annular edge of the funnel, the flange having a boss on an outer surface,

(d) the compression housing having a top annular edge and a bottom annular edge, an inner surface of the bottom edge having an annular indentation for receiving the boss from the funnel housing, the top annular edge having an inwardly projecting flange, the top edge and bottom edge being joined by a cylindrical wall enclosing a hollow cavity,

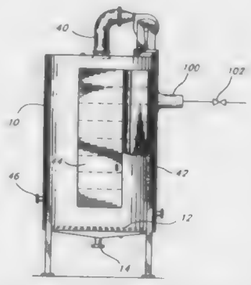
(e) the plunger housing having a disc shaped upper wall joined to a bottom annular edge of the housing, having an outwardly projecting flange, by a cylindrical wall enclosing a hollow cavity, a spike descending from an inner surface of the upper wall and projecting below the bottom annular edge to engage and a break a thin membrane seal located in the tube portion of the funnel housing upon pressing the upper wall downward towards the bottom edge of the compression housing, and a means to seal the three housings together to prevent leakage of the liquid out of the housing prior to rupturing of the membrane seal.

4,989,367

METHOD AND APPARATUS FOR GERMINATING SEED SPROUTS

Huy Chung, 11950 Pierrefonds Blvd., Apt. 417, Pierrefonds, Que. H9A 2X5, Canada

Continuation-in-part of Ser. No. 260,305, Oct. 20, 1988, Pat. No. 4,926,598. This application Dec. 11, 1989, Ser. No. 448,266
Int. Cl.[5] A01C *1/02*
U.S. Cl. 47—61 3 Claims



1. An apparatus for accelerated germination of seeds comprising:

an enclosed vessel having a screen in a lower portion of the vessel to hold a layer of seeds, the vessel having a drain in the lower portion below the screen,

a shower at the top of the vessel to spray water from a water supply onto the screen,

water heating means with water temperature sensing device and means to control temperature of the water supply to the shower,

an air supply means having an air heating means to supply air through an air inlet at the top of the vessel, the air flowing downwards and exiting through the drain,

air temperature sensing device in the vessel and means to control the air temperature in the vessel,

moisture producing means in the vessel with humidity measuring device and means to control humidity in the vessel,

sequence control means to control a soaking step and an air flow step with intermittent spraying from the shower; and

a bypass vent on said vessel.

4,989,368

TURNSTILE ASSEMBLY

Emmanuel M. Trikilis, 1545 W. 130th St., Brunswick, Ohio 44212

Filed Aug. 22, 1989, Ser. No. 397,050
Int. Cl.[5] E05D *15/02*
U.S. Cl. 49—42 28 Claims

1. A revolving door construction comprising:

an elongated pivot column including a plurality of integrally formed first grooves extending longitudinally therealong at equidistantly spaced intervals therearound;

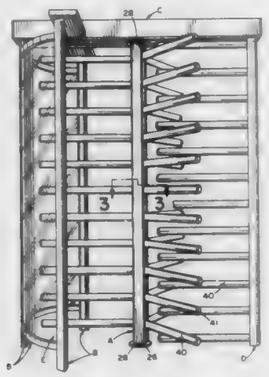
a plurality of barrier members, at least one of such members being associated with each first groove and arranged to extend radially outward of said first groove; and,

a locking means concealably contained and interposed between a side wall of each first groove and a terminal end of each barrier member mountingly associated therewith for retaining said barrier member in said groove, said locking means comprising:

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a second groove which extends longitudinally along said side wall of each first groove, and

a locking bar extending in said second groove, said locking



bar having a round side and a flat side and being selectively rotatable to wedgingly engage both a wall of said second groove and said terminal end of each barrier member.

4,989,369

SEALING AND RETAINING STRIPS

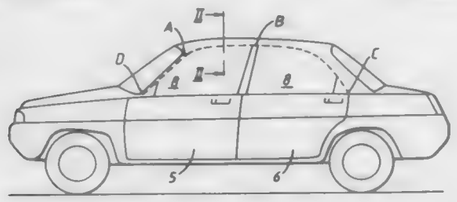
Klaus P. Maass, Viersen, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, United Kingdom

Filed Sep. 26, 1989, Ser. No. 412,897

Claims priority, application United Kingdom, Sep. 30, 1988, [illegible]

Int. Cl.[5] E06B 7/16

U.S. Cl. 49—477 11 Claims



1. Retaining means for retaining at least part of an edge of a door with respect to the frame of an opening, the door supporting a window glass adjacent said edge, the retaining means comprising

a retaining strip made of relatively flexible material running along and attached to at least part of said edge of the door and defining a first hollow chamber arranged so that a change in pressure therewithin alters its shape and moves a retaining member between a retaining position and a releasing position,

the strip defining a further hollow chamber having a flexible wall portion, the further hollow chamber and its flexible wall portion being positioned adjacent the said edge of the door and thereby adjacent to the window glass supported by the door whereby the flexible wall portion moves between a sealing position in sealing engagement with the window glass and a non-sealing position out of sealing engagement with the window glass according to the pressure within the further hollow chamber.

pressure-changing means connected to the two hollow chambers for changing the pressures therewithin so as to alter the shape of the first hollow chamber and to move the retaining member between the retaining position and the releasing position and to move the flexible wall portion of the further hollow chamber between the sealing position and the non-sealing position, and

a retaining profile separate from but attached to the said frame and so positioned thereon that it and the retaining member when in the retaining position mechanically interfere with each other and tend to prevent removal of the door from the opening.

4,989,370

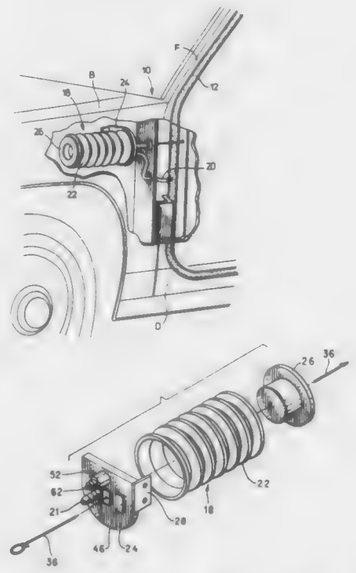
PROGRAMMED AIR LEAK FOR DEFLATABLE WEATHERSTRIP SYSTEM

Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 380,421, Jul. 17, 1989. This application Sep. 7, 1989, Ser. No. 403,954

Int. Cl.[5] E06B 7/16

U.S. Cl. 49—477 3 Claims



1. An apparatus for sealing between a closure and a body such as a door and door frame of a vehicle, comprising:

a deflatable sealing member for resilient interference engagement between said closure and said body;

vacuum source means in he form of a bellows actuatable by resilient memory to form a vacuum when connected to said deflatable sealing member; means for mounting said bellows at one end to one of said closure or said body and including an opposite, relatively displaceable end for actuating said bellows to condition said bellows for actuation by resilient memory;

means for connecting said relatively displaceable end of said bellows to the other of said closure or said body to contract said bellows for actuation by resilient memory only during opening of said closure, said bellows being expanded by resilient memory during closing of said closure; and

a flow control circuit connected o said bellows including first valve means operable to open said bellows to atmosphere during contraction of said bellows, second valve means operable to connect said sealing means to said bellows during actuation by resilient memory to deflate said sealing member to a reduced cross section only during closing of said closure so as to allow passage of air from inside the vehicle past said sealing member to substantially reduce closing effort and eliminate compression shock, and adjustable bleed valve means having an adjustable bleed port directly continuously connecting said bellows with atmosphere, said bleed port being adjustable to a size that assuredly allows said bellows to overcome air flowing from the atmosphere through said bleed port into said bellows during contracture so as to effect the deflation of said sealing member but also assuredly allow the internal pressure of said sealing member to fully return to atmospheric pressure and expand said sealing member by resilient memory to full cross section after closing of said closure so as to provide firm sealing engagement with the desired resilient interference between said closure and said body in various sealing installations having different air bleed requirements.

4,989,371

SEALING STRIP FOR MOTOR VEHICLES

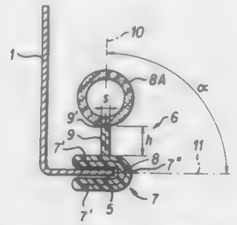
Federico Mancosu, and Giovanni Daminelli, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Jun. 22, 1989, Ser. No. 370,191

Claims priority, application Italy, Jun. 24, 1988, 21092 A/88

Int. Cl.[5] E06B 7/16

U.S. Cl. 49—497 16 Claims



1. A sealing strip for a motor vehicle adapted to be supported to an edge of an opening of a motor vehicle body to provide sealing along contours of side doors, trunk door, or other components connected by hinges to the motor vehicle body, said strip comprising:

a first elongated structural member including anchor means for anchoring the strip to the motor vehicle body;

a second elongated structural member formed of elastically deformable material, said second structural member having a substantially uniform shape along a cross-section thereof perpendicular to a longitudinal axis of said second structural member, said longitudinal axis of said second structural member being substantially parallel to a longitudinal axis of said first structural member;

an elongated rib formed of polymeric material, said rib interconnecting said first structural member and said second structural member, said rib having a longitudinal axis substantially parallel to said longitudinal axis of said first structural member and said longitudinal axis of said second structural member, said rib comprising means for simultaneously achieving effective sealing by said strip and facilitated closure of said doors or other components in response to application of a low closure force, said means comprising at least one portion of said rib including variations along said longitudinal axis of said rib with respect to one of geometric configuration, dimensions and physical properties.

4,989,372

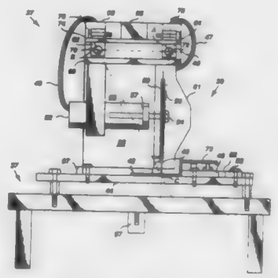
PRECISION RADIAL ARM SAW FOR COMPOSITE MATERIALS

Steven J. Avila, Federal Way, and Charles R. Reid, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 27, 1988, Ser. No. 225,333

Int. Cl.[5] B24B 7/22

U.S. Cl. 51—34 C 8 Claims



1. A radial arm saw comprising:

a cutting surface for retaining a specimen thereon while cutting said specimen;

a clamp for firmly holding said specimen to said cutting surface;

a plurality of support shafts positioned above said cutting surface;

a support beam coupled to said support shafts, said support beam having a horizontal portion and a vertical portion;

a radial arm saw slidably coupled to said support shafts;

a rigid lever arm coupled to said support beam for retaining said support beam in a generally horizontal plane with respect to said cutting surface as said saw is slid along said support shafts.

4,989,373

FLAT GLASS EDGING-BEVELLING MACHINE

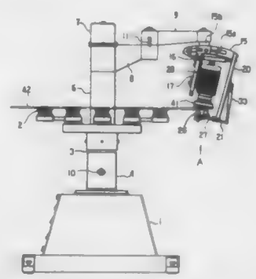
Kyung Park, 305-1109 Jugong Apt. 670 Daichi-Dong, Kangnam-Ku Seoul, Rep. of Korea

Filed Aug. 11, 1989, Ser. No. 392,862

Claims priority, application Rep. of Korea, Aug. 12, 1988, 13262/1988[U]

Int. Cl.[5] B24B 5/00

U.S. Cl. 51—131.1 7 Claims



1. A flat glass edging-bevelling machine in which a flat glass is placed on the surfaces of holding means located above a main body and the flat glass is edged-bevelled with a diamond abrasive grinding wheel connected to a motor, comprising:

a horizontal beam rotatably mounted on a vertical center shaft between a main body and glass holding means, said beam extending away from said shaft;

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a vertical beam secured to an end of said horizontal beam remote from said shaft;

articulated beam means supported by said vertical beam in a position higher than the glass holding means in height;

a bevel angle control means, a grinding wheel height control means and a positioning means for selectively varying the positon of a sagging-prevention roller, all connected to the articulated beam means by a rotational shaft; and

wherein at least the bevel angle control means and grinding wheel height control means of said machine are disposed higher than a flat glass supported on said glass holding means.

4,989,374

PORTABLE MACHINE TOOL WITH AUTOMATIC LOCKING OF THE WORK SPINDLE

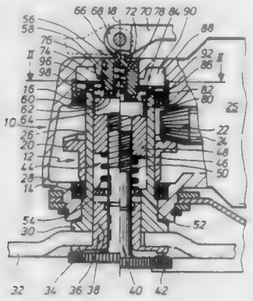
Boris Rudolf, and Walter Blutharsch, both of Stuttgart, Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,497

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741484

Int. Cl.[5] B24B *41/04, 45/00, 23/02;* B26D *1/12*

U.S. Cl. 51—168 13 Claims



1. Portable machine tool, in particular an angle grinder, comprising:

a drive,

a work spindle having a tool clamping means,

a securing device which is operable from outside an apparatus housing and by means of which the tool clamping means is transferable from a manually releasable position to a manually unreleasable position in which the tool is clamped and vice versa,

a locking device for non-rotatably fixing said work spindle in a non-rotatable manner on said apparatus housing, and

means for coupling said tool securing device and said locking device for fixing said work spindle in said non-rotatable manner when said securing device is operated for transferring said tool clamping means from said manually unreleasable position to said manually releasable position and for releasing said work spindle when said tool clamping means is operated for transferring said tool clamping means from said manually releasable position to said manually unreleasable position.

4,989,375

GRINDING WHEEL HAVING HIGH IMPACT RESISTANCE, FOR GRINDING ROLLS AS INSTALLED IN PLACE

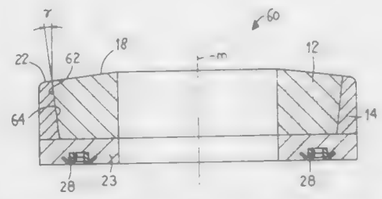
Yoshinori Henmi, Komaki; Akira Tanabe, Kasugai; Kouichi Saburi, Aichi; Kanji Hayashi, Hiroshima; Takayuki Goto, Yokohama, and Hisao Matsushima, Hiroshima, all of Japan, assignors to Noritake Co., Limited, Aichi and Mitsubishi Jukogo Kabushiki Kaisha, Tokyo, both of, Japan

Filed May 19, 1989, Ser. No. 354,983

Claims priority, application Japan, May 28, 1988, 63-131217; May 28, 1988, 63-131218; May 28, 1988, 63-131219; May 28, 1988, 63-131220

Int. Cl.[5] B24D *7/14*

U.S. Cl. 51—209 R 13 Claims



1. A grinding wheel having a circular outer periphery, and a working front end face for grinding a roll as installed in place for operation, such that the front end face is held in pressed frictionally sliding contact with an outer circumferential surface of the roll, comprising:

a first abrasive member having an annular shape and consisting of one of a vitrified-bond wheel, a resinoid-bond wheel and a metal-bond wheel; and

at least one second abrasive member having an annular shape, formed integrally with said first abrasive member, and disposed on corresponding one of radially outward and inward sides of said first abrasive member, each of said at least one second abrasive member comprising a mass of abrasive grains, and a bonding agent for bonding together said abrasive grains, said bonding agent of said each second abrasive member being different from a bonding agent for bonding together abrasive grains of said first abrasive member, said each second abrasive member having a lower modulus of elasticity than said first abrasive member, said each second abrasive member consisting of one of a resinoid-bond wheel containing one of epoxy resin, phenol resin and polyvinyl alcohol resin as the bonding agent, and a rubber-bond wheel containing synthetic or artificial rubber as the bonding agent.

4,989,376

CONTROL MECHANISM FOR ADVANCING PARTS OF A MACHINE TOOL

Joseph A. Armoud, River Grove; Juanito Rodenas, Carol Stream, and John F. Sepot, Franklin Park, all of Ill., assignors to Electro-Matic Products Co., Chicago, Ill.

Filed May 10, 1989, Ser. No. 349,845

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.71 17 Claims

1. In a grinder including a stand having a front and a rear side, a table mounted for reciprocation transversely of the stand, and from front to rear of the stand, the table being capable of supporting a workpiece thereon to be ground, a grinding wheel mounted on the stand for vertical movement between an upper limit retract position and a lower limit position adjacent the table a cross shaft operable on rotation thereof for moving the grinding wheel vertically,

the combination comprising,

motion transmitting means including a hydraulic unit and a mechanical unit, the hydraulic unit including a hydraulic motor operably connected with the mechanical unit for driving the latter, and the mechanical unit having an output shaft constituting an output shaft of the motion transmitting means,

means for driving the motion transmitting means,

a first connecting means operably connecting the output shaft with the cross shaft for rotating the latter,

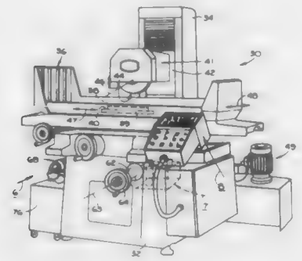
an encoder having a rotatable input shaft,

second connecting means operable connecting the cross shaft with said input shaft for rotating the latter,

a counter,

an electrical circuit,

the encoder being operable, in response to its rotation by the cross shaft for producing indications in the counter of the



positions of the grinding wheel produced by rotation of the cross shaft,

manually acutable means for entering signal in the counter according to predetermined positions of the grinding wheel for pre-setting the counter to produce functions by the encoder according to later positioning of the grinding wheel at the respective position,

the hydraulic unit

including electrically operated valves for controlling flow of the hydraulic fluid and thereby controlling the movement of the mechanical unit, and

the encoder and electrical circuit being operable in response to preset signals entered into the counter for actuating the valves to open and closes positions.

4,989,377

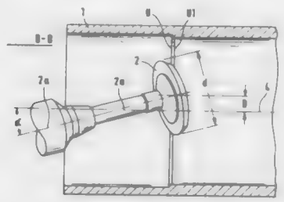
APPARATUS FOR INTERNAL GRINDING

Erwin Junker, Talstr. 78, 7611 Nordrach-Baden, Fed. Rep. of Germany

Continuation of Ser. No. 283,710, Dec. 13, 1989, abandoned. This application Aug. 15, 1990, Ser. No. 568,664

Int. Cl.[5] B24B *5/00*

U.S. Cl. 51—165.93 3 Claims



1. Apparatus for internally grinding a rotationally-symmetrical workpiece, which is clamped in position in a grinding machine so as to the rotatable about its longitudinal axis, said apparatus having a grinding disc which is displaceable along the rotational axis of the workpiece and is radially displaceable according to an internal profile to be ground, wherein the grinding disc, which abuts only against an end face of the workpiece, has a generatrix which extends in a flat manner and, by subtending a small clearance angle γ, is guided toward the area of the workpiece to be machined, and wherein a further clearance angle δ is formed by a skewed disposition of the axes of the grinding disc and of the workpiece relative to one another, the grinding disc and the completely ground workpiece face making contact at a point, the axis of the grinding disc lying in a plane spaced by a distance D from a horizontal plane in which the axis of workpiece lies causing the point of contact to be on the leading edge of the grinding disc.

4,989,378

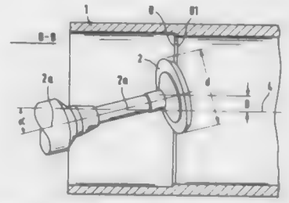
METHOD FOR INTERNAL GRINDING

Erwin Junker, Talstrasse 78, D 7611, Nordrach-Baden, Fed. Rep. of Germany

Division of Ser. No. 283,710, Dec. 13, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 535,439

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.93 3 Claims



1. Method for internally grinding a rotationally-symmetrical workpiece, comprising clamping the workpiece in a grinding machine so as to be rotatable about its longitudinal axis, the grinding machine having a grinding disc rotatable about its axis and displaceable along the rotational axis of the workpiece and radially displaceable according to an internal profile to be ground, while rotating the workpiece and the grinding disc about their respective axes abutting the grinding disc against an end face of the workpiece, the grinding disc having a generatrix which extends in a flat manner, and, with the grinding disc being oriented so that it subtends a small clearance angle γ and the axes of the grinding disc and of the workpiece being skewed relative to one another to form a further clearance angle δ, moving the grinding disc toward an area to be machined and grinding the workpiece with the grinding disc and the completely ground workpiece face making contact at a point, the axis of the grinding disc lying in a plane spaced by a distance D from a horizontal plane in which the axis of the workpiece lies causing the point of contact to be on the leading edge of the grinding disc.

4,989,379

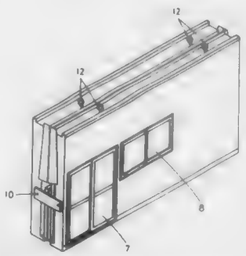
FOLDING HOUSE

Nobuo Suzuki, Osaka, Japan, assignor to Yugen Kaisha Suzuki House, Osaka, Japan

Filed Mar. 7, 1990, Ser. No. 494,086

Int. Cl.[5] E04B *1/346*

U.S. Cl. 52—66 5 Claims



1. A folding house which can be reduced in size when it is

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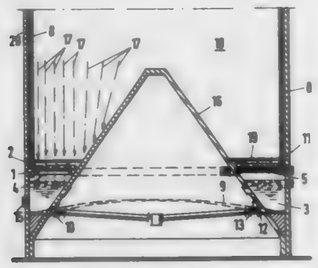
transported comprising fixed walls, at least one folding part including a roof which can be freely folded at its center line so that the center part sinks downwardly during folding, a floor which can be freely folded at its center line so that the center part extends upwardly during folding and non-foldable, one piece side walls which can be freely folded inside prior to folding said roof and said floor, and at least one door on either of said side walls or fixed walls.

4,989,380

SILO FOR PULVERULENT AND FINE-GRAINED BULK MATERIALS

Werner Kranss, Hamburg, Fed. Rep. of Germany, assignor to Iben Hamburg Ingenieurgesellschaft Industriebau mbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,256
Claims priority, application European Pat. Off., Jul. 28, 1988, 88112178.4
Int. Cl.[5] B65G *65/40;* E04H *7/00*
U.S. Cl. 52—197 18 Claims



1. A silo for pulverulent and other loose materials comprising:
(a) an outer silo wall;
(b) a lower circular silo base having an outlet opening for discharging materials from the silo;
(c) a conical cover in the center of the lower silo base for defining an inner silo wall;
(d) an upper, intermediate silo base located above the lower circular silo base and between the outer silo wall and conical cover and having a plurality of outlet openings formed therein, wherein an upper silo material storage area is formed above the intermediate silo base and a continuous annular space is formed between the upper and lower silo bases thereby defining a substantially open intermediate material collecting chamber for receiving materials through the plurality of upper base outlet openings from the upper silo storage area and collecting and holding the materials for discharge through the lower base outlet opening; and
(e) regulating means for regulating the discharge of loose materials through the lower silo base outlet opening from the intermediate material collecting chamber.

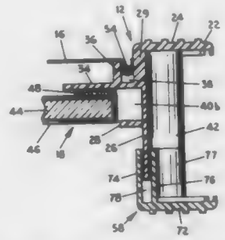
4,989,381

VENTILATED DOOR LIGHT

David A. De Block, and Kert E. Artwick, both of Holland, Mich., assignors to ODL, Incorporated, Zeeland, Mich.

Filed Apr. 10, 1986, Ser. No. 849,966
Int. Cl.[5] E06B *1/36, 3/24*
U.S. Cl. 52—204 11 Claims

1. A door light comprising:
a panel;
a screen;
a sash;
a one-piece outer frame to be mounted on a door from an outer side of the door, said outer frame including integral panel channel means for directly receiving and fixedly supporting said panel, integral screen spline channel means for directly receiving and supporting said screen, and integral sash channel means for directly receiving and supporting said sash for movement between a closed position substantially covering said screen and an open position wherein said screen is at least partially uncovered, said panel channel means and said screen spline channel means being generally coplanar with each other



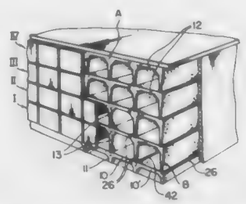
such that said panel and said screen are in general alignment with one another, said panel channel means, said screen spline channel means, and said sash channel means being unitary portions of said one-piece outer frame;
an inner frame to be mounted on the door from an inner side of the door opposite the outer frame; and
securing mean for securing the outer and inner frames together to support said door light within the door.

4,989,382

CONNECTORS FOR CONCRETE STRUCTURAL ELEMENTS

John R. Spronken, Suite 103, 1400 Kensington Road, N.W., Calgary, Alberta, Canada T2N 3P9

Filed Nov. 27, 1989, Ser. No. 441,531
Claims priority, application Canada, Nov. 25, 1988, 584172
Int. Cl.[5] E04B *1/21;* E04H *13/00*
U.S. Cl. 52—252 7 Claims



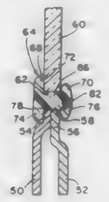
1. A connector assembly for concrete structural elements, said connector assembly comprising (a) a top corner member connectable to a concrete structural element with a horizontal top plate extending along the top of the structural element and a vertical edge plate extending down one side of the structural element, said vertical edge plate having an inwardly stepped portion extending downwardly from the top of the structural element and terminating in a horizontal shelf portion and said horizontal top plate having a recess adapted to extend into the concrete, one edge of said recess and the top end of the vertical edge plate having opposed interlock projections and (b) interlock plate means having projections for engaging said opposed interlock projections and one edge of said plate means having a downwardly projecting flange terminating above the corner member shelf portion, said downwardly projecting flange and shelf forming therebetween a pocket for retaining an end flange of projecting connector of an adjacent concrete structural element.

4,989,383

APPARATUS AND METHOD FOR WINDOW INSTALLATION

Donald L. Franck, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 160,662, Feb. 26, 1988, abandoned.
This application Mar. 15, 1990, Ser. No. 496,094
Int. Cl.[5] B60J *1/02, 10/02*
U.S. Cl. 52—400 5 Claims



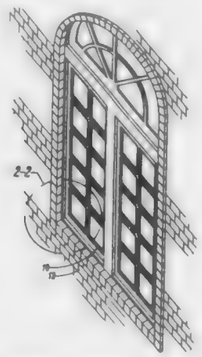
1. A device for mounting and sealing the edge of a window panel in a vehicle body panel having an opening defined by an edge, comprising:
a one-piece yieldable elastomeric molding having a first groove adapted to receive an edge of the window panel and a second groove adapted to receive an edge of the body panel, said molding having a deformable hollow tubular member embedded therein and extending in parallel relationship with the grooves, said tubular member acting upon deformation thereof to spread the molding into encapsulating containment of the window panel and the body panel whereby the molding acts to permanently and fixedly and sealingly mount the window in the vehicle body.

4,989,384

INSULATED WINDOW ASSEMBLY WITH INTERNAL MUNTIN BARS

James J. Kinghorn, and Mark J. Hunke, both of Pella, Iowa, assignors to Rolscreen Company, Pella, Iowa

Filed Jan. 2, 1990, Ser. No. 459,973
Int. Cl.[5] E06B *3/70*
U.S. Cl. 52—456 17 Claims



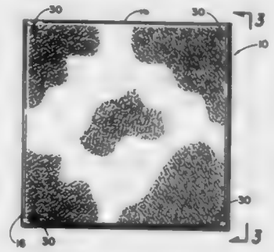
1. An insulated window assembly comprising,
first and second spaced apart panes of transparent sheet material;
a perimeter bar positioned between said panes and extending around the perimeter of said panes and defining two pairs of opposite sides of said window assembly;
an internal muntin bar grid including intersecting bars having opposite ends engaging said perimeter bar; and
said intersecting bars each include first and second component bars spaced apart in parallel relationship.

4,989,385

DEVICE FOR REPAIRING A HOLE IN A PLASTERBOARD WALL

Fredrick L. McCullough, 209 N. Division, Cleveland, Okla. 74020

Filed Dec. 27, 1989, Ser. No. 457,518
Int. Cl.[5] B32B *35/00;* E04G *23/02;* B29C *73/10;* B26D *3/00*
U.S. Cl. 52—514 7 Claims



1. A device for repairing a hole in a plasterboard wall comprising:
a flat, relatively thin, stiff coverboard having a front surface and a rear surface;
a slightly compressible insulation board having a front and back surface and of thickness approximately that of plasterboard, the front surface being secured by adhesive to said coverboard rear surface, said insulation board being dimensioned in length and width less than said coverboard leaving a clear peripheral area on said coverboard rear surface;
a sheet of impressionable material affixed to said insulation board rear surface whereby said sheet is susceptible to forming an outline when said insulation board is pressed against a wall having a hole therein to provide an outline of the hole on said sheet whereby said insulation board is cut to be slightly less in dimension than a hole in the to be repaired whereby said insulation board is receivable a substantially fills the hole in the wall to be repaired; and
means to secure peripheral clear space of said coverboard rear surface to a wall to be repaired to thereby retain said insulation board in the hole and said coverboard completely covering the hole.

4,989,386

PANEL BUILDING ELEMENTS

Howard G. Collis, 151 Hoel Isaf, Radyr, Cardiff, Great Britain CF4 8DX

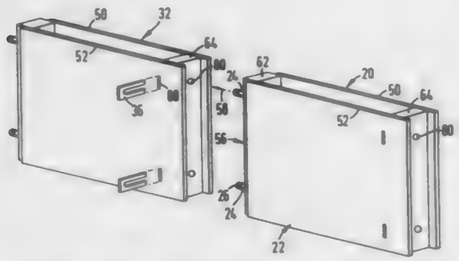
PCT No. PCT/GB87/00843, § 371 Date May 25, 1989, § 102(e) Date May 25, 1989, PCT Pub. No. WO88/03978, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 26, 1987, Ser. No. 360,898
Claims priority, application United Kingdom, Nov. 27, 1986, 8628320; Jun. 25, 1987, 8714856
Int. Cl.[5] E04B *2/18*
U.S. Cl. 52—584 7 Claims

1. A building assembly comprising:
first and second building elements comprising first and second respective double-skinned panel members;
at least one elongate fixing member having a longitudinal axis, said member having an anchoring end and a locking end;
first block means in a region of an edge of said first panel member for supporting said fixing member, the anchoring end of said fixing member passing through said block means;
anchor means on said anchoring end and said first block means for firmly anchoring said fixing member to said first panel member with the locking end projecting from said panel member;

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second block means in a region of an edge of said second panel member for receiving the projecting portion of said fixing member;

the locking end of said fixing member passing through said second block means, said locking end comprising a head portion and a recessed portion located adjacent to said head portion to define shoulder means;



a locking element engageable with the locking end of said fixing member, said locking element comprising a plate having an open-ended slot extending longitudinally from one end thereof, said slot being configured to receive the recessed locking end portion of said fixing member; and

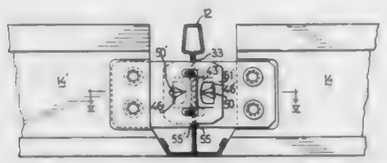
said second panel member having an opening in one of its skin panels to permit insertion of said locking element for engagement with the locking end of said fixing member to retain said building elements in contiguous relation.

4,989,387

CEILING SYSTEM WITH STAKED ON CONNECTORS

Ronald W. Vukmanic, Naperville; John S. Borucki, Bloomingdale; Chester A. Stanley, Des Plaines, and James J. Dunn, St. Charles, all of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Filed Aug. 24, 1989, Ser. No. 397,909
Int. Cl.[5] E04B *9/10*
U.S. Cl. 52—667 **19 Claims**



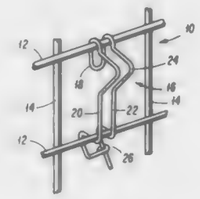
1. A suspended ceiling system comprising main members extending parallel to each other and cross members extending between the main members at spaced intervals, each of said members having an inverted T configuration with a pair of oppositely extending flanges connected by a web to a bead, each cross member having an end with the flanges terminating in end edges and the web having a tongue-like connector element extending beyond the end edges of the flanges and an end of the bead, each of the webs of the main members having elongated slots for receiving the connector element of the cross member with the end edge of the flange being received against an outer lateral surface of the flange of the main member and the end of the bead spaced from the bead of the main member, each of the connector elements having a cut-out portion forming a first abutment surface adjacent a leading end of the connector element, a portion of the connector element spaced inward from the first abutment surface being bent out of the plane of the connector element to form a second abutment surface disposed on a first surface of the element, spacer means including a pair of detents formed in the element between the first and second abutment surfaces to extend from a second surface opposite the first surface of the element to space the element from an edge of the slot in the main member, a U-shaped flap having a bight portion connecting two legs with the bight portion being bent into a concave shape, said U-shaped flap being deformed out of said element on said second surface, said U-shaped flap being formed by the cut-out portion forming the first abutment and by an outer U-shaped cut, said cut-out portion having a curved edge portion opposite said first abutment surface to prevent catching of the U-shaped flap during insertion of the connector element through the slot of the main member, and a third abutment formed in an edge of the element for engaging the web of the main member as the connector element is inserted therethrough as the end edges of the flanges engage the lateral surface of the flange of the main runner.

4,989,388

SPACER FOR SPACING REINFORCING MESH WIRE FROM THE FORM IN THE MANUFACTURE OF CONCRETE PIPE AND THE LIKE

Jon A. Schmidgall, and Galen G. Metzger, both of Des Moines, Iowa, assignors to Hawkeye Concrete Products Co., Cedar Rapids, Iowa

Filed Feb. 24, 1989, Ser. No. 314,801
Int. Cl.[5] E04C *5/16*
U.S. Cl. 52—687 **1 Claim**



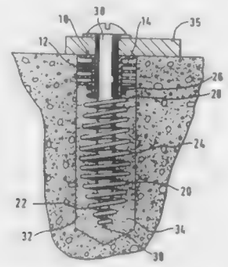
1. For use with a concrete reinforcing cage having parallel spaced-apart horizontal wires which cage is used in concrete products produced in a form that has spaced-apart surfaces, a spacer for maintaining the cage away from the surfaces of the form, said spacer comprising a continuous length of spring-steel material of a substantially round cross-section, a U-shaped loop formed in the material at the upper end of the spacer, the loop being formed to extend over one of the wires of the cage and then downwardly so as to lock over the wire, two generally parallel spaced-apart legs extending outwardly and downwardly from the loop to form a rounded nose that it is engageable with a surface in the concrete form to maintain the cage away from the surface, each of said legs continuing to extend downwardly and then inwardly from the nose to form a locking portion of double somewhat S-shaped hooks at the lower end of the spacer, said S-shaped hooks extending under, inwardly and upwardly and then downwardly around a second one of the wires of the cage parallel to the wire engageable by the loop at the upper end of the spacer, the end of one of the legs being wrapped around the other of the legs, and the spacing between the loop and the S-shaped hooks being such that when the loop is placed over a wire of the cage and the S-shaped hooks are snapped onto a second one of the parallel wires, the resilience of the spring-steel spacer will lock the spacer in place.

4,989,389

MORTAR-ANCHORED SYSTEM

Irmgard Maechtle; Guenther Woehler, both of Korntal-Muenchingen, and Joachim Mayer, Stuttgart, all of Fed. Rep. of Germany, assignors to 501 Maechtle GmbH, Korntal-Muenchingen, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 311,821
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 3836464
Int. Cl.[5] E04B *1/38*
U.S. Cl. 52—705 **9 Claims**



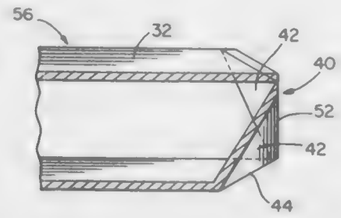
1. A mortar-anchored system for fastening construction components into lightweight masonry, wherein a wall borehole equipped with an anchoring means is filled through a lid means with mortar and wherein a fastening screw is threaded through the lid means into the anchoring means, characterized in that the lid means (10) comprises a bush segment (12) for entering the wall borehole (32), the bush segment has an opening extending through the lid means and acting as a coupling means for a nozzle (56) of a mortar injecting device (40) and this bush segment having an outside periphery being designed as retaining means for a first end of a wire spring (20) which is part of the anchoring means, and in that the wire spring (20) has a shape which tapers from widened zone (24) to a second end for unhindered spreading of mortar over the essential length of the wall bore hole (32) and acts as a guide for the thread of the fastening screw (28).

4,989,390

FABRICATED STRUCTURAL TUBE

Eugene O. Moore, III, P.O. Box 2293, Jackson, Miss. 39225-2293

Continuation of Ser. No. 45,560, May 4, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,921
Int. Cl.[5] E04C *3/32*
U.S. Cl. 52—720 **1 Claim**



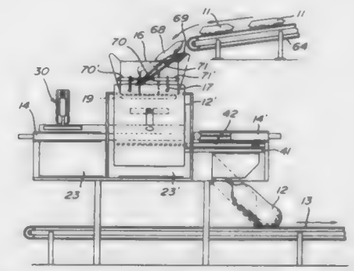
1. An elongated structural support having an axial end formation, comprising a sheet material member having marginal edges bonded to each other and a plurality of planar side faces between said marginal edges cross-sectionally defining a polygon, two of said side faces respectively terminating at angularly related end edges aligned respectively with first and second planes transverse to said plurality of the side faces at the axial end formation, said axial end formation including a first end wall formed integral with an extending in folded relation to a third of said plurality of the side faces, said first end wall abutting a first of said end edges substantially in said first of the planes, said axial end formation further including a second end wall formed integral with and extending in folded relation to a fourth of said plurality of the side faces, said second end wall abutting a second of the end edges substantially in the second of the planes transverse to said plurality of the side faces, the first and second end walls abutting each other substantially at an intersection of the first and the second planes.

4,989,391

AUTOMATIC BAGGING, HEAT SEALING AND DISCHARGE MACHINE

Bruno Wetter, St-Eustache, Canada, assignor to Glopak Inc., Montreal, Canada

Filed Feb. 15, 1990, Ser. No. 480,712
Int. Cl.[5] B65B *43/14, 43/36, 51/14, 51/32*
U.S. Cl. 53—131 **19 Claims**



1. An automatic bagging machine for positioning articles in a bag and sealing said bag prior to releasing same on discharge means to displace it from said machine, said machine comprising a collector for receiving a predetermined number of articles to be placed in a single bag, a trap door under said collector, support means for holding a plurality of stacked collapsed bags having an open top end, means for holding a first of said stacked bags adjacent said trap door, means for opening said first bag to position its opened end under said trap door, control means to release said predetermined number of articles in said opened end of said first bag, displaceable support means having a first bag support platform positioned spaced under said collector for supporting said bag from a bottom end thereof when said articles are disposed within said bag, clamping means to retain a top open end portion of said bag on a clamping surface, means to displace said displaceable support means to position said bag with said articles therein to a sealing station where a section of said top end portion of said bag spaced from a mouth opening thereof is guided in a bag gathering means to gather said section, heat sealing means for fusing said gathered section, a second bag support platform positioned under said trap door simultaneously when said bag with said articles is positioned in said gathering means, and bag discharge means for discharging said sealed bag from said first bag support platform at said sealing station onto said discharge conveying means.

4,989,392

WASHING AND CLEANING SYSTEM ON A PACKING MACHINE

Christer Lindgren, Ystad, and Rolf Schildt, Landskrona, both of Sweden, assignors to Tetra Pak Holdings & Finance S.A., Pully, Switzerland

Filed Dec. 6, 1989, Ser. No. 446,687
Claims priority, application Sweden, Dec. 21, 1988, 8804603
Int. Cl.[5] B65B *55/24, 55/10*
U.S. Cl. 53—167 **16 Claims**

1. A packing machine for manufacturing filled packing

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containers from prefabricated tubular container cases, comprising:

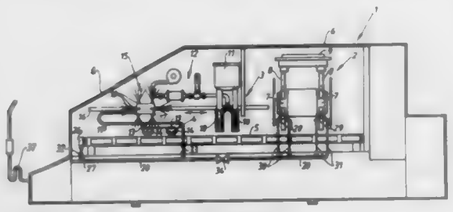
a substantially completely closed housing;

a bottom forming station located in the housing for closing and sealing a bottom end of the cases;

a filling station located in the housing for filling the cases;

a top-forming station located in the housing for closing and sealing a top end of the cases;

a conveyor located in the housing and extending between the bottom forming station, the filling station and the top forming station for conveying the cases from station to station;



a guide bar located in the housing;

a slider movably mounted on the guide bar for movement between the bottom forming station, the filling station and the top forming station;

a plurality of spaced apart nozzles mounted on the slider;

at least one vessel containing cleaning and washing fluid for cleaning and washing the inner surface of the housing and components located in the housing;

means fluidly connecting the nozzles to the at least one vessel for supplying cleaning and washing fluid from the at least one vessel to the nozzles.

4,989,393

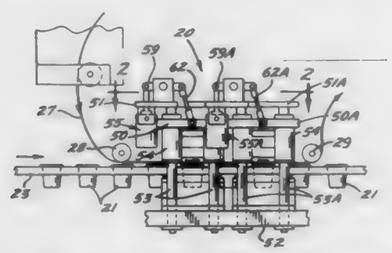
MACHINE FOR SEALING CUPS WITH FILM

Frank E. Sell, Janesville, Wis., and John H. Adams, Rockford, Ill., assignors to Rutherford Engineering, Inc., Roscoe, Ill.

Filed Dec. 22, 1989, Ser. No. 455,561

Int. Cl.[5] B65B 7/28; B26D 5/08

U.S. Cl. 53—299 6 Claims



1. A machine for applying and sealing heat-sealable film to the open upper ends of filled cups, said machine comprising, in combination, a conveyor for intermittently advancing said cups step-by-step along a predetermined path through a sealing station and for causing successive groups of cups to dwell momentarily in the sealing station, advancing an elongated web of film step-by-step through said sealing station in upwardly spaced relation with the cups being advanced therethrough and for causing said web to dwell each time a group of cups dwells in said sealing station, and mechanism for forcing said web downwardly toward the upper end portions of each group of cups dwelling in the sealing station and for sealing a portion of said web to the upper end of each such cup, said mechanism comprising a main support, a carriage mounted to move upwardly and downwardly on said support, a group of heated sealing heads corresponding in number to the number of cups which dwell as a group in said sealing station, said heads being mounted on said carriage to move upwardly and downwardly in unison with said carriage and also being supported to move upwardly and downwardly relative to said carriage, means for moving said carriage downwardly each time a group of cups dwells in said sealing station thereby to shift said heads downwardly into proximity with such cups, means for thereafter shifting said heads downwardly relative to said carriage to cause said heads to force portions of said web against and seal such portions to the upper end portions of the cups in the sealing station, and means for retracting said heads upwardly before the cups in the sealing station are advanced out of such station.

4,989,394

PRESS PLUNGER HAVING SEPARABLE PRESS RING

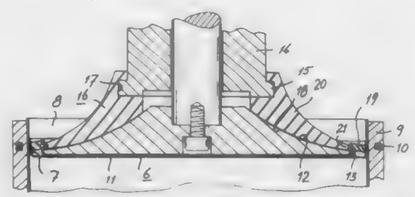
Gunnar Berg, Lidingö; Torkel Johansson, and Bo Sjogren, both of Bromma, all of Sweden, assignors to Akerlund & Rausing Licens Aktiebolag, Jarfalla, Sweden

Filed Nov. 21, 1989, Ser. No. 439,781

Claims priority, application Sweden, Nov. 23, 1988, 8804230

Int. Cl.[5] B65B 7/28; B67B 1/00, 3/16, 5/00

U.S. Cl. 53—330 10 Claims



1. A press plunger for exerting radially outwardly force around the inner surface of a workpiece surrounding it, said press plunger having an expansion part (2) including a unitary resiliently deformable cup shaped expansion body (16) made from elastic material and defining an endless radially outer peripheral surface, and a formation part (1) having a formation surface (12) against which at least a portion of said expansion body (16) in the direction of said formation part (1) to expand the radially outer peripheral surface, characterized in that said press plunger includes a resiliently deformable outer press ring (19) carried by and surrounding an associated portion of said expansion body (16) and defining said outer peripheral surface, said expansion body (16) is made from one elastic material, and said outer press ring (19) is made from another elastic material.

4,989,395

APPARATUS FOR AUTOMATICALLY DISPENSING BAGS AS ARTICLES ARE LOADED THEREIN AT THE EXIT OF A CHECK-OUT STATION

Pierre D'Estaintot, Meudon, France, assignor to Societe Anonyme Des Marches Usines-Auchan, Villeneuve D'Ascq., France

Continuation-in-part of Ser. No. 155,801, Feb. 16, 1988, Pat. No. 4,869,045. This application Aug. 11, 1989, Ser. No. 392,353

Claims priority, application France, Feb. 16, 1987, 87 01947

The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.

Int. Cl.[5] B65B 43/26, 17/00

U.S. Cl. 53—384 11 Claims

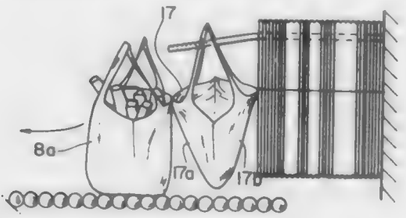
11. A device for facilitating the loading of articles into bags at a check-out desk of a store, comprising:

(a) a support wall;

(b) at least two rods, the first ends of said rods being attached to said support wall, the portions of said rods in proximity with said first ends being substantially horizontal, the portions of said rods in proximity with the second ends of said rods being downwardly inclined, the portions of said rods nearest said second ends further including means for providing increased resistance to the movement of said bags along said rods;

(c) means for moving said bags off of and away from said rods; and

(d) a plurality of bags, said bags having handles with apertures disposed therein, whereby said bags may be loaded onto said rods and whereby said bags may rest immobile on said substantially horizontal portions of said rods, said bags including means for joining the rear face of a preceding bag with the front face of a succeeding bag, whereby as said preceding bag moves down said downwardly inclined portions of said rods, said succeeding bag will be pulled open by said preceding bag, but whereby when said succeeding bag reaches said portions of said rods providing increased resistance to the movement of said bags, said means for joining said bags together will rupture, whereby said preceding bag will be transported away and whereby said succeeding bag will remain open on said rods.



4,989,396

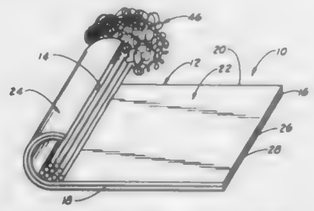
CURL WRAP AND METHODS FOR USING SAME

Donald E. Weder, Highland; William F. Straeter, Breese; Joseph G. Straeter, Highland, all of Ill.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill., and Jack W. Redditt, Nashville, Tenn., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned, and a continuation-in-part of Ser. No. 232,541, Aug. 11, 1988, Pat. No. 4,835,834, which is a continuation of Ser. No. 876,405, Jun. 20, 1986, abandoned. This application Aug. 15, 1989, Ser. No. 393,992

Int. Cl.[5] B65B 11/02, 11/10, 11/58, 43/08

U.S. Cl. 53—397 46 Claims



1. A method of wrapping an item, comprising:

providing a material having a first end and a second end, an upper surface and a lower surface, and having a curl present in the material whereby the first end of the material in an unrestrained condition rolls over itself forming a roll of the material, at least a portion of the item being disposable generally on the material in at least a partially restrained condition of the material and the first end of the material rolling over at least a portion of the item at least once for covering a portion of the item when the material is unrestrained;

restraining the material to prevent the material from rolling over itself;

disposing an item near the first end of the upper surface of the material; and

releasing the first end of the material whereby the first end rolls over at least a portion of the item and itself forming a roll containing the item.

4,989,397

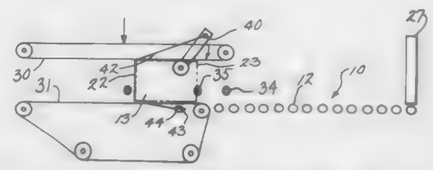
IN-LINE PACKAGE STRAPPING SYSTEM

Brian W. Tomac, Lodi; Stacey L. Overgaard, Madison, and Carl R. Marschke, Phillips, all of Wis., assignors to Marquip Inc., Phillips, Wis.

Filed Jun. 12, 1989, Ser. No. 365,091

Int. Cl.[5] B65B 13/04, 63/02, 27/08

U.S. Cl. 53—528 20 Claims



1. A system for strapping a compressible stack of sheet material comprising:

a squaring station including first conveyor means for conveying the stack into the squaring station;

a pair of side tamps disposed over the first conveyor means on opposite sides of the stack and movable laterally to engage and square the side faces of the stack and to position the stack with respect to the system centerline;

second conveyor means attached to each of said side tamps and including vertically disposed pusher dogs adapted to engage the vertical rear edge of the stack to square the forward and rear end faces thereof and to move said stack out of the squaring station;

a strapping station including third conveyor means for receiving the squared stack from the squaring station and moving the stack into a strapping position within the strapping station;

said third conveyor means including upper and lower conveyor belts offset laterally to one side of and parallel to the centerline of the system, one of said belts being movable vertically toward the other to compress the stack therebetween as the stack is moved into the strapping position and to hold the stack by said one side such that at least a portion of the stack on the other side of the centerline is unsupported;

strapping means, including a supply of a continuous length of strap, for supporting an end portion of said strap in a pre-wrap position in a vertical plane parallel to the centerline of the stack and for wrapping said strap end portion around the forward face and portions of the upper and lower faces of the stack in response to movement of the stack into the strapping position and into engagement with said strap end portion;

said strapping means further including a rotary strap arm adapted to support said strap portion opposite its free end and to rotatably carry said strap portion in said vertical plane around the rear face of the stack to a sealing position overlapping the free end; and,

means for connecting the free end and overlapping strap portion to enclose the stack.

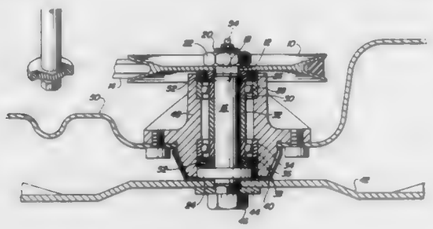
VOL 1123 ISS 1 FEB 5 1991 UMI

4,989,398

HUBLESS SHEAVE AND SPINDLE

John B. Kuhn, Rubicon, and Christopher S. Thorman, Beaver Dam, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Oct. 6, 1989, Ser. No. 417,984
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—17.5 13 Claims



1. A mower having:
frame means including a housing;
a power source such as a motor or engine carried by the frame;
belt means driven by the power source;
sheave structure that engages and is driven by the belt means, said sheave structure having a generally circular opening through its center;
a spindle having a neck portion of generally circular cross section positioned within the opening in the sheave structure, said neck portion being capable of rotation within the opening int the sheave structure and relative to the sheave structure;
support means rotatable with and positioned on the spindle, said support means being spaced from the neck portion of the spindle;
bearing means carried by the housing for supporting the spindle for rotation about the spindle's longitudinal axis;
a rotary cutting means fixed to the spindle for rotation therewith; and
clamping means for frictionally securing the sheave structure for rotation with the support means, said clamping means being effective to frictionally mount the sheave structure to the support means to prevent rotation of the sheave structure relative to the spindle.

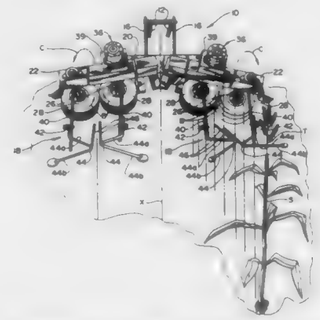
4,989,399

CORN DETASSELING HEAD

Kenneth P. Cler, Camargo, Ill., assignor to Paul's Machine and Welding Corporation, Villa Grove, Ill.

Filed May 25, 1989, Ser. No. 356,522
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—63 10 Claims

1. A corn detasseling head, comprising:
a frame;
a pair of generally parallel shafts on the frame, the shafts extending in a fore and aft direction relative to a normal forward direction of travel of the head;
a pair of cylindrical elements respectively mounted on the shafts for rotation about their axes relative to the frame, the cylindrical elements defining a detasseling nip; and
wherein the shafts lie in a plane inclined downwardly and outwardly in a transverse direction relative to the normal forward direction of travel of the head to thereby define an outward throw angle for the detasseling nip to throw



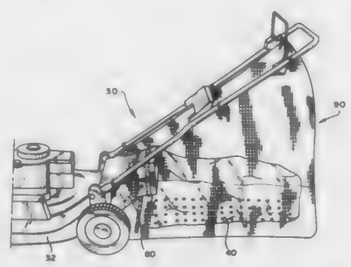
tassels outwardly away from the respective row of corn stalks from which they are being removed.

4,989,400

DISPOSABLE BAG AND MOUNTING APPARATUS FOR A LAWN MOWER

David L. Wark, Germantown, Tenn., assignor to Snapper Power Equipment, Division of Fuqua Industries, Inc., McDonough, Ga.

Filed Sep. 1, 1989, Ser. No. 401,924
Int. Cl.[5] A01D *53/06*
U.S. Cl. 56—202 23 Claims



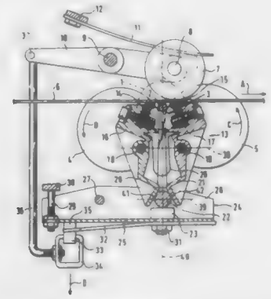
1. A disposable bag adapted to be mounted on a lawn mower to receive grass clippings from a discharge opening of the mower, the bag comprising in combination:
a first substantially linear closed end having a width; and an opposite open mouth having a width smaller than the first closed end width, a substantially linear first side edge generally perpendicular to the first closed end extending from the closed end to the mouth, a second substantially linear side edges extending from the first closed and generally parallel to the first side edge, a third substantially linear side edge extending from the open mouth generally parallel to the first side edge, a second closed end extending from the second side edge to the third side edge, the second closed end having a width, the third side edge having a length smaller than the width of said second closed end, said bag being defined by two layers of flexible sheet material which when inflated in use assume a generally ellipsoidal shape, said sheet material being apertured sufficient to allow escape of air while at the same time allowing the bag to be filled with grass clippings in use, and wherein a portion of the bag lying between the first and third side edges adjacent the open mouth provide a reduced neck portion facilitating mounting and handling of the bag while also inhibiting escape of grass clippings from the bag.

4,989,401

BRAKE FOR AN OPEN-END SPINNING ROTOR

Wolfgang Feuchter, Deggingen-Reichenbach im Täle, and Dieter Götz, Geislingen/Steige, both of Fed. Rep. of Germany, assignors to Wilhelm Stahlecker GmbH, Fed. Rep. of Germany

Filed Jun. 5, 1989, Ser. No. 361,314
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1988, 3820328
Int. Cl.[5] D01H *4/44*
U.S. Cl. 57—88 13 Claims



1. A brake for selectively braking an open-end spinning rotor shaft comprising:
first and second mirror-symmetrically arranged double-armed tong arms pivotally mounted at respective first and second brake axles extending parallel to the rotor shaft, each of said tong arms containing brake linings for engaging the rotor shaft when the tong arms are moved to a braking position, and
a common brake actuating element slidably engagable with both tong arms at brake actuation surfaces disposed on a side of the brake axles opposite the location of the rotor shaft, said brake actuating element being only in contact with the brake actuation surfaces and being freely movable with respect to both tong arms so as to accommodate and assure application of equal simultaneous braking forces at the brake actuating surfaces of both tong arms caused by movement of the brake actuating element toward the rotor shaft.

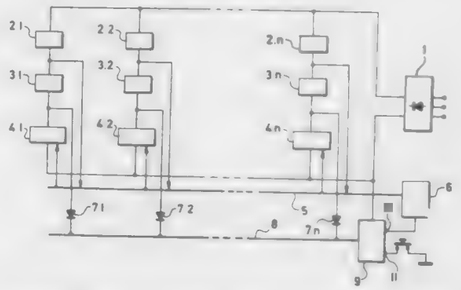
4,989,402

METHOD OF, AND DEVICE FOR, A SECURED CONTROL OF SPINNING UNITS OF A SPINNING MACHINE, ESPECIALLY OF AN OPEN-END SPINNING MACHINE

Jiří Sloupensky; Pavel Seidl; Lubomír Fait, and Miroslav Boucek, all of Ústí nad Orlicí, Czechoslovakia, assignors to Elitex koncern texilního strojírenství, Liberec, Czechoslovakia

Filed Oct. 5, 1988, Ser. No. 254,327
Claims priority, application Czechoslovakia, Oct. 5, 1987, 7149-87
Int. Cl.[5] D01H *13/24, 13/32*
U.S. Cl. 57—264 6 Claims

1. A method for controlling spinning units of a spinning machine, especially of an open-end spinning machine with a central control system measuring spun yarn length on each of a plurality of spinning stations whose run is interrupted by means of a controlled switch, comprising the steps of
providing a bidirectional bus for activating and deactivating said controlled switches by said central control system and a one-way bus for bypassing said controlled switches;
activating said one-way bus by a command coming from the central control system;
deactivating said bidirectional bus when said one-way bus is activated during periods when said controlled switches are not used;
deactivating said one-way bus and activating said bidirectional bus when controlled stoppage of spinning units is required;



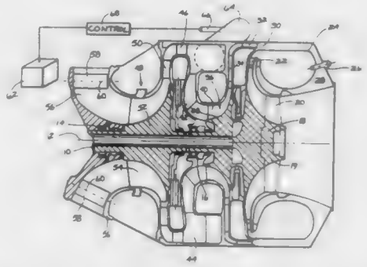
whereby when said spinning units are in normal operation, power is supplied only from said one-way bus and when a stoppage of spinning units is required, power is supplied only from said bidirectional bus.

4,989,403

SURGE PROTECTED GAS TURBINE ENGINE FOR PROVIDING VARIABLE BLEED AIR FLOW

Colin Rodgers, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 23, 1988, Ser. No. 197,626
Int. Cl.[5] F02C *7/057*
U.S. Cl. 60—39.07 1 Claim



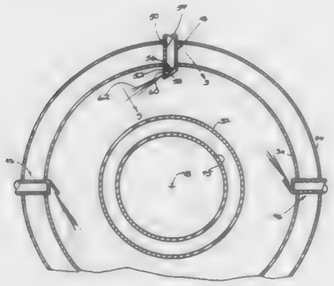
1. A surge protected gas turbine engine for providing a variable flow of bleed air without operation near full load condition, comprising:
a radial inflow, axial outflow turbine wheel rotatable about an axis;
an annular combustor located about said axis for producing hot gases of combustion;
means, including an annular nozzle, connected to said combustor and disposed about said turbine wheel such that hot gases of combustion impinge upon the turbine wheel to drive the same about said axis;
a pair of radial inflow, axial outflow, centrifugal compressors coupled to said turbine wheel to be driven thereby, said rotary compressors each having an inlet and an outlet being connected in series to thereby define a first stage compressor and a second stage compressor, said first stage compressor being a single stage, centrifugal compressor having a high specific speed (N_s in excess of about 100) where

$$N_s = \frac{N\sqrt{CFS}}{(H_{ad})\ .75}$$

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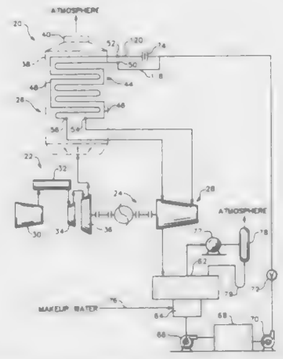
and
N=rpm of the first stage compressor,
CFS=first stage compressor inlet volumetric flow in ft^3/sec, and
H_{ad}=adiabatic head in ft.,
said second stage compressor further being back to back with said turbine wheel;
means connecting said second stage compressor outlet to said combustor to provide compressed air thereto;
means associated with at least said first stage compressor outlet for obtaining bleed air therefrom;
variable inlet guide vanes for said first stage inlet and selectively movable between open, closed and intermediate positions;
a sensor in said bleed air obtaining means; and
means responsive to said sensor for moving said guide vanes toward said closed position as bleed air flow decreases, and toward said open position as bleed air flow increases.

4,989,404
TURBINE ENGINE WITH HIGH EFFICIENCY FUEL ATOMIZATION
Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Dec. 12, 1988, Ser. No. 283,080
Int. Cl.[5] F02C 7/22; F23R 3/32
U.S. Cl. 60—39.36 8 Claims



1. A gas turbine engine comprising:
a rotary compressor;
a turbine wheel coupled to said compressor to drive the same;
an annular nozzle proximate said turbine wheel for directing gases of combustion at said turbine wheel;
an annular combustor having inner and outer walls defining an annular combustion space disposed about said turbine wheel and in fluid communication with both said compressor and said nozzle, said combustor receiving fuel from a source and air from said compressor and combusting the same to generate said gases of combustion; and
at least one fuel injector for said combustor, said fuel injector extending through an outer wall, said fuel injector comprising at least one generally radially inwardly opening discharge orifice and a plate within said combustor in the path of fuel discharged from said orifice and at an angle thereto so as to cause said fuel to enter said annular combustion space generally circumferentially relative thereto.

4,989,405
COMBINED CYCLE POWER PLANT
Thomas E. Duffy, San Diego; John P. Archibald, La Jolla, and Alan H. Campbell, Encinitas, all of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.
Division of Ser. No. 723,648, Apr. 16, 1985, Pat. No. 4,627,386, and a continuation of Ser. No. 483,437, Apr. 8, 1983, abandoned. This application Aug. 19, 1986, Ser. No. 898,128
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[5] F02C 6/18
U.S. Cl. 60—39.182 16 Claims

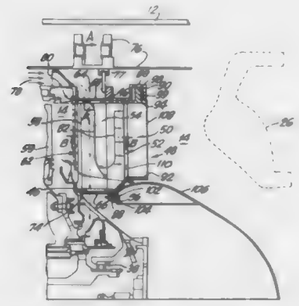


1. A combined cycle power plant comprising: a gas turbine engine; a once-through boiler; means for effecting a flow of feedwater into said boiler; means for effecting a flow of exhaust gases from said gas turbine engine through said once-through boiler to convert said feedwater to steam; a steam turbine; and means for effecting a flow of the steam generated in said boiler to said steam turbine to drive the latter, said once-through boiler comprising: a vertical casing having a gas inlet and a gas outlet respectively located at the lower and upper ends thereof; an overhead support structure in said casing; a plurality of independent steam generating circuits hung from said support structure, each of said circuits comprising a single, sinuous low pressure tube with horizontal tube runs and a high pressure tube of similar configuration internested with the low pressure tube, said horizontal tube runs being so staggered as to increase the transfer of heat from hot gases flowing upwardly through said casing to said high and low pressure tubes and said high pressure tubes each having feedwater, vaporizer, and superheater sections with said vaporizer and superheater sections being of greater diameter than the feedwater sections; and a feedwater pump for effecting a flow of water into said low and high pressure tubes at the inlet ends thereof.

4,989,406
TURBINE ENGINE ASSEMBLY WITH AFT MOUNTED OUTLET GUIDE VANES
John W. Vdoviak, Marblehead, Mass.; Roy E. Moyer, Cincinnati, Ohio, and Dennis C. Evans, Topsfield, Mass., assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 29, 1988, Ser. No. 291,840
Int. Cl.[5] F02K 3/10
U.S. Cl. 60—261 16 Claims

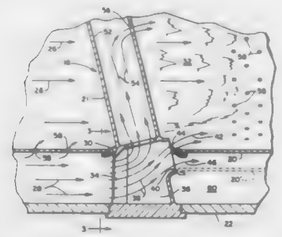
1. A turbine assembly having an inner casing, an outer casing, and a plurality of low pressure turbine blades located between said inner and outer casings, said assembly comprising:
an annular array of radially extending support struts for interconnecting said inner and outer casings aft of said low pressure turbine blades; and

a plurality of radially extending outlet guide vanes mounted within the turbine assembly aft of said support struts for



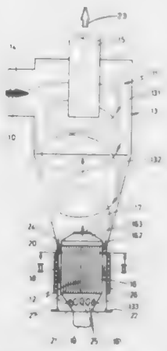
deswirling exhaust gasses exiting said low pressure turbine blades.

4,989,407
THRUST AUGMENTOR FLAMEHOLDER
James R. Grant, Jr., Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Aug. 29, 1986, Ser. No. 902,373
Int. Cl.[5] F02G 1/00
U.S. Cl. 60—261 1 Claim



1. A radial flameholder for a gas turbine engine thrust augmentor having a cylindrical outer case and a concentric inner liner, the inner liner defining means for conducting a stream of engine exhaust gases axially through the augmentor, said exhaust gases being mixed with fuel and combusted immediately downstream of said flameholder, and the outer case and the inner liner cooperatively defining an annular flow path therebetween and means for concentrically conducting a concurrent flow of relatively cool air therethrough, comprising:
a bluff body secured to the outer case and extending radially inward therefrom through a corresponding opening in the inner liner, the bluff body further including,
means, including a first upstream facing opening disposed wholly within the annular flow path, for ingesting a first portion of the relatively cool air flow, and
means, including a downstream facing discharge opening, for exhausting a first inner part of the first portion of the relatively cool air radially inwardly adjacent and parallel to the liner immediately downstream of the opening therein, and a second outer part of the first portion of the relatively cool air radially outwardly adjacent and parallel to the liner immediately downstream of the opening therein, said first inner part and said second outer part being divided radially by the liner, and
wherein the liner is expandable radially outward adjacent the bluff body in response to increasing temperature of the liner material, thereby increasing the portion of the first inner part of the discharged first portion relative to the second outer part thereof.

4,989,408
DEVICE FOR REMOVING SOOT FROM DIESEL EXHAUST
Rolf Leonhard, Schwieberdingen, and Ulrich Projahn, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Sep. 29, 1989, Ser. No. 415,040
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841182
Int. Cl.[5] F01N 3/02
U.S. Cl. 60—303 16 Claims



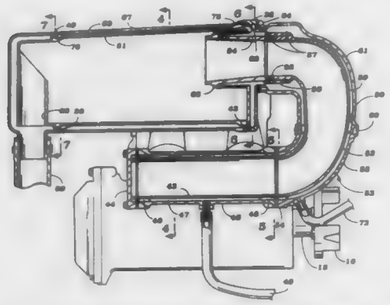
1. Device for removing solid particles from the exhaust gas of an internal combustion engine, comprising
a centrifugal separator which separates the exhaust gas flow into a mostly particle-free pure gas flow and a particle-enriched carrier gas flow, said separator comprising a cylindrical part, a conical part attached thereto which converges toward an end remote therefrom, and a collecting part attached to said end of said conical part, said collecting part having an internal wall and a closed end facing away said conical part,
means for tangentially supplying said exhaust gas to said cylindrical part,
a pure gas outlet coaxial to said cylindrical part opposite said conical part,
a combustion housing incorporated in the separator and comprising a supply chamber located at said closed end of said collecting part and which receives said carrier gas, a combustion chamber located in said collecting part and having an external wall which forms an annular channel with said internal wall and provided with a filter through which said carrier gas flows while exposed to a combustion flame, and an outlet chamber having an outlet opening facing said conical part and coaxial to said pure gas outlet.

4,989,409
EXHAUST DEVICE FOR SMALL SIZED BOAT ENGINE
Ryoichi Nakase, and Shigeharu Mineo, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Sep. 22, 1989, Ser. No. 411,033
Claims priority, application Japan, Sep. 22, 1988, 63-238260
Int. Cl.[5] F01N 3/02
U.S. Cl. 60—321 8 Claims

1. An exhaust system for an internal combustion engine comprising a first inner pipe having an outlet end, a second inner pipe have an inlet end and spaced from the outlet end of said first inner pipe, a first outer pipe encircling at least in part

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said first inner pipe, a second outer pipe encircling at least in part said second inner pipe, said outer pipes having spaced apart ends, an inner elastic joint interconnecting the outlet and



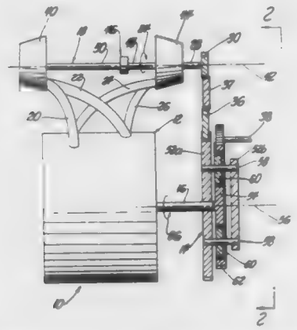
inlet ends of said inner pipes for exhaust gas flow therebetween, an outer elastic joint connecting the ends of said outer pipes to define a cooling jacket around said inner elastic joint, and means for admitting cooling water to said cooling jacket.

4,989,410

COMPOUND POWER PLANT

Roger R. Smith, 7261 Lyons Rd., Imlay City, Mich. 48444

Filed Apr. 3, 1989, Ser. No. 331,724
Int. Cl.[5] F02G 5/00
U.S. Cl. 60—607 9 Claims



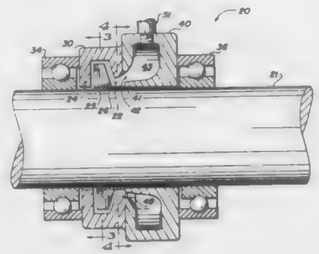
1. A compound motor for a vehicle, comprising:
an engine defining therein a chamber for the combustion of fuel, an intake passage leading to the combustion chamber and an exhaust passage leading from the combustion chamber;
a drive shaft extending from the engine;
means in the engine for rotating the drive shaft in response to the combustion of fuel in the chamber;
a rotary compressor at the entry end of the intake passage;
a turbine at the exit end of the exhaust passage, the turbine being drivable by exhaust gases from the combustion chamber;
means for selectively transferring rotational motion of the turbine to the compressor, the transferring means including a clutch for mechanically connecting or disconnecting the compressor from the turbine;
a planetary gear set having a sun gear member, a ring gear member surrounding the sun gear member, a planet gear member rotatable about its own axis and meshed between the sun gear member and the ring gear member, and a planet carrier member upon which the planet gear member is mounted for revolution about the sun gear member;
a gear train between one of the members of the planetary gear set and the turbine;
another one of the members of the planetary gear set being driven by the drive shaft extending from the engine; and
a final output shaft driven by a third member of the planetary gear set.

4,989,411

OVER THE SHAFT FUEL PUMPING SYSTEM

Jay N. Hoopes, Tempe; Christopher D. Eick, Phoenix, and John R. Williamson, Scottsdale, all of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 27, 1988, Ser. No. 289,957
Int. Cl.[5] F02C 1/00
U.S. Cl. 60—734 12 Claims



1. Gas turbine engine apparatus comprising: a compressor adapted to compress air inducted into said engine; a combustor adapted to receive and burn a mixture of fuel and compressed air to produce motive gas; a metering valve adapted to receive fuel and deliver said fuel to said combustor; a turbine adapted to receive said motive gas and produce rotary motion in response thereto; a shaft connected to said turbine and said compressor for transmitting said rotary motion to said compressor; and a vortex pump having an impeller girdling said shaft intermediate said compressor and said turbine rotating therewith, a pump inlet adjacent said shaft in fluid communication with a source of said fuel, a pump outlet in fluid communication with said metering valve, and means for defining a flow path between said fuel source and said inlet whereby said fuel is directed into said inlet in an axial direction which is substantially parallel to said shaft while preventing substantial fuel contact with said shaft so that circumferential fuel swirl at said inlet is minimized.

4,989,412

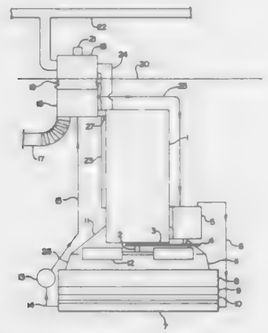
METHOD OF MANUFACTURE OF AN AUTOMOTIVE VEHICLE HAVING AN AIR CONDITIONING SYSTEM

Roger L. Johnson, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Division of Ser. No. 144,456, Jan. 15, 1988, Pat. No. 4,909,046.
This application Feb. 27, 1990, Ser. No. 485,712
Int. Cl.[5] F25B 27/00
U.S. Cl. 62—77 5 Claims

1. A method of manufacture of an automotive vehicle having an engine and an engine driven air conditioning system having principal components including a compressor, a condenser, and an evaporator comprising the steps of:
mounting each of the principal components of the refrigeration loop of said air conditioning system as discrete components on the vehicle engine;
appropriately connecting said principal air conditioning components with refrigerant tubing to form a closed refrigeration loop;
driving said compressor to operate said air conditioning system;

testing said air conditioning system for functional performance and for leakage; and



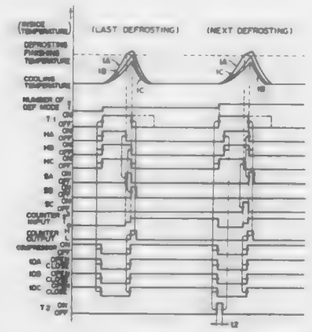
subsequently installing said engine and said refrigeration loop components as a unit into said vehicle.

4,989,413

METHOD FOR CONTROLLING THE DEFROSTING OF REFRIGERATOR-FREEZER UNITS OF VARYING DEGREES OF FROST ACCUMULATION

Toshiyuki Fukuda, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Division of Ser. No. 324,707, Mar. 17, 1989, Pat. No. 4,959,968.
This application Feb. 27, 1990, Ser. No. 485,582
Claims priority, application Japan, Mar. 17, 1988, 63-64628; Mar. 17, 1988, 63-64629; Mar. 17, 1988, 63-64630; Mar. 17, 1988, 63-64632; Mar. 17, 1988, 63-64633; Mar. 17, 1988, 63-64634
Int. Cl.[5] F25D 21/08
U.S. Cl. 62—155 2 Claims



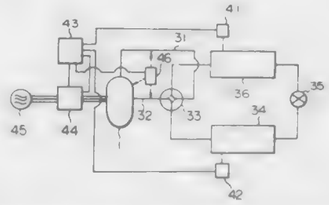
1. A method for controlling the defrosting of a plurality of refrigerator-freezer units, the respective units having respective evaporators and respective defrosting heaters for defrosting the evaporators, the respective evaporators being connected to a condenser and to a compressor via respective expansion valves and solenoid valves, comprising the steps of:
determining whether a previous defrosting mode for defrosting said evaporators has occurred,
if no previous defrosting mode has occurred, closing all of said solenoid valves, stopping the drive of said compressor and supplying electric current to all of said defrosting heaters after a defrosting timer having a cooling mode and a defrosting mode switches to its defrosting mode;
successively stopping the supply of electric current to a defrosting heater of said defrosting heaters after a corresponding sensor provided for each of said units detects the defrosting of its corresponding evaporator; and
resetting said defrosting timer to its cooling mode after a predetermined number of evaporators are defrosted, stopping the supply of electric current to the rest of said defrosting heaters, beginning the drive of said compressor and opening all of said solenoid valves; and
if a previous defrosting mode has occurred, closing all of said solenoid valves, stopping the drive of said compressor and supplying electric current to said rest of said defrosting heaters for a predetermined period of time after said defrosting timer switches to its defrosting mode, and after the predetermined period of time elapses supplying electric current to all said defrosting heaters,
successively stopping the supply of electric current to a defrosting heater after a corresponding sensor provided for each of said units detects the defrosting of its corresponding evaporator; and
resetting said defrosting timer to its cooling mode after a predetermined number of evaporators are defrosted, stopping the supply of electric current to the rest of said defrosting heaters, beginning the drive of said compressor and opening all of said solenoid valves.

4,989,414

CAPACITY-CONTROLLABLE AIR CONDITIONER

Akira Murayama; Hiroaki Kuno; Naoshi Uchikawa; Jyoji Okamoto, and Hiroyuki Imamura, all of Shimizu, Japan, assignors to Hitachi, Ltd, Tokyo and Shimizu Engineering Co., Ltd., Shizuoka, both of, Japan

Filed Oct. 23, 1989, Ser. No. 425,229
Claims priority, application Japan, Oct. 26, 1988, 63-270376
Int. Cl.[5] F25B 41/04, 1/00
U.S. Cl. 62—228.4 4 Claims



1. A wide range capacity controllable air conditioner comprising:
a refrigerant circuit including a refrigerant compressor, heat exchangers serving as a condenser and an evaporator, and expansion means provided between said heat exchangers;
an inverter power supply means for changing the frequency of a current for supply of power to an electric motor for driving said refrigerant compressor to control the rotational speed of said motor;
load detecting means;
a controller for controlling said inverter power supply means in dependence upon an output from said load detecting means;
refrigerant flow passage control means for changing, in accordance with an instruction from said controller, the rate at which a refrigerant flows from said refrigerant compressor to one of said heat exchangers, and
wherein upper and lower limits of frequencies of the current for supply of power from said inverter power supply means to said refrigerator compressor driving motor are set, and said controller controls said inverter power supply means within the range between said upper and lower limits, and controls said refrigerant flow passage control means to change the refrigerant flow rate beyond a limit determined by one of said upper and lower limits.

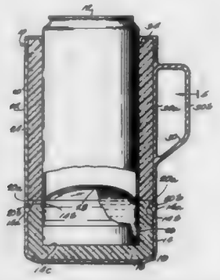
VOL 1123 ISS 1 FEB 5 1991 UMI

4,989,415

COOLING HOLDER FOR BEVERAGE CONTAINER

Jeffrey G. Lombness, 7352 N. 38th St., Milwaukee, Wis. 53209

Filed Aug. 7, 1989, Ser. No. 390,196
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—372 15 Claims



1. A holder for keeping a beverage container cold, said container having a generally cylindrical shape of a predetermined outside diameter and a bottom surface, said holder comprising:

a hollow, generally cup-shaped base, of an inside diameter sufficient to accommodate the outside diameter of said beverage container; and

a hollow generally cylindrical upper portion having two ends, one end being removably connectable to said base, said upper portion having an inside diameter matching the outside diameter of said beverage container and having both ends open;

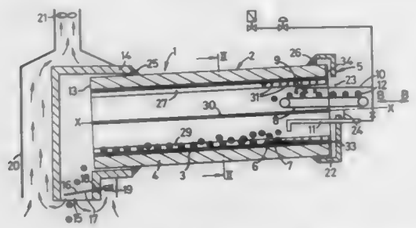
said base containing coolant, said coolant having a top surface which is extremely flexible so as to substantially conform to said bottom surface of said beverage container when placed into the holder, and maintain substantially continuous contact with the majority of said bottom surface, regardless of the shape of said bottom surface.

4,989,416

TUNNEL FREEZER

Jeremy P. Miller, Burton-on-Trent, and John V. Summers, Great Missenden, both of United Kingdom, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 1, 1989, Ser. No. 444,480
Claims priority, application United Kingdom, Dec. 9, 1988, 8828427
Int. Cl.[5] F25D *25/02*
U.S. Cl. 62—381 19 Claims



1. A freezer comprising in combination an elongated tunnel having a generally cylindrical shape, said tunnel being adapted for inclination at an angle to horizontal; said tunnel having a first or inlet end and a second or discharge end;

means to rotate said tunnel about its longitudinal axis;

means disposed adjacent said inlet end to trap and maintain a pool of liquid cryogen proximate said inlet end of said tunnel;

means disposed along the length of the interior of said tunnel to enable product to be moved inside said tunnel from said inlet end to said discharge end;

means to introduce said product into said pool adjacent said inlet end of said tunnel; and

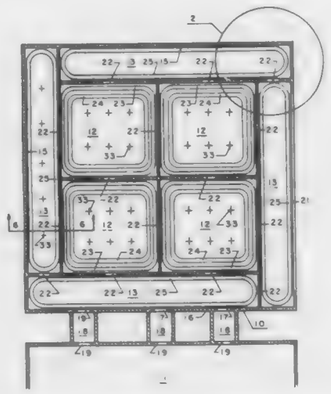
means to introduce liquid cryogen onto said product as it enters said tunnel and into said means to form said pool of liquid.

4,989,417

COLD STORAGE WAREHOUSE

Stanley Markiewicz, 842 Shoreview Dr., Henderson, Nev. 89015

Filed Nov. 8, 1989, Ser. No. 433,688
Int. Cl.[5] F25D *11/02*
U.S. Cl. 62—441 20 Claims



1. A cold storage warehouse comprising:

(a) a plurality of cells for receiving processed refrigerated and frozen food products to be maintained at predetermined storage temperatures;

(b) duct means having spaced openings therein, the duct means being suspended beneath the ceiling of each cell;

(c) an evaporator and fan unit for circulating cooled air through the duct means to create a negative pressure at the openings so that warm air rising from a cell interior will be drawn into the duct means to cause a heat transfer from the warm air to the cooled air flowing through the duct means;

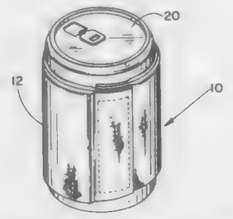
the heat transfer continuing until the cell temperature reaches equilibrium with the temperature of the air flowing from the evaporator and fan unit.

4,989,418

COOLING WRAP

Kenneth M. Hewlett, 702 17½St. SE., Rochester, Minn. 55904

Filed Jul. 10, 1990, Ser. No. 550,399
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—457.4 14 Claims



1. An improved flexible, multi-layer wrap for wrapping

around a fluid container to reduce the rate of heating of the fluid, which comprises:

(a) a pouch assembly formed by opposed inner and outer layers thereof having an entrance opening therein;

(b) an integral heat absorbing and heat insulating blanket which when cooled has an inner side capable of absorbing heat from the fluid and an outer side capable of insulating one side of the blanket, wherein the integral heat absorbing and heat insulating blanket is inserted into the entrance opening of the pouch; and

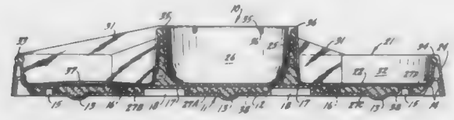
(c) first and second fastening means attached to opposite ends of the pouch assembly so that the ends of the pouch assembly may be secured together after the pouch assembly has been wrapped around the fluid container such that the inner side is adjacent to container, and wherein the fastening means are attached so as to secure the ends of the integral heat absorbing and heat insulating blanket permanently within the pouch.

4,989,419

CHILL-RETENTION FOOD SERVICE TRAY

Michael Brando, Chicago, and Anthony E. Fiello, Bensenville, both of Ill., assignors to Branello Industries, Inc., Bensenville, Ill.

Filed Jun. 8, 1990, Ser. No. 535,322
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—457.2 27 Claims



1. A chill-retention service tray capable of keeping its contents chilled for an extended time in a warm environment, comprising:

a bottom tray member including a bottom panel of given size and configuration, a bottom rim wall projecting upwardly from the periphery of the bottom panel, and at least one stiffening rib projecting upwardly to a predetermined level above a medial portion of the bottom panel;

a top tray member interfitting with and affixed to the bottom tray member, the top tray member including a service support panel positioned immediately above the top of the stiffening rib, a top rim wall projecting upwardly above the service panel and engaging the bottom rim wall around the periphery of the two panels, and an internal hollow wall, of closed configuration, projecting upwardly above the service panel;

the top and bottom tray members defining a main gel chamber, between them;

and a chilling gel filling the main gel chamber, the chilling gel having a high heat of fusion and a viscosity high enough to limit the gel sloshing about in the service tray when warm, yet liquid enough to be poured into the gel chamber.

4,989,420

RING WITH HIDDEN INTERNAL COMPARTMENTS

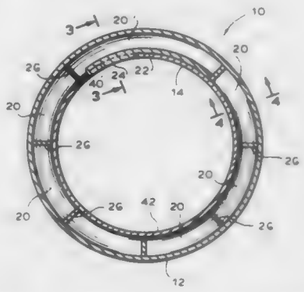
John B. Reinhold, and Marc Jacobs, both of New York, N.Y., assignors to Reinhold-Caribe, Inc., New York, N.Y.

Filed Jul. 3, 1990, Ser. No. 547,492
Int. Cl.[5] A44C *9/00*
U.S. Cl. 63—15 12 Claims

1. A ring with a plurality of hidden internal compartments for receiving articles, comprising:

(A) an outer circular member defining an inwardly biased tab and a plurality of laterally separated, inwardly open compartments for receiving articles, said inwardly biased tab being at least partially disposed in a predetermined one of said compartments; and

(B) an inner circular member concentrically mounted on said outer member for rotation relative thereto and defining a single aperture therethrough, said aperture being



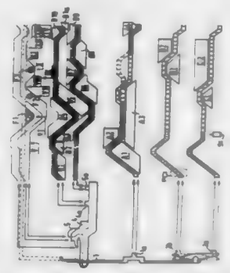
configured and dimensioned to at least partially receive said tab or to act as a passageway for articles into and out of a radially aligned one of said compartments, depending upon the relative rotational orientation of said inner and outer members.

4,989,421

PROCESS FOR PRODUCING A PATTERNED PLUSH FABRIC AS WELL AS A MULTISYSTEM CIRCULAR KNITTING MACHINE FOR CARRYING OUT THE PROCESS

Walter R. Schmidt, Gerengasse 37/10, A-3500 Krems, Austria

Filed Jun. 20, 1988, Ser. No. 208,500
Claims priority, application Austria, Jun. 19, 1987, 1558/87
Int. Cl.[4] D04B *9/12, 15/06*
U.S. Cl. 66—9 R 2 Claims



2. A multifeed circular knitting machine for producing patterned pile fabric comprised of a needle cylinder having a plurality of latch needles each with a needle hook and each being operatively mounted therein and a plurality of pile and feeding sinkers each being operatively associated with one of said needles and being moveable independently of each other, each pile sinker having integrally formed knitting, pile forming and loop forming ledges, said loop forming ledges serving for forming loops of a pile thread instantaneously after having been fed to said needles, characterized in that said pile forming ledge forms pile loops in the course of the knock-over movement of said needles, and wherein said feeding sinker is comprised of a feeding ledge, said feeding sinker being movable relative to said pile sinker so that a pile thread can, after feeding, be positively located in a needle hook positioned in a feeding position above said loop forming ledge.

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4,989,422

SOUND ABSORBENT SLEEVING PRODUCT

Richard A. Barlow, Newtown Square, Pa.; Thomas B. Conaghan, Rock Hall, Md.; Harry F. Gladfelter, Phoenixville, Pa.; J. Sellers Kite, III, West Chester, Pa., and Peter J. Mimmo, Cleamery, Pa., assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed May 19, 1989, Ser. No. 354,525
Int. Cl.[5] D04B *1/14;* D04C *1/02;* F16L *11/02*
U.S. Cl. 66—170 9 Claims

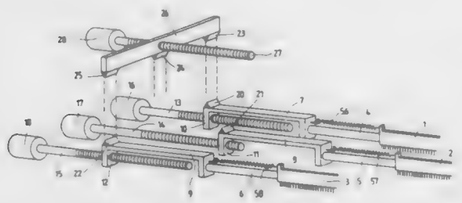
1. A textile sleeve for the bundling of elongated substrates said sleeve comprising interthreaded first and second yarns, said first yarn comprising a bulky filament yarn and said second yarn consisting essentially of a monofilament of an engineered plastic material, said monofilament having a diameter of about 0.007 to about 0.012 inches and a tensile modulus of at least 100,000 psi, the two yarns being present in a ratio of about one end of bulky yarn to between about one end to about three ends of monofilament.

4,989,423

WARP KNITTING MACHINE WITH GUIDE BARS ADJUSTABLE BY MEANS OF STEP MOTORS

Helmut Schäfer, Neuffen, Fed. Rep. of Germany, assignor to Liba Maschinenfabrik GmbH, Fed. Rep. of Germany

PCT No. PCT/DE88/00619, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO89/03443, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 6, 1988, Ser. No. 381,416
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734072
Int. Cl.[5] D04B *23/22*
U.S. Cl. 66—204 4 Claims



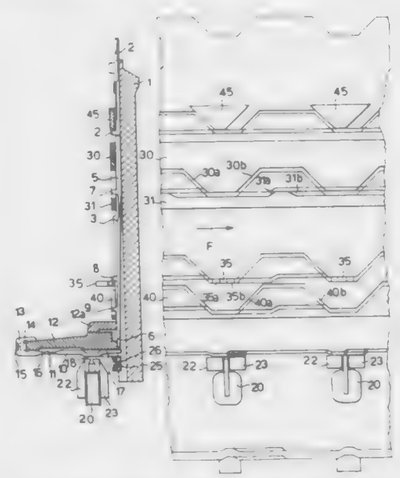
1. In a warp knitting machine with guide bars (1, 2, 3) shiftable in a longitudinal displacement direction by means of displacement stepping motors (16, 17, 18) according to a pattern, wherein said displacement stepping motors (16, 17, 18) obtain their displacement information in the form of a certain number of displacement pulses from a pattern memory (29) in a control device (19), the combination therewith of means for determining and correcting the position of said guide bars (1, 2, 3) of said knitting machine turned off in the underlay position, said guide bar position determining and correcting means including indicators (20, 21, 22) of an electric proximity switch connected to each of said guide bars (1, 2, 3), sensors (23, 24, 25) mounted on a measurement slider (26) shiftable in the displacement direction of said guide bars (1, 2, 3), said measurement slider (26) being shiftable from a start position (A) over a displacement region of said indicators (20, 21, and 22) by means of a measurement stepping motor (28), said start position (A) corresponding to the zero-position of said guide bars (1, 2, 3), a pulse counter (36) for counting the steps of said measurement stepping motor (28) during shifting to a point of coincidence of said indicators (20, 21, 22) and said sensors (23, 24, 25), a comparator (44) for comparing the steps of said measurement stepping motor (28) with the displacement pulse number obtained from a pattern memory (29) defining the respective displacement according to the pattern, and wherein a difference determined by said comparator (44) is fed to the corresponding displacement stepping motors (16, 17, 18) as a correction pulse number.

4,989,424

NEEDLE SELECTION DEVICE FOR A CIRCULAR KNITTING MACHINE, PARTICULARLY FOR LADIES' STOCKINGS

Edoardo Furia, San Casciano Val Di Pesa, Italy, assignor to Savio, SpA, Pordenone, Italy

Filed Apr. 10, 1989, Ser. No. 335,718
Claims priority, application Italy, Jan. 10, 1989, 9304 A/89
Int. Cl.[5] D04B *15/78*
U.S. Cl. 66—219 9 Claims



1. An electromagnetic device for selecting needles in a circular knitting machine, wherein the device has a rim structure fixed about a cylinder, wherein the device comprises:

(a) an elastic pusher jack for each needle, said jack having a head end for activating its corresponding needle and a foot end, wherein said jack is housed and is slidable in a groove of the cylinder and wherein said jack includes an upper butt, an intermediate butt, and a lower butt;

(b) a first ring cam in cooperation with said upper butt of said jack for lowering said jack into a lower needle selection position;

(c) a pressure cam in cooperation with said intermediate butt of said jack when said jack is in said lower needle selection position;

(d) a second ring cam in cooperation with said lower butt of said jack for raising said jack for activating the corresponding needle of said jack;

(e) a horizontal elastic selector having a head end located below and proximate to said foot of said jack wherein said head projects into said groove of the cylinder housing said jack and a foot end fixed in a vertical seat of the rim structure, wherein said horizontal elastic selector is rigidly fixed about the cylinder and housed in a radial groove of the rim structure;

(f) a ring spring attached to said foot of said horizontal elastic selector for retaining said foot in said vertical seat of the rim structure;

(g) a selection electromagnet located proximate said horizontal elastic selector for attracting said horizontal elastic selector when said electromagnet is activated; and

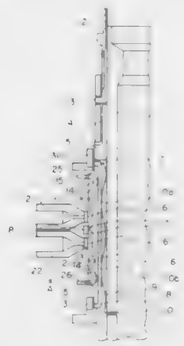
(h) at least one permanent retaining magnet located proximate said horizontal elastic selector for attracting said horizontal elastic selector when said selection electromagnet is activated to selectively attract said lower butt of said jack after said intermediate butt of said jack has passed said presser cam so that said jack selects the corresponding needle.

4,989,425

APPARATUS FOR THE ELECTRONICALLY CONTROLLED THREE-POSITION ELECTROMAGNETIC SELECTION OF NEEDLES FOR CIRCULAR KNITTING MACHINE WITH ALTERNATE MOTION

Edoardo Furia, Via Volterrana, 86, 50020 La Romola S. Cadciano V. Pesa (Firenze), Italy

Filed May 12, 1989, Ser. No. 351,023
Claims priority, application Italy, Apr. 26, 1989, N9411 A/88
Int. Cl.[5] D04B *15/78*
U.S. Cl. 66—220 5 Claims



1. An apparatus for the electronically controlled three-position electromagnetic selection of needles for a circular knitting machine with alternate motion comprising:

a needle cylinder including needles, underneedles connected to said needles and pusher jacks engageable with said underneedles;

oscillating selector means for needle section including oscillating selectors cooperating with pressure cams;

first and second electromagnets, each electromagnet being interposed between two permanent magnets for the selection of the oscillating selectors;

a first cam for driving the pusher jacks to a lower position for a retained stitch;

a second cam for driving the underneedles into the upper position for a discharged stitch;

a third cam for driving the needles upon the formation of a stitch;

said pusher jacks including a straight body with upper and lower ends each formed heel-shaped;

a spring positioned adjacent said pusher jack for urging said pusher jack outwardly from said needle cylinder;

said oscillating selectors are disposed vertically superimposed and symmetrically arranged with respect to a horizontal separation line, each oscillating selector including a convex portion turned toward a portion of the pusher jack and including heels directed outwardly of the needle cylinder, an end heel of each oscillating selector being provided for the contact with a pressure cam and with a spacer ring respectively, and an intermediate heel of each oscillating selectors being provided for magnetic attraction by a corresponding one of said electromagnets and associated permanent magnets;

said electromagnets are disposed superimposed on the same vertical plane, each electromagnet having poles juxtaposed to a corresponding said intermediate heel;

said pressure cams are disposed substantially aligned vertically and substantially lined up with the axis of said electromagnets; and

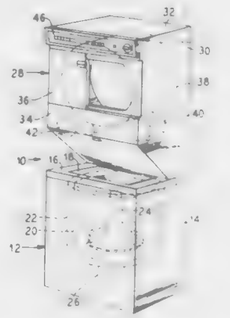
said cam is provided for the displacement of the upper heel of pusher jacks and of the superimposed heel of underneedle.

4,989,426

WASHER/DRYER FRAME CONSTRUCTION

Gerald L. Kretchman, St. Joseph Township, Berrien County; James R. Mulder, Berrien Township, Berrien County; Carl E. Eichman, and James I. Czech, both of Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 7/350,725, May 12, 1989, abandoned. This application May 8, 1990, Ser. No. 519,312
Int. Cl.[5] D06F *29/02*
U.S. Cl. 68—3 R 16 Claims



1. A vertically arranged unitary and fully self-supporting combination appliance comprising:

a lower appliance assembly;

an upper appliance assembly, positioned above said lower appliance assembly;

a cabinet enclosing said upper appliance assembly and said lower appliance assembly;

a base in contact with said lower appliance assembly and in contact with a supporting surface, such that said lower appliance assembly is fully supported through said base; and

a support structure to mount said upper appliance assembly above said lower appliance assembly, said support structure being enclosed within said cabinet, and said support structure fully supporting said upper appliance assembly through said base, said support structure comprising means for providing structural integrity to said combination appliance during transportation and operation, and said support structure comprising:

a first means for supporting the weight of the upper appliance assembly comprising at least one vertical main support member; and

at least one horizontal support member attached to said vertical main support member, in cantilever fashion and extending along a depth of said upper appliance assembly and attached to said upper appliance assembly such that a substantial overhanging portion of the supported weight of said upper appliance assembly is supported by said horizontal support member, and said horizontal support member transfers the substantial overhanging portion of the supported weight to said vertical main support member; and

said base comprises:

a second means for fully supporting the first means comprising at least one base frame member attached to said vertical main support member and extending along a depth of said lower appliance assembly such that the substantial overhanging portion of the supported weight of said upper appliance assembly is transferred from said vertical main support member to said base frame member, and said base frame member transfers force caused by the supported weight to the supporting surface.

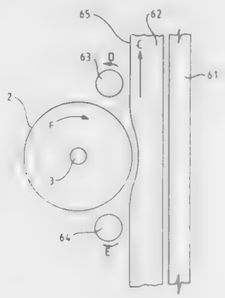
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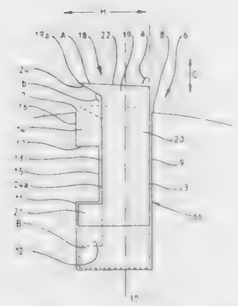
4,989,427

FLESHING MACHINE

Simon P. Van Der Park, Christchurch; Angus A. J. Robertson, Rangiora, and David P. Cairns, Christchurch, all of New Zealand, assignors to Her Majesty the Queen in right of New Zealand, Christchurch, New Zealand

Filed Sep. 2, 1988, Ser. No. 240,135
Claims priority, application New Zealand, Sep. 7, 1987, 221706
Int. Cl.[5] C14B *1/22*
U.S. Cl. 69—37 21 Claims





1. An improved roller for a fleshing machine, the machine comprising: a supporting means for supporting or holding a hide or pelt; a roller of a fixed position type and being capable of rotation about an axis, driving means for rotating the roller about the axis; and means to produce relative movement between the hide or pelt and the roller; wherein the roller improvement comprising:

the roller containing a plurality of shaped cavities with each cavity extending into the roller from an opening on the surface of the roller;

a plurality of shaped knives, one or more of the knives being contained within each cavity, each knife having a shaped cutting head which in used protrudes from the surface of the roller, and a shank and a base shaped such that each knife is capable of limited reciprocal movement in a direction perpendicular to the axis of the roller, each cavity being shaped so as to permit the limited movement of each knife and to retain the base of the knife within the cavity when the machine is in operation or stationary;

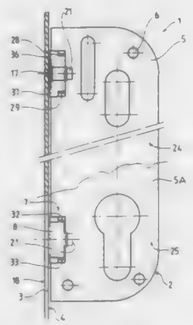
the positioning and shape of the cavities within the roller and the shape of the knives being such that, in operation, the cutting head of each knife contacts the surface of the hide or pelt with an approximately constant force and at approximately a right angle to the surface of the hide or pelt as the surface passes the roller and such that each cutting head is also capable of limited movement in a plane substantially perpendicular to a plane of reciprocal movement of the knife.

4,989,428

DEVICE FOR ASSEMBLING THE HEADPIECE AND THE CASING OR CASINGS OF A LOCKING DEVICE SUCH AS A LOCK, ESPAGNOLETTE, ESPAGNOLETTE-LOCK OR THE LIKE

Gérard Prevot, Willerwald, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed May 21, 1990, Ser. No. 525,854
Claims priority, application France, May 23, 1989, 89 06893
Int. Cl.[5] E05B *9/00*
U.S. Cl. 70—448 8 Claims



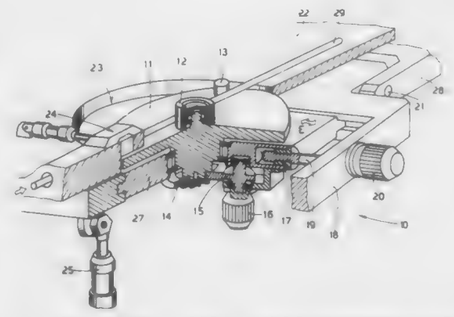
1. Locking device such as a lock, espagnolette, espagnolette-lock and the like, comprising a headpiece (3) having an inner face (4) onto which is inserted at least one casing (2) comprising two parallel walls (5, 5A), the assembling between the headpiece and the casing or casings (2) being obtained by means of riders (8) in the form of profile lengths (9) with a "U"-shaped cross-section comprised of two parallel wings (10, 11) and a transversal wall (14) made integral with the inner face (4) of said headpiece (3), both parallel wings (10, 11) of the riders (8) forming means for seizing each of the parallel walls (5, 5A) of the casing or casings (2).

4,989,429

ROCKER BENDING UNIT

Marcello Del Fabro, Udine, and Giorgio Del Fabro, Cassacco-Fraz.Montegnacco, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy

Filed Jan. 11, 1990, Ser. No. 463,445
Claims priority, application Italy, Jan. 18, 1989, 15902 A/89
Int. Cl.[5] B21D *7/022*
U.S. Cl. 72—307 5 Claims



1. A rocker bending unit of a type retractable below a surface of a working platform of a bending-shaping machine for bars and being operably connected to a frame of said bending-shaping machine, wherein said bars are fed through said bending-shaping machine in a longitudinally extending feed direction, comprising:

a base having one end at a downstream side with respect to said feed direction secured to said frame of said bending-shaping machine by a rocker pivot, said rocker pivot having an axis substantially parallel to said surface of said working platform in the geometric neighborhood thereof and perpendicular to said longitudinally extending feed direction;

a slider slidably supported on said base such that said slide is able to move with respect to said base in a direction perpendicular to said longitudinally extending feed direction; and

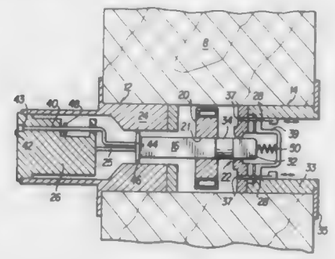
a bending disk fitted on said slider and having an upper major surface extending in a plane parallel to said axis of said rocker pivot, said bending disk being rotatable clockwise and counterclockwise about an axis of rotation perpendicular to said upper major surface, and being provided with a bending pin on its upper major surface positioned out of alignment with said axis of rotation and with a contrast roller or pin coaxial with said axis of rotation.

4,989,430

LATCH MECHANISM

Arthur J. Burt, Ipswich, Great Britain, assignor to Titon Hardware Limited, Cholchester, England

Continuation-in-part of Ser. No. 267,887, Nov. 7, 1988, abandoned. This application Nov. 29, 1989, Ser. No. 443,132
Claims priority, application United Kingdom, Nov. 5, 1987, 8725977
Int. Cl.[5] E05B *17/04*
U.S. Cl. 70—380 10 Claims



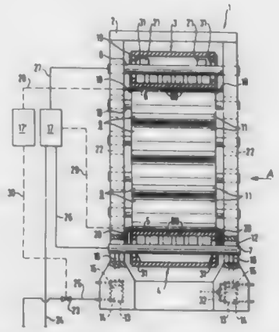
1. A latch mechanism for a closure in a frame, comprising latch means for holding said closure in said frame, said latch means including first and second independently rotatable latch operating members each defining a recess, a latch actuating spindle and first and second latch actuating means for applying a latch actuating torque to said spindle from first and second sides of said closure, respectively, wherein said first latch operating member has locking means for preventing rotation of the spindle from the first side, and said second latch operating member has locking means which are operable from the second side to prevent rotation of said second latch operating member, said first latch actuating means being permanently engaged with said spindle to transmit said torque and said spindle being axially displaceable between an engaged position, in which said spindle is engaged in said recess defined by said second latch operating member to transmit said torque, and a disengaged position, in which said spindle and second latch operating member are free to rotate independently.

4,989,431

ROLLING DEVICE

Wolf-Gunter Stotz, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jun. 29, 1989, Ser. No. 374,238
Claims priority, application Switzerland, Jun. 30, 1988, 02495/88
Int. Cl.[5] B21B *37/08, 31/16*
U.S. Cl. 72—21 6 Claims



1. Roll arrangement comprising: a stand; a roll train mounted in said stand and including upper and lower controlled deflection rolls, each of which comprises a respective non-rotatable carrier and a respective sleeve displaceably supported on and relative to the associated carrier by respective force generator means in the pressure plane of the arrangement, the carrier of the upper controlled deflection roll being at a fixed height relative to the stand; first regulator means for at least one of the controlled deflection rolls for setting and holding the sleeve thereof at a predetermined height relative to the associated carrier or the stand by control of its force generator means; second regulator means for controlling the carrier position of the lower controlled deflection roll in dependence upon the sleeve height relative to the associated carrier in the respective other controlled deflection roll; and at least one intermediate roll disposed between the upper and lower controlled deflection rolls with journals lying substantially in the pressure plane of the arrangement and being mounted for displacement in the pressure direction.

4,989,432

SYSTEM AND METHOD OF DETECTING ROLL POSITION IN A ROTARY STRAIGHTENER

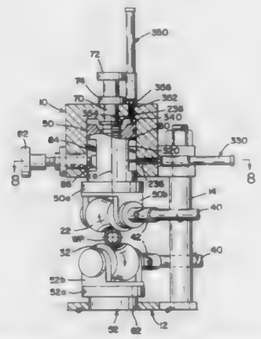
Phillip G. Taylor, Hartville, and Robert L. Bair, Canton, both of Ohio, assignors to Turner Machine Company, Salem, Ohio

Filed Jan. 16, 1990, Ser. No. 465,463
Int. Cl.[5] B21D *3/04*
U.S. Cl. 72—35 23 Claims

1. A system for detecting the exact operative position of the cross rolls with respect to the fixed housing of a rotary straightener for straightening an elongated workpiece as it travels through the straightener along a given path, said straightener having a number of concavely contoured, cross rolls divided into a first group of rolls extending axially along one side of said path and a second group of rolls matching said first group and extending axially along a second side of said path opposite to said first side, each of said cross rolls being rotatively mounted on a cylindrical roll frame member with a central axis and carried in a cylindrical, concentric cavity in said housing of said straightener whereby said rolls are each adjustable angularly about said central axis by rotating said roll frames in said cavity and selected ones of said rolls are adjustable axially along said central axis by translating said roll frames in said cavity, said system comprising: a first abutment

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surface means located directly on said roll frames and movable in a given direction about said central axis as said roll frame is rotated in said cavity for indicating the exact angular position of said frame, the roll frames of said selected rolls having a second abutment surface located directly on said roll frame and movable in a given direction axial of said central axis as said roll frame is translated in said cavity for detecting the exact axial position of said frame, respective linear transducer



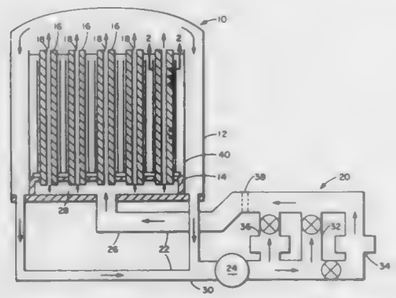
means for detecting the position of each of said first and second abutment surface means with respect to the housing of said straightener, said linear transducer means having a linearly movable member movable by said surface means and a voltage output indicative of the position of said linearly movable member, and readout means for converting the voltage output of each of said transducer means into digital numbers indicative of the exact positions of each of said surface means with respect to said housing.

4,989,433

METHOD AND MEANS FOR METAL SIZING EMPLOYING THERMAL EXPANSION AND CONTRACTION

John L. Harmon, 450 Appleton Way, Wilmington, N.C. 28403; Charles Schiltz, 214 N. Channel Dr., Wilmington, N.C. 28480, and Gerald W. McKenzie, 309 Lansdowne Rd., Wilmington, N.C. 28403

Filed Feb. 28, 1989, Ser. No. 317,244
Int. Cl.[5] B21D *39/20*
U.S. Cl. 72—38 26 Claims



1. A method of sizing an open-ended, metal circumferential enclosure, consisting essentially of the steps of:

(a) inserting a close fitting metal mandrel having an aptly and accurately shaped body through the length of an open-ended, metal circumferential enclosure whereby the enclosure surrounds a portion of the mandrel and the mandrel extends through the open-ended enclosure, said mandrel being constructed of a metal having a coefficient of thermal expansions substantially greater than the metal of the surrounding open-ended enclosure and being provided with internal cooling and heating means;

(b) heating the inserted metal mandrel to expand its shaped body to a dimension exceeding the internal dimension of the surrounding open-ended enclosure and thereby internally stretching the open-ended enclosure outward to an imposed accurate shape;

(c) retaining a level of heat until the stretch shaped circumferential open-ended enclosure is annealed while in the stretch imposed shape; and

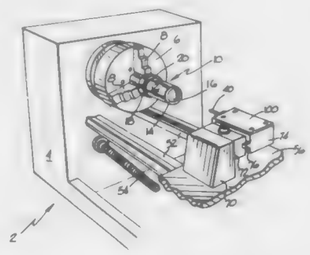
(d) cooling the inserted metal mandrel to contract its shaped body to its initial dimension of smaller than the enclosure and withdrawing the mandrel from the shaped open-ended enclosure.

4,989,434

METHOD AND APPARATUS FOR DOMING CAN BOTTOMS

Charles E. Brossia, Highlands Ranch; Roblee L. Talbott, Golden; Ronald B. Peterson, Arvada, and Warren R. Williams, Fort Collins, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Aug. 9, 1989, Ser. No. 391,959
Int. Cl.[5] B21D *22/16*
U.S. Cl. 72—82 12 Claims



1. Method for reshaping a can bottom wall into a desired configuration comprising:

mounting a mold member having a generally cylindrical outer peripheral surface having a longitudinal axis and a contoured bottom surface for rotation about a fixed axis of rotation;

moving a can body having a sidewall having a cylindrical inner surface having a longitudinal axis, an original overall axial extent and an integral bottom wall over said mold member until an annular portion of said bottom wall contacts at least an annular portion of said contoured bottom surface and said longitudinal axes coincide;

securing said can body to said mold member to prevent relative rotational movement therebetween during said rotation of said mold member and said can body;

rotation said mold member and said can body about said fixed axis;

moving a tool member having an outer surface for contacting said bottom wall in at least one linear direction over said bottom wall at least once between said annular portion of said bottom wall to said fixed axis of rotation;

applying forces to said bottom wall by linear movement in another direction of said tool member during said movement thereof in said one linear direction to move said bottom wall into conformation with said contoured bottom surface without changing said original overall axial extent of said can body; and

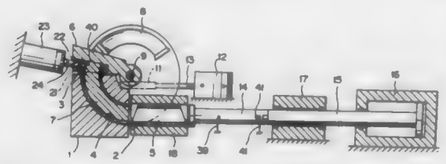
varying the wall thickness of said moved bottom wall of said can body by varying the rate of movement and the applied force of said tool member in said another linear direction.

4,989,435

METHOD AND APPARATUS FOR MANUFACTURING CURVED PIPE

Toshio Kaneko, Kanagawa, Japan, assignor to Kabushiki Kaisha Asahi Kinzoku Hogyosho, Kanagawa, Japan

Filed Dec. 11, 1989, Ser. No. 449,581
Int. Cl.[5] B21D *7/08, 9/12*
U.S. Cl. 72—133 6 Claims



1. A curved pipe manufacturing method comprising the steps of:

(1) providing a fixed die having a curved cavity, an entrance opening and an exit opening contained therein, said curved cavity being formed in a circular arc and extending from said entrance opening to said exit opening;

(2) providing a movable block having a curved mandrel attached to a first side thereof and a curved ejecting rod attached to a second side thereof opposite said first side, said curved mandrel and said curved ejecting rod being concentrically mounted on said movable block with respect to each other;

(3) inserting the curved mandrel into the curved cavity of the fixed die through the exit opening therein and forming a curved annular chamber therein;

(4) pressing a work with a presser rod through said entrance opening into said curved annular chamber to form a curved pipe;

(5) positioning a stopper directly adjacent said exit opening of said fixed die, said stopper having a through hole provided in an outermost portion which is adapted to allow the passage of said mandrel therethrough during the removal of said mandrel from said curved cavity but prevent the removal of said curved pipe from said curved cavity by restraining a tip end thereof;

(6)removing the mandrel from the fixed die exit opening and through the stopper through hole so that said mandrel is removed from said curved cavity without the accompanying removal of said curved pipe;

(7) inserting the ejecting rod into the fixed die entrance opening to eject said curved pipe from said curved cavity through said exit opening; and

(8) recovering said curved pipe.

4,989,436

SYSTEM FOR AXIALLY SHIFTING A ROLL IN A ROLL STAND

Helmut Setzer, Siegen-Geisweid, and Axel Sprenger, Hilchenbach, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 369,992
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 3821571
Int. Cl.[5] B21B *31/18*
U.S. Cl. 72—247 6 Claims

1. A roll stand comprising:

a generally stationary frame;

a roll centered on an axis;

a radial-thrust bearing having

an outer race fixed in the frame,

an inner race fixed on the roll, and

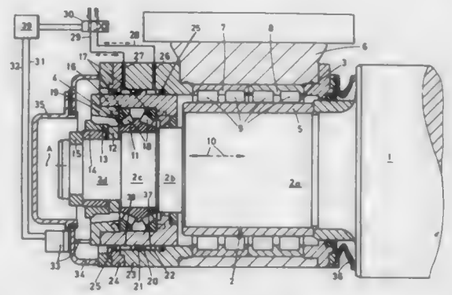
a plurality of rollers radially engaging the races and supporting the roll in the frame for rotation about the axis, one of the races being axially substantially longer than the combined length of the rollers and the rollers being axially shiftable along the one race;

an axial-thrust bearing having

an inner race axially fixed to the roll and

an outer race formed with a piston, the frame forming around the piston of the axial-bearing outer race a cylinder chamber subdivided by the piston into a pair of axially opposite compartments, the cylinder chamber being radially spaced from the axial thrust bearing; and

means for alternately pressurizing the compartments and thereby axially shifting the roll in the frame and thereby axially shifting the other of the radial-bearing races relative to the respective rollers and the one radial-bearing race.

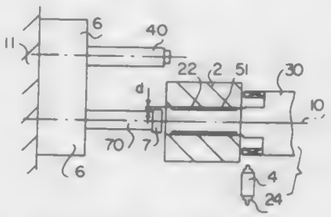


4,989,437

METHOD AND APPARATUS FOR EXTRUDING METAL

Guy Bessey, Auvers sur Oise, and Alain Noterman, Puiseux en France, both of France, assignors to Clecim, Cergy Pontoise, France

Filed Feb. 21, 1989, Ser. No. 312,996
Claims priority, application France, Feb. 19, 1988, 88 02035
Int. Cl.[5] B21C *35/04*
U.S. Cl. 72—254 15 Claims



1. Method for extruding a billet (5) of metal in an extrusion press, said billet (5) comprising, in the raw state, an outer layer (54) of a thickness (a) likely to contain surface defects, said press comprising:

a die (41) mounted on an extrusion block (4) at a first end of a fixed rammer (40) having first and second ends and pierced with an orifice (42), said die resting adjacent said second end of said fixed rammer on a supporting beam (11), said die (41) and said orifice (42) being centered on an extrusion axis (10);

a container (2) having a cylindrical bore (21) centered on said extrusion axis (10), said container (2) resting on a movable crossbeam (30) carrying a closure base (3) for said bore (21);

means (53) for loading a metal billet (5) to be extruded in said bore (21);

at least one jack (16) for displacing said movable crossbeam (30) and said container (2) towards said fixed rammer (40),

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so as to produce a bar by extruding in said die a metal billet (5) placed in said bore (21); and

means for scraping said bore (21) after extrusion, said means comprising a scraping block (7) mounted on a second rammer (70) and being adapted to be introduced into said bore (21);

said method comprising the steps of:

(a) mounting on said fixed rammer (40) an extrusion block (4) having an outer diameter (D1) which is less than a diameter (D2) of said bore (21), thereby leaving a play (c) between a periphery of said extrusion block (4) and said bore (21);

(b) placing said billet (5) in said bore (21), said billet (5) being in its raw state without prior removal of said outer layer (54);

(c) extruding said raw billet (5) by displacing said movable crossbeam (30) towards said fixed rammer (40), for producing a bar (50) which is discharged via said orifice (42) of said rammer (40);

(d) forming during extrusion a sleeve (51) having a thickness (a'), said play (c) being calculated so that said thickness (a') is at least equal to the thickness (a) of said outer layer (54);

(e) mounting on said second rammer (70) a scraping block (7) having an outer diameter (D3) which is less than said diameter (D2) of said bore (21) for leaving a play (d) between a periphery of said scraping block (7) and said bore (21), said play (d) being less than a thickness (a') of said sleeve (51); and

(f) scraping said bore (21) by said scraping block (7) over only a part of the thickness of said sleeve (51) and leaving, after scraping, a metal film (52) having a uniform thickness covering all the inner face (22) of said bore (21).

4,989,438

POWER ACTUATED DEVICE FOR INSTALLING METAL CORNER STRIP

Rodolphe J. Simon, Manchester, Conn., assignor to Nastasi-White, Inc., Flushing, N.Y.

Continuation-in-part of Ser. No. 157,377, Feb. 18, 1988, abandoned. This application Oct. 19, 1989, Ser. No. 423,950

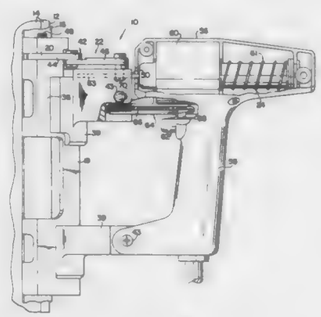
Int. Cl.[5] B23P *11/00*

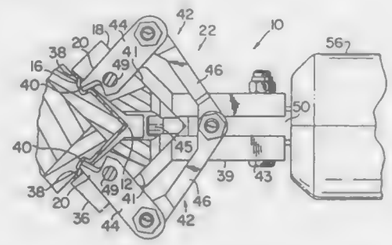
U.S. Cl. 72—325 13 Claims

13. A device for attaching a protective strip along a corner formed by the intersection of two wall panels comprising removable, interchangeable retaining means for holding the protective strip and the device in alignment with the corner, attaching means releasably supported on and operably connected to said retaining means for movement between an inactive position wherein said attaching means are out of engagement with the protective strip held by said retaining means and an attaching position wherein said attaching means engage and attach the protective strip into holding engagement with the wall panels, operating means connected to the attaching means for moving said attaching means from said inactive position to said attaching position, said operating means including means cooperating with said retaining means for maintaining said strip and said device in alignment with the corner as said attaching means are moved from their inactive position to their attaching position, biasing means for normally maintaining said attaching means in said inactive position, and power operated means mounted on said retaining means and operably connected to said operating means for actuating said operating means to move said attaching means to said attaching position, said power operated means including

a housing aligned with said operating means having a pistol grip extending transversely therefrom,

a shaft mounted within said housing extending transversely to said pistol grip for reciprocating movement connected to said operating means, and





means on said pistol grip for initiating reciprocating movement of said shaft.

4,989,439

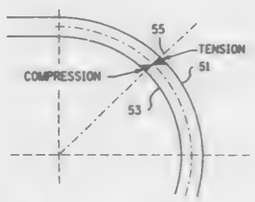
SPRINGBACK STRETCH PRESS

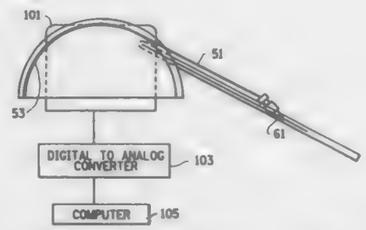
Lee R. Ewert, Garden Grove; Sumner B. Sargent, Bell, and Walter Leodolter, Rancho Palos Verdes, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 17, 1988, Ser. No. 272,403

Int. Cl.[5] B21D *37/02*

U.S. Cl. 72—372 20 Claims





1. A method of shaping a workpiece to a desired radius utilizing springback, die radius and geometry factor, comprising the steps of:

computing the springback of said workpiece based upon its stress strain characteristics;

computing the geometry factor of said workpiece based upon the stress difference between the inner and outer curvatures of the desired finished radius of the workpiece, the dimensions of the workpiece, and the stress strain characteristics of the workpiece;

computing the radius of a die as a function of said springback, said geometry factor and the desired radius of the workpiece;

constructing a die based upon said computed radius; and,

stretchably shaping said workpiece about said die.

4,989,440

DEVICE FOR MOVING A TOOL TO EXACT SHAPING OR WORKING ENGAGEMENT WITH A STRIP OF MATERIAL HAVING A REPEATED BASIC SHAPE

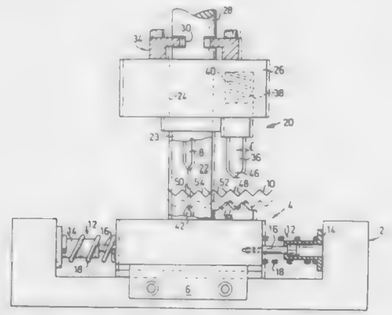
Börje Sjögren, Huddinge, Sweden, assignor to Nordisk Kartro AB, Farsta, Sweden

Division of Ser. No. 192,819, May 2, 1988. This application May 9, 1989, Ser. No. 349,242

Claims priority, application Sweden, Sep. 24, 1986, 8604042

Int. Cl.[5] B21D *13/02*

U.S. Cl. 72—385 8 Claims



1. Device of bringing a tool (8) to a desired engagement position relative to and in engagement with a strip of material (10), comprising means for intermittently advancing a said strip having a repeating basic non-planar shape, in its longitudinal direction past the tool, and for holding the strip stationary in its longitudinal direction between intermittent advances, so that the shaping or working engagement of the tool with the strip can take place through a movement perpendicular to the longitudinal direction of the strip, means for finely adjusting the position of the tool relative to a said basic shape in the strip by moving the tool in a direction parallel to the direction of strip advance to a correct engagement position, at least one basic shape sensor (36) connected to the tool for controlling said engagement position, said sensor being spaced at a specific distance from the tool as viewed in the longitudinal direction of the strip; means for controlling the position of the tool in said direction parallel to the direction of strip advance by the position of the basic shape sensor to locate the exact position of one (48) of the cyclically repeated basic shapes in the strip, located one or more basic shape spacings from the basic shape (50) with which the tool (8) is to be brought into engagement, means for moving said tool with and steering said tool by the sensor during its precision locating movement in the longitudinal direction of the strip; and means for effecting the shaping and working movement of the tool perpendicular to the strip only when the sensor has reached said exact position.

4,989,441

TUBE-BENDING DEVICE

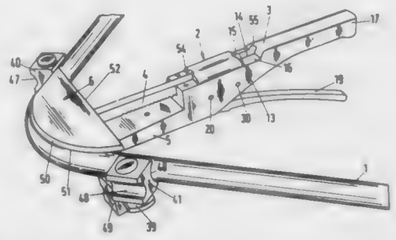
Rudolf Wagner, Stuggart, Fed. Rep. of Germany, assignor to REMS-WERK Christian Föll und Söhne GmbH & Co., Waiblingen, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,380

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 3803128

Int. Cl.[5] B21D *7/08*

U.S. Cl. 72—389 19 Claims



1. In a tube-bending device that comprises a main body, a ratchet lever pivotably mounted on said main body and movable against spring force, a driving pawl as well as a ratchet bar operatively associated therewith, said ratchet lever via said driving pawl engaging said ratchet bar that is displaceable guided in said main body as well as an anvil provided therewith, a detent also pivotably mounted on said main body and engaging said ratchet bar, including the improvement wherein:

a single holder having two sides is provided on said main body, with a first pair of blocks being disposed on one of said two sides of said single holder, as well as a second pair of blocks being disposed on the other of said two sides of said single holder, with a respective one of said pairs of blocks being provided for supporting a tube during a tube-bending process, said anvil, via displacement of said ratchet bar, being adapted to engage said tube, said pairs of blocks on said two sides of said single holder respectively having different spacing from each other to facilitate tube bending therebetween.

4,989,442

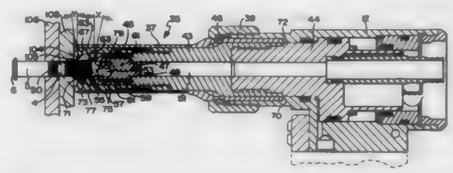
NOSE ASSEMBLY FOR PULLING FASTENERS THROUGH INTERFERENCE FIT HOLES

Hendrik E. Rosier, Kingston, N.Y., assignor to Huck Manufacturing Company, Irvine, Calif.

Continuation of Ser. No. 259,938, Oct. 19, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 430,912

Int. Cl.[5] B21J *15/18*

U.S. Cl. 72—391.2 4 Claims



1. A nose assembly for quietly pulling a fastener pin having a short shank formed with ridges and grooves through a workpiece so as to form an interference fit between said pin and said workpiece, said assembly comprising:

a housing operatively associated with said housing,

a collet operatively associated with said housing,

jaw means comprising a front axial portion formed with a plurality of teeth for engaging and mating with said ridges and grooves formed on said fastener pin, said jaw means

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being disposed within said collet, said front axial portion dimensioned to project outwardly from said collet during said pulling to facilitate gripping of said short shank, said jaw means further comprising a rear axial portion defining an axially extending recess bounded by an inner wall; and

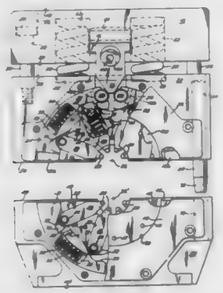
jaw support means for radially supporting said rear axial portion of said jaw means against radially inwardly directed pivoting movement caused by forces generated between said front axial portion of said jaw means and said pin shank as said front axial portion of said jaw means projects from said collet during said pulling, said jaw support means comprising an axial projection fitted within said recess with a clearance fit prior to said pulling to allow said jaw means to be freely positioned over said pin shank, said collet forcing said rear axial portion of said jaw means into engagement with said axial projection during said pulling such that said axial projection prevents said pivoting movement of said rear axial portion of said jaw means and prevents said jaw means from being pulled out of said collet.

4,989,443

CRIMPING APPARATUS

Edwin G. Sawdon, Marysville, Mich., assignor to BTM Corporation, Marysville, Mich.

Filed Apr. 13, 1990, Ser. No. 509,498
Int. Cl.[5] B21D *41/00*
U.S. Cl. 72—402 **19 Claims**



1. A crimping apparatus comprising:

(a) a first body member having generally opposite first and second end surfaces and a plurality of equally spaced slots extending radially outwardly from a first longitudinal axis generally coincident with said second end surface;

(b) a second body member having generally opposite third and fourth end surfaces, said third end surface being generally complementary to said second end surface, and a plurality of equally spaced slots extending radially outwardly from a second longitudinal axis parallel to and normally spaced from said first axis and coincident with said third end surface, said second body member being positioned for movement between a normal first loading position where it is spaced from said first body member with said second and third end surfaces facing one another and a second crimping position where said second and third end surfaces engage one another and said first and second axes become coaxial;

(c) a crimping die slidably disposed in each of said slots and having at the radially inner end thereof a crimping portion;

(d) cam means on said first and second body members for simultaneously moving said dies radially inwardly to crimp a workpiece disposed coaxially with respect to said axes when said body members are in said crimping position;

(e) an actuator member connected to said first body member adjacent said first end surface and being mounted for limited movement toward and away therefrom;

(f) first spring means for biasing said actuator member away from said first body member; and

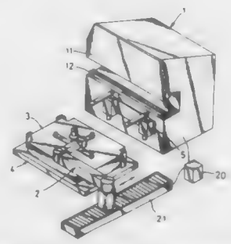
(g) actuating means on said actuator member for causing said cam means to cam said dies radially inwardly when a sufficient clamping force is exerted on said first and fourth end surfaces to cause said second and third surfaces to move into engagement with one another and thereafter cause said actuator member to move against the bias of said spring means toward said first body member.

4,989,444

INDUSTRIAL ROBOT FOR PRESSING SYSTEM, PRESSING SYSTEM, AND METHOD FOR BENDING PLATE MATERIAL

Manabu Murakami, Settsu; Masanori Yamashita, Suita; Tadafumi Mikoshi, Osaka, and Akihiko Fujii, Sakai, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Aug. 8, 1989, Ser. No. 390,827
Claims priority, application Japan, Aug. 9, 1988, 63-198156; Aug. 9, 1988, 63-198157; Oct. 3, 1988, 63-129910[U]
Int. Cl.[5] B21D *43/00*; B21J *13/10*; B25J *15/06*
U.S. Cl. 72—422 **16 Claims**



11. A method for pressing a plate shaped material by using a press brake for pressing said material for bending, and an industrial robot, having arm members with a vertical base arm formed at a base portion thereof and working arms connected to said base arm, for carrying said material in and out of said press brake, said method comprising the steps of:

(a) acquiring material with a holding member;

(b) transporting held material toward said press brake by moving said base arm along a path that is substantially in a plane defined by a lower portion of said press brake and is outside of a region that is opposite a front portion and a side portion of said press brake;

(c) carrying held material into said press brake by said base arm and said working arms;

(d) releasing held material by stopping said holding member from holding said material;

(e) bending said material with said press brake;

(f) moving said holding member to the bent portion of said material whereby said holding member follows a bending velocity of said material; and

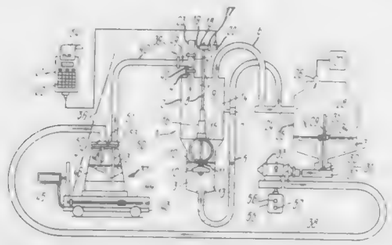
(g) holding said material bent by said press brake with said holding member and carrying said material out of said press brake.

4,989,445

APPARATUS FOR AUTOMATICALLY METERING MILK DRAWN BY A MILKER

Gennady A. Moskvin, Satixmes, 49, kv. 59 SSR, Elgava, U.S.S.R.

PCT No. PCT/SU89/00049, § 371 Date Jan. 5, 1990, § 102(e) Date Jan. 5, 1990, PCT Pub. No. WO89/10685, PCT Pub. Date Nov. 16, 1989
PCT Filed Feb. 21, 1989, Ser. No. 449,874
Claims priority, application U.S.S.R., May 5, 1988, 4413031
Int. Cl.[5] G01F *25/00*
U.S. Cl. 73—3 **5 Claims**



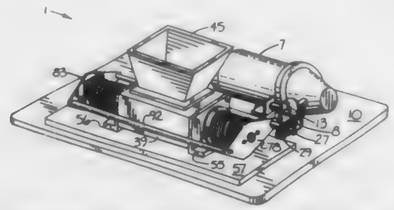
1. An apparatus for automatically metering milk drawn by a milker, comprising a float-type milk meter (1) for metering milk (3) having an admission chamber (14) communicating through an inlet pipe (4) with an evacuated milk pipeline (23) of the milker, the admission chamber (14) and a metering chamber (13) communicating therewith communicating through outlet pipes (6, 5) with an evacuated milk collector (25) of the milker connected to a vacuum system (27) of the milker and with a milk pump (33) of the milker and accommodating a hollow rod (8) carrying a valve member (10) at the lower end thereof and a magnet (17) at the upper end thereof cooperating during movement of the rod (8) with a hermetically sealed contact (20) electrically coupled to an electronic digital computer unit (21) for recording a quantity of milk (3) drawn by the milker, and a unit (36) for adjusting the float-type milk meter (1) for metering milk (3) for an optimum batch of freshly drawn milk (3) from a single cow connected to the milk pump (33).

4,989,446

ULTRASOUND CALIBRATOR

James C. Conti, Galena, Mo., assignor to Dynatek Laboratories, Inc., Galena, Mo.

Filed Jan. 23, 1990, Ser. No. 468,568
Int. Cl.[5] G01F *25/00*
U.S. Cl. 73—3 **13 Claims**



1. A calibration apparatus for calibrating the doppler mode of operation of ultrasound equipment, the apparatus comprising:

(a) a fluid flow channel having known cross-sectional area;

(b) a pair of bellows flow communicating with each other through said channel; each of said bellows and channel containing a fluent medium; each of said bellows adapted to oscillatorily convey said fluent repetitively between both of said bellows through said channel;

(c) motor means operably connected to both of said bellows;

(d) mechanical linkage means operably translating movement of said motor means to both of said bellows so as to produce oscillatory flow of the fluent medium between both of said bellows at a selected velocity; and

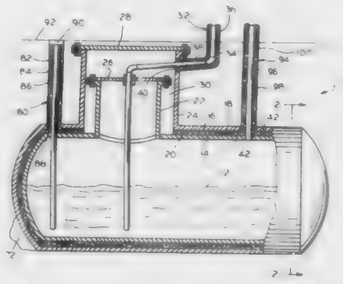
(e) a reservoir containing a liquid in close proximity to said channel; said reservoir adapted to receive a probe of the ultrasound equipment for determining the flow of said fluent medium in said channel so as to compare said selected velocity to that determined by the ultrasound equipment to allow calibration of the ultrasound equipment.

4,989,447

LIQUID CONFINEMENT LEAK DETECTION SYSTEM

Robert J. Gelin, Newark, Ohio, assignor to Ozite Corporation, Libertyville, Ill.

Filed Jun. 21, 1989, Ser. No. 368,584
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—49.2 **33 Claims**



1 A liquid confinement leak detection system, comprising:

an inner wall defining a liquid retaining chamber therewithin, an outer wall in closely spaced adjacent relation to said inner wall to define a normally liquid-tight leak detection chamber therebetween, and a porous material disposed between said inner and outer walls;

said porous material being a batt disposed between said inner and outer walls and being comprised of a needled nonwoven fibrous composite material having inner and outer surfaces in intimate contact with said inner and outer walls;

means for forming a structural bond between said porous material and said inner and outer walls; and

leak detection means associated with said leak detection chamber.

4,989,448

CYLINDER RECOGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

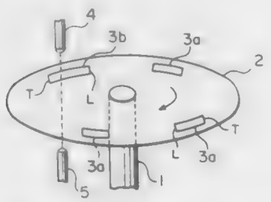
Wataru Fukui, and Toshio Iwata, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1989, Ser. No. 420,067
Claims priority, application Japan, Oct. 12, 1988, 63-254767; Oct. 12, 1988, 63-254768; Oct. 13, 1988, 63-255833
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—116 **4 Claims**

1. A cylinder recognition apparatus for a multi-cylinder internal combustion engine comprising:

means for generating a series of data values indicating the identity of each cylinder of the engine;

a first shift register for sequentially storing the data values for a prescribed number of engine cycles as a first series;
an engine controller; and



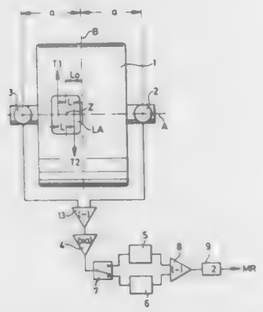
checking means for checking if the first series is a normal series and providing the first series to said engine controller only if the first series is a normal series.

4,989,449

METHOD AND APPARATUS FOR DETERMINING A RESTORING MOMENT PRODUCED BY TAGENTIAL FORCES IN A TIRE TESTING OPERATION

Uwe Mönch, Bensheim, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Jan. 18, 1990, Ser. No. 466,954
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909308
Int. Cl.[5] G01M *17/02*
U.S. Cl. 73—146 **12 Claims**



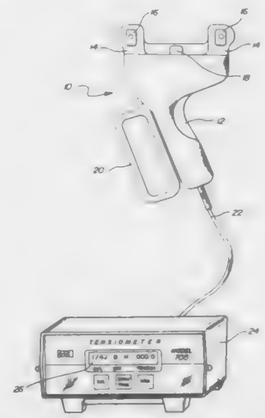
9. Apparatus for determining a restoring moment produced by tangential forces in a tire testing machine comprising a test surface against which in use a tire to be tested is pressed and rolled with a tire contact surface during first and second measuring runs, the second of which is performed with the tire turned side-for-side relative to the first run, force measurement transducer means for measuring tangential forces during the measuring runs, and an evaluation circuit connected to the transducer means for producing an electrical signal proportional to the restoring moment, the evaluation circuit including an adding circuit for adding the restoring moments obtained in the measuring runs and producing a corresponding signal at its output, a dividing circuit for halving the output signal from the adding circuit, and a subtracting circuit having a first input for receiving an input signal proportional to a restoring moment obtained in one of the two measuring runs and having a second input for receiving the output signal from the dividing circuit.

4,989,450

CABLE TENSIOMETER

Ralph Shoberg, Farmington Hills, and Hossein Firouzegan, Wixom, both of Mich., assignors to GSE, Inc., Farmington Hills, Mich.

Filed Aug. 1, 1989, Ser. No. 388,141
Int. Cl.[5] G01L *5/10*
U.S. Cl. 73—158 **15 Claims**



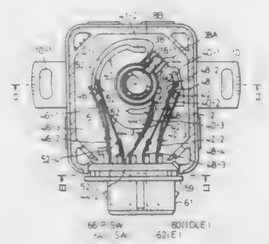
1. An apparatus for measuring the tension in a cable or wire comprising:
a hand-held tension sensor supporting two spaced cable engaging support nibs and an extensible cable deflecting nib mediate said support nibs for removably clamping said tension sensor onto said cable therebetween;
means carried by said tension sensor for selectively extending said cable deflecting nib to deflect said cable laterally between said support nibs;
sensor means connected to said cable deflecting nib to generate an output signal corresponding to the force required to deflect said cable; wherein,
said cable engaging support nibs are multisided and adjustable to accommodate a plurality of cable diameters.

4,989,451

THROTTLE VALVE POSITION SENSOR

Masaki Ogawa, and Yoshiaki Kato, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 29, 1989, Ser. No. 458,782
Claims priority, application Japan, Jan. 5, 1989, 64-42[U]; Aug. 28, 1989, 1-99034[U]
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 **9 Claims**



1. A throttle valve position sensor for detecting at least two different angular positions of a throttle valve of an internal combustion engine for an automobile, said sensors comprising:

at least two switches each having ON and OFF states, each of said at least two switches including a first contact, a first resilient member supporting said first contact, a second contact, and a second resilient member supporting said second contact, said first contact and said second contact forming a switch; and
a drive, responsive to movements of the throttle valve, for operating said at least two switches so that states of said at least two switches change between ON and OFF at respective different positions of the throttle valve, said drive cooperating with one of said resilient members to move between a first position at which said first and second contacts are separated and a second position at which said first contact abuts said second contact,
the setting of the states of said at least two switches being such that said switches cannot be made OFF simultaneously, over the entire range of movement of the throttle valve.

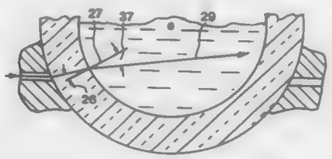
7. A fail-safe system for a throttle valve of an internal combustion engine, said system comprising:
at least two switches each having ON and OFF states;
a drive, responsive to movements of the throttle valve, for operating said at least two switches so that states of said at least two switches change between ON and OFF at respective different positions of the throttle valve;
the setting of the states of said at least two switches being such that said switches cannot be made OFF simultaneously, over the entire range of the movement of the throttle vale;
voltage generators separately connected to said at least two switches for generating voltage signals having a level which is one of High and Low in accordance with the state of each respective at least two switches;
a connector connecting the voltage generators with said at least two switches, and;
means for detecting a malfunction by determining whether voltage levels at all of the voltage generators correspond to a level obtained when both switches are OFF.

4,989,452

LIQUID-LEVEL DETECTOR

Donald A. Toon, Burlington, and Douglas J. Belshaw, Georgetown, both of Canada, assignors to Solinst Canada Ltd., Glen Williams, Canada

Filed Jun. 23, 1989, Ser. No. 370,821
Int. Cl.[5] G01F *23/02;* **G01N** *21/41*
U.S. Cl. 73—293 **7 Claims**



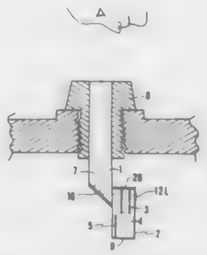
1. Apparatus, which is suitable for lowering into a body of a test liquid and for detecting and signalling the presence of the test liquid, wherein:
the apparatus includes a light emitting station, which is capable of emitting a beam of light, a light receiving station, a housing, and a tube;
the tube is made of a solid transparent material, and is cylindrical, having an outer cylindrical surface and an inner cylindrical surface;
the inner cylindrical surface defines a hollow internal chamber of the apparatus;
the light emitting station, the light receiving station, and the tube, are mounted in a housing, in such a manner that the stations and the tube are mechanically secured against movement relative to the housing and against movement relative to each other;
the stations lie outside the tube and lie on a chord of the tube, said chord being not a diameter of the tube;
the arrangement of the stations in the housing is such that, when the chamber is empty of the test liquid, light from the light emitting station passes in sequence along a light path which intersects the outer cylindrical surface, passes through the transparent material, intersects the inner cylindrical surface at a point of refraction, passes across the hollow chamber, intersects the inner cylindrical surface, passes back through the transparent material, intersects the outer cylindrical surface, and passes into the light receiving station;
the arrangement of the stations in the housing is such that, when the apparatus has been lowered to a sufficient depth into the body of test liquid that the liquid is present in the chamber and is in contact with the inner cylindrical surface at the point of refraction, the said beam is diverted by refraction at the point of refraction, and does not pass into the light receiving station;
the apparatus includes a means for detecting and signalling whether or not the beam of light is passing into the light receiving station;
the chamber includes a port for admitting the test liquid into the chamber when the apparatus is lowered into the liquid;
the apparatus includes a sealing means, which is so arranged that, when the apparatus is lowered into the test liquid, the sealing means is effective to prevent access by the liquid to both points on the outer cylindrical surface at which the said light path intersects the outer cylindrical surface.

4,989,453

BATTERY CONDITION INDICATOR

Alan Hilesalu, 322 N. Lima St., Burbank, Calif. 91505

Filed Nov. 6, 1989, Ser. No. 435,602
Int. Cl.[5] G01N *9/10*
U.S. Cl. 73—440 **4 Claims**



1. An indicator for the continuous monitoring of electrolytic density in a storage battery from a point external to the battery comprised of:
a. light transmitting means extending from the top of the battery to below the level of the electrolyte normally maintained in the battery, said light transmitting means being provided with a reflector at its lower end to permit an orthogonal view under and parallel to the surface of said electrolyte;
b. a transparent slide container attached to a lower vertical surface of the light transmitting means in a position to be viewable through said reflector and having inlet and outlet holes to permit free entry and exit of battery electrolyte and the venting of gases;
c. a number of vertically oriented, partially-hollow slides of varying weights and arranged in succession according to decreasing density and provided with restraints to move vertically when subjected to flotation forces by the battery electrolyte;
d. captions affixed to each slide and a vertical surface of said slide container;
whereby, when the indicator is installed in a storage battery

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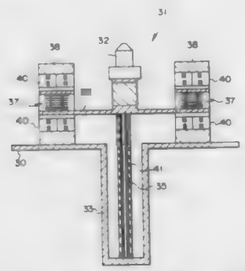
so that the slide container and its contents are immersed in the electrolyte, the number of slides which float is an indication of the electrolyte density and the battery charge, the absence of slide flotation is indicative of low electrolyte level and the condition of the battery can be judged by the caption seen at the end of the light transmitting means.

4,989,454

SCANNING APPARATUS FOR A SCANNING MICROSCOPE

Mitsugu Sakai, Hachioji; Koichi Karaki, Hino, and Yasuo Sasaki, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 365,149, Jun. 12, 1989, abandoned.
This application Aug. 9, 1990, Ser. No. 564,655
Claims priority, application Japan, Jun. 20, 1988, 63-81776; May 2, 1989, 1-52271
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—633 **8 Claims**



1. A scanning apparatus for ultrasonic scanning used in an ultrasonic scanning microscope having an observation means for acoustically observing a sample, said observation means including an acoustic lens projecting an ultrasonic beam onto said sample and receiving an acoustic wave distributed by said sample, wherein said sample is scanned in order to obtain an image of said sample, said scanning apparatus comprising:

a moving means for moving at least either said sample or said observation means in order to scan said sample, said moving means including a spring element which elastically supports at least one of said sample and said observation means; and

a vibration attenuating means, structurally provided for said moving means, for attenuating relative vibration in a moving direction of said moving means between said sample and said observation means, said vibration attenuating means provided separately from said spring element.

4,989,455

VIBRATOR

Yasutaka Gomyo; Akira Ito; Toshiyuki Ishisaka; Tetsurou Miwa; Satoshi Hosokawa, all of Toyama; Toshio Fujimori, Tokyo; Hiroshi Ando, Tokyo; Seiichi Akizuki, Tokyo, and Katsutoshi Yamaguchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan and Nissan Motor Sales Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,284
Claims priority, application Japan, May 24, 1988, 1-59177[U]; Jul. 23, 1988, 63-97485[U]; Aug. 2, 1988, 63-102474[U]; Sep. 29, 1988, 63-126365[U
Int. Cl.[5] G01M *5/00*
U.S. Cl. 73—669 **25 Claims**

1. A vibrator, comprising:

an plunger for bearing an object to be vibrated at an upper portion of said plunger;

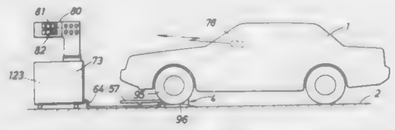
a vibration applying cylinder for vibrating said plunger at a desired amplitude and frequency having said plunger movably mounted therein;

an oil chamber defined by said plunger and said vibration applying cylinder for pressurizing said plunger such that said plunger is capable of reciprocatory motion in said vibration applying cylinder;

an electromagnetic valve means for supplying hydraulic fluid to said plunger to reciprocate said plunger, said electromagnetic valve means being controlled so as to reciprocate said plunger at a desired frequency and amplitude;

hydraulic fluid passages communicating said electromagnetic valve means with said oil chamber;

a hydraulic power unit;



a hydraulic circuit means fluidly connecting said hydraulic power unit and said electromagnetic valve means;

a control unit means for actuating said hydraulic power unit to supply hydraulic fluid to said electromagnetic valve means through said hydraulic circuit and actuate and control said electromagnetic valve means to reciprocate said plunger at a desired frequency and amplitude in response to a control signal;

a controller for outputting a control signal to said control unit means, said control signal setting the desired frequency and amplitude of said plunger; and

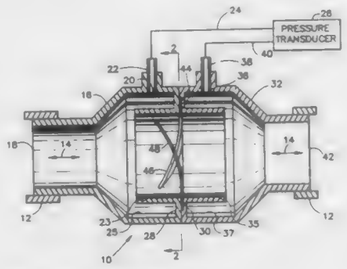
lifting means for lifting said vibration applying cylinder to a predetermined height.

4,989,456

VARIABLE AREA OBSTRUCTION GAS FLOW METER

Josef Stupecky, Irvine, Calif., assignor to Bicore Monitoring Systems, Irvine, Calif.

Filed Nov. 6, 1989, Ser. No. 432,041
Int. Cl.[5] G01F *1/24, 1/40*
U.S. Cl. 73—863.53 **47 Claims**



1. A flow meter comprising:

a conduit for communicating fluids therethrough and having a first port positioned at a first location in said conduit and a second port positioned at a second location in said conduit, wherein said first and second ports are adapted for connection to a transducer; and

an obstruction secured within the conduit between the first location and the second location, said obstruction comprising:

first and second independently flexible leaves which are each secured along a portion of their body adjacent to an inner conduit surface and which each extend in parallel configuration to a free end within the conduit;

a third independently flexible leaf which is secured along a portion of its body adjacent to an inner conduit surface and extends within the conduit in a direction opposite to said first direction so as to lie between the first and second leaves and in parallel configuration with them;

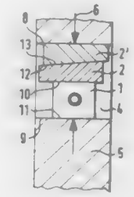
wherein the first, second and third leaves extend initially in a plane transverse to the flow of fluid in said conduit, each of said leaves being compliant to said fluid flow and deflected in response to one parameter of said fluid flow so that said obstruction to said fluid flow varies in response to said one parameter.

4,989,457

DEFLECTION MEASURING ROLLER

Bernd Berger, Kaarst; Gert Mucke, Hilden; Eberhart Neuschutz, Ratingen, and Helmut Thies, Kaarst, all of Fed. Rep. of Germany, assignors to Betriebsforschungsinstitut VDEh Institut fur angewandte Forschung, GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 14, 1989, Ser. No. 407,050
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1988, 3831331
Int. Cl.[5] G01L *5/04*
U.S. Cl. 73—862.07 **8 Claims**



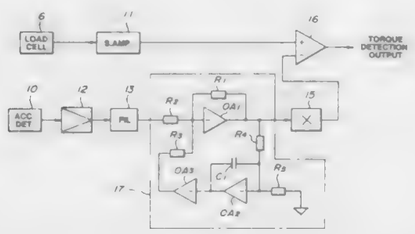
1. A deflection measuring roller, comprising: mutually non-rotatable rings having force sensors for determining the stress distribution of flexible strips, in which inner receiving chambers are provided for the rings, non-positively held force sensors being acted upon in these receiving chambers via the ring surface associated therewith wherein the receiving chamber of each ring is constructed as a window formed in the material of the wall of the ring, receiving surfaces which oppose one another in the impact direction of the force sensor are located in this window, and wedge means of self-locking inclination bears against at least one of these receiving surfaces and holds the force sensor in a clamped position.

4,989,458

APPARATUS FOR DETECTING TORQUE FOR OSCILLATION-TYPE ELECTRIC DYNAMOMETER

Yorikatsu Suzuki, Kanagawa, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,445
Int. Cl.[5] G01L *3/16, 3/22*
U.S. Cl. 73—862.09 **5 Claims**



5. A method for detecting torque of an oscillation-type electric dynamometer having a torque arm extending from the dynamometer and a load cell linked to the torque arm comprising:

(a) detecting a force received from the torque arm of the dynamometer and outputting the detected force representative signal;

(b) detecting the vibration of the torque arm in the direction in which the torque arm applies force to the load cell;

(c) eliminating a DC signal component from the detected vibration of the torque arm;

(d) setting a coefficient related to the vibration of the torque arm derived after eliminating the signal component; and

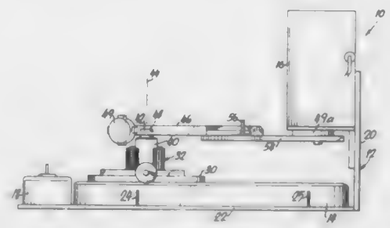
(e) adding the detected force signal and the coefficient setting signal to provide a detection signal of a torque derived from the dynamometer.

4,989,459

TORQUE TESTING APPARATUS

Nicholas J. Faber, Jr., Raleigh, N.C., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Dec. 11, 1989, Ser. No. 448,476
Int. Cl.[5] G01L *5/00*
U.S. Cl. 73—862.23 **7 Claims**



1. A torque testing apparatus for determining the amount of torque required to axially move a first part of an object relative to a second part thereof, comprising:

a torque meter;

mounting means operatively associated with said torque meter for holding said first part of said object;

a first elongated lever arm adapted to be secured at one end thereof to said second part of said object, said first lever arm and said second part both rotatable in a first rotational direction about a common first axis;

a second elongated lever arm adapted to be moved relative to said first lever arm, said second lever arm oriented in a plane parallel to that of said first lever arm and rotatable in a second rotational direction about a second axis which is parallel to said first axis;

motor means operatively connected to one end of said second lever arm to rotate same in said second direction about said second axis;

an abutment means interposed between the free ends of said first and second lever arms, said abutment means being fixedly secured to one of said free ends and adapted to contiguously slide along the other of said free ends as said second lever arm is rotated in said second direction; and

means to operate said motor means.

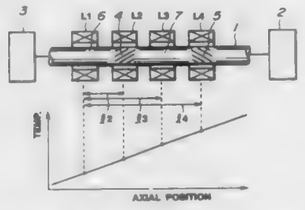
VOL 1123 ISS 1 FEB 5 1991 UMI

4,989,460

MAGNETOSTRICTION TYPE TORQUE SENSOR WITH TEMPERATURE DEPENDENT ERROR COMPENSATION

Masashi Mizuno; Katsuhiro Kojima; Yoji Ozawa; Takanobu Saito, all of Aichi; Munekatsu Shimada, Kanagawa; Masaaki Katsumata, Kanagawa, and Hiroyuki Aoki, Kanagawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Daidotokushuko Kabushikigaisha, Nagoya, both of, Japan

Filed Dec. 23, 1988, Ser. No. 288,824
Claims priority, application Japan, Dec. 26, 1987, 62-331263
Int. Cl.[5] G01L *3/10*
U.S. Cl. 73—862.36 19 Claims



1. A magnetostriction type torque sensor for monitoring rotational torque applied to a rotating object comprising:
- at least one magnetic anisotropy section formed in said rotating object;
- a plurality of electromagnetic coils disposed in the vicinity of said rotating object, one of said electromagnetic coils opposing said magnetic anisotropy section, each of said coils establishing a magnetic loop extending through said rotating object for monitoring a magnitude of magnetostriction caused by torsional deformation caused in said rotating object due to said rotational torque, each coil producing output signals representative of a monitored magnetostriction magnitude and including a temperature gradient dependent noise component;
- means for processing said output signals of said electromagnetic coils in combination for removing said noise components contained in respective output signals of said electromagnetic coils;
- means for deriving a value of said rotational torque applied to said rotating object on the basis of said output signals from which said noise components have been removed and producing a rotational torque indicative signal.

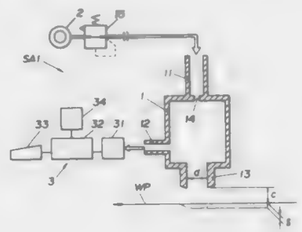
4,989,461

WEB TENSION METER AND WEB TENSION CONTROLLER

Nobuhiko Nishiwaki; Sankei Hori, and Noriyuki Shiba, all of Tokyo, Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,752
Claims priority, application Japan, Jun. 21, 1988, 63-151156
Int. Cl.[5] G01L *5/08*
U.S. Cl. 73—862.45 2 Claims

1. A web tension meter comprising a first hollow body provided at an upstream portion thereof with an inlet port to which a fluid supply source is connected, at a downstream end portion thereof with an ejection port an outer end surface of which is opposed to one surface of an object material with a clearance of a predetermined width left therebetween, and at an intermediate portion thereof between said inlet port and said ejection port with an internal pressure measuring port, a web tension measuring unit provided with at least a pressure measuring means joined to said internal pressure measuring port, a second hollow body provided at an upstream portion thereof with an upstream port to which a second fluid supply source is connected, and at a downstream portion thereof with discharge ports opposed to said ejection port of said first hollow body and to another surface of said object material with a predetermined width left therebetween, and means for controlling a pressure of said first and second fluid supply sources so that said web is not deflected due to fluid ejected from said ejection port of said first hollow body.

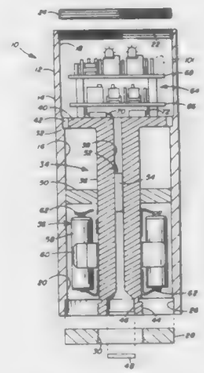


4,989,462

IMPACT SENSOR

Michael W. Davis, Prospect; Leonard J. Weiland, Butler, and Mark F. Zanella, Zelienople, all of Pa., assignors to AGR International, Inc., Butler, Pa.

Filed Jun. 30, 1989, Ser. No. 373,570
Int. Cl.[5] G01L *5/00*; G01P *15/04*
U.S. Cl. 73—862.53 20 Claims



8. A method for detecting the magnitude of an impact force applied to a moving container comprising the steps of,
- positioning a sensor within a movable container at the center of gravity of the container for detecting an impact force applied externally to the container during movement of the container,
- converting the impact force detected by the sensor to an electrical output signal having a value proportional to the magnitude of the impact force and representative of the direction of the impact force applied to the container, and
- processing the electrical output signal to obtain an indication of the magnitude of the force applied to the container.

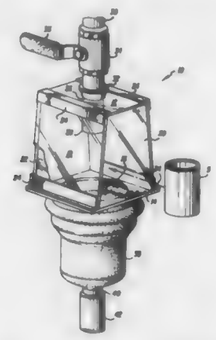
4,989,463

SAMPLE COLLECTION SHIELD

Karen A. Cimaglia, Henderson, and Jill M. Griffin, Las Vegas, both of Nev., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Mar. 2, 1990, Ser. No. 487,106
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.86 17 Claims

1. A sample shield for use in taking a fluid sample from a sampling line having a valve and a discharge outlet, said shield comprising:
- a shield enclosure into which the discharge outlet of the sampling line is inserted, said enclosure having a plurality of panels in fixed, immovable positions relative to one another, at least one of said panels being transparent to permit visual observation of the sample taking procedure;



means providing one open side of said enclosure for freely accessing the discharge outlet of the sampling line during the taking of a sample such that a fluid sample can be taken from the discharge outlet and removed from the enclosure without moving any of said panels of the enclosure.

4,989,464

METHOD AND APPARATUS FOR DETERMINING PARTICLE SIZE DISTRIBUTION

Paul C. Cirignano, Braintree, Mass., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 384,942, Jul. 25, 1989, Pat. No. 4,957,010.
This application May 7, 1990, Ser. No. 520,331
Int. Cl.[5] G01N *15/02*
U.S. Cl. 73—865.5 7 Claims



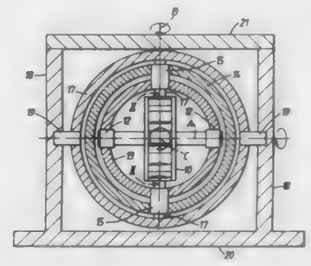
1. A method of determining the particle size distribution of lightweight polymer material, said method comprising the steps of:
- a. introducing the material into a chamber communicating with chamber gas supply means;
- b. creating a downward draft in said chamber from said chamber gas supply means while supplying to a flexible tube disposed in said chamber gas from material agitation gas supply means so as to cause said tube to move randomly in said chamber and agitate said material, to direct said material through size segregating means in communication with said chamber; and
- c. determining the amount of material remaining on said size segregating means.

4,989,465

APPARATUS AND METHODS FOR PRODUCING MOTIVE POWER

Michael S. Russell, Slough, England, assignor to Kidde-Graviner Limited, Derby, England

Filed Jul. 27, 1989, Ser. No. 386,282
Claims priority, application United Kingdom, Aug. 9, 1988, [illegible]
Int. Cl.[5] G01C *19/12*
U.S. Cl. 74—5.7 15 Claims



1. Motive power generating apparatus, comprising:
- a pyrotechnic gas-generating substance in the form of an azide composition comprising a mixture of at least one of the alkaline metal and alkaline earth metal azides combined with an oxidising agent,
- activating means for igniting the composition,
- filtering means for filtering the generated gas,
- means responsive to the filtered gas for producing a jet of the gas acting in a predetermined direction, and
- mechanically movable means positioned to react movably to the jet of gas and to acquire and retain kinetic energy therefrom.

4,989,466

GYROSCOPICALLY STABILIZED SENSOR POSITIONING SYSTEM

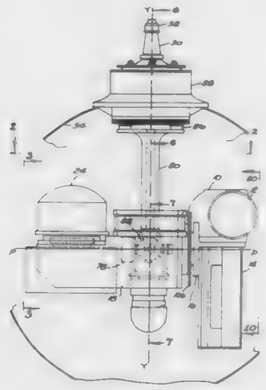
Ronald C. Goodman, 12302 Montana Ave., #303, Los Angeles, Calif. 90049

Filed Aug. 2, 1989, Ser. No. 388,660
Int. Cl.[5] G01C *19/16*; G03B *5/00*
U.S. Cl. 74—5.22 28 Claims

1. A gyroscopically stabilized system for pointing a sensor comprising:
- a support;
- a universal joint coupled to said support and having rotational freedom about first and second perpendicular axes;
- a platform for mounting said sensor;
- bearing means for coupling said platform to said universal joint so that said platform is rotatable about a third axis perpendicular to both of aid first and second axes;
- first and second torque motor means coupled to said universal joint for applying torquing moments about said first and second axes respectively;
- third torque motor means coupled to said bearing means for applying a torquing moment about said third axis;
- a gyrostabilizer assembly coupled to said platform and including at least three orthogonally oriented gyroscopes, each of said gyroscopes having means for sensing a precession angle thereof and generating an output signal proportional thereto;
- servo control means for receiving said output signals of said precession angle sensing means, developing torque com-

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mand signals therefrom and applying said torque command signals to said first, second and third torque motor means so as to maintain said platform n a space stabilized orientation;



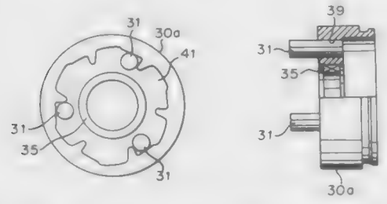
wherein the center of gravity of said system is coincident with the intersection of said first, second and third axes.

4,989,467

COAXIAL TYPE STARTER DEVICE

Akira Morishita; Kazuhiro Odahara, and Shuzoo Isozumi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1989, Ser. No. 425,526
Claims priority, application Japan, Nov. 26, 1988, 63-154019
Int. Cl.[5] F02N *11/00*
U.S. Cl. 74—6 3 Claims



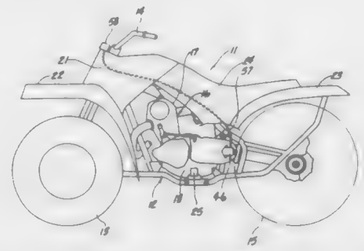
1. A coaxial type starter device, comprising: a motor having a tubular armature rotary shaft, a rotary output shaft partially inserted in one end of the tubular armature shaft, the rotary output shaft having a pinion adapted to be engaged with a ring gear of an engine, a driving force transmitting unit disposed at one axial end of the motor for operatively coupling the armature rotary shaft and the rotary output shaft, said unit comprising a roller type overrunning clutch and a planet gear wheel type speed reducing mechanism for reducing a revolutional speed of the armature rotary shaft, and an electromagnetic switch disposed at the other axial end of the motor for causing the pinion of the rotary output shaft to engage with or to disengage from the ring gear of the engine, wherein the number of rollers (30*b*) in the overrunning clutch is the same as or an integral multiple of the number of planet gear wheels (10*b*) in the planet gear wheel type speed reducing mechanism; a plurality of through holes (39) corresponding in number to pins (31) for supporting the planet gear wheels being formed in an outer member of the overrunning clutch to be fitted with the pins, and the clutch outer member being supported at an end portion of the armature rotary shaft by a bearing (35).

4,989,468

SPEED DETECTING STRUCTURE FOR VEHICLES

Toshiharu Kumazawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 12, 1985, Ser. No. 754,526
Claims priority, application Japan, Jul. 13, 1984, 59-144340
Int. Cl.[5] F16H *37/00*
U.S. Cl. 74—12 11 Claims



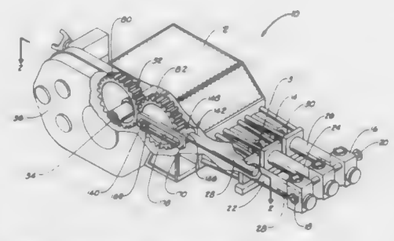
1. In a speed indicator for a transmission having a casing, said casing containing a primary transmission having a primary shaft and a secondary shaft and a plurality of change speed gears for coupling said shafts at different speed ratios and an auxiliary transmission having an input shaft consisting of said primary transmission secondary shaft and an output shaft rotatably journaled by said casing, means at one end of said output shaft of said auxiliary transmission for driving a vehicle, the improvement comprising said output shaft having an end portion at the other end thereof extending through said casing, speed detecting means driven by said output shaft end portion, and a cover affixed to said casing and containing said speed detecting means.

4,989,469

ECCENTRIC GEAR PUMP AND DRIVE MECHANISM THEREFOR

David Eslinger, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 24, 1989, Ser. No. 398,357
Int. Cl.[5] F16H *21/18, 57/04*
U.S. Cl. 74—25 21 Claims



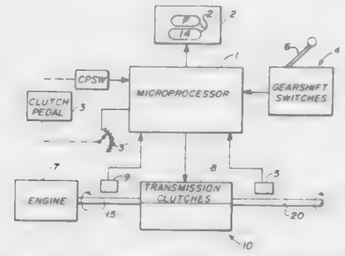
1. A drive mechanism comprising:
a first gear;
a first shaft engaged eccentrically with said first gear;
a second gear meshingly engaged with said first gear;
a second shaft engaged eccentrically with said second gear;
a cam track positioned adjacent to said second gear; and
a cam on said second shaft and in guided engagement with said cam track.

4,989,470

METHOD OF DECELERATING A POWER SHIFT TRANSMISSION

Garth H. Bulgrien, Ephrata, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 444,312, Dec. 1, 1989. This application May 10, 1990, Ser. No. 521,629
Int. Cl.[5] B60K *20/10, 41/18*
U.S. Cl. 74—335 14 Claims



1. A method of controlling vehicle deceleration during shuttle shifting of a transmission having an initial clutch set for selectively connecting an engine driven input drive shaft in driving relationship with a first plurality of shafts, a final clutch set for selectively connecting a second plurality of shafts in driving relationship with an output shaft for driving the vehicle, and an intermediate clutch set for selectively connecting the first plurality of shafts in driving relationship with said second plurality of shafts, first gears on said first plurality of shafts for driving all of said first plurality of shafts at the same speed when any clutch of said initial clutch set is energized, and second gears on said first plurality of shafts for driving said second plurality of shafts at different speeds relative to the speeds of said first plurality of shafts when any one clutch of said set of intermediate clutches is energized, said method comprising:
releasing all clutches in said initial set of clutches to disconnect the transmission from the engine;
energizing at least two clutches in said intermediate set of clutches to lock the transmission;
energizing at least one of the clutches in the final set of clutches;
sensing the vehicle speed, and,
when the vehicle speed approaches zero, selectively energizing one clutch in each of said clutch sets to select the speed at which the output shaft will be driven.

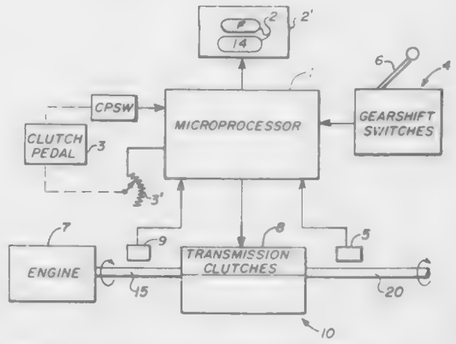
4,989,471

METHOD OF CALIBRATING CLUTCHES IN TRANSMISSIONS

Garth H. Bulgrien, Ephrata, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 444,312, Dec. 1, 1989. This application May 10, 1990, Ser. No. 521,808
Int. Cl.[5] F16H *5/46*
U.S. Cl. 74—336 R 10 Claims

1. A method of calibrating clutches in a transmission operably connected to an engine and having said clutches for selectively interconnecting an input drive shaft, an output drive shaft, and a plurality of gears rotatably housed in said transmission in driving relationship with said input and output drive shafts such that a selective engagement of said clutches will effect a varying of the speed of operation of said output shaft for a given speed of operation of said input shaft, said transmission further having an electrical control system including a microprocessor responsive to switches actuated by manual movement of a gearshift lever between a plurality of positions for controlling said clutches in the transmission, said clutches being operably connected to a hydraulic system for effecting the actuation of each respective said clutch by an increase in hydraulic pressure for each said clutch as controlled through operation of said microprocessor, the method comprising:
restraining said output shaft from rotation;
determining a reference engine speed;
applying an increment of hydraulic pressure to a selected one of said clutches;
after said applying step, sensing the current speed of operation of said engine;



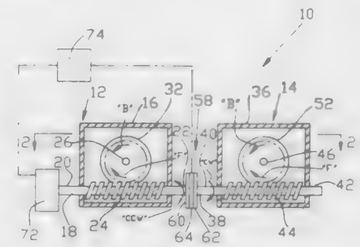
after said sensing step, comparing said current engine speed to said reference engine speed;
repeating said applying, sensing, and comparing steps until said current engine speed is less than said reference engine speed, thereby indicating that said engine is being loaded; and
storing in said microprocessor a value corresponding to the hydraulic pressure required to start loading of said engine.

4,989,472

REVERSIBLE ANTI-BACKLASH POWER TRANSMISSION

James R. James, Sr., Clarksville, and John K. Schleicher, Bordon, both of Ind., assignors to Accuratio Systems, Inc., Jeffersonville, Ind.

Filed Jan. 12, 1989, Ser. No. 296,196
Int. Cl.[5] F16H *55/18*
U.S. Cl. 74—409 13 Claims



1. An anti-backlash, selectively reversible power transmission comprising:
(a) a first gear box for transmitting power in one direction, comprising:
a first drive shaft;
first gear means associated with the first drive shaft for rotation therewith;
a first driven shaft;
second gear means associated with the first driven shaft for rotation therewith in meshing engagement with the first gear means of the first drive shaft; and,

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first driven gear means associated with the first driven shaft for rotation therewith;

(b) a second gear box for transmitting power in the opposite direction comprising:

a second drive shaft;

third gear means associated with the second drive shaft for rotation therewith;

a second driven shaft;

fourth gear means associated with the second driven shaft for rotation therewith in meshing engagement with the third gear means of the second driven shaft; and

second driven gear means associated with the second driven shaft for rotation therewith;

(c) final drive gear means in meshing engagement with the first driven gear means of the first gear box to the driven thereby in one direction, and in meshing engagement with the second driven gear means of the second gear box to be driven thereby in the opposite direction; and,

(d) electro-magnetic friction coupler means for selectively coupling and uncoupling the first drive shaft of the first gear box and the second drive shaft of the second gear box.

4,989,473

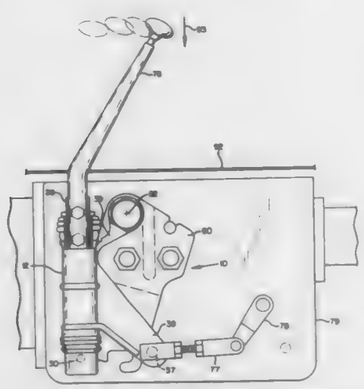
SHIFT ASSEMBLY FOR SHIFTING BETWEEN DRIVE POSITIONS IN A FOUR-WHEEL DRIVE VEHICLE

Michael L. McMorris, Milwaukie, Oreg., assignor to Warn Industries, Inc., Milwaukie, Oreg.

Filed Oct. 10, 1989, Ser. No. 418,534

Int. Cl.[5] G05G *9/10, 5/02*; B60K *17/344*

U.S. Cl. 74—475 **5 Claims**



1. A manually actuated shift assembly for shifting the gears in a transfer case of a four-wheel vehicle, said gears being shiftable to effect various vehicle drive positions as between two-wheel drive, four-wheel drive conventional, four-wheel drive low range and neutral, and an exposed shift member associated with said gears and movable between positions for selecting the various vehicle drive positions, said shift assembly comprising;

a configured base plate rigidly mounted relative to the transfer case, a support member pivotally mounted to the base plate and a shift rod mounted to the support member and axially slidable relative to the support member, biasing means biasing the shift rod to an upper axial position and manual control means for manually depressing the rod to a lower axial position, and a locating pin protruded form said shift rod,

said configured base plate having a configured bottom edge including a pair of upwardly directed cut out portions separated by a depending landing portion and said cut out portions bracketed by depending stop portions, said locating pin selectively protruded from said shift rod into the cut out portions and being manually shiftable through a combination of movements including depression of the shift rod against the biasing means and pivoting the rod and support member relative to the base plate, said landing portion between the cut out portions including a depression wherein the locating pin is seated by the biasing means upon moving the shift rod to a position between the cut out portions.

4,989,474

CONTROL PEDAL APPARATUS FOR A MOTOR VEHICLE

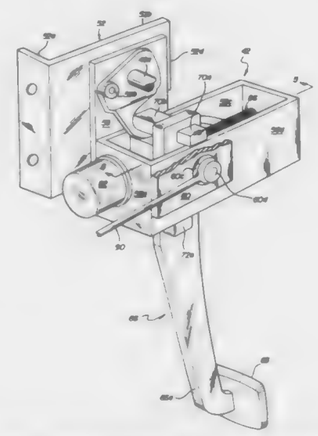
Edmond B. Cicotte, Utica, and Gabriel M. Sitrin, West Bloomfield, both of Mich., assignors to Brecom Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 188,122, Apr. 25, 1988, Pat. No. 4,875,385, which is a continuation of Ser. No. 897,197, Aug. 18, 1986, abandoned. This application May 1, 1989, Ser. No. 345,784

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—512 **21 Claims**



1. A control pedal apparatus for a motor vehicle comprising:

a pedal assembly including an adjustor member and an elongated pedal arm;

means mounting said pedal arm on said adjustor member for adjustable movement on said adjustor member;

pivot means mounting the upper end of said pedal assembly for pivotal movement on a mounting bracket structure about a pivot axis;

a pedal pad mounted on the lower end of said pedal arm;

attachment means on said adjustor member defining an attachment point for attachment of a control member for operation of a control system of the vehicle in response to pivotal movement of said pedal assembly upon the application of operator pressure through said pedal pad; and

pedal adjustor means operative to selectively adjust the position of said pedal arm on said adjustor member and thereby adjust the position of said pedal pad relative to the mounting bracket and operative during such adjustment to selectively vary both the distance from said pivot axis to said pedal pad and the distance from said pivot axis to said attachment point.

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GOVERNOR ARRANGEMENT IN AUTOMATIC TRANSMISSION

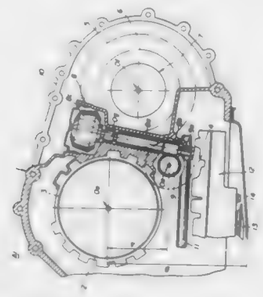
Osamu Furuya, Isehara, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 21, 1988, Ser. No. 287,296

Claims priority, application Japan, Dec. 24, 1987, 62-327887

Int. Cl.[5] F16H *57/02*

U.S. Cl. 74—606 R **7 Claims**



1. An automatic transmission comprising:

a transmission case;

a power train disposed within said transmission case and including a main power train, output gear, idler gear, final drive gear and differential gear;

said output gear, idler gear and final drive gear all having center axes arranged so that the center axis of said output gear, center axis of said idler gear and center axis of said final drive gear are parallel to each other;

an idler shaft provided with said idler gear; and

a governor disposed within said transmission case and operatively connected to said idler shaft for receiving rotary motion therefrom;

said governor having a governor shaft and being arranged so that a center axis of said governor shaft is offset from and disposed between said center axes of said idler gear and said final drive gear.

4,989,476

TORQUE TRANSMITTING DEVICE

Kazuhiko Shimada; Katsuhiko Masuda; Tetsurou Hamada; Kunitaka Furuya, and Kazunori Shibuya, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 136,405

Claims priority, application Japan, Dec. 24, 1986, 61-313806

Int. Cl.[5] F16H *35/04*

U.S. Cl. 74—650 **21 Claims**

1. A torque transmitting device comprising:

a casing having a cylindrical barrel with a plurality of teeth defined at inner peripheral surface thereof and closed opposite ends;

shafts rotatably supported in said casing in concentric relation to said cylindrical barrel;

a fluid chamber defined by an inner peripheral surface of said casing and outer peripheral surfaces of said shafts;

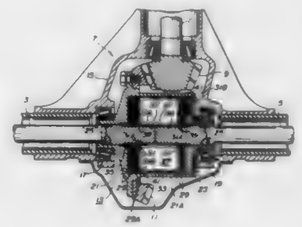
a plurality of annular outer plates disposed in said fluid chamber and rotatable with said casing, said outer plates having a plurality of teeth in mesh with said teeth defined at the cylindrical barrel;

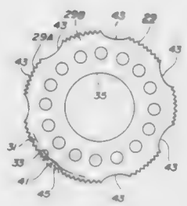
a plurality of annular inner plates disposed in said fluid chamber alternately with said outer plates and rotatable with said shafts;

a fluid having high viscosity and filled and sealed in said fluid chamber;

whereby torque can be transmitted between said casing and said shaft through the viscosity of the fluid present between said outer plates and said inner plates; and

flow passages defined in said fluid chamber and extending axially of said shaft from one end to the other end of said fluid chamber irrespective of the relative rotation of said





outer plates and inner plates for allowing the fluid to flow for circulation or convection in said fluid chamber, said flow passages being defined between said inner peripheral surface of the casing barrel and outer peripheries of said outer plates and each of said flow passages being formed over a plurality of teeth defined at said casing barrel.

4,989,477

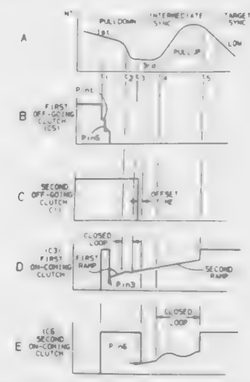
DOUBLE TRANSITION CLOSED THROTTLE DOWNSHIFT CONTROL IN AN AUTOMATIC TRANSMISSIONS

Joseph H. Hunter, and Kenneth B. Harmon, both of Carmel, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1990, Ser. No. 463,719

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **6 Claims**



1. In a vehicular automatic transmission having an input and an output, a turbine connected to the input to couple driving torque thereto, in which a downshift from a first transmission speed ratio to a second speed ratio is carried out through

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concurrent disengagement of first and second off-going fluid pressure operated torque transmitting devices associated with the first of such speed ratios and engagement of first and second on-coming fluid pressure operated torque transmitting devices associated with the second of such speed ratios, wherein the engagement of the second off-going torque transmitting device and the first on-coming torque transmitting device effects a third speed ratio lower than the second speed ratio, and further having turbine and output speed sensing means, the method of controlling the torque transmitting devices to effect closed throttle downshifting from the first speed ratio to the second speed ratio comprising the steps of:

effecting a shift to the third speed ratio by releasing the first off-going torque transmitting device and gradually engaging the first on-coming torque transmitting device while the second off-going torque transmitting device is still engaged, so that the turbine speed gradually decreases relative to the output speed,

determining from the turbine speed, the output speed and the third speed ratio when the relative speeds attain a third ratio synchronism, and

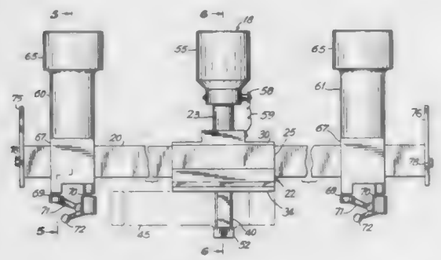
effecting the second ratio by releasing the second off-going torque transmitting device, gradually engaging the second on-coming torque transmitting device and gradually completing the engagement of the first on-coming torque transmitting device.

4,989,478

TURNING APPARATUS

Arvind Trivedi, 3 Whitehall Way, Englishtown, N.J. 07726, and Tadeusz Stachowiak, 48-B Juniper Plz., Cranbury, N.J. 08512

Filed Jun. 30, 1989, Ser. No. 374,154
Int. Cl.[5] B25B *13/00*
U.S. Cl. 81—57.36 **9 Claims**



1. Apparatus for turning a plurality of adjacent rotatable elements carried by a supporting structure, the apparatus comprising, in combination:

an elongated beam extending in a direction transverse to the axis of rotation of a selected rotatable element to be turned;

means including a drive member mounted on the beam in position to engage said selected rotatable element;

post means including at least one reaction member slidably supported for movement along the beam to and from a location intermediate the ends of the beam, and for movement into engagement with an additional rotatable element; and

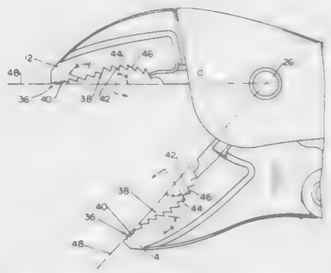
means for rotating said drive member in a given direction to thereby turn said selected rotatable element, said beam and said reaction member applying force to said additional rotatable element in the opposite direction during the turning of said selected rotatable element to prevent any significant movement of said additional element and said supporting structure.

4,989,479

PLIER JAWS

Alan D. Anderson, and Roland C. White, both of Sumter, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 2, 1989, Ser. No. 430,881
Int. Cl.[5] B25B *7/02*
U.S. Cl. 81—424.5 **2 Claims**



1. In a locking plier comprising a pair of opposed pivotable work-gripping jaws, a handle, and camming means for camming the jaws to a locked condition on a workpiece, said jaws comprising a straight tip portion on each jaw, facing curved portions on each jaw between the tip and the pivot, and transverse work-gripping teeth in the curved portion of each jaw, a line from the pivot to the point of contact of the tips of the jaws when the jaws are closed forming a primary form centerline, and each tooth having opposing faces, the improvement in which

the faces of the teeth in the curved portion of one jaw which face toward the handle comprise front faces which are at substantially the same angle of from about 75° to about 85° to the primary form centerline,

the faces of the teeth in the curved portion of the other jaw which face away from the handle comprise front faces which are at substantially the same angle to the primary form centerline as the aforesaid front faces, and

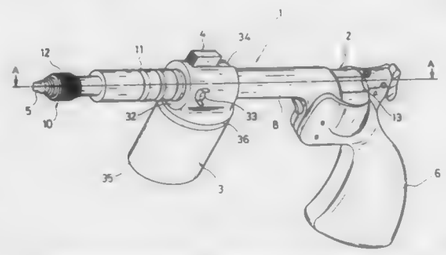
the opposite faces of the teeth are all at substantially the same angle of from about 45° to about 90° to the front face.

4,989,480

SCREW DRIVER OF REPLACER FOR THE DRIVING HEAD

Ming-Tang Chen, No. 23-4, Alley 21, Lane 205, Yong Xing Road, Taichung, Taiwan

Filed Aug. 15, 1989, Ser. No. 393,731
Int. Cl.[5] B25B *23/00*
U.S. Cl. 81—439 **3 Claims**



1. A screw driver having a replaceable driving head, which comprises:

a driving rod, which has a clamper to clamp said driving head at its front end and which has a pistol-like handle in a rear part, wherein a U-shaped nest is cut out of said handle rear part in cross direction to accommodate a wheel which contains driving heads of different types;

a front part of the wheel connected to a rod body of said driving rod, said driving rod having a slideway provided in its center for the driving head to pass all the way to a rod body front end where it is to be clamped;

annular flutes are provided on a rod body outer face for adjustably holding an auxiliary handle;

a striking means provided behind said wheel along a central, projected line of the said slideway, which comprises a striker which is connected to a v-shaped spring and positioning pins for holding said spring to said screw driver;

a wheel having two side faces, containing different driving heads is rotatably attached to said U-shaped nest in said pistol-like handle and said wheel being turnable by an outside force, and is held in position inside said U-shaped nest by a concave connection provided on said wheel having equally distanced angle pits and holes containing driving-heads wherein during turning of the wheel, a central projected line of each of the holes containing driving heads will fall in alignment with that of the slideway of said rod body;

a fender connected to the wheel rear face, which partially fends the driving head-containing holes;

a hollow cylindrical holding body connected to a sleeve barrel, wherein said sleeve barrels connected to aforesaid rod body for positioning the screw driver during operation;

a seat on one side of said sleeve barrel for holding a light while a union base on the opposite side is connected to the holding body;

said holding body being a one-side-sealed barrel which contains spare wheel and driving heads;

a light on said seat which provides illumination to the work site;

different driving heads, which are to be contained in the aforesaid wheel;

wherein said screw driver when pointed with its clamper up, offers a choice of different driving heads by turning the wheel;

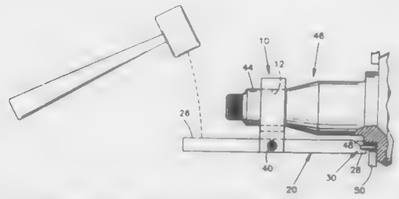
when the screw driver is pointed downward, a chosen driving head will protude from the clamper and will be ready for use when locked.

4,989,481

AXLE RING REMOVAL TOOL

Benjamin F. Grimes; David L. McLane, and Jim F. McGraw, all of Longview, Tex., assignors to Stemco Inc., Longview, Tex.

Filed Jul. 5, 1990, Ser. No. 548,698
Int. Cl.[5] B25B *27/00*
U.S. Cl. 81—488 **8 Claims**



1. An axle ring removal tool comprising:

(a) a pivot block having an aperture at least large enough to form a slip fit on a portion of an axle from which an axle ring is to be removed and at least one pivot pin opening and

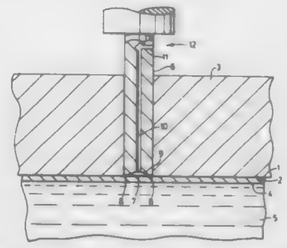
(b) a lever having at least one pivot pin opening and being pivotally connected to said pivot block by means of a pivot pin extending through at least one pivot pin opening in each of said pivot block and said lever and also having a force receiving end and a force transmitting end, said force transmitting end including a nose portion having a face adapted to contact an axle ring to be removed along a narrow band substantially parallel to the axis of said axle ring when force is applied to said force receiving end.

4,989,482

METHOD AND APPARATUS FOR PUNCHING A HOLE IN SHEET MATERIAL

Murray R. Mason, Woodstock, Canada, assignor to TI Corporate Services Limited, London, England

Filed Nov. 17, 1989, Ser. No. 437,587
Int. Cl.[5] B21D *28/28;* **B26F** *1/14*
U.S. Cl. 83—22 **12 Claims**



1. A method of punching a hole in sheet material comprising:

positioning a forward surface of said sheet material adjacent a die block face;

exposing a rearward surface of said sheet material, opposite said forward surface, to pressurized fluid;

advancing a punch housed within the die block to engage said forward surface, the punch having a forward face with a perimeter cutting edge, a space between said forward surface and the face of said punch maintained at a pressure less than the pressure of said fluid by venting means comprising a bore communicating between the punch face and a zone of pressure lower than the pressure of the fluid;

further advancing said punch through said sheet material to shear a slug from said material, said slug during and after shearing being continuously held against the face of said punch by the difference in pressure between said fluid and said space adjacent said punch face.

4,989,483

APPARATUS FOR PUTTING BAR CODES ON A THIN METAL STRIP

Joël G. Lacrouts-Cazenave, Neauphle Le Chateau, France, assignor to Lacrouts Cazenava Sarl, Les Clayes Sous Bois, France

Division of Ser. No. 205,450, Jun. 10, 1988. This application Feb. 7, 1990, Ser. No. 477,258
Claims priority, application France, Jun. 12, 1987, 87 08494
Int. Cl.[5] B26D *7/66;* **B26F** *1/04*
U.S. Cl. 83—76.9 **10 Claims**

1. An apparatus for putting a bar code on a thin strip, the bar code consisting of a plurality of parallel thin and wide bars of respective thin and wide widths and a plurality of thin and wide spaces separating the bars, the apparatus comprising:

a plurality of stations spaced apart along a transport path extending in a transport direction and each having a respective group of tools of the relatively thin width, the tools of each station being immediately juxtaposed with one another in the direction;

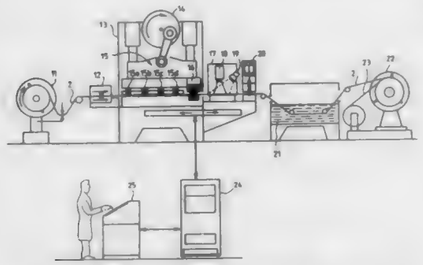
transport means for displacing the strip in the direction along the path through the stations with a stop at each station;

respective selector and actuator means at the stations for pressing only selected ones of the respective tools down into the strip thereat; and

control means connected to the selector and actuator means and to the transport means for

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(a) forming each of the thin bars by pressing into the strip a one of the tools; and
(b) forming each of the wide bars by
(b^1) pressing into the strip at an upstream one of the stations another one of the thin tools to form a respective partial wide bar,
(b^2) displacing the strip downstream to the next station,



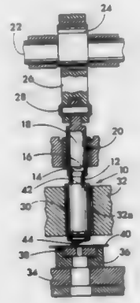
(b^3) pressing into the strip immediately adjacent the partial wide bar at the next downstream station another such thin tool having the relatively thin width to widen the partial wide bar, and
(b^4) repeating steps b2 and b3 at succeeding downstream stations until the partial wide bar is of the relatively wide width.

4,989,484

PUNCH AND STRIPPER ASSEMBLY

Gary E. Johnson; John T. Schneider, both of Ramsey, and Nils E. Sundquist, Plymouth, all of Minn., assignors to Mate Punch & Die Company, Anoka, Minn.

Filed Aug. 19, 1988, Ser. No. 233,735
Int. Cl.[5] B21D *45/08*; B26D *7/06, 7/18*
U.S. Cl. 83—140 **9 Claims**



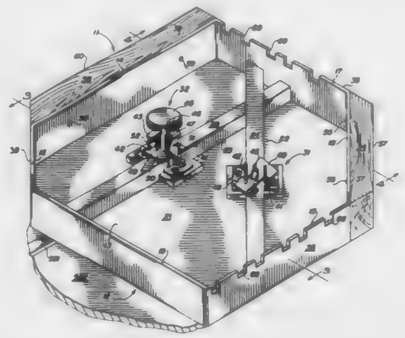
9. A punch assembly for a punch press comprising a punch sleeve, a punch slidably mounted therein, said punch having upper and lower ends, said upper end of the punch being adapted to engage a ram of the punch press, compression spring means operatively associated between the punch and the sleeve and a stripper plate removably mounted on the lower end of the punch, said stripper plate having at least one projection thereon, a stripper plate locking ring rotatably mounted on the sleeve adjacent the stripper plate including at least one member for engaging the stripper plate to hold the stripper plate in place on the punch assembly, a release pin slidably mounted in the punch assembly for engagement with the stripper plate and a locking pin connection to the release pin, a locking pin retaining slot in the locking ring, a spring for extending the release pin toward the stripper plate whereby insertion of the stripper plate will move the locking pin out of the locking pin retaining slot in the locking ring allowing the locking ring to rotate on the punch assembly to a position in which the retaining means overlaps the projection on the stripper plate and upon rotation of the locking ring to a position aligning the locking pin retaining slot with the locking pin, allowing the ejection spring to pop the punch outwardly to forcibly eject the stripper plate from the punch assembly.

4,989,485

TABLE SAW ACCESSORY

Robert W. Roy, Sr., and Robert W. Roy, Jr., both of 55 Blackstone St., Mendon, Mass. 01756

Filed Feb. 8, 1990, Ser. No. 476,854
Int. Cl.[5] B27B *25/10, 27/08*
U.S. Cl. 83—432 **20 Claims**



1. An accessory for use with a table saw having a generally horizontal surface defining at least one rectalinear groove and a circular saw blade projecting through the horizontal surface and parallel to the groove comprising;
a plate means having lower and upper surfaces, said lower surface adapted for sliding movement on the horizontal surface;
a first rectalinear rail means supported by said plate means and projecting in an active position below said lower surface and adapted to ride in the groove, and guide movement of said plate means parallel to the groove, said first rail means being further adapted for movement into an inactive position above said lower surface;
a second rectalinear rail means supported by said plate means and adapted for movement between an active position below said lower surface and an inactive position above said lower surface, said second rail means in said active position adapted to ride in the groove and guide movement of said plate means parallel to the groove, said second rail means being oriented at an angle of 45° to said first rail means;
a first fence means defining a first rectalinear guide surface oriented at an angle of 45° to said first rail means; and
a second fence means defining a second rectalinear guide surface oriented at an angle of 45° to said first rail means, and perpendicular to said second rail means.

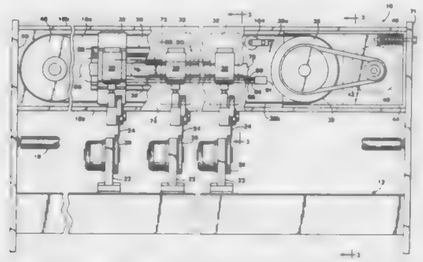
4,989,486

SYSTEM FOR AUTOMATICALLY POSITIONING MULTIPLE TOOL-HOLDING CARRIAGES

William R. Miller, Portland, Oreg., and Earl A. Sexton, Jr., Camas, Wash., assignors to Tidland Corporation, Camas, Wash.

Division of Ser. No. 202,974, Jun. 3, 1988. This application Sep. 5, 1989, Ser. No. 402,228
Int. Cl.[5] B26D *1/22, 3/12, 7/26*
U.S. Cl. 83—499 **3 Claims**

1. In a system having a plurality of tool-holding carriages movably mounted in respective positions along an elongate guide member, apparatus for variably positioning said carriages along said guide member, said apparatus comprising:
(a) drive means for selectively moving each of said carriages longitudinally along said guide member throughout a respective maximum range of movement of each carriage;
(b) respective flexible cables connected to respective ones of said carriages for conducting electrical and fluid power to each of said carriages, each cable having respective first and second portions extending in a longitudinal direction along said guide member in substantially parallel relation to each other and spaced apart from each other in a direction transverse to said longitudinal direction, the respective first portions of said respective cables being positioned in substantially parallel relationship to each other in a first transverse order, and the respective second portions of said respective cables being in substantially parallel relationship to each other in a second transverse order opposite to said first transverse order, so that the first and second portions of one cable are separated by a first transverse spacing and the first and second portions of each of the other cables are separated by different transverse spacings progressively greater than said first transverse spacing; and
(c) each of said carriages having means defining an opening in the carriage through which said first and second portions of said cables extend in said longitudinal direction.

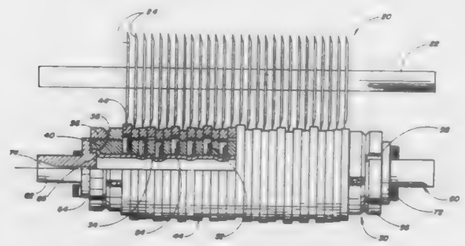


4,989,487

ANVIL ASSEMBLY FOR A SLITTING MACHINE

John P. Staley, P.O. Box 36116, Greensboro, N.C. 27416

Filed Jul. 24, 1989, Ser. No. 383,714
Int. Cl.[5] B26D *1/22*
U.S. Cl. 83—506 **22 Claims**



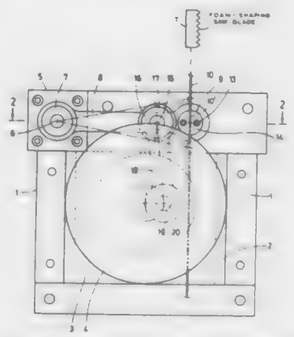
1. A resiliently supported anvil assembly for a slitting machine having a cutter assembly including a plurality of spaced apart cutting discs for cutting sheet material into strips, the anvil assembly comprising:
(a) a generally cylindrical core formed with an axially extending bore and a plurality of radial holes extending from the outer circumference of the core to the axial bore;
(b) a plurality of anvil rings disposed in spaced relationship about the core, each of the anvil rings including an outer cutting surface in rolling engagement with at least one of the cutting discs on the slitting machine and an inner bearing surface, the inside diameter of the anvil rings being greater that the outside diameter of the core;
(c) means for resiliently supporting the anvil rings in spaced relationship to the core so as to be movable radially with respect to the core; said support means including:
(1) an elastic member inserted into the axial bore of the core member;
(2) a plurality of support pins inserted into respective radial holes in the core such that the inner end thereof engages the elastic member and opposite end projects outwardly from the core to engage the inner bearing surface of the anvil rings.

4,989,488

DRIVE MECHANISM FOR AN OSCILLATING TOOL, ESPECIALLY A SAW BLADE

Rolf Pötzsch, Freudenberg, Fed. Rep. of Germany, assignor to Albrecht Bauner K.G., Spezialmaschinenfabrik, Freudenberg, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 339,171
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1988, 3812587
Int. Cl.[5] B26D *5/16*
U.S. Cl. 83—783 **5 Claims**



1. A drive mechanism for an oscillating tool, the drive mechanism comprising:
a housing;
a motor supported on said housing and having a shaft rotatable about a shaft axis and having an end;
a connecting rod having a shaft end and a rocker end;
an eccentric pin connecting said shaft end of the connecting rod with the end of said shaft, the pin having a pin axis parallel to and spaced transversely from said shaft axis, said connecting rod extending transversely to said shaft;
an elongated linear rocker lever formed with a pivoted end mounted pivotally about a fixed rocker axis parallel to said shaft axis on said housing and a free end spaced from said pivoted end, said rocker end of said connecting rod being pivotally connected with said rocker lever between said pivoted and free ends of the rocker lever, said connecting rod oscillating said free end of said lever about said rocker axis upon rotation of said shaft; and
a clamping device provided on said free end of said rocker lever, said device including:
a clamping bolt freely rotatable on the free rocker-lever end about a bolt axis parallel to said shaft and rocker axes and having a bolt head,
a clamping piece fixed on the bolt head for joint rotation therewith about the bolt axis during oscillation of the tool, said clamping piece and said bolt head being formed with respective grooves juxtaposed with one another and extending perpendicular to said bolt and shaft axes regardless of angular position of said free end of said member, whereby a band connecting a tool with

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said free end of the lever can be engaged between the bolt head and the clamping piece, and

means for connecting said clamping piece with said bolt head to clamp said band therebetween in the grooves.

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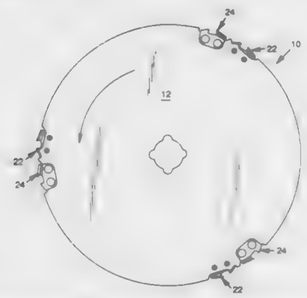
BRUSH CUTTING BLADE

J. Dana Pinney, 9130 SW. Apache Dr., Tualatin, Oreg. 97062

Continuation-in-part of Ser. No. 335,423, Apr. 10, 1989, Pat. No. 4,922,791, which is a continuation of Ser. No. 124,673, Nov. 24, 1987, Pat. No. 4,881,438, which is a continuation-in-part of Ser. No. 929,636, Nov. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 754,761, Jul. 15, 1985, abandoned. This application Jun. 23, 1989, Ser. No. 370,697

Int. Cl.[5] B27B *33/12*

U.S. Cl. 83—840 **23 Claims**



8. A brush cutting blade for a motor driven brush cutting machine;

said blade comprising a circular disc having a generally continuous periphery

a plurality of cutter elements on said blade adjacent the periphery thereof,

said cutter elements each having a kerf bottom cutting edge extending laterally across the central plane of said disc,

said cutter elements of each pair being in pairs one cutter element being of right hand configuration and the other cutter element of each pair being of left hand configuration,

the cutter elements of each pair being spaced closely together circumferentially,

said pairs being spaced apart circumferentially by a distance at least several times the spacing between the cutter elements of each pair.

4,989,490

Patent Not Issued For This Number

4,989,491

STRINGED INSTRUMENT WITH RESONATOR ROD ASSEMBLY

Lloyd R. Baggs, 1049 Saratoga Ave., Grover City, Calif. 93433

Filed Jan. 12, 1989, Ser. No. 297,136

Int. Cl.[5] G10H *3/18*

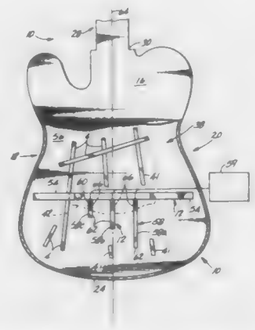
U.S. Cl. 84—723 **68 Claims**

57. A resonator rod assembly for installation on the surface of a sound board of a stringed instrument, the resonator assembly comprising:

(a) a support pedestal configured to be attached to the surface of the sound board;

(b) at least one rod mounted in the support pedestal, such a rod having a free end remote from the pedestal and configured to extend generally parallel to the surface of the sound board;

(c) a transducer mounted in the rod to pick up the vibration of the rod; and



(d) means for transmitting the picked-up vibration to an audio system.

4,989,492

SAFETY DEVICE FOR RELEASABLE AIRBORNE CHARGE

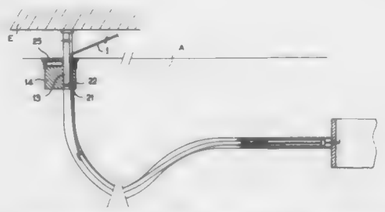
Jean Boucard, Boulogne; Jean Deliance, and André Winaver, both of Paris, all of France, assignors to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Dec. 22, 1989, Ser. No. 454,976

Claims priority, application France, Dec. 30, 1988, 88 17486

Int. Cl.[5] F42B *25/22; F42C 15/12;* **F64D** *1/06*

U.S. Cl. 89—1.55 **13 Claims**



1. An aircraft keel beam safety device for a charge releasable from this keel beam, comprising a cable placed inside a charge in a conduit fixed, firstly, to a support positioned on a periphery of the charge, to which there is fixed a sensor through which there comes out a first end of the cable fixed to the aircraft keel beam, this sensor detecting the presence of the aircraft keel beam by contact when, after a pulling of the cable, the sensor is translated and thus inhibiting the exertion of the tensile force on the cable and, secondly, means to activate a fuse for the firing of the charge, wherein the sensor is rotationally free and locked into the support by a holding system which, under the effect of sufficient tensile force exerted in the cable provided with a stop located at a determined distance from the sensor to give the sensor a motion of translation restricted by the aircraft keel beam when the charge is placed beneath this keel beam, is unlocked, enabling an activation of at least the means to activate the fuse for firing the charge, after this charge is released, and wherein the device further has means to insert the cable into the sensor, permitting a lateral exit of the cable.

4,989,493

EXPLOSIVE ATTENUATING STRUCTURE FOR USE INSIDE MISSILES AND THE LIKE

Eric J. Blommer, Taylorsville, and Dennis L. Wheeler, Lindon, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 789,794, Oct. 21, 1985, Pat. No. 4,768,418. This application May 6, 1988, Ser. No. 191,092

Int. Cl.[5] F41H *5/04*

U.S. Cl. 89—36.02 **5 Claims**



1. A laminated structure for attenuating explosive shock waves, comprising a rigid flat center layer having two opposite flat outer faces and a plurality of rigid flat sheets symmetrically layered from each outer face in bidirectionally identical layers of monotonically graduated acoustic impedance from the center layer, wherein the layers comprise a center layer of steel surrounded on both outer faces by successive layers of aluminum, plastic, and rigid foam.

4,989,494

FEED DEVICE INCORPORATED IN A TANK

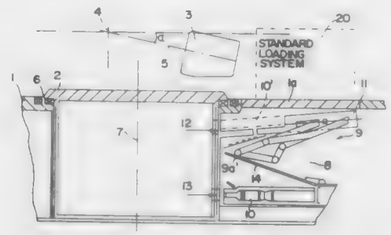
Sven Lindberg, Degerfors, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 12, 1989, Ser. No. 420,429

Claims priority, application Sweden, Oct. 12, 1988, 8803615-7

Int. Cl.[5] F41A *9/42*

U.S. Cl. 89—46 **9 Claims**



1. In a tank having an overlying gun, a crew turret adapted to follow movements of the gun, and an ammunition loading system, a reserve ammunition loading system for reserve ammunition units comprising:

an ammunition carrier tube for carrying at least one reserve ammunition unit, said ammunition carrier tube being provided with reserve ramming means, said ammunition carrier tube being movable between a rest position and a ramming position;

a linkage system displaceable between a folded and an unfolded position for supporting and carrying said ammunition carrier tube between said rest and ramming positions, respectively;

first and second apertures provided in a wall of the crew turret and being spaced apart;

said ammunition carrier tube in said rest position being in communication with said first aperture and said at least one reserve ammunition unit being in communication with said second aperture and accessible to a crew member for withdrawing said reserve ammunition unit through said second aperture and transferring said reserve ammunition unit through said first aperture into said ammunition carrier tube; and

said ammunition carrier tube with said reserve ammunition unit being movable by said linkage system through a closeable opening in a wall of the tank to a position at the breach of the gun from which said reserve ammunition unit is insertable into said breach of the gun by said reserve ramming means.

4,989,495

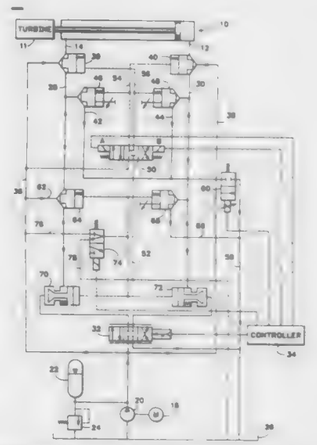
HYDRAULIC POSITIONING SYSTEM WITH NORMAL AND HIGH SUPPLY AND EXHAUST FLOW PATHS

Richard A. Gabellini, Aptos, Calif., and Lynn A. Stuart, Portland, Oreg., assignors to Hydra-Power Systems, Inc., Portland, Oreg.

Filed Aug. 21, 1989, Ser. No. 397,165

Int. Cl.[5] F01B *25/02*

U.S. Cl. 91—6 **8 Claims**



1. A positioning system for a governor for a hydropower turbine, comprising:

(a) a double acting piston and cylinder assembly having an extensible rod, and having a rod end inlet, to which the application of pressurized hydraulic fluid will cause the rod to be retracted, and a blind end inlet, to which the application of pressurized hydraulic fluid will cause the rod to be extended;

(b) a source of pressurized hydraulic fluid for supplying hydraulic fluid under pressure to said system, and a reservoir for receiving hydraulic fluid from said system and for supplying hydraulic fluid to said source;

(c) a first fluid conduit which extends from said rod end inlet and a second fluid conduit which extends from said blind end inlet;

(d) servo control valve means for selectively interconnecting said source to said first fluid conduit and said reservoir to said second fluid conduit, or connecting said reservoir to said first fluid conduit and said source to said second fluid conduit, and for regulating the flow rate of hydraulic fluid therethrough;

(e) a first high flow pressure conduit interconnecting said source to said rod end inlet, and a first logic valve interposed in said first high flow pressure conduit;

(f) a second high flow pressure conduit interconnecting said source to said blind end inlet, and a second logic valve interposed in said second high flow pressure conduit;

(g) a first high flow return conduit interconnecting said

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reservoir to said rod end inlet, and a third logic valve interposed in said first high flow return conduit;

(h) a second high flow return conduit interconnecting said reservoir to said blind end inlet, and a fourth logic valve interposed in said second high flow return conduit;

(i) proportional throttling valve means for regulating the flow rate of hydraulic fluid through said first and second high flow return conduits; and

(j) actuation means for simultaneously opening said first and fourth logic valves and closing said second and third logic valves, or simultaneously opening said second and third logic valves and closing said first and fourth logic valves.

4,989,496

VACUUM SUPPLY SYSTEM WITH THROTTLING VALVE IN A MOTOR VEHICLE

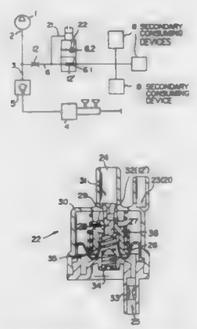
Franz Bender, Wendlingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,916

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806916

Int. Cl.[5] F15B *11/00*

U.S. Cl. 91—516 18 Claims



1. A vacuum supply system for a brake power assist unit in a motor vehicle, as well as for at least one secondary vacuum consuming device comprising:

a vacuum generating device;

a main pipe being provided between a suction connection of the vacuum generating device and the brake power assist unit and having a first check valve therein;

a secondary pipe which leads from the vacuum generating device to the at least one secondary consuming device;

the secondary pipe containing at least one first flow throttle for throttling suction flow from the secondary consuming device to the vacuum generating device;

a valve means for controlling the suction flow through the secondary pipe;

the valve means being switchable between two positions as a function of vacuum instantaneously existing in the system said suction flow being controlled in a first position of said valve means by an additional flow throttle that is connected in series with the first flow throttle by the valve means, and in a second position of the valve mans, only by the first flow throttle.

4,989,497

FLEXIBLE DIAPHRAGM-EXTREME TEMPERATURE USAGE

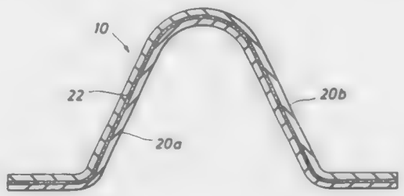
Guillermo Lerma, Fountain Valley, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 771,537, Aug. 30, 1985, Pat. No. 4,676,853.

This application Apr. 23, 1987, Ser. No. 41,389

Int. Cl.[5] F01B *19/00*

U.S. Cl. 92—103 SD 10 Claims



1. A flexible diaphragm suitable for extreme temperature usage, comprising a void free assembly fabricated by:

(a) preparing the working surface of a layup mold shaped for forming the diaphragm thereon,

(b) applying adhesive to the mold working surface and allowing the adhesive to develop good tack,

(c) applying a first bleeder means to the adhesive on the mold working surface,

(d) applying a first layer of silicone rubber sheet material over the bleeder means,

(e) applying a layer of fabric reinforcement onto the first layer of silicone rubber sheet material,

(f) coating the fabric reinforcement with an adhesive,

(g) applying a second layer of silicone rubber sheet material over the layer of fabric reinforcement,

(h) applying a parting means to the second layer of silicone rubber sheet material,

(i) applying a second bleeder means to the parting fabric,

(j) sealing a vacuum bag to the layup mold over the assembly of layers recited in the preceding steps (b) through (i),

(k) applying a vacuum between the vacuum bag and the layup mold,

(l) curing the assembly under heat and pressure applied externally to the vacuum bag, while maintaining a vacuum between the vacuum bag and the layup mold, and

(m) separating and removing the finished diaphragm assembly from the first bleeder means and the parting means; wherein said diaphragm remains flexible and usable and maintains its sealing capability in extreme temperature environments of below —150 degrees F, and also remains flexible and usable and maintains its sealing capability in temperature environments of above +500 degrees F, and also remains flexible and usable and maintains its sealing capability in temperature environments at all temperatures between the two extremes.

4,989,498

HYDRAULIC ACTUATOR

Kohei Mori, and Noboru Sekiguchi, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

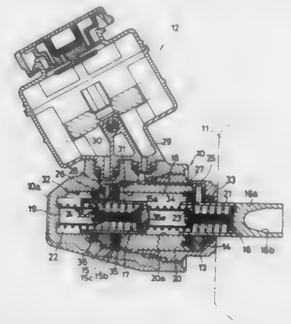
Filed Jul. 3, 1989, Ser. No. 374,971

Claims priority, application Japan, Jul. 5, 1988, 63-167085

Int. Cl.[5] F16J *15/18*

U.S. Cl. 92—168 5 Claims

1. A hydraulic actuator of the type including piston means installed slidably in a housing along the longitudinal axis thereof, annular sleeve means mounted fixedly in a bore of said housing and adapted to serve as a pressure chamber, a pair of piston guide means disposed on the opposite ends of said annular sleeve means and defined individually with passage means for a hydraulic fluid under pressure, and annular seal means defined with fitting holes to be engaged by a corresponding number of projections formed in said piston guide means and adapted to be located between said annular sleeve means and said piston guide means, wherein said hydraulic fluid under pressure in said pressure chamber may be directed to a hydraulic driven means to follow in accordance with the operation of said piston means, which further comprises a pair of projection means extending in continuous annular shape and projecting in the axial direction of said annular seal means in the inner and outer circumferential areas of said fitting holes defined in said annular seal means or in the circumferential area corresponding to the lateral surface of said piston guide means.



4,989,499

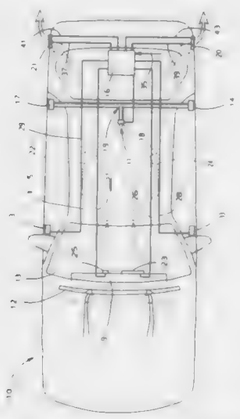
AIR PRESSURE CONTROL

Ardeean Scoccia, West Amherst; Karma V. Sangwan, East Amherst, and George H. Johnson, Newfane, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1989, Ser. No. 446,249

Int. Cl.[5] B60H *1/32*

U.S. Cl. 98—1.5 20 Claims



10. In a pressure control system, for the passenger compartment of a vehicle, having two positionable valves for regulating the compartment air pressure to a desired value, the vehicle containing a climate control system with various settings and a blower with various speeds, the improvement comprising:

an open-loop means for each valve, each generating an open-loop valve position command as a function of the climate control system setting, the vehicle speed, and the blower speed;

a measuring means for determining the actual compartment pressure; and

a valve control means for each valve, each positioning a valve responsive to an open-loop position command and the difference between the actual compartment pressure and the desired value.

4,989,500

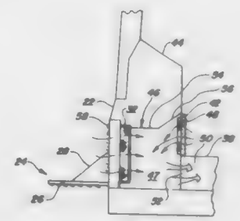
CAB DUCT ARRANGMENT FOR SERVICE OF AIR FILTERS THROUGH A SINGLE ACCESS OPENING

Roger L. Anliker, Plainfield, and Robert D. Doescher, Bolingbrook, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 10, 1990, Ser. No. 463,071

Int. Cl.[5] B60H *3/06*

U.S. Cl. 98—211 6 Claims



1. A cab duct arrangement comprising:

a vehicle housing defining a cab;

a blower arrangement having an inlet mounted within said vehicle cab;

an inlet plenum defined in part by said housing, said inlet plenum communicating with said blower inlet;

a first vent extending through said housing to allow air flow from outside said housing into said inlet plenum;

said inlet plenum being further defined by a console within said cab;

a second vent extending through said console to allow air flow from said cab into said inlet plenum;

air filters being disposed on both said first and second vents;

said first vent having a removable cover allowing access to said filter on said first vent, said filter on said second vent being positioned such that it is accessible through said first vent when said first filter has been removed.

4,989,501

METHOD AND APPARATUS FOR GENERATING AN AIR CURTAIN WITH HEATED AIR

Robert S. Catan, Green Lawn, N.Y., assignor to Dynaforce Corporation, Old Bethpage, N.Y.

Filed Oct. 27, 1989, Ser. No. 427,712

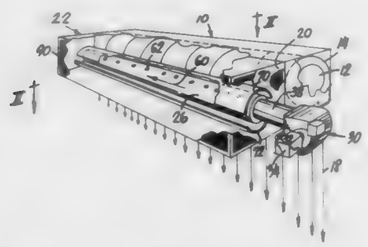
Int. Cl.[5] F24F *9/00*

U.S. Cl. 98—36 14 Claims

1. Apparatus comprising air curtain generating means for directing a flow of air along a path to constitute an air curtain, said air curtain generating means having an opening for the intake of air, and heating means to heat air for supply to said intake opening and thence to said path; said heating means including a conduit provided with an axial bore and radial openings positioned along said conduit, a supply of combustible gas, and burner means coupled to said supply of combustible gas to burn the gas in mixture with air to provide heated

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combustion products, said burner means being coupled endwise to said conduit so that said combustion products are



supplied axially through said axial bore and via said radial openings to the intake opening.

4,989,502

WEATHERPROOFING DOORS FOR THE AIR INTAKE OPENING OF VENTILATING SYSTEMS

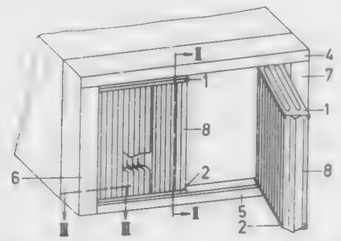
Gustav Ospelt, Vaduz, Liechtenstein, assignor to Hoval Interliz AG, Vaduz-Neugut, Liechtenstein

Filed Oct. 26, 1989, Ser. No. 427,873

Claims priority, application European Pat. Off., Oct. 26, 1988, 88117801.6

Int. Cl.[5] **E06B** *7/08*

U.S. Cl. 98—87 **6 Claims**



1. A weatherproofing door for an air intake opening of a ventilating unit, said door without any vertical door frame sections comprising:

only an upper horizontal doorframe section;

only a lower horizontal doorframe section, with said upper and lower doorframe sections being pivotable outwardly, about vertical door hinge pins, away from a housing frame that surrounds said air intake opening; and

vertically extending, lamellar profiled drop-extracting members that are disposed next to one another and extend between said upper and lower doorframe sections, with said profiled drop-extracting members, between an outer side and an inner side of said door, having profile curvatures that are laterally directed in the same direction, with the height of the profiled curvatures, in a horizontal direction, being at least as great as a horizontal clear distance of air passages formed between adjacent ones of said profiled drop-extracting members, whereby said lower doorframe section is provided with water drain means that communicates with said air passages, said housing frame including two vertical sections formed directly by said drop-extracting members and on each of which is disposed a fixed profiled drop-extracting member that has a curvature that conforms to said curvature of said other profiled drop-extracting members, with an air passage formed between a given one of said fixed profiled drop-extracting member and an adjacent profiled member of said door also communicating with water drain means.

4,989,503

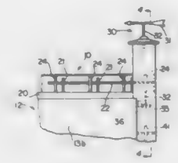
WIND CONTROLLED ROOF VENTILATION SYSTEM

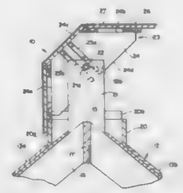
Sanford L. Shank, 1066 Chicago Ave., Harrisonburg, Va. 22801

Filed Feb. 26, 1990, Ser. No. 484,524

Int. Cl.[5] **F24F** *7/02*

U.S. Cl. 98—42.2 **6 Claims**





1. A wind-directed ventilator hood assembly for a narrow elongated air exit opening in the roof of a farm building spanning a long portion of the roof flanked by first and second opposite upwardly convergent roof sections, comprising hood supporting uprights projecting upwardly from the opening at plural spaced locations, a horizontal elongated pivot shaft journaled in the uprights above the opening, a pivoted elongated hood for covering the opening having transverse beams and a hood roof covering the beams, the hood roof having downwardly diverging side panel portions inclined about 90° to each other and said beams being fixed to said shaft for rotation therewith between a first position opening toward said first roof section with one of said side panel portions disposed vertically adjacent the second roof section and a second position opening toward the second roof section with the other side panel vertically adjacent the first roof section, a wind vane supported for movement responsive to wind forces, vane direction sensing means, motor means for driving the hood to said first and second hood positions, and electrical circuit means responsive to said sensing means for activating the motor means to position the hood is preselected relation to wind direction.

4,989,504

FOOD PROCESSING VAT

Jeffrey L. Jay, Winsted, Minn., assignor to Sherping Systems, Inc., Winstead, Minn.

Filed Nov. 9, 1988, Ser. No. 269,156

Int. Cl.[5] **A01J** *25/00;* **A23C** *19/00;* **B01F** *15/06*

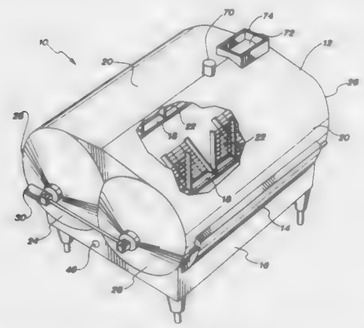
U.S. Cl. 99—455 **20 Claims**

1. A vat for processing a generally liquid food product comprising:

a plurality of generally horizontal shafts, each shaft having a rotatable agitator means for agitating the liquid food product and defining a swept volume created by rotation of the agitator means about the shaft, the shafts being horizontally spaced apart from one another by a distance greater than the larger of the radius of a swept volumes of adjacent shafts;

a plurality of adjacent inner wall sections, each inner wall section corresponding to one of the horizontal shafts such that the horizontal shaft is centrally disposed within the inner wall section, the inner wall section having a vertical cross-section corresponding to a first portion of the swept volume created by the rotation of the agitator means about the shaft:

a pair of end wall means for closing the ends of the inner wall sections, whereby the inner wall sections are arranged such that a second portion of the swept volume created by the rotation of the agitator means about the shaft will intersect and overlap a second portion of the swept volume created by the rotation of the agitator mean



about the shaft of an adjacent inner wall section, wherein the end wall means are each comprised of a plurality of generally conically shaped end sections, each end section corresponding to an inner wall section and having a vertical base cross section corresponding to the vertical cross section of that inner wall section.

4,989,505

APPARATUS FOR FORMING CASINGLESS SAUSAGE AND THE LIKE

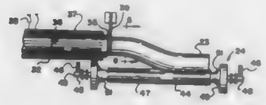
Timothy G. Mally, Oregon, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Aug. 29, 1989, Ser. No. 400,080

Int. Cl.[5] **A22C** *7/00, 11/00*

U.S. Cl. 99—483 **20 Claims**





1. An apparatus for forming a casingless sausage and the like, comprising:

means for stuffing and shaping flowable batter material;

heating means associated with said stuffing and shaping means, said heating means being for forming a proteinaceous skin of batter material from the batter material of the stuffing and shaping means;

ejecting means for removing a blank from the stuffing and shaping means, the blank having a shape determined by said stuffing and shaping means, the blank further having an external surface including the proteinaceous skin and a core portion including batter material which has not been formed into the proteinaceous skin; and

conveyor means for receiving and conveying the blank, said conveyor means including end forming means for engaging batter material at at least one end of the blank and for shaping the end batter material into a generally rounded configuration by relative rotational movement between the blank and the end forming means to thereby form a shaped product.

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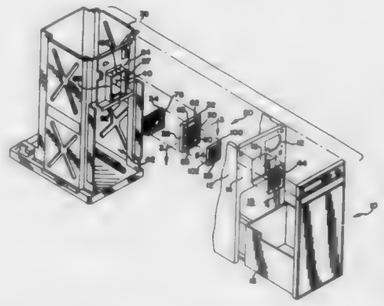
CHARCOAL FILTER SYSTEM FOR A TRASH COMPACTOR

Michael J. McCormick, Danville, Ky., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 9, 1988, Ser. No. 269,115

Int. Cl.[5] **B30B** *9/00, 15/06*

U.S. Cl. 100—90 **39 Claims**



1. A deodorizing system for a trash compactor comprising:

a trash receptacle;

a frame having a front wall with first and second openings formed therein, said first opening being dimensioned to receive said trash receptacle therethrough;

means disposed in said second opening for filtering air passed therethrough; and

means disposed to a rear of said filtering means for drawing air contained in the trash receptacle from the trash receptacle through said filtering means and blowing it back to said trash receptacle.

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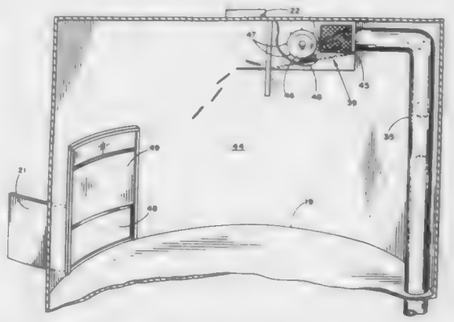
COLLECTOR FOR EMPTY USED RECYCLABLE BEVERAGE CANS

William M. Rhoades, and Lloyd D. Bailey, both of Forest Lake, Minn., assignors to Gadar Industries, Inc., Forest Lake, Minn.

Filed Jul. 10, 1989, Ser. No. 377,068

Int. Cl.[5] **B30B** *9/00, 9/32*

U.S. Cl. 100—91 **5 Claims**



1. A collector for empty used recyclable metal beverage cans, comprising:

a large cylindrical enclosure having an interior area;

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an opening into the interior area of said enclosure for inserting empty used beverage cans;

conveying means in the interior area of said enclosure for receiving cans inserted through said opening, said conveying means comprising an endless belt with one end of the conveying means located to receive the inserted cans, a part of said conveying means being magnetized for magnetically holding only magnetically permeable cans firmly onto said belt;

can crushing means in the interior area of said enclosure;

means in the interior area of said enclosure for pneumatically transporting each of the cans from said conveying means to said can crushing means, said pneumatic transporting means including a pair of vacuum suction conduits suitably sized to carry beverage cans, one of said conduits having an open end facing and in close proximity to the magnetized part of said conveying means and the other of said conduits having an opening facing and in close proximity to a non-magnetized part of said conveying means;

means for applying a vacuum to said conduits for respectively sucking up into said conduits cans which are not magnetically held onto said belt on the respective parts of said belt; and

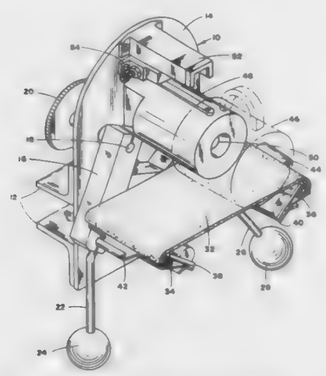
means in the interior area of said enclosure for receiving and storing crushed cans from said crushing means.

4,989,508

DEVICE FOR FACILITATING SUBLISTATIC PRINTING

James F. King, Winston-Salem, N.C., assignor to XPRES Corporation, Winston-Salem, N.C.

Filed Nov. 20, 1989, Ser. No. 439,051
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—35 16 Claims



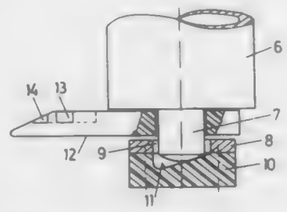
1. A device for facilitating sublistatic printing of a workpiece having an arcuate surface including a workpiece receiving member and means to position sublistatic transfer sheet against the surface of said workpiece held by said workpiece receiving member, said means including an elastic band having opposite ends, said band having band termination means at each of said opposite ends, said termination means having interlocking latch clip means to apply said elastic band means over said transfer sheet to provide a substantially uniform intimate radial pressure against said transfer sheet and said workpiece, said means to apply including means to hold said termination means, and first elastically stretch said band by moving said termination means apart and subsequently apply said band, while in said stretched condition, to said transfer sheet by moving said termination means around said workpiece receiving member and engaging said interlocking latch clips so that said elastic band holds said transfer sheet against said workpiece with a substantially uniform pressure.

4,989,509

MOUNTING ARRANGEMENT FOR APPLICATOR ROLLER

Johannes Zimmer, Ebentaler Strasse 133, A-9020 Klagenfurt, Austria

PCT No. PCT/AT88/00043, § 371 Date Feb. 2, 1989, § 102(e) Date Feb. 2, 1989, PCT Pub. No. WO88/09726, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 3, 1988, Ser. No. 328,251
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 8708044; Oct. 10, 1987, 8713787
Int. Cl.[5] B41F *15/44*
U.S. Cl. 101—120 11 Claims



1. An apparatus for the application of fluid substances in printing and coating machines, comprising:

a carrying beam having first and second ends;

first and second carrying plates attached respectively to said first and second ends of said carrying beam and having first and second recesses formed therein;

a rotatable application roller;

mounting means, comprising first and second pivot axles having a common pivot axis and extending through said first and second recesses, respectively, for mounting said roller to said first and second carrying plates for rotation with respect to said first and second carrying plates; and

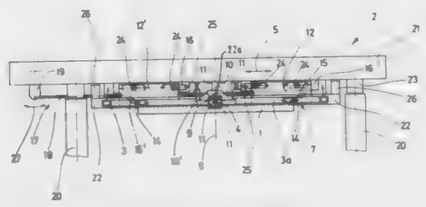
first and second stopping means for abutting with an end of each of said first and second pivot axles, respectively, to allow some axial movement of said roller but limit the axial movement of said roller in each respective axial direction, each of said first and second stopping means comprising a closing plate mounted to a corresponding one of said first and second carrying plates, respectively, and having a recess formed therein, said recess defining a stopping surface disposed at an oblique angle relative to said common pivot axis.

4,989,510

SCREEN PRINTING MACHINE

Karl Kölblin, Emmendingen, and Peter Geiger, Teningen, both of Fed. Rep. of Germany, assignors to Werner Thieme GmbH & Co. KG Maschinenfabrik, Fed. Rep. of Germany

Filed Nov. 9, 1988, Ser. No. 268,979
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3738038
Int. Cl.[5] B41F *15/00*
U.S. Cl. 101—123 13 Claims



1. A screen printing machine comprising:

a printing table,

a squeegee holder,

a squeegee holder support frame for guiding movement of the squeegee holder over the printing table,

a screen frame disposed between the squeegee holder and printing table,

a screen frame support means for supporting the screen frame, said screen frame support means including a central pivot support for controlling pivotal movement of the screen frame about a central pivot axis and a pair of screen frame raising devices disposed at respective opposite lateral sides of the central pivot support adjacent respective longitudinal edges of the screen frame,

wherein said screen frame raising devices each include a movable carriage which is displaceable in a direction parallel with an adjacent longitudinal edge of the screen frame, said movable carriage and said adjacent longitudinal edge of the screen frame including interengageable guide pin means and guide slot means for positively controlling raising movement of the longitudinal edge of the screen frame in response to movement of said carriage,

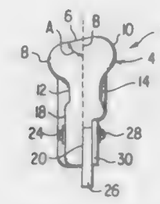
and wherein said guide slot means includes two slot portions which enclose an obtuse angle.

4,989,511

HANDLE FOR A SQUEEGEE

Joseph P. Clarke, Jr., Acworth, Ga., assignor to Flexible Products Company, Marietta, Ga.

Filed May 26, 1989, Ser. No. 357,302
Int. Cl.[5] B41F *15/44, 9/10*
U.S. Cl. 101—123 22 Claims



1. A handle for a squeegee the operation of which imposes stress on a hand or arm of a user, comprising means for minimizing he tendency for carpal tunnel syndrome, said means comprising an upper palm -engaging portion and a lower tool-engaging portion, substantially flat elongated upper surface means disposed at an angle to a longitudinal axis of the handle for receiving a palm portion of at least one hand of the user, said handle being characterized by an asymmetric cross-sectional profile of its upper portion with respect to said longitudinal axis, and, in use, said handle being characterized by a center of gravity remotely located from the user with respect to said longitudinal axis.

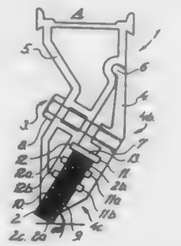
4,989,512

SQUEEGEE ARRANGEMENT

Astor Lindström, Rönninge, and Christer Källroos, Vagnhärad, both of Sweden, assignors to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Jun. 28, 1989, Ser. No. 372,471
Claims priority, application Sweden, Jun. 28, 1988, 8802430
Int. Cl.[5] B41F *15/44*
U.S. Cl. 101—123 18 Claims

1. A squeegee arrangement for use in silk-screen printers and including a squeegee and a squeegee holder for holding the squeegee, the squeegee holder being provided with a plurality of support positions, each of said support positions being provided for supporting a squeegee of predetermined height dimension, wherein the squeegee holder comprises two parts pivotally connected together, one of said two parts being directly pivotally connected only to the other of said two parts, said other part being the only one of said parts directly supported by and fixedly connected to a support device, said two parts having side walls which follow each other and define



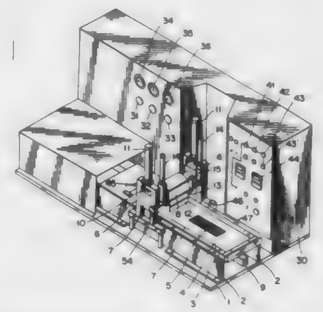
a recess for receiving the squeegee, said side walls of said two parts have provided therein grooves for holding a squeegee support element.

4,989,513

METHOD FOR PRINTING TEST AND APPARATUS FOR DOING THE SAME

Yukio Toda, Omiya; Takeshi Nakatsuka, Hiki; Toru Takahashi, Warabi, and Haruhito Arakawa, Urawa, all of Japan, assignors to Dainippon Ink and Chemicals Inc., Tokyo, Japan

PCT No. PCT/JP87/00756, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/02696, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 7, 1987, Ser. No. 221,907
Claims priority, application Japan, Oct. 7, 1986, 61-237115
Int. Cl.[5] B41F *3/20, 3/36, 3/51*
U.S. Cl. 101—158 16 Claims



1. A method for performing a printing test, comprising the steps of:

dropping ink onto a flat intaglio;

supplying said ink to a printing area on the intaglio with a doctor blade;

transferring said ink from said printing area onto a printing sheet by rolling an impression cylinder having said printing sheet wound on a circumference thereof, over said printing area under a predetermined printing pressure in relation to said intaglio wherein said rolling of said impression cylinder includes moving said impression cylinder from an initial position to perform a printing operation, stopping said impression cylinder and returning said impression cylinder to an initial position and is performed by means of a pneumatic cylinder;

controlling said rolling of said impression cylinder by adjusting a pressure of air supplied to said pneumatic cylinder;

controlling said predetermined printing pressure of said impression cylinder in relation to said intaglio by adjusting

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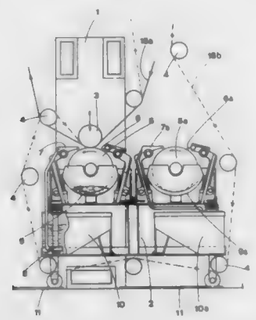
a pressure cylinder that is connected with said impression cylinder.

4,989,514

TROLLEY CARRYING PLURAL SETS OF PRINT CYLINDER ASSEMBLIES WITH INDEPENDENT DRIVES

Vito Schiavi, Piacenza, Italy, assignor to Schiavi Cesare Costruzioni Meccaniche S.p.A., Milan, Italy

Filed Sep. 15, 1989, Ser. No. 408,137
Claims priority, application Italy, Nov. 25, 1988, 40173 A/88
Int. Cl.[5] B41F *5/00*
U.S. Cl. 101—216 **2 Claims**



1. A trolley for print cylinder assemblies as used in a rotary machine including a print station having a gantry type structure, comprising:

a movable frame (2) carrying two distinct print assemblies disposed side by side, each affording a print cylinder (5—5*a*), a doctor (6—6*a*) and devices (7—7*a*) supplying ink to the cylinder, and capable of horizontal motion in a direction transverse to the gantry type structure (1) of the print station equipped with an impression cylinder (3) adapted to urge a web of printable material against the print cylinder (5, 5*a*) bearing the image to be transferred, and with first drive means serving to set the print cylinder in rotation;

means for horizontally moving the frame in a direction transverse to the gantry type structure of the print station;

first location means, designed to interact with second locating means offered by the structure (1) of the station, and to permit of making the trolley fast in relation to the station at either of two distinct positions whereby one of the two print assemblies is correctly aligned with the impression cylinder and the first drive means, ready to print, and the remaining assembly positioned outside the area of the print station and freely accessible for service purposes; and

second drive means that permit of setting the cylinders of the two print assemblies in rotation on the trolley, one independently of the other.

4,989,515

IGNITOR WITH STABLE LOW-ENERGY THERMITE IGNITING SYSTEM

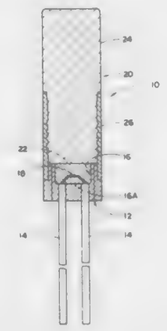
Michael D. Kelly, West Alexandria, and Alan C. Munger, Miamisburg, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1989, Ser. No. 390,853
Int. Cl.[5] F42B *3/10*
U.S. Cl. 102—202.9 **18 Claims**

1. An igniting system for use in an ignitor having an electrical ignition device operable in a hot-wire mode, said igniting system comprising:

(a) an initiating charge of a thermite in ultra-fine powder form disposable adjacent to the electrical ignition device and ignitable by the ignition device; and

(b) an output charge of a thermite in high-density consolidated form disposable adjacent to said initiating charge on



an opposite end thereof from the electrical ignition device and ignitable by the initiating charge; and

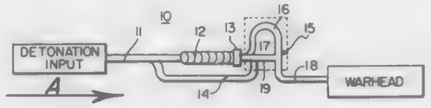
(c) a hot-wire means for direct igniting of said thermite mixtures.

4,989,516

SAFE/ARM EXPLOSIVE DELAY PATH

Denis A. Silvia, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1981, Ser. No. 279,643
Int. Cl.[5] F42C *19/08*
U.S. Cl. 102—275.9 **20 Claims**



1. A safe/arm explosive delay path for detonating an explosive device, comprising:

input means;

delay means;

means parallel to the delay means; and

a safety junction positioned between the delay means and the explosive device;

whereby, when a signal is provided to the input means, said signal is transmitted by the input means to both the delay means and the parallel means and then to the safety junction with the signal from the parallel means arriving at the safety junction prior to the signal from the delay means so as to enable the safety junction to pass the signal from the delay means to the explosive device.

4,989,517

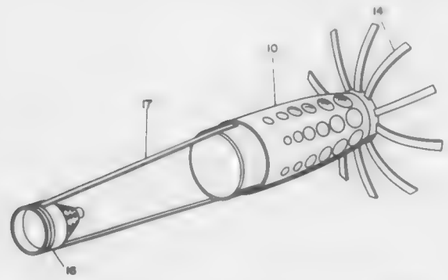
TANDEM BOMBLET

Louis J. Adimari, Montague, and Jerry Pentel, Montville, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1982, Ser. No. 376,431
Int. Cl.[5] F42B *10/32, 12/16*
U.S. Cl. 102—388 **3 Claims**

1. An improved conventional munition, comprising:

(a) a multiplicity of independently fuzed tandem bomblets in a stacked configuration, said tandem bomblets comprising at least an aft bomblet and a forward bomblet, each subset of bomblets including only one fuze, said fuze operatively disposed in said forward bomblet, bomblets subsequent to the first bomblet including a detonation means electrically connected to said fuze to initiate an explosive charge in subsequent bomblets, said tandem bomblets comprising a self-forging fragment plate in each said aft bomblet, each bomblet comprising an anti-materiel kill means and anti-personnel kill means, said first and second bomblets being



stacked in abutment with each other and connected by integral mechanical and electrical connecting means;

(b) launch and dispensing means within which the bomblets are carried; and

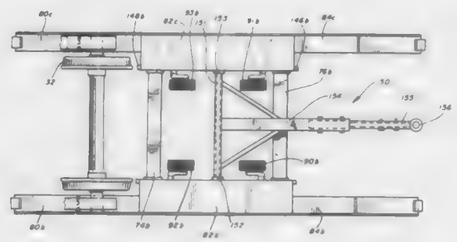
(c) fin means for stabilizing said tandem bomblets in flight to set the target and for separating said bomblets from one another to a fixed optimal stand-off distance when expelled from said dispensing means.

4,989,518

RAMP SYSTEM FOR ASSEMBLING AND DISASSEMBLING HIGHWAY TRAILERS AND RAILTRUCKS FOR INTERMODAL TRANSPORTATION

Thomas F. Kealey, Chicago, Ill.; Harry O. Wicks, El Paso, Tex.; Gary D. Christen, Merrillville, Ind.; Richard L. Jones, Bloomingdale, and Kenneth E. Combs, Homewood, both of Ill., assignors to The Chamberlain Group, Inc., Elmhurst, Ill.

Filed Jun. 7, 1989, Ser. No. 362,752
Int. Cl.[5] B61D *3/18*
U.S. Cl. 105—4.3 **22 Claims**



1. A system for connection of highway trailers to railtrucks for intermodal transportation, said system comprising:

a highway trailer including a main frame and at least one highway wheel assembly; said highway trailer having a first coupling means adjacent the lower rear thereof;

a railtruck having a pair of side frames and a bolster supported on said side frames; said railtruck having a second coupling means supported thereby, said second coupling means and said first coupling means being selectively matable and releasable; and,

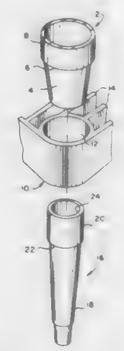
ramp means having an ascending portion for raising the level of said trailer frame into a raised position above said railtruck and a descending portion for lowering the level of said trailer frame into an operative position on top of said railtruck.

4,989,519

SHELVING SYSTEM HAVING TWO SETS OF LOCKING TAPERS

John H. Welsch, Moscow, Pa.; Anthony P. Montalbano, Bayville, and Douglas Hohlbein, Central Islip, both of N.Y., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Jul. 25, 1989, Ser. No. 385,061
Int. Cl.[5] A47B *3/00*
U.S. Cl. 108—111 **27 Claims**



1. A shelving apparatus, comprising:

a first support having a first frusto-conical surface;

a shelf having a first frusto-conical hole; and

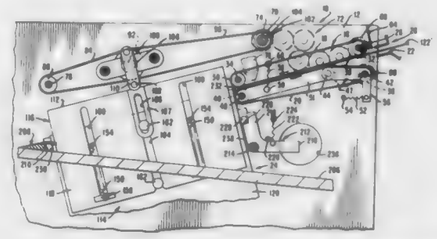
a second support having (a) a second frusto-conical surface adapted to engage said first frusto-conical hole, and (b) a second frusto-conical hole adapted to engage said first frusto-conical surface, wherein said first frusto-conical surface engages said second frusto-conical hole inside said first frusto-conical hole.

4,989,520

CONTAINER FOR HOLDING A STACK OF ARTICLES

David A. Hain, Monifieth, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 8, 1989, Ser. No. 433,497
Claims priority, application United Kingdom, Jun. 30, 1989, [illegible]
Int. Cl.[5] G07G *5/00*
U.S. Cl. 109—24.1 **11 Claims**



1. A container for holding a stack of articles, said container including an aperture for receiving articles one by one to be stacked in said container, a receiving portion for receiving the articles passed through said aperture and a storage portion for

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storing articles which have been received in said container, comprising:

gate means in said container for permitting, during a stacking operation, one-way passage of an article from said receiving portion of said container into said storage portion of said container;

pusher means movable between first and second positions and arranged when moved from said first position to said second position to push an article in said receiving portion past said gate means and into said storage portion; and

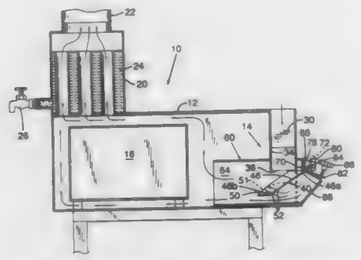
resilient support means mounted in said storage portion and arranged to support a stack of articles, said support means including a support member slidably mounted in said storage portion so as to be movable toward and away from said gate means, a shaft rotatably mounted on said support member, first and second gear means respectively secured to opposite end portions of said shaft, first and second rack members fixed relative to said storage portion and respectively engageable with said first and second gear means whereby movement of said support member towards or away from said gate means brings about rotation of said shaft in a direction determined by the direction of movement of said support member, a torsion spring mounted on said shaft with said shaft passing through said spring so as to be substantially coaxial therewith having one end of said spring secured to said shaft, retaining means rotatably mounted on said shaft and having said other end of said spring secured to said retaining means, and engagement means mounted on said support member and arranged to be engageable with said retaining means whereby, when said engagement means is in engagement with said retaining means and said support member is moved away from said gate means in response to movement of said pusher means toward said second position, rotation of said retaining means in the same direction as said shaft is prevented, thereby causing torsion to be built up in said spring, said torsion serving to urge said support member back toward said gate means when said pusher means moves back toward said first position.

4,989,521

GRAVITY FED PELLET BURNER

Joseph P. Traeger, 250 S. Oak St.; Mark A. Traeger, 530 Alder St., and Randolph J. Traeger, 540 Leo St., all of Mt. Angel, Oreg. 97362

Filed Apr. 6, 1990, Ser. No. 505,590
Int. Cl.[5] F23K *3/10, 3/16*
U.S. Cl. 110—108 5 Claims



1. A gravity operated burner for particulate fuel comprising:

an upright hopper for holding the fuel,

a constricted opening at the base of the hopper providing for controlled flow of fuel from the hopper,

a chute spaced downwardly from said opening having an upper end disposed laterally outwardly of one side of said opening and inclining downwardly from this upper end to a lower end disposed laterally outwardly to the opposite side of said opening, and

a substantially horizontal shelf adjacent and extending outwardly of the lower end of the chute providing a region where burning of fuel takes place,

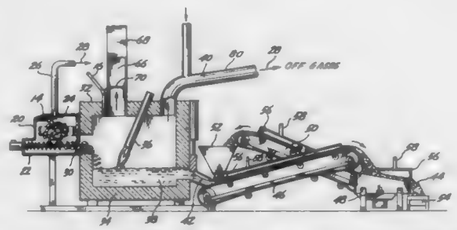
the burner further including a burner tube which houses the chute and the self and the burner tube having an interior spaced outwardly from the chute and self whereby an airflow passage is defined to support combustion of the fuel deposit on the shelf, the chute and shelf being joined and forming an integral unit and there being means detachably mounting the chute and shelf unit on the burner tube.

4,989,522

METHOD AND SYSTEM FOR INCINERATION AND DETOXIFICATION OF SEMILIQUID WASTE

George H. Cline, Anchorage, Ak.; Dale C. Edward, San Juan Bautista, Calif.; Bob G. Langberg, and Kurt G. Winkler, both of Anchorage, Ak., assignors to Sharpe Environmental Services, Anchorage, Ak.

Filed Aug. 11, 1989, Ser. No. 393,490
Int. Cl.[5] F23G *5/00*
U.S. Cl. 110—250 19 Claims



15. A system for detoxifying a semiliquid waste containing water and petroleum oil, earth, organic contaminants, and metal contaminants, said system comprising:

means for separating said semiliquid waste into a substantially solid waste portion and a substantially liquid waste portion;

a combustion chamber having an inlet for receiving said waste from said separating means;

feed means having an inlet from said separating means and an outlet to said combustion chamber for separately feeding said liquid waste portion and said solid waste portion into said combustion chamber;

a plasma arc torch mounted in fluid communication with said combustion chamber for combusting said waste to produce a substantially gaseous emission stream and an obsidian residue;

means associated with said outlet for receiving said solid obsidian residue and reducing the concentration of unbound metal contaminants in said solid residue to nontoxic levels;

means in communication with said combustion chamber for receiving said gaseous emission stream and for cleansing said gaseous emission stream to reduce the concentration of gaseous contaminants and solid particulates therein to nontoxic levels, producing a cleansed exhaust gas and an emission residue; and

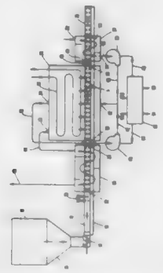
means for collecting said emission residue and for removing trace metal contaminants from said emission residue.

4,989,523

METHOD AND APPARATUS FOR EXTRACTING HEAT FROM A COMBUSTIBLE MATERIAL

Sung C. Ling, and Hsien P. Pao, both of Silver Spring, Md., assignors to General Technology, Inc., Silver Spring, Md.

Filed Mar. 16, 1990, Ser. No. 494,506
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—341 35 Claims



1. A method of extracting heat from a combustible material, comprising:

forming a solid material strip of said combustible material;

forming a plurality of spaced holes in said material strip;

combusting said material strip in a combustion oven; and

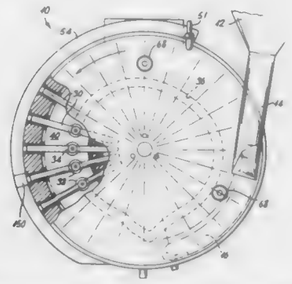
removing a structurally intact solid residual strip from said combustion over after said material strip has been completely combusted.

4,989,524

DIBBER DRILLS

Frank R. Brown, Shefford, and Derek J. Frost, North Brickhill, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 279,622, Dec. 5, 1988, abandoned. This application Apr. 13, 1990, Ser. No. 508,471
Claims priority, application United Kingdom, Dec. 8, 1987, 8728621
Int. Cl.[5] A01C *5/04*
U.S. Cl. 111—91 16 Claims



1. A metering and dibbing assembly for use in a dibber drill comprising

a rotary feed section having seed retaining locations therein,

inlet means for introducing seed at said seed retaining locations in the rotary feed section,

a rotary dibber section having a plurality of dibber elements at least in part housed in radially disposed bores in the dibber section,

programmed transfer means for positively transferring seeds from the feed section to said radially disposed bores in the dibber section, wherein said programmed transfer means is programmed to operate at preselected ones of the seed retaining locations,

programming means for programming said programmed transfer means to operate at said preselected ones of said seed retaining locations, and

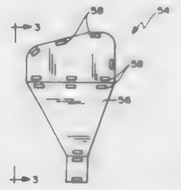
cam means operative to withdraw successive dibber elements to allow the transfer of seed from the feed section into the associated bores for these elements and thereafter to move the dibber elements in a radially outward movement so as to press the seed into the ground.

4,989,525

SEWING APPARATUS AND METHOD FOR MANUFACTURING VEHICULAR AIR BAGS

Mario Portilla, Pine Brook, Montville, N.J. 07006

Filed Mar. 7, 1990, Ser. No. 489,667
Int. Cl.[5] D05B *13/00, 21/00, 25/00;* B60H *21/16*
U.S. Cl. 112—10 12 Claims



1. An assembly of apparatus for manufacturing a vehicular air bag, said air bag comprising first and second side panels having peripheral edges and a main body panel having longitudinal side edges to be sewn to the peripheral edges of the air bag side panels, said apparatus comprising:

template means for mounting the first and second side panels thereto;

template rotating means for rotating the template means and the air bag side panels mounted to the template means;

first and second sewing machines for sewing the peripheral edges of said first and second side panels to the longitudinal side edges of the main body panel;

movable frame means for mounting the sewing machines in selected proximity to the template means and for moving the sewing machines relative to the template means for maintaining a selected alignment and spacing of the sewing machines relative to the template means, whereby the template means is rotated to advance the peripheral edges of the first and second side panels relative to the first and second sewing machines and whereby the frame means is adjusted to position the sewing machines relative to the template means for sewing the first and second side panels to the main body panel.

4,989,526

EQUIPMENT FOR THE AUTOMATIC SEWING OF SHOULDER PADS FOR CLOTHING

Bruno Brusini, Torino, Italy, assignor to ST Automations S.r.l., Torino, Italy

Filed Jul. 5, 1989, Ser. No. 375,651
Claims priority, application Italy, Jul. 5, 1988, 67634 A/88
Int. Cl.[5] D05B *21/00, 25/00*
U.S. Cl. 112—121.12 7 Claims

1. Equipment for the automatic sewing of shoulder pads for clothing comprising:

a support structure,

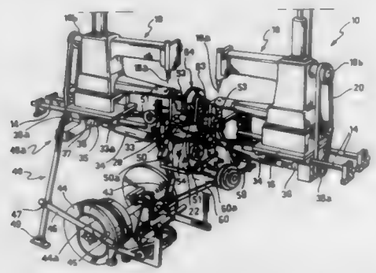
a pair of sewing machines supported for sliding, reciprocating, linear motion on the structure,

an oscillator device adapted for connection to a tool which clamps together two, facing, shaped pieces of cloth with an interposed pad for forming the shoulder pads, support means for supporting the oscillator device on the support structure for reciprocating rotation about an axis parallel to the sliding, reciprocating, linear motion of the sewing machines,

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means for driving the sewing machines in said reciprocating linear motion, and

means associated with the oscillator device for causing the reciprocating rotation of the oscillator device in synchro-



nism with the sliding, reciprocating, linear motion of the sewing machines in order to provide for the sewing together of the pieces of cloth and the pad along a predetermined outline.

4,989,527

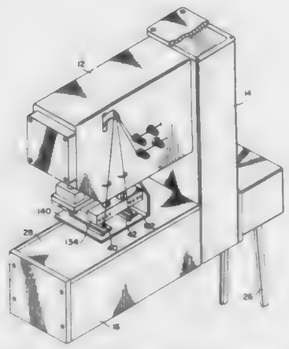
SEWING SYSTEM

Joseph W. A. Off, Irving, Tex., assignor to Automated Machinery Systems, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 909,314, Sep. 19, 1986, abandoned. This application Jul. 24, 1987, Ser. No. 78,007

Int. Cl.[5] D05B *3/04*

U.S. Cl. 112—121.15 3 Claims



1. A sewing machine comprising the combination of

an elongated, horizontally disposed needle clamp,

a top horizontal arm containing drive means for reciprocating with a vertical motion said elongated, horizontally disposed needle clamp,

first and second rigid needle bars extending downwardly from said top arm and spaced apart in a direction of elongation of said needle clamp, said needle bars being associated with said drive means and for reciprocation in unison by said drive means,

said spaced needle bars being secured to said needle clamp at symmetrically spaced positions thereon to provide rigid, balanced support for said needle clamp, and

means for securing a pair of needles to said needle clamp,

a bottom horizontal arm positioned substantially parallel to said top arm and containing thread looping means for cooperating with thread carried by the needles in said needle clamp to form stitches in a workpiece, and

a vertical arm extending between ends of said top arm and bottom arm and maintaining them in fixed relationship with each other,

a cloth holder for holding the workpiece to be stitched,

support means attached to said top arm for supporting said cloth holder in a position below said needle bars so that the needles pass through the workpiece on the cloth holder when the needle bars are vertically reciprocated,

first means attached to said support means for moving said cloth holder in a first horizontal direction relative to said reciprocating needles,

second means attached to said support means for moving said cloth holder in a second horizontal direction that is transverse to said first horizontal direction, and

extendable clamping means supported from said horizontal arm and movable with said cloth holder for clamping the work piece onto said cloth holder when in an extended position.

4,989,528

SEWING MACHINE NEEDLE MOUNTING DEVICE

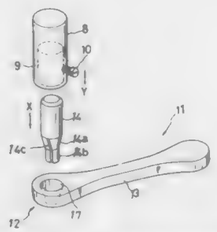
Shuji Fujita, Chofu, Japan, assignor to Juki Corporation, Chofu, Japan

Filed Feb. 27, 1990, Ser. No. 485,622

Claims priority, application Japan, Feb. 28, 1989, 1-23267[U]

Int. Cl.[5] D05B *55/04*

U.S. Cl. 112—226 2 Claims



1. A sewing machine needle mounting device having a needle engaging portion for releasably holding a sewing machine needle therein, and a grip portion for holding said device, wherein

a hole is vertically provided through said engaging portion, said hole being partially formed as an inverted cone, and wherein a substantially vertical, protruding ledge is formed along a conical interior surface of said engaging portion, said ledge being dimensioned to fit in a grooved thread guide of said sewing machine needle.

4,989,529

MANUFACTURE OF A MULTIPLE BIASED FABRIC BY FOLDING

Roy Shoesmith, Midland, Canada, assignor to Bay Mills Limited, Midland, Canada

Filed Jul. 10, 1989, Ser. No. 377,171

Int. Cl.[5] D05B *35/06, 1/00*

U.S. Cl. 112—262.1 10 Claims

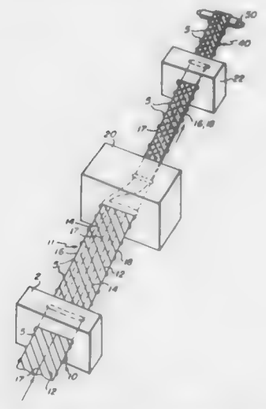
1. A method of making a multi-layer non-woven structural fabric comprising the steps of:

directing a layer of single biased structural fabric having at least two edges longitudinally from a feed end to an exit end, wherein said layer of fabric is comprised of a plurality of structural fibers oriented substantially parallel to each other and biased to said edges;

leading said layer to a first affixing stage comprised of means for affixing said structural fibers in alignment;

leading said layer from said first affixing stage into at least one folding stage wherein said layer is folded longitudinally from one said edge toward another to form a multiple biased fabric;

leading said multiple biased fabric from said folding stage into a second affixing stage wherein said multiple biased



fabric is affixed together to provide a single structural fabric being multiple biased.

4,989,530

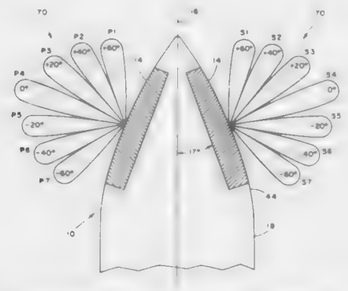
LOW DRAG HOMING TORPEDO NOSE ASSEMBLY HAVING SIDE MOUNTED PLANAR ARRAYS

William Thompson, Jr., State College; W. Jack Hughes, Boalsburg; Robert D. Marciniak, and Daniel L. DiGiannantoni, both of State College, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 19, 1981, Ser. No. 237,549

Int. Cl.[5] F42B *19/01*

U.S. Cl. 114—21.3 7 Claims



1. A low drag nose assembly suitable for use in an aqueous environment, comprising in combination:

a substantially conical pressure bulkhead having first and second apertures formed in the slanting side of said substantially conical pressure bulkhead said apertures being oriented at a preselected cone angle with respect to the pressure bulkhead longitudinal axis;

a first plurality of transducer elements having individual radiating faces;

a first web member having a plurality of holes adapted to receive said first plurality of transducer elements such that said individual radiating faces of said transducer elements are constrained to lie in a plane thus forming a first planar array;

a second plurality of transducer elements having individual radiating faces;

a second web member having a plurality of holes adapted to receive said second plurality of transducer elements such that said individual radiating faces of said transducer elements are constrained to lie in a plane thus forming a second planar array; and

first and second means for mounting said first and second web members in said first and second apertures respectively, said apertures being provided in said slanting side of said substantially conical pressure bulkhead such that said first and second planar arrays are essentially side looking;

said first and second planar arrays each providing a plurality of preformed sonar beams which display an azimuth that selectively extends to fore, to side and to aft of said longitudinal axis simultaneously.

4,989,531

TOWING RELEASE SYSTEM

Terrence P. Humphrey, 7 Wood La., Fairfax, Calif. 94930

Filed Aug. 17, 1989, Ser. No. 395,330

Int. Cl.[5] A63C *15/00*

U.S. Cl. 114—249 4 Claims



1. A towing release device for a towline attached to a boat, said towline used for pulling a rider utilizing a water sports implement and including a handle for grasping by said rider, said towline having a diameter, said release device comprising:

a bail member for secure attachment to said water sports implement, said bail member having a forward end forming a bar portion; and

a receiver element for installation onto said towline proximate said towline handle, said receiver element comprising a hollow cylinder having an internal diameter marginally greater than said towline diameter, said hollow cylinder conditioned to be threaded by said towline and positioned on said towline by knots formed in said towline, said receiver element further having a rearward end and a slot portion conditioned for releasable engagement with said bail member bar portion, said slot portion comprising a rearward-oriented slot partially defined by a tooth member and extending through said hollow cylinder, wherein when said receiver element slot portion is engaged with said bail member bar portion, pulling force from said boat and towline is transmitted directly to said water sports implement, and when said receiver element slot portion is disengaged from said bail member bar portion, pulling force from said boat and towline is transmitted directly to said towline handle.

4,989,532

LOCKING DEVICE FOR STEERING MAST OF SMALL WATERCRAFT

Hideki Kishi, and Muneaki Kago, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 30, 1989, Ser. No. 400,482

Claims priority, application Japan, Aug. 30, 1988, 63-216770; Aug. 30, 1988, 63-216771

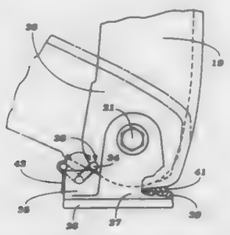
Int. Cl.[5] B63B *35/73*

U.S. Cl. 114—270 11 Claims

1. In a small watercraft comprising a hull having a stern, a bow, a horizontal platform and a removable hood that cooperatively define an operator space adjacent said stern to accommodate the operator, propulsion means carried by said hull for propelling said watercraft through the water including a steerable discharge nozzle mounted on said hull near said stern and an engine located forwardly of said operator space, said water-

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craft further comprising a mounting secured to said hull, a raisable steering mast having a lower portion pivotally connected to said mounting and an upper end, said steering mast being moveable between an upright position and a substantially horizontal lower position, steering means for steering said discharge nozzle associated with said steering mast and operable in an upward position of said steering mast by an operator standing in said operator space on said platform, the improvement comprising locking means pivotally connected to said mounting and engageable with the lower portion of said steering mast below where said steering mast is pivotally connected to said mounting for selectively locking said steering mast in said upright position for easy servicing of the engine.

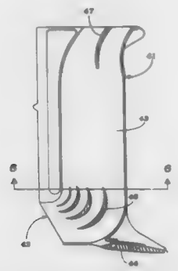


4,989,533

SUPPORT STRUT FOR HYDROFOIL CRAFT

Kotaro Horiuchi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 30, 1989, Ser. No. 374,290
Claims priority, application Japan, Jul. 4, 1988, 63-166488
Int. Cl.[5] B63B *1/26;* **B63H** *11/103*
U.S. Cl. 114—278 **3 Claims**



1. A support strut for a hydrofoil craft having a hull and a support strut depending from said hull to a position beneath the water level, said support strut having a forwardly facing water inlet formed in its lower end, said supporting strut having a triangular shape in planes parallel to said water level at least along the portion of said support column above said water inlet and in proximity to the water level.

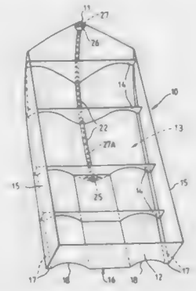
4,989,534

BOAT HULL HAVING STEPPED UNDERSIDE

Leonard E. Field, Steiglitz Wharf Road, Woongoolba Qld 4207, Australia

Filed Sep. 1, 1989, Ser. No. 402,834
Claims priority, application Australia, Sep. 1, 1989, PJ0200
Int. Cl.[5] B63B *1/32*
U.S. Cl. 114—289 **9 Claims**

1. A boat hull having a bow, a keel, an underside and also including at least one transverse step extending at least partly across said hull underside characterized in that there is provided a venting tube which extends from said at least one transverse step substantially adjacent to or contiguous with the hull underside and defining at least partly the longitudinal axis of said keel to form an inlet at or adjacent to the bow.

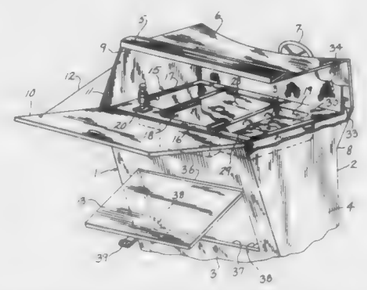


4,989,535

COMBINATION STEERING CONSOLE AND REFRESHMENT CENTER FOR PONTOON BOAT

Alain D. Lacasse, Palm Bay, and Michael T. Lilly, Melbourne, both of Fla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 27, 1989, Ser. No. 427,713
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—343 **18 Claims**



1. A console for a boat, comprising a housing having a first face and an opposed second face, steering means mounting on said first face, said second face having an opening in the upper portion thereof, a counter disposed within the housing and disposed at a level adjacent the lower edge of said opening, a cover to removably enclose said opening, and at least one well formed in said counter.

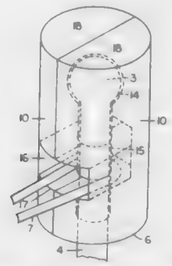
4,989,536

ANTENNA CLAMP

Richard E. Liming, and Treesa V. B. Liming, both of 916 Woodlawn Ave., Springfield, Ohio 45504

Continuation-in-part of Ser. No. 439,184, Nov. 20, 1989, abandoned. This application Jan. 1, 1990, Ser. No. 532,126
Int. Cl.[5] G09F *17/00*
U.S. Cl. 116—173 **4 Claims**

1. An antenna clamp for holding a cord of a banner-like object to a vehicle antenna mast, comprising:
an inner part consisting of complementary halves configured when closed together to form a means rotatably fitting around a vehicle antenna mast and tip to hold said cord around said mast within said inner part, said cord passing through an opening in an outer side surface of said inner part, and
an outer part comprising a one piece cap-like structure fitting tightly over said inner part in order to keep said inner part around said antenna mast and tip and having an orifice in a top surface thereof and an opening arranged and sized to correspond with said opening in said outer side surface of said inner part,
said inner and outer parts being frictionally fitted together so as to keep said outer part securely in place over said inner part until there occurs a sustained pulling of said outer part from said inner part which acts in conjunction with the drawing of air in through said orifice to relieve a partial vacuum formed between said inner and outer parts during removal of said outer part.

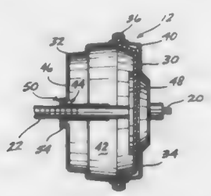


4,989,537

WEAR INDICATOR FOR VEHICLE AIR BRAKES

Jerry W. Hutchinson, Sr., Rte. 1, Box 1568; Jerry W. Hutchinson, Jr., 61 Summit Dr., both of Grandview, Wash. 98930, and James C. McMinimee, 1262 Price Rd., Outlook, Wash. 98938

Filed Aug. 1, 1989, Ser. No. 387,807
Int. Cl.[5] G01D *13/00;* **F16D** *66/02*
U.S. Cl. 116—208 **3 Claims**



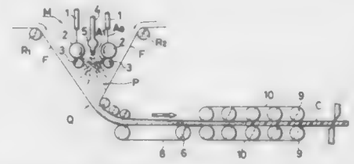
1. A brake wear indicator for a motor vehicle air brake system, the air brake system comprising an actuator having a diaphragm adapted to move within the actuator in response to application of pressurized air to the actuator, a push rod having a first end mechanically coupled to the diaphragm, the push rod extending from the actuator through an opening in a wall thereof, and coupling means for coupling the push rod to a brake of the vehicle, the indicator comprising:
marking means comprising a tubular member having an internal diameter large enough to permit the push rod to extend therethrough, and an outside diameter small enough to permit the tubular member to move through said opening, said marking means having a generally cylindrical outer surface, a longitudinal axis, a distance indicator on the outer surface for indicating distance along said longitudinal axis, and means for securing the marking means to the push rod within said opening, such that the marking means provides a visual indication of the position of the push rod along the longitudinal axis at said opening; said tabular member, when secured, extending along said push rod from a point adjacent said opening into said actuator.

4,989,538

APPARATUS FOR SPRINKLING RESIN COMPOSITION

Katsushige Tamura, Akashi; Shigehiro Yamamoto, Matsubara, and Hideo Saijyo, Takatsuki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 25, 1989, Ser. No. 426,202
Claims priority, application Japan, Oct. 26, 1988, 63-271721; Oct. 26, 1988, 63-271722; Oct. 26, 1988, 63-271723; Oct. 26, 1988, 63-271724
Int. Cl.[5] B05C *5/00*
U.S. Cl. 118—313 **9 Claims**



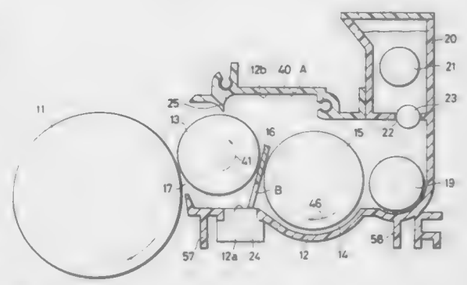
1. A resin composition sprinkling apparatus comprising:
a transfer roller for receiving a supply of liquid resin composition on the circumferential surface thereof; and
a sprinkling roller having the axis thereof disposed parallel with the axis of said transfer roller and rotated in the same direction as said transfer roller for sprinkling said liquid resin composition in finely divided form,
wherein said transfer roller has the circumferential surface thereof held in contact with the circumferential surface of said sprinkling roller rotating in a fixed position and is supported resiliently relative to the circumferential surface of said sprinkling roller for absorbing shocks resulting from contacting rotation; and
wherein said transfer roller includes an outer hollow cylindrical body and an inner rotary body disposed within said outer cylindrical body and connected to a rotational drive source.

4,989,539

DEVELOPING APPARATUS

Yoshiki Ichikawa, Shiki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 4, 1989, Ser. No. 293,415
Claims priority, application Japan, Jan. 6, 1988, 63-813[U]
Int. Cl.[5] G03G *15/09*
U.S. Cl. 118—658 **32 Claims**



30. A developing apparatus comprising:
a developing tank for storing a developing material, said developing tank having a top and bottom;
a developing roller disposed in the developing tank for forming a magnetic brush thereon,
a stirring member for stirring the developing material in the

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developing tank and for transporting the developing material toward the developing roller; and

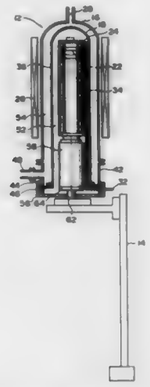
means for separating the developing roller and stirring member and for ensuring even flow of developing material and uniform developing material concentration along an axial direction of the developing roller.

4,989,540

APPARATUS FOR REACTION TREATMENT

Noboru Fuse, Yokohama, and Hirofumi Kitayama, Kanagawa, both of Japan, assignors to Tel Sagami Limited, Kanagawa, Japan

Filed Aug. 11, 1989, Ser. No. 392,597
Claims priority, application Japan, Aug. 17, 1988, 63-204447
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—719 11 Claims



1. A treatment apparatus which performs reaction treatment of an object by causing a reaction gas to flow into a reaction vessel, comprising:

division means removably disposed in the reaction vessel and dividing the inside of the reaction vessel into at least first and second spaces, said first space including a reaction region holding the object of treatment;

means for allowing the reaction region to communicate with the second space, inside the reaction vessel;

reaction gas supply means for supplying the reaction gas directly to the reaction region;

cleaning gas supply means for supplying a cleaning gas directly to the second space; and

exhaust means connected to the reaction vessel and adapted to discharge the gas directly from the second space;

wherein said reaction gas and said cleaning gas are supplied while the flow of the gases inside the reaction vessel is controlled, so that the pressure inside the reaction region is higher than the pressure inside the second space, during the reaction treatment.

4,989,541

THIN FILM FORMING APPARATUS

Nobuo Mikoshiba, 30-18, Yagiyama-Honcho 2-chome, and Kazuo Tsubouchi, 30-38, Hitokita 2-chome, both of Sendai-shi, Miyagi-ken, Japan

Filed Feb. 14, 1990, Ser. No. 479,941
Claims priority, application Japan, Feb. 23, 1989, 1-41891
Int. Cl.[5] C23C *16/48*
U.S. Cl. 118—723 7 Claims

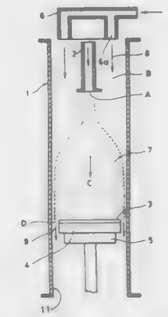
1. A thin film forming apparatus of a pressure-reduced reaction type for forming a thin film on a substrate under a pressure reduced condition, comprising:

a reaction chamber;

substrate support means for supporting the substrate in said reaction chamber, said support means including a heating susceptor having an outer circumferential margin which is spaced by a gap from an inner wall surface of said reaction chamber;

a material gas nozzle which is located directly above said substrate and ejects a material gas flow into said chamber toward said substrate perpendicular to an upwardly facing major surface of said substrate; and

means for preventing said material gas flow from engaging walls of said chamber as it travels from said material gas nozzle to said substrate, including a control gas nozzle which is disposed above said substrate and encircles said



material gas nozzle, said control gas nozzle ejecting into said chamber a control gas flow which encircles said material gas flow and which forcibly re-orients laterally expanding portions of said material gas flow in a direction toward said substrate;

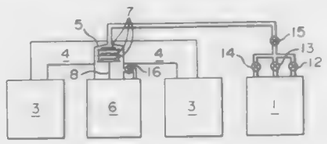
wherein said chamber has a gas outlet on an opposite side of said susceptor from said material gas nozzle, said outlet having a diameter larger than the width of said susceptor, wherein said material gas flow at the exit of said material gas nozzle has a speed faster than that of said control gas flow adjacent thereto, and wherein the total gas flow passing through said gap has a speed faster than a speed of the total gas flow above said substrate.

4,989,542

APPARATUS FOR SYNTHESIZING DIAMOND

Mutsukazu Kamo, Tsuchiura, Japan, assignor to National Institute for Research in Inorganic Materials, Tsukuba, Japan

Filed May 24, 1988, Ser. No. 197,916
Claims priority, application Japan, Jul. 21, 1987, 62-181790
Int. Cl.[5] C23C *16/48, 16/50*
U.S. Cl. 118—723 8 Claims



1. An apparatus for synthesizing diamond, which comprises:

(a) a reaction chamber,

(b) means for supplying to the reaction chamber a gas mixture comprising hydrogen gas and an organic compound decomposable by a plasma to form diamond, or a gas mixture comprising hydrogen gas, an inert gas and said organic compound,

(c) means of conducting a microwave having a frequency larger than 300 MHz to the reaction chamber to generate a microwave plasma in the gas mixture, and

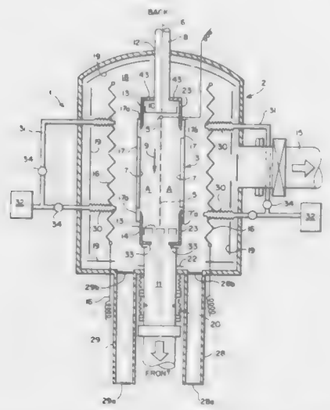
(d) one or more substrates held by one or more substrates holders to locate in the microwave plasma and on which said diamond is to be formed, wherein said microwave conducting means is designed to introduce the microwave to the reaction chamber from a plurality of directions, and further wherein a microwave absorber is placed around said one or more substrates, to the shape thereof.

4,989,543

PROCESS AND MEANS FOR PRODUCING FILMS FOR USE IN ELECTRONICS AND/OR OPTOELECTRONICS USING PLASMA

Jacques Schmitt, La Ville Du Bois, France, assignor to Solems (S.A.), Palaiseau, France

Filed Oct. 14, 1988, Ser. No. 257,905
Claims priority, application France, Oct. 15, 1987, 87 14245
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—723 4 Claims



1. Apparatus for producing thin films using a plasma deposit processing comprising:

a non-airtight enclosure in which the prevailing pressure is less than the atmospheric pressure for containing at least one substrate;

means for creating a plasma zone containing said at least one substrate within said enclosure, said means comprising at least one electrode connected to an electric power source;

means for introducing film producing gaseous reagents into said plasma zone;

means for removing the non-deposited residual portion of said gaseous reagents from said enclosure after said reagents have remained for a given period of time within said plasma zone;

an airtight chamber surrounding said enclosure, said chamber being kept at a pressure lower than the pressure within said enclosure;

means for heating said enclosure, said means being disposed within a space separating said enclosure form said chamber, for maintaining walls of said chamber at a temperature that is lower than the temperature of said enclosure; and,

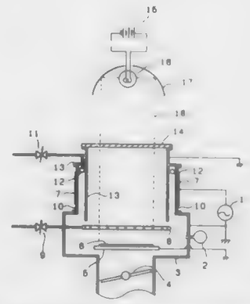
two obstacles that restrict the flow of the film-producing gaseous reagents into said enclosure through two openings in said enclosure, said obstacles being situated at opposite ends of said enclosure into which and from which said gaseous reagents are moved at least one of which is adjusted from outside said chamber to change the size of a respective opening.

4,989,544

APPARATUS FOR FORMING FUNCTIONAL DEPOSITED FILMS BY WAY OF HYBRID EXCITATION

Toshiaki Yoshikawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1990, Ser. No. 469,393
Claims priority, application Japan, Jan. 26, 1989, 1-14995; Dec. 28, 1989, 1-338400
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 7 Claims



1. In an apparatus for forming a deposited film on a substrate by the hybrid excitation chemical vapor deposition method, said apparatus comprising a substantially enclosed reaction vessel having means for holding said substrate thereon, a plasma generating means and means for irradiating light through a light introducing window provided with said reaction vessel to the surface of said substrate in said reaction vessel; the improvement that at least part of the circumferential side wall of said reaction vessel is hermetically constituted by an insulating member having an external cathode electrode member on the outer surface thereof, said external cathode electrode member being electrically connected to a high frequency power source, an internal electrode member to serve as the anode is installed in said reaction vessel at a position opposite to said external cathode electrode member, said internal electrode member being electrically grounded, said means for holding the substrate is positioned below said internal electrode member, said reaction vessel is provided with a gas feed pipe for supplying a raw material gas capable of producing a plasma which is open into the space between said insulating member and said internal electrode member, a light source for irradiating light to the surface of said substrate is disposed above said internal electrode member such that the path of said light is made coaxial with said reaction vessel, and said reaction vessel is provided with a gas feed pipe having a plurality of gas spouting holes for supplying a film-forming raw material gas above said means for holding the substrate.

4,989,545

VENTILATED CAGE AND OPEN RACK SYSTEM

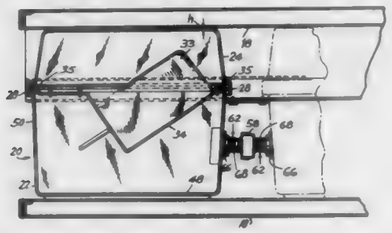
John E. Sheaffer, Perryville, and Eric A. Deitrich, Woodbine, both of Md., assignors to Lab Products, Inc., Maywood, N.J.

Filed Apr. 27, 1990, Ser. No. 515,803
Int. Cl.[5] A01K *1/00*
U.S. Cl. 119—17 19 Claims

1. A ventilated cage and rack system comprising a ventilated rack, said rack including a plurality of plenum shelf means for conveying air to a plurality of predetermined air positions within said ventilated rack, at least one cage for housing at least one animal therein, said at least one cage being a cage level barrier having a bottom portion and an upstanding sidewall and a filter bonnet positioned on said sidewall, and canopy cage guides for positioning at least one of said cages at at least one of said predetermined air positions, said cage guides having substantially the same shape as said filter bonnet and being

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disposed to form a friction fit with a portion of said bonnet while maintaining a gap between said filter bonnet and said



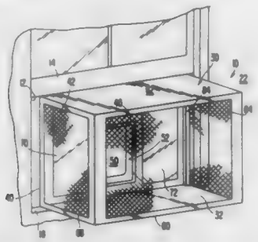
plenum shelf means, said shelf plenum means removing air disposed adjacent said filter bonnet.

4,989,546

PET REFUGE

Ted Cannaday, 1010 Middle St., Sullivan's Island, S.C. 29482

Filed Jul. 24, 1989, Ser. No. 383,600
Int. Cl.[5] A01K *1/03*
U.S. Cl. 119—19 **8 Claims**



1. A pet refuge for installation in a window opening, which window opening is between an interior space and an outside area, the pet refuge comprising:

(a) a projecting enclosure projecting into the outside area beyond the window opening, said projecting enclosure being at least partially perforate so as to freely admit outside air into the enclosure and so as to allow a pet in the enclosure to view the outside area, said projecting enclosure partially defining a pet dwelling space therewith;

(b) said projecting enclosure having a side defining a threshold area, said threshold area constituting a boundary of said pet dwelling space, across which boundary the pet will cross to enter the pet dwelling space;

(c) a closed threshold wall which is at least partially transparent and which extends across said threshold area and seals said pet dwelling space with respect to the interior space disposed inside the window opening, so that outside air admitted into the pet dwelling space is not admitted into the interior space, whereby said closed threshold wall acts as a closed barrier between said interior space and said outside area;

(d) a door in said threshold wall, said door being openable to permit the pet to pass freely between the interior space and the pet dwelling space, said door also being closable to maintain the seal between the pet dwelling space and the interior space.

4,989,547

LIQUID AND SOLID DISPENSER APPARATUS AND METHOD

Mark Eaton, 143 Casa Loma Ct., Georgetown, Tex. 78628

Filed Apr. 28, 1989, Ser. No. 344,762
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—51.11 **15 Claims**

1. A liquid and solid dispenser mechanism comprising:

A. a frame;

B. a motor means mounted on said frame;

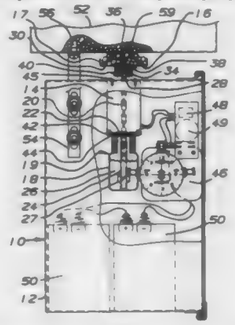
C. a solid dispenser means;

D. a liquid dispenser means;

E. a means interconnecting said soild dispenser means and said liquid dispenser means for rotating said solid dispenser means and liquid dispenser means when said motor means is operating so that solids and liquids are dispensed;

F. a timer means connected to said motor means so that said motor is alternately turned on and off at pre-determined intervals;

G. said solid dispenser means comprising a primary dispenser containing stored solids and a secondary dispenser with a base plate and sidewalls, said sidewalls being fixedly secured to said base plate, said secondary dispenser base plate and sidewalls forming an enclosure for holding said solids prior to rotation;



H. said liquid dispenser means comprising a liquid container, and said secondary dispenser base plate with at least one radial outlet, said liquid container and secondary dispenser base plate connected by said interconnecting means wherein said interconnecting means is a hollow shaft so that as said shaft is rotated liquid is drawn through said shaft and is dispensed from said radial outlet; and

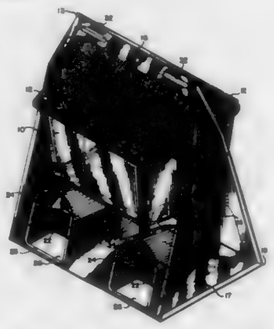
I. a liquid flow valve attached to said shaft so that the flow of liquid is regulated.

4,989,548

INSTANT/DISPOSABLE WILD BIRD FEEDER

Leonard V. Short, 31 Crestview Dr., Jaffrey, N.H. 03452, and Raymond Friedman, 5944 St. Agnes Dr., Plano, Tex. 75093

Filed Feb. 12, 1990, Ser. No. 484,217
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—52.2 **3 Claims**



1. An instant/disposable bird feeder comprising a blister pack formed from a single piece of material, said blister pack including an upper main portion having two substantially vertical outward walls being formed by folding two identical halves together and two substantially horizonal bottom walls containing bird food, and a recessed lower portion into which bird food is free to flow by gravity from the upper main portion through a narrowed reservoir exit aperture into two distinct feeding trays, said flow being regulated by a diverter means to ensure even distribution of the seed, and four perches,

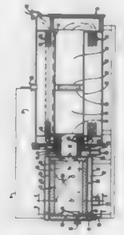
integral with the lower portion, said lower portion begin in the form of a recess containing four ports which provide access for a bird to bird food.

4,989,549

ULTRA-LOW NOX COMBUSTION APPARATUS

Jacob Korenberg, York, Pa., assignor to Donlee Technologies, Inc., York, Pa.

Filed Oct. 11, 1988, Ser. No. 255,994
Int. Cl.[5] F22B *7/12*
U.S. Cl. 122—149 **45 Claims**



1. A combustion apparatus for minimizing the formation of NO_x, the apparatus comprising:

an elongated combustion vessel having along its axial length a first and second combustion portion for sub-stoichiometric and above-stoichiometric combustion, respectively, the first and second portions being in communication and the combustion vessel including a substantially cylindrical wall;

means for supplying fuel into the first portion of said combustion vessel;

means for supplying a first stream of air into said first portion of said combustion vessel in an amount sufficient to form a fuel rich ratio for sub-stoichiometric combustion within the first portion of said combustion vessel;

means for tangentially supplying a second stream of air into the second portion of said combustion vessel to mix with the sub-stoichiometric combustion product gases and create a swirling air flow for above-stoichiometric combustion in said second combustion portion;

means for forming a cyclonic flow pattern of hot gases within at least one of said first and second combustion portions of said combustion vessel;

a cooling chamber extending rearwardly of the second portion of the combustion vessel for cooling the exhaust gases exiting from the second portion;

a gas swirler disposed between the second portion of the combustion vessel and the cooling chamber for promoting a swirling air flow thereby enhancing heat transfer; and

heat exchange means surrounding at least the second portion of said combustion vessel for maintaining the temperature in the combustion vessel at less than about 2000° F. throughout its operation.

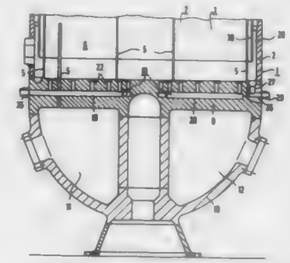
4,989,550

STEAM GENERATOR

Zvonimir Sterk, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 269,236, Nov. 9, 1988, Pat. No. 4,883,036. This application Oct. 31, 1989, Ser. No. 429,848
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738347
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] F22B *37/48*
U.S. Cl. 122—383 **6 Claims**

1. Steam generator, comprising a vertically elongated housing, a horizontal tube plate in said housing, and a U-shaped tube bundle in said housing, said tube bundle having mutually spaced apart legs defining an intermediate space therebetween and tube ends disposed in said tube plate, said tube plate having a horizontal blow-down line formed therein and said tube plate



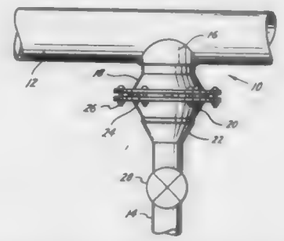
having holes formed therein leading from said blow-down line into said intermediate space.

4,989,551

WATER DIFFUSION PLATE FOR INJECTING WATER INTO STEAM

Hugh M. Sardoff, and Hung Q. Bui, both of Bakersfield, Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 25, 1990, Ser. No. 469,988
Int. Cl.[5] F22B *37/42*
U.S. Cl. 122—504 **5 Claims**



1. In a stream system in which residual cold water encounters hot steam headers during system startup, means to reduce condensation shock comprising:

a diffusion plate mounted in a steam generator discharge pipe in close proximity to an intersection within said steam system, said plate having a patterned array of apertures, said apertures being of sufficient number to not unduly restrict flow of water through said diffusion plate while breaking up residual cold water passing therethrough into a plurality of discrete water streams whereby the total surface area of the residual cold water exposed to the steam is substantially increased thus allowing more rapid heat transfer and reduction in condensation shock.

4,989,552

AIR-COOLED INTERNAL COMBUSTION ENGINE

Bertram Obermayer, and Wolfgang Kling, both of Graz, Austria, assignors to AVL Gesellschaft fiir Verbrennungskraftmaschinen und Messtechnik m.b.H., Prof.Dr.Dr.h.c. Hans List

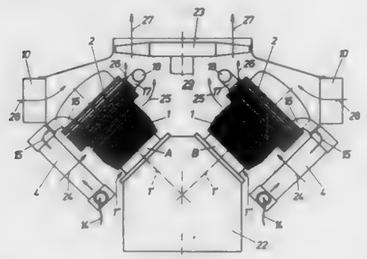
Filed Jan. 26, 1990, Ser. No. 470,588
Claims priority, application Austria, Feb. 7, 1989, 257/89
Int. Cl.[5] F01P *7/06*
U.S. Cl. 123—41.66 **3 Claims**

1. An air-cooled internal combustion engine which comprises:

two elongated cylinder banks arranged in a Vconfiguration to define a space therebetween, each cylinder bank including cylinder units which consist of cylinders and cylinder heads, each of said two cylinder banks defining an inner

side facing said space and an outer side opposite said inner side,

an elongated intercooler extending along the outer side of each of said cylinder banks for supplying an air charge from a compressor of an exhaust gas turbocharger to the cylinders of each cylinder unit, and



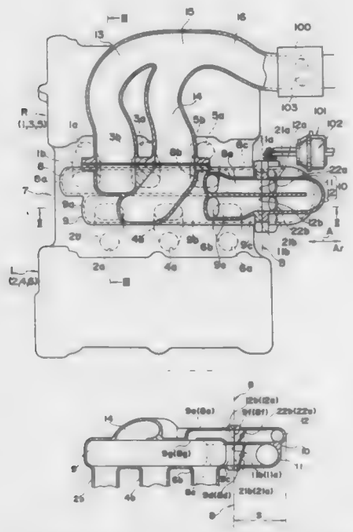
a blower located in said space between said cylinder banks for causing external cooling air to flow into said engine, the entirety of said external cooling air which passes through said cylinder banks first passing said intercoolers.

4,989,553

AIR INTAKE DEVICE OF ENGINE

Kazuhiko Ueda, Higashi-Hiroshima; Toshimitsu Tanaka, Kuga; Hiroyuki Oda, Hiroshima; Toshihiko Hattori, Hiroshima, and Mikihito Fujii, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 31, 1989, Ser. No. 429,366
Claims priority, application Japan, Oct. 31, 1988, 63-275889
Int. Cl.[5] F02B *75/18*
U.S. Cl. 123—52 MV 44 Claims



1. An air intake device for an engine having intake pipes connected to respective cylinders divided into first and second groups to prevent the continuance of intake strokes of adjacent cylinders, a first means for connecting intake pipes of the first group of cylinders, and a second means for connecting intake pipes of the second group of cylinders, said first and second connecting means being arranged parallel to each other, for effecting supercharging by utilizing the dynamic effect of intake air into each cylinder, said air intake device comprising:

an upstream intake system arranged at an upstream side of said first and second connecting means, said upstream intake system including upstream intake branch pipes joined at upstream ends thereof to each other at a junction and connected at downstream ends thereof to upper sides of said first and second connecting means, and an upstream intake main pipe connected at a downstream end thereof to said junction of said upstream intake branch pipes and at an upstream end thereof to the atmosphere, with a throttle valve being installed therein;

a first communicating passage connected at one end thereof to a longitudinal end of said first connecting means and at another end thereof to a longitudinal end of said second connecting means at the same end thereof;

a second communicating passage arranged at the same end as said first communicating passage relative to said first and second connecting means, said second communicating passage being connected at one end thereof to a side of said first connecting means and at another end thereof to a side of said second connecting means;

said first communicating passage having an effective length shorter than that of said second communicating passage; and

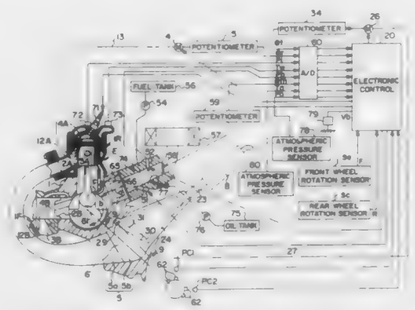
first and second opening and closing means positioned for opening and closing independently communication between said first and second connecting means and said first and second communicating passages.

4,989,554

FUEL INJECTION CONTROLLING DEVICE FOR TWO-CYCLE ENGINE

Kazumitsu Kushida, Tokyo; Kudou Osamu, Asaka; Sumitaka Ogawa, Oomiya, and Hiroshi Uike, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,529
Claims priority, application Japan, Feb. 23, 1989, 1-41825
Int. Cl.[5] F02D *17/00, 41/26*
U.S. Cl. 123—73 A 6 Claims



1. A fuel injection controlling device for a two-cycle engine including an electronic fuel injection system comprising:

fuel injection quantity determining means for determining a fuel injection amount in response to a rotational speed of said engine and a throttle opening;

misfire detecting means for detecting a misfire condition of said engine; and

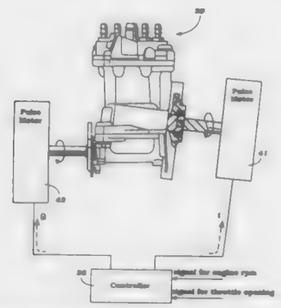
means for decreasing the amount of fuel injection upon transition from a misfire condition to a fired condition.

4,989,555

LUBRICANT SUPPLY FOR TWO CYCLE ENGINE

Noritaka Matsuo, and Hideaki Ito, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 30, 1990, Ser. No. 472,341
Claims priority, application Japan, Feb. 1, 1989, 1-20820
Int. Cl.[5] F01M *1/00*
U.S. Cl. 123—73 AD 14 Claims



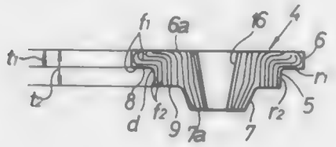
1. In a lubricating system for a reciprocating machine comprising a cyclically operable lubricant pump having a variable output per cycle, and means for varying the speed of said pump for varying the timing of said output, and control means for maintaining the output of said pump constant and the timing of the output variable under one range of running conditions and for holding the timing of operation constant and varying the output stroke within another range of engine operation.

4,989,556

VALVE SPRING RETAINER FOR VALVE OPERATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Haruo Shiina; Masami Hoshi, and Tadayoshi Hayashi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 414,692
Claims priority, application Japan, Oct. 7, 1988, 63-253373; Oct. 7, 1988, 63-253374; Oct. 11, 1988, 63-255627; Oct. 11, 1988, 63-255697
Int. Cl.[5] F01L *3/10*
U.S. Cl. 123—90.67 39 Claims



1. A valve spring retainer of a poppet valve operating mechanism for an internal combustion engine, comprising:

a matrix formed from a quenched and solidified aluminum alloy powder; and

a hard grain dispersed in said matrix;

said hard grain being at least one selected from the group consisting of grains of Al_2O_3, SiC, Si_3N_4, ZrO_2, SiO_2, TiO_2, Al_2O_3—SiO_2 and metal Si;

the amount of hard grain added being in a range of from 0.5% to 20% by weight; and

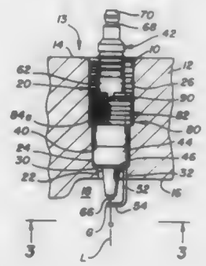
the area rate of said hard grain being in a range of from 1% to 6%.

4,989,557

SPARK PLUG ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Keith A. Penney, Davison, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1990, Ser. No. 513,300
Int. Cl.[5] F02P *15/00*
U.S. Cl. 123—169 EL 10 Claims



1. An internal combustion engine comprising: (a) a cylinder head having an outer wall, an inner wall forming at least a portion of a combustion chamber, a spark plug-receiving bore between the outer and inner walls and having a bore axis, said bore having an annular seat disposed between the outer and inner walls generally facing the outer wall and an axial slot extending between the seat and the cylinder head inner wall, (b) a spark plug assembly received in the bore, said spark plug assembly comprising a ground electrode element having an annulus disposed on the seat and an elongated ground electrode extending from the annulus and received in said slot for protruding into the combustion chamber, and a center electrode element having a center electrode and a surrounding insulator body, said insulator body having an annular shoulder for engaging the annulus, said center electrode protruding into the combustion chamber and spaced apart from the ground electrode in said combustion chamber, and (c) locking means for cooperatively engaging the cylinder head and the insulator body to clamp the insulator body shoulder against the annulus on said seat, thereby securing the center electrode element and the ground electrode element in position in said cylinder head bore.

4,989,558

SPHERICAL ROTARY VALVE ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

George J. Coates, 2500 Belmar Blvd., Wall Township, Manmouth County, N.J. 07719

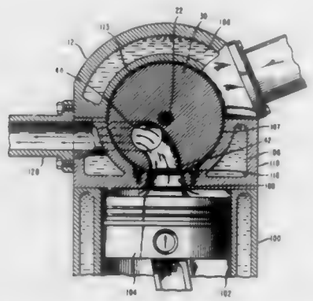
Continuation of Ser. No. 270,037, Nov. 14, 1988, Pat. No. 4,953,527. This application Sep. 14, 1989, Ser. No. 409,037
Int. Cl.[5] F01L *7/02*
U.S. Cl. 123—190 D 13 Claims

1. An improved rotary intake valve for use in a rotary valved internal combustion engine, which comprises:

a drum body of spherical section formed by two parallel planar side walls of a sphere disposed about a center thereof thereby defining a spherically-shaped end wall and formed with a shaft receiving aperture, said drum

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body formed with a circularly-shaped cavity in a side wall thereof and with a channel extending between said circularly-shaped cavity and an aperture formed in said spherically-shaped end wall.

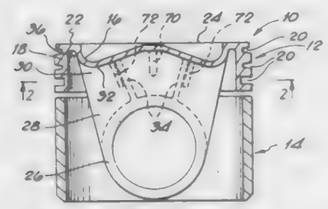


4,989,559

PISTONS FOR INTERNAL COMBUSTION ENGINES

David F. Fletcher-Jones, Burley, England, assignor to Wellworthy Limited, Manchester, England

Filed Oct. 4, 1989, Ser. No. 417,073
Claims priority, application United Kingdom, Oct. 15, 1988, [redacted]
Int. Cl.[5] F02F *3/00*
U.S. Cl. 123—193 P 10 Claims



1. A piston for an internal combustion engine, the piston comprising a crown having an associated piston ring groove belt and which crown is supported by gudgeon pin bosses connected thereto by two generally axially extending planar webs which are orientated transversely to the gudgeon pin axis and also supported by two subsidiary support ribs associated with each planar web and pin boss and which support ribs lie on the radially outer faces of said planar webs and extend in a generally axial direction from the crown underside and generally transversely to said planar webs.

4,989,560

AUTOMOTIVE ENGINE OIL LEVEL SURVEILLANCE SYSTEM

Marlin C. Rasdal, Keno; Virgil J. Rasdal, Klamath Falls, and Mark C. Bates, Sandy, all of Oreg., assignors to Tech. Telesis Ltd., Klamath Falls, Oreg.

Filed Oct. 3, 1989, Ser. No. 416,496
Int. Cl.[5] F01M *1/00*
U.S. Cl. 123—196 S 4 Claims

1. An engine crankcase oil surveillance system with restoration of oil sufficiency if needed, for use with an engine having a sump and an ignition system, comprising

a vertical oil detection member extending down to and into said pump;

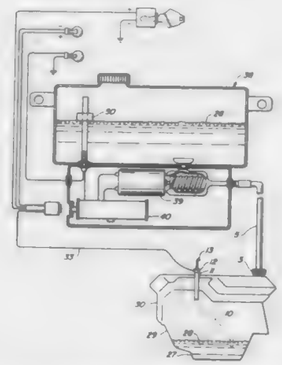
timing means set for a specific period of time after initiation;

timer initiation means for initiating said timing means upon shut-off of said engine ignition system that has been on;

oil level indicating means including a dip stick tube activated upon said timed period having taken place, for determining the oil level in said sump;

a reserve oil reservoir;

pump means connected to said reservoir for supplying reserve oil from said reservoir to said sump;



control means connected to said oil indicating means for activating said pump means upon indication by said oil level indicating means that the oil level in said sump is below a predetermined level; and

for cutting off fluid from said reservoir to said sump when said sump is filled to said predetermined level;

liquid level sensor means in said reservoir; and

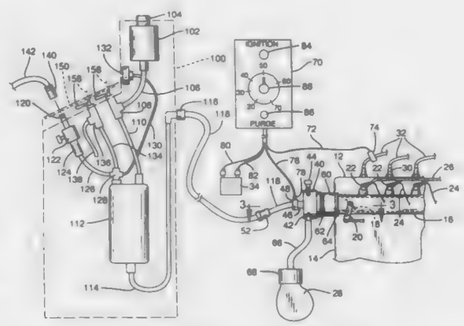
switch means responsive to said sensor means for turning off said pump means when oil in said reservoir is exhausted or nearly exhausted.

4,989,561

METHOD AND APPARATUS TO CLEAN THE INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Steven R. Hein, Vancouver, Wash.; Sidney R. Clack, Molalla, Oreg., and Joel L. Burrows, Sterling, Va., assignors to Precision Tune, Inc., Sterling, Va.

Filed May 11, 1990, Ser. No. 522,430
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 A 21 Claims



1. An apparatus for cleaning the intake system of an internal combustion engine comprising:

an air metering block having air passage means therein including an air outlet;

an adapter means to connect the outlet of said air metering block to the intake system of the engine;

air inlet means in said block communicating with said air passage means, an adjustment means within said air metering block for controlling the amount of air introduced into said air passage means;

an injector means for connection to the intake system of an engine for injecting a solvent into the intake system of the engine; and

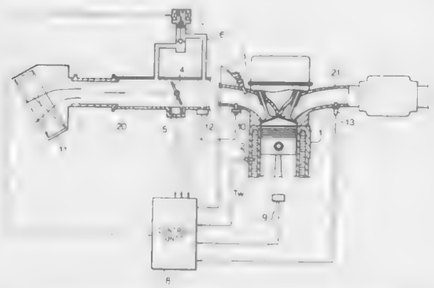
a control means for controlling said injector means to vary the amount of solvent injected into the intake system of the engine by said injector means.

4,989,562

TROUBLE DETECTOR SYSTEM FOR AN INTAKE SYSTEM OF AN AUTOMOTIVE ENGINE

Hiroya Ohkumo, and Shuji Miyama, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 300,108
Claims priority, application Japan, Feb. 16, 1988, 63-033200
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D 6 Claims



1. A trouble detecting system for detecting trouble of an intake system of an engine having a fuel supply means for supplying fuel to the engine and engine operating condition detecting means for producing first, second and third parameter signals respectively depending on first, second and third parameters representing engine operation conditions, and said parameter signals at least including an engine speed signal depending on engine speed, the trouble detecting system comprising:

setting means responsive to said first and second parameter signals for setting a reference value and for producing a reference value signal;

comparing means responsive to said reference value signal and said third parameter signal for producing a fail-safe signal when the third parameter exceeds said reference value; and

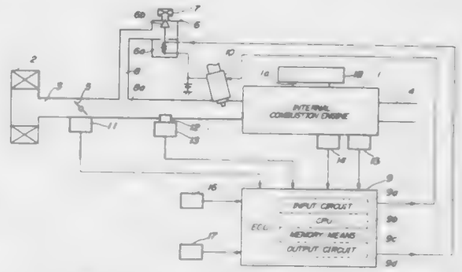
determining means responsive to said fail-safe signal and said engine speed signal for applying a fuel cut signal to said fuel supply means to cut off the fuel whenever said engine speed exceeds a predetermined value, and respectively, for enabling the supplying of the fuel whenever said engine speed falls below said predetermined value, whereby during the trouble said predetermined value prevents a vehicle having said engine from unexpectedly suddenly starting and maintains a minimum driving ability so as to enable moving the vehicle to a safe place.

4,989,563

AUXILIARY AIR AMOUNT CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES AT DECELERATION

Yohji Fukutomi, and Youichi Iwata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,572
Claims priority, application Japan, Aug. 3, 1988, 63-193627
Int. Cl.[5] F02D *41/12*
U.S. Cl. 123—327 19 Claims



1. An auxiliary air amount control system for an internal combustion engine having an output shaft, a transmission connected to said output shaft, an intake passage, and a throttle valve arranged in said intake passage, said system including an auxiliary air passage bypassing said throttle valve, a control valve for controlling an amount of auxiliary air supplied to said engine through said auxiliary air passage by varying an opening of said auxiliary air passage, valve opening-setting means responsive to an opening of said throttle valve for setting an opening of said control valve, and valve opening-progressively decreasing means for progressively decreasing the opening of said control valve from a value thereof set by said valve opening-setting means as an initial value when said engine is in a predetermined decelerating condition,

the improvement comprising:

reduction ratio-detecting means for detecting a reduction ratio assumed by said transmission; and

valve opening-varying means for varying the opening of said control valve set by said valve opening-setting means to a larger value as the reduction ratio detected by said reduction ratio-detecting means is larger, to thereby increase the opening of said control valve.

4,989,564

IDLE AIR BYPASS

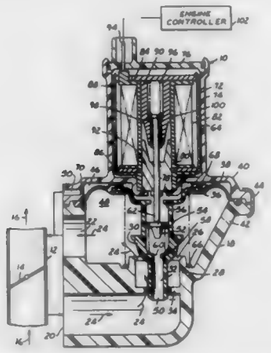
John E. Cook, and Ronald F. Mitchell, both of Chatham, Canada, assignors to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada

Filed Jan. 10, 1990, Ser. No. 463,093
Int. Cl.[5] F02M *3/00*
U.S. Cl. 123—339 27 Claims

1. In an internal combustion engine having a main induction air passage through which combustion air is inducted when the engine is operating at non-idle, an electronic control system that exercises control over certain functions associated with engine operation, and an idle air bypass valve assembly comprising an idle air passage bypassing that portion of the main induction air passage which contains a throttling mechanism for the main induction air passage, an idle air control valve for selectively controlling idle air flow through said idle air passage, a mechanism for operating said idle air control valve comprising a transducer having an armature means that is selectively positionable along a path of travel in accordance with the value of a control signal issued by the electronic control system, the improvement in said idle air bypass valve assembly which comprises a movable wall that separates two variable volume chambers from each other and that is selec-

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tively positionable in accordance with the respective volumes of said variable volume chambers to select the degree of restriction imposed by said idle air control valve on flow through said idle air passage, one of said variable volume chambers forming a portion of said idle air passage and the other of said variable volume chambers forming a portion of a flow path that parallels said idle air passage and comprises two orifices in



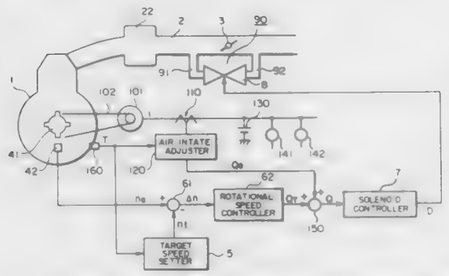
series, one orifice being disposed upstream of said other variable volume chamber and the other downstream of said other variable volume chamber, and a valve mechanism that is operable by a means that includes said armature means to regulate flow through said flow path that parallels said idle air passage, said other of said two orifices imposing a greater restriction on flow through said flow path that parallels said idle air passage than does said one orifice.

4,989,565

SPEED CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Setsuhiro Shimomura; Akira Demizu, both of Himeji, and Hitoshi Inoue, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433,298
Claims priority, application Japan, Nov. 9, 1988, 63-284437; Nov. 26, 1988, 63-298734
Int. Cl.[5] F02M *3/06*; H02P *9/04*
U.S. Cl. 123—339 6 Claims



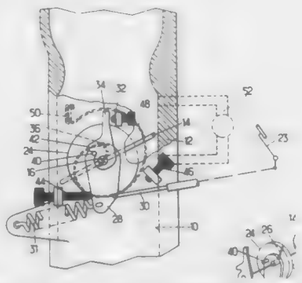
1. A rotational speed control apparatus for an internal combustion engine which drives a generator, comprising:
an air bypass passage which bypasses a throttle valve of the engine and through which engine intake air can enter the engine;
a bypass valve for controlling the flow of air through the air bypass passage;
a rotational speed sensor for sensing the actual rotational speed of the engine;
a target speed setter for setting a target rotational speed of the engine;
a rotational speed controller responsive to the rotational speed sensor and the target speed setter for calculating the air flow rate through the air bypass passage necessary to make the actual rotational speed equal the target rotational speed;
a current sensor for sensing the output current of the generator;
air intake adjusting means responsive to the current sensor for calculating the change in the air flow rate through the air bypass passage necessary to prevent the engine rotational speed from being changed from the target rotational speed by the operation of the generator; and
bypass valve control means responsive to the rotational speed controller and the air intake adjusting means for controlling the bypass valve so that the air flow rate through the air bypass passage equals the total of the air flow rate calculated by the rotational speed controller and the change in the air flow rate calculated by the air intake adjusting means, wherein the air intake adjusting means comprises means for calculating the change in the air flow rate as a function of the rate of change of the generator output current.

4,989,566

THROTTLE MEMBER CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE FUEL SUPPLY INSTALLATION

Philippe Wallerand, Sartrouville, France, assignor to Solex, Nanterre Cedex, France

Filed Oct. 30, 1989, Ser. No. 429,086
Claims priority, application France, Nov. 25, 1988, 88 15446
Int. Cl.[5] F02D *9/10*
U.S. Cl. 123—339 7 Claims



1. A device for controlling a throttle member for a fuel supply system of an internal combustion engine, comprising:
first sensor means, operatively connected to a driver actuatable member, for delivering an electrical signal representative of the position of said driver actuatable member;
an electric actuator mechanically connected to the throttle member for moving said throttle member;
second sensor means, mechanically connected to said throttle member, for delivering an electrical signal representative of the position of said throttle member;
an electric control circuit, having inputs connected to receive said electric signals from said first and second sensor means, for energizing said actuator to provide biassing of said throttle member to a position which depends on the position of the driver actuatable member; and
movable stop means mechanically connected to the driver actuatable member and limiting the amount of movement of the throttle member in the opening direction;
said driver actuatable member having a rest position so selected as to leave said electric actuator free to move said throttle member within a restricted range, selected to correspond to the amount of movement necessary for the regulation of idling speed responsive to the load of an engine supplied by said fuel supply system and to forced

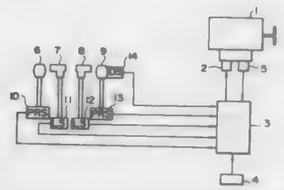
partial opening of the throttle member for starting and cold running.

4,989,567

ENGINE SPEED CONTROLLING SYSTEM IN CONSTRUCTION MACHINE

Jun Fujioka, Hiroshima, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 19, 1989, Ser. No. 381,966
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—385 4 Claims



1. In a construction machine having an engine speed setting device, a throttle lever for instructing a set number of revolutions to said engine speed setting device, a plurality of actuators and a plurality of operation levers each for instructing the operation of a respective actuator, an engine speed controlling system including:
lever neutral detecting means for detecting a neutral condition of said operating levers and outputting a lever neutral signal when all of said operating levers are in a neutral condition;
deceleration command issuing means for outputting a deceleration command signal when operated by an operator; and
control means for outputting to said engine speed setting device one of a normal operation command at the set number of revolutions provided by said throttle lever and a deceleration command at a small number of revolutions in accordance with the signals provided from said lever neutral detecting means and said deceleration command issuing means,
said control means comprising means for outputting the deceleration command to said engine speed setting device only when said control means has received the deceleration command signal from said deceleration command issuing means during issuance of the lever neutral signal from said lever neutral detecting means, said control means further comprising means for outputting the normal operation command to said engine speed setting device when the lever neutral signal from said lever neutral detecting means has been extinguished.

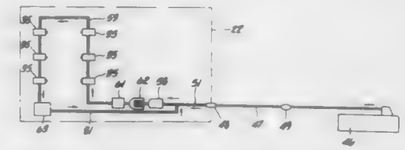
4,989,568

FUEL INJECTION SYSTEM FOR OUTBOARD MOTORS

Masafumi Sougawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 783,004, Oct. 2, 1985, abandoned. This application Jul. 22, 1987, Ser. No. 77,017
Claims priority, application Japan, Nov. 13, 1984, 59-237648
Int. Cl.[5] F02B *33/04*; F02M *39/00*
U.S. Cl. 123—456 19 Claims

1. An outboard motor fuel supply system, said outboard motor having a power head comprising an internal combustion engine and a surrounding protective cowling, a charge forming means for said internal combustion engine, propulsion means driven by said internal combustion engine from powering an associated watercraft through the water, a fuel tank for supplying fuel to said charge forming means, said fuel tank being positioned remotely from said power head and outside of said protective cowling, and conduit means for supply fuel from said fuel tank to said charge forming means, the improvement comprising pressure responsive valve means contained within said power head for regulating the pressure of fuel



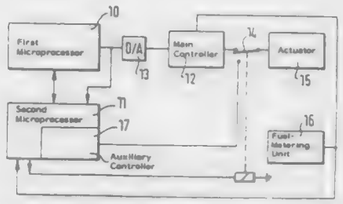
delivered from said fuel tank to said charge forming means including means for recycling excess fuel back to said conduit means and within said power head protective cowling.

4,989,569

FUEL-METERING SYSTEM HAVING A REDUNDANT CONTROL ARRANGEMENT

Franz Eidler, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1990, Ser. No. 516,980
Claims priority, application Fed. Rep. of Germany, May 2, 1989, 3914458; Jan. 27, 1990, 4002389
Int. Cl.[5] F02D *41/22*
U.S. Cl. 123—479 8 Claims



1. A fuel-metering system for an internal combustion engine, the fuel-metering system comprising:
a fuel-metering unit for measuring and metering fuel to the engine;
an actuator for adjusting said fuel-metering unit;
first means for supplying a fuel-quantity desired value signal;
main controller means for receiving said fuel-quantity desired value signal and for producing a first drive signal for driving said actuator;
auxiliary controller means for producing a second drive signal for driving said actuator;
switch-over means switchable in response to a switching signal for switching between a first position wherein said main controller means is connected to said actuator and a second position wherein said auxiliary controller means is connected to said actuator; and,
second means for supplying said switching signal to said switch-over means for testing purposes so as to check at least one of the following for operational capability: said auxiliary controller means and said switch-over means.

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4,989,570

FAIL DETECTING SYSTEM FOR SENSOR MONITORING CONCENTRATION OF A FUEL IN BLENDED MULTI-FUEL FOR INTERNAL COMBUSTION ENGINE AND FAIL-SAFE SYSTEM IN LAMBDA-CONTROL

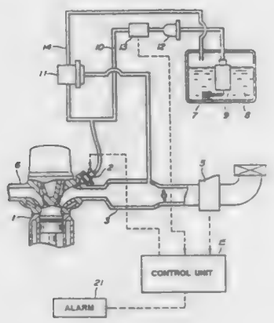
Masaru Kuribara; Masamichi Imamura, and Yoshiki Yuzuriha, all of Gunma, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isezaki, Japan

Filed Apr. 19, 1990, Ser. No. 510,694

Claims priority, application Japan, Apr. 19, 1989, 1-45871[U]; Jul. 11, 1989, 1-178222

Int. Cl.[5] **F02B** *75/12;* **F02D** *41/04;* **G01M** *19/00;* **G01F** *25/00*

U.S. Cl. 123—494 **16 Claims**



9. A fuel injection control system for an internal combustion engine for which a blended fuel composed of mutually different type of plurality of fuel is supplied for performing combustion, comprising:

a fuel injection system for injecting controlled amount of the blended fuel to an induction system of said engine for forming an air/fuel mixture to be combustioned in a combustion chamber of the engine;

first means for monitoring basic fuel injection control parameter for deriving a basic fuel injection amount on the basis thereof;

second means for monitoring preselected fuel injection amount correcting parameter for deriving a correction value for correcting said basic fuel injection amount;

third means for monitoring blending ratio of selected one of fuels in said blended fuel for deriving a blending ratio dependent correction value for correcting said basic fuel injection amount based thereon, said third means including a sensor for monitoring concentration of the selected one of fuels;

fourth means for detecting abnormality of said sensor, including a monitoring data providing means for receiving the output signal from said fuel concentration sensor for providing a monitored data associated with monitored fuel concentration, a reference data providing means for providing a reference data representative of normal range of the value of said monitored data, and an abnormality detecting means for comparing said monitored data with said reference data for detecting abnormality of said fuel concentration sensor when said monitored data is out of a predetermined relationship with said reference data; and

fifth means responsive to said fourth means detecting abnormality of said sensor for switching operational mode of said third means from normal mode in which the blending ratio dependent correction value on the basis of the monitored blending ratio, to a fail-safe mode in which said blending ratio dependent correction value is fixed at a given constant value.

4,989,571

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

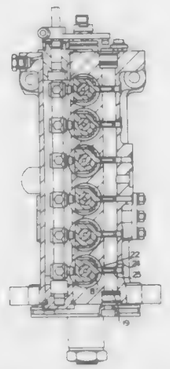
Josef Güentert, Gerlingen, and Johann Warga, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,427

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1988, 3844430

Int. Cl.[5] **F02M** *59/26*

U.S. Cl. 123—495 **25 Claims**



1. A fuel injection pump for internal combustion engines having a pump housing, a plurality of pump elements disposed in line in said pump housing, each of said pump elements have pump cylinders disposed in receiving bores of the pump housing and pump pistons operating in the pump cylinders by an associated cam shaft, separate suction chambers surrounding each of said pump cylinders and an overflow opening communicating with each of said suction chambers,

a control edge disposed on each of said pump pistons that cooperates with the overflow openings for metering of the injection quantity,

fuel inflow and fuel outflow primary conduits disposed parallel to the camshaft for the inflow and outflow of fuel to and from the separate suction chambers, and

a pair of connecting conduits, one connecting conduit present between each separate suction chamber and said inflow primary conduit and between each separate suction chamber and said outflow primary conduit, by means of said connecting conduits a same quantity of fuel can be metered to each of said separate suction chambers, under an influence of a pressure drop produced by said connecting conduits,

a throttle insert in said connecting conduit leading from said fuel inflow primary conduit to each said separate suction chamber, said throttle insert (24), closed at one end and open at one end and discharging with its open end into one of the said separate suction chambers (8) and the closed end protruding into the fuel inflow primary conduit (19), the throttle insert having a defined throttle opening (25) opening into said fuel inflow primary conduit

4,989,572

VEHICLE FUEL SYSTEM WITH REDUCED TANK HEATING

Roy A. Giacomazzi, Rochester Hills; S. Raghuma Reddy, West Bloomfield, and Gregory E. Rich, Richmond, all of Mich., assignors to General Motors Corportion, Detroit, Mich.

Filed Feb. 16, 1990, Ser. No. 481,087

Int. Cl.[5] **F02M** *37/04*

U.S. Cl. 123—514 **2 Claims**

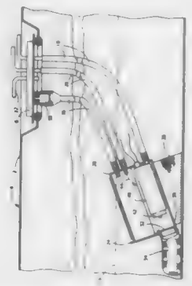
1. In a vehicle fuel system having a tank with a supply of stored liquid fuel, and in which at least some fuel is returned to the tank in a heated condition, a means for reducing the heating of said stored fuel caused by said returned fuel, comprising,

a containment enclosure located in the interior of said tank,

a fuel return line to said containment enclosure that sends said returned fuel only to said containment enclosure,

a fuel pump arranged so as to draw fuel only from inside said enclosure, and

a one-way make up fuel inlet to said containment enclosure



to allow stored fuel into said enclosure from said tank, but to substantially prevent the back flow of returned fuel to said tank from said enclosure, said inlet comprising the only communication between said enclosure and said stored fuel,

whereby, returned fuel is segregated from said stored fuel and is pumped preferentially from said enclosure, with make up fuel entering said inlet only as needed, thereby substantially reducing the heating effect of said returned fuel on said stored fuel.

4,989,573

GAS POWERED ENGINE WITH GLOW PLUG IGNITION

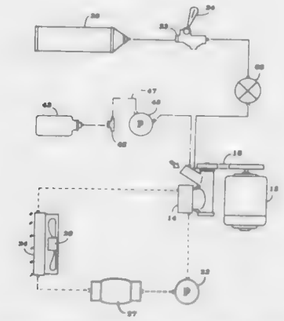
Yoshiharu Yokoyama; Shigeru Akiyama, and Tsuyoshi Kamiya, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 10, 1989, Ser. No. 377,479

Claims priority, application Japan, Jul. 11, 1988, 63-170867; Jul. 12, 1988, 63-171805

Int. Cl.[5] **F02B** *77/00*

U.S. Cl. 123—527 **14 Claims**



1. In a fuel supply circuit for a gas powered internal combustion engine comprising a source of pressurized gaseous fuel, conduit means for supplying fuel from said course to said engine, valve means for regulating the amount of fuel supplied to said engine for controlling the speed of said engine without throttling the air flow to said engine and means for deactivating said valve means for discontinuing the supply of fuel from said source to said engine when the speed of said engine falls below a predetermined value.

4,989,574

ELECTROMAGNETIC PICKUP

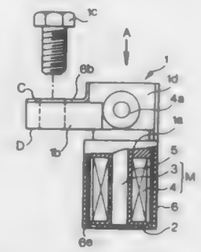
Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 411,321

Claims priority, application Japan, Sep. 27, 1988, 63-241871; Jan. 11, 1989, 1-4358

Int. Cl.[5] **F02P** *7/06;* **H01F** *15/04*

U.S. Cl. 123—617 **11 Claims**



1. In an electromagnetic pickup for an engine, the pickup having a coil, a core of ferromagnetic material disposed inside of the coil and a shielding member of magnetic material located around the coil and formed with openings at both ends thereof so as to form an open magnetic circuit with the core, the improvement in the pickup comprising:

a body member of plastic comprising a main body forming a bobbin on which the coil is wound, an upper body integrated with the main body, and a flange integrally extending from the upper body, the flange being formed as an attachment member having means for securing the flange to a body of the engine; and

positioning means integrated with the shielding member and engaged with the body member for positioning the shielding member to the body member so as to prevent the shielding member from disengaging from the body member.

4,989,575

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

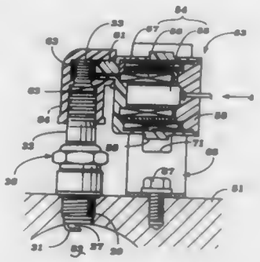
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 2, 1988, Ser. No. 278,860

Claims priority, application Japan, Dec. 2, 1987, 62-303234

Int. Cl.[5] **F02P** *3/02*

U.S. Cl. 123—635 **5 Claims**



1. A cylindrical spark coil for mounting on the spark plug of an internal combustion engine having an insulator and a central electrode having a terminal disposed at an upper end of the

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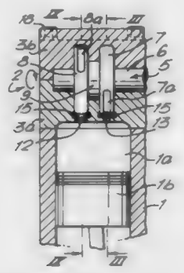
insulator, said coil comprising an core, a primary winding and a secondary winding with said secondary winding being provided at the upper end thereof with a terminal adapted to be attached to the terminal of the spark plug, a pair of leads for supplying electrical power to said primary winding, said primary winding, said secondary winding and said armature being substantially entirely disposed below the upper end of the spark plug terminal when attached thereto and the cylindrical axis of said coil extending perpendicularly relative to the center electrode.

4,989,576

INTERNAL COMBUSTION ENGINE

George J. Coates, 194 Belgard Heights, Belgard, County Dublin, Ireland

Filed Jul. 26, 1982, Ser. No. 401,631
Claims priority, application Ireland, Jul. 30, 1981, 1742/81; Mar. 3, 1982, 483/82; Apr. 20, 1982, 933/82
Int. Cl.[5] F01L 7/00
U.S. Cl. 123—80 D 24 Claims



1. In an internal combustion engine of the piston and cylinder type, the improvement which comprises:

a detachable cylinder head assembled from two hollowed-out components to provide a cavity having radial symmetry within the cylinder head and wherein the cavity is divided into a first and a second drum-accommodating section for each cylinder of the engine; a first passage for fuel mixture traversing said cylinder head by way of said first drum-accommodating section;

a second passage for exhaust gases traversing said cylinder head by way of said second drum-accommodating section;

a rotor journalled in said cylinder head, said rotor comprising a shaft having a first and a second drum for each cylinder of the engine coaxial thereon, each drum having a spherical section defined by two parallel planes of a sphere, the planes being disposed symmetrically about the centre of the sphere, the intersection between the planes and the spherical section being rounded off;

each drum having a surface recess thereon;

when in position, said rotor occupies said cavity in gas-tight sealing contact with the walls of the cylinder head so that the first and second drum-accommodating sections are in gas-tight sealing isolation from each other;

the first drum interrupts the first passage;

the second drum interrupts the second passage; and

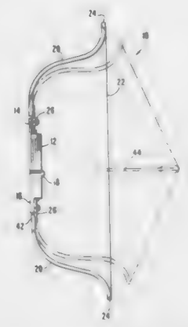
means is provided for rotating the rotor at a speed related to the operating cycle of the engine so that the surface recess of the first drum makes successive contact with the ends of the interrupted first passage to transfer successive charges of fuel mixture to the cylinder during rotation of the rotor and the surface recess of the second drum makes successive contact with the ends of the interrupted second passage to transfer successive charges of exhaust gases from the cylinder during rotation of the rotor.

4,989,577

POWER UNIT BOW

Ray Bixby, Box 11, Lillian, Tex. 76061

Filed Oct. 5, 1988, Ser. No. 253,602
Int. Cl.[5] F41B 5/10
U.S. Cl. 124—25.6 5 Claims



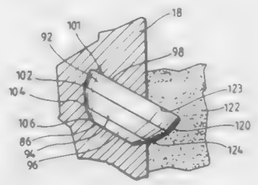
1. An archery bow comprising a rigid frame member, said frame member having at least one end fixedly secured to a first end of a deformable spring member, the second opposite end of said spring member being directly and fixedly secured to a first end of a rigid limb member said spring member having a plurality of coils disposed around a shaft fixedly secured to said at least one end of said frame member said limb member being adapted for rotation around said spring member, a bow string secured to the opposite unsecured second end of said limb member, said bow string being adapted to receive the end of an arrow and to be manually pulled rearward in a direction away from said frame member, whereby said limb member is rotated so as to deform said spring member to create stored energy in said spring member, said spring member being adapted to suddenly restore its undeformed position upon release of said bow string to rotate said limb member to the original position for said limb member, whereby said limb member restores said bow string to the original position for said bow string so as to project said arrow forward.

4,989,578

METHOD FOR FORMING DIAMOND CUTTING ELEMENTS FOR A DIAMOND DRILL BIT

Maurice P. Lebourg, 5592 Longmont, Houston, Tex. 77056

Filed Aug. 30, 1989, Ser. No. 400,510
Int. Cl.[5] B28D 1/32, 5/04; E21B 10/00
U.S. Cl. 125—23.01 10 Claims



1. A method for forming a hemispherical diamond cutting element for a drill bit comprising:

obtaining a natural diamond;

identifying a cleaving plane is said diamond and an axis perpendicular to said cleaving plane;

polishing said diamond to form a series of truncated cones approximating a hemisphere, said cones having as their longitudinal axis said perpendicular axis; and

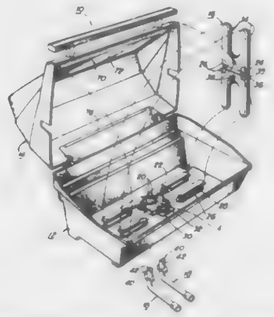
cleaving said diamond to form a hemisphere.

4,989,579

BARBECUE GRILL

Armand Murphy, Phenix City; John Seal, Auburn, both of Ala.; Robert C. Scroggs, and James R. Carden, both of Columbus, Ga., assignors to W.C. Bradley Co., Columbus, Ga.

Filed Aug. 11, 1989, Ser. No. 393,420
Int. Cl.[5] F24C 3/00
U.S. Cl. 126—41 R 22 Claims



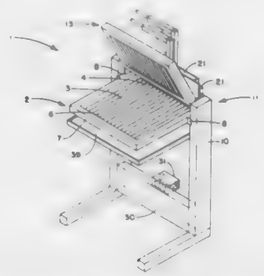
1. A barbecue grill having a fuel source and means for supporting a radiant material and for supporting food to be cooked thereon, said grill comprising a fire box with a burner element mounted therein, said fire box also receiving said support means, a hood member for covering said fire box and having an apex, said fire box including a floor portion having an integral collector means projecting upwardly therefrom for receiving fuel from said burner element, said burner element having a lower surface overlying said collector means for forming a gas collection chamber with said collector means, and said burner element has a plurality of port means near said collector means for directing fuel thereto.

4,989,580

DUAL GRILL COOKING APPARATUS

Jimmie W. Dunham, 9148 S. Blackwater Rd., Baton Rouge, La. 70818

Filed Mar. 7, 1990, Ser. No. 490,148
Int. Cl.[5] A47J 37/00; F24C 3/00
U.S. Cl. 126—41 R 20 Claims



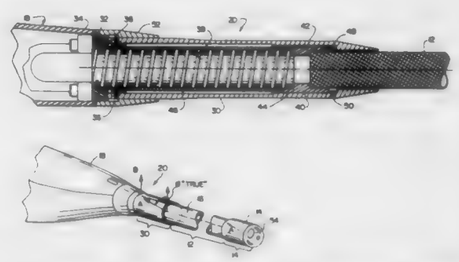
1. A cooking apparatus, comprising a first set of parallel tubes arranged in a plane, said tubes having an intake end and an exhaust end, means to deliver combustion gases to said intake ends of said first set of tubes, means connected to said exhaust ends of said first set of tubes for directing said combustion gases away from said first set of tubes, means to urge said combustion gases through said first set of tubes, a second set of parallel tubes arranged in a plane, said tubes having an intake end and an exhaust end, means to deliver combustion gases to said intake ends of said second set of tubes, means connected to said exhaust ends of said second set of tubes for directing said combustion gases away from said second set of tubes, means to urge said combustion gases through said second set of tubes, means to support said first set of tubes in a raised, horizontal position, and means to alternately support said second set of tubes in a first position parallel to and proximate to said first set of tubes, wherein said first and second tubes are in vertical alignment, and a second position wherein said second set of tubes is retracted from said first set of tubes.

4,989,581

TORSIONAL STRAIN RELIEF FOR BORESCOPE

Richard A. Tamburrino, Auburn, and Alan S. Knieriem, Syracuse, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jun. 1, 1990, Ser. No. 531,557
Int. Cl.[5] A61B 1/00
U.S. Cl. 128—4 7 Claims



1. Torsional strain relief assembly for absorbing torsional strain at a proximal end of an elongated, flexible insertion tube of a borescope or endoscope and for mechanically coupling the insertion tube to a frame, said strain relief assembly comprising a tubular rigid sleeve; means rigidly affixing a proximal end of the tubular rigid sleeve to said frame; a helical torsional spring situated within said tubular rigid sleeve; means rotationally affixing a proximal end of said spring to said frame; a bushing rotationally affixed to a distal end of said spring and to a proximal end of said insertion tube and rotatably mounted within said rigid tubular sleeve, permitting rotation of said insertion tube over at least a substantial rotational angle with respect to said rigid sleeve and said frame; such that said insertion tube is free to rotate over said substantial angle without significant twisting over the length of the insertion tube.

4,989,582

WINDING TYPE ENDOSCOPE APPARATUS

Katsunori Sakiyama, Hachioji; Tomoaki Sato, Higashiyamato, and Teruo Eino, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 146,982, Jan. 20, 1988, abandoned. This application Jun. 21, 1989, Ser. No. 369,589
Claims priority, application Japan, Jan. 20, 1987, 62-11009; Jul. 6, 1987, 62-104075; Jul. 31, 1987, 62-118366; Dec. 17, 1987, 62-322606; Jul. 5, 1988, 63-168170
Int. Cl.[5] A61B 1/00
U.S. Cl. 128—6 54 Claims

1. A winding type endoscope apparatus comprising:

an elongate flexible insertable part having an illuminating window and observing window in a tip part thereof;

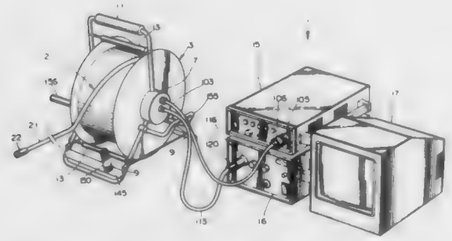
a winding unit having a winding member fitted with said insertable part in a base end part and capable of winding up and housing said insertable part, and a supporting part rotatably supporting said winding member;

an illuminating means for emitting an illuminating light out of said illuminating window;

an observing means for receiving the light from an object incident from said observing window to make the object observable;

an external apparatus provided separately from said winding member and forming at least one of said illuminating means and observing means; and

a flexible lead-out means, forming at least one of said illuminating means and observing means, extending axially out of a side of said winding member and connected to said external apparatus,



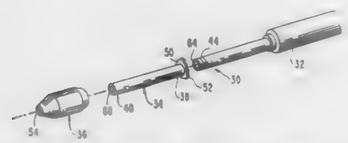
said winding member and said external apparatus being separated from each other and being connected by said lead-out means, and said lead-out means operatively connecting separate parts of at least one of said illuminating means and said observing means within said winding member and said external apparatus.

4,989,583

ULTRASONIC CUTTING TIP ASSEMBLY

Larry L. Hood, Laguna Hills, Calif., assignor to Nestle S.A., Switzerland

Filed Oct. 21, 1988, Ser. No. 260,702
Int. Cl.[5] G01N *29/00*
U.S. Cl. 128—24 A **53 Claims**



1. For an ultrasonic surgical cutting instrument having an ultrasonic transducer, an ultrasonic cutting tip assembly comprising:

a transition horn operatively couplable to the ultrasonic transducer,

said transition horn having a horn threaded portion,

a vibration-transmitting tube separable from said horn and having a tube proximal end and a tube distal end, and

a retaining nut having a nut threaded portion and adapted so that said nut threaded portion can threadably engage said horn threaded portion to hold said tube proximal end and said transition horn together so that ultrasonic vibrations can thereby be transmitted to said tube and emitted from said tube distal end to the surgical site.

4,989,584

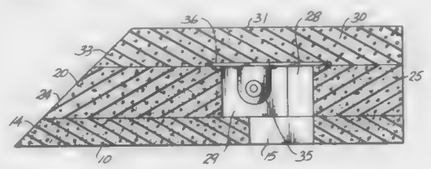
PORTABLE MASSAGING LEG REST

Gerald L. Simon, Sherman Oaks, Calif., assignor to Jereva, Inc., Sherman Oaks, Calif.

Filed Mar. 2, 1989, Ser. No. 319,174
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—33 **23 Claims**

1. A portable massaging leg rest comprising:

a resilient, polygonal, generally trapezoidal body having a horizontal top face sufficiently large for supporting a prone person's calves approximately horizontal and a sloping front face sufficiently large for supporting a prone person's thighs at an angle of about 45°;



means for vibrating at least the upper portion of the body for massaging a person's legs; and

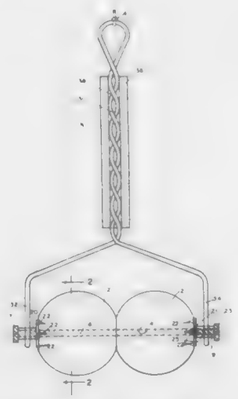
means for housing the vibrating means within the body.

4,989,585

HAND MANIPULATED ROLLER MASSAGE TOOL

Lawrence F. Auker, 10302 Kerrigan St., Santee, Calif. 92071

Filed Apr. 3, 1989, Ser. No. 332,671
Int. Cl.[5] A61H *15/00*
U.S. Cl. 128—57 **4 Claims**



1. A hand held massage device comprising:

a "Y" shaped body portion, having two legs terminating in free ends formed as eyes to form a gap therebetween, a single stem, a shaft connecting said free ends and received in said eyes, a pair of resilient spheres positioned on said shaft across the gap of the "Y" which rotate together relative to the "Y" shaped body portion and a handle grip member surrounding the single stem of the "Y" shaped body, said handle grip member being rotatable relative to said "Y" shaped body member.

4,989,586

ENDOSCOPE HAVING A SOLID-STATE IMAGE PICKUP DEVICE

Tatsuya Furukawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

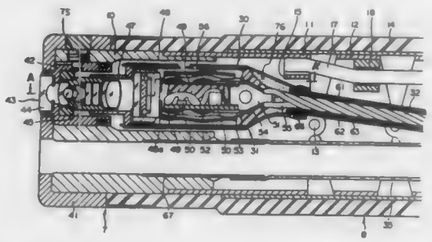
Filed May 7, 1990, Ser. No. 520,278
Claims priority, application Japan, Jul. 21, 1989, 1-85785[U]
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—6 **13 Claims**

1. An endoscope comprising:

an insert portion having a distal end portion and a central axis;

a solid-state image pickup device arranged in the distal end portion of the insert portion and having a central axis, the central axis of the solid-state image pickup device being apart from the central axis of the insert portion;

a plurality of signal lines arranged in the insert portion and connected to the solid-state image pickup device for transmitting a drive signal to the solid-state image pickup device and an image signal from the solid-state image pickup device; and



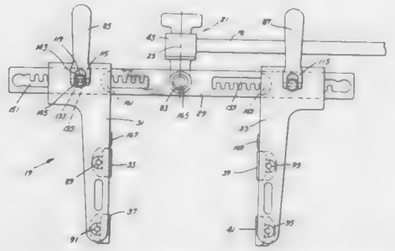
holding means provided in the connecting portion of the signal lines with the solid-state image pickup device for holding the signal lines in such a manner that the signal lines are fixed in a slanting state with respect to the central axis of the insert portion and directed from the solid-state image pickup device toward the central axis of the insert portion.

4,989,587

STERNAL RETRACTOR

Daniel K. Farley, 601 E. Lake Shore Dr., Barrington, Ill. 60010

Filed Apr. 26, 1989, Ser. No. 343,784
Int. Cl.[5] A61B *17/02*
U.S. Cl. 128—20 **14 Claims**



1. A sternal retraction system for spreading and elevating a sternum during surgery to provide access to organs lying under said sternum, comprising:

a support means mountable to a conventional surgical table;

pivot joint means connected to said support means for providing an axis of rotation in a plane above the plane of the surgical table;

alignment bar means secured to said pivot joint means for bidirectionally pivoting about said axis;

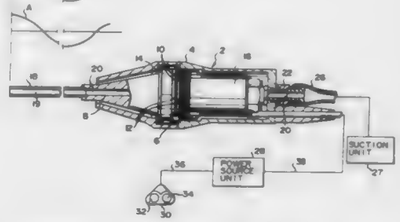
retraction means including at least two retraction arms slidingly disposed on said alignment bar means for spreading said sternum, said retraction means including crank adjustment means manually crankable for independent positioning of one of said arms relative to the other of said arms, said crank adjustment means moving said one arm along the longitudinal axes of said alignment bar means as the adjustment means is cranked, said retraction means elevating a first side of said sternum upon the pivoting of said alignment bar means in a first rotational direction about said axis while permitting displacement of a said retraction arm by manual cranking of said adjustment means, said retraction means alternately elevating a second side of said sternum upon the pivoting of said alignment bar means in a second rotational direction about said axis while permitting displacement of a said retraction arm by manual cranking of said adjustment means.

4,989,588

MEDICAL TREATMENT DEVICE UTILIZING ULTRASONIC WAVE

Tetsumaru Kubota; Akira Shiga; Akio Nakada; Syuichi Takayama; Ryouichi Konou; Yasuhiro Ueda; Hitoshi Karasawa; Tatsuo Nagasaki; Koji Taguchi; Hiroyoshi Fujimori; Shinichi Imade; Shinji Hatta; Yutaka Ohshima; Hiroyuki Kusunoki; Toshiki Terayama; Masaaki Hayashi; Tadao Hagino, and Akihiro Taguchi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 20,333
Claims priority, application Japan, Mar. 10, 1986, 61-51668; Mar. 13, 1986, 61-55511; Mar. 14, 1986, 61-56416; Mar. 17, 1986, 61-58602; Mar. 18, 1986, 61-59878; Jun. 11, 1986, 61-135179; Jun. 12, 1986, 61-136846
Int. Cl.[5] A61B *17/20*
U.S. Cl. 128—24 A **13 Claims**



1. An ultrasonic treatment device, comprising:

means for generating ultrasonic vibrations;

elongated probe means having a distal end portion and a proximal end portion, said proximal end portion being connected to said ultrasonic vibration generating means, said probe means being vibrated by said ultrasonic vibration generating means for resecting a tissue contacting said distal end portion of said probe means;

detecting means for detecting an amplitude variation or a frequency variation of vibration of said probe means arising from a physical property of the tissue contacted by the distal end portion of said probe means, and for producing a detection signal which is a function of the detected amplitude or frequency variation of vibration of said probe means;

comparing means for comparing a level of said detection signal from said detecting means with a predetermined signal level and for generating a driving signal when the difference between said detection signal and said predetermined signal level exceeds a predetermined value; and

safety means coupled to said comparing means for at least one of generating an alarm in response to said driving signal from said comparing means, and stopping a vibration of said probe means in response to said driving signal generated by said comparing means.

4,989,589

DEVICE FOR MASSAGING EXTERMITIES, SUCH AS LEGS

Kalle Pekanmäki, Pitkäkatu 12, 15150 Lahti 15, and Lasse Andersson, Mestarinkatu 14, 15800 Lahti 80, both of Finland

Continuation of Ser. No. 728,509, Apr. 29, 1985, abandoned.
This application Jan. 16, 1987, Ser. No. 5,284
Int. Cl.[5] A61H *9/00*
U.S. Cl. 128—64 9 Claims



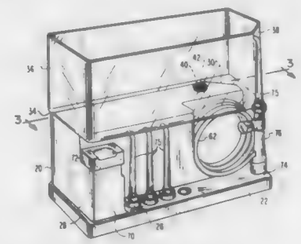
1. A device for massaging a bodily extremity, said device comprising:
a plurality of mutually and annularly connected jacket bags in mutual fluid communication through borders therebetween, said plurality of mutually connected jacket bags defining a first chamber;
a means for providing pressurized fluid;
a first inflow passage for supplying fluid from said means for supplying pressurized fluid to said first chamber:
a first outflow passage for removing fluid from said first chamber;
a means for sealing said plurality of jacket bags about the extremity so as to define an airtight second chamber, bounded on one side by the extremity, between said plurality of jacket bags and the extremity, said second chamber permitting fluid contact of fluid within said second chamber with the extremity, thereby ventilating the extremity;
a second inflow passage for supplying fluid from said means for supplying pressurized fluid to said second chamber;
a second outflow passage for removing fluid from said second chamber;
a valve, connected to said first and second inflow passages, including means for opening said first inflow passage, means for closing said first inflow passage and opening said second inflow passage when said jacket bags have filled with the fluid, and means for thereafter closing said second inflow passage when said second chamber is filled with the fluid;
whereby, when fluid pressure is applied to said first inflow passage, said jacket bags fill in succession along said first chamber, from said first inflow passage to said first outflow passage, and when fluid is supplied to said second chamber, the extremity is ventilated while said jacket bags are depleted of fluid.

4,989,590

IRRIGATION APPLIANCE

John Baum; Gary Thomas, and James Hickman, all of Fort Collins, Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Continuation of Ser. No. 875,203, Jun. 17, 1986, abandoned.
This application Jun. 21, 1990, Ser. No. 541,549
Int. Cl.[5] A61H *9/00;* A61G *17/02*
U.S. Cl. 128—66 28 Claims



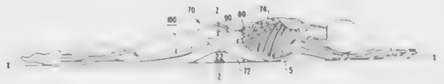
1. An irrigation appliance comprising:
a housing having a top wall and a bottom wall joined to said top wall by a circumferential side wall shaped to define an inset displaced laterally to and formed along one portion thereof;
a cover having a normally horizontal wall from which laterally projects a circumscribing wall shaped to mate with said side wall when said cover is positioned to overlie said housing in enveloping relationship, said circumscribing wall also having an inset, displaced laterally to and formed along said circumscribing wall, that mates with said inset of said side wall when said cover is so positioned;
inlet means defining an opening in said top wall;
outlet means defining an opening in said horizontal wall and so located as to be aligned with said inlet means when said cover is inverted to disposed said circumscribing wall normally upstanding from said horizontal wall;
means disposed within said housing for outletting a liquid therefrom;
means disposed within said housing for pumping liquid from said inlet means to said outletting means;
a device coupled for liquid flow from said outletting means for delivery to a point of use;
said bottom wall of said housing having a platform portion which fixedly projects outwardly from beneath said inset in said cover when said cover is so inverted;
and means in said platform portion defining a seat for exposure of said device adjacent to said inset when said cover is so inverted.

4,989,591

PRONE POSITION ORTHOPEDIC APPLIANCE FOR ALIGNING THE SPINE AND THE FEMORAE

Frank Anders, Jr., P.O. Box 630, Ville Platte, La. 70586

Filed Feb. 8, 1989, Ser. No. 307,611
Int. Cl.[5] A61F *5/32*
U.S. Cl. 128—69 29 Claims



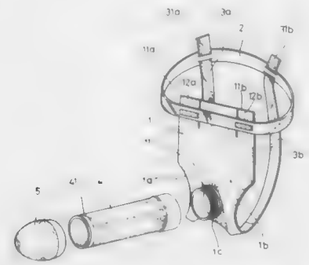
1. An orthopedic appliance for changing the angular relationship of an individual's longitudinal axis of the lower lumbar spine to a longitudinal axis of the femorae comprising a support device including:
a first pair of opposite edges which extend substantially parallel to a user's spine and a second pair of opposite edges which extend substantially perpendicular to a user's spine;
a lower suface to be disposed along a resting surface; and
an upper surface, disposed above the lower surface, including first and second surface portions angularly disposed relative to one another;
said upper surface being concave when said appliance is viewed from a direction perpendicular to said second pair of opposite edges and said upper surface being convex at its central cross section when viewed from a direction perpendicular to said first pair of opposite edges.

4,989,592

DEVICE TO AID SEXUAL POTENCY

Dao-pin Chang, 55, Hou Hu, Hu Pei Tsun, Lin kow Hsiang, Taipei Hsien, Taiwan

Filed Aug. 1, 1989, Ser. No. 388,582
Int. Cl.[5] A61F *5/41*
U.S. Cl. 128—79 7 Claims



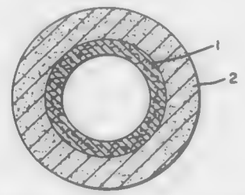
1. A device for improving male sexual potency, comprising:
a penis protecting pad,
arched lower edges disposed on said pad, said edges being conformed to match the shape of a human thigh,
a tube joint disposed at a center bottom location of said pad, tube joint threads disposed on said tube joint, said tube joint forming a hole through said pad,
a tube body, tube body threads disposed at a first end of said tube body, said tube body threads matching said tube joint threads for engagement therewith, ring grooves disposed at a second end of said tube body,
a flexible glans penis, flanges disposed inside said glans penis, said flanges matching said ring grooves and engageable therewith, wherein said device is similar to, and may be worn on, a real penis.

4,989,593

ORTHOPEDIC CAST

Anthony J. Campagna, Roseville, Minn.; Timothy C. Sandvig, Woodville, Wis.; Dean A. Ersfeld, Maplewood, and Matthew T. Scholz, Woodbury, both of Minn., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed Jul. 22, 1988, Ser. No. 222,752
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—89 R 13 Claims



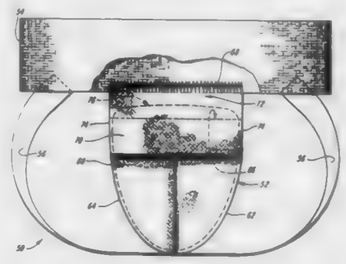
1. An orthopedic cast or splint adapted to immobilize a body part, comprising a water repellent padding having opposing surfaces and a cured casting material disposed on one of the surfaces, wherein the padding has been treated with a substantive compound selected from the group consisting of a fluorochemical and a silicone and has an apparent surface energy less than about 60 dynes per centimeter and a porosity of less than about 15 seconds.

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ATHLETIC SUPPORTER HAVING IMPROVED PROTECTIVE CUP RETAINING MEANS

Sara J. Doherty, Franklin, and William Litchfield, Sanbornton, both of N.H., assignors to Star Specialty Knitting Co., Inc., Laconia, N.H.

Filed Jun. 17, 1987, Ser. No. 63,117
Int. Cl.[5] A61F *5/40*
U.S. Cl. 128—158 8 Claims



6. An athletic supporter comprising
a pouch having a front and a back panel joined at the periphery to include an unsecured panel edge having an aperture therein adapted to receive a protective device, said front panel extends beyond said unsecured panel edge and overlapping said back panel and permanently fastened thereto to substantially occlude said aperture to retain said protective device within said pouch; and
means for supporting said pouch on the body of a user wherein
the periphery of said overlapping section includes a side edge thereof,
said side edge of said overlapping section being permanently fastened to said pouch
said overlapping portion is adapted to confront the body of said user.

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ASPIRATOR/NEBULIZER

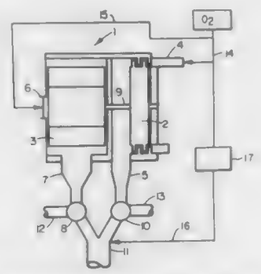
Anthony C. De Vuono, and Richard Razgaitis, both of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation of Ser. No. 778,838, Sep. 23, 1985, abandoned. This application Oct. 14, 1989, Ser. No. 110,640
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—200.017 5 Claims

1. A respiratory care device for delivering an oxygen-containing gas under positive pressure to a patient comprising:
a source of high-pressure oxygen,
a source of air,
a rotatable gas turbine,
a rotatable blower coupled to the gas turbine for rotation therewith and having an air entrance communicating with the source of air to admit the air to the blower and an air exit for discharging the air from the blower,
means for utilizing at least a first portion of the high-pressure oxygen to rotate the turbine,

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means for delivering the air from the blower air exit to the patient, and



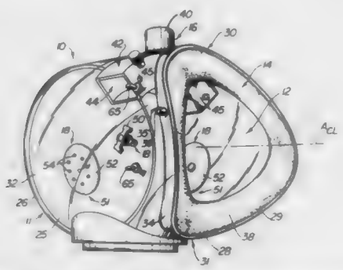
means for mixing a second portion of the oxygen with the air prior to delivery to the patient.

4,989,596

FACE CHAMBER

Allen G. Macris, 416 Johnson Ferry Rod., N.W., Atlanta, Ga. 30328; Stothe P. Kezios, 1060 Winding Creek Trail, N.W., Atlanta, Ga. 30328, and Harry L. Vaughan, 3482 Sweetwater Dr., Lawrenceville, Ga. 30245

Filed Feb. 14, 1989, Ser. No. 311,128
Int. Cl.[5] A62B *18/10*
U.S. Cl. 128—201.28 9 Claims



1. A face chamber for use with a continuous positive airways pressure source to treat a patient with the pressurized output gasses therefrom comprising:

a generally cylindrical, substantially rigid annular sidewall having a central axis, said sidewall having opposed ends, an upper portion and a lower portion; one of said ends being open and defining a sealing edge thereon contoured to generally conform to the patient's face; said sidewall having a diameter such that the sidewall extends around the patient's face from the chin to the forehead;

an end wall joined to and closing that end of said sidewall opposite said sealing edge; said end wall having a first substantially transparent portion oriented generally normal to the sidewall central axis and closing the upper portion of the open end of said sidewall so that the patient may see therethrough when said face chamber is in place on the face of the patient;

a face seal along said sealing edge of said sidewall adapted to seal the sealing edge to the face of the patient;

means for holding said sidewall on the face of the patient and maintain said seal in sealing contact with the patient's face,

said sidewall and said end wall defining a closed pressure chamber about the patient's face while said face chamber is seated against the patient's face so that the patient's face contacts said face chamber only along said seal to free the patient's face and permit the patient to talk and eat without having to remove said face chamber; and

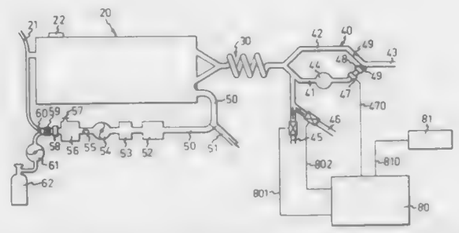
inlet connection means mounted on said face chamber for connecting the output gasses of the continuous positive airways pressure source to said pressure chamber.

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APPARATUS FOR ADMINISTRATION OF AT LEAST TWO GASES TO A PATIENT

Olof Werner, Lund, Sweden

PCT No. PCT/SE88/00106, § 371 Date Aug. 30, 1989, § 102(e) Date Aug. 30, 1989, PCT Pub. No. WO88/06903, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 8, 1988, Ser. No. 399,512
Claims priority, application Sweden, Mar. 9, 1987, 8700977
Int. Cl.[5] A61M *15/00, 16/00*
U.S. Cl. 128—203.12 30 Claims



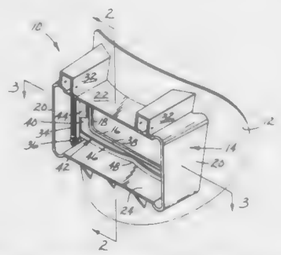
1. An apparatus for administration of at least two gases to a patient, said apparatus comprising a patient circuit (**40**) which consists of a circle system for rebreathing and a drive circuit (**20**), and which is provided with delivery means (**45, 46**) for supplying fresh gas, and a carbon dioxide absorber (**44**), said apparatus further comprising an actual value transducer (**47**) for the gas concentration of one gas type, a desired value transducer (**81**) for indicating the desired gas concentration, and a control device (**80**) for maintaining said gas concentration, characterised in that said patient circuit and said drive circuit communicate with each other via an exchanger (**30**) for open separation, and that said control device (**80**) comprises a calculating means for determining the gas volume and gas type to be supplied to said patient circuit (**40**) so as to obtain the desired value concentration.

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NEGATIVE PRESSURE FULL FACE RESPIRATOR HAVING A REPLACEABLE VIEWING WINDOW

Richard C. Berg, Bloomington, and Emil J. Kvaal, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 20, 1989, Ser. No. 439,288
Int. Cl.[5] A62B *18/08*
U.S. Cl. 128—206.23 14 Claims



1. A negative pressure respirator adapted to cover at least the mouth, nose and eyes of a wearer comprising;

a soft, conformable face sealing member having an exhalation valve and an inhalation valve;

a harness assembly attached to said face sealing member, said harness assembly being capable of holding said face sealing member tightly against the face of a wearer;

a filtration element capable of removing hazardous fumes and gases from inhaled air, said filtration element removably attached to said inhalation valve by means of a gas tight seal, said respirator being a negative pressure respirator in that respiration of said wearer causes a pressure within said respirator which is lower than ambient pressure;

a viewing window insert assembly, said insert assembly being peripherally engaged by said face sealing member by means of a gas tight seal, said viewing window insert assembly comprising;

a panel having an outer periphery and a centrally located opening;

a wall structure extending outwardly from one face of said panel around said panel opening, said wall structure and said panel defining a viewing window chamber within said wall structure, said panel comprising a bottom face of said chamber, the top face of said chamber being open to the atmosphere;

a resilient gasket material coextensive with and secured to said panel within said viewing window chamber;

a viewing window removably positioned against said gasket material in said viewing window chamber;

positioning means for keeping said viewing window located over said opening in said panel, said positioning means being located between said opening and said wall structure and disposed around said opening on the face of said panel within said chamber;

at least one retaining element attached to said wall structure within said chamber, said element being positioned above said panel at a distance greater than the combined thickness of said viewing window and said gasket material;

window retaining means for forcing said viewing window against said gasket material, said window retaining means disposed between said viewing window and said retaining element; and,

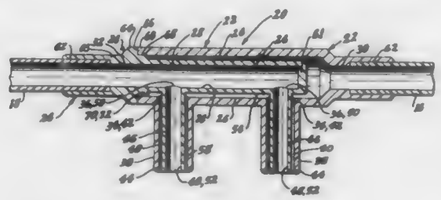
wherein, when said respirator is positioned on the face of a wearer, said viewing window is disposed opposite the face of the wearer with respect to said gasket material so that a negative pressure within said respirator resulting from inhalation of the wearer produces an additional force against said viewing window, forcing it more tightly against said gasket material.

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DUAL LUMEN CANNULA

William Carter, Indianapolis, Ind., assignor to Puritan-Bennett Corporation, Overland Park, Kans.

Filed Jan. 26, 1989, Ser. No. 302,188
Int. Cl.[5] A61M *15/08*
U.S. Cl. 128—207.18 14 Claims



1. Cannula apparatus providing for modified respiration and the monitoring thereof as to a human patient,

for use with (a) associated supply equipment for the providing of a supply of associated gas for providing the modified respiration, and with (b) associated control equipment for controlling the associated supply equipment and thereby controlling the delivery of the associated gas to the cannula apparatus,

the associated equipment being provided with a gas delivery hose and a monitoring hose, respectively for communication with the gas supply and the control equipment;

the cannula apparatus comprising:

a first body member and a second body member;

each of the first body member and the second body member having a generally hollow primary bore, and each of the first body member and second body member being provided with an inlet communicating the respective primary bore with one of the respective gas delivery hose and monitoring hose;

and the primary bore of each of the first body member and second body member also having a pair of outlets;

the first body member being provided with two cannula nipples, each of said nipples having a generally hollow secondary bore, and the said secondary bore of each of the cannula nipples of the first body member having an inlet an an outlet,

the inlet of the said secondary bore of each of the two cannula nipples of the first body member communicating directly with a respective one of the said two outlets of the primary bore of the first body member;

the second body member being provided with two cannula nipples, each of said nipples having a generally hollow secondary bore, and the said secondary bore of each of the cannula nipples of the second body member having an inlet and an outlet,

the inlet of the said secondary bore of each of the two cannula nipples of the second body member communicating directly with a respective one of the said two outlets of the primary bore of the second body member;

the pair of cannula nipples of the first body member and the pair of cannula nipples of the second body member being correspondingly spaced, and the portion of the second body member having the two outlets of its primary bore being located within the primary bore of the first body member, and the cannula nipples of the second body member being located within the secondary bore of the respective cannula nipples of the first body member;

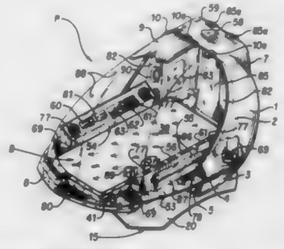
the cannula apparatus providing a cannula nipple outlet for each of a person's nostrils in proximity to one another for both delivering gas to each of the person's nostrils, and monitoring the respiration of the person by monitoring the respiration as to each of the person's nostrials.

4,989,600

TANNING POD

Joseph M. Collier, 1365 Stuart St., Green Bay, Wis. 54301

Filed Aug. 16, 1989, Ser. No. 394,670
Int. Cl.[5] A61N *5/00*
U.S. Cl. 128—372 11 Claims



1. A tanning pod comprising;

a body shell including an upper portion defining an occupant compartment therewithin,

said body shell having a lower portion adjacent said upper portion, a horizontally and vertically fixed floor plate intermediate said shell upper and lower portions,

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said body shell defining an elongated curved configuration having rear and front portions, said shell upper portion including a dome of transparent material extending downwardly from adjacent said rear portion to said front portion and encompassing a substantial area of said upper portion.

a pedestal assembly beneath said body shell,

motive means adjacent said body shell and pedestal assembly and operable to angularly displace said body shell relative said pedestal assembly,

a substantially fixed, longitudinal, rigid body support bed within said compartment mounted atop said floor plate and having opposite head and foot ends with said foot end adjacent said shell front portion, hinge means mounting said bed foot end to said floor plate,

vertical displacement means operable to raise and lower said bed head end to tilt said bed about said hinge means relative a horizontal plane and said body shell,

climate maintenance means including an HVAC unit disposed within said body shell, and

first, second, and third control means selectively operable by an occupant within said compartment respectively to operate said motive means, vertical displacement means and climate maintenance means.

4,989,601

METHOD, APPARATUS, AND SUBSTANCE FOR TREATING TISSUE HAVING NEOPLASTIC CELLS

Jose A. Marchosky, Creve Couer; Christopher J. Moran, St. Louis, both of Mo., and Neal E. Fearnot, West Lafayette, Ind., assignors to Medical Engineering & Development Institute, Inc., West Lafayette, Ind.

Continuation-in-part of Ser. No. 193,167, May 2, 1988, which is a continuation of Ser. No. 112,628, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 697,697, Feb. 4, 1985, Pat. No. 4,719,919, which is a continuation of Ser. No. 459,708, Jan. 21, 1983, abandoned. This application Sep. 22, 1988, Ser. No. 247,769

Int. Cl.[5] A61F 7/00; A61M 37/00

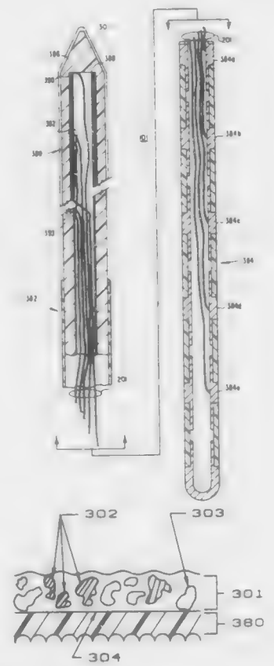
U.S. Cl. 128—399 39 Claims

1. A probe for treating a cancerous tumor comprising:

an elongated member sized for and having a distal end tapered for interstitially implanting said elongated member in said cancerous tumor;

a heater element positioned about said distal end for producing heat; and

a coating layer joined with said member about said distal end and responsive to said heat for releasing at a predetermined temperature above a temperature of said tumor a drug for providing a treatment of said tumor.



4,989,602

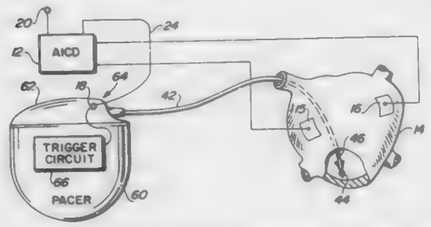
PROGRAMMABLE AUTOMATIC IMPLANTABLE CARDIOVERTER/DEFIBRILLATOR AND PACEMAKER SYSTEM

Jason A. Sholder, Northridge, and Brian M. Mann, Los Angeles, both of Calif., assignors to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Apr. 12, 1989, Ser. No. 336,996

Int. Cl.[5] A61N 1/39

U.S. Cl. 128—419 D 20 Claims



1. A programmable cardioverter/defibrillator system comprising:

(a) an automatic implantable cardioverter/ defibrillator (AICD), said AICD comprising:

high/low rate sensing means for sensing when a heart is beating above a fixed high threshold rate or below a fixed low threshold rate; and

means for delivering a high energy cardioversion/defibrillation pulse to the heart whenever said high/low rate sensing means senses that the heart is beating above the fixed high threshold rate or below the fixed low threshold rate;

(b) an implantable programmable pacemaker, said pacemaker comprising:

heart-rate sensing means for sensing the rate at which the heart is beating;

means for processing the sensed heart rate to determine whether the sensed heart rate lies within a programmed range of acceptable heart rates and for triggering the generation of said cardioversion/defibrillation pulse from said AICD so that the fixed high and low threshold rates of said AICD are replaced by the programmed range of heart rates of said implantable programmable pacemaker, said triggering occurring whenever the heart rate sensed by said heart rate sensing means of said pacemaker does not fall within said prescribed range of acceptable heart rates; and

programming means for allowing said programmed range of acceptable heart rates to be programmed into said processing means; and

(c) coupling means for coupling the operation of said AICD to said pacemaker.

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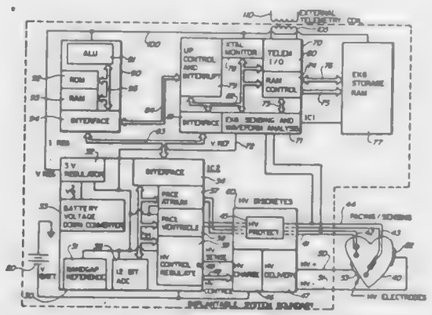
IMPLANTABLE CARDIAC DEFIBRILLATOR EMPLOYING A SWITCHED CAPACITOR FILTER STAGE HAVING A LOW CHARGE-INJECTION INDUCED OFFSET VOLTAGE

Kenneth J. Carroll, San Jose, and Benjamin D. Pless, Menlo Park, both of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 354,632, May 19, 1989, abandoned. This application Apr. 6, 1990, Ser. No. 505,430

Int. Cl.[5] A61N 1/00

U.S. Cl. 128—419 D 9 Claims



1. An implantable cardiac defibrillator comprising:

electrode means adapted to be coupled to a patient's heart;

sensing means having inputs coupled to said electrode means for sensing cardiac electrical signals;

means for storing a charge;

means for delivering a shock to the heart; and

said sensing means including switched capacitor filter means having MOS resistors coupled between MOS switches and sensitive nodes for providing a low charge-injection induced offset voltage on the output of an operational amplifier when said MOS switches are turned off by control signals having trapezoidal rising and falling edges.

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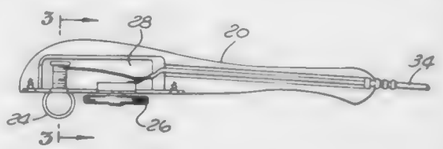
ELECTROMAGNETIC DEVICE

Paul Y. Fang, Anaheim, Calif., assignor to ACCU Science Corporation, Orange, Calif.

Filed Oct. 3, 1985, Ser. No. 783,477

Int. Cl.[5] A61N 1/40

U.S. Cl. 128—421 2 Claims



1. An electromagnetic energy pulse emitter for the stimulation of acupuncture points comprising:

means for providing pulses of electric current at a frequency in the range of 2 to 16 hertz;

transducer means, comprising a plurality of coils in series, responsive to said electric current pulses by emitting electromagnetic radiation pulses at the same frequency;

said plurality of coils having a pair of coils connected to each other in series, disposed adjacent one another and aligned along a same axis so that a relatively linear magnetic pulse is provided;

said coils are pulsed with an electric current forming an electromagnet having a north end and a south end; and said north end of the one of said coils is adjacent said south end of the other of said coils: and

each of said coils comprising a first having approximately 10 times the number of windings as a second coil.

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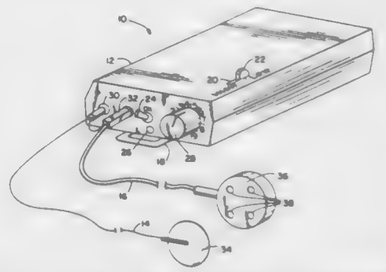
TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS) DEVICE

Joel Rossen, 604 Sartori Dr., Petaluma, Calif. 94952

Filed Mar. 31, 1989, Ser. No. 331,181

Int. Cl.[5] A61N 1/34

U.S. Cl. 128—422 15 Claims



15. An improved transcutaneous electrical nerve stimulation electrode system comprising:

(a) a pair of electrode means wherein each of said electrode means are for making separate surface contact with mammalian tissue and for supplying a therapeutically stimulating electrical current to said mammalian tissue; and

(b) at least one LED light source means for making surface contact and for supplying light to mammalian tissue at the location of and synchronously with at least one of said pair of electrical current electrode means.

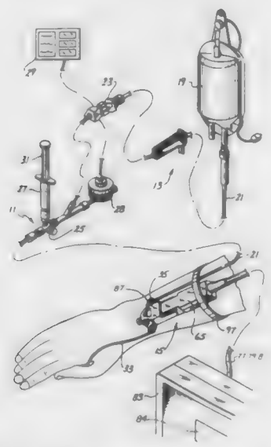
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4,989,606

INTRAVASCULAR BLOOD GAS SENSING SYSTEM

John L. Gehrich, Laguna Beach; Thomas P. Maxwell, Santa Ana, and Thomas G. Hacker, Anaheim, all of Calif., assignors to Minnesota Mining and Manufactoring Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 8,937, Jan. 30, 1987, Pat. No. 4,830,013. This application Aug. 8, 1988, Ser. No. 229,617
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—637 36 Claims



1. A sensor cassette for use in measuring a compositional parameter of the blood of a patient comprising:
a housing adapted and sized to be located outside the body of the patient and having a fluid flow passage therethrough which is capable of receiving blood from the patient; and
a sensing element located in said housing in or near said fluid flow passage for providing a signal in response to a compositional parameter of blood, said fluid flow passage at or near the location of said sensing element being at least 4.8 times as wide as its depth, the depth of said fluid flow passage extending directly outwardly from said sensing element and the wide direction of said fluid flow passage being substantially perpendicular to both the general direction of fluid flow in said fluid flow passage and to the depth of the fluid flow passage.

4,989,607

HIGHLY CONDUCTIVE NON-STRINGY ADHESIVE HYDROPHILIC GELS AND MEDICAL ELECTRODE ASSEMBLIES MANUFACTURED THEREFROM

Preston Keusch, 220 E. 84th St., Apt. 3-D, New York, N.Y. 10028; Christine A. Czap, 197 Oriol Dr., Montgomery, N.Y. 12549; Keith A. Murdock, 288 Haverstraw Rd., Suffern, N.Y. 10901, and Linda Leanon, R.D. 1, Box 834, Campbell Hall, N.Y. 10916

Filed Mar. 30, 1989, Ser. No. 330,669
Int. Cl.[5] A61B 5/0402; A61N 1/04
U.S. Cl. 128—640 39 Claims

1. A highly conductive non-stringy adhesive hydrophilic gel comprising a cohesive uniform aqueous mixture of poly(vinyl pyrrolidone) (PVP), a viscosity-enhancing hydrophilic polymer having a weight average molecular weight in excess of about 100 kilodaltons (kD), and an amount of a water-soluble electrolyte effective to reduce the transverse electrical resistance of said aqueous mixture to an impedance at 60 Hz of less than about 1,000 ohms,
which aqueous mixture had been exposed to a dose of radiant energy effective to provide a highly conductive non-stringy adhesive hydrophilic gel which exhibits a sharp, substantially featureless force-displacement curve, having a force value of least about 180 grams and an Adhesion Energy Density (AED) of at least about 5 to less than about 50 g/cm.

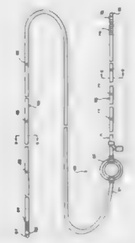
31. An electrode comprising: (a) a highly conductive non-stringy adhesive hydrophilic gel, which gel comprises a cohesive uniform aqueous mixture of poly(vinyl pyrrolidone) (PVP), a viscosity-enhancing hydrophilic polymer having a weight average molecular weight in excess of about 100 kilodaltons (kD), and an amount of a water-soluble electrolyte effective to reduce the transverse electrical resistance of said aqueous mixture to an impedance at 60 Hz of less than about 1,000 ohms,
which aqueous mixture had been exposed to a dose of radiant energy effective to provide a highly conductive non-stringy adhesive hydrophilic gel which exhibits a sharp, substantially featureless force-displacement curve, having a force value of at least about 180 grams and an Adhesion Energy Density (AED) of at least about 5 to less than about 50 g/cm; and (b) a conductive member, in intimate contact with said gel, to which may be connected external electrical apparatus.

4,989,608

DEVICE CONSTRUCTION AND METHOD FACILITATING MAGNETIC RESONANCE IMAGING OF FOREIGN OBJECTS IN A BODY

Adam V. Ratner, 815 Sea Spray La., Foster City, Calif. 94404

Continuation-in-part of Ser. No. 79,268, Jul. 2, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 345,892
Int. Cl.[5] A61B 5/055
U.S. Cl. 128—653 A 21 Claims



1. A device which is specifically useful during magnetic resonance imaging of body tissue comprising: a flexible member of resinous material adapted to be inserted in the body tissue, the flexible member having ferromagnetic particles embedded therein at a concentration of about 0.001% to about 10% by weight of the material wherein, under magnetic resonance imaging, the flexible member exhibits characteristics which differ substantially from characteristics of the body tissue so that the visibility of the flexible member under magnetic resonance imaging is substantially enhanced, resulting in the flexible member being distinguishable from adjacent tissue as a dark area in brighter tissues and as a bright area in darker tissues, said member being free of elements which tend to degrade the overall quality of magnetic resonance images of the body tissues.

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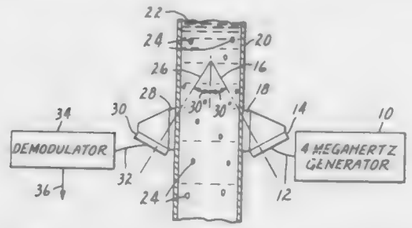
DOPPLER BLOOD FLOW SYSTEM AND METHOD USING SPECIAL ZERO FLOW RATE ANALYSIS

Dirk R. Smith, St. Paul, and Billy L. Weaver, Eagan, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 26, 1989, Ser. No. 302,402
Int. Cl.[5] A61B 5/026
U.S. Cl. 128—661.08 4 Claims

3. An apparatus for determining a value of rate of flow of a fluid containing particles flowing through a tube, including a

determination of whether a special case of the value of said rate of flow being equal to zero exists, comprising:
transmitting means for transmitting an ultrasonic signal through said tube at an oblique angle thereto;
receiving for receiving said ultrasonic signal which has been reflected off of said particles contained in said fluid creating a received ultrasonic signal which has an amplitude;
calculating means for calculating a preliminary rate of flow of said fluid from said received ultrasonic signal using Doppler techniques, said preliminary rate of flow being said rate of flow unless said special case of the value of said rate of flow being equal to zero exists;



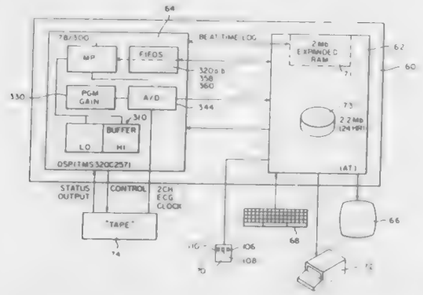
measuring means for measuring the magnitude of the amplitude of said received ultrasonic signal with a predetermined magnitude value;
comparing means responsive to said measuring means for comparing said magnitude of said amplitude of said received ultrasonic signal with a predetermined magnitude value; and
deciding means responsive to said comparing means for deciding that said special case of the value of said rate of flow being equal to zero exists when said magnitude of the amplitude of said received ultrasonic signal does not exceed said predetermined magnitude value.

4,989,610

METHOD AND SYSTEM OF ECG DATA REVIEW AND ANALYSIS

Craig A. Patton, Renton; Craig S. Siegman, Redmond; Roy E. Sundahl, Woodinville; Steven W. Webert, Redmond, all of Wash., and Harold G. Dow, Hillsboro, Ore. assignors to SpaceLabs, Inc., Redmond, Wash.

Filed Nov. 16, 1987, Ser. No. 121,817
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—695 13 Claims



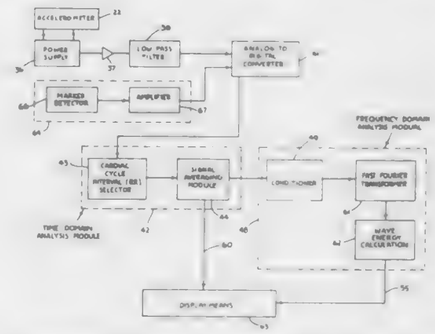
1. A method of analyzing data representing a patient's heart beats over a period of time as a plurality of waveforms, the method comprising the steps of:
(a) performing a Fourier analysis on the beat data to obtain pluralities of points in the complex plane representing the natural complex frequencies of each beat and preliminarily categorizing the beats into a plurality of bins of similar waveforms based on the proximity of corresponding pluralities of points in the complex plane;
(b) displaying a plurality of representative beats on a display screen, the beats being representative of a plurality of bins;
(c) selecting a bin for possible recategorization;
(d) after performing steps b and c, displaying the waveform of a representative beat from the selected bin superimposed over a waveform from a displayed bin to allow direct comparison of the waveform of the selected bin and the displayed bin;
(e) comparing the superimposed waveforms to determine if they are similar enough to be merged; and
(f) after comparing the superimposed waveforms, merging the selected bin and the displayed bin compared therewith if sufficient similarity is found.

4,989,611

CARDIAC COMPRESSION WAVE MEASURING SYSTEM AND METHOD

John M. Zanetti, Long Lake, and David M. Salerno, Minneapolis, both of Minn., assignors to SeisMed Instruments, Inc., Minneapolis, Minn.

Filed Aug. 19, 1988, Ser. No. 234,031
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—695 4 Claims



1. Apparatus for the diagnostic display of motion signals characterizing the ventricular wall motion of a patient's heart comprising:
compression wave detector means, coupled to said patient, responsive to cardiac induced compression waves at the surface of said patient, for generating motion signals indicative of said compression waves;
cardiac cycle selector means coupled to said patient for selecting normally conducted sinus beats of said patient's heart and for generating a cardiac cycle signal during each of said normally conducted beats;
display means coupled to said cardiac cycle selector means and coupled to said detector means for diagnostic display of averaged data corresponding to said motion signals collected during said cardiac cycle signals.

4,989,612

RESPIRATION MONITOR

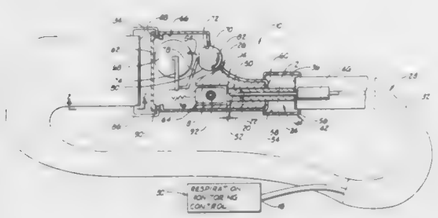
Don C. Fore, Vinita, Okla., assignor to William H. Castor, Vinita and Ida F. Thrope, Spavinaw, both of, Okla.

Continuation-in-part of Ser. No. 48,896, May 12, 1987, Pat. No. 4,838,279. This application Nov. 23, 1988, Ser. No. 275,770
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—721 12 Claims

1. A respiration monitor for monitoring respiration motion of an individual, comprising:
a light source for emitting light;
a receiving light conductor having a receiving end and a sending end, the receiving light conductor being suitable

for conducting light between the receiving and sending ends thereof;

means for positioning the receiving end of the receiving light conductor generally near and spaced a distance from the light source and for positioning the receiving end of the receiving light conductor and the light source near a portion of the individual which moves in response to respiration motion of the individual, and for holding the receiving end of the receiving light conductor and the light source so the distance between the receiving end of



the receiving light conductor and the light source varies in response to respiration motion of the individual, the intensity of the light received by the receiving end and emitted from the sending end of the receiving light conductor being indicative of the distance between the receiving end of the receiving light conductor and the light source; and

means for receiving light from the sending end of the receiving light conductor and determining indications of respiration motion in response to changes in the intensity of the received light and providing an output indication indicative of respiration motion.

4,989,614

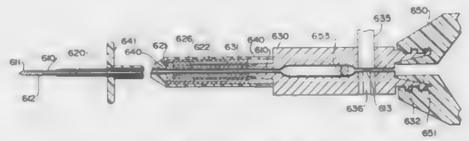
FINE-NEEDLE ASPIRATION CELL SAMPLING METHODS

Stephen W. Dejter, Jr., Washington, D.C., and Richard H. Goodwin, Jr., Bethesda, Md., assignors to Vance Products Incorporated, Spencer, Ind.

Filed Feb. 23, 1988, Ser. No. 159,320

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—752 **23 Claims**



1. A method of aspirating a cytological sample from a target area using a selectively occludable needle, comprising the steps of:

penetrating the target area with the needle in its occluded position;

creating a partial vacuum in the needle and unoccluding the needle;

collecting the cytological sample;

releasing the partial vacuum and re-occluding the needle; and

withdrawing the needle from the target area.

4,989,615

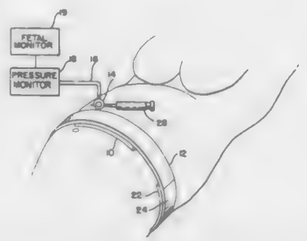
APPARATUS FOR NON-INVASIVE MONITORING OF UTERINE CONTRACTIONS

Howard M. Hochberg, Woodinville, Wash., assignor to International Biomedics, Inc., Bothell, Wash.

Continuation-in-part of Ser. No. 142,943, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 857,021, Apr. 29, 1986, abandoned. This application Jun. 6, 1989, Ser. No. 363,322

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—774 **5 Claims**



1. An apparatus for detecting uterine activity comprising:

a bladder-like member which includes an substantially air-tight cover member which defines an interior volume and a resilient insert element, disposed within the interior volume;

means for monitoring fluid pressure within the defined volume; and

a fluid conduit connecting the interior volume with the pressure monitoring means, wherein, when the bladder-like member is positioned against the abdomen of a patient in the vicinity of the uterus by a belt or similar article in such a manner that an initial pressure is produced against the patient's abdomen by the bladder-like member and the patient's abdomen hardens due to a uterine contraction, a change in the fluid pressure in the interior volume results, thereby indicating the presence of uterine activity.

4,989,613

DIAGNOSIS BY INTRASOUND

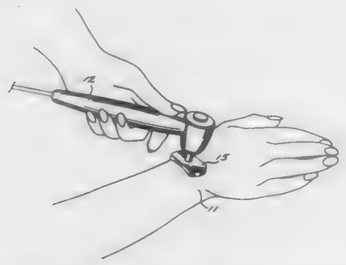
John G. Finkenberg, 1322 S. Gertruda, Redondo Beach, Calif.

WLFP

Filed Sep. 29, 1989, Ser. No. 415,096

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—739 **6 Claims**



1. A method of confirming a suspected occult fracture of a patient's bone, comprising the steps of:

inducing intrasonic vibration in said bone; and

observing a protective retraction response by said patient to said induced vibration as an indication of said occult fracture.

4,989,616

MONOSTATIC ANTI-BRUXISM DEVICE

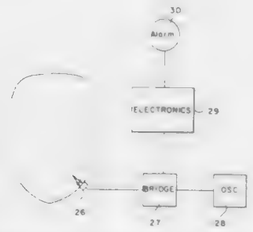
Alexander Y. Lee, Jr., 1075 S. Jefferson St., Apt. 321, Arlington, Va. 22204

Filed Aug. 28, 1989, Ser. No. 399,017

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—777 **2 Claims**



1. An apparatus for the control and prevention of bruxing of bruxing comprising:

a sound generating means adapted to be mounted on one of a subject's lower jaw or bony structure connected to the upper jaw,

an adjustable electrical signal generator means for transmitting a signal to said sound generating means,

an impedance measuring means located on line between said electrical signal generator means and said sound generating means,

and electronic control means for detecting predetermined variations in signal voltage coming from said impedance measuring means, said variations in signal voltage resulting from variations in impedance which occur with the onset of bruxing, and

an alarm means for alerting the subject when bruxing occurs, said alarm means being activated by said electronic control means when predetermined variations in impedance occur at the onset of bruxing.

4,989,617

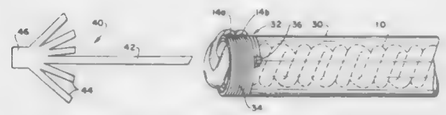
INTRAMUSCULAR ELECTRODE FOR NEUROMUSCULAR STIMULATION SYSTEM

William D. Memberg; Paul H. Peckham, both of Cleveland Hts., and Michael W. Keith, Moreland Hill, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Jul. 14, 1989, Ser. No. 379,830

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—785 **15 Claims**



1. An electrode for surgical implantation, the electrode comprising:

a multistrand wire extending along a helical path;

a flexible, insulating sheath surrounding and encasing the multistrand wire;

an insulation-free portion of the multistrand wire being wrapped around a periphery of a terminal end of the sheath to form an electrical contact adapted for transmitting electrical energy to tissue surrounding the electrode.

4,989,618

DEVICE AND METHOD FOR INTRAVAGINAL, BARRIER-TYPE PREVENTION OF CONCEPTION AND INFECTION

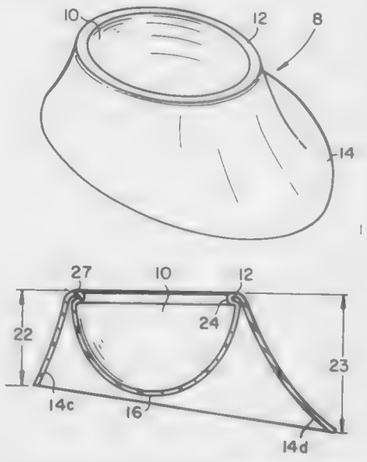
Alfred A. Shihata, Bonita, Calif., assignor to Vance Products Incorporated, Spencer, Ind.

Continuation of Ser. No. 159,846, Feb. 24, 1988, Pat. No. 4,858,624. This application Jul. 31, 1989, Ser. No. 386,882

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[5] A61F *6/08*

U.S. Cl. 128—841 **11 Claims**



1. A barrier-type device for preventing conception and infection by sexually-transmitted diseases, comprising:

a cervical dome fabricated from a flexible material, said dome having an upwardly facing opening and a curved surface extending from said opening to a downwardly facing dome peak; and

a continuous, generally annular fornical rim defining said opening, said rim being folded from said dome inwardly, upwardly, and outwardly, transitioning therefrom into a continuous, annular vaginal brim which circumscribes said cervical dome and extends both outwardly and downwardly, said fornical rim thereby forming an inwardly extending lip and a fluid trapping, inwardly extending groove between said brim and said lip.

4,989,619

SMOKING ARTICLE WITH IMPROVED FUEL ELEMENT

Jack F. Clearman, Blakely, Ga.; James L. Resce, Yadkinville, N.C.; Ernest G. Farrier, Winston-Salem, N.C.; Alan B. Norman; Olivia P. Furin, both of Clemmons, N.C., and William C. Squires, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 769,532, Aug. 26, 1985. This application Dec. 9, 1986, Ser. No. 939,592

Int. Cl.[5] A24D *1/00, 1/18*

U.S. Cl. 131—194 **85 Claims**

1. A smoking article comprising:

(a) a carbonaceous fuel element, said fuel element having a plurality of peripheral longitudinal passageways selected from (1) channels open on the periphery of the fuel element and (2) closed passageways situated sufficiently near the periphery of the fuel element whereby said passage-

VOL 1123 ISS 1 FE 5 1991 UMI

ways burn out to the periphery to form open channels during use; and



(b) an aerosol generating means including an aerosol forming material.

4,989,620

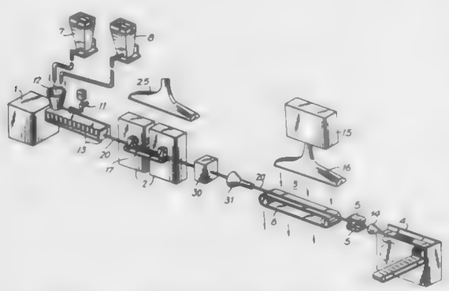
METHOD AND APPARATUS FOR COATING EXTRUDED TOBACCO-CONTAINING MATERIAL

Gus D. Keritsis; Richard A. Thesing, and Walter A. Nichols, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 74,990, Jul. 17, 1987, Pat. No. 4,874,000, which is a continuation-in-part of Ser. No. 900,715, Aug. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 740,325, Jun. 3, 1985, Pat. No. 4,632,131, and a continuation-in-part of Ser. No. 627,407, Jul. 3, 1984, abandoned, and a continuation-in-part of Ser. No. 723,883, Apr. 16, 1985, Pat. No. 4,625,737, and a continuation-in-part of Ser. No. 457,505, Dec. 30, 1982, Pat. No. 4,510,950. This application Sep. 19, 1988, Ser. No. 246,089

Int. Cl.[5] A24B *3/14*

U.S. Cl. 131—371 19 Claims



1. A method for processing continuously extruded tobacco-containing materials comprising providing an extruded tobacco-containing material having an OV content less than about 28%, and applying a powdery material to the surface of said extruded material, said powdery material modifying the characteristics of the resultant smoking article and said powdery material being selected from among the group consisting of tobacco, spices of other flavorants, inorganic or organometallic salts, fillers, or hydrocolloids.

4,989,621

HAIR WINDING DEVICE

Dieter Keller, Sindelfinger Str. 28, 7030 Böblingen, Fed. Rep. of Germany

PCT No. PCT/DE87/00326, § 371 Date Sep. 2, 1988, § 102(e) Date Sep. 2, 1988, PCT Pub. No. WO88/00445, PCT Pub. Date Jan. 28, 1988

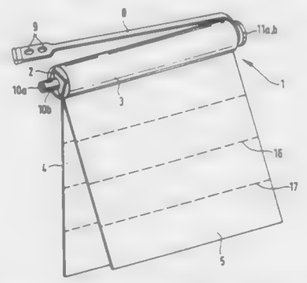
PCT Filed Jul. 21, 1987, Ser. No. 275,038

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624689

Int. Cl.[5] A45D *2/00, 2/14*

U.S. Cl. 132—245 9 Claims

1. Hair winding device with means of taking up and winding on hair strands, comprising: a hair winding rod (1) having a longitudinal axis and consisting of 2 parts (2, 3), means for connecting said parts to each other in an articulated manner and at least one foil attached to said rod, the improvement comprising two thin protective foils (4, 5) impermeable to waving fluid and secured respectively onto each of the two parts of the hair winding rod, face to face with free ends extending radially from the two-part rod, to produce a root permanent wave, and said protective foils projecting over a considerable length transversely to the longitudinal axis of the hair winding rod for winding about the hair winding rod with the hair strands captured therebetween.



4,989,622

VANITY CASE

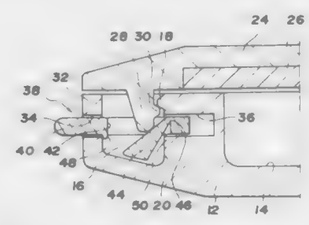
Shinichi Kozuka, Tokyo, and Yukitomo Yuhara, Abiko, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,754

Claims priority, application Japan, Feb. 1, 1988, 63-11199; Feb. 4, 1988, 63-13035; Feb. 4, 1988, 63-13036; Mar. 17, 1988, 63-34542; Apr. 8, 1988, 63-46898; May 20, 1988, 63-65747

Int. Cl.[5] A45D *42/02*

U.S. Cl. 132—301 29 Claims



1. A vanity case comprising:

a receptacle member;

a cover member hinged with said receptacle member at a rear end thereof;

one of said receptacle member and said cover member having formed in a front portion thereof a recess;

the other of said cover member and said receptacle member having extending from a front portion thereof a nose;

latch means for maintaining said cover member in a closed position with respect to said receptacle member;

a push piece mounted for sliding movement relative to said recess, said push piece having therethrough a center opening defined by a rear wall member, said center opening being located such that when said cover member is in said closed position said nose extends into said center opening;

an arm swingably and integrally hinged to said rear wall member and extending therefrom in a direction forwardly and toward a bottom of said recess, said arm having a first surface positioned closely adjacent said nose when said cover member is in said closed position; and

stationary abutment means for, upon rearward movement of said push piece, abutting against a second surface of said arm and thereby causing said arm to swing relative to said rear wall member and to move into said center opening, thus causing said arm to move said nose and release said latch means and open said cover member from said receptacle member.

4,989,623

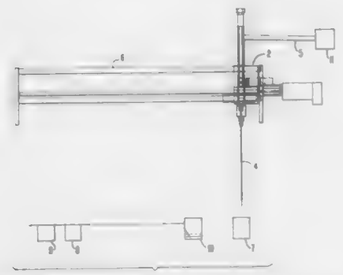
APPARATUS AND METHOD FOR CLEANING REAGENT DELIVERY PROBES

Julie F. Hoffman, Durham, N.C., and Lionel D. Jones, II, Ventura, Calif., assignors to Akzo N.V., Netherlands

Filed Dec. 1, 1989, Ser. No. 443,954

Int. Cl.[5] B08B *9/02;* G01N *37/00*

U.S. Cl. 134—88 10 Claims



1. A cleaning apparatus for a hollow delivery probe which is repeatedly used in an automatic system for dispensing protein-containing reagents, comprising:

a bath of a cleaning solution for a protein-containing reagent;

means for lowering the probe into said cleaning solution for aspirating cleaning solution into the probe and for coating the outside of the probe;

means for raising the probe from said cleaning solution;

means for forcing primer liquid through the probe for expelling aspirated cleaning solution followed by primer liquid from the probe for washing the inside of the probe; and

means for deflecting cleaning solution and primer liquid expelled from the probe onto the outside of the probe for washing the outside of the probe.

4,989,624

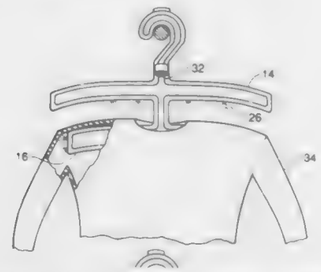
WETSUIT WASHER

Chris F. Darling, 825 Onstoot Rd., Lompoc, Calif. 93436

Filed Jun. 4, 1990, Ser. No. 532,872

Int. Cl.[5] B08B *11/02*

U.S. Cl. 134—100 8 Claims



1. A device for use in washing a wetsuit or similar article, comprising in combination:

a support member extending vertically and enclosing a vertically-extending passage;

a top cross arm extending horizontally from said support member and enclosing a horizontally-extending passage that communicates with the vertically-extending passage of said support member, said top cross arm including downwardly-directed ducts connecting its horizontally extending passage with the space below said top cross arm;

a lower cross arm extending horizontally from said support member and enclosing a horizontally-extending passage that communicates with the vertically-extending passage of said support member; said lower cross arm including ducts connecting its horizontally-extending passage with the space surrounding said lower cross arm.

4,989,625

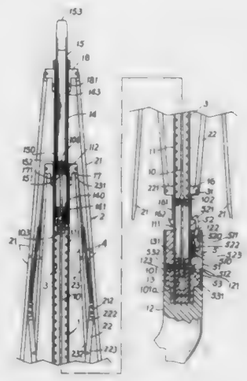
STABLY-RETAINED AUTOMATIC UMBRELLA

Tsun-Zong Wu, No. 16, Chen Tai Road, Sec 3, Wu-Ku Hsiang, Taipei Hsien, Taiwan 24801

Filed Sep. 7, 1990, Ser. No. 579,036

Int. Cl.[5] A45B *25/14*

U.S. Cl. 135—22 5 Claims



1. An automatic umbrella comprising:

a central shaft means including a lower shaft having a grip secured on a lower portion of said lower shaft, a middle tubular shaft telescopically mounted in said lower tubular shaft having a middle plug fixed on a lower end portion of said middle tubular shaft, and an upper tubular shaft telescopically mounted in said middle tubular shaft having an upper plub fixed on a lower end portion of said upper tubular shaft;

a rib assembly including at least a top rib having an inner end portion of said top rib pivotally secured to an upper ferrule fixed on an upper end portion of said middle tubular shaft, at least a stretcher rib having an inner end portion of said stretcher rib pivotally secured to a lower ferrule slidably held on said lower tubular shaft and having an outer portion of said stretcher rib pivotally secured to said top rib, and at least an intermediate linking rib pivotally secured between said stretcher rib and a middle ferrule fixed on an upper end portion of said lower tubular shaft;

an opening tensioning spring formed in said central shaft means for opening said umbrella having an upper spring end portion retained on said lower plug of said middle shaft and having a lower spring end portion retained on a lower retainer formed on a lower portion of a central rod of which an upper most end portion of said central rod is secured to said upper plug of said upper shaft, an upper retainer formed on an upper portion of said rod operatively retaining said lower plug, and a locking head formed on a lowermost end portion of said rod below said lower retainer; at least a retraction restoring spring each secured between said middle ferrule and an outer portion of said rib assembly for retracting said rib assembly when closing said umbrella; and a control means formed in said grip having a push button for selectively depressing an

opening controller for opening the automatic umbrella, or depressing a closing controller for closing the umbrella;

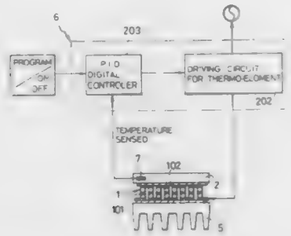
said lower ferrule having an extension ring formed on a lower portion of said lower ferrule engageable with an upper hook portion of said opening controller for pulling said lower and middle ferrules and said rib assembly downwardly along said central shaft means for retracting said rib assembly for extending said tensioning spring for storing its elastic potential energy, and upon adisengagement of said extension ring of said lower ferrule from said hook portion of said opening controller, said tensioning spring will restore to lower said middle shaft and said upper ferrule and raise said middle and middle ferrules for extending said rib assembly for opening said umbrella.

4,989,626

APPARATUS FOR AND METHOD OF CONTROLLING THE OPENING AND CLOSING OF CHANNEL FOR LIQUID

Yusuke Takagi; Yoshio Kojima, both of Hitachi, and Kenji Mitani, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433.330
Claims priority, application Japan, Nov. 11, 1988, 63-283890
Int. Cl.[5] F25B *2/02;* **F15C** *1/04*
U.S. Cl. 137—13 **45 Claims**



1. A method of controlling the opening and closing of a channel for a liquid, comprising the steps of:

cooling said liquid in said channel from the outside of said channel to solidify said liquid, thereby closing said channel; and heating said channel from the outside thereof to melt said liquid solidified in said channel, thereby opening said channel.

3. An apparatus for controlling the opening and closing of a channel for a liquid, comprising:

heat transmitting means of a good heat conductivity type through which at least one channel for a liquid extends;

at least one cooling and heating means having one heat absorbing and generating part secured to said heat transmitting means;

heat exchanger means secured to another part of said at least one cooling and heating means; and

controlling means for controlling said heat absorbing and generating part of said cooling and heating means to execute heat absorption or heat generation;

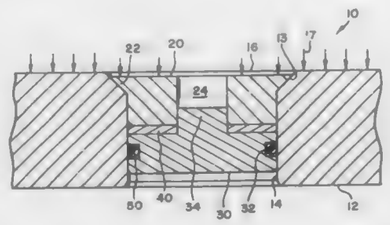
said apparatus being arranged such that said channel is closed first by causing said controlling means to control said heat absorbing and generating part of said cooling and heating means which is closer to said heat transmitting means to execute said heat absorption and then by cooling said heat transmitting means to solidify said liquid in said channels in said heat transmitting means, and such that said channel is opened first by causing said controlling means to control the same heat absorbing and generating part to execute said heat generation and then by heating said heat transmitting means to melt said liquid solidified in said channels in said heat transmitting means.

4,989,627

THERMAL FUSE VALVE

David D. McAfee, Niles, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 23, 1990, Ser. No. 498,502
Int. Cl.[5] F16K *17/38*
U.S. Cl. 137—72 **11 Claims**



1. In a vehicle wheel having a rim with a tire attached thereto to define a pressure chamber for a fluid, and a thermal fuse valve connected with the pressure chamber through a passage in the rim, the thermal fuse valve comprising a fuse body joined with a sealing fuse plug by means of a fusible material, the fuse body including valve retention means for retaining said fuse body and sealing fuse plug relative to said passage, the passage including complementary-shaped retention means for cooperating with the valve retention means to retain the fuse body in a stationary position relative to said passage, the fuse body including a through opening communicating with said pressure chamber, the sealing plug comprising sealing means disposed thereabout and engaging sealingly the passage to prevent the escape of fluid from said pressure chamber, and an extension which extends into said through opening of the fuse body, the fusible material disposed about said extension and between the fuse body and sealing fuse plug to join the body and plug together, the fusible material having a melting point at a predetermined temperature such that an increase of temperature at the vehicle wheel to the predetermined temperature causes the fusible material to melt and, in conjunction with fluid pressure exerted against said extension, permits said sealing fuse plug to be released from being joined with said fuse body so that the plug is displaced and the sealing means disengages sealingly the passage and permits fluid to escape through said opening.

4,989,628

MOISTURE-RESPONSIVE VALVE ASSEMBLY

Jacob Gil, 7 Havatselet Str., Kiryat Ono; Zvi Rubinstein, Timrat, and Yoram Hadar, Haifa, all of Israel, assignors to Plastro-Gvat, Kibbutz Gvat, a part interest; Asroteam Consultants Ltd., Migdal Haemek, a part interest and Jacob Gil, Kiryat Ono, all of, Israel, a part interest

Filed Feb. 14, 1990, Ser. No. 479,887
Claims priority, application Israel, Feb. 17, 1989, 89317
Int. Cl.[5] A01G *25/00*
U.S. Cl. 137—78.3 **15 Claims**

1. A moisture-responsive valve, comprising:

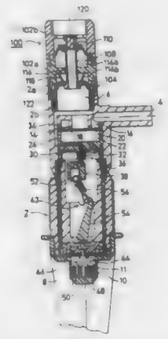
a housing including an inlet port for connection to a water supply pipe, an outlet port, a passageway connecting the inlet port to the outlet port, a valve opening in said passageway, and a displaceable valve member actuatable to open and close said valve opening;

said housing further including a moisture-pervious wall, a moisture-swellable body in communication with said moisture-pervious wall to swell in volume in response to the moisture passing therethrough, actuator means controlled by said moisture-swellable body for actuating said valve member to open and close the valve in response to the moisture passing through said moisture-pervious wall;

said actuator means including a control chamber connected to the inlet port so as to receive the pressure thereat;

said valve member being located with respect to said control chamber and said inlet port such that the pressure at the inlet port acts against a portion of the surface area of the valve member in the direction tending to open it, whereas the pressure in the control chamber acts against a larger portion of the surface area of the valve member in the opposite direction tending to close it when the pressure in the control chamber is equal to that at the inlet port;

venting means for venting said control chamber to the atmosphere;



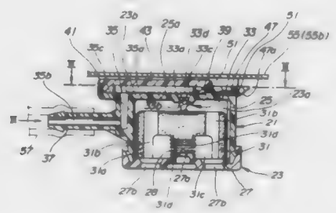
and a bi-stable snap-action device interposed between said moisture-swellable body and said valve member to actuate said valve member in response to the volume of said moisture swellable body, such that when the volume of the moisture-swellable body is low, the snap-action device opens said venting means to actuate the valve member to its open condition and to stably retain it in its open condition, and when the volume of the moisture-swellable body is high, the snap-action device closes said venting means to actuate said valve member to its closed condition and to stably retain it in its closed condition.

4,989,629

FUEL CUT VALVE FOR VENT LINE

Toshihiro Shirakawa, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jul. 7, 1989, Ser. No. 376,500
Claims priority, application Japan, Jul. 7, 1988, 63-89460[U]
Int. Cl.[5] F16K *31/22*
U.S. Cl. 137—202 **18 Claims**



1. A fuel cut valve for gaseous fuel ventilation system of a fuel tank for an automotive internal combustion engine, comprising:

a valve housing, attached by a mounting structure to an interior calling surface of said fuel tank, defining a hollow space therein and being in fluid communication with an interior space of a fuel tank for introducing gaseous state fuel;

a vent path means having a first horizontally extending section defined in said valve housing for fluid communication with the hollow space of said valve housing via a communication opening, a second horizontally extending section provided at offset position relative to said first horizontally extending section, and a third section establishing communication between said first and second horizontally extending sections;

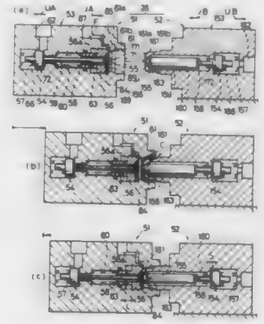
a valve means, associated with said communication opening for opening and closing the latter in response to the level of fuel in said fuel tank in order to permit the gaseous state fuel to flow through said vent path and block the liquid state fuel from flowing into said vent path.

4,989,630

QUICK-ACTING COUPLING

Keitaro Yonezawa, Nadaku Kobe, Japan, assignor to Kabushiki Kaisha KOSMEK, Hyogoken, Japan

Division of Ser. No. 423,276, Oct. 18, 1989. This application Jun. 22, 1990, Ser. No. 543,988
Claims priority, application Japan, Oct. 21, 1988, 63-266815; Nov. 29, 1988, 63-156341[U]
Int. Cl.[5] F16K *49/00*
U.S. Cl. 137—240 **2 Claims**



1. A quick-acting coupling with a fluid blow type cleaning device, comprising:

a socket-like first coupling (51) and a plug-like second coupling (52),

a coupling body (153) of said second coupling (52) being provided at its leading end portion with a connecting insert portion (161), said connecting insert portion (161) having a leading end surface (161*a*) and an outer surrounding surface (161*b*), a second coupling side flow passage (160) being opened in said leading end surface (161*a*), and an annular sealing contact portion (189) being formed in said leading end surface (161*a*) along the opening edge of said flow passage (160),

a coupling body (53) of said first coupling (51) being provided at its leading end portion with a connecting receive mouth (61) concaved therein, said connecting receive mouth (61) having an inmost end surface (61*a*) and an inner surrounding surface (61*b*), a first coupling side flow passage (60) being opened in the inmost end surface (61*a*), and an annular sealing contact portion (89) being formed in said inmost end surface (61*a*) along the opening edge of said flow passage (60),

the inner surrounding surface (61*b*) of said connecting receive mouth (61) being provided at least at a plurality of locations in its circumferential direction with ejection holes (85) for ejecting a cleaning fluid (F), said ejection holes (85) being opened in the inner surrounding surface (61*b*) of the connecting receive mouth (61) at its inmost portion, and the axes of said ejection holes (85) being oriented in such a direction as to spray the cleaning fluid (F) onto the inmost end surface (61*a*) of the connecting receive mouth (61) and the sealing contact portion (89),

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under the midway condition of the connection between said first coupling (51) and said second coupling (52), a cleaning flow passage (C) for the cleaning fluid (F) being formed along the whole length between the fitting surround surfaces of the connecting receive mouth (61) and the connecting insert portion (161), and said cleaning fluid (F) ejected from the ejection holes (85) being adapted to be sprayed onto the leading end surface (161*a*) and the outer surrounding surface (161*b*) of the connecting insert portion (161) for the cleaning, and

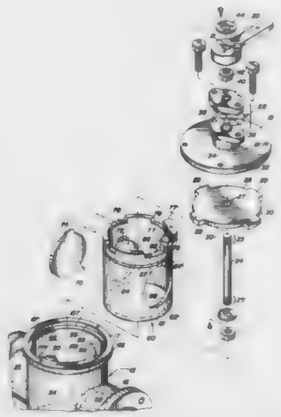
under the connected condition between the first coupling (51) and the second coupling (52), both the sealing contact portions (89) (189) being brought into contact with each other so as to seal between the fitting surfaces of the connecting receive mouth (61) and the connecting insert portion (161).

4,989,631

VALVE DEVICE WITH CONTROL SLEEVE AND CHECK VALVE

Roy W. Harbin, 8705 Heather, Odessa, Tex. 79764

Filed May 14, 1990, Ser. No. 523,495
Int. Cl.[5] F16K *15/18*
U.S. Cl. 137—269.5 **6 Claims**



1. A full opening sleeve valve device for controlling fluid flow comprising:

a housing, a flow passageway though said housing terminating in opposed ends, means by which the opposed ends of the passageway can be connected in a pipe; a bore extending through said housing transversely respective to said flow passageway and forming confronting passageway ends that terminate at and communicate with said bore, a flow control sleeve rotatably received within said bore and sealingly engaging the peripheral surface of the bore and thereby preventing flow through said passageway;

opposed ports in said sleeve diametrically opposed to one another that can selectively be rotated into registry with said flow passageway to thereby align said ports with said confronting passageway ends whereupon unrestricted flow can occur through the valve device;

check valve means for one of the sleeve ports arranged whereby when said sleeve is rotated to align said sleeve ports with said passageway confronting ends, said check valve can be moved into the opened position when flow occurs in one direction through said passageway, and said check valve means can be moved into the closed position when said sleeve is rotated to reverse the relationship of the sleeve ports respective to the confronting passageway ends and thereby effect flow in an opposite direction;

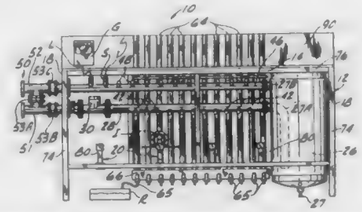
an actuator for rotating said sleeve to bring either of the sleeve ports into alignment with either of the confronting passageway ends and thereby place the valve in either of several alternate flow positions including an open and closed position; said actuator includes a plurality of castellations formed adjacent the upper marginal end of said sleeve, and a plate member having a plurality of projections formed thereon for being received within the intervening space between said castellations; shaft means for rotating said plate member and thereby rotating said sleeve from one into another flow position; an arcuate stop means on said body, said arcuate stop means has opposed ends, and stop means on said sleeve for abuttingly engaging the opposed ends of said arcuate stop means when said sleeve is rotated to selectively position the sleeve ports respective to the passageway confronting ends.

4,989,632

APPARATUS FOR USE IN AN AUTOMATED LIQUID COMBINATION AND TRANSPORT SYSTEM

William L. Bauerle, Wooster, Ohio, assignor to Bahm, Inc., St. Louis, Mo.

Filed Nov. 15, 1989, Ser. No. 437,462
Int. Cl.[5] G05D *11/13*
U.S. Cl. 137—343 **19 Claims**



1. Apparatus for use in an automated liquid combination and transport system including one or more injectors for injecting liquid additives from various reservoirs into a primary liquid, the apparatus comprising,

a frame having a front, a back and opposing sides, and including means for supporting the injectors thereon,

a tank connected to the frame,

a tubular input manifold mounted on the frame and connected to the tank for carrying the primary liquid and liquid additives into the tank, said input manifold having a plurality of inlets therein spaced axially thereof adapted for connection to the injectors which inject liquid additives from the reservoirs into the input manifold through its inlets, the input manifold being disposed with its inlets facing generally forwardly with respect to the frame such that its inlets are accessible from the front of the frame, and

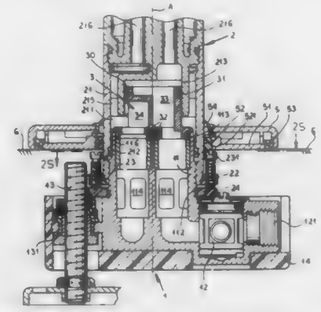
a tubular output manifold mounted on the frame and connected to the tank for transporting a primary liquid and liquid additive mixture from the tank, said output manifold having a plurality of ports therein spaced axially thereof, said output manifold extending generally side-to-side of the frame with its ports facing generally forwardly with respect to the frame such that all of its ports are accessible from the front of the frame.

4,989,633

ADJUSTABLE-LENGTH WALL-MOUNT FAUCET

Jürgen Humpert, Hemer; Bruno Heimann, Frondenberg-Ardey, and Jan R. Kostorz, Menden, all of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH+Co., Hemer, Fed. Rep. of Germany

Filed Feb. 26, 1990, Ser. No. 485,380
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1989, 3907586
Int. Cl.[5] F16L *5/00*
U.S. Cl. 137—360 **12 Claims**



1. A wall-mount faucet assembly comprising:

a wall fitting adapted to be recessed in a wall and having an externally threaded stem projecting from the wall centered on an axis and formed with hot- and cold-water outlet ports diametrically and symmetrically flanking the axis, the fitting being formed with hot- and cold-water inlet ports behind the wall and connected in the fitting to the outlet ports;

a mixing faucet having an internally threaded collar engageable with the stem and rotatable thereon for axially displacing the faucet on the fitting, the faucet being formed in the collar with concentric inner and outer hot- and cold-water inlets;

an adapter engaged in the collar between the faucet and the fitting and having hot- and cold-water passages with upstream ends at the respective outlet ports diametrically and symmetrically flanking the axis and inner and outer downstream ends at the respective inlets, the downstream ends being concentric such that the inlets connect thereto in any angular position of the faucet on the fitting;

locking means braceable axially between the faucet and the fitting for fixing the faucet on the fitting against rotation thereon in any relative angular position; and

an annular cover plate engageable around the collar and against the wall over the locking means to conceal same.

4,989,634

FUEL DISPENSER CATCHMENT BOX

Raymond J. Rieseck, Beaver Falls, Pa., assignor to Morgan Brothers Company, Beaver Falls, Pa.

Filed May 17, 1990, Ser. No. 525,130
Int. Cl.[5] H65B *1/04*
U.S. Cl. 137—363 **8 Claims**

1. A fuel dispenser catchment box comprising:

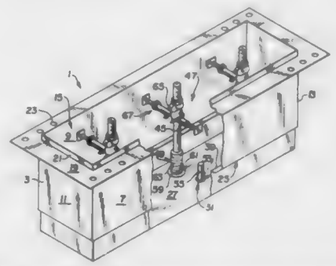
a metal casing, formed from spaced side walls and end walls, having an open top and open bottom;

means on the outer surface of said metal casing, spaced from said open top, for attachment of a dispenser housing;

a horizontally inwardly extending flange on said metal casing about the open bottom thereof;

a non-metallic closure member having a base, upwardly extending spaced side walls and end walls and an open top, said closure member having an outwardly extending lip about the open top thereof which rests on the horizontally inwardly extending flange of said metal casing to close the bottom of said casing;

at least one fuel supply line aperture, having a wall, formed in the base of said closure member for entry to said metal casing of a fuel supply line thereto;



a first seal between said fuel supply line and the wall of said fuel supply line aperture;

at least one auxiliary conduit aperture, having a wall, formed in the base of said closure member for entry to said metal casing of an auxiliary conduit thereto;

a second seal between said auxiliary conduit and the wall of said auxiliary conduit aperture, and

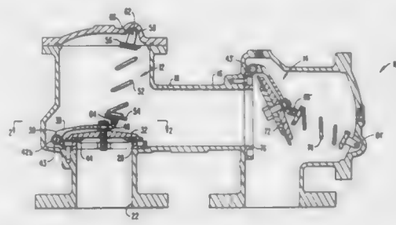
a support clamp extending between the spaced walls of said metal casing adjacently above said fuel supply line aperture for support of a fuel supply line therein.

4,989,635

CHECK VALVE WITH REDUCED HOLD-OPEN PRESSURE

Charles W. Dunmire, Fresno, Calif., assignor to CMB Industries, Inc., Fresno, Calif.

Filed Nov. 13, 1989, Ser. No. 435,870
Int. Cl.[5] F16K *15/03*
U.S. Cl. 137—527 **10 Claims**



1. A check valve, comprising:

a valve body having at least first and second ports, one of said ports being an inlet port and the other of said ports being an outlet port;

a valve seat adjacent to said first port;

a clapper configured to sealingly mate with said valve seat, said clapper pivotally attached to said valve seat to pivot about a first axis between a first position, wherein said clapper sealingly mates with said valve seat and at least a second position spaced from said valve seat;

first means for biasing said clapper in a direction toward said first position, said means for biasing having a first end and a second end, and forming a compressible connection

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between said clapper in said first position and said valve body;

second means, adjacent said first end, for attaching said means for biasing to said valve body at an attachment point; and

third means, adjacent said second end, for pivotally attaching said means for biasing to said clapper to permit pivoting of said means for biasing with respect to said clapper about a second axis, wherein the position of said second axis, with respect to said clapper and with respect to said second end, remains fixed during movement of said clapper from said first position to second position.

4,989,636

COUPLING FOR PRESSURE OF VACUUM FLUID SYSTEM

George S. Hunter, Richmond, and Michael J. Hawker, Hadleigh, both of Great Britain, assignors to Process Scientific Innovations Limited, Durham, Great Britain

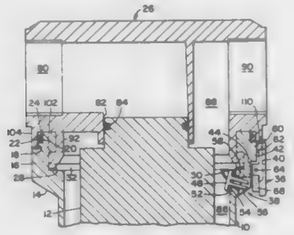
PCT No. PCT/GB88/00083, § 371 Date Oct. 13, 1989, § 102(e) Date Oct. 13, 1989, PCT Pub. No. WO88/06059, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 11, 1988, Ser. No. 382,692

Claims priority, application United Kingdom, Feb. 13, 1987, 8703313

Int. Cl.[5] **F16K** *37/00;* **B01D** *46/42*

U.S. Cl. 137—557 **14 Claims**



1. A coupling for a pressure or vacuum fluid system comprising:

first and second members that connect together by relative rotation to engage bayonet coupling means thereof and when connected together have outer walls overlapping with an intervening seal therebetween;

a pressure relief valve in one of the members; and

latch means that engages at an angular position of said members where the bayonet coupling is established to prevent relative rotation of said members and that is prevented from engagement at other angular positions, the latch means being decoupled from the valve when in its engaged state but being operatively coupled to the valve when in a disengaged state to open said valve, fluid flow therethrough providing an audible warning when a pressure differential exists across the valve.

4,989,637

GAS MIXING APPARATUS

Hans Dittrich, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe G.m.b.H., Karlsruhe, Fed. Rep. of Germany

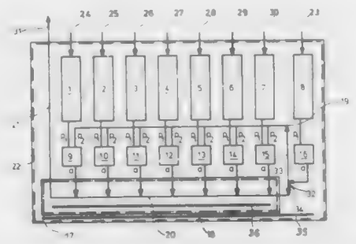
Filed Apr. 25, 1989, Ser. No. 342,869

Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814917

Int. Cl.[5] **F17D** *1/04;* **F16K** *49/00*

U.S. Cl. 137—599 **5 Claims**

1. A gas mixing apparatus for the generation of a continuous stream of a gas mixture consisting of a main stream of a carrier gas and a number of components added thereto in measured quantities, said apparatus including a carrier gas supply line, a collector in communication with said carrier gas supply line and adapted to receive the gas mixture, a component gas supply line connected to said collector for each of the component gases to be admixed to said carrier gas, each of said component gas supply lines including a mass flow regulator and a three-way valve with an output in communication with said collector and two inlets of which the first one which is in communication with the respective mass flow regulator is adapted to be selectively closed said carrier gas supply line including for each of said three-way valves a branch line connected to the second inlet such that said second inlets are in direct communication with the main carrier gas stream, said second inlets being always open so that pure carrier gas is always permitted to flow through each three-way valve.



4,989,638

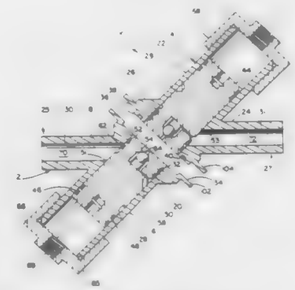
SUBSTANTIALLY LEAK-FREE DISCONNECTION APPARATUS

John N. Tervo, Scottsdale, Ariz., assignor to Allied-Signal, Morris County, N.J.

Filed Dec. 21, 1989, Ser. No. 454,234

Int. Cl.[5] **F16L** *37/28*

U.S. Cl. 137—614.01 **23 Claims**



1. Disconnection apparatus, comprising:

a first disconnect member, said member having a smaller bore formed therein to provide a first flow path, said member having a larger cylindrical bore formed therethrough and intersecting said smaller bore;

a second disconnect member, said second member having a smaller bore formed therein to provide a second flow path, said second member having a larger cylindrical bore formed therethrough and intersecting said smaller bore formed therein, said second member being in interfacing relationship with said first member whereby said larger cylindrical bores are coaxial and cooperatively form a channel that extends through said members and intersects said flow paths; and

first and second cylindrical cartridges slidably disposed in said channel, said first cartridge being positionable to block said first flow path where the latter is intersected by said channel, said second cartridge being positionable to block said second flow path where the latter is intersected by said channel.

4,989,639

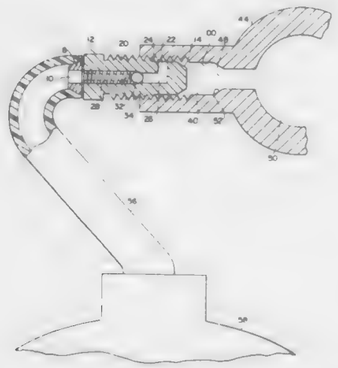
BRAKE BLEEDER CHECK VALVE

Michael T. Sulwer, Carpenter & Dystrup Sts., Lemont, Ill. 60439

Continuation-in-part of Ser. No. 267,970, Nov. 7, 1988, Pat. No. 4,869,292, which is a continuation-in-part of Ser. No. 192,048, May 9, 1988, abandoned. This application Apr. 17, 1989, Ser. No. 338,817

Int. Cl.[5] **F16K** *11/20*

U.S. Cl. 137—614.17 **3 Claims**



1. A brake bleeder valve and wheel brake cylinder housing combination, said break bleeder valve having an elongated valve body, an externally threaded cylindrical wall portion, an unthreaded sealing end portion extending from said externally threaded cylindrical wall portion and terminating at an inwardly extending sealing end, said wheel brake cylinder housing having a peripheral wall surrounding a cavity, an elongated cylindrical valve recess through said peripheral wall opening to said cavity, said recess including an internally threaded cylindrical wall portion, an unthreaded sealing portion extending from said internally threaded cylindrical wall portion inwardly and terminating at a sealing end of said recess surrounding an opening of said recess to said cavity, said externally threaded cylindrical wall portion of said valve body being rotatable within said internally threaded cylindrical wall portion of said valve recess to move said valve body between a first tightened position in which said inwardly extending sealing end of said valve body reaches said sealing end of said valve recess to sealingly close said cavity of said wheel brake cylinder housing and a second loosened position in which said sealing end of said valve body is drawn away from said sealing end of said valve recess to open said cavity of said wheel brake cylinder housing to aid valve recess such that air and brake fluid can be bled from the brake cylinder when said valve is in the loosened position and force is applied to a brake pedal to cause air and brake fluid to flow through said valve, a thin layer of sealing material between said externally threaded cylindrical wall portion of said valve body and said internally threaded cylindrical wall portion of said valve recess to seal against passage of air between aid externally threaded and internally threaded portions when said valve body is in said second loosened position within said valve recess whereby passage of air between said externally threaded and internally threaded portions is prevented during return movement of the brake pedal when said valve body is in the loosened position after a bleeding stroke of the pedal such that passage of air into the brake cylinder is prevented even where the ambient air pressure exceeds the pressure within the cylinder as a result of the brake pedal return after a bleeding stroke.

4,989,640

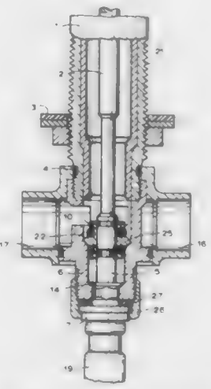
DIVERTER VALVE

Rudolf Steffes, Muecken, and Harald Meyer, Wittlich, both of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,824

Int. Cl.[5] **F16K** *11/044*

U.S. Cl. 137—625.5 **5 Claims**



1. A diverter valve assembly for diverting water from hot and cold water supply passages between at least two water outlet passages comprising:

a valve body having a chamber and at least two water outlet passages which communicate with said chamber and said hot and cold water supply passages;

a diverter valve actuating means positioned in said valve body to selectively open and close said at least two water outlet passages to said hot and cold water supply passages;

said diverter valve actuating means including a shiftable valve assembly having a valve cone thereon slidably supported in said chamber between a first position where said hot and cold water supply passages are open to one of said water outlet passages and a second position where said hot and cold water supply passages are open to the other of said water outlet passages, spindle means slidably supported in said valve body and extending slidably through said shiftable valve assembly for moving said shiftable valve assembly between its first and second positions, said spindle means being moved through said shiftable valve assembly for a predetermined distance before moving said shiftable valve assembly to open and close one of said water outlet passages to divert the flow of water therethrough, while reciprocably closing and opening the other of said water outlet passages.

4,989,641

ROTARY SELECTOR VALVE

Jeffrey A. Jones, Keene, and John W. Herndon, Bakersfield, both of Calif., assignors to Santa Fe Energy Co., Santa Fe Springs, Calif.

Filed Oct. 11, 1989, Ser. No. 420,026

Int. Cl.[5] **F16K** *13/02, 31/524*

U.S. Cl. 137—625.11 **31 Claims**

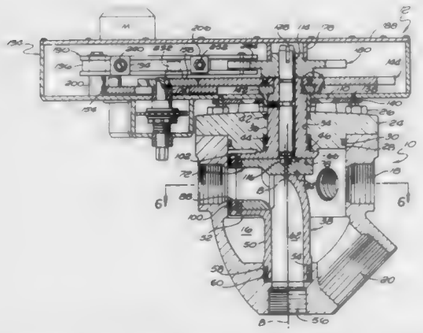
1. A selector valve comprising;

a valve body formed with a plurality of spaced apart inlet ports and first and second outlet ports;

a selector means formed with a fluid passage therethrough between inlet nozzle and outlet portions of said passage of said selector means,

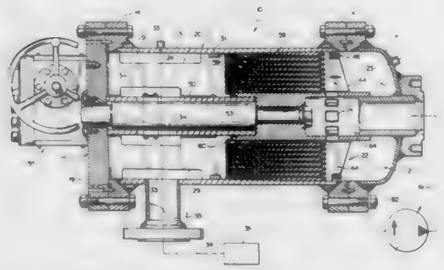
said selector means being movably mounted within said valve body with said outlet portion in communication with said first outlet port while said inlet nozzle portion is

sequentially movable into registration with said inlet ports;
a hollow seal support means coaxially reciprocably mounted at an outer end of said nozzle portion of said selector means for movement between extended and retracted positions;
an endless seal means mounted on an outer end face of said support means;
an actuating means comprising an actuating shaft mounted in contact with said seal support means for reciprocating said support means between extended and retracted positions to move said seal means into and out of sealing contact



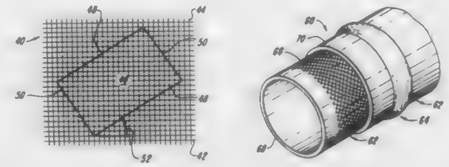
with said valve body around a selected one of said inlet ports in registration with said nozzle portion of said selector means;
a control means operatively connected to said selector means for moving said selector means into and out of registration with a selected one of said inlet ports; and
sequencing means operatively connected between said actuating means and said control means for effecting sequential retraction of said support means, movement of said selector means and retracted seal support means from one to another of said inlet ports, and extension of said support means.

4,989,642
THROTTLING VALVE
Dave L. Perry, Syracuse; Harold H. Hopkinson, Manlius, both of N.Y.; Caldwell Jones, Holland, Pa.; John D. Moeller, Clay, and Gabriel Silva, Liverpool, both of N.Y., assignors to Young & Franklin, Inc., Liverpool, N.Y.
Filed Dec. 29, 1989, Ser. No. 459,321
Int. Cl.[5] F16K *47/04*
U.S. Cl. 137—625.37 **20 Claims**



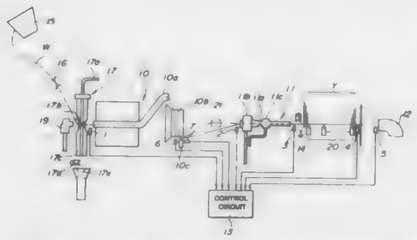
1. A throttling valve that includes
a housing having an inlet means that is axially aligned with an outlet means and a linear flow path connecting the inlet and the outlet means,
an outer ring unit mounted in the flow path having a first mounting means secured to the proximal end of a plurality of superimposed cylindrical shaped outer throttling rings for supporting said outer rings in spaced apart axial alignment with said inlet and outlet means to provide annular passages between the wall surfaces of said outer rings,
an inner ring unit also mounted in said flow path having a second mounting means secured to the proximal end of a plurality of superimposed cylindrical shaped inner throttling rings for supporting said inner rings in axial alignment inside the annular passages of said outer rings, the wall surfaces of adjacent rings forming a series of circular elongated control orifices extending axially between the inlet and outlet means, and
said mounting means of one ring unit facing said inlet means and the mounting means of the other ring unit facing the outlet means with said adjacent wall surfaces of the superimposed inner and outer throttling rings being tapered at the same angle downwardly from the mounting means of each ring towards the tip end of each ring so that a flow of fluid passing through said passages remains attached to the walls of the passages as it moves from the inlet means to the outlet means.

4,989,643
HIGH PERFORMANCE COMPOSITE HOSE
James C. Walton, Princeton; Thomas S. Moroney, Acton; William McNamara, Clinton; Donald G. Morgan, Hudson, and Arunas T. Simkus, North Oxford, all of Mass., assignors to Chase-Walton Elastomers, Inc., Hudson, Mass.
Filed Dec. 20, 1988, Ser. No. 287,409
Int. Cl.[5] F16L *9/14*
U.S. Cl. 138—126 **18 Claims**



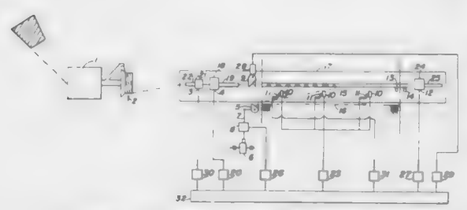
1. A high performance composite hose for use in high pressure, high temperature and high vibrational environments, said high performance composite hose having a longitudinal axis, comprising:
at least two plies of balanced fabric in tubular form disposed coaxially to define the longitudinal axis of said high performance composite hose, each ply of balanced fabric being formed of warps and wefts of high performance filament yarn as a balanced fabric sheet having comparable break strengths in warp and weft, said balanced fabric sheet being sectioned at a predetermined angle having a value in the range of about 39° to about 45° to said warp and weft of said high performance filament yarn to form each said ply of balanced fabric, said high performance filament yarn of each said balanced fabric ply orientated at said predetermined angle with respect to the longitudinal axis defining said high performance composite hose; and
a layer of high performance elastomer bonded to each inner and outer surface of each said ply of balanced fabric in tubular form to form said high performance composite hose wherein said high performance composite hose has an outer layer of high performance elastomer;
each said ply of balanced fabric being treated with a priming agent to ensure substantially complete and uniform bonding of each said layer of high performance elastomer to each said inner and outer surface of each said ply of balanced fabric.

4,989,644
AUTOMATIC MISPICKED WEFT YARN REMOVAL SYSTEM FOR A FLUID JET LOOM
Kazuhiro Tanaka, Ome; Masayuki Koriyama, Tokyo; Jotaro Uehara, Higashikurume; Keizo Shizuka, Tokyo, and Kimimasa Onishi, Hichioji, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 21, 1989, Ser. No. 341,403
Claims priority, application Japan, Aug. 6, 1988, 63-196979
Int. Cl.[5] D03D *47/30, 47/34*
U.S. Cl. 139—116.2 **46 Claims**



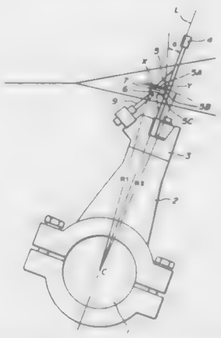
1. A fluid jet loom comprising a weft treatment system having a weft supply member and a weft storage unit including a weft winding arm and drum, and a weft inserting nozzle, said weft treatment system further comprising:
means for detecting a faulty weft yarn;
means for stopping the operation of a cutter for the weft yarn and operation of the loom;
means for reversely running the loom to expose the faulty weft yarn at a cloth fell of a woven fabric;
means for reversely rotating the weft winding arm around the drum to unwind the weft yarn wound on the drum; and
a weft traction device disposed between the weft supply member and the weft storage unit whereby said weft traction device draws a weft yarn including the faulty weft yarn so as to remove said faulty weft yarn.

4,989,645
MISPICK REMOVAL
Petr Velechovsky, Liberec, Czechoslovakia, assignor to Elitex koncern textilniho strojirenstvi, Liberec, Czechoslovakia
Filed Dec. 2, 1988, Ser. No. 279,582
Claims priority, application Czechoslovakia, Dec. 2, 1987, 8741-87
Int. Cl.[5] D03D *47/30*
U.S. Cl. 139—116.2 **5 Claims**



1. An apparatus for removing a mispicked weft length in jet weaving machines, comprising
a weft measuring device and a release mechanism mounted on the weft measuring device;
a main jet and a weft tensioning device mounted between the main jet and the weft measuring device;
ancillary scissors and a plurality of blowing-down jets, each blowing down jet being attached to a successively operating auxiliary jet;
a main scissors blocking device and;
a withdrawing device mounted on a shed end side of the weaving machine;
outlet holes of the blowing-down jets being directed along sides of the successively operating auxiliary jets.

4,989,646
PROFILED REED DENT WITH WEFT PASSAGE RECESS
Yoshio Nitta, Tokorozawa, and Masayuki Muramatsu, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 4, 1989, Ser. No. 389,595
Claims priority, application Japan, Aug. 16, 1988, 63-202760
Int. Cl.[5] D03D *47/30*
U.S. Cl. 139—192 **8 Claims**



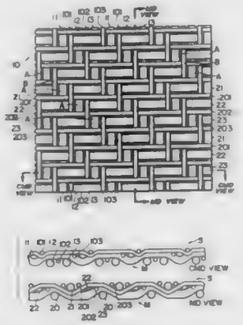
1. A mechanism for an air jet loom, comprising;
a reed swingable back and forth on a predetermined swing axis, said reed comprising a plurality of profiled dents each of which is formed with a recess, said profiled dents being arranged so that said recesses form a weft passage, each of said recesses being defined by an upper edge, a lower edge and an inner edge extending between said upper and lower edges, said upper edge of each profiled dent being so shaped that a first distance from said swing axis to an outer point lying on said upper edge is smaller than a second distance from said swing axis to an inner point which lies on said upper edge and which is closer to said inner edge than said outer point, said inner edge of each profiled dent intersecting at a predetermined angle with a straight line passing through said swing axis.

4,989,647
DUAL WARP FORMING FABRIC WITH A DIAGONAL KNUCKLE PATTERN
Rene Marchand, New Minas, Canada, assignor to Huyck Corporaiton, Wake Forest, N.C.
Continuation-in-part of Ser. No. 179,077, Apr. 8, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 325,774
Int. Cl.[5] D03D *13/00*
U.S. Cl. 139—383 A **6 Claims**

1. A papermakers' fabric useful in the forming section of a papermaking machine, said papermakers' fabric having a sheet forming surface and a machine contacting surface, said sheet forming surface comprising:
machine direction yarns;
cross machine direction yarns;
additional machine direction yarns'
additional cross machine direction yarns; all of said yarns being interwoven such that on the sheet forming surface of the fabric each of said machine direction yarns is alternately arranged with each of said additional machine direction yarns across the fabric in the machine direction and each of said cross machine direction yarns is alternately arranged with each of said additional cross machine

direction yarns across the fabric in the cross machine direction;

the yarns of said fabric also being interwoven so that on the sheet forming surface each of said machine direction yarns forms a single knuckle as the machine direction yarn appears on the sheet forming surface over only a single cross machine direction yarn to produce a repeating pattern of such single knuckles in a diagonal pattern across the sheet forming surface;



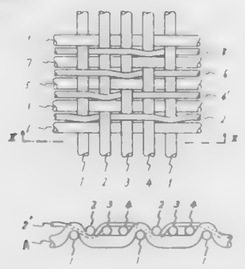
said additional machine direction yarns appearing at the sheet forming surface between the single knuckles to form a repeating pattern of floats, each of said floats being formed as an additional machine direction yarn passes over in an adjacent arrangement a cross machine direction yarn, an additional cross machine direction yarn and a cross machine direction yarn before descending away from the sheet forming surface.

4,989,648

SINGLE-LAYER PAPERMAKING FABRIC HAVING A FLAT SURFACE OF AUXILIARY WEFTS

Takuo Tate; Taketoshi Watanabe, and Hiroyuki Nagura, all of Tokyo, Japan, assignors to Nippon Filcon Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,212
Claims priority, application Japan, Aug. 31, 1988, 63-215023
Int. Cl.[5] D03D *15/00*
U.S. Cl. 139—383 A **6 Claims**



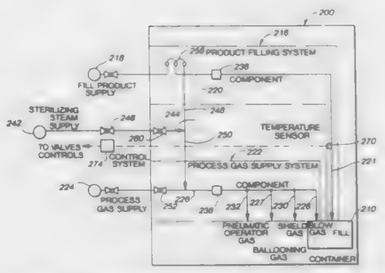
1. A single-layer papermaking woven fabric having a paper side and a running side and formed of warps and primary and auxiliary wefts and having more than four shafts in each repeating unit, where, in a repeating unit, at least one auxiliary weft having a smaller diameter than that of said primary weft is disposed essentially parallel with each of said primary wefts and between each primary weft, said auxiliary weft being over at least two adjacent warps, each of said auxiliary weft being woven only once into each unit by a warp, wherein said auxiliary weft is pushed or urged upwardly at two or more portions of each repeating unit by said warps to thereby form a flat, smooth surface on the paper side.

4,989,649

FILL MACHINE STERILIZATION PROCESS

Gerhard H. Weiler, Barrington; Arjun Ramrakhyani, Northbrook; Paul A. Anderson, Arlington Heights, and Frank N. Leo, Crystal Lake, all of Ill., assignors to Automatic Liquid Packaging, Inc., Woodstock, Ill.

Filed Sep. 14, 1989, Ser. No. 407,341
Int. Cl.[5] B65B *55/00*
U.S. Cl. 141—1 **20 Claims**



1. A method for steam sterilization of product components defining fill product passages and of process gas components defining process gas passages in a container filling machine, said method comprising the steps of:

(a) supplying a common source of sterilizing steam;

(b) simultaneously directing some of said steam from said common source into said product passages and some of said steam from said common source into said process gas passages in a single pass; and

(c) maintaining said steam in said product and process gas passages generally concurrently for a time period sufficient to sterilize said product components and process gas components.

4,989,650

METHOD AND DEVICE FOR FILLING CONTAINERS SUCH AS BOTTLES IN COUNTERPRESSURE FILLING MACHINES

Wilhelm Weiss, Lappersdorf, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 380,153
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825093
Int. Cl.[5] B67C *3/06*
U.S. Cl. 141—6 **10 Claims**

1. A method of filling containers such as bottles with a liquid, comprising the steps of:

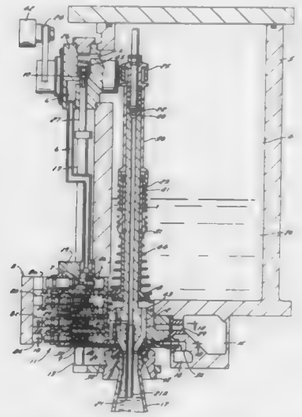
providing a tank containing a quantity of the liquid and having a pressurized gas above the liquid,

coupling a bottle to a filling device mounted to the tank and pressurizing the bottle with gas derived from the tank through a gas supply and return tube which has a tip in the bottle at a level corresponding to the level at which the bottle should be filled,

opening a liquid control valve to begin the flow of liquid to the bottle from the tank concurrently with the gas pressure in said bottle becoming equal to the pressure in said tank for the liquid to displace the gas in the bottle back into the tank through said gas supply and return tube until the major flow of liquid into the bottle is stopped by the liquid level rising in the bottle to the level of the tip of said tube but with an excess of liquid above the level of said tip,

blocking said gas supply and return tube against flow of liquid in either direction between the bottle and tank, and

opening a conduit which connects to said tank and is independent of the gas supply and return tube to correct the fill level by feeding gas through said conduit at the pressure in the tank to the interior of the bottle while bypassing said gas supply and return tube, and simultaneously connecting the interior of the bottle to a region having lower pressure than the pressure in the tank so the gas fed



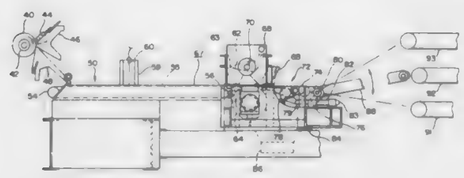
into said bottle from said tank through said conduit expels the excess liquid in said bottle to said region and then closing said conduit and disconnecting said bottle from said region.

4,989,651

AUTOMATIC VENEER LATHE TRASH GATE

Edward L. Snellgrove, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 17, 1989, Ser. No. 298,556
Int. Cl.[5] B27C *9/00*; B27B *1/00*; B27M *1/08*
U.S. Cl. 144—3 R **13 Claims**



1. A system for producing veneer, comprising:

lathe means for peeling veneer from a log, initially producing trash veneer;

means for recognizing the start of usable veneer;

cutter means for separating trash veneer from the usable veneer while the lathe means if peeling veneer;

trash gate means located in the downstream vicinity of the cutter means, said trash gate means having an open position and a closed position, wherein in the open position, trash veneer is directed therebeneath to a trash receiver or the like; and

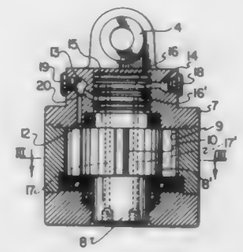
means for closing the trash gate at approximately the time that the separating means operates to separate the trash veneer from the usable veneer, such that when the trash gate is closed, usable veneer moves over the trash gate to a veneer tray for further processing, the trash gate being positioned relative to the separating means and operated relative to the separating means such that the lathe can operate continuously without interruption to accomplish complete peeling of the log.

4,989,652

ROTOR FOR CRANE-MOUNTED WORKING IMPLEMENTS, ESPECIALLY TREE-PROCESSING UNITS

Rolf Hansson, Dalajöfors, Sweden, assignor to OSA AB, Alfta, Sweden

PCT No. PCT/SE88/00635, § 371 Date Sep. 13, 1989, § 102(e) Date Sep. 13, 1989, PCT Pub. No. WO89/06216, PCT Pub. Date Jul. 13, 1989
PCT Filed Nov. 23, 1988, Ser. No. 399,540
Claims priority, application Sweden, Dec. 28, 1987, 8705170
Int. Cl.[5] A01G *23/08*; B66C *13/08*; F15B *13/12*
U.S. Cl. 144—34 R **2 Claims**



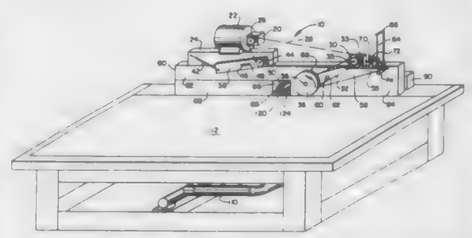
1. In a rotator for a crane mounted device, in which said crane includes a crane tip and said rotator includes a housing connected with said crane tip, and wherein said rotator has a pivot shaft pivotable relative to said housing, a chamber within said housing, said chamber having at least one vane dividing said chamber into at least two sub-chambers, a pair of first duct means in said housing for supplying said sub-chambers with and evacuating said sub-chambers of a hydraulic medium, a swivel connection in said housing, said swivel connection having at least two hollow chambers, and said pivot shaft including second duct means in fluid communication with said hollow chambers, the improvement wherein said rotator includes branch duct means in fluid communication between said first duct means and said hollow chambers of said housing, said branch duct means allowing fluid communication between said first and said second duct means to thereby supply hydraulic medium to said sub-chambers via said pivot shaft thereby eliminating external hydraulic medium connections on the outside of said housing.

4,989,653

EDGING APPARATUS

Philip A. Angus, 516 Morrow Ave., Carnegie, Pa. 15106

Filed Feb. 26, 1990, Ser. No. 485,346
Int. Cl.[5] B27C *1/00*
U.S. Cl. 144—117 B **8 Claims**



1. An apparatus for edging material wherein the material is comprised of a rigid sheet of a predetermined range of thicknesses having at least one straight edge, said apparatus comprising:

a material support surface lying in a plane;

a cutter, said cutter having a longitudinal axis lying in a

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plane parallel to and spaced from the plane of said support surface and a plurality of adjacent blades for rotating about said axis, each blade having a facing edge which lies in a plane generally perpendicular to the plane of said longitudinal axis;

means for rotating said cutter about said axis; and

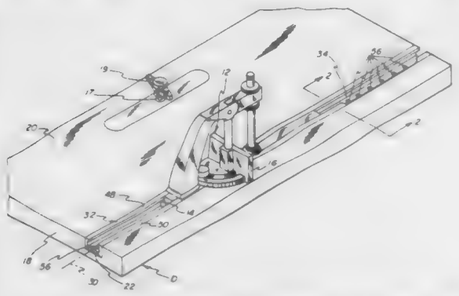
guide means for guiding and aligning material relative to said cutter when at least one straight edge of the material is abutted against said guide means, said guide means having a lead portion, a take-up portion, and a window disposed between said lead and take-up portions for receiving said cutter, said lead portion having a zone adjacent said support surface stepped in relative to said take-up portion such that said zone lies in a plane parallel to but spaced from the plane of said take-up portion, said cutter being positioned in said window such that said facing edges of said cutter are generally coplanar to the plane of said take-up portion, and said zone and take-up portion planes are perpendicular to the plane of said support surface, the dimension of the space between said zone plane and said take-up plane being that of a predetermined depth of cut of material passed over said support surface along said guide means from said lead portion past said facing edges of said blades of said cutter to said take-up portion.

4,989,654

WOODWORKING WORKABLE ASSEMBLY HAVING AN EXTRUDED T-SLOT

James E. Berkeley, Dayton, Ohio, assignor to Shopsmith, Inc., Dayton, Ohio

Filed Feb. 23, 1990, Ser. No. 483,699
Int. Cl.[5] B27C *9/00*
U.S. Cl. 144—286 A 17 Claims



7. A woodworking worktable assembly for use with a miter guide having a guide bar portion and a fence portion connected to said guide bar portion for contacting and guiding a workpiece, said worktable assembly comprising:

a work support surface for supporting a workpiece;

means forming an elongated guide slot in said work support surface, said slot defining a central longitudinal axis;

an insert having opposing side portions located within said slot, said insert extending substantially along the central longitudinal axis of said slot and defining a cavity for receiving and guiding the guide bar portion of a miter guide; and

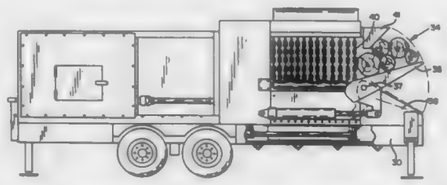
means for moving said side portions toward and away from said central longitudinal axis such that the tolerance between said side portions and the guide bar portion of a miter guide received therein may be adjusted.

4,989,655

SIDE LOADING DEBARKING/DELIMBING APPARATUS AND METHOD

Arnold N. Peterson, Eugene, and Larry A. Sprague, Dexter, both of Oreg., assignors to Peterson Pacific Corp., Eugene, Oreg.

Continuation of Ser. No. 238,905, Aug. 30, 1988, Pat. No. 4,903,744. This application Jan. 8, 1990, Ser. No. 462,086
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[5] B27L *1/00*
U.S. Cl. 144—341 6 Claims



1. An apparatus for debarking/delimbing tree stems comprising,

a housing, debarking/delimbing members contained in the housing and defining a debarking/delimbing station, said housing having an inlet and an outlet for directing tree stems into and through the debarking/delimbing station and establishing thereby a stem feeding direction,

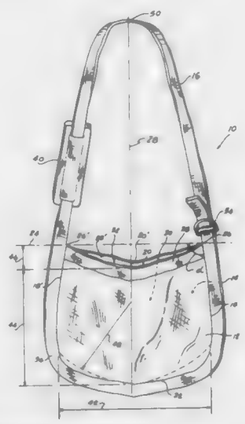
said housing having a side opening crossway to the stem feeding direction to permit entry of a stem bundle, and guide members mounted to said housing and flared outwardly from the side opening to receive and direct tree stems being maneuvered laterally toward the side opening into and through the side opening and into the debarking-/delimbing station.

4,989,656

SELF-CLOSING SHOULDER BAG

Patricia A. Derfler, Rte. 1, Box 264, Nashwauk, Minn. 55769

Filed Mar. 23, 1990, Ser. No. 498,037
Int. Cl.[5] A45C *1/02, 3/06, 13/00*; B65D *33/16*
U.S. Cl. 150—108 16 Claims



1. A self-closing bag comprising:

a front panel of flat flexible material having two side edges, each side edge forming an obtuse interior angle of between about 90 degrees and about 101 degrees with a reference line connecting the top of one side edge and the top of the other side edge, a concavely curved top edge symmetrical about a vertical axis perpendicular to and passing through the midpoint of the reference line, and a convexly curved bottom edge symmetrical about the vertical axis, wherein the maximum width of the panel perpendicular to the vertical axis is between about 11.8 inches and about 15.8 inches, wherein the distance along the vertical axis between the top edge and the bottom edge is between about 0.83 and about 0.96 times said maximum width, and wherein the distance along the vertical axis between the reference line and the top edge of said panel is between about 0.213 and about 0.289 times said maximum width;

a back panel of flat flexible material substantially identical in size and shape to the front panel and attached contiguously to the front panel along corresponding portions of the side and bottom edges of the two panels to form a pouch between the front panel and the back panel with an opening formed by the top edges of the front and back panels; and

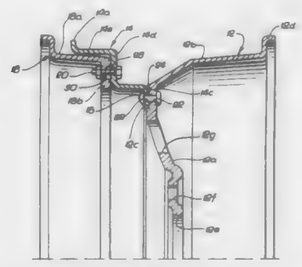
a strap of flat flexible material, with one end of the strap attached near the upper end of one common side edge of the front and back panels, and the other end of the strap attached near the upper end of the other common side edge of the front and back panels.

4,989,657

MODULAR VEHICLE WHEEL

Ray W. Lipper, Newport Beach, Calif., assignor to Center Line Tool Co., Inc., Santa Fe Springs, Calif.

Filed Apr. 8, 1985, Ser. No. 720,685
Int. Cl.[5] B60B *25/04*
U.S. Cl. 152—399 4 Claims



1. A modular vehicle wheel comprising:

a one piece first section having a center portion having a central opening therethrough and a first rim extending from the end of the center portion and having a cross-sectional thickness which is less than that of the center portion, said center portion including a peripheral circular machined registration surface spaced from the central opening on the side thereof facing away from the rim, said registration surface defining a circular ridge; and

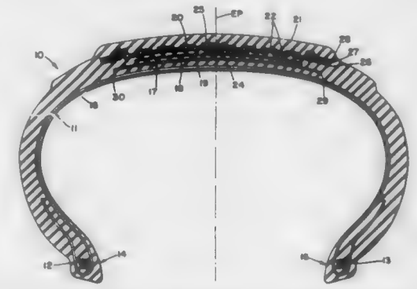
a second section defining a second rim and having a central opening approximately the same diameter as the diameter of the ridge, wherein the second section is secured to the first section at the registration surface and the ridge centers the second section with respect to the first section and wherein the resulting wheel has first and second rims and a single layer center section extending from the registration surface to the central opening.

4,989,658

BELT OVERLAY STRUCTURE FOR PNEUMATIC TIRES COMPRISING A SINGLE RIBBON WRAPPED ABOUT THE BELT STRUCTURE

Antonnis G. Maathuis, Fouhren; Jürgen Spielmann, Heisdorf, both of Luxembourg; Klaus Beer, Stow, and Thomas R. Oare, Suffield, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 9, 1989, Ser. No. 363,812
Int. Cl.[5] B60C *9/20, 9/08*; B29D *30/38*
U.S. Cl. 152—533 15 Claims



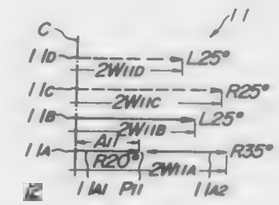
1. A pneumatic tire comprising a radial ply carcass, a belt structure disposed radially outwardly of the radial ply carcass, and a textile reinforced overlay structure disposed radially outwardly of the belt structure and having an axial width that is at least equal to the axial width of the belt structure, said overlay structure comprising a series of helical convolutions of a single continuous ribbon which comprises an elastomeric material reinforced by textile cords arranged side-by-side and extending longitudinally of the ribbon, adjacent turns of said ribbon being in an overlapping relationship, said single ribbon having a pair of ends with both of said ends being located not more than 5% of the axial width of the overlay structure away from the equatorial plane of the tire, the ribbon being disposed at more than 0° but not more than 5° with respect to the equatorial plane of the tire except that at each axial edge of the overlay the ribbon is disposed at 0° with respect to the equatorial plane of the tire for slightly less than one revolution of the ribbon around the belt structure.

4,989,659

PNEUMATIC RADIAL TIRE WITH A DIVIDED BELT LAYER

Yoichi Nakamura, Kodaira; Akira Tamura, Iruma, and Akihito Goto, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 288,937
Claims priority, application Japan, Dec. 28, 1987, 62-335334
Int. Cl.[5] B60C *9/30, 9/18*
U.S. Cl. 152—534 13 Claims



1. A pneumatic radial tire including a carcass anchored to a pair of beads, a tread, and laminated belts including at least two belt layers circumferentially extending outside of a crown

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portion of said carcass and consisting of steel cords intersecting between adjacent belt layers at acute angles with circumferential directions of the tire, wherein one of said laminated belts is divided substantially in close adjacent relation along circumferential directions of the tire into a center portion and two side portions, a divided width A of the divided belt from the equatorial plane of the center portion to a side edge of said center portion having a relation.

$$W/4 \leqq A < W$$

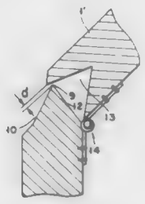
where, M is a half of a width of another laminated belt which is radially adjacent the divided belt and different in direction of cord inclination from that of the divided belt, and directions of steel cords of the center portion and the side portions of the divided belt are substantially the same, while cord angles α_{out} of the steel cords of the side portions of the divided belt with respect to the circumferential directions of the tire are larger in magnitude than cord angles α_c of the center portion of the divided belt with the circumferential directions and in a relation $5° < \alpha_{out} - a_c \leqq 15°$.

4,989,660

LIFT LINK GATE HAVING A PLURALITY OF TABULAR GATE ELEMENTS

Hugo Wagner, Kapuzinerstrasse 84e, A-4021 Linz, Austria

Filed Feb. 17, 1989, Ser. No. 312,611
Claims priority, application Austria, Feb. 2, 1988, 391/88
Int. Cl.[5] E05D *15/06*
U.S. Cl. 160—201 18 Claims



1. A lift link gate having a plurality of tabular gate elements joined together on their back sides by hinge means with each said hinge means extending about a horizontally extending pivot axis for use with lateral guide tracks and guide means coupling the gate elements for sliding movement in said lateral guide tracks for guiding the link gate out of a vertically closed position in a vertical direction and then along an arcuate path region and then in a horizontal direction into a horizontal open position, comprising:

each said gate element including a front face and a rear face, and in a first direction of movement in the vertical direction an upper edge of each said gate element includes a tooth-like projection extending from said front face up to said next adjacent gate element in said first direction of movement in the vertical direction and substantially symmetrical relative to a gate center plane and having a tooth tip, a rear flank, and a front flank ascending up to said tooth tip, said rear flank descending from said tooth tip to said rear face of said gate element;

each said gate element having at a lower edge thereof in a direction opposite to said first direction of movement at least one depression complementary to said projection of a next adjacent gate element for receiving therein the projection of said next adjacent element;

an aperture region provided between said adjacent elements which includes an open aperture spacing precluding the wedging of a finger therein, upon pivoting of said two adjacent elements in said arcuate path region of the guide track; and

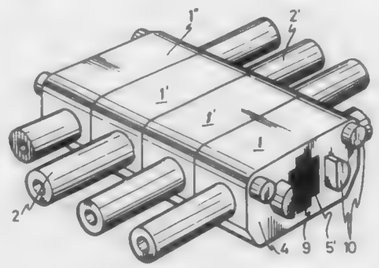
each of said gate elements consists of two formed sheet metal shells and connection means joining said sheet metal shells together.

4,989,661

FORMATION OF FOUNDRY CORE BLOCKS

Augustin A. Erana, Zorrestea, 4 Poligono Industrial Ali-Gobeo, 01010 Vitoria Alava, Spain

Continuation of Ser. No. 251,697, Sep. 29, 1988, Pat. No. 4,932,459. This application Mar. 28, 1990, Ser. No. 500,737
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] B22C *9/10*
U.S. Cl. 164—24 7 Claims



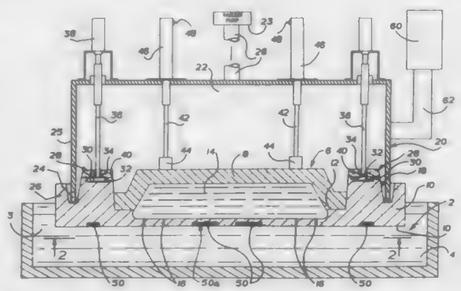
1. In a method of the formation of foundry core blocks, comprising the steps of forming individual cores with the aid of molds in a first blowing machine and assembling the individual cores into a final core block, the improvement comprising providing in each individual core prior to said assembling step a through hole extending between two lateral surfaces of the core, joining said individual cores with their lateral surfaces facing each other so that all individual cores and all holes thereof are in an axial alignment with each other and a common elongated channel extending in a direction of elongation of said joined individual cores is formed, transmitting said joined individual cores to a second blowing machine, and filling said elongated channel in said second blowing machine with a filling material similar to that of said cores so as to couple said cores with one another upon hardening of said filling material to produce a foundry core block of a final shape.

4,989,662

DIFFERENTIAL PRESSURE, COUNTERGRAVITY CASTING OF A MELT WITH A FUGATIVE ALLOYANT

Richard J. Sabraw, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1990, Ser. No. 485,449
Int. Cl.[5] B22D *27/00, 18/06*
U.S. Cl. 164—58.1 16 Claims



1. Apparatus for the differential pressure countergravity casting of molten metal containing a fugative alloyant susceptible to rapid loss from the molten metal, comprising:

(a) means for successively immersing a plurality of molds in a pool of said metal underlying said molds, each said mold having a mold cavity and an ingate communicating the mold cavity with a lower mold portion adapted for immersion in said pool,

(b) means for applying a differential pressure between the mold cavity and the pool sufficient to urge the molten iron upwardly through the ingate into the mold cavity while a said mold is immersed in said pool; and

(c) a treating agent comprising said alloyant disposed on an external surface of the lower mold portion of each mold so as to contact the molten metal when the lower mold portion is immersed in the pool and maintain a concentration of said alloyant in said molten metal above a predetermined effective level throughout the successive immersions of said molds.

8. In a method for the differential pressure countergravity casting of molten metal containing a fugative alloyant susceptible to rapid loss from the molten metal, comprising the-principal steps of forming a mold having a mold cavity and an ingate communicating the mold cavity with a lower mold portion adapted for immersion in an underlying molten metal pool, relatively moving the mold and the pool to immerse said lower mold portion in said pool, and applying a differential pressure between the mold cavity and the pool sufficient to urge the treated molten metal upwardly through the ingate into the mold cavity, the improvement comprising maintaining the concentration of said alloyant in said pool above a predetermined effective level by:

(a) disposing a treating agent comprising said alloyant on said lower portion; and

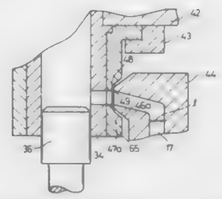
(b) contacting said treating agent and said molten metal upon immersion of said mold in said pool.

4,989,663

CASTING APPARATUS

Hiroshi Kitamura, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,199
Int. Cl.[5] B22D *17/30*
U.S. Cl. 164—312 13 Claims



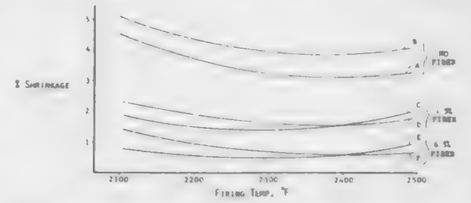
1. A casting apparatus comprising: a crucible furnace for containing a molten metal, a die assembly defining a die cavity having a casting volume for producing a die casting by forcing molten metal from said crucible furnace thereinto, an injection sleeve having a feed slot located therein, wherein said injection sleeve is vertically oriented and includes a vertically oriented ram for supplying said molten metal upwardly into said die cavity, a feed block proximate to said injection sleeve and comprising a curved passage therein one end of which communicates with said feed slot, a feed pipe connected to the other end of said curved passage for providing fluid communication between said crucible furnace and said curved passage, feeder means for feeding the molten metal from said crucible furnace, wherein said molten metal is fed from said crucible furnace, through said feed pipe, said curved passage and said feed slot into said injection sleeve.

4,989,664

CORE MOLDING COMPOSITION

Hilton A. Roth, Cheshire, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 216,490, Jul. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 18,113, Feb. 24, 1982, abandoned. This application Aug. 30, 1989, Ser. No. 401,532
Int. Cl.[5] B22C *19/02*
U.S. Cl. 164—361 13 Claims



1. A method for making an investment casting core, comprising the steps of:

(a) blending a mixture of coarse and fine ceramic particulates with high temperature stable fibers;

(b) mixing the ceramic particulates and fiber with a binder to form a mixture;

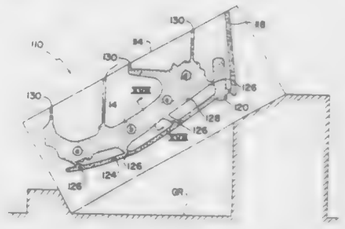
(c) prior to said mixing step, treating the particulate to produce thereon a nonpolar surface, wherein said surface is wettable by the binder, and wherein said step of treating produces a low viscosity mixture; and injecting molding the particulate, fiber and binder mixture to make a green core.

4,989,665

CASTING MOLD FOR A HOLLOW MEMBER

Toshio Yamagiwa, Niiza; Shigehiro Maruoka, Oomiya; Keiji Suzuki, Tokyo, and Takeo Horiike, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,062
Claims priority, application Japan, Dec. 21, 1987, 62-321536; Mar. 29, 1988, 63-75722; Mar. 29, 1988, 63-75721; May 24, 1988, 63-124885; Jun. 1, 1988, 63-132573
Int. Cl.[5] B22C *9/08*
U.S. Cl. 164—363 5 Claims



1. A casting mold for obtaining a long thin hollow member by gravity casting comprising:

a mold cavity for receiving molten metal;

a runner formed in a lowermost portion of said casting mold and being disposed as an inclined path with respect to a horizontal position, said runner being positioned below said mold cavity;

a plurality of dams disposed within said casting mold and being in communication with said runner and said mold cavity for supplying molten metal from said runner to said mold cavity; and

an exhaust path formed in an upper portion of said casting mold and being in communication with said mold cavity for venting exhaust gas therefrom;

whereby molten metal supplied to said inclined path of said

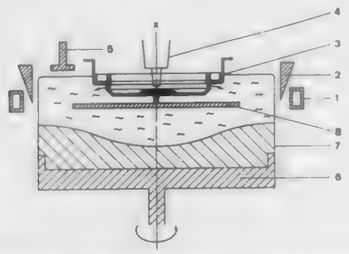
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runner flows downwardly by gravity and thereafter upwardly into said plurality of dams and into said mold cavity thereby avoiding air bubbles during casting.

4,989,666
PROCESS AND DEVICE FOR ELECTROMAGNETICALLY CASTING METALS

Jean-Claude Weber, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 13, 1989, Ser. No. 435,334
Claims priority, application Switzerland, Dec. 22, 1988, 4752/88
Int. Cl.[5] B22D *27/02*
U.S. Cl. 164—467 16 Claims



1. A process for vertically electromagnetically casting metal ingots which comprises the steps of:
providing an inductor to form an electromagnetic casting zone about the surface of molten metal;
introducing molten metal into said casting zone and forming a symmetrical ingot shape from said molten metal, wherein said ingot has a longitudinal axis which is the axis of symmetry of said ingot; and rotating the molten metal in said casting zone around the longitudinal axis during casting thereof thereby stirring the molten metal during casting step so as to provide a uniform cell structure over the final ingot cross-section symmetrical to the axis of rotation.

9. Apparatus for vertically electromagnetically casting metal ingots having a longitudinal axis which comprises:
an inductor to form an electromagnetic casting zone about the surface of molten metal;
a molten metal inlet system to introduce molten metal into said casting zone;
a dummy base for the ingot spaced from said metal inlet system; and
a stirrer located in the molten portion of said ingot in said casting zone.

4,989,667
SHELL MOULDS FOR CASTING METALS

Alan D. Kington, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Nov. 17, 1989, Ser. No. 437,626
Claims priority, application United Kingdom, Nov. 21, 1988, [illegible]
Int. Cl.[5] B22C *1/02*
U.S. Cl. 164—519 4 Claims

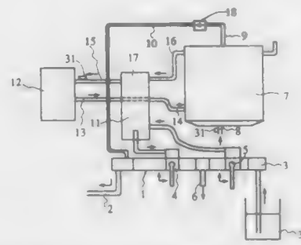
1. A shell mould comprising an inner layer of a first material of zirconium silicate particles suspended in an alcohol based binder on to which is stuccoed tabulated alumina particles which has a first co-efficient of thermal expansion and a predetermined creep characteristic at a predetermined temperature, and an outer layer of a second material which has a second lower co-efficient of thermal expansion and a lower creep characteristic than the inner layer at the predetermined temperature so as to subject the inner layer to compression when the mould is heated during firing and casting.

3. A method of manufacturing a shell mould comprising the step of forming on a wax pattern of the component to be cast a first layer comprising a ceramic material which has a first coefficient of thermal expansion by dipping the wax pattern in a slurry comprising zirconium silicate particles in a binder and stuccoing on the slurry particles of tabulated alumina, forming on the first layer a second layer comprising a ceramic material which has a second relatively lower co-efficient of thermal expansion than the first layer, and subsequently removing the pattern.

4,989,668
LIQUID HEATING OR COOLING CIRCULATOR

Yasuhiro Shimizu, Isehara, Japan, assignor to Toshin Technical Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1989, Ser. No. 329,237
Claims priority, application Japan, Dec. 12, 1988, 63-313501
Int. Cl.[5] F24H *1/00*; F28D *1/06*; F28F *21/08*; A23B *5/00*
U.S. Cl. 165—47 2 Claims

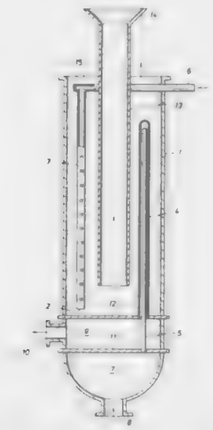


1. A liquid heat exchange circulator comprising:
a casing of a cylindrical shape:
a plurality of pipes having an interior surface formed of an aluminum alloy and vertically disposed in said casing along the vertical axis of said casing;
an upper holding plate and lower holding plate for holding an upper portion and lower portion of said pipes;
an upper guide case detachably mounted on said upper holding plate and having an upper port;
a lower guide case detachably mounted on said lower holding plate and having a lower port;
means for circulating a liquid through each of the pipes;
heat exchange means connected to said casing for controlling the temperature of an inside of said casing;
a one-way valve connected at a first end to the upper port for allowing liquid to flow only out of the upper port;
a drain pipe connected to a second end of the one-way valve, terminating in an output port;
a supply tank for supplying liquid to flow through the casing and connected to an inlet port;
a first valve having two positions and a body and connected at a first end to the inlet port;
a second valve having two positions and a body and connected at a first end to the feed port and connected at a second end to the outlet port; and
a pump connected between the body of the first valve and to the body of the second valve;
wherein when the first and second valves are both in a first position, liquid circulates from the supply tank via the inlet port through the first valve, to the pump, to the second valve, to the feed port to the lower port, through the casing, and out through the upper port, to the one-way valve, to the drain pipe, to the outlet port; and
wherein when the first and second valves are both in a second position, liquid in the casing circulates out of the casing via the lower port, to the feed port, to the first valve, to the pump, to the second valve, and to the outlet port.

4,989,669
APPARATUS AND PROCESS FOR EXCHANGING HEAT BETWEEN SOLID PARTICLES AND A HEAT EXCHANGE MEDIUM

Peter H. Barnes, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1989, Ser. No. 339,744
Claims priority, application United Kingdom, May 3, 1988, [illegible]
Int. Cl.[5] B01J *38/30, 38/32*; F28C *3/10*
U.S. Cl. 165—104.16 6 Claims



1. An apparatus for regenerating spent solid catalyst particles with indirect heat exchange means which comprises a housing containing an aeration zone, a first inlet means comprising a bundle of aeration tubes having openings in said end of said tubes and one or more perforations in said tubes for introduction of an aeration fluid through an open end in said first inlet means, an outlet means for passage of regenerated catalyst and spent aeration fluid from said housing, a second inlet means having two extremes for introduction of spent solid catalyst particles and an indirect heat exchange means situated in said housing wherein cooling fluid is entered to the indirect heat exchange means and warmed cooling fluid is withdrawn from said indirect heat exchange means and from said housing through a fluid withdrawal means wherein said open end of said first inlet means and said outlet means are situated to define said aeration zone and wherein said second inlet means has an inlet at one extreme for entry of spent catalyst to said second inlet means and an outlet at the other extreme to pass said spent solid catalyst particles to said housing at a point within said aeration zone.

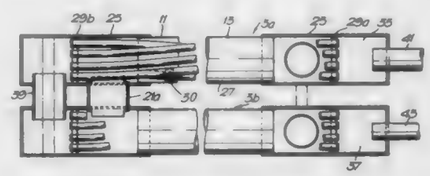
4,989,670
HEAT EXCHANGER

Peter N. Foley, Shoeburyness, England, assignor to York International Corp., Basildon, England

Filed May 17, 1989, Ser. No. 352,810
Claims priority, application United Kingdom, May 19, 1988, [illegible]
Int. Cl.[5] F28F *9/24, 9/26*
U.S. Cl. 165—143 12 Claims

1. A refrigerant evaporator liquid-to-refrigerant tube-in-tube heat exchanger for use in a tube defining an elongated chamber having a longitudinal axis and two ends; a plurality of inner tubes extending through the elongated chamber to provide a flow path for the refrigerant, the tubes being disposed side by side to one another to form a bundle and each having two ends, an inlet and an outlet at opposite ones of said ends, a longitudinal axis and an interior connecting the inlet and outlet, the interiors of the tubes being isolated from the space within the chamber surrounding the tubes, which space provides a flow path for the liquid, the bundle of tubes being provided with a pair of end mountings adjacent the respective ends of the tubes thereof, the end mountings being angularly offset relative to one another about the axis of the outer tube whereby the bundle of tubes is twisted to a helical configuration with each tube of the bundle having the same amount of angular twist; and a keying formation fixed relative tot he outer tube and in keyed engagement with the periphery of the tube bundle at one end thereof and keying the angular orientation of that end of the bundle relative to the longitudinal axis of the outer tube.

7. A refrigerant evaporator refrigerant to liquid heat exchanger comprising:
a plurality of heat exchangers, each heat exchanger comprising: an outer tube defining an elongated chamber having a longitudinal axis and two ends;
a plurality of inner tubes extending through the elongated chamber to provide a flow path for the refrigerant, the tubes being disposed side by said to one another to form a bundle and each having two ends, an inlet and an outlet at opposite ones of said ends;



a longitudinal axis and an interior connecting the inlet and outlet, the interiors of the tubes being isolated frmo the space within the chamber surrounding the tubes, which space provides a flow path for the liquid, the bundle of tubes being provided with a pair of end mountings adjacent the respective ends of the tubes thereof, the ends mountings being angularly offset relative to one another about the axis of the outer tube whereby the bundle of tubes is twisted to a helical configuration with each tube of the bundle having the same amount of angular twist; and
a keying formation fixed relative to the outer tube and in keyed engagement with the periphery of the tube bundle at one end thereof and keying the angular orientation of that end of the bundle relative tot he longitudinal axis of the outer tube;
the inner tubes of the heat exchangers and said spaces providing, respectively, a first flow path for the refrigerant and a second flow path for the liquid; and respective manifolds for admitting the refrigerant to and removing it from the first flow path.

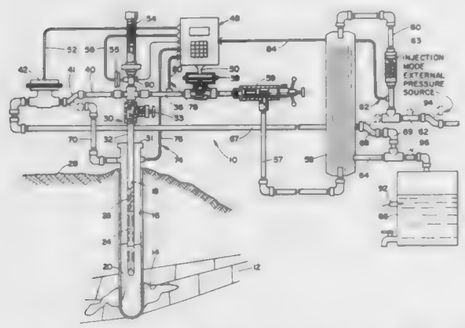
4,989,671
GAS AND OIL WELL CONTROLLER

Lawrence R. Lamp, Millersburg, Ohio, assignor to Multi Products Company, Millersburg, Ohio

Continuation of Ser. No. 56,461, May 29, 1987, abandoned, Continuation-in-part of Ser. No. 747,344, Jul. 24, 1985, abandoned. This application Aug. 7, 1989, Ser. No. 393,065
Int. Cl.[5] E21B *34/16, 43/12*
U.S. Cl. 166—53 10 Claims

1. A control system for a plurality of gas and oil well installations of the type each having a well casing and a tubing therein, a lower end of the tubing being open adjacent to a lower portion of the casing and an upper end of the tubing being connectable to a sales line, comprising:
a main production valve for selectively communicating the tubing with the sales lines and an auxiliary production valve for selectively communicating the tubing with a liquid storage tank or an injection fluid supply source with the casing;

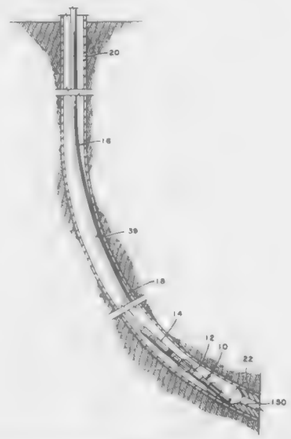
a casing pressure sensing means for detecting the pressure in the well casing;
a tubing pressure sensing means for detecting the pressure in the tubing upstream from said main production valve;
a line pressure sensing means for detecting the pressure in the sales line;
a microcomputer means in operative communication with said main production valve and said auxiliary valve, said casing pressure sensing means, said tubing pressure sensing means, and said line pressure means for opening and closing said main production valve to selectively communicate the sales line with the tubing including means for synchronized production for the plurality of installations comprising means for inhibiting production during a close time period to sequence respective start times at the plurality of installations, said microcomputer means including means for reversing said main production valve and said auxiliary production valve to enable the well to be operated in a casing injection mode comprising means for operating the auxiliary valve as a supply injection valve to control the flow of injection fluid from said supply source to the casing;



an input/output buffer means through which said microcomputer means provides an output signal to control the operation of said main production valve and said auxiliary production valve; and,
a plunger hold means for holding a plunger, which reciprocates in the tubing, adjacent a top position in the tubing, wherein said microcomputer means provides a control signal through said input/output buffer means to control the actuation of said plunger hold means to hold the plunger for inspection and cleaning after a preselected maximum number of plunger cycles.

4,989,672
PACKER LOCKING APPARATUS
Timothy D. Burns, Sr.; Kenneth D. Caskey, and Donald W. Winslow, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Feb. 5, 1990, Ser. No. 475,614
Int. Cl.[5] E21B *23/06, 33/128*
U.S. Cl. 166—196 20 Claims

1. An apparatus for locking a packer in a run-in position and preventing premature actuation of the packer in a well bore, said apparatus comprising:
a sleeve connectable to an outer portion of said packer;
mandrel means disposed in said sleeve for connecting to an actuating mandrel of said packer;
a locking member having a portion adjacent to said sleeve, said locking member being longitudinally and rotatably fixed with respect to said mandrel means;
a lug extending from one of said sleeve and locking member;
lug receiving means on the other of said sleeve and locking member for receiving said lug therein when in a locked position such that relative longitudinal movement between said mandrel means and said sleeve is prevented; and



lock disengaging means for disengaging said lug from said lug receiving means at a predetermined position in said well bore, thereby allowing relative longitudinal movement between said mandrel means and said sleeve.

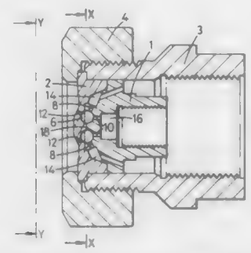
4,989,673
LOST CIRCULATION FLUID FOR OIL FIELD DRILLING OPERATIONS
Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Jul. 14, 1989, Ser. No. 380,565
Int. Cl.[5] C09K *7/02;* E21B *21/06, 21/08, 33/138*
U.S. Cl. 166—250 18 Claims

1. A process for preventing significant lost circulation while drilling a wellbore in a hydrocarbon-bearing formation having a formation matrix below an earthen surface, the process comprising:
admixing components of a continuous flowing gel at the surface comprising a water-soluble carboxylate-containing polymer, a complex capable of crosslinking said polymer and formed of at least one electropositive chromium III species and at least one electronegative carboxylate species, and an aqueous solvent for said polymer and said complex; and
circulating said gel through said wellbore while said wellbore is being drilled to prevent significant lost circulation.

4,989,674
ORGANOSILICON POLYMER HAVING NONRANDOM CROSSLINKAGES USEFUL IN ENHANCED OIL RECOVERY USING CARBON DIOXIDE FLOODING
Bruce W. Davis, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Apr. 7, 1989, Ser. No. 335,009
Int. Cl.[5] E21B *43/22*
U.S. Cl. 166—268 11 Claims

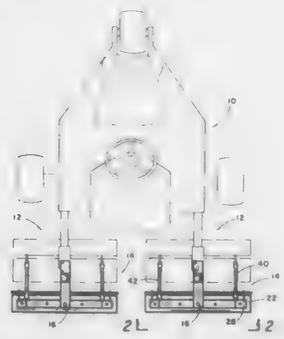
1. In a method for recovering oil from an underground oil-bearing earth formation penetrated by an injection well and a producing well, in which method carbon dioxide is injected into said formation to displace oil towards said producing well from which oil is produced to the surface, the improvement comprising injecting into said formation carbon dioxide, the viscosity of which is increased at least three-fold by the presence of a sufficient amount of an organosilicon polymer having nonrandom crosslinkages that enhance backbone rigidity and a sufficient amount of a cosolvent to form a solution of said polymer in said carbon dioxide.

4,989,675
SPRAY NOZZLE FOR FIRE CONTROL
Panayiotis G. Papavergos, Woking, England, assignor to British Petroleum Company p.l.c., London, England
Filed Mar. 9, 1990, Ser. No. 491,409
Claims priority, application United Kingdom, Mar. 14, 1989, 8905835
Int. Cl.[5] A62C *37/08*
U.S. Cl. 169—14 14 Claims



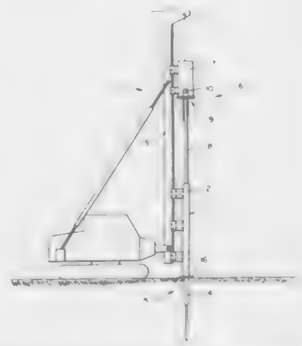
1. A spray nozzle for fire control comprising a body defining a mixing chamber having an oval transverse cross-section, said mixing chamber having:
(a) at least one inlet for pressurised liquid,
(b) at least one inlet for pressurised gas, and
(c) at least one outlet,
said mixing chamber being adapted to mix, in a toroidal mixing pattern, pressurised gas and pressurised liquid introduced through said inlets to form a gas/liquid mixture, and said at least one outlet being adapted to discharge said mixture as a spray having an oval transverse cross-section.

4,989,676
SWEEPER SYSTEM FOR LAWN MOWING
Billy G. Rogers, Rte. 1, Box 639, Drumright, Okla. 74030
Filed Jan. 16, 1990, Ser. No. 464,971
Int. Cl.[5] A01B *31/00*
U.S. Cl. 172—438 4 Claims



1. For a grass mowing machine used in the care of golf course greens in which the grass mowing machine has at least one mower assembly forming a part thereof, an improved sweeper system, comprising:
a sweeper stuctural support member having a forward end and a rearward end and having the forward end affixed to a mower assembly, the sweeper structural support member extending generally horizontally from the sweeper assembly;
an elongated broom having a horizontal headboard with a top and bottom surface and bristles extending downwardly form said bottom surface;
an elongated stuctural head member affixed to said broom headboard top surface and having opposed outer ends;
a cylindrical vertical shaft having a lower and an upper end, the lower end being affixed to said structural head member at a point intermediate said outer ends thereof, the shaft extending in the direction opposite said broom bristles;
a bearing trunnion affixed to said stuctural support member adjacent said rearward end thereof and rotatably receiving said shaft;
means to rotatably secure said shaft to wide structural support member;
means to elevationally position the spacing of said broom relative to said structural support member;
a first elastic member having a forward end and a rearward end, the forward end being secured to the mower assembly and the rearward end being secured to said structural head member adjacent one of said outer ends thereof; and
a second elastic member having a forward end and a rearward end, the forward end being secured to the mower assembly and the rearward end being secured to said structural head member adjacent the other of said ends thereof.

4,989,677
PILE DRIVING
Heng B. Lam, Petaling Jaya, Malaysia, assignor to Precast Micro Injection and Pile Technology Limited, both of, Hong Kong
Filed Mar. 4, 1987, Ser. No. 21,410
Claims priority, application United Kingdom, Mar. 7, 1986, 8605652; Oct. 13, 1986, 8624515
Int. Cl.[5] E21C *9/00*
U.S. Cl. 173—31 29 Claims



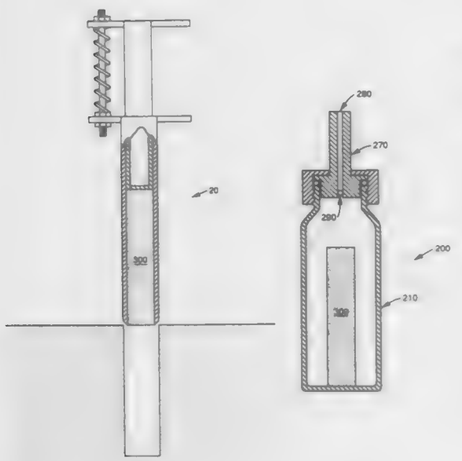
1. Apparatus for use in pile driving, comprising:
tubular guide means for receiving the pile;
reciprocating means including a ram, for driving the pile through the guide means such that a driven portion of the pile adjacent to a driven end is substantially prevented from bending;
a weight attached to the ram for driving the ram in a downward direction during a driving stroke and lifting means for lifting the weight during a return stroke; and
auxiliary drive means positioned above and connected to said reciprocating means, for further urging the ram downwards during the driving stroke.

4,989,678

SOIL SAMPLING KIT AND A METHOD OF SAMPLING THEREWITH

Cyril V. Thompson, Knoxville, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Dec. 1, 1989, Ser. No. 445,301
Int. Cl.[5] E21B *25/10*
U.S. Cl. 175—20 17 Claims



1. A soil sampling kit comprising

a soil sampling means in combination with a soil sample containment means;

said soil sampling means comprising

an outer longitudinal tubular member having an upper end and a lower end;

an inner longitudinal tubular member having an upper end and a lower end, said inner longitudinal tubular member being located within said outer longitudinal tubular member and being adapted to move longitudinally within said outer longitudinal tubular member, said lower end of said inner longitudinal tubular member having a plate attached thereto forming a flat surface essentially perpendicular to said inner longitudinal tubular member, said upper end of said inner longitudinal tubular member extending outside of said outer longitudinal tubular member;

a first positioning means perpendicularly connected to said upper end of said inner longitudinal tubular member; and

a second positioning means perpendicularly connected to said upper end of said outer longitudinal tubular member, said second positioning means being essentially parallel to said first positioning means, said first positioning means and said second positioning means being adapted to position said inner longitudinal tubular member within said outer longitudinal tubular member to form a cavity within said outer longitudinal tubular member for receiving a sample of soil, said cavity forming an adjustably predetermined volume, said first positioning means being connected to said second positioning means by an adjustable guiding member having a biasing element coacting therewith;

said soil sample containment means comprising

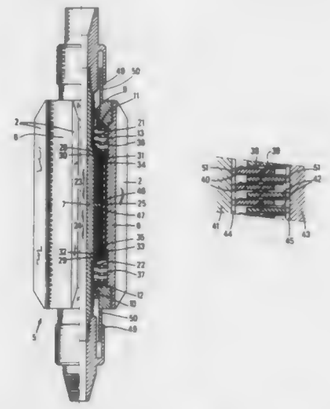
a container and a sealing means; said container having a first end, said first end of said container having an opening, said first end of said container being adapted to receive said sealing means, said sealing means being adapted to receive a probe from an analytical device without removing said sealing means from said container.

4,989,679

CENTERING DEVICE THAT CAN BE ENGAGED OR DISENGAGED, SPECIFICALLY FOR A DRILLING ASSEMBLY

Benoit Amaudric du Chaffaut, Versailles, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 22, 1988, Ser. No. 288,086
Claims priority, application France, Dec. 23, 1987, 87 18088
Int. Cl.[5] E21B *17/10*
U.S. Cl. 175—325 15 Claims



2. A centering device, for centering a drilling assembly, comprising at least one centering element relative to which said drilling assembly can rotate, and means for rotationally driving said at least one centering element including a friction clutch means interposed between said at least one centering element and said drilling assembly wherein said friction clutch means is one of a disk clutch means or a cone clutch means respectively having a plurality of clutch disks or clutch cones, some of which are rotationally integral with said at least one centering element and others of which are rotationally integral with said drilling assembly, and wherein said clutch disks or clutch cones are disposed in an overlapping relationship with respect to each other.

4,989,680

DRILL BIT HAVING IMPROVED HYDRAULIC ACTION FOR DIRECTING DRILLING FLUID

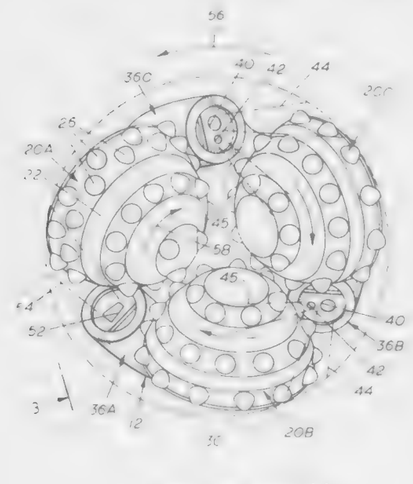
John D. Deane, and Craig R. Ivie, both of Houston, Tex., assignors to Camco International Inc., Houston, Tex.

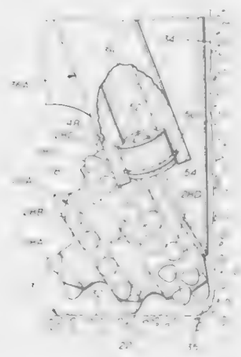
Continuation-in-part of Ser. No. 162,289, Jan. 29, 1988, Pat. No. 4,848,476, which is a continuation of Ser. No. 908,080, Sep. 15, 1986, Pat. No. 4,741,406. This application Jul. 17, 1989, Ser. No. 381,040
Int. Cl.[5] E21B *10/18*
U.S. Cl. 175—340 14 Claims

1. A rotary drill bit for drilling a well bore, said bit comprising:

a bit body having three cylindrical journals extending therefrom and three roller cutters mounted for relative rotation on said journals, each roller cutter comprising a generally conical roller cutter body and a plurality of cutting elements on the roller cutter body arranged in a plurality of spaced concentric annular rows including an outermost large diameter gage row of cutting elements;

a plurality of nozzle orifices on the bit body for discharge of liquid drilling fluid from the bit in a plurality of high velocity liquid streams, at least one roller cutter including an interlocking row closely adjacent the gage row thereof with the cutting elements in said interlocking row staggered relative to the cutting elements in said gage row and having a cutting path extending into the cutting path of said gage row, said one roller cutter having an associated orifice of a predetermined size positioned on the bit body





at a location above the rotational axis of said one cutter at the connection of its associated journal to the bit body to direct a stream of drilling fluid against the cutting elements on the leading side of said one cutter, the orifice and associated liquid stream for said one roller cutter being angled and positioned relative to said one cutter for directing drilling fluid against cutting elements in at least the gage row;

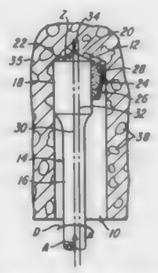
said orifice and associated liquid stream for said one cutter further being formed and positioned for directing more hydraulic energy against the cutting elements on the gage row than the cutting elements on any other rows including the interlocking row and for impinging the bottom of the bore hole thereafter generally at the juncture of the horizontal bottom portion thereof with the vertical side portion.

4,989,681

DRILL BIT FOR PRODUCING UNDERCUTS

Johann Lohmüller, Ravensburg, and Klaus Dreps, Altshausen, both of Fed. Rep. of Germany, assignors to DreBo Werkzeugfabrik GmbH, Altshausen, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,646
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1988, 3819833
Int. Cl.[5] E21B *10/00*
U.S. Cl. 175—398 9 Claims



1. In a drill bit for producing at least one undercut, with said drill bit including a shaft and a cutting edge that is disposed asymmetrically radially beyond said drill bit in a front end portion of said drill bit, said drill bit having an axis of rotation coaxial with an axis of said shaft, the improvement wherein:

said drill bit has a conical end face that is disposed on said front end portion remote from said drill bit shaft, with a planar guide surface being provided on said conical end face, with said guide surface being disposed radially opposite from said cutting edge, and with said drill bit having a tip concentric to said drill bit axis at which said guide surface terminates,

said drill bit being provided for use in a previously produced blind hole having a conically shaped base; and in said guide surface extending in an essentially radial direction form an outer periphery of said front end portion of said drill bit to said tip thereof at an angle to an axis of rotation of said drill bit, with said angle conforming to the cone angle of said base of said blind hole, and

said drill bit shaft being provided with a spring-loaded indicator sleeve that is adapted to snap into said blind hole as soon as said drill bit is centered in said blind hole.

4,989,682

CONTROL DEVICE OF ELECTRIC POWER STEERING SYSTEM FOR MOTOR VEHICLE

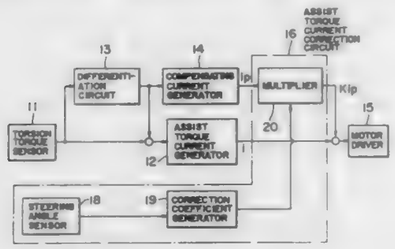
Tsutomu Takahashi; Saiichiro Oshita, and Toyohiko Mouri, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,812
Claims priority, application Japan, Apr. 6, 1988, 63-84384
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 9 Claims

1. In a control device of an electric power steering system for a motor vehicle, wherein power assist due to an electric motor is actuated by an addition of an assist motor current, said assist motor current being generated from an assist torque current generator in dependency on an output signal from a torsion torque sensor, and a compensating current generator generates a compensating current in dependency on a variation rate of the output signal from the torsion torque sensor, the improved wherein the control device comprises,

an assist torque current correction circuit including a steering angle sensor, a correction coefficient generator responsive to an output of said steering angle sensor generating a correction coefficient and a multiplier for multiplying said compensating current by said correction coefficient,

said assist torque current correction circuit controlling said compensating current generated from said compensating



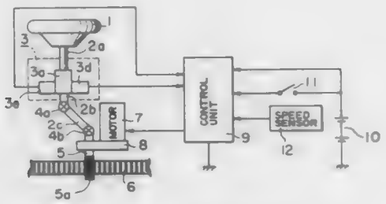
current generator such that said compensating current reduces as a steering angle of said steering system increases.

4,989,683

MOTORIZED POWER STEERING APPARATUS

Mitsuharu Morishita, Himeji City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,988
Claims priority, application Japan, Sep. 22, 1988, 63-239419
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 8 Claims



1. A motorized power steering apparatus for a vehicle, comprising:

torque sensing means for generating an output voltage proportional to both a variable supply voltage applies thereto and a steering torque exerted by a driver of the vehicle, said torque sensing means including resistive voltage dividing means connected between supply voltage terminal means and ground;

a motor (7) for generating an auxiliary steering force;

motor control means (9) for controlling an output torque of the motor in accordance with the output voltage of the torque sensing means; and

speed responsive voltage supply means (12, 950) coupled to said supply voltage terminal means for providing the torque sensing means with a variable supply voltage which decreases as the vehicle speed increases.

4,989,684

SUSPENSION DEVICE FOR THE CAB OF A TRUCK VEHICLE

Richard Conaway, 3327 Highcliff Rd., Riverside, Calif. 92506

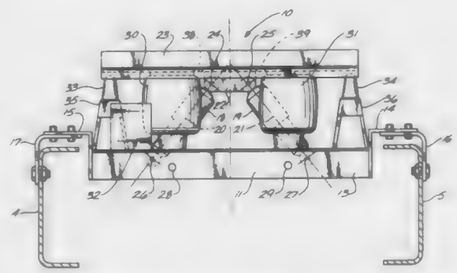
Filed Jul. 25, 1989, Ser. No. 385,281
Int. Cl.[5] B60G *17/00*; F16F *9/00*
U.S. Cl. 180—89.15 11 Claims

1. An improved vibration dampening suspension device for the cab of a truck vehicle comprising:

(a) a base member having a reference axis and adapted for mounting to the frame of said truck vehicle;

(b) a pair of hydraulic shock absorbers having a central axis and a first and second end, where said shock absorbers are oppositely and laterally spaced from said reference axis and where said first end of each said shock absorber is pivotally mounted to said base member such that the said central axes of said shock absorbers are inclined toward said reference axis so as to form the opposite sides of a trapezoid;

(c) an impact plate adapted for attachment to said cab and having a lateral dimension which is less than the lateral distance between the side beams of the truck frame where said impact plate is axially spaced from and substantially parallel to said base member for transmitting dampened vibration and shock forces to said cab, said second ends of



said shock absorbers are pivotally mounted to said impact plate such that the lateral distance between said second ends is less than the lateral distance between said first ends;

(d) a pair of air springs oppositely spaced from said reference axis and mounted to said base member and said impact plate where said air springs have a displacement axis substantially parallel to said reference axis; and,

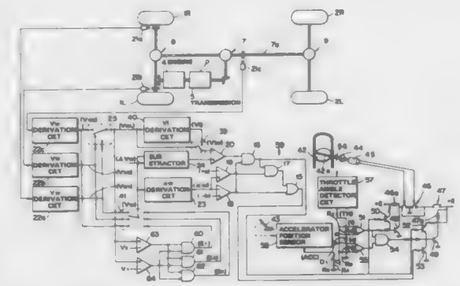
(e) a height control valve associated with said air springs for maintaining said air springs at a constant pre-selected height.

4,989,685

AUTOMOTIVE TRACTION CONTROL SYSTEM WITH FEATURE OF SELECTING WHEEL SLIPPAGE INDICATIVE PARAMETER DEPENDING UPON VEHICLE SPEED

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 918,137, Oct. 14, 1986, abandoned. This application Jun. 27, 1989, Ser. No. 372,157
Claims priority, application Japan, Oct. 11, 1985, 60-224934
Int. Cl.[5] B60K *28/10*
U.S. Cl. 180—197 17 Claims



1. A traction control system for an automotive vehicle comprising:

first sensor means for monitoring wheel speed of a first vehicular wheel for producing a first wheel speed indicative signal;

second sensor means for monitoring wheel speed of a second vehicular wheel for producing a second wheel speed indicative signal;

means for deriving a vehicle speed representative value based on one of said first and second wheel speed indicative signals, said deriving means comparing said vehicle speed representative value with a vehicle speed threshold in order to select one of said first and second wheel speed indicative signals having a value greater than the other indicative signals when said vehicle speed representative value is greater than said vehicle speed threshold and to select one of said first and second wheel speed indicative signals having a value smaller than the other when said vehicle speed representative value is smaller than said vehicle speed threshold; and

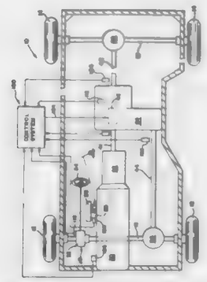
means for comparing said selected one of said first and second wheel speed indicative signals with said vehicle speed representative value for producing a control signal to reduce driving torque to be distributed to said first and second vehicular wheels when said selected one of said first and second wheel speed indicative signals becomes greater than said vehicle speed representative value.

4,989,686

SYSTEM FOR CONTROLLING TORQUE TRANSMISSION IN A FOUR WHEEL DRIVE VEHICLE

Alan L. Miller, Ithaca, N.Y.; James J. Coogan, Des Plaines; Scott R. Anderson, LaGrange, both of Ill., and James Kozlowski, Whiting, Ind., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 216,044, Jul. 7, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 365,530
Int. Cl.[5] B60K *17/344*
U.S. Cl. 180—197 62 Claims



1. A system for distributing torque to all four drive wheels of a vehicle powered by an engine, said system comprising:

a transfer case connected to said engine and having an input shaft connected to front and rear drive axles, said transfer case further including a differential for interconnecting said input shaft with the front and rear drive axles such that torque is transmitted to both of said drive axles in a predetermined manner;

a control system means including sensor means for monitoring drive axle rotational speeds and engine operating conditions, wheel slip detector means for detecting a slip condition between said front and rear drive axles and for generating an output, clutch torque command generator means responsive to the output of said wheel slip detector means for calculating and generating an output which is computed as a predetermined function of total torque delivered to said transfer case and delivered to a clutch actuator means;

said clutch torque command generator means including a first means for establishing a predetermined target torque level as a function of the total torque delivered to the transfer case and a second means for establishing the time torque is applied operatively connected to said first means and responsive to said output from said wheel slip detector means indicative of wheel slip; and

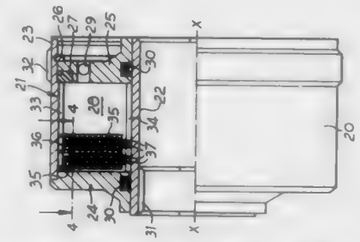
modulatable biasing clutch means operatively connected with the transfer case and including an electromagnetically actuated clutch assembly with friction members which are operably effective to interconnect two members of said differential, wherein said clutch actuator means regulates the electromagnetic clutch assembly in a manner whereby controlling the operable effectiveness of said clutch assembly and thereby controlling torque transmission to the front and rear drive axles as a function of a torque level established between said friction members.

4,989,687

VISCOUS SHEAR COUPLINGS

Georg Kwoka, Sieburg, and Herbert Taureg, Heanef, both of Fed. Rep. of Germany, assignors to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,310
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823180; Aug. 22, 1988, 3828422
Int. Cl.[5] B60K *17/348*; F16D *33/20*
U.S. Cl. 180—248 20 Claims



1. A viscous shear coupling comprising; a housing forming a first coupling part, a hub mounted within the housing for rotation relative to the housing about an axis and forming a second coupling part, a viscous liquid in the housing, two sets of annular plates in the housing, each plate having an inner and an outer periphery, each plate being bounded by radial faces and having a radial dimension defined between said peripheries, the plates of the two sets being mounted on and rotatable with the housing and with the hub respectively, and being interleaved so that a pair of plates of one of said sets is located between each two adjacent plates of the other of said sets, each plate of said one set being axially movable independently of the other plates of the set with respect to the coupling part on which they are mounted and each having apertures therein opening into said radial faces and defined at least partly by sides which extend across said radial dimension and converge in a direction away from that radial face of the plate which is adjacent to the other plate of the said pair.

4,989,688

ACOUSTICAL WALL PANEL AND METHOD OF ASSEMBLY

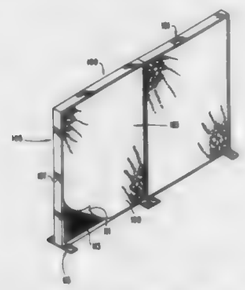
Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Filed Feb. 16, 1989, Ser. No. 319,056
Int. Cl.[5] E04B *1/82*
U.S. Cl. 181—287 25 Claims

1. A movable prefabricated acoustical wall panel, comprising: a rigid frame defining a frame perimeter around a partition area; an acoustical core located in said partition aren and supported by said frame, said acoustical core having a front side and a back side and comprising:

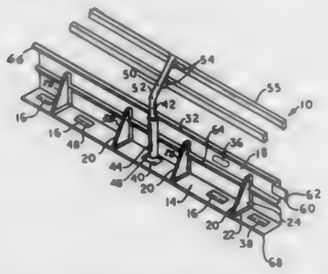
(a) a first divider grid formed by a network of intersecting divider walls, said divider walls defining a plurality of cells across said partition area along said front side;

(b) a second divider grid formed by a network of intersecting divider walls, said divider walls defining a plurality of cells across said partition wall along said back side;
(c) a substantially planar septum across said partition area and disposed between said first divider grid and said second divider grid, wherein said intersecting divider walls of said first divider grid run between said front side and said septum, and wherein said intersecting divider walls of said second divider grid run between said back side of said acoustical core and said septum;
(d) solid, low density insulation media in said cells of said first divider grid along said front side, wherein said insulation media along said front side is made of at least two distinct types of insulation having different densities inter-



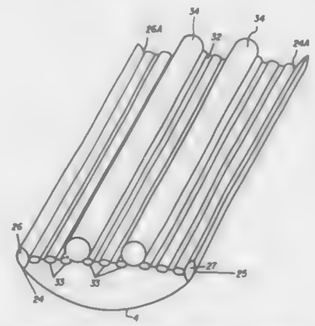
mingled across said first divider grid in adjacent cells to absorb different frequencies of sound;
(e) solid, low density insulation media in said cells of said second divider grid along said back side, wherein said insulation media along said back side is made of at least two distinct types of insulation having different densities intermingled across said second divider grid in adjacent cells to absorb different frequencies of sound;
(f) a first confinement layer across said first divider grid on said front side of said acoustical core to confine said insulation media in said first divider grid; and
(g) a second confinement layer across said second divider grid on said back side of said acoustical core to confine said back insulation media in said second divider grid.

4,989,689
YARD GUARD
Evan H. Berlin, 10247 Dunn Ave., Lake City, Pa. 16423
Continuation-in-part of Ser. No. 301,670, Jan. 26, 1989, abandoned. This application Nov. 6, 1989, Ser. No. 431,767
Int. Cl.[5] E04H *17/14*
U.S. Cl. 182—45 1 Claim



1. A yard guard for use on a building having a gable roof to prevent roofing material from sliding therefrom onto a yard during removal of said roof comprising,
a base plate adapted to rest on top of a roof and means for attaching said base plate to said roof,
a vertical plate disposed generally perpendicular to said base plate providing a barrier to stop said roofing material from falling,
spaced generally triangular gusset plates,
said gusset plates having a base, vertical side and a hypotenuse,
said gusset plate having said base fixed to said base plate,
said vertical side of said gusset plates being fixed to said vertical plate whereby said vertical plate is held in rigid relation to said base plate,
nail holes in said base plate,
each said nail hole adapted to receive a fastening means for fastening said yard guard to said roof,
at least one socket fixed to said base plate,
a column having an end received in said socked and extending upwardly therefrom,
said column having vertically spaced rail receiving brackets thereon adapted to receive a generally horizontally disposed rail,
said cloumn being made of an iron pipe,
each said gusset plate having a base flange attached to said base plate and a vertical attached to said vertical plate,
said column being removably attached to said yard guard,
rail receiving brackets attached to said column,
each said bracket being adapted to receive a rail generally rectangular in cross section,
each said column having a first end received in a socket attached to said yard guard,
said column being bent at an intermediate part whereby said rail is disposed in a plane with said vertical plate.

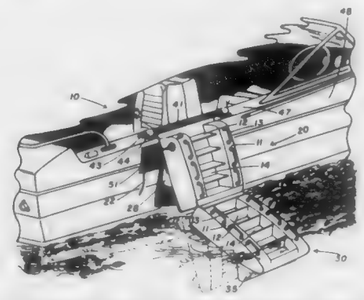
4,989,690
EMERGENCY DEVICE TO ALLOW A NUMBER OF PEOPLE TO BE TRANSFERRED BETWEEN TWO AREAS APART FROM EACH OTHER
Federico Mancosu, Milan, and Giovanni Daminelli, Bergamo, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy
Filed Feb. 12, 1990, Ser. No. 478,461
Claims priority, application Italy, Feb. 16, 1989, 19462 A/89
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—48 19 Claims



1. An emergency device for providing a passage for people and articles between locations spread apart from each other, said device comprising:
(a) an elongated plate comprising means enabling it to be alternately laid flat and rolled up upon itself by longitudinal deformation thereof and to undergo transverse deformation according to curvilinear profiles; and
(b) a plurality of deformation imparting elements for causing said transverse deformation of said plate according to said curvilinear profiles, each of said deformation imparting elements comprising at least a middle portion extending between two end points thereof and means for shortening the length of said middle portion; said two end points

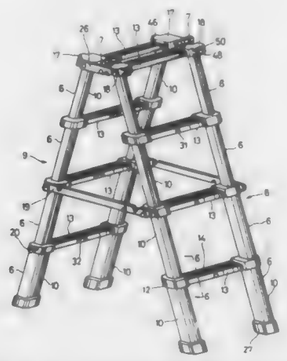
being fastened to said plate at opposite sides of a longitudinal center line of said plate.

4,989,691
INFLATABLE BOARDING LADDER AND RESCUE DEVICE
C. Williamson Wilkerson, 902 Spar Ct., New Bern, N.C. 28560, and James W. Gill, 3018 Buckingham Way, Apex, N.C. 27502
Filed May 7, 1990, Ser. No. 519,746
Int. Cl.[5] B63B *27/00*
U.S. Cl. 182—70 17 Claims



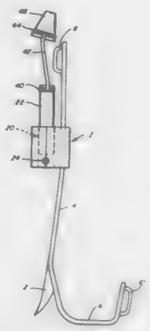
17. An inflatable ladder for use in boarding a boat comprising:
(a) a main inflatable ladder section having inflatable side rails and step means incorporated;
(b) means associated with the main ladder section for moveably mounting the inflatable ladder to the boat permitting movement between a generally horizontal non-loaded position and a second generally vertical loaded position; and
(c) means associated with the main ladder section for at least partially submerging the lower portion thereof when the same assumes the non-loaded position.

4,989,692
MULTI-PURPOSE EXTENDABLE & RETRACTABLE LADDER
Liaw S. Min, No. 3, Alley 25, Lane 194, Chung-Hsiao Road, Ping Tean, Hsiang, Tao-Yuan, Hsien, Taiwan
Filed Jun. 16, 1989, Ser. No. 367,193
Int. Cl.[5] E06C *1/12*
U.S. Cl. 182—166 2 Claims



1. A collapsible step ladder that can be converted into a straight ladder, comprising two mirror image ladder sections arrangeable in an inverted V-configuration, said ladder sections having upper ends thereof in near proximity to each other and lower ends thereof spaced apart to define a V-configuration; hinge means connecting the upper ends of said ladder section, whereby the two ladder sections can be collapsed together or reoriented into a straight line configuration for use as a straight ladder;
each ladder section comprising an upper U-shaped unit and a plural number of other U-shaped units having side rails thereof telescopically interconnected for contraction or extension of the U-shaped units;
each said other U-shaped unit comprising two spaced parallel tubular side rails having upper ends and lower ends, a plastic sleeve element affixed to the lower end of each side rail, a plastic connector block affixed to the upper end of each side rail, and a hollow foot-engageable cross bar having opposite ends thereof attached to said connection blocks on the associated side rails;
each connector block having a relatively large socket opening (122) therein encircling the upper end of the associated side rail, a relatively small guide bore (121) extending upwardly from said socket opening, a laterally-extending plug inserted into the end of the associated hollow cross bar, and a guide hole extending through said plug between the hollow bar interior space and the side rail interior space;
said U-shaped units being telescopically interconnected so that each side rail of a given unit has a slidable fit in a guide bore (121) of the next lowermost unit, and each plastic sleeve element has a slidable fit in the side rail of the next lowermost unit;
at least some of said side rails having latch openings therein located immediately above the associated plastic sleeve elements, slidable latch elements extending through said guide holes for insertion into latch openings in the associated side rails when the U-shaped units are in their extended positions, and manually-operable push button operators centrally mounted in selected ones of the cross bars for retracting the latch elements from the associated latch openings.

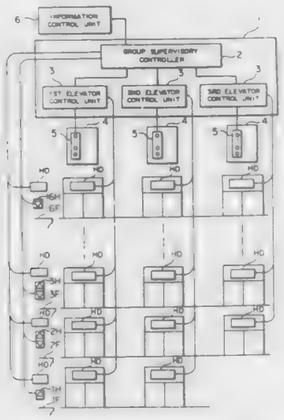
4,989,693
GAFF PROTECTIVE COVER
Danny R. Williams, Houston, Tex., assignor to Houston Industries Incorporated, Tex.
Filed Apr. 26, 1990, Ser. No. 514,530
Int. Cl.[5] A63B *27/02*
U.S. Cl. 182—221 15 Claims



1. A gaff guard for covering a gaff on a climbing iron, comprising:
(a) gaff cover cup means for covering the gaff;
(b) said gaff cover cup means being selectively removable from the gaff;
(c) resilient means for holding said gaff cover cup means in place on the gaff;
(d) housing means for enclosing said resilient means;
(e) clamp means for attaching to the climbing iron;

(f) said clamp means having a cavity formed therein for receiving said housing means; and
(g) pivot means for pivoting said housing means when said gaff cover cup is removed from the gaff.

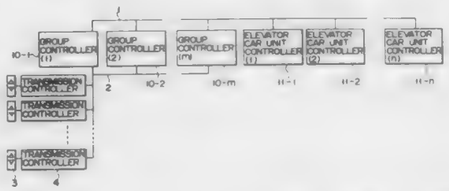
4,989,694
ELEVATOR GROUP SUPERVISORY SYSTEM
Takaaki Ueshima; Kenji Yoneda; Naobumi Nakata; Toshimitsu Tobita; Soshiro Kuzunuki, all of Katsuta; Yuzo Morita; Atsuya Fujino, both of Hitachi; Masato Suzuki, Ibaraki, and Masachika Yamazaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 8, 1989, Ser. No. 320,610
Claims priority, application Japan, Mar. 9, 1988, 63-53524; Nov. 7, 1988, 63-279340
Int. Cl.[5] B66B *3/00*
U.S. Cl. 187—121 20 Claims



1. An elevator group supervisory system comprising:
a plurality of elevators for service to a plurality of floors;
a hall calling unit provided at each elevator hall for calling said elevators;
a cage calling unit provided in each cage of said elevators for designating a destination floor;
a control unit responsive to a generated hall call for assigning one or more of said elevators;
a display provided at each elevator hall for displaying call assigned elevator selection conditions selectable by a passenger; and
a selection unit for selecting said displayed conditions.

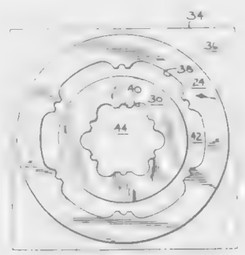
4,989,695
APPARATUS FOR PERFORMING GROUP CONTROL ON ELEVATORS UTILIZING DISTRIBUTED CONTROL, AND METHOD OF CONTROLLING THE SAME
Susumu Kubo, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 28, 1989, Ser. No. 329,830
Claims priority, application Japan, Mar. 31, 1988, 63-78789
Int. Cl.[5] B66B *1/18*
U.S. Cl. 187—101 12 Claims

1. An apparatus for performing group control on elevators, wherein a plurality of elevators are operated for a plurality of floors, a predetermined evaluation calculation is performed for each of the plurality of elevators upon generation of a hall call, an optimum elevator car is selected on the basis of an evaluation calculation result, and the selected elevator car is assigned to the hall call, thereby responding to the hall call, said apparatus comprising:
unit control means, arranged in units of cars of the elevators, for controlling unit control of each car and inputting/outputting information associated with its own car;
a plurality of group control means for performing the evaluation calculation for determining hall-call assignment in units of cars on the basis of the information associated with its own car and for performing group management of each elevator car on the basis of an evaluation calculation result; and



communicating means for causing said plurality of group control means to communicate with each other through a first data field and causing said unit control means and said group control means to communicate with each other through a second data field independent from said first data field.

4,989,696
MOTORCYCLE FRONT AND REAR DISC BRAKE SYSTEM
Erik Buell, Mukwonago, Wis., assignor to Buell Motor Company, Inc., Mukwonago, Wis.
Filed Jul. 25, 1989, Ser. No. 385,244
Int. Cl.[5] F16D *65/10;* B62D *61/02;* B23P *17/00*
U.S. Cl. 188—218 XL 9 Claims



1. A front and rear disc brake system mounted on the front and rear wheels of a motorcycle and stamped from a single sheet of brake disc material, said system comprising:
a first disc mounted on said front wheel of said motorcycle and in the form of an annulus having an outer diameter and an inner diameter defining a centrally located opening, said first disc stamped from said sheet of brake disc material and
a second disc mounted on said rear wheel of said motorcycle and having an outer diameter less than said first disc inner diameter, with said second disc stamped from the remaining brake disc material after said first disc has been stamped from said sheet of brake disc material.

4,989,697
COOLING, CLEANING AND DRYING MEANS FOR BRAKE DRUMS AND THE LIKE
Lynn E. Denton, 3502 10th Avenue, Council Bluffs, Iowa 51501
Continuation-in-part of Ser. No. 14,834, Feb. 13, 1987, Pat. No. 4,830,150, which is a continuation-in-part of Ser. No. 833,541, Feb. 27, 1986, Pat. No. 4,674,606. This application Mar. 9, 1989, Ser. No. 321,178
Int. Cl.[5] F16D *65/827*
U.S. Cl. 188—264 R 5 Claims

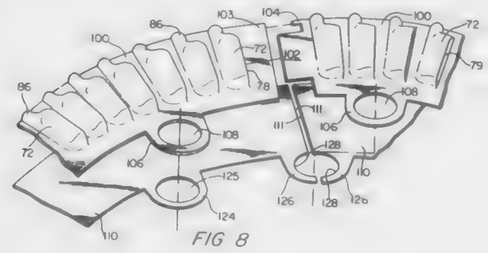
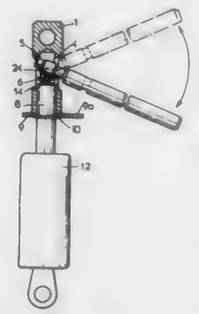


FIG 8

1. An apparatus for drying, cooling and cleaning a brake drum mounted for rotation in a given direction and being of the type having a generally upright annular wall with interior and exterior surfaces and a generally cylindrical wall extending inwardly from the outer periphery of the upright wall, said upright wall having a frustoconical shaped outer portion unitarily connected to the generally cylindrical wall and a plurality of drum mounting holes arranged in spaced relation radially inwardly from said frustoconical shaped outer portion and in circumferentially spaced relation thereon for securing said drum to a hub by threaded fasteners, said apparatus comprising:
(a) a generally circular elongated flexible strip means formed of a plurality of arcuate strip sectors connected in end-to-end manner and each having radially spaced apart inner and outer edges, and being formable into a frustoconical shape adapted for engagement against a matching surface of said frustoconical shaped outer portion of said upright wall;
(b) securement means for securing said arcuate strip sectors on the interior of said drum in engagement with the surface of said frustoconical shaped outer portion of said upright wall adjacent said cylindrical wall for lengthwise rotation with the drum:
(c) said arcuate strip sectors including a plurality of air scoops arranged in circumferentially spaced relation thereon and so shaped and positioned to extend substantially across said frustoconical shaped outer portion upon securement of said arcuate strip sectors thereon for causing air flow generally outwardly from said air scoop toward said cylindrical wall in response to rotation of the brake drum in one direction;
(d) said securement means including a plurality of tabs protruding radially inwardly from said inner edge of said arcuate strip sectors;
(e) said tabs being inclined relative to said flexible arcuate strip sectors so as to lie in a common plane upon securement of said arcuate strip sectors in engagement with said frustoconical shaped outer portion; and
(f) said tabs being of a size and position to overlie said drum mounting holes and said tabs each including a strip mounting hole alignable with a respective drum mounting hole for securement of the flexible arcuate strip sectors to the drum by the same threaded fasteners employed for mounting the drum on a hub.

4,989,[illegible]
CONTROL DEVICE FOR A LOCKABLE GAS SPRING
Dominique Douy, Roulans, France, assignor to AIRAX, France
Filed Sep. 21, 1989, Ser. No. 410,260
Claims priority, application France, Sep. 30, 1988, 88 12797
Int. Cl.[5] A47C *3/30*
U.S. Cl. 188—300 6 Claims

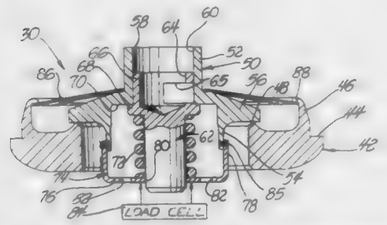


1. Control device for a lockable gas spring having two end comprising a closed enclosure and a movable rod which projects tightly from the said enclosure and which bears a piston which divides the enclosure into two chambers and means for selectively connecting the two chambers, the device comprising
a tubular connector which is designed so as to be fixed onto a fixing connector provided at one of the ends of the gas spring, and through which a sliding control finger whose head projects outside the fixing connector passes axially;
an actuating lever which includes a wide part flanked by two parts with a smaller cross-section;
two diametrically opposed windows provided in the tubular connector,
said windows, at least in their section furthest from the gas spring, having a cross-section such that the parts of the said lever with a small cross-section, but not the side part of this lever, can engage therein, at least one of the windows, in its section nearest the gas spring, having a larger cross-section so that the wide part of the lever can pass through;
the actuating lever, in its operative position, being mounted in the tubular connector with the two sections with a smaller cross-section engaged in the said windows and the wide part being in contact with the head of the said control finger so as to displace the control finger axially when the said lever pivots in a plane containing the axis of the spring by bearing against an edge of one of the said windows; and
means which, after mounting the connector on the gas spring, prevent the said wide part of the said lever from entering the said window section with a larger cross-section.

4,989,699
PRELOADED COMPRESSION VALVE AND METHOD FOR A HYDRAULIC DAMPER
Daniel P. Zaenglein, Centerville; Joel R. Wells, Huber Heights, and Thomas N. Tiller, Germantown, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 1, 1990, Ser. No. 473,568
Int. Cl.[5] F16F *9/34*
U.S. Cl. 188—322.14 2 Claims

1. A compression valve assembly for use in a hydraulic damper comprising:
(a) cage means having a stem at a first end and an annular skirt at a second end, the skirt including an exterior slidable surface;

(b) fluid passage means provided in the cage means;
(c) valve means for controlling fluid flow through the fluid passage means including
(i) a valve element for blocking fluid flow, and
(ii) selectively compressed spring means in contact at a first end with the valve element; and



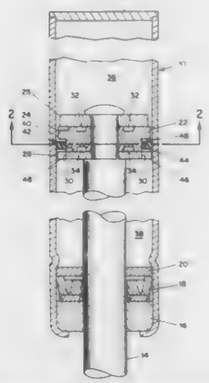
(d) cup means for retaining the selected compression of the spring means, the cup means including a base in contact with a second end of the spring means and an annular rim having an interior slidable surface slidably received over and welded to the exterior surface of the skirt.

4,989,700

GAS SPRING WITH AN ANTI-RATTLE PISTON ASSEMBLY

Mark Popjoy, Lansdale, Pa., assignor to Fichtel & Sachs Industries, Inc., Colmar, Pa.

Filed Dec. 28, 1989, Ser. No. 458,306
Int. Cl.[5] F16F *9/36*
U.S. Cl. 188—322.18 **5 Claims**



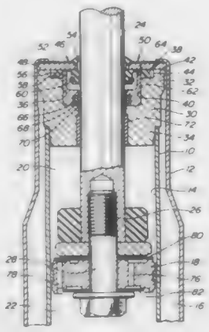
1. A gas spring having an elongated tube that is closed at one end and receives a piston rod in sealed and sliding relation at the other end, a piston unit affixed to the piston rod within the tube and defining a closed end chamber within the tube adjacent said one end and a rod end chamber within the tube adjacent said other end, a gas contained in the tube at a pressure greater than atmospheric pressure, a restricted bypass through the piston unit adapted to conduct fluid between the closed end and rod end chambers with a substantial flow resistance to throttle the flow, a one-way open bypass defined by an annular clearance space between a perimeter wall of the piston unit and the tube adjacent the closed end chamber and at least one passage in the piston unit adjacent the rod end chamber, and a sealing ring received in a ring groove in the piston unit intermediate the clearance space and passage, engaged in sealed and sliding relation with the inner wall of the tube, and movable in the ring groove axially with respect to the tube between a sealed position in engagement with a ringland adjacent the clearance space such as to close the open bypass and an open position spaced apart from the ringland, characterized in that the sealing ring has a serrated inner edge formed by spaced-apart internal projections and spaces between the projections defining with the base of the ring groove passages that constitute part of the open bypass when the sealing ring is in the open position and in that the internal projections are in close clearance with the base of the ring grooves such that they do not bind with the base of the ring grove but such that under transient lateral loads on the piston unit the projections are engaged by the base of the ring groove upon lateral deflections of the piston unit and inhibit lateral movement of the piston unit into contact with the inner wall of the tube.

4,989,701

SHOCK ABSORBER

Fumiyuki Yamaoka, and Tamotsu Yamaura, both of Atsugi, Japan, assignors to Atsugi Motor Parts Company Ltd, Atsugi, Japan

Filed Feb. 21, 1989, Ser. No. 313,017
Claims priority, application Japan, Feb. 22, 1988, 63-22172; Mar. 3, 1988, 63-28589; Apr. 6, 1988, 63-46493
Int. Cl.[5] F16F *9/36*
U.S. Cl. 188—322.17 **9 Claims**



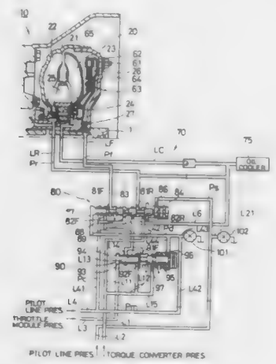
1. A shock absorber comprising:
a cylinder assembly defining a working chamber filled with a hydraulic working fluid and disposed therein a piston, and a fluid reservoir chamber filled with the hydraulic working fluid and a pneumatic working fluid;
a communication path for connecting said working chamber and said fluid reservoir chamber for fluid communication therebetween;
a check and flow restriction assembly disposed within said communication path for selectively establishing and blocking fluid communication between said working chamber and said fluid reservoir chamber, said check and flow assembly including a check means and a flow restriction means arranged in series, said flow restriction means permitting pneumatic and hydraulic fluid flow directed to said fluid reservoir chamber during a piston bounding stroke and providing flow restriction for the hydraulic fluid flow, and said check means blocking fluid communication between said fluid reservoir chamber and said working chamber during piston rebounding stroke and permitting hydraulic fluid flow during said piston bounding stroke;
said check means including a seal ring; and
said flow restriction means comprising an orifice extending in an axial direction between the outer periphery of a rod connected to said piston and an inner periphery of said seal ring.

4,989,702

CONTROL SYSTEM FOR TORQUE CONVERTER OF AUTOMATIC TRANSMISSION

Hiroshi Yoshimura; Takuji Fujiwara; Kozo Ishii, and Kazuo Takemoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 30, 1989, Ser. No. 428,763
Claims priority, application Japan, Oct. 31, 1988, 63-275894
Int. Cl.[5] F16H *45/02, 61/14*
U.S. Cl. 192—3.29 **11 Claims**



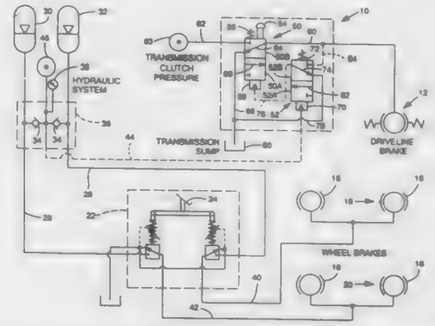
1. A control system for a torque converter of an automatic transmission comprising:
lock-up clutch means provided in said torque converter for connecting input and output members of the torque converter directly,
engaging and disengaging hydraulic means for controlling an engaging and disengaging action, respectively, of the lock-up clutch means,
shift valve means provided with first and second spools in series for controlling an introduction of a driving hydraulic pressure for said engaging and disengaging hydraulic means,
said first spool being subjected to a first hydraulic pressure at a first end thereof,
said second spool being subjected to a second hydraulic pressure at a second end thereof opposite to said first end of the first spool,
said first and second spools being subjected to a third hydraulic pressure therebetween,
first control means for controlling said first hydraulic pressure,
second control means for controlling said second hydraulic pressure,
adjusting valve means for controlling said driving hydraulic pressure for said engaging or disengaging hydraulic means,
third control means for adjusting a control pressure for controlling said adjusting valve means,
said shift valve means taking, selectively, a first position wherein both the first and second spools are positioned at a first end portion of the shift valve means, a second position wherein the first and second spools are positioned at a second end portion of the shift valve means opposite to the first end portion, and a third position wherein the first spool is positioned close to the first end portion and away from the second spool and the second spool is positioned at the second end portion,
said driving hydraulic pressure being introduced into said engaging hydraulic means to establish a lock-up condition of said torque converter when the shift valve means takes said first position,
said driving hydraulic pressure being introduced into said disengaging hydraulic means to establish a converter condition of said torque converter when said shift valve means takes said second position, and
said driving hydraulic pressure being introduced into both said engaging and disengaging hydraulic means to establish a slip condition of the torque converter when said shift valve means takes said third position.

4,989,703

HYDRAULIC BRAKE RELEASE SYSTEM

Allen P. Forsyth, Portland, and William E. Armstrong, Corbett, both of Oreg., assignors to Atlas Copco Construction and Mining Holding AB, Stockholm, Sweden

Filed Nov. 10, 1988, Ser. No. 269,627
Int. Cl.[5] B60K *41/26*
U.S. Cl. 192—4 A **21 Claims**



1. An all-hydraulic brake release system for a vehicle having a transmission fluid pressure source, a brake fluid pressure source and a spring-applied, fluid pressure-released vehicle braking means, the system comprising:
conduit means connecting the transmission fluid pressure source with the braking means; and
valve means in the conduit means for controlling communication between the transmission fluid pressure source and the braking means, wherein the valve means includes manually operable means movable between open and closed positions for opening and closing the conduit means to communication between the transmission fluid pressure source and braking means and wherein the valve means includes means responsive to transmission fluid pressure to (1) maintain the manually operable means in a selected open position when transmission fluid pressure is above a predetermined minimum pressure and (2) return the manually operable means from a selected open position to a closed position when the transmission fluid pressure is below the predetermined minimum pressure.

4,989,704

OVERRUNNING CLUTCH

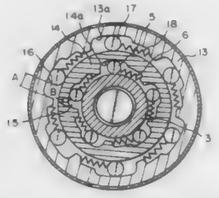
Akira Morishita, and Shuzoo Isozumi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,116
Claims priority, application Japan, Oct. 6, 1988, 63-131084[U]; Oct. 6, 1988, 63-131085[U]
Int. Cl.[5] F16D *41/06*
U.S. Cl. 192—45 **2 Claims**

1. An overrunning clutch, comprising:
a cylindrical, rotatable clutch inner member (3);
a cylindrical, rotatable intermediate member (14) surrounding the clutch inner member, said intermediate member having tapered cut portions (14*a*) formed in an inner periphery thereof so as to define first wedge-shaped spaces (15) between said inner periphery and an outer peripheral surface of said clutch inner member;

a cylindrical, rotatable clutch outer member (13;13c) surrounding the intermediate member, said clutch outer member having tapered cut portions (13a) formed in an inner peripheral surface thereof so as to define second wedge-shaped spaces (16;16a) between said inner peripheral surface and an outer peripheral surface of said intermediate member; and

a plurality of rollers (5,17;17a) individually and movably disposed within said first and second wedge-shaped spaces, respectively, wherein the amounts by which said rollers may advance into said first and second wedge-



shaped spaces are limited to first and second predetermined values, respectively, thereby determining an upper limit of transmitted torque in a predetermined direction of rotation, and wherein said intermediate member is a separate, discrete member devoid of connection to any other clutch members except via said rollers, wherein said first predetermined value is smaller than said second predetermined value such that the upper limit value of torque transmitted between said clutch outer member and said intermediate member is greater than the upper limit value of torque transmitted between said intermediate member and said clutch inner member.

4,989,705

ROTARY MEMBER WITH ONE-WAY CLUTCH

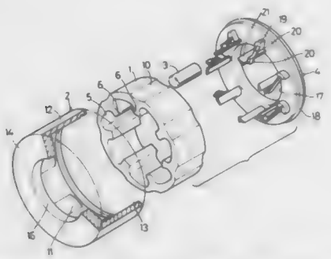
Yoshio Kashio; Masahiro Kurita; Yuji Okamoto; Mitsukazu Itayama, and Masahiko Katsuka, all of Kuwana, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Apr. 14, 1989, Ser. No. 338,809

Claims priority, application Japan, Nov. 17, 1988, 63-150885

Int. Cl.[5] F16D *3/34*

U.S. Cl. 192—45 7 Claims



1. A rotary member with a one way clutch, comprising:

an outer ring formed in the inner periphery thereof with a plurality of axial grooves defining respective spaces for retaining a plurality of rolling elements therein, each groove having a first side wall at a narrower side of said groove and a second side wall at a wider side of said groove, such that each rolling element is retained in a corresponding one of said axial grooves, adjacent said first sidewall;

an outer member mounted on said outer ring;

a closure member having an end wall formed in a center thereof with a hole, said end wall of said closure member closing one end of said axial grooves, each axial groove being formed with a cam surface tapered in one of the opposite directions of rotating;

an end wall formed in said outer member with a hole in the center thereof, said end wall of said outer member closing the other end of said axial grooves;

positioning means, provided on an inner radial surface of said closure member and received in said respective grooves, for holding said closure member in a fixed position with respect to said outer ring;

biasing means, integrally formed on said closure member and received in said respective grooves adjacent said second side wall thereof, for biasing said rolling elements toward said narrower side of said grooves; and

means for coupling said closure member together with said outer member.

4,989,706

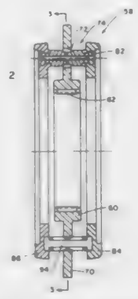
SYNCHRONIZER

Timothy J. Morscheck, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 25, 1989, Ser. No. 427,070

Int. Cl.[5] F16D *23/02*

U.S. Cl. 192—53 E 12 Claims



5. A synchronized jaw clutch assembly for engaging a gear to a shaft about which it is rotatably mounted, said assembly including a jaw clutch member relatively axially moveable towards the complimentary jaw clutch member fixed to said gear, synchronizer means including blocker means for preventing axial movement of said jaw clutch member towards said gear member during asynchronous rotation therebetween, said assembly characterized by;

anti-notchiness means for providing a significant mechanical advantage in axial movement of said jaw clutch member towards the clutch teeth carried by said gear during substantially all of a time period beginning subsequent to achieving synchronous rotation between said jaw clutch members and ending upon initial tooth abutment of said jaw clutch members.

4,989,707

RESETTABLE SHAFT CLUTCH-DISCONNECT FOR A CO-AXIAL DRIVE SHAFT

James H. Doty, Roscoe, and William F. Smith, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 3, 1989, Ser. No. 416,832

Int. Cl.[5] F16D *11/00*

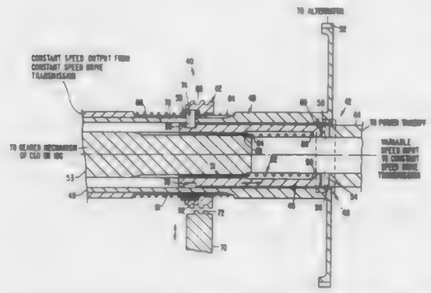
U.S. Cl. 192—67 R 26 Claims

1. A transmission having an inner rotationally mounted shaft with first and second parts and an outer concentric rotationally mounted shaft comprising:

a clutch, connected to the first and second parts of the inner shaft, which is movable between a first engaged position in which torque may be transmitted through the clutch between the first and second parts and a second position in which torque is not transmitted through the clutch;

means, coupling one of the parts of the inner shaft to the outer shaft to transmit torque from the one of the parts of the inner shaft to the outer shaft when the one part is rotating; and

an axially movable mechanism disposed outside of and concentric with the outer shaft and projecting through the outer shaft for engaging one of the parts of the inner shaft to move the one part between first and second positions,



the axially movable mechanism being movable between first and second positions to cause the one of the parts of the inner shaft to move axially between the first and second positions to move the clutch respectively between the first and second positions to control the transmission of torque between the parts of the inner shaft and between the inner shaft and the outer shaft.

4,989,708

MULTI-DISK FRICTION CLUTCH

Helmut Gaggermeier, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

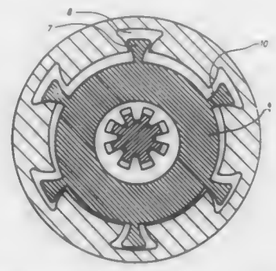
PCT No. PCT/EP89/00529, § 371 Date Mar. 5, 1990, § 102(e) Date Mar. 5, 1990, PCT Pub. No. WO89/11599, PCT Pub. Date Nov. 30, 1989

PCT Filed May 16, 1989, Ser. No. 458,678

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818239

Int. Cl.[5] F16D *13/68, 13/52*

U.S. Cl. 192—70.2 2 Claims



1. A multi-disk friction clutch having an outer body with grooves for the guiding of external disks by means of their toothing, as well as having a hub body with grooves for the guiding of internal disks by means of their toothing, the external and internal disks resting in and against their guides with play, characterized in that the teeth of the external disks are constructed with undercut tooth profiles, in that the grooves in the outer body have corresponding undercuts, and in that the external disks are constructed such that, when the external disks are arranged centrically in the outer body, the gap between the external disks and the outer body at the tooth profiles caused by the play is smaller than at the other points of the outer contour of the external disks.

4,989,709

DUSTPROOF MECHANISM FOR PULL-TYPE CLUTCH

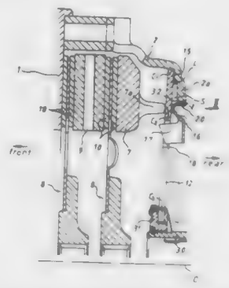
Hiroshi Takeuchi, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 12, 1990, Ser. No. 481,005

Claims priority, application Japan, Feb. 17, 1989, 1-18277[U]

Int. Cl.[5] F16D *13/72, 13/58*

U.S. Cl. 192—70.12 2 Claims



1. In a pull-type clutch including a clutch cover having an axial end secured to a flywheel and having an inwardly directed end wall extending toward the clutch axis at an axial end opposite to said end secured to said flywheel, a pressure plate freely movable in its axial direction, a clutch disc disposed between said pressure plate and said flywheel, a diaphragm spring having an outer peripheral fulcrum point supported by an end wall of said clutch cover and an intermediate fulcrum point mating with the pressure plate, said clutch being released by pulling an inner peripheral end of said diaphragm spring axially away from the direction of said flywheel; a dustproof mechanism for said clutch co-nprising an annular dustproof cover covering a radial inside opened end of a space existing between said clutch cover end wall and said diaphragm spring.

4,989,710

TORQUE TRANSMITTING AND TORSION DAMPING APPARATUS FOR USE IN MOTOR VEHICLES

Wolfgang Reik, Bühl, and Hans-Dieter Elison, Offenburg, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Division of Ser. No. 132,909, Dec. 14, 1987, abandoned, which is a division of Ser. No. 470, Jan. 5, 1987, Pat. No. 4,727,970, which is a continuation-in-part of Ser. No. 716,838, Mar. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 499,006, Nov. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 848,732, Apr. 4, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,792

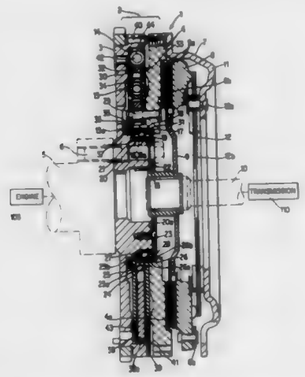
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421709; Nov. 23, 1984, 3442679; Apr. 15, 1985, 3513449; Apr. 16, 1985, 3513479

Int. Cl.[5] F16D *13/68*

U.S. Cl. 192—70.17 9 Claims

1. Apparatus for compensating for variations of torque, especially for fluctuations of torque which is transmitted between a combustion engine and an input means of a transmission, comprising at least two flywheels which are rotatable relative to each other, one of which is connectable with the engine and the other of which is connectable with the input means of the transmission and carries a disengageable friction clutch; a substantially disc-shaped member non-rotatably affixed to said other flywheel; antifriction bearing means interposed between said flywheels; and damper means arranged to oppose rotation of said flywheels relative to each other, said damper means at least comprising energy storing means acting in the circumferential direction of said flywheels, and a friction generating device which is axially interposed between said substantially disc-shaped member and said one flywheel, said

friction generating device comprising an energy storing element acting in the axial direction of said flywheels, said energy storing element being stressed to exert a force having a compo-



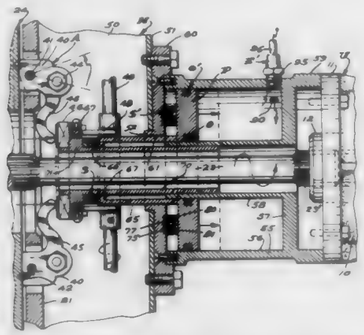
nent acting against said other flywheel in a direction counter to the direction of action of force which is to be applied to disengage the friction clutch.

4,989,711

CENTRIFUGAL CLUTCH CONTROLLER

William H. Schultz, P.O. Box 204, Pfafftown, N.C. 27040; Robert A. Eakins, 4842 Mangrove Ave., Covina, Calif. 91723, and Robert J. Bernstein, 664 Blue Bell Ct., Wellington, Fla. 33414

Filed May 29, 1990, Ser. No. 529,373
Int. Cl.[5] F16D *25/08, 43/06*
U.S. Cl. 192—105 F 21 Claims



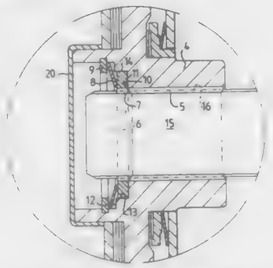
1. An elongate centrifugal clutch with front and rear ends, a front drive part in rotary driving engagement with a crankshaft of a related engine, a central elongate clutch shaft concentric with and rearward of the crankshaft, a plurality of annular, radially extending, axially spaced plates about the shaft and in rotary driving engagement with the drive part, annular radially extending driven disks between the plates and in rotary driving engagement with the shaft, a carrier part rearward of the plates in axial fixed and rotary driving engagement with the drive part, and, a plurality of actuating weights pivotally carried by the carrier part and having cam parts that engage and urge the rear-most plate forward and that have radially inwardly projecting actuating arms that pivot rearwardly when the clutch is rotated and the weights are caused to pivot radially outward; a controller to engage and slow rearward pivoting of the arms and including, an annular throw-out bearing about the shaft rearward of and normally engaging the arms, an elongate cylinder with front and rear ends mounted in fixed axial spaced relationship rearward of the bearing, a piston in the cylinder, an elongate rod on the piston and projecting forwardly from the cylinder and connected with the bearing, fluid inlet and exhaust ports in the cylinder rearward of the piston, a motive fluid supply connected with the inlet port and operable to conduct motive fluid into the cylinder to move the piston, rod and bearing forward to a stop forward unactuated position where said bearing engages said actuating arms when said arms are in a normal unactuated forward position, and, a fluid exhaust connected with the exhaust ports and operating to bleed fluid from within the cylinder at a rate to allow the piston, rod and bearing to move rearwardly and the arms to pivot rearwardly from their unactuated position at a predetermined controlled rate.

4,989,712

DEVICE FOR REDUCING MECHANICAL RATTLE IN A VEHICLE COUPLING

Grzegorz Janiszewski, Angered, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Aug. 7, 1989, Ser. No. 389,971
Claims priority, application Sweden, Aug. 18, 1988, 8802929
Int. Cl.[5] F16D *1/08, 13/68*
U.S. Cl. 192—106.1 5 Claims



1. Device for reducing mechanical rattle between a shaft and a sleeve element surrounding the shaft, having interengaging splines, comprising an annular element (6) with internal splines (7) which engages splines (16) on the shaft (15) and has a frictional surface (11) pressed against a frictional surface (10) of the sleeve element (4), the sleeve element (4) having an annular step (12) concentric with its splines (5), which step surrounds the annular element (6).

4,989,713

TORISONAL DAMPING MECHANISM

David A. Janson, Plymouth, Mich., assignor to Eaton Corporation, Cleveland, Ohio

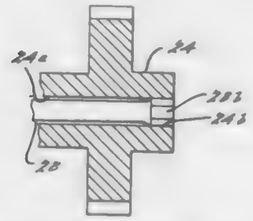
Continuation of Ser. No. 111,472, Oct. 19, 1987, abandoned, which is a division of Ser. No. 793,802, Nov. 1, 1985, Pat. No. 4,782,932. This application May 22, 1989, Ser. No. 355,603
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed
Int. Cl.[5] F16D *3/12, 3/66, 3/80*
U.S. Cl. 192—106.2 14 Claims

1. A torsional vibration damping mechanism for a driveline, the mechanism comprising:

a damper assembly having first and second relatively rotatable clutch means disposed for clutching coaction therebetween and damping of torsionals in response to the relative rotation;

means for disposing at least first and second resilient means in series with each other, one of the resilient means being flexibly operative to attenuate torsionals when the driveline is connected to a load, and the other resilient means being flexibly operative to attenuate torsionals when the driveline is not connected to a load and being flexibly inoperative when the driveline is connected to a load; characterized by:

the means for disposing including means fixedly connecting the first and second resilient means respectively to the first and second clutch means for effecting the relative rotation



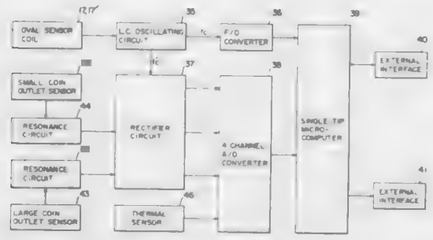
and the clutching coaction in response to flexing of either of said resilient means.

4,989,714

METHOD OF DISCRIMINATING COINS

Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1989, Ser. No. 434,328
Claims priority, application Japan, Nov. 15, 1988, 63-286736
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—317 5 Claims



1. A method of discriminating coins by use of a pair of oval sensor coils opposedly arranged at both sides of a coin passage in a coin acceptor with the longitudinal axis of the coils extended along a coin guide rail in the coin passage, the method comprising steps of detecting a variation of coil reactance caused by a coin rolling on the guide rail, counting clock pulses in a pass time from a start point to a final point of the variation of coil reactance, reading the whole variation of the coil reactance from the start point to the final point thereof by a microcomputer, providing a plurality of variation divided data by dividing the pass time by an integral number and comparing the variation data with corresponding reference data of a genuine coin previously stored in the microcomputer.

4,989,715

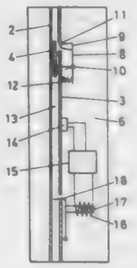
METHOD AND DEVICE FOR DETECTING COINS

Dieter Grünig, Wohlen, Switzerland, assignor to Grünig Administration, Badger, Minn.

Filed Aug. 22, 1988, Ser. No. 235,325
Claims priority, application Switzerland, Dec. 31, 1987, 05124/87
Int. Cl.[5] G07D *5/00*
U.S. Cl. 194—317 6 Claims

1. Method of electronic detection of coins for separating non-suitable coins from suitable coins, said method comprising the steps of imparting oscillation to the coins with a knock on a flat side surface of a coin; measuring a frequency of the imparted oscillation during subsequent free fall of the coin; and separating the coin when the measuring frequency characterizing the suitability of the coin, deviates from a nominal frequency beyond a predetermined tolerance limit.

2. An electronic coin detector for separating non-suitable coins from suitable coins, said coin detector comprising an insertion slot through which the coins fall; means for imparting oscillation to the coins with a knock on a flat side surface of a coin; microphone means for measuring a frequency of the oscillation imparted to the coin, during free fall of the coin; and



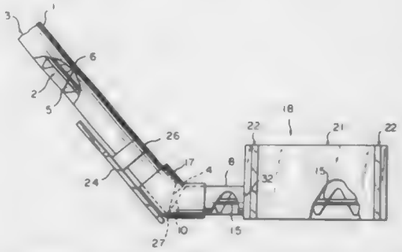
electronic means for detecting a measuring value generated by said microphone means and for effecting separation of non-suitable coins when the measuring value deviates from a nominal value beyond a pre-determined tolerance limit.

4,989,716

ADJUSTABLE ANGLE AUGER

Gerald Stuckey, R.R. 1, Box 174, Martinton, Ill. 60951

Filed Jun. 11, 1990, Ser. No. 535,531
Int. Cl.[5] B65G *33/32*
U.S. Cl. 198—311 8 Claims



1. A portable adjustable angle auger apparatus for conveying bulk materials comprising:

a conveyor duct having an end beveled to project at the bottom and recede at the top and a discharge end;

a supply duct having an end beveled to project at the bottom and recede at the top and a supply intake end;

a conveyor auger disposed within said conveyor duct;

a supply auger disposed within said supply duct;

means for coupling said supply auger to said conveyor auger so that said augers rotate together and the axes of said augers are pivotable relative to each other;

means for connecting said conveyor duct and said supply duct at the projecting beveled ends such that each duct end diverges upwardly from a convergence point formed by the connected projecting ends so that the slope and discharge end height of said conveyor duct can be varied by pivoting said conveyor duct relative to said supply duct about said duct connecting means; and

a movable flexible covering for said ducts at said convergence point, said auger coupling means disposed within said ducts and said duct connecting means while said apparatus is conveying bulk materials; wherein said movable flexible covering is displaceable from said convergence point so as to facilitate disassembly of said apparatus.

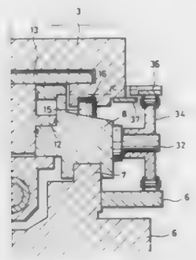
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4,989,717

PALLET EXCHANGING APPARATUS FOR MACHINE TOOL

Saburo Itoh, Fukui, Japan, assignor to Matsuura Machinery Corporation, Fukui, Japan

Division of Ser. No. 85,033, Aug. 12, 1987, Pat. No. 4,799,582.
This application Jul. 27, 1988, Ser. No. 224,968
Claims priority, application Japan, Feb. 23, 1987, 62-037843
Int. Cl.[5] B65G *47/00*
U.S. Cl. 198—346.1 2 Claims



1. The combination of a machine tool, a plurality of pallets and a pallet exchanging apparatus for the machine tool in which one of said pallets loaded with machined workpieces and placed on a table of such machine tool is moved to a first waiting position and exchanged with another of said pallets with workpieces to be machined which has been placed at a second waiting position, in which the table of the machine tool comprises a clamp base for mounting thereon of one of said pallets and a saddle on which the clamp base is mounted, the clamp base being movable on the saddle toward said first waiting position, a transmission device is connected to the clamp base to output rotational movement and a speed-up device is connected to said transmission device and adapted to provide said pallet loaded with machined workpieces with linear movement toward said first waiting position of higher speed and larger stroke than those of linear movement of said clamp base toward said first waiting position, said transmission device comprising two sprockets rotatably supported on said clamp base and said speed-up device comprising a chain wound around said sprockets, an engaging member fixed to a part of said chain, another part thereof being fixed to said saddle, and each of said pallets having fixed thereto a claw member engageable with said engaging member.

4,989,718

SURGE CONTROL METHOD AND APPARATUS

Dorian F. Steeber, Taylors, S.C., assignor to Hartness International, Inc., Greenville, S.C.

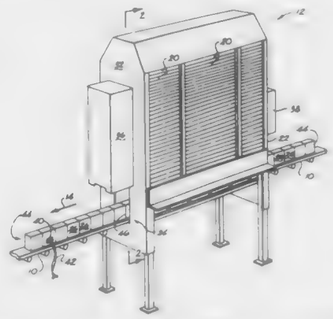
Filed Aug. 23, 1989, Ser. No. 397,688
Int. Cl.[5] B65G *1/00*
U.S. Cl. 198—347.3 64 Claims

1. A method of surge control for products being transported via a moving conveyor belt means between two production areas, said method comprising:

providing an accumulator device alongside the conveyor belt means intermediate the two production areas so that one of such areas is upstream of the accumulator device and the other production area is downstream of such device, such device being capable of controllably removing products from the conveyor belt means if there is a back-up of products being fed to the downstream production area;

selectively holding back all products emerging from the downstream end of the accumulator device during normal running operations so as to maintain a predetermined distance gap between each predetermined number of products moving towards the downstream production area from said accumulator device downstream end, by ensuring the presence of said predetermined distance gap before the release of a subsequent said predetermined number of products; and

controllably removing products from the conveyor belt means with the accumulator device if a predetermined



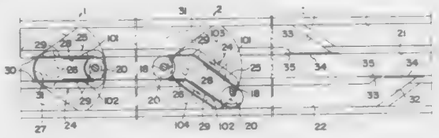
queue of products develops within the accumulator device before the predetermined distance gap occurs between products emerging from said accumulator device downstream end.

4,989,719

COMPOSITE CONVEYOR APPARATUS EQUIPPED WITH LATERALLY TILTABLE PLATE ELEMENTS

Aris Ballestrazzi, and Lamberto Tassi, both of Savignano sul Panaro, Italy, assignors to Sitma SpA, Spilamberto, Italy

Filed May 8, 1989, Ser. No. 348,988
Claims priority, application Italy, May 9, 1988, 20505 A/88
Int. Cl.[5] B65G *47/46*
U.S. Cl. 198—365 8 Claims



1. An apparatus having a framework for selectively conveying products, comprising:

(a) plate type elements which are laterally positioned on the framework;

(b) driving means for driving said plate type elements on the framework;

(c) guide means for supporting and guiding said driving means on the framework;

(d) a first sliding guide on the framework adapted to provide a closed loop path for said plate type elements, wherein said first sliding guide includes side walls;

(e) a pin downwardly extending from said plate type element for engaging in said first sliding guide;

(f) a second sliding guide on the framework, wherein said second sliding guide includes side walls and is parallel to said first sliding guide and in communications with said first sliding guide wherein said pin of said plate type element is adapted to move from said first sliding guide to said second sliding guide;

(g) a diverting wall element positioning across an opening between said first and second sliding guides adapted to provide a unitary directional path between said first and said second sliding guides;

(h) a transverse support element connected to said pin of said plate type element by means of a rotatable hinge, wherein said transverse support element is attached to at least one of said driving means; and

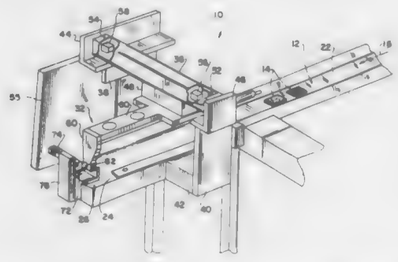
(i) a switching element having a first wall and a second wall and an actuating means, said switching element positioned between said side walls of said first sliding guide and said side walls of said second sliding guide for diverting said plate type elements from said first sliding guide to said second sliding guide, wherein said switching element comprises a first free end and a second free end so that when said switching element diverts said plate type element from said first sliding guide to said second sliding guide by said actuating means, said first free end slides in one direction relative to said first wall of said switching element and said second free end slides in a second direction relative to said second wall of said switching element for defining a continuous pathway for said plate type elements.

4,989,720

ICE CREAM SANDWICH COLLATING APPARATUS

Floyd W. Price, Freehold, N.J., and Harry W. Sloan, Charlotte, N.C., assignors to Interbake Foods, Inc., Elizabeth, N.J.

Continuation of Ser. No. 206,563, Jun. 2, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 474,627
Int. Cl.[5] B65G *29/00*
U.S. Cl. 198—430 11 Claims



1. Apparatus for collating articles for packaging, comprising:

a substantially flat plate;

conveying means for conveying said articles in a first direction onto said flat plate;

detector means for detecting when a predetermined number of said articles have been conveyed to a first position on said flat plate;

pusher means for pushing said predetermined number of articles from said first position to a second position so as to collate said pushed articles;

mounting means for mounting said pusher means above said flat plate for movement between a start position and an end position in a second direction substantially transverse to said first direction, said mounting means including opposite vertical supports and air cylinder means mounted by said opposite vertical supports above said flat plate and extending substantially in said second direction;

sliding plate means slidably mounted along said air cylinder means for supporting said pusher means for movement in said second direction;

said mounting means further including pivot bracket means secured to said sliding plate means for pivotalloy mounting said pusher means such that said pusher means extends substantially in said first direction; and

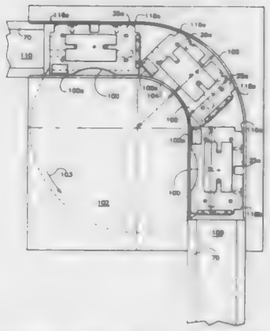
control means for moving said pusher means away from subsequent articles conveyed onto said flat plate when said pusher means is moved from said end position to said start position so as to permit conveyance of said subsequent articles onto said flat plate during movement of said pusher means from said end position to said start position.

4,989,721

PALLET TRANSFER CORNER SYSTEM

William D. Ach, Brooklyn Park; Edmund J. Anderson, Minneapolis; Lynn B. Behrends, Delano; Wayne P. Deerade, Brooklyn Park, and Gene J. Klos, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 8, 1988, Ser. No. 204,103
Int. Cl.[5] B65G *29/00*
U.S. Cl. 198—465.1 9 Claims



1. A pallet transfer corner system, comprising:

a transfer mechanism having a rotating corner portion centered about an axis and guide rail means defining the path of pallets around said corner, including a curved inner guide rail having a radius of curvature of r and a curved outer guide rail having a radius of curvature of r plus d; and

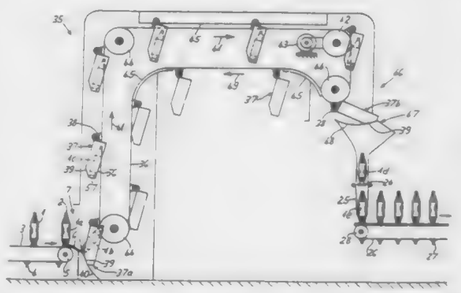
pallets having an inner sidewall with an arcuate surface on a portion thereof configured to cooperate with said inner guide rail, said pallet also having an outer substantially straight sidewall cooperating with said outer curved guide rail such that the maximum distance from said axis to said outer sidewall does not exceed r plus d.

4,989,722

APPARATUS FOR TRANSPORTING YARN PACKAGES

Wilhelm Kuepper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 252,816
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1987, 3733510
Int. Cl.[5] B65G *47/34*
U.S. Cl. 198—475.1 11 Claims



1. An apparatus for transporting yarn packages from one yarn processing machine to another yarn processing machine, comprising:

an endless belt extending between said machines;

means for driving said belt;

a plurality of package carrier members having means for supporting packages thereon, each of said package supporting means including a lower surface and a generally upstanding surface with said lower surface sloping upwardly from said upstanding surface to support a package with one end on said lower surface and in leaning disposition against said upstanding surface;

pivot connections mounting said carrier members at spaced intervals on said belt in freely pivotal hanging disposition for maintaining said supporting means in package supporting deposition as said carrier members travel on said belt from one machine to the other; and

means adjacent said other machine for pivoting said carrier members with respect to said endless belt to release the supported packages therefrom as said carrier members travel thereby.

4,989,723

PLASTIC CONVEYOR BELT SYSTEM WITH IMPROVED PRODUCT SUPPORT

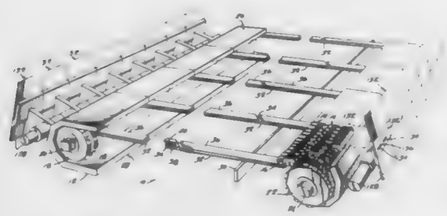
Robert H. Bode, and William P. Hidden, both of Wenham, Mass., assignors to The Cambridge Wire Cloth Company, Cambridge, Md.

Filed Feb. 6, 1984, Ser. No. 577,361

The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.

Int. Cl.[5] B65G *47/74, 17/06*

U.S. Cl. 198—635 **30 Claims**



1. A conveyor system, comprising:

an endless conveyor belt assembled of a plurality of belt modules integrally molded of synthetic plastic material, each belt module including:

a plurality of longitudinally extending, transversally closely spaced ribs providing a generally flat upwardly facing support surface;

transversally extending web means inter-connecting said ribs;

said ribs being arranged in two intercalated series, of which one has knuckle portions leading the leading ends of said ribs of the other series, and of which said other series has knuckle portions trailing the trailing ends of said ribs of said one series;

means defining a relatively open hinge slot through each said knuckle portion; and

means defining at least one downwardly-opening sprocket tooth-reception cavity located midway between the knuckle portions of each of said two series of ribs;

said belt modules being arranged in a plurality of rows in an interdigitated manner so that trailing hinge slots of respective landing belt modules are aligned transversally of the belt with leading hinge slots of respective longitudinally neighboring trailing belt modules;

the respective longitudinally neighboring belt module rows being pivotally joined by respective connecting rods received through the respective aligned hinge slots;

said belt being entrained about a drive roll means and a tracking roll means, and drive roll means including at least one sprocket having a plurality of perimetrically spaced radiating teeth constructed and arranged to drivingly engage said belt in said at least one downwardly opening cavity in respective ones of said belt modules, and central hub means constructed and arranged for mounting said at least one sprocket on a drive shaft for rotation therewith;

on each belt module said web means comprising two generally arcuate webs which are convex towards one another so as to be more nearly vertical and more nearly parallel to one another towards the upper extent thereof, and to flare away from one another near the lower extend thereof, said two webs being spaced from one another longitudinally of the conveyor belt in which the belt module is designed to be incorporated;

on each belt module said at least one downwardly-opening sprocket tooth-reception cavity comprising a plurality of transversally spaced like ones of such cavities, each defined longitudinally between said webs of that belt module and transversally between a respective at least two said ribs of that module;

on each belt module the respective at least two ribs which in part define each said downwardly-opening sprocket tooth-reception cavity being in a first series of said two series of ribs, and each said respective at least two ribs being spaced apart by at least one truncated said rib from a second series of said two series of ribs, each such truncated rib thereby comprising an upper end wall of the respective said downwardly-opening sprocket tooth-reception cavity;

on each said belt module all of said respective at least two ribs and said two webs having means defining a flat lower surface in common, so that each of said cavities is perimetrically bounded by a flat lower surface, which flat lower surface extends longitudinally on said knuckle portions of said ribs to sites underlying said hinge slots.

4,989,724

FASTENING ARRANGEMENT FOR THE ENTRAINING ELEMENTS OF CHAIN CONVEYORS

Michael Komotzki, Gernotstr. 4, D-4600 Dortmund 13, Fed. Rep. of Germany

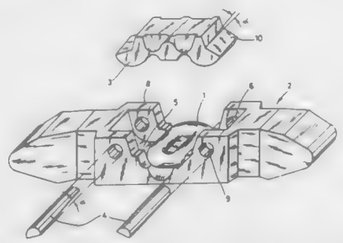
PCT No. PCT/DE88/00062, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988, PCT Pub. No. WO88/06136, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 11, 1988, Ser. No. 273,814

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704509; Feb. 25, 1987, 3705914

Int. Cl.[5] B65G *19/24*

U.S. Cl. 198—731 **11 Claims**



1. An entraining element for a chain conveyor having a conveying chain which includes a multiplicity of interconnected links, said entraining element comprising a confining member having a longitudinal axis and a recess designed to confine at lest one of said links in such a manner that said chain conveys said confining member along a predetermined direction transverse to said axis, said confining member further having at least one passage which opens to said recess and extends along said predetermined direction, and said one link and said recess together defining a space having a predetermined configuration when said one link is in said recess; a clamping member receivable in said recess to clamp said one link therein, said clamping member having a configuration complementary to said predetermined configuration and at least one wedge receivable in said passage and designed to urge said clamping member against said one link so as to lock the latter in said recess.

4,989,725

GRATE BAR SURFACE IN PASTEURIZERS

Uwe Knabe, Holzwickede; Alois Klinge, Lünen; Hans-Joachim Fründt, and Ulrich Geltenpoth, both of Dortmund, all of Fed. Rep. of Germany, assignors to Holstein und Kappert Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 403,652

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1988, 3830960

Int. Cl.[5] B65G *25/00*

U.S. Cl. 198—774.1 **3 Claims**

1. In a surface formed by grate bars in pasteurizers, the grate bars being movable so as to perform a pilgrim step-type movement, and grate bars being placed on grate supports in the form of sectional girders, each sectional girder having an upper end face, wherein the grate bars have first and second ends placed on the sectional girders, the ends being Z-shaped, the improvement comprising each sectional girder having at the upper end face thereof a groove-shaped recess and each sectional girder having an elongated slot-like recess vertically spaced from the groove-shaped recess, each slot-like recess defining a lateral opening, the end of each grate having an opening for inserting the grate bar into the slot-like recess of the sectional girder, whereby, by inserting the first end of a grate bar in the slot-like recess of the sectional girder and raising the second end of an opposite grate bar, the first and second grate bar ends are vertically and laterally centered.

4,989,727

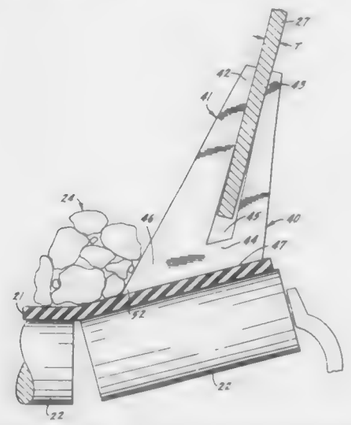
SKIRTBOARD APRON FOR A BELT CONVEYOR

James R. Gordon, Benton, Ill., assignor to Gordon Belt Scrapers, Inc., Benton, Ill.

Filed May 4, 1990, Ser. No. 518,786

Int. Cl.[5] B65G *21/20*

U.S. Cl. 198—836.1 **14 Claims**



1. A skirtboard apron for a belt conveyor of the kind comprising a conveyor belt, a rigid skirtboard of predetermined thickness positioned a short distance above and extending along one side of the conveyor belt, and a resilient, replaceable apron mounted on and extending downwardly from the skirtboard to close off the gap between the skirtboard and the belt, the apron comprising:

an elongated elastomer mounting portion of substantially U-shaped configuration, mountable on the skirtboard with the legs of the U on opposite sides of the skirtboard and the upper parts of the legs of the U engaging the skirtboard;

and an elongated elastomer wiper portion extending downwardly from the bight of the U-shaped mounting portion into engagement with the upper surface of the conveyor belt.

4,989,728

CIGARETTE PACKAGE UNIT INCORPORATING A MATCH DRAWER

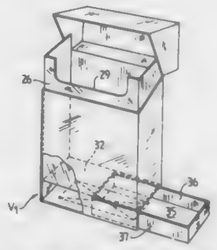
Stéphane Neyret, 4 avenue Bonon, 75016 Paris, France, and Patrick Verilhac, 15 Boulevard Gambetta, 38000 Grenoble, both of France

Filed Dec. 23, 1988, Ser. No. 289,354

Claims priority, application France, Dec. 23, 1987, 87 18089

Int. Cl.[5] B65D *5/18, 5/66, 25/04, 5/48*

U.S. Cl. 206—91 **5 Claims**



5. A cigarette package unit incorporating a match drawer, comprising an outer envelope defining therewithin a rectangular parallelepipedal volume made from a single blank of material, said outer envelope comprising side walls of front and rear flaps, said front and rear flaps being shorter than a total height of the outer envelope and being connected to respective front and rear faces of said outer envelope while defining therebetween a rectangular cut-off forming a three sided hollow space including a bottom of said outer envelope;

an inner compartment made from a second blank of material and adapted for receiving the cigarettes, said inner compartment being disposed within said outer envelope and having a central panel adjacent said front face of said outer envelope interiorally thereof, the central panel being disposed above a substantially continuous bottom wall, the substantially continuous bottom wall forming a fourth side and an upper wall of said hollow space of said outer envelope, said bottom wall and said central panel of said inner compartment being separated by a fold line, and a tongue adjacent said rear face of said outer envelope interiorally thereof and disposed above said bottom wall, said bottom wall being connected to said tongue by a fold line; and

a match drawer slidably retained in said hollow space, said substantially continuous bottom wall of said inner compartment constituting means for ensuring easy and binding-free sliding motion of said drawer in said hollow space.

4,989,729

AUTOMATIC RAPID HEATING CAN

Kin-Shen Huang, No. 116, Shuang-fu Village, Min-Hsiung Hsiang, Chia-I Hsien, Taiwan

Filed Jun. 1, 1989, Ser. No. 359,592

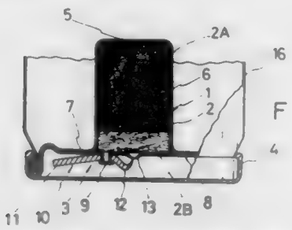
Int. Cl.[5] B65B *25/22*

U.S. Cl. 206—222 **2 Claims**

1. In a packing can for providing heated food or beverage comprising an exterior side wall defining a food or beverage containing compartment, a bottom wall and an interior separating wall defining a container for chemicals which are capa-

ble of reacting to produce heat, and means for effecting mixing of said chemicals, the improvement wherein

said separating wall comprises a cylindrical portion defining said container so that said container and said packing can are generally coaxial with said container projecting upwardly from and inside of said bottom wall of said packing can, said separating wall further extending outwardly perpendicular to the axis of said container and packing can



adjacent said bottom wall, and joining means for joining said exterior side wall, said separating wall and said bottom wall in a seal at the lower outside portion of said packing can, and

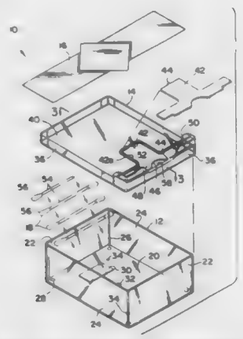
said means for effecting mixing comprising a lever having a handle and a pointed end, said lever being anchored intermediate said handle and said pointed end to said bottom wall by a post.

4,989,730

COTTON SWAB SHIPPING CONTAINER AND DISPENSER

Philippe Lemoine, 50 Rue Saint Ferdinand, 750/7 Paris, France

Filed May 1, 1989, Ser. No. 345,778
Int. Cl.[5] B65D *83/02*
U.S. Cl. 206—362 1 Claim



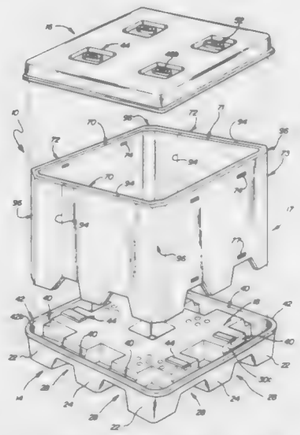
1. For use with cotton swabs, a combination shipping container and dispenser comprising a hollow rectangular body of plastic construction material having a removable front panel, said front panel fastened to said body by selectively removable attachment means, a removable portion in the lower end of said front panel consisting of a T-shape having a top which is located proximate the edge of said panel, delineated in said front panel by a groove except for a selected number of connecting bridges therebetween at spaced intervals along said groove, a fingergrip opening in the top portion of said T-shape to facilitate the gripping thereof incident to the rupturing of said connecting bridges, and a pair of lips in adjacent position to the top of said T-shape and extending laterally of said front panel so as to obviate contact against said T-shape as might cause the inadvertent detachment thereof during shipment of said cotton swabs, said lips located beyond the corresponding margin of said body, and being clear of the horizontal extend of the top portion of said T-shape to facilitate finger access to the central portion of the dispensed swabs, whereby the removal of said T-shape provides an access opening to the cotton swabs stored in said body and covers said body from a shipping container to a cotton swab dispenser.

4,989,731

BULK CONTAINER

Lyle H. Shuert, 1034 Stratford Pl., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 219,042, Feb. 14, 1988, Pat. No. 4,936,451. This application Mar. 5, 1990, Ser. No. 489,331
Int. Cl.[5] B65D *19/06*
U.S. Cl. 206—386 54 Claims



1. A container of the type comprising a rigid plastic pallet and a tubular sleeve adapted to be supported in upstanding fashion on the upper face of the pallet to form the container, characterized in that the wall of the sleeve has a sandwich cross-sectional configuration including an inner plastic layer, a central cardboard layer, and an outer plastic layer.

4,989,732

PRESSURE UNITIZED PACK OF HANDLED PLASTIC FILM SACKS

Graham Smith, Walworth, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

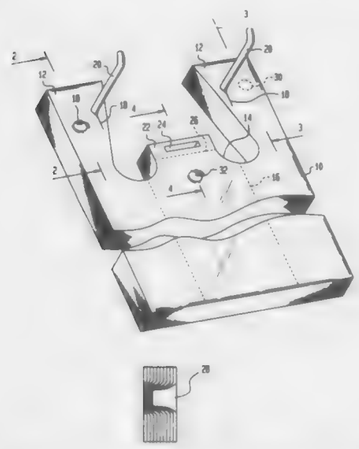
Filed Feb. 6, 1990, Ser. No. 475,572
Int. Cl.[5] B65D *27/10*
U.S. Cl. 206—554 6 Claims

1. A pack of thermoplastic film bags, said bags being in at least approximate registration, each bag comprising a bottom, front and rear bag walls connected by way of gussetted side walls, a bag mouth, double film loop handles at opposite ends of the gag mouth, said handles being integral extensions of said walls;

said pack having pack suspension and dispensing means in association with said handles about intermediate between the top and the base of said handles; and

an area of the film of each of the handles of said pack adjacent to said suspension means being releasably-pressure bonded together, in the absence of an added adhesive so as

to form a depression extending partially into the handles of said pack bringing the adjacent areas of said depression



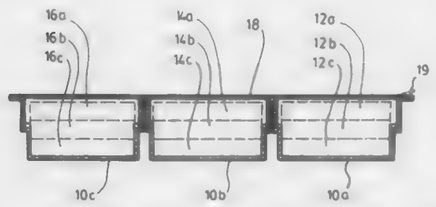
into intimate face-to-face contact, excluding substantially all air space from therebetween.

4,989,733

READY-TO-USE MEDICAL TRAYS

Marc Patry, 60, du Chanoine-Groulx, Vaudreuil, Quebec, Canada J7V 2V2

Filed May 21, 1990, Ser. No. 525,668
Int. Cl.[5] B65D *1/36, 85/62*
U.S. Cl. 206—570 20 Claims



1. A ready-to-use medical tray for retaining medical preparations, said tray comprising a first cell for retaining at least one member selected from the group consisting of sponges or cloths impregnated with a disinfectant, a second cell for retaining a member selected from the group consisting of at least one member selected from sponges or cloths inpregnated with a disinfectant, for applying said disinfectant for a surgical intervention, said tray further comprising a sealing closure for sealing the top of said tray and thereby each of said cells individually.

4,989,734

ORDER FILLER AND SUPPLY CONTAINER APPARATUS

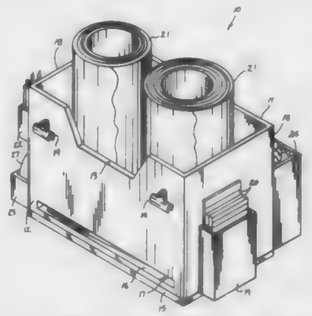
Ronald L. Mode, 1713 S. 11th St., Blue Springs, Mo. 64015; Earl W. Lacey, 6125 N. Wheeling, Kansas City, Mo. 64119, and Jack R. Shilt, 8740 N.W. Boone, Kansas City, Mo. 64155

Filed May 29, 1990, Ser. No. 529,540
Int. Cl.[5] B65D *85/671*
U.S. Cl. 206—575 6 Claims

1. An order fill and supply container apparatus comprising, in combination,

a container including a rear wall, a forward wall, and spaced side walls, the walls of a substantially equal predetermined height, with the forward wall including a "U" shaped access effecting access interiorly of a central compartment defined within a container defined by the rear wall, forward wall, and spaced side walls, and

the central compartment including at least one shrink-wrap foil cylinder contained therewithin, wherein the cylinder



includes a continuous sheet of foil for wrapping and various components, and

the forward wall includes a plurality of spring clips, and

an elongate slot recess formed through the forward wall, the slot recess substantially coextensive with the forward wall adjacent a lower terminal edge of the forward wall, and

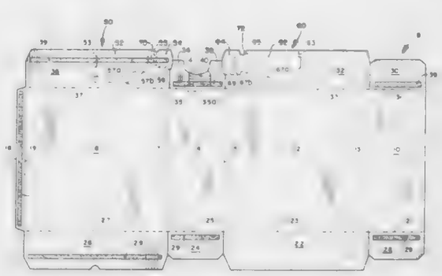
a floor of the container including a magnetic base.

4,989,735

DISPENSING CARTON

Patrick J. O'Brien, Hackensack, N.J., assignor to Container Corporation of America, Clayton, Mo.

Filed Aug. 13, 1990, Ser. No. 567,610
Int. Cl.[5] B65D *5/70*
U.S. Cl. 206—621.6 9 Claims



1. An easy opening, reclosable, dispensing carton formed from a unitary blank of foldable sheet material, such as paperboard, comprising:

(a) pairs of opposed major and minor side wall panels foldably interconnected to form a tubular structure open at the ends;

(b) a bottom closure including bottom closure flaps foldably joined to lower edges of said side wall panels and secured to each other in overlapping relation;

(c) a top closure including a pair of first and second outer major top closure flaps and a pair of inner minor closure flaps foldably joined to upper edges of said major and minor side wall panels, respectively, and secured to each other in overlapping relation;

(d) said top closure including a multi-ply locking tab having overlying, adhesively interconnected, first and second sections formed from material of said first and second major top closure flaps, respectively, and being partially

detachable from and hinged to their respective major closure flaps to provide an opening for pouring contents from the cartons;

(e) said locking tab sections being located at corresponding corners of their respective major top closure flaps and each including:

(i) a body portion having a rear edge hinged to its related major closure flap and having an inboard side edge defined by a pair of spaced, reverse, partial cut lines that form a flange therebetween;

(ii) a head portion having a rear edge hinged to a front edge of said body portion and having an inboard side edge defined by a single weakened line of tear;

(iii) a shoulder adapted to be tucked under an adjacent edge of the other of said major closure flaps upon reclosure to provide a relatively sift-proof reclosure of said dispensing opening after initial opening of the carton.

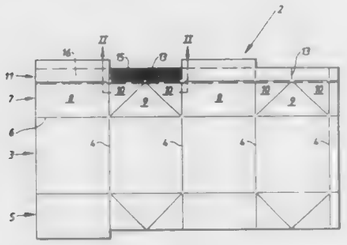
(f) the head protion of said locking tab sections being releasably adhered to an outer surface of an adjacent inner minor closure flap intermediate opposing inboard edges of said outer major closure flaps.

4,989,736

PACKING CONTAINER AND BLANK FOR USE IN THE MANUFACTURE THEREOF

Thorbjörn Andersson, Södra Sandby, and Niklas Rydh, Malmö, both of Sweden, assignors to AB Profor, Lund, Sweden

Filed Aug. 25, 1989, Ser. No. 398,477
Claims priority, application Sweden, Aug. 30, 1988, 8803023
Int. Cl.[5] B65D *5/74*
U.S. Cl. 206—631.3 11 Claims



1. A container, comprising:

a bottom wall, side walls connected to the bottom wall and a top having an openable closure through which contents in the container can be discharged, said openable closure including two oppositely positioned main panels and inwardly directed back-folding panels positioned between the two main panels, each of the main panels being connected to one of said side walls, each of the back-folding panels being connected to one of said main panels and having an inner surface that faces one of said main panels when said openable closure is closed, said packing container having a coating of seal-preventing means located on the inner surface of said back-folding panels and a heat-sealable film extending over the coating of seal-preventing means, the coating of seal-preventing means substantially preventing the formation of a seal between the seal-preventing means and the heat-sealable film.

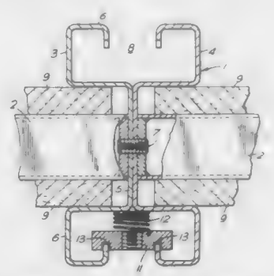
4,989,737

RELATING TO RACKING SYSTEMS

Leslie J. Chapman, Alresford, United Kingdom, assignor to Keith Hancock Structures Ltd., Alton, United Kingdom

Filed Dec. 20, 1989, Ser. No. 453,694
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—193 4 Claims

1. A cantilever racking system comprising an arrangement oaf vertically extending pillars located in a common vertical plane, from which pillars are supported, cantilever arms extending on both sides of said vertical plane, wherein each pillar comprises an assembly of two rolled steel sections secured together and meeting at an intermediate vertical plane extending at right angles to said common vertical plane, each section comprising a central web portion extending parallel to said intermediate plane and two channel portions bounding said web portion, each said channel portion comprising a first side wall portion extending from said web portion substantially at right angles thereto, a base portion extending from said first side wall portion in a direction away from and substantially parallel to said web portion, a second side wall portion extending from said base portion in a direction substantially parallel to said first side wall portion and an inturned rim portion



extending from said second side wall portion and terminating in a free edge spaced from the first side wall portion, said two sections respectively being symmetrical about said intermediate vertical plane whereby the juxtaposed channel portions thereof form on each side of said common vertical plane T-slots opening away therefrom with said inturned rims bounding the openings to said T-slots, and each cantilever arm being secured in place by clamping means which, on the one hand, engage against the external faces of the second side wall portions of said juxtaposed channel portions and on the other hand are located within said T-slots and engage against the free edges of the said inturned rims, said clamping means being releasable for vertical adjustment of the positions of said cantilever arms.

4,989,738

PLASTIC BOTTLE WITH REINFORCED CONCAVE BOTTOM

Robert S. Thayer, Pittsfield, Mass., and Richard D. Clark, Sunbury, Ohio, assignors to General Electric Company, Pittsfield, Mass. and Liqui-Box Corporation, Worthington, Ohio

Filed Oct. 13, 1989, Ser. No. 420,884
Int. Cl.[5] B65D *1/44, 1/02*
U.S. Cl. 215—1 C 6 Claims

1. A bottle with a reinforced concave bottom formed from a plastic material, comprising

a tubular wall having an upper portion and a lower portion,

a nipple formed on the upper portion to provide for flow of contents into and out of the bottle;

a bottom including a center concave portion and a bottom rim portion surrounding and extending down from the concave portion;

a depending solid rib extending across the concave portion and joined at opposite ends of the solid rib to opposite sides of the bottom rim portion; and

a pair of depending hollow ribs formed in the concave portion on respective opposite sides of the solid rib;

said hollow ribs extending radially in the concave portion and being joined to the bottom rim so as to produce increased thickness of the plastic material in regions of the bottom rim portion at the junctions with the hollow ribs compared to similar bottom rims portions formed with the



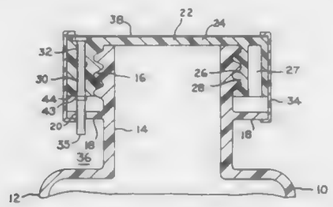
same amount of plastic material but without such hollow ribs.

4,989,739

SAFETY CAP FOR CONTAINERS

Domenic A. Falcone, and Ida F. Falcone, both of 14423 Chadbourne, Houston, Tex. 77079

Filed May 29, 1990, Ser. No. 529,667
Int. Cl.[5] B65D *55/10*
U.S. Cl. 215—221 6 Claims



1. In combination, a container having a cylindrical wall forming a mouth; external threads extending along and around said mouth wall; a flange radiating from said mouth wall, said flange having a first face proximate to the external threads and a second face remote from the threads; a first opening extending through said flange;

a cap that includes a radial end wall having an outer end face, and a circumferential wall extending axially from the radial end wall away from said outer end face; internal threads on said circumferential wall adapted to mesh with the external threads for screw-on attachment of the cap to the container;

a second opening extending from the cap outer end face through the circumferential wall;

said first and second opening being orientated so that when the cap is fully screwed onto the container the two openings are axially aligned;

and a lock pin slidably positioned in said second opening; said pin having a length that is greater than the distance from the cap end face to the second face of the container flange when the cap is fully screwed onto the container; said pin having a cap rotation-obstruct position extending through both openings, and a non-obstruct position removed from the first opening;

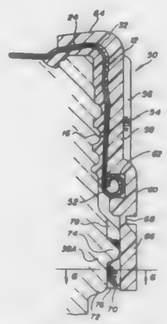
the space adjacent to the second face of the flange being accessible for actuation of the locking pin by finger pressure on an end of said pin.

4,989,740

COMPOSITE CAP INCLUDING TAMPER INDICATING FEATURE

Peter A. Vercillo, Hinsdale, Ill., assignor to Continental White Cap, Inc., Norwalk, Conn.

Filed Mar. 7, 1990, Ser. No. 489,533
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 18 Claims



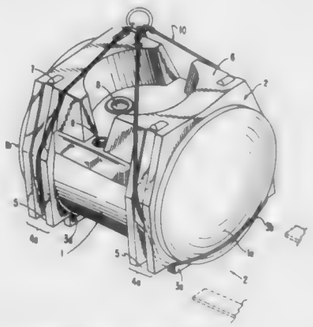
1. A closure of the press-on twist-off type, said closure comprising a metal shell including an end panel and a generally cylindrical skirt terminating in a curl, and sealing compound in said shell lining a radially part of said end panel and said skirt, said shell having an internal coating facilitating bonding of said sealing compound, said closure being improved by an overcap telescoped over said shell and engaged over said curl for effecting twisting of said shells to remove said closure from a container, said curl being outturned with said coating being disposed outermost and forming a friction interlock with said overcap.

4,989,741

NESTABLE AND TRANSPORTABLE CLOSED CHEMICAL HANDLING SYSTEM

Lawrence C. Dull, Greensboro, and Patrick T. Jackson, High Point, both of N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 227,246, Aug. 2, 1988, abandoned. This application Jan. 8, 1990, Ser. No. 463,926
Int. Cl.[5] B65D *21/02*
U.S. Cl. 220—1.65 26 Claims



1. A fluid handling tank comprising:

a generally hollow body portion for containing fluid therein, and a supporting portion integral with said body portion,

said hollow body portion having a longitudinal axis,

said supporting portion including a base for resting on a supporting surface to support said body portion thereon, said base extending laterally with respect to and to each

side of said longitudinal axis of said body portion, and a respective tip-over-preventing portion extending laterally with respect to said longitudinal axis and at a predetermined angle from said base on each side of said longitudinal axis, said tip-over-preventing portion for preventing the tank from tipping over when the tank is tilted laterally with respect to said longitudinal axis about said base while resting on the supporting surface by coming into contact with the supporting surface as the tank is tilted,

the longitudinal axis of said body portion extending generally horizontally when the base rests on the supporting surface, and

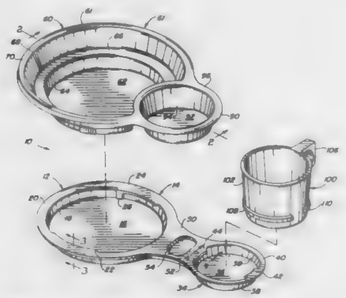
the tank having a center of gravity that is located at a predetermined distance from with the base resting on said supporting surface, that is less than half the length of the tank as taken along said longitudinal axis of said body portion.

4,989,742

TRAY APPARATUS

Earl A. Powell, 509 SW. Elm, Ankeny, Iowa 50021

Continuation-in-part of Ser. No. 206,671, Jun. 15, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,767
Int. Cl.[5] B65D *21/02*
U.S. Cl. 220—23.4 30 Claims



1. Tray apparatus, comprising, in combination:

a base tray, including

a first portion having

a bottom,

a side wall secured to the bottom and extending generally upwardly therefrom,

a rim secured to the side wall and extending generally outwardly therefrom remote from the bottom, and

tab means extending inwardly from the side wall at the rim and comprising cooperative locking means for securing a plate insert to the base tray;

a cup portion, including

a bottom,

a side wall secured to the bottom and extending generally upwardly therefrom,

a rim secured to the side wall and extending generally outwardly therefrom remote from the bottom, and

tab means extending inwardly from the side wall at the rim and comprising cooperative locking means for securing a cup insert to the cup portion of the base tray;

connecting means for spacing apart and connecting together the first plate portion and the cup portion and comprising a hand hold portion adapted to be grasped by a user's hand for holding the tray apparatus; and

insert means securable to the base tray, including

first plate insert means securable to the first plate portion, including

a bottom,

side wall means extending generally upwardly from the bottom for defining, with the bottom, a food enclosing area, and

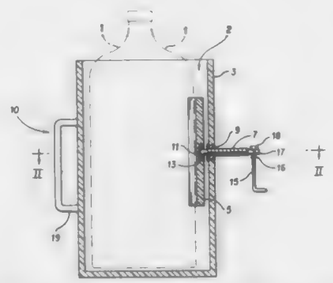
groove means in the side wall means for receiving the tab means of the base tray to lock the first plate insert means to the base tray as the first plate insert means is rotated relative to the base tray.

4,989,743

DEVICE FOR STORING CARBONATED BEVERAGES

Vance E. Lowery, Rte. 1, Box 297 KB, Catawaba, N.C. 28609

Filed Dec. 28, 1989, Ser. No. 458,416
Int. Cl.[5] B56D *35/00*
U.S. Cl. 220—85 H 5 Claims



1. A device for storing carbonated beverages comprising:

(a) a cylindrical receptacle being adapted to receive a carbonated beverage container having a flexible sidewall; and

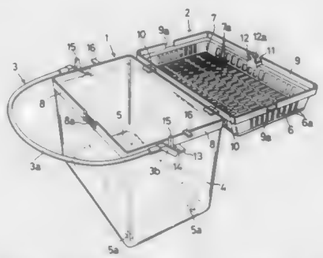
(b) a means to compress said flexible sidewall of said carbonated beverage container laterally and decrease the volume of gas and raise the level of said beverage in said carbonated beverage container such that a beverage in said carbonated beverage container retains its carbonation over an extended period of time, said means being removably attachable to said cylindrical receptacle.

4,989,744

PORTABLE CONTAINER

Kazutoshi Tominaga, Higashiosakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Osaka, Japan

Filed Feb. 12, 1990, Ser. No. 478,355
Int. Cl.[5] B65D *25/32*
U.S. Cl. 220—94 A 5 Claims



1. A portable container made in one piece of plastics, the container comprising:

a body portion;

a cover portion hinged to the body portion;

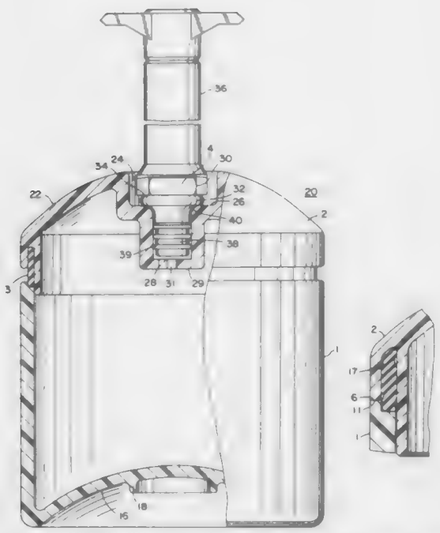
a handle portion including a main portion and leg portions, the leg portions being rotatively connected to the body portion, wherein the leg portions have branched portions engageable with projections formed on the edges of opposite rims of the body portion so that the leg portions are enabled to lock on the projections.

4,989,745

CONTAINER

Bernardus J. J. A. Schneider, Zuideindseweg 54, 2645 BH Delfgauw, Netherlands

Filed Jun. 5, 1989, Ser. No. 361,220
Claims priority, application European Pat. Off., Jan. 19, 1989, 89200117.3
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—208 16 Claims



1. A container capable of being evacuated by a pump which is capable of being removably sealably attached thereto comprising:

a cover having a valve mounted therein, said valve adapted for sealing engagement with a removably pump;

a container adapted to receive said cover;

a deformable indication sealing means positioned between said cover and said container body when said cover is positioned on said container body, said deformable indication sealing means being at least partially directly visible by an observer from outside said container when said container is not properly evacuated;

first and second cooperating means defined by said cover and said container body at the interface thereof for retaining said deformable indication sealing means therebetween in an at least a partially visible position as viewed externally of said container by an observer when said container is in a non-evacuated condition;

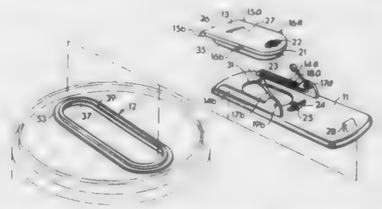
said first and second cooperating means being movable relative to each other when said container is being evacuated, the extent of such movement being dependent on the pressure difference between the interior and the surroundings of said container whereby said deformable indication sealing means is at least partially visible from the exterior of said container when said container is not properly evacuated and said deformable indication sealing means is not directly visible from the exterior of said container when said container is properly evacuated.

4,989,746

RESEALABLE CONTAINER CLOSURE SYSTEM

Thomas W. Pierce, 3045 New Castle Dr., Marietta, Ga. 30064

Filed Aug. 24, 1989, Ser. No. 398,000
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—254 32 Claims



1. A resealable closure system for use on a container, which container includes at least an opening defined in a wall of the container, said closure system comprising:

an insert for mounting to the container wall within the opening, said insert including, at least, top and bottom surfaces and an inner wall forming a passageway which extends from said insert top surface to said insert bottom surface, said passageway including, at least, a bead protruding therefrom;

plug means for sealing said passageway, said plug means including, at least, a soft plug portion, said soft plug portion comprising, at least, a channel formed therein;

linkage means for holding said plug means alternately between a first position, with said soft plug portion inserted into said passageway, which seals said passageway, and a second position, with said soft plug portion removed from said passageway, which does not seal said passageway,

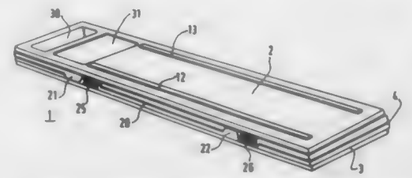
said channel of said soft plug portion interlocking with said bead of said passageway when said plug means is in said first position, whereby a seal is formed between the soft plug portion and said passageway.

4,989,747

LATCHING MEANS FOR MOLDED PLASTIC BOX

Jean P. Demurger, Roanne, France, assignor to Demurger et Cie, France

Filed Feb. 5, 1990, Ser. No. 475,217
Claims priority, application France, Feb. 7, 1989, 89 01788
Int. Cl.[5] B65D *45/18*
U.S. Cl. 220—324 3 Claims



1. A molded one-piece elongated plastic packing box for packaging elongated members, that includes:

a flat lid and a flat base rotatably supported about a longitudinal hinge disposed along one side of the box and defining between them a closing line arranged on a longitudinal side opposite the hinge;

a first closing means and a second closing means for releasably securing the lid and base together molded in said flat lid and base at spaced apart intervals along the said closing line;

each of said closing means having a male part interacting with a corresponding female part,

a pressure bearing surface operatively connected to one of

said male or female parts in each of said first and second closing means, and

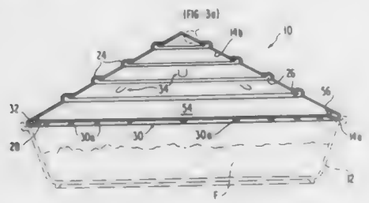
said second closing means and its bearing surface together being inverted, relative to said first closing means and its bearing surface; so that under the application of pressure on the bearing surfaces of said first and second closing means, the lid is released from the base.

4,989,748

MOISTURE RECIRCULATING COVER FOR MICROWAVE OVEN DISH

Guy H. Parr, Jr., 116 Ridgewood Rd., Baltimore, Md. 21210, and Robert F. Prettyman, 710 Wesley Rd., Glen Burnie, Md. 21061

Filed Apr. 4, 1990, Ser. No. 504,206
Int. Cl.[5] B65D *51/02*
U.S. Cl. 220—367 18 Claims



1. In a cover for a dish for heating or cooking food in a microwave oven, said cover being formed of microwave-transparent paper, the improvement wherein:

said paper includes, at least on the surface thereof facing said dish, a moisture resistant material,

said cover is configured to provide a downwardly and outwardly sloping interior surface from the top to bottom, for preventing dripping of condensed moisture onto the food within said underlying dish, and said cover further comprises:

means for reinforcing said paper cover, and

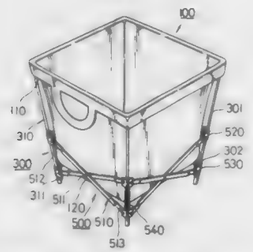
means for trapping otherwise uninhibited moisture condensing on the interior surface thereof for revaporization.

4,989,749

PORTABLE LITTER BASKET

Kwang S. Choi, 250-13, Sangdo-4-Dong, Seoul, Rep. of Korea 156-094

Filed Sep. 8, 1989, Ser. No. 404,426
Int. Cl.[5] B65D *7/24*
U.S. Cl. 220—401 16 Claims



1. A portable litter basket comprising:

a vynil bag, one side thereof being open, other sides thereof being closed;

a plurality of support members of equal length;

a plurality of brace members which consist of a pair of elongated bars being rotatably joined each other on their centers;

the upper portions of said brace members being slidably joined on the upper portion of said support members, and the lower portion of said brace members being rotatably joined on the lower portion of said support members, so that the breadths between said support members be controlled by operation of said brace members;

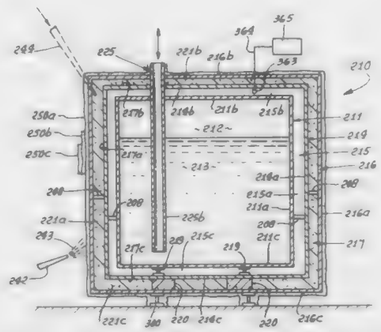
whereby support members hold the opening of said vynil bag to be stretched, making it convenient for people to throw litterings into said vynil bag.

4,989,750

FIRE RESISTANT TANK CONSTRUCTION

David C. McGarvey, San Gabriel, Calif., assignor to LRS, Inc., South El Monte, Calif.

Filed Apr. 16, 1990, Ser. No. 509,142
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—444 32 Claims



1. In fire resistant tank apparatus adapted for transportation and for installation above-ground to receive and dispense a liquid hydrocarbon or hydrocarbons, or the like, the combination comprising

(a) a tank assembly having lightweight wall means defining inner walls means, intermediate wall means and outer wall means, there being primary space between the intermediate wall means and the inner wall means, and secondary space between the intermediate wall means and the outer wall means,

(b) first means on the assembly adapted defining access porting to a tank interior defined by the assembly,

(c) a bottom wall defined by the assembly to support the assembly at an installation site,

(d) and thermal barrier material located in one of said first and second spaces to effectively define a shell about said tank interior.

4,989,751

STORAGE TANKS

Graham Gillett, Wembley, Australia, assignor to Interlok Limited, Australia

Continuation of Ser. No. 720,517, Apr. 5, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 9,056
Claims priority, application Australia, Apr. 5, 1984, PG4440; Aug. 10, 1984, PG6510
Int. Cl.[5] B65D *6/28, 6/34, 90/08*
U.S. Cl. 220—565 12 Claims

1. A storage tank comprising:

(a) an endless wall formed of a plurality of panel members each having:

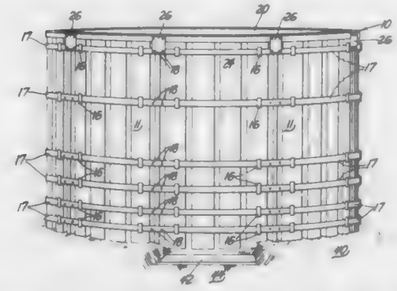
(i) one or ore generally flat portions of single skin thickness;

(ii) a first lateral edge and a second lateral edge opposite said first lateral edge;

(iii) a plurality of upright raised ribs each located laterally of said one or more flat portions, all of said upright raised ribs projecting in the same direction from the or each said generally flat portion; and

(iv) one or more integral loops formed from two substantially parallel slits made in the single skin of said generally flat portions and having intervening material between the slits deformed in a direction opposite to that of the upright raised ribs;

(b) at least one endless support strap being substantially flat and elongated and extending substantially horizontally around said endless wall and disposed through and retained by a plurality of said loops to retain and align adjacent panel members in vertical and side by side overlapped relation and to provide support to said endless wall, the retention of the or each endless support strap in said loops providing restraint for adjacent panel members to substantial relative immobility and said loops having an aperture substantially equal in cross-sectional dimension to the cross-sectional dimension of said endless support strap it is to retain, said first and second lateral edges of said adjacent panel members being devoid of means to positively fix them together.

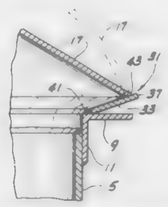


4,989,752

FRANGIBLE ROOF JOINT FOR STORAGE TANKS

John V. Birtwistle, Chesterfield; E. Ernest Morgenegg, Jr., St. Louis, and Marvin W. Ringer, Jr., Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 18, 1987, Ser. No. 16,153
Int. Cl.[5] B65D *87/00*
U.S. Cl. 220—610 9 Claims



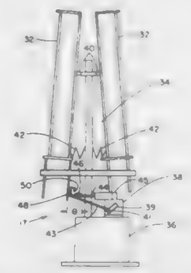
1. A frangible roof joint for small diameter tanks wherein the joint forms a flexible gastight connection between the tank shell and the roof and comprises annular link means containing an annular plate having an inner edge corresponding to a first edge thereof and an outer edge corresponding to a second edge thereof sealingly secured at or adjacent the first edge to a rim of the tank shell, the rim of the tank shell containing an angle secured to the outside of the tank shell having a leg extending generally horizontally outwardly from the tank shell, by a first weld at the junction of the inner edge of the annular plate and the upper surface of the leg and sealingly secured at or adjacent the second edge to the periphery of the roof by a second weld at the junction of the peripheral edge of the roof and the upper surface of the annular plate adjacent the outer edge of the plate, the securement of the annular link means to the rim and the roof being such as to permit articulation of the annular link means relative to the rim and roof to a point of failure of the joint upon pressurization of the tank above a predetermined pressure.

4,989,753

CUP DISPENSER FOR AN AUTOMATED DRINKMAKER SYSTEM

Salvatore J. Brogna, Southbury, and George E. Riehm, New Fairfield, both of Conn., assignors to PepsiCo Inc., Purchase, N.Y.

Filed May 18, 1989, Ser. No. 353,882
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—121 8 Claims



1. A cup dispensing arrangement for separating the bottommost cup from a stack of cups supported in a cup carousel, comprising a cup carousel having a plurality of cup dispensers positioned circumferentially around the cup carousel, such that any one of the cup dispensers can be positioned at a cup drop station, with each cup dispenser supporting a stack of cups to be dispensed, and each cup dispenser being pivotally mounted to the cup carousel by a substantially horizontal pivot, about which the cup dispenser is cyclically pivoted to allow the bottom of the cup stack to cyclically swing through a dispensing travel arc during dispensing of the cups, and each cup dispenser having a pair of opposed cup separating members supported therewith on the cup carousel for rotation therewith, with the pair of opposed cup separating members being mounted on opposite sides of the stack of cups in the cup dispenser along said dispensing travel arc, said opposed cup separating members being spaced a distance apart substantially equal to the width of a cup just beneath the cup rim, and each of said pair opposed cup separating members comprising at least one cup separating wedge positioned opposite to a corresponding cup separating wedge in the oppositely positioned cup separating member, with the oppositely positioned cup separating wedges cooperating to separate a bottommost cup from the cup stack as the cup dispenser is pivoted along the dispensing travel arc.

4,989,754

TONER LEVEL DETECTION SYSTEM

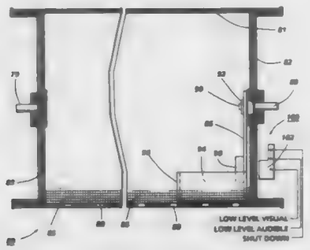
Patrick J. Grasso; John L. Webb, both of Fairport; Glen A. Woodhams, Rochester, and Michael A. Kelly, Walworth, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 30, 1989, Ser. No. 445,071
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—39 8 Claims

1. In a system for dispensing toner particles from a rotatable cylindrical toner cartridge to a developer mixture, a sensing system for detecting a low toner condition within said cartridge, said sensing system comprising:

an arm assembly pivotably mounted within the toner cartridge and on its central axis, said arm assembly including a downwardly extending arm member having a magnet attached thereto, the arm member being at least partially enveloped by the toner within the cartridge, when the

cartridge is filled to above a low toner level height, and a switching device adapted to generate an electrical signal when said arm assembly is in a vertical or plumb orientation within the cartridge, said arm assembly adapted to be



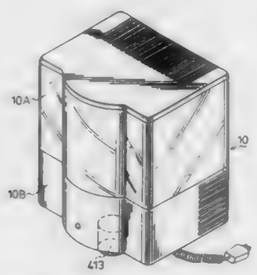
prevented from attaining said plumb position until the toner level has been depleted to a level low enough to free the arm assembly from viscous drag forces exerted by the toner as it rotates.

4,989,755

AUTOMATIC CLEANING-LIQUID DISPENSING DEVICE

Guey-Chuan Shiau, No. 4-3, Lane 123, An-Ho 1st St., Keelung City, Taiwan

Continuation-in-part of Ser. No. 281,812, Dec. 20, 1988, abandoned. This application Nov. 21, 1989, Ser. No. 439,301
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—63 **2 Claims**



1. An automatic cleaning-fluid dispensing device comprising:

a containing structure having an upper containing unit for containing cleaning fluid therein, a cleaning fluid orifice located in a bottom side of said upper containing unit and a lower housing having an open section in a back side thereof connected to said bottom side;

a sensing means located within said open section of said lower housing for performing external-object sensing operation; said sensing means including a base plate having an outlet formed in conjunction with said open section of said lower housing, a motor arrangement including an eccentric gear driven by a driving motor, and a microswitch for actuating said motor arrangement; and

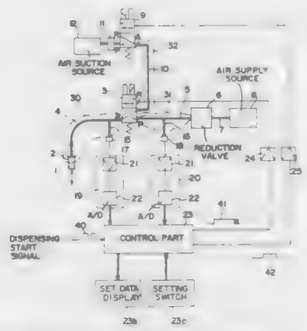
a dispensing means installed in said lower housing and having a push structure functionally connected with said sensing means for providing a sway action and a pumping structure operatively engaged with said push structure for drawing cleaning fluid from said upper containing unit according to said sway action of said push structure; said push structure positioned on top of said driving motor and formed with a push member and a guide frame, said push member including an inside open recess situated on top of said eccentric gear of said motor arrangement and an arch-shaped member fixed on a back side of said push member for making contact with said microswitch of said sensing means, and said guide member fixed onto said driving motor and having a sliding slot slidingly engaging said push member so as to provide said sway action by enabling said push member to be pushed to sway left and right by action of said eccentric gear of said driving motor thereon; said pumping structure supported by said base plate and including a suction nozzle resiliently provided at one end thereof, an inlet port located at another end thereof in communication with said suction nozzle and communicatively connected to said cleaning fluid orifice of said upper containing unit, and a flow tube communicatively linked between said suction nozzle and said outlet of said base plate; so that when an external object under said lower housing is sensed by said sensing means, said sensing means will be energized to rotate said driving motor causing said eccentric gear to push said push member to sway left and right against said suction nozzle to supply a given amount of cleaning fluid from said upper containing unit onto the external object for cleaning purposes, as well as to turn off said driving motor to stop flow of said cleaning fluid.

4,989,756

DISPENSING APPARATUS

Mitsuru Kagamihara; Minoru Kawagishi, and Nobuto Yamazaki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 306,346
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—55 **3 Claims**



1. A paste-dispensing apparatus comprising:

a syringe which holds paste therein;

an air supply source which supplies air under a positive pressure to said syringe;

a dispensing electromagnetic valve provided between said syringe and air supply source, said valve being connected to said syringe via a first pipe and to said air supply source via a second pipe so that said syringe and air supply source communicate with each other when paste is dispensed;

a first pressure sensor which measures the pressure inside of said first pipe;

a second pressure sensor which measures the pressure inside of said second pipe; and

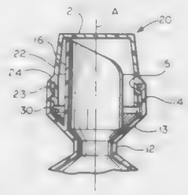
a control section wherein pressures measured by said first and second pressure sensors are input, said control section outputting a voltage signal that actuates said dispensing electromagnetic valve so that said first and second pipes communicate with each other when the dispensing of paste is initiated, said control section further providing a means for controlling an output time of said voltage signal in accordance with changes in the time required for the pressure measured by said first pressure sensor to reach a preset pressure after said first and second pipes have been connected.

4,989,757

PLASTIC CONTAINER WITH SELF-DRAINING FEATURE

Thomas J. Krall, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 160,559, Feb. 25, 1988, abandoned. This application Aug. 29, 1989, Ser. No. 401,517
Int. Cl.[5] B67D *1/16*
U.S. Cl. 222—111 **13 Claims**



1. A self-draining container molded in one piece having a body portion;

an integrally formed neck defining a cylindrical opening having a predetermined diameter, said neck formed in situ with and extending upwardly from said body portion, a dispensing spout formed integral and in situ with and at least partially encircling said neck, at least a portion of said dispensing spout being a section of cylinder having an internal surface with a diameter at least equal to said predetermined diameter, all portions of said dispensing spout being above said neck, said dispensing spout having a circumferential extent of at least 180° but less than 360° and presenting opposing edges which define a gap at the lower end of said spout, and an integrally formed annular wall encircling said spout in spaced relation thereto;

a web connecting said annular wall and said spout to said neck, said web being formed in situ with said annular wall and dispensing spout and cooperating therewith to define a channel for receiving liquids draining from said dispensing spout when the container is moved from an inverted dispensing position to an upright position;

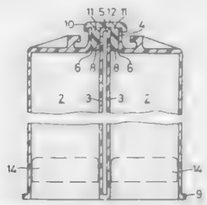
said gap providing an opening through which liquids may flow from said channel to said neck and body portion when the container is upright, said container being manufactured by a process in which at least the neck, dispensing spout, annular wall, web and said gap through which liquids flow are formed in a first mold in one operation and the body portion is thereafter formed by blow molding with no post-molding operations required for those portions formed in the first mold.

4,989,758

DOUBLE DELIVERY CARTRIDGE FOR TWO MASSES

Wilhelm A. Keller, Riedstrasse 1, CH-6330 Cham, Switzerland

Continuation of Ser. No. 92,770, Sep. 3, 1987, abandoned. This application Oct. 26, 1989, Ser. No. 427,999
Claims priority, application Switzerland, Sep. 14, 1986, 03680/86
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—137 **13 Claims**



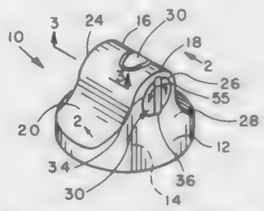
1. A double discharge cartridge molded in one piece for two-component compounds, said cartridge comprising two reservoir cylinders arranged with parallel axes die by side, said cartridges having an orifice with an end face which is common to both cylinders and which connects them in one piece, said orifice containing two axial discharge channels, each discharge channel starting from a respective cylinder, the two discharge channels being separated by two wall sections, said wall sections extending continuously from separated cylinder walls, said extending wall sections being separated up to the end face, forming a diffusion barrier between said channels.

4,989,759

INSTANT COFFEE AND DRY PRODUCT DISPENSER

Robert B. Gangloff, 54 Dorchester St., Huntington Station, N.Y. 11746

Filed Jul. 11, 1989, Ser. No. 377,956
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **2 Claims**



1. A metering dispenser for use in conjunction with a container of granular product comprising:

(A) a cap for covering an open mouth container, said cap having a neck portion which has threads thereon for co-operatively engaging threads on the container to place said cap in covering relation with the open mouth of the container;

(B) a product dispensing element mounted in said cap, and which includes

(1) a cylindrical hollow body positioned to extend over the open mouth of the container and having an inner volume and a longitudinal axis, said hollow body including fingers on said hollow body, with each finger including a notch defined therein, a shoulder defined in said cap to engage said finger notches, and a plurality of slots defined in said cap adjacent to said shoulder,

(2) a transfer opening in said hollow body through which material passes into and out of said hollow body,

(3) mounting means on said cap for mounting said hollow body to rotate about said body longitudinal axis from a filling position in communication with the interior of the container to receive product from that container to a dispensing position which is angularly spaced apart from said filling position, said longitudinal axis being located parallel to and spaced from a plane containing the open mouth of the container;

(C) a handle means connected to said product dispensing hollow body to rotate said body about said longitudinal axis;

(D) a product dispensing opening located in said cap to be positioned congruently with said transfer opening to permit material to pass through said product dispensing opening when said hollow body is in said dispensing position;

(E) a transfer slot defined in said cap for connecting the inner volume of the container with said transfer opening; and

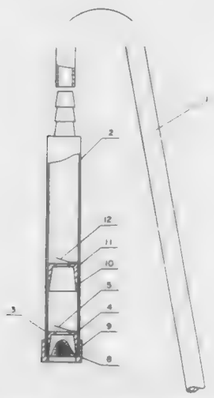
(F) a locking means for preventing rotation of said hollow body.

4,989,760

SELF-FILL SIPHON PIPES

Liu Songzeng, G/F, 74-3, Southwest Region, Zhongshan University, Guangzhou, China

Filed Apr. 12, 1989, Ser. No. 337,091
Claims priority, application China, Apr. 14, 1988, 88204537.7; Jul. 9, 1988, 88208412.7
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—204 13 Claims



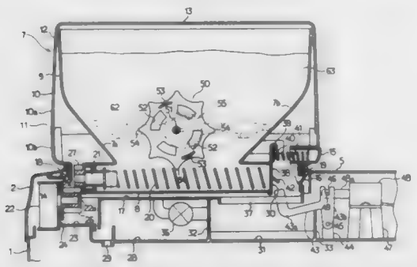
1. A siphon tool used for sucking liquids comprising;
a straight tube;
a hose fitted onto an upper end of said straight tube and in communication with said straight tube;
a one-way valve fitted into a lower end of said straight tube, wherein said one-way valve only allows the liquid to enter into the interior of the straight tube upon reciprocation of the straight tube; and
a tubular piston positioned in said straight tube freely slidable between said lower end and said upper end of said straight tube in response to liquids moving through said straight tube.

4,989,761

DETERGENT DISPENSER FOR A WASHING MACHINE OR THE LIKE

Yoshio Ikeda, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 15, 1988, Ser. No. 284,702
Claims priority, application Japan, Dec. 19, 1987, 62-321756
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—231 6 Claims



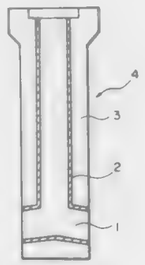
1. A detergent dispenser for a washing machine or the like, comprising:
(a) a detergent container for containing detergent, the detergent container having peripheral walls at least including oppositely disposed inclined end walls;
(b) detergent discharging means for discharging the detergent contained in the detergent container to a detergent receiving portion of the washing machine or the like;
(c) a shaft provided so as to be rotated upon operation of the detergent discharging means;
(d) a crank mechanism for changing the rotational movement transmitted from the shaft to the reciprocal movement; and
(e) a reciprocating member having opposite end portions positioned so as to correspond to the inclined end walls of the detergent container, respectively, the end portions being reciprocally moved in the detergent container in the directions of the end walls and in the directions opposite to the end walls by transmission of the reciprocal movement to the reciprocating member from the crank mechanism, the end portions of the reciprocating member being moved along the inclined inside surfaces of the end walls of the detergent container when moved in the directions of the end walls, respectively, and the end portions of the reciprocating member being alternately brought into sliding contact with the end walls of the detergent container for the majority of their stroke as the reciprocating member is reciprocally moved.

4,989,762

MOLTEN STEEL POURING NOZZLE

Mitsuru Ando, and Takafumi Aoki, both of Gifu, Japan, assignors to Akechi Ceramics Co., Ltd., Ena, Japan

Filed Jan. 2, 1990, Ser. No. 460,239
Claims priority, application Japan, Feb. 7, 1989, 1-28279
Int. Cl.[5] B22D *41/08*
U.S. Cl. 222—607 13 Claims



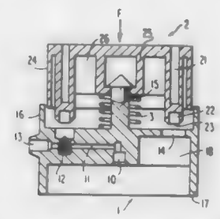
1. A molten steel pouring nozzle having along the axis thereof a bore through which molten steel flows, comprising
at least part of an inner portion of said molten steel pouring nozzle, which inner portion forms said bore, is formed from a refractory consisting essentially of:
from 40 to 85 wt. % of a zirconia clinker comprising cubic zirconia and calcium zirconate,
the content of calcium oxide in said zirconia clinker being from 3 to 35 weight parts relative to 100 weight parts of said zirconia clinker;
graphite:from 10 to 30 wt. %;
and
at least one element selected from the group consisting of:
silica:from 1 to 15 wt. %, and
magnesia:from 1 to 15 wt. %.

4,989,763

PUSHBUTTON FOR A SPRAY DEVICE ARRANGED TO MIX A PREDETERMINED QUANTITY OF A SECONDARY SUBSTANCE IN THE EMISSION OF A MAIN SUSTANCE

Michel Brunet, Sainte Colombe La Commanderie, France, assignor to Valois, Le Neubourg, France

Filed Jan. 26, 1989, Ser. No. 301,790
Claims priority, application France, Jan. 28, 1988, 88 00970
Int. Cl.[5] B65D *83/14*
U.S. Cl. 222—635 19 Claims



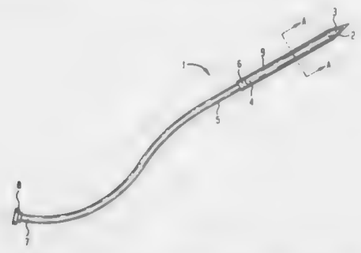
1. A pushbutton for fitting to a spray device containing a primary substance, said pushbutton including an emission channel, the pushbutton comprising first and second pieces, said first piece being moveably mounted relative to said second piece, said second piece containing said emission channel, said first piece of said pushbutton including containers each containing a predetermined quantity of a secondary substance and hermetically closed by individual membranes, said pushbutton further including resilient means for resiliently urging said first piece away from said second piece, said second piece including means for piercing the membrane of one of the containers when said pushbutton is actuated, the corresponding predetermined quantity of secondary substance being delivered into said emission channel.

4,989,764

DISPOSABLE SEWING IMPLEMENT

Janice Hoffman, and Fredrick M. Weintraub, both of 104 Grotke Rd., Chestnut Ridge, N.Y. 10972

Filed Mar. 26, 1990, Ser. No. 498,721
Int. Cl.[5] D05B *85/00, 85/12*
U.S. Cl. 223—102 2 Claims



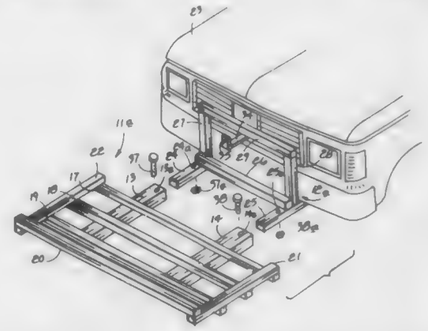
1. A sewing implement comprising a metallic needle having a sharp pointed end and a blunt end, and a length of fibrous material abutting the blunt end of said needle an its entirety, said needle and the end of said fibrous material disposed adjacently to said needle being coated by a film of plastic, said needle and said fibrous material being held in fixedly attachment by said film of plastic.

4,989,765

VEHICULAR CARRIER APPARATUS

Jerry J. Huebner, 324 E. Summitt Ave., P.O. Box 634, Ellsworth, Wis. 54011

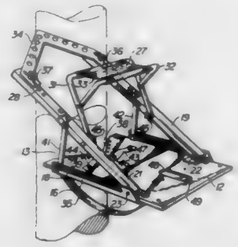
Filed Oct. 27, 1989, Ser. No. 427,530
Int. Cl.[5] B60R *9/00*; B62D *43/00*
U.S. Cl. 224—42.07 6 Claims



1. A vehicular carrier apparatus for securement to a self-propelled vehicle that includes an elongate bumper member, the apparatus comprising,
a vertical rack means for securement to the vehicle underlying a bottom edge of the bumper member, the vertical rack means including a right elongate support in an aligned parallel relationship to a left elongate support, and
an interconnecting bar means positioned rearwardly of respective forward ends of the right and left elongate supports for securement of a vehicular tire member thereto, and
wherein the interconnecting bar means includes a bottom interconnecting bar secured to upper surfaces of the right and left elongate supports and orthogonally mounted relative to the right and left elongate supports, and further including right and left vertical bars, each of a predetermined length spaced parallel relative to one another and mounted at bottom ends to the bottom interconnecting bar and including a top interconnecting bar mounted to upper ends of the right and left vertical bars, wherein the top interconnecting bar is aligned in an overlying parallel relationship relative to the bottom interconnecting bar, and
further including a positioning bar having one end connected to the top interconnecting bar and an opposite end terminating in threaded boss and connector member, the positioning bar extending orthogonally forwardly of said top interconnecting bar such that said threaded boss and connector member is mounted for projection through a wheel rim aperture of the vehicular tire member for securing said tire member thereto, and
including a "T" shaped bar connected to and directed upwardly relative to the positioning bar, wherein the "T" shaped bar is spaced above the threaded boss and connector member for abutment relative to the tire member, and
including a horizontal rack member removably mounted to the vertical rack means, the horizontal rack member including first and second support beams, each of a predetermined length and spaced in aligned parallel relationship relative to one another, said rack member including a plurality of grid bars mounted upon an upper surface of the first and second support beams, the first and second support beams having first ends removably mounted to the forward ends of said respective right and left elongate supports utilizing a respective fastener to secure the first and second support beams to the respective right and left elongate supports.

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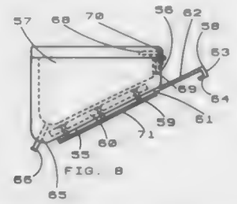
4,989,766
CONVERTIBLE BACK PACK
Michael Lewallyn, P.O. Box 1361, Dalton, Ga. 30720, and David McKin, P.O. Box 201, Fairmount, Ga. 30139
Filed Aug. 17, 1989, Ser. No. 395,067
Int. Cl.[5] A45F 4/02; A45C 15/00
U.S. Cl. 224—155 12 Claims



1. A back pack assembly comprising a rigid, substantially planar, member,
first and second elongated side bars having first and second ends and outer sides and inner sides mounted to said planar member, each of said side bars having a slot extending along substantially the entire length thereof between said ends,
first and second elongated side frame members, each of said frame members having a proximal end and a distal end and an outer side and an inner side, the proximal end of said first side frame member being pivotally attached to the inner side of said first side bar adjacent the first end thereof, and the proximal end of said second frame member being pivotally attached to the inner side of said second side bar adjacent the first end thereof,
a load bearing assembly pivotally attached to the inner sides of said side frame members intermediate the ends thereof,
first and second bracing members each having proximal and distal ends, said first bracing member having its distal end pivotally mounted to the outer side of said first side frame member intermediate the ends thereof and having its proximal end pivotally and slidably mounted in the slot of said first side bar, and said second bracing member having its distal end pivotally mounted to the outer side of said second side frame member intermediate the ends thereof and having its proximal end pivotally and slidably mounted in the slot of said second side bar,
first and second frame extension means each having first and second ends,
hinge means for hingedly mounting the first end of said first extension means to the distal end of said first side frame member and for hingedly mounting the first end of said second extension means to the distal end of said second side frame member, whereby the frame extension means are movable between an extended operable position where the backpack assembly is used as a seat, to a hinged inoperable position where the backpack assembly is carried as a backpack,
a blade member removably mounted to said second ends of said frame extension means remote from said first ends to which the hinge means are mounted, when said frame extension means are in the extended position,
and carrying means mounted on said planar member.

4,989,767
GOLF CART COOLER
Vernon D. Buschbom, 212 Delaware Dr., Ozawkie, Kans. 66070
Filed Oct. 31, 1988, Ser. No. 264,548
Int. Cl.[5] B60R 9/06
U.S. Cl. 224—274 3 Claims

1. A cooler attachable to the front portion of a motorized golf cart having an outside front portion with a sloped cowling having an upper edge comprised of:
a rigid multi-sided enclosure having as two of its sides two oblique substantially symmetrical end walls, said end walls each having four or more edges, each edge having a length and angularly related such that one edge, being a bottom wall edge, is substantially parallel to the cowling, while an adjacent edge comprising a front wall edge is approximately vertical or within 20 degrees thereof; a next adjacent edge, comprising a top wall edge, extends approximately horizontal or within 20 degrees thereof when the bottom wall edge is placed against or near the cowling and has a length such that the next adjacent edge, comprising a rear wall edge, which connects the top wall edge and the bottom wall edge together, is approximately vertical or within 20 degrees thereof. The said end walls are spaced apart in a substantially parallel relationship with their corresponding and mutually opposed parallel

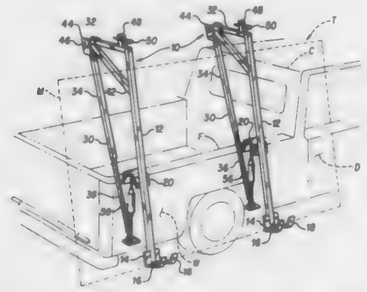


edges connected therebetween by the remaining walls comprised of a bottom wall, a front wall, a top wall, and a rear wall, respectively, said top wall or a portion thereof comprised of a lid hingedly joined to the remainder of the enclosure on one parallel edge to allow access to the interior of the enclosure;
means for releasably securing the cooler to the cowling wherein the securing means is comprised of an elongated hook member having three or more substantially planar portions each having two opposing ends, one of said portions being secured to the bottom wall of the cooler and connected to the remaining planar portions being secured to the bottom wall of the cooler and connected to the remaining planar portions to create an elongated hook member extending beyond the rear wall of said cooler and is releasably attachable over the upper edge of said cowling and having leveling means for leveling the cooler while on the cowling.

4,989,768
REMOVABLE SIDE RACK AND ATTACHMENTS FOR PICKUP TRUCK VEHICLES AND THE LIKE
Edward L. McNulty, Rte. 1, Box 524, Midland, Va. 22728
Filed May 3, 1990, Ser. No. 518,462
Int. Cl.[5] B60R 9/00; B60P 3/00
U.S. Cl. 224—42.45 R 5 Claims

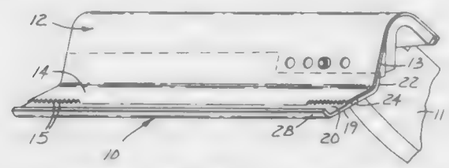
1. In combination with a vehicle having an open cargo area, said cargo area at least partially defined by at least one vertical side wall, said side wall having an inwardly extending generally horizontal flange at its upper edge;
a temporarily installable and removable rack for the carriage of long and/or large sheet materials,
said rack comprising a beam defined by an upper and a lower end,
said lower end having an essentially horizontal shoe providing for the support of materials carried thereupon and provision for the attachment of a material retaining strap,
said upper end having an inwardly extending generally horizontal member and provision for the attachment of a material retaining strap,
said inwardly extending member having an inboard end,
said inboard end providing for the attachment of a securing member,

said securing member having an upper and a lower end,
said upper end of said securing member attached to said inboard end of said inwardly extending member and extending generally downward from said attachment,
lower securing means,



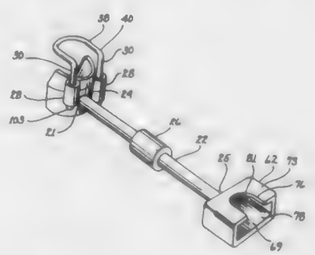
said lower securing means attached within said cargo area of said vehicle and adjustably attached to said lower end of said securing member, and
an upper shoe,
said upper shoe secured at the approximate midpoint of said beam and providing for the support of said rack upon said flange of said vehicle sidewall.

4,989,769
BLADE GUARD
Frederic A. Longworth, St. Paul, and Todd R. Betterley, Hastings, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Jul. 20, 1989, Ser. No. 383,040
Int. Cl.[5] B26F 3/02
U.S. Cl. 225—20 14 Claims



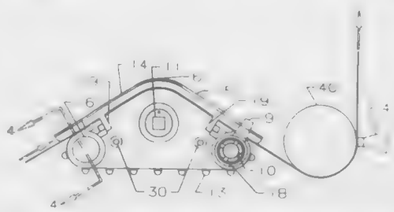
1. A guard for a cutting blade, the cutting blade having a first surface and a plurality of similarly shaped teeth providing a cutting edge portion of the blade, the teeth defining parts of the first surface of the blade generally in the shapes of triangles having bases aligned in a first direction along the blade with the points of the teeth projecting away from the first direction, said guard comprising a guard portion of polyvinyl chloride having a side part adapted to lay along the first surface of the blade including along the parts of the first surface defined by the teeth and a projecting part adapted to project past the points of the teeth, an anchor portion of polyvinyl chloride having a side surface adapted to be fixed to the first surface of the blade at a position spaced from the bases of the generally triangular shaped parts of the first surface, and a hinge portion of resiliently flexible polyethylene being a coextrusion with and joining said guard and anchor portions, said hinge portion affording when said anchor portion is fixed to the blade movement of said guard portion relative to said anchor portion from a normal protecting position at which said side part is positioned along the first surface of the blade including along the parts of the first surface defined by the teeth, to a cut position with said guard portion at a position spaced from the teeth, and said hinge portion biasing said guard portion to said normal protecting position.

4,989,770
LOCKRING REMOVAL DEVICE
Manuel A. Soto, 1219 E. Hess Ave., Phoenix, Ariz. 85034
Filed Feb. 12, 1990, Ser. No. 478,360
Int. Cl.[5] B26F 3/00
U.S. Cl. 225—103 9 Claims



7. A device for removing a ring closed and locked by a fastener containing a protruding fastener lock, the device comprising:
a. a handle having first and second ends;
b. a first fastener engagement member comprising a semicylindrical member defining a recess adapted to snugly receive a lower section of the fastener therein; a semicircular floor connected to a bottom edge of the semicylindrical member; an inwardly sloping wall having a bottom edge equal in length and connected to a top edge of the semicylindrical member, the inwardly sloping wall defining a recess adapted to snugly receive an upper section of the fastener therein, wherein the first end of the handle is connected to an outer surface of the semicylindrical member; and
c. a second fastener enclosure member comprising an open box member defining a rectangular recess adapted to receive a rectangular fastener therein, the open box member having a rectangular rear wall perpendicular and connected on opposing side edges to respective side edges of a pair of opposing rectangular side walls, wherein bottom edges of the rectangular rear and side walls are connected to respective rear and side edges of a rectangular floor, the open box member further including a top face connected on its rear and side edges to respective top edges of the rear and side walls, the top face having a U-shape orifice extending rearwardly from a leading edge, wherein the second end of the handle is connected to an outer surface of the rear wall.

4,989,771
FORMS FEEDING APPARATUS
Gregory A. Ferguson, New Bedford, Mass., assignor to Precision Handling Devices, Inc., Fall River, Mass.
Filed May 31, 1988, Ser. No. 200,486
Int. Cl.[5] B65H 20/20
U.S. Cl. 226—74 14 Claims



1. A tractor for feeding paper with perforations spaced at a given pitch which comprises an endless belt having pins spaced at said pitch which enter the perforations and also having spaced lugs, said pins and lugs being respectively disposed on

first and second sides of said belt which are opposite to each other, said belt being subject to a load due to force applied thereto by said paper and being characterized as being sufficiently flexible to enable the pitch between said pins to vary when said belt is in unstressed condition when said load is released, a belt drive sprocket having an outer periphery, spaced receptacles along said outer periphery, said sprocket being of sufficient diameter with respect to the spacing of said lugs to engage a plurality of adjacent ones of said lugs, means ahead of and behind said sprocket in the direction of movement of said belt and engagable with said second side of said belt for defining a path for said belt extending around said sprocket and said path defining means, said path having first, second and third sections defined by said sprocket and said path defining means in which the load is polarized between said first and second sections such that one of of said first and second sections is stressed while the other is in the unstressed condition for a low load entry of said pins on said belt in said other of said sections into said perforations, said first and second sections both being engagable simultaneously with the paper and being disposed between said sprocket and said path defining means, and said third section being disposed between said first and second sections and being spaced from said drive sprocket such that said belt in said third section is out of engagement with said drive sprocket.

4,989,772

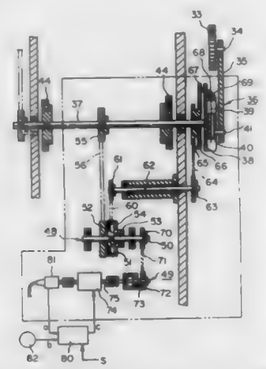
AUTOMATIC FILE FEED REGISTER DEVICE

Hiromichi Singou, Yokohama, and Yukio Sasayama, Tokyo, both of Japan, assignors to Toyo Shokuhin Kikai Kabushiki Kaisha, Yokohama, Japan

Continuation of Ser. No. 253,123, Oct. 4, 1988, abandoned. This application Feb. 27, 1990, Ser. No. 488,426

Int. Cl.[5] **B65H** *17/22*

U.S. Cl. 226—139 **1 Claim**



1. In an automatic film feeding system having film drive means comprised of intermittently operated film feed rollers, eccentric crank means connected to drive said intermittent feed rollers through an electromagnetic brake and electromagnetic clutch, a drive shaft connected to said crank means, adjusting means for adjusting the eccentricity of said eccentric crank means, photo-electric detecting means for detecting a printed registration mark on said film, a high-speed control unit for controlling operation of said electromagnetic brake and said electromagnetic clutch at high speed in response to a signal (t) from said photo-electric detector means, the improvement comprising; an adding mechanism connected between said drive shaft and said eccentric shaft adjusting means, said adding mechanism including a differential shaft, a timing pulley connecting said differential shaft to said drive shaft, and a sun gear and planetary gears connected through an intermediate drive means to said eccentric crank adjusting means; microcomputer controlled drive means for driving said adding mechansism, said microcomputer controlled drive means including a timing belt pulley connected by a timing belt to said differential shaft of said adding mechanism, and feedback encoder means connected between said stepper motor and said microcomputer to feed back a signal representing the absolute film feeding length; microcomputer means for controlling the motion of said microcomputer controlled drive means; encorder means providing an input signal to said microcomputer means representing intermittent film feed distance; correction signal input means for inputting a correction signal while said film feeding device is running representing the excess offset distance (d) of intermittent film feeding from said printed registration mark; said microcomputer controlled drive means including a stepper motor; said microcomputer means providing an output correction signal to said stepper motor of said microcomputer drive means while said film feed system is in operation in response to a correction signal from said correction signal input means; whereby said microcomputer causes said adding mechanism to automatically adjust said eccentric crank means to correct for excess offset distance of said film input by said encoder means to keep said film feed registration mark within a predetermined range.

4,989,773

METHOD OF JOINING GRAPHITE AND METALLIC MATERIAL WITH A MATERIAL COMPRISING TITANIUM, NICKEL AND COPPER

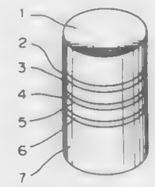
Sintarou Ishiyama, Tokaimura, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Division of Ser. No. 112,271, Oct. 26, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,973

Claims priority, application Japan, Oct. 31, 1986, 61-258155

Int. Cl.[5] **B23K** *1/19, 103/16*

U.S. Cl. 228—122 **5 Claims**



1. A method for joining graphite and metallic material, comprising joining graphite and metallic material in an argon atmosphere using a joining material comprising titanium, nickel and copper in a composition ratio of, by weight,

Ti 69–57
Ni 24–20
Cu 7–23

at a vacuum above 10^{-5} torr and at a temperature above 1100° C.

4,989,774

STRUCTURAL BOX BEAMS

David Stephen; Martin H. Mansbridge, and David J. Irwin, all of Bristol, England, assignors to British Aerospace Public Limited Company, London, England

Filed Aug. 17, 1989, Ser. No. 394,984

Claims priority, application United Kingdom, Aug. 17, 1988, 8819535

Int. Cl.[5] **B64C** *1/26, 3/20;* **B23K** *101/02, 103/14*

U.S. Cl. 228—157 **6 Claims**

1. A four sheet cellular structural box beam including two substantially parallel longitudinal corrugated shear webs, two or more transverse shear diaphragm interconnecting said corrugated shear webs at spaced apart locations along the length thereof and longitudinal transverse shear webs extending substantially over the length of box beam adjacent its upper and lower boundaries and upper and lower boom elements at said upper boundaries and upper and lower boom elements at said upper and lower boundaries, at least said upper boom elements having substantially horizontal side flanges protruding outwardly from each corrugated shear web along their length, said cellular structural box beam being of the type formed by a superplastic forming and diffusion bonding method including the steps of:

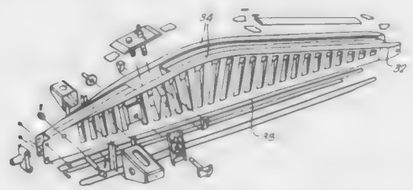
positioning first and second metal sheets, each capable of superplastic deformation and diffusion bonding, in face to face relationship;

attaching the sheets together at a series of spaced substantially continuous joint lines across their faces;

positioning third and fourth metal sheets, each capable of superplastic deformation and diffusion bonding respectively adjacent said first and second metal sheets,

fixedly inserting supplementary metal laminations each capable of superplastic deformation and diffusion bonding at selected locations between said first and third and said second and fourth metal sheets;

sealingly attaching the four metal sheets together along their common periphery so that said first and second metal sheets form at least one inflatable envelope and said third and fourth metal sheets form a single inflatable envelope about said first and second metal sheets;



clamping said sheets between upper and lower tool parts respectively of a forming mould and heating said forming mould and said sheets to within a temperature range at which the sheets exhibit superplastic characteristics;

inflating said third and fourth metal sheets in said forming mould to deform the sheets in conformity with the mould surface said forming mould configured to corrugate said sheets;

subsequently inflating said first and second sheets sufficiently to cause the or each envelope in the areas determined by the said continuous joint lines to expand in balloon like fashion to form cavities, of generally rectangular shape when neighbouring regions of the cavities forming walls meet and the said sheets contact and adopt the configuration of the already formed outer sheets;

characterised in that continuing inflatory pressure on said first and second sheets causes at least some of said laminate material to be moulded around said forming mould and said formed third and fourth sheets to form at least the top boom having said outwardly protruding substantially horizontal side flanges and

on completion of the forming cycle diffusion bonding occurs between the abutment surfaces of the respective component parts.

4,989,775

METHOD FOR BRAZING ALUMINUM COMPONENTS

Yoshifumi Shimajiri, Utunomiyashi; Masakazu Furuta, and Akio Tani, both of Oyamashi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

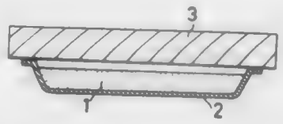
Filed Dec. 14, 1988, Ser. No. 285,054

Claims priority, application Japan, Dec. 15, 1987, 62-317100; Jan. 27, 1988, 63-16696

Int. Cl.[5] **B23K** *31/06*

U.S. Cl. 228—218 **15 Claims**

1. A method for brazing aluminum components, the method comprising: placing a flux and aluminum components in a furnace filled with a nonoxidizing gaseous medium, said flux being placed in an open receptacle and being separated from said aluminum components; suspending the flux in the nonoxidizing gaseous medium to allow it to contact the aluminum



components; heating the aluminum component to a brazeable temperature; and melting a braze metal to provide a braze joint between the aluminum components.

4,989,776

METHOD OF BRAZING ARTICLES CONTAINING ALUMINUM

William D. Hepburn, Edinburgh, Scotland, assignor to GEC Ferranti Defence Systems Limited, Stanmore, England

Filed Jul. 28, 1989, Ser. No. 386,119

Claims priority, application United Kingdom, Aug. 4, 1988, 8818541

Int. Cl.[5] **B23K** *35/00, 35/26*

U.S. Cl. 228—118 **17 Claims**

1. A method of brazing articles containing aluminum with a preform of an aluminum-containing brazing alloy comprising rendering the surfaces of the articles and the preform free of oxide, covering them with a film of metal compatible with the brazing alloy, said metal film also being compatible with said articles and noble metals, coating the films with a metal having a noble metal constituent to inhibit oxidation thereof and subsequently brazing the coated articles with the preform in an oxygen-free non-liquid environment.

4,989,777

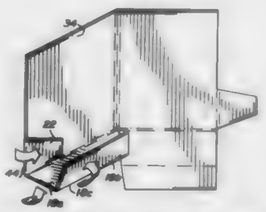
PORTFOLIO

Harold L. Miller, 8245 N. 27th Ave., Apt. 1059, Phoenix, Ariz. 85021

Filed Sep. 18, 1989, Ser. No. 408,748

Int. Cl.[5] **B65D** *27/08*

U.S. Cl. 229—1.5 R **4 Claims**



1. A portfolio for holding and displaying papers and the like, said portfolio having a front and back cover hingedly secured one to the other, with at least one of said covers provided with an expandable pocket, the first side of said pocket formed by a portion of said cover and the second side of said pocket formed by a flap extending along a bottom edge of said cover and a flap positioned on a side of said cover, said bottom flap further comprising a first section immediately adjacent the bottom edge of said cover and a second section immediately adjacent said first section and wherein said side flap is sandwiched between said sections of said bottom flap in a manner such that said second section of said bottom flap is on the inside of said pocket.

4,989,778

CARTON WITH SLOT TYPE CARRYING HANDLE

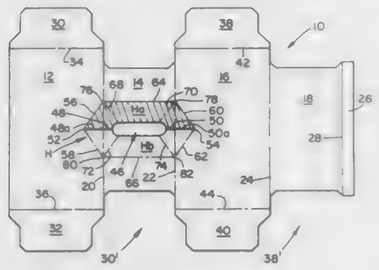
Alain Saulas, Chateauroux, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 30, 1990, Ser. No. 502,097

Claims priority, application United Kingdom, Apr. 1, 1989, [redacted]07407

Int. Cl.[5] B65D *5/46*

U.S. Cl. 229—117.13 6 Claims



1. A carton blank comprising:

a plurality of interconnected panels for providing top, bottom and side walls of a carton;

an opening in said top panel having a peripheral edge;

slit means extending from opposed locations on said peripheral edge across said top panel and into the adjacent one of said side wall panels;

a handle panel defined in said top panel by a handle fold line extending across said top panel, said handle panel defining a free edge along said slit means and the corresponding portions of the peripheral edge between said slit means, and

a second handle panel defined by a second handle fold line extending across said top panel, said second handle panel having a free edge defined by said peripheral edge of said opening and by said slit means.

4,989,779

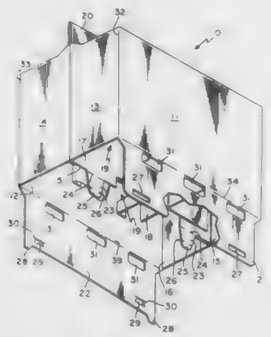
BOTTOM LOCK ARRANGEMENT FOR CARTONS

Jeffrey A. Lashyro, Crosby, Minn., assignor to Minnesota Automation, Inc., Crosby, Minn.

Filed Aug. 23, 1989, Ser. No. 398,138

Int. Cl.[5] B65D *5/48*

U.S. Cl. 229—120.18 15 Claims



1. A bottom lock arrangement for a basket carrier having opposed end panels, opposed side walls and a floor structure, said basket carrier further having a center wall disposed parallel and between said side walls to provide at least two side by side cells for said carrier, said bottom lock arrangement comprising at least one connector tab extending from said center wall, said floor structure further comprising opposed first and second floor panels, said first panel foldably connected to one side wall and said second panel foldably connected to the opposite side wall, said first and second panels being sized to overlap one another, said first and second panels further having aligned connector slots to receive, position and lock said connector tab of said center wall and to maintain the floor structure in a secure configuration and to maintain the end and side walls in a square configuration.

4,989,780

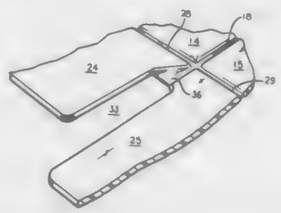
BLANK FOR SEALED CARTON WITH INTEGRAL RECLOSABLE POUR-OUT SPOUT

James B. Foote, and James A. Karabedian, both of Toledo, Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 638,145, Aug. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 638,144, Aug. 6, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 798,217

Int. Cl.[5] B65D *5/74*

U.S. Cl. 229—125.42 5 Claims



1. A die-cut blank of a foldable polymeric sheetlike material, a major portion of the thickness of said foldable polymeric sheetlike material comprising an expanded polymeric material, said blank comprising, in combination:

a series of four rectangularly-shaped panels which are separated from one another by scored fold lines, said panels being adapted to be folded with respect to one another along said fold lines into an open-ended tubular body portion of said carton;

flap means foldably attached to said series of panels along transverse scored fold lines extending between the fold lines separating said panels, said flap means being adapted to be folded with respect to said panels along said transverse scored fold lines to form end structure means sealingly closing an end of said tubular body portion of said carton;

second flap means foldably attached to three of said four panels in said series along second transverse scored fold lines, said second flap means being adapted to be folded with respect to said three panels along said second scored fold lines to form means sealingly closing a portion of the other end of said tubular body portion of said carton; and

third flap means foldably attached to the fourth of said panels in said series and to the adjoining panels of said series of four panels on the opposite sides of said fourth panel along third transverse scored fold lines, said third flap means being adapted to be folded with respect to said fourth panel and to said adjoining panels to form a reclosable pour-out spout which sealingly closes the remaining portion of said other open end of said tubular body portion of said carton when said carton is in the closed position, said third flap means comprising:

a rectangular panel portion which is foldably attached to said fourth panel in said series along said third transverse fold line;

a pair of outwardly facing L-shaped portions on opposite sides of said rectangular panel portion, one leg of each L-shaped portion being foldably attached to one of the edges of said rectangular panel portion along a scored fold line, the other leg of each of said pair of L-shaped portions being foldably attached to the adjacent of said adjoining panels along a fourth transverse fold line which is aligned with said third transverse fold line;

tab means foldably attached to said rectangular panel portion along a tab means score line that is spaced from and extends generally parallel to said third transverse scored fold line; and

slot means separating said third flap means from said second flap means, said slot means being adapted to have said tab means inserted into said slot means when said pour-out spout is in said closed position; and

wherein said flap means comprises;

four flaps, each of said four flaps comprising an integrally formed portion of said blank and depending from and being foldable with respect to one of said panels along one of said transverse scored fold lines at the juncture between said each of said four flaps and said one of said panels, said four flaps being separated from one another by slots, each of said slots extending from the marginal edge of said blank adjacent said four flaps only partially to the fold lines between said panels and said flaps; and

a plurality of gusset areas, each of said gusset areas lying between an adjacent pair of said flaps when said end structure means is formed by the inward folding of each of said four flaps to seal the corner of said carton that is adjacent said adjacent pair of said flaps, each of said gusset areas being compressed in the die-cutting step to a thickness of no more than about one-half of the thickness of said blank to reduce the thickness of the corners of said end structure means.

4,989,781

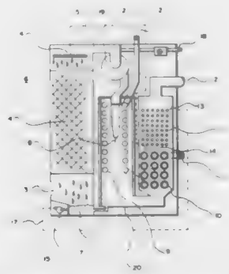
HIGH-EFFICIENCY HEATING UNIT

Eric C. Guyer, Dover, Mass., and Martin K. Gollin, St. Davids, Pa., assignors to H. B. Smith Co., Westfield, Mass. and Dunkirk Radiator Corp., Dunkirk, N.Y.

Filed Feb. 6, 1990, Ser. No. 478,128

Int. Cl.[5] F24D *3/00*

U.S. Cl. 237—56 9 Claims



1. A self-balancing, forced hot-water heating system wherein sensible and latent heat from exhaust gases is recycled into incoming air, said system comprising:

a. a burner for burning fuel in a stream of incoming air;

b. a first heat exchanger for transferring heat from the combustion products of said burner to a water loop circulating through the space to be heated;

c. a second heat exchanger disposed downstream from said first heat exchanger with respect to the flow of said combustion products, for transferring additional heat from said combustion products to a second water loop while maintaining a physical barrier therebetween;

d. evaporative air-heating and water-cooling means for transferring heat from said second water loop to the incoming air;

e. means for conducting the incoming air from said evaporative water-cooling and air-heating means to said burner;

f. a sump for collecting unevaporated water from said evaporative water-cooling and air-heating means; and

g. pumping means for directing water from said sump to said second heat-exchange means and thence to said evaporative water-cooling and air-heating means.

4,989,782

RAIL AND TRACK

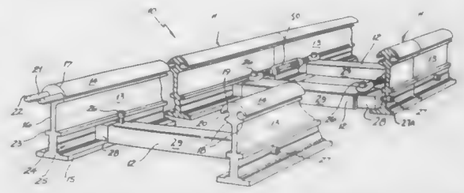
Peter S. McKie, 7 Quirk Street, Rozelle, New South Wales 2039, Australia

Filed Dec. 29, 1988, Ser. No. 291,596

Claims priority, application Australia, Dec. 29, 1987, 83113/87

Int. Cl.[5] E01B *23/04*

U.S. Cl. 238—10 R 17 Claims



1. A track for a wheeled vehicle, comprising a pair of rails, each rail being elongated and having a substantially "I" transverse cross section, each of said rails having an upper rail head and a lower rail foot joined by a web, each of said rail heads having at least two laterally spaced apart apertures to receive alignment pins to couple and engage a plurality of rails one to the other with aperture pins extending between abutting ends of said rails to maintain said rails in an abutting and aligned relationship, at least one spacer being provided for each of the pair of rails, said at least one spacer extending between said pair of rails, the at least one spacer being pivotally secured to each of said rails in the pair to allow relative movement between said rails in the pair toward and away from each other, said track further comprising a flange on said web, said flange extending outwardly from said web, and wherein ends of said at least one spacer are secured to said rails within a recess defined by an upper surface of the rail foot and an underside of the flange.

4,989,783

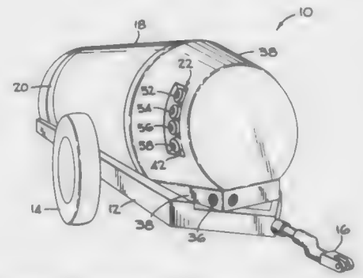
SENSOR MOUNTING

Barry D. Douglas, Doylestown, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 14, 1989, Ser. No. 393,167

Int. Cl.[5] B05B *15/00*

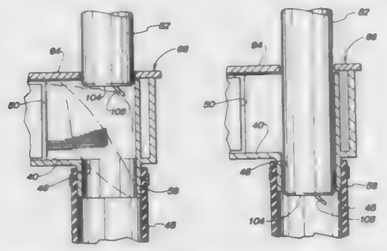
U.S. Cl. 239—77 4 Claims



4. In a mobile air sprayer for dispensing chemicals in groves and vineyards, said sprayer having a forward shroud to deflect branches and vines, the improvement comprising:

a recessed plenum formed in said shroud to form front, rear, top and bottom walls;
a fan mounted under said shroud;
a single supply hose connecting the fan output to said plenum;
an inlet pipe connected to the intake of said fan and extending through the shroud at a forward portion thereof;
a plurality of housings pivotally mounted in said plenum and arranged in a substantially vertical array;
said housing having opposite vertical surfaces engaging said front and rear walls and cylindrically shaped top and bottom surfaces for engagement with adjacent housings and with said top and bottom walls to substantially seal said plenum while permitting said housings to individually pivot;
a transducer mounted in each housing; and
channels formed in each of said housings for directing air from said plenum to form a core of air around and forward of each transducer.

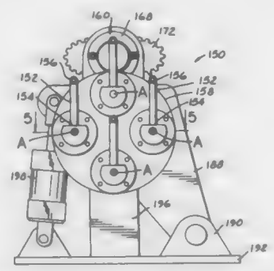
4,989,784
FERTILIZER APPLICATOR ATTACHMENT
Dean S. Fairchild, 1481 N. Birch Lake Blvd., White Bear Lake, Minn. 55110
Filed Jun. 13, 1989, Ser. No. 365,752
Int. Cl.[5] A01C *15/04*
U.S. Cl. 239—114 **7 Claims**



1. Apparatus for cleaning a peripherally-disposed, centrifugally-fed entry port to a distributor conduit extending from a fertilizer distributor head, comprising:
(a) a plunger having a distal end defined by a wall, said plunger being disposed for movement between a retracted position, wherein said distal end is located so as to permit free centrifugal flow of fertilizer within the distributor head, through the entry port, and into the distributor conduit, and an extended position, wherein said distal end extends through the entry port; and
(b) means for selectively moving said plunger between said retracted and said extended positions;
(c) wherein at least a portion of said wall is angled so that, when said plunger is in said retracted position, said angled portion will deflect fertilizer through the entry port and into the distributor conduit.

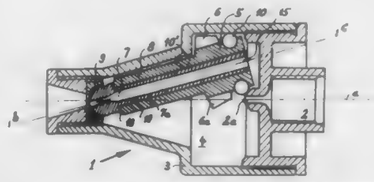
4,989,785
METHOD OF AND APPARATUS FOR WATER JET CLEANING
Stanley J. Walendowski, P.O. Box 587, Marine City, Mich. 48039
Continuation-in-part of Ser. No. 824,155, Jan. 30, 1986, abandoned. This application May 17, 1988, Ser. No. 194,789
Int. Cl.[5] B05B *3/12*
U.S. Cl. 239—227 **18 Claims**

1. An apparatus for high-pressure water cleaning comprising:
a high pressure nozzle having inlet and discharge ends;
said nozzle discharge end being displaced radially from and being rotatable about an independent axis;
said independent axis being arranged in radially spaced relation from a central axis and being parallel thereto;
a support for mounting the nozzle for rotation about said independent axis and also for revolution about said central axis;
said nozzle discharge end providing a water jet extending parallel to said independent and central axis; and



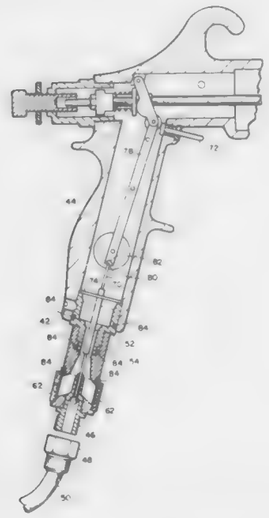
a drive means for revolving the nozzle to move said independent axis about said central axis and rotate said nozzle about its independent axis independent of water delivery thereto whereby said discharge end provides a jet of water whose impingement pattern creates a uniform dense water cleaning spray.

4,989,786
ROTATABLE NOZZLE IN PARTICULAR FOR HIGH PRESSURE CLEANING APPARATUSES
Josef Kränzle, Rudolf-Diesel-Str. 20, D-7918 Illertissen, and Anton Jäger, Eschachstr. 4, D-7913 Senden, both of Fed. Rep. of Germany
Filed Nov. 14, 1989, Ser. No. 435,858
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1989, 3902478
Int. Cl.[5] B05B *3/02;* **B08B** *3/02*
U.S. Cl. 239—240 **14 Claims**



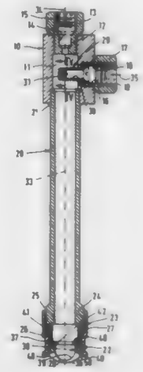
1. A rotatable nozzle particularly adapted for high pressure cleaning apparatuses comprising:
a housing having provided at a rear end thereof a central inlet opening extending along a central axis of said housing for supply of pressurized liquid and enclosing an essentially cylindrical collecting space;
a rotor rotatably supported in said housing for rotation about a longitudinal axis inclined in respect of said central axis;
a blade wheel means peripherally mounted on a rear portion of said rotor having blades arranged in a path of an inlet beam of said pressurized liquid entering said collecting space through said central inlet opening, causing an orbiting movement of said rotor about said central axis; and
a nozzle means arranged at front end of said rotor and having a front end formed as a part of a bearing provided at an outlet side of said housing;
wherein said inlet opening ends in an inlet nozzle having a central axis directed to said blades of said blade wheel.

4,989,787
LIQUID SPRAY GUN ACCESSORIES
Robert E. Nikkel, 4101 Mount Vernon Ct., Fort Collins, Colo. 80525; Paul Guidi, 15500 W. Telegraph D-30, Santa Paula, Calif. 93060, and John K. Rains, 7074 El Malabar, Ventura, Calif. 93003
Filed May 5, 1989, Ser. No. 347,918
Int. Cl.[5] B05B *7/12*
U.S. Cl. 239—346 **11 Claims**



1. A selectively removable external attachment for a conventional liquid spray device, said liquid spray device having a body with an exit nozzle at one end thereof and a handle having an upstream distal end at the other end of said body, an attachment means at the upstream distal end of said handle for attaching said liquid spray device to a source of pressurized air in the range of 0 to over 100 PSI and a valve actuating means, said external attachment being employed for reducing the pressure of said pressurized air entering said liquid spray device to a pressure level of 10 PSI or less at the exit nozzle while substantially maintaining the same volume of air to said spray device comprising:
a venturi assembly for attaching in series between said attachment means of said spraying device and said source of pressurized air, said venturi assembly comprises a first downstream and a second upstream interconnected body portions, said second upstream portion having a conical shaped passageway at its upstream end with a cylindrical passageway extending downstream therefrom, said first downstream body portion having a conical shaped passageway at the downstream end and a cylindrical passageway extending therefrom upstream, said cylindrical passageways of said body portions having an abutting restrictive relationship whereby a venturi is formed, a plurality of bores extend from the outer surface of said second upstream body portion to the venturi area for allowing ambient air to be drawn into said venturi area by the action of the venturi to mix with the pressurized air from said source entering the upstream of said external attachment thereby reducing the pressure of said air prior to entering said spray device while substantially maintaining the volume of pressurized air entering said spray device that is required by said spray device for normal operation.

4,989,788
BINARY FLAT-JET NOZZLE FOR ATOMIZING LIQUIDS
Lothar Bendig, Pfullingen, and Karl Holder, Urach-Hengen, both of Fed. Rep. of Germany, assignors to Lechler GmbH & Co. KG, Fellbach, Fed. Rep. of Germany
Filed Jan. 17, 1990, Ser. No. 466,596
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915210
Int. Cl.[5] B05B *7/04*
U.S. Cl. 239—429 **10 Claims**

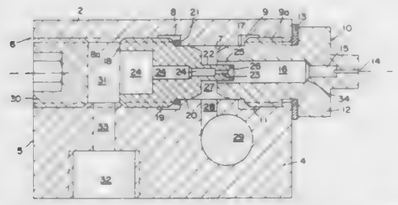


1. A binary, flat-jet nozzle for atomizing liquids with uniform liquid distribution (so-called rectangle characteristic), with a mixing head (**10**) forming a mixing chamber (**11**) and comprising a first connector (**13**) for a gaseous medium and a second connector (**17**) for the liquid to be atomized, further with a preferably tubular connector (**20**, *20a*, *20b*) connected to the above connectors in the direction of flow (**34**) and with a snout (**22**) forming the nozzle discharge (**28**) and mounted preferably in detachable manner by a coupling nut (**23**) at the discharge side of the tubular connector, the nozzle-discharge side end (**36**) of said snout being rounded and in the form of a nozzle discharge evincing a slit (**28**) of variable width the first connector (**13**) for the gas supply being coaxial with the longitudinal axis (**33**) common to the mixing head (**10**), tubular connector (**20**, **20**, *20b)* and snout (**22**) and the second connector (**17**) for the liquid supply being orthogonal to this longitudinal axis (**33**), characterized in that a cylindrical metering inset (**29**, *29a*, *29b*) entering the mixing chamber (**11**) is mounted in the second connector (**17**) for the liquid supply and comprises a cylindrical blind bore (**30**) which issues approximately at the center of the mixing chamber (**11**) on each side into a crossbore (**31**, **32**; *31a*, *32a*) subtending an angle (α) relative to the longitudinal axis (**33**), and in that the snout (**22**) comprises an offset cylindrical bore (**38**) with an arched bottom (**39**) and in that a baffle (**40**, **43**) with a sharp-edged, central transmission aperture (**42**) is seated on the bore offset (**37**), the inside diameter of said transmission aperture being less than the diameter of the offset snout bore (**38**).

4,989,789
INJECTOR DEVICE FOR GASEOUS FLUID CARRIED LIQUIDS
Jose C. Moruno, C.Industria, 45, 08202 Sabadell (Barcelona), Spain
Filed Jul. 17, 1989, Ser. No. 380,857
Claims priority, application Spain, Jul. 18, 1988, 8802583
Int. Cl.[5] B05B *7/04*
U.S. Cl. 239—433 **4 Claims**

1. An injector device for gaseous fluid carried liquids, of the type comprising a body (**1**) endowed with a pressure chamber (**27**) which is open at one of its ends, communicating with a

steam inlet (29) and from the bottom of which a liquid supplying nipple (22) extends, with its orifice (23) communicating with a liquid inlet (32), the mouth of the pressure chamber having fitted therein a nozzle (10) having the outlet orifice (14) for the liquid-steam mixture and communicating with a hole (16) which surrounds the nipple (22) thus forming an annular gap (25) about the lateral surface of the same, the steam stream issuing from this gap thus originating a Venturi effect which sweeps the liquid present in the nipple orifice, and comprising a guide surface (26) formed at the end of the liquid supplying nipple (22) extending from the border of the orifice (23) of such nipple up to the border of the end of the same, this surface guiding the liquid issuing from the said orifice (23) towards the annular gap (25) formed between the outer surface of the nipple (22) and the inner surface of the nozzle hole (16), in



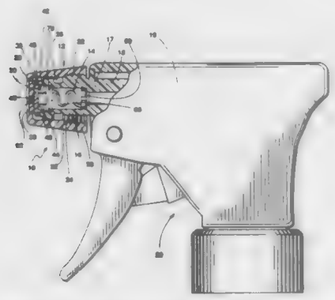
which gap (25) the carrier steam circulates at a maximum velocity and comprising the device being made of a base body (1;1*a*) provided with a through hole (6;6*a*, . . . 6*d*) having an intermediate cylindrical portion (7) and two end portions (8*a*, 9*a*) of a greater diameter and formed with a screw thread, the nipple (18) and the nozzle (10) being formed of respective parts having corresponding cylindrical surfaces (20, 17) adapted to fit with the intermediate cylindrical surface (7) of the hole (6;6*a*, . . . 6*d*), as well as screw threaded surfaces (19, 11) engaging the screw threaded surfaces (8*a*, 9*a*) of this hole, the pressure chamber (27) being formed within the said intermediate cylindrical portion (7) of the hole, between the facing ends of the nipple (18) and the nozzle (10), and the liquid input chamber (31) between the nipple (18) and the adjacent end of the through hole (6;6*a*, . . . 6*d*) of the base body (1;1*a*).

4,989,790

NOZZLE CAP, SPRING VALVE AND BODY ASSEMBLY

Douglas S. Martin, Forest City, N.C., and Wilhelmus J. J. Maas, Someren, Netherlands, assignors to AFA Products, Inc., Forest City, N.C.

Filed Dec. 26, 1989, Ser. No. 456,634
Int. Cl.[5] B05B *9/043, 1/12*
U.S. Cl. 239—483 11 Claims



1. A nozzle cap, spring valve and body assembly comprising:

a nose bushing portion of the body which is adapted to be mounted to, or integral with a dispensing end of a liquid dispenser, which has an outer threaded portion and which has a cavity therein opening onto a front end of said nose bushing portion of the body,

a spring valve received in said cavity,

and a cup shaped nozzle cap which has a front wall with an outlet orifice therein and a rearwardly extending generally cylindrical sleeve, said sleeve having internal threads therein for threadably mounting said cap on said threaded portion of said nose bushing portion of the body,

said spring valve including a front face disc having a front face, an outer annular periphery and two circumferentially spaced apart angular, spin causing grooves in said annular periphery, means coupled to said face disc for mounting said spring valve in said cavity, a sinuous spring which is received in said cavity and which extends rearwardly from said mounting means, and a movable valve seat at the rear end of said spring;

said nose bushing portion of the body having passage means communicating at one end with liquid outlet means in the liquid dispensing device and at another end with said cavity and having a stationary valve seat in said cavity on which said movable valve seat is seated;

and said nozzle cap having specially contoured surfaces on the back side of said front wall including an inner wall surface within said nozzle cap constructed and configured to cooperate with and mate with portions of said face disc;

said nozzle cap being rotatable and axially moveable relative to said nose bushing portion of the body between three positions,

the first position being defined by the nozzle cap being threaded onto said nose bushing portion of the body to a point where portions of said front face and said annular periphery of said face disc mate with portions of said specially configured surfaces of said nozzle cap to close off and seal said outlet orifice,

the second position being defined by said nozzle cap being partially unthreaded from said nose bushing portion of the body to unseat said front face of said face disc from said inner wall surface but with said annular periphery still in sealing engagement with a portion of said specially contoured surface within said nozzle cap so that a swirl chamber is established between said inner wall surface and said front face of said face disc and so that liquid pumped past said movable valve seat is channeled through said two angular spin causing grooves to travel in a swirl in said swirl chamber and exit said outlet orifice in a conical spray pattern, and

said third position being defined by a further partially unthreaded position of said nozzle cap off of said nose bushing portion of the body where said face disc is completely unseated from said specially contoured surface within said nozzle cap so that liquid can now flow over said outer annular periphery of said face disc and radially inwardly to and out said outlet orifice in a stream pattern.

4,989,791

VALVE NOZZLE ASSEMBLY

Ralph G. Ridenour, 626 Lexington-Ontario Rd., Rte. 12, Mansfield, Ohio 44906

Continuation of Ser. No. 214,611, Jul. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 111,258, Oct. 22, 1987, abandoned. This application Jan. 3, 1990, Ser. No. 464,628
Int. Cl.[5] B05B *1/32*
U.S. Cl. 239—579 25 Claims

1. A valve nozzle assembly comprising, in combination:

a female body having a first longitudinal axis and a generally longitudinal first conduit;

a male body having a second longitudinal axis and a generally longitudinal second conduit;

a socket in said female body;

a substantially circular cross section on said male body for cooperation with said socket, with said first and second conduits adapted to be in communication;

said male body having a narrow neck adjacent said socket;

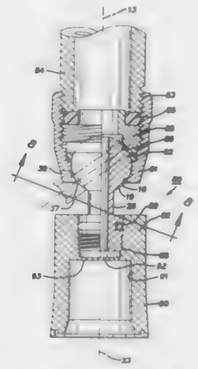
a nozzle mounted in one of said bodies;

gasket means in one of said bodies and surrounding the conduit therein for sealing between said socket and said circular cross section male body;

said narrow neck having a first transverse dimension;

said socket having an opening larger than and receiving said neck for permitting angular adjustment of said nozzle for a preset number of degrees relative to said first longitudinal axis;

a recess in said socket extending along a diametral plane and merging with said larger socket opening to form a recessed opening having a width sufficient to receive said neck for permitting said nozzle to be rotated beyond said



preset number of degrees between first and second positions so that said first conduit in one of said positions is substantially sealed from communication with said second conduit by said gasket means for a shut-off valve or trickle-flow condition of said valve nozzle assembly; the other of said positions establishing fluid communication between said conduits for establishing fluid flow through said nozzle; and

said first and second longitudinal conduits having cross-sectional dimensions sufficient to maintain substantially full fluid flow in the other of said positions while providing angular adjustment of the nozzle up to said preset number of degrees in all directions relative to the axis of said other of said bodies.

4,989,792

VALVE ARRANGEMENT FOR INTERMITTENT APPLICATION OF A FLUID ADHESIVE TO A SUBSTRATE

Henning J. Claassen, Lüneburg, Fed. Rep. of Germany, assignor to Nordson Corporation, Westlake, Ohio

Filed Jan. 27, 1989, Ser. No. 302,528
Claims priority, application European Pat. Off., Feb. 26, 1988, 88 102 920.1
Int. Cl.[5] B05B *1/30*
U.S. Cl. 239—586 6 Claims

1. A valve arrangement for intermittent application of a liquid adhesive, to a substrate, said valve arrangement comprising:

a valve body with a bore therein terminating in an outlet nozzle;

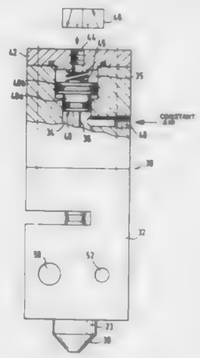
a conduit for supplying adhesive to the bore;

a valve needle reciprocable in the bore for opening or closing the outlet nozzle;

a control piston connected to the valve needle, said control piston constructed as a differential or step piston, a smaller surface of said differential or step piston facing the outlet nozzle;

a first supply line, opening into the bore between the smaller surface of said differential or step piston and the outlet nozzle for continuously supplying a pressurized gas to the smaller surface of the differential or step piston for biasing the valve needle for movement into an opened position;

a second supply line opening into the bore between a larger surface of the differential or step piston and an end of the bore opposite the outlet nozzle for supplying a pressurized



gas to the larger surface of the differential or step piston; and

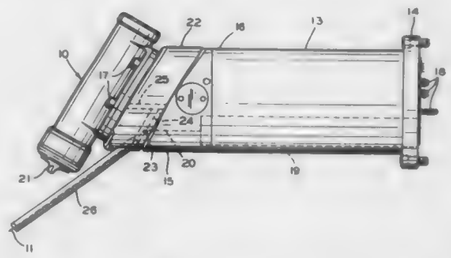
a control means for subjecting the second supply line intermittently to the pressurized gas, wherein when the second supply line is subjected to the pressurized gas, the biasing is overcome abruptly moving the valve needle into a closed position.

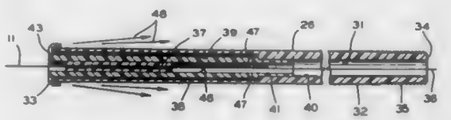
4,989,793

INDIRECT CHARGING ELECTRODE FOR ELECTROSTATIC SPRAY GUNS

James J. Gimple, Oregon, Ohio, assignor to Illinois Tool Works, Inc., Glenview, Ill.

Filed Feb. 2, 1990, Ser. No. 473,356
Int. Cl.[5] B05B *5/025*
U.S. Cl. 239—696 6 Claims





1. An improved electrode for indirectly charging atomized liquid droplets discharged from a spray nozzle to a high voltage, said electrode receiving the high voltage from a power source, said electrode comprising an elongated tubular housing having a central opening extending between first and second housing ends, a conductor extending through said opening and having an electrode end projecting from said first housing end, means for supplying compressed air to said second housing end, and means at said first housing end for directing a flow of

such compressed air back along exterior surfaces of said housing toward said second housing end to prevent liquid droplets from accumulating on said housing surfaces.

4,989,794

METHOD OF PRODUCING FINE PARTICLES

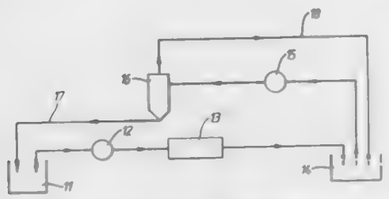
Herbert F. Askew, Turville, and Stephen C. Brown, Middlesex, both of England, assignors to Alcan International Limited, Montreal, Canada

Continuation-in-part of Ser. No. 216,561, Jul. 8, 1988, abandoned, and a continuation-in-part of Ser. No. 391,628, Aug. 4, 1989, and a continuation-in-part of Ser. No. 74,044, Jul. 8, 1987, abandoned. This application Jan. 26, 1990, Ser. No. 470,641

Claims priority, application United Kingdom, Jul. 16, 1986, 8617387; Jul. 9, 1987, 8716213

Int. Cl.[5] B02C *19/00*

U.S. Cl. 241—16 25 Claims



1. A batch method of producing solid particles of material of reduced median particle size, which method comprises:

milling in a milling stage a liquid suspension of solid particles of said material,

feeding the milled suspension to a suspension blending stage,

classifying in a classifying stage the blended suspension to separate the blended suspension into a coarse fraction and a fine fraction, the particles of the coarse fraction having a greater median particle size than the particles of the fine fraction,

recycling the coarse fraction back to the milling stage,

recycling the fine fraction back to the suspension blending stage, and

continuing recycling of both coarse and fine fractions without essentially any product being drawn off until solid particles of the desired reduced particle size are produced.

4,989,795

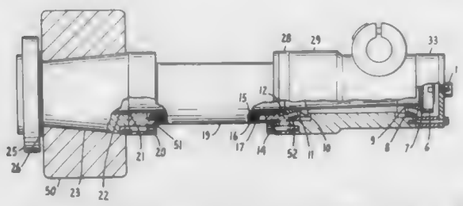
ROLLER MILL JOURNAL LABYRINTH LUBRICATION SYSTEM

Donald P. de Lackner, 19931 Yucca Loma Rd., Apple Valley, Calif. 92308, assignor to Thomas A. de Lackner, Palo Alto, Calif.

Filed Nov. 20, 1988, Ser. No. 439,866

Int. Cl.[5] B02C *15/00*

U.S. Cl. 241—117 2 Claims



1. In a roller mill journal used in rock grinding roller mills comprising a main shaft, a roll mount assembly mounted on the lower end of said shaft including a roll fixed to a lower housing and a locking nut located at the bottom of said shaft fixing said roll to said lower housing, bearings mounted on the upper end of said lower housing adjacent to said main shaft, an upper housing fixed to the top of said main shaft with a cover assembly attached to the extreme top of said upper housing, and means to lubricate said bearings along said shaft including an inlet port mounted on said cover assembly, passageway to said bearings and passageway to an outlet port at a slinger ring mounted on said roll mount assembly, the improvement which comprises:

a means to lubricate and prevent contaminants from entering the bearings of said journal, said means comprising a plurality of concentric tubes positioned parallel to the shaft on said journal beyond said bearings along the flow of lubricant and surrounding said main shaft of said journal with at least one of said tubes mounted to and rotatable with said lower housing of said journal and at least one of said tubes mounted to said upper housing of said journal in such a way as to form a labyrinthine seal between the bearings and an outlet port between a lower tube mounting fixed to said lower housing and an outer tube of said concentric tubes.

4,989,796

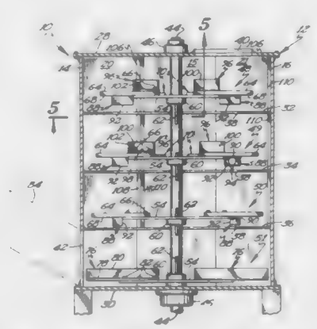
MILL FOR GRINDING GARBAGE

Russel L. Eide, Mondovi, Wis., assignor to Light Work Inc., Columbia Heights, Minn.

Continuation-in-part of Ser. No. 377,712, Jul. 10, 1989. This application Aug. 29, 1989, Ser. No. 400,095

Int. Cl.[5] B02C *13/18*

U.S. Cl. 241—154 10 Claims



1. In a mill for grinding material such as garbage or the like including a grinding chamber having a generally cylindrical perimeter, an inlet opening and an outlet opening, a shaft rotatably mounted in the grinding chamber and concentrically within the cylindrical perimeter of the grinding chamber, and a plurality of grinding rotors rotatably fixed to the shaft, the improvement comprising means connected to the grinding chamber for deflecting material from adjacent and circulating the grinding rotors towards the grinding rotors when the grinding rotors are rotated; wherein the deflecting means comprises a first plate having a first edge connected to the cylindrical perimeter of the grinding chamber, with the plate having a height which is a multiple of the height of the grinding rotors; wherein the first plate is connected generally perpendicular to the cylindrical perimeter of the grinding chamber; and wherein the first plate deflects the material inwardly towards the grinding rotors along a chord of the cylindrical perimeter of the grinding chamber.

4,989,797

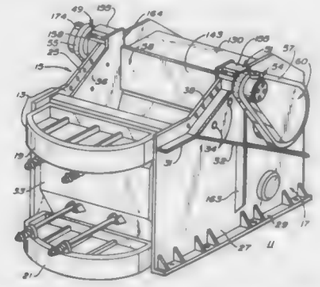
SINGLE SWING JAW CRUSHING APPARATUS WITH AN UNOBSTRUCTED FEED OPENING

Ronald B. DeDiemar, 3401 Vera Cruz Dr., San Ramon, Calif. 94583; R. Reid Greenlaw, 56 Claremont Ave., Orinda, Calif. 94563, and F. Curtis Archer, S. 5518 Cree Dr., Spokane, Wash. 99206

Continuation of Ser. No. 120,822, Nov. 16, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 339,956

Int. Cl.[5] B02C *1/04*

U.S. Cl. 241—264 20 Claims



1. A single swing jaw crushing apparatus with an unobstructed feed opening comprising

a stationary frame having a top feed opening and opposed side panel structures, the separation of which substantially defines the width of said top feed opening,

a cantilevered swing jaw having an upper hinge section and a lower jaw section,

a stationary jaw, said stationary jaw and the lower jaw section of said swing jaw being positioned in opposition to each other within said stationary frame such that a gravity fed crushing chamber having a top end and bottom discharge end is formed therebetween below said top feed opening,

lateral hinge supports straddling the top feed opening of said stationary frame and hingedly holding the upper hinge section of said swing jaw to said stationary frame on a hinge axis, and

means for driving said swing jaw about said hinge axis in an oscillatory crushing motion,

said hinge axis being elevated a substantial distance above the top end of said crushing chamber such that a substantial oscillatory crushing motion occurs in the lower jaw section of said swing jaw at the top end as well as the bottom end of said crushing chamber, said hinge axis being in a plane passing through said crushing chamber, and said upper hinge section of said swing jaw being comprised of upper lateral support arms which straddle said side panel structures of said stationary frame, so that said top feed opening extends through the hinge axis of said swing jaw.

4,989,798

HIGH SPEED PRECISION YARN WINDING SYSTEM

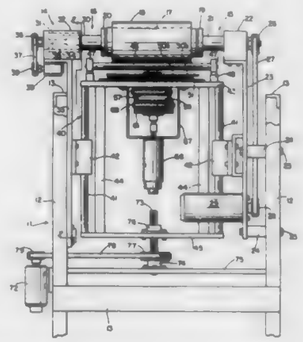
Larry C. Nickell, Lewisburg, W. Va., assignor to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Division of Ser. No. 432,663, Nov. 7, 1989, which is a continuation-in-part of Ser. No. 270,813, Nov. 7, 1988, abandoned. This application Dec. 14, 1989, Ser. No. 458,420

Int. Cl.[5] B65H *54/02, 54/28*

U.S. Cl. 242—18 R 16 Claims

1. In a high-speed precision winder for winding a running yarn onto a tube to form a cross wound yarn package, including spindle means for rotating the tube about a spindle axis, yarn traversing means for guiding running yarn received along an infeed path back and forth across a traverse zone adjacent said tube to form the cross wound package, and a bail roll disposed in rolling contact with the peripheral surface of the yarn package being wound; the improvement comprising a down pressure drive, a drive motor, and associated motor control circuit for said down pressure drive, said down pressure drive including down pressure adjusting means for continuously regulating the relative positions of said bail roll and said spindle axis with respect to each other, an upper main frame plate, a platform forming a support for said traversing means and bail roll, a pair of supporting arms fixed to pivot shaft members for arcuate movement about a horizontal pivot axis spaced above said plate and platform, a pair of upright bearing posts extending from said plate journalling said pivot shaft members for rotation, a reduction gearbox having a pair of opposite outputs coupled to said pivot shaft members for rotating the pivot shaft members and the supporting arms fixed



thereto about said horizontal pivot axis from a lower start position upwardly through increasing angles to a raised doff position, said drive motor forming a retractor motor for driving the gearbox, bail roll supports carried by said platform for supporting said bail roll, a load cell forming the support structure for a portion of the platform beneath said bail roll for responding to variations in pressure thereon and producing load cell output signals, said load cell continuously sensing package down pressure on the bail roll and platform for producing said down pressure status signals and including means responsive thereto for generating activation and speed control signals for said retractor motor to vary the angular position of said support arms above said bail roll and traversing means on said platform for controlling the vertical position of the tube being driven by said spindle means.

4,989,799

APPARATUS FOR WINDING A MULTIFILAMENT WITH FLAT SHAPE AND BROAD WIDTH

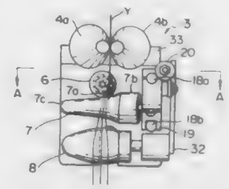
Shoji Nakai, Ibaraki, and Shuichiro Imai, Toyonaka, both of Japan, assignors to Kamitsu Seisakusho Ltd., Hyogo, Japan

Filed Dec. 18, 1989, Ser. No. 452,610

Claims priority, application Japan, Dec. 26, 1988, 63-326182; May 1, 1989, 1-112648; Nov. 13, 1989, 1-130975[U]

Int. Cl.[5] B65H *54/00, 57/16*

U.S. Cl. 242—042 7 Claims



1. An apparatus for winding a multifilament in a flat shape

with a broad width, said apparatus comprising an independently driven mandrel for winding the multifilament and a yarn guiding device arranged upstream from the mandrel for feeding the multifilament spread into a flat shape with a borad width to the mandrel while applying a transverse movement to the multifilament;

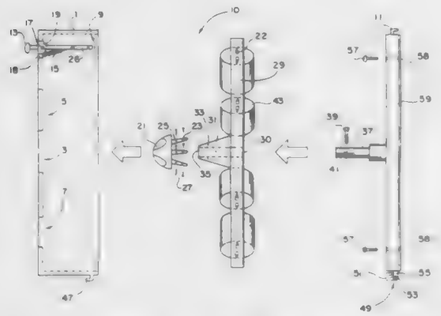
wherein said yarn guiding device comprises a pair of rotatably supported guide rolls each having a generatrix arranged in parallel to the other in such a manner that a space through which the multifilament can pass is formed in a direction perpendicular to the traverse direction of the multifilament between the pair of rotatably guide rolls, a collecting means arranged downstream of the pair of guide rolls for collecting the multifilament along the traverse direction of the multifilament, a spreading means arranged downstream of the collecting means for spreading the multifilament along the traverse direction of the multifilament, and means for movably mounting said mandrel whereby a distance between the mandrel and the spreading means is increased in accordance with an increase of a diameter of a yarn package of the multifilament wound on the mandrel.

4,989,800

TISSUE ROLL DISPENSER

Kim M. Tritch, Rte. 2, P.O. Box 335, Paragould, Ark. 72450

Filed Oct. 3, 1989, Ser. No. 416,507
Int. Cl.[5] B65H *19/00*
U.S. Cl. 242—55.3 7 Claims



1. An improved tissue holder dispenser comprising:

(a) a mounting plate having an axle centrally located thereon;

(b) a rotatable tissue roll holder further comprising:

(i) an outer ring portion;

(ii) a hub portion,

(iii) a plurality of first spindles connecting said outer ring portion and said hub, said first spindles providing structural support for said outer ring portion, and

(iv) a plurality of second spindles detachably connected at one end to said outer ring portion and at the other end to said hub portion, each respective said second spindle adapted to receive and retain a tissue roll;

(c) wherein said hub portion is adapted to be mounted on said axle to allow rotation of said tissue roll holder; and

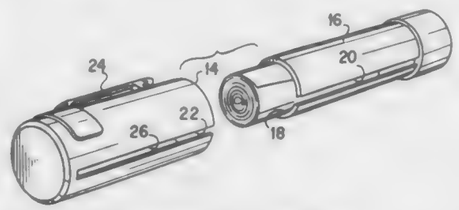
(d) a cover having a first opening for accessing a said tissue roll and a second opening allowing rotation of said tissue roll holder, said cover being mountable on said mounting plate for enclosing said tissue roll holder.

4,989,801

ADHESIVE NOTE ROLL AND DISPENSER

Paul R. Thomas, and William J. Scott, both of Taylorville, Ill., assignors to Notepen, Inc., Okla.

Filed Apr. 11, 1988, Ser. No. 179,886
Int. Cl.[5] B65H *19/00*
U.S. Cl. 242—55.530 6 Claims



1. A note roll dispensing device comprising:

a note roll of continuous length paper;

self-stick adhesive carried along a length of said paper on a second side of said roll;

a first side of said note roll having a clean surface for written notes,

dispensing means for dispensing said paper from said note roll in indeterminate lengths so that notes may be written on said first side which sufficient self-stick adhesive is located on said second side;

said dispensing means including a hollow barrel which accommodates said note roll of paper having first and second ends;

a first end cap carried on said first end of said barrel;

a second end cap carried on said second end of said barrel;

aligned central openings carried by each of said first and second end caps for receiving a writing instrument;

retaining means for affixing said hollow barrel concentrically upon said writing instrument;

a paper dispensing slot formed in said barrel through which paper from a note roll concentric with said writing instrument may be pulled from said roll and dispensed from said barrel;

said first end cap being removable for reloading said hollow barrel with a note roll; and

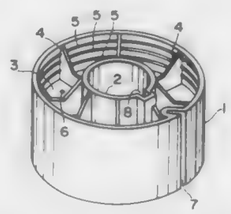
said retainer means including resilient means carried by said first and second end caps biased against said writing instrument.

4,989,802

CORE FOR WEB MATERIAL

Mutsuo Akao, and Koji Inoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 7, 1988, Ser. No. 268,372
Claims priority, application Japan, Nov. 6, 1987, 62-169097[U]; Dec. 9, 1987, 62-309430
Int. Cl.[5] B65H *75/18*
U.S. Cl. 242—68.5 9 Claims



1. A core for web material that is fabricated from a thermoplastic material and molded by injection molding through use of a mold core, comprising:

an outer cylinder;

an inner cylinder disposed coaxially with respect to the outer cylinder;

a ring plate positioned between and joining said inner and outer cylinders, said ring plate being disposed perpendicular to the longitudinal axes of the inner and outer cylinders and passing through the approximate axial centers of the inner and outer cylinders;

a plurality of substantially symmetrically and radially disposed ribs positioned between and joining the inner and outer cylinders; and

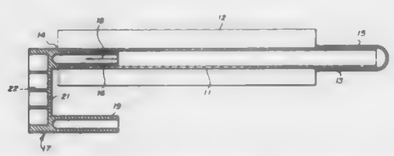
projection means formed on an inner surface of the outer cylinder for increasing the frictional resistance between the core and the core mold, said projection means having a shape that is configured different from each of said plurality of ribs.

4,989,803

APPARATUS FOR DISPENSING PLASTICS STRETCH FILM

James Lambert, Kehlen, Luxembourg, and William E. Rice, Fairport, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 858,876, May 1, 1986, Pat. No. 4,630,786, which is a continuation of Ser. No. 636,771, Aug. 1, 1984, abandoned. This application Dec. 10, 1986, Ser. No. 939,994
Claims priority, application United Kingdom, Feb. 8, 1984, 8403314
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[5] B65H *23/06*
U.S. Cl. 242—96 1 Claim



1. An apparatus for dispensing plastic film having a hollow core with an axial centerline comprising:

a first handle extending along the axial centerline of the core and fixed to one end of the core for simultaneous rotation therewith;

a braking means for controlling the rate of rotation of said first handle;

a second handle having a handgrip and a resilient member having a centerline coincident with said centerline of said core mounted in the other end of said core to remain stationary and urging by its own resiliency against the internal surface of said core, while permitting axial rotation of said core.

4,989,804

BELT RETRACTOR FOR SAFETY-BELT RESTRAINING SYSTEMS IN MOTOR VEHICLES

Ralf Ebner, Gschwend, and Bernhard Kaufmann, Schechingen, both of Fed. Rep. of Germany, assignors to TRW Repa GmbH, Fed. Rep. of Germany

Filed Nov. 9, 1989, Ser. No. 434,011
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838175
Int. Cl.[5] B65H *75/48*
U.S. Cl. 242—107 10 Claims

1. A safety belt retractor for vehicles, comprising:

a base member;

a reel for taking up webbing of said safety belt;

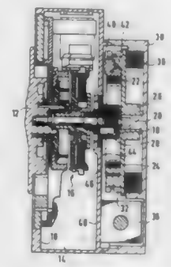
a ratchet wheel mounted for rotation relative to said base member and to said reel;

a retractor spring having a first end connected to said ratchet wheel and a second end connected to said base member;

an auxiliary spiral spring having a first end connected to said ratchet wheel and a second end connected to said reel, said auxiliary spring being of weaker spring force than said retractor spring;

a pawl pivotally mounted on said base member and cooperating with ratchet teeth of said ratchet wheel to stop or enable rotation of said ratchet wheel in response to a control means; and

brake means mounted on said ratchet wheel to counteract rotation of said ratchet wheel with respect to said base member, said brake means being adapted to be actuated when said auxiliary spiral spring is relaxed and to be released when said auxiliary spiral spring is tensioned, by sensing the outer diameter of said auxiliary spiral spring.

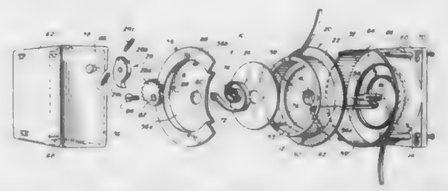


4,989,805

RETRACTABLE REEL ASSEMBLY FOR TELEPHONE EXTENSION CORD

Paul C. Burke, P.O. Box 324, Lake Forest, Ill. 60045

Filed Nov. 4, 1988, Ser. No. 267,184
Int. Cl.[5] B65H *75/48*
U.S. Cl. 242—107.1 15 Claims



1. A retractable reel assembly for a telephone extension cord, comprising:

a housing adapted to be mounted on a wall in proximity to a telephone or telephone jack;

a reel defined by a cylindrical wall journaled for rotation about an axis in said housing;

a spring for biasing said reel for rotation in one direction, said spring being mounted to extend between said housing and said reel;

a ratchet in said housing for selectively restraining rotation of said reel in said one direction;

said reel having a cord-retaining radial wall on at least one side thereof, said radial wall being disposed in closely spaced axially adjacent relation to a wall of said housing and being adapted for rotational movement relative to said wall of said housing, said radial wall and said housing wall defining a radial cord expansion chamber in said housing;

said housing having a first opening disposed about the perimeter thereof leading to said expansion chamber, said housing having a second opening disposed about the perimeter thereof leading from said reel;

said first opening being axially spaced from said second opening;

said radial wall of said reel having an axially extending aperture leading from said expansion chamber in closely spaced adjacent relation to said axis of said reel, said cylindrical wall of said reel having a radially extending aperture spaced from said axially extending aperture in said radial wall of said reel;

said cord including a first portion normally being wound in a radially confined helical array about said axis of said reel in said expansion chamber, said first portion of said cord being maintained in an axially confined planar helical array by said radial wall of said reel and said housing wall and being of a length to permit withdrawal of at least a portion thereof to reach said telephone or telephone jack, said first portion of said cord having an end extending from said first opening in said housing for connection to said telephone jack or a telephone handset;

said cord extending through said axially extending aperture in said radial wall of said reel and said radially extending aperture in said cylindrical wall of said reel;

said cord also including a second portion normally being substantially entirely wound on said cylindrical wall of said reel, said second portion of said cord being of a length to permit withdrawal of at least a portion thereof by pulling on said second portion of said cord to rotate said reel in a direction opposite said one direction to accommodate movement of said telephone or telephone handset from one location to another, said second portion of said cord having an end extending from said second opening in said housing for connection to said telephone or telephone handset;

said spring accommodating retraction of said second portion of said cord by biasing said reel for rotation in said one direction;

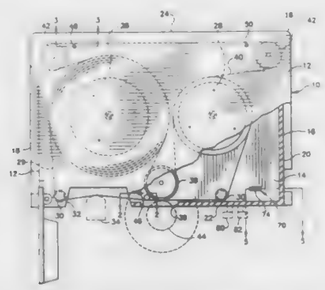
said first portion of said cord being unwound to a radially expanded helical array within said expansion chamber during substantially complete withdrawal of said second portion of said cord and being rewound to said radially confined helical array within said expansion chamber during substantially complete retraction of said second portion of said cord.

4,989,805

TAPE CARTRIDGE HOUSING FASTENER SYSTEM

James A. Eggebeen, San Diego, Calif., assignor to Gigatek Memory Systems, La Costa, Calif.

Filed Sep. 21, 1989, Ser. No. 410,602
Int. Cl.[5] G03B *1/04*
U.S. Cl. 242—199 15 Claims



14. A tape cartridge housing for housing a data tape and tape drive assembly, comprising:

a generally rectangular enclosure comprising an upper wall, a lower wall, and peripheral side, front and rear walls;

at least the lower wall of the enclosure comprising a flat base member of a material having a first thermal expansion rate;

at least the upper wall of the enclosure comprising a cover member of a material having a second, different thermal expansion rate;

a single fixed fastener rigidly connected between a first point on the base member and a second, opposed point on the cover member, the fixed fastener comprising means for restricting lateral movement in any direction between said opposing points; and

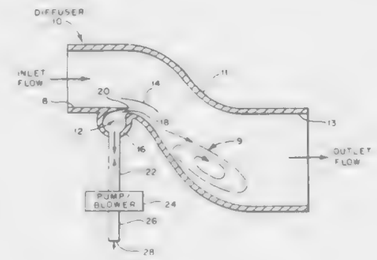
at least one expansion fastener rigidly connected at one end to one of the members at a location spaced from the fixed fastener and loosely connected at the other end to an opposing location on the other member, the loose connection comprising means for allowing a predetermined amount of relative sliding movement of said members at said opposed locations in any direction parallel to the plane of said members, said expansion fastener further including means for restricting relative movement in a direction perpendicular to the plane of said members.

4,989,807

S-SHAPED JET ENGINE INLET DIFFUSER

Kenneth M. Foreman, Bellmore, and Richard C. Jenkins, Smithtown, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 178,931, Apr. 7, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 421,312
Int. Cl.[5] B64D *33/02*
U.S. Cl. 244—53 B 3 Claims



1

1. A diffuser for a jet engine comprising:

a straight inlet section;

a straight outlet section located in parallel spaced relation to the inlet section and having an increased cross-sectional area compared therewith;

a curved median section intermediately communicating between the inlet and outlet sections and having a gradually increasing cross-sectional area between inlet and outlet ends thereof;

a solid, thin vane located at a junction between the inlet and median sections for directing airflow against the interior wall of the median section thereby assisting in minimizing the separation of boundary layer airflow along the interior wall which increases the efficiency of the diffuser and shields, along with offset inlet and outlet sections, observable signals from the engine; and

a slot that is backward-facing relative to the direction of inlet airflow, the slot transversely located adjacent to the vane for disturbing low energy boundary layer air flowing thereacross so as to further minimize the separation of boundary layer airflow along the interior wall thereby increasing the efficiency of the diffuser, the slot including

(a) a cylindrical upstream surface terminating in a sharp-edge lip; and

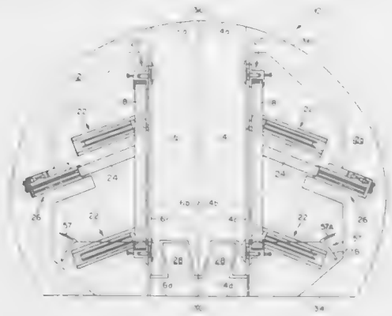
(b) a convex smooth downstream surface.

4,989,808

SLIDING POCKET DOOR FOR AIRCRAFT USE CAPABLE OF NON-DESTRUCTIVE BLOW-OUT

Michael R. Spraggins, San Antonio, Tex., and Charles F. Steel, Huntington Beach, Calif., assignors to MSA Aircraft Interior Products, Inc., San Antonio, Tex.

Filed Jul. 7, 1989, Ser. No. 376,852
Int. Cl.[5] B64C *1/14*
U.S. Cl. 244—118.5 11 Claims



1. For use in an aircraft interior, a pocket door capable of remaining intact during decompressive blow-out of the pocket door comprising:

at least one generally tabular door segment comprised of durable but lightweight materials and sized to fit within a bulkhead of the aircraft interior;

means for mounting said door segment to the aircraft interior wherein said mounting means is capable of sliding said door segment between an open position and a closed position, the open position allowing passage through the door and the closed position preventing such passage; and

extensible articulation means for attaching said door segment to said mounting means, said extensible articulation means for allowing said door segment to rotate from a pre-rotation position in the sliding plane to a post-rotation position out of the sliding plane when the door is in a substantially closed position while simultaneously allowing the axis of rotation to shift inboard with respect to said mounting means, said extensible articulation means recessed within the bulkhead of the aircraft interior and hidden from the view of an occupant of the aircraft;

wherein the combined motion of rotation and shifting prevents interference between said door segment and the aircraft interior when sudden pressure on the door causes a blow-out.

4,989,809

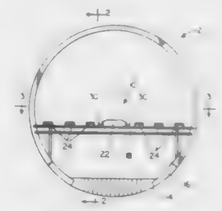
REMOVABLE AIRCRAFT FLOOR STRUCTURE-REINFORCING STRONGBACK

Alison M. Arnold, Island County, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 167,349, Mar. 14, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 427,978
Int. Cl.[5] B64D *9/00*
U.S. Cl. 244—137.1 16 Claims

1. A removable, longitudinal, floor structure-reinforcing beam for an aircraft of the type having longitudinal seat tracks on opposite sides of an aircraft centerline, comprising:

a substantially continuous elongated beam having a predetermined length sufficient to overlay a substantial plurality of transverse floor beams in the aircraft floor, and also having a width sufficient to substantially span the distance between two adjacent seat tracks in the aircraft floor and a substantial depth sufficient to increase an axle load rating of the aircraft floor structure at least 12%–16%; wherein the depth and width of the beam are insufficient to prevent a conventional, wheeled military vehicle from passing thereover.



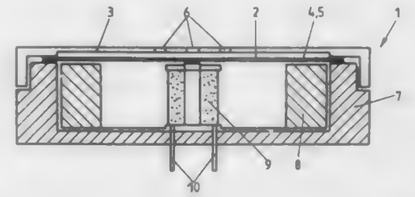
attachment means spaced at regular intervals along the beam length for removably attaching the beam to seat tracks on an aircraft floor.

4,989,810

METHOD AND APPARATUS FOR INFLUENCING A LAMINAR TURBULENT BOUNDARY LAYER TRANSITION ON BODIES IN FLOW

Hans U. Meier; Alois Maier, both of Göttingen, Fed. Rep. of Germany, and Ming de Zhou, Nanjing, China, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Baumfahrt, Fed. Rep. of Germany

Filed Nov. 17, 1988, Ser. No. 272,627
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738366
Int. Cl.[5] F15D *1/12;* H04R *9/06*
U.S. Cl. 244—208 21 Claims



1. A method of generating a laminar-turbulent boundary layer transition on the surface of a body in a flow medium at selectable points, comprising introducing unsteady disturbances into the boundary layer of the medium, by alternately blowing out and sucking off parts of the medium flowing adjacent the surface of the body and introducing the disturbances at a frequency which corresponds approximately to a respective Tollmien-Schlichting frequency dependant from the velocity of the flow of the medium adjacent the surface of the body.

4,989,811

ATTACHABLE BABY BOTTLE HOLDER WITH AN ATTACHING MECHANISM

Patricia C. Millis, and H. Lowell Millis, III, both of 2422 E. Locust Ave., Orange, Calif. 92667

Filed Oct. 13, 1989, Ser. No. 421,366
Int. Cl.[5] A47D *15/00*
U.S. Cl. 248—104 7 Claims

1. A retrievable baby bottle holding means for use by an infant, said baby bottle holding means being capable of being removably secured to an external support means but freely manipulable by an infant while said holding means is secured to said external support means, said baby bottle holding means comprising:

jacket means adapted to hold a baby bottle;

readily flexible strap means having first and second end sections;

means for securing the first end section of said readily flexible strap means to said jacket means;

fastener means adapted to be removably secured to the external support means; and

means for securing said fastener means to the second end section of said readily flexible strap means whereby said baby bottle holding means may be removable secured to said external support means by said fastener means, said readily flexible strap means enabling said bottle holding means to be freely manipulated when held by an infant while said bottle holding means is secured to said external



support means and readily retrieved if said bottle holding means is released by the infant;

said jacket means includes cylindrically-shaped sleeve means and circular bottom means fixed to the bottom of said sleeve means, the outer surface of a baby bottle being held within said sleeve means and the bottom of said baby bottle being supported by said bottom means, said sleeve means and said bottom means being formed of a cushioning and thermally insulating material which both cushions said baby bottle against external shocks and thermally insulates its contents.

4,989,812

BODY WITH DEPLOYABLE SUPPORT MEANS

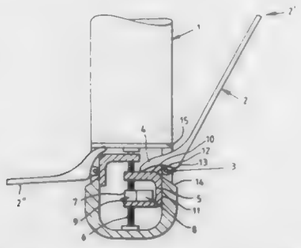
David H. Lloyd, Bristol, England, assignor to British Aerospace Public Limited Company, London, England

Filed Aug. 23, 1989, Ser. No. 397,687

Claims priority, application United Kingdom, Sep. 9, 1988, 8821217

Int. Cl.[5] F16M *11/38*

U.S. Cl. 248—170 **5 Claims**



1. A body which is intended, in use, to be positioned with a generally upright axis on a surface includes a plurality of legs, each having a pivot by which it is mounted upon the body for pivotal movement from a stowed position generally parallel to the body axis to a support position in which it extends generally outwardly and downwardly form the body axis, each leg having a cam follower portion extending from the region of its pivot towards the body axis for engagement with an axially movable cam carried by the body for movement along the axis, thereby to effect pivotal movement of the legs, and actuation means to effect such axial movement.

4,989,813

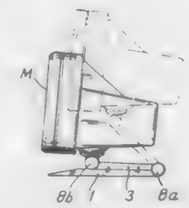
SUPPORTING BASE FOR CONTROLLING HEIGHT, SWIVEL AND INCLINATION OF DISPLAY MEANS

Jineui Kim, Pusan; Youngbae Choi, Ulsan, and Sangbong Park, Pusan, all of Rep. of Korea, assignors to Samsung Electron Devices Co., Ltd., Kyungki, Rep. of Korea

Filed Nov. 29, 1989, Ser. No. 443,520

Int. Cl.[5] F16M *11/12*

U.S. Cl. 248—183 **3 Claims**



1. A support for a display means so as to adjust the height, swivel and inclination thereof, said support comprising:

a base to be placed on a desk or the like, and having first boss means;

an elongated arm having second and third boss means, respectively at opposite ends of said arm;

a plate to be connected to the display means, and having fourth boss means;

first knuckle means rotatably connecting said second boss means at one end of said arm to said first boss means so that said arm is rotatable about a first axis substantially parallel to the desk; and second knuckle means rotatably connecting said third boss means at the other end of said arm to said fourth boss means so that said plate is rotatable about a second axis substantially parallel to said first axis;

wherein said second and fourth boss means each have tapered bores, said first and second knuckle means each including tapered bushings within said bores respectively; threaded bars respectively within said bores and threaded tapered pins respectively within said tapered bushings and threadedly engaging said threaded bars, whereby degree of rotation of said plate and arm are adjustable;

comprising torsion spring means interposed between said first and second boss means, and between said third and fourth boss means, respectively.

4,989,814

COUNTER-BALANCING MECHANISM FOR CAMERA UNIVERSAL HEAD

Ken-ichi Uehara, Kawagoe, and Hisashi Tomioka, Asaka, both of Japan, assignors to Daiwa Corporation, Tokyo, Japan

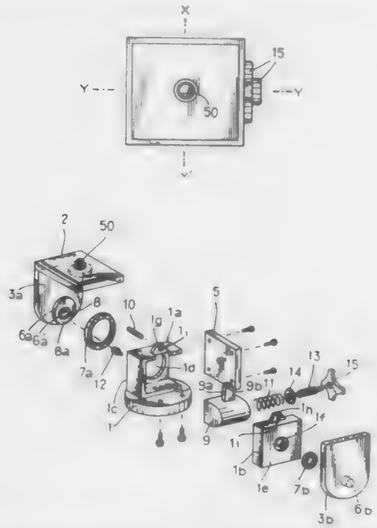
Filed May 21, 1990, Ser. No. 525,586

Claims priority, application Japan, Jun. 7, 1989, 1-65835

Int. Cl.[5] F16M *11/10*

U.S. Cl. 248—185 **1 Claim**

1. A counter-balancing mechanism to act against vertical rotative moment of a camera mounting table in a camera universal head with said camera mounting table mounted vertically rotatively on a laterally rotative base support, wherein, a housing having been fixed on said base support and having an open side is provided; and respective bearings are fitted into bearing fitting holes on two opposite sides other than said open side; and axial pieces are protruded from the inner surfaces of both side plates of said camera mounting table to be a center of said vertical rotation by being inserted into said bearings; and a roller for contacting on a concave cam formed on the end of one of said axial pieces of the one of said side plates is fixed on a spring receiving seat suspended free to make rocking motions within said housing; and a spring to suppressingly contact said



roller upon said concave cam is accommodated within said spring receiving seat.

4,989,815

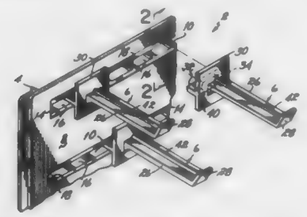
RELEASABLE CONNECTOR SYSTEM

William McAuley, Lincoln, R.I., assignor to Superior Jewelry Company, Cincinnati, Ohio

Filed May 22, 1990, Ser. No. 527,107

Int. Cl.[5] A47F *7/00*

U.S. Cl. 248—225.2 **17 Claims**



1. A connector system for securing objects to a fixed member comprising:

a panel having a primary flat surface with at least one channel recessed therefrom, said channel having at least one wall non-parallel to said primary flat surface, said wall having at least one aperture therein with a raised lip on the reverse side of said primary flat surface adjacent to said aperture; and

a securing member having a flange with a projection extending therefrom, said projection attached to a prong having substantially the same length as said aperture, said prong having an inwardly projecting tip capable of engaging said lip adjacent said aperture.

4,989,816

UNIVERSAL CARRIER BRACKET

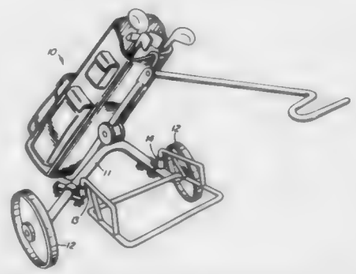
Joseph R. Lamarche, 7 Kingsview Ct., Oshawa, Ontario, Canada L1H 7K3

Filed Jul. 19, 1989, Ser. No. 381,850

Claims priority, application Canada, Jul. 28, 1988, 573246

Int. Cl.[5] A47B *96/06*

U.S. Cl. 248—231.6 **6 Claims**



1. A socket member for removably attaching a carrier to the frame of a hand cart, which carrier has a rigid structure including a load supporting section and a pair of normally downwardly directed pins adapted to be slidably inserted one in each of two sockets provided on the frame of a cart, said socket member including:

(a) a hollow cylindric base and a pair of annular flange members disposed one at each end of the base, said annular flange members clamping therebetween and within the base, a generally spherical member provided with an opening complementary with an associated carrier to allow a sliding inserting therein or withdrawal therefrom of a respective one of said pins;

(b) the base being provided with mounting means for mounting the base to a support at a position which is adjustable by selectively turning the base about a second axis transverse to the axis of the sleeve, and/or by selectively displacing same along said second axis;

(c) clamp means operatively associated with the support to fixedly secure the support and thus the socket member to a part frame section of the respective hand cart.

4,989,817

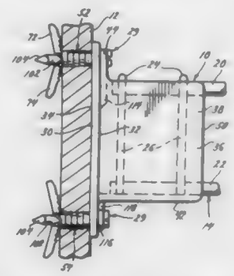
WALL BRACKET

Charles F. Camilleri, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.

Filed Jan. 2, 1986, Ser. No. 815,650

Int. Cl.[5] F16B *13/00*

U.S. Cl. 248—231.91 **9 Claims**



1. A wall bracket attachable to a wall to support a shelf or the like comprising a support member for supporting the shelf or the like, a back plate integral with the support member, and a wall anchor assembly including a tubular wall anchor socket integral with and extending beyond the back plate to an end

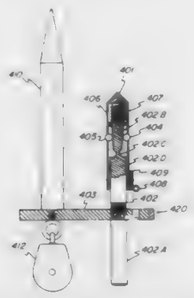
spaced from the back plate, a passage through the socket having an entrance adjacent the back plate for receiving a pin, a pair of fingers pivotally joined to said end of the socket, the fingers being biased for normally extending longitudinally from the socket while substantially occupying an area circumscribed by a projection of the socket, the fingers having walls extending across a projection of the passage, the wall anchor assembly further including a pin having a shank extending between a head and a point, means defined by the passage for gripping the shank adjacent the head for holding the pin at least partially within the passage while the wall bracket is installed and in readiness for being driven further into the socket, means projecting from the shank of the pin engageable with the socket for interfering with withdrawal of the pin while allowing the pin to be driven into the socket, the shank of the pin being longer than the socket enabling the pin to be drawn through the socket to extend beyond the passage and into engagement with the walls to pivot the fingers to laterally outwardly extending positions relative to the socket, whereby the integral support member, back plate, and socket and the means for gripping the shank combine to allow the wall bracket to hold the pin and be held by one human hand as it is located on a wall with the fingers and the socket projecting through a hole in the wall thereby freeing a second human hand for driving the pin into the socket to spread the fingers.

4,989,818

NOZZLE DAM REMOTE INSTALLATION SYSTEM AND TECHNIQUE

Mark H. Trundle, Signal Mountain, Tenn., and William C. Jones, Tunnel Hill, Ga., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Division of Ser. No. 365,641, Jun. 13, 1989, Pat. No. 4,959,192. This application Apr. 19, 1990, Ser. No. 511,167
Int. Cl.[5] B66C *1/54*; G21C *19/00*
U.S. Cl. 248—332 5 Claims



1. In an improved device for gripping and cooperatively engaging a plurality of tubes of substantially equal inner diameters, said improved device including shaft means, said shaft means including a tapered upper portion, a generally cylindrical lower portion, and an intermediate neck portion; cylindrical sleeve means, said cylindrical sleeve means being spaced around said shaft means and including at least two apertures generally opposite said tapered portion of said shaft means, the outer diameter of said cylindrical sleeve means being less than the inner diameter of said tubes; resilient means operatively connected between said shaft means and said sleeve means for biasing relative longitudinal motion between said shaft means and said cylindrical sleeve means; locking means arranged for operative association with each of said apertures, said locking means arranged for operative association with said tapered upper portion and the inner surface of one of said tubes, and each said locking means comprising a spherical-shaped member of material being substantially nondeformable relative to said tubes and having a diameter such that longitudinal motion of said cylindrical sleeve means relative to said shaft means causes said tapered portion to contact each of said locking means while said locking means protrude outside the surface of said cylindrical sleeve means; and stop means generally disposed near the lower end of said cylindrical sleeve means and arranged for limiting the sleeve insertion into said tubes, the improvement in combination therewith which comprises:

(a) sleeve engagement means disposed near the lower portion of said cylindrical sleeve means and projecting away from the outside surface thereof, and said sleeve engagement means disposed vertically above later mentioned plate means;

(b) plate means associated with said generally cylindrical lower portion of said shaft means, said plate means disposed generally perpendicular to said shaft means and arranged to provide that at least a portion of said generally cylindrical lower portion of said shaft means projects both upwardly and downwardly from said plate means;

(c) at least two tube insertion pin means associated with said plate means and projecting upwardly therefrom, the outer diameter of said pin means being less than the inner diameter of said tubes; and

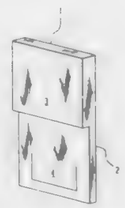
(d) load attaching means associated with said plate means and projecting downwardly therefrom.

4,989,819

INDICIA DISPLAY DEVICE

Shimon Sigler, 40 Kadish Luz Str., Kiryat Motzkin 26406, Israel

Filed Jul. 7, 1989, Ser. No. 376,494
Claims priority, application Israel, Jul. 10, 1986, 87057
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—476 7 Claims



1. An indicia display device comprising a planar element; at least one exposed surface portion of said planar element being flat and formed of a plastics material having elongated, substantially unidirectional polymeric chains of substantially maximum flexibility, said plastics material having maximal adhesive properties with respect to a vitreous like surface to which it is pressed so as to be attached over substantially all of said exposed surface portion, said attachment being easily releaseable by exertion of a lifting pressure thereon; an opposite surface portion of said planar element; and retaining means for indicia to be displayed in a direction facing in the same direction as said exposed surfaces associated with said opposite surface.

4,989,820

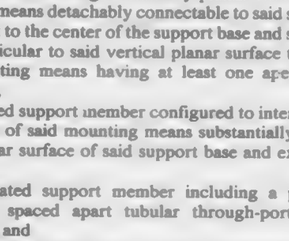
HOLDER FOR CHRISTMAS TREES AND THE LIKE

Lawrence G. Sterling, Greensboro, N.C., assignor to Overload, Ltd., Kowloon, Hong Kong

Filed Dec. 22, 1989, Ser. No. 455,032
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—523 15 Claims

1. A holding device for holding a Christmas tree and the like in an upright position, comprising:

a resilient ring-like member disposed in a horizontal plane, said resilient ring-like member having a plurality of resilient integral fingers which extend inwardly of said resilient ring-like member in the horizontal plane, said fingers being spaced around an edge of said ring-like member, and each of said fingers having a width which is less than the length between adjacent fingers along the edge of said ring-like member; and



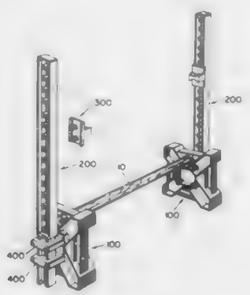
means for opening and closing said resilient ring-like member to increase and decrease, respectively, a diameter thereof.

4,989,821

SUPPORT DEVICES FOR PRODUCING VARIABLE HEIGHT BARRIERS

William P. W. Wong, 3030 Montrose Ave., La Crescenta, Calif. 91214

Filed Jun. 5, 1989, Ser. No. 361,510
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—529 14 Claims



1. A support apparatus comprising,

a support base defining a relatively planar vertical surface,

mounting means detachably connectable to said support base adjacent to the center of the support base and substantially perpendicular to said vertical planar surface thereof,

said mounting means having at least one aperture therethrough,

an elongated support member configured to interlock in said aperture of said mounting means substantially parallel to the planar surface of said support base and extend thereabove,

said elongated support member including a plurality of parallel, spaced apart tubular through-ports mounted thereon, and

support bracket means having at least one pin and one shelf extending in opposite directions therefrom,

said pin adapted to be snugly engaged within any of said tubes, thereby to support said support bracket means on said elongated support member above said support base.

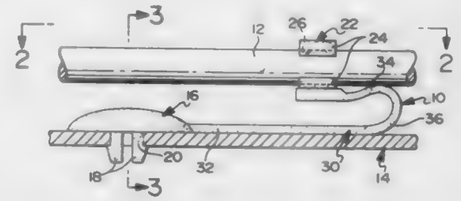
4,989,822

ROD GUIDE CLIP

Joseph P. Fannon, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 7, 1990, Ser. No. 534,605
Int. Cl.[5] F16L *3/02, 3/18, 3/20*
U.S. Cl. 248—632 4 Claims

1. In combination with a support and a rod member spaced from the support and movable relative thereto, a rod guide member capable of guiding linear and shiftable movement of the rod member relative to the support and preventing rattle therebetween, comprising, a strap portion of flexible material, support attachment means at one end portion of the strap portion cooperable with the support to removably secure the one end portion of the guide member thereto, and rod member attachment means at the other end portion of the strap portion cooperable with the rod member to removably secure the



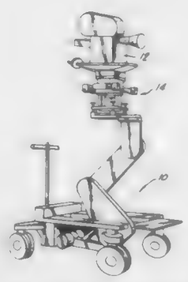
other end portion of the strap portion thereto, the strap portion being return bent upon itself between the end portions thereof, the legs and the bight of the return bent strap portion being located between the support and the rod member to provide an anti-rattle cushion therebetween, the legs of the return bent strap portion extending and retracting relative to each other as the rod member moves linearly, and, such legs shifting laterally relative to each other as the rod member shifts laterally relative to the support.

4,989,823

SHOCK AND VIBRATION ISOLATOR

Leonard T. Chapman, North Hollywood, Calif., assignor to Leonard Studio Equipment, Inc., North Hollywood, Calif.

Filed Apr. 28, 1989, Ser. No. 345,108
Int. Cl.[5] B60N *1/08*
U.S. Cl. 248—638 19 Claims



1. A vibration and shock isolator comprising:

a support plate assembly having at least one ferrule;

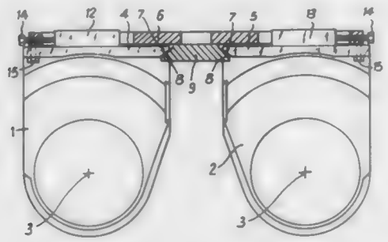
at least one lateral guide bar passing through said ferrule, said guide bar having a radius of curvature in a plane perpendicular to the plane of said support plate assembly; and

lateral biasing means for biasing said support plate towards a lateral center position on said guide bar.

4,989,824
MOTOR BLOCK FASTENING DEVICE FOR A TRENCHING MACHINE

Jean-Claude Detilleux, Les Ulis; Philippe Chagnot, Voulx; Karl Bollinger, Rueil Malmaison; Jean-Pierre Schreiber, Mareil-sur-Mauldre; André Ponsada, Rueil Malmaison, France, and Phillippe Lefort, Brunoy, all of France, assignors to Societe Anonyme dite - SOLETANCHE, Nanterre, France

Filed Nov. 17, 1989, Ser. No. 438,722
Claims priority, application France, Nov. 18, 1988, 88 15022
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—674 6 Claims



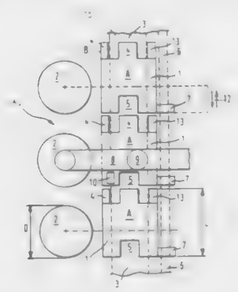
1. A cutting machine for cutting trenches in the ground, including
(a) a flat bottom face portion for supporting a pair of motor blocks;
(b) two motor blocks, with parallel axes, adapted to mount half-drum cutters;
(c) each motor block comprising a central vertical keel projecting downwardly from a horizontal top plate;
(d) connection means securing each motor top plate to said bottom face;
(e) the inner edge of each top plate being provided with a beveled surface;
(f) an abutment member having parallel beveled edges complementary in shape to the beveled edge of each top plate;
(g) means mounting said abutment member to the central portions of said bottom surface;
(h) locking means urging the beveled edge of each top plate against the beveled edges of said abutment member.

4,989,825
SUPPORT MEANS FOR SUPPORTING CALENDER ROLLS

Joachim Hinz, Tettnang; Josef Schneid, Vogt; Wolf-Gunter Stotz, Ravensburg, and Werner Schmid, Bliezhausen, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,332
Claims priority, application Switzerland, Apr. 28, 1988, 01591/88
Int. Cl.[5] F16M *1/00*; B30B *3/04*
U.S. Cl. 248—676 10 Claims

1. Support means for supporting rolls of a calender for treating substantially web-shaped materials, comprising:
a roll stand;
at least two supports containing walls which surround said roll stand of the calender;
said roll stand being provided with guideways extending in a predetermined direction for slidably guiding said at least two supports at said roll stand;
two adjacent ones of said at least two supports possessing a predetermined number of pairs of mutually facing edges;
at least one pair of said predetermined number of pairs of mutually facing edges being substantially complementary shaped;
means for slidably displacing at least said two adjacent supports relative to each other for interengagement of said at least one pair of substantially complementary shaped mutually facing edges;
each one of said two adjacent supports supporting an associated calender roll having a predetermined diameter; and

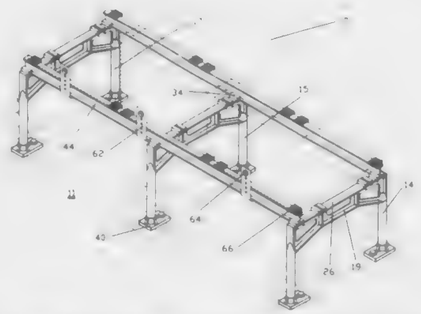


each one of said at least two supports defining a predetermined support length greater than said predetermined diameter of said associated calender roll and extending in said predetermined direction of said guideways.

4,989,826
EQUIPMENT ROOF MOUNTING SYSTEM

Robert G. Johnston, Jr., 323-B N. Federal Hwy., Boynton Beach, Fla. 33435

Filed Sep. 5, 1989, Ser. No. 402,568
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—676 7 Claims

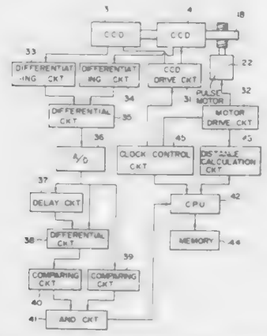


1. A system for the support of equipment upon a substantially horizontal roof comprising:
(a) at least two parallel spaced-apart trusses, each of said trusses having a pair of legs which legs define lateral edges of each truss, each of said trusses having a linear top edge extending between those lines comprising longitudinal axes of said legs, said top edge having a transverse width, each of said edges having a plurality of integrally formed female track elements, and each of said track elements having axes normal to said linear edge of each of said trusses;
(b) one base element for each of said legs of each of said truss, each of said base elements including a recess proportioned for complemental engagement with a lower end of each of said legs, each base having a flat lower surface for engagement of said horizontal roof, said complemental engagement including rotational engagement of said flat surface relative to said legs to thereby selectively position said lower surface in an optimal fashion respective to weight bearing beams within said roof; and
(c) at least two I-beams, each I-beam having a top, a base parallel to said top, and a rib normally integrally connecting said top and base of said I-beam, said bottom of each I-beam proportioned for complemental, securable, slideable engagement within each of said female track elements, and normal to a plane defined by the body of each of said trusses,
whereby securement of at least two of said I-beams between at least two of said trusses will define a suspension bed for said equipment to be supported upon a horizontal roof.

4,989,827
DISTANCE DISTRIBUTION MEASURING METHOD AND APPARATUS VARYING SPACING BETWEEN AN IMAGE PICKUP AND THE OPTICAL AXIS

Kanehiro Sorimachi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 396,759, Aug. 22, 1989, abandoned, which is a continuation of Ser. No. 114,520, Oct. 30, 1987, abandoned. This application Jun. 20, 1990, Ser. No. 540,309
Claims priority, application Japan, Oct. 31, 1986, 61-258579; Oct. 31, 1986, 61-258580; Dec. 4, 1986, 61-287778
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.1 16 Claims

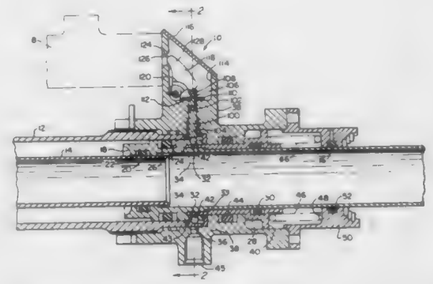


15. A distance measuring apparatus for measuring distance to an object, comprising:
a distance measuring system having first and second optical systems, optical axes of which are parallel with each other, a first sensor for detecting a position of an image formed by said first optical system, and a second sensor for detecting a position of an image formed by said second sensor;
a driving mechanism for varying the positional relationship of said first and second optical systems and said first and second sensors with a predetermined trajectory to vary the imaging state of said first and second optical systems on said first and second sensors so that a position of the image focussed by said first optical system and a position of the image focussed by said second optical system are in a predetermined positional relationship on said first and second sensors respectively; and
a signal processing system having a differential circuit for differentiating the image signals obtained by said first and second sensors, a detection circuit for detecting that a differentiated signal of said first sensor and a differentiated signal of said second sensor are in a predetermined relationship corresponding to said positional relationship, and a calculator for calculating the distance toward the object on the basis of the positional relationship of said first and second optical systems and said first and second sensors at a time when the detection by said detection circuit is performed.

4,989,828
BALL LOCK CONTROL VALVE ACTUATION PLUNGER-MECHANICAL TYPE

Joseph C. Pellegrino, Baldwin, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 25, 1990, Ser. No. 556,991
Int. Cl.[5] F15B *13/01*
U.S. Cl. 251—58 5 Claims



1. A valve actuator comprising:
a piston head having an annular groove transversely formed therein for receiving a plurality of locking balls;
a locking plunger positioned coaxial with the piston head and having an annular end adapted to selectively engage the piston head groove in response to pressure exerted on the head, the annular end contacting the balls thus forcing them radially outward when the plunger end engages the piston groove;
spring means contacting the locking plunger for normally retaining it in a preselected engaged position relative to the piston groove;
radial plunger means radially displaced relative to the piston by the locking balls;
a cam having a first portion retained in contacting relation with the outward end of the radial plunger means;
a port communicating with the piston head annular groove and the locking plunger annular end for causing disengagement between the locking plunger and piston head upon introduction of pressurized fluid into the port which moves the balls radially inward and away from the radial plunger means;
wherein a second portion of the cam contacts a plunger of the valve for moving it from one position to another when the radial plunger means likewise moves from one position to another.

4,989,829
PRESSURE BALANCED PROPORTIONAL FLOW CONTROL VALVE

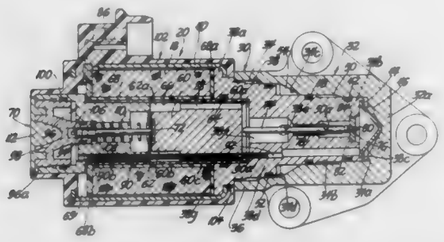
Donald W. Bickel, Rockford, Ill., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Apr. 27, 1990, Ser. No. 515,797
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.07 8 Claims

1. A pressure control valve having a valve housing (30) supporting an armature (60) for movement therein and including a pressure inlet port (46) adapted to be connected to a high pressure source defining a system pressure (26) and including an outlet port (50*a*) adapted to be connected to a device (24) whose operation is controlled in accordance with the output pressure of the valve, a solenoid coil (18) for positioning the armature relative to the valve housing and a needle valve (76) having a valve pin (74) producing a back pressure force on the armature during regulation of the output pressure from the valve in accordance with the energization level of said solenoid coil characterized by:
spring means (110) for biasing said armature in a first prede-

termined direction to either maintain said needle valve in a normally open position or a normally closed position;

said armature having an outlet pressure reaction surface (60*a*) and pressure balancing reaction surface (60*b*), said back pressure force of said needle valve pin acting on said outlet pressure reaction surface during regulation of the pressure at said outlet port; and



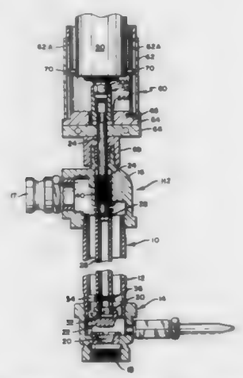
pressure balance means (70) for controlling the position of said needle valve solely in response to the average current flow to said solenoid coil and for maintaining the adjusted position of said needle valve as set by said average current regardless of changes in the system pressure.

4,989,830

MOTORIZED HYDRANT

H. Ronald Ratnik, Pittsford, N.Y., assignor to Ratnik Industries, Inc., Victor, N.Y.

Filed Jan. 26, 1990, Ser. No. 470,812
Int. Cl.[5] F16K *31/04, 31/50*
U.S. Cl. 251—129.11 3 Claims



1. A motorized hydrant apparatus for controlling the flow of a fluid, said hydrant apparatus comprising:

(a) a first housing including means defining (i) a valve seat through which a fluid can enter said first housing and (ii) an outlet through which a fluid within said first housing can exit therefrom;

(b) a plug adapted to cooperate with said valve seat for controlling the flow of fluid into said first housing through said valve seat;

(c) a valve stem operatively coupled to said plug for controlling the position of said plug relative to said valve seat, said valve stem having an end portion disposed outside said first housing;

(d) threaded means in said first housing for rotatably supporting said valve stem and for converting rotational movement of said valve stem to axial movement of said valve stem, whereby said plug is moved toward and away from said valve seat during rotational movement of said valve stem;

(e) motor means for rotatably driving said valve stem, said motor means comprising a rotatably-mounted drive shaft, a bi-directional electric motor adapted to selectively rotate said drive shaft in either of opposite directions, and coupling means for operatively coupling said drive shaft with the end portion of said valve stem;

(f) mounting means for slidably supporting said motor means on said first housing to allow said motor means to slide in a direction parallel to the longitudinal axis of said valve stem in order to accommodate the axial movement of said valve stem occasioned by the rotational movement thereof by said motor means; and

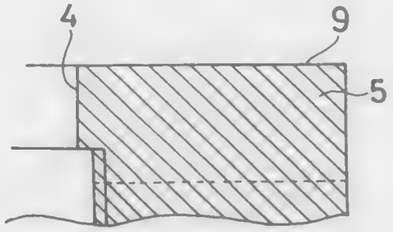
(g) a second housing for protectively enclosing said motor means, said second housing being rigidly connected to said first housing, said motor means being slidably supported within said second housing.

4,989,831

COUPLING DEVICE

Noboru Ootsuki, Akashi; Toshihiko Oonishi, Kakogawa; Katsumi Tomioka, Kobe, and Kouzou Miura, Hiroshima, all of Japan, assignors to Nippon Air Brake, Kobe and Hirotec Corporation, Hiroshima, both of, Japan

Filed Jun. 8, 1990, Ser. No. 535,590
Claims priority, application Japan, Mar. 6, 1990, 2-22562
Int. Cl.[5] F16L *37/28*
U.S. Cl. 251—149.7 5 Claims



1. A coupling device comprising:

a first coupling section to be attached to a first member with a first bore and having a large bore, a small bore, and a valve seat between said large and small bores;

a second coupling section to be attached to a second member and having a second bore opening at a contact surface which is opposed to said first coupling section;

a valve having a valve head normally resting on said valve seat and a tubular body snugly fitted in said small bore and having an axial opening with a mouth at an end and a plurality of radial openings at the other end so that they communicate with said large bore when said valve head leaves said valve seat;

a drain passage provided along said small bore and having an end opening at a bottom of said large bore and the other end opening at a lower side of said first coupling section; and

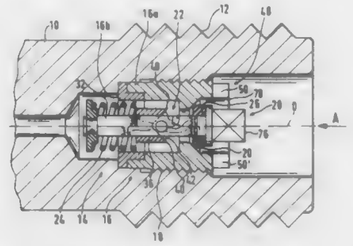
a drain valve provided in said drain passage and having a cylindrical hole intersecting said drain passage and a piston snugly fitted in said cylindrical hole and having a circumferential channel for opening said drain passage and a land portion for closing said drain passage.

4,989,832

VALVE ARRANGEMENT FOR FILLING AND EMPTYING A GAS CONTAINER

Paul Kremer, Walferdange, Luxembourg, assignor to Ceodeux S.A., Lintgen, Luxembourg

Filed Dec. 6, 1989, Ser. No. 446,844
Claims priority, application Luxembourg, Dec. 6, 1988, 87400
Int. Cl.[5] F16K *31/00*
U.S. Cl. 251—291 12 Claims



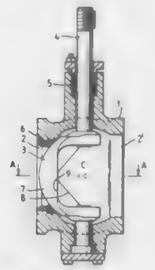
1. Valve arrangement for filling and emptying a gas container and in particular a gas container for high-purity gases, said valve arrangement having a residual pressure valve (14) and having a filling apparatus (52) mountable on the residual pressure valve, said pressure valve having a body (16) and having a closing part (22) movable axially in the body, a pressure spring (24) between the valve body and the closing part and urging the closing part toward a closed position, said closing part having a stem (32) with an axis (0), said valve arrangement being characterized in that the valve body and the stem of the closing part have interacting cam means which, under the influence of the pressure spring, produce a stable closed position of the valve stem and, under manual action counter to the influence of the pressure spring, produce an unstable open position of the valve stem, said filling apparatus having manually operable means for actuating the valve stem via the cam means counter to the action of the pressure spring, said manually operable means having a locking device which locks the valve stem in the unstable open position until the filling apparatus is removed from the residual pressure valve.

4,989,833

METHOD FOR CHANGING THE CHARACTERISTIC CURVE OF A REGULATION VALVE UNDER PRESSURE AND A REGULATION VALVE

Juhani Polón, Helsinki, Finland, assignor to Neles Oy, Helsinki, Finland

Filed Dec. 21, 1989, Ser. No. 454,634
Claims priority, application Finland, Dec. 30, 1988, 886051
Int. Cl.[5] F16K *5/10*
U.S. Cl. 251—209 9 Claims



1. A regulation valve comprising:

a housing having a first opening and a second opening which are connected by a flow duct;

a closing member disposed in the flow duct in the housing for regulating flow through the flow duct, the closing member being rotatable about a shaft axis so that a closing face of the closing member closes one of said openings at a time, the closing face closing the flow duct when the closing member is disposed in a closed position, the closing face having a first edge which regulates flow through said one opening when the closing member is rotated from said closed position in a first direction about said shaft axis, the closing face having a second edge which regulates flow through said one opening when the closing member is rotated from said closed position in a direction opposite said first direction about said shaft axis, said first and second edges having different shapes; and

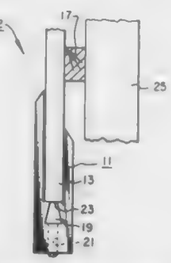
a turning shaft extending from said closing member to outside the housing for rotating the closing member about said shaft axis in said first and opposite directions.

4,989,834

FENCE COMBINATION

Hal D. Hudgins, 5423 Spring Creek Dr., Tyler, Tex. 75703

Filed Jul. 20, 1990, Ser. No. 555,312
Int. Cl.[5] E04H *17/00*
U.S. Cl. 256—1 3 Claims



1. A base fence protector disposed along a line of a fence and adapted to hold fence material off the ground comprising:

a. a plurality of sections abutting in end-to-end engagement; each said section having an upper substantially planar fence receiving slot defined by upstanding edges along respective sides; each said fence receiving slot being disposed in a plane; and a lower drain slot intersecting said fence receiving slot and disposed in a plane parallel with the plane of the fence receiving slot, said lower drain slot intersecting said fence receiving slot and having lesser lateral dimensions so as to define fence receiving shoulders at the intersection with the fence receiving slot; each said section having a plurality of liquid drain passageways for draining off any liquid that tends to accumulate in said liquid drain slot; said liquid drain passageways extending from the bottom of said liquid drain slot to the bottom of said fence protector; and

b. a plurality of fastening means adapted to engage respective ends drain passageways for holding said sections together and aligned along the line of the fence.

4,989,835

VEHICLE BARRIER

Robert A. Hirsh, Bethel Park, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

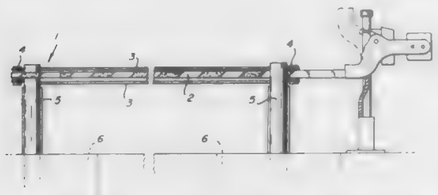
Filed Apr. 15, 1988, Ser. No. 181,993
Int. Cl.[5] E01F *13/00*
U.S. Cl. 256—13.1 6 Claims

1. A security barrier comprising:

first and second spaced post assemblies which define a passageway therebetween for a vehicle, each post assembly comprising a pair of pipe posts substantially anchored in a base support to define a space therebetween such that

upon impact a cable connection means will not be drawn through the space between the two pipe posts;

an elongated gate arm pivotally and separately supported at a first end portion, which is disposed adjacent to and spaced from the pipe posts of said first post assembly, to rotate between a lowered position in which the gate arm extends between the pipe posts of said first and second post assemblies so that a second end portion of the gate arm is disposed adjacent the pipe posts of said second post assembly to block the passage of a vehicle through the passageway, and a raised position in which the gate arm is pivoted away from the pipe posts of said first and second



post assemblies to allow a vehicle to pass through the passageway;

an elongated cable supported along and extending from said first end portion of said elongated gate arm to said second end portion of said elongated gate arm;

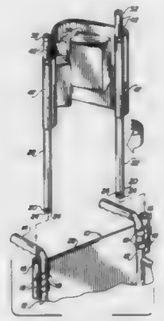
cable connection means attached to said first and second end portions of said gate arm for securing end portions of said cable to said gate arm and operating to engage the pipe posts of said first and second post assemblies when a vehicle moves into the passageway, thereby contacting and deflecting said gate arm and said cable when the gate arm is in the lowered position.

4,989,836

DETACHABLE WHEELCHAIR HEADREST

E. W. Hudson, III, Tempe, and Lewis B. Anderson, Glendale, both of Ariz., assignors to Premier Solutions, Ltd., Tempe, Ariz.

Filed Apr. 4, 1989, Ser. No. 333,175
Int. Cl.[5] A47C *1/10*
U.S. Cl. 297—391 10 Claims



1. A headrest attached to first and second vertical frame members of a wheelchair, for preventing involuntary head movement by a person seated in the wheelchair, the headrest comprising in combination:

(a) upright first and second mounting tubes attached to the first and second vertical frame members, respectively;

(b) upright first and second headrest poles each having a lower end inserted in the first and second mounting tubes, respectively;

(c) a flexible panel having parallel first and second sleeves attached to opposed first and second side edges thereof, the first and second headrest poles extending through the first and second sleeves, respectively; and

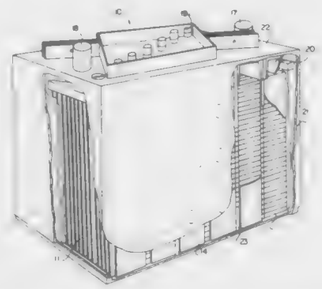
(d) first and second resilient head supports attached to a front face of the panel and spaced apart to restrain the head from involuntary side-to-side wobbling, wherein each of the first and second headrest poles has in its lower end a first pair of opposed notches, and wherein each of the first and second headrest poles has in its lower end a second pair of opposed notches, the first and second mounting tubes having therein means for engaging the notches of the first and second headrest poles, respectively, so that tension of the flexible panel can be more precisely adjusted by turning one of the first and second headrest poles to engage the second pair of notches.

4,989,837

PROCEDURE FOR PRODUCING AN ENVELOPE STRUCTURE FOR A STORAGE BATTERY

Toivo Kärnä, Porvoo; Ahti Kemppi, Järvelä; Esko Savolainen, Hollola; Kalevi Lind, Tampere; Niilo Jääskö, Porvoo, and Olli Walden, Espoo, all of Finland, assignors to Neste Oy, Finland

Filed Jun. 9, 1989, Ser. No. 364,781
Claims priority, application Finland, Jun. 9, 1988, 882728
Int. Cl.[5] B29C *39/10*
U.S. Cl. 264—261 8 Claims



1. Method for producing an envelope structure for a storage battery having at least one cell therein, comprising the steps of

arranging said at least one cell as an inner mold for casting of said envelope structure,

arranging a separate mold structure as an outer mold for the casting of said envelope structure,

casting electrically-insulating and electrolyte-impermeable material between said inner mold and outer mold, and

determining wall thickness of housing forming at least part of said envelope structure, with a spacer structure situated to remain inside said casting.

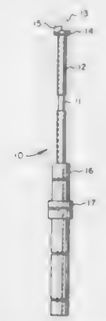
4,989,838

METALLURGICAL TREATMENT LANCE

Richard G. Kaldon, 1293 Greystone Dr., Upper St. Clair, Pa. 15241, and William K. Brown, 323 Ridge Point Cir., Bridgeville, Pa. 15017

Filed Aug. 10, 1989, Ser. No. 392,056
Int. Cl.[5] C21B *7/16*
U.S. Cl. 266—44 12 Claims

1. A steel or iron-making lance comprising an elongated member having a first end at one extremity of said member and another end at the opposite extremity of said member, said elongated member having a principal axis extending between said ends and defining the elongated dimension of said member, an aperture essentially parallel to said elongated dimension and extending from a pre-determined position adjacent said one end of said elongated member in the direction of said axis to said other end of said elongated member, said elongated member having an exterior surface slagline region for contacting the slagline of molten steel or iron when said lance is in use, a refractory coating on the exterior of said member, and a



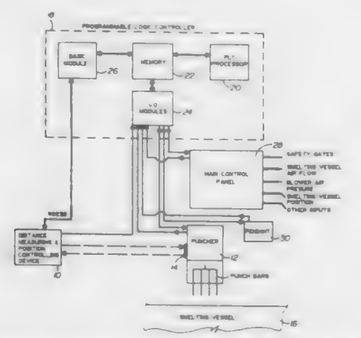
detachable sleeve mated to the exterior surface of said refractory coating to cover said slagline region and to protect said slagline region when said lance is in use.

4,989,839

AUTOMATIC TUYERE PUNCHER

Dale Simms, Kirkland Lake; Walter A. Dutton, Mississauga; Norman Seymour, Kirkland Lake, and Albert Pelletier, Candiac, all of Canada, assignors to Noranda Inc., Toronto, Canada

Filed Sep. 15, 1989, Ser. No. 407,656
Claims priority, application Canada, Sep. 15, 1988, 577548
Int. Cl.[5] C21B *7/16*
U.S. Cl. 266—80 12 Claims



1. A system for automatically or semi-automatically controlling the operation of a tuyere puncher which is movable along a smelting vessel to punch a series of tuyeres mounted on the smelting vessel comprising:

a) a single distance measuring device which measures the distance of the movable puncher from a reference position;

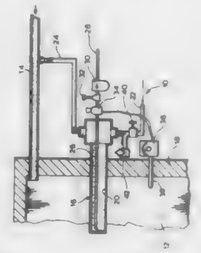
b) a programmable device having a memory which stores the position of each tuyere relative to said reference position, having the capability of communicating with the distance measuring device to obtain the current puncher position, an input capability to read signals from external devices, an output capability to control indicating devices and the movement and punching operations of the puncher, and a calculating facility to determine the motion of the puncher to punch all possible punchable tuyeres.

4,989,840

CONTROLLING HIGH HUMIDITY ATMOSPHERES IN FURNACE MAIN BODY

Radovan R. Maric, Willowdale, Canada, assignor to Union Carbide Canada Limited, Toronto, Canada

Filed Nov. 8, 1989, Ser. No. 433,560
Int. Cl.[5] C23C *11/00*
U.S. Cl. 266—111 11 Claims



1. A method of humidifying an atmosphere, which comprises;

feeding a primary gas flow to said atmosphere,

feeding a secondary gas flow through a heated humidifying zone to be humidified therein by superheated steam,

maintaining an inner surface of said humidifying zone at a temperature significantly in excess of 100° C. so as to heat said secondary gas flow therein and thereby increase the carrying capacity of said secondary gas flow for superheated steam,

feeding water onto said inner surface of said humidifying zone to generate said superheated steam in said humidifying zone to humidify said secondary gas flow by said superheated steam in said humidifying zone simultaneously with said heating of said secondary gas flow, said

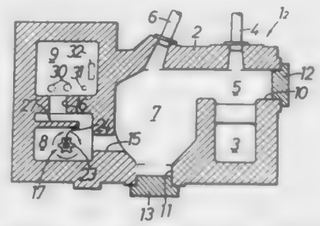
feeding said humidified secondary gas flow into said primary gas flow to be mixed therewith prior to feed of said primary gas flow to said atmosphere, thereby humidifying said primary gas flow and hence said atmosphere.

4,989,841

METAL CONTINUOUSLY MELTING AND RETAINING FURNACE

Kenzo Tokumasu, Kawagoe; Katsuo Taki, Kawasaki; Ryotatsu Ootsuka, Sakai; Masaaki Nakamura, Tokyo, and Tatsuo Akino, Saitama, all of Japan, assignors to Honda Foundry Co., Ltd., Kawagoe; Taisei Furnace Ind. Co., Ltd., Ayase and Showa Aluminum Corporation, Sakai, all of, Japan

Filed Apr. 14, 1989, Ser. No. 338,837
Claims priority, application Japan, Apr. 21, 1988, 63-98522
Int. Cl.[5] F27B *3/04*
U.S. Cl. 266—217 19 Claims



1. A metal continuously melting and retaining furnace having a substantially rectangular cross-section, said furnace comprising:

a preheating chamber for preheating a metallic material to be fed therein;

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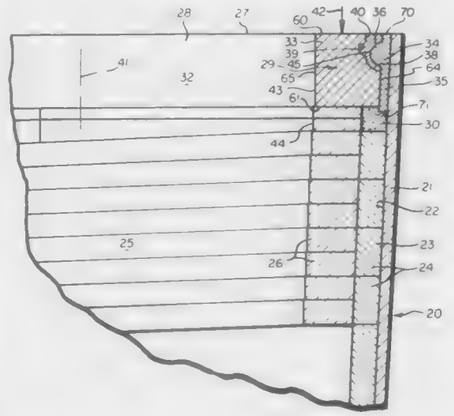
a melting chamber connected to said preheating chamber for melting the metallic material into a molten metal;
a retaining chamber connected to said melting chamber for retaining the molten metal from said melting chamber;
a treating chamber connected to said retaining chamber;
a ladling chamber connected to said treating chamber with a partition wall therebetween having an outlet port;
a bubble baffle means for baffling said molten metal and provided in the vicinity of the outlet port; and
a refining means for refining the molten metal and positioned in the vicinity of the partition wall,
wherein said preheating, melting, retaining, treating and ladling chambers are positioned in a manner such that cross-sections of all the chambers constitute the substantially rectangular cross-section of said furnace.

4,989,843

RETAINING STRUCTURE FOR REFRACTORY LINING IN HIGH TEMPERATURE VESSEL

William B. Dittrich, Portage, Ind., and Ian D. Prendergast, State College, Pa., assignors to Inland Steel Company, Chicago, Ill. and North American Refactories Co., Cleveland, Ohio

Continuation of Ser. No. 273,071, Nov. 18, 1988, abandoned.
This application Feb. 28, 1990, Ser. No. 492,285
Int. Cl.[5] C21B 7/06
U.S. Cl. 266—283 29 Claims



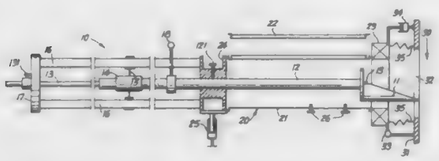
1. In a vessel for use at elevated temperatures, wherein said vessel includes (a) a metal outer shell having an inner surface, (b) an inner lining composed of a plurality of courses of refractory brick, and (c) an opening at one end of said vessel, the improvement comprising (d) retaining structure at said one end for retaining said inner lining in place, said retaining structure comprising:
an end course of refractory bricks at said one end;
and a metal retaining member adjacent said one end for cooperating with said end course of refractory bricks;
said retaining member comprising a base portion, attached to the inner surface of said metal shell at said one end of the vessel, and a protrusion extending from said base portion inwardly toward the interior of the vessel;
said end course of refractory bricks including a plurality of retaining bricks facing inwardly in side by side relation and each including a recess facing said metal shell and comprising means for receiving said protrusion from a horizontal direction;
said recess having an open end facing said one end of the vessel;
refractory means, including said retaining bricks, for encasing said protrusion;
said protrusion comprising means for retaining said end course in place;
said end course comprising means cooperating with said retaining member for holding said inner lining in place;
and means, including said recess and said protrusion, for initially accommodating thermal expansion by said end course in a first direction toward said one end of said vessel and for then preventing further expansion in said first direction while permitting thermal expansion in an inward second direction;
said end course comprising means for tightening the engagement between said refractory bricks in the end course in response to said expansion in said second direction.

4,989,842

DEVICE FOR CHARGING AND DISCHARGING A TILTING SMELTING FURNACE WITH A REMOVABLE CRUCIBLE

Jean-Claude Doriath, Eragny sur Oise; Georges M. C. A. Gauje, Saulx les Chartreux, and Jacques L. E. Grammagnac, Crisenoy, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation, Evry, France

Filed Jun. 19, 1980, Ser. No. 164,812
Claims priority, application France, Jun. 27, 1979, 79 16511
Int. Cl.[5] C21B 3/00
U.S. Cl. 266—276 6 Claims



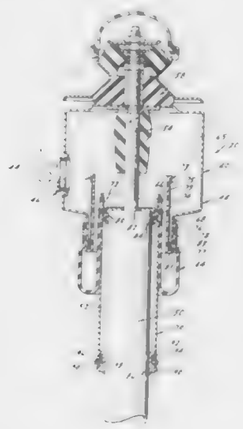
1. A device for placing a cylindrical crucible with a compact cylindrical smelting charge in a smelting furnace, comprising:
a charging shovel in the form of a gutter the cross section of which is in the shape of an arc of a circle;
a rectilinear rod, with the shovel attached to its end, the rod and the shovel being approximately co-axial;
means for maintaining the rod horizontally in alignment with a tilting furnace in the horizontal position;
means for moving the rod in travel in the direction of its axis,
the inside radius of the cross section of the shovel being at least equal to the semi-diameter of the charge, and its outside radius being less than the inside radius of the crucible, and means permitting the rod to rotate about its axis, in a manner such as to permit placement of the charge in the shovel, to cap the charge and the shovel by the crucible, and, once the shovel, charge, and crucible have been inserted in the furnace by axial movement of said rod, release the crucible and charge without substantial shock by rotating the shovel;
the rod being axially bored and having in its bore a slidable rectilinear lever appreciably longer than the rod permitting the lever to slide into the shovel, and means to momentarily hold the aforesaid lever in a fixed position in space in order to hold the charge and the crucible toward the back of the furnace as the shovel is extracted.

4,989,844

VEHICLE LEVELING SHOCK ABSORBER ASSEMBLY

Jan M. A. Wijnhoven; Henri C. J. Vanhove, both of Sint Truiden, and Marc J. I. J. Panis, Kessel-Lo, all of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 877,121, Jun. 23, 1986, Pat. No. 4,802,657.
This application Nov. 14, 1988, Ser. No. 270,543
Int. Cl.[5] F16F 9/04
U.S. Cl. 267—64.24 9 Claims



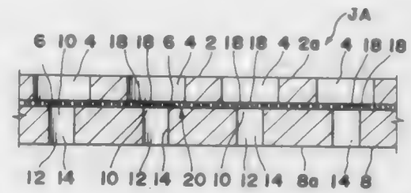
1. A fluid adjustable shock absorber assembly comprising:
a shock absorber having an elongated housing, a piston slidably movable within said housing, and a piston rod attached to said piston and extending laterally outwardly from one end of said housing for longitudinal movement relative to said housing;
a generally hollow and relatively rigid dirt shield generally surrounding at least a portion of said shock absorber and being removably and sealingly interconnected with a longitudinally outer end of said piston rod;
a flexible diaphragm member sealingly interconnected with both said dirt shield and said housing in order to at least in part define a variable-volume pressurizable fluid chamber therewith;
a generally tubular diaphragm support member for laterally supporting at least a portion of said diaphragm member in a laterally spaced-apart relationship with said housing at least at longitudinally spaced-apart first and second longitudinal positions thereon;
a support ring fixedly attached to said housing at said second position thereon;
a plurality of pin members operable to be inserted through said flexible diaphragm support member and into said support ring so as to removably attach said flexible diaphragm support member to said support ring; and
a generally cup-shaped cap member having an opening extending longitudinally therethrough for receiving said piston rod, said cap member being fixedly attached to said housing at said first longitudinal position with a portion of said housing extending into said cap member, said diaphragm support member being removably attached to and laterally supported by said cap member at said first longitudinal position on said housing;
whereby said flexible diaphragm member can be removably attached to said generally tubular diaphragm support member so as to permit said shock absorber to be selectively disconnected from said dirt shield.

4,989,845

PELLET ACCOMMODATING AND ALIGNING JIG

Yoshio Kurita, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 8, 1989, Ser. No. 447,826
Claims priority, application Japan, Dec. 9, 1988, 63-312563
Int. Cl.[5] B25B 11/00
U.S. Cl. 269—21 2 Claims



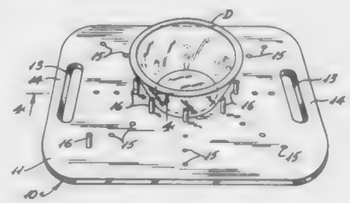
1. A pellet accommodating and aligning jig comprising an upper portion defining an upper surface of the jig and a plurality of pellet-accommodating recesses extending therein from said upper surface to surfaces in the jig defining the bottoms of said recesses, respectively; a lower portion defining a lower surface of the jig and a respective through-bore extending between said bottom surface and each of the surfaces defining the bottoms of said pellet-accommodating recesses wherein each respective said through-bore has one end open at said bottom surface of the jig and another end open to a respective one of said pellet-accommodating recesses, said one end constituting a vacuum exhaust inlet and said another end constituting a vacuum exhaust outlet through which air in each said through-bore can be evacuated to attract pellets in said pellet-accommodating recesses to said surfaces defining the bottoms of said recesses; and a micromesh member disposed at the bottoms of said pellet-accommodating recesses and defining a plurality of apertures therethrough, said apertures having respective diameters that are smaller than the diameter of each respective said through-bore.

4,989,846

COVERED DISH CARRIER

Lucinda Quinn, 706 Glenwood Rd., Talladega, Ala. 35160

Filed May 8, 1990, Ser. No. 520,408
Int. Cl.[5] B23Q 01/00
U.S. Cl. 260—54.5 7 Claims



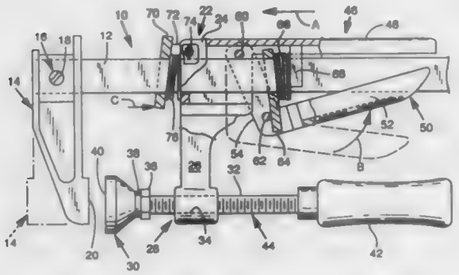
1. A carrier for transporting dishes comprising a tray, said tray having upper and lower surfaces, said tray being formed of a non-heat conducting material, said tray having a central portion and side portions, a plurality of holes in said tray and extending from said upper surface toward said lower surface, said holes terminating in spaced relationship from said lower surface, said holes being arranged in spaced relationship to one another so that a number of holes will be in surrounding relationship with a dish placed on said upper surface of said tray, a plurality of pin members, said pin members being selectively and frictionally seated within said holes, whereby when a dish is placed on the upper surface of said tray said pin members may be inserted within said number of holes so as to be in surrounding and generally abutting relationship thereto.

4,989,847

CLAMPING DEVICE

Grant Chapman, 817 Mt. Adams, Boardman, Oreg. 97818

Filed Sep. 12, 1989, Ser. No. 406,261
Int. Cl.[5] B25B *5/02*
U.S. Cl. 269—170 6 Claims



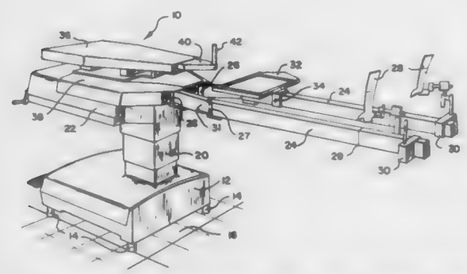
1. An improved bar-clamp apparatus comprising:
an elongate bar;
a first clamping jaw affixed adjacent one end of said bar;
a carrier mounted for selective reversible movement on and along said bar;
a second clamping jaw facing said first jaw and mounted on said carrier for movement both therewith and relative thereto; and
a trigger/lever, one-hand-actuatable drive mechanism drivingly connected to said carrier, actuatable to drive said carrier along said bar towards the bar's said one end, including a handle disposed on one side of said bar, and an elongate, pivoted trigger/level, whose long axis generally parallels that of said bar, disposed on the opposite side of said bar.

4,989,848

APPARATUS FOR ADJUSTING THE POSITION OF THE UPPER BODY SUPPORT OF AN ORTHOPEDIC TABLE

Lawrence S. Monroe, Erie, Pa., assignor to American Sterilizer Company

Filed Dec. 21, 1981, Ser. No. 332,655
Int. Cl.[5] A61G *13/00*
U.S. Cl. 269—322 1 Claim



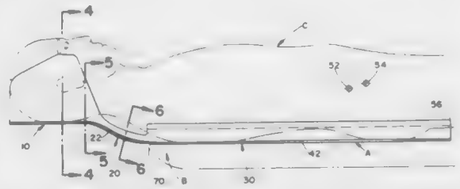
1. Apparatus for mounting the upper body support to the base of an orthopedic table which supports and positions a patient, the table defining a longitudinal axis and being of the type having a support for the upper body of the patient, a base adapted to position the upper body support a distance from the floor, members secured to the base adapted to support the legs of the patient and a support for the sacrum of the patient supported by the base, said mounting apparatus permitting movement of the upper body support transversely of said longitudinal axis and comprising:
a slide bar mounted to the upper body support;
a bearing secured to the base adapted to receive said slide bar and through which said slide bar can slide transversely of said longitudinal axis of the table;
a lock bar mounted to the upper body support and adapted to releasably engage a lock pin, said lock pin preventing said lock bar and the upper body support from sliding when said lock pin and said lock bar are engaged with each other; and
means for causing said lock bar to become engaged with or disengaged from said lock pin;
said lock bar defining an opening adapted to receive said lock pin and means for biasing said lock bar toward said lock pin, and further defining a cam opening;
said causing means including an operator bar to which a cam pin is secured, said cam pin extending through and slidable within said cam opening, movement of said cam pin within said cam opening causing a change of position of said opening relative to said lock pin, and an operator for moving said operator bar relative to the upper body support and moving said cam pin within said cam opening between a position in which said lock pin can be disposed within said opening and a position in which said lock pin cannot be disposed within said opening.

4,989,849

HEADREST FOR MEDICAL TREATMENT COUCH

Anton Z. Zupancic, Kirtland, and William H. Amor, Chagrin Falls, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Nov. 23, 1988, Ser. No. 275,577
Int. Cl.[5] A61G *13/00*
U.S. Cl. 269—328 12 Claims



1. An upper body support structure for patients undergoing radiographic, diagnostic examination of head and spinal column regions, the structure comprising:
an integrally formed, unitary upper body support member which is transparent to diagnostic radiation, the member including:
a torso receiving region having an upper portion, said torso receiving region being which is dimensioned to slide between a flat upper surface of a patient supporting couch and a patient laying on the couch in a prone position without requiring the patient to sit up, roll-over, or bend its spinal column, the torso receiving region defining a pair of indented portions adjacent upper portion side edges thereof, each indented portion having a generally vertical surface disposed adjacent one side edge of the torso receiving region,
a neck region connected integrally with the upper portion of the torso receiving region and extending upward therefrom along a generally arcuate path,
a head receiving region integrally formed with the neck region to support the patient's head in a prone position, the head receiving region including side members for inhibiting head rotation and preventing the patient's head from sliding off the head receiving region;
a pair of arm supports, each arm support including (i) a downward extending detent having a generally vertical surface for frictionally engaging the torso receiving region indented portion generally vertical surface, (ii) a downward depending foot portion for abutting a side surface of the patient receiving couch, and (iii) an arm

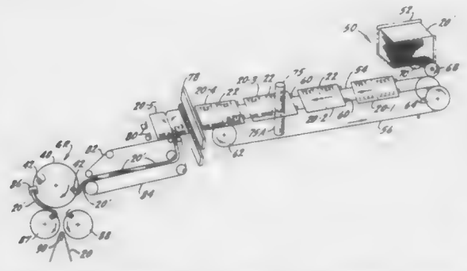
supporting surface which is mounted in a generally horizontal position when the generally vertical surfaces are frictionally engaged and the foot portion is pressing against the vertical side surface of the couch; and
wherein the torso receiving region extends between the patient and the couch at least beyond a center of gravity of the patient, such that the torso receiving region is urged firmly against the patient couch upper surface by the patient's weight when the neck and head regions are cantilevered over an end of the couch.

4,989,850

SIGNATURE MACHINES

Ronald W. Weller, 13368 Strawberry La., Orland Park, Ill. 60462

Filed Mar. 30, 1989, Ser. No. 330,453
Int. Cl.[5] B41F *13/54*
U.S. Cl. 270—1.1 11 Claims



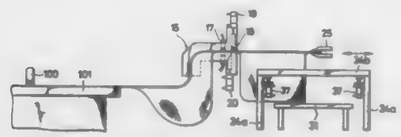
1. Signature machine for feeding to a signature gatherer folded signatures having inside pages with pre-printed text thereon facing one another, said machine comprising:
a pocket feeder including a hopper for receiving a supply of the pre-printed signatures, in an unfolded state, and also including means to withdraw and feed signatures therefrom one by one to a conveyor having a horizontal run for conveying the signatures, fed thereto from the pocket feeder, in a forward direction toward the gatherer with the pre-printed text parallel to the axis of conveyor travel; an ink jet printer in the raceway downstream of the pocket feeder positioned and oriented to add text to the signature parallel to the pre-printed text thereon; a signature folder downstream of the printer to fold the signature to form a backbone so that the added text is on an inside page of the folded signature, and means to deliver the folded signature to the gatherer.

4,989,851

METHOD AND APPARATUS FOR STACKING FABRIC STRIPS WITH SLIDE FASTENER STRINGERS

Yukio Maede, Kurobe; Akio Yunoki, Namerikawa, and Masaharu Matsui, Toyama, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,263
Claims priority, application Japan, Feb. 17, 1988, 63-35950
Int. Cl.[5] B41L *43/04*
U.S. Cl. 270—41 7 Claims



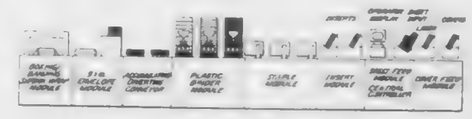
1. A method of stacking a multiplicity of fabric strips attached with a slide fastener chain one upon another in alignment, which method comprises the steps of feeding a slide fastener chain in its longitudinal direction, said chain having a series of individual fabric strips attached at predetermined intervals; folding each of said fabric strips in halves, juxposed to each other, along the longitudinal axis of said fastener chain; positioning said strip tautly in alignment with a stacking table; clamping said strip from both sides closely along its folded edge; cutting said fastener chain adjacent to a trailing end of said strip; tilting the cut strip toward the stacking table; and releasing the cut strip to lie flat on the table.

4,989,852

ELECTRONIC PUBLISHING SYSTEM

William H. Gunther, Jr., Mystic, Conn., assignor to Gunther International, Ltd., Mystic, Conn.

Continuation of Ser. No. 314,086, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 58,183, Jun. 4, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 464,318
Int. Cl.[5] B65H *43/02*
U.S. Cl. 270—56 11 Claims



1. A mechanism for processing a document having at least one pre-printed sheet with information data thereon, which comprises a central controller having stored therein information comparison data necessary to process said document a feeder module, said feeder module having feeder means to receive a plurality of sheets in a stack and to feed said sheets one-by-one from said stack, means operatively associated with said feeder module for reading information data on each sheet before each sheet is fed from said stack, the information data on the first sheet of said stack being at least partial instructions to the central controller as to the manner of processing said document, said reader being positioned adjacent the feeder means so that it reads the information data on a sheet in the stack before the sheet is fed from the stack, means for comparing the information data read on each sheet with the information comparison data in the central controller to determine whether the proper sheet will be fed from the stack, means responsive to the central controller and adapted to stop the operation of the mechanism and to prevent the feed of a sheet from the stack if the information data on the sheet does not match with the information comparison data in the central controller processed, and means controlled by the central controller to process said document in a predetermine manner responsive to the partial instructions received by the central controller from said first sheet.

4,989,853

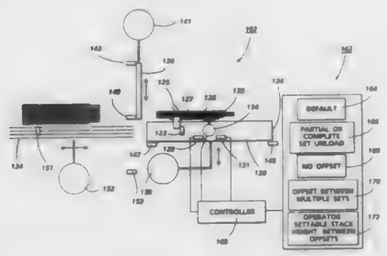
APPARATUS FOR OFFSETTING SHEETS

James F. Matysek, Fairport; Richard C. Schenk, Webster, and Charles E. Smith, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1988, Ser. No. 276,986
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—58 20 Claims

1. An apparatus for delivering to an operator offset batches of sheets reproduced from at least one set of documents, including:
means for selecting the number of sheets of each batch to be offset from one another;
means for receiving and supporting the sheets; and
means, responsive to said selecting means, for moving said receiving and supporting means at selected intervals to offset from one another a selected number of sheets corre-

sponding to a batch of sheets with the selected number of sheets in the batch ranging from a number of sheets less



than a complete set to a number of sheets greater than a complete set.

4,989,854

DOCUMENT SET DELIVERY APPARATUS

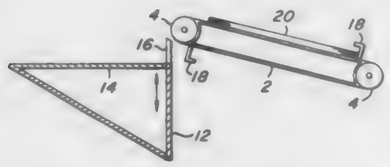
Michael R. McNamara, Hoddesdon, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 15, 1988, Ser. No. 206,799

Claims priority, application United Kingdom, Jun. 26, 1987, [illegible]

Int. Cl.[5] B65H *5/22*

U.S. Cl. 271—3.1 4 Claims



1. A document set delivery apparatus, comprising a belt adapted to extend below a supply of sheets delivered seriatim so that they form a stack above an upper run of the belt, which is intended to remain stationary until after the last sheet has been delivered, and at least two projections from the belt surface which are aligned across the width of the belt, each projection having an integral, non-movable portion thereof substantially orthogonal with respect to the upper run of the belt and ending in a forward hook that is parallel to the upper run of the belt and adapted to overlie the rear edge of the set when it is contacted by the orthogonal projections after a major portion of the set has been driven beyond the surface of said belt, and wherein said forward hook of said at least two projections is initially contacted by the set only after the major portion of the set has left the surface of said belt, whereby when the belt is driven in a forward direction to deliver the set to an output tray, the hooked ends of the projections are effective to keep the rear edge of the set in contact with the projections until the set has dropped out of the path of the projections.

4,989,855

DEVICE FOR POSITIONING PLATE-SHAPED PIECES DURING THEIR TRANSFER INTO A PROCESSING MACHINE

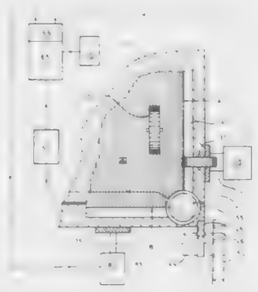
Georges Polic, Prilly, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed May 16, 1989, Ser. No. 352,369

Claims priority, application Switzerland, May 19, 1988, [illegible]

Int. Cl.[5] B65H *7/08*

U.S. Cl. 271—227 10 Claims



10. A method for setting up a device for aligning a sheet of material having printed matter with the printed material being aligned with a subsequent processing device, said method including providing a feed table having a camera fixed for visualizing portions of a printed area on a sheet being moved into alignment relative to a front edge stop and a lateral edge stop; moving the sheet forward until it will be situated underneath a visual area of the camera and close to a carrier for moving it into the processing device; appropriately modifying the camera position, the enlargement rate of the lens in a way to insure proper contrast between the printed areas on the sheet, the unprinted areas between the printed areas and the edges, and the table uncovered by the sheet; locking in these settings; modifying appropriately the parameters of the corrections for the light intensity and/or contrast and digital enlargement rates of a signal processing device; and then running the sheet at a low speed through the device and recording the various reference values in a control means for the device for subsequent use in determining error signals for positioning subsequent sheets.

4,989,856

SAFETY ROCKING HORSE

Kuo-Chen Shieh, No. 10, Alley 1, Lane 92, Kwangchow Street, Taipei City, Taiwan

Filed Jan. 19, 1990, Ser. No. 467,175

Int. Cl.[5] A63G *17/00*

U.S. Cl. 272—52 1 Claim

1. A safety rocking horse comprising:

(a) a user support means;

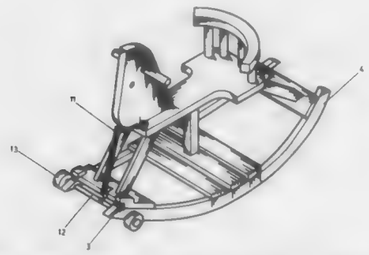
(b) a pair of rocker arms for engaging a support surface and forward and rearward ends, and the user support means being mounted on the rocker arms;

(c) the forward ends of the rocker arms being provided with upper groove means and lower groove means;

(d) a buffer assembly including an axle, wheel means supported on the axle and an elastic rope, one of end of the elastic rope being secured to the user support means and another end of the elastic rope being secured to the axle;

(e) the axle being selectively engageable within either the upper groove means or the lower groove means and maintained in either position of engagement under tension of the elastic rope; and

(f) whereby when the axle is engaged in the lower groove means and rocking of the horse by the user causes the center line of the horse to approach its declination line, the



wheel means engages the support surface to dissipate the forward velocity of the horse and cause the horse to move forwardly along the support surface, thereby preventing the horse from turning over.

4,989,857

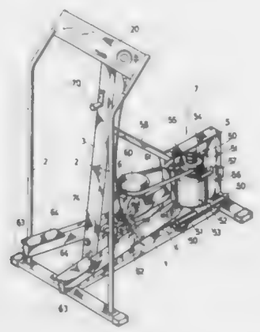
STAIRCLIMBER WITH A SAFETY SPEED CHANGING DEVICE

Hai-Pin Kuo, Chi-Lu-Chien No. 30, Pao-An-Tsun, Jen-Ten Hsian, Tainan County, Taiwan

Filed Jun. 12, 1990, Ser. No. 536,986

Int. Cl.[5] A63B *1/00, 22/02*

U.S. Cl. 272—70 1 Claim



1. A stairclimber with a safety speed changing device comprising:

a base;

a handle frame vertically mounted on said base;

a support vertically mounted between a gauge board and said base;

a front bracket fixed on said base and spaced apart from said support;

a rear bracket mounted on said base and disposed rearwardly of said front bracket;

a motor having a variable speed V-pulley and slideably mounted on said rear bracket;

a transmission mechanism fixedly mounted on the upper side of said front bracket and provided with a pulley connected to said variable speed V-pulley of said motor via a belt, and a linkage pivotally connected with an oscillating rod having a pair of pedals, said oscillating rod having a rear end which is in turn pivoted on two sides of said rear bracket; and

a speed changing mechanism having a rotating handle disposed on upper half of said support to control an upper gear which in turn drives a lower gear via a chain, said lower gear connected to a universal joint connected with an axle having male threads and a stop collar at the end so that the axle may be engaged with a sleeve with female threads, said sleeve being formed at the top with a groove adapted to receive a stop member on the rear bracket, whereby said sleeve is moved rearwardly to push said motor and thereby change the exercising speed via the variable speed V-pulley.

4,989,858

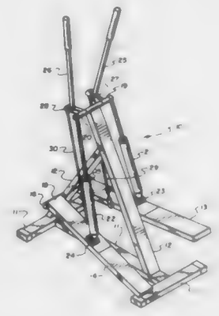
APPARATUS FOR EXERCISING BOTH ARMS AND LEGS

Dow W. Young, Santa Clara; Marcus B. Sorenson, St. George, and Gary B. Young, Monticello, all of Utah, assignors to Cardio-Fit, Inc., Santa Clara, Utah

Filed Jan. 29, 1990, Ser. No. 472,359

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—70 6 Claims



1. A combination arm and leg exercising apparatus comprising in combination:

a horizontal base member;

an upright support frame attached at its lower end to said base member;

a pair of foot pedals pivotally attached at one respective end thereof to said support frame for vertical reciprocating motion;

a cross member attached to the upper end of said support frame;

a pair of upwardly extending arm handles pivotally attached at one respective end thereof to said cross member for reciprocating motion;

a pair of actuating rods pivotally attached at one respective end thereof to said arm handles and at the other respective end to said foot pedals, so that as an arm handle is reciprocatingly moved, the corresponding foot pedal is reciprocatingly moved through said actuating rod independently of the other foot pedal; and

a pair of tensioning means pivotally attached at one end thereof respectively to said upright support frame and at the other end thereof respectively to said foot pedals.

4,989,859

METHOD FOR TESTING AND/OR EXERCISING THE ROTARY NECK MUSCLES OF THE HUMAN BODY

Arthur A. Jones, 1155 NE. 77th St., Ocala, Fla. 32670

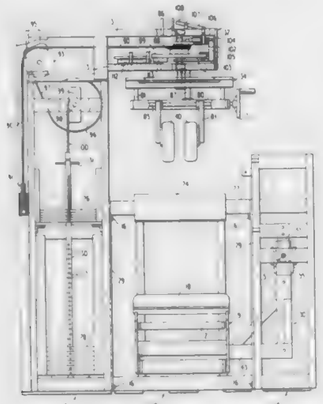
Continuation-in-part of Ser. No. 60,679, Jun. 11, 1987, Pat. No. 4,836,536, and a continuation-in-part of Ser. No. 236,367, Aug. 25, 1988, Pat. No. 4,902,009, and a continuation-in-part of Ser. No. 181,372, Apr. 14, 1988, Pat. No. 4,834,365. This application Feb. 8, 1989, Ser. No. 307,706

Int. Cl.[5] A63B *23/025, 21/062*

U.S. Cl. 272—94 2 Claims

1. A method of exercising rotary muscles of the neck of a

human subject comprising the steps of immobilizing the chest and shoulders of the subject below the neck to isolate the neck muscles from the torso of the subject, positioning the subject's head against a resistance pad movable about a vertical axis, having the subject exert with said muscles a force against the resistance pad to rotate the pad about said vertical axis while the subject rotates the head towards a first side of the subject, and connecting a yieldable resistance weight to the pad to yieldingly oppose movement of said pad toward said first side,



and then having the subject rotate his head from said first side towards an opposite second side while said resistance weight returns towards a starting position and wherein said resistance weight is less than the static strength of the subject's neck muscle being exercised and wherein the chest and shoulders of the subject are immobilized by rotating about a vertical axis a pad frame to a position in front of the exerciser, and then moving a chest pad on the frame horizontally to engage chest and shoulder areas of the subject.

4,989,860

DEVICE FOR PROVIDING ENHANCED MOVEMENT OF A PERSON'S TRUNCAL MUSCLES AND SPINE

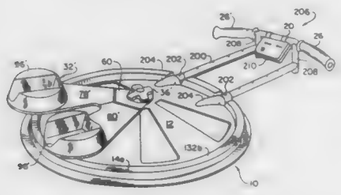
John F. Iams, Poway; Robson L. Splane, Jr., Granada Hills, and John A. Drusch, III, Escondido, all of Calif., assignors to Superspine, Inc., Poway, Calif.

Division of Ser. No. 232,861, Aug. 16, 1988, Pat. No. 4,846,465, which is a continuation of Ser. No. 843,558, Mar. 25, 1986, Pat. No. 4,858,918. This application May 25, 1989, Ser. No. 345,112

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—127 **9 Claims**



1. A device for providing enhanced movement of a person's truncal muscles and spinal joints in the lower spinal region, which comprises:

a generally horizontal base sized to support the person in an all fours kneeling posture in which there is minimal gravity-induced axial loading of the person's spine,

stationary rest means, fixed to said base, for engaging and supporting said person's two hands or two knees,

pivoting support means pivotably attached to the base in substantially the same horizontal plane as the stationary rest means for pivoting in a substantially level circular arc above the base and for engaging and supporting the person's remaining two hands or two knees to permit their movement in a circular arc, the pivoting support means being spaced apart from the stationary rest means sufficiently so that the person may assume a kneeling posture with the knees and the hands supported on the pivoting means and the stationary rest means, and

pivoting motion resistance means, attached to the base and to the pivoting support means, for providing resistance to the pivoting motion of the pivoting support means,

wherein said pivoting motion of the remaining two hands or two knees causes relative motion in the frontal, or coronal, plane between the thoracic and pelvic portions that the person's trunk while the person remains in the kneeling posture.

4,989,861

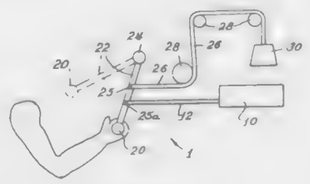
PULSE FORCE GENERATING AND LOADING EXERCISE DEVICE AND METHOD

Alan A. Halpern, 1400 Low Rd., Kalamazoo, Mich. 49008

Continuation of Ser. No. 256,602, Oct. 12, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 465,447

Int. Cl.[5] A63B *21/005*

U.S. Cl. 272—129 **35 Claims**



1. An exercise device comprising:

means for generating a series of mechanical pulse forces solely in one direction, and

means for directly engaging a body member of an exercising subject and applying said series of mechanical pulse forces directly to said body member and for moving with said body member while the body member is applying force in a certain direction,

said pulse force being of sufficient magnitude, direction, and duration to cause said body member to move a short distance with each pulse force in a direction opposite to said certain direction in which said body member is applying force, thereby causing the muscles of said body member to be stretched and strengthened.

4,989,862

BASKETBALL GAME PRACTICE DEVICE

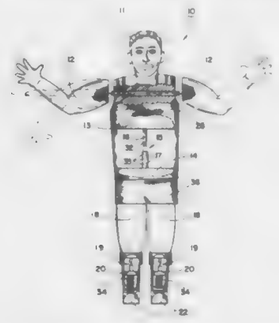
Michael Curtis, 911 Skeet Club Rd., High Point, N.C. 27260

Filed Sep. 20, 1989, Ser. No. 409,705

Int. Cl.[5] A63B *69/34, 71/04;* **A63H** *3/46, 15/06*

U.S. Cl. 273—1.5 A **16 Claims**

16. A device for use by practicing basketball players which appears as a defensive opponent comprising: a simulated player form, said form having an upper and lower torso, a first pair of limbs, a spline shaft, said spline shaft attached to said upper torso, said first pair of limbs attached to said spline shaft, a second pair of limbs, said second pair of limbs attached to said



lower torso and height adjusting means, said height adjusting means attached to said player form.

4,989,863

GAMES TABLE

David A. Hall, Greenborough House Twinney, Upchurch Sittingbourne, Kent, England M39 7DA

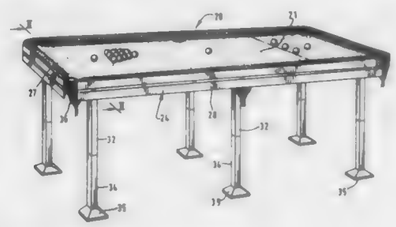
Continuation of Ser. No. 929,854, filed as PCT GB86/00115 on Mar. 4, 1986, published as WO86/05110 on Sep. 12, 1986, abandoned.

This application Dec. 14, 1988, Ser. No. 284,365

Claims priority, application United Kingdom, Mar. 7, 1985, 8505959; Apr. 2, 1985, 8508577; May 9, 1985, 8511805

Int. Cl.[5] A63D *15/00*

U.S. Cl. 273—3 A **6 Claims**



1. A ball games table, comprising:

a table base;

a table top supported by and fixed to said table base, said table top having edges and comprising a plurality of flat separate sections of boarding;

means connected to said sections for enabling rigid interconnection of said sections of boarding with one another as the table is assembled;

a plurality of separate sheets of material covering said separate sections, said plurality of separate sheets including an uppermost sheet, each of said separate sheets covering said boarding and the uppermost sheet of said plurality of sheets acting to form a playing surface, each of said sheets of said plurality of sheets of material being affixed to said table top at said edges thereof, the uppermost sheet of said plurality of separate sheets of material being selected from the group consisting of canvas and tarpaulin and each other sheet of said plurality of separate sheets interposed between the uppermost sheet and the boarding being of plastics material; and

a plurality of members interposed between said table base and said table top, each of said members having a height which is individually variable to allow said table top to be levelled.

4,989,864

RACQUET STRING STRAIGHTENER

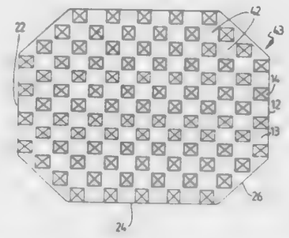
Vaclay Ubl, 5 Winona Road, Mount Eliza, 3930, Victoria, Australia

Filed Feb. 17, 1988, Ser. No. 156,634

Claims priority, application Australia, Jan. 27, 1988, PI6428

Int. Cl.[5] A63B *49/00*

U.S. Cl. 273—73 D **9 Claims**



1. A racquet string straightener device comprising a support and an array of teeth fixed to and projecting from the support, each of said teeth having a base of a shape to be received in engagement with a respective opening formed by an orthogonal arrays of strings of a racquet and in engagement with the strings and an outer end of reduced size to facilitate insertion into the opening, said teeth being disposed relative to each other in rows to define therebetween a first plurality of parallel gaps and a second plurality of parallel gaps extending perpendicular to said first plurality of gaps, said gaps being of a width only slightly larger than the width of said strings to each receive a portion of a respective string therein to reform a displaced string back into its original configuration by interaction between the displaced string and adjacent rows of teeth, being aligned in rows that extend parallel to said gaps the spacing between adjacent teeth of said rows being greater than the width of said gaps.

4,989,865

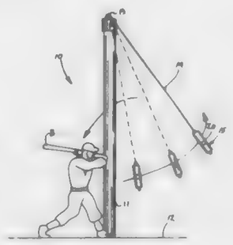
BATTING PRACTICE APPARATUS

Albert J. Plevier, 401 St. Clair Ave., Spring Lake, N.J. 07762

Filed Apr. 13, 1990, Ser. No. 508,830

Int. Cl.[5] A63B *69/40*

U.S. Cl. 273—26 R **5 Claims**



1. A batting practice apparatus comprising,

an elongate vertical support post, the support post including an upper post end, and

an elongate flexible tether line, the flexible tether line mounted to the post end at an upper end of the flexible tether line and wherein a lower free end of the tether line is mounted to an elongate target cylinder, the target cylinder including a cylinder loop fixedly secured to an upper terminal end of the target cylinder with the loop mounted to the free end of the tether line, and

wherein the target cylinder is formed of a polymeric semi-

rigid material, and includes an elongate aperture coaxially and coextensively directed through the cylinder, and an elongate rod directed through the aperture, the elongate rod mounted to the loop at an upper end of the rod, and a lower end of the rod projecting exteriorly of a lower end of the cylinder including lower fastening means mounted to the rod to secure the rod within the aperture, and

wherein the target cylinder includes at least one fiberglass tape member mounted medially of the cylinder about an exterior surface of the cylinder orthogonally oriented relative to the elongate rod.

4,989,866

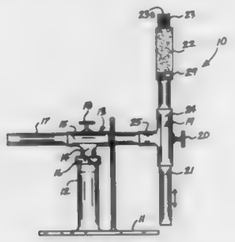
ADJUSTABLE BATTING TEE

David N. Dill, 2314 Vance Dr., Florence, S.C. 29501

Filed Feb. 5, 1990, Ser. No. 475,234

Int. Cl.[5] A63B *69/40*

U.S. Cl. 273—26 R **8 Claims**



1. An adjustable batting tee apparatus comprising, in combination,

a planar support plate having upper and lower surfaces for placement of a support surface,

a first follow vertical support post having an upper end said vertical support post being rigidly and orthogonally mounted to an upper surface of said support plate,

and elongated horizontally extending first adjustment means having a forward end said first adjustment means being rotatably mounted on the upper end of said first vertical support post for rotative positioning of the first adjustment means relative to the first vertical support post,

a second elongated vertically extending adjustment means mounted on said forward end of said first adjustment means for vertical positioning of the second adjustment means relative to the first adjustment means, the second adjustment means having an upper end,

the upper end of the second adjustment means defining an arcuate convex surface for receiving a spherical baseball thereon, and

first and second spaced abutment members mounted on the upper surface of the planar support plate for limiting rotative adjustment of the first adjustment means relative to the support plate.

4,989,867

DAMPED TENNIS PRACTICE DEVICE

Robert M. Herrick, P.O. Box 5304, Arlington, Va. 22205

Filed May 18, 1989, Ser. No. 348,604

Int. Cl.[5] A63B *69/00*

U.S. Cl. 273—29 A **7 Claims**

1. A damped tennis practice device comprising:

a support;

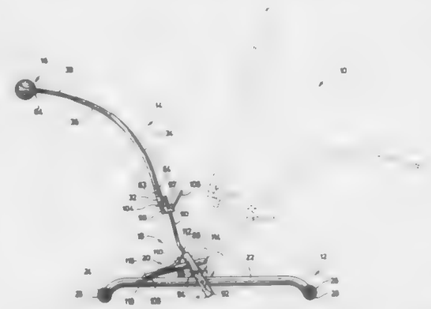
a ball;

wand means having a ball end and a support end, said wand means interconnecting said ball and said support;

means pivotally mounting said wand to said support;

resilient means interconnecting said support and said wand and oriented for biasing of said wand toward a stationary ready position during pivoting of said wand from the stationary ready position to a displaced position; and

gravitationally operable damping means separate from said wand and ball including a weighted member pivotally



mounted on said support and oriented for responsive pivoting relative to said wand such that said weighted member is upwardly displaced during pivoting of said wand from said ready position to said displaced position.

4,989,868

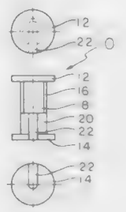
GOLF TEE TOOL

Edward E. Manko, 499 St. Vincent Dr., Akron, Ohio 44313

Filed Apr. 28, 1988, Ser. No. 187,352

Int. Cl.[5] A63B *57/00*

U.S. Cl. 273—32.5 **3 Claims**



1. A tool for placing a golf tee into the ground such as to maintain a golf ball at a predetermined height above the ground, comprising:

an elongated hollow cylindrical body member having spaced apart top and bottom plate members;

an elongated body member having said inner wall surface and an outer wall surface and interconnecting said top and bottom plate members;

a lip extending inwardly from said inner wall surface and being intermediate said top and bottom plate members; and

an opening in said bottom plate member for receiving a stem of a golf tee therethrough, said opening comprising a slot passing from a side edge of said bottom plate member to the center of said bottom plate member, said top plate and lip being adapted to mutually exclusively engage a cup of said tee.

4,989,869

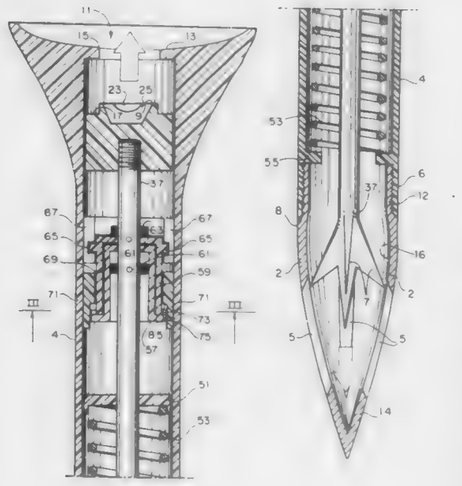
GOLF TEE

Lamar Lackey, 1122 Colombian Rd., Homewood, Ala. 35209

Filed Mar. 28, 1990, Ser. No. 500,553

Int. Cl.[5] A63B *57/00*

U.S. Cl. 273—33 **5 Claims**



1. An improved golf tee comprising:

(a) an upper housing made of flexible material capable of withstanding impact from a golf club without breaking, said upper housing including a cupped portion for holding a golf ball;

(b) a lower housing made of a rigid material, said lower housing including a tapered portion having a plurality of slots therein, said lower housing being removably connectable to said upper housing;

(c) a spike assembly including a metal rod, said metal rod having a head portion attached at one end and a plurality of spikes attached at the other end; and

(d) a spring loaded locking means for releasably locking said spike assembly between a first position and a second position, wherein each one of said metal spikes extends through each one of said slots in said lower housing in said first position and each one of said spikes is within said lower housing in said second position;

(e) whereby said spikes, when said spike assembly is in a said first position, permit said improved golf tee to further resist displacement from an inground position due to impact from a said golf club.

4,989,870

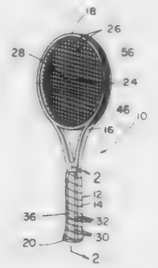
TENNIS RACKET

Richard Janes, Belchertown, Mass., assignor to Spalding & Evenflo Companies, Inc., Del.

Continuation-in-part of Ser. No. 194,617, May 16, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 463,766

Int. Cl.[5] A63B *49/08*

U.S. Cl. 273—73 J **8 Claims**



1. A tennis racket comprising a frame with an opening at the head end consisting of a bow and with a handle at the opposite end, the frame being fabricated of a rigid material, the handle including a separate intermediate member on the rigid frame with an exterior cross-sectional configuration having a plurality of flat sections and edges extending along the length thereof and an interior configuration conforming to the frame, the intermediate member being molded of a dense, soft urethane having a durometer at its exterior surface of about between 50 and 80 on the Shore A scale, the intermediate member having a common cross-sectional configuration along the majority of its length but varying in thickness around its circumference, the handle further including a separate soft grip material wrapped around the exterior of the intermediate member, the bow being formed with a common cross-sectional configuration enlarged in the direction of the axis of the opening and located around the majority of the opening and having a radial dimension of about 12 milimeters plus or minus about 10% and an axial dimension of about 20 millimeters plus or minus about 10%; and a grommet strip being molded of a soft, durable, wear resistant polyurethane-polycarbonate blend having a durometer of about 57 on a Shore D scale plus or minus 5 and secured to the radially exterior edge of the bow around the majority of the opening.

4,989,871

BADMINGTON RACQUET STRUCTURE

Chang C. Sheng, 9-1, Lane 161, Hsing Hu Rd., Sec. 1, Taichung, Taiwan

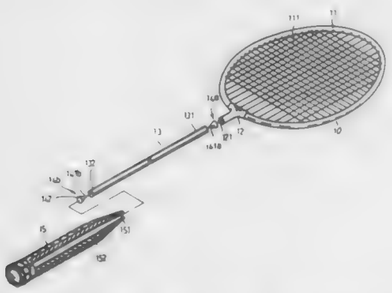
Filed May 2, 1990, Ser. No. 517,813

Int. Cl.[5] A63B *49/02*

U.S. Cl. 273—73 G **3 Claims**

1. An improved badminton racquet structure comprising; a head frame of substantially oval shape, said head frame threaded through in a criss-crossing fashion forming a net surface within said head frame; a T-shaped connector disposed on one side of said head frame along its major axis, said T-shaped connector being hollow; a handle with an internal receiving cavity co-axial with said handle; a connecting tube disposed to a maximum extent, on either end of said connecting tube, within said receiving cavity and said T-shaped connector; said connecting tube being co-axial with said handle and major axis of said head frame; two rigid retaining elements, one each of said rigid retaining elements disposed at the rearmost space in said receiving cavity and at the frontmost space inside of said T-shaped connector, said retaining elements being

co-axial with said receiving cavity and said T-shaped connector; and two outward retaining flares formed at the opposite



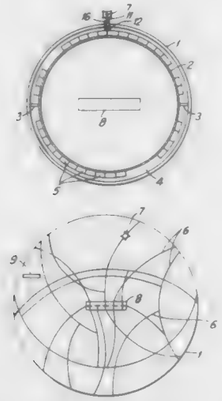
ends of said connecting tube, forming a sturdy connection between said connecting tube and said handle and head frame.

4,989,872

GAME OF ENTERTAINMENT

Rafael Urrestarazu Borda, P° Oriamendi, B° Ayete, San Sebastián, Spain 28009)

Filed Jul. 12, 1989, Ser. No. 378,640
Claims priority, application Spain, Oct. 28, 1988, 8803198[U]
Int. Cl.[5] A63B *71/00*; A63F *9/08*
U.S. Cl. 273—139 6 Claims



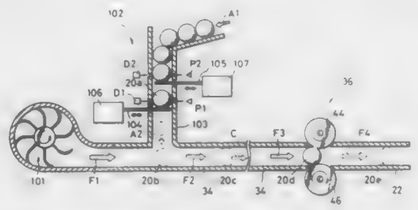
1. A game of entertainment, comprising:
two spheres, arranged one inside the other;
rigid separators provided between said spheres so as to separate and form a chamber between said spheres;
a plurality of cubically shaped counters housed in said chamber, each of said counters having an open side and an another side provided with a numeric code, the outer sphere being fluted by a random arrangement of grooves, said grooves determining paths toward a window divided into five equal parts and provided in an outer one of said spheres; and
a positioner slidable along said grooves and formed so as to be able to trap one of said counters and move said one counter toward said window, an arrangement in said window of five of said counters having a common code determining accomplishment of a final objective.

4,989,873

ROULETTE PLAYING DEVICE

Katsuki Manabe, Tokyo, Japan, assignor to Sigma Enterprises, Incorporated, Tokyo, Japan

Continuation of Ser. No. 120,127, Nov. 13, 1987, abandoned.
This application Aug. 14, 1989, Ser. No. 393,382
Claims priority, application Japan, Nov. 14, 1986, 61-271564; Nov. 14, 1986, 61-271565; Nov. 14, 1986, 61-271566; Nov. 14, 1986, 61-175094; Sep. 28, 1987, 62-243410
Int. Cl.[5] A63F *5/00*
U.S. Cl. 273—142 R 19 Claims



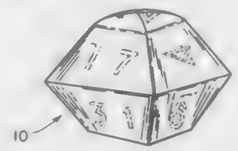
1. A roulette playing device comprising:
a rotatory roulette wheel having a plurality of ball pockets with betting marks;
an inclined, substantially circular runway surrounding the roulette wheel;
a substantially circular wall provided around an outer edge of the substantially circular runway continuously thereto and having an opening defined therein for a ball to be released through;
hitting means for releasing the ball into said substantially circular runway from said opening through an outlet, said hitting means comprising a first rotatable roller provided upstream of said outlet, a second rotatable roller with an opening therebetween which is smaller than the diameter of the ball, and drive means for driving said first and second rollers in opposite directions to each other;
release means for feeding balls one by one to said hitting means, said release means comprising a pair of reciprocable shutters positionable within a feed passage, said feed passage receives balls at one end thereof and is connected to the release passage at another end thereof, said release means further including reciprocation means for sequentially moving the shutters into and out of the feed passage to thereby feed the balls one by one; and
press means for pressing the fed ball against said first and second rotatable rollers of said hitting means,
the ball pressed against said first and second rotatable rollers by said press means being hit out by rotation of said first and second rollers to be released through a release passage leading to the outlet and then through said outlet.

4,989,874

LOTTERY SELECTING DICE

Harold Freitas, 438 Dutton Ave., San Leandro, Calif. 94577

Continuation-in-part of Ser. No. 330,681, Mar. 30, 1989, abandoned.
This application Sep. 11, 1989, Ser. No. 405,867
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—146 1 Claim



1. A set of six regular decahedron shaped lottery game dice comprising five dice modified to display nine numbered planar

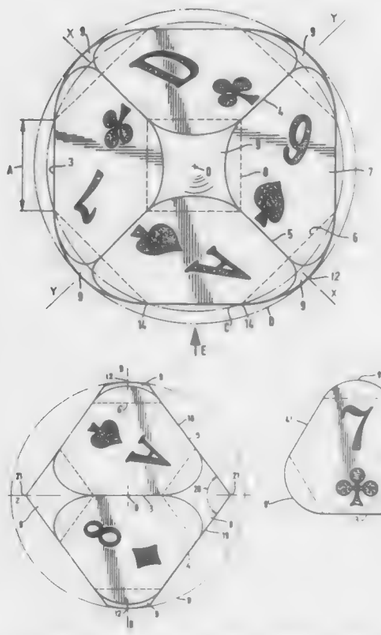
surfaces and one die modified to display eight numbered surfaces, each numbered surface having a different number between the numbers one through fifty-three.

4,989,875

DICE HAVING EIGHT FACES AND PROCESS OF PRODUCING SAME

Gilbert Capy, La Botte, Jarnioux, F-69640 Denice, and Jacques Bensarrouch, Caluire-et-Cuire, both of France, assignors to Gilbert Capy, Denice, France

Filed Jan. 26, 1989, Ser. No. 301,610
Claims priority, application France, Feb. 2, 1988, 88-01470; Jul. 12, 1988, 88-09704; Aug. 26, 1988, 88-11426
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—146 28 Claims



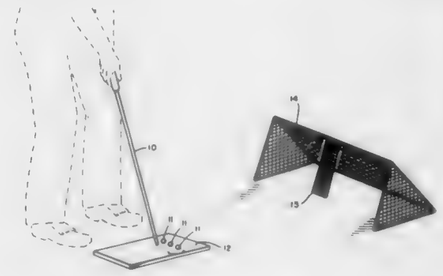
6. A die comprising eight planar surfaces and six convex faces, said planar surfaces comprising substantially hexagonal faces; said substantially hexagonal faces being grouped in a first block and a second block, with each of said first block and said second block containing four substantially hexagonal faces; each of said substantially hexagonal faces has two sides in common with two other substantially hexagonal faces in each of said first block and said second block in order to thereby define, in each of said first block and said second block, four common edges and a substantially pyramidal shaped having a base including a third side of each of said substantially hexagonal faces; said first block and said second block being positioned relative to one another so that the base defined by said first block is coextensive bases form four common edges; sides of each of said substantially hexagonal faces that are not in common with sides of the other substantially hexagonal faces forming six zones; said six convex faces being positioned so that each of said six zones includes one of said six convex faces; and each of said six convex faces being dimensioned so as to constitute areas of unstable equilibrium to favor positioning of the die on one of said substantially hexagonal faces, wherein each side of each of said substantially hexagonal faces has a length substantially A, and said convex faces are a portion of a sphere having a radius of approximately said length A.

4,989,876

PRACTICE GOLF CLUB AND SYSTEM

Arnold R. Hawkins, Sr., 1487 Sixth Ave., San Francisco, Calif. 94122, and Arnold R. Hawkins, Jr., 2437 Williams Ct. So., San Francisco, Calif. 94080

Continuation-in-part of Ser. No. 128,032, Dec. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 11,677, Feb. 6, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,215
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—176 F 46 Claims



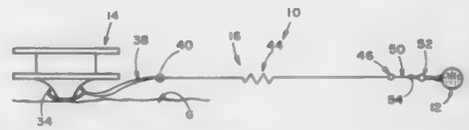
1. A practice golf club comprising:
a shaft;
grip means at the upper portion of the shaft; and
the lower end of the shaft comprises a surface area adapted for hitting a ball which area available for contacting the ball is no more than about 3.5 cm wide, wherein the weight and length of the practice golf club is comparable to a conventional golf club.

4,989,877

GOLF PRACTICE DEVICE

Thomas W. Bias, Rte. 6, Box 279, South Point, Ohio 45680

Filed Apr. 17, 1990, Ser. No. 509,756
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—200 R 2 Claims



1. A golf accessory comprising:
(A) an anchor which includes a golf tee-like element having
(1) a body having a point on one end for guiding said anchor into a supporting medium, such as the ground,
(2) a first flange mounted on a second end of said body remote from said first end,
(3) a cylindrical spool body attached at one end thereof to said first flange and extending parallel to the ground when said body is embedded in the ground in an operative orientation,
(4) a second flange mounted on a second end of said spool body and being oriented to be parallel to said first flange and spaced from said first flange,;
(B) a tethering unit connected to said anchor unit and including

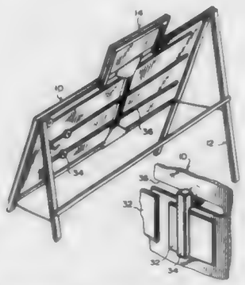
(1) a ring element on said tee-like element body,
(2) a bungee cord attached at one end thereof to said ring element, and having a second ring element attached thereto at a second end thereof,
(3) a monofilament line connected at one end thereof to said second ring element,
(4) a grommet affixed to a second end of said monofilament line,
(5) an elastic cord attached at one end thereof to said grommet, and
(6) a swivel connecting assembly attached at one end thereof to a second end of said elastic cord and having
(a) a cord connecting ring on said swivel connecting assembly one end,
(b) a body connected to said cord connecting ring,
(c) a first swivel joint connecting said body to said cord connecting ring,
(d) a second connecting ring connected to said body, and
(e) a second swivel joint connecting said body to said second connecting ring; and
(D) a golf ball element which includes
(1) a solid core golf ball having a diameter,
(2) a cotter pin securely affixed to said golf ball to extend along said golf ball diameter and having a cotter ring on one end thereof, said swivel connecting assembly second swivel joint being connected to said cotter ring, and
(3) fixing means fixedly securing said cotter pin to said golf ball.

4,989,870

WHEEL WORD GAME

Robert R. Davies, 3307 88th St., Lubbock, Tex. 79423

Filed Dec. 18, 1989, Ser. No. 451,783
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—240 8 Claims



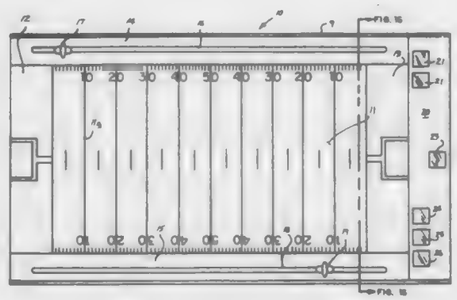
1. A wheel word game comprising:
(a) a puzzle board on a first easel, for displaying a puzzle as it is worked out, said puzzle board including a plurality of squares in which a host can write thereon the letters of the puzzle as they are called by the contestant to indicate to the contestant and audience how many words and of what length are in the puzzle, said puzzle board having a horizontal slot above each of the rows of said letters squares, and a marker in each of said slots, in which said marker can slide in said slot above each row of said letter squares to show how many letters are in each word, said marker hangs down so it can be positioned at the right hand edge of said last letter square to be used;
(b) an alphabet board for displaying letters called by a contestant, but not used in the puzzle;
(c) a plurality of puzzle cards having the completed puzzle written thereon;
(d) a plurality of free spin tokens for a contestant who wins free spins;
(e) a dry erase pen;
(f) a wiping cloth;
(g) a plurality of contestant selection cards for selecting a contestant and their order of play; and
(h) a spinning wheel rotatably carried on a second easel to randomly determine the options of each contestant for each play of the game.

4,989,879

FOOTBALL BOARD GAME

James L. Nigh, 5321 W. 76 Ave., Apt. #306, Arvada, Colo. 80003

Filed May 7, 1990, Ser. No. 519,804
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—247 5 Claims





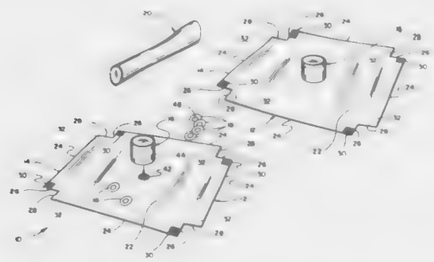
1. A board game apparatus for use by a plurality of opposing players for simulating a football game, wherein the apparatus comprises,
a planar game board, including first indicia defining a football field, wherein the football field further includes second indicia to define simulated ten yard designations at equal predetermined spacings along the football field, and
a forward and rear end of the football field including a forward and rear goal line respectively, and further including a left side line border and a right side line border, the left side line border including a first slot coextensive with the football field, and the right side line border including a second slot coextensive with the football field, wherein the first and second slots are parallel relative to one another, and
a first yardage marker slidably mounted within the first slot, and a second side line marker mounted within the second slot, wherein the first and second side line markers are utilized by the respective opposing players for indication of relative positioning of the respective positioning of the opposing players on the football field, and
a score board member orthogonally mounted relative to the football field in a spaced relationship relative to the football field, and
a plurality of dice pair, wherein each pair of the plurality of dice pairs are defined by a distinct array of digits relative to opposing dice pair for indication of relative movement of the opposing players about the football field said plurality of dice pairs include, a first offensive dice pair and a first defensive dice pair, each die of said first offensive and defensive dice pairs having digits of a medial range for representing football plays resulting in total yardage movements of medial range, a second offensive dice pair and a second defensive dice pair, each die of said second offensive and defensive dice pairs having digits of greater range than said first offensive and defensive dice pairs for representing football plays resulting in total yardage movements potentially smaller than the smallest total yardage movement obtainable by said first offensive and defensive dice pairs and total yardage movements potentially larger than the largest total yardage movement obtainable by said first offensive and defensive dice pairs, a third offensive dice pair and a third defensive dice pair, each die of said third offensive and defensive dice pairs having digits of greater range than said second offensive and defensive dice pairs for representing football plays resulting in total yardage movements potentially smaller than the smallest total yardage movement obtainable by said first offensive and defensive dice pairs and total yardage movements potentially larger than the largest total yardage movement obtainable by said second offensive and defensive dice pairs; a kick-off yardage dice pair; a punt yardage dice pair; a return yardage dice pair; and a field goal dice pair, wherein each die of each dice pair is defined by six-sided dice.

4,989,880

TOSSING GAME APPARATUS

Edward R. Gettemeier, and Marsha A. Gettemeier, both of Edwardsville, Ill., assignors to G-2 Products, Incorporated, Edwardsville, Ill.

Filed Jun. 21, 1990, Ser. No. 541,623
Int. Cl.[5] A63B *67/06*
U.S. Cl. 273—336 11 Claims



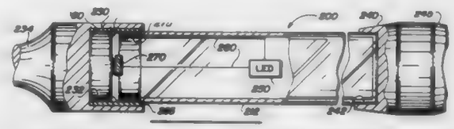
1. A target apparatus for receiving tossed playing pieces comprising:
a target assembly including a flexible mat having a central portion and at least two adjacent peripheral wall portions having end portions with cooperatively engageable means thereon, the cooperatively engageable means on adjacent peripheral wall portions being engageable to hold the peripheral wall portions in folded outwardly extending relation to the central portion,
and a cup shaped target receiver member with means for attaching the target receiver member to the central portion of said mat.

4,989,881

ILLUMINATED SPORTS PROJECTILE

Christopher L. Gamble, P.O. Box 9154, Canoga Park, Calif. 91309

Filed Feb. 28, 1989, Ser. No. 316,912
Int. Cl.[5] A63B *65/02*
U.S. Cl. 273—416 1 Claim



1. A dart for throwing at a target in a game area comprising:
(a) a generally elongate barrel with opposite ends having a light transmitting area and defining a compartment therein;
(b) a tail section and a point section at opposite ends of said barrel, at least one of said sections being detachable from said barrel to provide access to said compartment; and
(c) light emitting means in said compartment comprising an LED and a power source, at least one of said tail and point sections defining a recess, said power source including a battery in said recess, first and second contact means in said recess, third and fourth contact means associated with said barrel and connected via a wire pair to said LED, said first and second contacts respectively being in electrical connection with said third and fourth contacts when said sections and barrel are assembled to selectively activate said LED.

4,989,882

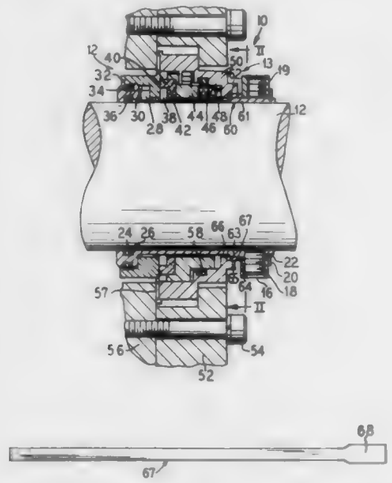
SHAFT SEAL WITH PREDETERMINED MOUNTING PARAMETERS

Dale J. Warner, 3916 Belmoor Dr., Palm Harbor, Fla. 33563, and Dale J. Warner, 2085 Swan La., Safety Harbor, Fla. 34695

Filed Sep. 14, 1989, Ser. No. 407,117
Int. Cl.[5] F16J *15/34, 15/38*
U.S. Cl. 277—11 9 Claims

1. In a shaft seal comprising a rotary seal assembly including a rotary seal member, a stationary seal assembly including a stationary seal member, wherein the rotary seal member is adapted for sealing engagement with the stationary seal member, and further wherein said sealing engagement is optimized by placing said seal assemblies into predetermined, relative axial and radial positions, a seal positioning assembly comprising the following:
a generally planar positioning groove disposed on an inner surface of said stationary seal assembly;
a generally annular abutment area provided on said rotary seal assembly and adjacent said positioning groove; and
a removable spacer strip disposed between and in contact

with said positioning groove and said abutment area, said spacer strip having a predetermined width and thickness



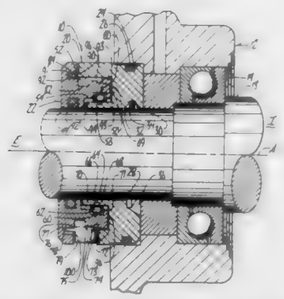
corresponding to said predetermined axial and radial positions of said seal assemblies.

4,989,883

STATIC AND DYNAMIC SHAFT SEAL ASSEMBLY

David C. Orlowski, Rock Island, Ill., assignor to Inpro Companies, Inc., Rock Island, Ill.

Filed Jun. 14, 1989, Ser. No. 365,895
Int. Cl.[5] F16J *15/16*
U.S. Cl. 277—25 20 Claims



1. A bearing isolator functionally interposed between a machinery housing and a rotatable shaft extending through the housing for isolating a shaft bearing and housing interior from an environment outside the housing; the isolator comprising, in combination,

a stator member adapted for connection to the housing,

a rotor adapted to be mounted on the shaft, the stator and rotor being formed with a flange and mating recess having opposed annular, axially-extending surfaces, the rotor having a radially extending recess located to confront the annular axially-extending stator surface, and

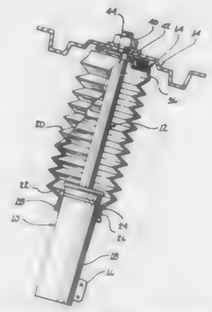
an annular, resilient seal member disposed in the recess and adapter to sealingly engage the rotor and the adjacent stator annular surface when the rotor is not in motion to prevent egress of lubricants from the housing interior and ingress of contaminants from the environment, the seal member being adapted to be directed radially away from and out of contact with the adjacent stator surface when the rotor is in operating motion.

4,989,884

AUTOMOTIVE BOOT

Clarence R. Goodman, 10827 W. Ruth, Peoria, Ariz. 85345

Filed Mar. 13, 1989, Ser. No. 322,539
Int. Cl.[5] B61F *15/22;* F16J *15/50, 15/52*
U.S. Cl. 277—31 15 Claims



1. A rotatable seal for an end of an automotive boot disposed about a strut, said seal comprising in combination:

(a) a radial flange;

(b) a radial channel having a greater radially oriented depth than axially oriented width for receiving said radial flange, said radial channel and said radial flange being dimensioned to accommodate rotation of said radial flange within said radial channel;

(c) means for interconnecting the end of the boot and the strut with said radial channel and said radial flange; and

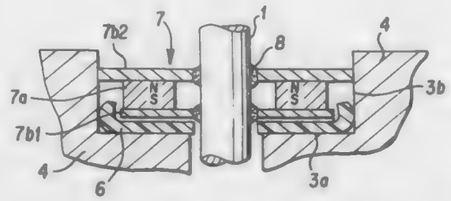
(d) means for developing a seal between said radial flange and said radial channel, said developing means including means extending axially intermediate said radial flange and said radial channel.

4,989,885

MAGNETIC FLUID RETAINER, AND SHAFT SEALER EMPLOYING SAME

Masao Iwata, Chichibu; Kiyoshi Eguchi, Kumagaya; Kenichi Mouri, Ohmiya, and Hiroshi Tsuchida, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 288,823, Dec. 23, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 484,472
Int. Cl.[5] F16J *15/40*
U.S. Cl. 277—80 1 Claim



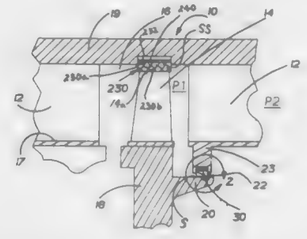
1. Apparatus for sealing a magnetic shaft comprising: a magnetic housing having a shaft-receiving hole and a stepped portion at least at one end of said shaft-receiving hole of a diameter sufficiently greater than the outer diameter of the shaft to be fitted therein; a magnetic fluid retainer having a shaft hole for passing therethrough the magnetic shaft and fittingly mounted in said stepped portion of said housing; and a magnetic fluid retained between said magnetic shaft and said magnetic fluid retainer; said magnetic fluid retainer being constituted by at least one pair of magnetic yokes and an axially magnetized permanent magnet gripped between said yokes, one of said yokes having a smaller outer diameter than the other to form a broader gap space between the yoke of smaller outer diameter and the inner periphery of said stepped portion of said housing than between the yoke of greater outer diameter and said stepped portion of said housing, wherein said yoke having the greater outer diameter abuts said housing periphery, the apparatus further including a non-magnetic member separating said yoke having the small outer diameter from said housing.

4,989,886

BRAIDED FILAMENTARY SEALING ELEMENT

Raymond J. Rulis, Birmingham, Mich., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 292,482, Dec. 30, 1988. This application Mar. 9, 1989, Ser. No. 321,370
Int. Cl.[5] F02F *11/00;* F03D *11/00*
U.S. Cl. 277—230 26 Claims



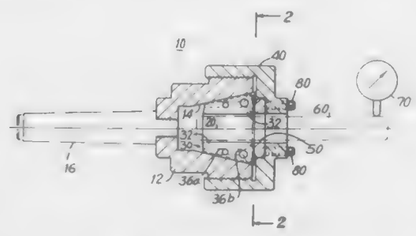
26. In a machine having two relatively rotatable components which are separated by a clearance space, a sealing element carried on one of the components and having a sealing portion in the clearance space in juxtaposition to the other of the components, said sealing portion comprising a plurality of three dimensionally braided filaments having a free length in a direction toward said other of the components for engaging said other of the components to effect a sealing action between the components.

4,989,887

METHODS AND APPARATUS FOR ADJUSTING THE CENTER OF A COLLET

Paul T. Jordan, Seneca, S.C., assignor to Jacobs Chuck Technology Corporation, Wilmington, Del.

Filed Jun. 15, 1990, Ser. No. 538,909
Int. Cl.[5] B23B *31/02*
U.S. Cl. 279—48 6 Claims



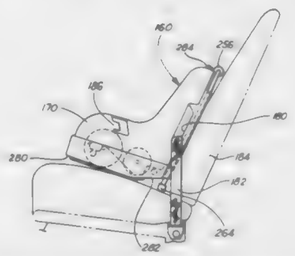
1. A collet having a plurality of substantially rigid gripper members disposed in an annular array and circumferentially spaced from one another by resilient means, a frustoconical surface substantially concentric with said annular array, and means for forcing said annular array against said frustoconical surface substantially parallel to an axis concentric with said annular array so that said frustoconical surface changes the circumferential spacing between said gripper members, said collet further comprising means for displacing some of said gripper members relative to others of said gripper members along said frustoconical surface in a direction generally parallel to said axis in order to shift the center of said array in a direction transverse to said axis.

4,989,888

COMBINATION CHILD RESTRAINT & STROLLER

Khurshid A. Qureshi, 1870 Whitewater Dr., Rochester Hills, Mich. 48063, and Gregory E. Peterson, 190 Ogemaw, Pontiac, Mich. 48053

Continuation-in-part of Ser. No. 86,027, Aug. 17, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 288,018
Int. Cl.[5] B62B *7/12*
U.S. Cl. 280—30 13 Claims



1. A combination child restraint/stroller apparatus for use as a passive restraint in cooperation with a vehicle seat and seat belt, and as a stroller outside the vehicle, said apparatus comprising:

a body having a child supporting surface including a seat, a back and a pair of armrests, a wall portion defining a partially enclosed internal cavity below the seat having a downwardly facing opening therein, and attachment means for removably attaching the vehicle seat belt to the body;

a pair of front and a pair of rear wheels;

at least one front and one rear strut freely rotatably supporting the front and rear wheels, said struts pivotably attached to the body; and

lock means for locking the front and rear struts in either a retracted position in which the wheels and struts are enclosed within the body internal cavity when the apparatus is in cooperation with a vehicle seat, or an extended position in which the body is supported upon the wheels, said lock means being shiftable between a locked position where both struts are locked, a partially unlocked position where only one strut is unlocked, and a fully unlocked position in which both struts are unlocked.

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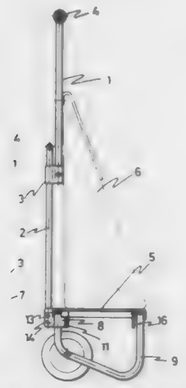
FOLDABLE CART FOR SHOPPING

Juan Server Perez, C.N. 332, Km. 164, 03750 Pedreguer, Spain

Filed Jan. 10, 1989, Ser. No. 295,747
Claims priority, application Spain, Jun. 28, 1988, 8802023
Int. Cl.[5] B62B *1/12*
U.S. Cl. 280—40 7 Claims

1. A foldable shopping cart comprising a rigid base for supporting a bottom portion of a shopping bag, first and second frameworks disposed parallel to one another, first and second frames secured to said base and supporting first and second wheels, means connecting said base and frames for allowing the wheels to be folded underneath said base, said first framework being slidabale relative to said second framework from an extended position for use to a folded position for

transport, said first framework being attached to an upper portion of the bag for pulling the bag from a folded position of reduced size to an extended position, said second framework being articulated to and secured adjacent an articulation axle to said base, a first member connected to said base and having a first lug which allows rotation about said axle of said second framework, said first lug passing through a slot provided in



said base, to a position where said lug retains said wheels in an unfolded position by contact with the associated wheel frame, a quadrangular piece secured to a lower walls, end of one of said frameworks and havaing first and second walls, said first wall parallel to said second wall and having a greater flexibility than said second wall, an inner projection extending from an inner face of said first wall secures the framework and bag in the unfolded position by engaging said base.

4,989,890

LENGTH AND WIDTH ADJUSTABLE WHEELCHAIR

Walter G. Lockard, Elyria; Herbert J. Hoekstra, Ridgeville; Allen J. Boris, and Douglas M. Nickles, both of Elyria, all of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Continuation of Ser. No. 927,802, Nov. 5, 1986, Pat. No. 4,813,693, which is a continuation-in-part of Ser. No. 931,501, Sep. 30, 1986, Pat. No. 4,840,390. This application Dec. 14, 1988, Ser. No. 284,233

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] B62M *1/14*; B62B *11/00*

U.S. Cl. 280—42 **13 Claims**

7. A width adjustable wheelchair, comprising:

a pair of side frames;

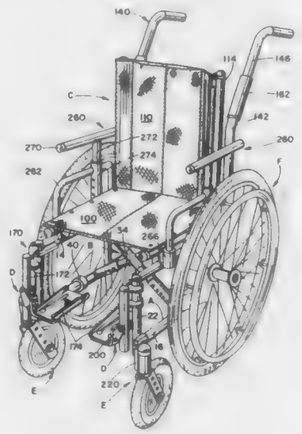
a pair of seat supporting members;

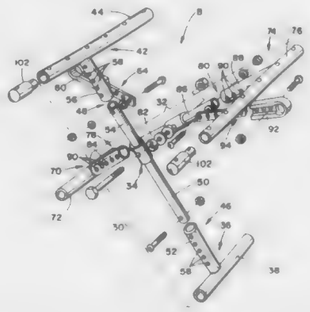
means for supporting said seat supporting members in a predetermined vertical relationship relative to said side frames;

a pair of cross brace members pivotally interconnected along a single central pivot axis by a central pivot means, each of said cross brace members having a lower end pivotally connected to one of said side frames along a lower pivot axis and an upper end connected to one of said seat supporting members, said cross brace members including means for selectively adjusting the lengths of said cross brace members to permit adjustment of the distance between said side frames while retaining the predetermined vertical relationship between said seat supporting members and said side frames;

a seat supported between said seat supporting members;

a connecting link having a pivotal connection with one of





said cross brace members and a pivotal connection with one of said side frames; and

means for adjusting the length of said connecting link.

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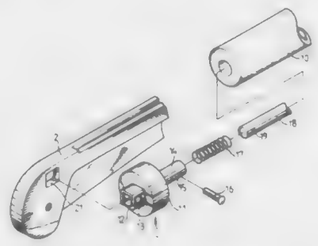
REMOVABLE SAFETY BAR FOR A BABY STROLLER

Ming-Tai Huang, 4 Fl., No. 302, Pai Ling Wu Rd., Taipei, Taiwan

Filed Apr. 12, 1990, Ser. No. 508,847

Int. Cl.[5] B62B *7/14*

U.S. Cl. 280—47.38 **1 Claim**



1. A removable safety bar for the attachment to the arms of a baby stroller comprising

a rigid shaft formed at each end thereof with a pin hole within which a pin is securably fixable;

an engaging means which is attachable to each of both ends of said rigid shaft, said engaging means comprising a tube portion for accepting an end of said rigid shaft, said tube being formed with a slot through which said pin is passable, a spring being disposed within said tube abutting against said end of said rigid shaft and said pin, said pin making contact with a forward end of said slot due to said spring, said engaging means being further formed with an engaging piece which securely hooks over the rim of a flange formed on the inner wall of an arm of the baby stroller, said engaging piece being unhookable from said flange by means of a slight pressure applied by a user's fingers, said engaging means being removable from said arm of the baby stroller by being slid back along said rigid shaft until said pin makes contact with the back end of said slot in said tube, said engaging means returning to an original position thereof by means of a restorative force applied by said spring.

one extremity to prevent movement through said aperture of each said parallel leg and said guide passage near its one extremity, and having a groove near its opposite extremity to engage a locking means; and

(d) a locking means for engaging said groove of said pin and preventing said pin from slidably disengaging from said aperture and said guide passage.

4,989,892

TRAILER HITCH

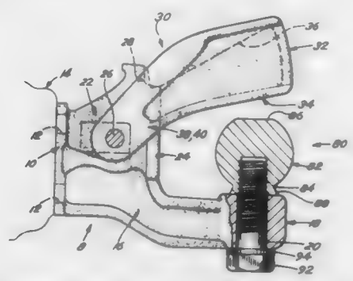
George C. Kerins, 607 S. Jackson, Hinsdale, Ill. 60521, and James Kerins, 63 W. 75th Pl., Willowbrook, Ill. 60514

Division of Ser. No. 75,553, Jul. 20, 1987, Pat. No. 4,844,498, which is a continuation-in-part of Ser. No. 6,473, Jan. 23, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 327,307

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] B60D *1/04*

U.S. Cl. 280—504 **7 Claims**



1. An improved trailer hitch of the type having an integral body including a rear mount having a plurality of longitudinal holes to receive means for attaching said body to a towing vehicle; a longitudinal beam integrally connected to said rear mount at one end, extending perpendicularly outward from said rear mount parallel to said holes and away from said towing vehicle, and terminating in an integral circular ball housing having a transverse bore to receive means for mounting a removable ball stud; and a transverse column integrally attached to said rear mount on one side, having an integral, transverse, flat plate on the opposite side for mating with the attachment means of a towed vehicle, integrally attached to said longitudinal beam at one end, and having a transverse guide passage extending completely through the transverse column perpendicular to said longitudinal beam; wherein the improvement comprises:

(a) a detachable latching arm including a head, having a front face and a rear face, and a pair of substantially parallel legs each integrally attached to opposite sides of said head, extending beyond said faces of said head, and having a single, substantially circular aperture through its end opposite said head for mating with said guide passage of said transverse column and engaging a pin;

(b) a notch on said transverse column for engaging said rear face of said latching arm to prevent rotation of said latching arm;

(c) a removable pin engaging said latching arm at each said aperture of each said parallel leg and said guide passage of said transverse column, said pin having a curvature near

4,989,893

TOE UNIT FOR A SAFETY SKI BINDING

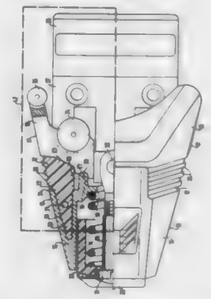
Ulrich Kowatsch, Leonberg; Martin Bogner, Ostfildern, and Otto Harsányi, Leonberg, all of Fed. Rep. of Germany, assignors to EZE Sport International GmbH, Leonberg, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,147

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742483

Int. Cl.[5] A63C *9/00*

U.S. Cl. 280—625 **2 Claims**



1. A toe unit for a ski safety binding comprising:

a housing fixable to a ski;

a release spring;

sole clamp arms being adapted to locate a tip of an inserted ski boot laterally on the ski;

said clamp arms pivot sideways outwardly against a force exerted by said release spring from a normal position to a release position and release the ski boot upon the ocurrence of sideways forces which lie above a predetermined release value;

a space for movement of said clamp arms defined by and located between the housing and the outwardly pivotable sole clamp arms;

an elastic filling piece filling said space for movement, at least when the sole clamp arms are in the normal position, the elastic filling piece having elasticity, at least along a border of said space with an outside atmosphere;

the elasticity of said filling piece being restricted so that an elastic resetting force at the sole clamp arm generated by the filling piece is a fraction of a resetting force generated by the release spring;

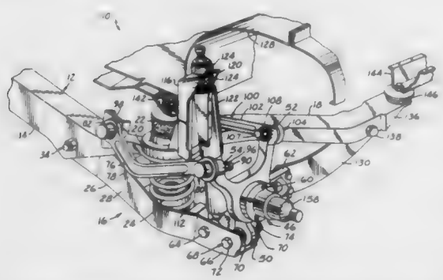
wherein the housing has a blind hollow chamber which extends substantially in the longitudinal direction of the ski relative to the filling piece; a mounting projection arranged on the filling piece engaging into the blind hollow chamber, where said mounting projection is releasably secured to the housing.

4,989,894

INDEPENDENT REAR SUSPENSION

Fred J. Winsor, Birmingham, and Hadrian A. Rori, Farmington Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 30, 1989, Ser. No. 428,705
Int. Cl.[5] B60G *3/00*
U.S. Cl. 280—690 10 Claims



1. An independent rear suspension sub-assembly for mounting on a frame rail of a vehicle, said sub-assembly comprising a sub-frame having a laterally extending portion, a forwardly extending portion, a spring mounting portion at the juncture of said laterally extending and forwardly extending portions, and a shock absorber mounting bracket extending upwardly from one side of said spring mounting portion; a knuckle having a central wheel mounting portion, a lower control arm mounting portion, an upper leading control arm mounting portion, and an upper trailing control arm mounting portion; a lower control arm pivotally connected at each end thereof between said lower control arm mounting portion and said laterally extending portion of said sub-frame, and having a spring mounting seat formed at an intermediate portion thereof; a first upper control arm pivotally connected at each end thereof between said upper trailing control arm mounting portion and said laterally extending portion of said sub-frame; a second upper control arm pivotally connected at each end thereof between said upper leading control arm mounting portion and said forwardly extending portion of said sub-frame; a coil spring mounted between said lower control arm spring mounting seat and said spring mounting portion of said sub-frame; a shock absorber mounted between said shock absorber bracket and said lower control arm intermediate said coil spring and said knuckle lower control arm mounting portion; a trailing arm having one end thereof fixedly secured to said knuckle and the other end thereof pivotally connected to the distal end of said forwardly extending portion of said sub-frame; and two isolators mounted on the outer surface of said spring mounting portion and on the distal end of said forwardly extending portion of said sub-frame for mounting said sub-assembly to said frame rail.

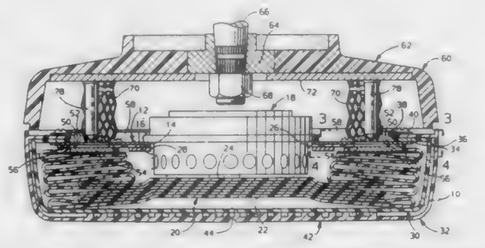
4,989,895

OCCUPANT RESTRAINT SYSTEM

Jeffery L. Pearson, Rochester; Gregory A. Miller, Troy, and John D. Horsch, Rochester Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1990, Ser. No. 511,364
Int. Cl.[5] B60R *21/22, 21/28*
U.S. Cl. 280—731 11 Claims

1. In a vehicle, a modular occupant restraint for a vehicle occupant comprising, a support, a source of pressure fluid mounted to the support, a folded occupant restraint cushion mounted to the support in communication with the source of pressure fluid, the pressure fluid inflating the cushion and deploying the cushion relative to the support for engagement by the vehicle occupant, an enclosure for the source of pressure fluid and cushion mounted to the support, rupturable vent means in the support in communication with the cushion and ambient, the support, source, cushion and enclosure providing a module, means mounting the module on the vehicle for movement relative thereto upon the application of a predetermined force to the module, and means rupturing the vent means to communicate the cushion with ambient through the support upon the application of the predetermined force to the module resulting from the engagement of the deploying cushion by the vehicle occupant.



4,989,896

DOUBLE DOOR CLOSURE FOR AN AIR BAG DEPLOYMENT OPENING

Anthony J. DiSalvo, Allen Park, and David J. Bauer, West Bloomfield, both of Mich., assignors to Tip Engineering Group, Inc., Farmington Hills, Mich.

Filed Oct. 17, 1988, Ser. No. 258,890
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 14 Claims



1. A closure for a deployment opening for an automotive air bag system, said opening formed in a mounting structure forming a part of the interior structure of an automobile comprising:

a door assemblage of an upper door and a lower door connected together on either side of a line of separation, and together configured to be fit within and completely close off said opening;

hinging means associated with a side of each door opposite said line of separation allowing each of said upper door and lower door to swing out from said opening when said doors are free along said line of separation;

said door assemblage including a bridging portion integral with each of said upper door and lower door and extending across said line of separation, said bridging portion being weakened to form a frangible seam extending along said line of separation;

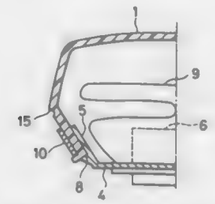
at least one protrusion extending inwardly from each of said upper and lower closure doors, each protrusion having a peak surface adjacent said line of separation to cause contact with an inflating air bag on said doors so as to insure maximum shearing pressure on said bridging portion; each protrusion extending from a point adjacent the hinging side to said frangible seam to occupy a substantial proportion of the top to bottom width of the associated doors.

4,989,897

APPARATUS FOR JOINING AN AIR BAG COVER TO A RETAINER

Juichiro Takada, No. 12-1 Shinmachi, 3-chome, Setagayaku, Tokyo 105, Japan

Filed Apr. 10, 1989, Ser. No. 335,277
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—743 1 Claim



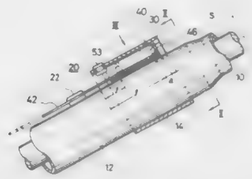
1. Apparatus for joining an air bag cover to a retainer, the retainer having a main wall on which the air bag and an inflator are mounted and a peripheral wall projecting from the main wall, and the cover having a main wall and side walls forming a cavity in which the air bag is received in folded relation and flanges extending from the edges of the side walls and engaging in face-to-face relation the outer faces of the peripheral wall of the retainer, characterized in that the cover flanges have outwardly projecting beads along their free edges, in that the flanges are clamped by plates engaging the outside surfaces of the flanges to the peripheral wall, the plates extending substantially continuously along the peripheral wall of the retainer, in that the edges of the plates are engaged by the beads entirely along the lengths of the beads, whereby the loads on the flanges resulting from loads on the cover when the air bag inflates and breaks the cover are transmitted by the beads to the plates, in that the peripheral wall of the retainer projects from the main wall in a direction away from the main wall of the cover, in that the cover flanges also have beads that project inwardly and engage the free edge of the peripheral wall of the retainer, and in that the flanges are clamped to the peripheral wall of the retainer by fasteners that pass through the plates, the flanges and the peripheral wall of the retainer.

4,989,898

ENERGY ABSORPTION TYPE STEERING APPARATUS

Mikio Yamaguchi, and Sakae Matsumoto, both of Takasaki, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 403,949
Int. Cl.[5] B62D *1/19*
U.S. Cl. 280—777 1 Claim



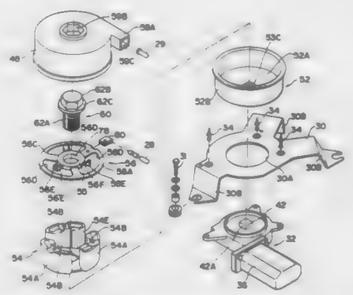
1. An energy absorption type steering apparatus comprising a steering shaft with a steering wheel mounted on a rear end thereof, a steering column rotatably supporting said steering shaft, a column bracket mounting said steering column on a portion of a vehicle for axially forward movement, an energy absorption box secured to said vehicle portion, and a deformable plate member having one end secured to said energy absorption box and another end extending forwardly from said energy absorption box, said another end having a slot extending axially of said steering column and engaging a projection formed on said steering column with forward axial play, said deformable plate member having an intermediate portion folded into a U-shape accommodated in said energy absorption box and restrained between upper and lower walls of said energy absorption box such that during a collision of the vehicle the U-fold of said intermediate portion is progressively shifted forward with a constant radius of curvature by collision-energy-absorbing plastic deformation of a plastic deformation portion of said intermediate portion, said plastic deformation portion flaring adjacent to and toward said one end at a first angle and then at a second angle greater than said first angle such that loading of said plastic deformation portion increases at a first rate and then at a second rate greater than said first rate as said plastic deformation progresses along said plastic deformation portion.

4,989,899

WEBBING DRIVE APPARATUS FOR AUTOMATIC SEAT BELT APPARATUS

Yuji Nishimura, and Takashi Ogasawara, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Apr. 17, 1989, Ser. No. 338,742
Claims priority, application Japan, Apr. 21, 1988, 63-53764[U]
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—804 18 Claims



1. A webbing drive apparatus for an automatic seat belt apparatus which functions to fit a webbing around a seat occupant by driving one end of said webbing, comprising:

a wire which is connected to said one end of said webbing;

a drum which is rotated by a driving force; and

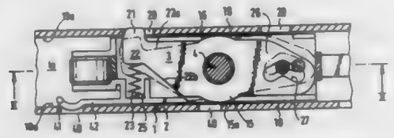
a screw plate with which said wire is engaged and which has portions for contact with said drum so as to be rotated through said contact portions, when said drum is rotated, whereby said wire is spirally wound around said drum and said one end of said webbing is driven, said contact portions having bent portions each of which is formed by bending substantially at right angles with respect to said direction of said rotational axis of said drum and which are brought into contact with said drum when said drum is rotated.

4,989,900

APPARATUS FOR ADJUSTING THE LEVEL OF THE DEFLECTOR FOR A SHOULDER BELT IN THE OCCUPANT RESTRAINT SYSTEM OF AN AUTOMOTIVE VEHICLE

Günter Steinhöser, Glückstadt, Fed. Rep. of Germany, assignor to AUTOLIV-KOLB GmbH & Co., Dachau, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 457,200
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1988, 3844258
Int. Cl.[5] B60R *22/00*
U.S. Cl. 280—808 41 Claims



1. Apparatus for changing the level of a deflector for a shoulder belt in an occupant restraint system for a motor vehicle, comprising a guide connectable to the body of a motor vehicle and defining an elongated track which is substantially vertical in upright position of the vehicle, said guide having two sidewalls flanking said track and one of said sidewalls having a plurality of sockets spaced apart from each other in the longitudinal direction of said track; a slide installed in said guide for movement along said track; means for separably coupling said slide to said guide including a lever having at least one arm including a projection adjacent said one sidewall to enter or leave a selected socket in response to pivoting of said lever about an axis which is normal to said track and is disposed substantially midway between said sidewalls; deflector-supporting pivot means defining said axis and secured to said slide, said lever having substantially mirror symmetrical centering portions flanking said pivot means and each closely or immediately adjacent a different one of said sidewalls; means for yieldably biasing said lever for pivotal movement about said axis in a first direction to urge said projection against said one sidewall and into a selected socket in response to movement of said slide along said track to a position in which the projection is in register with the selected socket; and means for pivoting said lever about said axis in a second direction counter to said first direction to thus withdraw said projection from a selected socket preparatory to movement of said slide along said track.

4,989,901

VERTICAL ADJUSTMENT MEANS FOR A FITTING OF A SAFETY-BELT RESTRAINING SYSTEM IN MOTOR VEHICLES

Heinz-Dieter Adomeit, Berlin, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Fed. Rep. of Germany

Filed Aug. 31, 1989, Ser. No. 401,084
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829929
Int. Cl.[5] B60R *22/20*
U.S. Cl. 280—808 11 Claims

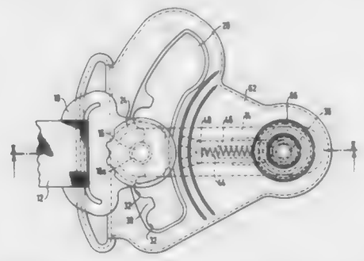
1. A vertical adjustment device for adjusting a fitting of a safety belt-restraining system in a motor vehicle to a selected one of a plurality of different levels with respect to a vehicle bodywork to which said restraining system is mounted, said vertical adjustment device comprising:

an elongate plate having a first end to which said fitting is secured and a second end pivotally mounted about a pivot axis fixed to the vehicle bodywork;

locking means for selectively locking said elongate plate in one of a plurality of different pivotal positions with respect to the vehicle bodywork, each pivotal position of said elongate plate defining a respective one of said plurality of different levels for said fitting;

said locking means comprising a detent pin fixed to said elongate plate at said first end of said elongate plate, and a plurality of detent openings formed in a member secured to the vehicle bodywork, said detent openings being spaced apart along an arc concentric with said pivot axis of said elongate plate, said detent pin being selectively engageable with said detent openings;

said elongate plate having at its second end a longitudinally



extending slot accomodating said pivot axis for allowing displacement of said elongate plate in its longitudinal direction with respect to said pivot axis, between a first position away from said pivot axis in which said detent pin engages a respective one of said detent openings, and a second position closer to said pivot axis in which said detent pin is disengaged from said detent openings; and

spring means for urging said elongate plate away from said pivot axis and into said first position;

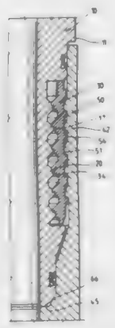
wherein said detent pin is formed as a bolt securing said fitting to said first end of said elongate plate.

4,989,902

RATCHETING AND THREADED WELL CONNECTOR

Samuel W. Putch, Houston, Tex., assignor to Norman A. Nelson, Houston, Tex., a part interest

Filed May 5, 1988, Ser. No. 190,610
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—18 10 Claims



1. A ratcheting and threaded connection for remotely connecting an upper and a lower tubular member in a well, one of which is a male member and the other of which is a female member, comprising,

said lower tubular member having threads for mating with the upper tubular member,

a spring biased and resiliently expandable and contractible cylindrical ratcheting and threaded connector element positioned on the upper tubular member for longitudinal and rotational engagement with the lower tubular member,

said connector element including mating threads on one side for coacting with the threads on the lower tubular member,

coacting circumferentially extending shoulders on the upper tubular member and the connector element for engagement when the upper tubular member is rotated relative to the lower tubular member for providing a rigid interconnection,

said coacting circumferentially extending shoulders on the upper tubular member and the connector element are coacting threads,

the area of the coacting circumferentially extending shoulders on the upper tubular member and connector element being substantially equal to the coacting area between the threads on the lower tubular member and the mating threads on the connector element thereby providing a substantially balanced load distribution between the upper and lower tubular members and allowing the connector element to have a minimum thickness,

wherein the threads on the connector elements that coact with the upper and lower tubular members, respectively are vertically offset from each other, and

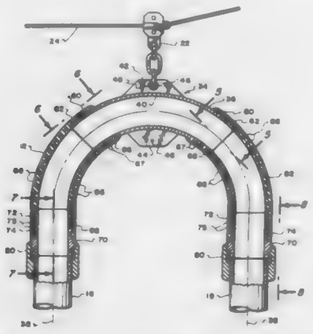
said threads on the connector element that coact with the upper and lower tubular members have the same pitch and direction.

4,989,903

FLEXIBLE FLOW THROUGH SADDLE

Keith R. McAllister, Davidsonville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1989, Ser. No. 383,112
Int. Cl.[5] F16L *13/04, 35/00*
U.S. Cl. 285—114 8 Claims



1. A bending strain relief device for use in connecting the elements of a hose in a ship-to-ship refueling system, comprising:

an elongated tubular member having an axis, an inner cylindrical surface, a pair of protrusions at each end thereof and a pair of ribs, said first rib being positioned on top of said tubular member and having an aperture, and said second rib being positioned on the bottom of said tubular member and having an aperture;

first and second coupling members positioned along said axis, each of said coupling members having a pair of protrusions;

a first helical shaped wire having one end wound in a helical pattern between the protrusions of one end of said tubular member, and passing over one of said protrusions of said tubular member, and having the opposite end wound in a helical pattern between the protrusions of said first coupling member and passing over one of said protrusions of said first coupling member, said first helical shaped wire extending along said axis from said tubular member to said first coupling member;

a second helical shaped wire having one end wound in a helical pattern between the protrusions of the other end of said tubular member, and passing over one of said protrusions of said tubular member, and having the opposite end wound in a helical pattern between the protrusions of said second coupling member and passing over one of said protrusions of said second coupling member, said second helical shaped wire extending along said axis from said tubular member to said second coupling member;

first, second, third and fourth binding wires, said first binding wire being wound around one end of said first helical shaped wire so as to secure said first helical shaped wire to said one end of said tubular member, said second binding wire being wound around the opposite end of said first helical shaped wire so as to secure said first helical shaped wire to said first coupling member, said third binding wire being wound around one end of said second helical shaped wire so as to secure said second helical shaped wire to said other end of said tubular member and said fourth binding wire being wound around the opposite end of said second helical shaped wire so as to secure said second helical shaped wire to said second coupling member; and

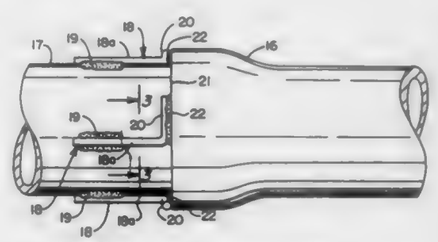
a deformable elastomeric material, encasing said first helical shaped wire between said first coupling member and said tubular member and encasing said second helical shaped wire between said second coupling member and said tubular member, said elastomeric material having an inner cylindrical surface of the same diameter as the inner cylindrical surface of said tubular member.

4,989,904

CONNECTOR FOR PUSH-ON BELL-TYPE PIPE JOINT

Paul V. Metcalfe, 3501 Oxmoor Industrial Blvd., Dothan, Ala. 36303

Filed Aug. 10, 1989, Ser. No. 392,229
Int. Cl.[5] F16L *13/02*
U.S. Cl. 285—286 6 Claims



1. A push-on bell-type pipe joint comprising:

a male member,

a gasket surrounding said male member,

a female member provided with an enlarged open end having an inside diameter greater than the outside diameter of said male member and surrounding said gasket and said male member, with said male member and said gasket inserted snugly into the enlarged open end of said female member,

at least one connector having only a first leg and only a second leg disposed at right angles to each other,

means for attaching said first leg to the exterior of said male member adjacent to but exterior of said female member, said first leg having its longitudinal axis parallel to the longitudinal axis of said male member,

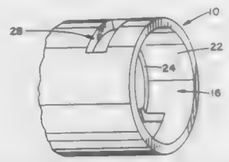
means for attaching said second leg to the peripheral end of said enlarged open end of said female member exterior of said female member.

4,989,905

FITTING FOR CORRUGATED TUBING

James A. Rajecki, Parma, Ohio, assignor to Lamson & Sessions Co., Cleveland, Ohio

Filed Feb. 5, 1990, Ser. No. 475,237
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—319 5 Claims



1. A fitting connection for joining corrugated plastic tubing to associated structure comprising:

a main fitting body of generally cylindrical configuration having an axially inwardly extending cylindrical chamber terminating in an inner end portion of a diameter d_1, said inner end portion terminating at its innermost end in a radially inwardly extending circumferential wall, the axial outer end of said chamber opening to the exterior of said body and having an open diameter d_2 which is greater than d_1, and a radially extending shoulder between said inner and outer end portions of said chamber;

a plastic tubing having circumferential corrugations with a major outer diameter which is only slightly less than d_1 having an end portion extending axially into said chamber from the exterior of said fitting with the innermost end of said tubing abutting said circumferential wall;

retaining ring means for retaining said tubing in said fitting body, said retaining ring means including a cylindrical sleeve of a length no greater than the axial length of the outer portion of said chamber, said sleeve having an open inner diameter of approximately d_1 and a wall approximately equal to $\frac{1}{2}(d_2-d_1)$, said sleeve surrounding said tubing and completely received in the outer portion of said chamber, a plurality of pairs of circumferentially spaced slots extending into said sleeve from the innermost end to define a plurality of resilient tabs having free ends extending toward said shoulder and spaced sections of said sleeve between adjacent tabs having inner ends in engagement with said shoulder to limit inward movement of said sleeve, radially inward extending first detents carried on the tabs adjacent their free ends at a location to enter into a circumferential corrugation on said tubing, radially outward extending second detents carried on the exterior of said tabs;

radially open slots formed through said fitting body adjacent said shoulder for receiving said second detents, said radially open slots and said second detents having inter-engaging surfaces lying generally in a plane generally perpendicular to the axis of said chamber for preventing axial withdrawal of said retaining ring means from said chamber; and,

the free ends of said tabs terminating in a plane perpendicular to the axis of said chamber and said radially open slots intersecting said shoulder and having portions of said chamber.

4,989,906

DEVICE FOR TYING AN ELASTIC BALLOON

John F. Peverley, 3341 Terrywood Rd., Fort Collins, Colo. [illegible]

Filed Aug. 7, 1989, Ser. No. 390,632
Int. Cl.[5] D03J *3/00;* B65H *69/04*
U.S. Cl. 289—17 3 Claims

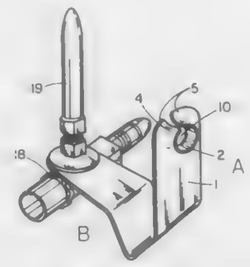
1. A device for tying an elastic balloon comprising:

a. a bracket having two ends;

b. a retaining element having an external surface and a distal edge connected to one end of said bracket at an intersection between said bracket and said retaining element, and defining a hole having a rim which defines a plane, the retaining element acting upon an elastic balloon in operation of the device;

c. a means for allowing removal of said elastic balloon from said retaining element after it has been tied;

d. a retention element; and



e. a means for reducing friction wherein said means for reducing friction comprises:

i. a smooth texture on said external surface of said retaining element; and

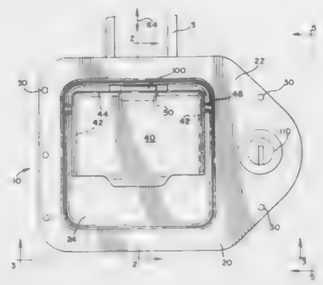
ii. a radius along said intersection between said bracket and said retaining element.

4,989,907

PADDLE HANDLE LATCH

Michael Edmonds, Columbia, S.C.; David Perotto, Kenosha, Wis., and Kenneth Cain, West Columbia, S.C., assignors to Versch Lock Mfg. Co., Inc., Columbia, S.C.

Filed Apr. 27, 1989, Ser. No. 344,251
Int. Cl.[5] E05C *3/08*
U.S. Cl. 292—223 18 Claims



1. A paddle handle latch/striker assembly comprising:

a frame having a perimeter flange and defining a recess internal of the flange,

a paddle handle received in the recess and mounted to the frame for pivotal movement in the recess;

means for mounting the flange to a first support element;

a striker mounted to a second support element for movement along a latching axis relative to the frame;

a retainer mounted to define a channel aligned with the latching axis, said retainer shaped to receive the striker moving along the latching axis and to retain the striker against movement transverse to the latching axis;

a catch mounted in the retainer to move between an open position, in which the catch allows the striker to move along the latching axis in and out of the channel, and a closed position, in which the catch prevents the striker from moving along the latching axis out of the channel; and

a linkage interconnecting the paddle handle and the catch

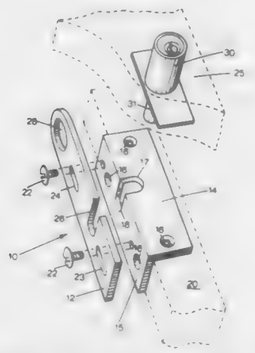
such that the paddle handle operates to move the catch from the closed position to the open position.

[illegible]

LATCHING DEVICE FOR SLIDING DOOR/WINDOW

Clark R. Futch, 1406 S. Dogwood, and Bobbie W. Futch, 1410 Cecil Rd., both of Nashville, Ga. 31639

Filed Aug. 13, 1990, Ser. No. 566,138
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—341.15 5 Claims



1. An improved device for latching a door slideably mounted within a frame wherein a bolt of a push-bolt lock mounted on the door can be extended into a recess formed in the frame, wherein the improvement comprises:

(a) a stationary member fixed to the frame and having two surfaces disposed perpendicularly to each other which form a corner edge, the first of the two surfaces being disposed parallel to the door; the corner edge bounding a passageway created when the door is opened;

(b) the stationary member having a notch formed in the corner edge, the notch extending across both of said surfaces and communicating with the recess, the portion of the notch extending across the first surface being disposed transversely to the longitudinal axis of the bolt and being sized to receive the bolt when it is extended into the recess; the notch including a side opening disposed perpendicularly to said portion, the side opening being sufficiently wide and long to allow the bolt, when fully extended, to be moved sideways through the side opening; and

(c) a frame member slideably mounted on the stationary member, the frame member having a cutout that is similar in shape and size to the side opening; and

(d) means for aligning the cutout in the frame member with the side opening in the stationary member, thereby enabling the bolt, even when fully extended, to be moved sideways through both the side opening and the cutout.

4,989,909

FRICTION GRIP FOR TUBULAR GOODS

Vernon J. Bouligny, Jr., New Iberia, and Charles M. Webre, Lafayette, both of La., assignors to Franks Casing Crew and Rental tools, Inc., Lafayette, La.

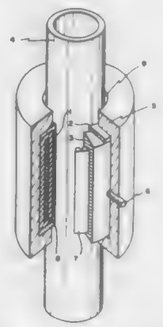
Filed Aug. 17, 1989, Ser. No. 394,949
Int. Cl.[5] B66C *1/46*
U.S. Cl. 294—119.3 16 Claims

1. An improved friction grip, for gripping a cylindrical member about its outer diameter without causing surface or structural damage to said cylindrical member, for use in conjunction with means to axially rotate said cylindrical member, or secure said member against axial rotation, comprising:

(a) a rigid, generally cylindrical outer sleeve having an axial bore slightly larger than the workpiece to be gripped, and having a somewhat larger annular shaped central cavity therein;

(b) an elastic flexible liner securely attached to the radially inward face of the annular shaped cavity of the outer sleeve;

(c) a generally cylindrical internal sleeve, disposed within said flexible liner, said internal sleeve having one side securely attached to said flexible liner, and its opposite side forming an internal annular bladder-like structure by being releasable from the flexible liner said releasable side of internal sleeve having a mechanical structure which



interfittingly mates with a corresponding structure on the adjacent side of the flexible liner in such a manner that the flexible liner may move radially inward in response to fluid pressure between the internal sleeve and flexible liner but which precludes relative tangential movement between the internal sleeve and flexible liner thereby causing torque forces to be distributed substantially uniformly throughout the flexible liner; and,

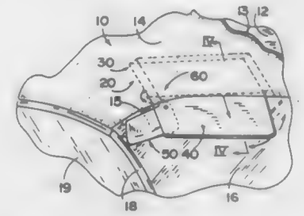
(d) means for introduction of or withdrawal of a desired amount of fluid pressure into or from the annular bladder, so as to cause a desired amount of radially inward force to act on a workpiece within the improved friction grip.

4,989,910

PIVOTED SLIDE-OUT VISOR PANEL

Wesley D. Mersman, Holland, and Russell L. Clark, Zeeland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Jan. 31, 1990, Ser. No. 472,712
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.4 17 Claims



13. A concealed visor mounted behind a vehicle headliner and movable between a concealed stored position and an extended use position, said visor comprising:

a first panel; a second panel which moves in relationship to said first panel as said visor is extended outwardly from said headliner to increase the effective width of said visor when extended, said visor including bias means between said first panel and said second panel to urge said second panel away from said first panel as said visor is extended.

4,989,911

SNAP-IN VISOR MOUNT

Kim L. Van Order, Hamilton, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Aug. 16, 1989, Ser. No. 394,937
Int. Cl.[5] B60J 3/00
U.S. Cl. 296—97.9 14 Claims



12. A mounting system for receiving a screw fastener visor mounting bracket to a vehicle roof support by a snap-in assembly during vehicle manufacturing comprising:

a screw-type visor mounting bracket for securing an end of a visor to a vehicle;

a mounting plate shaped to receive said screw-type visor mounting bracket, said plate including apertures aligned for receiving fastening screws such that said bracket and plate can be preassembled by securing said bracket to said plate; and

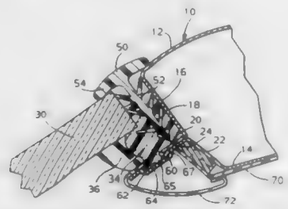
spring steel locking means associated with said plate for lockably fitting within an aperture formed in a vehicle roof support when said preassembled bracket and plate are pushed toward the roof aperture such that said locking means engages the roof support and secures said plate and bracket to the vehicle roof by a snap-in action.

4,989,912

WINDOW RETENTION APPARATUS

Herbert Furman, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 264,668, Oct. 31, 1988, Pat. No. 4,889,574.
This application Sep. 8, 1989, Ser. No. 404,486
Int. Cl.[5] B60J 1/00
U.S. Cl. 296—201 1 Claim



1. In a motor vehicle body having inner and outer panels with juxtaposed flanges welded together to define a window opening, and a window panel mounted in the window opening by a bead of curable adhesive applied to the flange of the outer panel and having the window panel applied against the adhesive and adhesively retained to the flange, the improvement comprising:

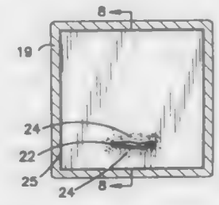
the outer flange having an aperture and the inner flange having a depression formed therein, said hole and said depression being aligned with one another so that the adhesive enters the aperture and the depression, and the depression having a larger dimension than the dimension of the hole so that the adhesive forms a mechanical connection as well as an adhesive connection with the vehicle body.

4,989,913

BARRIER FOR USE IN HOLLOW CHANNEL IN MOTOR VEHICLE BODY AND METHOD FOR PRODUCING SAME

Dan T. Moore, III, Cleveland Heights, Ohio, assignor to Dan T. Moore Company, Cleveland, Ohio

Filed Mar. 16, 1990, Ser. No. 494,973
Int. Cl.[5] B62D 25/02
U.S. Cl. 296—205 30 Claims



1. A barrier for use in a hollow channel in a motor vehicle body, said barrier comprising:

(a) a resilient body having at least one side and ends; and

(b) means defining a passageway between said ends when said barrier is mounted in said hollow channel;

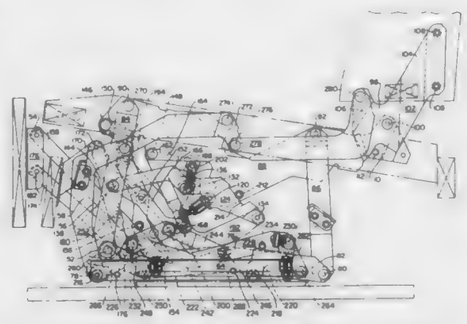
with at least part of said passageway defining means being collapsible upon application of heat when said barrier is mounted in said hollow channel, so as to close said passageway.

4,989,914

RECLINER CHAIR WITH MECHANISM PERMITTING PROXIMITY OF UPPER END OF CHAIR BACK TO ROOM WALL

James J. Pine, Tupelo, Miss., assignor to Action Industries, Inc., Tupelo, Miss.

Filed Oct. 21, 1988, Ser. No. 260,696
Int. Cl.[5] A47C 1/02
U.S. Cl. 297—85 7 Claims



1. A wall proximity-type of recliner chair, comprising:

a chair base adapted to be supported on a floor of a room near where the floor intersects a wall of the room;

an upholstered seat unit including a seat frame having left and right longitudinally extending seat frame elements rigidly interconnected by at least one transverse seat frame element, and a covering of upholstery providing a seat which has a transverse front edge, a transverse rear edge, a longitudinal left edge and a longitudinal right edge;

an upholstered back unit including a back frame having left and right longitudinally extending back frame elements rigidly interconnected by at least one transverse back frame element, and a covering of upholstery providing a back which, in an erect condition, has a transverse top edge, a transverse bottom edge, a longitudinal left edge and a longitudinal right edge;

an ottoman, comprising a primary ottoman having a transversally extending rigid frame element having a left end and a right end;

a motion chair mechanism, comprising:

a first plurality of interpivoted links organized into a generally longitudinally extending left side linkage;

a second plurality of interpivoted links organized into a generally longitudinally extending right side linkage;

each of said links being disposed generally on edge, and said left side linkage being substantially a mirror image of said right side linkage, so that each of said side linkages has a plurality of corresponding links, a plurality of corresponding pivot joints and a plurality of corresponding attachment points;

a plurality of transverse members rigidly connecting corresponding sites on said left side linkage with respective corresponding sites on said right side linkage so that operational movement of said side linkages is substantially fully coordinated;

means mounting said motion chair mechanism on said base;

said attachment points of said left and right side linkages including:

a plurality of first attachment points, located above said mounting means, by which corresponding first link means of said side linkages are secured to said seat frame, whereby said upholstered seat unit is mounted on said base;

a plurality of second attachment points located above said mounting means and towards the rear of said left and right side linkages, by which corresponding second link means of said side linkages are secured to said back frame near said lower edge of said back, so that said back is mounted to said base and said back, when erect, projects upwards from said upholstered seat unit from near said rear edge of said seat;

a plurality of third attachment points located above said mounting means, and towards the front of said left and right longitudinally extending seat frame elements and under said front edge of said seat, when said ottoman is in a fully retracted and stowed condition, by which said rigid frame element of said primary ottoman is secured to corresponding third link means of said side linkages;

said motion chair mechanism further including:

crank means connecting one of said transverse members of said motion chair mechanism, for rotating said one transverse member about its own transversally extending longitudinal axis, without translating said axis relative to said upholstered seat unit;

said third link means comprising left and right pantographic linkage systems operatively connecting with said one transverse member so that when said crank means is operated to rotate said one transverse member fully in one direction, said ottoman is raised and projected forwards from said fully retracted and stowed condition, to a fully projected condition in which it is available for supporting, off of the floor, the feet or the backs of the legs in the vicinity of the feet, of a user seated on the seat of the recliner chair, and so that when said crank means is operated to rotate said one transverse member fully in a direction opposite to said one direction, said ottoman is lowered and retracted from said fully projected condition to said retracted and stowed condition;

said first and second plurality of interpivoted links being so organized that as said crank means is rotated in said one direction, said ottoman moves forwardly and upwards in an arc, while said seat unit and back unit move forwardly and tilt rearwardly as a whole relative to said base, without causing any substantial change in position or angle of said back relative to said seat, and as said crank means is rotated in said opposite direction, said ottoman moves rearwardly and downwards along said arc, while said seat unit and back unit move rearwardly and tilt forwardly as a whole relative to said base, without causing any substantial change in position or angle of said back relative to said seat;

said first and second plurality of interpivoted links being so organized as to permit said crank means to be fully rotated in said one direction and in said opposite direction without thereby causing reclining or erection of said back relative to said seat;

an actuator, operatively connected with said crank means, and disposed for accessibility to a user seated in the recliner chair from externally of said recliner chair, for selectively rotating said crank means a selected amount in said one direction and in said opposite direction for thereby raising and thrusting, and for thereby lowering and retracting said ottoman by desired amounts;

said first and second plurality of interpivoted links being so organized as to permit said back to be reclined from an erect condition and erected from a reclined condition, relative to said seat, by action of a user seated on said seat:

pushing backwards on an upper region of said back while placing somewhat less of his or her weight downwards on said seat, for causing said back to become more reclined relative to said seat, while said seat unit and back unit travel forwards and upwards, as a unit, relative to said base, along an imaginary, substantially flat inclined plane which slopes forwardly upwards at an angle of less than forty-five degrees above horizontal, while rotating in a sense to lower said rear edge of said seat relative to said front edge of said seat, and

leaning somewhat forwards so as to take some of his or her weight off of said upper region of said back while placing somewhat more of his or her weight downwards on said seat, for causing said back to become more erect relative to said seat, while said set unit and back unit travel rearwards and downwards, as a unit relative to said base, along said imaginary inclined plane, while rotating in a sense to raise said rear edge of said seat relative to said front edge of said seat

said first and second plurality of interpivoted links including lock means which effectively bar movement of said second attachment points relative to said first attachment points unless and until said ottoman is either in or nearly in, said fully projected condition, but which effectively permit movement of said second attachment points relative to said first attachment points while said ottoman is either in or nearly in said fully projected condition, so that said back cannot be reclined unless said ottoman is already at least nearly fully projected and so that said ottoman cannot be substantially extended from said fully retracted and stowed condition unless said back is in said fully erect condition;

the sum of forward movement of said seat unit and said back unit relative to said base as said ottoman is moved from said fully retracted and stowed condition to said fully projected condition, and as said back is moved from said fully erect to said fully reclined condition being sufficient to prevent said upper edge of said back from moving substantially rearwards while reclining, whereby said recliner chair need not be moved substantially further away from a wall for use including reclining of said back than for use not including reclining of said back;

each said side linkage including a horizontally extending

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longitudinal base rail, comprising an inverted L-shaped channel member with an upper, medially directed horizontal flange and, at its lateral edge, a depending vertical flange; forward and rear nut and bolt assemblies installed vertically through the horizontal flange mount the base rails of the left and right side linkages to opposite ends of a plurality of said transverse members;

each said side linkage further including first and second, forward and rear horizontal axis pivot joints respectively provided in forward and rear end portions of a flat, horizontally, longitudinally extending long lower main link which is disposed in a vertical plane located outboard of and, in the erect condition of the chair back, with its profile generally superimposed upon that of the respective said vertical flange;

each forward pivot joint pivotally mounting a lower end of a front generally vertical support link, an upper end of which link, in use, pivoting from about ten degrees behind being vertical to about ten degrees in front of being vertical as said ottoman is being fully thrust;

said rear pivot joint pivotally mounting a lower end of a rear generally vertical support link, which, in use, pivots from being approximately vertical to being disposed at approximately a forty-five degree angle with an upper end thereof located forwardly of said lower end thereof;

each side linkage further including a main upper, generally horizontally, longitudinally extending long link;

said upper end of each said front support link being pivotally secured to the respective said upper long link by a third transverse, horizontal-axis pivot joint, located in an upper front corner region of the respective upper long link;

said upper end of each said rear support link being pivotally secured to the respective said upper long link by a transverse, horizontal-axis twenty-ninth pivot joint, located about three-quarters of the way back along the respective said upper long link;

on each said side linkage, the lower main link, front support link, rear support link and upper main link being connected to provide a respective parallelogram, four-bar linkage, by said first and second pivot joints;

said first attachment points securing said seat frame to said upper long links;

each said upper long link being provided at an upper rear corner with a fourth transverse, horizontal axis pivot joint securing a respective reverse J-shaped chair back-mounting link to the respective upper long link;

said second attachment points securing said back frame to said reverse J-shaped back-mounting link;

each said fourth pivot joint being located in a U-portion of the respective reverse J-shaped link nearer a rear, longer leg thereof, than a forward, shorter leg thereof;

each said longer leg being provided near an upper end thereof with the respective said second attachment means;

each said upper long link being provided with a medially, horizontally projecting pin which is engageable, in use, with an edge of the respective said reverse J-shaped link for providing a positive stop against further reclining of the chair back unit to define an extreme of full recline for the chair back unit;

each said upper long link being approximately, reclining Y-shaped, with the respective said third pivot joint being located on an upper one of two forwardly projecting arms thereof, and the respective said fourth pivot joint at a rear end of a single rear leg thereof;

each said upper long link further including a lower said forwardly projecting arm which projects forwardly and downwardly and at a forward end thereof is provided with a transverse, horizontal-axis fifth pivot joint;

each said lower arm is substantially shorter than the respective said upper arm, so each fifth pivot joint is located substantially further back than the respective third pivot joint on the respective upper arm;

each said fifth pivot joint mounting an intermediate portion of a generally straight link, which, by being rotated and translated forwardly as said one transverse member is rotated in one angular sense, acts to raise and thrust the ottoman, and by being rotated and translated rearwardly as said one transverse member is rotated in the opposite angular sense, acts to lower and stow the ottoman;

said one transverse member being a torque tube comprising a main, straight portion, and, near a handle end to which said actuator is mounted as a handle, an integral extension which is bent immediately outboard of a respective upper long link, and bent back further out, to provide an oblique portion, and a handle-attachment portion, which is located on a common rotational axis of both fifth pivot joints;

each said generally straight link has two opposite ends, respectively provided with respective transverse, horizontal axis sixth and seventh pivot joints, disposed such that when the ottoman is fully retracted and stowed, each generally straight link is spatially oriented approximately horizontally, with its sixth pivot joint forwards and located above its seventh pivot joint;

raising and thrusting of the ottoman requiring rotating the handle rearwardly through about one hundred-twenty degrees, so that when the ottoman is in its fully thrust condition, each generally straight link is spatially oriented with its seventh pivot joint forwards and located below its sixth pivot joint;

each side linkage further including a flat, hockey stick-shaped link provided handle forwards, blade rearwards, arched upwards, with a blade end pivoted to the respective generally flat link by the respective sixth pivot joint and a handle end pivoted to the respective front support link at a level midway along the vertical extent of the respective front link support, by an eighth transverse, horizontal-axis pivot joint;

the inside of an elbow in each hockey stick-shaped link permitting the respective hockey stick-shaped link to move down at the respective sixth pivot joint as the ottoman is being thrust, without coming into interfering relationship with the torque tube;

the torque tube being secured to the generally flat links of the left and right side linkages;

said third attachment means of each side linkage mounting said ottoman to pantograph-type ottoman mounting linkage portions of said side linkages;

each pantograph linkage portion being based on a front, lower part of the respective upper main link by a forward, upper transverse, horizontal-axis ninth pivot joint, and a lower, rear transverse horizontal-axis pivot tenth joint;

each ninth pivot joint mounting a rear end of a respective first rear bar which is uppermost in a rear segment thereof, has an intermediate transverse, horizontal-axis eleventh pivot joint and then is lowermost forwardly of that eleventh pivot joint;

each first bar being provided at a front end thereof with a transverse, horizontal-axis twelfth pivot joint;

between the respective eleventh and twelfth pivot joints and each first bar being provided with a horizontal, medially directed pin which engages respective edges of two other links to limit extension and retraction of the respective linkage pantograph;

each pantographic linkage portion further including a first front link which has a rear segment lowermost, is connected to the forward end of the respective first rear link by the respective twelfth pivot joint, has a thirteenth transverse, horizontal axis pivot joint provided at a front end thereof, and crosses from being lowermost to being uppermost in the respective pantographic linkage portion, at an intermediate transverse, horizontal-axis fourteenth pivot joint;

each pantographic linkage portion is shown further including a series of four links, namely a leg of a V-shaped link having the tenth pivot joint located at a base thereof, a second link having a rear end connected by a transverse, horizontal-axis fifteenth pivot joint to a forward end of said link leg, a third link having a rear end connected by a transverse, horizontal-axis sixteenth pivot joint to a forward end of said second link, and a fourth link having a rear end connected by a transverse, horizontal-axis sixteenth pivot joint to a forward end of said third link;

intermediate sites on the respective first rear bar and second link being pivotally interconnected, scissors-fashion, by the respective eleventh pivot joint, and intermediate sites on the respective third link and first front link being pivotally interconnected, scissors fashion, by the respective fourteenth pivot joint;

respective parallelograms defined on respective three sides by the respective first front, third and fourth links being completed at a respective front end by a longitudinal-vertical plane flange of a respective L-shaped channel bracket which is pivotally mounted to the front ends of respective first front and fourth links by the respective thirteenth pivot joints and a transverse, horizontal-axis seventeenth pivot joint;

each L-shaped channel bracket further including a medially directed flange to which said ottoman is mounted;

each pantographic linkage portion being driven for extension and retraction by a second hockey stick-shaped link having a rear, lower blade end pivotally secured to the respective said crank link by the respective said seventh pivot joint, and a forward, upper handle end pivotally secured to a location on the respective said first rear link intermediate the respective ninth and eleventh pivot joints by a transverse, horizontal-axis eighteenth pivot joint;

on an outboard side thereof, the depending vertical flange of each said longitudinal rail of the mechanism base is provided respectively near its front end and its rear end with transverse, horizontal-axis nineteenth and twentieth pivot joints; each twentieth pivot joint mounts a lower end of a short, flat S-shaped link, and each nineteenth pivot joint mounts the lower ends of two links, the further-inboard one of which is a slightly S-shaped link;

a fourth side of respective parallelograms of links provided by the respective depending vertical flange, and the respective S-shaped and slightly S-shaped support links, is provided by a respective secondary generally horizontal long link which is pivotally secured to the upper end of the respective S-shaped link by a transverse, horizontal-axis twenty-first pivot joint, and to an intermediate height location on the respective slightly S-shaped link by a respective transverse, horizontal-axis twenty-second pivot joint;

the upper end of each slightly S-shaped link being provided with a transverse, horizontal-axis twenty-third pivot joint;

for each side linkage, a further link being provided and having a forward, upper end connected with the upper end of the respective slightly S-shaped link via the respective twenty-third pivot joint, whereas its lower, rear end is pivotally connected with an intermediate site on the respective said lower main link by a transverse, horizontal-axis twenty-fourth pivot joint;

another said link which is pivotally secured to said flange of each said base rail by the respective nineteenth pivot joints is a respective forwardly and downwardly arched link, a lower end of which is so-secured;

each said forwardly and downwardly arched link arches concavely rearwardly around front of a respective stop roller, so that a rear edge thereof is arranged to engage the respective stop roller for substantially restricting reclining of the chair back until the ottoman is fully raised and thrust;

each said stop roller being rotatably mounted on a medially directed axle secured on the forward end of the respective said lower main link, above the respective first pivot joint;

further coordination and control of each lower main link in relation to the respective secondary long link being provided at the rear by a respective short link pivotally connected to the respective secondary long link and to the respective s-shaped link at a corner of the respective parallelogram, by the respective twenty-first pivot joint, and to the respective lower main link, forwardly of the respective second pivot joint, by a transverse, horizontal-axis twenty-fourth pivot joint;

each structure comprising a respective said lower main link, secondary long link and short link, as connected by respective said pivot joints is completed as a parallelogram linkage structure by a respective short front bar pivotally secured at upper and lower ends thereof to the respective secondary long link and lower main link by the respective twenty-second pivot joint and a respective twenty-fifth transverse horizontal-axis pivot joint;

each said arcuate link is provided at its upper end with a horizontal, transverse-axis twenty-sixth pivot joint which mounts a forward end of a respective downwardly convex link which has an intermediate, upper knee provided with a transverse, horizontal-axis twenty-seventh pivot joint at, and a rear end provided with a transverse, horizontal-axis twenty-eighth pivot joint; each said twenty-seventh pivot joint connects the respective downwardly convex link with the respective upper main link, at a location generally midway between the respective third and twenty-ninth pivot joints, and the respective twenty-eighth pivot joint connects the lower, rear end of the respective downwardly convex link with the forward end of a reclining, reversed L-shaped link, a generally vertically upwardly directed short leg of which has its upper end pivotally secured to the upper end of the short leg of the respective reversed J-shaped back-mounting link by a respective transverse, horizontal-axis thirtieth pivot joint.

4,989,915

SEATING ELEMENT FOR ARRANGEMENT IN ROWS

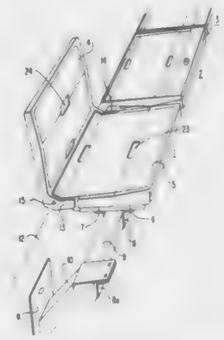
Werner Hansal, Rehteichweg 13, 7506 Bad Herrenalb, Fed. Rep. of Germany

Filed Jun. 20, 1989, Ser. No. 370,748

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 3837914

Int. Cl.[5] **B60N** *2/02*

U.S. Cl. 297—378 **13 Claims**



1. A seating element for use in row-type seating arrangements, comprising:

a seat section adapted to be mounted approximately horizontally to a support element;

a back-rest section pivotally mounted to said seat section for movement between a use position in which said back-rest section extends upwardly from said seat section and a covering position in which said back-rest section extends in approximately horizontal covering relation over said seat section;

first and second pivot pins respectively connected to said seat section along a common pivot axis at a rearward end of each side of said seat section;

first and second brackets respectively extending from each side of said bracket section, each of said first and second

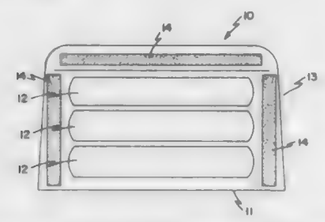
brackets having an opening therein which receives a respective one of said first and second pivot pins such that said back-rest section is pivotal relative to said seat section; and pivoting means for automatically pivoting said back-rest section about said common pivot axis from said use position to said covering position in the absence of a force holding said back-rest section in said use position, said pivoting means comprising a spring element mounted between and bearing against both said seat section and said backrest section, and means, mounted between said back-rest section and said seat section, for introducing a pivoting force against said back-rest section when said back-rest section is in said use position to cause pivoting of said back-rest section toward said covering position, and for releasing said pivoting force from against said back-rest section after said back-rest section has pivoted to a point where its center of gravity has moved past its top-dead-center position such that gravity will cause said back-rest section to pivot further and into said covering position.

4,989,916

UPHOLSTERED ARTICLE OF FURNITURE

James A. Powell, Graystones, Westfield Road, Leeds, England

PCT No. PCT/GB88/00567, § 371 Date Mar. 15, 1990, § 102(e) Date Mar. 15, 1990, PCT Pub. No. WO89/00391, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 14, 1988, Ser. No. 469,532
Claims priority, application United Kingdom, Jul. 15, 1987, 8716691
Int. Cl.[5] A47C *16/00*
U.S. Cl. 297—439 6 Claims



1. An upholstered article of furniture which comprises a base (11), a tire (12) mounted generally horizontally on the base, upholstery (13), and padding (14) arranged at predetermined locations between the tire and the upholstery.

4,989,917

ARTICULATED HOPPER DISPOSAL SYSTEM

Ronald L. Schmidt, Jr., Glencoe, Ill., assignor to Peabody Myers Corporation, Streator, Ill.

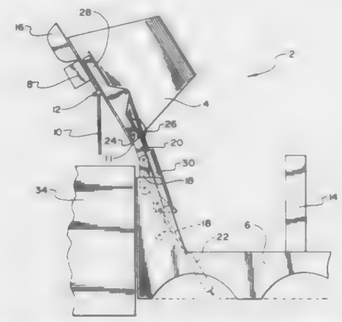
Filed Aug. 11, 1989, Ser. No. 392,438
Int. Cl.[5] B60P *1/34*
U.S. Cl. 298—11 9 Claims

1. Apparatus for transferring the contents of a hopper having a hopper lip around its perimeter into a receptacle that has a receptacle lip around its perimeter, which receptacle lip is elevated and laterally displaced with respect to said hopper lip, comprising:

a support frame having a substantially vertical portion;

at least one linkage comprising a substantially vertically extending bar coupled to said vertical portion of said support frame and two hinge bars, each of said hinge bars pivotally mounted between said vertically extending bar and said vertical portion of said support frame to provide elevational freedom of movement and coupled to a side of said hopper at an upper distal end of said vertically extending bar with rotational freedom of movement;

at least one first operator mounted between said support frame and said vertically extending bar of said linkage to elevate said hopper from said support frame along the travel of said vertically extending bar of said linkage relative to said support frame; and



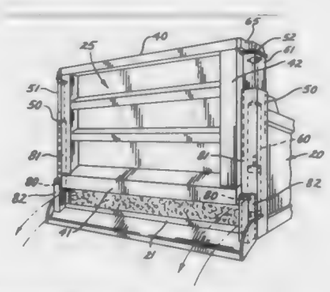
at least one second operator mounted between said hopper and said vertically extending bar to rotate said hopper around the rotational axis of said distal end coupling to said vertically extending bar of said linkage.

4,989,918

MATERIAL HANDLING VEHICLE WITH IMPROVED TAILGATE

Darrell W. Biddy, 8241 Tuckaseegee Rd., Charlotte, N.C. 28214

Filed Aug. 14, 1989, Ser. No. 393,378
Int. Cl.[5] B60P *1/26*
U.S. Cl. 298—23 MD 6 Claims



1. A material handling vehicle comprising

a frame mounted on wheels for permitting travel along a roadway,

a substantially rectangular material container comprising a bottom wall, opposite side walls, a front end including a front end wall, and an open rear end,

means for pivotally mounting said container to said frame for pivotal rotation about a transverse axis so as to lift said front end of said container and cause material in said container to be discharged through said open rear end,

a one piece, generally rectangular tailgate sized to close said open rear end of said container and including parallel upper and lower edges, and parallel opposite side edges,

means mounting said tailgate to said container for permitting the tailgate to be selectively moved between

(1) a closed position wherein said tailgate overlies and closes said open rear end of said container,

(2) a partially raised position of limited vertical height for allowing a metered discharge in a controlled manner of material held within said container wherein said bottom edge of said tailgate is spaced above said bottom wall of said container no greater than the height of said sidewalls, and

(3) a fully raised position wherein said tailgate is free to swing outwardly about a pivotal axis which extends parallel to and closely adjacent said upper edge of said tailgate,

wherein said means mounting said tailgate comprises at least one guide rod extending outwardly from one side edge of said tailgate, with said one guide rod being located adjacent said lower edge of said tailgate, and

at least one vertically directed guide channel means mounted to one of said side walls adjacent said rear end, with said one guide channel means being positioned so as to engage said one guide rod when said tailgate is in said closed and said partially raised positions, and wherein said one guide channel means includes a rearward surface of a limited vertical height which comprises a significant portion of the height of said side walls corresponding to the partially raised position for guiding the tailgate during raising and preventing rearward pivoting outwardly of said tailgate over the distance said rearward surface extends, and

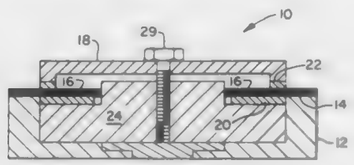
power means for selectively moving said tailgate between said three positions.

4,989,919

METHOD AND APPARATUS FOR MANUFACTURING COMPLIANT BRUSH SEALS

John Greer, Burlington, Canada, assignor to Pratt & Whitney Canada, Longueuil, Canada

Division of Ser. No. 238,082, Aug. 30, 1988, Pat. No. 4,884,850. This application Aug. 14, 1989, Ser. No. 393,191
Int. Cl.[5] B25B *11/00*
U.S. Cl. 300—10 1 Claim



1. A fixture for assembling a compliant seal having a plurality of bristle elements and first and second seal backing rings, wherein the fixture comprises:

an annular aligning member including means for receiving and aligning the plurality of bristle elements,

a first, lower holding ring, disposed cocentrically within the aligning member,

a second, upper holding ring,

wherein the first and second seal backing rings are disposed adjacent to the bristle elements and cocentrically within the aligning ring, the backing rings sandwiching the bristle elements therebetween,

the first and second holding rings sandwiching the first and second backing rings therebetween, and

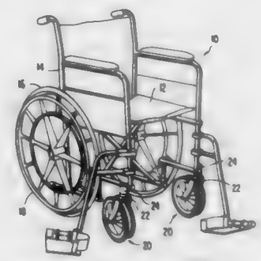
means for releasably clamping the first and second seal backing rings between the first and second holding rings, thereby releasably clamping the bristle elements between the first and second backing rings wherein the means for receiving and aligning the plurality of bristle elements includes a pluralaity of linear grooves disposed in an annular surface of the aligning member, the grooves being angularly skewed with respect to a central axis of the aligning member and adapted to receive a quantity of bristle elements therein.

4,989,920

SELF-DAMPING CASTER WHEEL

James J. Kauzlarich, Chile, and Colin A. McLaurin, Charlottesville, both of Va., assignors to University of Virginia Alumni Patents Found., Charlottesville, Va.

Filed May 27, 1983, Ser. No. 498,543
Int. Cl.[5] B60T *7/12*
U.S. Cl. 301—63 PW 6 Claims



1. A dual co-rotating, non-rigid caster wheel for at least partially supporting a wheel chair, gurney, cart, or the like for reducing caster wheel shimmy comprising:

a hub having a central axis of rotation;

a first resilient peripheral tread extending circumferentially about said hub for contacting a ground surface and lying in a plane perpendicular to the central axis of rotation of said hub;

a second resilient peripheral tread extending circumferentially about said hub for contacting a ground surface, co-rotating with said first peripheral tread and having the same diameter length as said first tread, and lying in a second plane mutually parallel with said first plane and being laterally displaced from said first plane;

said first and second resilient peripheral treads defining a separation groove therebetween;

means for pivoting said caster wheel about a first vertical axis located between said first and second treads and equidistant to said treads, said first vertical axis being a positive trail distance away from a second vertical axis extending through a center point of said hub;

the diameter of said treads being between about four and eight inches and the axial distance between said first and second peripheral treads about said hub being between about one-half and two inches wherein operating speed may be enhanced without producing self-excited caster wheel oscillation or shimmy effects.

4,989,921

MINE HOIST BRAKE REGULATOR

Clemens J. G. Vanzeyl, Peterborough, Canada, assignor to General Electric Canada Inc., Mississauga, Canada

Filed Sep. 13, 1989, Ser. No. 406,496
Claims priority, application Canada, Sep. 29, 1988, 578890
Int. Cl.[5] B60T *7/12*
U.S. Cl. 303—91 8 Claims

1. A hydraulic friction brake for controlling deceleration of a mine hoist comprising:

pump means continually circulating hydraulic braking fluid through a valve means, the valve means regulating flow of hydraulic fluid to control braking pressure applied by the brake for braking the mine hoist; and,

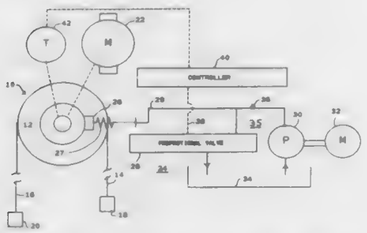
control means controlling operation of the valve means including:

means for sensing the speed of the hoist and providing a signal representing the speed,

means for differentiating the speed signal to obtain a differentiated signal representing the rate of change of the speed of the mine hoist,

means for producing a reference signal representing a predetermined hoist deceleration rate,

means for comparing the differentiated signal with the reference signal to provide an output signal having a value when the differentiated signal is less than the reference signal, and



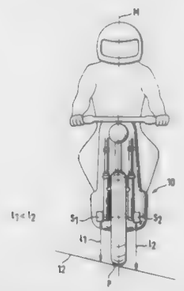
integration means responsive to the output signal to provide a first valve signal that controls the operation of the valve means, the first valve signal decreasing at a predetermined rate to correspondingly control the opening of the valve means and proportionally reduce the braking pressure of the brake.

4,989,922

METHOD OF ANTI-LOCK BRAKE CONTROL FOR MOTORCYCLE VEHICLE

Josef Pickenhahn, Plaidt; Stephen P. J. Barr, Nauort; Christoph Beuerle, Koblenz; Klaus Glasmacher, Boppard; Alois Weidele, Essingen, and Martin Fischer, Erzhausen, all of Fed. Rep. of Germany, assignors to Lucas Industries public limited company, Birmingham, England

Filed Nov. 20, 1989, Ser. No. 439,734
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1988, 3839520; Oct. 5, 1989, 3933294
Int. Cl.[5] B60T *8/32, 8/18;* B62L *3/08*
U.S. Cl. 303—100 8 Claims



1. A method of anti-lock brake control in a motorcycle vehicle or the like, said method comprising the steps of

measuring the rotational speed of the wheels of the motorcycle vehicle and determining at least one of the parameters slip and retardation of a braked wheel,

comparing the at least one measured parameter with a given threshold value,

changing a pressure of the brake at the braked wheel in response to said comparison during anti-lock brake control,

determining the position of lateral inclination of the motorcycle vehicle and

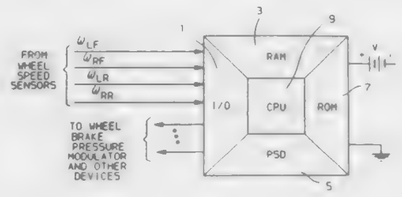
changing said threshold value in response to said determined lateral inclination of said motorcycle vehicle.

4,989,923

ABS REFERENCE SPEED DETERMINATION

Alan J. Lee, Farmington Hills, and Philip M. Headley, Brighton, both of Mich., assignors to General Motors Corporation, Detroit, Mich. and Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 14, 1989, Ser. No. 392,902
Int. Cl.[5] B60T *8/68*
U.S. Cl. 303—109 11 Claims



1. A system for determining a vehicle reference speed value for the purposes of wheel lock control for a vehicle having a plurality of wheels, the system comprising in combination:

means for measuring a value of speed for each of the vehicle wheels;

means for (a) comparing predetermined parameters of each wheel with predetermined limits and (b) selecting the wheel speed values of the wheels whose parameters are within the predetermined limits; and

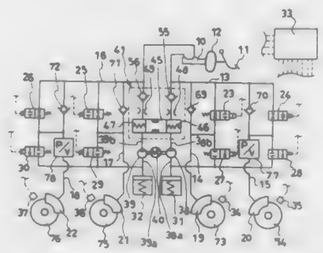
means for determining an average of the selected wheel speed values, the average of the selected wheel speed values comprising the vehicle reference speed.

4,989,924

FLUID PRESSURE CIRCUIT

Hiroshi Toda, Kariya; Masashi Sawada, Chiryu; Hideyasu Miyata, Nagoya, and Hiroaki Takeuchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 30, 1989, Ser. No. 330,447
Claims priority, application Japan, Mar. 31, 1988, 63-080924
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—113 9 Claims



1. An anti-skid braking system having two independent fluid pressure circuits comprising;

a master cylinder;

a pressure generator including fluid pressure pumps powered by a common motor for supplying fluid pressure to each of the fluid pressure circuits, the fluid pressure pumps located between a low pressure reservoir and said master cylinder, the independent fluid pressure circuits having a phase difference of a half period with respect to the fluid pressure therein; and

a pressure reducer having a body with an inner opening for permitting outlet passages of the pressure generator to communicate with each other, a reciprocating piston disposed in the inner opening of the body so as to form a

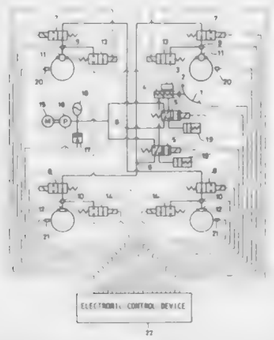
pair of damper chambers at each end of the piston, movement of the piston in response to the common motor transmits the fluid pressure to alternately discharge from said pressure generator.

4,989,925

BRAKE PRESSURE CONTROL DEVICE FOR VEHICLES

Teruhisa Kohno, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 90,589, Aug. 28, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,274
Claims priority, application Japan, Sep. 4, 1986, 61-209039
Int. Cl.[5] B60T *1/08*
U.S. Cl. 303—116 6 Claims



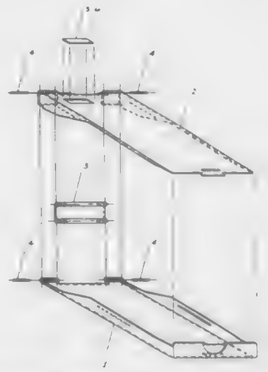
1. A brake pressure control system for vehicle brakes, comprising brake means for braking vehicle wheels, master cylinder means driven by a pedal force for operating said brake means, first fluid conduit means for connecting said master cylinder means to said brake means, pump means for generating a pump pressure to operate said brake means, absorber means for taking up fluid, switchable first valve means having at least three ports and at least two positions, said switchable first valve means being operatively inserted in said first fluid conduit means, said at least three ports having a first port connected with said master cylinder means, a second port connected with said brake means, and a third port connected with said absorber means, said switchable first valve means communicating selectively said first port with said second port in one of said at least two positions and said first port with said third port in the other of said at least two positions when said switchable first valve means are operated; second fluid conduit means connecting said pump means to said first fluid conduit means through said switchable first valve means, whereby said second fluid conduit means are connectable to said brake means through said first fluid conduit means, switchable second valve means having at least two ports and at least first and second valve positions, said switchable second valve means being operatively connected in said second fluid conduit means, said switchable second valve means permitting in said first valve position pump pressure to enter into said first fluid conduit means, said switchable second valve means prohibiting in said second valve position pump pressure from passing through said switchable second valve means, adjusting means operatively inserted in said first fluid conduit means for adjusting the pump pressure to be applied to said brake means, input force detecting means positioned for detecting a force applied by an operator to said master cylinder means, pump pressure detecting means for detecting the pump pressure generated by said pump means, speed detecting means for detecting the speed of a vehicle wheel, and electronic control means connected for outputting driving signals for operating said switchable first, and second valve means and said adjusting means in response to signals detected by said input force detecting means, by said pump pressure detecting means, and by said speed detecting means.

4,989,926

CASE-STAND FOR HAND HELD CALCULATORS, COMPUTERS AND DATA COLLECTORS

Allison D. Snow, Jr., 5808 Westport Cir., Las Vegas, Nev. 89108

Filed Nov. 21, 1989, Ser. No. 439,490
Int. Cl.[5] A47B *21/00*
U.S. Cl. 312—208 8 Claims



1. A combination case-stand for holding hand-held instruments, such as calculators, computers or data collectors, comprising:

a rectangular case bottom, a rectangular case top and a hinge member made of hard, durable material of sufficient size to accommodate and encase such instruments,

the case bottom and the case top each having a first end and a second end,

a first set of hinge pins journalled in aligned hinge knuckles on a first end of the case bottom and a first edge of the hinge member for attaching the case bottom to the hinge member,

and a second set of hinge pins journalled in aligned hinge knuckles on the first end of the case top and a second edge of the hinge member for attaching the case top to the hinge member,

whereby the case top can be pivoted about the second set of hinge pins from the case bottom and then shifted over the first end of the case bottom in a direction to rotate the hinge member approximately one hundred and eighty degrees about the first set of hinge pins allowing the case top to be pivoted further about the second set of hinge pins to a position underneath the case bottom to form a support stand for the latter.

4,989,927

CONVERTIBLE DRESSER

William S. Suvak, Salem, Ind., assignor to Smith Cabinet Manufacturing Company, Inc., Salem, Ind.

Filed Nov. 24, 1989, Ser. No. 440,709
Int. Cl.[5] A47B *83/00*
U.S. Cl. 312—277 3 Claims

1. A cabinet that can be converted into a dressing table comprising:

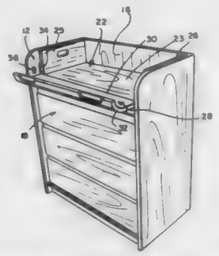
a cabinet body having first and second side panels with front and back edges, with the first and second side panels situated in spaced apart parallel relationship,

a back panel having a left edge attached to the back edge of the first side panel and a right edge attached to the back edge of the second side panel,

an at least one drawer positioned between the first and second side panel,

a front cabinet door, attached to the first and second side panels for swinging movement therebetween, the cabinet door arranged in an open positioned when positioned substantially perpendicular to the back panel and in a closed position when positioned parallel to the back panel, and

a flippable board situated to lie stop the cabinet body above the an at least one drawer, the flippable board having a



first and second surface, with first and second supports attached to the first surface, the first and second supports being arranged in parallel spaced apart relationship, the flippable board capable of assuming two orientations with respect to the cabinet body, respectively oriented in a first orientation with the second surface positioned to form a cabinet top of the cabinet body and a second orientation with the first surface positioned to form a dressing table having its first surface in alignment with the front cabinet door when the door is in its open position.

4,989,928

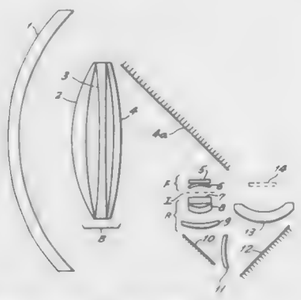
COMPACT INFRARED LENS ARRANGEMENT INCLUDING AT LEAST THREE REFLECTIONS

Louis R. Fantozzi, 4 Gordon Ave., Pelham, N.H. 03051; Lawrence Kessler, 173 8th St., Bethpage, N.Y. 11714, and Richard Draxler, 59 E. Neck Ct., West Babylon, N.Y. 11704

Continuation of Ser. No. 300,170, Jan. 19, 1989, abandoned, which is a continuation of Ser. No. 181,724, Apr. 14, 1988, abandoned, which is a continuation of Ser. No. 924,625, Oct. 29, 1986, abandoned. This application Dec. 28, 1989, Ser. No. 455,774

Int. Cl.[5] G02B *23/02, 13/14*

U.S. Cl. 350—1.3 **18 Claims**



1. A lens arrangement comprising:

a plurality of optical elements, for receiving input radiation and providing an optical path for said input radiation,

said optical path including at least three reflections, and an internal focal plane between the first and second reflections,

wherein the length of the optical path for input radiation in the infrared range is at least about 240 mm, the lens arrangement being fully contained in a spherical region no more than about 150 mm in diameter.

4,989,929

PROCESS OF MAKING AN ACHROMATIC HOLOGRAM WHICH IS ADAPTED TO BE RECONSTRUCTED WITH WHITE LIGHT

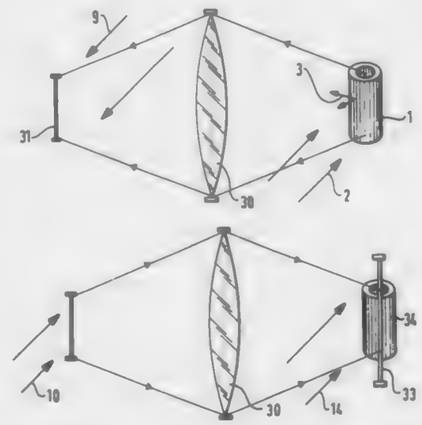
Gunther J. Dausmann, Erding; Rudi T. de Jongh, Rosenheim, and Klaus A. Gnadig, Munich, all of Fed. Rep. of Germany, assignors to Holtronic, GmbH, Erding, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 786,236, Oct. 10, 1985, abandoned. This application Nov. 23, 1988, Ser. No. 275,394

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437355

Int. Cl.[5] G03H *1/20, 1/22*

U.S. Cl. 350—3.83 **8 Claims**



1. A process for making an achromatic hologram which is adapted to be reconstructed with white light and which is recorded on photographic record carrier by means of an object beam and a reference beam of coherent monochromatic light in an operation in which the object beam passes through an image-forming optical element disposed between an object and the recording material of said photographic record carrier comprising:

(1) disposing said image-forming optical element having a relatively large aperture between said object and said recording material and recording a first hologram on said record carrier by passing said object beam and said reference beam through said aperture and through said recording material from one side thereof;

(2) developing said first hologram;

(3) re-inserting said first hologram in the same location;

(4) then projecting a beam which in conjugate to said reference beam through the first recorded hologram so as to reconstruct the object wave from said first hologram, said object wave being projected back through said image-forming optical element and forming an image of said object at the original position of said object; and

(5) making a second hologram at that location by interfering said image with a reference beam identical to that used to form said first hologram so as to record an undistorted image of the object in said second hologram on a second record carrier, said relatively large aperture being at least large enough so that an achromatic core zone for viewing the reconstructed image is obtained.

4,989,930

OPTOELECTRONICS PACKAGE

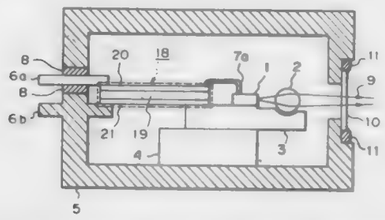
Eiichi Nakagawa, and Junichiro Yamashita, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,437

Claims priority, application Japan, Jan. 28, 1988, 63-18082

Int. Cl.[5] G02B *6/42*

U.S. Cl. 350—96.2 **13 Claims**



1. An optoelectronics package comprising a semiconducting optical element, an electronic cooling element electrically coupled to said semiconducting optical element, an airtight vessel enclosing said semiconducting optical element and said electronic cooling element and having a signal terminal integrally formed therewith, and a microstrip transmission line comprising a dielectric substrate having a thin metal film pattern deposited on two sides thereof, one side of said microstrip electrically coupling said first signal terminal to said electronic cooling element, a second side of said microstrip electrically coupling said semiconducting optical element to a second signal terminal.

4,989,931

SOLAR-RAY ENERGY RADIATION DEVICE FOR MEDICAL APPLICATION

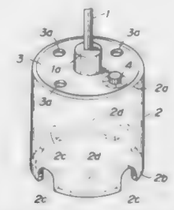
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Dec. 4, 1986, Ser. No. 937,654

Claims priority, application Japan, Jan. 9, 1986, 61-2662

Int. Cl.[5] G02B *6/00, 27/00*

U.S. Cl. 350—96.10 **7 Claims**



1. A solar-ray energy radiation device for the application of the visible light rays component of solar rays to a localized part of a person's body comprising a cylindrical means having a cylindrical portion with a longitudinal axis and a closure portion on one longitudinal end of said cylindrical portion, said cylindrical portion being made of a transparent or a semi-transparent material, an optical conductor for transmitting the visible light rays component of solar rays from which ultraviolet rays and infrared rays have been excluded, said optical conductor having a light-rays emitting end mounted on said closure portion at a position generally aligned with the axis of said cylindrical portion such that the visible light-rays component of solar rays emitted from said light-rays emitting end of said optical conductor pass into said cylindrical portion, the other longitudinal end of said cylindrical portion operable to contact a person's body such that a part of said person's body is encircled by said contact means, and opening means in said cylindrical means to permit air to pass between the interior and exterior of said cylindrical means, whereby the visible light-rays component of solar rays pass from said light-emitting end through the interior of said cylindrical portion to said encircled part of said person's body while said opening means precludes fogging and moisture build-up within said cylindrical means during application of the device on a person's body.

4,989,932

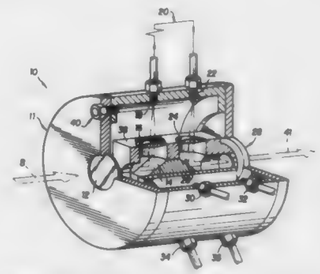
MULTIPLEXER FOR USE WITH A DEVICE FOR OPTICALLY ANALYZING A SAMPLE

Isaac Landa, Potomac; Michael M. Anthony, Gaithersburg, and George E. Toth, Colombia, all of Md., assignors to LT Industries, Rockville, Md.

Filed Mar. 3, 1989, Ser. No. 318,246

Int. Cl.[5] G02B *6/00*

U.S. Cl. 350—96.1 **11 Claims**



1. A multiplexer for introducing light to multiple samples, comprising

a body portion, said body portion including a primary inlet port for receiving a stream of light;

a conjugate optical barrel, said conjugate optical barrel being rotatably attached to said body portion;

means for reflecting the stream of light passing through said primary inlet port at an angle;

said body portion having an exit port oriented to selectively receive light reflected by said means for reflecting; and

an inlet port for receiving light down stream of said exit port; the conjugate optical barrel further comprising means for reflecting the stream of light through a primary exit port.

4,989,933

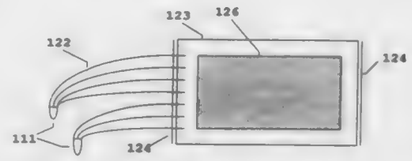
GUIDED LIGHT DIFFUSER

Michel A. Duguay, 825 Beauregard, Apt. 818, Saint-Foy, Quebec, Canada GlV 4L7 and Melanie L. Light 52 W 74th St., New York, NY 10023

Filed Apr. 24, 1989, Ser. No. 342,559

Int. Cl.[5] G02B *6/00, 6/14;* **F21V** *7/04*

U.S. Cl. 350—96.10 **10 Claims**



1. Apparatus comprising:

means for injecting light from at least one source of light into a light guide resonator means;

the light guide resonator means comprises (A) a light guide means and (B) means for reflecting most of the light into light incident thereupon back into the light guide means; and

means for diffusing light from at least a portion of the light

distributed in the light guide resonator means, wherein a regime of optical resonance prevails in the light guide resonator means.

4,989,934

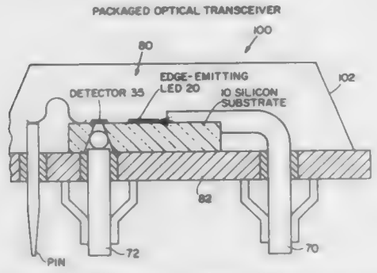
MONOLITHIC INTEGRATED TRANSCEIVER OF III-V DEVICES ON SILICON

Paul M. Zavracky, Norwood; Matthew M. Zavracky, N. Attleboro; John C. C. Fan, Chestnut Hill, and Jack P. Salerno, Waban, all of Mass., assignors to Kopin Corporation, Taunton, Mass.

Continuation of Ser. No. 120,021, Nov. 13, 1987, Pat. No. 4,890,895. This application Nov. 3, 1989, Ser. No. 431,561

Int. Cl.[5] G02B *6/12, 6/42*

U.S. Cl. 350—96.11 **10 Claims**



1. A monolithic integrated transceiver formed on a silicon substrate for converting first optical signals to first electrical signals in one path and second electrical signals to second optical signals in a second path comprising:

a. a III-V compound light source for transmitting said first optical signals to a fiber which is aligned with said light source in a pyramidal anisotropically back etched groove formed in said silicon substrate along said one path; and

b. a III-V compound light detector for receiving said second optical signals in said second path and for converting said second optical signals to said second electrical signals and electrical circuitry coupled to said detector responsive to said second electric signals for generating output electrical signals.

4,989,935

OPTOELECTRONIC TRANSMITTER AND RECEIVER

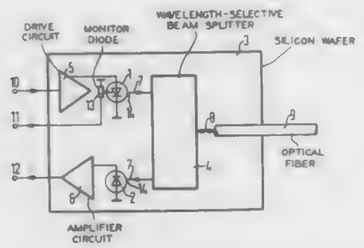
Karl-Ulrich Stein, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1989, Ser. No. 408,561

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833311

Int. Cl.[5] G02B *6/12*

U.S. Cl. 350—96.11 **25 Claims**



1. An optoelectronic transmitter and receiver device on a silicon wafer, comprising:

an optical transmitter inserted into the silicon wafer and formed of a laser composed of III/V compound semiconductor material;

an optical receiver inserted into the silicon wafer and formed of a receptor diode;

a controller monolithically integrated in the silicon wafer including:

a drive circuit means for driving said optical transmitter;

a pre-amplifier circuit means for amplifying output signals from said optical receiver;

coupling optics on the silicon wafer having a connection for an optical fiber;

light guides monolithically integrated in the silicon wafer and connected between said coupling optics and said optical transmitter and said optical receiver; and

a wavelength selective beam splitter in said light guides between said coupling optics and said optical transmitter and said optical receiver for beam splitting, said beam splitter being monolithically integrated into the silicon wafer.

4,989,936

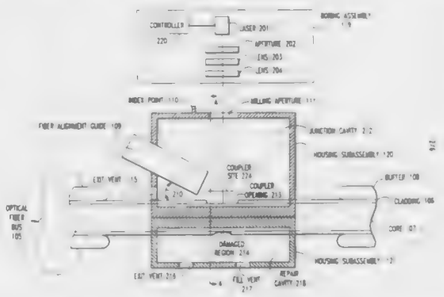
FABRICATION OF OPTICAL COMPONENTS UTILIZING A LASER

Richard J. Coyle, Jr., Lawrenceville, N.J.; Gary J. Grimes, Thornton; Lawrence J. Hass, Broomfield, both of Colo.; Anthony J. Serafino, Cranbury, and George J. Shevchuk, Old Bridge, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1989, Ser. No. 454,603

Int. Cl.[5] G02B *6/26, 6/36*

U.S. Cl. 350—96.15 **3 Claims**



1. A coupler for communicating optical energy into or out of an optical fiber said optical fiber being comprised of a core surrounded by a cladding, said coupler comprising

an assembly adapted to be attached to said optical fiber and formed so as to define (a) a first cavity that is in communication with a selected site on said fiber when said housing is attached to said optical fiber (b) a milling aperture through which a radiation beam is focused onto said site to ablatively remove a portion of said cladding to expose the underlying portion of said core, (c) a second cavity that is in communication with a region of said optical fiber opposite to said site when said housing is attached to said optical fiber,

a coupler fiber alignment guide disposed in said assembly in such a way that a coupler fiber inserted into said guide is aligned with said site,

a coupler fiber inserted into said alignment guide,

a body of junction media filling said first cavity which allows for the communication of light between said coupler fiber and said site and which physically secures said coupler fiber to said assembly, and

a body of repair medium filling said second cavity, said repair media having substantially the same index of refraction as said core.

4,989,937

LIGHT WAVEGUIDE COUPLER HAVING THREE OR MORE GATES AND UTILIZING THE BEAM SPLITTER PRINCIPLE AND THE METHOD FOR MANUFACTURE

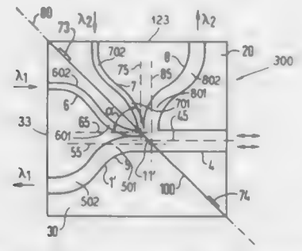
Hans F. Mahlein, Unterhaching, and Gerhard Winzer, Putzbrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 863,858

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519810

Int. Cl.[5] G02B *6/26*

U.S. Cl. 350—96.15 **12 Claims**



1. A method for manufacturing a light waveguide coupler having at least three gates and utilizing a beam splitter principle, said coupler having a carrier member supporting a light waveguide structure with a branching node and branches extending therefrom, said structure being divided at the branching node by a partially light transmitting optical layer, said method comprising of steps of providing a carrier member of glass; manufacturing a continuous branching light waveguide structure with a branching node in the carrier member by providing a metal mask on a surface of the carrier member, said mask having an opening in a pattern corresponding to the shape of the light waveguide structure, and said mask having portions defining two marks on the surface of the carrier member to define a line for a parting plane, and by an ion exchange method with the branching node being at a point approximately adjacent the parting plane; parting the carrier member into two parts by cutting along the parting plane defined by said two marks; polishing the cut surface of each part to form two surfaces of optical qualities; applying a partially light transmitting optical layer to one of the two surfaces of optical quality; and then joining the two parts together with the other surface of optical quality engaging the optical layer and the waveguides of one part being aligned with the waveguides of the other part.

4,989,938

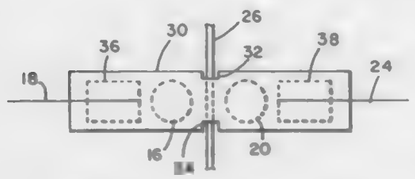
CONTINUOUSLY VARIABLE FIBER OPTIC ATTENUATOR

Thomas W. Tamulevich, Chelmsford, Mass., assignor to Light Control Systems, Inc., Tyngsboro, Mass.

Continuation-in-part of Ser. No. 241,606, Sep. 8, 1988, Pat. No. 4,904,044. This application Feb. 7, 1990, Ser. No. 476,743

Int. Cl.[5] G02B *6/26, 5/20*

U.S. Cl. 350—96.15 **11 Claims**



1. An optical attenuator for attenuating transmission signals, comprising:

(a) a flexible optical filter having a varying optical density gradient along at least one of its dimensions;

(b) a first optical fiber for carrying the transmission signals to the flexible optical filter;

(c) a second optical fiber for receiving resulting attenuated transmission signals from the flexible optical fiber; and

(d) a reciprocating means for moving the flexible optical filter along the at least one dimension over which the optical density gradient varies as to adjust a level of attenuation of the transmission signals.

4,989,939

COUPLER FOR OPTICAL FIBERS

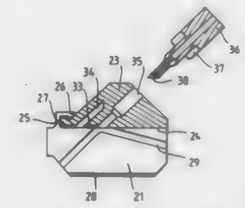
Eric R. Cox, Chester, England, and Philippe J. C. Lelaert, Maldegem, Belgium, assignors to Imperial Chemical Industries plc, London, England

Continuation of Ser. No. 744,270, Jun. 13, 1985, abandoned. This application May 30, 1989, Ser. No. 358,507

Claims priority, application United Kingdom, Jun. 21, 1984, 8415890; Jan. 31, 1985, 8502451

Int. Cl.[5] G02B *6/26, 6/42*

U.S. Cl. 350—96.15 **4 Claims**



1. A device for optically coupling a main optical fibre comprising a core surrounded by cladding of lower refractive index, and having a protective layer surrounding of the cladding, to at least one tap fibre having a light receptive portion in the form of an exposed end face, the device comprising means to hold an intermediate portion of the main fibre with cladding and protective layer intact and to conform it to a predetermined path which executed a bend having a radius of curvature sufficiently small to cause some of any light flowing through the main fibre to leak from the cladding around the outer surface of the bend, the holding means comprising means to hold the end portion of the tap fibre with its end portion adjacent the outer surface of the bend to receive a least a portion of the light leaking from the cladding around the outer surface of the bend, in which the means for holding the main fibre comprises a first assembly having a mating surface positioned with respect to said predetermined path such that the cladding on the outer surface of the bend in the main fibrelies flush with the mating surface, and the means for holding the tap fibre comprises a second assembly lockable against the mating surface in a predetermined position wherein the light receptive portion of the tap fibre is positioned to receive at least a portion of the light leaking from the cladding around the outer surface of the bend in the main fibre, and including a stripping blade fixed to the second assembly which blade can be slid along the mating surface to strip a portion of the protective layer from the outer surface of the bend which is proud of the mating surface to expose the cladding as the second assembly is moved to its lockable position.

4,989,940

METHOD OF AND DEVICE FOR ALIGNING AN OPTICAL FIBER WITH RESPECT TO THE LENS OF A CONNECTOR

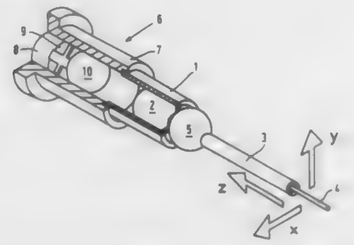
Heinrich W. Wollenweber, Vettweiss; Detlev Lohmuller, Bonn; Achim P. Mihm, and Wolfgang W. Entin, both of Cologne, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 25, 1990, Ser. No. 470,293

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 3902264

Int. Cl.[5] G02B 6/32

U.S. Cl. 350—96.18 20 Claims



1. A device for aligning an optical fiber (4) with respect to a lens (2) of a connector, the optical fiber (4) being aligned such that a beam issuing from the optical fiber (4) and passing through the lens (2) is directed concentrically at a four-quadrant measuring device (8), said aligning device, comprising means for moving the optical fiber (4) relative to the said lens (2) and a four-quadrant measuring device (8) at which the beam issuing from the optical fiber (4) is directed, wherein the four-quadrant measuring device (8) is arranged in the focal point of a focusing lens (10), and the output signals of the four-quadrant measuring device (8) are supplied to a summing circuit which forms a sum signal from the individual signals of the four-quadrant elements (9).

4,989,941

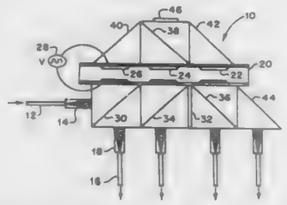
NORMAL INCIDENCE OPTICAL SWITCHES USING FERROELECTRIC LIQUID CRYSTALS

Richard A. Soref, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 18, 1988, Ser. No. 169,910

Int. Cl.[5] G02B 6/32

U.S. Cl. 350—96.18 25 Claims



1. An optical path routing switch comprising:

(a) a ferroelectric liquid crystal means for receiving at least one optical signal and having means for selectively changing the polarization state of the optical signal passing through said ferroelectric crystal means;

(b) a first light waveguide means for directing an optical signal into the ferroelectric liquid crystal means at substantially normal incidence thereto; and

(c) second light waveguide means for directing an optical signal emerging from said ferroelectric liquid crystal away from said liquid crystal along at least one path according to the polarization state of the optical signal passing through said ferroelectric crystal means.

4,989,942

COLLIMATED LIGHT OPTRODE

Harold M. Koenigsberg, Beverly Hills, and Dan J. O'Neal, Hermosa Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 27, 1989, Ser. No. 413,497

Int. Cl.[5] G02B 6/32

U.S. Cl. 350—96.18 20 Claims

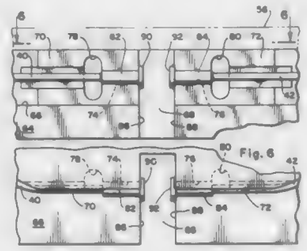


Fig. 6

1. An optrode comprising:

first and second optical fibers;

a body having means for supporting said first and second optical fibers and for positioning their ends on a common axis;

walls defining a gap in said body;

first and second GRIN lenses for collimating light;

means in said body adjacent said gap for supporting said first and second GRIN lenses on opposite sides of said gap in substantial axial alignment with each other, said first and second optical fibers being respectively attached to said GRIN lenses so that light transmitted in said first optical fiber and through said first GRIN lens is partially absorbed in liquid in said gap in accordance with the composition of material in said liquid in said gap so that the light in said second fiber contains information related to the liquid in said gap.

4,989,943

OPTICAL FIBER ALIGNMENT DEVICE

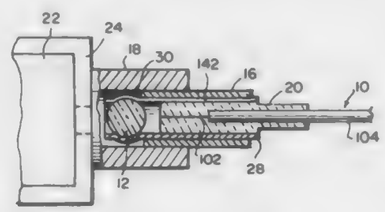
Akitoshi Yoshinaga, and Mitsuru Sugawara, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 18, 1989, Ser. No. 409,585

Claims priority, application Japan, Nov. 2, 1988, 63-277817

Int. Cl.[5] G02B 6/32, 6/26; H01J 5/16

U.S. Cl. 350—96.18 16 Claims



1. An optical circuit device comprising:

optical fiber means for introducing optical signals;

lens means for focusing the optical signals from the fiber means;

inner elastic holding means for employing the elasticity of the inner holding means to hold the fiber means and the lens means on the same optical axis; and

second holding means adapted to be connected to another device, for holding the inner holding means therein, the optical axis of the inner holding means being adjusted by shifting a position of the inner holding means in the second holding means parallel to the optical axis and by moving the second holding means perpendicular to the optical axis.

4,989,944

METHOD AND DEVICE FOR MANUFACTURING A CONNECTOR PART FOR AN OPTICAL CONNECTOR

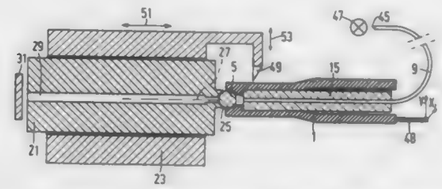
Antonius H. L. Tholen; Cornelis J. T. Potters, and Antonius J. A. Nicia, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 17, 1986, Ser. No. 875,417

Claims priority, application Netherlands, Jun. 21, 1985, 8501797

Int. Cl.[5] G02B 6/32

U.S. Cl. 350—96.18 5 Claims



1. A method of manufacturing an optical fiber connector element, said method comprising the steps of:

providing a tubular housing having first and second opposite ends and a bore extending from the first end to the second end, said housing having an outer surface;

providing a spherical lens at the first end of the housing, said lens having a focal plane and a center;

providing an optical fiber having first and second opposite ends, said first fiber end having an end face, said end face having a center;

arranging the first fiber end in the bore of the housing with the fiber end face at the focal plane of the lens, the center of the end face and the center of the lens defining an optical axis;

providing alight detector having a central axis, said detector providing an electrical output signal indicating when light incident thereon is centered on the central axis;

arranging the center of the spherical lens on the central axis of the light detector while allowing the lens to rotate around its center;

illuminating the second end of the optical fiber so as to emit a beam of light from the first end of the fiber through the lens onto the detector;

displacing the second end of the housing so as to pivot the housing on the center of the lens;

monitoring the detector electrical output signal to determine when the light beam from the fiber is centered on the central axis of the detector;

fixing the position of the second end of the housing when the detector electrical output signal indicated that the light beam from the fiber is centered on the central axis;

rotating a tool around the central axis of the detector; and

machining the outer surface of the housing with the tool to render such outer surface concentric with said central axis and thereby also concentric with the optical axis.

4,989,945

BRANCH DEVICE FOR MULTI-CORE OPTICAL FIBER

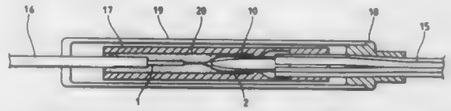
Toshihiko Ohkura, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 12, 1990, Ser. No. 507,995

Claims priority, application Japan, Apr. 14, 1989, 1-95943; Aug. 22, 1989, 1-217039

Int. Cl.[5] G02B 6/26, 6/44

U.S. Cl. 350—96.20 8 Claims



1. A branch device for a multi-core optical fiber (1), in which single-core optical fibers (2) branching out from said multi-core optical fiber are respectively inserted through single-core optical fiber protection tubes (15), said branch device comprising:

a branch portion protector (10) being arranged between an end portion of said multi-core optical fiber (1) and said single-core optical fiber protection tubes (15), said branch portion protector including a perforated member (12) having a plurality of insertion holes (13, 14) formed at the same circumference and a substantially spindle-shaped protector (11) formed integrally with said perforated member and disposed coaxially with said perforated member,

wherein said single-core optical fibers branching out from said multi-core optical fiber are passed over said spindle-shaped protector along an outer surface thereof and passed through said insertion holes of said perforated member so as to be inserted through said single-core optical fiber protection tubes respectively.

4,989,946

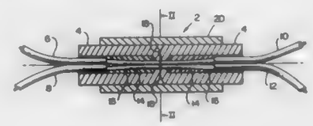
FIBER OPTIC SWITCH

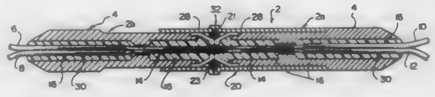
Joseph C. Williams, Casanova, and Sarah E. Goodman, Roanoke, both of Va., assignors to Alcatel NA, Inc., Hickory, N.C.

Filed Jan. 19, 1989, Ser. No. 300,088

Int. Cl.[5] G02B 6/26

U.S. Cl. 350—96.20 17 Claims





1. A fiber optic switch comprising:

first and second ferrules, each having a front surface and an aperture formed therethrough;

at least one optical fiber mounted in said first ferrule along an axis offset from and parallel to an axis of the ferrule, said optical fiber terminating at a polished end surface disposed adjacent to said front surface;

a plurality of optical fibers mounted in the second ferrule, each optical fiber being positioned along an axis, said axes being parallel to and offset from an axis of the ferrule, said

optical fibers terminating at a polished end surface disposed adjacent said front surface of the second ferrule, the axes of all optical fibers in both ferrules being offset from the ferrule axes by the same distance; and

means for rotatably mounting said ferrules for relative rotation with their front surfaces in juxtaposition and their axes aligned, so that one of said first and second ferrules may be rotated about its axis relative to the other ferrule, whereby the ferrules may be relatively rotated to selectively align and misalign the optical fibers mounted in said first and second ferrules.

4,989,947

PLASTIC OPTICAL FIBERS

Isao Sasaki; Kozi Nishida; Masaru Morimoto; Hisao Anzai, and Hideaki Makino, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 7,165, Jan. 27, 1987, abandoned. This application Jan. 10, 1989, Ser. No. 296,293

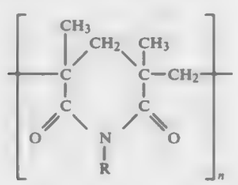
Claims priority, application Japan, Jan. 27, 1986, 61-13790

Int. Cl.[5] B32B *27/00;* G02B *6/00*

U.S. Cl. 350—96.34 7 Claims

1. A core-clad plastic optical fiber comprising

(a) a polyglutarimide series polymer having a polymeric structural unit represented by formula (I)



(I)

wherein R represents a hydrogen atom, an alkyl group, a cycloalkyl group, or an aromatic group and n represents a positive integer, having a thermal deformation temperature of at least 120° C. as a core, and

(b) an organic polymer having a refractive index lower than the refractive index of the core as a cladding layer, said plastic optical fiber having the characteristic that the light transmission loss measured at 655 nm is not more than 500 dB/km, wherein the polyglutarimide series polymer forming the core is a polymer produced by solution polymerization using an aromatic hydrocarbon solvent selected from benzene, toluene, ethylbenzene and xylene under the polymerization temperature of 60° C. to 140° C. and has a YI_S value of not more than 3 in a mixed solvent of said aromatic hydrocarbon and methanol, reacting polymethyl methacrylate polymer solution with an amine represented by formula (II)

$$R'—NH_2 \quad \text{(II)}$$

wherein R' represents a hydrogen atom, an alkyl group, a cycloalkyl group, or an aromatic group, and then removing volatile components in the reaction system, wherein said polymethyl methacrylic polymer contains not more than 500 ppm of impurities, measured by gas chromatography, which react with the amine shown by formula (II) to form yellow materials.

4,989,948

REFLECTIVE SHEETING MATERIAL

John F. Dreyer, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 8, 1989, Ser. No. 348,817

Int. Cl.[5] G02B *5/12*

U.S. Cl. 350—97 23 Claims



1. A specularly reflective sheeting material having a structured reflective surface comprising a linear array of isosceles prism reflecting elements, each of said elements including a pair of reflecting surfaces having an angle of about 120° therebetween, each reflective surface also forming a reflective groove with an adjacent reflective surface, the surfaces of said groove having an angle of about 120° therebetween.

4,989,949

ARRANGEMENT FOR DISCRIMINATING WHETHER OR NOT SEMICONDUCTOR LASER IS FUNCTIONAL

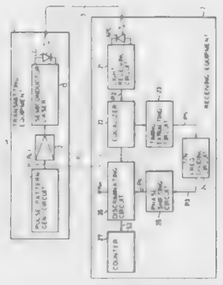
Hajime Imai, Kawasaki, and Hiroshi Nishimoto, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1988, Ser. No. 261,169

Claims priority, application Japan, Oct. 23, 1987, 62-266560

Int. Cl.[5] G01J *1/00;* H01S *3/13*

U.S. Cl. 356—121 14 Claims



1. An arrangement for discriminating whether a semiconductor laser of transmitting equipment is functional or non-functional due to mode hopping, said arrangement comprising:

a pulse pattern generating circuit, operatively connected to the semiconductor laser, for generating a pulse pattern repeatedly with a unit of a plurality of bits and outputting the pulse pattern to the semiconductor laser;

a medium, operatively connected to the semiconductor laser, with a chromatic dispersion for passing a light pulse signal output from the semiconductor laser; and

receiving equipment, operatively connected via said medium to the transmitting equipment, comprising

a receiving circuit, operatively connected to said medium, for regenerating the pulse pattern from the light pulse signal and outputting a regenerative pulse pattern, and

a discriminating circuit, operatively connected to said receiving circuit, for discriminating whether or not a pseudo-pulse exceeding a predetermined threshold level appears at a specific position in the regenerative pulse pattern during a predetermined time interval, the pseudo-pulse occurring because the light pulse signal output from the semiconductor laser is subjected to the chromatic dispersion while passing through said medium, thereby indicating a result of whether the semiconductor laser is functional or non-functional due to mode hopping.

4,989,950

LENS POSITION CORRECTION DEVICE

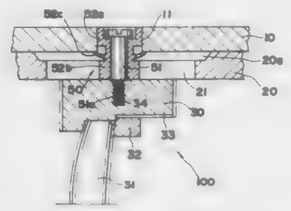
Hiroaki Nakauchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1988, Ser. No. 282,447

Claims priority, application Japan, Dec. 12, 1987, 62-189274[U]

Int. Cl.[5] G02B *7/04*

U.S. Cl. 350—251 10 Claims



1. A lens position correction device for use in a lens barrel having a movable lens barrel with a first cam channel, a fixed lens barrel with a second cam channel, a lens holding member and a cam follower pin, said lens position correction device is characterized in that said cam follower pin is constituted from an eccentric collar to be fitted in each of the first and second cam channels and an anchor member for tightly fixing the eccentric collar onto the lens holding member, the eccentric collar being made of elastic material and having a contact portion formed on a peripheral surface thereof so as to be in elastically pressing contact with one of the movable barrel, the fixed barrel and the lens holding member.

4,989,951

CATADIOPTRIC LENS SYSTEM CAPABLE OF AUTOMATIC FOCUSING OPERATION

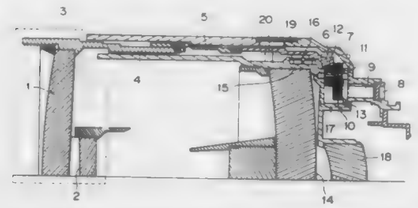
Masaaki Miyano, and Kyoko Hashimoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 15, 1989, Ser. No. 352,121

Claims priority, application Japan, May 16, 1988, 63-118614

Int. Cl.[5] G02B *7/02*

U.S. Cl. 350—255 13 Claims



1. A catadioptric lens system capable of an automatic focusing operation which includes at least a first catoptric unit disposed to reflect light coming from an object toward an object side and a second catoptric unit disposed to reflect the light from said first catoptric unit toward an image side, comprising:

a focusing optical unit for focusing;

a focusing unit holder holding said focusing optical unit, said focusing unit holder being moveable in a direction of an optical axis;

a mount for attaching the lens system to a camera body; and

a driving means disposed between said mount and said first catoptric unit and connected to said focusing unit holder for transmitting a driving force generated by a motor to said focusing unit holder,

wherein said focusing unit holder is moved in the direction of the optical axis by said driving force.

4,989,952

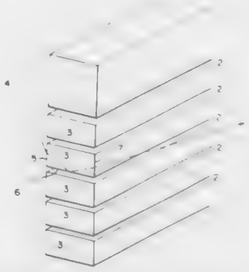
TRANSPARENT LIGHT DEFLECTING PANEL FOR DAYLIGHTING ROOMS

Ian R. Edmonds, 12 Lentara St., Kenmore, 4069 Qld., Australia

Filed May 4, 1989, Ser. No. 347,201

Int. Cl.[5] G02B *17/00, 27/00*

U.S. Cl. 350—259 6 Claims



1. A plane panel adapted to be mounted in vertical orientation in an opening in the facade of a building so as to redirect incident daylight towards the ceiling of said building, said panel comprising:

a transparent plastic plate having a plurality of parallel equally spaced apart laser cuts made perpendicularly through said plate such that said plate is divided into a series of parallel, equally spaced apart horizontally aligned parallelpipeds of rectangular cross section, said parallelpipeds being suppored by a narrow continuum of said transparent plate extending around the periphery of said transparent plate and extending at intervals across said transparent plate in a direction perpendicular to the horizontal axis of said parallelpipeds.

4,989,953

VIDEO DISPLAY TERMINAL FILTER

Kevin A. Kirschner, 1010 Rancho Rd., Corona, Calif. 91720

Filed Jan. 24, 1989, Ser. No. 301,238

Int. Cl.[5] G02B *5/20;* H04N *5/65*

U.S. Cl. 350—311 25 Claims

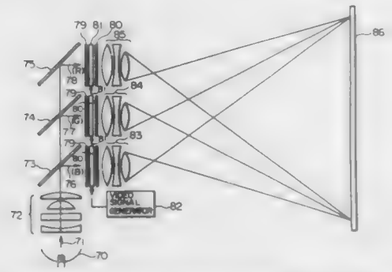
1. An optical filter for improving the viewability of images displayed on a visual display device of the type having a faceplate viewing window, comprising a thin, generally uniform thickness, substantially transparent flexible plastic film adherable to said faceplate without the use of an adhesive, said film having an optical transmission property which enhances the brightness of said images on said display device relative to background areas not displaying images.

4,989,954

PROJECTION TYPE LIQUID CYRSTAL DISPLAY DEVICE

Kazuo Yokoyama, Hirakata; Junichi Asada, Ibaraki; Hiroshi Watanabe, Yawata; Shoichi Ishihara, Katano; Sadayoshi Hotta, Hirakata; Fumiko Yokotani, Suita, and Yoshihiro Matsuo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1988, Ser. No. 254,244
Claims priority, application Japan, Oct. 9, 1987, 62-255397; Dec. 2, 1987, 62-304804; Apr. 25, 1988, 63-102131
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—337 4 Claims



1. A projection type liquid crystal display device comprising three liquid crystal panels for transmitting three color light beams of RGB, respectively, a polarizer and an analyzer arranged respectively on the input side and the output side of each of said liquid crystal panels, and an optical system for focusing images of said three liquid crystal panels on a same screen, wherein the device has negative 90° twisted nematic (TN) mode liquid crystal panels in which the polarization axes of said polarizer and said analyzer are aligned so as to be nearly in a state of parallel Nicols, and the gap lengths of the three liquid crystal panels are the same, and crossing angles of polarization axes of said polarizer and said analyzer for each of said three liquid crystal panels are different from each other to minimize transmittance of the three panels that are not driven, wherein the crossing angle θ_R of the polarization axes of the R light liquid crystal panel is in the range $0>\theta_R>-20°$, the crossing angle θ_B of the polarization axes of the B light liquid crystal panel is in the range of $0<\theta_B<+20°$, and the crossing angle θ_G of the polarization axes of the G light liquid crystal panel takes one of respective values satisfying the relations $\theta_G=0$ and $\theta_R<\theta_G<\theta_B$, provided that the direction, in which the polarization axis is rotated to reduce a twist angle of a linearly polarized light beam, is defined to be positive.

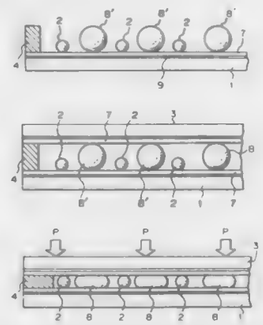
4,989,955

LIQUID CRYSTAL ELECTRO-OPTICAL ELEMENT AND PROCESS FOR PREPARATION THEREOF

Kokichi Ito, Funabashi; Takamasa Harada, Inba; Koichiro Oka, Ibaraki, and Hiroyuki Ikeuchi, Kyoto, all of Japan, assignors to Toray Industries, Inc. and Seiko Instruments & Electronics Ltd., both of Tokyo, Japan

Continuation of Ser. No. 910,573, Sep. 23, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 267,704
Claims priority, application Japan, Sep. 25, 1985, 60-211400; Oct. 4, 1985, 60-220421; Oct. 17, 1985, 60-232036
Int. Cl.[5] G02F *1/133*
U.S. Cl. 350—344 12 Claims

1. A process for the preparation of a liquid crystal electro-optical element comprising a liquid crystal, two substrates secured by a sealing material to confront each other with a certain space and hold the liquid crystal therebetween, alignmental films present in interfaces between the liquid crystal and the substrates to line up molecules of the liquid crystal and the driving means for applying a voltage to the molecules of the liquid crystal, said process comprising the steps of arranging the sealing material on one substrate having an electrode and alignmental film on the surface thereof in a peripheral edge portion thereof on the alignmental film side, dispersing and arranging spacer particles having a diameter equal to an intended space length and adhesive particles comprising as the main component a partially amine cured epoxy resin containing a phenolic latent curing agent which is compatible with the epoxy resin, the adhesive particles having a particle size larger than the diameter of the spacer particles, on the surface of one substrate, bonding the two substrates by, heat-pressing the substrates in the piled state, and sealing the liquid crystal in the space between the substrates.

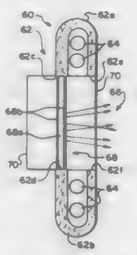


4,989,956

VISUAL DISPLAY DEVICE WITH FLUORESCENT DYE-DOPED EDGE-ILLUMINATING EMITTER PANEL

Wei-Yu Wu, Calabasas; Tsung Y. Hsu, Thousand Oaks; Anna M. Lackner, Los Angeles, and Willis H. Smith, Jr., Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 4, 1989, Ser. No. 293,875
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—345 48 Claims



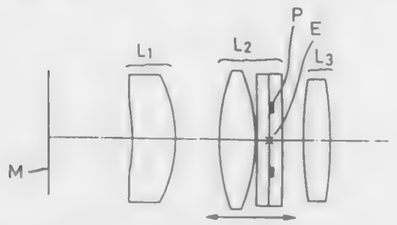
1. A visual display device, comprising:
display panel means formed with a display pattern on a surface thereof and having a light receiving edge and
fluorescent dye doped emitter panel means for absorbing light incident upon a surface thereof and emitting light through an edge thereof, said edges of said emitter and display panel means being optically coupled to each other for edge illumination of said display pattern, said emitter and display panel means each comprising light transmitting substrates.

4,989,957

OBJECTIVE LENS FOR MICROSCOPES

Toshinobu Suzuki, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1989, Ser. No. 361,644
Claims priority, application Japan, Jun. 6, 1988, 63-139125
Int. Cl.[5] G02B *21/02*
U.S. Cl. 350—414 7 Claims



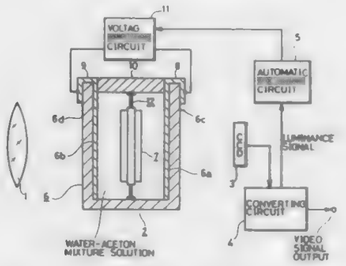
1. An objective lens for microscopes, comprising:
a plurality of lens units constructed so that at least one of said lens units is moved along an optical axis to cancel variation of aberration attributed to a thickness of a cover glass; and
an optical modulator arranged substantially at an pupil position of said microscope objective lens,
said optical modulator being moved integral with said moving lens unit along the optical axis.

4,989,958

FOCUS ADJUSTING APPARATUS PROVIDED WITH A FOCUS LENS MEMBER FORMED OF POLYMER GEL SUBSTANCE HAVING ELECTRO-REACTIVE DEFORMABILITY

Yuji Hamada; Takanori Fujii; Masakazu Sakata, all of Hirakata; Yoshitaka Nishio, Moriguchi; Yoshikazu Tsujino, Sakai; Kazuhiko Kuroki, Uji, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Nov. 2, 1988, Ser. No. 266,452
Claims priority, application Japan, Nov. 5, 1987, 62-279613
Int. Cl.[5] G02B *3/14, 1/06, 15/00*
U.S. Cl. 350—419 9 Claims



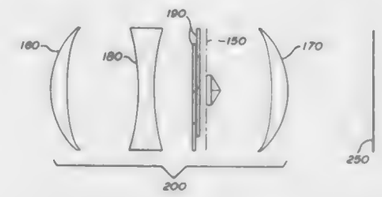
1. A focus adjusting apparatus comprising:
an optical system including focus lens means formed of a polymer gel substance having electro-reactive deformability, said focus lens means having portions formed of said polymer gel substance with different deformable characteristics; and
drive means for driving said focus lens means.

4,989,959

ANTI-ALIASING OPTICAL SYSTEM WITH PYRAMIDAL TRANSPARENT STRUCTURE

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 12, 1989, Ser. No. 364,658
Int. Cl.[5] G02B *5/06, 1/00, 27/12*
U.S. Cl. 350—447 6 Claims



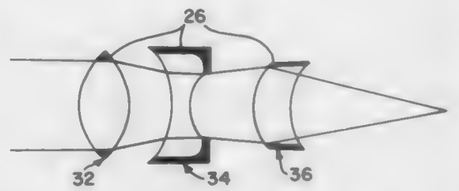
1. An optical, low-pass filter, anti-aliasing apparatus comprising:
an objective lens for forming an image; and
a pyramidal structure fabricated of a substantially transparent material and located at or near the aperture stop of said objective lens or at or near its image to create a multiplicity of overlapping object images for the purpose of providing the low-pass filtering, said low-pass filtering remaining substantially constant as the aperture size of said objective lens changes.

4,989,960

REDUCING STRAY LIGHT IN LENSED OPTICAL SYSTEMS

Nils I. Thomas, Roanoke, Va., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 18, 1988, Ser. No. 233,502
Int. Cl.[5] G02B *1/12*
U.S. Cl. 350—448 5 Claims



1. A lens made of a glass composition including a metal oxide in the glass matrix, said lens having an optical axis in one direction and an outer diameter surface radially spaced in a direction normal to said optical axis, said lens further comprising:
an optical transmitting surface on one side of said lens having a radius of curvature of a selected optical power centered on said optical axis;
an optical receiving surface on an opposite side of said lens having a radius of curvature of a selected optical power centered on said optical axis; and
at least one light absorbing area located at a position along said outer diameter surface selected so as to be located between said transmitting and receiving surfaces and extending into the lens from said outer surface thereof to a depth sufficient to absorb stray light received through said receiving surface or said transmitting surface and reflected off of a surface within the lens, said light absorbing area including said metal oxide being chemically reduced in the glass matrix to provide optical darkening of

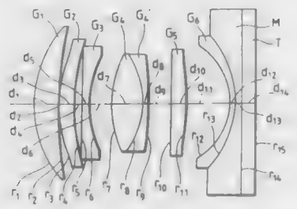
said area for absorption of stray light to reduce the amount of stray light in said lens to approximately 0.1%.

4,989,961

PROJECTION LENS SYSTEMS FOR USE IN PROJECTION TELEVISION

Takayuki Yoshioka, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,152
Claims priority, application Japan, Apr. 8, 1988, 63-85155
Int. Cl.[5] G02B *9/62*
U.S. Cl. 350—464 **11 Claims**



1. A projection lens system including seven lens elements for use in a projection television having a screen which comprises in order from the screen side:
- a first lens unit composed of a positive lens element;
- a second lens unit composed of an aspherical lens element made of plastic in a meniscus form having at least one aspherical surface;
- a third lens unit composed of a concave lens element;
- a fourth lens unit composed of a positive cemented lens doublet having a convex surface on both sides;
- a fifth lens unit composed of a positive lens element made of plastic substantially in meniscus form having at least one aspherical surface; and
- a sixth lens unit composed of a negative lens element which has a concave surface directed toward the screen, the sixth lens unit being made of a plastic lens substantially in meniscus form having at least one aspherical surface wherein the system satisfies the following relation:

$$0.2<\Psi 1m2<0.7$$

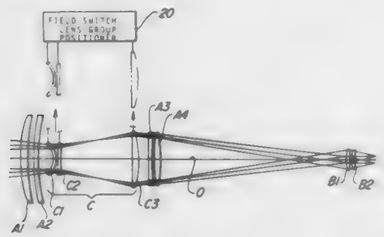
where $\Psi 1,2$ is the composite power of the first and second lens units.

4,989,962

DUAL BAND/DUAL FOV INFRARED TELESCOPE

Reynold S. Kebo, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 31, 1988, Ser. No. 264,714
Int. Cl.[5] G02B *23/00, 15/00, 15/24*
U.S. Cl. 350—537 **11 Claims**



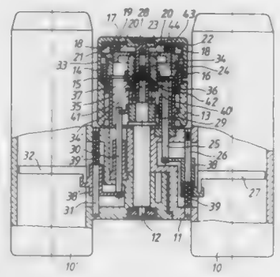
9. A dual field of view telescope for operating in both the medium infrared spectral band having radiation with wavelengths from 3.8 to 5 micrometers radiation with and in the long infrared spectral band having wavelengths from 8 to 11.5 micrometers, said telescope including an objective lens group and an eyepiece lens group on an optical axis, the improvement which comprises:
- said objective lens group including a front doublet and a rear doublet displaced along the optical axis, the front doublet being defined by a positive chalcogenide lens and a negative zinc sulfide lens, the rear doublet being defined by a negative germanium lens and a positive chalcogenide lens;
- said eyepiece lens group being defined by a doublet including two positive chalcogenide lenses; and
- field switch lens group means having a plurality of lenses selected from the group of monoxide chalcogenide glass and zinc sulfide, said field switch group cooperating with the lenses of the objective lens group to shorten the focal length of the thereby providing a wider field of view for the telescope when the field switch lens group is placed on the optical axis.

4,989,963

BINOCULAR TELESCOPE WITH COUPLED JOINT FOCUSING AND UNCOUPLED SEPARATE FOCUSING

H. Peter Farnung, Bad Nauheim; Alfred Hengst, Lahnau, and Heinz Keiner, Solms, all of Fed. Rep. of Germany, assignors to Leica GmbH, Solms, Fed. Rep. of Germany

Filed Sep. 8, 1989, Ser. No. 404,511
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830620
Int. Cl.[5] G02B *23/00, 7/06*
U.S. Cl. 350—556 **13 Claims**



1. A binocular telescope comprising:
- a. a first tube;
- b. a second tube;
- c. an articulated bridge connected to said first tube and to said second tube;
- d. a first focusing member located in said first tube;
- e. a second focusing member located in said second tube;
- f. a first setting ring coupled to said first focusing member;
- g. a second setting ring coupled to said second focusing member;
- h. means for selectively coupling and uncoupling said first and second focusing members to provide a joint internally focusing mechanism.

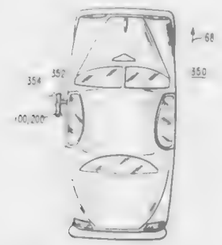
4,989,964

REAR-VIEW MIRROR

William H. Meise, P.O. Box 7138, Wrightstown Township, Bucks County, Pa. 18940

Filed Jun. 7, 1989, Ser. No. 362,520
Int. Cl.[5] G02B *7/18*
U.S. Cl. 350—616 **34 Claims**

1. A vehicle with a side rear-view mirror, comprising;
- a plurality of elongated, generally planar mirror segments, each of said mirror segments having an axis of elongation lying in the plane of the mirror segment, said plurality of mirror segments being arrayed in an array direction, with said axes of elongation approximately parallel and with said planes of said mirror segments approximately parallel, to form a mirror array; and



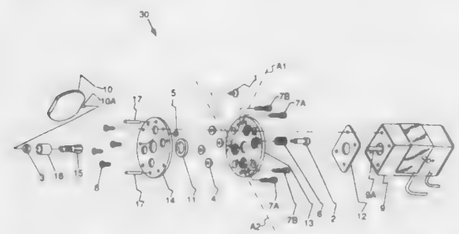
- mounting means for holding said mirror array at a side of said vehicle in a location which is viewable by a vehicle operator, said mounting means holding said mirror array with said array direction approximately parallel to the direction of motion of said vehicle.

4,989,965

COLLET MOUNTING FOR AN OPTICAL ELEMENT

Raymond G. Bryan, Reno, Nev., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jun. 13, 1989, Ser. No. 365,576
Int. Cl.[5] G02B *7/18, 26/08*
U.S. Cl. 350—632 **16 Claims**



11. A method for coupling a first shaft to a second shaft comprising the steps of:
- providing a collet having a first end which is compressible and a second end, the first end defining cavity and comprising an outer wall tapered to be of greater outside diameter at a portion closer to the first end than at a portion nearer the second end;
- inserting the first shaft in the cavity;
- providing a sleeve around the first end of the collet;
- tightening the sleeve onto the first end of the collet, so as to compress the first end of the collet on the first shaft; and
- attaching the second shaft to the second end of the collet.

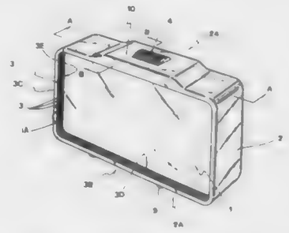
4,989,966

ADJUSTABLE VEHICLE SIDE VIEW MIRROR

Hyun G. Kim, 115-295, Mun Won-dong, GWA Chun, Kyungki-do, Rep. of Korea

Filed Mar. 7, 1990, Ser. No. 490,060
Claims priority, application Rep. of Korea, Apr. 29, 1989, [illegible]/89
Int. Cl.[5] G02B *7/18;* B60R *1/06*
U.S. Cl. 350—632 **3 Claims**

1. An adjustable side view mirror for use with a vehicle, said mirror comprising:
- a mirror having a periphery;
- a flexible member in contact with a portion of said periphery of said mirror and having a first end and a second end;
- a frame having an opening to receive said mirror and said flexible member in contact with a portion of said periphery of said mirror; and
- an adjusting means positioned on said frame for adjusting the distance separating said first and said second ends of said flexible member such that in use said mirror is adjusted by manipulating said adjusting means to increase the distance separating said first and said second ends of said flexible



member thereby decreasing the tension of the flexible member on said mirror to enable said mirror to be moved to a desired position and securing said mirror by manipulating said adjusting means to decrease the distance separating said first and said second ends of said flexible member to thereby increasing the tension of the flexible member on said mirror to stabilize said mirror against further movement.

4,989,967

LENS FOR SPECTACLES

Ryoji Matsuda, 1-15, Konyamachi, Kokurakita-ku, Kitakyushu-shi, Fukuoka, Japan

Filed Apr. 6, 1989, Ser. No. 334,852
Claims priority, application Japan, Apr. 8, 1988, 63-47852; Jun. 13, 1988, 63-78190
Int. Cl.[5] G02C *7/10*
U.S. Cl. 351—165 **5 Claims**

1. A lens for spectacles comprising:
- a lens body made of glass or plastic and a surface layer provided on at least one side of said lens body in a predetermined pattern so that a plurality of transparent portions will be left on said one side of said lens body, said transparent portions having an area such that the light transmission rate of the lens will be less than 100 per cent, said surface layer being a material selected from the group consisting of a fluorescent material, a light absorbing material and a light reflecting material, and said lens further comprising an interface layer interposed between said surface layer and said lens body.

4,989,968

PHOTOSCREENING CAMERA SYSTEM

Howard L. Freedman, 3113 E. Lake Sammamish Pkwy., NE., Redmond, Wash.

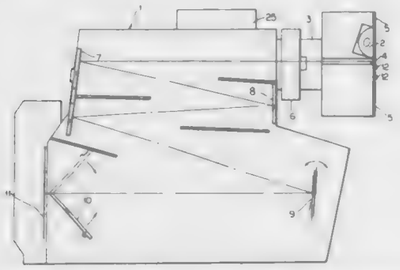
Filed Jul. 31, 1989, Ser. No. 387,697
Int. Cl.[5] A61B *3/14*
U.S. Cl. 351—206 **27 Claims**

1. A camera for detecting the photorefractive errors as well

as strabismus, media opacities and ocular abnormalities of a patient's eyes for the purpose of diagnosing factors which can lead to amblyopia, comprising:

a strobe for providing a flash of light to a patient's eyes and having a strobe edge;

a lens disposed behind said strobe, said lens including a shutter and a narrow aperture defined on one side by said strobe edge to minimize the eccentricity of the flash with respect to the lens aperture;



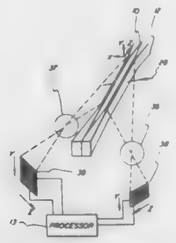
a plurality of mirrors inside of said camera's housing forming a foldable light path to receive and reflect light reflected back from the patient's eyes to provide a long focal length and a large magnified image indicating any photorefractive error or strabismus, media opacities or other ocular abnormalities of the patient's eyes which are detectable including differences in brightness of the red reflex, abnormalities in corneal light reflection, appearance of opacities in the red reflex, and photorefractive errors causing defocus of light exiting the eye imaged by the camera.

4,989,969

TIME OF FLIGHT VELOCIMETER

Edward T. Siebert, New Fairfield, and Patrick R. Manzo, Danbury, both of Conn., assignors to Hughes Danbury Optical Systems, Inc., Danbury, Conn.

Filed Jun. 30, 1988, Ser. No. 213,854
Int. Cl.[5] G01P 3/36
U.S. Cl. 356—28 26 Claims



1. A time of flight velocimeter comprising:

a radiation source projecting a first beam and a second beam which converge into a first and second waist portion, respectively; each said waste portion extending longitudinally and having an elongated height;

a first detector means and a second detector means positioned to receive radiation backscattered by a particle intersecting said first and second waist portions, respectively, each of said first and said second detector means being comprised of an array of discrete detector elements;

means to focus the first and second waist portions onto said first and second detector means, respectively; and

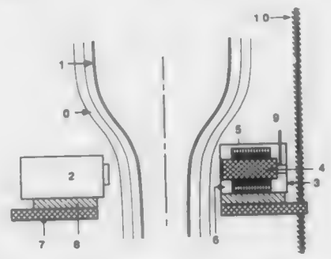
processor means to receive signals from said first and second detector means in response to backscattered radiation and calculate the particle velocity.

4,989,970

NON-CONTACT SENSING APPARATUS AND METHOD FOR TEMPERATURE PROFILE AND THICKNESS DETERMINATION AND CONTROL OF RADIATION TRANSLUCENT MATERIALS

Gregory A. Campbell, R.D. #2, Box 318, Canton, N.Y. 13617; Bangshu Cao, P.O. Box 135, and Paul A. Sweeney, 9 Washington St., Apartment 1, both of Potsdam, N.Y. 13676

Filed Apr. 26, 1989, Ser. No. 343,278
Int. Cl.[5] G01N 21/01; G01J 5/28, 5/06; G01B 11/06
U.S. Cl. 356—73 14 Claims



1. An apparatus for temperature profile determination in radiation translucent materials of arbitrary thickness comprising:

an optical path for radiation to pass through the material;

means of irradiating the material with a variable intensity radiation source such that radiation passes through the material;

means of detecting the level of said radiation transmitted through the material, said detecting means generating an electrical signal responsive to the intensity of said transmitted radiation;

a means for providing the surface temperature(s) of the material;

computing means for receiving electrical signals from the radiation detection means and operating thereon for the determination of the material apparent transmissivity, apparent emissivity, and average (bulk) temperature of said material;

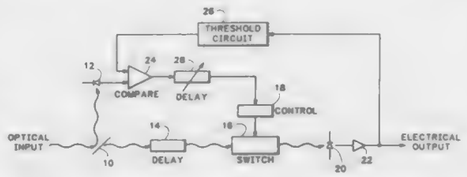
computing means used in conjunction with said surface temperature(s) and average temperature, operating thereon for the calculation of temperature profiles and thickness of said material.

4,989,971

AUTOMATIC MASK TRIGGER FOR AN OPTICAL TIME DOMAIN REFLECTOMETER

Kevin B. McDonald, Bend, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 14, 1989, Ser. No. 379,852
Int. Cl.[5] G01N 21/01, 21/88
U.S. Cl. 356—73.1 7 Claims



1. An improved optical time domain reflectometer of the type having an optical switch to which an optical signal in the form of return reflected light from a fiber under test is input, means for controlling the optical switch in response to a control signal, and means for converting the optical signal from the optical switch into an electrical signal, the improvement comprising:

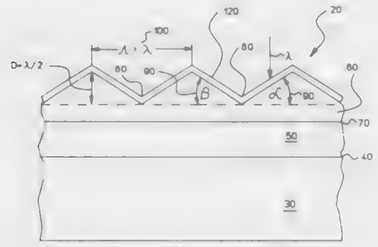
means for automatically generating the control signal as a function of a current optical input level of the optical signal for the optical switch and the electrical signal so that the optical switch is turned off when the current optical level exceeds a threshold electrical signal determined by the electrical signal to inhibit the optical signal from being passed through the optical switch.

4,989,972

LOW REFLECTIVITY SURFACE RELIEF GRATINGS FOR PHOTODETECTORS

David M. Braun, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 1, 1989, Ser. No. 346,182
Int. Cl.[5] G01J 1/42; H01L 31/0232
U.S. Cl. 356—225 32 Claims



1. A low reflectivity surface relief grating incorporated into optical receiving means responsive to incident light having a given wavelength useful, by way of example, in an optical measurement system, comprising:

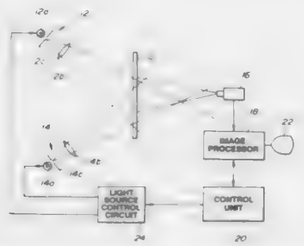
a plurality of triangular grooves formed on a surface of a layer of material, the grooves having a uniform repeat optical distance greater than the wavelength of the incident light, a uniform free-space depth substantially equal to an integral multiple of a half-wavelength of incident light and a plurality of side-angles with respect to the surface on which the grooves are formed.

4,989,973

SURFACE CONDITION ESTIMATING APPARATUS

Kazunori Noso, Yokohama, and Hiroshi Saito, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 2, 1989, Ser. No. 415,582
Claims priority, application Japan, Oct. 3, 1988, 63-247434; Oct. 12, 1988, 63-254902
Int. Cl.[5] G01B 11/00; G06K 9/00; G01N 21/84
U.S. Cl. 356—239 19 Claims



1. An apparatus for estimating a surface condition of a plate object, comprising:

a lighting unit for generating light toward the plate object, the lighting unit including a plurality of light sources for generating light in different directions toward the plate object;

means for controlling the light unit to cause sequential actuation of the light sources in a predetermined sequence;

a light sensor located out of paths of the light generated from the lighting unit for producing an electrical signal in response to light of diffused reflection from the plate object;

a processing unit for processing the electrical signal fed thereto from the light sensor for producing an image including a defective portion reflective of the light of diffused reflection, the processing unit including means for storing an image segment produced during the actuation of each of the light sources, means for expanding the image segment in a direction determined by the direction of the light incident on the plate object, and means for combining all of the expanded image segments to produce the image; and

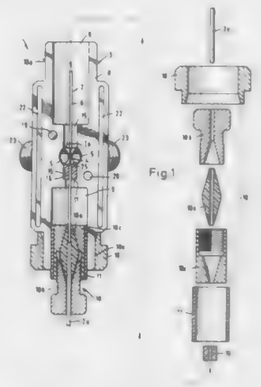
an estimating unit for estimating the surface condition of the plate object based on the defective portion of the produced image.

4,989,974

MICRO-FLOW CELL

Klaus Anton, Basel; Peter Dätwyler, Oberwil; Ernst Gassmann, Hofstetten; Peter E. Jordi, Basel, and Nico Pericles, Herznach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1989, Ser. No. 294,028
Claims priority, application Switzerland, Jan. 14, 1988, 121/88
Int. Cl.[5] G01N 21/05
U.S. Cl. 356—246 25 Claims



1. A micro-flow cell for chromatographic, spectrometric or scintillation measurements, comprising

a capillary tube with an inlet and outlet and defining a flow path between said inlet and outlet for a medium to be examined,

a holding device for said capillary tube comprising a first holding part and a second holding part, the two holding parts being designed as two substantially equal shell halves, each having a front face and a substantially semicircular cross-section, being adapted to be secured about the length of the capillary tube to hold the latter, and being separable in their longitudinal direction along contact planes which run parallel to each other,

at least one window for the transmission of measuring light to said tube formed in at least one of said holding parts,

means for connecting each end of the capillary tube in a flow path for said medium, and

means for locking said holding parts together about said capillary tube.

4,989,975

ATOMIC ABSORPTION SPECTROMETER

Carl G. Dencks, Prielstrasse 3; Gunther Roedel, Hunter den Garten 13, both of 7776 Owingen/DE, and Klaus P. Rogasch, TH-Hofmannweg 3, 7772 Uhldingen - Muhlhofen 1/DE, all of Fed. Rep. of Germany

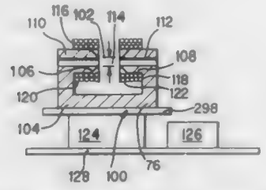
PCT No. PCT/EP89/00258, § 371 Date Nov. 16, 1989, § 102(e) Date Nov. 16, 1989, PCT Pub. No. WO89/08831, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 13, 1989, Ser. No. 439,404

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809216

Int. Cl.[5] G01N *21/31, 21/72, 21/74*

U.S. Cl. 356—307 10 Claims



1. Atomic absorption spectrometer comprising

(a) an atomizing device for atomizing a sample which is to be analyzed such that the atoms of the element contained in the sample are present in atomic state in an atomization area,

(b) a line emitting light source

(c) an optical system for generating a measuring light beam originating from a line emitting light source and passing through the atomization area,

(d) and a photo-electrical detector to which the measuring light beam is passed by the optical system after passing through the atomization area, wherein

(e) the light source, the optical system and the photo-electrical detector (38) are arranged in a housing which forms a sample cavity accessible from outside, which is passed through by a measuring light beam and which is arranged for different atomizing devices optionally being inserted, characterized in that

(f) atomizing devices are assembled to distinct insert units in which the atomizing devices have well-defined positions relative to the insert unit which in turn are arranged to be singly inserted into the sample cavity in a well-defined position to provide an entirely functioning atomic absorption spectrometer.

4,989,976

DEVICE FOR SUPPLYING LIQUID TO A NEBULIZER IN A SPECTROMETER

Bernhard Huber, Hildegardring 42, 7770 Uberlingen, Fed. Rep. of Germany

Filed May 23, 1989, Ser. No. 355,949

Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818058

Int. Cl.[5] G01N *21/72, 21/73*

U.S. Cl. 356—315 15 Claims

1. In combination,

atomization means for transforming sample into an atomic state for spectroscopic analysis,

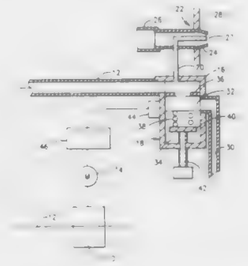
nebulizer means for nebulizing liquid for introduction into said atomization means, said nebulizer means being connected to said atomization means,

supply conduit means for conducting liquid to be nebulized to said nebulizer means,

peristaltic pump means for supplying liquid through said conduit means to said nebulizer means,

said nebulizer means having a predetermined liquid input feed rate,

discharge valve means for automatically discharging liquid feed to said nebulizer in excess of said predetermined input feed rate so as to prevent liquid feed jamming at said nebulizer, said valve means being connected to said supply conduit means and having a discharge outlet, and



discharge conduit means connected to the outlet of said valve means for discharging excess liquid.

4,989,977

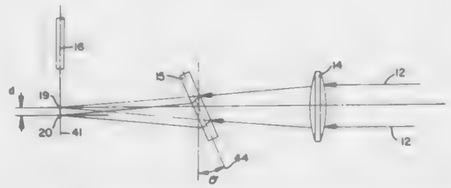
FLOW CYTOMETRY APPARATUS WITH IMPROVED LIGHT BEAM ADJUSTMENT

Howard L. North, Jr., Los Gatos, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 29, 1985, Ser. No. 760,205

Int. Cl.[5] G01N *21/64*

U.S. Cl. 356—338 5 Claims



1. A flow cytometry apparatus for determining characteristics of cells flowing in a liquid stream comprising:

means for moving cells, substantially one at a time, in a liquid flow stream;

a light source for providing a beam of illumination directed at the cells in said flow stream;

a focusing lens positioned in the optical path of said light beam to focus said light beam on said cells flowing in the flow stream;

a light beam steering member angularly positioned in the optical path between said lens and said flow stream for refracting the focused light beam to cause a displacement of the focal point of said beam on said stream, said steering member being a light transmissive plate to thereby obtain an adjustment of said focused light beam;

means for detecting light associated with each moving cell as said cell passes through said adjusted, focused light beam; and

means for using said detected light to determine one or more characteristics of said cells.

4,989,978

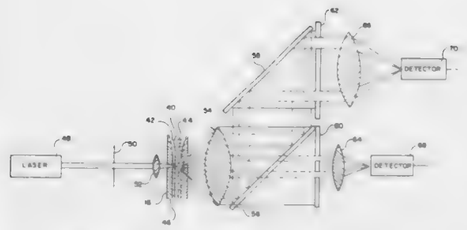
METHOD AND APPARATUS FOR DETERMINING THE COUNT PER UNIT VOLUME OF PARTICLES

Warren Groner, Whitestone, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 4, 1986, Ser. No. 848,172

Int. Cl.[5] G01N *21/53*

U.S. Cl. 356—343 24 Claims



1. A method for accurately determining the count per unit volume of first particles suspended in a fluid containing said first particles having a first index of refraction and at least one second particle having a second index of refraction different from the first index of refraction, comprising the steps of:

passing each of said first and second particles from a predetermined volume of suspension fluid, in turn, through a light beam, each of said first and second particles producing, at least one forward light scattering pattern;

detecting and counting the combined total number of said first and second particles passing through said light beam from said light scattering pattern;

measuring the index of refraction of said second particles above or below a threshold value and counting and determining the volume of said second particles; and

correcting the total count and volume of particles by the count and volume of said second particles to determine the count per unit volume of said first particles.

4,989,979

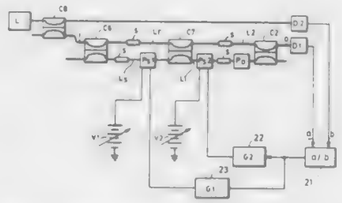
OPTICAL FIBER SENSORS WITH FULL COMMON-MODE COMPENSATION AND MEASURAND SENSITIVITY ENHANCEMENT

A. Bruce Buckman, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jan. 17, 1989, Ser. No. 297,736

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—345 56 Claims



1. An optical sensor comprising:

a light source;

an optical sensing circuit connected to said light source and including an optrode for converting a change in a measurand into a change in a characteristic of light passing through said optrode, said optical sensing circuit having at least one optical output indicative of said measurand;

means for controlling phase shifts of light propagating in said optical sensing circuit, including means for controlling phase shifts dependent upon said at least one optical output to maximize sensitivity of said at least one optical output to changes in said measurand;

an optical compensating circuit, including a plurality of optical paths, connected to said light source and said optical sensing circuit; and

means for controlling phase shifts of light propagating in said optical compensating circuit, including means for controlling phase shifts in at least one of said plurality of optical paths to minimize changes in said at least one optical output due to common-mode noise other than said measurand.

4,989,980

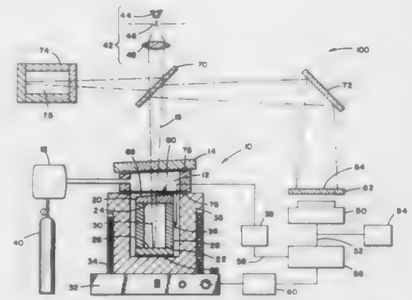
METHOD AND APPARATUS FOR MEASURING COEFFICIENT OF THERMAL EXPANSION

Ralph T. Berg, Ramsey, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 2, 1989, Ser. No. 318,076

Int. Cl.[5] G01B *11/02*; G01N *25/16*

U.S. Cl. 356—357 16 Claims



1. A method of making linear measurement changes in the optical pathlength between an interferometer's first and second light reflecting surfaces in which said changes occur between first and second instants, the method comprising the steps of:

directing light to impinge on said interferometer first and second surfaces;

generating a newton rings interference pattern comprised of at least a first newton ring resulting from interference between light rays reflected from said first and second interferometer surfaces; and

determining the area of said first newton ring corresponding to said first instant;

determining the area of said first newton ring corresponding to said second instant;

determining any change in optical pathlength between said interferometer first and second surfaces occurring between said first and second instants as a function of a first area difference corresponding to any difference between the area of said first newton ring at said first instant and the area of said first newton ring at said second instant.

4. An apparatus for making linear measurement changes in a material sample in which said sample changes occur between first and second instants, the apparatus comprising:

interferometer means having an optical pathlength between an interferometer's first and second light reflecting surfaces separated, at least in part, by said sample;

first means for generating a newton rings interference pattern comprised of at least a first newton ring resulting

from interference between light rays reflected from said first and second surfaces of said interferonmeter means; and

second means responsive to said newton ring interference pattern for determining the area of said first newton ring corresponding to said first instant, and for determining the area of said first newton ring corresponding to said second instant;

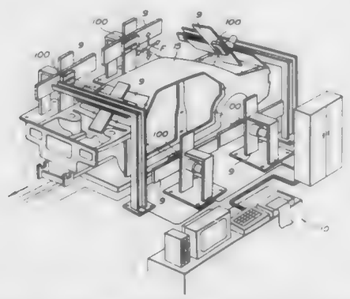
third means for determining the change in the optical path-length between said first and second surfaces caused by any change in the size of said sample occurring between said first and second instants as a function of a first area difference corresponding to any difference between the area of said first newton ring at said first instant and the area of said first newton ring at said second instant.

4,989,981

AUTOMATIC QUALITY CONTROL MEASURING SYSTEM FOR AUTOMOTIVE ASSEMBLY LINE OR THE LIKE

Takaaki Kawamura, Yokohama, and Tomoyasu Yamazaki, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 6, 1988, Ser. No. 215,708
Claims priority, application Japan, Jul. 7, 1987, 62-167935
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—394 9 Claims



1. In a system for measuring dimensions of an object such as a vehicle chassis,

means defining a measuring system coordinate grid;

a scanning means, wherein said scanning means includes a coherent light scanning device, for scanning an object located in said measuring system coordinate grid and producing a signal indicative of the distance from said scanning device to a plurality of points on the object which is being scanned;

means for selectively moving said scanning device from a standard position; and

control circuit means which operates said scanning device in said standard position and, based on the output of said scanning device determines the location of a set of reference points on said object and, based on said determined reference point locations, calculates the orientation of said object in said measuring grid, and

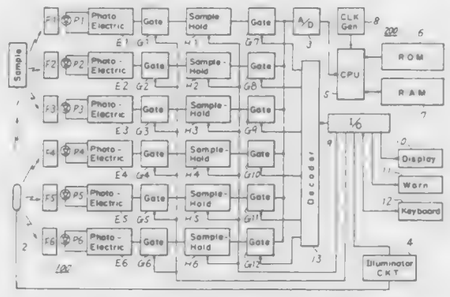
based on said calculated orientation, derives the amount and direction in which said scanning device must be selectively positioned before scanning said object for dimensional data, and actuates said selective moving means to move said scanning device in a manner corresponding to said derived amount and direction, thereby compensating said scanning means for said calculated object orientation when said scanning means scans said object for dimensional data.

4,989,982

SPECTRAL SENSITIVITY CORRECTING DEVICE IN A PHOTOELECTRIC TRISTIMULUS COLORIMETER

Shigeru Osaki, and Masami Sugiyama, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1989, Ser. No. 389,486
Claims priority, application Japan, Aug. 5, 1988, 63-195400
Int. Cl.[5] G01J *3/51*; G01N *21/27*
U.S. Cl. 356—405 12 Claims



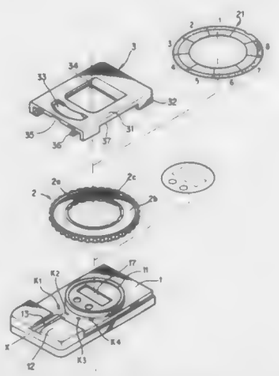
1. A spectral sensitivity correcting device in a photoelectric tristimulus colorimeter which comprises three light receiving systems for the measurement of tristimulus values and providing respective outputs thereof; means for providing correction coefficients to be added to the outputs of the light receiving systems; and correction means for correcting the outputs of the light receiving systems such that signals indicative of respective outputs from two of the light receiving systems multiplied by predetermined correction coefficients are added to or subtracted from an output from the remaining light receiving system such that the spectral sensitivity characteristics of the remaining light receiving system approach predetermined spectral sensitivity characteristics.

4,989,983

TEST SAMPLE COLOR COMPARISON DEVICE

Takao Terada; Hiroyuki Ota, both of Osaka, and Shigeru Makita, Kyoto, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Division of Ser. No. 268,561, Nov. 8, 1988. This application Jan. 5, 1990, Ser. No. 461,530
Claims priority, application Japan, Nov. 9, 1987, 62-282780; Dec. 7, 1987, 62-310246
Int. Cl.[5] G01J *3/52*
U.S. Cl. 356—423 7 Claims



1. In a test sample color comparison device in which a color of a test sample is compared with a plurality of reference colors shades and in which a stored value corresponding to the color shade which best matches the color of the test sample is displayed on a display device the improvement comprising:

a casing unit having an insertion slot for receiving a color test sample, and a display section for viewably displaying a color test sample inserted in said slot along with a succession of reference color shades;

a rotatable wheel having an upper portion;

a comparative color test sample section provided on said upper portion of said wheel and having said succession of reference shades positioned in a pattern forming a circular array of said succession of color shades around an axis of said color wheel, said succession of reference color shades being successively moved into a viewable position adjacent said color test sample in said display section upon rotation of said wheel to thereby permit a visual comparison of said reference color shades with a color of said color test sample through said display section;

switch means for converting the position of said rotatable wheel into an electrical signal representing a position of said comparative color test sample section relative to said color test sample; and

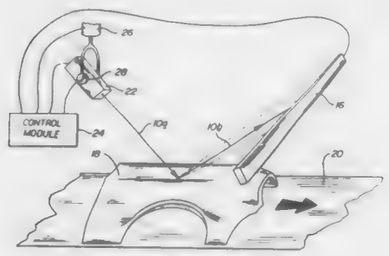
an uneven patterned code section movable with movement of said rotatable wheel for operating said switch means.

4,989,984

SYSTEM FOR MEASURING OPTICAL CHARACTERISTICS OF CURVED SURFACES

Jeremy A. Salinger, Southfield, Mich., assignor to Environmental research Institute of Michigan, Ann Arbor, Mich.

Filed Nov. 8, 1989, Ser. No. 433,140
Int. Cl.[5] G01N *21/55*; G01B *11/24*
U.S. Cl. 356—445 20 Claims



1. An inspection system adapted to measure optical characteristics of a curved surface in motion relative thereto, said system comprising:

a light source operative to scan a beam of light across a plurality of points on the curved surface for reflection therefrom;

ranging means for measuring the distance from the light source to the point being scanned and generating a ranging signal corresponding thereto;

a photo detector disposed in a fixed positional relationship relative to a transverse direction to the motion of the curve surface and adapted to receive at least a portion of the reflected beam;

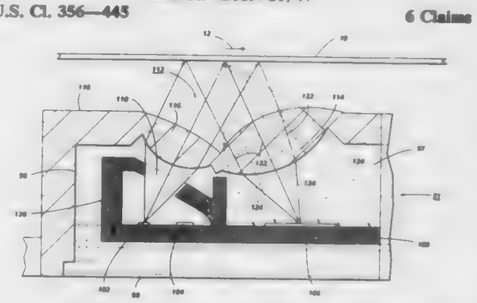
controller means adapted to: (1) receive said ranging signal, (2) compute parameters of a light path from the source to the point on the surface being scanned such that at least a portion of the light following that path will be reflected onto the detector and (3) control the position of the light source so as to scan the beam along the computed path.

4,989,985

DENSITOMETER FOR MEASURING SPECULAR REFLECTIVITY

Fred F. Hubble, III, and Theresa K. Mattioli, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1988, Ser. No. 246,242
Int. Cl.[5] G01N *21/47*
U.S. Cl. 356—445 6 Claims



1. A densitometer used in an electrophotographic printing machine to measure the reduction in the specular component of the reflectivity of marking particles deposited on a moving photoconductive belt wherein said densitometer, including:

a collimating lens;

a light source positioned to project light rays through said collimating lens;

a collector lens positioned to receive reflected light rays;

a photosensor array positioned to receive the reflected light rays transmitted through said collector lens and being adapted to generate a total signal proportional to the total flux of the light rays transmitted through said collector lens and a diffuse signal proportional to the diffuse component of the total flux of the light rays transmitted through said collector lens; and

control circuitry, electrically connected to said photosensor array, for comparing the total signal and the diffuse signal to determine the difference therebetween for generating a specular signal proportional to the specular component of the total flux of the light rays transmitted through said collector lens.

4,989,986

DOUBLE COUNTER FLOW DRUM MIXER

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed May 15, 1989, Ser. No. 352,014
Int. Cl.[5] B28C *5/26*
U.S. Cl. 366—4 11 Claims

1. In a method for continuously producing an asphaltic composition comprising the steps of:

introducing a first volume of material into an inclined, rotating drum at a first end to flow generally from the first end to a second end of the drum;

creating a flame at an intermediate location in the drum and directing the hot gases produced thereby to flow towards the first end of the drum in countercurrent relation to the first volume of material for heating the first volume of material;

introducing a second volume of material into the drum between the flame and the second end of the drum to flow generally to the second end of the drum;

mixing the heated first volume of material with the second volume of material between the flame and the second end of the drum;

generating a second stream of hot gas to flow from the second end of the drum to the first end of the drum in countercurrent relation to the flow of said materials for heating the mixing first and second volumes of materials; and

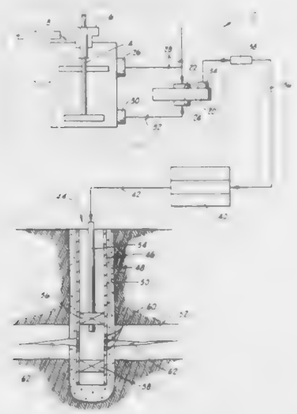
discharging the asphaltic composition from the second end of the drum.

4,989,987

SLURRY MIXING APPARATUS

Leslie N. Berryman; Herbert J. Horinek; Max L. Phillippi; David A. Prucha; Vincent G. Reidenbach, and Stanley V. Stephenson, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 340,110, Apr. 18, 1989. This application Dec. 18, 1989, Ser. No. 452,296
Int. Cl.[5] B28C *5/08*; B01F *5/12*
U.S. Cl. 366—65 4 Claims



1. A mixing apparatus, comprising:
a mixing tub having upper and lower fluid outlets defined therein;
a pump having a centrifugal impeller rotating about a generally vertical axis within a pump housing and having upper and lower suction inlets defined in said housing on axially opposite sides of said impeller;
a lower suction conduit connecting said lower fluid outlet of said tub with said lower suction inlet of said pump; and
a standpipe having a lower end connected to said upper suction inlet of said pump and having a fluid inlet communicated with said upper fluid outlet of said tub so that fluids can fill said tub and said standpipe to substantially equal elevations.

4,989,988

APPARATUS FOR MIXING MEDIA CAPABLE TO FLOW

Karl Hütter, Graz; Heinz Lackner, Kindberg, and Rolf Marr, Graz, all of Austria, assignors to Kenematica GmbH, Littau, Switzerland

Filed Jul. 13, 1988, Ser. No. 218,306
Claims priority, application Austria, Jul. 13, 1987, 109713
Int. Cl.[5] B01F *15/02*
U.S. Cl. 366—150 32 Claims

32. An emulsifying or mixing apparatus comprising,
a housing,
an injection nozzle positioned at one portion of the housing for injecting a continuous phase media,
a hollow body positioned opposite to said injection nozzle in said housing and separated from said injection nozzle by an annular gap, said hollow body having a sharp-edged inlet end, an outlet end and being disposed in a mirror-inverted manner,
at least one injection channel for injecting a discontinous phase media into the annular gap,
whereby the continuous phase media is injected into the annular gap by said nozzle and the discontinous phase media is injected into the annular gap through said injection channel, both media entering said hollow body through the sharp-edged inlet end and passing out of said hollow body through the outlet end, and
a homogenizer adjoining said hollow body in said housing, said homogenizer having an inlet adjoining the outlet end of said hollow body for receiving the media from said hollow body, the media having a direction of flow in said homogenizer, an outlet for passing the media, and a homogenizing chamber having a geometrical shape for causing turbulence in the media through internal walls adapted to cause turbulence in the media, the internal walls comprising aplurality of plates, each plate having at least one bore with at least one edge, each edge of each bore forming an angle with respect to the direction of flow of the media.

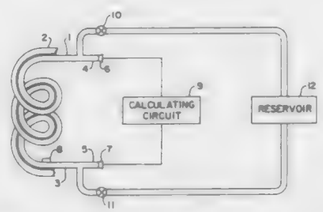


4,989,989

HYDRAULIC SENSOR FOR QUENCH DETECTION AND LOCATION IN SUPERCONDUCTORS

William R. Wolfe, Penn Hills, and James R. Logan, Hampton Twp., Allegheny County both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1989, Ser. No. 401,593
Int. Cl.[5] G01K *3/12*
U.S. Cl. 374—107 7 Claims



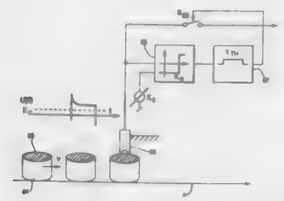
1. A sensor for detecting a quench initiation region of quench occurring in a superconductor comprising: a sealed tube capable of being placed in proximity to the superconductor such that thermal transfer can occur between the sealed tube and the superconductor; a working fluid located within the tube and having a significantly changing vapor pressure over a certain temperature range; a first pressure sensor at one end of the tube which detects a change in pressure of the working fluid caused by a change in temperature of the working fluid due to the occurrence of the quench in the superconductor; a second pressure sensor at the other end of the tube which detects the change in pressure of the working fluid caused by the quench in the superconductor; and a calculating circuit connected to both pressure sensors for determining a time difference between when the change in pressure of the working fluid is selected by the first pressure sensor and when the change in pressure of the working fluid is detected by the second pressure sensor and using the time difference to calculate the location of the quench initiation region.

4,989,990

METHOD AND ARRANGEMENT FOR MEASURING A TEMPERATURE STATE OF OPEN CONTAINER BODIES

Martin Lehmann, Obere Farnbühlstrasse 1, 5610 Wohlen, Switzerland

Division of Ser. No. 6,554, Feb. 6, 1987, Pat. No. 4,869,530. This application Apr. 21, 1989, Ser. No. 341,485
Claims priority, application Switzerland, Dec. 4, 1985, 1577/85
Int. Cl.[5] G01J *5/10*
U.S. Cl. 374—121 6 Claims



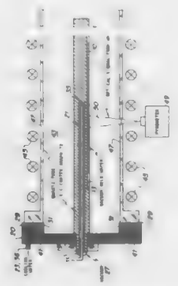
4. A temperature detecting arrangement for detecting a temperature state of open container bodies, the temperature detecting arrangement being disposed along a conveyor means for conveying in a line the open container bodies disposed on said conveyor means so as to have freely accessible openings, the temperature detecting arrangement comprising a pyro-electric detector means mounted along a path of said conveyor means spaced from said open container bodies and facing said openings of said open container bodies as said open container bodies are conveyed by said conveyor means, position detection means for generating a detection signal when the opening of the respective open container bodies has reached a position opposite said pyro-electric detector means, and wherein an output signal of said pyro-electric detector means is enabled by said detection signal, and said enabled output signal indicates overall thermal energy of the respective open container bodies as the temperature state of said open container bodies.

4,989,991

EMISSIVITY CALIBRATION APPARATUS AND METHOD

Michel Pecot, Palo Alto, and Jaim Nulman, Sunnyvale, both of Calif., assignors to AG Processing Technologies, Inc., Sunnyvale, Calif.

Division of Ser. No. 114,542, Oct. 26, 1987, Pat. No. 4,854,727. This application Jun. 12, 1989, Ser. No. 365,678
Int. Cl.[5] G01J *5/12*; G01N *25/00*
U.S. Cl. 374—133 4 Claims



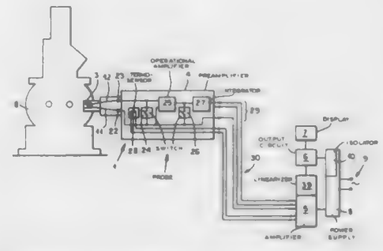
1. A method of sensing the elevated temperature of a semiconductor wafer within a processing chamber, the method comprising the steps of:
supporting the wafer on a thermally-conductive susceptor within the processing chamber;
irradiating the surface of at least one of the wafer and susceptor within the processing chamber to elevate the temperature of the wafer and susceptor in substantial thermal equilibrium; and
sensing the temperature at a location within the susceptor that is in substantial thermal equilibrium with the wafer.

4,989,992

DEVICE FOR MEASURING THE TEMPERATURE OF THE MATERIAL CONTAINED IN A CLOSED APPARATUS

Bruno Piai, Castellanza, Italy, assignor to Pomini Farrel S.p.A., Castellanza, Italy

Filed Jul. 7, 1989, Ser. No. 377,630
Claims priority, application Italy, Jul. 29, 1988, 21573 A/88
Int. Cl.[5] G01K *7/02*; H01H *37/08*; B29C *47/92*
U.S. Cl. 374—141 12 Claims



1. An apparatus for measuring the temperature of materials in a closed environment, comprising:
a probe including
an elongated housing having a first end adapted to contact said material and a second end remote from said first end,
a thermocouple constituted of two wires of metals having different thermoelectric characteristics and connected together at one end to form a weld located at said first end, and
an electrically and thermally insulating ceramic envelope receiving said wires and in which said weld is received at a short distance from a surface of said envelope at said first end in contact with said material, said envelope being constituted of a composition containing 60 to 70% zirconium oxide and 20 to 30% alumina and having a coefficient of thermal expansion close to that of said wires;
an electronic preamplification circuit in a housing mounted on said second end of said probe, connected to said wires; and
signal processing means remote from said probe and electrically connected to said preamplification circuit, said signal processing means including a remotely located amplifier and means for displaying an output from said probe.

4,989,993

CARTON LOOK PLASTIC BAG WITH EAR HANDLES

Delbert J. Barnard, 33315 - 5th Pl. SW., Federal Way, Wash. 98023

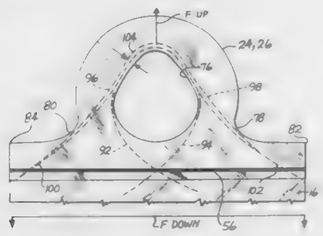
Division of Ser. No. 286,454, Dec. 19, 1988, Pat. No. 4,877,335. This application Jul. 6, 1989, Ser. No. 377,339
Int. Cl.[5] B65D *33/08*
U.S. Cl. 383—6 4 Claims

1. A plastic bag, comprising:
a bag of thermoplastic material including front and rear bag

panels, a top gusset panel between the bag panels at one end of the bag, and fill opening at the opposite end of the bag, said bag panels having parallel side edges, and said top gusset panel having end edges colinear with and positioned between upper portions of the side edges of the bag panels when the bag is flat and unfilled, and having substantially parallel side edges;

transverse seals connecting the side edges of the top gusset panel to the bag panels, and side seals connecting the side edges of the bag panels together, and further connecting the end edges of the top gusset panel together and to the upper portions of the side edges of the bag panels, in a manner resulting int he bag, when filled, assuming a substantially hexahedral shape and the top gusset panel forming a substantially closed top for the bag;

said bag when filled having four sidewalls and corners were the sidewalls meet;



handle panels of thermoplastic material, one on each side of the bag, said handle panels being one piece upper extensions of the front and rear bag panels, said handle panels having base portions contiguous to the side edges of the top gusset panel, and central ear handles extending from the base portions, said central ear handles being substantially identical in size and shape and including substantially circular hand-receiving openings;

said base portions of the handle panels extending the full width of the front and rear bag panels;

wherein in use the bag is filled through the fill opening and then the fill opening of the bag is sealed shut; and

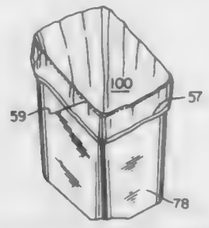
wherein when the filled bag is picked up by use of the handles upper stress boundaries are created in each handle panel, and said stress boundaries surround the hand-receiving openings at upper portions thereof and then extending downwardly and outwardly, towards the corners of the filled bag.

4,989,994

NESTED PLASTIC BAGS AND METHOD OF MANUFACTURE

Edward S. Gelbard, 11 av. Princesse Grace, Monte Carlo, Monaco MC 98000

Filed Mar. 13, 1989, Ser. No. 322,651
Int. Cl.[5] B65D *30/00, 33/14*
U.S. Cl. 383—37 8 Claims



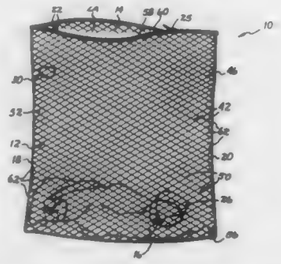
1. An article of manufacture for use in lining containers such as waste paper baskets or the like, comprising a plurality of flat nested plastic bags, each of said nested bags having an open top and a closed bottom, and means for joining the outer periphery of each bag to the inner periphery of each contiguous bag near their open top edges, said means for joining extending about substantially the entire periphery thereby forming substantially a single upper edge for all of the nested bags so that the nested bags can be placed in a container with said single upper edge folded about the outer surface of the container and the nested bags opened to the innermost nested bag, said folded single upper edge serving to retain said nested bags without the need of additional retaining means, said nested bags including means for enabling the inner-most nested bags to be separated readily from the remaining nested bags.

4,989,995

ANTI-STATIC GARMENT BAG FOR REDUCING STATIC BUILDUP IN THE DRYCLEANING PROCESS

Gerald N. Rubenstein, Pittsburgh, Pa., and John H. Geer, Cincinnati, Ohio, assignors to Fabritec International Corporation, Cold Spring, Ky.

Filed Sep. 7, 1988, Ser. No. 241,403
Int. Cl.[5] B65D *30/06*
U.S. Cl. 383—117 29 Claims



1. An anti-static garment bag comprising:

container means for containing a garment therein, said container means having a sidewall formed substantially of non-conductive yarns joined together to define a plurality of interstices sized to permit solvent and dirt from a garment contained in said container means, but not the garment itself, to pass therethrough, said container means further having an opening sized to permit a garment to pass therethrough and through which the garment is receivable into said container means;

a plurality of conductive strands interspersed in said sidewall with said non-conductive yarns so as to provide an electrical resistance of less than 1 kilohm between any two portions of said sidewall including said conductive strands and within twelve inches of each other to reduce static buildup and thereby render said container means anti-static; and

closure means for selectively closing said opening to retain the garment within said container means.

4,989,996

LINEAR BALL BUSH

Manfred Binder, Schweinfurt; Karl-Heinz Reuss, Unterelsbach, and Rainer Hofling, Arnstein, all of Fed. Rep. of Germany, assignors to Deutsche Star GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 27, 1990, Ser. No. 499,897
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1989, 3910456
Int. Cl.[5] F16C *29/06*
U.S. Cl. 384—43 10 Claims

1. Linear ball bush (10) comprising a cage (12) with a cage axis and with a plurality of ball circuits,

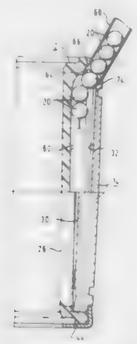
where each ball circuit comprises two straight ball rows (22,

24) substantially parallel to the cage axis, namely a carrier ball row (22) and a return ball row (24), and two curved ball rows (28) connecting the two straight ball rows (22,24),

where furthermore at least one straight ball row (22,24) of a ball circuit rests radially outwards on a runner plate (14) which is inserted into a pertinent aperture of the cage (12) and possesses an outer surface (16) for abutment on an inner circumferential surface of a bearing housing bore accommodating the cage (12),

where further a straight track section (30,32) for at least one straight ball row (22,24) of the respective ball circuit is formed on an inner surface (18) of the runner plate (14), where the respective carrier ball row (22) partially radially inwardly penetrates a slot (26) of the cage (12), in order to be able to take abutment on a shaft at least partially enclosed by the cage (12),

where further the aperture (60) of the cage (12) possesses a charging slope (66) at least at one of its ends and approximately in alignment with the one straight track section (30,32), and/or the runner plate (14) possesses a charging bevel (74) on its inner surface in the region of at least one of its ends in approximate alignment with the one straight track section (30, 32), this charging slope (66) and/or this charging bevel (74) permitting the charging of balls (20) into the one straight track section (30, 32) when the runner plate (14) is wholly or partially lifted out of the aperture (60) at this one end.

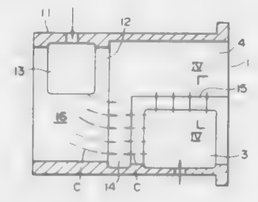


4,989,997

RADIAL LOAD REDUCING DEVICE, AND SLIDING BEARING AND SCREW COMPRESSOR USING THE DEVICE

Shoji Yoshimura, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 1, 1990, Ser. No. 473,407
Claims priority, application Japan, Jul. 28, 1989, 1-197492
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—100 9 Claims



1. A radial load reducing device comprising:

a stationary housing;

a rotating element rotatably mounted in said stationary housing;

a high pressure fluid chamber filled with a high pressure fluid and defined between an outer circumferential portion of said rotating element and said stationary housing; and

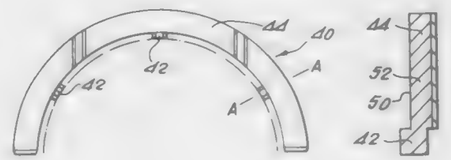
a low pressure fluid chamber filled with a fluid having a pressure lower than that of said high pressure fluid and defined between said outer circumferential portion of said rotating element and said stationary housing at a location axially aligned with, and radially opposite to, said high pressure fluid chamber.

4,989,998

BEARINGS

Michael G. Willis, Wembley, and Ewan N. F. Robbie, Maidenhead, both of England, assignors to Vandervell Limited, Maidenhead, England

Filed Nov. 17, 1989, Ser. No. 437,904
Claims priority, application United Kingdom, Nov. 25, 1988, 8827606
Int. Cl.[5] F16C *17/10*
U.S. Cl. 384—275 4 Claims



1. A flanged bearing, the bearing comprising a thin wall bearing liner and at least one substantially planar thrust flange attached to a bearing liner end face, said thrust flange having at least one radially inwardly directed lug on the inner periphery and which lug co-operates with a slot formed in the bearing liner end face, the circumferentially outer edges of which slot are deformed such as to retain said thrust flange on said bearing liner in the axial direction, wherein the material comprising said at least one lug at its region of attachment to said liner is axially inwardly offset relative to the plane of the axially inner face of the material comprising the remainder of said thrust flange.

4,989,999

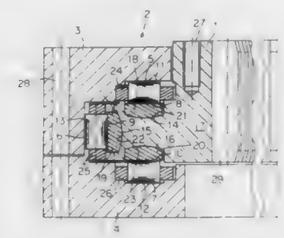
EMPTY-CENTER ROTATING-ROLLER JOINT

Heinrich Siemensmeyer, Dortmund, Fed. Rep. of Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 478,621
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909664; Dec. 23, 1989, 3942847
Int. Cl.[5] F16C *33/61*
U.S. Cl. 384—455 6 Claims

1. An empty-center rotating roller joint comprising: a non-segmented race having a lip extending radially outward; a multiple-part outer race having a U-shaped cross-section and enclosing said lip; two rows of rollers for transmitting axial loads and one row of rollers for transmitting radial loads between said races; hardened roller-contact surfaces, said rollers

rolling over said hardened roller-contact surfaces; said roller-contact surfaces comprising hardened wires inserted only at



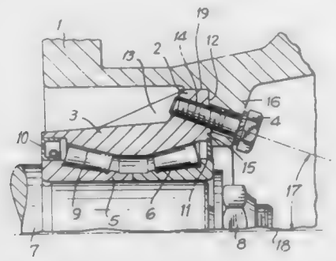
said lip of said non-segmented race, said wires being divided at least once along circumferences of said wires.

4,990,000

ROLLER BEARING

Ortwin Harsdorff, Zell, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 6, 1990, Ser. No. 489,456
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909557
Int. Cl.[5] F16C *43/04, 33/58;* B60B *27/00*
U.S. Cl. 384—542 10 Claims



1. In a rolling bearing having an inner part, an outer ring and a plurality of rolling elements arranged in one or more rows between the inner part and the outer ring, wherein the outer ring has a bore with outer races for the rolling elements and a flange projecting radially outward with a locating face at one end thereof, the locating face of the flange having holes for the attachment of the flange with its locating face against the mating face of a connecting element, with screws or the like, the improvement wherein said holes in the flange extend obliquely radially outward from the locating face at an acute angle to the bearing axis.

4,990,001

SYNTHESIS OF DRIVE SYSTEMS OF INFINITE DISTURBANCE REJECTION RATIO AND ZERO-DYNAMICS/INSTANTANEOUS RESPONSE

Novica A. Losic, 7802-23 Avenue, Kenosha, Wis. 53140, and Ljubomir Dj. Varga, Deskaseva 6, 11000 Beograd, Yugoslavia

Filed Jan. 22, 1990, Ser. No. 468,122
Int. Cl.[5] H02P *7/00*
U.S. Cl. 388—811 9 Claims



1. A method for synthesizing electric motor drive system of infinite disturbance rejection ratio and zero dynamics comprising:

accepting a source of electrical energy of a constant voltage at an input to a power converter,

coupling mechanically a shaft of an electric motor to a load to be driven at an output,

controlling a power flow from said input to said output,

modulating said power converter for the control of said power flow in a pulse width modulation manner,

supplying a total control signal for modulating said power converter,

supplying position feedback pulses,

feeding back said position feedback pulses and comparing their frequency and phase with frequency and phase of position command pulses in a phase frequency detector in a negative feedback manner; thereby producing a position error voltage proportional to a difference in frequency and phase between said position command pulses and said position feedback pulses;

supplying a position command obtained as a voltage potential,

passing said position command through a position direct path circuit; thereby producing said position command pulses,

passing said position command through a differentiation circuit; thereby producing a velocity signal voltage,

passing said velocity signal voltage through a velocity direct path circuit; thereby producing a velocity command voltage,

passing said velocity signal voltage through a feedforward circuit; thereby producing a feedforward signal,

supplying a velocity feedback signal,

feeding back said velocity feedback signal and summing it with said velocity command voltage and said position error voltage in a negative feedback manner; thereby producing a resulting error voltage,

passing said resulting error voltage through a cascade connection of a stabilizing network and a control circuit; thereby producing a control signal proportional to the algebraic sum of said velocity command voltage and said velocity feedback signal and said position error voltage,

sensing a current through said electric motor,

feeding back the sensed current signal through a current feedback circuit in a positive feedback loop with respect to said control signal and said feedforward signal and summing the sensed current signal with said control signal and said feedforward signal,

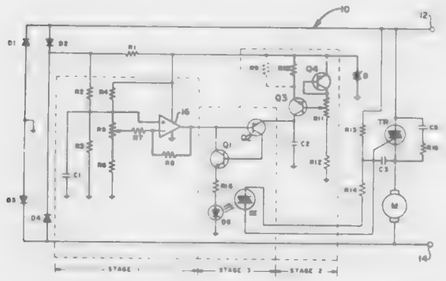
supplying said total control signal, obtained as the sum of said control signal and said feedforward signal and the current signal fed through said current feedback circuit, for modulating said power converter for the control of the flow of power from the input electrical source to the output mechanical load, whereby all electrical and mechanical time constants associated with said electric motor and with the mechanical load are brought to zero yielding an infinite disturbance rejection ratio by making an angular shaft position and speed independent of said load and yielding a zero dynamics by cancelling remaining time constants in the system and making a transfer function from said position command to said angular shaft position a constant and therefore of zero dynamics.

4,990,002

MOTOR CONTROL CIRCUIT

Alan P. French, Ravenna, Ohio, assignor to Ametek, Inc., Kent, Ohio

Filed Sep. 12, 1988, Ser. No. 242,901
Int. Cl.[5] H02P *7/62*
U.S. Cl. 388—833 11 Claims



1. A control circuit for regulating power from a sinusoidal line voltage to a motor, comprising:

first means connected to the line voltage and generating a first signal as a function of the line voltage, said first means comprising an amplifier comparing the line voltage to a reference voltage and amplifying the difference, said amplifier being inactivated an reactivated upon the line voltage passing through a neutral voltage potential;

a ramp generator producing a ramp signal;

second means interconnected between said first means and said ramp generator for comparing said ramp and first signal, generating a second signal when said ramp signal exceeds said first signal;

power phase control means interconnected between said line voltage, said second means, and the motor for passing power to the motor upon receipt of said second signal; and

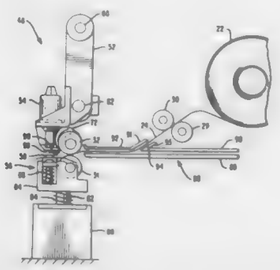
a full wave rectifier receiving the line voltage and generating a full wave rectified signal therefrom, said full wave rectified signal being applied as an input to said amplifier, and a zener diode clamping said full wave rectified signal to establish a clamped signal which establishes said reference voltage and powers said amplifier.

4,990,003

PAPER FEED MECHANISM FOR DOT MATRIX PRINTER

Toshihiro Jingu, Hiratsuka; Ryuji Yamazaki, Isehara, and Kazunori Matsumoto, Fujisawa, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 24, 1989, Ser. No. 384,200
Claims priority, application Japan, Sep. 16, 1988, 63-230161
Int. Cl.[5] B41J *11/20*
U.S. Cl. 400—56 9 Claims



1. A feed mechanism for record media in a dot matrix printer having spaced side walls and a printing station positioned between said side walls, said feed mechanism comprising a

platen assembly supported by said side walls,

printing means positioned in opposed manner to said platen assembly for printing on said record media, a

feed roller operably associated with said platen assembly, a

guide structure adjacent and along which said record media travels toward and through said printing station formed by said platen assembly and said printing means,

means for moving said platen assembly in a direction from said printing means, and

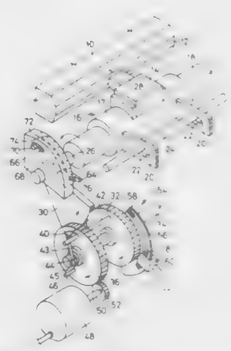
roller means movably journaled in said side walls and cooperating with said feed roller for advancing record media along said guide structure and in a path through said printing station, said platen assembly being movable to separate said feed roller from said printing means, and said roller means moving in the direction of said platen assembly to guide said record media in a path through said printing station to avoid contact with said printing means.

4,990,004

PRINTER HAVING HEAD GAP ADJUSTING DEVICE

Yuuji Kawahara, and Atsushi Murakami, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 10, 1989, Ser. No. 419,592
Claims priority, application Japan, Oct. 12, 1988, 63-257946; Oct. 12, 1988, 63-257947; Oct. 21, 1988, 63-138096[U]
Int. Cl.[5] B41J *11/20*
U.S. Cl. 400—56 31 Claims



1. A printing apparatus comprising:

a platen for supporting a recording medium;

a print head disposed movably in a transverse direction toward and away from said platen;

a head advancing and retracting device for moving said print head in said transverse direction;

automatic head gap adjusting means for controlling said head advancing and retracting device to advance said print head until the print head comes into contact with said recording medium and then retracting the print head by a predetermined distance, to thereby adjust a head gap between said recording medium and said print head;

operator-controlled head gap adjusting means for manually operating said head advancing and retracting device, to thereby adjust said head gap; and

adjusting mode selecting means for selecting one of an automatic adjusting mode in which said head gap is adjusted by said automatic head gap adjusting means, and a manual adjusting mode in which said head gap is adjusted by said operator-controlled head gap adjusting means.

4,990,005

PRINTER THAT PRINTS A TABLE OF INFORMATION ABOUT PRINTING EFFECTS USING THE SELECTED PRINTING EFFECTS

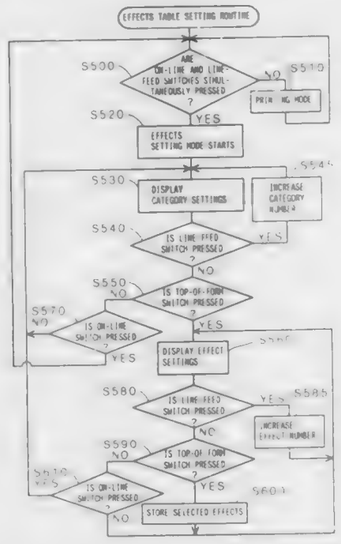
Hiroyuki Karakawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 12, 1988, Ser. No. 256,855

Claims priority, application Japan, Oct. 30, 1987, 62-276904; Oct. 30, 1987, 62-276905

Int. Cl.[5] B41J *5/30*

U.S. Cl. 400—76 5 Claims



1. A printer having selectable printing effects that prints a table about the printing effects using the selected printing effects, comprising:

a printing means for printing characters on paper according to the selected printing effects;

a setting means for setting the selected printing effects;

a storing means for storing information about the printing effects; and

a printing control means for directing the printing means to print a table of information about the printing effects, said printing control means further directing the printing means to print the table itself using the selected printing effects, enabling an operator to verify the selected printing effects by viewing the printing effects that the printing means used to print the table, wherein said setting means comprises a plurality of switching means, the actuation of a first combination of switching means causing said setting means to enter a menu level whereby a plurality of selection levels, each selection level containing a plurality of printing effects, can be selected; the actuation of a second combination of switching means, when said setting means is in the menu level, causing a cycling through the selection levels; the actuation of a third combination of switching means, when in the menu level causing said setting means to enter an effect selection level whereby a plurality of effects within a selected selection level can be selected; the actuation of said second combination of switches, when in the effect selection level, causing a cycling through the effects within a selection level; and the selection of said third combination of switches, when in the effect selection level, causing a selected effect to be stored in the storing means.

4,990,006

HOLDER OF A RIBBON FOR TYPEWRITERS OR SIMILAR MACHINES

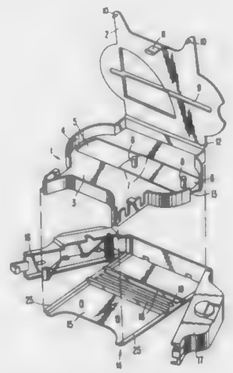
Johannes Haftmann, Schwabach, and Werner Haczek, Furth, both of Fed. Rep. of Germany, assignors to Ta Triumph Adler Aktiengesells, Nuremberg, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 278,820

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 3741361

Int. Cl.[5] B41J *35/28*

U.S. Cl. 400—208 9 Claims



1. A holder of a ribbon for typewriters or similar machines where the ribbon can be transferred from a supply spool to a take-up spool, comprising:

a slider on which both spools are disposed, the holder and the slider being in the form of one-piece plastic part; and

bars connecting the slider and the holder in the form of predetermined breaking points, such that the slider can be broken off the holder when the holder is placed on a receptacle.

4,990,007

SINGLE-RUN TYPEWRITER RIBBON CARTRIDGE HAVING A REVERSE WINDING ARRANGEMENT

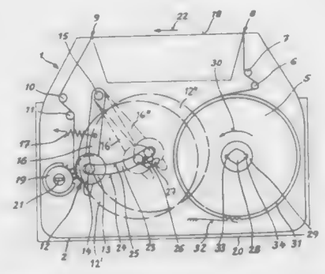
Uwe Schmidt, and Arthur Kittel, both of Wilhelmshaven, Fed. Rep. of Germany, assignors to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 213,963

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722226

Int. Cl.[5] B41J *32/00, 33/00*

U.S. Cl. 400—208 8 Claims



1. In a single-run ink ribbon cartridge for use in an office machine; the cartridge including a housing; a ribbon; a supply reel for storing unused ribbon wound thereon and a take-up reel for storing used ribbon wound thereon; the reels being rotatably supported in said housing; said ribbon extending from said supply reel to said take-up reel and having a length portion passing externally of said housing; a sole drive roller rotatably supported in said housing; resilient means for resilient urging the drive roller and the ribbon wound on the take-up reel into a peripheral, torque-transmitting contact with one another; said drive roller being arranged for being drivingly engaged by an advancing mechanism of an office machine when the cartridge is in place thereon, whereby the drive roller applies a winding torque to the take-up reel only in a winding direction for pulling the ribbon off the supply reel, for moving the ribbon through a printing station of the office machine and for winding the ribbon on the take-up reel and locking means normally preventing rotation of said drive roller in a direction opposite said winding direction; the improvement comprising provision to permit a prolongation of the service of said single-run ink ribbon cartridge including reverse winding means for pulling ribbon off the take-up reel and for winding the ribbon on the supply reel; said reverse winding means including

(a) means for applying a winding torque to said supply reel; and

(b) means for releasing said locking means to prevent blockage of said take-up reel by said drive roller while winding the ribbon on the supply reel.

4,990,008

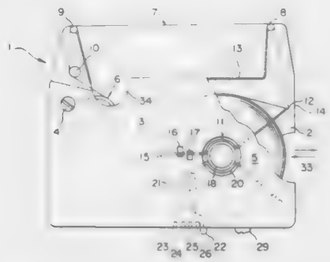
REFILLABLE INK RIBBON CARTRIDGE FOR USE IN ELECTRONIC TYPEWRITER

Chiman Hwang, 28606 Pacific Hwy. S. 65, Federal Way, Wash. 98003

Filed Oct. 26, 1989, Ser. No. 426,670

Int. Cl.[5] B41J *35/28*

U.S. Cl. 400—208 20 Claims



1. A refillable ink ribbon cartridge for use in an electric typewriter and a printer which comprises:

a case housing including a casing base, a front casing cover, a top cover, a winding spool side wall, a feed spool side opening, and a bottom plate, said bottom plate having a bottom door, and said front casing cover having a hole disposed in the vicinity of said feed spool side opening,

a plurality of pins disposed in said case housing and on the opposite side of said feed spool side opening,

a changeable feed spool engaged within said case housing, said changeable feed spool having a hub and provided with a C-shaped first feed spool spring and a C-shaped second feed spool spring pivotably disposed in said case housing about said pins, respectively, for being symmetrically located adjacent to each other and for housing the hub of the feed spool in the space between said first and second feed spool springs,

an ink ribbon,

a replaceable winding spool engaged within said case housing in the vicinity of said changeable feed spool for winding said ink ribbon received from said feed spool, said replaceable winding spool provided with a pivotal connecting spring for connecting to a hub of the winding spool,

a lever disposed in said bottom door for connecting to said pivotal connecting spring,

a lever opener slidably disposed in the lower portion of said feed spool for locking and releasing said lever,

means for transferring the ink ribbon from said feed spool to said winding spool, and

a drive roller having a jagged wheel disposed within said housing means and in the vicinity of said winding spool for maintaining tension on the ink ribbon on the winding spool, whereby the feed spool can be inserted into and removed from the ribbon cartridge through the feed spool side opening and the winding spool can be replaced after removal of the used in ribbon wound about the winding spool so that the used cartridge can be reused and maintains a certain tension on the ink ribbon between the feed spool and winding spool.

4,990,009

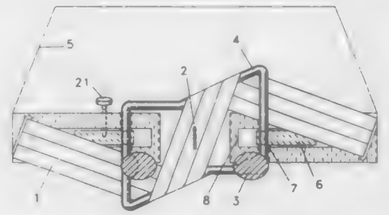
COLOR CONVERTER FOR MONOCHROME DOT MATRIX PRINTERS

Jonn V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810

Continuation-in-part of Ser. No. 201,923, Jun. 3, 1988, abandoned. This application Jul. 3, 1989, Ser. No. 373,689

Int. Cl.[5] B41J *35/14*

U.S. Cl. 400—216.3 18 Claims



1. In a printer of the type having a ribbon, a printhead, and a medium on which information can be printed, said printhead being movable back and forth in a printing direction across said medium, said ribbon having a plurality of widthwise portions and including an active section disposed in operative engagement between said print head and said medium, and improvement for providing ribbon-shifting capability, wherein the improvement comprises:

ribbon guide means for directing the active section of said ribbon at an angle nonparallel to the printing direction;

slide means for low-friction shifting of said ribbon guide means, relative to said print head in a direction generally parallel to the printing direction;

means for limiting the distance said slide means can shift in the printing direction relative to said print head; and

friction means on said ribbon guide means responsive to movement of said print head in the printing direction, for changing which one of said portions of the ribbon is in operative engagement with the printhead by transmitting a frictional engagement from said medium to said ribbon guide means as said print head moves in the printing direction.

4,990,010

PAPER FEED TRACTOR WITH FIXED AND PIVOTABLE PRESSURE PLATES

Minoru Mizutani, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,321

Claims priority, application Japan, Jan. 29, 1988, 63-16888

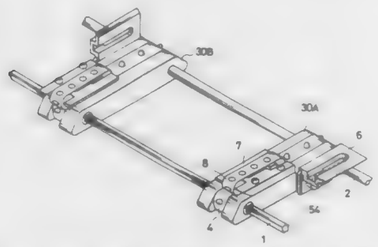
Int. Cl.[5] B41J *11/34*

U.S. Cl. 400—616.2 6 Claims

1. A paper feed mechanism for feeding paper having perforations formed therein at even intervals linearly along a feeding direction of the paper, comprising:

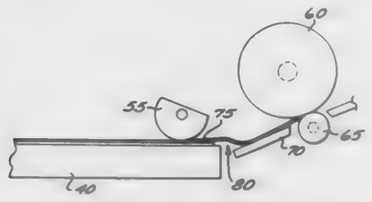
a side frame;

a drive pulley mounted to said side frame and adapted to be driven to rotate about a first axis;
a driven pulley mounted to said side frame for rotation about a second axis, said second axis being parallel to said first axis;
an endless feed belt trained about said drive pulley and said driven pulley so as to be rotated in an endless path about said drive pulley and said driven pulley upon rotation of said drive pulley, said feed belt having pins projecting outwardly therefrom at even intervals linearly along the feeding direction, said even intervals of said pins corresponding to the even intervals of the perforations of the paper such that said pins are engageable with the perforations;
a first pressure plate mounted in a fixed position to said side frame in overlying relation to said feed belt at a downstream end of said side frame with respect to the feeding direction of the paper.



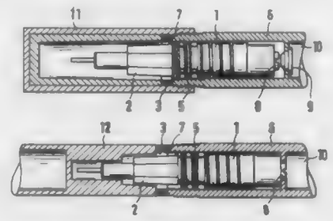
a second pressure plate pivotably mounted to said side frame at an upstream end thereof for movement between a closed first position in which said second pressure plate overlies said feed belt and is adapted to press the paper against the belt, and an open second position which allows the paper to be loaded such that the perforations of the paper are engaged with said pins of said feed belt; and
an endless film, mounted for rotation about said first pressure plate, having perforations formed therein at even intervals linearly along the feeding direction of the paper, said even intervals of said perforations of said endless film corresponding to said even intervals of said pins of said feed belt and said perforations of said endless film being engaged with said pins of said feed belt such that rotation of said feed belt causes rotation of said endless film, and such that when the perforations of the paper are engage with said pins of said feed belt, the paper is disposed between said endless film and said feed belt.

4,990,011
SHEET ALIGNMENT USING REVERSE ADVANCE ROLL AND STATIONARY PICK ROLL
John A. Underwood, Escondido; Anthony W. Ebersole, Poway, and Todd R. Medin, Escondido, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sep. 21, 1989, Ser. No. 410,395
Int. Cl.[5] B41J *13/02*
U.S. Cl. 400—636 **20 Claims**



1. In a printer system having a printer mechanism a sheet tray for storing a stack of print media sheets, and a sheet feed path extending between the sheet tray and the print mechanism, an active sheet alignment system for feeding and aligning a sheet relative to the printer mechanism, comprising:
a sheet pick roller mounted for axially rotational movement and for contacting a sheet in the tray;
a main sheet advance roller disposed in a sheet feed path between the tray and the print mechanism and arranged so that the distance between the sheet pick roller and the main sheet advance roller is less than the length of the sheet;
at least one pinch roller disposed adjacent said main roller, said main and pinch rollers being disposed to engagingly receive a sheet in the nip therebetween;
means for selectively driving said main roller in a sheet advancing or in a sheet retracting direction;
means for coupling said sheet pick roller to said motor drive means so that said sheet pick roller and said main roller are driven in the sheet advancing direction to feed a sheet from said tray toward said printer mechanism, and when the main roller is driven in the sheet retracting direction, the sheet pick roller is not driven and remains stationary; and
means for controlling said drive means to feed sheets to the printer mechanism with the sheet leading edge aligned with the spring mechanism, comprising:
means for controlling said drive means to drive said sheet pick and main drive rollers in the sheet advancing direction so that the leading edge of the sheet is fed past the nip of the main and pinch rollers;
means for reversing the drive means, thereby driving the main roller in the sheet retracting direction while the sheet pick roller is stationary and does not move, thereby forming a buckle in the sheet which tends to align the sheet leading edge with the nip; and
means for changing the motor drive direction to advance the sheet to the print position.

4,990,012
WRITING INSTRUMENT WITH DISPLACEABLE SAFETY SEPARATOR
Gerald Groetsch, Fürth, and Ute Herold, Nünberg, both of Fed. Rep. of Germany, assignors to J.S. Staedtler GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Dec. 6, 1988, Ser. No. 280,386
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3741886
Int. Cl.[5] B43K *5/14*
U.S. Cl. 401—134 **5 Claims**

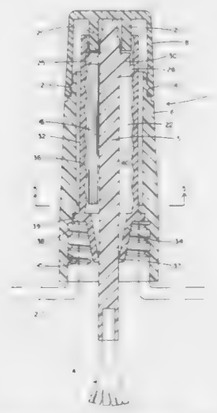


1. A writing instrument having a writing tip inserted therein and a fluid reservoir for ink or India ink disposed therein, a separator piece separating the back end of the writing tip a distance from the front end of the reservoir retained on a shoulder and permitting the back end of the writing tip to come into contact with the first end of the reservoir after removal of the separator from the shoulder, thus enabling the reservoir to come into contact with the front end of the reservoir after displacement of the separator from the shoulder thus enabling the reservoir to be opened, the shoulder forming a front edge of the writing instrument shaft, the separator piece being flexibly connected to the writing tip, the separator piece when placed against the shaft edge limiting the depth of insertion of the writing tip into the shaft so that the back end of the writing tip and the front end of the reservoir are spaced from one another within the shaft, the separator piece being inwardly flexed toward the writing tip so as to be retained within the shaft upon compressing the separator piece while forcing the writing tip into the shaft, thus causing displacement of the separator piece and subsequent movement of the back end of the writing tip into adjacency to the reservoir.

4,990,013
GLITTER CRAYON
Conrad L. Hejmanowski, 80 Banner Ave., Lancaster, N.Y. 14086
Continuation-in-part of Ser. No. 261,427, Oct. 20, 1988, abandoned. This application Aug. 28, 1989, Ser. No. 399,577
Int. Cl.[5] B43K *19/00;* **C09D** *11/00*
U.S. Cl. 401—49 **4 Claims**

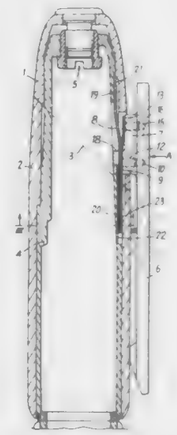
1. An improved crayon composition comprising from about 25 to about 50 weight percent stearic acid, from about 30 to about 65 weight percent paraffin wax, from about 1 to about 20 weight percent candelilla wax, from about 1 to about 20 weight percent carnauba wax and from about 0.01 to about 5.0 weight percent of a polymer reflective flake.

4,990,014
CLOSURE ASSEMBLY HAVING A ROTATABLE STEM AND AN AXIALLY MOVABLE APPLICATOR BRUSH
Richard K. O'Neill, P.O. Box 2452, Wrightwood, Calif. 92397
Filed Jun. 25, 1990, Ser. No. 543,099
Int. Cl.[5] A46B *11/00;* **A45D** *34/04*
U.S. Cl. 401—127 **7 Claims**



1. A closure assembly to be removably connected to the neck of a container in which a fluid supply is located, said closure assembly comprising:
a body to be mated to the neck of the container;
a cap attached to said body and rotatable relative thereto;
motion transferring means projecting from said cap and rotatable therewith;
an elongated stem, a first end of which is received by said cap and the opposite end carrying a fluid applicator and extending into the container to position the applicator in contact with the fluid supply of the container, said stem having thread means projecting outwardly therefrom;
a sleeve coaxially aligned with and surrounding said elongated stem and having axially advancing spiral threads extending therearound, such that the thread means of said stem communicates with the threads of said sleeve, a rotation of said cap causing said motion transferring means to rotate into contact with the thread means of said stem to correspondingly rotate said stem and further cause the thread means of said stem to ride along the threads of said sleeve, whereby said stem and the applicator associated therewith are displaced axially relative to the container; and
a hollow sealing head interconnected with said sleeve and surrounding said stem in engagement therewith to permit the rotation and axial displacement of said stem, said sealing head having a sealing surface located at the interface of said sealing head with said stem to prevent the leakage of fluid therepast.

4,990,015
PEN OR SIMILAR ARTICLE, WITH AN IMPROVED CLIP
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed May 24, 1990, Ser. No. 528,073
Claims priority, application France, May 29, 1989, 89 07007
Int. Cl.[5] B43K *25/00*
U.S. Cl. 401—243 **10 Claims**

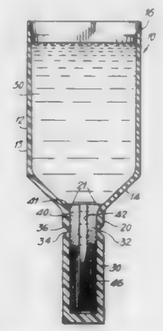


1. A pen including a tubular body and a rigid fastening clip that extends longitudinally of the body and is movable by pivoting with respect to the body, characterized in that the clip (**6**) is solidly attached in its upper portion (**7**) to at least one point of an elastic device (**8, 9**) accommodated in said body (**1, 2**) and immobilized with respect thereto in the longitudinal and transverse directions, said elastic device comprising two superimposed spring leaves (**8, 9**) extending longitudinally of the body, the inner (**8**) of which leaves is immobilized with respect to said body in the longitudinal direction and the other, outer (**9**) of which leaves is in contact over part of its length with the clip and includes an upper end portion (**13**) extending outwardly, the two leaves (**8, 9**) being joined to one another and to the clip by means of a fastener (**10**).

4,990,016
LIQUID APPLICATOR SAMPLER TUBE
David Seidler, 69-10 108th St., Forest Hills, N.Y. 11375
Filed Dec. 16, 1988, Ser. No. 285,442
Int. Cl.[5] A46B *11/00, 11/02*
U.S. Cl. 401—268 **6 Claims**

1. A disposable liquid applicator for applying a liquid to a surface comprising a one-piece tube formed from a plastic material capable of holding said liquid therein having an annu-

lar first end and a second end, said first end of said tube having a tapered neck portion, a circular brush holder disposed in said neck portion having bristles formed integrally therewith extending outwardly therefrom, said brush holder having a flared annular end which seats tightly in said neck portion, cap means integrally formed with the first end of said tube, said cap means enclosing said bristles, said neck portion including an inner wall, said inner wall being tapered to permit easy insertion of



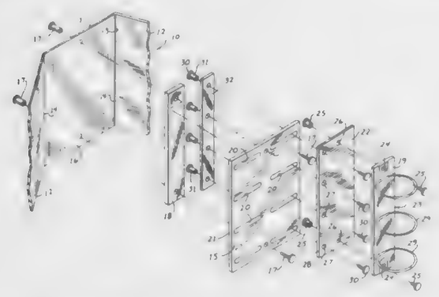
said bristles therethrough when manufactured, said neck portion having an annular reduced thickness portion surrounding said brush holder adjacent said cap means, said flared annular end of said brush holder positioning said brush holder to extend across said annular reduced thickness portion of said neck portion, said brush holder preventing liquid in said tube from escaping through said reduced thickness portion, said cap means being removable from said tube by breaking at said reduced thickness portion.

4,990,017

EXPANDABLE DOUBLE RING BINDER

Donald A. Rotherham, 165 Canterbury Rd., Williston Park, N.Y. 11596

Filed Jul. 31, 1990, Ser. No. 560,121
Int. Cl.[5] B42F *13/22*
U.S. Cl. 402—75 **12 Claims**



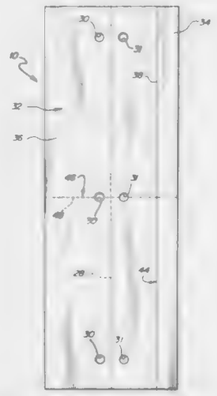
1. An expandable binder for carrying and displaying a plurality of pieces of material comprising:
a display case;
a mounting base attached to the interior of said case;
a pair of loose leaf ring metals disposed in parallel spaced relation on said mounting base; and,
means for slidably attaching said ring metals to said mounting base to permit relative lateral movement between said ring metals while retaining their parallel spaced relation.

4,990,018

MULTIPLE RING BINDER ADAPTER FOR NEGATIVE

Scott Best, Troy, and James F. Turner, Farmington, both of Mich., assignors to Saxon, Inc., Ferndale, Mich.

Filed Dec. 14, 1989, Ser. No. 451,295
Int. Cl.[5] B42F *3/00*
U.S. Cl. 402—79 **11 Claims**



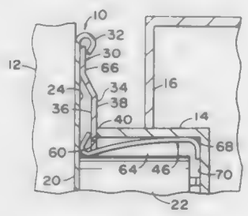
1. An adapter assembly (10) for modifying a photographic image holding sleeve (12) for storage in a storage container said assembly comprising:
sheet-like tear resistent material (22) having an adhesive surface (24);
longitudinal fold means (28) for accurately folding said adapter assembly (10) onto itself (10) and the photographic image holding sleeve (12);
mounting means (30, 31) for mounting said assembly (10) in a multiple ring binder;
backing means (32) having a first section (34) and a second section (36) removably attached to said adhesive surface (24);
separation line means (38) for separating and for distinguishing said first section (34) from said second section (36), said assembly (10) characterized by
said separation line means (38) being parallel to and spaced apart from said longitudinal fold means (28).

4,990,019

GUIDE PIN ASSEMBLY

Robert W. Dobyns, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 21, 1990, Ser. No. 526,482
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—13 **11 Claims**



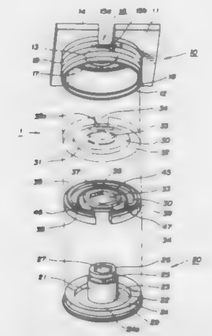
1. A guide pin assembly, comprising:
a base plate having a first surface;
a guide pin extending from the first surface;
a flexible retaining plate held by the baseplate, the retaining plate having a first surface facing and spaced from the first surface of the base plate; and
at least one spring member having an elastic portion extending alongside the guide pin from a rotatably retained end portion to a distal end portion, where the rotatably retained end portion is maintained in rotatable contact with the base plate by the first surface of the flexible retaining plate and rotation of the retained end portion is caused by flexure of the flexible retaining plate.

4,990,020

ASSEMBLING DEVICE

Kazuhiro Matsui, Aichi, Japan, assignor to Kabushiki Kaisha Kojima Shohten, Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,446
Claims priority, application Japan, Sep. 13, 1988, 63-229071
Int. Cl.[5] B25G *3/00*; **F16B** *1/00*
U.S. Cl. 403—20 **5 Claims**



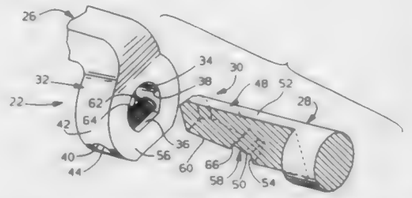
3. An assembling device for releasably fixedly securing first and second plate-like members together, comprising:
an annular case adapted to be fixedly positioned within an opening in the first member, said case having an annular outer peripheral wall, said outer peripheral wall having an opening extending radially therethrough;
an engagement member fixed to and projecting from the second member; and
a rotary body rotatably disposed about an axis in said case, said rotary body having a substantially spool-shaped construction including a rotary shaft and first and second axially spaced disks which are disposed adjacent opposite ends of said rotary shaft and are rotationally fast therewith, mutually facing axial surfaces of said first and second disks having an annular cam portion projecting axially therefrom, said cam portions defining radially inwardly facing cam surfaces which are spaced from and eccentric about said rotary shaft, said second disk having a cut-out opening at its radially outer edge, said cut-out opening extending circumferentially for a limited extent and extending radially completely through said cam portion of said second disk, said rotary body being rotatable relative to said case to radially align said cut-out opening with said case opening, said engagement member being insertable through said aligned cut-out opening and case opening into a space defined axially between said disks and radially inside said cam surfaces, said spool-shaped rotary body including means located axially outside of at least one of said disks for facilitating rotation of said rotary body, and said engagement member having means defining an engagement surface for slidable engagement with at least one of said cam surfaces as said rotary body rotates.

4,990,021

DETENT CONNECTION

Leland N. Olgren, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1990, Ser. No. 516,850
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 **5 Claims**



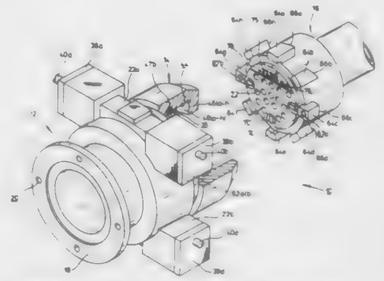
1. In a tilt-adjustable automotive steering column, a connection between a hidden release lever and an exposed hand lever comprising:
means defining a socket in said hidden release lever having a first flat portion,
means defining a plug-end on said exposed hand lever shaped for insertion into said socket and including a second flat portion facing said first flat portion when said plug-end is inserted into said socket,
means defining a first trough in said first flat portion extending the full length thereof,
means defining a second trough in said second flat portion extending the full length thereof and facing said first trough when said plug-end is inserted into said socket and cooperating with said first trough in defining a detent tunnel,
an elongated resilient detent element disposed in radial compression in said detent tunnel and extending the full lengths of said first and said second flat portions, and
means attaching said detent element to one of said hidden release lever and said exposed hand lever.

4,990,022

ROBOT HAND COUPLING ASSEMBLY

Shinpei Watanabe; Yasuto Watanabe; Yuzi Ikeda; Keiichiro Gunji, and Ryo Niikawa, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,029
Int. Cl.[5] F16B *7/20*
U.S. Cl. 403—349 **8 Claims**



1. A robot hand coupling assembly comprising:
a first joint member mounted on a robot arm;
a second joint member mounted on a robot hand;
means for operatively connecting said first and second joint members, said means for operatively connecting comprising at least one manifold, optical fiber members, electrical

connector terminal and engaging means, having a plurality of radially extending teeth, said teeth including slanted engaging surfaces mounted on each of said first and second joint members and angularly movable relative thereto for preventing a load exerted on said second joint member by the robot hand from being locally imposed on said coupling assembly;

actuator means for angularly moving said engaging means for detachably coupling said first and second joint members, aid actuator means includes at least one cylinder including a rod connected to a rack mounted on said first joint member, said engaging means includes a pinion meshing with said rack whereby when said cylinder is operated to move said rod, said engaging means is angularly moved by said rack and said pinion for bringing said first and second teeth into engagement with each other to couple said first and second joint members; and

fluid actuation means for enabling movement of the robot hand upon connection of said coupling assembly.

4,990,023

JOINT FOR ASSEMBLING OF SIEVE ELEMENTS

Georgi N. Angelov; Bogdan T. Ivanov; Ivan Y. Binbashiev, and Mariela P. Popsavova, all of Sofia, Bulgaria, assignors to Institut Po Technicheska Kibernet Ika I Robotika, Sofia, United Kingdom

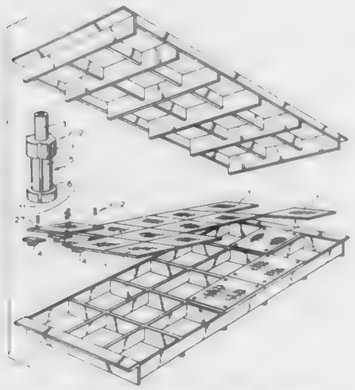
PCT No. PCT/BG86/00003, § 371 Date Jan. 21, 1987, § 102(e) Date Jan. 21, 1987, PCT Pub. No. WO86/05558, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 21, 1985, Ser. No. 8,508

Claims priority, application Bulgaria, Mar. 21, 1985, 69366

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—408.1 **4 Claims**



1. A connector for assembling sieve elements on a grid comprising:

a mounting element having a stem with opposing gripping elements extending therefrom to grip a grid element, a crossbar extending from the stem for supporting a sieve element, the crossbar having at least one aperture for receiving a fastener, and a rounded portion connecting the stem to the crossbar to provide damping;

a fastener inserted in the aperture of the crossbar having a cylindrical body, an upper collar on one end of the cylindrical body, and a bevelled lower collar on the other end of the cylindrical body, a cylindrical axial bore through the cylindrical body, at least one first slot extending longitudinally in the cylindrical body, and a membrane extending across the first slot;

a securing pin inserted in the axial bore of the fastener; wherein the membrane is broken and the fastener is split as a result of insertion of the securing pin.

4,990,024

PREFORMED POLYURETHANE ROADWAY-MARKING STRIP WHICH IS HIGHLY CONFORMANT TO ROAD SURFACE ROUGHNESS

Ludwig Eigenmann, Vacallo, Switzerland, assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 916,452, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 716,234, Mar. 26, 1985, abandoned. This application May 12, 1988, Ser. No. 193,477

Claims priority, application Switzerland, Mar. 26, 1984, 1498/84-9; Oct. 29, 1984, 5194/84-4; Oct. 29, 1984, 5150/84-0; Feb. 13, 1985, 0046/85-0

Int. Cl.[5] E01F *9/08;* **G02B** *5/12*

U.S. Cl. 404—12 **12 Claims**

1. A preformed roadway-marking strip made of polyurethane and characterized by the fact that it is wear resistant and has a roadway-marking function by the inclusion of anti-skid elements and light-retroreflecting elements, and by a solid self-adhesive film which has the function to attach the marking strip to the roadway surface and, at the same time, together with the polyurethane film to resist traffic wear.

4,990,025

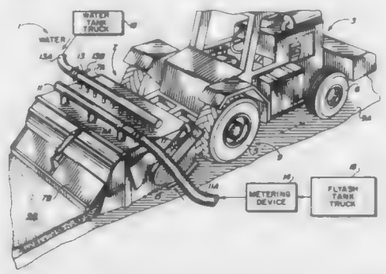
SOIL STABILIZING METHOD AND APPARATUS

Bryant C. Young, and Arne L. Harris, both of Tucson, Ariz., assignors to Soil Stabilization Inc., Tucson, Ariz.

Filed May 3, 1989, Ser. No. 347,160

Int. Cl.[5] E01C *19/18*

U.S. Cl. 404—92 **12 Claims**



1. A method of introducing powdery filler material into base material of a load base, comprising the steps of:

(a) operating a tiller machine to till a layer of the base material by means of a tiller element under a hood;

(b) simultaneously with step (a), spraying a dense spray of water through a plurality of nozzles extending from a first manifold through the hood over a rotary tiler element and located ahead of a rotation axis of the tiller element to prewet base material being tilled;

(c) simultaneously with steps (a) and (b), spraying a powdery filler material from a plurality of nozzles extending from a second manifold through the hood behind the first manifold and located behind the rotation axis to effectuate uniform mixing of the powdery filler material with the tilled, prewetted base material and to prevent spreading of dust including the powdery filler material outside of the shroud.

4,990,026

PROCESS FOR LOWERING BUILDING STRUCTURES

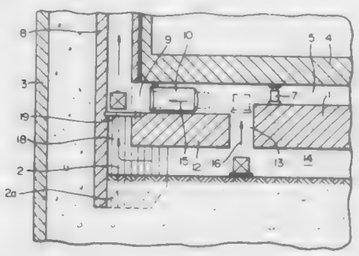
Josef Ofenstein, Krailling, Fed. Rep. of Germany, assignor to Alfred Kunz GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 301,010

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1988, 3803743

Int. Cl.[5] E02D *23/06*

U.S. Cl. 405—8 **4 Claims**



1. In a process for lowering a building structure into the ground, the steps comprising:

constructing a caisson below a bed plate of the building structure, which caisson has a reinforced top plate for supporting the building structure by means of supporting elements, a space between the bed plate and the top plate, and a reinforced concrete ring, which depends from a rim of the top plate and constitutes a cutting edge,

providing at least one transfer duct, to be lowered with the top plate, extending upwardly from the rim of the top plate,

maintaining superatmospheric pressure, in a working chamber which is defined under the top plate, and enclosed by the ring,

connecting the top plate to the bed plate by a vertically extending sealing wall located adjacent the rim of the top plate, forming an aperture in the top plate, which connects the working chamber to the space between the top plate and the bed plate, and

providing air locks extending through the sealing wall for selectively providing communication between said space and the transfer duct.

4,990,027

SHIELD TUNNELING METHOD AND SHIELD MACHINE THEREFOR

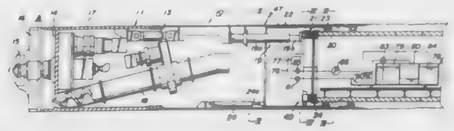
Masato Hattori, Higashimurayama; Rihei Nukushina, Tokyo, and Akira Kamide, Higashi Osaka, all of Japan, assignors to Kubota Construction Co., Ltd., Japan

Filed Feb. 28, 1990, Ser. No. 486,392

Claims priority, application Japan, Jun. 16, 1989, 1-152092

Int. Cl.[5] E21D *11/08, 11/10*

U.S. Cl. 405—146 **11 Claims**



1. A shield machine for use in a shield tunneling method for constructing a small-diameter tunnel, wherein a set of three 120° arcuate segments are assembled into a segment ring within a tail portion of the shield machine defined by a tail skin plate thereof, and a back-filling material is charged into an annular gap formed between the outer periphery of the segment ring and natural soil surrounding the segment ring, said shield machine comprising:

means for charging the back-filling material into said annular gap;

an annular seal device to be arranged between the inner periphery of the tail skin plate and the outer periphery of the segment ring, adapted to slidably move in the axial direction of the tunnel toward and away from a face where excavation of soil is to be carried out; and

an actuator adapted to cause said seal device to move in the axial direction away from the face, between the inner periphery of the tail skin plate and the outer periphery of the segment ring, after the back-filling material has been charged into said annular gap, thereby to compress said back-filling material.

4,990,028

ANTI-FRICTION COMPOSITION CONTAINING MGO AND METHOD

William Alexander, Naperville, and Mark Bertane, Elgin, both of Ill., assignors to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 784,604, Oct. 4, 1985, Pat. No. 4,944,634. This application May 5, 1988, Ser. No. 190,368

Int. Cl.[5] E03F *3/06*

U.S. Cl. 405—184 **16 Claims**

1. A method of installing a cable or conduit underground comprising:

extracting soil along a predetermined path underground to form a substantially annular tunnel having tunnel walls formed by said soil extraction extending from a first path end to a second path end;

disposing said cable or pipe at said first path end and forcing said cable or pipe along said predetermined path toward said second path end; and

contacting the tunnel walls surrounding the cable or pipe with a pumpable composition comprising a fully hydrated water-swellable smectite clay and MgO, wherein the MgO comprises at least 0.025% based on the dry weight of the clay, while forcing said cable or pipe along said predetermined path to substantially lessen the friction between an outer surface of the cable or pipe and the tunnel walls, and to stabilize the tunnel walls thereby substantially lessening the time and/or force necessary to install the cable or pipe.

4,990,029

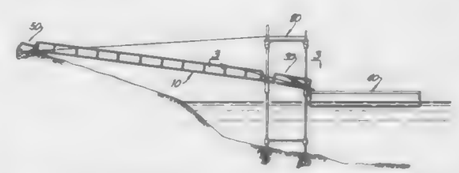
MOORING SYSTEM

Paul W. Hemminger, Rte. 4, Box 1466, Eufaula, Okla. 74432

Filed Aug. 5, 1988, Ser. No. 229,145

Int. Cl.[5] E01D *1/00*

U.S. Cl. 405—203 **6 Claims**



1. A mooring system for use on a controlled waterlevel lake comprising:

a shoreline mooring section;

a gangway section;

a drawbridge section; and,

a floatation section;

wherein said shoreline mooring section securely retains said gangway section to the shore while allowing adjustment to compensate for changes in position of said gangway section with respect to the shore when the water level of said lake is changed; said gangway section being securely and adjustably

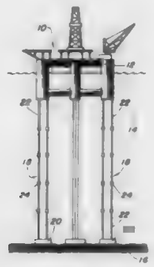
attached to said anchor section; said floatation section being coupled to said anchor section; and said drawbridge section, having an end hinged to said anchor section and another end capable of freely swinging about said hinged end, when in a lowered position, spanning the distance from said gangway section to said floatation section allowing access between said floatation section and said shore, and effectively creating a moat, when in a raised position, limiting access between said floatation section and said shore.

4,990,030

HYBRID COMPOSITE MOORING ELEMENT FOR DEEP WATER OFFSHORE STRUCTURES

Mamdouh M. Salama, Ponca City, Okla., and Richard M. Venaett, Oslo, Norway, assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 21, 1984, Ser. No. 684,779
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—224 12 Claims



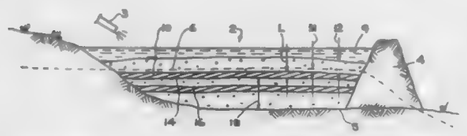
1. A tension load-bearing assembly (for use in a tensioned mooring element for a floating offshore structure) comprising a pretensioned body having a first diameter and a plurality of longitudinally oriented non-metallic fibrous elements in tension prestress, said pretensioned body being in fixed attachment to a surrounding, larger diameter metallic tubular member in compression prestress.

4,990,031

TREATMENT OF MINE TAILINGS

David W. Blowes, and Carol J. Ptacek, both of 17-368 Bearinger Road, Waterloo, Ontario, Canada N2L 6E7

Filed Jun. 7, 1989, Ser. No. 362,672
Claims priority, application United Kingdom, Jun. 9, 1988, 8813698
Int. Cl.[5] E02C *3/00*
U.S. Cl. 405—263 9 Claims



8. An impoundment, in combination with a body of sulphide-containing tailings, wherein:

the level of the stabilized water table in the impoundment is such that V meters of the depth of the tailings lies above the stabilized water table, and A meters lies below the stabilized water table;

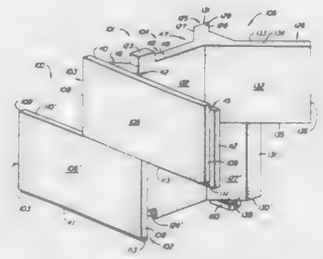
a layer of organic carbon material is included in the body of tailings, the layer being positioned slightly below the stabilized water table, the depth of the layer being substantially less than the depth A.

4,990,032

RETAINING WALL MODULE WITH ASYMMETRICAL ANCHOR

Peter J. Smith, Gansevoort, N.Y., assignor to Fomico International, Inc., New York, N.Y.

Filed Jan. 30, 1990, Ser. No. 472,324
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—286 9 Claims



1. A precast concrete retaining wall unit for use in constructing a retaining wall composed of superposed rows of such units, the unit comprising:

a face member having a front surface for forming part of an exposed face of a retaining wall, a rear surface, an upper edge, a lower edge, and first and second side edges;

a single support member having a top, a bottom, a first side, a second side, a front end portion, a rear end portion spaced from the front end portion, and an intermediate portion connecting the front and rear end portions, the front end portion of the support member being connected to the rear surface of the face member; and

an anchor member formed integrally with the rear end portion of the support member, the anchor member including a first wing extending at an angle of at least 90° from the first side of the support member and a second wing extending at an angle of at least 90° from the second side of the support member opposite to the first side, wherein the length of the first wing is substantially less than the length of the second wing,;

wherein the front end portion of the support member is formed integrally with the face member so as to extend rigidly and substantially perpendicularly to the rear surface of the face member at a location spaced from the first side edge of the face member by approximately one-fourth the distance between the first and second side edges of the face member.

4,990,033

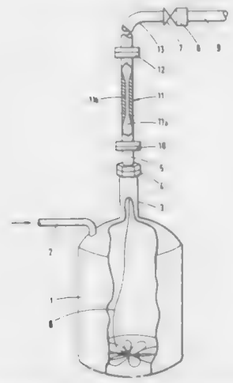
METHOD AND APPARATUS FOR BLOWING AN OPTICAL FIBRE MEMBER

Graham R. Handley, 79 Arrowe Park Road, Upton, Wirral, England 149 OUG; Neville J. Ditchfield, 19 Glencagles Close, Vicars Cross, Chester, England C305HW, and Ronald B. Radcliffe, 46 Merilyn Road, Rhyl, Clwyd, England LL18 4HH

Filed Nov. 22, 1988, Ser. No. 275,126
Claims priority, application United Kingdom, Nov. 25, 1987, 87 27581
Int. Cl.[5] B65G *51/04*
U.S. Cl. 406—82 12 Claims

1. An apparatus for introducing at least one optical fiber member into a tubular passageway, comprising a pressure vessel for containing a supply of the optical fiber member, the vessel either containing a gas under super-atmospheric pressure or being provided with an inlet by means of which such gas can be introduced; means defining a path for the optical

fiber member to travel from the vessel into the tubular passageway; and fiber introducing means for exerting a fluid dynamic



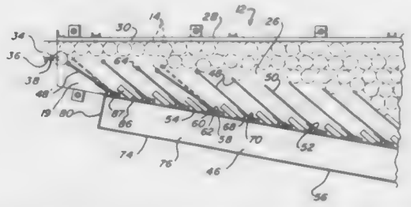
force on the optical fiber member to create slack in the optical fiber member as it travels along said path.

4,990,034

METHOD AND APPARATUS FOR FACILITATING FORMATION OF MOVING CYLINDRICAL ARTICLES INTO SINGLE FILE

Milton W. Kapke, Golden, and Richard H. VanderMeer, Loveland, both of Colo., assignors to Goldco Industries, Inc., Loveland, Colo.

Filed Oct. 12, 1988, Ser. No. 256,733
Int. Cl.[5] B65G *51/03*
U.S. Cl. 406—88 28 Claims



13. An apparatus for facilitating formation of moving cylindrical articles into single file, said apparatus comprising:

fluid conveying means including a pair of vertically spaced plates establishing a single filing area therebetween with at least one of said plates having apertures therein through which fluid is introduced into said single filing area for urging movement of a plurality of cylindrical articles in directions having at least a component of movement in one predetermined direction through said single filing area one portion of which has said articles moving therethrough substantially in a single line in said one predetermined direction;

mounting means;

arm means including a plurality of elongated arms having an article engagable portion at said single filing area, each of said arms having a width greater than one-half of the distance between said plates but less than the distance between said plates, and each of said arms also having a mounting portion for pivotably mounting said arms on said mounting means with said arms extending from said mounting means at an acute angle with respect to said one predetermined direction of movement of said articles and with said arms extending substantially parallel to one another in said single filing area so that said article engaging portion can be pivoted by said articles urged to movement by said conveying means and so that the article engaging portions of said arms successively engage articles moving through said single filing area that are not then in single file at said single filing area;

said mounting means having apertures therein between at least two adjacent ones of said mounting portions of said arms for directing fluid therethrough into said single filing area; and

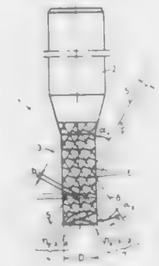
biasing means for biasing said arms against pivoted movement imposed by said articles urged to movement by said conveying means whereby articles engaged by said article engaging portion of said arms are yieldably urged toward said single file portion of said single filing area.

4,990,035

CONTOUR MILLING CUTTER

Anton Scheuch, Ravensburg, and Johann Schmidt, Bainfurt, both of Fed. Rep. of Germany, assignors to Hawera Präzisionswerkzeuge GmbH, Ravensburg, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 390,392
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833204
Int. Cl.[5] B26D *01/12*
U.S. Cl. 407—30 10 Claims



1. A cutting tool, for machining printed circuit boards and the like, comprising:

a cutting part having a longitudinal axis of rotation, an outer surface, and a plurality of staggered teeth formed on said outer surface, said cutting part having a first predetermined number of main cutting grooves formed in said outer surface which extend along said cutting part at a first lead angle and a second predetermined number of divider grooves intersecting said main cutting grooves, said divider grooves extending along said cutting part at a second lead angle, said main cutting grooves and said divider grooves defining said plurality of teeth, said first predetermined angle of said main cutting grooves being substantially equal to said second predetermined angle of said divider grooves, wherein said first predetermined number is a prime number and wherein said second predetermined number is greater than said first predetermined number by two, such that said teeth are staggered as viewed in a radial direction which is perpendicular to said longitudinal axis and such that each of said teeth partially overlaps in said radial direction at least another one of said teeth.

4,990,036

CUTTING INSERT

Sven L. Eklund; Kaj-Ragnar Loqvist, and Karl-Erik Forsberg, all of Fagersta, Sweden, assignors to Seco Tools AB, Fagersta, Sweden

Filed Oct. 18, 1988, Ser. No. 259,316
Claims priority, application Sweden, Oct. 19, 1987, 8704055
Int. Cl.[5] B23B *1/00*
U.S. Cl. 407—113 7 Claims

1. A cutting insert for chip removal machining, including

longitudinal turning, comprising upper and lower surfaces interconnected by side surface means to form at least one corner, an intersection of said side surface means and said upper surface forming an edge region including first and second edge portions, said first edge portion including a main cutting edge at least a portion of which is curved and extends around said corner, said first edge portion including a clearance portion extending from a terminal end of said main cutting edge lying on said curved portion generally toward a center axis of the insert, said second edge portion having an end situated adjacent said clearance portion and extending away from said clearance portion in a direction generally away



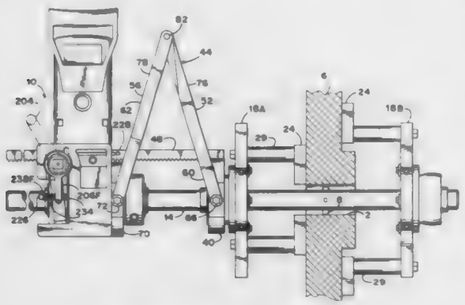
from said center axis, said second edge portion intersecting a tangent line which is tangent to said terminal end of said main cutting edge and extending past such tangent line in a direction generally away from said center axis to define a secondary cutting edge located on a side of said tangent line which is opposite that of said main cutting edge, said secondary cutting edge extending to a terminal end thereof which is spaced from said terminal end of said main cutting edge by a distance of from 0.1 to 4.0 mm along a line interconnecting said terminal ends, whereby said main and secondary cutting edges are adapted to cut during chip removal machining, including longitudinal turning.

4,990,037

PORTABLE BORING MACHINE

David S. Strait, Newberg, Oreg., assignor to Climax Portable Machine Tools, Inc., Newberg, Oreg.

Filed Aug. 2, 1989, Ser. No. 388,985
Int. Cl.[5] B23B *41/12*
U.S. Cl. 408—72 P. 35 Claims



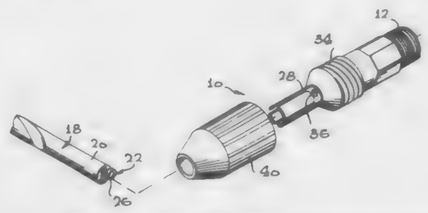
1. A boring machine comprising:
a power unit having a housing, a drive member for engaging a boring bar, and a motor for driving the drive member to rotate relative to the housing,
a bearing assembly comprising an inner bearing member defining a passage through which the boring bar extends, and an outer bearing member in which the inner bearing member is fitted in a manner permitting angular movement of the inner bearing member relative to the outer bearing member about axes perpendicular to the axis of the passage defined by the inner bearing member,
attachment means for attaching the bearing assembly to a workpiece in a manner preventing movement of the outer bearing member relative to the workpiece, and
a collapsible torque transmission linkage connecting the housing of the power unit to the outer bearing member, whereby the housing unit is held against rotation relative to the outer bearing member.

4,990,038

ROTATIONALLY AND AXIALLY RESTRAINED DRILL BIT AND CHUCK ASSEMBLY

Robert DeLong, Temple City, Calif. 91780, assignor to G & H Technology, Inc., Camarillo, Calif.

Filed Jan. 29, 1990, Ser. No. 471,624
Int. Cl.[5] B23B *47/00*
U.S. Cl. 408—127 7 Claims



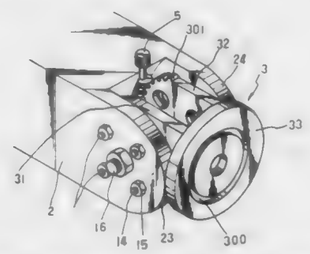
1. An axially and rotationally restrained drill bit and chuck assembly, comprising:
a boss affixed to a drive end of a drill bit, said boss including an enlarged head secured to the drill bit drive and via a smaller dimensioned stem;
said chuck including a collet having an end opening for receiving the drive end of the drill bit therewithin and an internal wall against which the drill bit drive and bottoms during use, said internal wall including an opening dimensioned to receive the boss enlarged head and wall portions for lockingly contacting said boss enlarged head and restraining said boss enlarged head from both axial release from said opening and from rotating in excess of a predetermined maximum angular extent with respect to the collet.

4,990,039

STRUCTURE OF VERTICAL MILLING MACHINE RAM ADAPTER

Y. T. Liaw, No. 48, Lane 450, Bei Yang Rd., Feng Yuan, Taiwan

Filed Nov. 17, 1989, Ser. No. 437,734
Int. Cl.[5] B23C *1/12*
U.S. Cl. 409—201 3 Claims



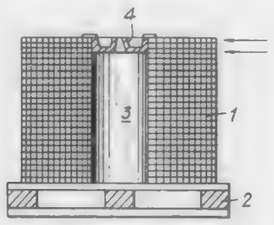
1. A vertical milling machine ram adapter, comprising:
a cylindrical hollow body having a front plate integrally formed with a pair of lateral side walls, each of said side walls being defined by a respective lateral flat plate, each of said lateral flat plates having (1) a circular face formed on a rear end portion thereof, and (2) a front end portion coupled to said front plate, wherein said two lateral flat plates and a said front plate are formed in a U-shaped configuration with each of said lateral flat plates and said front plate having a circular groove formed therein and at least one tapered hole formed therethrough, said tapered hole being in open communication with said circular groove, one of said lateral flat plates having an arcuate tooth surface formed on said rear end portion and disposed in mating relationship with an adjustment worm gear for control of a revolving angle of he ram adapter.

4,990,040

BRACING DEVICE FOR PRESERVING THE SHAPE OF LARGE COILS

Henner Nülle, Bolivar, Ohio, and Edmund Munk, Oberstenfeld, Fed. Rep. of Germany, assignors to Werzalit-Werke, J.F. Werz KG, Oberstenfeld, Fed. Rep. of Germany

Filed Jan. 10, 1985, Ser. No. 690,572
Claims priority, application European Pat. Off., Aug. 10, 1984, 84109561.5
Int. Cl.[5] B65D *85/67*
U.S. Cl. 410—47 2 Claims



1. A hub-shaped bracing device insertable in cylindrical holes of large coils for preserving the shape of large coils, comprising a circular disk formed as a single piece of a pressed mixture of lignocellulose-containing fibrous materials and thermo-setting binding agents and having a central vertical axis and a central opening extending through said vertical axis, said disk having a substantially U-shaped cross-section and including a vertical outer portion of substantially cylindrical cross-section, a vertical inner portion radially spaced from said outer portion and extending at a slight angle to said central vertical axis, and a substantially horizontal portion connecting said inner portion and said outer portion to each other, said horizontal portion being arched inwardly whereby said disk when inserted into a cylindrical hole of the coil is able to compensate for radial forces exerted on the coil, said outer vertical portion having a radially outer edge and at least two flanges formed at said edge and projecting radially outwardly beyond said outer edge whereby said flanges are supported on an edge of the coil when the bracing device is inserted into the coil.

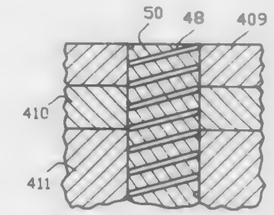
4,990,041

FASTENING DEVICE

Emanuel Winston, 1448 Old Skokie Rd., Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 228,324, Aug. 4, 1988, which is a continuation-in-part of Ser. No. 885,152, Jul. 4, 1986. This application Feb. 1, 1989, Ser. No. 305,152
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—23 29 Claims

1. A fastening device for securing within an aperture of a workpiece, comprising in combination:
a longitudinally extending body member for insertion within the aperture of the workpiece;
a locking shoulder secured to said longitudinally extending body member for engagement with the workpiece;
groove means disposed in said longitudinally extending body member; and



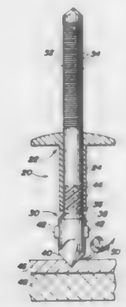
resilient means established in said groove means for coacting between said longitudinally extending body member and the workpiece for reducing undesired movement therebetween.

4,990,042

SELF-DRILLING BLIND SETTING RIVET

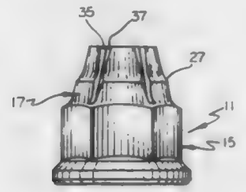
Geza J. Szayer, 24771 Acropolis Dr., and Stig V. Naona, 23572 Valarta La. both of, Mission Viejo, Calif. 92691

Filed Sep. 5, 1989, Ser. No. 402,765
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—29 19 Claims



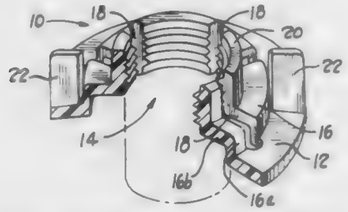
1. A self-drilling, blind setting rivet, comprising in combination:
a hollow rivet sleeve having a radially outwardly flanged head located at a first end thereof, said hollow rivet sleeve having a second end;
a shaft having a first end and a second end, said first end of said shaft extending through said hollow rivet sleeve and extending out of said hollow rivet sleeve at said first end thereof;
a tapered mandrel tapering from a smaller diameter at a first end to a larger diameter at a second end, said first end of said tapered mandrel being attached to said second end of said shaft, said tapered mandrel cooperating with said hollow rivet sleeve to expand said second end of said hollow rivet sleeve when said shaft draws said tapered mandrel into said second end of said hollow rivet sleeve;
a plurality of spiral flutes located in said shaft adjacent said second end of said shaft, said plurality of spiral flutes providing localized weakening of said shaft for ultimate fracture and severance from said tapered mandrel; and
a generally cylindrical segment having a first end attached to said second end of said tapered mandrel, said cylindrical segment having a drill head at a second end thereof.

4,990,043
LOCK NUT
Paul B. Hafeli, El Toro, and Dennis B. Kneff, Lomita, both of Calif., assignors to Rexnord Holdings Inc., Carson, Calif.
Filed Mar. 30, 1989, Ser. No. 331,271
Int. Cl.[5] F16B *39/284*
U.S. Cl. 411—280 6 Claims



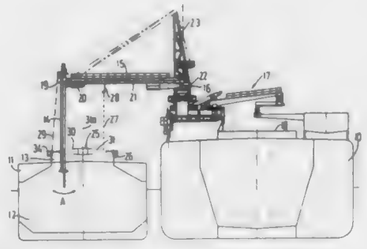
1. A locking beam nut adapted to receive a bolt, comprising:
a rigid body having a circular opening extending through it; and
a plurality of resilient, circumferentially-spaced locking beams projecting from one end of the rigid body and having inner surfaces that define a circular opening aligned with the circular opening in the rigid body, the locking beams all deviating radially inwardly such that the circular opening they define has a uniformly-decreasing diameter;
wherein the circular openings defined by the rigid body and the plurality of locking beams contain threads along their entire axial length for receiving a bolt, the locking beams resiliently flexing radially outwardly to lock the bolt in place;
wherein the plurality of locking beams each have side walls arranged in spaced, confronting relationship with the side walls of circumferentially-adjacent locking beams;
and wherein the plurality of locking beams are configured such that substantial portions of the confronting side walls of adjacent beams diverge from each other, with increasing radial distance, with the amount of the diverging portions increasing from a minimum at the base ends of the beams, adjacent to the rigid body, to a maximum at the remote ends of the beams, such that any debris located in the space between the side walls does not inhibit a resilient return of the beams to their unflexed, radially-inward locations when the bolt is removed from the locking beam nut.

4,990,044
THREADED PUSH-ON FASTENER
Daniel Kimak, 16460 Hosmer Rd., Middlefield, Ohio 44062
Continuation of Ser. No. 359,784, Mar. 19, 1982, abandoned.
This application Jun. 26, 1985, Ser. No. 749,124
Int. Cl.[5] F16B *37/00*
U.S. Cl. 411—427 5 Claims



1. A push on threaded female fastener comprising a base with a face constructed to bear against an abutting surface, an opening of a first diameter through the base, a split annular flexible and resilient web means surrounding the opening and having a first portion attached to the base and extending from the base in the direction of a central axis of the opening and a second portion extending from the first portion radially inward toward and at a right angle to the central axis in a plane parallel to the general extent of said base face, and arcuate internally threaded nut portions attached to and of substantially greater axial length than the second portion of the web means, extending axially away from the base and forming a passage axially aligned with the opening through the base and of a second diameter sensibly smaller than said first diameter, there being a number of arcuate nut portions equal to the number of splits in the annular web means, and said annular split web means being thinner in cross section than either the base or said nut portions and flexible enough to allow through distortion the nut portions to more axially of the fastener in opposite directions from an undistorted condition in which the second portion of the web means is at a right angle to the central axis, in response to axially applied forces to the nut portions.

4,990,045
ARRANGEMENTS FOR UNLOADING BULK MATERIAL FROM HOLDS OF CARGO VESSELS
Per T. Aralt, Hopsnesvn. 75, N-5043 Hop, Norway
Filed Jul. 27, 1989, Ser. No. 386,359
Int. Cl.[5] B63B *19/14, 27/00*
U.S. Cl. 414—137.4 14 Claims

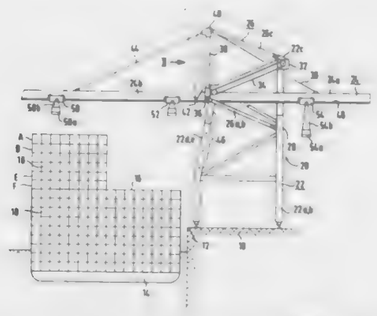


12. In combination,
a hatch cover having a framework for mounting on a coaming of a ship and a cover section rotatably mounted within said framework and including a guide opening of limited longitudinal and lateral dimension extending radially thereof;
an unloading means for passage through said guide opening into a hold of a ship; and
support means for suspending said unloading means and said hatch cover therefrom over a hatch of a ship.

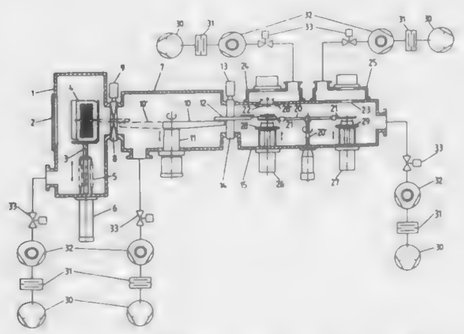
4,990,046
APPARATUS FOR LOADING CONTAINERS ON TO SHIPS AND UNLOADING THEM THEREFROM
Hans Tax, Munich, and Klaus Hösler, Eichenau, both of Fed. Rep. of Germany, assignors to Tax Ingenieurgesellschaft mbH, Munich, Fed. Rep. of Germany
Filed Jul. 21, 1989, Ser. No. 384,294
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1988, 3826274
Int. Cl.[5] B65G *67/60;* B66C *23/68*
U.S. Cl. 414—141.4 17 Claims

1. Apparatus for loading containers onto and unloading containers from ships which receive the containers at locations of varying height, comprising a quayside carrier framework (22) and a travelling carrier system (24) fitted on the carrier framework (22), with a horizontal track (48) on which at least one container-receiving crane trolley (50) can travel, said travelling carrier system (24) being mounted on the carrier framework (22) for variation in height, at least one power appliance (34) being provided for the height displacement of the travelling carrier system (24), said travelling carrier system

(24) being supported by a rigid support member (30) having a predetermined orientation in space, said rigid support member (30) being connected with said carrier framework (22) by a lower and an upper link rod system, each of said link rod systems comprising at least one link rod (*26a, 26b, 26c*) pivotally connected with said carrier framework (22) by a first respective end portion and with said rigid support member (30) by a second respective end portion at respective first and second pivot axes, said pivot axes being substantially horizontal and transverse to said horizontal track (48), said link rod systems being part of a parallelogram linkage (26) which also includes said rigid support member (30) and a portion of said carrier framework (22), said portion of said carrier framework (22) being a base portion of said parallelogram linkage (26), said parallelogram linkage (26) being deformable by said power appliance (34), so as to lift and lower said rigid support member (30) while maintaining said predetermined orientation in space during such lifting and lowering.



4,990,047
VACUUM APPARATUS
Rudolf Wagner, Fontnas, Switzerland; Bader Martin, Balzers, Liechtenstein; Moll Eberhard, Schellenberg, Liechtenstein; Renzo Zanardo, Balzers, Liechtenstein, and J. G. Van Agtmaal, Hilversum, Netherlands, assignors to Balzers Aktiengesellschaft, Balzers, Liechtenstein
Filed May 24, 1989, Ser. No. 356,872
Claims priority, application Switzerland, May 24, 1988, 1951/88; Jul. 15, 1988, 2722/88
Int. Cl.[5] B65G *49/07*
U.S. Cl. 414—217 22 Claims



1. A vacuum apparatus for the treatment of workpieces, comprising:
at least one distribution chamber with at least three ports, said ports being shutable with respective vacuum-tight shut-off members;
pumping means connected to said distribution chamber for evacuating at least said distribution chamber;
at least one intermediate chamber with at least three ports;
pumping means connected to said intermediate chamber for evacuating at least said intermediate chamber;
at least two treatment chambers each having a port, said at least two treatment chambers being connected at their ports to two respective ports of said intermediate chamber, said intermediate chamber having a remaining port;
said distribution chamber being connected at one of its ports to the remaining port of said intermediate chamber, said distribution chamber having two remaining ports;
said two remaining ports of said distribution chamber being connected to respective ports of at least two of the group including: a workpiece input chamber having a port; a workpiece output chamber having a port; a workpiece input and output chamber having a port; a treatment chamber having a port; a further distribution chamber having at least three ports, and a further intermediate chamber having at least three ports;
first transistor means within said at least one distribution chamber for transporting workpieces to and from said at least three ports of said distribution chamber; and
second transport means within said at least one intermediate chamber for transporting workpieces to and from said at least three ports of said intermediate chamber.

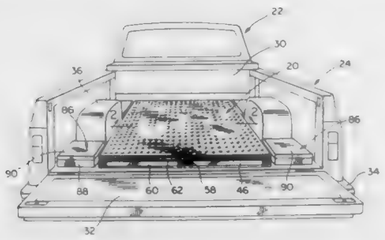
4,990,048
APPARATUS FOR COLLECTING AND COMPACTING GARBAGE AND THEN LOADING IT INTO A ROAD VEHICLE
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741
Division of Ser. No. 189,522, May 3, 1988, Pat. No. 4,923,356.
This application May 26, 1989, Ser. No. 357,094
Int. Cl.[5] B65G *65/02*
U.S. Cl. 414—398 11 Claims



1. For use with a comparator for bulk material, a containment and compaction vault adapted to receive bulk material from the comparator, for further compaction into a compacted body and then delivery on to a receiver, said vault comprising:
a pair of spaced apart sidewalls, a top wall and a base portion, said top wall, said sidewalls and said base portion together defining a chamber having an inlet at one end of the vault in through which bulk material is received from said compactor and an outlet for delivery of material to said receiver;
a barrier wall within the chamber between the inlet and outlet, said barrier wall being movable between a down position in which it extends substantially across the chamber, and a retracted up position, enabling the barrier wall to be in its down position when bulk material is first being delivered into said chamber, so that the bulk material will be further compacted against said wall to form a leading end portion of the compacted body of bulk material, said barrier wall when in its retracted position being positioned to allow forward movement of the compacted body of bulk material through the chamber in response to introduction of additional bulk material into the chamber;
said base portion including a reciprocating floor conveyor which forms a floor for the chamber, said reciprocating floor conveyor comprising floor slat members movable towards the outlet to convey the material in the chamber towards the outlet and retractable back towards the inlet

to bring the floor slat members back to a start position at the inlet; and
means for moving said slat members.

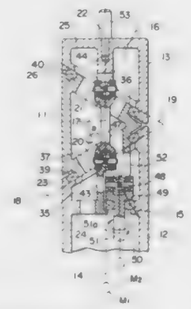
4,990,049
UNIVERSAL PICKUP TRUCK BED LINER, LOADING RAMP AND LADDER ASSEMBLY
James F. Hargrove, Rt. 2 Box 89, Hope Hull, Ala. 36043
Filed Oct. 25, 1988, Ser. No. 261,745
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—537 12 Claims



1. A pickup truck bed liner, loading ramp and ladder assembly comprising a rigid, generally rectangular bed liner for a pickup truck bed having a rear end with a tailgate, said liner including a load supporting surface adapted to cover substantially the entire area between wheel wells on the truck bed, frame means extending downwardly from the periphery of the load supporting surface to engage the pickup truck bed and support the load supporting surface in spaced relation to the pickup truck bed to form a storage space, said frame means having an open end, said open end of the frame means facing to the rear end of the pickup truck bed and providing access to the storage space under the load supporting surface when the pickup tailgate is in an open position, and ramp means slidably positioned through the open end of the frame means for positioning in stored relation in the storage space below the load supporting surface of the liner and movement rearwardly to a downwardly inclined position toward a ground surface at the rear end of the pickup truck bed to provide a ramp from the ground surface to the load supporting surface of the liner, said ramp means comprising a frame having parallel side rails and a plurality of spaced cross rails to provide a ladder structure capable of use as a ramp for the bed liner and as a ladder structure, said ramp means including a mesh panel overlying the side rails and cross rails and means detachably connecting the mesh panel to the ramp means, said means connecting the mesh panel to the ramp means including a depending rigid channel-shaped cleat mounted on the undersurface of the mesh panel in downwardly telescoping relation to one of said cross rails to position the mesh panel on the ramp means to enable removal of the mesh panel when desired for use of the ramp means as a ladder or as a ramp for vehicles having large wheels, said load supporting surface being a tread plate having projections on the upper surface thereof to enhance traction, said bed liner frame means including a pair of inwardly facing, channel-shaped parallel side rails, a pair of centrally disposed, outwardly facing channel-shaped center rails secured in back-to-back relation and facing the side rails to form two parallel spaces in underlying relation to the load supporting surface, said ramp means including two ramps with the ramps being individually slidable into the spaces.

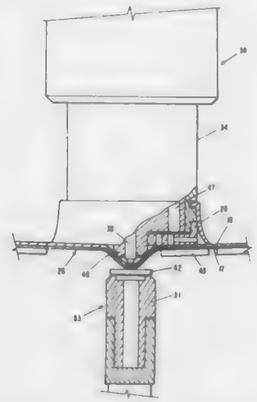
10. A loading rap for a pickup truck bed comprising a generally rectangular frame defined by parallel side rails and parallel cross rails perpendicular to the side rails and rigidly connected therewith to form a ladder-type frame to extend from a supporting ground surface to a rear edge portion of a pickup truck bed and for use as a ladder structure to enable a user to climb to an elevated position, a mesh panel completely overlying one side of the ladder frame, means releasably mounting the mesh panel on the frame to enable the mesh panel to form a loading ramp for vehicles having small wheels and a loading ramp for walking users of the pickup truck bed with the mesh panel being removable to enable the use of the ladder frame as a ladder, and a kit to convert the frame to a utility trailer, said kit including a hitch and two wheel assemblies, said hitch being connected to on end of the frame, said wheel assemblies being connected to and depending from the side portions of the other end of the frame.

4,990,050
WRIST MECHANISM
Kazuo Tsuge, Yokohama; Yukio Ohtani, Kawasaki; Noriyuki Utsumi, and Satoshi Uehara, both of Yokohama, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan
Continuation of Ser. No. 99,696, Sep. 18, 1987, abandoned, which is a continuation of Ser. No. 787,676, Oct. 15, 1985, abandoned. This application Apr. 10, 1989, Ser. No. 336,607
Claims priority, application Japan, Oct. 15, 1984, 59-215347; Nov. 15, 1984, 59-241355; Jan. 18, 1985, 60-7134
Int. Cl.[5] B25J *17/02*
U.S. Cl. 414—735 13 Claims



1. A wrist mechanism comprising:
at least three tubular rigid elements, said rigid elements being rotatively connected in series to form a tubular wrist so that adjacent two elements are rotatable relative to each other about a rotation axis, any two adjacent rotation axes intersecting each other;
a first drive connected to a first rigid element in said rigid element series for rotating both said first rigid element and every second rigid element;
a second drive for rotating every other rigid element, the latter having an opening extending therethrough from end to end thereof defined by a tubular wall;
first transmission means connecting both said first rigid element and said every second rigid element in a movement-locking manner, for transmitting rotation from said first rigid element to said every second rigid element, said first transmission means extending through said opening in said every other rigid element within the confines of said tubular wall; and
second transmission means, connecting both said second drive and said every other rigid element in a movement-locking manner, for transmitting rotation from said second drive to said every other rigid element, said second transmission means being arranged to be within said tubular wrist, whereby said first drive rotates both said first rigid element and every second rigid element in synchronous rotation relative to said every other rigid element, and said second drive rotates said every other rigid element in independent synchronous rotation relative to both said first rigid element and said every second rigid element.

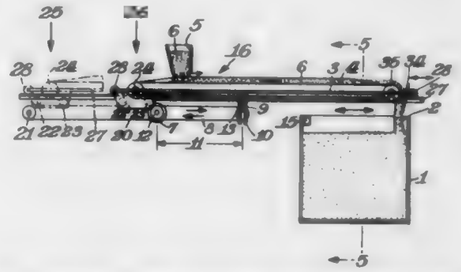
4,990,051
PRE-PEEL DIE EJECTOR APPARATUS
Ali R. Safabakhsh, Lafayette Hills, and Vincent G. Amorosi, Warminster, both of Pa., assignors to Kulicke and Soffa Industries, Inc., Willow Grove, Pa.
Division of Ser. No. 101,842, Sep. 28, 1987, Pat. No. 4,850,780. This application Apr. 4, 1989, Ser. No. 332,988
Int. Cl.[5] B23P *21/00*
U.S. Cl. 414—786 4 Claims



1. A method of removing a large die from a sawn wafer mounted on an adhesive coated flexible tape carrier, comprising the steps of:
engaging a reverse side of said flexible tape with a movable die chuck extending under several dice,
engaging a reverse side of the selected large die via the flexible tape with a pedestal collar smaller than said large die,
applying a vacuum through the chuck to the reverse side of said flexible tape under the edges of said selected die,
moving said die chuck relative to said pedestal collar while continuing to maintain the applied vacuum,
peeling said adhesive tape from beneath the lateral edges of said selected die by movement of the chuck relative to the collar,
further separating said selected die from said adhesive tape by engaging a small area on a reverse side of said flexible tape beneath said die with a die eject pin, and
picking up said preselected die with a die collet.

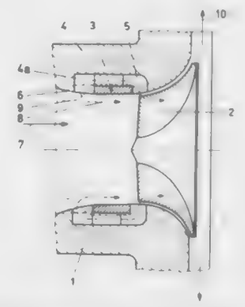
4,990,052
PROCESS FOR PRODUCTION OF UNIFORMLY DISCHARGED PARTICLE FLOW
Uwe Kunstmann, Roesdorf, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany
Division of Ser. No. 302,762, Jan. 26, 1989, Pat. No. 4,948,322. This application Jun. 7, 1990, Ser. No. 534,766
Claims priority, application European Pat. Off., Apr. 6, 1988, [redacted]105443.1
Int. Cl.[5] B65G *65/32, 69/04*
U.S. Cl. 414—786 2 Claims

1. A process for the production of a uniform flow of particles to be discharged over the width of a hopper, such as fibers consisting of cellulose-containing or mineral-containing materials or fibers, chips or mixtures of such particles provided with binders for the production of boards from these materials by charging a hopper with a feeding device arranged above the hopper transversely to the longitudinal axis of the hopper and with a stationary feed to the side of the hopper that supplies particles to the feeding device, the process comprising the steps of arranging a horizontal endless belt conveyor with a discharge end above the hopper, shifting the entire conveyor in a back and forth direction so that the discharge end traverses the hopper from side-to-side thereof in a forward direction toward the hopper and a backward direction away from the hopper, driving the endless belt of the conveyor in the same direction at a given speed, shifting the entire conveyor back and forth at the same or higher speed as the belt of the conveyor to render the relative belt speed zero or higher when the



entire conveyor is shifted in the forward direction toward the hopper and twice as high or higher than the belt conveyor when the entire conveyor is shifted in the reverse direction away from the hopper whereby the speed of the endless belt relative to the stationary feed remains the same when the entire conveyor is shifted back and forth, and supplying the width of the endless belt with material from the stationary feed.

4,990,053
DEVICE FOR EXTENDING THE PERFORMANCES OF A RADIAL COMPRESSOR
Karl-Heinz Rohne, Nussbaumen, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Jun. 21, 1989, Ser. No. 369,331
Claims priority, application Switzerland, Jun. 29, 1988, 2478/88
Int. Cl.[5] F04D *29/44*
U.S. Cl. 415—58.4 15 Claims



1. A compressor arrangement extending the performance of a radial compressor at small throughputs in the inlet region of a radial flow impeller of a radial compressor comprising a recess which is oriented in the circumferential direction of an inlet duct of the radial compressor and which extends upstream from an inlet aperture of the radial flow impeller, a stabilization ring being integrated in said recess and arranged in front of the radial flow impeller and outside the principal flow of the transported medium, an inlet edge of said radial flow impeller being located downstream of an end edge of the stabilization ring and upstream of an end edge of said recess, said stabilization ring carrying on its outside circumference a number of blades which are themselves anchored to an inner contour of the recess.

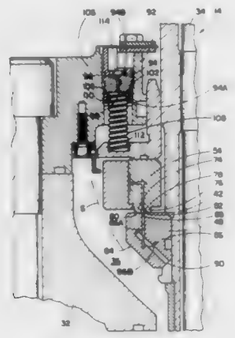
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4,990,054

DEVICE INCORPORATING MICRO-POROUS MEMBRANE FOR VENTING GASES FROM SEAL ASSEMBLY OF A REACTOR COOLANT PUMP

David J. Janocko, Forest Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 13, 1989, Ser. No. 450,354
Int. Cl.[5] F01D *11/00;* **F03B** *11/00*
U.S. Cl. 415—111 **17 Claims**



1. For use in a pump having a stationary seal housing with pressurized liquid and gas therein, a rotatable member disposed in the housing and operable for causing rotation of the liquid within the housing, and a seal assembly disposed within the housing between the housing and rotatable member, a gas venting device comprising:

(a) a body having spaced inner and outer sides and being mountable to the seal housing so as to dispose said inner and outer sides of said body respectively adjacent to, and in communication with, the interior and exterior of the seal housing;

(b) means defined through said body for facilitating flow of the liquid and gas from the interior to exterior of the seal housing; and

(c) means mounted on said body for permitting flow of gas from the interior to the exterior of the housing through said flow facilitating means while blocking flow of liquid therethrough from the interior to the exterior of the housing.

4,990,055

DYNAMIC SEAL WITH FLUSHING PROTECTION OF STATIC SEAL

Izya Korenblit, Cincinnati, Ohio, assignor to ITT Corporation, New York, N.Y.

Filed Jul. 25, 1989, Ser. No. 385,596
Int. Cl.[5] F01B *25/00;* **F01D** *11/00*
U.S. Cl. 415—144 **11 Claims**

1. In a centrifugal pump, apparatus comprising:

a dynamic seal;

a static seal;

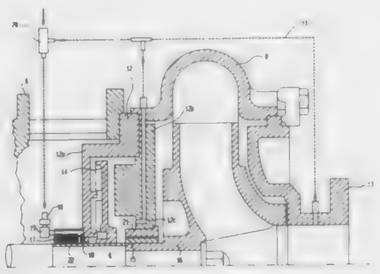
means positioned between said static and dynamic seals for providing flushing protection for said static seal;

a by-pass line connected between a suction end housing of said pump and said dynamic seal;

a flush liquid line coupled by end fitting means to said flushing protection means;

pressure regulator means connected between said flush liquid line and said by-pass line;

a throttling device located between said auxiliary impeller and the impeller of said pump; and



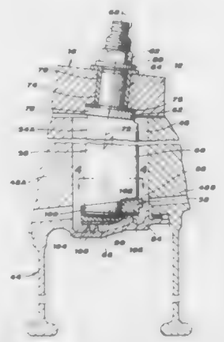
said dynamic seal having an end cover having a channel which is connected to the by-pass line.

4,990,056

STATOR VANE STAGE IN AXIAL FLOW COMPRESSOR

John C. McClain, Plainfield; Patrick D. Murphy, and David S. Huelster, both of Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1989, Ser. No. 437,240
Int. Cl.[5] F01D *1/02;* **F04D** *29/56*
U.S. Cl. 415—160 **3 Claims**



1. A method of making an annular stage of variable geometry stator vanes on a case of an axial flow compressor,

said case being split in a horizontal center-plane thereof a first case half and a second case abutting in said horizontal center-plane at respective longitudinal edges thereof and each of said stator vanes having a pivot shaft at one end and a vane button at the other end,

said method comprising the steps of:

forming on each of said first and said second case halves a 180-degree array of a plurality of radial bores in a plane perpendicular to a longitudinal axis of said compressor case,

inserting each of said vane pivot shafts loosely into a respective one of said radial bores,

forming a first unitary 180-degree arc shroud ring segment having a first planar end and a second planar end and a plurality of vane button sockets in an outer surface thereof equal in number to the number of said stator vanes in said 180-degree array on said first case half,

forming a second unitary 180-degree arc shroud ring segment having a first planar end and a second planar end and a plurality of vane button sockets in an outer surface thereof equal in number to the number of said stator vanes in said 180-degree array on said second case half,

maintaining each of said first and said second shroud segments in a pinched condition achieved by resiliently deflecting said first and said second planar ends toward each other,

fitting said first shroud ring segment on said 180-degree array of stator vanes on said first case half by inserting said vane buttons thereof into respective ones of said vane button sockets on said first shroud ring segment,

fitting said second shroud ring segment on said 180-degree array of stator vanes on said second case half by inserting said vane buttons thereof into respective ones of said vane button sockets on said second shroud ring segment,

releasing each of said first and said second shroud ring segments from said pinched condition,

inserting a bushing between each of said stator vane pivot shafts and the corresponding one of said radial bores to rotatably mount each of said stator vanes on respective ones of said first and said second case halves, and

joining said first and said second case halves at said longitudinal edges thereof.

3. In a split-case axial flow compressor having a case including a first case half having a pair of longitudinal edges and a second case half having a pair of longitudinal edges abutting respective ones of said longitudinal edges of said first case half in a horizontal center-plane of said case,

a stator vane stage comprising

means defining a plurality of radial bores in each of said first and said second case halves in a plane perpendicular to a longitudinal axis of said case and arrayed symmetrically between said longitudinal edges of the corresponding ones of said first and said second case halves,

a plurality of stator vanes each having a pivot shaft at a first end thereof loosely received in a respective one of said radial bores in said upper and said lower case halves and a cylindrical vane button at a second end thereof,

a plurality of bushings interposed between each of said stator vane pivot shafts and the corresponding one of said radial bores whereby each of said stator vanes is supported on a corresponding one of said first and said second case halves for rotation about a radial axis of said case,

a first unitary 180-degree arc shroud ring segment having an outer surface with a plurality of cylindrical bores therein symmetrically spaced between a pair of planar ends of said first shroud ring segment and rotatably receiving a corresponding one of said vane buttons on said stator vanes on said first case half, and

a second unitary 180-degree arc shroud ring segment having an outer surface with a plurality of cylindrical bores therein symmetrically spaced between a pair of planar ends of said second shroud ring segment and rotatably receiving a corresponding one of said vane buttons on said stator vanes on said second case half.

4,990,057

ELECTRONIC CONTROL FOR MONITORING STATUS OF A COMPRESSOR

Douglas J. Rollins, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed May 3, 1989, Ser. No. 346,749
Int. Cl.[5] F04B *49/02*
U.S. Cl. 417—12 **14 Claims**

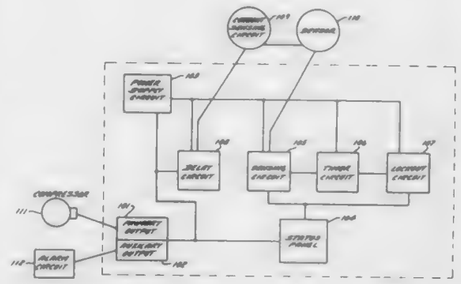
1. An electronic controller which monitors a status of a compressor, comprising:

fault detecting means for detecting a fault in said compressor;

timing means, connected to said fault detecting means, for initiating a predetermined timing period in response to a fault detected by said fault detecting means;

power means for providing power to said compressor, said power means responsive to said timing means, for disconnecting power to said compressor when the detected fault is not corrected within said predetermined timing period, and for continuing power to said compressor when said detected fault is corrected within said predetermined period;

means for resetting said timing means when said detected fault is corrected within said predetermined timing period; and



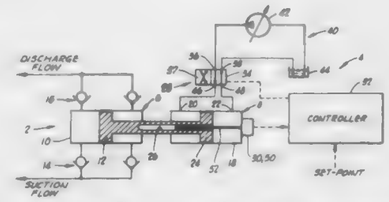
an alarm circuit which activates an alarm in response to the detection of a fault by said fault detecting means and which deactivates said alarm at the conclusion of said predetermined timing period only if said fault is not corrected within said timing period, and which deactivates said alarm during said timing period only if said fault is corrected within said timing period.

4,990,058

PUMPING APPARATUS AND PUMP CONTROL APPARATUS AND METHOD

David M. Eslinger, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 28, 1989, Ser. No. 442,031
Int. Cl.[5] F04B *49/00*
U.S. Cl. 417—46 **17 Claims**



1. An apparatus for pumping a fluid at a selected flow rate, comprising:

fluid end means for receiving and discharging the fluid;

power end means, connected to said fluid end means, for operating said fluid end means;

fluid communicating means for communicating a variable amount of an actuating fluid to said power end means;

position detecting means for sensing a position of said power end means and for providing a signal in response thereto; and

control means, responsive to said signal from said position detecting means and to a set point signal designating the selected flow rate, for operating said fluid communicating means to communicate actuating fluid to said power end means so that said power end means operates said fluid end means to discharge at the selected flow rate the fluid received in said fluid end means, said control means including computer means for computing a velocity value and a position value in response to said selected flow rate

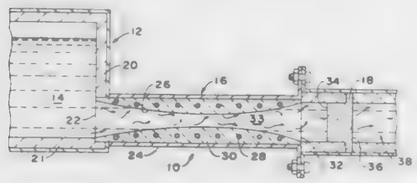
and for processing said velocity value, said position value and said signal from said position detecting means in response to a predetermined closed loop proportional gain, a predetermined closed loop integral gain and a predetermined open-loop feed-forward loop gain to produce a signal for operating said fluid communicating means.

4,990,059

METHOD FOR FILTERING LIQUID-PHASE METALS

Richard S. James, Gibsonia, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 19, 1988, Ser. No. 286,157
Int. Cl.[5] B22D *37/100*
U.S. Cl. 417—50 **4 Claims**



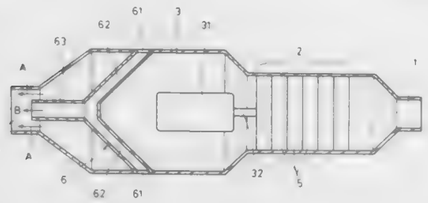
1. A method for filtering liquid-phase metal, comprising the steps of:
establishing a bath of liquid-phase metal;
providing a conduit connecting said bath to a filtering means; and
producing a magnetic field within said conduit to;
(a) supplement the force of gravity.
(b) produce axial flow of said liquid-phase metal within said conduit at a pressure greater than would occur from the force of gravity acting to move said molten metal through said filter metal and
(c) to transfer at least a portion of said liquid-phase metal through said filtering means.

4,990,060

AIR PUMP WITH SECONDARY AIR INLET

Wang Cheng-Chung, Taipei, Taiwan, assignor to Team Worldwide Corporation, Taiwan

Division of Ser. No. 326,105, Mar. 20, 1989, abandoned. This application Feb. 21, 1990, Ser. No. 485,774
Int. Cl.[5] F04B *23/08*
U.S. Cl. 417—84 **6 Claims**



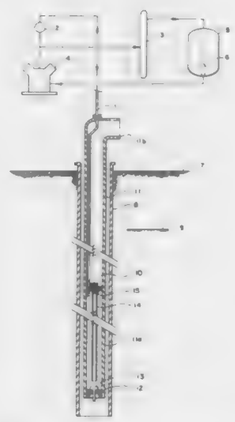
1. An air pump for inflating an inflatable article, comprising:
a housing;
a primary intake conduit for introducing primary air into said air pump;
a motor including a shaft for providing rotation power to said air pump;
a multi-stage centrifugal compressing section including a plurality of compressing units connected in series and driven by said motor shaft, each of said compressing units including a stator fixed to said housing of said air pump and a rotor which is fixed to said motor shaft and is received within a corresponding stator, said rotor including a plurality of blades so that air entering each of said compressing units may be compressed gradually by centrifugal force produced by the rotation of said blades together with said motor shaft;
a discharge conduit downstream of said multi-stage centrifugal compressing section for introducing compressed air into said inflatable article, said discharge conduit having a nozzle-like profile so as to accelerate said primary air passing therethrough;
said air pump further including, between said multi-stage centrifugal compressing section and said discharge conduit, at least one secondary air inlet through which secondary air may be introduced into said air pump and at least one air valve for opening said at least one secondary air inlet when the pressure inside of said secondary air inlet is below a predetermined level, and closing said secondary air inlet when the pressure inside of said secondary air inlet is over a predetermined level; and
a blower downstream of said multi-stage centrifugal compressing section for inhaling secondary air rapidly through said secondary air inlet into said air pump at the beginning of inflation so as to accelerate the inflation.

4,990,061

FLUID CONTROLLED GAS LIFT PUMP

Elton D. Fowler, and Eileen C. Fowler, both of 202 Pasadena Dr., Victoria, Tex. 77904

Continuation-in-part of Ser. No. 122,362, Nov. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,532, Oct. 22, 1986, abandoned. This application May 9, 1989, Ser. No. 349,433
Int. Cl.[5] F04F *1/06*
U.S. Cl. 417—143 **16 Claims**



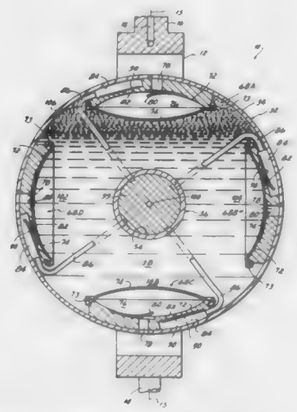
1. A well pumping system for a well extending from the surface into the earth having therein a tubing string, comprising;
a pumping chamber for positioning adjacent a lower end of the tubing string including a lower check valve allowing liquid entry into the chamber, a dip tube extending into the pumping chamber providing communication between the pumping chamber and the tubing string, and an upper check valve allowing upward flow through the dip tube into the tubing string;
a gas conduit extending into the pumping chamber adjacent the upper end thereof; and
means providing a closed gas cycle for delivering pressurized gas down the gas conduit to discharge liquid in the pumping chamber through the dip tube and upper check valve into the tubing string and then receiving gas flowing upwardly in the gas conduit from the chamber to depressurize the chamber comprising
a suction tank having an inlet and an outlet,
a gas compressor having an inlet connected to the suction tank outlet and an outlet connected to the gas conduit, and
a control unit having an inlet connected to the gas compressor outlet in parallel with the gas conduit for simultaneously receiving pressurized gas from the compressor outlet and an outlet connected to the suction tank inlet, the control unit comprising
means including a continuously open flow restrictor for diverting pressurized gas into the gas conduit for a predetermined interval and, after the predetermined interval, for allowing passage of pressurized gas from the gas compressor outlet to the suction tank inlet.

4,990,062

POSITIVE DISPLACEMENT PUMPS

Robert P. Swank, Bellville, Ohio, assignor to Impact MST Incorporated, Cincinnati, Ohio

Filed Nov. 14, 1988, Ser. No. 271,166
Int. Cl.[5] F04B *1/20, 19/20*
U.S. Cl. 417—211 **23 Claims**



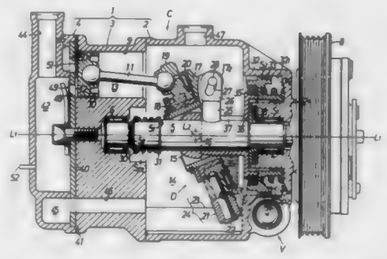
1. Apparatus for pumping fluid, comprising:
a liquid mass having a center of gravity;
means for rotating said liquid mass about a first axis so that centrifugal force is applied to said liquid mass, said center of gravity of said liquid mass being positioned at a fixed position relative to said first axis in response to application of centrifugal force and remaining at said fixed position relative to said first axis throughout the application of the centrifugal force, said liquid mass with said center of gravity thereof at said fixed position relative to said first axis creating at least one zone of greater force and at least one other zone of lesser force;
means for simultaneously moving a pumping unit relative to said liquid mass and relative to said fixed center of gravity of said liquid mass through said zones of greater force and lesser force, said pumping unit having intake and exhaust means for intaking fluid in the course of moving to one of said zones of greater force and lesser force and for exhausting fluid in the course of moving to the other of said zones of greater force and lesser force.

4,990,063

CONTROL CYLINDER DEVICE IN VARIABLE DISPLACEMENT COMPRESSOR

Hiromitsu Oono; Yasuo Minakawa; Hidetaka Nakasone, and Seiji Kato, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 339,782
Claims priority, application Japan, Apr. 20, 1988, 63-52912[U]; April 20, 1988, 63-52913[U]
Int. Cl.[5] F04B *1/28*
U.S. Cl. 417—222 **5 Claims**



1. A variable displacement compressor comprising:
a compressor body including a housing, a cylinder block and a cylinder head;
a driving rotary shaft rotatably carried on the compressor body;
a sleeve axially slidably carried on the driving rotary shaft within the housing;
a journal supported on the sleeve for swinging movement about an axis perpendicular to an axis of the driving rotary shaft and connected to the rotary shaft;
a swingable swash plate carried on the journal so as to be swingable only about the axis of the journal;
a plurality of operating pistons connected to the swingable swash plate through a plurality of connecting rods;
a plurality of cylinders disposed around the driving rotary shaft in the cylinder block and each having a corresponding one of the operating pistons slidably received therein, wherein angular positions of the journal and the swingable swash plate are varied by controlling sliding movements of the sleeve in an axial direction of the driving rotary shaft, thereby varying operation strokes of said operating pistons;
said compressor body housing being formed integrally with an outward projecting cylindrical end wall, an inner lateral surface of said end wall being formed as an annular cylinder in said end wall of the housing concentric with the driving rotary shaft; and
an annular control cylinder device comprising an annular control piston slidably fitted in said annular cylinder, said annular control piston being connected to the sleeve so that sliding movements of the sleeve are controlled by operation of the control piston.

4,990,064

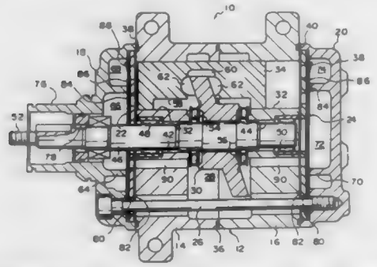
MULTI-PISTON SWASH PLATE TYPE COMPRESSOR WITH INTERNAL LUBRICATING ARRANGEMENT

Hayato Ikeda; Hideo Mori, and Kazuhiro Ohta, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Aug. 4, 1989, Ser. No. 389,740
Claims priority, application Japan, Aug. 8, 1988, 63-104803[U]
Int. Cl.[5] F04B *1/12*
U.S. Cl. 417—269 **6 Claims**

1. A multi-piston swash plate type compressor for an air-conditioning system used in a vehicle such as an automobile which comprises, in combination:
a cylinder block means in which a swash plate chamber is

formed for receiving a swash plate therein, and which has cylinder bores radially and concentrically formed therein with a central axis of said cylinder block means, each of said cylinder bores receiving a piston so as to be slidably engaged with said swash plate to reciprocate said piston in the corresponding cylinder bore by rotation of said swash plate, said swash plate chamber being fed with a refrigerant inclusive of a lubricating oil from an evaporator of the air-conditioning system, said swash plate being fixedly mounted on a driving shaft which extends into said swash plate chamber through said cylinder block means, and which is operatively connected to a prime motor of the vehicle for rotation of said swash plate, said driving shaft being rotatably supported in the axial bore of said cylinder block means by thrust bearing means provided around said driving shaft at the sides of said swash plate and by radial bearing means provided within said axial bore;



housing means provided on said cylinder block means for forming a suction chamber which is communicated with said cylinder bores through a valve element and a discharge chamber which is communicated with said cylinder bores through a valve element, said suction chamber being in communication with said swash plate chamber through the axial bore of said cylinder block means, said discharge chamber being connected to a condenser of the air-conditioning system for feeding a compressed refrigerant thereto; and

said thrust bearing means including a race element surrounding said driving shaft with a clearance therebetween, which has a narrow width, but is locally widened, whereby the refrigerant is able to be sufficiently introduced into the axial bore of said cylinder block means without aggravating undulation or wobble of the race element of said thrust bearing means, whereby effective lubrication of the radial bearing means is able to be carried out.

4,990,065

PLUNGER PUMP

Mizuo Otaki, Kanagawa, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Filed May 23, 1989, Ser. No. 355,631

Claims priority, application Japan, May 23, 1988, 63-66792[U]

Int. Cl.[5] F04B *1/04, 7/04*

U.S. Cl. 417—273 **3 Claims**

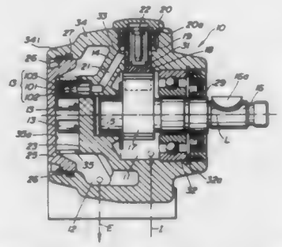
1. A plunger pump including at least one plunger chamber slidably accommodating a plunger associated with and radially arranged relative to a rotatable cam shaft having a driven connection with an engine, for pressurizing fluid within said plunger chamber, comprising:

a substantially cylindrical member for defining an internal space therein, said cylindrical member having an inlet port for introducing fluid into said internal space and an outlet port for discharging fluid from said internal space;

a partition member radially and inwardly extending from the inner peripheral wall of said cylindrical member, for dividing said internal space of said cylindrical member into a low-pressure chamber communicating with said inlet port and a high-pressure chamber communicating with said outlet port, said partition member being integrally connected to said cylindrical member;

means for blocking and establishing communication between said plunger chamber and said low-pressure chamber depending on the position of said plunger during reciprocating operation of said plunger;

means for communicating said plunger chamber with said high-pressure chamber, said communicating means being formed in said partition member;



said cylindrical member defining a first opening through which said cam shaft is inserted into said low-pressure chamber and a second opening through which said check valve is inserted into said high-pressure chamber;

means for sealingly closing said second opening in such a manner as to be proof against the high-pressure of pressurized fluid in said plunger chamber; and

said closing means being firmly supported by a lock ring inserted into a groove formed in the inner peripheral wall of said cylindrical member and a compression spring arranged within said high-pressure chamber for normally biasing said closing means to said lock ring.

4,990,066

METERING PUMP

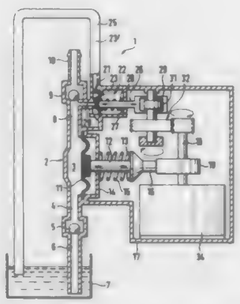
Hans Kern, Wimpasing 4, D-8221 Vachendorf, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 393,527

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827489

Int. Cl.[5] F04B *23/06*

U.S. Cl. 417—307 **4 Claims**



1. A metering pump for pumping a fluid, comprising a pump chamber having an inlet and an outlet for connection with a metering point, a suction conduit connected with the inlet to the pump chamber such as to supply fluid via the suction conduit from a tank to the pump chamber, a suction valve in said suction conduit, a pressure valve at said outlet of the pump chamber, a return conduit branching off from said outlet immediately upstream of said pressure valve for connection of said outlet with said tank such as to return fluid from said pump chamber to the tank, a diaphragm in the pump chamber for inducing fluid from the tank into the pump chamber and through the outlet thereof to the metering point, first drive means for actuating the diaphragm to perform a suction stroke and a pressure stroke, venting means in said return conduit, second drive means for actuating said venting means to open or close said return conduit to allow or not allow fluid to pass through the return conduit from outlet to the tank, and means for controlling said second drive means in relation to said first drive means to cause said venting means to open said return conduit during a pressure stroke of the diaphragm and to close said return conduit during a suction stroke of said diaphragm.

4,990,067

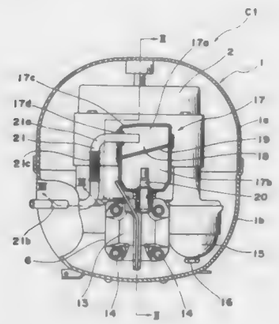
HERMETIC COMPRESSOR

Hiroshi Sasano; Hideki Kawai, both of Fujisawa, and Toshihiko Ohta, Chigasaki, all of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

Filed Aug. 7, 1989, Ser. No. 390,816

Int. Cl.[5] F04B *35/00*

U.S. Cl. 417—312 **7 Claims**



1. A hermetic compressor which comprises a closed casing, a compressing unit provided with a cylinder block having a cylinder formed with an opening and accommodated in said closed casing and a piston accommodated in said cylinder, an electric motor for reciprocating the piston of said compressing unit, a valve plate provided to cover the opening of said cylinder and provided with valves at a suction port and a discharge port thereof, a header provided for the valve seat at its side remote from said cylinder, a suction muffler mounted in said closed casing for leading a cooling medium to the suction port of said valve plate, a discharge muffler into which the cooling medium from the discharge port of said valve plate flows so as to be led to outside of said closed casing, and a suction pipe fixed to and extending outside of said closed casing for leading the suction gas from outside of said closed casing to said suction muffler, said suction pipe being formed of a material having a low heat conductivity as compared with that of said closed casing.

4,990,068

UNIQUE GREASE LUBRICATED BALL BEARING CANNED MOTOR PUMP

Xing X. Zhong, and Yu Z. Zhao, both of No. 1, Ma Shen Miao, Hai Dian District, Beijing, China

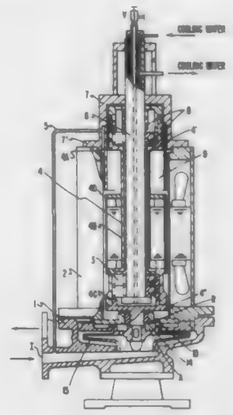
Filed Mar. 18, 1988, Ser. No. 170,274

Claims priority, application China, Mar. 23, 1987, 87102185

Int. Cl.[5] F04B *39/06*

U.S. Cl. 417—423.8 **13 Claims**

1. In a canned or sealed centrifugal motor pump for pumping fluid from an inlet to an outlet and having a pump housing containing a fluid impeller and a motor having a coaxially mounted stator and an inner hollow rotor, the combination of an inner shaft passing axially through the rotor and mounting the same by upper and lower ball-bearing means disposed in chambers within the upper and lower ends of the hollow rotor, the rotor being closed at its lower end adjacent said impeller and open at its upper end; and an inverted cup closing the top of the stator, centrally mounting said shaft and enclosing the upper end of the rotor; means for filling the chambers of the



ball-bearing means with lubricant; means for pumping a portion of the pumped fluid between the stator and rotor to cool the same and for returning such fluid portion back to the inlet of the pump; and means for producing an air-cushion seal within said cup and between the stator and rotor for preventing the fluid from entering the chambers containing the ball-bearing means at the ends of the hollow rotor and thereby isolating the ball bearing means from such fluid.

4,990,069

MULTI-STAGE ROOTS VACUUM PUMP WITH SEALING MODULE

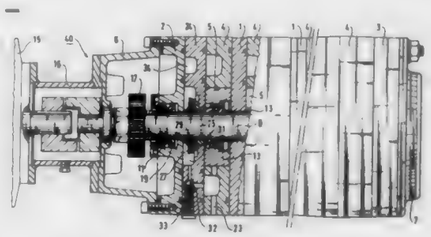
Dominique Guittet, Annecy; Eric Taberlet, and Jean-Francois Vuillermoz, both of Annecy-Le Vieux, all of France, assignors to Societe Anonyme dite: Alcatel Cit, Paris, France

Filed Nov. 6, 1989, Ser. No. 432,428

Claims priority, application France, Nov. 7, 1988, 88 14494

Int. Cl.[5] F04C *18/18, 27/00, 25/02*

U.S. Cl. 418—9 **3 Claims**



1. In a multistage Roots-type vacuum pump comprising:

a stator defining a plurality of successive compression chambers which are axially separated from one another by intermediate plates and terminating in a high pressure compression chamber at delivery pressure;

a rotor assembly disposed inside the stator and constituted by two parallel shafts supported by bearings in end plates of the stator, each shaft being fitted inside each chamber with a compression lobe such that each chamber thus contains two conjugate compression lobes;

a motor for driving one of the two shafts in rotation, with the

other shaft being driven in the opposite direction by gearing situated in a housing fixed to the corresponding end plate of the stator with said high pressure compression chamber at delivery pressure being proximate to said housing situating said gearing, and with each of the shafts passing through said end plate via a corresponding lip seal;

the improvement wherein a sealing module is interposed between the said end plate situated adjacent to said housing and the high pressure compression chamber adjacent to said housing, said module comprising a partition around each of the shafts and fitted with the fixed portion of a corresponding labyrinth seal, with each shaft being provided with the moving complementary portion of the labyrinth seal, said moving portions of the labyrinth seals being situated in a common cavity of said module, said cavity being connected via a non-return valve to the delivery channel from said high pressure compression chamber adjacent to said housing, whereby said valve allows fluid to flow from said cavity into said delivery channel to prevent migration of oil passing via said lip seal into the cavity from reaching said high pressure compression chamber.

4,990,070

ROTARY SCREW PUMP WITH SUCTION VANES AT INTAKE PORT

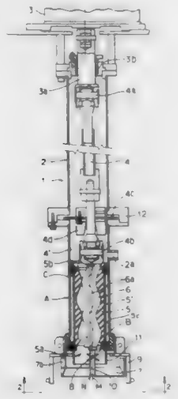
Hiroshi Maruyama, Kobe, Japan, assignor to Heishin Sobi Kabushiki Kaisha, Kobe, Japan

Filed May 9, 1989, Ser. No. 349,039

Claims priority, application Japan, May 20, 1988, 63-124087

Int. Cl.[5] F04C *5/00, 15/02*

U.S. Cl. 418—48 **11 Claims**



1. A vertical type uniaxial eccentric rotary screw pump with suction vanes at intake port for transfer of powder, comprising a female screw type stator including a stator cavity, a screw type rotor in said cavity, wherein said stator and said rotor extend vertically, said rotor being adapted to be eccentrically rotated by a driving means, a powder intake port at the lower end of said stator, a propeller shaft connected to said rotor and projecting from said rotor, said shaft projecting into said powder suction port in said stator, vanes for sucking powder mounted slantwise on said shaft so as to generate an upward suction force upon rotation on said shaft and the vanes, and a powder delivery port formed in said stator adjacent the upper end of said stator, said vanes comprising large-sized suction vanes on the lower end of said shaft, and small-sized suction vanes mounted on an intermediate portion of the shaft.

4,990,071

SCROLL TYPE FLUID APPARATUS HAVING TWO ORBITING END PLATES LINKED TOGETHER

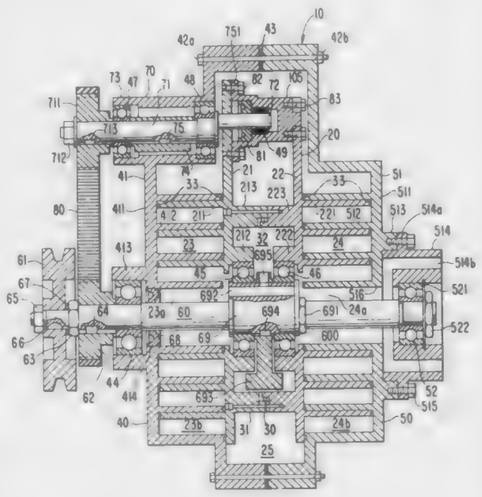
Kazuo Sugimoto, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed May 12, 1989, Ser. No. 350,762

Claims priority, application Japan, May 12, 1988, 63-113544

Int. Cl.[5] F01C *1/04, 11/00, 17/06*

U.S. Cl. 418—55.2 **15 Claims**



1. In a scroll type fluid apparatus including first and second casings disposed adjacent to each other to form an operating chamber therebetween, said first casing including a first fixed scroll having a first fixed end plate from which a first fixed spiral element extends within said operating chamber, said second casing including a second fixed scroll having a second fixed end plate from which a second fixed spiral element extends within said operating chamber, an orbiting scroll disposed within said operating chamber and having first and second orbiting spiral elements extending from opposite surfaces thereof, said orbiting scroll disposed within said chamber at an angular and radial offset with respect to said first fixed scroll and at an angular and radial offset with respect to said second fixed scroll such that said first fixed spiral element and said first orbiting spiral element interfit to form at least one pair of fluid pockets therebetween, and said second fixed spiral element and said second orbital spiral element interfit to form at least one pair of fluid pockets therebetween, respectively, a drive mechanism including a drive shaft operatively connected to said orbiting scroll to effect orbital motion of said orbiting scroll within said operating chamber, said drive shaft having a balance weight fixedly disposed thereon, and rotation preventing means for preventing rotational motion of said orbiting scroll during orbital motion of said orbiting scroll, the improvement comprising:

said orbiting scroll including first and second orbiting end plate members linked together to enclose a hollow portion therebetween,

said first and said second orbiting spiral elements extending from said first and second orbiting end plate members,

said balance weight disposed in said hollow portion, said balance weight rotating about the longitudinal axis of said drive shaft and within said hollow porition.

4,990,072

ROTATING HELICAL CHARGER WITH AXIALLY MOVABLE DISPLACEMENT DISK

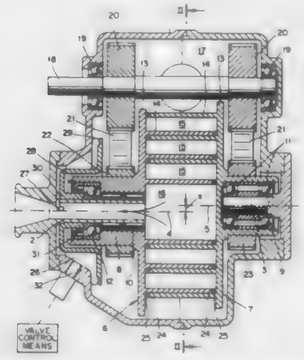
Frank Güttinger, Oberehrendingen, Switzerland, assignor to Aginfor AG fur Industrielle Forschung, Wettingen, Switzerland

Filed Jul. 18, 1989, Ser. No. 380,886

Claims priority, application Switzerland, Jul. 20, 1988, 1786/88

Int. Cl.[5] F04C *18/04, 27/00*

U.S. Cl. 418—55.3 **3 Claims**



1. A rotating helical charger for compressible media, comprising:

a housing having an inlet and an outlet;

drive means;

two symmetrically constructed displacement disks located within said housing, said disks being rotated by said drive means;

journals in said housing on which said displacement disks are drawn loosely, wherein the longitudinal axes of said journals are offset relative to each other;

helical ribs provided on one side of each of said two displacement disks, which ribs engage each other to form a conveying space and with their free edges having means for forming a seal against the opposing displacement disk;

one of said displacement disks being axially movable on its journal;

means forming a pressure chamber having an annular disk disposed within said housing, said pressure chamber communicating with said outlet of the charger and capable of acting on the annular disk which is actively connected with the axially movable displacement disk in order to move the axially displacement disk toward the other of said two displacement disks; and

valve means for selectively connecting and disconnecting the pressure chamber with the atmosphere.

4,990,073

TWO-CYLINDER ROTARY COMPRESSOR HAVING IMPROVED VALVE COVER STRUCTURE

Motohiro Kudo, and Yasuhiro Tsuchiya, both of Numazu, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 27, 1989, Ser. No. 427,472

Claims priority, application Japan, Oct. 31, 1988, 63-142052[U]

Int. Cl.[5] F04C *29/06, 23/00*

U.S. Cl. 418—60 **8 Claims**

1. A rotary compressor comprising:

a sealed case having first and second housing portions therein;

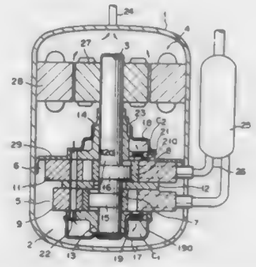
a motor section arranged in said first housing portion of said sealed case and having a rotating shaft extending toward said second housing portion;

a compression section having first and second compression mechanisms stacked in said second housing portion of the said sealed case and driven by said rotating shaft;

a first valve cover; and

a second valve cover, said second valve cover having a predetermined volume so as to temporarily store a high-pressure fluid discharged from said second compression mechanism near said motor section, said first valve cover having a predetermined volume larger than that of said second valve cover so as to temporarily store a high-pressure fluid discharged from said first compression mechanism opposite said motor section;

wherein said first valve cover communicates with said sealed case through a first path, and said second valve cover communicates with said sealed case through a second path, said second path being formed along said rotating shaft,



a sectional area of said first path being set to be a sufficient value larger than a sectional area of said second path for causing a high-pressure fluid to flow at substantially the same flow rate per unit time as that of the high-pressure fluid flowing in said second path, the volume of said first valve cover and the sectional area of said first path being selected to adjust the super compression of said first compression mechanism to a level substantially equal to that of the super compression of said second compression mechanism,

said first ad second compression mechanisms including a pair of cylinders coupled to each other respectively through spacer means, and a pair of rotors respectively arranged in said cylinders so as to be eccentrically rotatable, said first path being formed to extend through said pair of cylinders and said spacer means.

4,990,074

OIL PUMP HAVING PIVOTING VANES

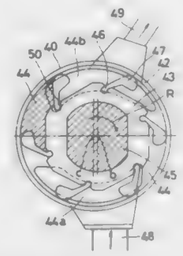
Takashi Nakagawa, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 20, 1989, Ser. No. 409,722

Claims priority, application Japan, Sep. 27, 1988, 63-241544

Int. Cl.[5] F04C *2/44*

U.S. Cl. 418—172 **5 Claims**



1. An oil pump comprising:

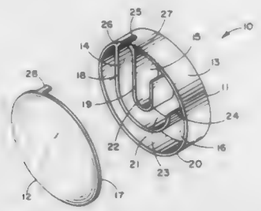
an airtight housing;
a circular ring fitted in said housing for rotation about a ring axis;
a driving shaft rotatably mounted in said housing and within said ring for rotation in a direction of rotation about an axis eccentric from but substantially parallel to, and ring axis;
an inner rotor in said circular ring and mounted to said driving shaft for rotation therewith;
a plurality of circumferentially spaced vanes, each having an inner end pivotally mounted to said rotor about a pivot axis, each of said vanes being oriented with respect to a radial direction such that said vanes are centrifugally swung radially outward and into contact with said ring in response to rotation of said driving shaft and said inner rotor in said direction of rotation, whereby airtight pump chambers are formed between adjacent ones of said vanes;
tapered support surfaces on said inner rotor against which said inner ends of said vanes bear, said support surfaces comprising means for limiting a pivoting angle of said vanes such that said vanes will substantially contact said ring when said vanes are at a minimum volume position of said pump chambers; and
intake and discharge ports respectively communicating with said pump chambers at circumferential positions thereof where said pump chambers are expanding and contracting,
whereby oil from said intake port is pumped by said pump chambers to said discharge port.

4,990,075

REACTION VESSEL FOR PERFORMING SEQUENTIAL ANALYTICAL ASSAYS

Frank W. Wogoman, So. Bend, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Apr. 11, 1988, Ser. No. 179,843
Int. Cl.[5] G01N *33/52*
U.S. Cl. 422—58 54 Claims



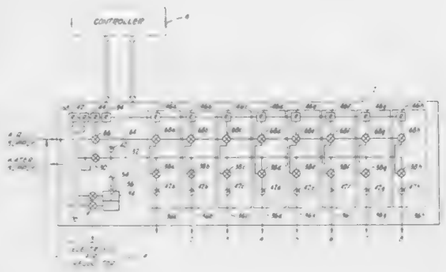
38. An analytical reagent reaction vessel for performing sequential analytical reactions to determine an analyte in a liquid test sample, said reaction vessel comprising a closed container having a substantially horizontal axis of rotation and comprising (a) an analytical reagent reaction channel comprising (i) first and second reaction zones incorporated with first and second analytical reagents which interact with an analyte in said liquid test sample to produce a detectable response as a function of the analyte, said second reaction zone being situated a predetermined distance away from and in open liquid flow communication with said first reaction zone, whereby a liquid test sample disposed in said reaction channel is transported by gravity along said reaction channel between said reaction zones and said viewing chamber by rotating said closed container about said horizontal axis, and (ii) an analytical reaction viewing zone in the form of a chamber in open liquid flow communication with said first and second reaction zones, (b) liquid test sample delivery means for providing unidirectional flow of a liquid test sample into said reaction channel; and (c) an inlet port for introducing a liquid test sample into said delivery means.

4,990,076

PRESSURE CONTROL APPARATUS AND METHOD

Michael J. Lynch; G. Allen Turner; Mark Ehlert, and Jim B. Surjaatmadja, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 31, 1989, Ser. No. 359,809
Int. Cl.[5] B01J *3/04*
U.S. Cl. 422—112 19 Claims



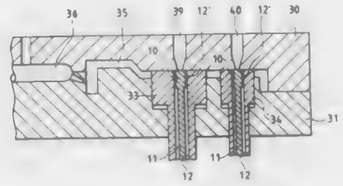
7. An apparatus for controlling an autoclave valve, a tank valve and a piston of a pump within a fluid circuit for pressurizing an autoclave, said apparatus comprising:
means for converting the position of the piston into a corresponding electrical signal;
first comparing means for comparing the corresponding electrical signal with a first preset electrical signal representing the piston being at a first position;
second comparing means for comparing the corresponding electrical signal with a second preset electrical signal representing the piston being at a second position;
third comparing means for comparing the corresponding electrical signal with a third preset electrical signal representing the piston being at a predetermined position between the first and second positions;
a first latch connected to said first and third comparing means so that said first latch is set when the comparison of the corresponding electrical signal and the first preset electrical signal by said first comparing means indicates the piston is at the first position and so that said first latch is reset when the comparison of the corresponding electrical signal and the third preset electrical signal by said third comparing means indicates the piston is at the predetermined position between the first and second positions;
a second latch connected to said second and third comparing means so that said second latch is set when the comparison of the corresponding electrical signal and the second preset electrical signal by said second comparison means indicates the piston is at the second position and so that said second latch is reset when the comparison of the corresponding electrical signal and the third preset electrical signal by said third comparing means indicates the piston is at the predetermined position between the first and second positions;
first timing means, connected to said first and second latches, for providing a first timing signal for closing and opening the autoclave valve in response to the setting and resetting of said first and second latches; and
second timing means, connected to said first and second latches, for providing a second timing signal for opening and closing the tank valve in response to the setting and resetting of said first and second latches.

4,990,077

INJECTION MOLD

Kiyoo Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Dec. 1, 1989, Ser. No. 444,232
Claims priority, application Japan, Dec. 2, 1988, 63-304214
Int. Cl.[5] B29C *45/16*
U.S. Cl. 425—130 1 Claim



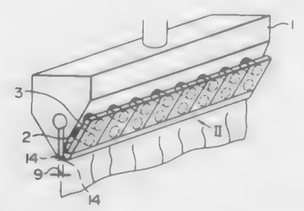
1. An injection mold for molding a cassette half body for a magnetic tape cassette, comprising: a fixed mold member and a movable mold member, a molding cavity being defined by said fixed and movable mold members having a shape of said cassette half body; a pair of slide cores slidably disposed in corresponding openings in said movable mold member, said slide cores being slidably insertable into and out of said molding cavity, a pair of injector pins, each of said injector pins being slidably received in a cylindrical opening in a corresponding one of said slide cores with a fitting gap therebetween of not more than 0.1 mm to allow the discharge of gas therethrough, a submarine gate being formed between said fixed and movable mold members for injecting an opaque resin into said molding cavity when said slide cores and injector pins are inserted into said molding cavity to thereby mold opaque portions of said half body, and direct gates being formed in said fixed mold member opposite each of said slide cores for injecting a transparent resin into spaces vacated by withdrawing said slide cores and injector pins from said molding cavity after injection of said opaque resin through said submarine gate to thereby mold transparent window portions of said half body, wherein gas formed during injection of said transparent resin through said direct gates escapes around said ejector pins.

4,990,078

STRUCTURE OF LIP DRIVE PORTION OF T-DIE

Yoshiyuki Tomita, Tanashi, Japan, assignor to Sumimoto Heavy Industries, Ltd., Tokyo, Japan

Filed Aug. 11, 1989, Ser. No. 392,798
Int. Cl.[5] B29C *47/16*
U.S. Cl. 425—141 5 Claims



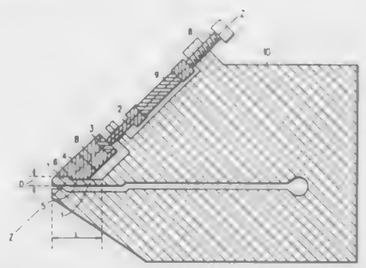
1. An extruder comprising a die housing defining a T-die therein, adapted to allow the extrusion of molten resin therethrough; die nozzle means outwardly terminating said T-die and forming a die opening, comprising two substantially parallel, elongated lip members; elastically deformable pivot means mounted on said die housing and operatively attached to at least a first of said elongated lip members so disposed as to permit the opening of said nozzle means to be adjusted by pivoting said first lip member; direct drive means disposed along the length of said first lip member for driving said pivot means and including a plurality of compressed air actuated bellows, positioned such that said pivot means is disposed between said drive means and said nozzle means; and means to supply compressed air to said bellows; whereby increasing the supply of said compressed air decreases the opening of said nozzle means and decreasing the supply of said compressed air increases the opening of said nozzle means.

4,990,079

EXTRUSION SLOT DIE WITH FLEXIBLE LIP

Hans Lorenz, Darmstadt, Fed. Rep. of Germany, assignor to Rohm GMBH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,664
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 8813801[U]
Int. Cl.[5] B29C *47/16, 47/92*
U.S. Cl. 425—141 15 Claims



1. An extrusion slot die for extruding flat thermoplastic webs, comprising:
a die body having a flexible lip forming a portion of a slot through which the web is extruded;
a plurality of plates having bottom surfaces mounted to said lip and mutually spaced in a thickness direction parallel to a plane of the web and transverse to a direction of extrusion of the web;
at least one control element adjustably mounted relative to said die body; and
a flexible strip pressed between said at least one control element and said plates,
whereby a regulating force from said at least one control element is applied to said lip via said flexible strip and said plates.

4,990,080

PUNCH PRESS FOR PIERCING GREEN SHEET WITH LINER

Masakazu Kakimoto, Aichi, Japan, assignor to Ushio Co. Ltd., Aichi, Japan

Filed Jun. 23, 1989, Ser. No. 370,874
Claims priority, application Japan, Jun. 29, 1988, 63-163186; Jun. 29, 1988, 63-163187
Int. Cl.[5] B29C *53/58*
U.S. Cl. 425—290 23 Claims

1. A punch press for piercing a green sheet having a liner, comprising:
a punch press frame and a plurality of piercing assemblies provided with a number of punches and corresponding female dies carried by said punch press frame;
a feeding mechanism further comprising means for feeding a first web of said green sheet from a first bobbin, means for coiling said green sheet onto a second bobbin, thereby forming a second web, and means for holding and tensioning said green sheet between said means for feeding and said means for coiling; and

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means for moving one of said punch press and said feeding mechanism selectively in a first direction, a second direction, or both said first and second directions.

4,990,081

APPARATUS FOR SHAPING CARBONACEOUS BLOCKS BY MULTIAXIAL COMPACTING

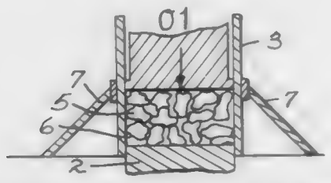
Claude VanVoren; Benoit Coste, both of St. Jean de Maurienne; Jean Biarez, Boulogne, and Francois Keime, Meylan, all of France, assignors to Aluminium Pechiney, Paris, France

Continuation of Ser. No. 303,052, Jan. 27, 1989, abandoned, which is a continuation of Ser. No. 99,781, Sep. 22, 1987, abandoned. This application Mar. 30, 1990, Ser. No. 501,299

Claims priority, application France, Sep. 30, 1986, 86 13779

Int. Cl.[5] B28B *3/00*

U.S. Cl. 425—330 **7 Claims**



1. An apparatus for compacting carbonaceous blocks formed by a carbonaceous paste based on a carbonaceous aggregate selected from the group consisting of coke, anthracite and graphite, and an organic cokable binder comprising tar, comprising a mould for compacting carbonaceous paste therein having a non-deformable bottom, a first displaceable wall, means for displacing said first wall reversibly toward the carbonaceous paste, a pair of parallel displaceable walls along axes perpendicular to the axis of said first wall and separated by a minimum distance greater than the width of said first wall, means for displacing said pair of walls up to a predetermined maximum distance of travel, reversibly away from the carbonaceous paste, means for controlling the amplitude of displacement of said pair of parallel walls such that said pair of parallel walls are displaceable in response to the full amplitude of displacement of said first wall, means permitting displacement only of said pair of walls in response to the displacement of said first wall, and removable blocking means capable of locking said pair of walls in a fixed position, displaced by less than said predetermined maximum distance of travel.

4,990,082

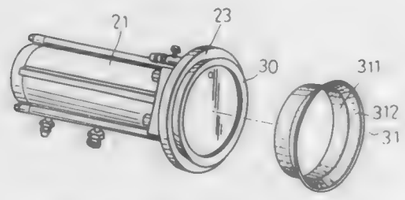
VIBRATOR WITH SUCTION APPARATUS

Yuan-Ho Lee, No. 851, Chung-San Rd., Nan-Pao Tsun, Kuei-Jen Hsian, Tainan Hsieng, Taiwan

Filed Jun. 22, 1989, Ser. No. 369,870

Int. Cl.[5] B28B *11/00*

U.S. Cl. 425—456 **3 Claims**



1. A vibrator for packing freshly poured concrete confined in a forming mold comprising:

a vibrator body; and

a suction disc means serving to connect said vibrator body to the forming mold, said suction disc means having a rigid disc which has one end secured to said vibrator body and another end with an annular flange defining a vacuum chamber, and a flexible and resilient gasket to provide a gas-tight seal between the forming mold and said rigid disc, said gasket having a cylindrical portion disposed in a tight fit around said annular flange and having a horn-like annular flared portion extending from and inclining away from said cylindrical portion, said annular flared portion flexing from said cylindrical portion to an extent sufficient to place said annular flange of said rigid disc in contact with the forming mold when a vacuum is created in said vacuum chamber.

4,990,083

NOZZLE FOR INJECTION MOLDING MACHINES

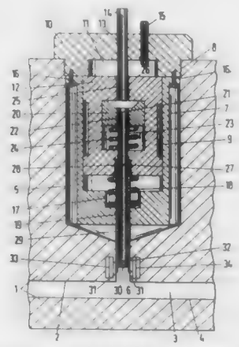
Achim Bernhardt, Heinburg, Fed. Rep. of Germany, assignor to Knökner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,116

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1988, 3834917

Int. Cl.[5] B29C *45/22*

U.S. Cl. 425—547 **12 Claims**



1. A nozzle for injecting a first medium into a mold cavity of an injection mold, the mold cavity defined by a pair of opposed first and second mold surfaces of said injection mold, said mold cavity having a second medium present therein, the injection mold having a first bore located outside the first mold surface wherein the first mold surface is connected to the first bore via a second bore, said first bore being larger in diameter than said second bore, the nozzle comprising:

an outer blowing needle located within the first bore and the second bore, said outer blowing needle having a first terminal end;

an inner blowing needle located within said outer blowing needle, said inner blowing needle having a second terminal end and a central bore closed at said second terminal end, said inner blowing needle having near said second terminal end at least one opening communicating with the central bore;

first displacing means for displacing said inner blowing needle axially relative to said outer blowing needle and axially relative to the first and second bores of the injection mold such that the second terminal end of said inner blowing needle moves from a first position even with the first terminal end of the outer blowing needle to a second position located between said opposed first and second mold surfaces and back to said first position, whereby said first medium passes through said central bore, out of said at least one opening and into said second medium when said second terminal end is in the second position; and

second displacing means for displacing said outer and said inner blowing needles axially relative to the first and second bores of the injection mold when said second terminal end of said inner blowing needle is moved back to said first position such that said second terminal end of the inner blowing needle and the first terminal end of said outer blowing needle are moved to a third position even with the first mold surface,

whereby the first and second terminal ends of said inner and outer blowing needles supplement the first mold surface to ensure that said mold cavity is smooth and seamless.

4,990,084

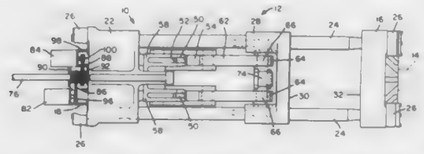
MOLD CLAMPING SYSTEM

William A. Reinhart, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 6, 1989, Ser. No. 432,462

Int. Cl.[5] B29C *45/66*

U.S. Cl. 425—590 **10 Claims**



1. A clamping system for a molding machine for molding flowable materials in a mold cavity defined by a pair of cooperating mold portions, said clamping system comprising:

a. mold clamping means for opening and closing a pair of cooperating mold portions, the mold clamping means including at least one movable platen that carries a mold portion;

b. platen moving means connecting with the at least one movable platen for moving the at least one movable platen toward and away from a second platen, the platen moving means including screw means secured to the movable platen in non-rotational relationship therewith, a first rotary drive means operatively connected with the screw means for rotational engagement therewith for axially moving the screw means at a first linear speed, and second rotary drive means operatively connected with the screw means for rotational engagement therewith for axially moving the screw means at a second linear speed, the second drive means adapted to provide a larger output torque than the first drive means, wherein the platen moving means includes first ball nut means rotatably carried on the screw means and operatively connected with the first drive means, and second ball nut means rotatably carried on the screw means and operatively connected with the second drive means, and wherein the first drive means is activable to cause rapid traverse of the movable platen toward and away from the second platen, and the second drive means is activable to cause slow traverse of the movable platen toward the second platen to bring the platens into contacting relationship and to hold the platens tightly together with a contact force sufficient to offset an oppositely directed force resulting from the injection into the mold cavity under pressure of a flowable material.

4,990,085

ARRANGEMENT FOR AN EXHAUST IN A PLANT ARRANGED FOR THE HEAT-TREATMENT OF PRODUCTS IN FORM OF A CONTINUOUS STRIP

Jürgen Socha, Vänersborg, Sweden, assignor to Impact Systems Inc., San Jose, Calif.

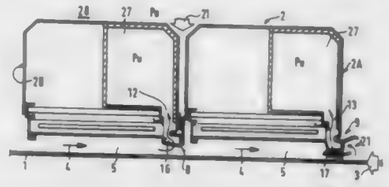
PCT No. PCT/SE88/00078, § 371 Date Aug. 22, 1989, § 102(e) Date Aug. 22, 1989, PCT Pub. No. WO88/06657, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 24, 1988, Ser. No. 399,528

Claims priority, application Sweden, Feb. 24, 1987, 8700765

Int. Cl.[5] F27B *9/28;* **F26B** *13/00*

U.S. Cl. 432—59 **17 Claims**



1. Arrangement for an exhaust in a heat-treatment plant having a number of heat-treatment ramps arranged next to one another in rows for heat-treating a product in the form of a continuous strip, including means for affecting the continuous strip with a heat-treatment medium which is supplied to the continuous strip to flow essentially parallel along the strip in a common direction, and an exhaust which allows the heat-treatment medium to pass outwards from one surface of the continuous strip, characterized in that said exhaust is situated at the ends of the ramp, respectively, along the flow direction of the heat-treatment medium, said exhaust being connected to an exhaust channel in which negative pressure is present, said exhaust, via an opening, communicates with an area along the surface of the continuous strip, and said exhaust includes an air opening communicating with a space where essentially atmospheric pressure is present, and via which the pressure system inside the heat-treatment plant can be affected by air introduced from the surrounding environment.

4,990,086

SYSTEM FOR UNDER-CART COOLING OF FURNACE CARTS IN TUNNEL FURNACES

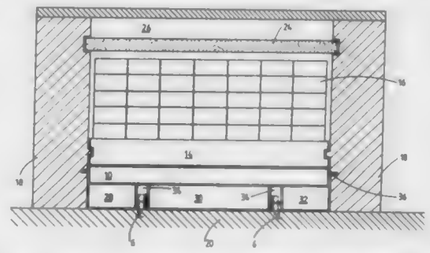
Claudio Eustacchio, Angelo-Eustacchio-Gasse 4, A-8010 Graz, Austria

Filed Oct. 14, 1988, Ser. No. 257,670

Claims priority, application European Pat. Off., Nov. 2, 1987, 87116103

Int. Cl.[5] F27B *9/00;* **F27D** *3/12*

U.S. Cl. 432—133 **8 Claims**



1. In a system for under-cart cooling of furnace carts in a tunnel furnace, said tunnel furnace including an elongated foundation, an elongated ceiling, and elongated side walls which define an elongated tunnel, and an elongated track for said furnace carts; said furnace carts including a frame structure for supporting material to be treated within said tunnel

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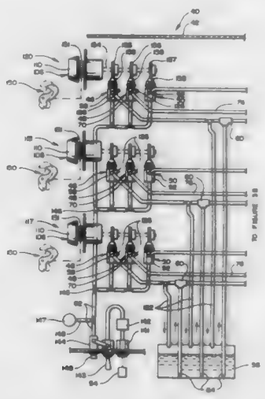
furnace and being configured to substantially divide said tunnel furnace into a burning channel above said furnace carts and an under-cart channel as defined by the undersides of said furnace carts, said tunnel foundation, and that part of said tunnel side walls which extend below the underside of the furnace carts, and having laterally spaced apart wheels for supporting said furnace carts on said track for movement in a longitudinal direction through said tunnel furnace, said wheels being disposed within said under-cart channel; said system including an elongated central duct mounted within said under-cart channel and extending in a longitudinal direction for a substantial distance therealong between said laterally spaced apart wheels of said furnace carts, said duct having one side disposed to extend closely adjacent to the underside of said furnace carts, and sides disposed to extend closely adjacent to one side of said wheels of said furnace carts, and to substantially fill said under-cart channel between the laterally spaced apart wheels of said furnace carts, and providing an elongated cooling air channel through which cooling air may be streamed for cooling of said under-cart channel.

4,990,087

DENTAL TOOL MAINTENANCE APPARATUS AND METHOD

Louis G. De Rocchis, 608 Trout Lake Dr.; William M. Miller, 3741 McGrath Rd.; Bradley J. Robart, 2714 Lakeridge La., all of, Bellingham, Wash. 98226, and David H. Bates, 1014 Talcott St., Sedro Woolley, Wash. 98284

Filed Jan. 26, 1990, Ser. No. 470,827
Int. Cl.[5] A61C *1/02*
U.S. Cl. 433—104 25 Claims



1. An apparatus for providing a maintenance treatment to a dental tool that is controlled by a dental tool control system and which has agent-benefitted portions, contact with which by an agent used in said maintenance treatment is beneficial, and agent-detrimented portions, prolonged contact with which by excess amounts of said agent is undesirable, said tool having passageway means that are able to communicate with said agent benefitted portions and said agent detrimented portions, said apparatus comprising:

a. a station to which said tool is able to be detachably mounted, said station having agent conduit means and purging conduit means, said agent conduit means and said purging conduit means being able to be detachably connected to said passageway means of said tool;

b. an agent supply means that is arranged to transmit said agent through said agent conduit means in a manner that said agent contacts portions of said agent-benefitted portions of said tool;

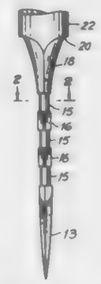
c. a purging substance supply means that is arranged to transmit a purging substance through said purging conduit means in a manner that said purging substance is able to remove particles of said agent from portions of said agent-detrimented portions, said apparatus being characterized in that it is independent of said dental tool control system.

4,990,088

DENTAL TOOL COMBINING REAMER AND ROUTER

Bernard B. Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Mar. 24, 1988, Ser. No. 172,483
Int. Cl.[5] A61C *3/02*
U.S. Cl. 433—165 12 Claims



1. A combination dental tool providing for drilling and grinding, the tool comprising a first holder end portion designed to be receivable in a dental tool holder such that the dental holder can rotate the dental tool; a second drilling end portion having a proximal end and a distal tip end relative to the holder end portion, the drilling end tapering longitudinally from a maximum effective diameter at the proximal end to a minimum effective diameter at the distal tip end, the drilling end portion having a polygonal cross-section, which provides axially facing cutting edges for drilling a bore into a tooth of a patient upon rotation of the tool; a shank portion extending intermediate the two end portions and including a first and a second intersecting, longitudinally extending, axially successive shank sections, the first such shank section having laterally facing cutting edges, a relatively larger effective diameter, and a polygonal cross-section; and the second such shank section having a relatively smaller diameter relative to the first shank section and to the maximum diameter of the drilling end portion; the intersection of the first and second shank sections of the tool being at angles not less than a right angle; such that upon the application of a laterally directed force, while rotating the tool within a previously drilled bore, undercut portions are routed out from the interior surface of the bore.

4,990,089

METHOD AND MATERIAL FOR BRIGHTENING TEETH

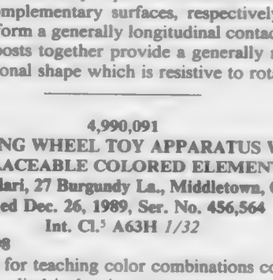
John R. Munro, Crossville, Tenn., assignor to Dunhall Pharmaceuticals, Inc., Gravette, Ark.

Continuation of Ser. No. 235,304, Aug. 23, 1988, abandoned.
This application May 4, 1990, Ser. No. 519,318
Int. Cl.[5] A61C *5/00*
U.S. Cl. 433—215 16 Claims

1. The process of brightening teeth comprising the steps of:

obtaining a substantially liquid tight splint to cover the tooth or teeth to be brightened;

placing within said splint a brightener agent at the location within said splint associated with the tooth surfaces to be brightened; and



placing the splint containing said brightener agent around the tooth or teeth to be brightened.

4,990,090

ENDODONTIC POST CONSTRUCTION

James B. Roane, 707 Southwest 24th St., Ste. 201, Norman, Okla. 73069

Continuation of Ser. No. 274,305, Nov. 18, 1988, abandoned.
This application Jul. 30, 1990, Ser. No. 562,416
Int. Cl.[5] A61C *5/08*
U.S. Cl. 433—220 32 Claims

1. An endodontic post construction for anchoring a tooth restoration, comprising:

at least first and second generally cylindrical endodontic posts of substantially equal diameters having first and second complementary surfaces, respectively, fitted together to form a generally longitudinal contact surface so that said posts together provide a generally non-circular cross-sectional shape which is resistive to rotation.

4,990,091

ROTATING WHEEL TOY APPARATUS WITH REPLACEABLE COLORED ELEMENTS

Saeed Mir-Heidari, 27 Burgundy La., Middletown, Conn. 06457

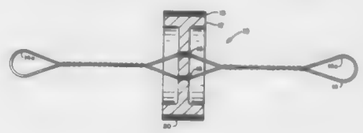
Filed Dec. 26, 1989, Ser. No. 456,564
Int. Cl.[5] A63H *1/32*
U.S. Cl. 434—98 7 Claims

1. Apparatus for teaching color combinations comprising:

a generally cylindrical spinner member having first and second apertures extending therethrough proximate to the geometric center thereof, said generally cylindrical member having an axis and first and second faces through which said axis extends;

a loop of twine extending through said apertures with a portion thereof being disposed on each side of said spinner member; and

means for securing a plurality of colored members on the circumferential surface of said spinner member, said means for securing including a plurality of pockets disposed about the circumference of said generally cylindrical spinner member, said pockets being dimensioned and configured for receiving respective generally planar, colored members, said pockets each including first and second sides, said first and second sides being respectively





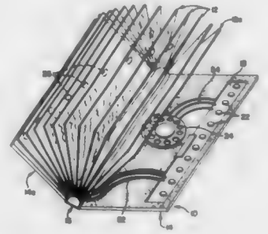
proximate to said first and second faces of said generally cylindrical member, said pockets each including an opening at one of said sides thereof.

4,990,092

TALKING BOOK

Charles A. Cummings, Cincinnati, Ohio, assignor to Tonka Corporation, Minnetonka, Minn.

Filed Aug. 14, 1989, Ser. No. 393,511
Int. Cl.[5] G09B *5/00*
U.S. Cl. 434—317 22 Claims



1. Apparatus comprising:

(a) a book including a plurality of pages;

(b) a power source mounted in said book;

(c) at least one voice chip mounted in said book;

(d) audio means mounted in said book and connected to receive signals from said voice chip; and

(e) at least one pressure-sensitive switch associated with one of said pages and operable to activate said voice chip to send audio reproducible signals to said audio means, and said pressure-sensitive switch is activated be pressing a mark on a page, whereby the pressure on the page is transferred through the page to said pressure-sensitive switch.

4,990,093

TEACHING AND AMUSEMENT APPARATUS

Stephen O. Frazer, 124 Fordwych Road, London, United Kingdom NW23PB, and Martin P. Riddiford, 23 Elfindale Road, London, United Kingdom SE24

Filed Aug. 7, 1989, Ser. No. 382,626
Claims priority, application United Kingdom, Feb. 6, 1987, [illegible]
Int. Cl.[5] G09B *7/00*
U.S. Cl. 434—337 9 Claims

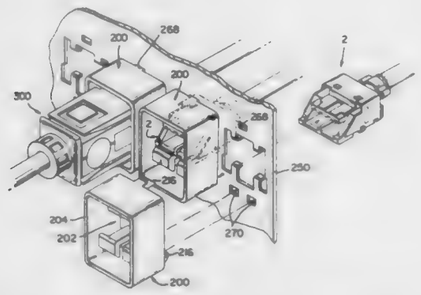
1. An interactive apparatus for use in conjunction with a substrate bearing information in coded form, said apparatus comprising:

a hand held body;
an infra red sensing detector head at one end of said body;
means for discriminating between intelligence carrying indicia printed on said substrate, said means for discriminating providing a sense perceptible signal in response to a property of said indicia when said detector is positioned against said indicia;
means within said body for switching said apparatus between a first mode in which said apparatus differentiates between a plurality of said intelligence containing printed



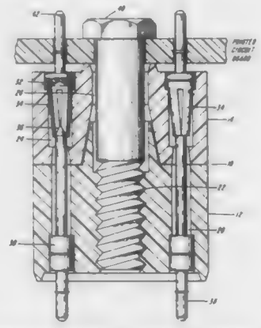
indicia and a second mode wherein a set of operating instructions can be selected and input from indicia on said substrate for controlling the operation of said first mode;
said apparatus including within said body an audible output means, a screen located at the end of said body opposite said detector head for displaying in alphanumeric form a visual output of said sense perceptible signal, and means for producing a signal to inform a user that a pre-selected set of operating instructions has been input to said apparatus.

4,990,094
DATA DISTRIBUTION PANEL
Curtis S. Chandler, King; George H. Foster, Jr., Winston-Salem; David Lane, Greensboro, and Ned A. Sigmon, Clemmons, all of, N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 323,043, Mar. 10, 1989, abandoned, which is a continuation of Ser. No. 136,220, Dec. 21, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 390,598
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—108 28 Claims



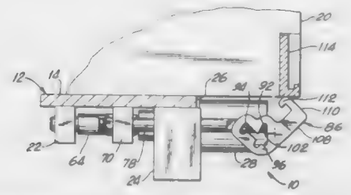
1. A data distribution interface for interconnection to an electrically shielded cable, and for the matable interconnection of a shielded data connector; the interface comprising:
(a) a shielded subassembly comprising:
(i) an insulative housing means having terminal supporting means including a platform for the receipt of a plurality of electrical terminals, and sidewalls upstanding from the platform, the platform and the sidewalls defining an open upper face of the housing means,
(ii) a plurality of electrical terminals including base portions for mounting on the platform in transition with reversely bent portions forming resilient contact portions, the contact portions extending rearwardly to free ends of the terminals, the contact portions being intermatable with like contact portions in a complementary connector, the terminals further comprising wire connecting portions extending from ends of the terminal base portions,
(iii) an insulative cap member, securable within the housing means, including means for aligning individual wires of the shielded cable with selected wire connecting portions,
(iv) shield means securable to the housing means, and substantially enclosing the exterior of the sidewalls, the exterior of the platform, and the open upper face of the platform, thereby overlying the terminal wire connecting portions, the insulative cap member providing a spaced relation between the shield means and the wire connecting portions of the terminals;
(b) a conductive panel means comprising an opening therethrough for the receipt of the shielded subassembly, the panel means and the shielded subassembly cooperatively including commoning means to common the shield means directly to the panel means; and
(c) means for retaining the shielded subassembly to the panel means in a secured relation.

4,990,095
ZERO SEPARATION FORCE CONNECTOR
William B. Walkup, Barrington, R.I., assignor to Augat Inc., Mansfield, Mass.
Filed Jun. 27, 1989, Ser. No. 372,296
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—152 14 Claims



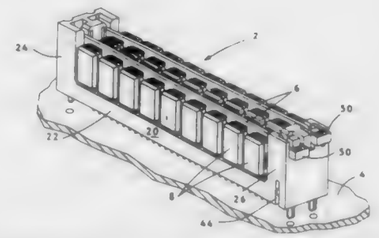
1. A zero separation force electrical connector, comprising:
a first housing member having a plurality of contact cavities;
a second housing member having a plurality of contact cavities;
a plurality of male electrical contacts disposed in said contact cavities of said first housing member and having end means for coacting with corresponding contacts disposed in said second housing member;
a plurality of female electrical contacts disposed in said contact cavities of said second housing member and having a plurality of spring fingers for coating with said coacting end means of corresponding ones of said plurality of male contacts by being biased outwardly therefrom to develop and store a resilient force; and
means associated with said first and second housing members and operable for securing said first housing member in mated combination with said second housing member;
said securing means causing said coacting end means of said plurality of male electrical contacts to mechanically and electrically engage said plurality of spring fingers of said plurality of female electrical contacts and to bias said plurality of spring fingers outwardly therefrom to develop and store said resilient force therein;
said resilient force stored in said plurality of spring fingers of said of female electrical contacts coacting against said coacting end means of said plurality of male electrical contacts upon release of said securing means to automatically demate said pluralities of male and female electrical contacts and to automatically separate said first and second housing members with zero separation force.

4,990,096
APPARATUS FOR MATING, UNMATING AND HOLDING DOWN ELECTRONIC EQUIPMENT
Geza Bujtas, Boonton; Robert Hupp, Manville, and Donald Proefrock, Hackettstown, all of N.J., assignors to Smiths Industries, Florham Park, N.J.
Filed Jun. 20, 1990, Ser. No. 541,136
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—157 19 Claims



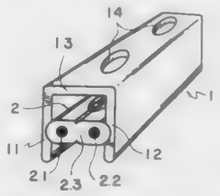
1. Apparatus for use with an electrical assembly and a modular subassembly of electronic equipment, said modular subassembly being selectively movable along a mating axis in a mating direction toward the electrical assembly for electrically mating therewith and alternatively in an unmating direction away from the electrical assembly for unmating, said apparatus being operative to assist in the mating and the unmating of the modular subassembly with the electrical assembly, and comprising:
actuator means mounted in proximity to the electrical assembly for generating forces along the mating axis selectively in either of the mating and the unmating directions;
connecting means operatively connected to the actuator for movement along the mating axis in response to the forces generated by the actuator;
a plurality of latch means operatively connected to the connecting means and selectively engageable with the modular subassembly at a corresponding plurality of locations thereon for exerting substantially uniform forces on the modular subassembly, whereby the selective engagement of the modular subassembly by the latch means and the selective actuation of the actuator relative to the electrical assembly urge the latch means and the modular subassembly engaged thereby selectively towards and away from the electrical assembly for achieving mating and unmating therewith.

4,990,097
ELECTRICAL CONNECTOR WITH MODULE EXTRACTION APPARATUS
Timothy B. Billman, King, and Roger L. Thrush, Clemmons, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 21, 1990, Ser. No. 483,193
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—160 6 Claims



1. An electrical connector of the type having a housing with a plurality of terminals disposed on opposite sides of a circuit panel receiving slot for electrically engaging traces on a circuit panel which may be inserted therein, said connector characterized in that the housing includes a circuit panel retaining means extending normally outwardly from the panel receiving slot and includes a pocket, said housing further includes a circuit panel extraction member positioned in said pocket and comprising an elongated arm, a projection at one end of said arm extending outwardly from one surface to underlie a circuit panel when in engagement with the terminals and a handle at an opposite end of said arm and extending outwardly from an opposite surface to provide an application of force to said extraction member to cause a linearly motion thereof whereby at least and end of the circuit panel overlying said projection moves out of engagement with the terminals.

4,990,098
CURRENT BAR ARRANGEMENT
Rudolf Neidecker, Basel, and Jacques Kunz, Schonenbuch, both of Switzerland, assignors to Multi-Contact AG, Switzerland
Filed Nov. 9, 1989, Ser. No. 434,880
Claims priority, application Switzerland, Nov. 15, 1988, 4225/88-6
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—207 9 Claims



1. Current bar arrangement comprising a flat, two-strand, flexible cable (2) including a rubber-like insulation (2.3) with a plurality of holes (2.4) stamped into the insulation at a distance from each other between the two strands (2.1, 2.1), the two strands being laid open for a short distance in width in each case, and a cable channel (1) being form-stable in the lengthwise direction and having a substantially U-shaped profile, the cable channel (1) including a base strip (1.3) and two leg strips (1.1, 1.2) for receiving and holding the cable between the two leg strips in the parallel direction of the base strip.

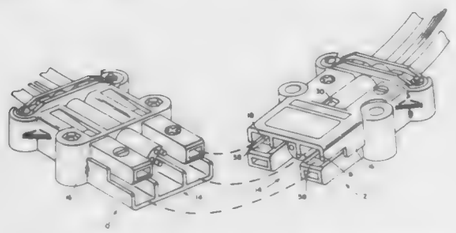
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4,990,099

KEYED ELECTRICAL CONNECTOR WITH MAIN AND AUXILIARY ELECTRICAL CONTACTS

Jorge G. Maria, Boston; Craig H. Baker, Quincy, and Lester E. Wilson, Bedford, all of Mass., assignors to High Voltage Engineering Corp., Boston, Mass.

Filed Sep. 18, 1989, Ser. No. 408,240
Int. Cl.[5] H01R *13/28*
U.S. Cl. 439—284 11 Claims



1. A keyed genderless electrical connector comprising:

A. a main housing means having

(i) first and second main electrical contact receiving means, and

(ii) first and second genderless main electrical contacts positioned within said corresponding first and second main electrical contact receiving means, respectively,

B. a longitudinally extending auxiliary housing means having

(i) a plurality of auxiliary electrical contact receiving means, and

(ii) a plurality of auxiliary electrical contacts positioned within said corresponding plurality of auxiliary electrical contact receiving means,

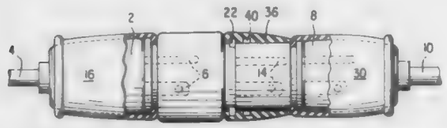
said auxiliary housing means being rotationally positioned about its longitudinal axis with respect to said main housing means to provide a key for the electrical connector that prevents the electrical connector from being mated with a duplicate but differently keyed electrical connector.

4,990,100

DEVICE FOR SECURING TWO CORDS TOGETHER

Dean R. Lukkes, R.R. #1, Box 58A, Bradley, S. Dak. 57217

Filed Jan. 26, 1990, Ser. No. 471,269
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—311 10 Claims



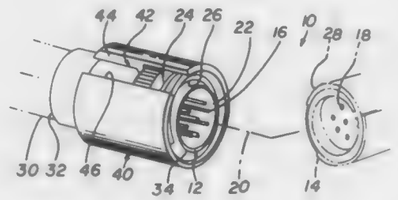
1. Apparatus for securing two ends of an electrical cord together wherein each of said ends comprises electrical connectors for engaging electrical connectors of the other of said ends, said apparatus comprising base means for engaging said electrical connectors of one of said ends and for providing electrical connection means connected to said electrical connectors for transmitting electrical power from said one of said ends to the other of said ends, grip means connected to said base means for engaging said one of said ends for holding said base means to said one of said ends, and securing means for securing said base means to a second base means.

4,990,101

COVER FOR CIRCULAR ELECTRICAL CONNECTORS

Kenneth C. Blaisdell, Phoenix, Ariz., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 1, 1989, Ser. No. 445,072
Int. Cl.[5] H01R *4/38*
U.S. Cl. 439—320 13 Claims



1. Apparatus for use with an electrical connector system that includes first and second mateable connectors, said first connector including a body and a coupling nut that is rotatably mounted on said body and that can threadably engage a thread on said second connector, which guards against unwanted turning of the nut, comprising:

a substantially tubular cover having an axis extending in forward and rearward directions, said cover having an internal diameter large enough to fit around said nut, said cover having an internal surface forming a pair of shoulders facing at least partially respectively in said forward and rearward directions and situated to abut locations on at least one of said connectors to limit axial movement of said cover;

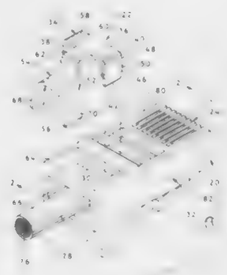
said cover having a slot extending largely parallel to said axis to form a pair of cover slot edges that can move apart and together, and said cover being formed of material resilient enough to allow expansion of said cover by separating of said edges so said cover can be moved in a radial direction off said nut.

4,990,102

ELECTRICAL CONNECTOR HAVING A SECONDARY CABLE STRAIN RELIEF AND A STRAIN RELIEF MEMBER THEREFOR

Ronald W. Myers, Landisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 28, 1989, Ser. No. 386,845
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—452 7 Claims



1. A strain relief member adapted for securing a multiple conductor cable to a connector to provide strain relief to terminations of conductors of the multi-conductor cable to respective contacts in the connector when the strain relief member is secured to both the connector and the cable, the connector having a recess defining wall means, the strain relief comprising:

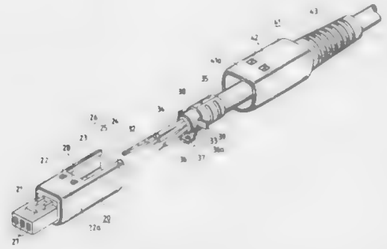
a U-shaped portion having a bight and two legs extending therefrom, said U-shaped portion is adapted to be received in the recess of the connector with said legs adapted to pass beside the cable with the cable received between said legs, said legs having securing means thereon adapted to secure said strain relief member to the connector, said bight having extending therefrom an insulation support ferrule adapted to be crimped about the cable, whereby when the connector is terminated to the cable and the strain relief member is secured to the connector with the ferrule crimped about the cable, forces transmitted along with the cable are transferred to the connector through the strain relief member and are thereby prevented from being transmitted to the conductor to contact terminations.

4,990,103

PLUG WITH CORD

Toshio Sazaki, Nabari, and Hisao Toramoto, Souraku, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jul. 19, 1990, Ser. No. 554,340
Claims priority, application Japan, Aug. 11, 1989, 1-95038[U]
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—455 6 Claims



1. A plug comprising:

a plug body made of an insulating material and having a plurality of contact receiving holes extending therethrough in the front-to-back direction, a clamper fixing slot made in its rear end portion and engaging lugs protrusively provided on its outer peripheral surface;

a plurality of contacts received in said contact receiving holes of said plug body;

a cord having its core conductors each connected to one of said contacts;

a clamper crimped around said cord and having a forwardly extending coupling piece inserted in and locked to said clamper fixing slot of said plug body; and

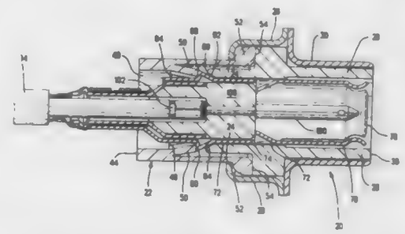
a cylindrical cap made of an insulating material and having holes for engagement with said lugs of said plug body, for receiving said plug body in its forward portion, said cap having at its rear end an integral flexible cord protecting portion and said cord being led out of said cap through said cord protecting portion.

4,990,104

SNAP-IN RETENTION SYSTEM FOR COAXIAL CONTACT

Stephen B. Schieferly, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1990, Ser. No. 531,212
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 23 Claims



1. An electrical connector, comprising:

an insulative first housing member for receiving at least one coaxial contact, said first housing member having a forward face, a coaxial contact receiving face, and at least one coaxial contact receiving passage extending therebetween, said first housing member having at least one resiliently deflectable tine extending from the forward face, said at least one tine axially aligned with said at least one coaxial contact receiving passage and extending angularly toward each other into the profile of said passage; and

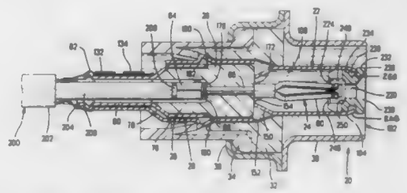
an insulative second housing member, the second housing member for engaging the first housing member, for receiving at least one coaxial contact and for securing said at least one coaxial contact in the first and second housing members, said second housing member having at least one coaxial contact receiving passage corresponding in location to said at least one coaxial contact receiving passage in said first housing member, whereby a coaxial contact axially received in said at least one coaxial contact receiving passage is secured between the first and second housing members.

4,990,105

TAPERED LEAD-IN INSERT FOR A COAXIAL CONTACT

Robert J. Karlovich, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1990, Ser. No. 531,204
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 20 Claims



1. A coaxial contact, comprising:

an electrically conductive shell defining an open forward end;

a center contact for termination to a center conductor of a coaxial cable, the center contact having a mating portion defining cantilever beam means, said cantilever beam means extending to respective distal ends, said center contact disposed concentrically in said shell and isolated therefrom; and

a dielectric insert having a forward portion and a rearward

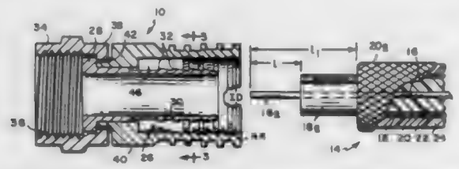
portion, said insert secured in the shell proximate the open forward end, the insert having an axial bore therethrough for receiving a center pin contact of a mating connector, the rearward portion receiving the distal ends and a limited length of said cantilever beam means within said bore.

4,990,106

COAXIAL CABLE END CONNECTOR

Andrew Szegda, Canastota, N.Y., assignor to John Mezzalingua Assoc. Inc., Manlius, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,303
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—585 8 Claims



1. An end connector for connecting a coaxial cable to a port, said cable being of the type having an electrical inner conductor surrounded by and spaced inwardly from an electrical outer conductor, with a dielectric insulator interposed between said inner and outer conductors, and with a dielectric jacket surrounding the outer conductor, said end connector comprising:

a tubular post having a front end and a rear end, with a cylindrical first sleeve opening towards said rear end;

fastener means on the front end of said post for attaching said connector to said port; and

a tubular body supported on the front end of said post at a location adjacent to said fastener means, said body having a cylindrical second sleeve surrounding and spaced radially from said first sleeve to define an annular chamber therebetween, said second sleeve having an open rear end leading to said annular chamber, said second sleeve having discrete axially spaced circular grooves in its interior surface defining a plurality of discrete axially spaced circular serrations and having grooves in its exterior surface defining a plurality of axially spaced circular ribs,

said first sleeve being adapted for insertion into a position in an end of said cable at which said first sleeve is in electrical contact with said outer conductor and electrically isolated from said inner conductor by said dielectric insulator, with said jacket being received in said chamber and being surrounded by said second sleeve,

said ribs being deformable into a hexagonal configuration with an accompanying inward twisting deformation of said circular serrations toward said first sleeve and indented mechanical engagement with said jacket.

4,990,107

INTEGRATED CIRCUIT MODULE CONNECTOR ASSEMBLY

Jon A. Fortuna, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1989, Ser. No. 439,210
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—637 7 Claims

1. An electrical connector assembly for providing electrical connections between a plurality of contact pads (22) on a first board (20) and respective ones of a plurality of contact areas (24) on a second board (26), the assembly comprising:

an elongated dielectric housing (28) having a longitudinal axis (30), a top surface (32) and a bottom surface (34), said housing (28) being formed with a plurality of contact receiving cavities (36) extending from said top surface (32) toward said bottom surface (34) and transverse to said axis (30) and a first plurality of apertures (56) through said bottom surface (34) and each intersecting a respective one of said plurality of contact receiving cavities (36), said housing (28) being further formed with a first board receiving cavity (38) extending from said top surface (32) toward said bottom surface (34) along said axis (30) and intersecting said plurality of contact receiving cavities (36); and

a plurality of contact members (40) disposed in respective ones of said plurality of contact receiving cavities (36), each of said contact members (40) arranged to engage only one side of said first board (20) and including a contact leg (44) extending through a respective one of said first plurality of apertures (56) through said bottom surface (34) of said housing (28), a contact portion (42) arranged for engagement with only one side of said first board (20) to make electrical contact with one of said



plurality of contact pads (22), and a spring portion (46) between said contact leg (44) and said contact portion (42), said contact leg (44) being on the opposite side of said board receiving cavity (38) from said contact portion (42) when said contact member (40) is disposed in a respective one of said plurality of contact receiving cavities (36) so that when said first board (20) is inserted in said first board receiving cavity (38) with said one of said plurality of contact pads (22) engaging said contact portion (42) said contact leg (44) is pulled toward said first board (20), said pluarlity of contact members (40) being so oriented in said plurality of contact receiving cavities (36) that insertion of said first board (20) into said first board receiving cavity (38) results in compressive stress being induced in said housing (28) through said contact legs (44) of said plurality of contact members (40).

4,990,108

CONNECTOR DEVICE FOR CONNECTING ELECTRONIC COMPONENTS

Takahiro Sakaguchi, Kodaira, Japan, assignor to Teac Corporation, Japan

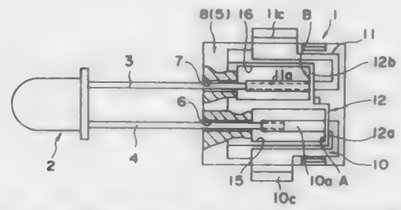
Filed Oct. 20, 1989, Ser. No. 424,666
Claims priority, application Japan, Oct. 27, 1988, 63-140242
Int. Cl.[5] H01R *13/64*
U.S. Cl. 439—678 7 Claims

1. A connector device for electrically connecting an electronic component having a plurality of connection pins, each of the connection pins having a length which is different so that the polarity assigned to the pins can be discriminated, comprising:

a body provided with an insertion part adapted to accept said plurality of pins;

an electrical contact member adapted to engage with said plurality of pins when the pins inserted into the connector have reached respective predetermined positions; and

insertion prohibiting means provided unitarily with the body of the connector device in correspondence to at least one of said connection pins so as to prevent the insertion of the



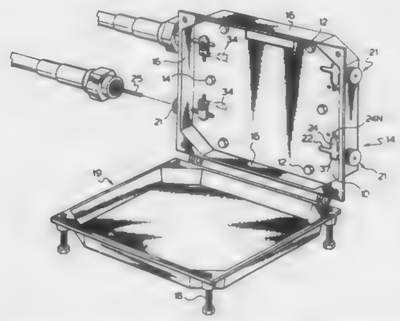
pins to said predetermined positions when the pins are inserted into the insertion part with a wrong polarity, said insertion prohibiting means comprising a stopper part provided at a predetermined insertion depth of one of the pins, said stopper making a contact engagement with a pin properly inserted to said predetermined insertion depth and prohibiting further insertion of the pin.

4,990,109

COAXIAL CABLE TERMINAL

Robert L. Romerein; Mark C. Adamson, and Zdenek J. Nepovim, all of Lindsay, Canada, assignors to J. E. Thomas Specialties Limited, Ontario, Canada

Filed Jul. 18, 1990, Ser. No. 553,561
Int. Cl.[5] H01R *4/42*
U.S. Cl. 439—801 21 Claims



1. Terminal for connecting a central pin of a coaxial cable to electrical circuitry on a circuit board of insulating material, comprising:

an upper plate attached to said circuit board and arranged to contact the upper surface of said coaxial cable pin which pin extends inwardly beyond an edge of said printed circuit board,

a lower plate securable to one of said upper plate or said circuit board and slidable between extended and retracted positions, transverse to the longitudinal axis of said coaxial cable pin, wherein in the extended position the lower plate may contact the lower surface of said coaxial cable pin,

said board and upper plate being adapted, with said lower plate in the retracted position, to move upwardly away from said pin,

said upper and lower plate being adapted, with said lower plate in the extended position, to assume a clamped or unclamped position relative to said cable pin,

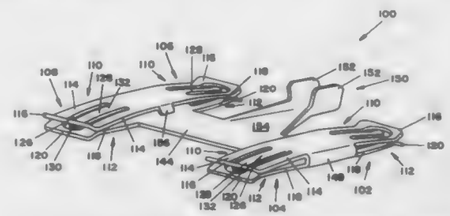
means in the extended position of said lower plate for moving said upper and lower plate between the clamped and unclamped positions.

4,990,110

ELECTRICAL CONTACT ARRANGEMENT

Norman R. Byrne, 2736 Honey Creek, NE, Ada, Mich. 49301

Continuation of Ser. No. 365,194, Jun. 12, 1989, abandoned.
This application Dec. 11, 1989, Ser. No. 448,709
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—861 20 Claims



1. An electrical receptacle apparatus comprising at least one electrical receptacle adapted to conductively engage a blade terminal or the like, said electrical receptacle comprising:

a pair of upper substantially parallel and elongated lateral arms extending forwardly;

an upper bridge portion conductively interconnecting said upper lateral arms, said upper bridge portion and said upper lateral arms forming an upper spatial area;

a pair of lower substantially parallel and elongated lateral arms extending forwardly and positioned substantially directly below said pair of upper lateral arms;

a lower bridge portion conductively interconnecting said lower lateral arms, said lower bridge portion and said lower lateral arms forming a lower spatial area;

an upper cantilever member extending forwardly within said upper spatial area and having an arcuate shape forming an upper first contact location on a lower surface thereof;

a lower cantilever member extending forwardly within said lower spatial area and having an arcuate shape forming a lower first contact location on an upper surface thereof;

said interconnection of said upper bridge portion to said upper lateral arms forming second and third upper contact locations, and said interconnection of said lower bridge portion to said lower lateral arms forming second and third lower contact locations; and

said upper bridge portion and said upper lateral arms are conductively interconnected to said upper cantilever member, lower cantilever member, lower bridge portion and lower lateral arms, and said receptacle is sized and configured so that said male blade terminal inserted between said upper and lower bridge portions is adapted to conductively contact said receptacle at said first, second and third upper and lower contact locations so as to form at least six electrical contact locations with said receptacle.

4,990,111

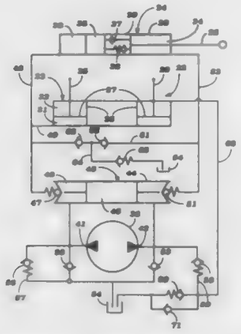
TILT DEVICE FOR MARINE PROPULSION UNIT

Hideki Saitoh, Numazu, and Akihiro Onoue, Hamamatsu, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 8, 1989, Ser. No. 348,962
Claims priority, application Japan, May 9, 1988, 63-110506
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—61 4 Claims

1. In a hydraulic tilt and trim system for a marine outboard drive comprised of an outboard drive adapted to be supported on the transom of a watercraft for movement between selected trim positions and a tilted up out of the water condition comprised of a trim cylinder operatively interposed between said transom and said outboard drive unit for moving said outboard drive unit between a trimmed down and a fully trimmed up condition, a tilt cylinder operatively interposed between said transom and said outboard drive unit for moving said outboard

drive unit at least between said fully trimmed up position and a tilted up out of the water position, said operative connection of said trim cylinder being such to permit said outboard drive unit to be tilted up beyond said fully trimmed up position without operation of said trim cylinder, and a fluid operating circuit including a single pump and a reservoir for selectively pressurizing both of said tilt cylinder and said trim cylinder to



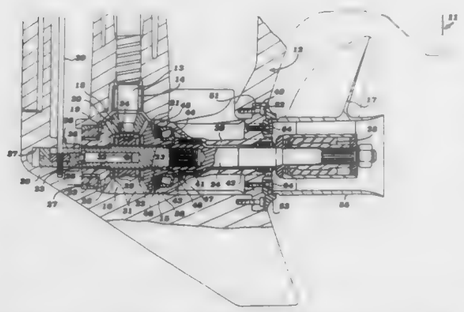
effect tilting up and down of the outboard drive and trim up of the outboard drive and for permitting retraction of the trim cylinder when the tilt cylinder has tilted the outboard drive unit to its tilted up out of the water condition, the improvement comprising means for bleeding air from the system during its operation and for permitting make up fluid to be added to the system.

4,990,112

POWER TRANSMITTING DEVICE FOR MARINE PROPULSION UNIT

Hirofumi Imaeda, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 26, 1989, Ser. No. 357,475
Claims priority, application Japan, Jun. 1, 1988, 63-134825
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—75 8 Claims



1. In a lower unit for a marine propulsion device comprised of an outer casing defining a cavity extending through a rear face thereof which defines a rear opening, a drive shaft journaled by said outer casing and extending into said cavity, a driven shaft extending at least in part within said cavity and driving a propulsion means, a bevel gear transmission for driving said driven shaft from said drive shaft, a unitary bearing carrier supported within said cavity extending from said bevel gear transmission rearwardly and closing at least in part the rear opening thereof, and bearing means carried by said bearing carrier adjacent said bevel gear transmission and journaling said driven shaft, said bearing means taking thrust from said driven shaft in at least the forward direction and transferring the forward thrust forces to said bearing carrier, the improvement comprising means for transmitting such forward thrust forces from said bearing carrier to said outer housing contiguous to said rear face which is contiguous to the rear opening of said cavity.

4,990,113

HAND GRIP FOR AEROBATIC MANEUVERS ON SURFBOARDS

Richard Q. Morrison, Calabasas, Calif., assignor to Sexwax Incorporated, Carpinteria, Calif.

Filed Feb. 16, 1989, Ser. No. 311,687
Int. Cl.[5] A63C *15/06*
U.S. Cl. 441—75 2 Claims



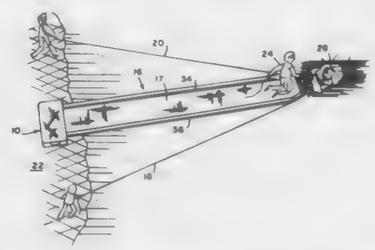
1. A hand grip for a surfboard comprising: a unitary structure with a pair of spaced apart mounts, each mount having a flat mounting surface to be adhered to a surface of a surfboard, and a strap permanently fixed to and extending between said mounts, said mounts spacing said strap from said board when attached to said board to give ready access for the fingers of a rider, said strap having limited flexibility and elasticity such that at least its central position can be pressed against the surfboard surface when the rider lays on it, and can be pulled away from the said surface by a limited distance to facilitate gripping the hand grip and guiding the board while the rider stands on the board, maintaining his position relative to the board by pulling on the strap so as to hold his feet against said surface, said strap being generally parallel to the surface of said board during active use, said strap widening toward said mounts, and including grooves for improved gripping.

4,990,114

INFLATABLE RESCUE RAMP

George W. LeBlanc, Jr., 16 Atlantic St., Lynn, Mass. 01902

Filed Sep. 7, 1989, Ser. No. 404,171
Int. Cl.[5] B63C *9/32*
U.S. Cl. 441—80 10 Claims



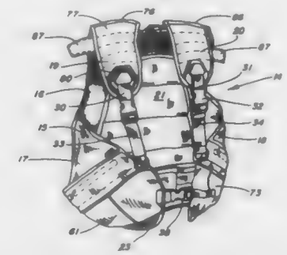
1. An inflatable rescue ramp comprising, a pair of spaced inflatable tubes, each said tube having an inner side and an outer side, and a flexible web, said flexible web extending between said inner sides of said tubes and defining a passageway between said tubes, said web having portions extending laterally and passing under said tubes and being attached to said outer sides of said tubes along a respective longitudinally extending seam , said web being substantially unattached to said tubes except along said longitudinally extending seam such that downward pressure on the web passageway causes said tubes to axially rotate outwardly of each other, maintaining a substantial separation between said tubes and providig a passageway there-between under load.

4,990,115

BUOYANCY COMPENSATOR WITH EXPANDABLE CUMMERBUND AND AUXILIARY HARNESS

Marjorie Vorhaner, Spring Valley, and Neil Bergstrom, La Mesa, both of Calif., assignors to Soniform, Inc., El Cajon, Calif.

Filed Jun. 22, 1989, Ser. No. 369,760
Int. Cl.[5] B63C *11/02*
U.S. Cl. 441—111 10 Claims



1. A buoyancy compensator comprising a vest having a back portion, a pair of shoulder portions, and a pair of front portions, the back portion having an outside surface and an inside surface adapted to face the back of a wearer, a cummerbund attached to the inside surface of the back portion and adapted to encircle the waist of the wearer, the cummerbund including a central portion formed of elastic material which is secured to the back portion and a pair of end portions formed of relatively non-elastic material which are secured to the elastic portion.

4,990,116

COMBINING STRUCTURE FOR TOY BLOCKS

Tsan L. Chen, 14, Hsin Ping Rd., An Ping Industrial Zone, Tainan City, Taiwan

Filed Jun. 26, 1989, Ser. No. 371,119
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—124 1 Claim

1. A combining structure for toy blocks, said combining structure comprising

a single unit block made of plastics,

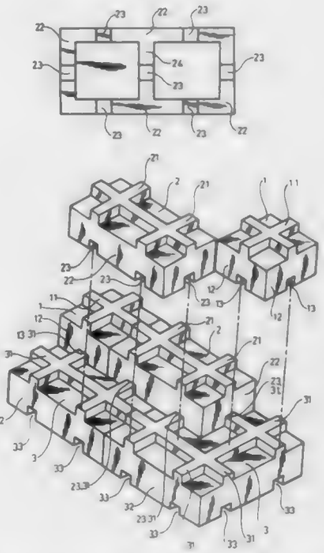
at least two intersections formed by intersecting tenons on a top surface of said block,

a wall extending downward on each of four sides of said block,

at least one separate mortise in a bottom surface of each wall,

at least two openings defined by said four walls and at least one separation wall to separate said openings and the openings extending to an underside of the top surface having said tenons so that the tenons of other blocks having similar structure as said single block unit tightly stick within the mortises of said walls,

a number of said at least two openings being equal to a number of intersections of said intersecting tenons, and each separation wall between adjacent openings includes a mortise,



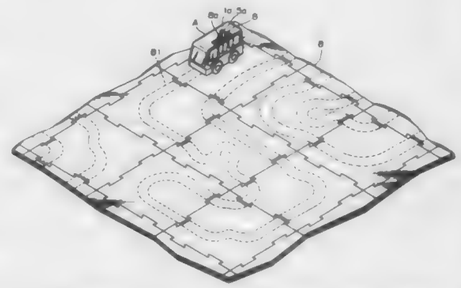
said single unit block being able to be combined together one by one with other blocks by inserting the tenons in the mortises.

4,990,117

MAGNETIC FORCE-GUIDED TRAVELLING TOY

Shigeru Yonezawa, Tokyo, Japan, assignor to Yonezawa Corporation, Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 427,790
Claims priority, application Japan, Oct. 27, 1988, 63-140286[U]; Aug. 23, 1989, 1-98336[U]
Int. Cl.[5] A63H *33/26, 18/00, 17/36*
U.S. Cl. 446—136 9 Claims



1. A travelling toy guided by magnetic force capable of travelling along a guide path made of magnetically attractive material and provided on a travel board, said travelling toy comprising:

a body having a bottom surface and a front end;

means for driving said body forward along said guide path, said drive means being attached to said body and including a drive wheel which contacts said travel board, said drive wheel being located substantially in the center of

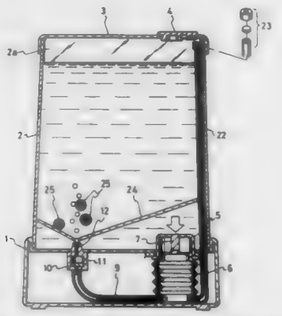
said bottom surface so that the center of gravity of said toy resides substantially over said drive wheel;
a magnet attached to said body in front of said drive wheel, said magnet being attracted to said magnetically attractive material of said guide path so that said magnet steers said body along said guide path as said toy is driven forward by said drive means, said magnet steers said body about said centrally located drive wheel;
means for supporting said front end of said body above said guide board against the pull of said magnet and said magnetically attractive material.

4,990,118

TOY UTILIZING BUBBLES IN LIQUID

Akio Shiina, Toyama, Japan, assignor to Sente Creations Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,596
Claims priority, application Japan, Jul. 19, 1988, 63-95431
Int. Cl.[5] A63H *29/10, 23/00*
U.S. Cl. 446—197 **7 Claims**



1. A toy utilizing bubbles in liquid, comprising at least one in-liquid movable member, a transparent sealed vessel adapted to contain a liquid and said in-liquid movable member, said vessel having a lower portion, an upper portion and an opening adapted to permit introduction of said liquid into said vessel, such that a volume of air will remain in the upper portion of said sealed vessel, a lid for closing said opening to seal said vessel, a bubble generating means adapted to manually introduce air into said sealed vessel through a bubble generating opening in the lower portion of said vessel thereby creating air bubbles which will ascend through said liquid, which bubbles are capable of engaging and moving said in-liquid moveable member, whereby the air from said bubbles will be collected in said volume of air remaining in the upper portion of said sealed vessel, and an air suction pipe for permitting air to travel from said volume of air in the upper portion of said sealed vessel to said bubble generating means, said air suction pipe having a check valve adapted to prevent the liquid in said vessel from flowing into said air suction pipe.

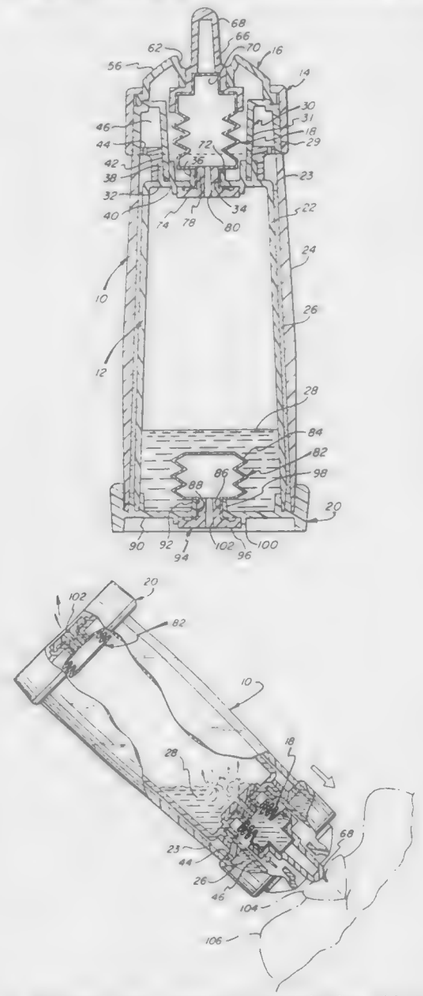
4,990,119

SIMULATED NURSING BOTTLE FOR DOLL

Francis R. Amici, Northford, Conn.; Brian Fontaine, Southbridge, Mass., and Craig Dubois, Granby, Conn., assignors to Hasbro, Inc., Pawtucket, R.I.

Filed Jul. 26, 1989, Ser. No. 385,288
Int. Cl.[5] A63H *3/52*
U.S. Cl. 446—267 **20 Claims**

1. A simulated nursing bottle for dolls comprising:
(a) an outer shell having the appearance of a baby nursing bottle, said outer shell having an elongated sidewall;
(b) a cap on said upper end of said outer shell;
(c) a simulated nipple mounted in said cap and having at least a portion reciprocatable axially inwardly relative to said outer shell;
(d) an inner container having an elongated sidewall spaced from, but closely adjacent, said sidewall of said outer shell to provide a narrow annular cavity therebetween;
(e) means sealing said annular cavity adjacent the base of said sidewalls;
(f) closure means on the upper end of said inner container and providing an air passage therethrough to said inner container;
(g) means within said cap providing a chamber communicating with the upper end of said annular cavity, said chamber being substantially concealed by said cap;
(h) a resiliently compressible member providing an air chamber above said inner container communicating with said air passage into said inner container, said reciprocatable nipple portion being operative to compress said member when reciprocated axially and thereby to cause air to flow into said inner chamber;
(i) colored liquid in said annular cavity; and
(j) clear liquid in said inner container, whereby, when said bottle is tipped downwardly, the colored liquid in said annular cavity slowly drains into said closed chamber and is concealed therein and reciprocation of said nipple portion causes said clear liquid in said inner container to be agitated.

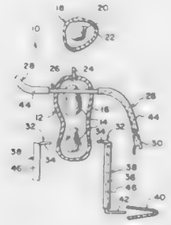


4,990,120

PEANUT PEOPLE

Arthur Famiglietti, P.O. Box 94, Corfu, N.Y. 14036, and George Spector, 233 Broadway, #3815, New York, N.Y. 10007

Filed Apr. 2, 1990, Ser. No. 503,060
Int. Cl.[5] A63H *3/36;* **A23G** *1/00;* **A01N** *1/00, 3/00*
U.S. Cl. 446—386 **4 Claims**



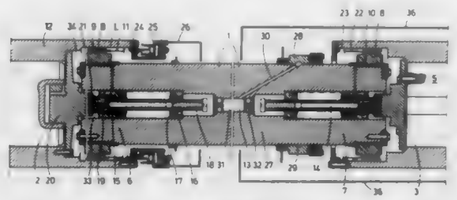
1. A peanut person comprising:
(a) a body made of a double peanut in a shell;
(b) a head made of a single peanut in a shell;
(c) a wire post for securing said peanut head to said peanut body;
(d) a wire extending through each side of upper portion of said peanut body to form the arms;
(e) a pair of electric connectors, each attached to one end of one of the arms to form one hand;
(f) a pair of Z-shaped wires, each connected at upper bent end to one side of lower portion of said peanut body so that middle segment will form a leg; and
(g) a pair of plastic plates, each folded and affixed to lower bent end of one said Z-shaped wires to form a foot.

4,990,121

ROLLING MILL DRIVE HAVING A SPINDLE WITH CURVED TOOTHING

Heinz Vosbeck, Hilchenbach; Gerhard Artel, Kirchhundem, and Jürgen Stelbrink, Hilchenbach, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 17, 1989, Ser. No. 298,069
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1988, 3800999; Apr. 8, 1988, 3811790
Int. Cl.[5] F16D *3/18;* **B21B** *35/14*
U.S. Cl. 464—16 **7 Claims**



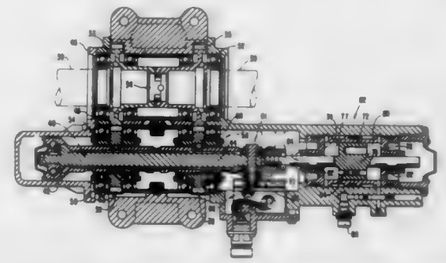
1. In a rolling mill drive including a spindle having an axis and being arranged between a driven neck of a pinion and a drive neck of a roll, the spindle being axially slidable along a length of possible displacement, the spindle having two ends and a head at each end of the spindle, each spindle head being provided with a wobbler having a curved toothing, a coupling sleeve at each end of the spindle, each coupling sleeve having an internal toothing surrounding the wobbler, the coupling sleeve being connected to the neck, the spindle being guided between the coupling sleeves by means of at least one support element arranged in the region of the spindle axis and an axially adjustable pressure plunger, the wobbler and the coupling sleeve each having an axis, wherein the improvement comprises that the axis of the wobbler and the axis of the coupling sleeve in the horizontal plane include a preselected angle of deflection which is at least a few tenths of a degree.

4,990,122

SHAFT FAILURE INDICATOR

Duane H. Grimm, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 21, 1987, Ser. No. 135,456
Int. Cl.[5] B64C *13/34;* **F16H** *25/22;* **G08B** *21/00*
U.S. Cl. 464—23 **23 Claims**



1. A system for damping rotation between axially aligned first and second driven shafts rotating in the same direction comprising:
(a) means coupling the driven shafts together to transmit torque from one of the shafts to the other of the shafts upon a predetermined relative angular rotation between the two shafts and providing a free zone of relative rotation bet ween the shafts without transmitting torque between the shafts when the shafts have moved less than the predetermined angular rotation with respect to each other in the free zone of rotation;
(b) means, coupled to the shafts, for moving a movable member a distance which is proportional to the degree of relative rotation between the shafts during relative rotation between the shafts less than the predetermined relative angular rotation within the free zone of rotation, the movable member engaging first and second fixedly positioned drivers which are spaced apart from each other by a constant distance, the first and second drivers being rotated in response to rotation of the first and second shafts with torque from the first and second drivers being transmitted to the movable member to move the movable member in a first direction when a rate of rotation of the first driver is higher than a rate of rotation of the second driver and to move the movable member in a second direction when the rate of rotation of the second driver is higher than the rate of rotation of the first driver; and
(c) means for retarding the motion of the movable member with a retarding force when the shafts are rotating relatively with respect to each other through an angle less than the predetermined relative angular rotation within the free zone of rotation which restricts the rate of relative motion of the shafts with respect to each other.

4,990,123

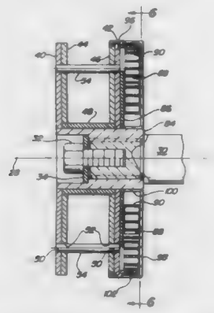
CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM HAVING A VARIABLE DIAMETER PULLEY WITH RESILIENTLY BIASED BELT ENGAGING MEMBERS

Werner Krude, Oxford, Mich., assignor to GKN Automotive, Inc., Auburn Hills, Mich.

Filed Jun. 13, 1989, Ser. No. 365,605
Int. Cl.[5] F16H *11/00, 7/08*
U.S. Cl. 474—50 **72 Claims**

1. A continuously variable transmissional system comprising:
a variable diameter pulley having a plurality of resiliently

biased belt engaging members arranged in a circular pattern about an axis of rotation, the diameter of said circular pattern being the effective diameter of said variable diameter pulley, said plurality of belt engaging members being displaceable in a radial direction between a minimum and a maximum radial position in response to radial forces acting on said plurality of resiliently belt engaging members to vary said effective diameter;
at least one other pulley;



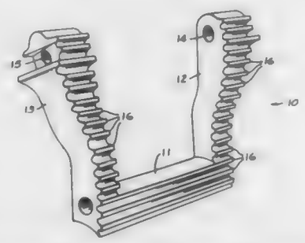
a drive belt connecting said variable diameter pulley with said at least one other pulley for rotation therewith;
belt tensioner means for producing a force for maintaining at least a minimum tension force on said drive belt; and
means for changing the radial forces acting on said plurality of belt engaging members to change the radial positions of said plurality of belt engaging members, thereby changing the effective diameter of said variable diameter pulley.

4,990,124

TUFF-FACE DRAG CHAIN LINK

A. J. Bartoletto, 1975 Tuckaway, Bloomfield Hills, Mich. 48013, and Ronald W. T. Birchard, 395 Church Street, Beaconsfield, Quebec, Canada H9W 3R5

Filed Feb. 12, 1990, Ser. No. 478,832
Int. Cl.[5] F16G *13/06*
U.S. Cl. 474—206 22 Claims



1. Drag chain link characterized by link face surface formed with rib means for interengaging particulate material to be conveyed by dragging.

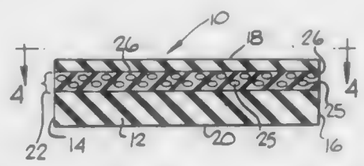
4,990,125

FLAT BELT, BELT DRIVE, AND METHOD

Robert E. Stuemky, Franktown, and Jon A. Johnston, Northglenn, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jan. 12, 1990, Ser. No. 464,059
Int. Cl.[5] F16G *1/10*
U.S. Cl. 474—261 15 Claims

1. In a power transmission belt of the flat type with an elastomeric body and oppositely facing sides; an outer surface; a power transmitting inner surface; and a tensile member of embedded, fibrous material with fibers thereof forming opposite helical angles in relation to the belt and giving the belt some degree of elasticity in a lengthwise direction of the belt, and wherein the improvement comprises:
a first layer of circumjacent yarns oriented generally transversely in relation to the belt and extending between the oppositely facing sides, and wherein the yarns of the first



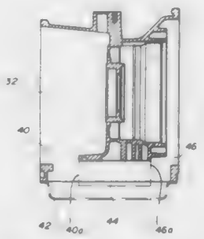
layer are at a first helical angle that is from about 25 to about 80 degrees; and
a second layer of circumjacent yarns juxtaposed the first layer and oriented generally transversely in relation to the belt, extending between the oppositely facing sides and wherein the yarns of the second layer are at a second helical angle that is opposite the first helical angle and is from about 25 to about 80 degrees.

4,990,126

CONTINUOUSLY VARIABLE TRANSMISSION

Yasufumi Ideta, Ayase, and Hiromi Taguchi, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 20, 1988, Ser. No. 260,216
Claims priority, application Japan, Oct. 23, 1987, 62-266229
Int. Cl.[5] F16H *37/08*
U.S. Cl. 475—210 3 Claims



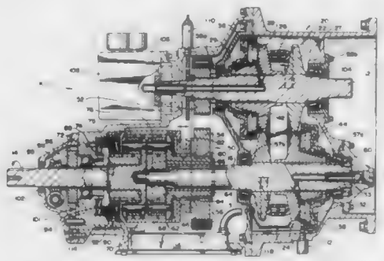
1. In a continuously variable transmission:
a casing having a first chamber, a second chamber, and a partition wall arranged to separate said second chamber from said first chamber;
a V-belt power transmission mechanism including a V-belt drivingly interconnecting driver and follower pulleys, said V-belt type continuously variable transmission mechanism being arranged within said first chamber;
a differential mechanism arranged within said second chamber;
an oil pan secured to said casing;
said casing having first hole means for providing fluid communication between said first chamber and said oil pan, and second hole means for providing fluid communication between said second chamber and said oil pan,
said oil pan containing a quantity of oil,
said V-belt power transmission mechanism and said differential mechanism both using said oil contained in said oil pan,
said casing having a predetermined mounting site,
a control valved assembly secured to said casing at said predetermined mounting site and disposed between said first and second hole means, said control valve assembly having first wall means extending from said first hole means toward said oil pan and second wall means extending from said second hole means toward said oil pan.

4,990,127

DUAL RANGE INFINITELY VARIABLE TRANSMISSION

Richard W. Roberts, deceased, late of Lombard (by R. Hopley Roberts, executor); Richard L. Smirl, Arlington Heights, and Herbert N. Underwood, Chicago, all of Ill., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Oct. 17, 1989, Ser. No. 422,626
Int. Cl.[5] F16H *37/08*
U.S. Cl. 475—211 16 Claims



1. An infinitely variable transmission apparatus to couple a torque input source to a torque output, comprising:
rotatable input and output shafts;
a rotatable intermediate shaft;
first planetary gearset means having a first planetary portion, a second planetary portion and a third planetary portion;
first drive means for selectively drivingly coupling said input shaft with said first planetary portion, said first drive means including jaw clutch means operatively disposed to allow said selective driving coupling,
second drive means for drivingly coupling said input shaft with said intermediate shaft, said second drive means being a continuously variable speed mechanism engaging said input shaft and said intermediate shaft;
said intermediate shaft being drivingly coupled to said second planetary portion;
said jaw clutch means being operatively disposed for selective locking of said first planetary portion with said third planetary portion; and,
said third planetary portion being operatively coupled to said output shaft.

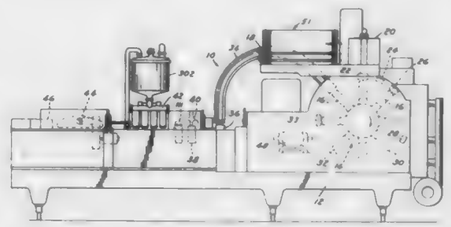
4,990,128

CARTON END PANEL FOLDING MECHANISM

Howard E. Murrah, Fenton, Mich., assignor to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Sep. 11, 1989, Ser. No. 405,757
Int. Cl.[5] B31B *3/32*
U.S. Cl. 493—133 9 Claims

1. For use with a rotating turret (14) having a plurality of radially extending mandrels including respective end faces and bearing an openended carton with a leading, a trailing, and two side closure panels extending beyond the end face of the mandrel substantially aligned with their respective body panels, a carton end panel closing mechanism characterized by a rotatable full round roller (50) having a peripheral face and fixedly mounted such that the face (56) of the roller is spaced a predetermined distance from the end face (58) of said mandrel as the latter rotates therepast, so as to be rotated by contact with said leading panel as it passes and to progressively fold same rearwardly until closed, and while continuing to rotate to engage



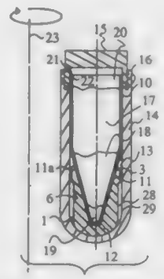
said trailing panel as it passes and to progressively fold same forwardly until closed.

4,990,129

SWINGING BUCKET ULTRACENTRIFUGE ROTOR, SAMPLE TUBE AND ADAPTER

Steven T. Nielsen, 1126 W. Knickerbocker Dr., Sunnyvale, Calif. 94087

Filed Aug. 16, 1988, Ser. No. 232,813
Int. Cl.[5] B04B *5/02*
U.S. Cl. 494—20 21 Claims



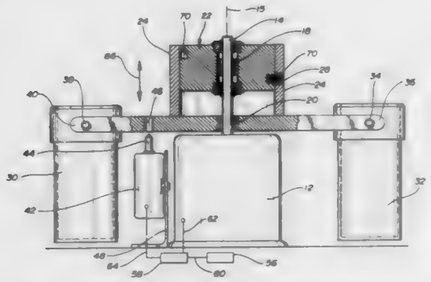
7. In combination, an ultracentrifuge swinging bucket rotor having a major cylindrical section and an essentially hemispherical closed end, a sample tube insertable into said rotor and an adapter extending between a bottom portion of said tube and said closed end of said rotor;
wherein said tube comprises an upper cylindrical portion having an open-top adapted for sample entry, and wherein said tube bottom portion is essentially conical;
wherein said adapter comprises an essentially conical open top interior for reception of said tube conical bottom portion, an essentially hemispherical bottom seatable in said rotor closed end, an annular support rim adjacent said adapter open top, and a reduced diameter section extending between said rim and said adapter essentially hemispherical bottom, whereby after rotative operation of an ultracentrifuge containing said rotor, said tube and said adapter, said tube is removable from said rotor for sample retrieval; and
wherein in an assembled condition in said rotor said adapter annular support rim extends around a top section of said tube conical bottom portion and below said tube upper cylindrical bottom.

4,990,130

MULTIPLE MOTION CENTRIFUGE

A. Wesley Prais, Hewitt, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 2, 1990, Ser. No. 547,711
Int. Cl.[5] B04B 5/02, 9/02
U.S. Cl. 494—20 6 Claims



1. A device for imparting sequentially, centrifugal force or agitation to a fluid sample placed in the device, comprising
(a) a source of power;
(b) reversible rotatable motor means;
(c) flow communication means extending between said power source and said rotatable motor means;
(d) control means in said flow communication means for controlling the direction of rotation of said rotatable motor means;
(e) a drive shaft extending from said reversible motor means;
(f) a first clutch mounted on said drive shaft, said first clutch fixed for driving with said drive shaft in a first direction, and freely rotatable on said shaft in a second direction;
(g) a second clutch mounted on said drive shaft, said second clutch freely rotatable on said drive shaft in said first direction, and fixed for rotation on said shaft in said second direction;
(h) a rotor connected to said first clutch;
(i) a cam follower mounted for rotation with said rotor;
(j) a cam connected to said second clutch;
(k) means connected to said control means and movable for preventing rotation of said rotor with said first clutch in said second direction of rotation; and
(l) means for supporting fluid samples on each end of said rotor.

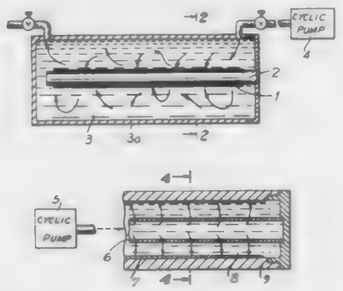
4,990,131

TUBULAR PROSTHESES FOR VASCULAR RECONSTRUCTIVE SURGERY AND PROCESS FOR PREPARING SAME

Herbert Dardik, 270 Highwood Ave., Tenafly, N.J. 07670, and Irving I. Dardik, Hillcrest Rd., Great Meadows, N.J. 07838

Continuation of Ser. No. 91,661, Sep. 1, 1987. This application Nov. 9, 1989, Ser. No. 434,940
Int. Cl.[5] A61F 2/06, 2/04
U.S. Cl. 600—36 13 Claims

1. A process for producing a tubular prosthesis for vascular reconstructive surgery from a selected blood vessel of a human umbilical cord, wherein said umbilical cord comprises blood vessels and umbilical cord tissue, said blood vessels comprising a vein and two arteries, comprising the steps of:
a. cleansing the umbilical cord;
b. separating the two arteries and vein from the umbilical cord tissue and from one another;
c. removing umbilical cord tissue from the outer surface of said selected blood vessel;
d. establishing and maintaining a minimum bore dimension of said selected blood vessel by inserting within the bore of said selected blood vessel a mandrel having an outer diameter essentially equal to said minimum bore dimension of said selected blood vessel, said selected blood vessel being open at least at one end;
e. treating said selected blood vessel by applying tanning agent under cyclic pressure to the outer surface of said selected blood vessel such that said selected blood vessel contracts down to said outer diameter of said mandrel;
f. inserting a hollow cannula having radially directed perforations within the bore of said selected blood vessel;
g. placing said blood vessel and cannula of step d. in a chamber of predetermined inner diameter; and



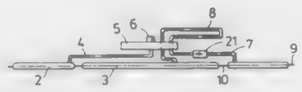
h. treating said selected blood vessel by applying tanning agent within said chamber under cyclic pressure axially into said cannula, whereby said tanning agent exits via the radially directed perforations of said cannula against the inner bore surface of said selected blood vessel and whereby said selected blood vessel is tanned by said tanning agent but is prevented from expanding outwardly beyond said predetermined inner diameter of said chamber.

4,990,132

METHOD AND APPARATUS FOR PLASMAPHERESIS

Peter Unger, Stockholm, and Eric Westberg, Lidingö, both of Sweden, assignors to Omega Medicinteknik AB, Sweden

PCT No. PCT/SE87/00240, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO87/06844, PCT Pub. Date Nov. 19, 1987
PCT Filed May 13, 1987, Ser. No. 275,056
Claims priority, application Sweden, May 16, 1986, 8602242-3; Dec. 18, 1986, 8605456-6
Int. Cl.[5] A61M 37/00; B04B 5/00
U.S. Cl. 604—6 7 Claims



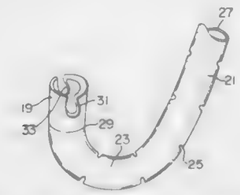
1. A method for carrying out plasmapheresis comprising the steps of:
withdrawing a quantity of blood from a blood donor to an annular primary container forming part of a closed flexible processing assembly positioned in a processing space in the rotor of a centrifuge, said processing space being conformed to the processing assembly;
agitating the motor during withdrawal of the blood and thereby also agitating the blood;
centrifuging the blood in the primary container and thereby separating the blood into blood cells and plasma;
compressing the primary container during centrifuging and thereby expelling the plasma to a secondary container disposed in a central region of the annular primary container;
simultaneously feeding liquid dilutent to the primary container and agitating said primary container with the rotor and thereby resuspending said blood cells, and
returning the suspended blood cells to the blood donor.

4,990,133

REMOVABLE J-J URETERAL STENT

Anthony Solazzo, Warren Township, Somerset County, N.J., assignor to Tenax-Glynn Corporation, Flemington, N.J., a part interest

Filed Apr. 2, 1990, Ser. No. 503,277
Int. Cl.[5] A61M 5/00, 5/178, 25/00
U.S. Cl. 604—8 8 Claims



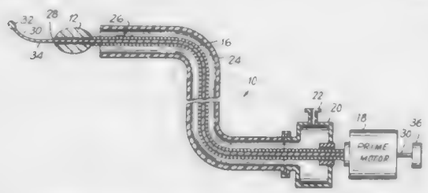
1. An ureteral catheter stent, which comprises: an elongated relatively flexible hollow tubular member having a plurality of drainage openings extending through a wall thereof and having two end portions, each end portion being in the form of a hook, and at least one hook being separate and attachable to said elongated member and having at least one of a male or female interlock unit at the end of said hook and the other of said male or female interlock unit at the end of said elongated member; and, further, wherein the flexibilty of said tubular member is such that said interlock unit is formed so as to functionally engage in an interlocking fashion with the corresponding male or female interlock unit of a separate hook only when a stiff rod in inserted into said hook and said elongated relatively flexible hollow tubular member.

4,990,134

TRANSLUMINAL MICRODISSECTION DEVICE

David C. Auth, Redmond, Wash., assignor to Heart Technology, Inc., Bellevue, Wash.

Continuation of Ser. No. 929,956, Nov. 12, 1986 abandoned, which is a continuation-in-part of Ser. No. 816,190, Jan. 6, 1986, abandoned.
This application Jul. 11, 1989, Ser. No. 378,741
Int. Cl.[5] A61B 17/20
U.S. Cl. 604—22 13 Claims



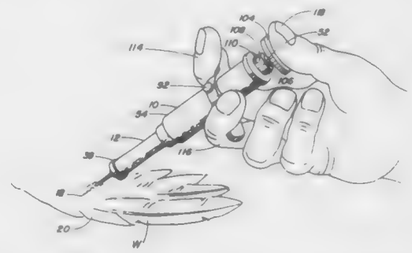
1. A transluminal microdissection device comprising:
(a) flexible, hollow drive shaft having a rotatable, substantially elliposoidal cutting tip attached thereto, said tip having a diameter which is greater than that of said drive shaft and said tip having a substantially cylindrical opening in fluid communication with said hollow drive shaft so that said drive shaft and tip can be guided along a guide wire;
(b) an abrasive surface on said tip, said abrasive surface being comprised of abrasive material attached to the surface of said tip; and
(c) a rotatable prime mover which is capable of rotating said drive shaft at a rotation rate of from about 20,000 revolutions per minute to about 160,000 revolutions per minute, whereby said abrasive material microdissects particles small enough to pass through the capillaries of a person.

4,990,135

INOCULATOR AND NEEDLE THEREFOR

R. Grant Truesdale, Jr., 115 Woodburn Rd., Raleigh, N.C. 27605

Filed Aug. 29, 1989, Ser. No. 399,847
Int. Cl.[5] A61B 17/20
U.S. Cl. 604—47 19 Claims



1. A serum inoculator of the type used to inoculate birds and the like against diseases and comprising:
a serum holding reservoir having a dispensing hole;
a needle extending through said reservoir along the axis of the inoculator and being reciprocable in said reservoir from a closed position with its pointed end substantially contained in said hole, to an inoculating position with its end projecting an inoculating distance beyond said hole;
said needle having a measured serum dose receiving means at a closely spaced distance from said pointed end, said measured dose receiving means including an elongated slot having a side opening that is flared about a substantial portion of its outer perimeter and being adapted for attracting therein a predetermined measured serum dose when said dose receiving means is in contact with said reservoir and for releasing the serum into a bird when the pointed end of the needle is inserted therein;
fixed wiper means in said reservoir adjacent said dispensing hole forming with the pointed end of said needle when said needle is in closed position a seal for sealing serum within said reservoir;
said fixed wiper means for wiping said needle on each inoculating movement thereof except that of a measured dose contained within said measured dose receiving means, and
means including a plunger connected to said needle and extending along the axis of the inoculator to a position to be manually activated to move said needle from a closed to an inoculating position and spring means coiled about said needle and acting on said plunger to return the needle from its inoculating position to its said closed position.

4,990,136

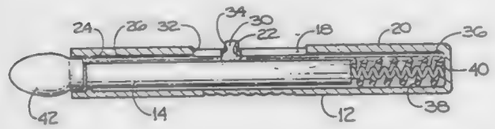
SUPPOSITORY APPLICATOR

Navin M. Geria, Warren, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 12, 1989, Ser. No. 420,797
Int. Cl.[5] A61M 31/00
U.S. Cl. 604—63 8 Claims

1. A suppository applicator which comprises:
a cylinder formed with a longitudinal bore, having an open end and a closed end, said open end adapted for holding a suppository;

a plunger disposed in said cylinder for movement between an extended position, and a withdrawn position; and



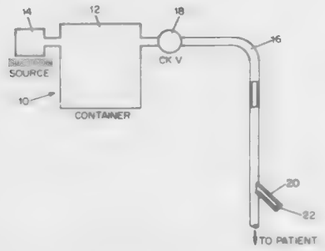
a compound spring disposed between said plunger and said closed end of said cylinder to urge said plunger toward said extended position.

4,990,137

CLOSED WOUND DRAINAGE SYSTEM WITH CLEARING PORT AND METHOD FOR STERILE CLEARING OF CLOSED WOUND DRAINAGE SYSTEM

Dennis Graham, Woodhaven, N.Y., assignor to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Filed Jun. 29, 1988, Ser. No. 212,902
Int. Cl.[5] A61M *1/06*
U.S. Cl. 604—73 **13 Claims**



1. A closed wound drainage system for sterile drainage of body fluids from a patient comprising:

a closed container for receipt of body fluids from a patient;

a suction line connected to the container having an end for placement in fluid communication with the patient for passage of body fluids therethrough into the container; and

a clearing port connected in continuous open fluid communication with the suction line proximal the patient would end and distal the container, the clearing port having a permeable membrane for sealable passage of a syringe needle therethrough for injection of fluid into the suction line towards the container, so as to flush the system without opening the system to atmosphere.

4,990,138

CATHETER APPARATUS, AND COMPOSITIONS USEFUL FOR PRODUCING SAME

Steven R. Bacich, Laguna Niguel; Ronald J. Jabba, Newport Beach; Manouchehr Miraki, Santa Ana; Robert Skribiski, Irvine; Louis Seiler, Jr., Huntington Beach, and Robert L. Wilcox, Fullerton, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

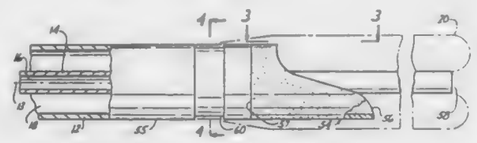
Filed Jul. 18, 1989, Ser. No. 381,895
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 **37 Claims**

1. An apparatus for insertion into the body of a patient comprising:

a flexible catheter tube sized and adapted to be inserted into the body of a patient;

said catheter tube having a distal end portion and a body portion located proximally of said distal end portion;

said catheter tube including a distal end opening defined by a rim which is beveled; and



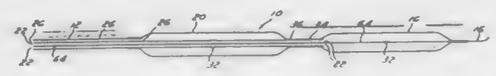
balloon means attached to said catheter tube and capable of being inverted in said catheter tube and of being everted therefrom.

4,990,139

TANDEM INDEPENDENTLY INFLATABLE/DEFLATABLE MULTIPLE DIAMETER BALLOON ANGIOPLASTY CATHETER SYSTEMS

G. David Jang, 204 E. South St., Redlands, Calif. 92373

Continuation of Ser. No. 232,916, Aug. 16, 1988, abandoned, which is a continuation of Ser. No. 905,840, Sep. 10, 1986, Pat. No. 4,763,653. This application Apr. 25, 1990, Ser. No. 514,156
Int. Cl.[5] A61M *25/10*
U.S. Cl. 604—101 **2 Claims**



1. A catheter for performing balloon angioplasty, comprising:

an elongate, flexible catheter shaft having a plurality of lumens therethrough;

a plurality of imperforate angioplasty balloons on said shaft, with the interior of each of said balloons in fluid communication with a different one of said lumens for separate inflation and deflation, each of said balloons having a predetermined maximum inflated diameter and being formed of non-elastomeric material, said balloons being capable of substantially maintaining said predetermined maximum inflated diameter at inflation pressures of 100 psi;

an axial torque guidewire extending through said catheter shaft and out of the distal end of said catheter shaft;

said balloons comprising:

a first balloon on said catheter shaft near the distal end thereof; and

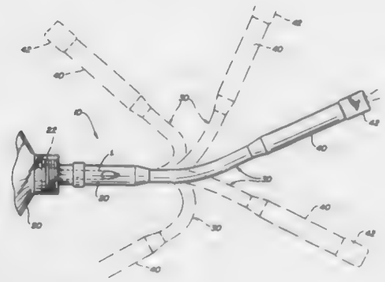
a second balloon on said catheter shaft proximally of and adjacent to said first balloon, wherein the maximum inflated diameter of said first balloon is less than the maximum inflated diameter of said second balloon, wherein the distal end of said first balloon is bonded to said guidewire and the proximal end of said first balloon is bonded to said shaft, said shaft terminating at the proximal end of said first balloon so that when said first balloon is deflated, the distal end of said catheter at said first balloon has a diameter less than the diameter of said shaft, such that when said second balloon is positioned in a stenosis in a branch of the left main artery system, and the first balloon extends into an artery of decreasing diameter, said first balloon does not occlude said artery.

4,990,140

FLEXIBLE SPRAY TIP FOR SYRINGE

John R. Black, Trenton, N.J., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Nov. 13, 1989, Ser. No. 435,855
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **6 Claims**



1. In combination:

a syringe containing a hypodermic needle; and

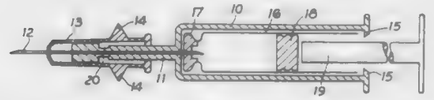
for attachment to said syringe, a bendable connector having a spray tip at one end, said connector having means for retaining said connector in a rigid position after bending and means for attachment to said syringe, said attachment means inserted over said hypodermic needle.

4,990,141

SINGLE-USE SYRINGE

Phillip O. Byrne; Penelope R. Sisson, and Harry R. Ingham, all of Newcastle upon Tyne, England, assignors to National Research Development Corporation, London, England

Filed Jan. 9, 1989, Ser. No. 294,786
Claims priority, application United Kingdom, Jan. 15, 1988, [illegible]
Int. Cl.[5] A61M *5/32, 5/00*
U.S. Cl. 604—198 **6 Claims**



1. A hypodermic syringe suitable for safe disposal after a single use, which syringe comprises:

(a) a generally tubular syringe body which is closed at a first end thereof;

(b) an elongated projection extending in an axial direction from said closed first end of the generally tubular syringe body;

(c) a double-ended hollow needle extending generally axially through said elongated projection from the interior of the syringe body to beyond the distal end of the projection;

(d) a needle sheath slidably mounted upon said elongated projection for movement between a first position in which the needle is exposed for use and a second position in which the needle is enclosed therein;

(e) the second end of said syringe body being generally open whereby an ampoule may be inserted into said syringe body;

(f) an ampoule having a generally tubular body, a closure member at a first end thereof and a piston slidable within the generally tubular body;

(g) a resilient retaining means extending from said second end of said syringe body in a direction which is generally radially inward with respect to said syringe body, whereby to allow said ampoule to enter said syringe body but to obstruct and thereby prevent removal of said ampoule; and

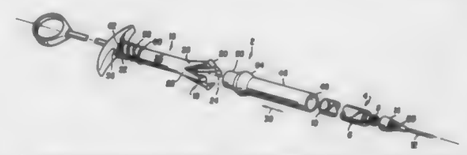
(h) a plunger rod which is adapted to enter a said ampoule within said syringe body and to engage the piston of said ampoule without interconnection therewith and thereby to slide the piston within the ampoule towards the closed end of said ampoule.

4,990,142

HYPODERMIC SYRINGE

J. Kenneth Hoffman, Warren, Pa., and Joseph W. Blake, III, New Canaan, Conn., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 23, 1989, Ser. No. 425,253
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—232 **6 Claims**



1. Apparatus for use with a cartridge to form a hypodermic syringe, said cartridge including an elongated body having a first end and a second end and having a needle attached to said first end by means of a hub which is attached to one end of said needle, comprising;

an elongated tubular member having one end which includes a plurality of arms extending therefrom and an opposite other end, said arms being moveable in a radial direction relative to a longitudinal axis of said elongated member and being resiliently biased away from said longitudinal axis;

said elongated tubular member being configured such that said cartridge is insertable into said elongaed tubular member at said second end of said cartridge until said hub is adjacent said plurality of arms and said meedle is extending from said elongated tubular member in the direction of said longitudinal axis;

said elongated member and said plurality of arms being formed by a unitary structure, said elongated tubular member including a body portion, and each arm of said plurality of arms being integrally hinged to said body portion and extending at an angle away from said body portions at a respective hinge;

urging means positioned around said elongated tubular member and being slideable relative to said elongated tubular member in the direction of said longituinal axis, for urging each arm of said plurality of arms towards said longitudinal axis, and into locking engagement with said hub when said cartridge has been inserted into said elongated member, as said means is moved towards said one end and engages said plurality of arms;

said body portion being cylindrical and further wherein said urging means comprises a sleeve having an inner diameter greater than an outer diameter of said body portion to facilitate sliding movement of said sleeve relative to said body portion along said longitudinal axis;

said sleeve being elongated and including an end adjacent said plurality of arms and an opposite end, said sleeve further including a first rest extending from an inner surface of said elongated tubular member and located between said end and said opposite end, wherein said opposite other end of said elongated tubular member includes a second rest, and further including a compression spring externally concentric with said elongated tubular member and intermally concentric with said sleeve, a first end of said compression spring bearing against said first rest and a second end of said compression spring bearing against said second rest;

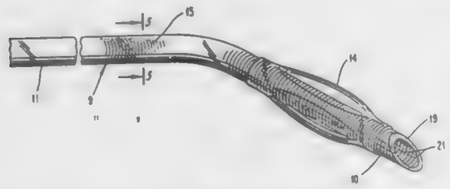
and means associated with said elongated tubular member for dispensing and aspirating said hypodermic syringe which is formed when said cartridge is inserted into and coupled to said elongated tubular member.

4,990,143

REINFORCED MEDICO-SURGICAL TUBES

David S. Sheridan, Argyle, N.Y., assignor to Sheridan Catheter Corporation, Argyle, N.Y.

Filed Apr. 9, 1990, Ser. No. 506,196
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—282 **14 Claims**



1. A reinforced medico-surgical tube comprising:
a tube of flexible material;
a filament helix coaxial with the tube and disposed between inner and outer peripheries of the tube and extending along the tube to a distal end thereof; and
means comprising a plurality of coils of the filament helix at the distal end for providing increased compressive strength of the distal end, the distal end including a distal end face, the filament helix being separated from the distal end face by a thin layer of flexible material such that a cut filament end of the helix is not exposed at the distal end face.

4,990,144

MEDICATING IMPRESSED FILM WOUND DRESSING

Patrick L. Blott, Bishop's Stortford, United Kingdom, assignor to Smith and Nephew Associated Companies plc, England

Continuation of Ser. No. 85,475, Aug. 13, 1987, abandoned. This application Jun. 8, 1989, Ser. No. 363,508
Claims priority, application United Kingdom, Aug. 20, 1986, 8620117
Int. Cl.[5] A61F *13/02*
U.S. Cl. 604—304 **26 Claims**



1. A non-adherent dressing comprising a film which contains depressions impressed out of the plane of the film over the operative area of the dressing and flat land areas between the depressions, wherein at least a portion of the depressions contain one or more apertures, which land area may contact the skin when the dressing is in place and a viscous pharmaceutically acceptable carrier contained within the depressions.

4,990,145

DISPOSABLE BAG WITH HAND PROTECTION

Richard L. Fleury, Chicago, Ill., assignor to GKR Industries, Inc., Alsip, Ill.

Filed Feb. 7, 1989, Ser. No. 306,501
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—317 **18 Claims**

8. A device for capturing body fluids comprising a bag-like container, a funnel-shaped upper member sealingly attached to said bag-like container, and a cover attached to said device for covering a user's hand during use of said device,



said cover and said bag-like container being heat sealed to said funnel-shaped upper member at substantially the same location.

4,990,146

CONTAINERS OF AMINOPOLYMERS

Heinrich Deibig, Guensberg, and Albrecht Dinkelaker, Biberist, both of Switzerland, assignors to Belland AG, Solothurn, Switzerland

Filed Dec. 12, 1988, Ser. No. 283,193
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742472
Int. Cl.[5] A61F *5/44, 25/00*
U.S. Cl. 604—332 **12 Claims**

1. A flexible container, having a composite, layered, synthetic, copolymeric construction having aminogroups, said copolymer comprising:
(a) a first monomer having the formula

$$CH_2{=}CR_1{-}COOR_2,$$

wherein R_1 is hydrogen or methyl and R_2 is an alkyl radical with from 1 to 18 carbon atoms,
(b) a second amino monomer having the formula

$$CH_2{=}CR_1{-}COOR_2\ N{-}R4\ R5,$$

wherein R_1 is the same as before, R_3 is an alkyl radical having 1 to 6 carbon atoms and R4 and R5 are the same or different and represent hydrogen or alkyl radicals having 1 to 4 carbon atoms,
(c) the molar ratio of the first monomer to the second monomer is from 8 to 1 to 2 to 1, and
(d) a third monomer selected from the group consisting of a vinyl ether having 3 to 18 carbon atoms, aromatic vinyl hydrocarbons having 8 to 11 carbon atoms, and acrylates or methacrylates of alcohols having 1 to 18 carbon atoms, and mixtures thereof, and present to the extent of from zero to 16 molar percent,
wherein the molecular weight of the copolymer is from 40,000 to 200,000 daltons.

4,990,147

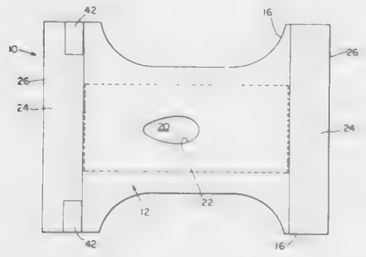
ABSORBENT ARTICLE WITH ELASTIC LINER FOR WASTE MATERIAL ISOLATION

M. Elaine Freeland, Norwood, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 2, 1988, Ser. No. 241,165
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—385.2 **8 Claims**

1. A disposable absorbent article having a longitudinal axis, said article comprising:

a urine impervious backsheet;
an elastic liner made of a two-dimensional elastic material and having at least one passageway through said liner and adapted to permit waste materials to pass through said



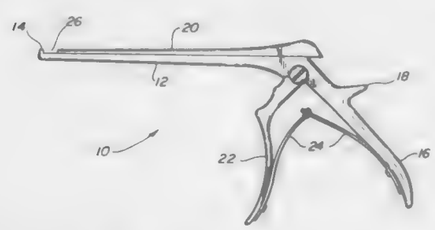
liner, said liner being at least partially peripherally affixed to and foreshortened relative to said backsheet to form a void space registered with said passageway and intermediate said liner and said backsheet; and
an absorbent core intermediate said liner and said backsheet.

4,990,148

THIN FOOTPLATE RONGEUR

Charles B. Worrick, III, Hanson, and John A. Santangelo, East Freetown, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Jan. 13, 1989, Ser. No. 297,141
Int. Cl.[5] A61B *17/16*
U.S. Cl. 606—83 **8 Claims**



1. In a rongeur comprising:
an elongated shank having a perimeter, a distal end, a proximal end, a longitudinal axis and a base plane along at least a portion of said perimeter, said base plane extending in a direction generally parallel to said longitudinal axis;
a footplate at the distal end of said shank extending generally transversely to the axis of said shank from said base plane and having a proximally facing anvil surface;
an elongated crossbar adapted to reciprocate axially with respect to said shank and having a distal end and a proximal end;
cutting means at the distal end of said crossbar aligned in confronting relationship to said footplate so that said footplate provides an anvil against which tissue may be cut;
a recess in the surface of said footplate confronting said cutting means to provide a space to receive tissue during cutting;
means operatively connecting said crossbar and said shank to permit said cutting means to reciprocate against said footplate to cut tissue;
groove means on said base plane and on said anvil surface aligned generally transverse to said shank longitudinal axis and extending from said shank perimeter for separating the intersection of stress fields in said footplate and said shank when said rongeur is placed under stress during cutting.

4,990,149

RELEASABLE ORTHOPEDIC BROACH HANDLE APPARATUS

Thomas W. Fallin, Memphis, Tenn., assignor to Richards Medical Company, Memphis, Tenn.

Filed Jan. 24, 1989, Ser. No. 301,159
Int. Cl.[5] A61B *17/16*
U.S. Cl. 606—85 **15 Claims**



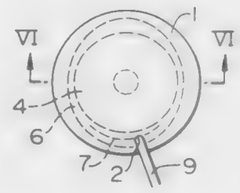
1. An improved broach handle for use with an orthopedic broach having a tapered configuration for preparing a bone to receive an implant, the broach including a tapered roughened portion and an upper end with a portion adapted to engage the handle, comprising:
(a) an elongated handle body portion having a first portion defining a connection end adapted for connection to the upper end portion of the broach, and a second portion adapted to be gripped by a user;
(b) socket means formed at the connection end portion of the handle body for receiving at least a portion of the end portion of the broach;
(c) lock means in the form of a solid sliding member adapted for movement relative to the elongated handle body portion between engaged and disengaged positions, and including a first end portion adapted to extend into the socket and engage a cooperating portion of the upper end of the broach for locking the broach relative to the handle;
(d) the lock means including a second end portion adapted to be disposed in the vicinity of the second portion of the handle body portion in an exposed position so that the lock means can be engaged and moved by the user with one hand when simultaneously gripping the handle body portion; and
(e) spring means for urging the lock means toward the engaged position, the lock means being movable toward the disengaged position by the user.

4,990,150

BANDAGE FOR MAINTAINING ANTERIOR CHAMBER OF EYE

Kazuo Tsubota, Utsunomiya, and Hiroshi Sakai, Kodaira, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,580
Int. Cl.[5] A01F *9/00*
U.S. Cl. 606—107 **9 Claims**



1. A bandage having anterior and posterior surfaces and a peripheral edge for maintaining the anterior chamber of an eye during an opthalmic operation, which is formed so as to cover the outer front surface of the eye and an incision therethrough

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during said operation and to tightly contact the incision and its circumference so as to prevent the outflow of aqueous humor from the anterior chamber, said bandage having a small hole extending from said anterior surface to said posterior surface inside said peripheral edge for insertion of instruments for said operation, said small hole being in a position on said bandage to substantially overlie the incision during said operation, and said bandage being transparent.

4,990,151

DEVICE FOR TRANSLUMINAL IMPLANTATION OR EXTRACTION

Hans I. Wallstén, Villa Pré-Boisé , Sweden, assignor to Medinvent S.A., Lausanne, Switzerland

Filed Sep. 18, 1989, Ser. No. 408,362
Claims priority, application Sweden, Sep. 28, 1988, 8803444
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—108 19 Claims



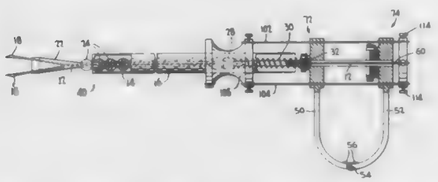
1. A device for transluminal implantation and extraction of a substantially tubular, radially expandable stent, comprising a central tube surrounded by a concentric exterior tube axially displaceable relative to the central tube, a plurality of axially extending gripping members attached to an outer surface of said central tube at a distal end thereof, said members being substantially evenly distributed around the periphery of said central tube and outwardly expandable when said exterior tube is axially displaced from the distal end of said central tube and toward a proximal end of said device, radial openings provided in said central tube to receive said gripping members therein, said members forming a nip between said members and said central tube when said exterior tube is moved in an axial direction toward the distal end of said central tube and away from said proximal end.

4,990,152

APPLICATOR DEVICE HOUSING MULTIPLE ELASTIC LIGATURES IN SERIES AND FOR DILATING AND APPLYING ELASTIC LIGATURES ONTO ANATOMICAL TISSUE

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Filed Oct. 12, 1988, Ser. No. 256,639
Int. Cl.[5] A61B *17/12*
U.S. Cl. 606—140 14 Claims



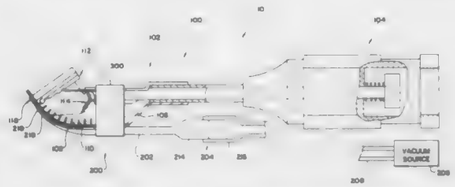
12. In combination, at least one apertured elastic ligature and a device for applying said at least one apertured elastic ligature to anatomical tissue comprising elongate applicator means having a proximal end and a distal end including means disposed between said proximal and distal ends of said applicator means for storing said at least one elastic ligature in a relaxed, substantially unexpanded state, means for positioning anatomical tissue in a ligating position adjacent said distal end of said applicator means, means for expanding said at least one elastic ligature and positioning said elastic ligature about the anatomical tissue in the ligating position, and means disposed at said proximal end of said application means for operating said expanding and positioning means whereby said at least one elastic ligature is stored in a relaxed, substantially unexpanded state prior to engagement with anatomical tissue for ligation thereof.

4,990,153

SURGICAL SUTURING SYSTEM AND PROBE ASSEMBLY

William D. Richards, Medway, Mass., assignor to Ophthalmic Ventures Limited Partnership, Norwood, Mass.

Division of Ser. No. 255,541, Oct. 7, 1988, Pat. No. 4,927,428.
This application May 22, 1990, Ser. No. 527,101
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—148 12 Claims



1. A surgical suturing system for suturing human and animal tissue, said system configured to be connected to a vacuum source, said system comprising:

(a) stapler means for suturing human and animal tissue, said staple means configured to selectively eject at least one staple from an ejection slot in said stapler means for suturing adjacent edges of the tissue; and

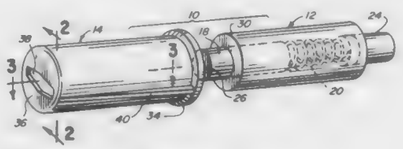
(b) a probe connected to said stapler means for positioning and holding the edges of the tissue to be sutured in juxtapositional coplanar alignment, an aperture formed at a working end of said probe is positioned in proximity to said ejection slot, said probe configured to be connected to a vacuum source, a suction at said aperture at said working end of said probe being sufficient to captively hold the tissue being sutured when said probe is placed in proximity to the tissue, said working end of said probe configured to capture one edge of the tissue to be sutured and hold the one edge while said stapler means is moved to a position for placing the one edge in juxtapositional alignment with the other or free edge of the tissue and capturing the free edge of the tissue, the one edge and the other edge of the tissue to be sutured are held in coplanar juxtapositional alignment by said probe while said stapler means is suturing the tissue.

4,990,154

LANCET ASSEMBLY

Michael K. Brown; Mohammad Kheiri, both of Elkhart, Ind.; D. Glenn Purcell, Edwardsburg, Mich.; William Taylor, Goshen, and Robert Whitson, Osceola, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Jun. 19, 1989, Ser. No. 367,862
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—182 10 Claims



1. A lancet assembly comprising:

a base unit providing a handle for said lancet assembly,

a disposable end cap releasably attachable to said base unit,

a lancet mounted in and entirely contained within said end cap,

a hammer member mounted in said base unit for engaging and driving said lancet in said end cap, and

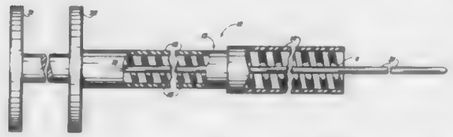
a lancet return member located within said end cap for moving the entire lancet totally within said end cap after said lancet is driven by said hammer.

4,990,155

SURGICAL STENT METHOD AND APPARATUS

Howard M. Wilkoff, 88 Hickory Rd., Weston, Mass. 02193

Filed May 19, 1989, Ser. No. 354,185
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—191 21 Claims



1. A method for preventing arterial restenosis after angioplasty, comprising the steps of:

winding a plastic material filament into a helical base coil having a cross-section of substantially uniform given diameter; said providing step comprising the step of inducing in said filament an elastic memory that provides an inherent tendency for said base coil to return to said given diameter after any distortion thereof;

forming from said base coil a helical coil stent with a cross-section having a substantially uniform predetermined diameter substantially less than said given diameter;

releasably coupling said coil stent to an elongated delivery device adapted to pass through a blood carrying vessel;

inserting said coil stent and delivery device into a vessel;

manipulating said delivery device within the vessel so as to position said coil stent at a desired location therein;

decoupling said coil stent from said delivery device;

removing said delivery device from the vessel; and

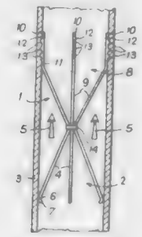
allowing said elastic memory to expand said coil stent into contact with the inner walls of the vessel and to a diameter substantially greater than said predetermined diameter.

4,990,156

FILTER FOR MEDICAL USE

Jean-Marie Lefebvre, 219, boulevard de la Liberté , 59800 Lille, France

Filed Jun. 14, 1989, Ser. No. 365,970
Claims priority, application France, Jun. 21, 1988, 88 08689
Int. Cl.[5] A61M *25/04*
U.S. Cl. 606—200 16 Claims



1. A medical filter adapted to be implanted in a blood vessel of a patient through the endovenous route via a catheter, said blood vessel having a flow of blood therethrough and possible clots and an inner wall, said filter comprising

filtering means adapted to open out in said vessel when positioned within the patient,

said filtering means being formed without hooking means for engaging the inner wall of said vessel,

and means for holding said filtering means in place with respect to the vessel,

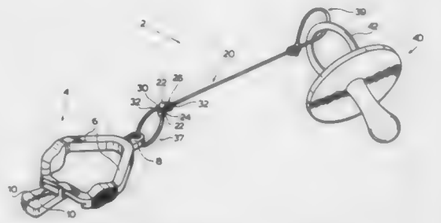
said holding means permitting temporary use of said filter and passage from a situation of temporary use wherein the filter may be withdrawn from the vessel to a situation of definitive use of the filter.

4,990,157

SOOTHER RETAINER

David L. Roberts, Toronto, and Clyde D. Hillier, London, both of Canada, assignors to Robhill Industries Inc., Toronto, Canada

Filed Nov. 13, 1989, Ser. No. 435,040
Int. Cl.[5] A61J *17/00*; A61F *5/37*; A61B *17/00*
U.S. Cl. 606—234 12 Claims



1. In combination a baby soother, a retaining strap and a one piece plastic clip;

said baby soother including a large open ring portion to one side thereof;

said one piece plastic clip having overlapping arms biased towards one another and defining a fabric gripping portion therebetween, said plastic clip further having means for releasably engaging said strap generally remote from said fabric gripping portion;

said plastic strap at one end forming a closed loop engaging said large open ring portion of said baby soother such that said ring is slidable thereon and pivotal thereabout, said plastic strap at the opposite end forming a closed loop portion engaging said means for releasably engaging said strap such that said plastic clip is slidable along and pivotal about said respective closed loop portion, said strap having sufficient structural integrity to move to an elongate configuration when bent in the length thereof to form a loop and thereafter released.

4,990,158

SYNTHETIC SEMIABSORBABLE TUBULAR PROSTHESIS

Donald S. Kaplan, Weston; John Keanedy, Stratford, and Ross R. Muth, Brookfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed May 10, 1989, Ser. No. 349,648
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—1 38 Claims

1. A synthetic, semiabsorbable composite yarn which comprises:

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(a) a nonabsorbable, elastic core yarn imparting resiliency to the composite yarn; and,



(b) at least one absorbable, relatively inelastic sheath yarn imparting transverse strength to the composite yarn.

4,990,159

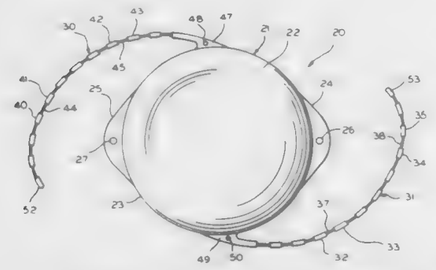
INTRAOCULAR LENS APPARATUS WITH HAPTICS OF VARYING CROSS-SECTIONAL AREAS

Manus C. Kraff, 5600 W. Addison, Chicago, Ill. 60634

Filed Dec. 2, 1988, Ser. No. 279,572

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 **16 Claims**



1. An intraocular lens apparatus for implantation in the posterior chamber of an eye, in which said apparatus is inserted into an eye along a longitudinal direction through an incision made in the eye, said apparatus having strong, yet flexible support means for positioning and maintaining of said position of said apparatus within the interior of the eye, and further enabling ease in manipulation, rotation and positioning of said apparatus after insertion into said posterior chamber of the eye, said intraocular lens apparatus comprising:

substantially circular lens means having an anterior side, an opposite posterior side and a peripheral edge;

positioning means operably attached to said lens means for enabling facilitated manipulation of said intraocular lens apparatus once the apparatus is inserted within the eye for proper positioning therein;

resilient support means operably attached to said lens means and extending outwardly therefrom, for retaining and stabilizing said intraocular lens apparatus once appropriately located within the eye by contacting said eye interior along a region of contact, and

said support means comprising at least one flexible loop member having a plurality of regions of increased cross-section, each positioned adjacent to a region of narrowed cross-section along its length, so as to comprise alternating regions of increased and decreased cross-section with at least, one of said regions of increased cross-section having a substantially continuous transverse cross-section along its length, for increasing flexibility of said at least one loop member and provide a maximized region of contact within said interior of said eye, while simultaneously enabling said intraocular lens apparatus to be inserted into the eye through a relatively small axial incision.

4,990,160

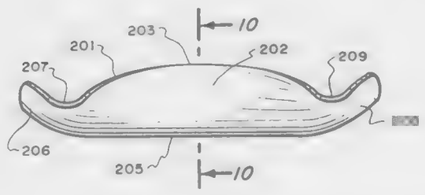
EXTENDED CHIN AND MANDIBLE IMPLANTS

Edward Terino, 28222 Agoura Rd., Ste. 241, Agoura Hills, Calif. 91301

Continuation of Ser. No. 154,535, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 822,172, Jan. 24, 1986, abandoned. This application Sep. 5, 1989, Ser. No. 404,005

Int. Cl.[5] A61F *2/02*

U.S. Cl. 623—11 **4 Claims**



1. A chin shell implant used in cosmetic and reconstructive surgery for surgical incision adjacent the human mandible and underneath the fleshy portion of the chin for creating a fuller chin profile in a patient having a receding or minimal chin area comprising:

a chin implant having a front portion;

a left side flank portion, and an opposite right side flank portion each extending rearwardly from said front portion;

said front portion having a front convex surface and a back concave surface, said front portion having the appearance of an elongate clam shell;

the horizontal cross section of said front convex surface of said front portion being a convex contour;

the vertical cross sections of said front convex surface of said front portion being variable convex contours;

said front convex surface of said front portion having an area of greatest prominence at the lower mid-region of said front convex surface for forming a naturally appearing and aesthetically pleasing chin;

the horizontal cross section of said back surface of said front portion having a concave contour for close positioning of the implant against the mandible;

the vertical cross sections of said back concave surface having variable concave contours;

said back concave surface having an area of acute concavity behind said lower mid-region of said front convex surface for providing a snug fit against the underlying mandible;

said vertical concave cross sections having the most acute concave contour at said area of acute concavity, said vertical contours becoming less acute on either side of said area of said acute concavity and flattening out when going to the ends of both said flank portions;

said front portion forming a lower edge which is relatively flat and is for being positioned below the lower rim of a patient's mandible after the implant is surgically implanted for giving the appearance of a fuller chin on the patient by pushing out the overlying fleshy portion of the patient's chin;

said front portion, said left side flank portion, and said right side flank portion forming an upper edge on said implant;

said upper edge having an arcuate medial area for riding high upon the chin area of said patient for creating a fuller chin and mandible appearance;

said medial upward arcuate portion of said upper edge tapering downward toward said flank portions and further including a pair of bilateral cutaways on said upper edge for avoiding the mental foramina.

4,990,161

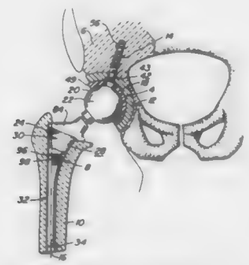
IMPLANT WITH RESORBABLE STEM

Stanley L. Kampner, 1270 Armsby Dr., Hillsborough, Calif. 94010

Continuation-in-part of Ser. No. 590,258, Mar. 16, 1984. This application Sep. 6, 1984, Ser. No. 647,764

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—16 **34 Claims**



1. An anchor for a permanent implant for a bone joint comprising an elongated member for insertion into a bone cavity for fixing the implant relative to the bone, the member being constructed substantially entirely of a biodegradable material so that the member can resorb after a period of time, the member having an exterior surface shaped to tightly engage the cavity and to be substantially immovably disposed within the cavity after being placed therein, and means for securing the member to the permanent implant.

4,990,162

ROTARY HAND PROSTHESIS

Maurice LeBlanc, Redwood City, Calif.; Lawrence Carlson, Boulder, and Carlb Nelson, Denver, both of Colo., assignors to Children's Hospital at Stanford, Palo Alto, Calif.

Continuation of Ser. No. 170,489, Mar. 21, 1988, abandoned. This application Aug. 22, 1989, Ser. No. 397,328

Int. Cl.[5] A61F *2/54, 2/68*

U.S. Cl. 623—63 **15 Claims**

1. A prosthetic prehensor for attachment to the end of an arm, comprising:

a first elongate member extending away from said arm and having a first member far end and edge and palm surfaces between said arm and said far end, said palm surface being substantially wider than said edge surface;

a second elongate member rotatably coupled to said first elongate member and extending in a direction parallel to said first elongate member and having a second member far end and first and second opposed sides between said arm and said second member far end; and

means for rotating said second elongate member about an axis removed from said first elongate member in a first direction of rotation so that said first side of said second member contacts said edge surface of said first member and rotating said second elongate member in a second opposite direction of rotation so that said second side of



said second member contacts said palm surface of said first member.

4,990,163

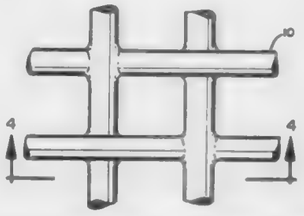
METHOD OF DEPOSITING CALCIUM PHOSPHATE CERMAMICS FOR BONE TISSUE CALCIFICATION ENHANCEMENT

Paul Ducheyne, Bryn Mawr; John Cuckler, Haverford, both of Pa., and Shulamit Radin, Cherry Hill, N.J., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Feb. 6, 1989, Ser. No. 307,326

Int. Cl.[5] A61F *2/28*

U.S. Cl. 623—66 **15 Claims**



1. A method of depositing a highly soluble bone tissue activation material upon the porous metallic substrate surface of a bone implant device, comprising the steps of:

(a) combining a calcium deficient hydroxyapatite powder which contains approximately less than about 5% by weight of adsorbed water and a non-aqueous liquid to form a suspension;

(b) agitating said suspension to deglomerate said powder;

(c) immersing the substrate into said suspension;

(d) depositing a calcium phosphate film on said substrate by low voltage electrophoresis to form a uniform coating in thickness on all surfaces of the substrate whereby said thickness is at least 5 microns which, after implantation, enhances bone tissue growth into said device.

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4,990,164

PROCESS FOR THE PHOTOCHEMICAL STABILIZATION OF UNDYED AND DYED POLYAMIDE FIBRE MATERIAL AND BLENDS THEREOF WITH COPPER COMPLEX OF HYDROXY-SALICYL-OYL-HYDROXYLAMINE DERIVATIVE

Helmut Huber-Emden, Schönenbuch, and Gerhard Reinert, Allschwill, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

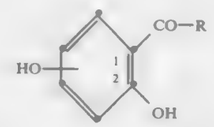
Filed Sep. 27, 1989, Ser. No. 413,370

Claims priority, application Switzerland, Sep. 29, 1988, 3621/88

Int. Cl.[5] **C07F** *1/08;* **D06P** *1/64, 3/24;* **D06M** *13/50*

U.S. Cl. 8—442 **9 Claims**

1. A process for the photochemical stabilization of undyed and dyed polyamide fibre material, or blends thereof with other fibre material, using photochemically stabilizing compositions based on copper compounds of phenols, which process comprises treating said polyamide fibre material with fibre-reactive organic copper complexes of the reaction products of o-hydroxybenzoyl derivatives of the formula



(I)

wherein R is hydrogen or C_1–C_4 alkyl and the OH substituent is located in the 3-, 4-or 5-position, with hydroxylamine.

4,990,165

PERMEABLE MEMBRANES FOR ENHANCED GAS SEPARATION

Benjamin Bikson, Brookline; James E. Miller, Waltham, and Joyce K. Nelson, Lexington, all of Mass., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Division of Ser. No. 80,476, Jul. 31, 1987, Pat. No. 4,881,954. This application Sep. 27, 1989, Ser. No. 413,094

Int. Cl.[5] **B01D** *53/22, 71/68*

U.S. Cl. 55—158 **15 Claims**

1. An asymmetric membrane having enhanced gas separation characteristics comprising a relatively thin dense semipermeable skin region and a less dense, porous non-selective support region that serves to preclude the collapse of the skin region under pressure, said skin region being capable of selectively permeating a more readily permeable component of a feed mixture to be separated at a desirably high permeation rate, said membrane having washed and dried, and having been exposed in essentially dry form to an elevated temperature of from about 15° C. to about 1° C. less than the glass transition temperature of the membrane material under non-swelling conditions for a period of time sufficient to modify the membrane structure to create asymmetry therein and to increase its compaction resistance and collapse pressure, whereby said asymmetric membrane exhibits enhanced selectivity and permeability characteristics, and advantageous combinations of selectivity and permeability, together with desirable compaction resistance and collapse pressure, on a repeatable basis, enhancing the uniformity and reliability of the membrane for use in gas separation operations.

4,990,166

GAS STREAM PURIFYING EQUIPMENT

William F. Babich, 419 Franklin St., East Pittsburgh, Pa. 15112

Filed Jun. 8, 1989, Ser. No. 363,626

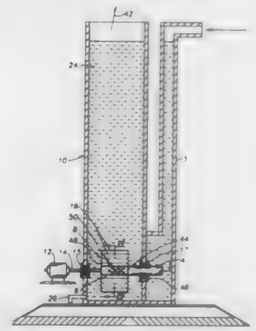
Int. Cl.[5] **B01D** *47/06*

U.S. Cl. 55—228 **13 Claims**

1. Apparatus for purifying a contaminated gas stream by removing particulate matter and contaminant gases therefrom, said apparatus comprising

tank means of substantial height containing a liquid medium therein;

rotor means positioned in the vicinity of the bottom portion of said tank means, said rotor means forming a central space interiorly thereof and having a plurality of spaced blade means along the periphery thereof;



means for causing rotation of said rotor means at a velocity sufficiently high to prevent liquid in said tank means from entering spaces between said blade means, said velocity further being sufficiently high to draw contaminated gas into said central space by suction;

means for conducting a stream of contaminated gas to said central space; and

means positioned within said central space for enhancing the suction created by rotation of said rotor means.

4,990,167

SCRUBBING COLUMN FOR AN APPARATUS FOR THE DESULFURIZATION OF FLUE GASES

Werner Stehning, Dorsten, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 450,901

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843810

Int. Cl.[5] **B01D** *47/06*

U.S. Cl. 55—257.1 **10 Claims**

1. A scrubber for an apparatus for the desulfurization of a boiler flue gas, comprising:

an upright substantially cylindrical column;

inlet means for admitting a flue gas to be scrubbed to said column at a lower portion thereof;

means forming a sump collecting scrubbing liquid in said column below said inlet means;

means connected with said column for introducing a scrubbing liquid into said column and means in said column for spraying scrubbing liquid into a rising stream of said flue gas in said column;

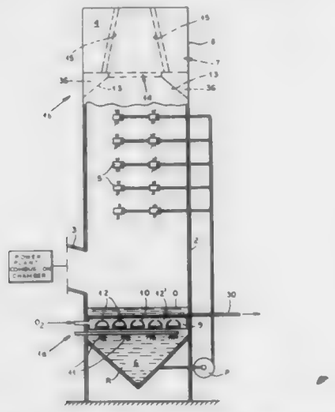
means forming a head with a circular cross section at an upper end of said column, said head being formed with a radial outlet for scrubbed flue gas;

a partition in said head defining an elongated slot-shaped central passage extending along a diameter of said circular cross section in a direction of said radial outlet between an interior of said head and a portion of the column below said head, said scrubbed flue gas passing through said slot-shaped central passage into said head;

a pair of liquid-separator registers flanking said slot-shaped central passage in said head along opposite longitudinal sides of said slot-shaped central passage and traversed by said scrubbed flue gas so that said scrubbed flue gas passes

into spaces outwardly of said registers and communicating with said radial outlet; and

a further liquid-separator register in said head upstream of said radial outlet and disposed at an end of said slot-shaped



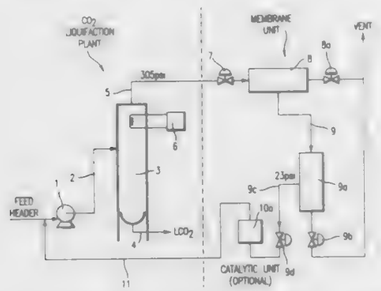
central passage proximal to said radial outlet, each of said registers comprising an array of impingement baffles recovering liquid entrained by the scrubbed flue gas traversing the registers as said scrubbed flue gas passes into said radial outlet.

4,990,168

RECOVERY OF CARBON DIOXIDE FROM A CARBON DIOXIDE PLANT VENT GAS USING MEMBRANES

Richard A. Sauer, 5601 Quincy St., Hinsdale, Ill. 60521, and Joseph E. Paganessi, 31-35 Avenue Thierry, Ville d'Avray, France

Filed Jul. 17, 1989, Ser. No. 380,380
Int. Cl.[5] F25J *3/02*
U.S. Cl. 62—24 13 Claims



1. A process for recovering CO_2 from a CO_2 liquefaction plant vent gas, said process consisting essentially of:

(1) feeding said vent gas to at least a first semipermeable gas separation membrane to form a CO_2-enriched permeate and non-permeating gas;

(2) venting said non-permeating gas to the atmosphere;

(3) optionally passing said CO_2-enriched permeate from said first semipermeable gas separation membrane to a second semipermeable gas separation membrane;

(4) optionally passing said CO_2-enriched permeate through a passive catalytic burn-out unit; and

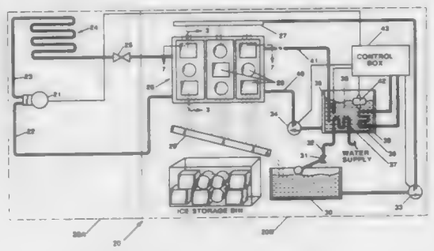
(5) passing said CO_2-enriched permeate to a feed-input of said CO_2 liquefaction plant.

4,990,169

ICE MAKING METHOD AND FOR APPARATUS

John A. Broadbent, Golden Valley, Minn., assignor to Broad Research, Golden Valley, Minn.

Continuation-in-part of Ser. No. 271,228, Nov. 14, 1988, Pat. No. 4,922,723. This application Sep. 21, 1989, Ser. No. 410,369
Int. Cl.[5] F25C *1/12*
U.S. Cl. 62—72 27 Claims



9. Apparatus for making ice comprising:

a refrigerated surface;

a flexible ice forming membrane coupled to said refrigerated surface forming a chamber therebetween;

a water supply means adjacent said ice forming membrane for distributing water onto the exterior side of said ice forming membrane;

hydrostatic liquid pressure means coupled to said chamber for flexing said membrane into contact with said refrigerated surface by the application of a lower than ambient pressure to said chamber, whereby said ice is formed on said membrane;

pump means for pumping a flexing fluid into said chamber and flexing said membrane away from said refrigerated surface, whereby said ice is detached from said membrane;

means for detecting a leakage of said flexing fluid from said chamber;

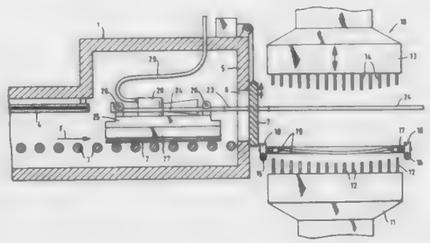
control circuitry connected to said leakage detecting means to deactivate said ice making apparatus if leakage of said flexing fluid from said chamber is detected.

4,990,170

METHOD AND APPARATUS FOR BENDING AND TEMPERING GLASS PLATES

Luc Vanaschen, Eupen, Belgium; Hans-Werner Kuster; Benoit D'Iribarne, both of Aachen, Fed. Rep. of Germany, and Heinz Kentrat, Geilenkirchen, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Apr. 16, 1990, Ser. No. 509,163
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1989, 3913571
Int. Cl.[5] C03B *23/025, 27/044*
U.S. Cl. 65—104 8 Claims



1. An apparatus for bending and tempering a glass plate, comprising:

a furnace having a conveyor for conveying glass plates in a downstream direction;

a bending and tempering station adjacent said furnace; and

a suction plate movable between said furnace and said bending and tempering station for transferring a glass plate from said furnace to said bending and tempering station,

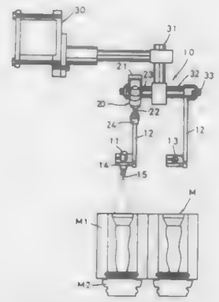
wherein said bending and tempering station is external to said furnace and comprises a concave circumferential bending ring on which the glass plate can be supported for bending the glass sheet, a movable carriage on which said bending ring is supported and two blowing boxes positioned for blowing cooling air on a glass sheet supported on the bending ring.

4,990,171

LUBRICANT SPRAY NOZZLE ON A GUIDE RAIL FOR GLASS BOTTLE MOLDS

Hajime Kojima, Gifu, and Akihiko Ono, Hashima, both of Japan, assignors to Kabushiki Kaisha N-Tech and Nihon Taisanbin Kogyo Kabushiki Kaisha, both of Ogaki, Japan

Filed Dec. 4, 1989, Ser. No. 444,911
Claims priority, application Japan, Dec. 6, 1988, 63-158763[U]
Int. Cl.[5] C03B *40/00*
U.S. Cl. 65—169 6 Claims



1. In a glass bottle making machine, having an array of a plurality of molding sections, each section having a molding die, a spraying nozzle for spraying a mist of lubricant mixed with air onto an inner surface of each said molding dies, said spraying nozzle, at the time of said spraying, being located in a defined space above each said molding dies, an actuator connected to said spraying nozzle for reciprocating the latter between a spraying position in which the spraying nozzle is located directly above each of said molding dies to spray a mist of lubricant onto the inner surface of each of said molding dies and an inoperative position apart from said spraying position, the improvement comprising a guide rail and means for moving said spraying nozzle and said actuator along said guide rail to said defined space above each said molding die.

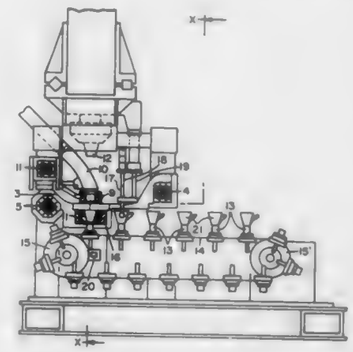
4,990,172

AUTOMATIC MACHINE FOR MOULDING GLASS ARTICLES

Gilbert D. Pujol, Dammarie Leslys, and Ian F. Rae, Avon, both of France, assignors to Corning Incorporated, Corning, N.Y.

Filed Mar. 20, 1990, Ser. No. 496,364
Claims priority, application France, Mar. 21, 1989, 89 03667
Int. Cl.[5] C03B *11/12*
U.S. Cl. 65—319 2 Claims

1. An automatic machine for moulding glass articles by means of pressing, comprising a single split mould, means for opening and closing the mould, means for introducing a metered batch of molten glass into the said mould when the latter is in the closed position, pressing means in order to shape the batch of molten glass introduced into the said mould to the form of the said mould, and means for taking the shaped glass article away from the mould after opening of the latter, characterized in that the mould has two main parts capable of being brought into a closed or open position and intended to shape, in cooperation with the pressing means, the article to be moulded, with the exception of the base thereof, and means for periodically cooling the said main parts at least at certain locations thereof, using a pulse of cooling fluid, and in that it



additionally comprises a plurality of mould bases capable of being brought successively into a position in which they complete the said mould after the said main parts have been brought into the closed position, the said mould bases additionally serving to take away the still malleable glass article having just been moulded, after opening of the mould and to support the said glass article until it has reached a degree of cooling such that it can be manipulated without risk of deformation.

4,990,173

HYDROPHILIC MUSHROOM GROWTH SUPPLEMENT AND METHOD OF USING SAME

Hirschel A. Katz; George W. Pratt, and Duane O. Tackaberry, all of Cedar Rapids, Iowa, assignors to Penford Products Co., Cedar Rapids, Iowa

Continuation of Ser. No. 169,883, Mar. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 047,825, May 8, 1987, abandoned. This application Jun. 9, 1989, Ser. No. 364,485
Int. Cl.[5] C05F *11/08*
U.S. Cl. 71—5 17 Claims

1. A medium for growing mushrooms comprising: po1 (a) composted organic materials;

(b) mushroom mycelia;

(c) casing materials; and

(d) hydrophilic granular nutrient supplement particles each comprising an inner core and an outer hydrophilic coating wherein said inner core comprises 75–99% by weight of said particle and consists essentially of a granular proteinaceous material selected from the group consisting of casein, whey, cottonseed meal, soybean meal, soy protein, corn gluten feed, corn gluten meal and wheat gluten; and said outer hydrophilic coating comprises 1–25% by weight of said particle and comprises hydrophilic starch coated on the surface of said inner core.

4,990,174

N-PHENYLTETRAHYDROINDAZOLE DERIVATIVES HERBICIDAL COMPOSITIONS AND USE

Lothar Rueb, Speyer; Karl Eicken, Wachenheim; Peter Plath, Frankenthal; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

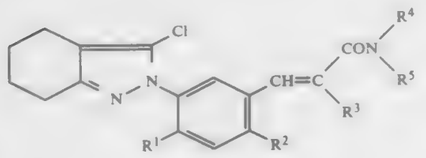
Filed Jan. 9, 1990, Ser. No. 462,704

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1989, 3901705

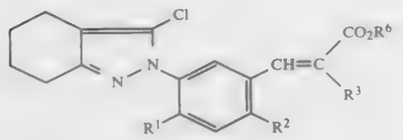
Int. Cl.[5] A01N *43/56, 43/84;* C07D *231/56, 413/10*

U.S. Cl. 71—92 3 Claims

1. N-Phenyltetrahydroindazole derivatives of the formulae Ia and Ib



Ia



Ib

where

R^1 is hydrogen or fluorine,

R^2 is halogen,

R^3 is hydrogen, halogen or a C_1–C_4-alkyl,

R^4, R^5 are hydrogen, C_1–C_6-alkyl, C_2–C_4-alkyl which carries a hydroxyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio group, C_1–C_6-alkoxy, C_3–C_6-alkenyl, C_3–C_6-alkynyl, C_3–C_6-alkenyloxy or C_3–C_6-alkynyloxy, or together with the nitrogen atom form a 5- or 6-membered aliphatic ring in which a methylene group may be replaced by an oxygen atom, and

R^6 is hydrogen, C_1–C_6-alkyl which is unsubstituted or substituted by one or two C_1–C_4-alkoxy groups, or is C_3–C_6-alkenyl, C_3–C_6-aklynyl or benzyl.

2. A herbicidal agent which comprises an N-phenyltetrahydroindazole derivative of the formulae Ia or Ib, or a mixture of Ia and Ib, as set forth in claim 1, and inert additives.

4,990,175

FOLIAR APPLIED HERBICIDAL COMPOSITIONS CONTAINING A SILICONE GLYCOLSILICONE ALKANE TERPOLYMER ADJUVANT

Lenin J. Petroff, Bay County; David J. Romenesko, and Robert A. Ekeland, both of Midland County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 365,628, Jun. 13, 1989, abandoned. This application Dec. 13, 1989, Ser. No. 450,342

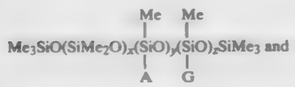
Int. Cl.[5] A01N *43/48*

U.S. Cl. 71—92 10 Claims

1. A composition comprising:

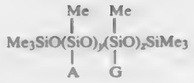
(I) a Primisulfuron herbicide; and

(II) from about 0.1 to about 10 parts by weight, for each part by weight of said herbicide (I), of a silicone glycol-silicone alkane terpolymer adjuvant having the average formula selected from the group consisting of



and

-continued



wherein Me denotes a methyl radical, A is a linear or branched alkyl radical having 6 to 24 carbon atoms, G is a glycol moiety having the formula $—R'(OCH_2CH_2-)_mOZ$, in which R' is a divalent alkylene group having 2 to 6 carbon atoms, Z is selected from the group consisting of hydrogen, an alkyl radical having 1 to 3 carbon atoms and an acyl group having 2 to 4 carbon atoms and m is 12 to 32, x is 0.01 to 3, y is 0.1 to 1.25 and z is 0.75 to 1.9, with the proviso that when the weight fraction of $—OCH_2CH_2—$ groups of said terpolymer (II) is less than 0.7 said alkyl radical A contains from 6 to 12 carbon atoms and when the weight fraction of $—OCH_2CH_2—$ groups of said terpolymer (II) is more than 0.8 said alkyl radical A contains from 8 to 24 carbon atoms.

4,990,176

4-METHYLTETRAHYDROPHTHALIMIDE HERBICIDES

Beat Böhner, Binningen; Hans Moser, Magden, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 88,638, Aug. 24, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 826,428

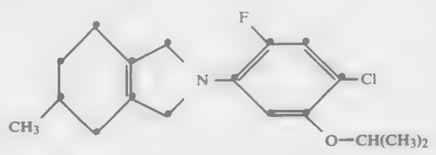
Claims priority, application Switzerland, Sep. 3, 1986, 3537/86

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[5] A01N *43/38;* C07D *209/48*

U.S. Cl. 71—96 5 Claims

1. A compound of the formula



2. A herbicidal composition, characterized in that, in addition to carriers and/or other adjuvants, it contains as active ingredient the compound according to claim 1.

4,990,177

HERBICIDAL METHOD USING DIFLUFENICAN

Richard H. Hewett, Thaxted, and Ponnan Veerasekaran, Ongar, both of England, assignors to May & Baker, Ltd., Dagenham, England

Filed Jul. 1, 1986, Ser. No. 881,006

Claims priority, application United Kingdom, Jul. 2, 1985, 8516764; Oct. 30, 1985, 8526733

Int. Cl.[5] A01N *31/08, 37/22, 43/40*

U.S. Cl. 71—94 14 Claims

1. A method of controlling the growth of weeds at a locus which comprises applying to the locus an effective amount of a composition consisting essentially of

(a) at least one urea herbicide of the general formula:

$$R^1N(R^2)CON(R^3)R^4 \qquad I$$

wherein

R^2 represents a hydrogen atom;

R^3 represents a group;

R^1 represents a 3-chloro-4-methylphenyl or 4-isopropylphenyl group and R^4 represents the methyl group, or R^1 represents a 3,4-dichlorophenyl group and R^4 -represents a methyl, methoxy or butyl group, and;

(b) diflufenican, which is N-(2,4-difluorophenyl)-2-(3-trifluoromethylphenoxy) nicotinamide,

in which the application rate of the urea herbicide is in the range of about 150 g to about 4 kg per hectare and the application rate of diflufenican is in the range of about 25 g to about 750 g of diflufenican per hectare.

4,990,178

NEW HERBICIDE, ITS PREPARATION AND USE

Tatsuo Haneishi; Mutsuo Nakajima, both of Tokyo; Kiyoshi Koi, Shiga; Kohei Furuya, Tokyo; Seigo Iwado, Tokyo, and Sadao Sata, Tokyo, all of Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

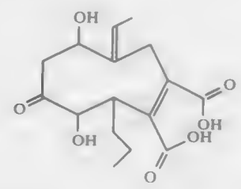
Division of Ser. No. 184,409, Apr. 21, 1988, Pat. No. 4,897,104. This application Nov. 13, 1989, Ser. No. 435,695

Claims priority, application Japan, Apr. 27, 1987, 62-103976

Int. Cl.[5] A01N *37/00;* C07C *62/00*

U.S. Cl. 71—113 5 Claims

1. A compound of formula (II):



(II)

and agriculturally acceptable salts thereof.

4,990,179

PROCESS FOR INCREASING THE LIFE OF CARBON CRUCIBLES IN PLASMA FURNACES

Theodore F. Munday, Kendall Park, and Richard A. Mohr, Martinsville, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 23, 1990, Ser. No. 513,121

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.19 11 Claims

1. A process for reducing cavity formation in carbon crucibles used to contain iron-based compositions containing valuable metals in essentially a nonoxidized form that are heated in a plasma furnace to a temperature of from about 2000° C. to about 2700° C. to form a melt, comprising adding carbon particles to the crucible in amounts of at least about 6 weight percent of the melt but always in amounts at least equal to the solubility of carbon in the melt.

4,990,180

COMBUSTION SYNTHESIS OF LOW EXOTHERMIC COMPONENT RICH COMPOSITES

Danny C. Halverson, Modesto; Beverly Y. Lum, Livermore, and Zuhair A. Munir, Davis, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 225,413, Jul. 28, 1988, Pat. No. 4,879,262. This application Sep. 1, 1989, Ser. No. 401,698

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

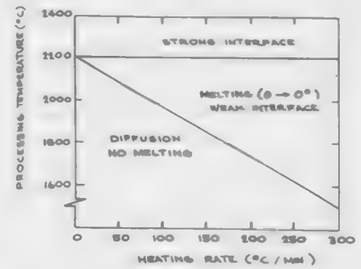
Int. Cl.[5] C22C *29/02*

U.S. Cl. 75—239 20 Claims

1. A method of forming a composite product having a major phase of low exothermic potential product (LEPP) and a minor phase of high exothermic potential product (HEPP) and having a preselected LEPP rich LEPP/HEPP mole ratio, comprising:

forming a powder compact of low exothermic potential (LEP) and high exothermic potential (HEP) reactants in ratios which produce the desired LEPP/HEPP mole ratio;

preheating the powder compact to a preignition temperature determined by the desired LEPP/HEPP mole ratio;



producing a self-propagating combustion wave in the preheated powder compact to form a composite product of the desired LEPP rich LEPP/HEPP mole ratio.

4,990,181

ALUMINIDE STRUCTURES AND METHOD

Kim D. Pierotti; Srinivas H. Swaroop, and Raja R. Wusirika, all of Painted Post, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,449

Int. Cl.[5] B22F *9/00*

U.S. Cl. 75—246 26 Claims

1. A porous sintered structure, with total porosity between about 25% and about 75% by volume, comprised of aluminide compositions of metal selected from the group consisting of titanium, nickel, rare earth metals, the alloys thereof, combinations of said aluminide compositions, combinations of said aluminide compositions and said metal and/or aluminum.

4,990,182

CARBON-CONTAINING MAGNETIC METAL POWDER

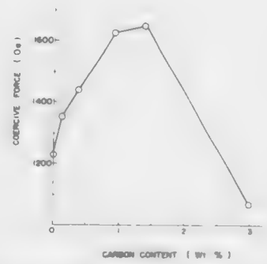
Yoshiteru Kageyama; Yoshiaki Sawada, and Tadashi Teramoto, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 401,964

Claims priority, application Japan, Sep. 5, 1988, 63-221952; Oct. 6, 1988, 63-252639

Int. Cl.[5] B22F *9/30*

U.S. Cl. 148—306 7 Claims



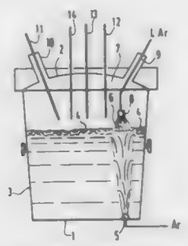
1. A magnetic metal powder comprising fine particles of a transition metal which contain 0.2% to 2.5% by weight of carbon substantially in the form of metal carbide and which are of such a geometry as a minor axis length of 100 to 300 Å and an axial ratio of 1 to 50.

4,990,183

PROCESS FOR PRODUCING STEEL HAVING A LOW CONTENT OF NITROGEN IN A LADLE FURNACE

Sara H. Anderson, Westmont, Ill.; Noël Lutgen, Igny, and Jean Foulard, Ablon, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France and Liquid Air Corporation, Walnut Creek, Calif.

Filed Aug. 24, 1989, Ser. No. 397,976
Claims priority, application France, Aug. 29, 1988, 88 11313
Int. Cl.[5] G21C *5/34*
U.S. Cl. 75—555 10 Claims



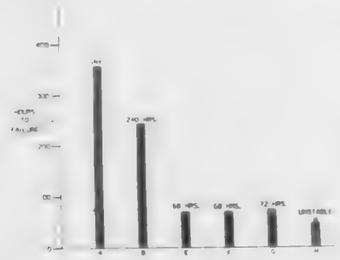
1. In a process for producing steel in a ladle furnace comprising stirring the steel in a molten state by injecting inert gas in a lower part of the furnace and adding additives to the molten steel so as to modify the composition of the molten metal, the inert gas being gaseous argon injected at a rate of flow of at least 5 Nm^3/h so as to distribute said additives in a homogeneous manner, and in which a layer of slag is formed on the surface of the molten steel, the invention comprising simultaneously injecting liquid argon above the surface of the bath, in a region of intumescence of said slag layer, said injection of liquid argon being at a rate of flow equal to at least 1.5 l/min., said liquid argon being directed in a jet toward a central part of the intumescence such that the liquid argon so injected flows over substantially the whole of area of said intumescence, thereby reducing any increase in the nitrogen content of said steel, wherein the ratio of the flow of gaseous argon (expressed in Nm^3) to the flow of liquid argon (express in Nm^3) is between 0.01 and 0.11.

4,990,184

WATER REDUCIBLE SOFT COATING COMPOSITIONS

Daniel J. Dotson, Huntington, W. Va., and Stephen E. See, Wheelersburg, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 124,655, Nov. 24, 1987. This application Apr. 12, 1989, Ser. No. 337,013
Int. Cl.[5] C09D *5/08*; C08K *3/38, 3/28*; C08L *91/06*
U.S. Cl. 106—14.11 11 Claims



1. An oil-in-water coating composition having emulsified wax-containing particles capable of imparting a corrosion resistant coating to metal surfaces that is easily removed with hot water, said composition comprising:

(a) about 10 to 40% by weight of a film forming material selected from the group consisting of slack wax, paraffin wax, or petrolatum, that are oxidized or unoxidized, or a mixture thereof;

(b) about 0.5 to 10% by weight of a film forming polymer selected from the group consisting of: a substantially linear polyethylene molecule with a terminal carboxylic acid group having a softening point determined according to ASTM E-28 in the range of about 158° F. (70° C.) to 230°F. (110° C.) and a molecular weight of at least 1500; polybutene characterized as an isobutene polymer having an average molecular weight in the range of about 400–1900; and a polypropylene characterized as a hydrocarbyl having a molecular weight in the range of about 400–1900;

(c) about 0.5 to 10% by weight of a wax modifier selected from the group consisting of naphthenic oil and paraffinic oil;

(d) about 0.5 to about 10% by weight of a corrosion inhibitor selected from the group consisting of a sulfonic acid salt or an amine soap of a fatty acid;

(e) about 1 to 15% by weight of a processing aid comprising mineral spirits and ethylene glycol monopropyl ether;

(f) About 0.5 to 15% by weight of a dual component anionic surfactant; and

(g) about 30% to 80% by weight of water.

4,990,185

LITHOGRAPHIC INK COMPOSITIONS

Ramasamy Krishnan, Sewaren, N.J., assignor to Sun Chemical Corporation, Fort Lee, N.J.

Filed Aug. 2, 1989, Ser. No. 388,776
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 12 Claims

1. A lithographic ink composition for reducing glazing on printing press rollers comprising a lithographic ink and about 0.0005 to 0.05 above to wt. %, based on the weight of the composition, of a crown ether.

4,990,186

INK COMPOSITION FOR INK JET PRINTING

Raymond T. Jones, Webster, and Thomas J. Clifford, Jr., Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 204,828, Jun. 10, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,459
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 3 Claims

1. An ink composition useful in an ink jet printing process, said ink composition consisting essentially of:

(1) from 60 to 90 percent by weight of a solvent consisting of at least one member selected from the group consisting of methyl ethyl ketone, acetone, ethyl alcohol, ethyl acetate, cyclohexanone and diacetone alcohol;

(2) from 2 to 7 percent by weight of a polymeric binder that is soluble in said solvent;

(3) from 3 to 8 percent by weight of a dye that is soluble in said solvent;

(4) from 2 to 11 percent by weight of an evaporation retardant consisting of at least one member selected from the group consisting of 4-butyrolactone and butyl alcohol; and (5) from 3 to 14 percent by weight of water.

4,990,187

PROCESS FOR PREPARING GRAVURE BASE INK

Chi K. Dien, Jamesburg, and Daniel J. Carlick, Livingston, both of N.J., assignors to Sun Chemical Corporation, Fort Lee, N.J.

Continuation-in-part of Ser. No. 190,569, May 5, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 419,294
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—30 14 Claims

1. A process for the preparation of a base ink suitable for conversion to gravure printing ink comprising the steps of:

(a) admixing an aqueous slurry of a pigment with a solution of at least one metal resinate in an organic solvent, the resulting admixture having a solvent to metal resinate weight ratio of at least 40:60, a pH ranging from 4 to 10, and containing a minor amount of a C_8–C_{24} fatty acid amine or C_8–C_{24} fatty acid quaternary ammonium salt, said metal resinate being selected from the group consisting of: (i) calcium resinate, (ii) magnesium resinate, (iii) a mixture of a major amount of calcium resinate and a minor amount of zinc resinate, (iv) a mixture of a major amount of magnesium resinate and a minor amount of zinc resinate, and (v) a mixture of a major amount of calcium resinate plus a minor amount of magnesium resinate and zinc resinate;

(b) agitating the resultant admixture in a mixer at a temperature of from about 15 to about 95° C. for a time sufficient to form large pigment beads;

(c) discontinuing the agitation and permitting the large pigment beads to separate;

(d) removing water from the large pigment beads by physical means other than filtration;

(e) removing residual water from the pigment mass resulting from step (d) by azeotropic distillation; and

(f) cooling the resultant substantially water-free mass to ambient temperature.

4,990,188

ANTI-SLIP COMPOSITION

Arthur P. Micek, Trumbell, Conn., and James T. Elfstrum, Yorktown Heights, N.Y., assignors to Rhone-Poulenc Basic Chemicals Co., Shelton, Conn.

Filed Dec. 19, 1988, Ser. No. 286,187
Int. Cl.[5] C09K *3/14*
U.S. Cl. 106—36 12 Claims

1. An anti-slip composition for a surface which can be dry or may have liquid thereon comprising a major amount of sodium bicarbonate and a minor amount of a coefficient of friction improving agent which is a substantially water-insoluble inorganic abrasive, said agent being substantially insoluble in the liquid which may be on the surface to which the composition is applied for a period of time sufficient and in an amount sufficient to increase the coefficient of friction over sodium bicarbonate alone, said coefficient of friction improving agent being present in an amount of less than about 15% by weight based on the dry weight of the sodium bicarbonate and the agent.

9. A process for increasing the coefficient of friction between two surfaces, one of which may have a liquid thereon, which comprises applying to one surface an anti-slip composition comprising a major amount of sodium bicarbonate and a minor amount of a coefficient of friction increasing agent which is an inorganic abrasive that is substantially insoluble in the liquid and which is present in an amount of less than about 15% by weight based on the dry weight of the sodium bicarbonate and the agent for a period of time sufficient to increase the coefficient of friction between the surfaces.

4,990,189

IRON OXIDE PIGMENTS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Jürgen Wiese; Axel Westerhaus; Jürgen Scharschmidt, and Gunter Buxbaum, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1989, Ser. No. 364,052
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3821342
Int. Cl.[5] C09C *1/22*
U.S. Cl. 106—456 9 Claims



110

1. Iron oxide pigments with a rhombic dodecahedral form and an average particle diameter of from 0.05 to 3.0 μm with a standard deviation of the particle size distribution of ±30%.

4,990,190

STRENGTH ENHANCING ADDITIVE FOR CERTAIN PORTLAND CEMENTS

David F. Myers, Columbia, and Ellis M. Gartner, Silver Spring, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 6, 1989, Ser. No. 418,071
Int. Cl.[5] C04B *7/38*
U.S. Cl. 106—727 20 Claims

1. A strength enhanced hydraulic cement mix comprising a hydraulic portland cement in an amount up to 80 percent by weight based upon the total weight of said cement mix and said cement containing at least 4% C_4AF, sufficient water to effect hydraulic setting of the cement, and triisopropanolamine in an amount of less than 0.2% which is sufficient to increase the 7 and 28-day compressive strength of the mix.

4,990,191

AMINATED SULFONATED OR SULFOMETHYLATED LIGNINS AS CEMENT FLUID LOSS CONTROL ADDITIVES

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 21, 1989, Ser. No. 312,497
Int. Cl.[5] C04B *24/12, 24/18*
U.S. Cl. 106—805 4 Claims

1. A hydraulic cement slurry composition which comprises:

(a) a hydraulic cement, and the following expressed as parts by weight per 100 parts of said hydraulic cement,

(b) water from about 25 to 105 parts, and

(c) from about 0.5 to 2.5 parts of a compound selected from the group consisting of a sulfonated lignin and a sulfomethylated lignin, wherein said lignin has been aminated by reacting it with between about 2–5 moles of a polyamine per 1,000 g of said lignin and 2–5 moles of an aldehyde per 1,000 g of said lignin, and

(d) 0.1 to 1.5 parts of a compound selected from the group consisting of sodium carbonate, sodium metasilicate, sodium phosphate, sodium sulfite, sodium naphthalene sulfonate and a combination thereof.

4,990,192

METHOD OF REMOVING LINT, HAIR AND OTHER PARTICULATE MATTER FROM FABRIC

Thomas J. Pallose, South Barrington; Larry J. Alanis; William C. Weber, Jr., both of Naperville, and Robert F. Farmer, Barrington, all of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Filed Oct. 16, 1989, Ser. No. 421,641
Int. Cl.[5] B08B 7/00
U.S. Cl. 134—4 17 Claims

1. The method of removing lint, hair, and other particulate matter from fabric, comprising:

(a) preparing a sprayable adhesive composition in a valve-equipped aerosol container, said composition comprising an adhesive film-forming resin in admixture with a tackifier or plasticizer and an aerosol propellant in which said resin is soluble or dispersible, said propellant having a vapor pressure of 10 psig or higher at 70° F.;

(b) spraying said composition from said container onto flexible sheet material which has an essentially non-shedding surface for receiving the spray, said spraying being carried out so as to splatter said surface with tacky adherent globules of the tackified or plasticized resin without forming a continuous coating on said surface; and

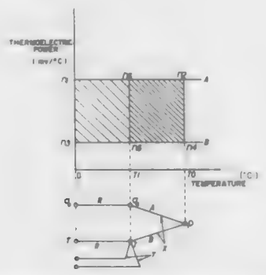
(c) as soon as said globules are substantially free of said propellant contacting the sprayed surface of the sheet material to the fabric from which the particulate matter is to be removed.

4,990,193

METHOD AND APPARATUS FOR MEASURING TEMPERATURE USING THERMOCOUPLE

Hideo Kimura, Kyoto, Japan, assignor to Yamari Industries, Limited, Osaka, Japan

Filed Aug. 25, 1988, Ser. No. 237,032
Claims priority, application Japan, Jun. 24, 1988, 63-157471
Int. Cl.[5] H01L 35/34, 35/02
U.S. Cl. 136—201 5 Claims



1. A method of measuring temperature, comprising the steps of:

preparing a first thermocouple which has no compensating lead wire, and has cold junctions between which a temperature difference exists;

connecting a second thermocouple to one of the cold junctions to provide cold junction compensation, the second thermocouple being an auxiliary thermocouple; and

connecting extension leads to the first thermocouple for taking thermo electromotive forces therefrom, the leads being made from a material having a thermoelectromotive characteristic agreeing with the thermoelectromotive characteristic of a thermocouple leg which does not compensate cold junctions of the first thermocouple at low temperatures.

4,990,194

THIN HIGH-STRENGTH ARTICLE OF SPHEROIDAL GRAPHITE CAST IRON AND METHOD OF PRODUCING SAME

Fumio Obata; Hideaki Nagayoshi, both of Kitakyusyu, and Eiji Nakano, Saikawa, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 403,876
Claims priority, application Japan, Sep. 9, 1988, 63-225830; Feb. 9, 1989, 1-30167
Int. Cl.[5] C22C 37/04; C21D 5/00
U.S. Cl. 148—3 12 Claims

1. A thin high-strength article of spheroidal graphite cast iron having graphite particles dispersed in a ferrite matrix containing 10% or less of pearlite, wherein there are substantially no fine gaps of about 2 μm or more between said graphite particles and said ferrite matrix.

4,990,195

PROCESS FOR PRODUCING TUNGSTEN HEAVY ALLOYS

James R. Spencer, Sayre, Pa.; James A. Mullendore, Towanda, Pa., assignors GTE Products Corporation, Stanford, Ct.

Filed Jan. 3, 1989, Ser. No. 293,030
Int. Cl.[5] B22F 1/00; B21B 3/00; C21D 8/02
U.S. Cl. 148—11.5F 2 Claims

1. A process for producing consolidated tungsten heavy alloy bodies which process comprises:

(a) forming a bar of a tungsten heavy alloy consisting essentially of from about 60% to about 98% by weight of tungsten, balance nickel and iron in a weight ratio of nickel to iron of from about 6:4 to about 9:1, by sintering at a temperature below the melting point of said iron and nickel;

(b) working the bar at a temperature of between about 700° C and about 900° C using a series of passes to achieve up to about a 5% reduction in cross-sectional area per pass to produce an initially reduced bar having a reduction in cross sectional area of about 20%;

(c) annealing the reduced bar at temperature of from about 1200° C to about 1400° C for at least about 2 hours;

(d) working the annealed bar at about 700° C to about 900° C using a series of passes to achieve from about 5% to about 20% reduction per pass until about an additional 30% reduction in cross-sectional area is achieved;

(e) repeating steps (c) and (d) in sequence as necessary to achieve a desired reduction;

(f) annealing said bar from step (e) at a temperature of about 1200° C to about 1400° C;

(g) working said bar from step (f) at about 20° C to about 300° C to achieve about a 7% to about a 25% reduction in area, and

(h) age hardening said bar at about 400° C to about 600° C.

4,990,196

PROCESS FOR MANUFACTURING BUILDING CONSTRUCTION STEEL HAVING EXCELLENT FIRE RESISTANCE AND LOW YIELD RATIO

Hiroshi Tamehiro, Kimitsu, Rikio Chiziiwa, Kimitsu, Yoshifumi Sakumoto, Tokyo, Kazuo Funato, Kimitsu, Yuzuru Yoshida, Kimitsu, Koichiro Keira, Tokyo, all of Japan

Filed June 9, 1989, Ser. No. 364,608
Int. Cl.[5] C21D 8/00
U.S. Cl. 148—12.4; 148—12F; 148—12.1 12 Claims

1. A process for manufacturing a building construction steel having an excellent fire resistance and a low yield ratio, which comprises heating a slab, billet or bloom consisting of 0.04 to 0.15% by weight of C, up to 0.6% by weight of Si, 0.5 to 1.6% by weight of Mn, 0.005 to 0.04% by weight of Nb, 0.4 to 0.7% by weight of Mo, up to 0.1% by weight of Al and 0.001 to 0.006% by weight of N, with the balance being Fe and unavoidable impurities, at a temperature in the range of from 1100 to 1300° C and hot rolling with a finishing temperature of from 800 to 1000° C and naturally cooling to room temperature.

4,990,197

HEAT TREATMENT OF RAPIDLY QUENCHED FE-6.5 WT% SI RIBBON

Santosh K. Das, Randolph, N.J., Chin-Fong Chang, Lake Hiawatha, N.J., and Richard L. Bye Jr., Morristown, N.J., assignors of Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed May 30, 1989, Ser. No. 357,834
Division of Ser. No. 183,342, Apr. 12, 1988, Pat. No. 4,865,657, which is a continuation of Ser. No. 894,139, Aug. 1, 1986, abandoned.
Int. Cl.[5] H01F 1/147
U.S. Cl. 148—307; 420—117 1 Claim

1. A ribbon consisting essentially of Fe and 6 to 7 wt% Si, said ribbon having:

a substantially <100> texture with intensity at least 2 times that of a reference sample having a randomly oriented grain structure;

a grain size of about 1–2 mm;

a B2 domain size of about 100 to 250 nm;

a DO3 domain size of about 5 to 10 nm;

an ac core loss of about 1.2 to 1.5 W/kg at an induction level of B=1.4 T and at a frequency of f=60 Hz;

an exciting power of about 15 to 26 VA/kg at an induction level of B=1.4 T and at a frequency of f=60 Hz,

said ribbon having been rapidly solidified and then annealed by a process comprising the steps of:

vacuum annealing at a temperature between 1000°C and 1200°C for 1 to 4 hours; and

annealing at a temperature between 790°C and 860°C for 1 to 4 hours and cooling at a rate sufficient to form therein an annealed domain structure of said DO3 domains.

4,990,198

HIGH STRENGTH MAGNESIUM-BASED AMORPHOUS ALLOY

Tsuyoshi Masumoto, Sendai-Shi, Akihisa Inoue, Sendai-Shi, Katsumasa Odera, and Kurobe-Shie, all of Japan, assignors, Yoshida Kogyo, K. K., Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 398,993
Int. Cl.[5] C22C 45/00
U.S. Cl. 148—403 4 Claims

1. A high strength magnesium-based alloy at least 50% by volume of which is amorphous, said magnesium-based alloy having a composition represented by the general formula (I):

$$Mg_aX_b \text{ ——— (I)}$$

wherein:

X is at least two elements selected from the group consisting of Cu, Ni, Sn and Zn; and a and b are atomic percentages falling within the following ranges:

$40 \leqq a \leqq 90$ and $10 \leqq b \leqq 60$.

2. A high strength magnesium-based alloy at least 50% by volume of which is amorphous, said magnesium-based alloy having a composition represented by the general formula (II):

$$Mg_aX_cM_d \text{ ——— (II)}$$

wherein:

X is one or more elements selected from the group consisting of Cu, Ni, Sn and Zn; M is one or more elements selected from the group consisting of Al, Si and Ca; and a, c and d are atomic percentages falling within the following ranges:

$40 \leqq a \leqq 90$, $4 \leqq c \leqq 35$ and $2 \leqq d \leqq 25$.

3. A high strength magnesium-based alloy at least 50% by volume of which is amorphous, said magnesium-based alloy having a composition represented by the general formula (III):

$$Mg_aX_cLn_e \text{ ——— (III)}$$

wherein:

X is one or more elements selected from the group consisting of Cu, Ni, Sn and Zn; Ln is one or more elements selected from the group consisting of Y, La, Ce, Nd and Sm or a misch metal (Mm) of rare earth elements; and a, c and e are atomic percentages falling within the following ranges:

$40 \leqq a \leqq 90$, $4 \leqq c \leqq 35$ and $4 \leqq e \leqq 25$.

4. A high strength magnesium-based alloy at least 50% by volume of which is amorphous, said magnesium-based alloy having a composition represented by the general formula (IV):

$$Mg_aX_cM_dLn_e \text{ ——— (IV)}$$

wherein:

X is one or more elements selected from the group consisting of Cu, Ni, Sn and Zn; M is one or more elements selected from the group consisting of Al, Si and Ca; Ln is one or more elements selected from the group consisting of Y, La, Ce, Nd and Sm or a misch metal (Mm) of rare earth elements; and a, c, d and e are atomic percentages falling within the following ranges:

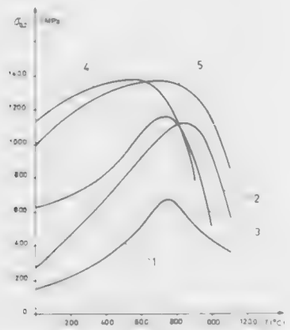
$40 \leqq a \leqq 90$, $4 \leqq c \leqq 35$, $2 \leqq d \leqq 25$ and $4 \leqq e \leqq 25$.

4,990,199

OXIDATION-RESISTANT AND CORROSION-RESISTANT HIGH-TEMPERATURE ALLOY FOR DIRECTIONAL SOLIDIFICATION ON THE BASIS OF AN INTERMETALLIC COMPOUND OF THE NICKEL ALUMINIDE TYPE

Maohamed Nazmy, Fislisbach, and Markus Staubli, Dottikon, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Nov. 13, 1989, Ser. No. 434,269
Claims priority, application Switzerland, Nov. 15, 1988, 4230/88
Int. Cl.[5] C22C *19/00*
U.S. Cl. 148—429 3 Claims



1. An oxidation-resistant and corrosion-resistant high-temperature alloy for directional solidification based on an intermetallic compound of the nickel aluminide type consisting essentially of

Al=10–16 atomic %
Si=0.5–8 atomic %
Ta=0.5–9 atomic %
HF=0.1–2 atomic %
B=0.1–2 atomic %
Ni=the remainder

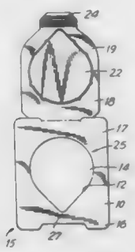
and consisting at least of 90% by volume of a mixture of the intermetallic phases Ni_3Al, Ni_3Si and Ni_3Ta.

4,990,200

FITMENT APPLICATION PROCESS AND APPARATUS

Daniel Heinz, Joppatowne, Md., assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 29, 1989, Ser. No. 459,052
Int. Cl.[5] B32B *31/12*
U.S. Cl. 156—69 21 Claims



1. A process for affixing a fitment having a pouring aperture to a carton having a product dispensing aperture, comprising

(a) applying a first set of generally parallel strips of adhesive to said fitment on opposite sides of said pouring aperture,

(b) applying a second set of generally parallel strips of adhesive to said fitment on opposite sides of said pouring aperture in an orientation such that an uninterrupted, endless adhesive pattern is created,

(c) positioning said fitment over the carton dispensing aperture, and

(d) sealingly contacting said fitment to a erected carton.

4,990,201

METHOD FOR RETICULATING PERFORATED SHEETS

Thomas E. Trnka, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 14, 1989, Ser. No. 338,924
Int. Cl.[5] B32B *31/12, 31/26*
U.S. Cl. 156—85 6 Claims

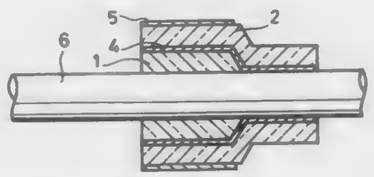
1. A method of reticulating a perforated substrate comprising the steps of tacking a sheet of viscous reticulating adhesive onto one side of the perforated substrate; positioning said perforated substrate in a stationary fixture adjacent a nozzle for heated air; positioning said nozzle on a robot arm and controlling the motion of said nozzle with respect to said substrate such that the nozzle sweeps the entire adhesive-free surface of the perforated substrate in a controlled manner at a substantially constant rate and at a substantially constant distance; controlling the temperature and rate of flow of the air through said nozzle as it is manipulated by the robot arm such that the adhesive softens and bubbles over the perforations in the perforated substrate but such that the temperature of the adhesive remains below the temperature at which final cure is initiated; and controlling the flow rate of air from the nozzle such that said bubbles burst and the adhesive is substantially redeposited onto the adhesive side of the substrate.

4,990,202

METHOD OF MANUFACTURING AN LC COMPOSITE COMPONENT

Michihiro Murata; Harufumi Mandai, and Yasuyuki Naito, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 879,908, Jun. 30, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 296,408
Claims priority, application Japan, Jul. 4, 1985, 60-147219
Int. Cl.[5] B32B *31/14*
U.S. Cl. 156—89 15 Claims



1. A method of manufacturing an LC composite component, comprising the steps of:

cofiring green compacts of a dielectric material capable of being sintered at below about 1,000° C. and a magnetic adhered state thereby to integrally sinter the same;

wherein the compacts are sintered at about 800°–1,100° C. for about one hour such that substantially no counterdiffusion takes place between said compacts upon cofiring;

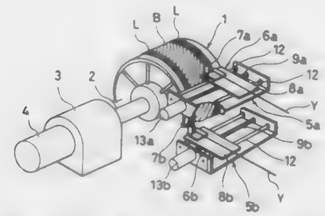
at least one inner electrode layer being formed between at least part of said magnetic compact and at least part of said dielectric compact.

4,990,203

METHOD OF WINDING REINFORCEMENT LAYER OF PNEUMATIC RADIAL TIRE

Noboru Okada, Ninomiya, and Tsutomu Takeuchi, Isehara, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,317
Claims priority, application Japan, Sep. 2, 1988, 63-218364
Int. Cl.[5] B29D *30/06*
U.S. Cl. 156—117 4 Claims



1. A method of winding a reinforcement layer of a pneumatic radial tire; which includes winding at least two reinforcement belts on a building drum and spirally winding a rubberized fiber cord composed of at least one textile cord in a continuous manner on at least both edges of said reinforcement belts along substantially the circumferential direction of said building drum to form at least one reinforcement layer comprising said rubberized fiber cord at each of said edges of said reinforcement belts, wherein the improvement comprises the steps: of providing a pair of traverse devices each having a fiber cord feed guide and constructed so as to be reciprocated along the axial direction of said building drum at circumferentially spaced locations opposite to the front face of an outer peripheral surface of said building drum; and moving each of said traverse devices along the axial direction of said building drum by independent driving means while rotating said building drum, thereby simultaneously and independently feeding fiber cords respectively from each of said feed guides to wind two reinforcement layers on said reinforcement belts.

4,990,204

IMPROVED SPUNBONDING OF LINEAR POLYETHYLENES

Stephen P. Krupp; Edward N. Knickerbocker, and John O. Bieser, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 114,169, Oct. 27, 1987, Pat. No. 4,842,922. This application Apr. 17, 1989, Ser. No. 339,335
Int. Cl.[5] D04H *3/16*
U.S. Cl. 156—167 30 Claims

1. A method for improving the spunbonding capability of a high molecular weight linear polyethylene in a spunbonded process, said method comprising

(A) blending with the high molecular weight linear polyethylene a sufficient amount of low molecular weight linear polyethylene to produce a blend which is spunbondable at a throughput rate and a linear spinning velocity suitable to produce a fiber size of smaller than 3 denier/filament in commercial operations,

said high molecular weight linear polyethylene having a melt index measured in accordance with ASTM D-1238, Condition E (190° C./2.16) within the range between about 0.5 to about 25 g/10 minutes, and

said low molecular weight linear polyethylene having a melt index measured in accordance with ASTM D-1238, Condition E (190° C./2.16) greater than 25 g/10 minutes, and

(B) spunbonding said blend to a fiber size of smaller than 3 denier/filament.

4,990,205

PROCESS FOR MANUFACTURING A BLADE

Bruno J. M. Barbier, Sannois, and Jean A. Michaud-Soret, Paris, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Division of Ser. No. 203,373, Jun. 7, 1988, Pat. No. 4,892,462. This application Sep. 15, 1989, Ser. No. 408,018
Claims priority, application France, Jun. 9, 1987, 87 07981
Int. Cl.[5] B29C *43/20*
U.S. Cl. 156—242 5 Claims



1. Process for manufacturing a blade, by means of a lower half-mould and an upper half-mould providing complementary impressions having respective forms of a pressure face portion and a suction face portion of the blade, comprising:

desposting in the lower half-mould a panel of each of separate layers of fabric and mats or sheets of reinforcing fibers with high mechanical strength impregnated with a polymerisable synthetic resin, and designed to constitute a pressure face covering of a shell of the blade,

putting in place, over the panels, materials constituting filling bodies, and in an area of a blade footing, the layers of fabric and mats or sheets of reinforcing fibers, impregnated with a polymerizable synthetic resin, of the pressure face portion of the shell,

putting in place, over the panels and layers of fabric and mats or sheets of fibers for reinforcing the pressure face portion of the blade, and between the filling bodies, end portions, designed to be fixed in the shell, of two bundles of an elongated skein folded back on itself, constituted by rovings of aramide fibers agglomerated by a polymerisable synthetic resin designed to form a spar of the blade, and arranging, beyond a corresponding end of the panels, layers of fabrics and mats or sheets of reinforcing fibers and filling bodies, the portions of the two bundles that are in the vicinity of an area of folding so as to form a loop designed to constitute a root portion of the spar, and that passes round a metallic socket placed in the lower half-mould,

a putting in place, in the area of the blade footing and over the spar, the layers of fabric and mats or sheets of reinforcing fibers impregnated with a polymerizable synthetic resin of the suction face portion of the shell,

arranging on the whole thus formed in the lower half-mould, a panel of each of the layers of fabrics and mats or sheets of fibers with high mechanical strength impregnated with a polymerizable synthetic resin designed to constitute a suction face covering of the shell,

placing the upper half-mould on the lower half-mould

placing the rovings of the two bundles of the skein of the spar in longitudinal traction, substantially parallel to a longitudinal axis of the blade,

closing the mold, polymerising the resin or rims impregnating and/or agglomerating all of the elements enclosed in the mould, so as to mould the blade in a single operation,

maintaining traction on the rovings throughout polymerisation; and

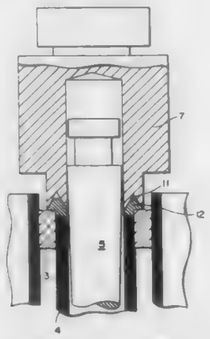
after polymerisation is complete, removing the blade from the mould.

4,990,206

METHOD OF WELDING TUBE ENDS ONTO A TUBE SHEET

Friedrich Garske, and Bernd Kraft, both of Wuppertal, Fed. Rep. of Germany, assignors to Akzo N.V., Netherlands

Filed Jul. 13, 1988, Ser. No. 218,268
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723317
Int. Cl.[5] B29C *65/18*
U.S. Cl. 156—282 6 Claims



1. A method of welding porous tube ends to a tube sheet having bores, comprising:

inserting said tube ends, having a porosity of at least 20% of tube wall volume, into the bores of said tube sheet so that said ends extend beyond an opposite surface of said tube sheet;

partially melting said tube ends by contact with a hot tool which does not extend into said tube ends, while said tube ends are being cooled from their interiors, so that a melt so formed is conducted radially outwardly to rest partially upon and in contact with a flat annular portion of said opposite surface of said tube sheet and so that said tube sheet partially remains in contact with unmelted portions of said tube ends; and then

hating said flat annular portion of said opposite surface of said tube sheet, thereby welding said tube ends and said tube sheet together.

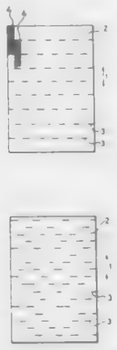
4,990,207

PROCESS FOR PREPARING FIBER-REINFORCED THERMOPLASTIC MOLDED ARTICLES

Hideo Sakai; Toshiyuki Nakakura, and Satoru Kishi, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 15, 1989, Ser. No. 351,533
Claims priority, application Japan, Oct. 13, 1988, 62-79715; Nov. 4, 1988, 62-101805
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—242 13 Claims

1. A process for preparing a fiber-reinforced thermoplastic article comprising applying to each of a plurality of sheet prepregs each comprising unidirectionally arranged reinforcing fibers impregnated with a thermoplastic resin, at least one notch in a direction traversing said reinforcing fibers at a depth sufficient to cut said reinforcing fibers, wherein said prepreg contains at least two notches having lengths of from about 2 mm to about 10 mm forming rows having a notch to notch spacing of from about 2 mm to about 30 mm in the direction of said notches and said rows being spaced from each other a distance of from about 5 mm to about 100 mm, and stacking



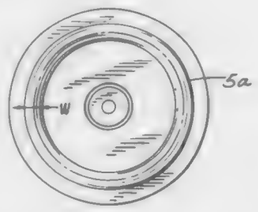
said sheet prepregs and molding said prepregs to form a fiber-reinforced thermoplastic article.

4,990,208

METHOD OF MANUFACTURING AN OPTICAL RECORDING MEDIUM

Nobuhiko Kano, Nagano, Japan, assignor to Seiko Epson Corporation, a Japanese Corporation, Tokyo, Japan

Continuation of Ser. No. 113,774, Oct. 28, 1987, abandoned.
This application Jan. 16, 1990, Ser. No. 464,691
Claims priority, application Japan, Oct. 31, 1986, 61-260254; Nov. 4, 1986, 61-262335; Oct. 1, 1987, 62-248832
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—275.3 33 Claims



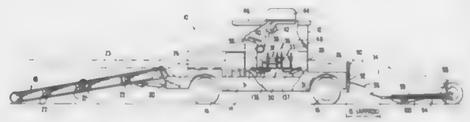
1. A method of manufacturing an optical recording medium using a first substrate having a first surface formed as the surface of a layer of dielectric material and a second substrate having a second surface facing said first surface of said first substrate, at least one of said first and second substrates including an information recording layer proximate the respective first and second surfaces thereof, comprising the steps of selectively applying an adhesive material to said first surface of said first substrate in a ring shaped pattern so that adhesive will properly wet the surface of the substrates, creating a partial vacuum of between about 30 torr and 5×10^{-3} torr around said first and second substrates, and positioning said second surface of said second substrate adjacent said first surface of said first substrate with said adhesive material therebetween and pressing the substrates together with a force no greater than about the weight of one of the first and second substrates to adhere said first and second substrates together to form said optical recording medium.

4,990,209

SELF PROPELLED PIPE FUSION MACHINE

George C. Rakes, 2120 Fairway Dr., Bozeman, Mont. 59715

Continuation of Ser. No. 879,589, Jun. 27, 1986, abandoned.
This application Dec. 15, 1989, Ser. No. 451,315
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—351 13 Claims



2. A machine for forming a pipeline out of sections of plastic pipe comprising:

a. a single self propelled housing, including an engine providing motive power for said housing;

b. an electric generator mounted within said housing and driven by said engine;

c. fusion apparatus mounted within said housing having at least one electric resistance heating element for fusing sections of plastic pipe together inside the housing to form a joint, said fusion apparatus being connected to and energized by said generator; and,

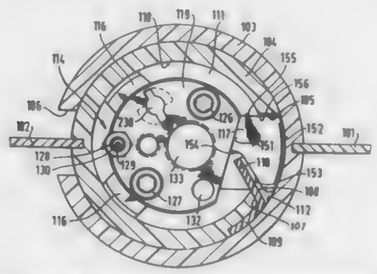
d. cooling apparatus energized by said generator to supply cooling air within said housing to a joint following fusion, said apparatus including an air conditioner carried by said housing to supply the cooling air, and a heat dissipater for applying the cooling air to the joint.

4,990,210

APPARATUS FOR INTRODUCING AND JOINING DIAPHRAGMS IN SLOTTED WALLS

Eberhard Gläser, Aichwald; Eberhard Beitinger, Stuttgart, and Manfred Nussbaumer, Leonberg, all of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Division of Ser. No. 37,082, Apr. 18, 1987, Pat. No. 4,838,980, which is a division of Ser. No. 768,458, Aug. 22, 1983, abandoned. This application Apr. 28, 1989, Ser. No. 345,100
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430789; Jun. 11, 1985, 3520820; Jun. 11, 1985, 3520817
Int. Cl.[5] B29C *47/12*
U.S. Cl. 156—391 20 Claims



1. A welding apparatus for joining slotted first and second connecting pipes including facing contact surfaces to be welded as located relative to each other and including an inner connecting pipe of a diaphragm section as well as an outer connecting pipe of another adjoining diaphragm section installed in a slotted wall, said apparatus comprising:

a joining unit having a frame on which are mounted pressure rollers which engage against an inner wall of said inner connecting pipe, said frame being moveable longitudinally of said connecting pipes; and

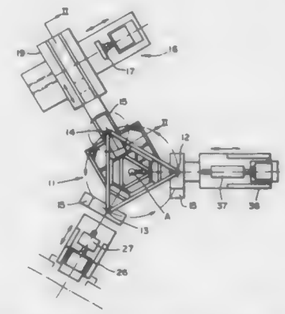
a heating device connected to said joining unit which effects said joining, said heating device projecting through at least one of the slotted connecting pipes to a positioning between the contact surfaces to be welded as to the inner and outer connecting pipes included therewith, said pressure rollers serving to press facing contact surfaces against each other upon plasticizing of said facing contact surfaces by said heating device.

4,990,211

TIRE BUILDING APPARATUS INCLUDING A TURRET FOR CONVEYING A TRANSFER BOX

Anthony G. Goodfellow, Maghull nr Liverpool, United Kingdom, assignor to Apsley Metals Limited, United Kingdom

Division of Ser. No. 81,745, Aug. 5, 1987, Pat. No. 4,792,370.
This application Oct. 19, 1988, Ser. No. 259,725
Claims priority, application United Kingdom, Aug. 12, 1986, 8619617
Int. Cl.[5] B60C *30/08*
U.S. Cl. 156—396 7 Claims



1. Apparatus for the manufacture of a tire and which comprises:

at least three tire building stations;

a transfer box having means accurately to locate an annular tire component,

a conveyor means in the form of a turret having at least three discrete positions thereon at each of which a transfer box is locatable, said turret being rotatable between said at least three tire building stations arranged at circumferentially spaced locations around the turret to move a respective transfer box between said tire building stations,

location means operable between the turret and a transfer box at each of said discrete positions to accurately locate a respective transfer box on the turret at each position,

and attachment and movement means associated with at least one of said discrete positions whereby the transfer box can be readily attached and detached from the turret and moved to at least one of said tire building stations for the purpose of collecting a tire component from said at least one tire building station.

4,990,212

DEVICE FOR APPLYING AN ELASTOMERIC FILLER ON THE BEAD CORE OF A PNEUMATIC TIRE

Augusto Pizzorno, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy

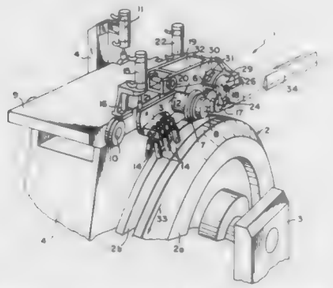
Filed May 16, 1989, Ser. No. 352,254
Claims priority, application Italy, Jun. 8, 1988, 20889 A/88
Int. Cl.[5] B29D *30/48*
U.S. Cl. 156—398 8 Claims

1. A device for applying an elastomeric filler on a bead core of a pneumatic tire comprising:

a supporting frame;

a bearing element rotatably engaged with respect to said frame and positioned to engage rigidly and releasably a bead core of a pneumatic tire; and

a pair of pressure discs rotatably supported with respect to said frame, and positioned such that they will apply said elastomeric filler to said core, said pair of pressure discs being arranged symmetrically with respect to a median lying plane of said bead core and having respective perimetric projections mutually facing which act on opposite sides of an elastomeric filler to apply said filler, along an outer circumferential chafer of said bead core while said bead core is rotated around its own axis, a driving means



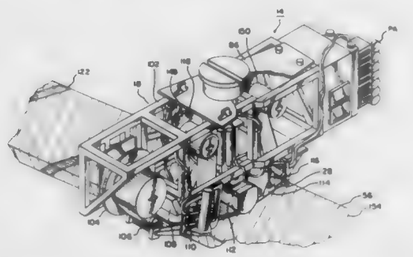
for rotating said core about its axis, said driving means working on said bearing element, said pressure discs being rotatably idle and released from said driving means, said pressure disc according to respective planes that diverge one with respect to the other toward the direction of advances of said bead core in a zone of maximum compression imparted to said filler and which converge mutually in a direction toward the axis of rotation of said bead core.

4,990,213

AUTOMATED TAPE LAMINATOR HEAD FOR THERMOPLASTIC MATRIX COMPOSITE MATERIAL

Christopher L. Brown, Arlington, Tex.; Harry C. Ashcraft, Orlando, Fla.; Daniel R. Tichenor, Maple Valley, Wash., and Robert M. Garcia, Laguna Hills, Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Nov. 29, 1988, Ser. No. 277,587
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—425 6 Claims



1. Apparatus for dispensing thermoplastic composite tape onto a recipient surface of a mandrel comprising in combination:

support means for mounting a reel of tape;

feed means for unwinding the tape from the reel and advancing it to the mandrel;

a pre-heater for the tape for providing initial heat to the tape;

heated pressure roller means for providing additional heat to the tape to heat said tape to the laminating process operating temperature above the glass transition temperature and for applying the required pressure to the tape for lamination of the tape onto the recipient surface;

means for maintaining a back tension on the heated tape as it is applied to the mandrel;

cooling shoe means for reducing the heat of the laminated tape on the recipient surface to prevent delamination and for smoothing the surface of the laminated tape, and

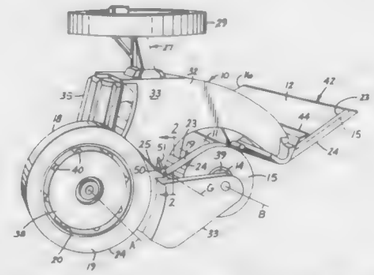
additional means operatively positioned with respect to the pressure roller, tape and recipient surface for placing a high temperature interference film between the pressure roller and the tape to prevent tape from sticking the heated pressure to roller as it is laid.

4,990,214

MASKING DEVICE WITH TAPE TRACKING MEMBER

Robert H. Heil, New Richmond, Wis.; Frederic A. Longworth, Shoreview, and Allen J. Rivard, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 326,015, Mar. 20, 1989, Pat. No. 4,915,769. This application Mar. 9, 1990, Ser. No. 491,281
Int. Cl.[5] B32B *35/00, 31/08*
U.S. Cl. 156—527 **2 Claims**



1. A portable device for use with a roll of masking material comprising a length of masking material helically wound around a core and having opposite major surfaces and opposite first and second elongate edges, and a roll of tape comprising a length of tape helically wound around a core and comprising a backing having front and rear surfaces and opposite first and second elongate edges and a coating of pressure sensitive adhesive on said front surface, said portable device comprising:

a frame including a hub support portion having opposite sides and including a handle adapted for manual engagement to manipulate said device;

first and second hubs mounted on said hub support portion of said frame for rotation about spaced generally parallel axes, said first hub including means for receiving the core of said roll of tape and for positioning the first edge of the length of tape at a first predetermined position axially with respect to said first and second hubs with the second edge of the length of tape projecting past the frame, and said second hub being adapted to receive the core of said roll of masking material and position the first edge of the length of masking material at a second predetermined position axially with respect to said first and second hubs with the width of said length of tape extending from the first position past the second position and the width of the masking material extending from the second position past the first position so that a portion of the length of tape along the first edge of the length of tape and a portion of the length of masking material along the first edge of the length of masking material are both positioned between said first and second positions; and

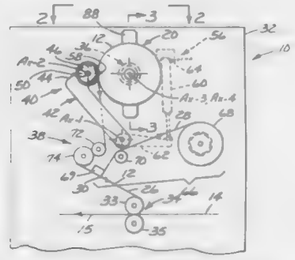
path defining means defining a path for said length of tape from said roll of tape along which path the second edge of the tape is unguided and a path for said length of masking material from said roll of masking material, said paths including a tape path portion for said tape from said roll of tape to the periphery of said roll of masking material and a common path portion beginning at the periphery of said roll of masking material where said portion of the length of tape along the first edge of the length of tape is adhered to said portion of the length of masking material along the first edge of the length of masking material to form a composite masking sheet having opposite edges defined by the second edges of the length of tape and the length of masking material and an exposed portion of the coating of pressure sensitive adhesive along the second edge of the length of tape along one major surface of the composite masking sheet so that the exposed portion of the coating of pressure sensitive adhesive can be adhered along a surface to be masked to attach the composite masking sheet thereto; said path defining means including a tracking member fixed to said frame at a position between said first and second hubs and having a tracking surface that has a length in a direction parallel to the axes of said hubs which is significantly less than the width of said tape between said first and second edges, said tracking surface being positioned and adapted to engage said tape along said tape path portion only at a position spaced from the periphery of the roll of masking material and to engage the rear surface of the tape along said portion of the length of tape along the first edge of the length of tape to deflect the tape along the tape path portion toward a plane through the axes of said hubs from a plane which is mutually tangent to the peripheries of said roll of tape and said roll of masking material.

4,990,215

WEB-ALIGNING APPARATUS

Conrad V. Anderson, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 2, 1988, Ser. No. 279,192
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—540 **30 Claims**



1. Apparatus for aligning an elongate web with respect to a predetermined path of travel, the web having opposite edges extending longitudinally of the web and being supplied from a supply roll formed by the web being wound around an inner web layer and having an outer web layer, the apparatus comprising:

a frame;

rotatable-holding means on the frame adapted to hold the supply roll for rotation about an axis to afford unwinding of the web from the supply roll, and adapted for axial movement of the supply roll; and

an alignment device comprising web-guiding means mounted on the frame generally rigid in the direction parallel to the axis of the rotatable-holding means for guiding the opposite edges of the outer web layer of the supply roll laterally with respect to the longitudinal direction of the web, with the rotatable-holding means affording translation of the supply roll to accommodate telescoped or non-uniformly wound supply rolls, thereby to maintain alignment of the outer web layer with respect to the predetermined path of travel;

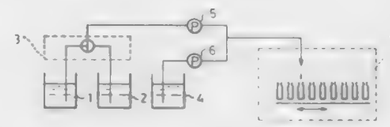
the web-guiding means comprising a web guide including at least one guide roller adapted to roll along the opposite edges of the outer web layer to position the outer web layer laterally with respect to the longitudinal direction of the web without engaging web layers that are spaced substantially inwardly of the outer web layer, and means for maintaining the web guide in engagement with the outer web layer of the supply roll.

4,990,216

PROCESS AND APPARATUS FOR PREPARATION OF SINGLE CRYSTAL OF BIOPOLYMER

Shozo Fujita, Atsugi; Koji Asano, Ebina, and Takafumi Hashitani, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 27, 1988, Ser. No. 263,242
Claims priority, application Japan, Oct. 27, 1987, 62-269411; Oct. 27, 1987, 62-269413; Jul. 5, 1988, 63-168490
Int. Cl.[5] B01D *9/02*
U.S. Cl. 156—600 **19 Claims**



1. A process for optimizing the conditions for preparing single biopolymer crystals by growth from a solution, comprising:

providing an apparatus having an elongated, hollow chamber therein;

filling said chamber with a solution of a biopolymer substance and an active substance capable of influencing the crystallization of the biopolymer substance as a single crystal to thereby present an elongated column of said solution;

distributing one of said substances in the solution in such a way that the concentration of the distributed substance in the solution changes linearly along the length of the column of solution;

dividing the column of solution into a plurality of lengths, whereby said lengths of solution each have a different concentration of said one of said substances therein.

4,990,217

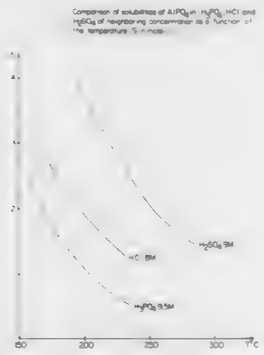
PROCESS FOR THE PREPARATION OF BERLINITE CRYSTALS WITH HIGH Q FACTOR

Etienne Philippot, Saint Mathieu de Treviers; Jean-Claude Jumas, Castelnau le Nez; Bernard Capelle, Villejuif; Yves Toudic, Lannion; Jacques Detaint, Villemomble; Jacquie Schwartzel, Palaiseau; Aline Goiffon, Saint Clement la Riviere; Maurice Maurin, Montpellier; Jean-Claude Doukhan, Villeneuve, and Albert Zarka, Paris, all of France, assignors to Centre National de al Recherche Scientifique (CNRS) and Etat Francais, représenté par le Ministre des PTT (Centre National d'Etudes des Télécommunications), both of Paris, France

Continuation-in-part of Ser. No. 240,148, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 21,182, Mar. 3, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 303,001
Claims priority, application France, Mar. 4, 1986, 86 03009
Int. Cl.[5] C30B *29/14, 7/10;* **C01B** *15/16*
U.S. Cl. 156—623 R **9 Claims**

1. Process for the preparation of crystals of berlinite $AlPO_4$

by a hydrothermal method, wherein the crystallization solution is an aqueous sulfuric solution of $AlPO_4$ and the crystalli-



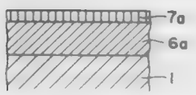
zation temperature is in the range of about 190° C. to about 300° C.

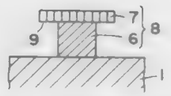
4,990,218

METHOD OF TESTING CONDUCTOR FILM QUALITY

Atsumu Tezaki, Kawasaki, and Katsuya Okumura, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 12, 1989, Ser. No. 336,800
Claims priority, application Japan, Sep. 26, 1988, 63-240499
Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—627 7 Claims





1. A method of testing the quality of a conductor film laminated onto a surface of a substrate, comprising the steps of:

forming a test stand, having substantially a T-shaped cross section provided with an undercut portion around the entire periphery of said testing stand, on the surface of the substrate;

laminating a conductor film having a predetermined thickness on the surface of said substrate;

forming on a top surface of said testing stand a wiring pattern formed with said conductor film electrically insulated from said conductor film around said testing stand on said substrate; and

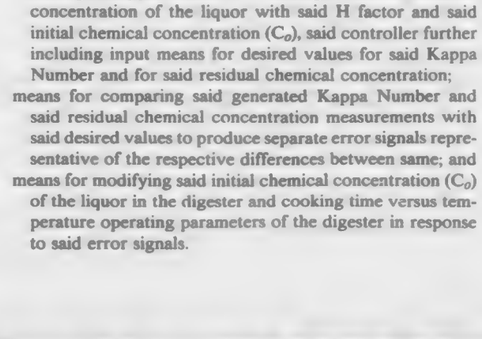
applying an electric current to said wiring pattern, whereby characteristic testing of the conductor film can be performed immediately after the laminating of the conductor film, to significantly reduce the testing time.

4,990,219

APPARATUS FOR CONTROLLING THE DEGREE OF COOKING IN A DIGESTER

Jeffrey A. Beller, Willoughby; Ralph K. Johnson, Highland Heights, both of Ohio; Roger Kammerer, Mercer Island, Wash.; Azmi Kaya, Akron, and Marion A. Keyes, IV, Chagrin Falls, both of Ohio, assignors to Elsag International B.V., Amsterdam, Netherlands

Division of Ser. No. 365,350, Jun. 13, 1989. This application Nov. 1, 1989, Ser. No. 430,854
Int. Cl.[5] D21C *7/12*
U.S. Cl. 162—238 5 Claims



1. Apparatus for controlling the degree of cooking in a delignification digester with the digester having a flow of liquors and wood therein for forming a reaction mixture, comprising:

means for monitoring a reagent concentration of the liquors flowing into the digester;

means for sensing the flow (F) of the liquors and wood into the digester;

means for measuring a temperature (T) of the reaction mixture in the digester;

a controller connected to said monitoring, sensing and measuring means and having means for providing a plurality of constants including an activation energy constant (E) for the digester reaction and a universal gas constant (R), said controller including means for continuously calculating a reaction rate (k) of the digester as a function of temperature and said plurality of constants, and integrating said reaction rate over time to obtain an H factor corresponding to a degree of cooking within the digester, said controller including means for calculating an initial chemical concentration (C_o) of the liquor within the digester as a function of sensed liquor flows and wood flow into the digester and monitored reagent concentration of the same liquors, said controller including means for generating a Kappa Number for cooking a residual chemical concentration of the liquor with said H factor and said initial chemical concentration (C_o), said controller further including input means for desired values for said Kappa Number and for said residual chemical concentration;

means for comparing said generated Kappa Number and said residual chemical concentration measurements with said desired values to produce separate error signals representative of the respective differences between same; and

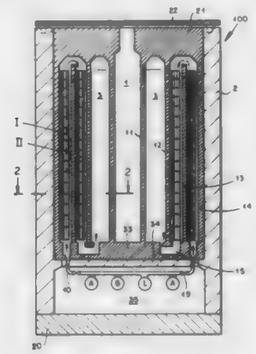
means for modifying said initial chemical concentration (C_o) of the liquor in the digester and cooking time versus temperature operating parameters of the digester in response to said error signals.

4,990,220

COKING REACTOR

Gerd Nashan, Oberhausen; Klaus Wessiepe, Essen; Heribert Bertling, Hattingen; Wolfgang Rohde, Essen; Manfred Blase, Essen; Manfred Galow, Essen; Ulrich Kochanski, Bochum; Heinz Dürselen, Essen; Johannes Janicka, Oberhausen; Dieter Stalherm, Recklinghausen; Joachim Holtz, Herten; Jürgen Tietze, Bochum, and Ralf Schumacher, Hagen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 22, 1989, Ser. No. 399,527
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643916; Dec. 22, 1986, 3643917; Dec. 22, 1986, 3643918; Dec. 22, 1986, 3643919
Int. Cl.[5] C10B *5/16*
U.S. Cl. 202—139 12 Claims



1. A coking reactor supplied batchwise with coking blends comprising:

a reactor chamber having a width of at least 0.7 m, a useful height of at least 8.5 m and a useful length of at least 18 m;

a flue chamber adjacently positioned plane parallel on either side of said reactor chamber, each of said flue chambers comprising:

a stretcher wall adjacent said reactor chamber; and

a partition wall facing opposite and outward from stretcher wall;

one pair of rigid lateral walls encompassing therebetween said flue chambers and said reactor chamber;

an adjustable heating means for supplying hot heating media and heating said reactor chamber indirectly through said flue chambers;

a plurality of regenerator means for recovering heat from the hot heating media; and

separate control means for regulating said adjustable heating means and allowing each of said flue chambers to be independently heated.

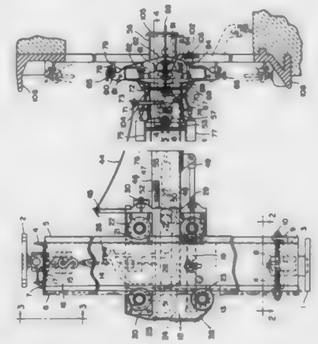
4,990,221

COKE OVEN DOOR JAMB CLEANER

William R. Baird, and Billy C. Baird, both of Sturgis, Ky., assignors to Saturn Machine & Welding Co., Inc., Sturgis, Ky.

Filed Jul. 1, 1987, Ser. No. 68,407
Int. Cl.[5] C10B *43/04*
U.S. Cl. 202—241 10 Claims

1. A coke oven door jamb cleaner comprising a generally vertically disposed support column having upper and lower ends, a carriage mounted on said support column for vertical movement, jamb cleaning means mounted on said carriage for movement therewith and for movement toward and away from a door jamb, said jamb cleaning means including a plurality of scraper elements engaged with a jamb surface during vertical movement of the carriage and jamb cleaning means, and drive means interconnecting the carriage and column for moving the carriage vertically on the column between upper and lower positions, said drive means including a motor on the carriage, a drive pinion gear driven by the motor and an elongated rack gear on the column in meshing engagement with the drive pinion gear for movement of the carriage vertically on the column when the drive pinion gear is driven by the motor, said support column including upper and lower plates



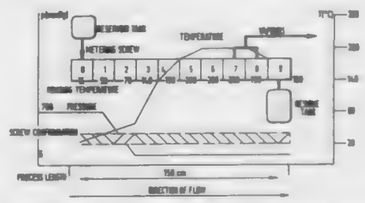
engaging opposed supporting surfaces, pivot means connecting the plates to the ends of the column to enable the column to pivot about a generally vertically disposed longitudinal axis, said pivot means including spring means limiting and resisting pivotal movement of the support column and returning the support column to an original position about its longitudinal axis.

4,990,222

PROCESS FOR THE PURIFICATION OF THERMOLABILE COMPOUNDS BY DISTILLATION

Michael Aigner; Wolfgang Dersch; Dieter Reichert, all of Ingelheim am Rhein; Horst Schwall, Gau-Algesheim, and Werner Warth, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 112,849
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636188; Oct. 24, 1986, 3636187; Jul. 28, 1987, 3724933; Aug. 8, 1987, 3726499
Int. Cl.[5] B01D *3/00*; C07D *319/12*
U.S. Cl. 203—91 6 Claims



1. A method for purifying a thermolabile compound by distillation which comprises:

(a) introducing the thermolabile compound to be purified into the first end of a twin screw extruder having a first end and a second end, twin screws for conveying material through the extruder from the first end toward the second end, at least one volatilization zone between the first and second ends of the extruder which is heated to the boiling point of the compound to be purified and, at least one exhaust vapor line located in the area of the said volatilization zone or zones for removing volatilized compound from the extruder;

(b) conveying the compound from said first end of the ex-

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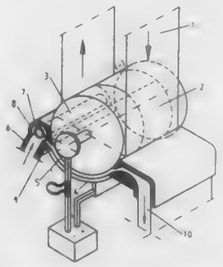
truder toward the second end thereof by means of the twin screws therein, whereby the compound passes through the volatilization zone or zones, thereby volatilizing the compound;
(c) drawing off the volatilized compound through the exhaust vapor lines; and,
(d) condensing the volatilized compound thus drawn off.

4,990,223

METHOD AND APPARATUS FOR THE ELECTROLYTIC COATING OF ONE SIDE OF A MOVING METAL STRIP

Bala K. Paramanathan, Heemstede, Netherlands, assignor to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed Sep. 15, 1989, Ser. No. 407,732
Claims priority, application Netherlands, Sep. 23, 1988, 8802353
Int. Cl.[5] C25D 7/06, 17/00
U.S. Cl. 204—28 9 Claims



1. Method of electrolytic coating of one side of a moving metal strip, comprising the steps of (a) passing the moving strip around a rotating roller having an insoluble anode extending concentrically therewith so that there is a circumferential slot between the anode and the strip, in which the electrolyte coating takes place, (b) supplying electrolyte from a plurality of sources to said slot at an end thereof at which the strip exits through a nozzle whose conformation is substantially uniform across the width of the strip in a larger volume relative to the volume of the nozzle and at a sufficient average velocity that turbulent flow occurs, said electrolyte being fed into said slot at a velocity which nowhere across the width of the strip deviates by more than 10% from said average velocity, and (c) applying electrical current to the strip as cathode and the anode so that electrolyte coating of the strip takes place in the slot.

4,990,224

COPPER PLATING BATH AND PROCESS FOR DIFFICULT TO PLATE METALS

Issa S. Mahmoud, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 289,993, Dec. 21, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 427,923
Int. Cl.[5] C25D 3/38, 5/30, 5/38
U.S. Cl. 204—29 5 Claims

3. An aqueous acid copper electroplating bath composition for strongly electropositive metals such as aluminum and tungsten comprising:
sulfuric acid, 30–50 grams/liter;
hydrated copper sulfate, 50–72 grams/liter;
urea, 1 gram/liter;
Beta-phenylethyltosylate, 1 gram/liter; and
cationic surfactant, 1 gram/liter.

4. A process for copper plating electropositive metals comprising the steps of:
A. preparing a bath containing
0.5 to 0.75 mols per liter sulfuric acid,
0.3 to 0.5 mols per liter hydrated copper sulfate,
1 to 2 grams per liter, urea,
1 to 2 milliliters per liter, sodium lauryl sulfate,
1 to 2 grams per liter, a tosyl or mesyl sulfonic acid ester, and
sufficient deionized water to make one liter by first mixing components in order set out then filtering the solution;
B. soaking the parts to be plated in the bath for 2 to 3 minutes; and
C. electrodepositing copper from the bath,
at a temperature of about 20 to 30 degrees centigrade,
at a current density of 10 to 20 amperes per square foot,
with continuous agitation.

4,990,225

METHOD OF MANUFACTURING HIGH MAGNETIC FLUX DENSITY ELECTRODEPOSITED QUATERNARY ALLOY THIN FILM

Yuuji Omata, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 19, 1990, Ser. No. 511,336
Claims priority, application Japan, Apr. 28, 1989, 01-109362
Int. Cl.[5] C25D 3/56
U.S. Cl. 204—44 4 Claims

1. A method of manufacturing a high magnetic flux density quaternary alloy electrodeposited thin film, comprising the steps of:
forming an FeCoNiCr or an FeCoNiCu quaternary alloy thin film on a cathode by using an electrodepositing electrolyte bath to which four kinds of ions of Fe, Co, Ni and Cr or Cu have been supplied through sulfate and/or hydrochloride, each of which contains bivalent or tervalent Fe, Co, Ni, and Cr or Cu ions, by using a bath having on the basis of the density of $[Ni^{2+}]$ ion such compositions as

$$0.02 < [Co^{2+}]/[Ni^{2+}] < 0.9,$$
$$0.095 < [Fe^{2+}]/[Ni^{2+}] < 0.4 \text{ and}$$
$$0.075 < [Cr^{3+}]/[Ni^{2+}] < 0.4, \text{ or}$$
$$0.001 < [Cu^{2+}]/[Ni^{2+}] < 0.03;$$

and setting electrodeposition current density J to be in a range of $J < 60$ (mA/cm^2) at said cathode.

4,990,226

ELECTROPLATING WIRES WITH NICKEL AT HIGH-SPEED AND A NICKEL FLUOBORATE BATH THEREFOR

Tom E. Byler, Pittsfield, and Kimberly J. Suchar, Waterford, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 6, 1989, Ser. No. 431,809
Int. Cl.[5] C25D 3/12, 7/06
U.S. Cl. 204—28 8 Claims

1. A bath for the electrodeposition of ductile nickel plate onto a wire substrate, said bath consisting essentially of: an aqueous acidic nickel plating solution consisting essentially of nickel fluoborate, wherein the concentration of said nickel fluoborate is between about 155 and 171 grams/liter; borice acid in an amount sufficient to saturate said solution; and fluoboric acid in an amount sufficient to adjust the pH of said solution to between about 0.1 and 0.6.

4. A method for plating nickel onto a wire substrate using a high speed, high current density continuous wire plating cell, said method comprising the steps of:
(a) forming a bath consisting essentially of an aqueous acidic nickel plating solution consisting essentially of: nickel fluoborate, wherein the concentration of said nickel fluoborate is between about 155 and 171 grams/liter; boric acid in an amount sufficient to saturate said solution; and fluoboric acid in an amount sufficient to adjust the pH of said solution to between about 0.1 and 0.6;

(b) heating said solution to between about 82° C. and 93°;
(c) passing said wire substrate through said solution at a current density of at least 200 amps per square foot to obtain a smooth, ductile nickel plating on said wire substrate.

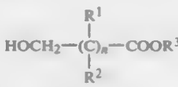
4,990,227

PREPARATION OF HYDROXYCARBOXYLIC ESTERS

Michael Steiniger, Neustadt, and Heinz Hannebaum, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

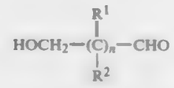
Filed Mar. 31, 1989, Ser. No. 331,943
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814498
Int. Cl.[5] C25B 3/02
U.S. Cl. 204—59 R 5 Claims

1. A process for the preparation of a hydroxycarboxylic ester of the formula



I

where n is an integer from 0 to 10, R^1 and R^2 are each hydrogen, hydroxyl, alkoxy or an aliphatic or olefinic, straight-chain, branched or cyclic hydrocarbon radical, and R^1 and R^2 together may furthermore form an alkylene radical, and the hydrocarbon radicals may furthermore be substituted by halogen, hydroxyl, epoxy or nitrile, and R^3 is a low molecular weight alkyl radical, by electrochemical oxidation of a hydroxyaldehyde of the formula



II

in the presence of an alcohol of the formula R^3OH, where n, R^1, R^2 and R^3 have the abovementioned meanings, wherein the electrochemical oxidation is carried out in the presence of an ionic bromide or chloride in an undivided electrolysis cell.

4,990,228

CATION EXCHANGE MEMBRANE AND USE

Stephen A. Perusich, Newark, and James T. Keating, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1989, Ser. No. 316,634
Int. Cl.[5] B05D 3/06, 3/10; C25B 1/16, 11/20; D06M 14/10, 14/28, 15/256, 101/22
U.S. Cl. 204—98 20 Claims

1. A fluorinated cation exchange membrane comprising a lamination of:
(A) a fabric comprising interengaged, oriented, hydrolyzed fluorinated cation exchange yarns, the fabric base being a copolymer having a mole ratio of non-functional:functional monomer of 2.8–11.8 to 1, the fabric base being coated on at least one surface or the individual yarns of the fabric being coated or the individual yarns of the fabric having been superficially converted to melt-processible form prior to fabric formation therefrom, the coating or superficial conversion comprising a melt-processible form of a fluorinated cation exchange copolymer having a mole ratio of non-functional:functional monomer differing from that of the fabric base copolymer by no more than 3 units; and
(B) at least one film of at least one hydrolyzable precursor to a melt-processible fluorinated cation exchange copolymer in which the mole ratio of non-functional:functional monomer is 2.8–11.8 to 1, said mole ratio in the film adjacent to the fabric being different than that of the fabric surface copolymer by no more than 3 units.

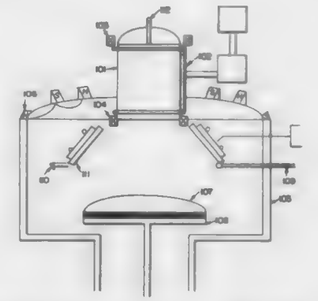
15. An improved process for the electrolysis of an alkali metal halide to make a halogen and an alkali metal hydroxide, the improvement comprising use of the membrane of claim 1.

4,990,229

HIGH DENSITY PLASMA DEPOSITION AND ETCHING APPARATUS

Gregor Campbell, Glendale; Robert W. Conn, Los Angeles, both of Calif., and Tatsuo Shoji, Nagoya, Japan, assignors to Plasma & Materials Technologies, Inc., Burbank, Calif.

Filed Jun. 13, 1989, Ser. No. 365,533
Int. Cl.[5] C23C 14/35
U.S. Cl. 204—298.06 18 Claims



1. A plasma processing apparatus, comprising:
(a) an antenna, the antenna radiating electromagnetic waves, the antenna comprising: (i) a first current loop, the first current loop residing in a first plane and; (ii) a second current loop, the second current loop residing in a second plane, the first and second current loops residing in a spaced apart relationship wherein the first plane and the second plane are substantially parallel;
(b) a plasma generation chamber, the plasma generation chamber being proximate to and in electromagnetic communication with the antenna, such that a line perpendicular to the planes of the first and second current loops defines a longitudinal axis of the plasma generation chamber;
(c) a first fluid injector, the first fluid injector introducing a fluid into the plasma generation chamber, thereby permitting the creation of a plasma within the plasma generation chamber;
(d) a magnetic field generator, the magnetic field generator generating a magnetic field;
(e) a process chamber, the plasma being transported to the process chamber by the magnetic field;
(f) a second fluid injector, the second fluid injector introducing a fluid into the process chamber.
(g) a current controller, the current controller controlling the current within the magnetic field generator, thereby controlling plasma shape;
(h) a substrate holder, the substrate holder residing within the process chamber;
(i) an auxiliary radio frequency generator, the auxiliary radio frequency generator adapted for applying radio frequency power to a substrate residing on the substrate holder;
(j) a radio frequency exciter, the radio frequency exciter generating a radio frequency voltage and current; and
(k) a matching network, the matching network interconnecting the radio frequency exciter and the antenna, thereby promoting the efficient transfer of radio frequency energy from the radio frequency exciter to the antenna.

17. A sputter deposition device according to claim 1, further comprising:

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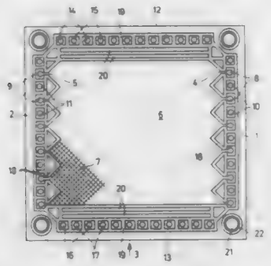
(a) First magnetic field coils, the first magnetic field coils being magnetically coupled and proximate to the plasma generation chamber, the first magnetic field coils generating a magnetic field in a first direction;
(b) Second magnetic field coils, the second magnetic field coils being magnetically coupled and proximate to the process chamber, the second magnetic field coils generating a magnetic field in a second direction, the second direction being substantially parallel to the first direction;
(c) Third magnetic field coils, the third magnetic field coils being magnetically coupled and proximate to a target, the target residing within the process chamber, the magnetic field coils causing the plasma to conform to the target; and
(d) A negative voltage power supply, the negative voltage power supply being electrically coupled to the target, the target thereby depositing material onto the substrate.

4,990,230

MEMBRANE STACK UNIT FOR MULTICHAMBER PROCESSES

Hartwig Voss, Lauenburg; Klemens Kneifel, Geesthacht, and Uwe Martens, Hohnsdorf, all of Fed. Rep. of Germany, assignors to Forschungszentrum Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

Continuation of Ser. No. 339,941, Apr. 17, 1989, abandoned. This application Mar. 5, 1990, Ser. No. 488,505
Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219869; Feb. 5, 1983, 3303910
Int. Cl.[5] B01D *13/02*
U.S. Cl. 204—301 7 Claims



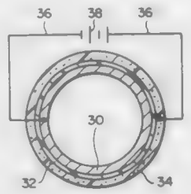
1. A membrane stack unit for performing a multichamber treatment of four component fluids, comprising:
at least four substantially identical sealing frames, each of said sealing frames having a square shape and being rotated by an integral multiple of 90° about the axis of said stack unit relative to the immediately adjacent one of said sealing frames; membranes interposed between said frames; and two end plates disposed at respective opposite ends of said unit with said frames and membranes interposed therebetween;
each of said frames having four side edges enclosing a region constituting a treatment chamber, said four side edges including a first and a second pair of opposed side edges, with said first pair of opposed side edges being provided with a set of through bores for conducting fluid, a set of second bores, and inlet and discharge channels each communicating with a respective one of said second bores and with said chamber, and said second pair of opposed side edges being provided with through bores for conducting fluid;
each said membrane being provided with openings aligned with all of said bores;
said sealing frames being oriented relative to one another such that in each pair of immediately adjacent sealing frames said through bores and second bores in said first pair of edges of each one of the sealing frames of the pair of sealing frames communicate with through bores in said second pair of edges of the other of the sealing frames of the pair of sealing frames;
each of said end plates being provided with a plurality of bores communicating with selected ones of said bores in said sealing frames, and a plurality of fluid flow channels communicating with said bores in each of said end plates; and
said through bores, said second bores and said bores in said end plates together comprising four separate flow paths through said stack unit.

4,990,231

CORROSION PROTECTION SYSTEM

Ray F. Stewart; Michael Masia, both of Redwood City, and Albert B. Macknick, Newark, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 684,752, Dec. 21, 1984, abandoned, which is a continuation of Ser. No. 403,203, Jul. 29, 1982, Pat. No. 4,502,929, which is a continuation-in-part of Ser. No. 272,854, Jun. 12, 1981, abandoned. This application Jan. 26, 1990, Ser. No. 476,105
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.[5] C23F *13/00*
U.S. Cl. 204—147 20 Claims



1. A method of cathodically protecting metal reinforcing bars encased in concrete, which method comprises establishing a potential difference between the reinforcing bars as cathode and a distributed elongate anode which is spaced apart from the reinforcing bars by concrete, said distributed anode
(1) being in the form of a flexible strip,
(2) comprising a continuous, elongate, flexible low resistance core which does not form part of the electrochemically active surface of the strip, and
(3) having an electrically active outer surface which is provided by an elongate element which
(a) is in electrical contact with the core,
(b) is composed of a conductive polymer having an elongation of at least 10%, and
(c) is at least 500 microns thick.

4,990,232

PROCESS FOR THE PREPARATION OF CARBODIIMIDES

Alex Alder, Arisdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 2, 1988, Ser. No. 240,166
Claims priority, application Switzerland, Sep. 9, 1987, 3483/87-5
Int. Cl.[5] C07C *209/80*
U.S. Cl. 204—157.81 13 Claims

1. A process for the preparation of carbodiimide of the formula I

$$R-N=C=N-R^1 \quad (I)$$

in which
R and R^1 independently of one another are C_1–C_{20}alkyl, C_2–C_{18}alkenyl, or C_2–C_{18}alkynyl; C_3–C_{10}cycloalkyl, C_3–C_{10}cycloalkenyl, heterocyclyl which has 3 to 10 ring atoms and is bonded via a C atom, heterocycloalkenyl which has 3 to 10 and is bonded via a C atom, a polycyclic hydrocarbon radical with 6 to 10 atoms, C_6–C_{14}aryl, C_7–C_{20}aralkyl, heteroaryl with 5 or 6 ring atoms or heteroaralkyl with 5 to 6 ring atoms and 1 to 6 C atoms in the alkyl group, which cyclic groups are unsubstituted or substituted by C_1–C_{12}alkyl, C_1–C_{12}alkoxy, C_1–C_{12}alkylthio, C_3–C_6cycloalkyl, C_3–C_6cycloalkoxy C_3–C_6cycloalkylthio, C_6–C_{10}aryl, C_6–C_{10}aryloxy, C_6–C_{10}arylthio, C_7–C_{16}aralkyl, C_7–C_{16}aralkoxy, C_7–C_{16}aralkylthio, heteroaryl with 5 or 6 ring atoms, heteroaryloxy with 5 or 6 ring atoms, cyano, halogen, C_2–C_{24}secondary amino, —C(O)OR[2], —O(O)CR[4], —NR[2](O)CR[4] or —C(O)NR[2]R[3];
R^2 and R^4 independently from each other are C_1–C_{12}alkyl, phenyl or benzyl;
R^3 is hydrogen C_1–C_{12}alkyl, phenyl or benzyl;
it being possible for the substituents C_1–C_{12}alkyl, C_1–C_{12}alkoxy and C_1–C_{12} alkylthio in turn to be substituted by C_1–C_{12}alkoxy, halogen, cyano, C_2–C_{24}secondary amino, —C(O)OR[2], —O(O)CR[4], —NR[2](O)CR[4], —C(O)NR[2]R[3], cycloalkyl or heterocycloalkyl with 4–8 ring C atoms or 5 or 6 ring atoms,
and for the substituents cycloalkyl, cycloalkoxy, cycloalkylthio, aryl, aryloxy, arylthio, aralkyl, aralkoxy, aralkylthio, heteroaryl or heteroeryloxy to be substituted by C_1–C_{12}alkyl, -alkoxy or -alkylthio, halogen, cyano, C_2–C_{24}secondary amino, —C(O)OR[2], —O(O)CR[4], —NR[2](O)CR[4], —C(O)NR[2]R[3], and
it being possible for cycloalkyl, cycloalkenyl, heterocycloalkyl or heterocycloalkenyl as defined for R and R^1 to be fused with C_6–C_{14}aryl or heteroaryl with 5 or 6 ring atoms, by photooxidation of a thiourea of the formula II

$$R-NH-\overset{\overset{S}{\|}}{C}-NH-R^1, \quad (II)$$

in which R and R^1 are as defined above with oxygen in a solvent, which comprises carrying out the reaction in the presence of an acid trapping agent which is soluble in the reaction medium.

4,990,233

METHOD FOR RETARDING MINERAL BUILDUP IN DOWNHOLE PUMPS

Granville Hahn, Big Spring, Tex., assignor to Permian Research Corporation, Big Spring, Tex.

Filed Jun. 14, 1985, Ser. No. 745,322
Int. Cl.[5] C23C *14/48;* B05D *3/06*
U.S. Cl. 204—192.31 6 Claims



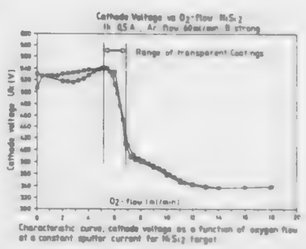
1. A method for retarding non-corrosive mineral plugging in a check valve utilized in a downhole reciprocating rod pump, said check valve being characterized by a threaded valve body and a valve seat said method comprising
ion implanting a layer of material selected from the group consisting of nonferrous metals or nonferrous metal oxides on the interior facing surfaces of the valve body and the valve seat.

4,990,234

PROCESS FOR COATING SUBSTRATES MADE OF A TRANSPARENT MATERIAL, FOR EXAMPLE FLOATGLASS

Joachim Szczyrbowski, Goldbach; Stephan Rögels, Rodenbach, both of Fed. Rep. of Germany; Anton Dietrich, Triesen, Liechtenstein, and Klaus Hartig, Ronneburg, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jul. 10, 1989, Ser. No. 377,531
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1989, 3906453
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.230 2 Claims



Characteristic curve, cathode voltage as a function of oxygen flow at a constant sputter current for Nb_2O_5 target

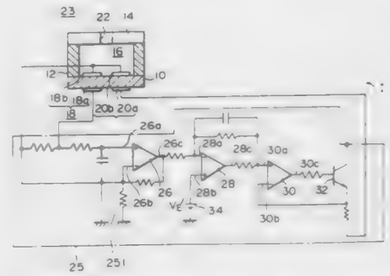
1. Process for coating transparent substrate with a transparent dielectric layer having a refractive index less than 1.7 and a layer growth rate greater than 6.0 A cm^2/W sec by means of reactive direct current cathode sputtering in a vacuum chamber into which a reactive gas and a process gas are introduced, the chamber including a cathode which is provided on one of its surfaces with the material to be sputtered and deposited on the substrate, characterized in that the material to be sputtered is a composition of 66–90 at .% silicon, balance nickel, and the layer deposited on the substrate is the corresponding oxide, and the reactive gas introduced into the vacuum chamber is oxygen and the process gas is a noble gas.

4,990,235

OXYGEN SENSOR

Yoshiki Chujo, Mishima, Japan, assignor to Toyota Jidosha Kabushiki, Toyota, Japan

Filed Feb. 9, 1990, Ser. No. 477,734
Claims priority, application Japan, Feb. 23, 1989, 1-019507[U]; Feb 27, 1989, 1-043167
Int. Cl.[5] G01N *27/407*
U.S. Cl. 204—424 9 Claims



1. An oxygen sensor for detecting oxygen density of an oxygen-containing gas in a region of pulsating pressure, said oxygen sensor comprising:
a body formed of a solid electrolyte material that is capable of conducting oxygen ions;
a wall enclosing a portion of the surface of the solid electrolyte body, the wall and the solid electrolyte body forming

a hollow structure, the interior of which forms a diffusion chamber; and

a plurality of electrodes mounted on the structure, the electrodes being adapted to be connected to a voltage source to provide a sensor cell and a pumping cell, wherein

the structure, when placed in said region of pulsating pressure, is permeable to gas molecules only through at least one pin-hole opening formed in the structure and through a porous portion of the structure not including the pin-hole opening,

the total flow area of the at least one pin-hole opening is selected to be small enough to control the rate of diffusion of oxygen molecules from the region of pulsating pressure into the diffusion chamber, and the flow area of each pin-hole opening is selected to be large enough to control the diffusion rate primarily by causing multiple collisions between the gas molecules passing through the pin-hole rather than primarily by multiple collisions between the gas molecules and the inner surface of the pin-hole opening, and

the size of each pore in the porous portion is much smaller than the size of the pin-hole and the total pore area of all the pores in the porous portion is substantially smaller than the flow area of the pin-hole opening but is sufficient to permit pulsative changes in the pulsating pressure region to be transmitted to the diffusion chamber.

4,990,236

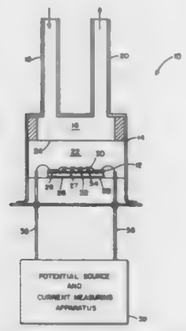
THIN FILM MOISTURE SENSING ELEMENT

Fred C. Sittler, Victoria, Minn.; Radhakrishna M. Neti, Brea, Calif., and Adrian C. toy, Eden Prairie, Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 153,168, Feb. 8, 1988, abandoned. This application Feb. 21, 1990, Ser. No. 485,772

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—430 **16 Claims**



1. A thin film moisture sensing element comprising:

a substantially planar surface layer of silicon dioxide;

at least two electrodes disposed on the surface layer, the electrodes being spaced to define an interelectrode gap therebetween;

each electrode including a noble metal layer and an alloy layer between the noble metal layer and the silicon dioxide surface layer, the alloy layer composed of a binding metal alloyed with the surface layer and the noble metal layer to bind them together, the alloy layer consisting essentially of alloys of the binding metal, the surface layer and the noble metal layer;

a hygroscopic material disposed in at least a first continuous layer over at least a portion of the surface layer and over portions of the two electrodes; and

means for electrically connecting the electrodes across a source of electrical potential and to electric current measuring instrumentation.

4,990,237

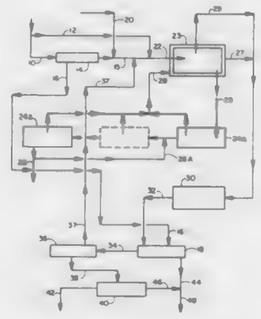
PROCESS FOR THE RECOVERY OF OIL FROM WASTE OIL SLUDGES

Steven R. Heuer, 6864 Welch Ct., Arvada, Colo. 80004, and Victor R. Reynolds, 14 Twelve O'Clock Rd., Westin, Conn. 06883

Continuation-in-part of Ser. No. 77,888, Jul. 27, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 313,240

Int. Cl.[5] C10G *17/00*

U.S. Cl. 208—13 **15 Claims**



1. A process for the recovery of oil, useful for further processing as refinery feed stock, from waste oil sludge containing oil, water and at least 5% by weight solids, and from which the oil and water cannot be separated by mechanical means, comprising:

(a) heating said sludge at a temperature sufficient to volatilize the oil and water in said sludge, and recovering solids free of oil and water, said solids being classified nonhazardous by EPA taoxicity test procedure,

(b) condensing said oil and water.

(c) centrifuging the resulting condensate from step (b) to separate oil from water and any entrainded solids,

(d) recovering oil from said centrifuging for further refinery processing, and

(e) recovering water from said centrifuging whereby said water is sufficientay clean for further treatment in a conventional water treatment facility to lower the Chemical Oxygen Demand to an acceptable limit.

4,990,238

NON-CARCINOGENIC LIGHT LUBRICANTS AND A PROCESS FOR PRODUCING SAME

George Cruzan, Ringoes; Carl R. Mackerer, Pennington; Joseph J. Yang, Warren, and George E. Cox, Skillman, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 459,234

Int. Cl.[5] C10G *71/00*

U.S. Cl. 208—18 **20 Claims**

1. A process for the production of a substantially non-carcinogenic light lubricant from a tumorigenic atmospheric distilled light hydrocarbon oil, comprising the step of blending an effective amount of a substantially non-tumorigenic vacuum distilled hydrocarbon oil of lubricating viscosity having a significant level of C_{21} and higher hydrocarbons with the tumorigenic atmospheric distilled light hydrocarbon oil, the tumorigenic light hydrocarbon oil boiling within the range of from about 250° F. to about 700° F., wherein the resultant blend is of lubricating viscosity and is substantially non-carcinogenic as indicated by a long-term topical administration test conducted on a mice population in which less than 10% of the population develop skin tumors.

4,990,239

PRODUCTION OF GASOLINE AND DISTILLATE FUELS FROM LIGHT CYCLE OIL

W. Rodman Derr, Jr., Vincentown; Peter J. Owens, Mantua, and Michael S. Sarli, Haddonfield, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 433,251, Nov. 8, 1989. This application Dec. 13, 1989, Ser. No. 449,168

Int. Cl.[5] C10G *65/12*

U.S. Cl. 208—68 **18 Claims**

1. A process for the co-production of high quality gasoline and distillate products from catalytically cracked feedstocks which comprises:

(i) catalytically cracking a hydrocarbon feedstock to produce a substantially dealkylated cracked product,

(ii) hydrocracking the substantially dealkylated product with a hydrocracking catalyst at a hydrogen partial pressure not greater than 1200 psig and a conversion to gasoline boiling range products not more than 75 wt. percent;

(iii) separating the products of hydrocracking into a gasoline boiling range fraction, a first distillate range fraction boiling immediately above the gasoline fraction with an end point in the range of 450° to 500° F. and a second, higher boiling distillate fraction which is more paraffinic than the first distillate fraction;

(iv) recycling at least a portion of the first, lower boiling distillate fraction to the catalytic cracking step,

(v) recovering the second, higher boiling distillate fraction .

4,990,240

VANADIUM PASSIVATION IN A HYDROCARBON CATALYTIC CRACKING PROCESS

Eugene A. Pasek, Monroeville, and Norman C. Morgan, Ford City, both of Pa., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 207,604, Jun. 16, 1988, Pat. No. 4,929,583, which is a continuation-in-part of Ser. No. 752,994, Jul. 8, 1985, abandoned. This application Feb. 14, 1990, Ser. No. 479,772

Int. Cl.[5] C10G *11/04*

U.S. Cl. 208—120 **4 Claims**

1. A process for the catalytic cracking of a vanadium-containing hydrocarbon charge stock which comprises contacting said charge stock under catalytic cracking conditions with the catalyst composition comprising a crystalline aluminosilicate zeolite, a matrix material, and from 5 to 40 weight percent, based on the total catalyst composition, of a vanadium passivator having a passivation factor of at least 2.0, the anion of said vanadium passivator is of a weak non-volatile acid having a pKa greater than 5 and the cation is a Group IIA metal having an atomic number of greater than 20.

4,990,241

HYDROTREATING PROCESS TO MINIMIZE CATALYST SLUMPING

Robert D. Buttke, Naperville, Ill.; Robert E. Boening, Galveston, Tex., and Frank W. Pickell, Alvin, Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Aug. 31, 1988, Ser. No. 238,928

Int. Cl.[5] C10G *45/00*

U.S. Cl. 208—143 **8 Claims**

1. A hydrotreating process, comprising the steps of:

feeding oil into an ebullated bed reactor;

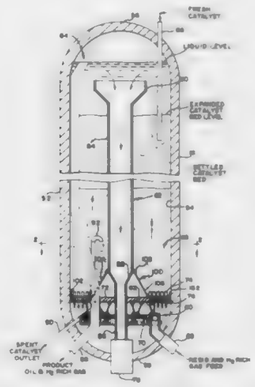
injecting hydrogen-rich gases into said reactor;

dispensing a hydrotreating catalyst into said reactor to form a catalyst bed;

expanding said catalyst bed;

hydroprocessing, contacting, and mixing said oil and gases in the presence of said catalyst in said reactor to produce an upgraded hydrotreated oil; while concurrently

substantially deflecting said catalyst downwardly and inwardly away from the walls of said reactor with an annular internal baffle positioned adjacent said walls in the bottom portion of the reactor while simultaneously substantially minimizing clustering of said catalyst in said



reactor by increasing upward velocity of said oil and gases.

4,990,242

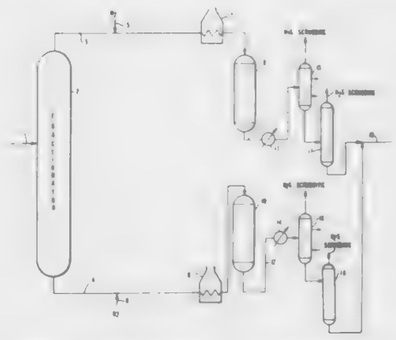
ENHANCED SULFUR REMOVAL FROM FUELS

Stephen Louie, Kingwood, Tex., and Gerald E. Markley, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 14, 1989, Ser. No. 366,067

Int. Cl.[5] C10G *23/02*

U.S. Cl. 208—218 **15 Claims**



1. A process for hydrotreating a petroleum distillate feedstock in a plurality of hydrotreating zones, comprising:

(1) splitting the feedstock by fractionation into at least two different boiling point fractions, including a first distillate stream relatively depleted in sulfur and a second distillate stream relatively concentrated in sulfur, wherein said first distillate stream boils in the range of 350° to 575° F. and said second distillate stream boils in the range of 575°to 700° F.;

2) hydrotreating in a first hydrotreating zone the first distillate stream in admixture with an excess of hydrogen to obtain a first effluent; and

(3) hydrotreating in a second hydrotreating zone, the second distillate stream in admixture with an excess of hydrogen to obtain a second effluent;

wherein the first hydrotreating zone is at a total pressure of 100 to 250 psia and the second hydrotreating zone is at a total pressure of 100 to 800 psia and the ratio of total pressure in the first hydrotreating zone to the total pressure in the second

hydrotreating zone is in the range of about 1:2 to 1:8 and whereby a greater hydrogen consumption per barrel occurs in the second hydrotreating zone than in the first hydrotreating zone.

4,990,243

PROCESS FOR HYDRODENITROGENATING HYDROCARBON OILS

Philip L. Winslow, Hercules, and Richard F. Sullivan, San Rafael, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed May 10, 1989, Ser. No. 349,848
Int. Cl.[5] C10G *1/00*
U.S. Cl. 208—254 H 14 Claims

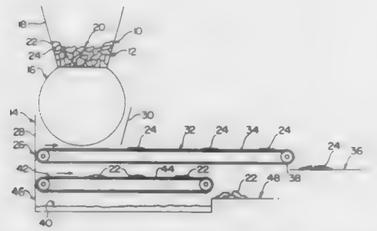
1. A process for denitrification of hydrocarbon oils comprising contacting the hydrocarbon oils with hydrogen in the presence of a layered catalyst comprising a first layer of a catalyst which comprises a catalyst selected from the group consisting of a nickel-molybdenum-phosphorus/alumina catalyst and a cobalt-molybdenum-phosphorus/alumina catalyst having a molybdenum content greater than about 14% by weight of the first layer catalyst and having an average pore size of at least about 60 Å and comprising a second layer of a catalyst which comprises a catalyst selected from the group consisting of a nickel-tungsten/silica-alumina-zeolite and a nickel-molybdenum/silica-alumina-zeolite catalyst, wherein the zeolite component comprises at least about 2% by weight of the second layer catalyst.

4,990,244

RECYCLING THE COMPONENTS OF USED SINGLE USE HUMAN WASTE COLLECTING AND/OR ABSORBING PRODUCTS

Gene F. Anderson, 1622 S. 258th, Kent, Wash. 98032

Filed Feb. 2, 1989, Ser. No. 305,791
Int. Cl.[5] B07B *9/00*
U.S. Cl. 209—2 26 Claims



1. A process for hygienically returning for reuse, in subsequent manufacturing processes, substantially most of the original liquid absorbing materials and moisture sealing materials originally secured together by adhesives of used one use collecting and absorbing products, previously manufactured and then used to collect human waste, which includes urine and feces, comprising:

(a) gathering the used collecting and absorbing products containing human waste;

(b) arranging the used collecting and absorbing products containing human waste, into overall groups not exceeding a designated preselected weight;

(c) loading a selected overall group of used collecting and absorbing products containing human waste, into machinery, which utilizes water for soaking and washing the selected overall group, to remove the human waste and to divert the human waste, via water leaving the machinery, into municipal sewers for subsequent municipal sewer treatment;

(d) operating this machinery for soaking and washing to remove the human waste from the selected overall group of used collecting and absorbing products;

(e) heating the washed selected overall group of used collecting and absorbing products to a temperature high enough to liquidize the adhesives used during the original manufacturing process to bond together the original liquid absorbing materials to the original moisture sealing materials;

(f) withdrawing the liquidized adhesives from the original liquid absorbing materials and the original moisture sealing materials; and

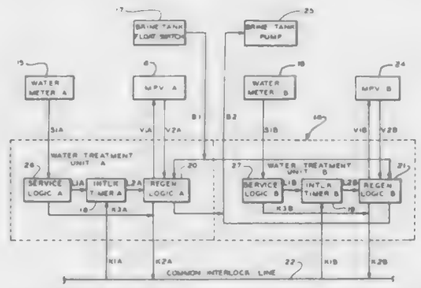
(g) separating the original liquid absorbing materials and the original moisture sealing materials, from one another.

4,990,245

SEQUENCE CONTROLLER SYSTEM FOR REGENERATING WATER TREATMENT UNITS

Samuel Wieme, Wayne, N.J., assignor to The Permutit Company, Paramus, N.J.

Filed Jun. 8, 1989, Ser. No. 363,469
Int. Cl.[5] B01D *21/30*
U.S. Cl. 210—96.1 6 Claims



1. A sequence controller system for regenerating a water treatment plant comprising:

a plurality of water treatment units for treatment of water flowing through said treatment units, each of said treatment units having a timer and a sequencing means for sequencing of each of said treatment units through successively repeating cycles of service and regeneration;

priority specifying means for setting time intervals in each of said timers to establish a regeneration priority for each treatment unit prior to any unit beginning a regeneration cycle which is activated when two or more treatment units have completed their service cycles at the same time;

means for energizing said sequencing means to begin the regeneration cycle only for the treatment unit whose timer has first completed its set time interval; and

means for locking out all of said treatment units from beginning their regeneration cycles except for that water treatment unit which has begun its regeneration cycle.

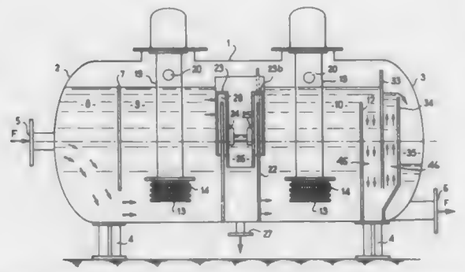
4,990,246

SEPARATOR FOR TWO NON-MISCIBLE LIQUIDS

Jean Blazejczak, Billere, and Luc Delons, Pau, both of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Continuation of Ser. No. 116,318, Nov. 4, 1987, abandoned. This application Oct. 31, 1989, Ser. No. 430,058
Claims priority, application France, Nov. 4, 1986, 86 15337
Int. Cl.[5] B01D *21/24*
U.S. Cl. 210—109 7 Claims

1. A separator for separating two liquids which are not miscible, said separator comprising; a casing comprised of active cells and passive cells, means for introducing liquid to be separated into one of the passive cells, means for removing liquid from another of the passive cells, said passive cells each comprising a tranquilizing region, said active cells being disposed between said passive cells, each of said active cells comprising a rotor-stator assembly for creating foam to perform separation of the liquids induced gas, a common skimmer disposed in a center region of the casing, said skimmer com-



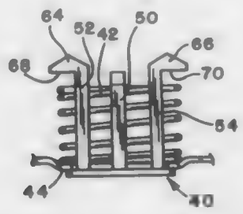
prising a movable part having a downwardly opening annulus extending around a fixed part of corresponding configuration, a gas seal in said annulus between said fixed part and said moving part, said gas seal being maintained by induced gas created by said rotor-stator assemblies, and means for discharging liquid and foam flowing over said movable part.

4,990,247

RELIEF VALVE FOR LIQUID FILTER

Theodorus A. Vandenberk, Stratford, Canada, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 8, 1989, Ser. No. 404,477
Int. Cl.[5] B01D *27/10*
U.S. Cl. 210—130 6 Claims



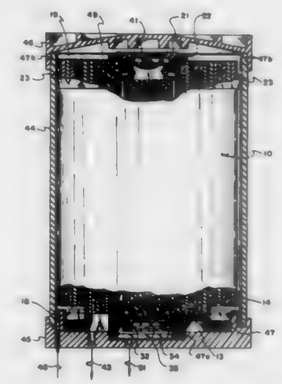
1. Liquid filter for filtering a liquid filtrate comprising a housing having an inlet and an outlet, filtering media within said housing dividing the latter into an inlet chamber communicated with said inlet and an outlet chamber communicated with said outlet, and a relief valve assembly opening to permit the liquid filtrate to communicate directly from the inlet chamber to the outlet chamber bypassing said filtering media when the pressure differential between the inlet and outlet chambers exceeds a predetermined level, said relief valve assembly including a retainer cooperating with the filtering media to separate the inlet chamber from the outlet chamber, said retainer defining an aperture communicating the inlet chamber with the outlet chamber, a valve member for closing said aperture, and a spring yieldably urging said valve member into a position closing said aperture, said valve member including first and second sets of spring engaging members, each of said spring engaging members carrying spring engaging surfaces, the spring engaging surfaces on one of said sets engaging said spring to hold the latter away from the spring engaging surfaces on the other set, whereby the spring engaging surfaces on said other set engage said spring only upon breakage of said first set of spring engaging members to prevent the valve member from falling away from said retainer.

4,990,248

REVERSE OSMOSIS APPARATUS

Barry M. Brown, Baldwinsville; Evan A. Edwards, Pittsford; Joseph C. Holzer, Liverpool, all of N.Y.; Augustine Pavel, Fallbrook, Calif.; Frederick Tone, Holley, and Henry L. West, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 57,545, Jun. 3, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 208,817
Int. Cl.[5] B01D *61/08*
U.S. Cl. 210—136 8 Claims



1. A water filter cartridge having first and second ends and including:

a prefilter of annular form adapted for flow of feed water generally axially therethrough from said first end to said second end;

a tubular impermeable barrier surrounding the outer surface of the prefilter;

a reverse osmosis filter including a membrane wound on a winding tube through which permeate may pass to the interior of the winding tube, and an impermeable barrier layer surrounding the outer surface of said membrane, said reverse osmosis filter being of annular form in section and disposed radially within said prefilter;

a post-filter comprising granular filter material disposed radially within said reverse osmosis filter; and

means for leading permeate to the granular filter material at said second end;

the arrangement being such that feed-water which enters said prefilter at said first end may leave the prefilter at the second end and may thereafter enter the reverse osmosis filter at the second end, and that waste water leaves the reverse osmosis filter at said first end and the permeate, after passing through said winding tube and passing to said post-filter at said second end, leaves said post-filter at said first end.

4,990,249

APPARATUS FOR THE DESLUDGING OF BATHS

Andreas Leuenberger, Biel-Benken, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

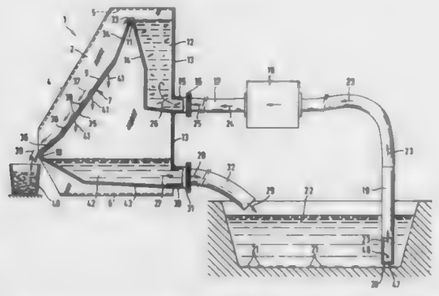
Filed Feb. 27, 1990, Ser. No. 486,371
Claims priority, application Switzerland, Mar. 2, 1989, 774/89
Int. Cl.[5] B01D *24/00*
U.S. Cl. 210—167 6 Claims

1. Apparatus for the desludging of baths, in particular for the freeing of tick immersion baths for cows, from solid particles introduced by the animals, comprising:

a suction tube immersible in liquid;

a pump and a preliminary basin supplied by said pump, said basin being equipped with an overflow conducting the liquid to be purified to the upper edge of a sieve plate

extending obliquely relative to the direction of gravity and retaining the solid particles, said plate being provided with a plurality of slots extending essentially transversely to the direction of flow; and,



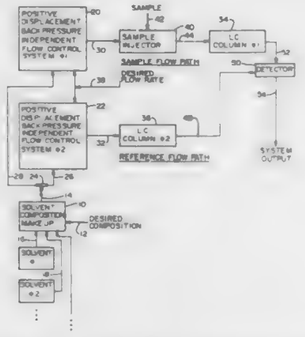
a collector basin located under the sieve plate for receiving the filtered liquid and connected by means of a drain with the bath, the sieve plate being designed to provide ribbed support for a filter cloth of a tight mesh plastic fabric placed upon it.

4,990,250

REFERENCE FLOW LIQUID CHROMATOGRAPHY SYSTEM WITH STABLE BASELINE

Lance Hellinger, San Jose, Calif., assignor to Spectra Physics, Inc., San Jose, Calif.

Continuation of Ser. No. 155,592, Feb. 12, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 456,021
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 19 Claims



1. An apparatus for stabilizing the baseline response of a chromatography system comprising:

supply means for making up a solvent composition from one or more solvents;

a detector means having a first fluid input and a second fluid input for detecting the difference in a selected characteristic between the fluid in a stream entering said first fluid input and the fluid in a stream entering said second fluid input;

a first fluid flow path from said supply means to said detector means first input having a flow path length;

a second fluid flow path from said supply means to said detector means second input having a flow path length which is identical to the flow path length of a said first fluid flow path;

a liquid chromatography column in said first fluid flow path having a defined set of column parameters including resistance to flow;

reference means in said second fluid flow path for substantially reproducing at least the resistance to flow parameter of said liquid chromatography column;

sample injection means for receiving a sample of unknown composition and injecting said sample into a solvent stream received at an input and coupled to said first fluid flow path such that said sample is injected in said first fluid flow path and having an output coupled to said first liquid chromatography column;

first pumping means in said first fluid flow path and coupled to said sample injection means for forcing solvent received from said supply means through said first liquid chromatography column at a selected flow rate regardless of the amount of resistance to flow caused by said first liquid chromatography column;

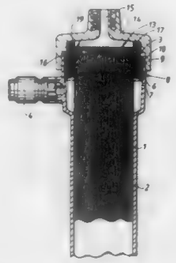
second pumping means in said second fluid flow path for forcing solvent received from said supply means through said reference means at a substantially identical flow rate as exists in said first fluid flow path regardless of differences in resistance to flow caused by said reference means said first and second pumping means being located at positions in the first and second flow paths that are not common to both the first and second flow paths.

4,990,251

RESILIENT SEALING RING

Kurt Spranger, Ammerbuch; Roland Antoni, Hechingen-Boll; Joachim Lutterbeck, Hechingen; Gerd Ott, Burladingen; Herbert Raabe, Haigerloch-Stetten, and Josef Volm, Haigerloch-Owingen, all of Fed. Rep. of Germany, assignors to Gambro Dialystoren GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,135
Claims priority, application Sweden, Jul. 7, 1988, 8802542
Int. Cl.[5] B01D *63/04*
U.S. Cl. 210—321.8 13 Claims



1. A diffusion/filtration device comprising

a housing defining a longitudinally extending internal chamber including a first end and a second end,

a bundle of semi-permeable hollow fibers disposed within said internal chamber, said hollow fibers extending longitudinally from said first end of said housing to said second end of said housing, said hollow fibers having an outer surface and a first end and a second end corresponding, respectively, to said first end and said second end of said housing,

lid means for attachment to said first end of said housing, said lid means including fluid communication means for providing fluid to or withdrawing fluid from said first end of said internal chamber,

end wall means supporting said first end of said hollow fibers within said internal chamber so as to sealingly separate said first end of said hollow fibers from said outer surface of said hollow fibers between said first and second ends thereof, and

sealing ring means for providing acceptable compression force between said end wall means and said lid means over an extended range of deformations, said sealing ring means comprising an annular ring of resilient material having a cross-sectional configuration such that in its uncompressed condition said sealing ring has a substantially longitudinally extending configuration between first and second ends thereof including a longitudinal dimension which is greater than its transverse dimension, whereby upon being compressed between said end wall means and said lid means said sealing ring bends in a manner such that said first and second ends approach each other.

4,990,252

STABLE MEMBRANES FROM SULFONATED POLYARYLETHERS

John E. Tomaschke, San Diego, Calif.; Anthony J. Testa, Westwood, and James G. Vouros, Boston, both of Mass., assignors to Hydranautics, Goleta, Calif.

Continuation of Ser. No. 10,865, Feb. 4, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 397,346
Int. Cl.[5] B01D *63/02*
U.S. Cl. 210—321.83 16 Claims

1. An improved oxidatively resistant membrane consisting essentially of an oxidatively resistant porous substrate to which is bonded a coating film of a sulfonated polyarylether polymer and which membrane is prepared by a process which comprises:

(a) forming a solution of a sulfonated polyarylether polymer in a potentiating solvent system containing at least 10% formic acid, said solvent system being substantially polar, volatile enough to be removed by gentle heating, of low enough surface tension to wet the porous substrate, and not able to dissolve the porous substrate;

(b) uniformly applying said solution of the sulfonated polyarylether to at least one surface of the porous substrate; and

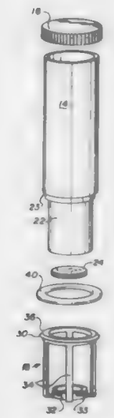
(c) removing said solvent from the solution to form a coating or film of the sulfonated polyarylether adherently attached to the porous substrate.

4,990,253

FLUID SAMPLE FILTRATION DEVICE

John L. Vcelka, Zion, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 148,260, Jan. 25, 1988, Pat. No. 4,891,134. This application Oct. 10, 1989, Ser. No. 419,186
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] B01D *33/00*
U.S. Cl. 210—359 5 Claims



1. A differential pressure sample filtration device comprising:

an outer container for receiving a fluid for filtering; and

a hollow plunger dimensioned to be slidably received in said outer container and comprising:

a first piece having at one end a reduced diameter portion forming an annular shoulder, means for collecting fluid filtrate and filter means disposed between said one end of the plunger and said means for collecting fluid filtrate; and

a second piece having an annular axial face and being dimensioned to be secured to said first piece such that the annular axial face and the annular shoulder cooperate to form an annular groove about said plunger, said annular groove being adapted for receiving a sealing means for forming a fluid seal between the outer container and the hollow plunger,

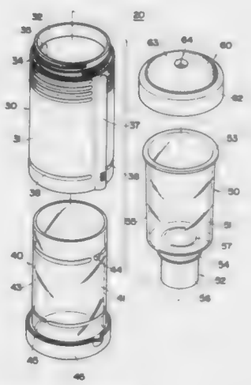
wherein said second piece comprises a first annular ring dimensioned to slidably fit over said one end of said first piece, a second annular ring dimensioned to slidably fit into the hollow portion of said one end of the first piece to abut said filter means, and a plurality of legs connecting said first annular ring to said second annular ring.

4,990,254

PORTABLE WATER PURIFIER

Shoji Toida; Takeshi Kuwana; Kazunori Iwasaki, and Tooru Goto, all of Tokyo, Japan, assignors to Japan Oxygen Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1990, Ser. No. 469,636
Claims priority, application Japan, Jan. 25, 1989, 1-7267[U]
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—464 8 Claims



1. A water purifier comprising:

an outer elongated hollow body having openings at top and bottom portions, an outer body portion with an inner wall and an engaging protrusive portion provided on said inner wall of said outer body portion at a lower portion thereof;

a cup adapted to be fitted into said outer elongated hollow body from said lower opening thereof and having a cup body portion with an outer wall and a stopper projection provided on said outer wall of, and at a lower portion of, said cup body portion thereof, said stopper projection sliding over said protrusive portion of said outer elongated hollow body to come in engagement with said protrusive portion when said cup is fitted in said outer elongated hollow body;

a filtering elongated hollow body adapted to be fitted in said cup from said upper opening of said outer elongated hollow body, having a flange at a periphery of an upper portion thereof, said flange being engageable with an upper edge of said outer elongated hollow body, and having a filter disposed in a lower portion thereof; and

a cap fitted detachable on an upper portion of said outer

elongated hollow body to cover said upper opening thereof.

4,990,255

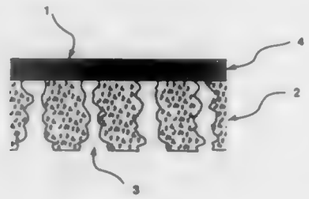
COMPOSITE MEMBRANES FOR FLUID SEPARATIONS

Ingo Blume, Hengelo, Netherlands; Klaus-Viktor Peinemann, Reinbek, Fed. Rep. of Germany; Ingo Pinnau, Austin, Tex., and Johannes G. Wijmans, Menlo Park, Calif., assignors to Membrane Technology & Research Inc., Menlo Park, Calif.

Continuation of Ser. No. 361,024, Jun. 2, 1989, Pat. No. 4,931,181. This application Apr. 30, 1990, Ser. No. 516,181

Int. Cl.[5] B01D *61/36, 67/00*

U.S. Cl. 210—500.27 15 Claims



1. A process for making a composite separation membrane, said membrane comprising a two-layer composite of a support membrane layer and a permselective membrane layer, said process comprising:

(a) providing a support membrane layer characterized by permeation rates $P_{1(A)}/l_1$ and $P_{1(B)}/l_1$ respectively of components A and B of a fluid mixture, wherein l_1 is the thickness of the support membrane layer and $P_{1(A)}$ and $P_{1(B)}$ are the permeabilities to components A and B;

(b) providing a permselective material characterized by permeabilities $P_{2(A)}$ and $P_{2(B)}$ respectively to said components A and B, and by intrinsic selectivity α;

(c) determining an appropriate selectivity $\alpha_{A/B}$ for said composite separation membrane for component A over component B;

(d) determining a thickness l_2 for said permselective membrane layer which satisfies the relationship:

$$\alpha_{A/B} = \frac{l_1/P_{1(B)} + l_2/P_{2(B)}}{l_1/P_{1(A)} + l_2/P_{2(A)}};$$

(e) coating said support membrane layer with said permselective material to create a permselective membrane layer of thickness l_2.

4,990,256

METHOD, DEVICE AND FILTER MODULE FOR THE FILTRATION OF LIQUIDS IN CROSS-FLOW OPERATION

Hans-Weddo Schmidt, Hardegsen, Fed. Rep. of Germany, assignor to Sartorius AG, Göttingen, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 350,932

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816334

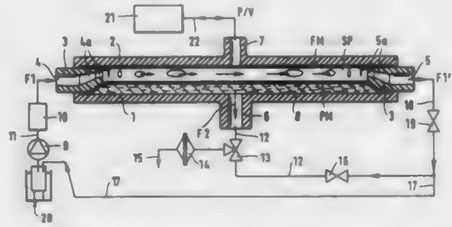
Int. Cl.[5] B01D *65/02*

U.S. Cl. 210—636 24 Claims

1. A method for preventing or breaking down a developing filter covering layer (DS) during the filtration of liquids with finely distributed constituents therein a cross-flow operation comprising the steps of

conducting liquid to be treated in a narrow overflow slot (SP) between a filter surface (PM) and an impermeable, flat slot limiter surface (FM),

periodically disposing the slot limiter surface (FM) adhesively into areal contact with the developing filter covering layer (DS) or with the filter surface (PM) by means of relative motion relative to the filter surface (PM), and



removing the filter covering layer (DS) in a rinsing fashion from the filter surface (PM) by reactivating the overflow slot (SP) and overflowing the filter surface (PM) and the slot limiter surface (FM).

4,990,257

CONCENTRATION OF SOLUTION BY REVERSE OSMOSIS

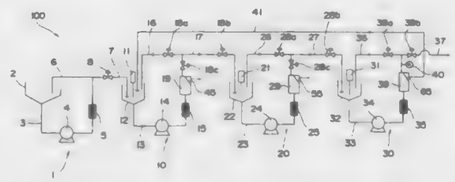
Atsuo Watanabe, Saitama; Mitsutoshi Nakajima; Hiroshi Nabetani, both of Ibaragi; Yasunori Yamada, Tochigi, and Tsutomu Ohmori, Ibaragi, all of Japan, assignors to Director of National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries, Ibaragi and Kagome Co., Ltd., Aichi, both of, Japan

Filed Jun. 14, 1990, Ser. No. 538,540

Claims priority, application Japan, Jun. 19, 1989, 1-156197

Int. Cl.[5] B01D *61/08, 61/12*

U.S. Cl. 210—641 13 Claims



1. A multistage apparatus for concentrating a solution by reverse osmosis, comprising:

means for maximizing the concentration of a solute in a solution in a multistage reverse osmosis apparatus having only standard capacity pumps, including first concentrating means for concentrating a solution, said first concentrating means comprising at least one concentrating unit and being positioned upstream with respect to a direction in which a solution to be concentrated flows, and second concentrating means for concentrating the solution which has been concentrated by said first concentrating means, said second concentrating means comprising at least one concentrating unit and being positioned downstream with respect to said direction;

said concentrating units consisting essentially of respective membrane modules and respective standard capacity pumps, the membrane module of the concentrating unit of said first concentrating means comprising a tight reverse osmosis membrane with a high rejection percentage sufficient to achieve a high concentration of said solution with a high flux density of solvent flowing through the membrane, and the membrane module of the concentrating unit of said second concentrating means comprising a loose reverse osmosis membrane with a lower rejection percentage sufficient to easily achieve a further concentration of said solution which has been concentrated by said first concentrating means with a high flux density of solution flowing through the membrane.

11. A multistage method of concentrating a solution by reverse osmosis, comprising the step of:

providing means for maximizing the concentration of a solute in a solution in a multistage apparatus having only standard capacity pumps, including steps of providing first concentrating means for concentrating a solution to a first concentration, said first concentrating means comprising at least one concentrating unit which is positioned upstream with respect to a direction in which a solution to be concentrated flows, and providing second concentrating means for concentrating the solution that has been concentrated by said first concentrating means to a second concentration which is higher than said first concentration, said second concentrating means comprising at least one concentrating unit which is positioned downstream with respect to said direction;

said concentrating units consisting essentially of respective membrane modules and respective standard capacity pumps, the membrane module of the concentrating unit of said first concentrating means comprising a tight reverse osmosis membrane with a high rejection percentage sufficient to achieve a high concentration of said solution with a high flux density of solvent flowing through the membrane, and the membrane module of the concentrating unit of said second concentrating means comprising a loose reverse osmosis membrane with a lower rejection percentage sufficient to easily achieve a further concentration of said solution which has been concentrated by said first concentrating means with a high flux density of solution flowing through the membrane.

4,990,258

MONITOR FOR THE CONTROL AND/OR CHECKING OF TWO OR MORE FUNCTIONS

Bjorn A. Bjare, Lund; Bengt-Ake G. Gummesson, Bara; Anders G. Eckerbom, Bromma, and Jan P. Sternby, Lund, all of Sweden, assignors to Gambro AB, Sweden

Filed May 29, 1986, Ser. No. 868,354

Claims priority, application Sweden, Jun. 4, 1985, 8502756

Int. Cl.[5] B01D *61/34*

U.S. Cl. 210—647 20 Claims



1. A control panel for use with a system having means for regulating a plurality of parameters according to at least one control constant associated with each parameter, said control panel comprising:

(a) a plurality of separate display means, one of said display means being associated with each of said parameters, each of said display means being operative to display the value of a control constant employed by said system for the associated parameter;

(b) variable signal means including a single manually-movable maneuvering element for providing a manually variable signal dependent upon the position of said maneuvering element;

(c) parameter selection means including a plurality of manually operably actuators, one of said actuators being associated with each of said display means and disposed on said control panel adjacent thereto on said panel for selecting the parameter associated with each of said display means upon operation of said manually operable actuator associated therewith; and

(d) interpretation means for interpreting said variable signal provided by said variable signal means as a new value of said control constant for the parameter selected by said parameter selection means and supplying said new value to said system.

15. In a method of controlling the dialysis fluid portion of a hemodialysis system, the improvement comprising the step of setting control constant values for at least one parameter selected from the group consisting of conductivity, temperature, fluid flow, transmembrane pressure, ultrafiltrate volume, ultrafiltration rate, time, chemical composition, ph, and blood leakage using the control panel of claim 1.

4,990,259

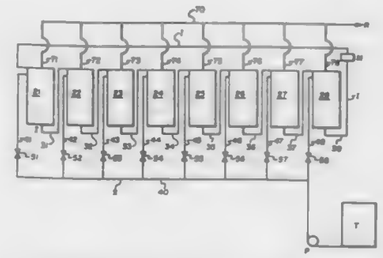
CHROMATOGRAPHIC SEPARATOR SORBENT BED PREPARATION

Michael M. Kearney, Twin Falls, and Michael W. Munns, Hansen, both of Id., assignors to The Amalgamated Sugar Company, Ogden, Utah

Continuation-in-part of Ser. No. 285,717, Dec. 16, 1988, abandoned. This application Sep. 26, 1989, Ser. No. 412,417

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—659 6 Claims



1. In a simulated moving bed process in which a plurality of sorbent beds are contained within respective vessels with inlets and outlets connected in a loop so that circulating liquid moves in sequence through said beds while process input streams are cyclically introduced in corresponding sequence to said loop at selected locations associated with said vessels, and compensating process output streams are withdrawn in similarly corresponding sequence from said loop at other selected locations associated with said vessels, all while maintaining a forward flow in a fixed direction through the loop during a plurality of cycles, the improvement which comprises:

operating said simulated moving bed process to establish an equilibrated percent solids waveform whereby a contraction phase continuously moves through said loop;

monitoring the position of said contraction phase in said loop over time; and

introducing sorbent to a selected sorbent bed following the passage of said contraction phase therethrough while maintaining said forward flow through said loop.

4,990,260

METHOD AND APPARATUS FOR REMOVING OXIDIZABLE CONTAMINANTS IN WATER TO ACHIEVE HIGH PURITY WATER FOR INDUSTRIAL USE

Joseph Pisani, Sierra Madre, Calif., assignor to The Water Group, Inc., El Segundo, Calif.

Filed Jan. 28, 1988, Ser. No. 149,384

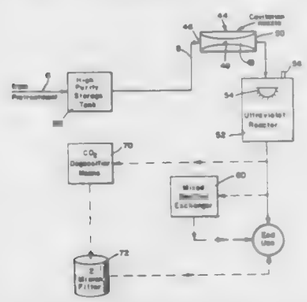
Int. Cl.[5] C02F *1/46*

U.S. Cl. 210—664 7 Claims

1. A method for removing oxidizable contaminants in recycled water prior to use of the water, wherein the water has been pre-treated to achieve a purity level of approximately 18 megaohms resistivity with dissolved total inorganic solids of 1

part per trillion and dissolved total organic carbon contaminants in the range of approximately 100 parts per billion, comprising:

a. inducing cavitation in the water by causing the water to flow through a cavitation critical flow nozzle wherein the hydrodynamic pressure of the water is lower than the vapor pressure of the water causing vapor bubbles to form and then collapse as the pressures equilibrate, imparting a large amplitude shock wave of several hundred atmospheres with local temperatures of many hundred degrees centigrade to thereby create hydroxyl free radicals in the water to act as an oxidizing agent; and



b. irradiating the cavitated water containing the hydroxyl free radicals with ultraviolet radiation by causing the cavitated water to flow into an ultraviolet reactor and be irradiated by an ultraviolet lamp;

c. whereby the cavitation process which creates the hydroxyl free radicals oxidizes the oxidizable organic contaminants in the water and the irradiation with ultraviolet radiation continues the oxidation process initiated by the hydroxyl free radicals to fully oxidize the oxidizable organic contaminants and thereby decompose the oxidizable organic contaminants contained in the water so that the water is purified to a level of dissolved total organic carbon contaminants in the range of approximately 10 parts per billion.

4,990,261

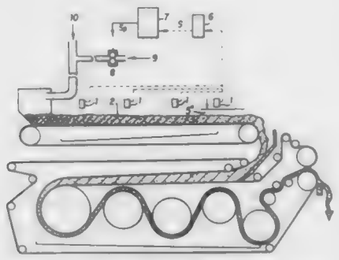
METHOD FOR MONITORING AND/OR CONTROLLING LIQUID-SOLID SEPARATION PROCESSES

Bosco P. Ho, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 122,976, Nov. 19, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 329,730

Int. Cl.[5] C02F *11/14*

U.S. Cl. 210—709 24 Claims



1. A method for monitoring and/or controlling a liquid/-solid separation process, wherein a liquid/solid composition having a surface and an initial liquid:solid weight ratio contacts a separation zone wherein a change from said initial liquid:solid weight ratio to a lower liquid:solid weight ratio occurs, comprising:

(a) positioning at least one photodetector in close proximity to and above said surface so as to enable said photodetector to view light reflected by said surface of said liquid/-solid composition and to generate an output signal in response to said view proportional to said change, and

(b) utilizing said output signal from said photodetector to monitor and/or control said liquid/solid separation process.

4,990,262

PREPARATION OF HIGH SOLID MINERAL SLURRIES

Andrew J. Sharpe, Jr., Star Rte. 1, Box 130, Comfort, W. Va. 25049

Filed Feb. 13, 1989, Ser. No. 310,249

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—710 14 Claims

1. Method of treating an aqueous mineral slurry to obtain improved dewatering, and a final solids content of at least about 50% said slurry containing at least 10% or more finely divided mineral solids, comprising adding thereto an at least about 0.02 pound of a low molecular weight condensation polymer comprising essentially of the reaction product of one mole of dicyandiamide with about 1.5 to about 3.5 moles of formaldehyde, about 0.5 to about 1.0 mole of ammonia or a soluble ammonia salt, up to about a mole of a polyalkylene polyamine, and up to about a mole of a multivalent metal salt per ton of solids in said slurry, dewatering said slurry, and redispersing said slurry with sufficient water and dispersant to a solids content of at least 50% and a final Brookfield viscosity of less than 1000 cps.

4,990,263

MELAMINE-FORMALDEHYDE RESINS IN THE FLOCCULATION OF HIGH SOLIDS MINERAL SLURRIES

Andrew J. Sharpe, Jr., Star Rte. 1, Box 130, Comfort, W. Va. 25049

Filed Feb. 13, 1989, Ser. No. 310,247

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—710 7 Claims

1. Method of treating an aqueous mineral slurry to obtain improved dewatering and a final solids content of at least 50 percent, said slurry containing initially at least about ten percent finely divided mineral solids, comprising adding thereto at least about 0.01 pound of a polymer comprising the reaction product of one mole of melamine with at least about 1.5 mole of formaldehyde per ton of solids in said slurry, wherein the molecular weight of the polymer is such that a 7% dispersion in hydrochloric acid has a Brookfield viscosity of less than 10 cps, dewatering said slurry, and redispersing at least a portion of said slurry with sufficient water and dispersant to a final solids content of at least 50 percent and a final Brookfield viscosity of less than 1000 cps.

4,990,264

ORE DEWATERING PROCESS AND COMPOSITIONS THEREFOR

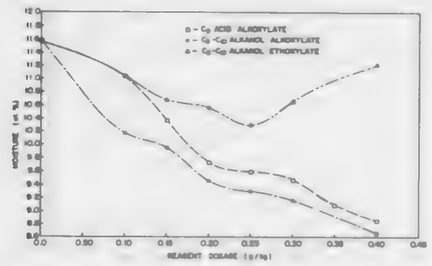
James G. Fuller, Dublin; Owen Portwood, Columbus, and Joe W. Cotton, Ostrander, all of Ohio, assignors to Sherex Chemical Company, Inc., Dublin, Ohio

Filed Oct. 13, 1989, Ser. No. 421,092

Int. Cl.[5] B01D *21/01*

U.S. Cl. 210—729 8 Claims

1. In a method for dewatering an aqueous particulate solid slurry wherein a dewatering aid is added to said slurry followed by filtration thereof, the improvement which comprises using an effective amount for dewatering of a dewatering aid consisting essentially of an alkoxylated C_8–C_{11} alkanol or carboxylic acid wherein alkoxylation is conducted with propylene oxide or butylene oxide.



4,990,265

METHOD OF DEWATERING OIL MUD

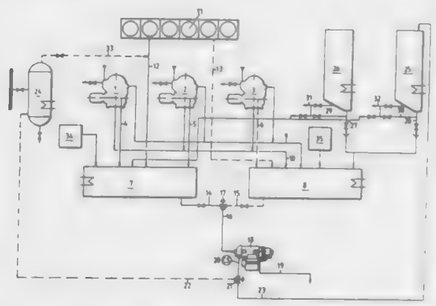
Aloys Tenthoff, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 393,350

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 3829309

Int. Cl.[5] B04B *5/10*

U.S. Cl. 210—739 4 Claims



1. A method of dewatering oil mud that occurs on board ships during treatment of heavy, diesel, and lubricating oils and which consists of a mixture of water and mineral-oil residue, comprising the steps of treating mixtures respectively comprising heavy, diesel and lubricating oils to obtain respective oil mud liquids and water, collecting said two separate containers by conveying liquids that contain heavy oil and diesel oil to a first container and conveying liquids that contain lubricating oil to a second container along with water obtained from treatment of the oils, sequentially conveying the contents of the two containers to one and the same centrifuging device, centrifuging the sequentially conveyed contents to concentrate solids from liquid phases, and subjecting resulting liquid phases to separate further treatment with on-board equipment to permit disposal or further use of the liquids.

4,990,266

PROCESS FOR REMOVING THE NITRITE AND/OR NITRATE CONTENT IN WATER

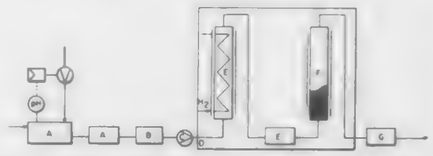
Klaus-Dieter Vorlop; Thomas Tacke, both of Brunswick; Michael Sell, Peine, and Günther Strauss, Hanover, all of Fed. Rep. of Germany, assignors to Umweltschutztechnologie mbH GUTEC: Gesellschaft zur Entwicklung von, Hanover, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 404,988

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3830850

Int. Cl.[5] C02F *1/70*

U.S. Cl. 210—748 37 Claims



1. A continuously performable process for decreasing the nitrite or nitrate content of nitrite-polluted or nitrate-polluted water with the selective formation of nitrogen, comprising the steps of introducing hydrogen gas into the nitrite or nitrate-polluted water, and contacting the resulting hydrogen-loaded water with a metal catalyst formed of a porous inorganic carrier impregnated with a metal component selected from the group consisting of palladium, rhodium, mixtures of palladium and rhodium, and mixtures of palladium and a metal of the copper group, wherein said inorganic carrier has at least one of the following characteristics (a), (b) and (c):

(a) a bimodal pore radius distribution with a proportion of at least 20%, relative to the overall pore volume, of macropores having a minimum radius of 2,000 Å;

(b) a non-homogenous distribution of the metal with a concentration in the surface area or

(c) is a powder, and

wherein for treating water polluted only with nitrite, a catalyst is used in which the metal component is selected from the group consisting of palladium, rhodium and mixtures thereof, and wherein for treating water also polluted with nitrate, a catalyst is used in which the metal component is selected from the group consisting of mixtures of palladium and a metal of the copper group, rhodium, and mixtures of rhodium and palladium, or wherein a mixture is used of a catalyst in which the metal component comprises palladium and a metal of the copper group, and of a catalyst in which the metal component consists solely of palladium, and wherein the pH value of the water is maintained not higher than pH 8.

4,990,267

ANHYDROUS PREPARATION FOR FINISHING SEWING YARN AND THREAD:CONTAINS DIMETHYL-POLYSILOXANE

Friedhelm Nickel, Bremen; Sylvia Rodewald, both of Bremen, and Hans Rott, Oyten, all of Fed. Rep. of Germany, assignors to Hansa Textilchemie GmbH, Oyten, Fed. Rep. of Germany

Filed Apr. 18, 1989, Ser. No. 339,716

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815231

Int. Cl.[5] D06M *13/20, 15/64;* C10M *107/50, 129/40*

U.S. Cl. 252—8.8 8 Claims

1. An anhydrous preparation containing organopolysiloxanes suitable for finishing sewing yarn and thread, said preparation essentially comprising

90 to 99% by weight of a dimethylpolysiloxane with a viscosity of 50 to 10,000 mm^2/sec. at 25° C. and a hydroxyl content of 0.3 to 1.5% by weight and

1 to 30% by weight of a fatty acid or a fatty amine with, on the average, 8 to 18 carbon atoms.

4,990,268

MIXED METAL HYDROXIDES FOR THICKENING WATER OR HYDROPHYLIC FLUIDS

John L. Burba, III, Angleton, and Greene W. Strother, Brazoria, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 752,325, Jul. 5, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,133
Int. Cl.[5] C09K *7/02*; B01J *13/00*
U.S. Cl. 252—8.514 44 Claims

43. A composition for use as a drilling fluid component, said composition comprising a liquid having dispersed therein at least one monodispersed monolayer crystalline metal hydroxide conforming essentially to the empirical formula

$Li_mD_dT(OH)(m+2d+3+na)A_a^n$, where

D represents divalent metal ions,

T represents trivalent metal ions,

A represents monovalent or polyvalent anions or negative-valence radicals other than OH^- ions,

m is from about zero to about 1, representing the amount of Li ion,

d is from about zero to about 4,

(m+d) is greater than zero, and

na is from about zero to about −3; and

a is an amount of A ions of valence n,

where (m+2d+3+na) is equal to or greater than 3

wherein said drilling fluid also contains at least one fluid loss control agent.

44. The composition of claim 43 for use as a drilling fluid component, wherein said drilling fluid also contains at least one fluid loss control agent selected from the group consisting of hydroxyethylcarboxymethyl-cellulose, cornstarch, sodium polyacrylate, starch, polyacrylates, and carboxymethyl-cellulose.

4,990,269

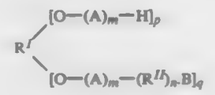
SURFACE ACTIVE COMPOUND, A MICROEMULSION CONTAINING SAID COMPOUND AND THE USE THEREOF

Eva M. Andreasson, Gothenburg; Krister A. Holmberg, Molndal; Borje Nystrom, Knivsta; Eva M. Osterberg, Gothenburg, all of Sweden, and Finn Egeli, Stavanger, Norway, assignors to Berol Kemi AB, Stenungsund, Sweden and Tendex Kjemi Service A/S, Stavanger, Norway

Continuation-in-part of Ser. No. 117,538, Nov. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 814,060, Dec. 27, 1985, abandoned. This application Sep. 21, 1989, Ser. No. 411,195
Claims priority, application Norway, Jan. 3, 1985, 850027
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 8 Claims

1. In a process for recovering oil from an oil well wherein a microemulsion containing water, an oil component and a surfactant system is supplied to said oil well to chemically flood the oil well and increase the amount of oil that can be recovered therefrom, the improvement wherein the surfactant system consists essentially of a surface active compound which contains one hydrophobic group containing 9–50 carbon atoms and 2–6 separate hydrophilic end groups, at least one of said 2–6 separate hydrophilic end groups being a nonionic group obtained by reacting a compound having a reactive hydrogen atom with an alkylene oxide having 2–4 carbon atoms and at least one being an anionic group.

2. A process according to claim 1, wherein said surface active compound has the general formula



wherein R^I is a hydrophobic group containing 9–50 carbon atoms and optionally functional groups, R^{II} is an alkylene or hydroxyalkylene group with 1–4 carbon atoms, A is an alkyleneoxy group derived from an alkylene oxide having 2–4 carbon atoms, m, which may be different for each branch (p and/or q), has an average value of 1–10, n is 0 or 1, p and q are 1–5, the sum p+q is 2–6, and B is an anionic group.

4,990,270

WATER SOLUBLE GRAFT COPOLYMERS OF LIGNIN METHODS OF MAKING THE SAME AND USES THEREFORE

John J. Meister, 31675 Westlady Rd., Beverly Hills, Mich. 48010-5614

Division of Ser. No. 286,534, Dec. 19, 1988, Pat. No. 4,940,764.
This application May 4, 1990, Ser. No. 519,003
Int. Cl.[5] E21B *43/22*; C09K *3/00*
U.S. Cl. 252—8.554 2 Claims

2. A method for recovering oil from subterranean wells which comprises:

(a) dispersing a positively-charged soluble graft copolymer of lignin with a neutralizing anion in injection water;

(b) injecting said dispersion into the subterranean formation; and

(c) moving said injection fluid through the formation as a hydraulic ram, thereby pushing the resident oil to a production well.

4,990,271

ANTIWEAR, ANTIOXIDANT AND FRICTION REDUCING ADDITIVE FOR LUBRICATING OILS

James N. Francis, Maplewood, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 7, 1989, Ser. No. 404,142
Int. Cl.[5] C10M *135/14*
U.S. Cl. 252—33.6 20 Claims

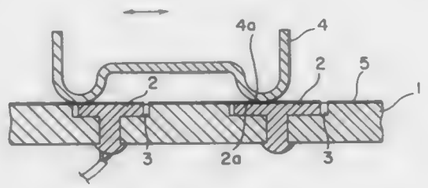
1. A lubricating oil composition comprising: an oil of lubricating viscosity and an additive formed by contacting molybdenum hexacarbonyl with a dixanthogen of the formula $(ROCS_2)_2$ for a time sufficient to form the additive, wherein R is an organo group having a sufficient number of carbon atoms to render the additive soluble in the oil.

4,990,272

GREASE COMPOSITION

Masayuki Morita; Sugako Otake, both of Niwa; Eigo Mukasa, Fujisawa, and Kikuo Hosaki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi and Nippon Koyu Ltd., Tokyo, both of, Japan

Filed Dec. 8, 1988, Ser. No. 281,391
Claims priority, application Japan, Dec. 8, 1987, 62-311283; Dec. 8, 1987, 62-311284; Jan. 12, 1988, 63-5487
Int. Cl.[5] C10M *113/10*
U.S. Cl. 252—41 14 Claims



1. A grease composition for a sliding contact which comprises 100 parts by weight of a base oil consisting of a mixture of an addition polymerization oligomer of alkylene oxide and polyvalent alcohol and a chain hydrocarbon oligomer in a molar ratio of 1:0.2–1:1.5, and 5–30 parts by weight of a lithium salt of a higher fatty acid, and 0.5–10 parts by weight of an organophilic quaternary ammonium salt-containing clay mineral.

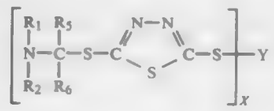
4,990,273

LUBRICATION ANTI-WEAR ADDITIVE

Michael C. Croudace, Santa Ana, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 781,966, Sep. 30, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 122,519
Int. Cl.[5] C10M *135/36*; C07D *285/125*
U.S. Cl. 252—46.4 48 Claims

1. A method for enhancing the extreme pressure anti-wear characteristics of a lubricating composition comprising an oleaginous material, said method comprising admixing into said lubricating composition an extreme pressure anti-wear enhancing amount of a compound of the formula:



wherein:

X is 1 or 2;

Y is hydrogen, a Ia, IIa, or Ib series metal, a transition metal or an amino radical of the formula:



wherein:

R_1, R_2, R_3 and R_4 are the same or different and are hydrogen or a radical derived from an aliphatic or alicyclic compound with the total number of carbon atoms for R_1+R_2 and R_3 R_4, independently being from about 8 to about 100; and

R_5, R_6, R_7 and R_8 are the same or different and are hydrogen or an organic radical derived from an aliphatic, alicyclic or aromatic compound, wherein the total number of carbon atoms for R_5+R_6 and R_7+R_8, independently is from about 0 to about 20.

4,990,274

FLOWABLE GRAFT AND DERIVATIZED POLYMER CONCENTRATE AND LUBRICANT CONTAINING SAME

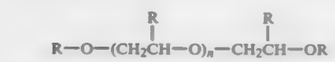
Theodore E. Nalesnik, Beacon, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 21, 1988, Ser. No. 273,540
Int. Cl.[5] C10M *129/16*, *129/72*
U.S. Cl. 252—52 A 14 Claims

1. An oil additive concentrate comprising:

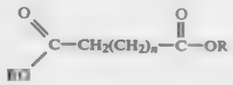
(1) a mixture of a graft and derivatized polymer and a mineral oil of lubricating viscosity said mixture comprising from about 5 to 35 weight percent of said polymer and the balance said mineral oil and having a bulk viscosity measured as the Kinematic Viscosity at 100° C. above about 2000 Centistokes, and

(2) a minor amount of co-solvent effective for substantially reducing the bulk viscosity of said mixture, said co-solvent being selected from the group represented by the formulas:



(a)

in which R represents hydrogen and a hydrocarbyl radical having from 1 to 25 carbon atoms and n has a value from 0 to 10, and



(b)

in which R represents a hydrocarbyl radical having from 1 to 12 carbon atoms and n has a value from 0 to 10.

4,990,275

POLYIMIDE ALIPHATIC POLYESTER COPOLYMERS (C-2356)

W. S. Winston Ho; Guido Sartori, both of Annandale; Warren A. Thaler, Flemington, and David C. Dalrymple, Bloomsbury, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 422,385, Oct. 16, 1989, Pat. No. 4,944,880.
This application May 4, 1990, Ser. No. 519,526
Int. Cl.[5] B01D *69/00*
U.S. Cl. 252—62.3 Q 15 Claims



1. A copolymer composition of matter comprising a hard segment having a glass transition temperature (Tg) of greater than 130° C. and a soft segment having a Tg less than the Tg of the hard segment, having properties for enabling separations of aromatics from saturates when used in a membrane.

9. A copolymer composition of matter comprising the hard segment of a polyimide and the soft segment of an oligomeric aliphatic polyester, wherein said polyimide is derived from a dianhydride having between 8 and 20 carbons and a diamine having between 2 and 30 carbons, and said oligomeric aliphatic polyester is a polyadipate, a polysuccinate, a polymalonate, a polyoxalate or a polyglutarate.

4,990,276

MAGNETIC DISPERSION

John F. Bishop; Robert O. James, both of Rochester, and Diane E. Kestner, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1990, Ser. No. 473,500
Int. Cl.[5] H01F *1/28*
U.S. Cl. 252—62.54 7 Claims

1. A dispersion consisting essentially of magnetic particles, a dialkylester of phthalic acid, and a dispersing agent "said dialkylester being present in the amount of between 25 and 75% by weight and said dispersing agent being present up to 10% by weight with the balance being magnetic particles."

4,990,277

COMPOSITIONS BASED ON CHLOROFLUORINATED ETHER AND SOLVENT AND THEIR APPLICATION IN ABSORPTION APPARATUS

Laurence Rolland, Sceaux; René Bertocchio, Vourles Par Vernaison, and Jacques Cheron, Maisons Laffite, all of France, assignors to Atochem, Gaz de France and Institut Francais du Petrol, France

Filed Oct. 28, 1988, Ser. No. 264,072
Claims priority, application France, Oct. 30, 1987, 87 15095; Oct. 30, 1987, 87 15101
Int. Cl.[5] C09K *5/00*
U.S. Cl. 252—69 5 Claims

1. A composition containing a chlorofluorinated ether and at least one solvent, comprising the chlorofluorinated ether being 1-difluoromethoxy-1,1,2-trifluoro-2-chloroethane and the solvent being selected among aromatic esters and ω, ω'-dialkylated polyoxyethylene glycols.

4,990,278

CORROSION INHIBITED DEICING COMPOSITION AND METHOD OF ITS USE

John T. Wyeth, Clayton, Ind., assignor to Reilly Industries, Inc., Indianapolis, Ind.

Filed Jan. 26, 1998, Ser. No. 470,843
Int. Cl.[5] C09K *3/18*
U.S. Cl. 252—70 30 Claims

1. A corrosion inhibited low-temperature deicing composition consisting essentially of a major portion by weight of magnesium chloride and an effective amount of an inhibitor including a polyphosphate salt to reduce corrosion of ferrous metals, wherein said composition is free from any significant amount of chloride ion other than that present from the magnesium chloride, or an aqueous solution thereof.

4,990,279

ELECTRORHEOLOGICAL FLUIDS

Syed M. Ahmed, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 21, 1989, Ser. No. 341,450
Int. Cl.[5] C10M *169/04;* C09K *3/00*
U.S. Cl. 252—73 23 Claims

1. An electrorheological fluid comprising in dispersion in a non-polar electrically insulating liquid, a polar liquid-containing solid phase, said solid phase consisting essentially of polymer particles, wherein said polymer particles have a hydrophobic polymer core and an unneutralized hydrophilic polymer shell around said core.

4,990,280

PHOTOACTIVATOR DYE COMPOSITION FOR DETERGENT USE

Bitten Thorengaard, Charlottenlund, Denmark, and David W. York, Waterloo, Belgium, assignors to Danochemo A/S, Ballerup, Denmark and The Proctor & Gamble Co., Cincinnati, Ohio

Filed Mar. 13, 1989, Ser. No. 322,636
Claims priority, application United Kingdom, Mar. 14, 1988, 8805816
Int. Cl.[5] C11D *3/40, 3/395;* B01J *13/04*
U.S. Cl. 252—95 19 Claims

1. A photoactivator dye composition comprising microcapsules of a solid dispersion of a water-soluble photoactivator dye in an encapsulating material that is quickly soluble in water, said microcapsules comprising, by weight of the capsules,

(a) from 1% to 60% of the photoactivator dye,

(b) from 38% to 97% of an encapsulating material selected from the group consisting of gelatine, hydrolyzed gelatine and film-forming carbohydrates, and

(c) from 2% to 12% water.

4,990,281

ADHESION PROMOTING PRIMER ACTIVATOR FOR AN ANAEROBIC COMPOSITIONS

Paul J. Clark, West Simsbury, Conn., assignor to Loctite Corporation, Newington, Conn.

Division of Ser. No. 771,391, Aug. 30, 1985, Pat. No. 4,731,146.
This application Nov. 6, 1987, Ser. No. 118,370
Int. Cl.[5] C09J *5/04;* C08F *30/04*
U.S. Cl. 252—184 10 Claims

1. A composition useful as an adhesion promoting primer activator for cureable (meth)acrylic monomer formulations consisting essentially of a solution in a volatile organic solvent of a salt of a metal ion selected from Cu(II), Co(II), Mn(II), Mn(III), and Cr(III) and a counter ion derived from a (meth)acrylic functional acid phosphate monomer effective for activating cure of the curable formulation and for improving the cured adhesion of the curable formulation to a galvanized steel substrate relative to a reference solution in which said salt is replaced by a chemically equivalent amount of an acetylacetonate salt of said metal ion.

4,990,282

TITANIUM ACTIVATED HAFNIA AND/OR ZIRCONIA HOST PHOSPHOR CONTAINING SCANDIUM

Gregory S. Jarrold, Hearietta; Philip S. Bryan, Webster; Patrick M. Lambert, Rochester; Christine and M. Towers, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 437,417, Nov. 16, 1989. This application Jun. 27, 1990, Ser. No. 544,567
Int. Cl.[5] C09K *11/67*
U.S. Cl. 252—301.4 F 12 Claims

1. A phosphor capable of absorbing X-radiation and emitting longer wavelength radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide and/or zirconium dioxide host consisting essentially of oxygen and combined elements satisfying the relationship

$$DTi_xM_ySc_w$$

wherein

D represents at least one of zirconium and hafnium ions;

M represents at least one alkali metal;

w is in the range of from 1×10^{-6} to 1×10^{-2};

x is in the range of from 3×10^{-4} to 1.0; and

y is up to 1;

the phosphor exhibiting reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent scandium.

2. A phosphor capable of absorbing X-radiation and emitting longer wavelength radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide and/or zirconium dioxide host consisting essentially of oxygen and combined elements satisfying the relationship

$$DTi_xM_ySc_wNd_v$$

wherein

D represents at least one of zirconium and hafnium ions;

M represents at least one alkali metal;

v is in the range of from at least 5×10^{-8} up to 5×10^{-4};

w is in the range of from 1×10^{-6} to 1×10^{-2};

x is in the range of from 3×10^{-4} to 1.0; and

y is up to 1;

the phosphor exhibiting reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent neodymium.

4,990,283

MICROEMULSIONS CONTAINING PERFLUOROPOLYETHERS

Mario Visca, Alessandria, and Alba Chittofrati, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 41,526, Apr. 23, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 259,451
Claims priority, application Italy, Jun. 26, 1986, 20910 A/86; Feb. 26, 1987, 19494 A/87
Int. Cl.[5] B01J *13/00*
U.S. Cl. 252—309 12 Claims

1. Microemulsions of the type "oil in water" or "water in oil," macroscopically constituted by one single homogeneous limpid or translucent liquid, indefinitely stable within a temperature range determined by that range in which they are prepared by mixing their components, comprising as essential components:

an aqueous solution,

a fluorinated surfactant, and

a perfluoropolyether having a mean molecular weight ranging from 400 to 10,000 represented by a formula selected from the class consisting of the following formulae from (A) through (H):

$$R_fO(CF(CF_3)-CF_2O)_n(CFO)_m(CF_2O)_pR'_f \quad (A)$$
(CF3 on the CFO unit)

with a random distribution of the perfluorooxyalkylene units, where R_f and R'_f alike or different from each other, are $-CF_3$, $-C_2F_5$, $-C_3F_7$, and m, n, p have such values as to fulfill the above mean molecular weight condition; (B) $R_fO(CF_2CF_2O)_n(CF_2O)_mR'_f$ with a random distribution of the perfluoroxyalkylene units, where R_f and R'_f, alike or different from each other, are $-CF_3$, $-C_2F_5$, and m and n have such values as to fulfill the above mean molecular weight conditions;

$$R_fO(CF_2-CF_2O)_n(CF_2O)_m\left(\begin{matrix}CFO\\|\\CF_3\end{matrix}\right)_p\left(\begin{matrix}CF-CF_2O\\|\\CF_3\end{matrix}\right)_qR'_f \quad (C)$$

with a random distribution of the perfluoroxyalkylene units, where R_f and R'_f, alike or different from each other, are $-CF_3$, $-C_2F_5$, $-C_3F_7$, and m, n, p, q have such values as to fulfill the above mean molecular weight condition;

$$R_fO\left(\begin{matrix}CF-CF_2O\\|\\CF_3\end{matrix}\right)_n-R'_f \quad (D)$$

where R_f and R'_f, alike or different from each other, are $-C_2F_5$, $-C_3F_7$, and n has such values as to fulfill the above mean molecular weight condition;

(E) $R_fO(CF_2CF_2O)_nR'_f$, where R_f and R'_f, alike or different from each other, are $-CF_3$, $-C_2F_5$, and n has such values as to fulfill the above mean molecular weight condition; (F) $R_fO(CF_2CF_2CF_2O)_nR'_f$, where R_f and R'_f, alike or different from each other, are $-CF_3$, $-C_2F_5$, or $-C_3F_7$, and n having such values as to fulfill the above mean molecular weight condition;

$$R_fO\left(\begin{matrix}CF_3\\|\\C\\|\\CF_3\end{matrix}-\begin{matrix}R''_f\\|\\C\\|\\R''_f\end{matrix}-\begin{matrix}R''_f\\|\\C\\|\\R''_f\end{matrix}-\begin{matrix}O\\|\\C\\|\\R''_f\end{matrix}\right)_nR'_f \quad (G)$$

where R_f and R'_f, are perfluoroalkyl, R''_f are F or perfluoroalkyl, n having such values as to fulfill the above average molecular weight range; and

$$R_fO\left(\begin{matrix}CF_3\\|\\C\\|\\CF_3\end{matrix}-\begin{matrix}R''_f\\|\\C\\|\\R''_f\end{matrix}-\begin{matrix}R''_f\\|\\C\\|\\R''_f\end{matrix}-\begin{matrix}R''_f\\|\\C\\|\\R''_f\end{matrix}-O-\right)_nR'_f \quad (H)$$

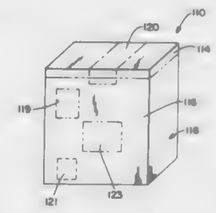
where R_f and R'_f are perfluoroalkyl, R''_f are F or perfluoroalkyl, n having such values as to fulfill the above average molecular weight range.

4,990,284

MOISTURE INDICATING INK AND PACKAGE HAVING SAME

John H. Lauterbach, and Carl B. Jenkins, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Oct. 11, 1989, Ser. No. 419,797
Int. Cl.[5] G01N *31/00*
U.S. Cl. 252—408.1 29 Claims



1. A solution-type moisture indicating printing ink to be printed on a substrate at a high rate of speed, comprising:

(a) a solvent carrier system selected from the group consisting of: water, alcohol, acetone, ethyl acetate, and, mixtures thereof;

(b) a moisture indicating material including cobaltous chloride which changes color at a predetermined moisture level;

(c) a resin system as a binder to bond the cobaltous chloride to a substrate upon which the ink is to be deposited, said system including a film forming and a viscosity adjusting agent selected from the group consisting of polyvinyl alcohol, cellulose acetate, cellulose acetate propionate, polyethylene glycol, cellulose acetate butyrate, vinyl-acrylic latex, poly(vinyl akyl) ester, and, poly(vinyl aklyl ether).

4,990,285

BALANCED ULTRA-HIGH MODULUS AND HIGH TENSILE STRENGTH CARBON FIBERS

Jacob Lahijani, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 158,677, Feb. 22, 1988, Pat. No. 4,915,926.
This application Nov. 20, 1989, Ser. No. 439,055
Int. Cl.[5] H01B *1/18*
U.S. Cl. 252—502 3 Claims

1. A composite comprising a matrix reinforced with substantially round or circular cross-sectional, pitch-derived carbon fibers with balanced tensile strength and modulus characteristics having a crystal orientation angle of less than 6 degrees, a small angle x-ray scattering (SAXS) slope between about −1.8 and −2.1, an ultra-high modulus greater than 100 Mpsi, and a fiber tensile strength of at least about 500 kpsi.

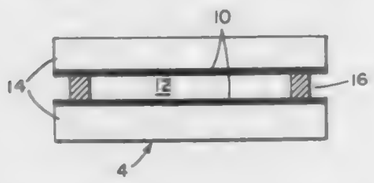
VOL 1123 ISS 1 FEB 5 1991 UMI

4,990,286

ZINC OXYFLUORIDE TRANSPARENT CONDUCTOR

Roy G. Gordon, Cambridge, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Mar. 17, 1989, Ser. No. 324,808
Int. Cl.[5] C01B *11/24;* C04B *35/02;* H01B *1/06*
U.S. Cl. 252—518 22 Claims



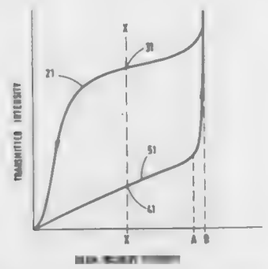
1. A compound of the formula $ZnO_{1-x}F_x$ wherein x is in the range 0.001 to 0.1.

4,990,287

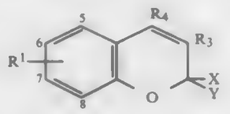
OPTICAL DEVICES UTILIZING PHOTOCHROMIC COMPOUNDS

Ian Bennion, Ravensthorpe; Rosemary Cush, Duston; Christopher J. Groves-Kirby, Bugbrooke, and Clive Trundle, Silverstone, all of England, assignors to The Plessey Company PLC, Ilford, England

PCT No. PCT/GB87/00428, § 371 Date Feb. 19, 1988, § 102(e) Date Feb. 19, 1988, PCT Pub. No. WO87/07963, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 19, 1987, Ser. No. 162,385
Claims priority, application United Kingdom, Jun. 19, 1986, 8614771
Int. Cl.[5] G02B *5/23*
U.S. Cl. 252—586 14 Claims



1. An optical resonant assembly which comprises a plurality of partially light-transmitting mirrors, a layer of photochromic material supported on or in a matrix, which matrix is in the form of a transparent plastic substrate, and disposed between mirrors, a light source providing a single light beam of variable intensity incident on the layer of photochromic material and detecting means for determining transmittance values of said incident beam at different intensity levels, said photochromic material having a low quantum yield for bleaching with light of a wavelength corresponding to the wavelength of said light beam and being selected from pyran compounds of the general formula (I) below:



(I)

wherein X and Y together represent a spiro-adamantylidene group or a spiro-carbocyclic or heterocyclic group or X and Y independently represent hydrogen, lower alkyl having 1 to 5 carbon atoms or phenyl and R_3 and R_4 each independently represent hydrogen, alkyl, aralkyl wherein the alkyl portion is attached to the pyran ring, aryl, halogen or a heterocyclic group and R^1 represents hydrogen, lower alkyl having 1 to 5 carbon atoms, aryl, alkoxy, alkyl- or dialkyl amino, halogen, or a heterocyclic group or R^1 represents a fused benzene ring at the 5, 6 or 7, 8 positions, said alkyl- or dialkyl amino groups being bound to the pyran ring via their respective nitrogen atoms, whereby said assembly is switchable between a lower and a higher transmission state and vice versa by variation of the intensity of said single light beam with the proviso that said single light beam is the only light beam which illuminates said photochromic layer.

4,990,288

CONTROL OF DISALT IN α-SULFOFATTY ACID ESTER SURFACTANTS

Robert Piorr, Ratingen-Hoesel; Guenter Panthel, Haan; Karl H. Schmid, Mettmann; Dietmar Colignon, Erkrath; Hans J. Rommerskirchen, Duesseldorf-Eller; Wolfgang Schmidt, Monheim, and Horst Ritterbex, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 753,304, Jul. 10, 1985, Pat. No. 4,695,409. This application Jun. 18, 1987, Ser. No. 37,377
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432324
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.[5] C07B *45/02;* C07C *309/62, 309/22, 309/17*
U.S. Cl. 260—400 14 Claims

1. A process for the preparation of α-sulfofatty acid alkyl esters having a low disalt content comprising the steps of:

A. sulfonating a fatty acid alkyl ester with more than 1 but less than 2 moles of SO_3 per mole of fatty acid alkyl ester to produce an α-sulfofatty acid alkyl ester;

B. At least partially transesterifying the α-sulfofatty acid alkyl ester from step A with an at least about 0.5 mole equivalent, based on the quantity of SO_3 which is not used for a α-sulfonation of an alcohol different from the alcohol forming the ester moiety of the α-sulfofatty acid alkyl ester, at a temperature of from about 40° to about 150° C., to form a reaction mixture containing transesterified α-sulfofatty acid alkyl ester and alkyl sulfate; and

C. working up the product mixture from step B in an aqueous medium to form salts of α-sulfofatty acid alkyl esters present in the mixture.

4,990,289

BIOLOGICALLY ACTIVE LIPIDS BINDING MEMBRANE RECEPTORS

Mohammed Shoyab, and George J. Todaro, both of Seattle, Wash., assignors to Oncogen, Seattle, Wash.

Continuation-in-part of Ser. No. 638,811, Jul. 8, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 920,518
Int. Cl.[5] C11C *3/02*
U.S. Cl. 260—410.8 1 Claim

1. A substantially pure glyceride composition comprising:

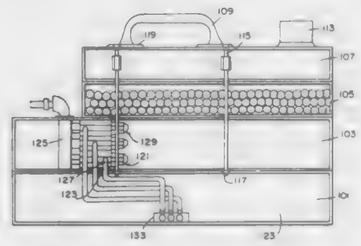
a mixture of two di-glycerides having a higher fatty acid of from 14 to 20 carbon atoms and a lower fatty acid of from 4 to 6 carbon atoms, wherein said di-glycerides are 1-palmityl, 2-butyryl-di-glyceride and 1-stearyl, 2-butyryl-di-glyceride, said composition being capable of isolation from milk and having phorbol receptor-binding activity.

4,990,290

DIFFUSION FOGGER

James G. Gill, and Martin J. Becker, both of 5300 Melrose Ave., Suite 201D, Hollywood, Calif. 90038

Continuation of Ser. No. 348,775, May 8, 1989, abandoned. This application Apr. 16, 1990, Ser. No. 511,947
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—30 24 Claims



23. A mist head assembly comprising a plurality of chambers, a first chamber being an oil sump chamber having oil intake means, a second chamber being a nozzle chamber adjacent the first chamber and having a plurality of spray nozzles with receiving means for air and receiving means for oil, and having a mist flow hole for allowing mist to flow from the nozzle chamber, a maze chamber positioned adjacent to the nozzle chamber having a plurality of openings for receiving mist, and having means for collection of large mist particles and passage of finer mist particles, and having an opening for releasing the mist from the maze chamber, a filter chamber positioned adjacent to the maze chamber having a plurality of openings for receiving mist from the maze chamber and having a mist releasing opening, the entire mist head assembly being assembled together as one unit.

4,990,291

METHOD OF MAKING LIPID TUBULES BY A COOLING PROCESS

Paul E. Schoen, Alexandria, Va.; Paul Yager, Seattle, Wash., and Joel M. Schnur, Burke, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 852,596, Apr. 15, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 161,934
Int. Cl.[5] A61K *9/127;* B01J *13/18*
U.S. Cl. 264—4.7 12 Claims

1. A method of forming tubules relatively free from amorphous material from diacetylinic phosphocholines having hydrocarbon chains of 15 to 29 carbons each comprising the steps of:

hydrating a diacetylinic phosphocholine crystalline, lipid powder above its endothermic transition temperature;

cooling said hydrated lipid at a rate not exceeding 1° per minute to a formation temperature 1° to 10° C. below the exothermic transition temperature; and

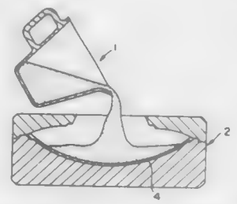
holding said formation temperature for 30 minutes to 2 hours to form tubule structures.

4,990,292

METHOD FOR PRODUCING CARBON FIBER-REINFORCED GYPSUM MODELS AND FORMING MOLDS

Yoshiaki Hattori, Yokkaichi, and Makoto Ishihara, Ama, both of Japan, assignors to Noritake Co., Limited, Nagoya, Japan

Continuation-in-part of Ser. No. 110,619, Oct. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 714,900, Mar. 22, 1985, abandoned, which is a division of Ser. No. 601,851, Apr. 19, 1984, Pat. No. 4,552,329. This application Jul. 25, 1989, Ser. No. 384,767
Claims priority, application Japan, Apr. 19, 1983, 58-068954; Apr. 23, 1983, 58-071963
Int. Cl.[5] B06B *1/00;* B28B *1/08*
U.S. Cl. 264—23 16 Claims



1. A method of manufacturing a carbon fiber-reinforced gypsum model which comprises the steps of:

a. cutting bundles of carbon fibers having a sizing agent coated thereon into a length of from 5 to 200 mm;

b. heating the bundles of cut carbon fibers to remove the sizing agent coated thereon;

c. agitating the bundles of heat treated carbon fibers by agitator blades in water while simultaneously applying ultrasonic oscillation, thereby separating the bundles of carbon fibers into a multitude of single fibers;

d. mixing gypsum hemihydrate ($CaSO_4.\frac{1}{2}H_2O$) powder, from 0.01 to 2.4 wt% of said single fibers based on said gypsum powder, and water under agitation to obtain a gypsum slurry in which said single fibers are uniformly dispersed;

e. forming the gypsum slurry and

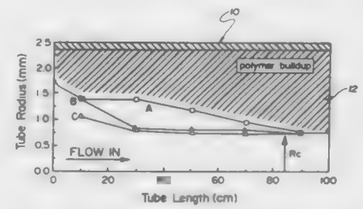
f. hardening and drying the formed slurry to produce said model.

4,990,293

PROCESS OF AND APPARATUS FOR EXTRUDING A REACTIVE POLYMER MIXTURE

Christopher W. Macosko, Minneapolis; Thierry G. Charbonneaux, New Brighton, both of Minn., and Kirk J. Mikkelsen, Piscataway, N.J., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Filed Nov. 9, 1987, Ser. No. 118,717
Int. Cl.[5] B29C *47/04, 47/92*
U.S. Cl. 264—40.1 35 Claims



1. An extrusion die for the continuous extrusion of a premixed reactive precursor mixture having an increasing viscosity over time, comprising:

(a) a die inlet for receiving the premixed reactive precursor

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mixture from a source of premixed reactive precursor mixture;

(b) spreader means in flow communication with said die inlet for spreading the reactive precursor mixture through the die, said spreader means having at least one channel, said channel having dimensions which produce a wall shear stress value for the increasingly viscous reactive precursor mixture being extruded which exceeds the critical wall shear stress value for the reactive precursor mixture such that the viscosity of a substantial portion of the reactive precursor mixture does not increase to the gel point for the mixture within the die; substantially even flow rate of the reactive precursor mixture through the die is maintained; and occlusion of said channel is avoided; and

(c) an outlet means connected in flow communication to said spreader means for extruding the reactive precursor mixture onto a substrate said outlet means having dimensions which will produce a wall shear stress value for the increasingly viscous reactive precursor mixture exceeding the critical wall shear stress value for the reactive precursor mixture such that the viscosity of a substantial portion of the reactive precursor mixture does not increase to the gel point for the mixture within the die; flow of the reactive precursor mixture through the die is maintained; and occlusion of said outlet means is avoided.

24. A method for the continuous extrusion of a premixed reactive precursor mixture having an increasing viscosity over time, comprising:

(a) selecting components for a premixed reactive precursor mixture;

(b) mixing the components to form a premixed reactive precursor mixture;

(c) introducing a flow of the premixed reactive precursor mixture into an inlet of an extrusion die, said extrusion die having at least one channel, the channel in flow communication with the inlet for conducting the flow of the premixed reactive precursor mixture through the die, said channel having dimensions which produce a wall shear stress value for the increasingly viscous reactive precursor mixture being extruded which exceeds the critical wall shear stress value for the premixed reactive precursor mixture; and

(d) extruding the premixed reactive precursor mixture through an extrusion outlet means of the die, such that the viscosity of a substantial portion of the reactive precursor mixture does not increase to the gel point for the mixture within the die; the occlusion of the die is avoided; and flow of the reactive precursor mixture through the die is substantially maintained.

4,990,294

PROCESS FOR PRODUCING FLUOROCARBON MEMBRANES AND MEMBRANE PRODUCT

Larry Y. Yen, Tewksbury; George Lopatin, Newton Centre; Howard Malarkey, Lowell, all of Mass., and David Soane, Piedmont, Calif., assignors to Millipore Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 190,285, May 4, 1988, Pat. No. 4,902,456. This application Sep. 26, 1989, Ser. No. 412,959

Int. Cl.[5] C08L *9/26;* **B01D** *13/00*

U.S. Cl. 264—41 **5 Claims**

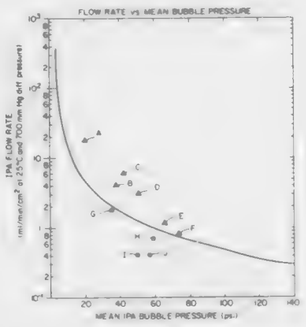
1. A process for forming a microporous or open ultrafiltration polymeric-fluorocarbon membrane which comprises:

(a) forming a melt blend of a polymer selected from the group consisting of poly (tetrafluoroethylene-co perfluoro(alkyl vinyl ether) and poly (tetrafluoroethylene-co-hexafluoropropylene) and a chlorotrifluoroethylene oligomer solvent containing between about 10 and 35 weight percent of polymer based upon the weight of the blend,

(b) shaping said melt blend to form a shaped precursor to said membrane, said precursor having a first surface and a second surface,

(c) contacting at least one of said surfaces with said solvent prior to phase separation of said melt blend,

(d) cooling said shaped precursor to a temperature at which said solvent separates from the polymer by liquid-liquid phase separation to form a gel film or hollow fibers,



(e) selectively extracting said solvent formed from said gel film or hollow fibers in step (d) to form a porous membrane of said polymer and

(f) drying said membrane from step (e) under restraint.

4,990,295

PROCESS FOR MAKING A SILICON CARBIDE COMPOSITION

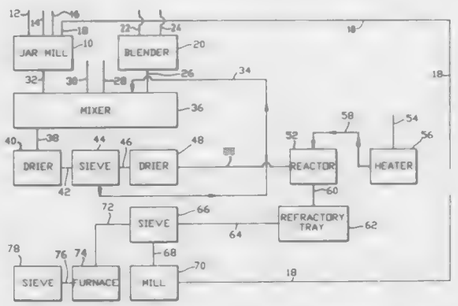
George T. Hida, North Tonawanda, N.Y., assignor to Benchmark Structural Ceramics Corporation, Amherst, N.Y.

Continuation-in-part of Ser. No. 254,178, Oct. 6, 1988. This application Dec. 2, 1988, Ser. No. 279,428

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] C04B *35/10, 35/56*

U.S. Cl. 264—65 **15 Claims**



1. A process for preparing a ceramic composite which is comprised of alpha silicon carbide whiskers and alpha aluminum oxide powder, comprising the steps of sequentially:

(a) providing a slurry comprised of from about 80 to about 92 volume percent of solid material and from about 20 to about 8 volume percent of non-aqueous liquid, wherein:

1. said solid material comprises from about 30 to about 38 weight percent of aluminum material, from about 10 to about 14 weight percent of amorphous carbon, and from about 52 to about 62 weight percent of silica;

2. said aluminum material has a specific surface area of from about 0.2 to about 1.1 square meters per gram, has a particle size distribution which ranges from about 4 to about 28 microns, and has at least 80 weight percent of its particles being in the range of from about 6 to about 12 microns;

3. said amorphous carbon has a specific surface area of at least 4 square meters per gram;

4. said silica has a specific surface area of from about 1.2 to about 400 square meters per gram;

5. said non-aqueous liquid is volatile at a temperature of 80 degrees centigrade;

6. said slurry is comprised of from about 1 to about 5 weight percent of a source of carbon monoxide, which, when it is subjected to a temperature of from about 700 to about 1,600 degrees centigrade, generates carbon monoxide;

7. said slurry is comprised of from about 1 to about 5 weight percent of a source of hydrogen fluoride which, when subjected to a temperature of from about 200 to about 400 degrees centigrade, generates hydrogen fluoride;

(b) pelletizing said slurry to provide a multiplicity of pellets comprised of from about 80 to about 92 volume percent of solids;

(c) drying said pellets to a moisture content of from about 0.1 to about 2.0 weight percent;

(d) preheating said dried pellets to a temperature of from about 200 to about 300 degrees centigrade; and

(f) igniting said pellets.

4,990,296

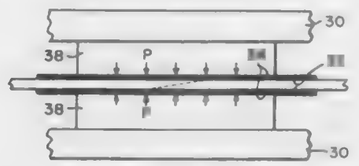
WELDING OF FILLED SINTERED POLYTETRAFLUOROETHYLENE

Stefan Pitolaj, Palmyra, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed Aug. 21, 1989, Ser. No. 396,249

Int. Cl.[5] B29C *65/02*

U.S. Cl. 264—162 **16 Claims**



1. A method for welding a pair of filled, sintered, polytetrafluoroethylene components to one another comprising the steps of

a. forming of said components to have an overlap portion,

b. tapering each of said overlap portions at equal angles to form planar reverse mated surfaces each having a length not substantially less than $\frac{1}{4}$",

c. assembling said components in a press with the reverse mated surfaces in relatively opposed relationship and in the absence of other material therebetween,

d. clamping the assembled components in place directly across the area of the reverse mated surfaces to prevent relative movement of said surfaces,

e. applying heat and pressure sufficient to fuse said reverse mated surfaces without material thinning of the area under pressure as the pressure increases from an initial positive level to a higher level due to thermal expansion, and

f. cooling the resultant fused assembly at a positive pressure less than the initial pressure of step e.

4,990,297

APPARATUS AND METHOD FOR COOLING AND CONDITIONING MELT-SPUN MATERIAL

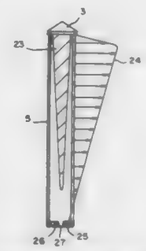
Werner Stibal, Trimmis, and Albert Blum, Domat/Ems, both of Switzerland, assignors to Ems-Inventa AG, Domat/EMS, Switzerland

Continuation of Ser. No. 60,056, Jun. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 908,040, Sep. 16, 1986, Pat. No. 4,756,679. This application Jun. 7, 1989, Ser. No. 363,434

Claims priority, application Switzerland, Mar. 5, 1987, 821/87

Int. Cl.[5] D01D *5/092*

U.S. Cl. 264—211.14 **8 Claims**



1. A method of spinning filaments from a melt which comprises flowing said melt through openings in a nozzle plate to form a stream of said filaments, upwardly directing a coolant gas outwardly from the center of said stream through a porous wall of a dispersing head provided with an inner guide at the upper end thereof and a downstream baffle with a central aperture adjusted to reduce the inside pressures of the coolant adjacent to the baffle to exhibit a negative pressure, the resistance of the said coolant caused by the wall porosity satisfying the relationship

$$1.43\times10^{6}\bar{m}+2222\bar{m}^{2}\leqq\Delta p\leqq-96.96\bar{m}+20202\bar{m}^{2}$$

wherein $\bar{m}$ is the rate of flow of said coolant across the area of said porous wall in the kg/h-cm^2, and Δp is the pressure drop in Pa.

4,990,298

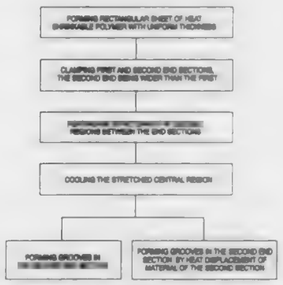
METHOD OF FORMING A WRAP AROUND HEAT SHRINKABLE CLOSURE WITH FLEXIBLE EXTENSION

Richard Young, 2401 Walsh Ave., Santa Clara, Calif. 94051

Division of Ser. No. 880,129, Jun. 30, 1986, Pat. No. 4,738,883. This application Apr. 18, 1988, Ser. No. 213,687

Int. Cl.[5] B29C *55/02, 61/02*

U.S. Cl. 264—291 **2 Claims**



1. The method of forming a wrap around closure comprising:

forming a generally rectangular sheet of heat shrinkable polymer with substantially uniform thickness,

clamping along opposite edges of said sheet a first end sec-

tion and a second end section with said second section being wider than said first end section.

heating and stretching the region of said sheet between said end sections and cooling said region in stretched condition, and

forming grooves in said second end section.

4,990,299

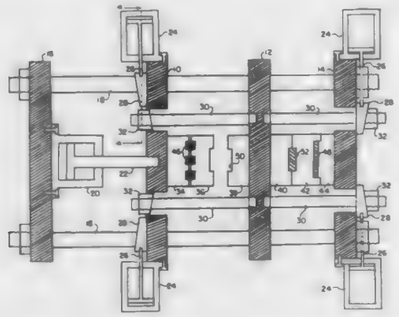
MULTI-PARTING MOLDING SYSTEM WITH CLAMPING MEANS

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Primtec, Rancho Santa Fe, Calif.

Continuation of Ser. No. 115,902, Nov. 2, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 336,650

Int. Cl.[5] B30B 7/00

U.S. Cl. 264—297.4 19 Claims



1. A method of clamping a closed molding cavity of a desynchronously opened, stacked, multi-parting molding system that includes left, center, and right molding blocks for defining a left molding cavity between the left and center molding blocks and a right molding cavity between the center and right molding blocks; first means for moving the left, center and right molding blocks along a common axis with respect to each other for desynchronously opening and closing the left and right molding cavities by retracting the first means, and for simultaneously clamping both molding cavities in a closed position by protracting the first means; and second means for locking one molding cavity in a closed position while both molding cavities are clamped in a closed position and for maintaining the one molding cavity in a closed position while the other molding cavity is in an open position, comprising the steps of

(a) locking one molding cavity in a closed position while both molding cavities are clamped in a closed position by the first means;

(b) maintaining the one molding cavity in a locked-closed position after the other molding cavity is opened; and

(c) while the first means is retracted to open the other molding cavity, expanding the thickness of at least one of the molding blocks that defines the one molding cavity in order to provide axial clamping force to the one molding cavity that is maintained in a closed position by the second means after the other molding cavity is opened.

4,990,300

PROCESS FOR MIXING AND CONVEYING POLYURETHANE INTO A SHOE SOLE MOLD CAVITY

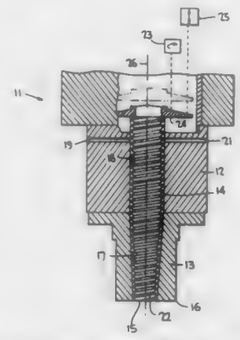
Günter Rebers, Achim, Fed. Rep. of Germany, assignor to Klockner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed May 3, 1989, Ser. No. 346,712

Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814993

Int. Cl.[5] B29C 45/80

U.S. Cl. 264—328.6 1 Claim



1. A process for mixing and conveying polyurethane into a shoe mold cavity, comprising the steps of mixing isocyanate and a polyol that reacts to form polyurethane used for the production of shoe soles, comprising the steps of feeding the isocyanate and the polyol into the bore of an elongated cylinder having a discharge opening at one end, the bore having a conical surface tapering toward said end, mixing the isocyanate and the polyol into a mixture reacting into polyurethane by rotating an externally threaded worm in said bore at an initial location, said worm having a shape matching the shape of said bore, conveying the polyurethane through said opening into a shoe sole mold cavity, and after the mixing and conveying steps axially shifting said worm first in one direction toward said one end followed by axially shifting said worm in a direction opposite said one direction away from said one end to the initial position so that the worm is axially shifted at least once for a short interval, the rotating and shifting steps being carried out while disposing the worm and the cylinder along a substantially vertical axis relative to the mold cavity, and downwardly directing the discharge opening toward the mold cavity, the shifting steps preventing formation of any dribbles or drips of the mixture of the isocyanate and the polyol at said discharge end.

4,990,301

METHOD AND APPARATUS FOR INJECTION MOLDING OF MULTILAYER PREFORMS

Suppayan M. Krishnakumar, Nashua; Wayne N. Collette, Merrimack, and Thomas E. Nahill, Amherst, all of N.H., assignors to Continental PET Technologies, Inc., Norwalk, Conn.

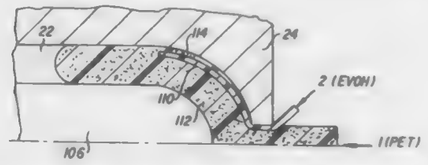
Filed Jan. 25, 1989, Ser. No. 301,066

Int. Cl.[5] B29C 45/16

U.S. Cl. 264—513 31 Claims

1. A method of injection molding multiple layer multiple material plastic preforms to be blow molded into biaxially oriented containers, said method comprising the steps of providing a multiple passage coaxial nozzle and supply means for separately supplying different materials to selective ones of said nozzle passages, said method including the step of utilizing said nozzle and said supply means to separately and simultaneously inject the several plastic materials into an injection mold for a container preform, said nozzle being provided with a central passage and at least one surrounding passage con-

verging on said central passage, a primary material is injected through one of said passages, and a secondary material being simultaneously injected through the other of said passages during a portion of the time said first material is being injected wherein said second material forms an intermediate layer be-



tween two layers of said primary material in a selected portion of said preform, and two layers of said primary material being directed through said central passage and said secondary material being directed through said surrounding passage to form said intermediate layer positioned off center in said preform towards an exterior of said preform.

4,990,302

APPARATUS FOR MEASURING NUCLEAR REACTOR POWER DISTRIBUTION

Minoru Oda; Kunio Ooba, and Hirotsugu Fujiwara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 265,944

Claims priority, application Japan, Dec. 25, 1987, 62-327239

Int. Cl.[5] G21C 7/36

U.S. Cl. 376—216 6 Claims

1. An apparatus for measuring nuclear reactor power distribution including a neutron detector of virtually the same length as the height of a core of a nuclear reactor installed on the outside of the nuclear reactor and adapted such that the reactor power distribution in the axial direction is calculated from detected outputs of small size detectors provided by cutting said neutron detector across its axis into segments, said apparatus for measuring nuclear reactor power distribution comprising:

Fourier coefficient calculation means for calculating, during the course of calibration, a first set of Fourier coefficients from the outputs of said neutron detectors and a second set of Fourier coefficients from the integrated values of the measured reactor power for each height interval of the core divided into virtually the same height intervals as those of said small size detectors; and

transformation means utilizing said first and said sets of Fourier coefficients for deriving a transformation operator for transforming said first set of Fourier coefficients of the outputs of said neutron detectors into said second set of Fourier coefficients of the integrated values of the measured reactor power for each height interval, whereby data for calibration is obtained.

4,990,303

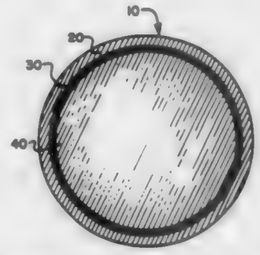
ELEMENT WITH BURNABLE POISON COATING

William J. Bryan, Granby; Nathan Fuhrman, Plainville, both of Conn., and David C. Jones, Austin, Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 24, 1988, Ser. No. 211,182

Int. Cl.[5] G21C 3/00

U.S. Cl. 376—419 6 Claims



1. In a fuel element for use in a nuclear reactor which includes a fissionable material contained within a zirconium-alloy cladding tube, the improvement which comprises: a coating on the inside of the zirconium-alloy cladding tube, said coating including a boron-containing glass compound.

4,990,304

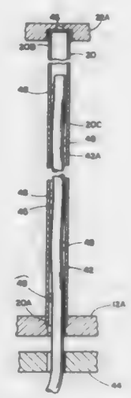
INSTRUMENTATION TUBE FEATURES FOR REDUCTION OF COOLANT FLOW-INDUCED VIBRATION OF FLUX THIMBLE TUBE

John A. Rylatt, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1989, Ser. No. 302,488

Int. Cl.[5] G21C 3/32

U.S. Cl. 376—434 15 Claims



1. In a fuel assembly having a instrumentation tube with a hollow interior and a flux thimble tube inserted in said hollow interior of said instrumentation tube for taking flux measurements, said flux thimble tube radially spaced inwardly at its exterior surface from an interior surface of said instrumentation tube so as to define a coolant flow annulus therebetween, means for reducing coolant flow-inducing vibration of said thimble tube, comprising:

a plurality of mechanical elements defined on said interior surface of said instrumentation tube in said hollow interior

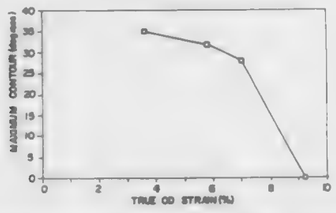
of said instrumentation tube at a plurality of axially spaced points therealong for engaging said exterior surface of said flux thimble tube within said instrumentation tube and inducing a controlled elastic sinuous deflection of said thimble tube to reduce vibration thereof induced by coolant flow in said annulus between said instrumentation and thimble tubes.

4,990,305

SINGLE PEAK RADIAL TEXTURE ZIRCALOY TUBING

John P. Foster, Monroeville; Charles S. Cook, Murrysville, and George P. Sabol, Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 28, 1989, Ser. No. 372,483
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—457 17 Claims



1. A method of producing finished tubing composed of a zirconium alloy and having a desired final outside diameter useful for nuclear fuel rod cladding including the steps of:

a. processing tubing composed of a zirconium alloy and with an initial outside diameter to produce tubing having an intermediate outside diameter about 20% less than the desired final diameter of the finished tubing;

b. annealing said intermediate diameter processed tubing; and

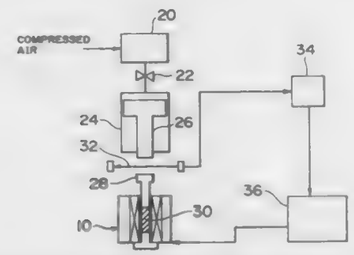
c. finally expanding the intermediate diameter of the processed tubing about 20% of the desired tubing final outside diameter dimension, thereby producing a single peak radial texture in the finished tubing.

4,990,306

METHOD OF PRODUCING POLAR ANISOTROPIC RARE EARTH MAGNET

Ken Ohashi, Fukui, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 437,561
Claims priority, application Japan, Nov. 18, 1988, 63-293406
Int. Cl.[5] B22F *3/24*
U.S. Cl. 419—28 6 Claims



1. A method for producing a polar anisotropic rare earth magnet having a cylindrical or annular shape and magnetized in radial directions, the method comprising the steps:

packing a magnetic alloy powder essentially composed of Nd, Fe and B in a cylindrical or annular cavity of a mold;

producing a single pulse-like magnetic filed in the mold cavity so as to cause polar anisotropic orientation of said magnetic alloy powder with at least six poles distributed around the outer circumference of the cavity;

after producing said pulse-like magnetic field, applying an impactive and pulse-like pressure to the magnetic alloy powder in the mold cavity such that the powder is compacted into a cylindrically or annularly shaped body while said pulse-like magnetic filed is lasting;

sintering said shaped body; and

before magnetizing the sintered body, abrading the side surface of the sintered body to remove projecting regions of the side surface attributed anisotropic shrinkage during sintering until the side surface becomes accurately cylindrical.

4,990,307

METHOD FOR PRODUCING PARTICLES FOR THE PRODUCTION OF PERMANENT MAGNETS

Floyd E. Camp, Trafford, Pa., assignor to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1988, Ser. No. 171,775
Int. Cl.[5] B22F *9/18*
U.S. Cl. 419—30 14 Claims

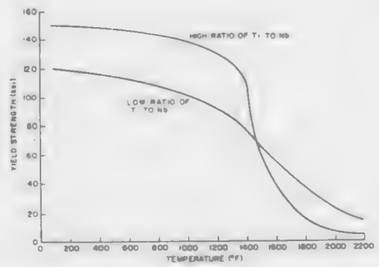
1. A method for producing alloy particles for the production of permanent magnets said method comprising producing a compacted article comprising Ca and a rare earth oxide including at least Nd oxide, heating said article to effect Ca reduction of said rare earth oxide including at least Nd oxide, forming particles of a size of −60 mesh or finer from said article, and leaching Ca from said particles by contacting said particles with an organic acid having at least three carbon atoms.

4,990,308

CHROMIUM CONTAINING HIGH TEMPERATURE NB—TI—AL ALLOY

Melvin R. Jackson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,085
Int. Cl.[5] C22C *27/02*
U.S. Cl. 420—426 4 Claims



1. A composition of matter consisting essentially of niobium, titanium, aluminum and chromium in the approximate concentration in atomic percent as follows:

	Concentration in Atomic Percent	
Ingredient	From	To
Nb	balance	
Ti	32	48
Al	8	16
Cr	2	12

provided that the sum (Al+Cr)≦22%, and where Ti is less than 37 a/o the sum (Al+Cr)≦16 a/o.

4,990,309

HIGH STRENGTH COPPER-NICKEL-TIN-ZINC-ALUMINUM ALLOY OF EXCELLENT BENDING PROCESSABILITY

Motohisa Miyafuji, Shimonoseki; Riichi Tsuno, Shimonoseki; Tatsuya Kinoshita, Shimonoseki; Hitoshi Tanaka, Kitakyushu, all of Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan.

Filed Jul. 6, 1989, Ser. No. 375,936
Int. Cl.[5] C22C *9/06*; C22C *9/01*; C22C *9/04*
U.S. Cl. 420—471 2 Claims

1. A high strength copper alloy of excellent bending processability consisting of Ni : 12.3–20 wt.%, Sn : 0.5–1.2 wt.%, Al : 0.5–5 wt.%, Mg : 0.001–0.05 wt.%, Cr : 0.001–0.1 wt.%, Zn : 0.05–5 wt.%, the balance of Cu and inevitable impurities, and having a tensile strength of from 80 to 120 kgf/mm^2.

4,990,310

CREEP-RESISTANT DIE CAST ZINC ALLOYS

Moinuddin S. Rashid, Bloomfield Hills; M. David Hanna, Royal Oak, both of Mich., assignor General Motors Corporation, Detroit, Mich.

Filed Sept. 11, 1989, Ser. No. 405,809
Int. Cl.[5] C22C *18/04*; C22C *18/02*; C22C *18/00*
U.S. Cl. 420—514 3 Claims

1. A creep resistant zinc-base die casting consisting essentially of, by weight, between about 4 and 12 percent copper, 2 and 4 percent aluminum, up to 0.05 percent magnesium and the balance zinc and impurities, said die casting having fine epsilon and eta grains dispersed in a ternary eutectic matrix and exhibiting a creep strain at 150° C subjected to a 40 MPa load of less than 2 percent after more than 70 hours.

4,990,311

DEODORIZING APPARATUS AND METHOD

Yoichi Hirai, Ohbu; Toshikazu Ito, Nagoya, both of Japan, assignor Tohkai Kogyo Co., Ltd., Aichi, Japan

Filed Dec. 29, 1987, Ser. No. 138,853
Int. Cl.[6] B01J *19/08*
U.S. Cl. 422—4 17 Claims

1. A deodorizing apparatus for a gas mixture including air and a malodorous substance, comprising means defining a flow passage for the gas mixture having entrance and exit ends, means in said apparatus for inducing air flow in a predetermined direction through said passage, an ultraviolet lamp positioned in said apparatus to irradiate said passage adjacent its entrance and for generating uv rays in said flow passage for generating ozone from the air in the gas mixture entering said passage, an ozone-decomposing catalyst layer positioned in said passage downstream from said entrance end for contacting the ozone-containing gas mixture flowing through said passage, and an ozone-decomposing ultraviolet lamp in said apparatus for generating uv rays positioned to irradiate said layer directly.

4,990,312

HIGH-PRESSURE PROMOTED COMBUSTION CHAMBER

Michelle A. Racker, and Joel M. Stoltzfus, both of Las Cruces, N. Mex., assignors The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 18, 1989, Ser. No. 381,239
Int. Cl.[5] G01N *31/12*
U.S. Cl. 422/78 32 Claims

1. Test apparatus for evaluating samples of materials in a controlled environment comprising:

a hollow body having interior walls defining an internal chamber and having an access opening in one end thereof for installing a test sample in said chamber;

inlet and outlet ports in said body for introducing gases into said chamber during an evaluation test;

closure means arranged to be removably installed on said body for sealing said access opening and for gaining access to said chamber;

viewing means for observing a test sample in said chamber including at least one lateral opening in said body, a window disposed in said lateral opening, and means for sealing said window within said lateral opening;

means for protecting the interior walls of said hollow body as a test sample is burning therein including a heat-resistant tubular member having a side opening and removably disposed in said chamber, and a first flame-resistant tubular liner having a side opening and removably disposed in said tubular member and angularly positioned in relation thereto to align said side openings with said lateral opening in said body; means for protecting said window as a test sample is burning in said chamber including a transparent barrier removably disposed in said lateral opening between said window and said chamber, and a second flame-resistant tubular liner removably disposed in said lateral opening between said transparent barrier and said chamber;

first and second flame-resistant end plates removably disposed at opposite ends of said chamber for protecting the end opposite said one end of said body and said closure means as a test sample is burning in said chamber;

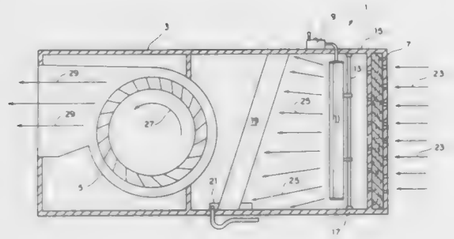
means for supporting a test sample in said chamber inside of said first flame-resistant tubular liner and between said first and second flame-resistant end plates.

4,990,313

ULTRAVIOLET DEVICE

Richard W. Pacosz, Myrtle Beach, S.C., assignor to American Ultra Air, Inc., Myrtle Beach, S.C.

Filed Jan. 12, 1990, Ser. No. 464,438
Int. Cl.[5] A62B 7/08
U.S. Cl. 422—121 3 Claims



1. An ultraviolet device in combination with an air-return system of an air-conditioning unit to resupply return air; said air-return system comprising a housing member mounting inline an upstream filter, a downstream cooling coil and drain pan, and downstream blower fan, said blower fan drawing therethrough and resupplying said return air through said filter and cooling coil, said ultraviolet device being interposed inline between said filter and said cooling coil and drain pan with emissions from said ultraviolet device being directed to said cooling coil and drain pan to retard, or otherwise destroy, bacterial accumulations and growth of mold spores and slime on and around said cooling coil and drain pan, dust mites, airborne diseases, pollens and pollutants, and to purify said return air.

4,990,314

PROCESS AND APPARATUS FOR TWO-PHASE FLUID CATALYTIC CRACKING SYSTEM

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 903,367, Sep. 3, 1986, Pat. No. 4,787,967.
This application Nov. 15, 1988, Ser. No. 271,803
Int. Cl.[5] F27B 15/08; C10G 49/16
U.S. Cl. 422—144 18 Claims

1. A fluid catalytic cracking apparatus, comprising:

a fluid catalytic cracking reactor riser defining a first zone and a second zone;

means for introducing particles comprising large pore crystalline zeolite cracking catalyst, particles comprising intermediate pore crystalline zeolite cracking catalyst and a lift gas into said first zone, wherein said intermediate pore particles and said large pore particles differ according to at least one physical characteristic, such that said intermediate pore particles are more elutriatable than said large pore particles;

means for introducing a hydrocarbon feedstock having an initial boiling point of at least 400° F. into said second zone of said riser to form a mixture at fluid catalytic cracking conditions, said second zone being located above said first zone;

first means for stripping catalyst;

means for discharging said mixture from said riser and means for directing a stream comprising said catalyst of said mixture to said first stripping means;

means for countercurrently contacting said catalyst in said first stripping means with upwardly passing stripping gas to upwardly direct a first portion of said catalyst;

means for passing said first portion of said catalyst out of said first stripping zone and means for passing a remaining portion of said catalyst downwardly through said first stripping means, said first portion having a higher ratio of intermediate pore catalyst to large pore catalyst than said remaining portion;

second means for stripping said first portion;

a fluid catalytic regenerator for regenerating said remaining portion; and

means for recycling said first portion from said second stripping means, and said remaining portion from said regenerator, to said reactor riser.

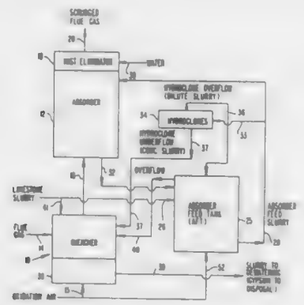
4,990,315

APPARATUS FOR DESULFURIZATION

James D. Colley, Austin, Tex., assignor to Tampa Electric Company, Tampa, Fla.

Division of Ser. No. 154,946, Feb. 10, 1988, Pat. No. 4,876,076.
This application Sep. 25, 1989, Ser. No. 412,854
Int. Cl.[5] B01D 53/14
U.S. Cl. 422—170 3 Claims

1. In a double-loop desulfurization system having a quencher for receipt of flue gas to be desulfurized, an absorber for receiving the gas after passage through said quencher, absorber feed means, means for introducing limestone into said absorber feed means, first conduit means for supplying limestone slurry to said quencher, means for introducing air into said quencher to convert the calcium sulfite therein to gypsum; second conduit means for supplying limestone slurry from said absorber feed means to said absorber; a solids-liquid separator connected to receive a portion of the limestone slurry in said second conduit means and to pass a solids-rich slurry to said first conduit means; and means for introducing air into said quencher; the improvement which comprises, means for introducing air into said absorber feed means for converting calcium sulfite therein to larger gypsum crystals for preferential separation into said solids-rich slurry.

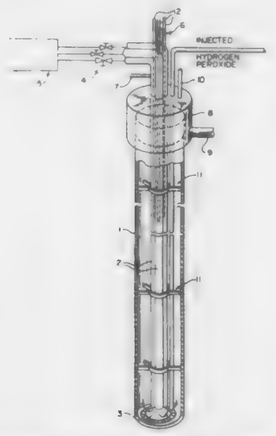


4,990,316

APPARATUS FOR THE DISOLUTION OF OZONE IN A FLUID

Jean-Pierre Duguet, Le Pecq, France, assignor to Lyonnaise des Eaux, Paris, France

Filed Dec. 21, 1989, Ser. No. 454,242
Claims priority, application France, Dec. 23, 1988, 88-17134
Int. Cl.[5] C02F 1/78, 1/50
U.S. Cl. 422—186.07 3 Claims



1. In an apparatus for the dissolution of ozone in a liquid undergoing treatment by the introduced ozone, the apparatus having a tubular chamber, submerged inlet pipes for introducing, in a first direction, ozonized gas into the chamber where it dissolves in the liquid to form ozonized liquid, the apparatus further comprising:

means for injecting hydrogen peroxide into the ozonized liquid for completing an oxidation reaction therein through a radical route; and

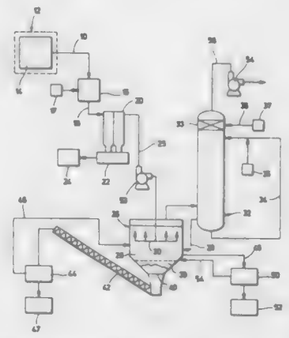
means for discharging liquid treated with ozone and hydrogen peroxide as the treated liquid proceeds through the chamber in an opposite direction.

4,990,317

PROCESS FOR THE TREATMENT OF HOT WASTE GAS CONTAINING HYDROGEN CHLORIDE

Kai K. Mak, Concord, and Rudy G. Novak, Knoxville, both of Tenn., assignors to International Technology Corporation, Knoxville, Tenn.

Filed Nov. 20, 1989, Ser. No. 439,629
Int. Cl.[5] B01D 53/14, 53/34
U.S. Cl. 423—215.5 20 Claims



1. A process for the treatment of a waste gas containing hydrogen chloride wherein the gas is at an elevated temperature in the range of from about 300° F. to about 3000° F. and is produced from the thermal decomposition of material contaminated with chlorinated organic compounds, comprising:

contacting the waste gas in a reaction unit with an alkaline brine solution under conditions such that hydrogen chloride in the waste gas reacts with the alkali to form a chloride salt and water;

utilizing the heat of the waste gas to evaporate water from the brine solution to maintain the chloride salt concentration in the solution sufficiently high to cause the formation of chloride salt crystals therein;

removing the gas from the reaction unit following contact with the solution under conditions such that the gas includes the water evaporated from the brine solution;

removing the chloride salt crystals from the reaction unit; and

adding water to the reaction unit to compensate for water vaporized from the solution, whereby hydrogen chloride is removed from the waste gas with a minimum of liquid discharge.

4,990,318

SELECTIVE REMOVAL OF HYDROGEN SULFIDE OVER A NICKEL-PROMOTED ABSORBING COMPOSITION

Dennis R. Kidd, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 7, 1989, Ser. No. 363,029
Int. Cl.[5] C01B 17/16, 31/20
U.S. Cl. 423—230 14 Claims

1. A process for removing hydrogen sulfide from a fluid stream containing hydrogen sulfide and less than 500 ppm of free hydrogen comprising the step of contacting said fluid stream under suitable absorbing conditions with an absorbing composition consisting essentially of nickel oxide, alumina, and zinc oxide.

4,990,319

PROCESS FOR PRODUCING AMMONIA AND SULFUR DIOXIDE

Yoeji Takenouchi; Katsuhiko Nishiguchi, both of Okayama, and Kunio Abe, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Okayama; Kyowa Gas Chemical Industry Co., Ltd. and JGC Corporation, both of Tokyo, all of, Japan

Continuation-in-part of Ser. No. 245,689, Sep. 15, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 322,205

Claims priority, application Japan, Sep. 15, 1987, 62-230480

Int. Cl.[5] C01B *17/50;* C01C *1/00*

U.S. Cl. 423—352 10 Claims



1. A process for producing NH_3 and SO_2 from ammonium sulfate, which comprises

(i) reacting ammonium sulfate with magnesium oxide or hydroxide at a temperature of not more than 200° C. to form NH_3, water and magnesium sulfate heptahydrate or an aqueous solution or slurry containing magnesium sulfate in a concentration of at least 15% by weight; recovering NH_3;

(ii) heating the magnesium sulfate heptahydrate or the aqueous solution or slurry containing magnesium sulfate in a concentration of at least 15% by weight to 100° to 200° C. in a closed system and maintaining it at this temperature for at least 60 minutes; and separating and recovering the resulting solid product from the resulting liquid,

(iii) decomposing the solid product in the presence of a reducing agent to form magnesium oxide and SO_2 and recovering SO_2, and

(iv) recycling the magnesium oxide to step (i) as such or after it converted to magnesium hydroxide.

4,990,320

PROCESS FOR PURIFYING HYDROGEN FLUORIDE

William H. Gumprecht, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1989, Ser. No. 429,508

Int. Cl.[5] B01D *3/00;* C01B *7/19;* C01G *28/00*

U.S. Cl. 423—484 13 Claims

1. A process for purifying hydrogen fluoride comprising the steps of:

(a) contacting anhydrous hydrogen fluoride containing arsenic impurities with an effective amount of an iodine compound capable of providing iodide ions to precipitate at least a portion of said arsenic impurities as AsI_3, and

(b) recovering purified anhydrous hydrogen fluoride having reduced amounts of arsenic impurities.

4,990,321

METHOD FOR RECOVERING HYDROBROMIC ACID AND METHANOL

Masakatsu Sato, Matsudo; Sadami Shimizu, Tokyo, and Hanzo Tamabayashi, Tokuyama, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Jan. 24, 1990, Ser. No. 469,385

Claims priority, application Japan, Jan. 27, 1989, 1-16295

Int. Cl.[5] C01B *7/09;* C07C *29/74, 37/68, 39/16*

U.S. Cl. 423—486 2 Claims

1. A method for recovering hydrobromic acid and methanol from a filtrate obtained by brominating bisphenol A in a methanol solvent and filtering off the resulting brominated bisphenol A, which comprises adding water to the filtrate until the concentration of hydrobromic acid in the filtrate becomes not higher than about 10% by weight, followed by distillation for purification.

4,990,322

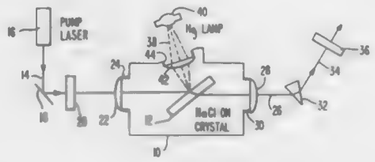
NACL:OH COLOR CENTER LASER

Clifford R. Pollock; Joseph F. Pinto, and Efstratios Georgiou, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 295,963, Jan. 11, 1989, abandoned, which is a division of Ser. No. 870,810, Jun. 5, 1986, Pat. No. 4,839,009. This application Jul. 19, 1990, Ser. No. 555,365

Int. Cl.[5] C01D *3/04;* H01S *3/17*

U.S. Cl. 423—499 9 Claims



1. A tunable operation-stable laser material which comprises a sodium chloride crystal incorporating oxygen impurities, said crystal having a crystallographic structure containing point defects comprising anion vacancy $-1-$centers having adjacent thereto $F_2{}^+$color centers forming $F_2{}^+{:}0^-$centers thereby providing a lasing capability, said crystal being prepared by a method which comprises:

forming a sodium chloride crystal containing an oxygen-impurity dopant;

additively coloring said doped sodium chloride crystal;

exposing the resultant crystal to UV light to produce a broad absorption band centered at about 1.04 μm; in said crystal;

cooling said crystal and again exposing it to UV light to shift said absorption band to about 1.07 μm;

thereby providing said $F_2{}^+{:}0^-$color centers.

4,990,323

COMPOSITION FOR REDUCTION-REOXIDATION TYPE SEMICONDUCTIVE CERAMIC CAPACITOR

Kazuhito Narumi, Bibai; Fumio Takeuchi, and Michiaki Sakaguchi, both of Iwamizawa, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,793

Claims priority, application Japan, Jul. 1, 1988, 63-162568

Int. Cl.[5] C01G *23/00*

U.S. Cl. 423—593 4 Claims

1. A composition for a reduction-reoxidation type semiconductive ceramic capacitor, consisting substantially of 100 mol % of a barium composite oxide consisting of $BaTiO_3$ and $BaZrO_3$ and having a $BaZrO_3$ content in the range of 0 to 20 mol %, 0.3 to 3.0 mol % of Bi_2O_3, and 0.1 to 8.5 mol % of at least one member selected from the group consisting of TiO_2 and ZrO_2 and further incorporating therein 0.001 to 1.00% by weight of at least one member selected from the group consisting of the oxides of Cr, Fe, Co, Zn, Cu, Al, Si, and Mg.

4,990,324

METHOD FOR PRODUCING TWO-COMPONENT OR THREE-COMPONENT LEAD ZIRCONATE-TITANATE

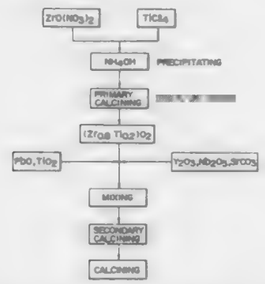
Masahiro Tomita; Akira Fujii; Naoto Niwa; Hitoshi Niwa, all of Aichi, and Shin-ichi Shirasaki, Ibaraki, all of Japan, assignors to Nippondenso Co., Ltd., Aichi and Science and Technology Agency Natl. Institute for Research in Inorganic Materials, Araki, both of, Japan

Continuation of Ser. No. 134,056, Dec. 17, 1987, abandoned. This application Oct. 4, 1989, Ser. No. 418,740

Claims priority, application Japan, Dec. 17, 1986, 61-298902; Dec. 17, 1986, 61-298905; Dec. 17, 1986, 61-300742; Dec. 17, 1986, 61-300746; Dec. 17, 1986, 61-300748

Int. Cl.[5] C01G *25/02, 27/02*

U.S. Cl. 423—608 6 Claims



1. A method for producing a powdered $Pb(Y_{\frac{1}{4}}Nb_{\frac{1}{4}})O_3$-$PbTiO_3$ compound, said method comprising:

a first step of: preparing a first aqueous solution which contains zirconium in an amount necessary to produce said powdered $Pb(Y_{\frac{1}{4}}Nb_{\frac{1}{4}})O_3$-$PbTiO_3$-$PbZrO_3$ compound, and a second aqueous solution which contains titanium in an amount corresponding to part of the total amount necessary to produce said powdered $Pb(Y_{\frac{1}{4}}Nb_{\frac{1}{4}})O_3$-$PbTiO_3$-$PbZrO_3$ compound; mixing the first and second aqueous solutions, thereby producing a mixture; hydrolyzing the mixture, thereby producing a sol; drying the sol; and calcining the sol at 700° to 1300° C., thereby forming a modified powder; and

a second step of: mixing the modified powder obtained through the first step with a mixture which contains the remaining titanium and the other components, lead, niobium, and yttrium, necessary to produce said powdered $Pb(Y_{\frac{1}{4}}Nb_{\frac{1}{4}})O_3$-$PbTiO_3$-$PbZrO_3$ compound, and calcining the resultant mixture at 500° to 1,200° C., thereby producing said powdered $Pb(Y_{\frac{1}{4}}Nb_{\frac{1}{4}})O_3$-$PbTiO_3$-$PbZrO_3$ compound.

4,990,325

PROCESS FOR SYNTHESIS OF BERYLLIUM CHLORIDE DIETHERATE

Charles Bergeron, Baton Rouge, La.; John E. Bullard, Kendall Park, N.J., and Evan Morgan, Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 22, 1989, Ser. No. 441,682

Int. Cl.[5] C01B *3/02, 7/00;* C01F *3/00;* C07C *43/12*

U.S. Cl. 423—648.1 13 Claims

1. A low temperature method for producing beryllium chloride dietherate, comprising the steps of:

mixing beryllium metal with an ether in a reaction vessel;

introducing hydrogen chloride into the ether in the reaction vessel;

removing hydrogen gas produced by the reaction with a reflux condenser; and

distilling the resulting mixture to purify the beryllium chloride ether solution.

4,990,326

METHOD FOR DETECTING BLOOD PLATELETS

Antoine A. Noujaim, Sherwood Park, and Bryan M. Longenecker, Edmonton, both of Canada, assignors to Summa Medical Corporation, Albuquerque, N. Mex.

Continuation of Ser. No. 739,697, May 31, 1985, abandoned. This application Mar. 15, 1988, Ser. No. 170,447

Int. Cl.[5] G01N *33/48, 33/53, 53/00;* C12N *15/00*

U.S. Cl. 424—9 16 Claims

1. A method of detecting blood platelets, comprising:

(a) contacting blood platelets of a host with an effective amount of labeled monoclonal antibody 50 H.19 which the same as that secreted by hybridoma ATCC HB 8807;

(b) allowing the labeled antibody to remain in contact with the platelets for a period of time sufficient to allow the antibody to bind to the platelets;

(c) thereafter detecting the platelets to which the labeled antibody has bound by means capable of detecting the label on the antibody.

4,990,327

DESENSITIZING DENTAL COMPOSITION

Rudi D. Neirinckx, 20 Elm Close, Amersham, Buckinghamshire, United Kingdom

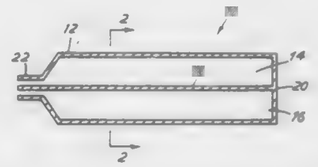
PCT No. PCT/GB86/00690, § 371 Date Aug. 18, 1987, § 102(e) Date Aug. 18, 1987, PCT Pub. No. WO87/02890, PCT Pub. Date May 21, 1987

PCT Filed Nov. 7, 1986, Ser. No. 76,932

Claims priority, application United Kingdom, Nov. 13, 1985, #527962

Int. Cl.[5] A61K *7/16, 7/18*

U.S. Cl. 424—52 12 Claims



1. A system for preparing a desensitizing composition effective in producing an enhanced desensitizing effect comprising strontium and fluoride, said system comprising a source of first and second compositions, said compositions being segregated and containing respectively a physiologically acceptable source of free strontium ions and a physiologically acceptable source of free fluoride ions, and dispensing means arranged to dispense said compositions so that a mixture thereof may be formed on or immediately prior to application thereof to the teeth.

4,990,328

ANTICALCULUS COMPOSITIONS

Stephen F. McClanahan, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 9, 1989, Ser. No. 321,249

Int. Cl.[5] A61K *9/16, 9/18*

U.S. Cl. 424—52 9 Claims

1. An oral composition comprising:

(a) a safe and effective amount of a phosphocitrate material; and

(b) an acceptable mouthwash carrier for topical application in the mouth.

4,990,329

COMPOSITION FOR TREATING ORAL DISEASES

Padmini Sampathkumar, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

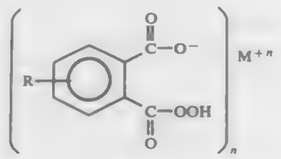
Continuation of Ser. No. 942,471, Dec. 15, 1986, abandoned, which is a division of Ser. No. 738,103, May 24, 1985, Pat. No. 4,670,252. This application Nov. 3, 1988, Ser. No. 266,316

Int. Cl.[5] A61K *7/29, 7/18, 7/16*

U.S. Cl. 424—53 14 Claims

1. An aqueous mouth rinse composition comprising:

(a) from about 0.05% to about 5% of a monoperphthalate compound having the general structure



wherein M^{+n} is a cation selected from the group consisting of an alkali metal, an alkaline earth metal, a non-toxic heavy metal, and trialkylammonium; and R is one or more substituents compatible with the peroxy acid functionality of the aromatic ring; and

(b) a mouth rinse carrier comprising:

(1) from about 0.1% to about 10% of a flavoring agent;
(2) from about 0.1% to about 10% of a sweetening agent;
(3) from 0% to 20% of a humectant;
(4) from 0% to 2% of an emulsifying agent;
(5) from 0% to 60% ethanol; and
(6) the balance water.

4,990,330

COMPOSITIONS FOR TOPICAL USE HAVING MELANIN SYNTHESIS-INHIBITING ACTIVITY

Yasuaki Oyama, Onojo, Japan, assignor to Sansho Seiyaku Co., Ltd., Fukuoka, Japan

Filed Sep. 23, 1988, Ser. No. 248,693

Claims priority, application Japan, Sep. 25, 1987, 62-241966

Int. Cl.[5] A61K *7/42, 7/44, 7/48*

U.S. Cl. 424—59 3 Claims

1. A topical synergistic skin whitening and anti-suntan agent composition comprising kojic acid or an ester thereof and at least one amine compound selected from the group consisting of glucosamine, tetra-O-acetylglucosamine, tetra-O-propanoylglucosamine, O-β-octanoylglucosamine and cystein, in a ratio of 1:0.01 to 1:20 by weight effective to inhibit melanin synthesis.

4,990,331

NOVEL PHEROMONE COMPOSITION FOR USE IN CONTROLLING HONEY BEE COLONIES

Keith N. Slessor, 10105 Rolley Crescent, Whonnock, B.C., V2X 8X7; Lori-Ann Kaminski, 303 - 1771 East Georgia, Vancouver, B.C., V5L 2B3; Gaylord G. S. King, 305 - 561 Cottonwood Ave., Coquitlam, B.C., V3J 2R9; John H. Borden, 6552 Carnegie St., Burnaby, B.C., V5B 1Y3, and Mark L. Winston, 302 Princess Street, New Westminster, B.C., V3L 1V5, all of Canada

Filed Dec. 1, 1987, Ser. No. 127,198

Int. Cl.[5] A01K *57/00;* A01N *25/00*

U.S. Cl. 424—84 4 Claims

1. A synthetic composition comprising the following components:

(1) 4-hydroxy-3-methoxyphenylethanol or a honey bee biologically active ester thereof; and

(2) at least one compound selected from the group consisting of:

(a) 9-Keto-2(E)-decenoic acid;
(b) R-(−)-9-Hydroxy-2(E)-decenoic acid;
(c) S-(+)-9-Hydroxy-2(E)-decenoic acid;
(d) Methyl phydroxybenzoate; and
honey bee biologically active esters thereof;

the components present in amounts effective to control or attract honey bees.

4,990,332

NOVEL LEPIDOPTERAN-ACTIVE BACILLUS THUDINGIENSIS ISOLATE

Jewel Payne; George G. Soares; Henry W. Talbot, and Theresa C. Olson, all of San Diego, Calif., assignors to Mycogen Corporation, San Diego, Calif.

Filed Oct. 25, 1988, Ser. No. 262,401

Int. Cl.[5] A61K *39/07;* A01N *63/00, 65/00*

U.S. Cl. 424—93 26 Claims

1. A process for controlling lepidopteran insect pests which comprises contacting said insect pests with an insect-controlling effective amount of *B. thuringiensis* PS85A1 having the identifying characteristics of NRRL B-18426, or mutants thereof.

4,990,333

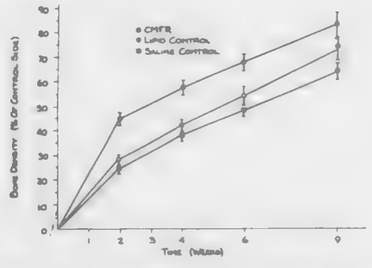
METHOD FOR HEALING BONE DAMAGE

Joseph Lane, New York, N.Y.; Nicholas Catsimpoolas, Newton Centre, Mass., and Robert S. Sinn, New York, N.Y., assignors to Anglo Medical Corporation, New York, N.Y. and Trustees of Boston University, Boston, Mass.

Filed Dec. 20, 1985, Ser. No. 811,894

Int. Cl.[5] A01N *63/02*

U.S. Cl. 424—551 1 Claim



1. Method for enhancement of bone healing in mammals which comprises treating damaged mammalian bone with pharmaceutically and physiologically active amounts of isolated omental lipid consisting essentially of ganglioside to enhance healing of the damage wherein the damage comprises a fracture, osteoarthritis, arthrodesis, osteonecrosis or a bone graft and wherein treating the damaged bone with the omental ganglioside-containing lipid enhances at least one of bone density, bone perfusion or bone strength.

4,990,334

GLYCEROL-CHLORINE MATRIX

Ronald M. Longino, 2801 S. King Dr., #1902, Chicago, 60616; Elliott A. Treadwell, 1306 Naperville Rd., Wheaton, 60187, and Dwight C. Boykins, 29 W. 431 Hawthorne, Warrenville, all of Ill. 60555

Filed Nov. 8, 1988, Ser. No. 268,554

Int. Cl.[5] A61K *9/08*

U.S. Cl. 424—401 15 Claims

1. A germicidal solution comprising:

(a) glycerol in the range of about 3.2% +/−1.8% by weight;

(b) sodium hypochlorite in the range of about 2.1% +/−1.0% by weight;

(c) soft water, including sodium ions, in the range of about 60.8% +/−3.0% by weight;

(d) fragrant oil and non-ionic surfactant in the range of about 0.5% +/−0.4% by weight; and

(e) isopropyl alcohol in the range of about 33.4% +/−3.0% by weight.

4,990,335

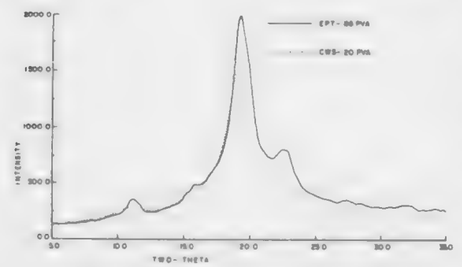
USE OF VINYL ALCOHOL HOMOPOLYMER AND COPOLYMERS FOR TABLETING ACTIVE MATERIALS

Linda R. Bateman; Robert C. Di Laccio; Clare A. Stewart, Jr., all of Wilmington, Del.; Donna L. Visioli, Lower Swynedd, Pa., and David P. Beach-Coffin, Lindenhurst, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 29,996, Mar. 25, 1987. This application May 12, 1988, Ser. No. 165,230

Int. Cl.[5] A01N *25/34*

U.S. Cl. 424—408 21 Claims



1. A method of making a compressed tablet for delivery of an active ingredient comprising mixing the active ingredient and binder in powder form and compressing the mixture into a tablet, characterized by that the binder consists essentially of at least one polymer selected from the group consisting of amorphous polyvinyl alcohol, copolymers of vinyl alcohol with up to about 10 mole percent methyl acrylate or methyl methacrylate, and blends of such copolymers with polyvinyl alcohol, the polymer having: a number average molecular weight in the range of about 25,000 to 100,000; polydispersity in the range of about 1.4 to 2.6; viscosity in 4% aqueous solution in the range of about 10 to 70 mPa.sec; a surface area in the range of about 0.6 to 6.0 m^2/g; percent hydrolysis of at least 98%; the polymer being in the form of spheroidal particles arranged in spheroidal clusters, with a size distribution such that less than about 5% of the polymer is retained on a 20 mesh (0.833 mm) screen, less than about 50% of the polymer is retained on an 80 mesh (0.175 mm) screen, and more than about 70% is retained on a 200 mesh (0.074 mm) screen.

4,990,336

SUSTAINED RELEASE DOSAGE FORM

Loui J. Silvestri, Miramar, and H. Ruth Pyle, Ft. Lauderdale, both of Fla., assignors to BioSearch, Inc., Pembroke Pines, Fla.

Filed Feb. 8, 1989, Ser. No. 308,225

Int. Cl.[5] A61K *39/00, 39/35, 39/36, 9/14*

U.S. Cl. 424—426 20 Claims

1. A multiphasic sustained release injectable delivery system for prolonged, controlled delivery of microencapsulated allergen extract comprising allergen extract encapsulated in microcapsules of bioerodible encapsulating polymer, which permits a sustained, multiphasic release of said allergen extract, including:

(i) a first portion of allergen extract that upon injection is released from said microcapsules of bioerodible encapsulating polymer in a quantity sufficient to stimulate an immune response, but insufficient to trigger serious allergenic adverse reactions; and

(ii) a second portion of allergen extract that is released from said microcapsules to provide a level of allergen extract in doses which could provoke a serious reaction in the patient had the first portion not been administrated;

wherein said bioerodible encapsulating polymer is selected from the group consisting of poly(lactides), poly(glycolides), non-peptide polyamino acids, poly(ortho esters), polyanhydrides, polyiminocarbonates, poly(alpha-aminoacids), polyalkyl-cyanoacrylate, polyphosphazenes, acyloxymethyl polyaspartates, polyglutamates, and copolymers and combinations thereof.

4,990,337

CYCLOSPORIN FORMULATIONS OF MONO OR DIGLYCERIDE FATTY ACID

Kozo Kurihara, and Masaru Murano, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 303,646, Jan. 27, 1989, abandoned. This application Apr. 12, 1990, Ser. No. 511,992

Claims priority, application Japan, Jan. 29, 1988, 63-19125; May 10, 1988, 63-111639; Jul. 22, 1988, 63-183127

Int. Cl.[5] A61K *9/10*

U.S. Cl. 424—427 58 Claims

1. A pharmaceutical composition comprising at least one cyclosporin in admixture with an amount of at least one mono- or di- glyceride of a C_6–C_{10} fatty acid sufficient to dissolve the cyclosporin.

4,990,338

ANTIMICROBIAL SUPERABSORBENT COMPOSITIONS AND METHODS

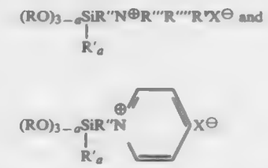
Lynne M. B. Blank, Brighton, N.Y., and Thomas D. Boyce, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 9, 1988, Ser. No. 191,945

Int. Cl.[5] A61F *13/00;* A61K *9/70, 31/74;* A61L *15/16*

U.S. Cl. 424—443 4 Claims

1. An antimicrobial superabsorbent composition comprising a water absorbing cross-linked hydrophilic sodium salt form of a partially neutralized acrylic acid-based polymer gel having covalently bonded thereto an organosilane, the organosilane being present in an amount to prevent hydrophobing and reduction of the absorbent capacity of the polymer gel, the organosilane having the general formula selected from the group consisting of



wherein, in each formula,

R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;
a has a value of 0, 1 or 2;
R′ is a methyl or ethyl radical;
R″ is an alkylene group of 1 to 4 carbon atoms;
R‴, R⁗ and R^{v} are each independently selected from a group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and R^{vi} is a perfluoroalkyl radical having from 1 to 12 carbon atoms; and
X is chloride, bromide, fluoride, iodide, acetate or tosylate.

VOL 1123 ISS 1 FE 5 1991 UMI

4,990,339

DERMAL TREATMENT FILM

Steven L. Scholl, Cottage Grove; Eugene R. Simmons, Maplewood, and William L. Bunnelle, Hugo, all of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed Nov. 16, 1987, Ser. No. 124,257
Int. Cl.[5] A61L *15/24;* A61K *7/40;* A61F *13/00*
U.S. Cl. 424—443 31 Claims

1. An aqueous soluble dermal treatment film which comprises:
(a) a structural layer comprising a polyalkyloxazoline polymer; and
(b) a pressure sensitive adhesive layer comprising 10–75 wt. % of a polyalkyloxazoline polymer, 10–75 wt. % of a functional diluent comprising a hydroxy compound or a carboxylic acid compound; and 5–35 wt. % of a compatible tackifier.

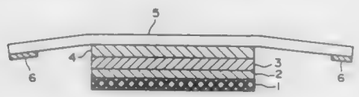
20. An aqueous liquid concentrate for application to the surface of skin to form a dermal treatment film removable by an aqueous treatment, which concentrate comprises:
(a) a major proportion of an aqueous liquid;
(b) about 5 to 85 wt. % of a polyoxazoline polymer to form a structural layer; and
(c) an effective amount of a compatible tackifier, plasticizer or mixtures thereof.

4,990,340

SUSTAINED RELEASE PHARMACEUTICAL PREPARATION

Osafumi Hidaka, and Tomoki Sakai, both of Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP87/00036, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/44343, PCT Pub. Date Jul. 30, 1987
Continuation of Ser. No. 110,760, Sep. 22, 1987, abandoned. This PCT application Jan. 21, 1987, Ser. No. 522,493
Claims priority, application Japan, Jan. 22, 1986, 61-9844
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—449 3 Claims



1. A sustained release pharmaceutical preparation for percutaneous administration comprising:
a support and
a drug layer provided on said support, said drug layer having no adhesiveness to skin and comprising
(a) a knitted fabric of hollow porous fibers of polyethylene terephthalate wherein the pores pass centrifugally from the wall of a tubular hollow to the peripheral surface of said fibers, and
(b) drugs.

4,990,341

CONTROLLED RELEASE HYDROMORPHONE COMPOSITION

Robert S. Goldie, Comberton; Sandra T. A. Malkowska, Landbeach; Stewart T. Leslie, Cambridge, all of United Kingdom, and Ronald B. Miller, Basel, Switzerland, assignors to Euroceltique, S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 113,865, Oct. 26, 1987, Pat. No. 4,844,909. This application Apr. 28, 1989, Ser. No. 345,354
Claims priority, application United Kingdom, Oct. 26, 1987, 8626098
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] A61K *9/20*
U.S. Cl. 424—484 6 Claims

1. A solid, controlled release, oral dosage form, the dosage form comprising a therapeutically effective amount of hydromorphone or a salt thereof in a matrix wherein the dissolution rate in vitro of the dosage form, when measured by the USP Paddle Method at 100 rpm at 900 ml aqueous buffer (pH between 1.6 and 7.2) at 37° C. is between 12.5% and 42.5% (by weight) hydromorphone released after 1 hour, between 25% and 55% (by weight) hydromorphone released after 2 hours, between 45% and 75% (by weight) hydromorphone released after 4 hours and between 55% and 85% (by weight) hydromorphone released after 6 hours, the in vitro release rate being independent of pH between pH 1.6 and 7.2 and chosen such that the peak plasma level of hydromorphone obtained in vivo occurs between 2 and 4 hours after administration of the dosage form.

4,990,342

FUNGICIDAL COMPOSITION WITH SYNERGISTIC ACTIVITY

Thomas Wilde, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 490,153, Mar. 7, 1990, which is a division of Ser. No. 287,902, Dec. 21, 1988, Pat. No. 4,937,261. This application Jun. 21, 1990, Ser. No. 541,503
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3744053
Int. Cl.[5] A01N *47/10, 59/20*
U.S. Cl. 424—635 4 Claims

1. A fungicidal composition comprising a synergistic effective amount of the mixture of
(A) propyl 3-(dimethylamino)propylcarbamate or an acid addition salt thereof, and
(B) copper (I) oxide,
and a carrier, wherein the ratio of component A to component B is from about 1:0.1 to 3.

4,990,343

ENZYME PRODUCT AND METHOD OF IMPROVING THE PROPERTIES OF DOUGH AND THE QUALITY OF BREAD

Sampsa Haarasilta, Kerava; Timo Pullinen, Vantaa; Seppo Vaisanen, Kerava, and Ina Tammersalo-Karsten, Espoo, all of Finland, assignors to Cultor Ltd., Helsinki, Finland

Filed Apr. 21, 1989, Ser. No. 341,389
Claims priority, application Finland, Apr. 22, 1988, 881905; Jan. 3, 1989, 890021
Int. Cl.[5] A21D *8/04*
U.S. Cl. 426—10 20 Claims

1. A method for improving rheological properties of a flour dough and the quality of the baked product produced therefrom which comprises combining flour, yeast and water with an effective amount of an enzyme preparation comprising hemicellulose and/or cellulose degrading enzymes and glucose oxidase and mixing said ingredients to form a suitable baking dough.

4,990,344

METHOD FOR MAKING SOLUBLE RICE PROTEIN CONCENTRATE AND THE PRODUCT PRODUCED THEREFROM

John R. Euber, Evansville; Gabor Puski, Newburgh, and Grant H. Hartman, Jr., Evansville, all of Ind., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 11, 1989, Ser. No. 377,978
Int. Cl.[5] A23C *11/00*
U.S. Cl. 426—28 22 Claims

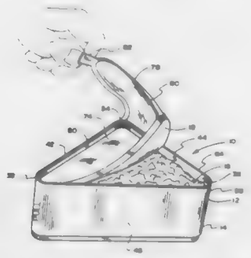
1. Soluble rice protein concentrate having a protein content of more than 16% on a solids basis.

4,990,345

PACKAGE WITH COMPARTMENTED CLOSURE ASSEMBLY

John D. Webb, 2101 Victoria Dr., Clearwater, Fla. 34623

Filed Dec. 5, 1988, Ser. No. 279,497
Int. Cl.[5] B65D *51/20, 50/00, 43/14, 21/00*
U.S. Cl. 426—123 4 Claims



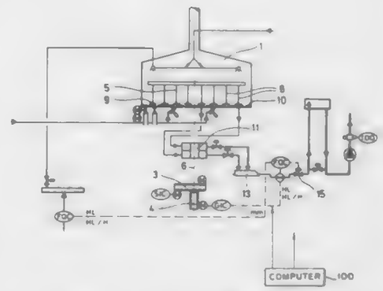
1. A package including a container and contents for the storing and the direct consumption of edible contents therefrom comprising:
a container comprising an upstanding circumferential sidewall, a separable upper lid and an essentially parallel bottom closure; said sidewall, upper lid and bottom closure hermetically sealing edible contents contained therein;
a cover separably mounted and at least partly spaced above the upper lid to define a space between the upper lid and the cover, said cover having a grasping means for initiating separation of said cover from said upper lid; said cover being bonded to the upper lid adjacent thereto by light adhesive over a major portion of the extent of their bonding sufficient to allow for the easy separation of the cover from the upper lid adjacent thereto during opening and the cover being bonded with respect to the upper lid adjacent thereto by a stronger adhesive than said light adhesive over the remaining minor portion of the extent of their bonding remote from said grasping means sufficient to preclude total separation of the cover from the upper lid adjacent thereto during use;
a utensil within the space for use in the consuming of the edible contents stored within the container;
the upper lid being bonded by additional light adhesive to the sidewall adjacent thereto sufficient to allow for the easy separation of the upper lid with respect to the sidewall adjacent thereto over a major portion of the extent of their bonding and wherein the upper lid is bonded by additional stronger adhesive stronger than said additional light adhesive to the sidewall adjacent thereto for prohibiting the easy separation of the upper lid with respect to the sidewall adjacent thereto over the remaining minor portion of the extent of their bonding sufficient to preclude total separation of the upper lid being bonded to the upper edge of the sidewall with said additional light and said additional stronger adhesive extending around the entire periphery of the upper lid and sidewall to render such area of bonding tamper evident; said adhesives bonding said cover to said upper lid and said adhesives bonding said upper lid to said side wall providing an air tight seal for said utensil and said contents, respectively; said minor portion of said bond between said upper lid and said side wall being remote from said minor portion of said bond between said cover and said upper lid and positioned under and approximately adjacent said grasping means and said adhesives and additional adhesives selected, and said minor portion of said bond between said cover and said upper lid being stronger than said major portion of the bond between said upper lid and said sidewall such that upward pulling on said grasping means breaks the bond between said cover and said upper lid until said minor portion of stronger bonding between said cover and said upper lid is reached whereupon said utensil is exposed, and further separation of said cover from the upper lid is precluded and such that continued upward pulling of said grasping means breaks the bond between said upper lid and said sidewall until said minor portion of stronger bonding between said upper lid and said side wall is reached, whereupon the contents are exposed and total separation of the upper lid from the side wall is precluded, thus causing the cover and upper lid and the upper lid and side wall, respectively, to remain partially bonded to each other.

4,990,346

METHOD FOR OPERATING THE RAKE GEAR IN A LAUTER TUB FOR BEER PRODUCTION

Kurt Strippler, Marzling; Klaus Wasmuht, Ellingen, and Wolfgang Maitner, Freising, all of Fed. Rep. of Germany, assignors to Anton Steinecker Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Oct. 6, 1989, Ser. No. 418,345
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1988, 3834207; Dec. 30, 1988, 3844389
Int. Cl.[5] C12C *7/00*
U.S. Cl. 426—231 7 Claims



1. A method for operating a raking device in a lauter tub having a wort outflow and containing a lauter wort from which beer is produced from a lautering process within the tub, comprising the steps of
(a) continuously rotating the raking device within the tub; and
(b) continuously vertically displacing the raking device within the tub in accordance with the flow of the lauter wort through the wort outflow of the lauter tub and in accordance with the pressure differential within the tub, thereby to optimize the lautering process.

4,990,347

HEAT PROCESSING OF VISCOUS FOOD MATERIALS IN ROTATING CANS

Glenn O. Rasmussen, Champlin; Enrique Rotstein; Kenneth J. Valentas, both of Golden Valley; Shahed Zaman, St. Paul, and Israel Saguy, Edina, all of Minn., assignors to The Pillsbury Co., Minneapolis, Minn.

Filed Mar. 10, 1989, Ser. No. 321,616
Int. Cl.[5] B65B *55/00*
U.S. Cl. 426—232 4 Claims

2. A method of heat processing a viscous food product, said method comprising:
(a) placing food product in a plurality of similar containers, said food having a consistency in the range of between about 20 and about 32 prior to completion of heat processing;
(b) placing said containers in a heat processor means for heating said containers and food product, said heat pro-

cessor means being operable for rotating said containers during heating; and

(c) prior to completing a substantial portion of a production run after the initiation of a processing or container change, counting the number of rotations of said at least one container and comparing said number of rotations to the number of rotations in a functional relationship that relates number of rotations to lethality and modifying at least one of said process and container, if necessary, such that the number of rotations of containers containing product is adequate to achieve a predetermined confidence level for lethality for said product.

4,990,348

MICROWAVE-PUFFABLE HALF-PRODUCTS OF STARCH-CONTAINING MATERIAL AND THEIR PRODUCTION PROCESS

Winston A. Spratt, R.R. #1, Manotick, Ontario, Canada K0A 2N0; David Paton, 1150 Bordeau Grove, Orleans, Ontario, Canada K1C 2M7, and Gordon E. Timbers, 5 Dallas Place, Nepean, Ontario, Canada K2G 3E2

Filed Oct. 5, 1988, Ser. No. 253,551

Claims priority, application Canada, Oct. 14, 1987, 549213

Int. Cl.[5] A21D *13/00*

U.S. Cl. 426—242 22 Claims

1. A process for manufacturing a shelf-stable hard densified transparent or translucent half-product in a rope or piece form: having a moisture content of more than 14% but not more than 25% by weight, the half-product being expandable into expanded snack foods upon heating by at least a consumer microwave oven, a consumer oven or a consumer convection/microwave oven comprising the steps of:

(a) providing a material being comprised predominantly of starch and having a moisture content of more than 14% but not more than about 25% by weight, wherein the moisture content is the total amount of water usually naturally contained in a raw material comprised predominantly of starch, and water which may have to be added when the raw material does not contain the required amount of water;

(b) extruding the starch-containing material at a barrel temperature from approximately 80° to about 110° C. and at an extruder die temperature of less than 100° C. without causing any expansion, thereby producing a hot melt extrudate of the material in a rope or piece form; and

(c) cooling the extrudate thereby causing the extrudate to harden without substantially lowering the moisture content, thereby producing the shelf-stable ready-to-be expanded half-product.

4,990,349

MICROWAVABLE PASTA PRODUCT COMPRISING TRIETHYL CITRATE AND EGGS AND A PROCESS FOR PREPARING SAME

Dhyaneshwar B. Chawan, Liverpool; Carleton G. Merritt, Phoenix, both of N.Y., and Wiley W. Hargrove, Crystal Lake, Ill., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 404,828, Sep. 7, 1989, abandoned. This application Dec. 15, 1989, Ser. No. 451,735

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—243 46 Claims

1. A process for preparing a pasta product with improved texture and which can be rapidly cooked, said process comprising the steps of:

(a) preparing uncooked pasta dough wherein the pasta dough comprises glutinous or farinaceous flour, liquid, and an edible acid derivative selected from ester derivatives of dibasic and tribasic organic acids; and

(b) drying the pasta dough of step (a) to produce a dried pasta product.

32. A process for microwave cooking pasta comprising the steps of:

(a) adding a liquid with a temperature between about 33° and 140° F. (0.6 and 60° C.) to uncooked pasta, wherein the amount of liquid added is the minimal amount needed to hydrate the pasta, and wherein the pasta does not become gummy or mushy, and

(b) exposing the liquid and uncooked pasta to microwave radiation of sufficient power and for sufficient duration to cook the pasta,

said uncooked pasta comprising glutinous or farinaceous flour, egg whites, water, and triethyl citrate.

4,990,350

PROCESS FOR PREPARING REDUCED ALCOHOLIC SPIRITS AND THE PRODUCT PRODUCED THEREFROM

Thomas Rohmann, Mahopac, N.Y., assignor to Joseph E. Seagrams and Sons, Inc., New York, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,384

Int. Cl.[5] C12G *3/08*

U.S. Cl. 426—330.4 10 Claims

1. A continuous, single pass process for the removal of a portion of the alcohol from distilled spirits in a reverse osmosis permeator system comprised of at least one semi-permeable membrane, said process comprised of the steps of feeding a stream of distilled spirits into said system, pressurizing the feed stream against the permeable membrane in a pressure range between 1000–1500 psig, and separating said feed stream into permeate and retentate components.

4,990,351

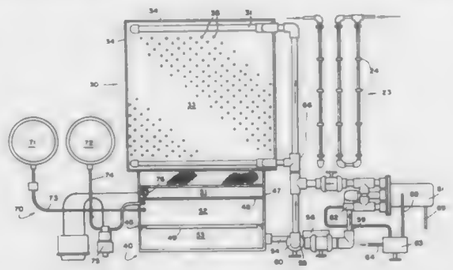
METHOD FOR TREATING FRESH FRUIT TO PREVENT AND RETARD THE GROWTH OF FUNGUS

Charles R. Orman, San Bernardino, and Paul E. Johnson, Riverside, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Jun. 10, 1988, Ser. No. 204,722

Int. Cl.[5] A23L *1/212*

U.S. Cl. 426—333 14 Claims



1. A method of treating fresh fruit produce to prevent and retard the growth of fungi consisting essentially of:

(a) Passing said fruit through a fruit scrubbing station wherein said fruit is contacted by scrubbing means to remove debris from said fruit;

(b) Simultaneously with said scrubbing step drenching said fruit with a falling liquid in a quantity sufficient to remove all debris carried by said fruit, said liquid comprising a solution of sodium orthophenylphenate, the quantity of said sodium orthophenylphenate being maintained such that the concentration of orthophenylphenol in said liquid is sufficient to apply a fungicide coating to said fruit at the end of said scrubbing step sufficient to prevent fungus growth on said fruit, said fungicide amount not exceeding that which would deleteriously affect the quality of said fruit.

4,990,352

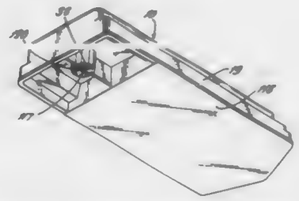
METHOD FOR PREPARING BEVERAGES

Alec T. Newman; Andrew C. Bentley; Christine A. King, all of Banbury; Alistair J. MacMahon, Northants; Robert W. Tansley, and Andrew R. Gibbs, both of Warwickshire, all of United Kingdom, assignors to General Foods Limited, Banbury, United Kingdom

Division of Ser. No. 324,357, Mar. 15, 1989, Pat. No. 4,909,136. This application Nov. 2, 1989, Ser. No. 431,006

Int. Cl.[5] B65B *55/00*

U.S. Cl. 426—392 8 Claims



1. A method of preparing a beverage employing a package having a sealed outlet wi h a counterbore containing at least one beverage ingredient comprising locating said package at brewing station; piercing the sealing material of said package at said sealed outlet with a tool to form an outlet opening in the package; introducing through an inlet means an aqueous medium into the package allowing the aqueous medium to comingle with the beverage ingredient and collecting the beverage so formed through the outlet opening formed in the package; wherein the piercing tool is employed both to form the outlet opening and to fold within the counterbore of said outlet opening the sealing material surrounding said opening out of the path of the beverage which subsequently emerges through the outlet opening.

4,990,353

METHOD OF PRE-WASHING AND AFTER-WASHING TUBEROUS PRODUCTS OR PEELING THEREOF AND AN APPARATUS FOR PERFORMING THE METHOD

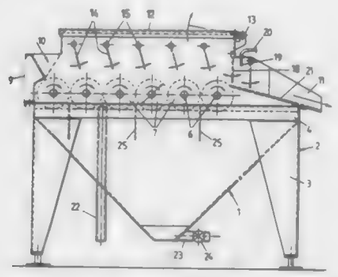
Peter W. C. van der Schoot, Groot-Ammers, Netherlands, assignor to Goudsche Machinefabriek B.V., Ca Gouda, Netherlands

Filed May 4, 1990, Ser. No. 518,893

Claims priority, application Netherlands, Jan. 21, 1986, 8600173

Int. Cl.[5] A23N *7/00, 9/00*

U.S. Cl. 426—483 8 Claims



1. A method of washing or peeling tuberous products comprising: providing a bed of rotatably driven elements in a container and wherein the elements define a top surface of the bed, supplying liquid into the container to only partially submerge the elements so that only the undersides of the elements extend into the liquid, disposing the tuberous products on the top surface of the bed at one end of the bed; transporting the tuberous products from the one end of the bed to another end of the bed solely by rotating the elements; and washing or peeling the tuberous products by adjusting the rotational speed of the elements to sling liquid off the elements against the tuberous products and by slowing down the transport speed of the tuberous products from said one end of the bed to said another end thereof without decreasing the rotational speed of the elements solely by contacting the tuberous products along the length of the bed with generally downwardly extending cleats disposed entirely above the top surface of the bed and having lowermost ends spaced above the top surface of the bed.

4,990,354

COMPOSITION FOR ENHANCING THE SWEETNESS INTENSITY AND MASKING THE AFTERTASTE OF INTENSE AND ARTIFICIAL SWEETENERS

Abraham I. Bakal, Parsippany, N.J., and Marvin E. Eisenstadt, Neponsit, N.Y., assignors to Cumberland Packing Corp., Brooklyn, N.Y.

Filed Jul. 5, 1990, Ser. No. 548,665

Int. Cl.[5] A23L *1/236*

U.S. Cl. 426—548 26 Claims

1. Intense sweetener composition, said composition comprising an intense or artificial sweetener having an undesired aftertaste, and at least one of natural honey flavor or natural coconut flavor in an amount below the threshold recognition level of the taste of said natural flavor, while being sufficient to intensify the sweetness of said intense or artificial sweetener and reduce the undesired aftertaste thereof.

4,990,355

LOW FAT SPREAD

Bharat B. Gupta, 92 Leighton Road, Weston, Bath, Avon, BA1 4NG, and Brian L. Platt, 25 Fairfield, Sampford Peverell, Devon, EX16 7DE, both of England

Filed Jan. 30, 1989, Ser. No. 303,853

Claims priority, application United Kingdom, Feb. 2, 1988, 8802223

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] A23D *7/00*

U.S. Cl. 426—602 19 Claims

1. A low fat spread which is a water-in-oil emulsion comprising a continuous fat phase and a dispersed aqueous phase, the aqueous phase comprising at least 6% by weight of one or more proteins derived from milk and from 1.3 to 4.0% by weight of a modified starch, the fat phase comprising 18 to 37% by weight of the total composition of the low fat spread.

4,990,356

FOOD COMPOSITION

Robert G. Hamilton, 14 Bonniebrae St., Wynnum West, Queensland, and Frank J. Van Doore, 148 Windsor Road, Kelvin Grove, Queensland 4059, both of Australia

Continuation-in-part of Ser. No. 905,649, Sep. 11, 1986, Pat. No. 4,842,885. This application May 31, 1989, Ser. No. 359,345

Claims priority, application Australia, Apr. 22, 1986, PH5570

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] A23K *1/10*

U.S. Cl. 426—623 12 Claims

1. An intermediate moisture stable food composition having a pH of approximately 4 to 6, useful as a component in the preparation of a pet food and adapted to be stored indefinitely without substantial deterioration consisting essentially of:

(a) a source of protein in an amount effective to provide a minimum protein content of 15% by weight which comprises hash and optionally contains bone-in fractions,

(b) a moisture content in the range of approximately 15 to 35% by weight based on the total weight of the food composition, and

(c) at least one humectant in an amount of approximately 5

to 15% based on the total weight of the food composition and which is effective to provide a maximum water activity of 0.9.

4,990,357

ELASTOMERIC SEGMENTED HYDROPHILIC POLYETHERURETHANE BASED LUBRICIOUS COATINGS

Mutin Karakelle, Dayton; Houshang Karimi, Kettering; Min-Shui Lee, Spring Valley, and Robert A. Taller, Centerville, all of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed May 4, 1989, Ser. No. 347,133
Int. Cl.[5] A01N 1/02
U.S. Cl. 427—2 16 Claims

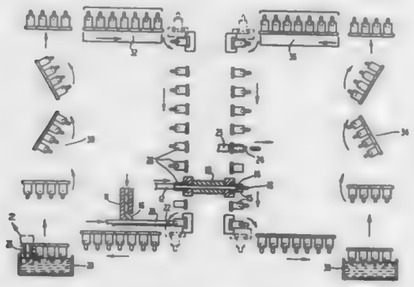
10. A method for lubricating a polymeric surface comprising coating onto a polymeric surface a composition comprising a substantially uniform blend of a hydrophilic polymer and an elastomeric segmented hydrophilic polyetherurethane which is the reaction product of a diisocyanate, a hydrophilic polyether glycol and a diol chain extender to give a coated surface and contacting said coated surface with a liquid.

4,990,358

METHOD FOR DOUBLE DIPPING GELATIN COATED CAPLETS

Norbert I. Berta, Radnor, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Division of Ser. No. 129,109, Dec. 4, 1987, Pat. No. 4,867,983, and a continuation-in-part of Ser. No. 16,914, Feb. 20, 1987, Pat. No. 4,820,524. This application Mar. 21, 1989, Ser. No. 326,588
Int. Cl.[5] A61K 9/00
U.S. Cl. 427—3 1 Claim



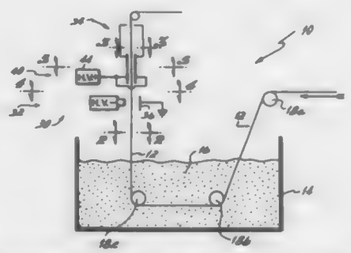
1. A method for coating a caplet with a gelatinous coating to produce a simulated capsule-like medicament comprising:
(a) providing a holding means having a caplet channel defined therein;
(b) inserting a first end of said caplet into said caplet channel while leaving a second end of said caplet exposed;
(c) applying a first gelatinous material to said second exposed end of said caplet to form a coated second end;
(d) permitting said coated second end to dry;
(f) applying a second gelatinous material to said first end of said caplet, said second gelatinous material having a greater viscosity than said first gelatinous material so as to provide a thicker gelatinous coating to said first end; and
(g) permitting said thicker gelatinous coating on said first end to dry.

4,990,359

ELECTROSTATIC METHOD FOR COATING REDISTRIBUTION

Alan J. Knobbe, Lorain, Ohio, assignor to Nordson Corporation

Filed Nov. 13, 1989, Ser. No. 435,570
Int. Cl.[5] B05D 1/04
U.S. Cl. 427—32 12 Claims



1. A method for enhancing the uniformity of a coating on a substrate wherein the coating has been deposited in a non-uniform thickness across a substrate and has a non-solidified flowable state following its deposition onto the substrate and before its solidification thereon, the method comprising the steps of:
electrostatically charging the non-solidified coating deposited on the substrate; and then
placing the substrate in relative proximity to at least one charged electrode shaped to selectively exert electrostatic force differently to different portions of the coating to electrostatically redistribute the coating on the substrate.

4,990,360

ELECTRICALLY CONDUCTIVE COMPOSITIONS CONTAINING ACRYLATE FUNCTIONAL ORGANOSILOXANE/OXYALKYLENE COPOLYMERS AND SOLUBILIZED LITHIUM SALT

Gerald A. Gornowicz, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 281,589, Dec. 9, 1988, Pat. No. 4,906,718. This application Sep. 29, 1989, Ser. No. 414,541
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—35(139) 4 Claims

1. A solid, electroconductive organosiloxane copolymer comprising the product obtained by curing a liquid composition comprising

A. an organosiloxane copolymer having the general formula

$$R^1{}_3SiO(R^2{}_2SiO)_x(R^3R^4SiO)_y(R^3R^5SiO)_zSiR^1{}_3,$$

where R^1, R^2, and R^3 monovalent hydrocarbon or substituted monovalent hydrocarbon radicals, R^4 represents $-R^6O(CH_2CH_2O)_mA$, R^5 represents $-R^7O(CH_2CH_2O)_nC(O)CR^8{=}CH_2$, R^6 and R^7 represent identical or different alkylene radicals containing from 2 by 12 carbon atoms, R^8 represents methyl or hydrogen, A represents an alkyl or aryl radical or an acyl group, the values represented by m ad n are from 4 to 30, the value represented by x is from 0 to 100, the value represented by y is from 0 to 100, the value represented by z is at least 2, the value of x+y+z is equivalent to a viscosity of up to 1 Pa.s at 25° C., and

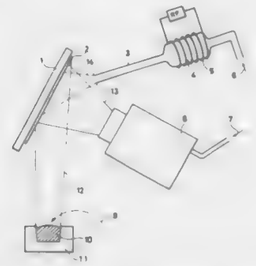
B. an amount of a solubilized, ionizable lithium salt equivalent to one mole of said salt per 7 to 30 moles of CH2CH2O units in said copolymer.

4,990,361

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM

Tadashi Yasunaga; Akio Yanai, and Koji Sasazawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 182,819, Apr. 18, 1988. This application Aug. 28, 1989, Ser. No. 403,075
Claims priority, application Japan, Apr. 16, 1987, 62-94136; Feb. 1, 1988, 63-21811
Int. Cl.[5] H01F 10/02
U.S. Cl. 427—36 15 Claims



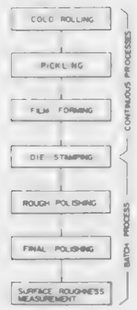
1. A method for producing a magnetic recording medium in which an iron nitride ferromagnetic thin film containing at least iron and nitrogen is formed on a nonmagnetic substrate, comprising the steps of: applying at least one of uncharged nitrogen molecules in an excited state and uncharged nitrogen atoms in an excited state to said nonmagnetic substrate; and simultaneously applying an uncharged iron vapor flow and a charged ion flow to said substrate to thereby form said thin film on said nonmagnetic substrate.

4,990,362

METHOD OF MANUFACTURING A TITANIUM MAGNETIC DISK SUBSTRATE

Hiroshi Kibe; Hideaki Fukai, and Hiroyoshi Suenaga, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 482,026
Claims priority, application Japan, Jun. 16, 1989, 1-153861
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—38 3 Claims



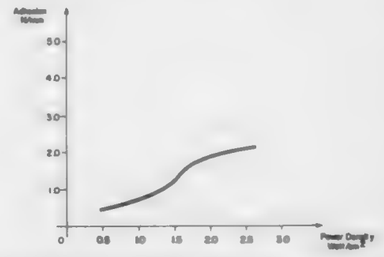
1. A method of manufacturing titanium magnetic disk substrates comprising steps of:
preparing a base by removing not less than 5 μm from the surface layer of a titanium cold-rolled plate, and
forming a film of not less than 5 μm consisting essentially of 1 or more non-magnetic transition metal elements belonging to Groups IVA, VA, VIA, VIIA and VIIIA of the Periodic Table, on the surface of the base.

4,990,363

METHOD OF PRODUCING VERY ADHESIVE METALLIC STRUCTURES ON FLUORINE POLYMERS AND THERMOPLASTIC SYNTHETIC MATERIALS

Harald Suhr, Tübingen, and Christa Haag, Ofterdingen, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 289,368
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3744062
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—40 13 Claims



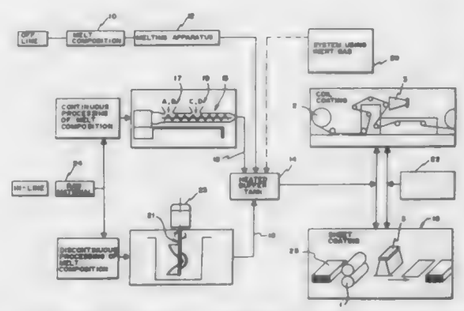
1. A method of producing metallic structures on non-conductors selected from the group consisting of fluorine polymers and thermoplastic synthetic plastic materials, comprising the steps of subjecting a surface of a nonconductor to be metallized to an etching and cleaning process in a glow discharge zone by supplying an etching gas into said glow discharge zone to the surface of the non-conductor; and thereafter metallizing the non-conductor by decomposing of a metallo-organic compound in the same glow discharge zone with formation of a metallic film.

4,990,364

SOLVENT-FREE, LOW-MONOMER OR MONOMER-FREE POLYMERIZABLE HOT MELT COATING PROCESS

Georg Bolte, Vechelde, and Rudolf Hinterwaldner, Moosach-Altenburg, both of Fed. Rep. of Germany, assignors to 501 Schmalbach Lubeca AG, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 129,110
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641436
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—44 19 Claims



1. A method of coating a substrate to provide a protective coating or film thereon, said method comprising the steps of:
(a) providing a solvent-free, low monomer or monomer-free, polymerizable hot melt comprised of a polymerizable component selected from the group consisting of (1) at least one polymerizable, hydroxyl-containing polymer

containing <0.01 wt. % residual free monomers and having a mean molecular weight ($\overline{M}_w$) of between about 1,000 and about 500,000 and a glass transition temperature (T_g)≧−20° C. to +181° C.; (2) at least one polymerizable, linear straight chain and/or branched polyester and-/or copolymer thereof containing ≦0.1 wt. % residual free monomers and having a mean molecular weight ($\overline{M}_w$) between about 800 and about 50,000 and a glass transition temperature (T_g)≧−50° C. to +50° C.; (3) components (1) and (2) in admixture; and (4) components (1) and/or (2) in admixture with a polymerizable, ethylenically-unsaturated group carrying oligomer consisting of acrylic, methacrylic, ether, ester, urethane, amide, imide, epoxy, siloxane, phenol, novolak and/or mercapto compounds containing ≦0.5 wt. % residual free monomers and having a mean molecular weight ($\overline{M}_w$) of about 400 to about 10,000;

(b) applying said hot melt to a substrate in the form of a coating or thin film, and

(c) polymerizing said hot melt.

4,990,365

METHOD FOR PRODUCING SILICON BORONITRIDE LAYERS

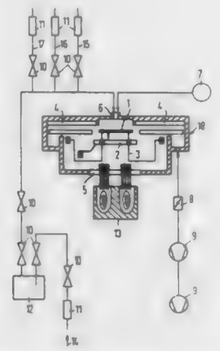
Helmuth Treichel, Augsburg; Oswald Spindler, Vaterstetten, and Bernhard Neureither, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1989, Ser. No. 367,358

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827949

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—45.1 12 Claims



1. A method for producing a silicon boronitride layer having a dielectric constant ϵ of less than 4 ϵ_o by chemical vapor deposition in an alternating electromagnetic field, comprising the step of utilizing as a fluid initial compound a compound chosen from the group consisting of:

$B_3N_3H_3(SiR_3)_3$ wherein R is chosen from the group consisting of hydrogen, NH_2, and alkyl;

$B_3N_3(SiR_3)_6$ wherein R is chosen from the group consisting of hydrogen, and alkyl; and

the compound is introduced into a reactor chamber with a carrier gas.

4,990,366

METHOD FOR THE METALLIZATION OF A LUMINESCENT SCREEN

Antimo Pezzulo, Anagni, and Himanshu Patel, Rome, both of Italy, assignors to Videocolor, Courbevoie, France

Filed Oct. 17, 1988, Ser. No. 258,677

Claims priority, application France, Oct. 20, 1987, 87 14431

Int. Cl.[5] B05D *5/12, 5/06*

U.S. Cl. 427—68 6 Claims

1. A method for metallizing a luminescent screen, comprising the steps of:

depositing at least one luminophor coat containing at least one binder on the inner face of a panel to form a luminescent screen;

depositing a sub-layer consisting of at least one aqueous emulsion of an acrylic film-forming resin on the screen;

drying said sub-layer by heating the screen to a temperature sufficient to form a first film that is relatively hard, continuous, thin, reflective and hydrophobic;

maintaining the temperature of the screen at a temperature equivalent to or greater than the minimum temperature for the formation of a second film while depositing a finishing layer on the first film from the same aqueous emulsion of acrylic film-forming resin having a film-forming temperature of below 45° C. which is the same aqueous from which the first film is formed;

drying the finishing layer to form the second film having properties identical to those of the first film;

depositing a metallic coating on the dried second film; and

volatilizing the binder of the luminophor screen, the first film and the second film.

4,990,367

CANINE DISTEMPER VIRUS VACCINE

Edmund P. Bass, Menlo Park; William H. Kelsey, Alameda, both of Calif., and Michael D. McFarland, Boone, Iowa, assignors to Diamond Scientific Company, Des Moines, Iowa

Continuation of Ser. No. 351,774, May 15, 1989, abandoned, which is a continuation of Ser. No. 115,345, Nov. 2, 1987, abandoned, which is a division of Ser. No. 23,814, Mar. 9, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 463,763

Int. Cl.[5] A61K *39/12*

U.S. Cl. 424—89 8 Claims

1. A process of inactivating canine distemper virus which allows said virus to test negatively for residual live canine distemper virus and to substantially retain its immunogenicity, said process comprising:

exposing said virus to a small but inactivating effective amount of binary ethyleneimine at a temperature ranging from about −10° C. to about 40° C. for a time sufficient to render said virus non-infectious.

4,990,368

PROCESS FOR FLAME RETARDING TEXTILES

James R. Johnson, McLeansville, and Arvind D. Joshi, Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 13, 1989, Ser. No. 365,463

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—190 19 Claims

1. A process of imparting flame resistance to a textile substrate comprising applying to a textile substrate a water-insoluble flame retardant composition containing a flame retardant capable of fusing or melting and attaching to the textile substrate at elevated temperatures, the flame retardant composition applied in powder form to the textile substrate under conditions such that the flame retardant fuses onto and durably attaches to the textile substrate and enhances the textile substrate's flame resistance.

4,990,369

PROCESS FOR SURFACE MODIFICATION OF POLYMER ARTICLES

Michael T. Burchill, Cranbury; Maryan Rafiei, Bayonne, and Joseph Silbermann, Old Bridge, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation of Ser. No. 338,337, Apr. 13, 1989, abandoned, which is a continuation of Ser. No. 209,750, Jun. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 945,595, Dec. 23, 1986, Pat. No. 4,770,905. This application Sep. 22, 1989, Ser. No. 410,760

Int. Cl.[5] B05D *5/00, 1/18*

U.S. Cl. 427—160 19 Claims

1. A process of incorporating a modifier ingredient into the surface region of a resinous article comprising the steps of:

(a) immersing a resinous article in a water;

(b) contacting the immersed article with a solution of a modifier ingredient in a solvent and

(c) conducting the process at a temperature of about 13° C. or lower.

4,990,370

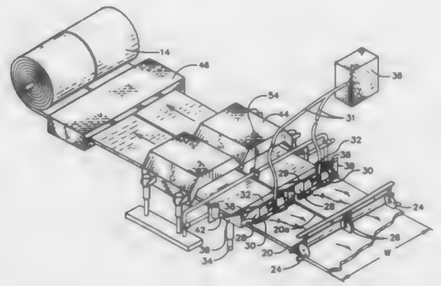
ON-LINE SURFACE AND EDGE COATING OF FIBER GLASS DUCT LINER

James R. Terry, Cleburne, Tex.; Kent R. Matthews, Littleton, Colo.; Ricky W. Totach, Joshua, and Donny L. Timms, Cleburne, both of Tex., assignors to Manville Corporation, Denver, Colo.

Continuation of Ser. No. 349,199, May 9, 1989, abandoned. This application Apr. 2, 1990, Ser. No. 503,082

Int. Cl.[5] B05D *1/00;* B05C *3/00*

U.S. Cl. 427—209 9 Claims



1. An on-line process of forming a surface coated duct liner material from a fiber glass blanket comprising the steps of;

supplying a fiber glass blanket having an upper surface and opposed marginal edge surfaces;

supplying coating material to the upper surface of said blanket to cause a reservoir build-up of material on such surface;

spreading the material completely across the upper surface and causing some of the coating material to flow over the edge surfaces;

delivering said overflow material to a spreading means adjacent each edge surface and spreading the coating material across each said edge surface to coat each edge surface of the blanket; and,

curing the coating on the blanket.

4,990,371

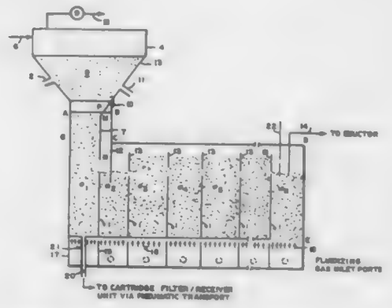
PROCESS FOR COATING SMALL SOLIDS

Arunava Dutta, Danvers; Leonard V. Dullea, Peabody, and Ernest A. Dale, Hamilton, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Aug. 1, 1989, Ser. No. 388,187

Int. Cl.[5] B05D *7/00*

U.S. Cl. 427—213 31 Claims



1. A method of coating small solid particles with a conformal coating of a protective material, said method comprising the steps of:

(a) contacting the small particles with a vapor phase precursor coating material in a first multi-stage fluid bed reactor, such that the particles adsorb at least a portion of said precursor coating material;

(b) passing the particles having precursor coating material adsorbed thereon to a second multi-stage fluid bed reactor wherein said precursor coating material is oxidized to a protective material;

(c) passing said coated particles to a cooling zone; and

(d) recirculating the solids through the first and second multi-stage fluid bed reactors and the cooling zone, an appropriate number of times, to achieve a thicker coating of the protective material.

4,990,372

METHOD FOR PRODUCING WEAR RESISTANCE INTERNAL SURFACES OF STRUCTURES

Swaminathan Sunder, Allentown; Diwakar Garg, Macungie, and Paul N. Dyer, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

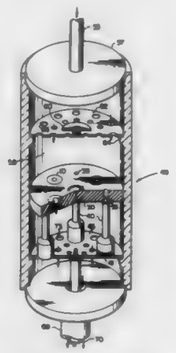
Continuation-in-part of Ser. No. 92,809, Sep. 3, 1987, Pat. No. 4,874,642, and a continuation-in-part of Ser. No. 153,738, Feb. 8, 1988, Pat. No. 4,855,188. This application Jul. 31, 1989, Ser. No. 388,104

Int. Cl.[5] C23C *16/08, 16/32, 16/46*

U.S. Cl. 427—237 24 Claims

1. A low temperature chemical vapor deposition method for increasing the wear life and hardness of an internal surface of a structure comprising a material selected from the group consisting of ferrous and non-ferrous metals and alloys, metal matrix composites and metal carbides, said method comprising the steps of directing to an internal surface of said structure a first reaction mixture of process gases comprising a tungsten halide and hydrogen to chemical vapor deposit an intermediate layer of substantially pure columnar tungsten thereon; directing to said tungsten coated internal surface a second reaction mixture of process gases comprising (1) a tungsten halide, (2) a volatile oxygen- and hydrogen-containing organic compound, and (3) hydrogen; controlling the flow rate of said tungsten halide and said oxygen- and hydrogen-containing organic compound in said second reaction mixture so that the W/C atomic ratio is within the range of about 0.5 to about 15 to chemical vapor deposit a mixture of W and W_2C, W and W_3C, or W and W_2C and W_3C as a top coat onto said intermediate

tungsten layer; controlling the amount of said hydrogen present in the first and second reaction mixtures during the chemical vapor deposition steps so that the amount is more than the stoichiometric amount required for the reduction of said tungsten halide; controlling the chemical vapor deposition temperature in the range of about 300° to about 650° C.; controlling the chemical vapor deposition pressure within the range of about 1 Torr. to about 1000 Torr., said top coating being fine grained, non-columnar and having a substantially layered microstructure and a thickness sufficient to confer a desired degree of wear resistance and hardness on said internal surface.



4,990,373

MEMBRANE-FORMING FOAM COMPOSITION AND METHOD

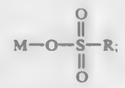
Paul A. Kittle, West Chester, Pa., assignor to Rusmar Incorporated, West Chester, Pa.

Filed Sep. 29, 1989, Ser. No. 414,687
Int. Cl.[5] B05D *5/00, 5/10;* B05C *1/16;* E01C *5/00*
U.S. Cl. 427—244 17 Claims

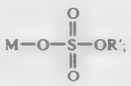
13. A method of forming a barrier layer between a substrate and the atmosphere which comprises applying to the substrate a foam prepared from an aqueous membrane-forming foamable composition comprising, based on the weight of solids in the aqueous composition:

(a) about 60 to about 90 weight percent of a polymer in latex form selected from styrene-butadiene copolymer, poly(vinyl acetate), acrylic ester polymers, polyacrylonitrile, and mixtures thereof;

(b) about 5 to about 10 weight percent of a water-soluble anionic surfactant selected from compounds having the formula



compounds having the formula



and mixtures thereof, where M is a monovalent cation selected from sodium, potassium, ammonium, alkyl-substituted ammonium, alkanol-substituted ammonium and mixtures thereof, R is an alkyl, alkenyl, or alkaryl group having 10–20 carbon atoms, R′ is an alkyl, alkenyl, or alkaryl group having 10–20 carbon atoms or an alkyl polyether having the structure

where R″ is an alkyl group having 10 to 20 carbon atoms, R‴ is H or the methyl radical and n is an integer in the range 1 to 12;

(c) sufficient base to neutralize the acidic components in the composition and adjust the pH of the composition to a value of at least 7.5;

(d) an alkanol having 12 to 14 carbon atoms, in an amount up to about 10 weight percent;

(e) an acrylic acid polymer viscosity modifier in an amount up to about 10 weight percent;

(f) a swelling agent in an amount up to about 10 weight percent; and

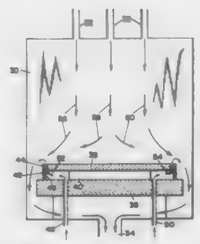
(g) powdered carbon in an amount up to about 20 weight percent.

4,990,374

SELECTIVE AREA CHEMICAL VAPOR DEPOSITION

Joseph T. Keeley, Woburn; Jitendra S. Goela, Andover; Michael A. Pickering, Dracut, and Raymond L. Taylor, Saugus, all of Mass., assignors to CVD Incorporated, Woburn, Mass.

Filed Nov. 28, 1989, Ser. No. 442,263
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—255.1 16 Claims



1. A method of isolating a predetermined area in a hot-walled chemical vapor deposition chamber, which area comprises the surface area of a substrate that is positioned in the chamber and on which a coating of a chemical vapor deposition material is to be deposited, comprising the steps of:

(a) surrounding the said area by a suitably supported ring having an inner wall that matches the shape of the said area and thereby of the surface area of the substrate except for a narrow annular space that separates the inner wall of the ring from the boundary of the said area, and

(b) establishing a flow of nonreactive gas through the annular space in a direction substantially in opposition to the direction of flow of the chemical vapor deposition material in the chemical vapor deposition chamber, with the rate of flow of the nonreactive gas being such as to maintain a small pressure differential between the gas in the annular space and the gas in the chemical vapor deposition chamber.

8. Apparatus for effecting the isolation of a predetermined deposition area in a hot-walled chemical vapor deposition chamber, comprising:

first means for establishing the predetermined deposition area in the chemical vapor deposition chamber, said area having a boundary,

a ring enclosing the predetermined deposition area with a substantially uniform annular space separating the boundary of the predetermined deposition area from the inner wall of the ring,

second means for establishing a flow of chemically vapor deposition material in said chamber, and

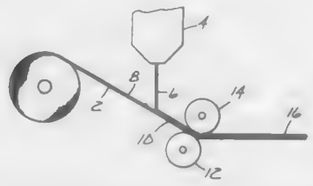
third means for establishing a flow of nonreactive gas through said annular space in a direction substantially opposite to the flow of chemically vapor deposition material in said chamber.

4,990,375

METHOD OF FORMING RECEPTOR SHEETS WITH AN IMAGE-BEARING NON-RECEPTOR SURFACE

Donald L. Swihart, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 20, 1988, Ser. No. 260,262
Int. Cl.[5] B29C *59/04;* B05D *5/06*
U.S. Cl. 427—278 6 Claims



1. A process for the manufacture of a paper base for imaging materials comprising the steps of

(a) providing a paper base,

(b) extrusion coating a thermoplastic polymer onto one surface of said base,

(c) passing said paper base between a set of nip rollers,

(d) cooling said thermoplastic polymer by having one of said nip roller at a temperature below the temperatures of said polymer, said one of said nip rollers contacting said polymer, and

(e) removing said base from said one of said nip rollers, the surface of said one of said nip rollers having differential surface characteristics with vertical variations of less than 20 microns so that cooling of said polymer by said one of said nip rollers generates a visually observable image.

4,990,376

FLEXIBLE SILICONE COATINGS FOR PLASTIC SUBSTRATES AND METHODS FOR MAKING THERMOFORMABLE, ABRASION-RESISTANT THERMOPLASTIC ARTICLES

Gautam A. Patel, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 185,594, Apr. 25, 1988, Pat. No. 4,914,143.
This application Nov. 24, 1989, Ser. No. 440,829
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—387 5 Claims

1. A method for coating polycarbonate substrates with a silica-containing coating, which comprises:

(A) applying to the substrate a curable silicone resin coating composition having a pH between about 7.1 and 7.8 and comprising a water/organic solvent dispersion of colloidal silica in a water/organic solvent dispersion of ammonium-stabilized colloidal silica having an average particle diameter no greater than about 5 to 10 millimicrons and a partial condensate of a mixture of a diorganodiorganooxysilane and an organotriorganooxysilane in a weight ratio in the range of about 1:99 to 15:85, wherein the diorganodiorganooxysilane has the formula $R'_2Si(OR)_2$ and the organotriorganooxysilane has the formula $R'Si(OR)_3$, each R being independently selected from the group consisting of alkyl groups containing about 1–8 carbon atoms and aromatic groups containing about 6–20 carbon atoms, each R′ being independently selected from the group consisting of alkyl groups containing about 1–3 carbon atoms and aromatic groups containing about 6–13 carbon atoms; and

(B) curing the composition at a temperature of about 100° C. to 130° C. in the presence of an effective amount of a curing catalyst.

4,990,377

BUFFERED SILANE EMULSIONS HAVING LOW VOLATILE ORGANIC COMPOUNDS WHEN CURED

Michael E. Wilson, Middleburg, Fla., assignor to PCR Group, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 189,146, May 2, 1988, Pat. No. 4,877,654. This application Aug. 10, 1989, Ser. No. 392,107
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—387 74 Claims

37. A process for increasing the resistance to penetration by aqueous media of a porous substrate, said process comprising:

(i) applying to the surface of said substrate a buffered aqueous silane emulsion composition having a volatile organic compound content of less than about 400 g/l when cured comprising effective amounts of:

(a) a hydrolyzable silane essentially hydrolytically stable within a determinable pH range;

(b) an emulsifier or mixture of emulsifiers having an HLB value of from about 1.5 to about 20;

(c) at least one compound for buffering the pH of said composition within said determinable pH stable range; and

(d) water; and

(ii) allowing said composition to cure.

4,990,378

HOT MELT WAX COATINGS FOR FIBROUS SUBSTRATES

Richard L. Jones, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 6, 1989, Ser. No. 307,875
Int. Cl.[5] B32B *7/04*
U.S. Cl. 427—420 26 Claims

1. A process for coating fibrous substrates with a wax composition which comprises:

(a) forming a falling curtain of a viscous molten, thermoplastic wax composition,

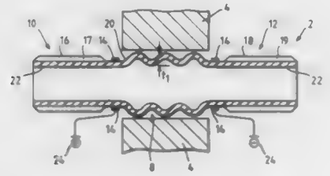
(b) causing a fibrous substrate to pass through said curtain of wax so as to deposit the wax on at least one surface of said fibrous substrate, and

(c) permitting the wax to congeal on the surface of the fibrous substrate; the improvement which comprises employing as the falling curtain of wax, a composition which comprises:

a mixture of (1) a paraffin wax having a melting point of from about 120° F. to about 160° F., (2) a petroleum wax selected from the group consisting of a recrystallized heavy intermediate wax having a melting point of from about 145° F. to about 185° F. and a microcrystalline wax having a melting point of from about 145° F. to about 200° F., and mixtures thereof, (3) a polymeric hydrocarbon compound having a molecular weight of from about 2,000 to about 100,000, (4) a hydrocarbon resin derived from a C_5 olefin petroleum feed stock or a polyterpene resin; and (5) optionally, but preferably, a petroleum-wax soluble, phenolic anti-oxidant.

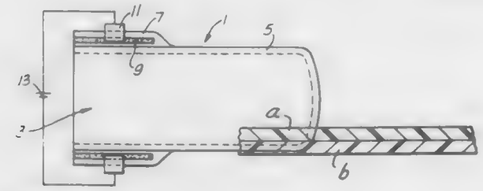
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4,990,379
HEAT RECOVERABLE ARTICLE
Per J. T. Jensen, Slangerup, and Joergen M. Berth, Kvistgaard, both of Denmark, assignors to Raychem Corporation, Menlo Park, Calif.
Filed Sep. 8, 1988, Ser. No. 241,659
Claims priority, application United Kingdom, Aug. 25, 1987, 8720015
Int. Cl.[5] H05B *3/10*
U.S. Cl. 428—349 5 Claims



1. A tubular heat recoverable article, which has been deformed to make it recoverable, comprising
(a) a conductive polymer and
(b) electrical connection means,
the deformation of the article and the position of the electrical connection means being such that, when the electrical connection means are electrically connected to an appropriate source of electrical power, electrical current flows through the conductive polymer in at least one region of the article, heating and recovering at least the said region of the article, whereby on recovery
(i) at least a section of the said region of the article increases in wall thickness, and
(ii) a region of the article, at least in its recovered state, is convoluted.

4,990,380
HEAT RECOVERABLE ARTICLE
Per J. T. Jensen, Slangerup, Denmark; George B. Park, Swindon, England; Stephen M. Baigrie, Swindon, England; George M. J. Gansbuehler, Swindon, England, and Richard J. Penneck, Swindon, England, assignors to Raychem Corporation, Menlo Park, Calif.
Filed Sep. 8, 1988, Ser. No. 241,749
Claims priority, application United Kingdom, Sep. 9, 1987, 8721181; Sep. 9, 1987, 8721179; Oct. 9, 1987, 8723761; Oct. 9, 1987, 8723759; Dec. 14, 1987, 8729119; May 4, 1988, 8810522
Int. Cl.[5] H05B *3/06*
U.S. Cl. 428—349 38 Claims

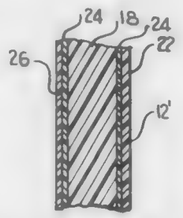


1. An article which
(1) is heat recoverable, and
(2) comprises
(a) a heat recoverable element which is composed of a conductive polymer and
(b) at least two support elements which
(i) are not heat recoverable, and
(ii) are spaced apart from each other, so that if an electrode is attached to each support element and connected to a suitable power source, current passes between the electrodes through the conductive polymer element and generates heat therein which thereby effects recovery of the article,
with the proviso that, if the article is of open cross-section, at least one of the support elements is not part of a closure system for maintaining the article in a tubular configuration around a substrate.

4,990,381
MULTI-LAYER SANDWICH SHEET AND PACKAGING USING THE SAID SHEET
Günter Holzner, Grand-Lancy, Switzerland, assignor to Firmenich SA, Geneva, Switzerland
Filed Jul. 18, 1988, Ser. No. 220,711
Claims priority, application Switzerland, Jul. 22, 1987, 2781/87
Int. Cl.[5] A61K *31/74;* A61L *21/904*
U.S. Cl. 428—35.3 20 Claims

1. A multilayer sandwich sheeting comprising at least two separately and simultaneously extruded layers of polymeric materials, a first layer being composed of a first polymeric material selected from a group consisting of a polyolefin resin and a copolymer of polyamide and polyether, said first polymeric material being mixed before extruding with a volatile active agent selected from the group consisting of a perfuming composition, a deodorizing composition, a flavoring agent, an aroma agent, an insecticidal substance and a bactericidal substance; and a second layer being composed of a second polymeric material which is impervious to said volatile active agent, said second layer being extruded as the outer layer while the first layer forms the inner layer, such that evaporation of said volatile active agent is substantially prevented during said extrusion; said first and second layers being permanently stuck together.

4,990,382
PLASTIC CONTAINER WITH GLASS-LIKE APPEARANCE, PARISON FOR AND METHOD OF MAKING SAME
Harry Weissenstein, Woodridge, and Timothy Heisel, Bartlett, both of Ill., assignors to Continental Plastic Containers, Inc., Norwalk, Conn.
Filed Sep. 11, 1987, Ser. No. 95,257
Int. Cl.[5] B65D *23/00*
U.S. Cl. 428—35.7 17 Claims

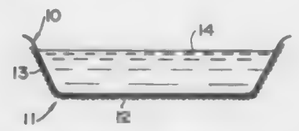


1. A multi-layer plastic material parison for forming a blow molded container having a glass-like appearance, said parison being in the form of an extruded tube including a thick primary intermediate layer, an inner layer for direct contact with a product, and a thin outside gloss coat forming means for giving a container blow molded from said preform a glass-like appearance, said outside gloss coat being selected from EVOH, nylon and mixtures of EVOH and nylon.

4,990,383
PLASTIC COATED STEEL TUBE AND METHOD FOR PREPARING THE SAME
Christer Bergström; Johan Von Knorring, both of Espoo, and Mikko Karttunen, Porvoo, all of Finland, assignors to Neste Oy, Finland
Filed Jun. 5, 1989, Ser. No. 361,491
Claims priority, application Finland, Jun. 7, 1988, 882691
Int. Cl.[5] F16L *9/00;* B05D *3/00*
U.S. Cl. 428—35.9 21 Claims

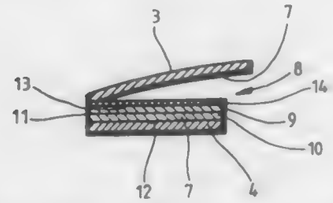
1. Plastic-coated steel tube, comprising a steel tube having thereon an inner layer of at least one cross-linked polyolefin modified with hydrolyzable silane and an outer unmodified or soot-blended polyolefin layer on the exposed surface of the inner layer.

4,990,384
PAPER COOK POT
Takeshi Jinbo, Matsudo, Japan, assignor to Somar Corporation, Japan
Filed Apr. 14, 1989, Ser. No. 338,207
Int. Cl.[5] B32B *27/12, 27/34*
U.S. Cl. 428—36.1 3 Claims



1. A cook pot formed from a sheet having a thickness of 20–250 μm and comprising a fibrous web formed of a flame retardative polyimide or aromatic polyamide and a continuous water-impermeable surface layer of said polyimide or polyamide having a thickness of at least 3 μm and integrally formed on at least the side of said web forming the interior surface of said cook pot, said continuous water-impermeable layer formed by calendering said web at a temperature and under a pressure sufficient to fuse said surface of said web, said cook pot having a bottom wall and a side wall extending upwardly about the periphery of said bottom wall.

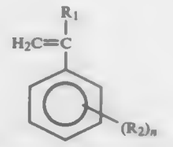
4,990,385
EXCHANGEABLE TRIMMING FOR A JACKET COLLAR
Herbert Haar, Mensinge 36, 1083 HC Amsterdam, Netherlands
Filed Nov. 3, 1988, Ser. No. 266,910
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1987, 8715179
Int. Cl.[5] A61F *13/02*
U.S. Cl. 428—40 5 Claims



1. A jacket collar in combination with an exchangeable trimming, wherein the trimming has an underside with adhesive surfaces.

4,990,385
OPTICAL DISK SUBSTRATE
Junichiro Washiyama; Motoyuki Hirata; Tetsuo Yazuda, and Shigenobu Ishihara, all of Kanagawa, Japan, assignors to Showa Denko Kabushiki Kaishi, Tokyo, Japan
Filed Apr. 7, 1989, Ser. No. 334,492
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 10 Claims

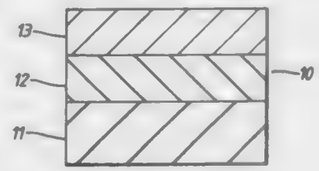
1. An optical disk substrate molded from a terpolymer composed of (A) an aromatic vinyl monomer represented by formula (I)



(I)

wherein R_1 represents a hydrogen atom or a hydrocarbon group having one or two carbon atoms, R_2 represents a straight-chain, branched-chain or cyclic hydrocarbon group having not more than 8 carbon atoms, and n is 0 or an integer of 1 to 5, (B) cyclohexylmaleimide, and (C) at least one compound selected from the group consisting of (meth)acrylontrile, isobornyl (meth)acrylate and cyclohexyl (meth)acrylate, with the cyclohexylmaleimide (B) being present in an amount of from 5 to 60 wt% of said terpolymer and with the at least one compound (C) being present in an amount of from 5 to 80 wt% of said terpolymer.

4,990,387
OPTICAL MEMORY
Hideki Ohkawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 30, 1989, Ser. No. 303,612
Claims priority, application Japan, Jan. 30, 1988, 63-20312
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 12 Claims



1. An optical memory comprising:
a substrate containing an organic resin;
an under-layer containing carbon and fluorine supported on the substrate and having a thickness of about 20 to 1,000 Angstroms; and
a recording layer containing carbon and at least one of a metal and a semiconductor element supported on the under-layer, the recording layer having a thickness of about 2,000 Angstroms or less.

4,990,[illegible]

OPTICAL INFORMATION RECORDING MEDIUM

Emiko Hamada; Yuji Arai; Yuaki Shin, and Takashi Ishiguro, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

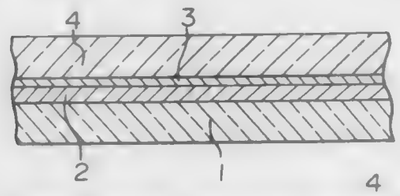
Filed Apr. 14, 1989, Ser. No. 340,082

Claims priority, application Japan, Jul. 30, 1988, 63-191716; Aug. 26, 1988, 63-213386; Sep. 16, 1988, 63-231820; Sep. 24, 1988, 63-239165; Oct. 26, 1988, 63-270409; Jan. 14, 1989, 1-7511; Jan. 14, 1989, 1-7512

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 11 Claims



1. An optical information recording medium comprising:
a light transmitting substrate;
a light absorptive layer overlaying the substrate to absorb a laser beam; and
a light reflective layer overlaying the light absorptive layer,
wherein said substrate has a surface layer, adjacent to the light absorptive layer, which is deformable by energy generated upon absorption of the laser beam by the light absorptive layer, to form optically readable pits.

4,990,389

DISK FOR MAGNETIC RECORDING

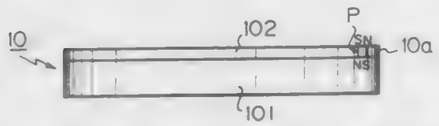
Kensaburou Iijima, and Kazuyuki Asano, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation of Ser. No. 81,661, Aug. 4, 1987, abandoned, which is a continuation of Ser. No. 786,651, Oct. 11, 1985, abandoned. This application Jul. 5, 1988, Ser. No. 215,209

Claims priority, application Japan, Oct. 12, 1984, 59-213833; Oct. 12, 1984, 59-213834

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—64 4 Claims



1. An improved disk for magnetic recording, comprising:
a support substrate; and
at least one magnetic wafer, thinner than said substrate, bonded to at least one face of said substrate and made of Fe-Cr-Co magnetic material, said Fe-Cr-Co magnetic material containing 15 to 45 % by weight of Cr, 10 to 15% by weight of Co and Fe substantially in balance;
wherein said support substrate consists essentially of a high magnetic permeability material, said support substrate being of sufficient thickness to mechanically support said magnetic wafer by itself, the thickness of said substrate being in a range from 0.5 to 10 mm.

4,990,390

FIBER GRID REINFORCEMENT

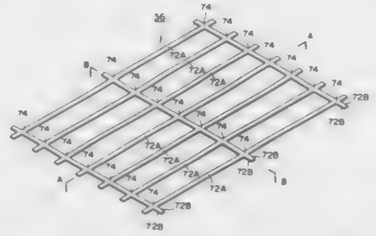
Hirotaka Kawasaki; Takanori Hirai; Takuro Odawara; Kimitoshi Ryokai; Osamu Furukawa; Masayoshi Sato; Teruyuki Nakatsuji; Minoru Sugita, all of Tokyo, and Kenichi Sekine, Sagamihara, all of Japan, assignors to Shimizu Construction Co., Ltd., Tokyo and Dainihon Glass Industry Co., Ltd., Sagamihara, both of, Japan

Filed Dec. 12, 1989, Ser. No. 448,950

Claims priority, application Japan, Dec. 15, 1988, 63-317081; Jul. 21, 1989, 1-189737; Aug. 9, 1989, 1-206122

Int. Cl.[5] B32B *5/12*

U.S. Cl. 428—113 6 Claims



1. A fiber grid reinforcement of a flat shape, the fiber grid reinforcement having first and second directions perpendicular to each other, the fiber grid reinforcement comprising:
(a) a plurality of first fiber bundles generally disposed along the first direction and generally parallel to one another, each of the first fiber bundles including at least one first group of fibers;
(b) a plurality of second fiber bundles generally disposed along the second direction and generally parallel to one another, each of the second fiber bundles including at least one second group of fibers, the second fiber bundles intersecting perpendicular to the first fiber bundles at intersecting sections so as to form a grid structure, the first group and the second group of fibers being layered alternately at the intersecting sections in such a manner that at least one outermost layer is the second group; and
(c) a resin material bonding fibers in each group, and bonding the groups to one another, each of the first group having a plurality of fibers, the fibers being generally arranged along the first direction, each of the second group having a plurality of fibers, the fibers being generally arranged along the second direction, each of the second fiber bundles including a greater number of fibers than each of the first fiber bundles whereby the fiber grid reinforcement having a greater flexibility in the first direction than in the second direction.

4,990,391

RETICULATED CORE TO PERFORATE SHEET BONDING AND GALVANIC BARRIER

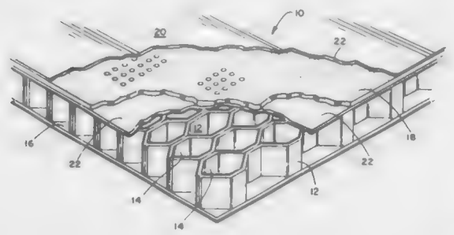
Ross E. Veta, Carlsbad, and Ernest C. Millard, Redlands, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Feb. 3, 1989, Ser. No. 305,515

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—116 10 Claims

1. A method for producing acoustical honeycomb sandwich laminate panel for use as supporting structure for an aircraft for sound suppression wherein said acoustic honeycomb sandwich laminate panel is exposed to the element and engine sounds comprising the steps of:
providing a honeycomb core having a plurality of open cells defined by edgewise directed walls positioned transverse to the surface of said panel;
providing a thin sheet of perforated facing material for bonding to one the faying edge surface of said honeycomb core;
providing a thin layer of porous material for bonding to the other surface of said thin sheet of perforated material;
positioning said thin sheet of perforated material between said honeycomb core and said thin layer of porous material;
bonding together said honeycomb, perforated facing material, thin layer of porous material comprising the steps of,
positioning a thin sheet of a reticulative adhesive material between said honeycomb core and said perforated sheet



heating said thin sheet of reticulative adhesive to a molten state,
passing air through said cells, perforated sheet and pores of said thin layer of porous material thereby causing the reticulative material to be attracted to the solid areas of said perforated sheet clearing the perforations of said reticulative material;
providing a thin sheet of imperforate material; and
bonding said thin sheet of imperforate material to the other faying edge of said honeycomb material.

4,990,392

THERMO-ADHESIVE TEXTILE PRODUCT COMPRISING A MICRO-ENCAPSULATED CROSS LINKING AGENT

Pierre Groshens, Peronne, and Christian Paire, Roisel, both of France, assignors to Lainiere de Picardie, S.A., Peronne, France

Continuation of Ser. No. 292,228, Jan. 6, 1989, abandoned. This application Jul. 6, 1990, Ser. No. 549,646

Claims priority, application France, Jan. 8, 1988, 88 00143

Int. Cl.[5] A41D *27/00, 27/06;* B32B *3/10, 7/14*

U.S. Cl. 428—196 9 Claims

1. A textile fabric-bondable, thermo-adhesive product comprising a backing fabric and an adhesive layer made up of dot patterns deposited on its surface, the adhesive layer comprising a thermo-plastic polymer and a cross linking agent for its thermoplastic polymer wherein the cross linking agent is isolated from the thermoplastic polymer by heat- or pressure-releasable micro-encapsulation.

4,990,393

PRINTED CIRCUIT BOARD

Norihiko Shibano, and Yasuyuki Yamada, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

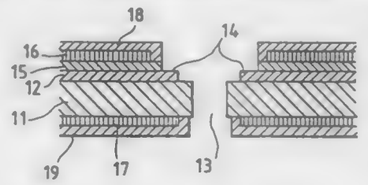
Filed Jul. 20, 1989, Ser. No. 382,928

Claims priority, application Japan, Dec. 23, 1988, 63-165831[U]

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—209 4 Claims

1. In printed circuit board of the type having a substrate, an electrically conductive printed circuit at least on the top surface of said substrate, a plurality of holes in said board and lands of said printed circuit for soldering circuit elements thereto; the improvement comprising, a conductive layer over-



lying said substrate and printed circuit, but not covering said land areas, and insulated from said printed circuit by insulation

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4,990,394

METHOD AND MATERIALS FOR DENTAL STRUCTURES

Itzhak Shoher, 50 Shlomo-Hamelech St., Tel-Aviv, Israel (64386), and Aharon E. Whiteman, 13 J.L. Perez St., Petach-Tikvah, Israel 49206

Continuation-in-part of Ser. No. 176,084, Apr. 1, 1988, abandoned, which is a division of Ser. No. 937,001, Dec. 2, 1986, Pat. No. 4,742,861. This application May 8, 1989, Ser. No. 348,942

Int. Cl.[5] B32B *7/02, 5/18;* A61C *8/00*

U.S. Cl. 428—212 8 Claims

1. A dental material for forming, repairing or reinforcing a dental restoration comprising a composition of metal particles subjected to heat treatment at a preselected temperature level for carrying out the function of forming, repairing or reinforcing a dental restoration, said composition, including metal particles of a first high fusing temperature metal component having a melting point above the selected heat treatment temperature and metal particles of a second low fusing temperature metal component which substantially melts during said heat treatment, and being smaller in size than the high fusing metal particles, such that upon said heat treatment, a porous sponge structure is formed having a total void volume of between 20–80% with the concentration of the low fusing metal component in the porous sponge being substantially equal or greater than the high fusing metal component in percent by volume such that said porous sponge structure may be readily reshaped by grinding, burnishing and/or pressing.

4,990,395

ELECTRICALLY CONDUCTIVE COPPER LAYERS AND PROCESS FOR PREPARING SAME

Jurgen Hupe, Langenfeld; Frank Sonnenschein, and Herbert Breidenbach, both of Solingen, all of Fed. Rep. of Germany, assignors to Blasberg Oberflachentechnik GmbH, Solingen, Fed. Rep. of Germany

Continuation of Ser. No. 22,207, Mar. 5, 1987, abandoned, which is a division of Ser. No. 806,679, Dec. 9, 1985, Pat. No. 4,750,976. This application May 16, 1988, Ser. No. 195,448

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446319; May 11, 1985, 3517009

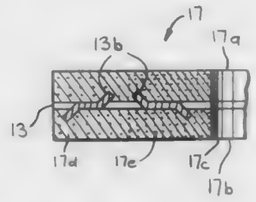
Int. Cl.[5] B32B *15/04, 15/20;* C25D *5/02*

U.S. Cl. 428—216 11 Claims

1. A conductor plate comprising an electrically conductive copper layer having two opposing surfaces, an insulator base plate on one of said surfaces, and a black metal coating that is acid-soluble and applicable in acidic medium on the other of said surfaces.

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4,990,396
GASKET HAVING MULTIPLE REGIONS OF DIFFERENT DENSITIES AND THICKNESSES
Jerome G. Belter, Mt. Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio
Division of Ser. No. 875,621, Jun. 18, 1986, Pat. No. 4,810,454.
This application Feb. 24, 1989, Ser. No. 314,915
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—218 3 Claims

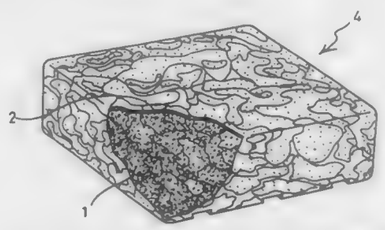


1. A gasket having a uniform thickness portion and multiple regions of different densities within the uniform thickness portion comprising:
a first lamina of a gasket material;
a second lamina of a gasket material, said second lamina being disposed in partial overlapping relationship with said first lamina;
a perforated core having a plurality of prongs formed thereon, said prongs extending from a first side of said core into said first and second laminae so as to form a unitary gasket having a uniform thickness portion, said uniform thickness portion including a first density region defined by that portion of the first lamina which is overlapped by the second lamina and a second density region defined by that portion of the first lamina which is not overlapped by the second lamina.

4,990,397
UNSATURATED POLYESTER RESIN COMPOSITIONS AND ELECTRICAL LAMINATES MADE THEREFROM
Hidenari Tsunemi, Otsu; Yasuo Fushiki, Takatsuki; Asaichi Nishimura, and Yousuke Kawai, both of Otsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 296,159, Jan. 12, 1989, Pat. No. 4,943,474.
This application May 3, 1990, Ser. No. 520,498
Int. Cl.[5] C08L 67/06
U.S. Cl. 428—246 14 Claims

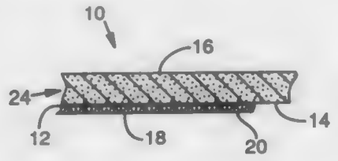
1. An unsaturated polyester resin composition comprising (a) a mixture of a hard unsaturated polyester and a soft unsaturated polyester, said soft polyester containing a polyoxyalkylene segment having a molecular weight from 600 to 6000 in the backbone thereof, said hard polyester being free from said polyoxyalkylene segment, (b) a crosslinking monomer, and (c) a polyoxyalkylene polyol having an average molecular weight from 2000 to 8000 and about 20 to 70 mole % of whose hydroxy groups are esterified with a polymerizable unsaturated carboxylic acid.

4,990,398
SKIN-SURFACED FOAM GLASS TILE AND METHOD FOR PRODUCTION THEREOF
Katsuhisa Fukumoto, Tokoname; Kiyotaka Kawanishi, Nagoya; Ryo Nakada, Tsuchiura, and Junpei Yamano, Nagoya, all of Japan, assignors to Inax Corporation, Japan
Filed Aug. 23, 1988, Ser. No. 235,372
Claims priority, application Japan, Aug. 26, 1987, 62-212457; Aug. 27, 1987, 62-213673; Aug. 27, 1987, 62-213674
Int. Cl.[5] B32B 3/26
U.S. Cl. 428—312.2 11 Claims



1. A method for producing a thermally insulating foam glass tile having a surface skin comprising the steps of:
molding a mixture consisting essentially of a first vitrifiable mineral and an effective amount of a first foaming agent into a tile-like block,
forming a coated block by coating at least a top surface of said tile-like block with a layer of a vitrifying agent for said vitrifiable mineral,
heating said coated block to a first temperature to melt said vitrifying agent, thereby permeating substantially all of said molten vitrifying agent into at least said top surface of said coated block to form a softened secondary layer consisting of said vitrifying agent and said vitrifiable mineral,
heating said coated block to a second temperature to soften said vitrifiable mineral and decompose said foaming agent to form a foamed tile-like block, and
cooling said foamed tile-like block, whereby the permeated molten vitrifying agent is integrally melt-bonded to at least said top surface of said coated block to form a rigid reinforcing skin layer consisting essentially of a vitrified mixture of said vitrifying agent and said vitrifiable mineral.

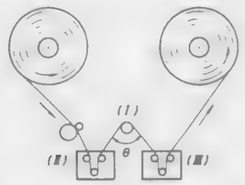
4,990,399
CARPET CUSHION WITH ADHESIVE
Merle R. Hoopengardner, Lafayette, Calif., assignor to Step Loc Corporation, Lafayette, Calif.
Continuation-in-part of Ser. No. 243,606, Sep. 13, 1988, which is a continuation-in-part of Ser. No. 147,214, Jan. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 882,173, Jul. 7, 1986, Pat. No. 4,797,170. This application Dec. 27, 1989, Ser. No. 457,961
Int. Cl.[5] B32B 7/12; D04H 11/00
U.S. Cl. 428—317.3 10 Claims



1. A carpet cushion for use in securing a wall-to-wall carpet to a floor with the cushion between the carpet and the floor, comprising,

a carpet cushion of compressible material suitable for cushioning a wall-to-wall carpet, and being of such thickness, density and compressibility as to serve as a wall-to-wall carpet cushion,
the carpet cushion having preapplied to only one side, a pressure sensitive adhesive of suitable tackiness to securely bond the carpet cushion to a floor after being pressed against the floor, in such a way as to hold the cushion against the floor substantially permanently,
the carpet cushion further having applied against the adhesive a spacer means distributed substantially evenly over the adhesive, for partially holding the adhesive coated surface of the carpet cushion away from a surface unless and until the carpet cushion is deliberately pressed into tight engagement with the surface, the spacer means having one side engaged with the adhesive and having an outer side substantially free of adhesive, and
the carpet cushion being stored in rolled form, without any release sheet between the adhesive coated surface and the opposed, uncoated carpet cushion surface in contact with the spacer means.

4,990,400
POLYESTER FILMS, MAGNETIC RECORDING MEDIA AND FILM CAPACITORS PRODUCED THEREFROM
Kazuo Endo; Nobuyasu Shudo, both of Yokohama; Chikakazu Kawaguchi, Atsugi; Yoshio Meguro, Machida; Masahiko Fujimoto, Yokohama; Toshifumi Takisawa, Tokyo; Masashi Inagaki, Machida; Kenji Kato, Yokohama; Shigeo Utsumi, Yokohama; Kichinojo Tomitaka, Yokohama; Shigeyuki Watanabe, Kawasaki, and Kazuyuki Akatsu, Yokohama, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan
Filed Oct. 12, 1989, Ser. No. 420,740
Claims priority, application Japan, Feb. 12, 1987, 62-30393; Apr. 3, 1987, 62-82481; May 22, 1987, 62-125056; Jun. 11, 1987, 62-145752; Jun. 12, 1987, 62-146302; Jun. 18, 1987, 62-152222; Jun. 18, 1987, 62-152223; Jun. 19, 1987, 62-152570; Jun. 22, 1987, 62-155174; Jun. 23, 1987, 62-156214
Int. Cl.[5] G11B 23/00
U.S. Cl. 428—331 23 Claims



1. A biaxially stretched polyester film which contains 0.001 to 5% by weight of fine spherical silica particles obtained by subjecting alkoxysilane to hydrolysis reaction and condensation reaction, said fine spherical silica particles being amorphous and having an average diameter of 0.01 to 3.0 μm, the diameter dispersion index of said fine spherical silica particles represented by the following formula (1) being in the range of 1.1 to 2.7:

$$\frac{d_{10}}{d_{90}} \quad (1)$$

wherein d_{10} is the diameter of the fine spherical silica particle when the cumulative number thereof is 10% of the total number of said particles, d_{90} is the diameter of the fine spherical silica particle when the cumulative number thereof is 90% of the total number of said particles, and d_{10} and d_{90} are measured under an electron microscope, said cumulative numbers being calculated beginning with the largest particle size, wherein said fine spherical silica particles have a specific surface area ratio (R) defined by the following formula (3) of 5.0 or above:

$$R = \frac{\text{specific surface area determined by } BET \text{ method}}{\text{specific surface area calculated based on equivalent spheres}} \quad (3)$$

and wherein the refractive index is thicknesswise direction is at least 1.492.

4,990,401
BIAXIALLY-ORIENTED POLYESTER FILM HAVING A DUAL-SIDED APPEARANCE AND METHOD FOR MAKING SAME
Brenda L. Renalls, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 6, 1989, Ser. No. 294,414
Int. Cl.[5] B32B 27/36, 5/16
U.S. Cl. 428—403 7 Claims

1. A biaxially-oriented monolayer film of polyester containing discrete, substantially uniformly distributed polymeric particles having an average diameter of about 5 to about 100 micrometers and comprising about 5 to about 30 percent by volume of the polyester film to provide a matte finish, and comprising between about 60 and about 96 weight percent of polyester, between about 3.0 and about 40 weight percent of particle forming polymer, and between about 0.2 and about 4.0 weight percent of carbon black pigment, wherein a first side of the film has a matte finish and a Hunter Colormetric L Factor of between about 52 and about 67, and a second side of the film has a Hunter Colormetric Color L Factor of between about 38 and about 53, the Delta L between said first side and said second side being at least about 5.

4,990,402
PROCESS FOR THE MANUFACTURE OF A SOLDERED JOINT
Gunther Kneringer, Reutte; Nikolaus Reheis, Jerzens, and Walter Thalman, Breitenwang, all of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.
Filed Jul. 31, 1989, Ser. No. 387,708
Claims priority, application Austria, Aug. 1, 1988, 1937/88
Int. Cl.[5] B32B 15/14
U.S. Cl. 428—408 11 Claims

1. A soldered product comprised of:
(a) a pyrolytic graphite part;
(b) a first solder film positioned on said pyrolytic graphite part;
(c) a carbon-fiber-reinforced graphite part positioned on top of said first solder film;
(d) a second solder film positioned on said carbon fiber-reinforced graphite part; and
(e) a metal part positioned on top of said second solder film.

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4,990,403

DIAMOND COATED SINTERED BODY

Toshimichi Ito, Tokyo, Japan, assignor to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Jan. 2, 1990, Ser. No. 459,626
Claims priority, application Japan, Jan. 20, 1989, 1-11572
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—408 10 Claims

1. A diamond coated sintered body comprising:
(1) a sintered body prepared from a mixture consisting essentiaily of (A) tungsten carbide and (B) at least one compound selected from the group consisting of carbides and nitrides of silicon or boron; and
(2) a diamond film formed on the surface of said sintered body by a gas synthesis method.

4,990,404

PROCESS FOR DESTRUCTION OF TOXIC ORGANIC CHEMICALS AND THE RESULTANT INERT POLYMER BY-PRODUCT

Harold W. Adams, Monroe, Conn., assignor to Sultech, Inc., Pittsburgh, Pa.

Division of Ser. No. 6,846,916, Apr. 1, 1986, Pat. No. 4,921,936, Continuation-in-part of Ser. No. 6,644,545, Aug. 27, 1984, Pat. No. 4,581,442. This application Oct. 2, 1989, Ser. No. 415,656
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—411.1 17 Claims

1. An article formed with an adherent coating of a chemically inert solid composition of matter which is formed on a substrate by laying an initial coating of a carbonaceous chemical on the surface of said substrate, and subsequently exposing said coated substrate to sulfur vapor at a temperature above the vaporization temperature of sulfur in the range of 500 degrees C. to 1500 degrees C. in a substantially oxygen-free reactor chamber thereby converting the initial coating of said carbonaceous chemical into an adherent coating of said chemically inert solid composition of matter on said article, said chemically inert solid composition of matter being largely composed of carbon and sulfur.

4,990,405

MULTI-PLY COMPOSITES AND SHEETS OF EPOXY AND FLOCCED 2:1 LAYERED SILICATES

Walter J. Bohrn; Shelly N. Garman, and Thomas M. Tymon, all of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 143,945, Jan. 14, 1988, Pat. No. 4,851,021, which is a continuation-in-part of Ser. No. 15,756, Feb. 17, 1987, Pat. No. 4,877,484, which is a continuation-in-part of Ser. No. 715,973, Mar. 25, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 339,410
Int. Cl.[5] B32B *27/38;* C08L *63/00*
U.S. Cl. 428—413 27 Claims

1. A sheet comprising a film of a silicate floc and an epoxy, said film being a flocculated codispersion of the epoxy and a 2:1 layered silicate which is selected from the group consisting of mica and vermiculite, the film also having a coating that also contains an epoxy.

4,990,406

SURFACE COATING BASED ON FLUORO TERPOLYMERS AND ACRYLIC RESINS AND RESULTANT PRODUCTS

Patrick Kappler, 20, Allée Simon Saint-Jean, 69130 Ecully, and Jean-Luc Perillon, 18 Lot Bois Taillefer, 27300 Bernay, both of France

Filed Sep. 25, 1989, Ser. No. 411,717
Claims priority, application France, Sep. 29, 1988, 88 12754
Int. Cl.[5] C08L *27/16, 33/04, 27/28, 27/30*
U.S. Cl. 428—422 10 Claims

1. A composition for lining or coating surfaces, comprising at least one fluoro terpolymer and at least one acrylic resin, said at least one fluoro terpolymer consisting essentially of, on a molar basis of:
(a) 70 to 85% of units derived from vinylidene fluoride,
(b) 10 to 25% of units derived from tetrafluoroethylene, and
(c) 3 to 9% of units derived from chlorotrifluoroethylene.

4,990,407

CEILING TILE COMPOSITE

Edward W. Watras, P.O. Drawer P, Deer Park, N.Y. 11729

Filed Jul. 6, 1989, Ser. No. 376,889
Int. Cl.[5] B32B *17/06, 19/04, 27/04*
U.S. Cl. 428—426 4 Claims



1. A ceiling tile composite, consisting of:
a. reflective means, said reflective means comprising a glass mirror,
b. shock and heat retardant means, said shock and heat retardant means comprising mineral fiber-board having at least one substantially planar fissured surface, and
c. bonding means, said bonding means comprising an adhesive layer directly bonding said reflective means to the fissured surface of said shock and heat retardant means, the adhesive of said adhesive layer being selected from the group consisting of latex-base and epoxy adhesives.

4,990,408

LOW REFLECTANCE, HIGHLY SATURATED COLORED COATING FOR MONOLITHIC GLAZING

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 25, 1987, Ser. No. 125,437
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—469 5 Claims

1. An article of manufacture for the reflectance of solar energy comprising:
a. a transparent substrate;
b. a transparent reflective metallic film deposited on a surface of the substrate;
c. a transparent tin/antimony oxide film of a thickness which exhibits color by interference effects deposited on said metallic film; and
d. a second reflective transparent metallic film deposited on said tin/antimony oxide film.

4,990,409

FLAME RETARDANT ELECTRICAL LAMINATE

Kazuyuki Tanaka; Etsuji Iwami, both of Hitachi; Akinori Hanawa, Shimotsuma, and Mitsuo Yokota, Yuki, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,355
Claims priority, application Japan, Aug. 20, 1987, 62-207230
Int. Cl.[5] B32B *27/10, 15/08*
U.S. Cl. 428—481 15 Claims

1. A flame retardant electrical laminate prepared by impregnating a base material with a halogen-containing unsaturated polyester resin which is prepared by dissolving a halogen-containing unsaturated polyester into a polymerizable monomer: and then curing the halogen-containing unsaturated polyester resin; wherein the halogen-containing unsaturated polyester has a molecular weight per 1 mole of unsaturated group of 350 to 1,000, and the cured halogen-containing unsaturated polyester resin has a glass transition temperature of 30° to 90° C.

4,990,410

COATED SURFACE REFINED SINTERED ALLOY

Takeshi Saitoh; Tuyoshi Saito; Mitsuo Ueki, all of Kawasaki; Hisashi Suzuki, Tokyo, and Keiichi Kobori, Kawasaki, all of Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan

Filed Mar. 7, 1989, Ser. No. 320,059
Claims priority, application Japan, May 13, 1988, 63-116351; Sep. 27, 1988, 63-241268
Int. Cl.[5] B22F *7/00*
U.S. Cl. 428—547 9 Claims

1. A surface refined sintered alloy with a burnt surface, comprising 75 to 95 % by weight of a hard phase containing Ti, C (carbon) and N (nitrogen) as the essential components and otherwise comprising at least one of Zr, Hf, V, Nb, Ta, Cr, Mo and W and the balance of the alloy comprising a binder phase composed mainly of Co and/or Ni and inevitable impurities, wherein said sintered alloy satisfies at least two conditions selected from the group consisting of the following (1) to (3):
(1) the average grain size of the hard phase in a surface layer to the inner portion of 0.05 mm from the burnt surface of said sintered alloy is 0.8 to 1.2-fold of the average grain size of the hard phase in the inner portion of the sintered alloy excluding said surface layer;
(2) the average content of the binder phase in the surface layer to the inner portion of 0.05 mm from the burnt surface of said sintered alloy is 0.7 to 1.2-fold of the average content of the binder phase in the inner portion of the sintered alloy; and
(3) the average hardness in the surface layer to the inner portion of 0.05 mm from the burnt surface of said sintered alloy is 0.95 to 1.10-fold of the average hardness in the inner portion of of the sintered alloy.

2. A coated surface refined sintered alloy, comprising the surface refined sintered alloy according to claim 1 and a rigid film having higher hardness than said surface refined sintered alloy covered on the surface of said surface refined sintered alloy.

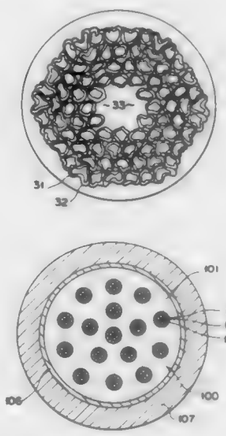
4,990,411

COMPOUND SUPERCONDUCTING WIRE AND METHOD OF MANUFACTURING THE SAME

Shigeo Nakayama, Yokohama; Hachio Shiraki, Kawasaki; Satoru Murase, Yokohama; Keizo Shimamura, Kawasaki, and Yoshiko Kohanawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 9, 1989, Ser. No. 363,720
Claims priority, application Japan, Jan. 9, 1988, 63-142616; Jan. 23, 1989, 1-13436
Int. Cl.[5] H01B *12/00;* H01L *39/24*
U.S. Cl. 428—614 26 Claims

1. A compound superconducting wire, comprising:
a superconducting member including a compound superconductor;
a stabilizing member made of mainly copper; and



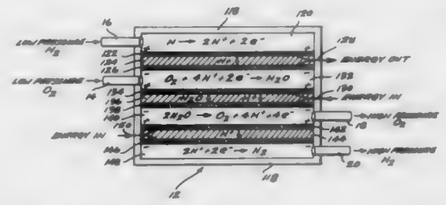
a diffusion-preventing layer for preventing diffusion of one or more elements of said compound superconductor into said stabilizing member, said layer consisting essentially of metal oxide and located between said superconducting member and said stabilizing member.

4,990,412

CRYOGENIC COOLING SYSTEM WITH PRECOOLING STAGE

Devin W. Hersey, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 256,206, Oct. 11, 1988, Pat. No. 4,829,785, which is a continuation of Ser. No. 128,945, Dec. 4, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 307,487
Int. Cl.[5] H01M *14/00*
U.S. Cl. 429—8 23 Claims



1. A compressor comprising:
(a) means for chemically combining a first and a second gas to form a liquid;
(b) means for increasing the pressure of the liquid; and
(c) means for dissociating the liquid into the first and the second gases at higher pressures than when they were chemically combined.

4,990,413

COMPOSITE SOLID ELECTROLYTES AND ELECTROCHEMICAL DEVICES EMPLOYING THE SAME

Mei-Tsu Lee, Los Angeles, Calif., and Denis Fauteux, Centerville, Ohio, assignors to MHB Joint Venture, Ohio

Filed Jan. 18, 1989, Ser. No. 298,169
Int. Cl.[5] H01M *6/16, 6/18*
U.S. Cl. 429—191 **23 Claims**

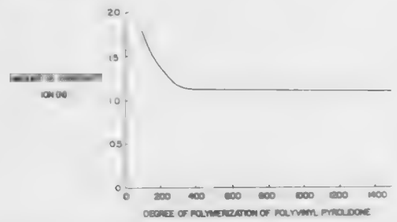
1. A composite solid electrolyte comprising a mixture of a solid ionically conductive powder and an ionically conductive polymeric material wherein said polymeric material provides a matrix for containing said solid ionically conductive powder.

4,990,414

CADMIUM NEGATIVE ELECTRODE FOR USE IN AN ALKALINE STORAGE CELL AND ITS MANUFACTURING METHOD

Kazuhiro Matsui, Tokyo; Akira Sugano, Sumoto; Ichirou Yoshida, Sumoto; Yukiharu Nishikawa, Sumoto; Toshiaki Shiojiri, Sumoto; Takahisa Awajitani, Sumoto; Shinsuke Nakahori, Sumoto, and Yuji Morioka, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 8, 1990, Ser. No. 476,927
Claims priority, application Japan, Feb. 9, 1989, 1-30398; Mar. 29, 1989, 1-80138; Jun. 13, 1989, 1-150931; Oct. 9, 1989, 1-263544
Int. Cl.[5] H01M *4/62, 4/26*
U.S. Cl. 429—217 **16 Claims**



1. A rechargeable alkaline storage cell comprising:
a negative electrode including a cadmium active material, said negative electrode including polyvinyl pyrolidone having a degree of polymerization of 350–1,000;
a positive electrode;
a separator interposed between said negative and positive electrodes; and
an alkaline electrolyte included in said separator.

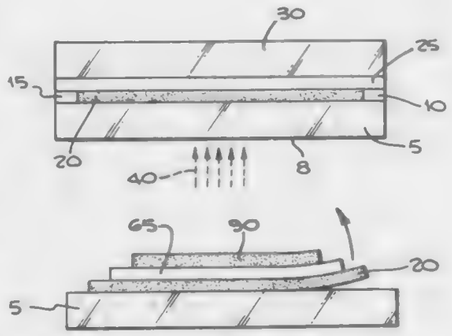
4,990,415

THIN FOIL HOLOGRAM

Kevin H. Yu, Temple City, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 1, 1988, Ser. No. 226,591
Int. Cl.[5] G03H *1/04*
U.S. Cl. 430—2 **7 Claims**

1. A process for producing a thin foil hologram comprising the steps of:
a. First applying a thin layer of an polyene-based urethane or epoxy acrylate to the surface of a substrate;
b. Second, applying a thin layer of a photo sensitive material on top of said thin layer of polyene-based urethane or epoxy acrylate; and
c. Third, processing said photo sensitive material so as to record thereon a holographic image wherein said processing includes the steps of exposing said photo sensitive material and thereafter wet processing of said material, and wherein said substrate, polyene-based urethane or epoxy acrylate, and photo sensitive material are pre-



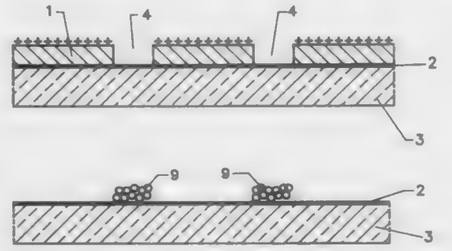
soaked in a solution of potassium iodide or sodium iodide between said exposure and said wet processing steps.

4,990,416

DEPOSITION OF CATHODOLUMINESCENT MATERIALS BY REVERSAL TONING

John B. Mooney, San Jose, Calif., assignor to Coloray Display Corporation, Fremont, Calif.

Filed Jun. 19, 1989, Ser. No. 368,268
Int. Cl.[5] G03F *7/28*
U.S. Cl. 430—26 **13 Claims**



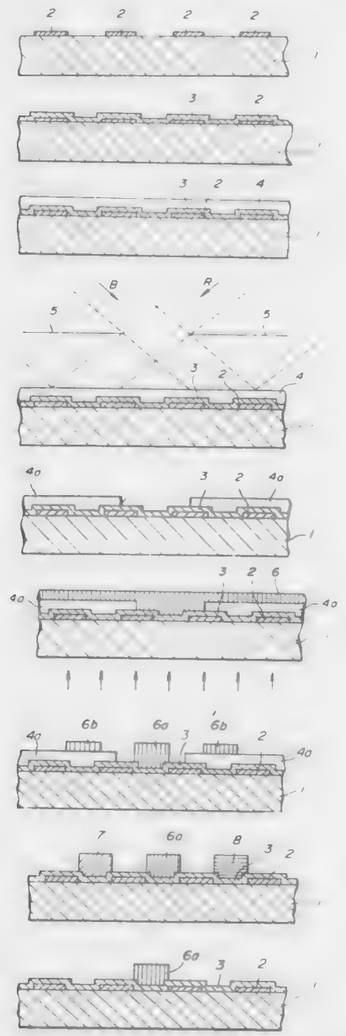
1. In a method depositing cathodoluminescent materials on a transparent substrate, the steps of:
(a) applying a transparent electrode layer over a transparent substrate;
(b) applying a photoresist layer over said transparent electrode layer;
(c) exposing said photoresist layer to radiation through a photomask;
(d) developing said photoresist layer to expose areas of said electrode layer in a desired pattern as defined by said photomask;
(e) charging the surface of said photoresist layer;
(f) charging phosphor containing particles in a toner with a charge of the same sign as the charge on said photoresist layer;
(g) depositing said particles in said desired pattern by exposing said photoresist layer to said charged particles in the presence of a counterelectrode.

4,990,417

METHOD OF MANUFACTURING A CATHODE RAY TUBE

Koki Inada, Chiba, and Norihiro Tateyama, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 158,655, Feb. 22, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,512
Claims priority, application Japan, Feb. 23, 1987, 62-39806; Feb. 24, 1987, 62-40903
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—28 **5 Claims**



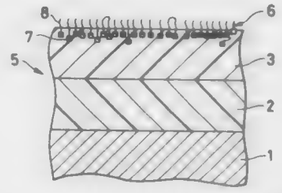
1. A method for forming a phosphor pattern on a panel of a color cathode ray tube which comprises:
forming a light absorptive layer in a predetermined pattern on the inner surface of said panel,
coating said inner surface with a protective layer covering the entire surface of said absorptive layer, with a photosensitive resin which is not dissolved in aqueous hydrogen peroxide after exposure to light, said photosensitive resin being selected from the group consisting polyvinylpyrrolidone-azide photosensitive resins, diazo photosensitive resins and polyvinyl alcohol-stilbazolium photosensitive resins,
forming a phosphor strip of a first color by:
(a) forming a resist layer on portions of said protective layer other than the portion to be occupied by said first color,
(b) coating said resist layer with a phosphor slurry containing a photosensitive agent and a phosphor of said first color, said agent being non-removable by an inverting agent which removes said resist layer,
(c) exposing the overall surface from the outer surface of said panel,
(d) developing the exposed slurry layer and
(e) removing the resist layer on said portions other than the portion occupied by said first color through the use of said inverting agent and repeating the steps of forming said phosphor strip for at least one additional color.

4,990,418

ELECTROPHOTOGRAPHIC PHOTORECEPTOR AND METHOD OF PRODUCING THE SAME

Akio Mukoh; Mitsuoshi Shoji; Shigeo Suzuki; Takayuki Nakakawaji; Yutaka Ito; Shigeki Komatsuzaki; Ryuichi Shimizu; Hiroyoshi Kokaku; Tsuneaki Kawanishi, and Atsushi Kakuta, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,047
Claims priority, application Japan, Jun. 7, 1988, 63-138356
Int. Cl.[5] G03G *15/00*
U.S. Cl. 430—56 **12 Claims**



1. An electrophotographic photoreceptor comprising:
a conductive substrate;
an organic photoconductive layer formed on said substrate and comprising a mixture of an organic photoconductive material and an organic polymer resin; and
an organic lubricant of a fluorine compound, a portion of the compound being embedded in a surface region of said organic photoconductive layer and the remainder portion of the compound being exposed from the surface of said photoconductive layer, wherein the exposed portion has lubricating characteristics, and said fluorine compound is expressed by the following general formula:

$$Rf—[R_1—(R_2)_m—(R_3—\bigcirc)_n—H]_l$$

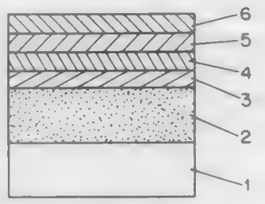
where Rf represents a fluorine-containing group having a skeleton composed of perfluoropolyoxyalkyl group or a perfluoropolyoxyalkylene group, R_1 represents a direct bond, —CH_2— group, —CO— group or —CONH— group, R_2 represents an oxyalkylene group having a carbon number of 2 or 3, R_3 represents a direct bond, —O— group, —COO— group, —CONH— group, —NHCO— group, —OC_pH_{2p} group (p being an integer of 1 or 2), or —$C(CH_3)_2$— group, R_3 being changeable in each repetition, m represents O or positive integer, n represents an integer of one or more and l represents an integer of 1 or

2, said lubricant having a group soluble in the organic polymer of the photoconductive layer.

4,990,419
FUNCTION SEPARATION TYPE ELECTROPHOTOGRAPHIC PHOTORECEPTOR COMPRISING ARSENIC, SELENIUM AND TELLURIUM

Seizou Kitagawa, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 368,238, Jun. 16, 1989, abandoned.
This application Mar. 22, 1990, Ser. No. 497,823
Claims priority, application Japan, Jun. 16, 1988, 63-148988
Int. Cl.[5] G03G 5/14
U.S. Cl. 430—58 3 Claims

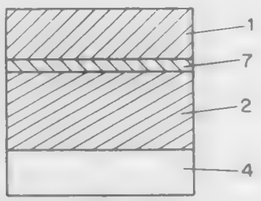


1. An electrophotographic photoreceptor comprising, in sequence:
(a) a conductive base;
(b) a carrier transport layer comprising As_2SE_3;
(c) a carrier generation layer comprising a tellurium-selenium alloy;
(d) a carrier injection regulating layer;
(e) a surface protective layer comprising As_2SE_3 and
(f) a transparent insulation layer.

4,990,420
ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH DOPED SE OR SE ALLOY INTERLAYER

Kazayuki Urabe, Nagano, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 4, 1989, Ser. No. 389,856
Claims priority, application Japan, Aug. 5, 1988, 63-195483; Aug. 5, 1988, 63-195491
Int. Cl.[5] G03G 5/47, 5/14
U.S. Cl. 430—58 8 Claims



1. An electrophotographic photoreceptor comprising an electroconductive substrate and a plurality of amorphous selenium-based layers laminated thereon, said plurality of layers comprising
a photosensitive carrier generation layer,
a carrier transport layer, and
a hole injection layer located between said carrier transport layer and said carrier generation layer, said hole injection layer having a thickness of 0.01 to 5 μm and comprising selenium or a selenium-based alloy, and from 10 atom-ppm to 5 atom % of an element chosen from the group consisting of gallium, indium, zinc, gold, silver, carbon, platinum, germanium, lead and antimony wherein when said alloy contains tellurium, the tellurium is present in an amount of up to 10 atom %.

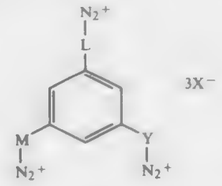
4,990,421
ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING A TRISAZO DYE

David R. Terrell, Lint; Marcel J. Monbaliu, Mortsel; Carina Geelen; Guy P. Verbeek, both of Leuven; Frans C. De Schrijver, Linden, and Mark G. Van der Auweraer, Leuven, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Jul. 14, 1989, Ser. No. 380,034
Claims priority, application European Pat. Off., Jul. 14, 1988, 88201507.6
Int. Cl.[5] G03G 5/047, 5/06
U.S. Cl. 430—58 11 Claims

1. An electrophotographic recording material comprising a conductive support and a photosensitive layer containing in a resin binder a photoconductive compound that has p-type charge generating capacity and is a trisazo compound which is the reaction product of the coupling reaction between a coupler compound that does not contain a carboxylic acid or sulphonic acid group and a diazonium salt represented by the following general formula (I):

(I)



wherein: each of L, M and Y (same or different) represents a phenylene group including a phenylene groups substituted with one or more substituents selected from the group consisting of lower alkyl (C_1—C_2), nitro, methoxy, ethoxy or halogen, or represents said phenylene group fused-on with the necessary atoms to close a saturated or unsaturated carbocyclic or heterocyclic ring or ring system including said ring or ring-system in substituted form, and X^- is an anion.

2. An electrophotographic recording material according to claim 1, wherein said electrically conductive support has thereon a charge generating layer in contiguous relationship with a charge transporting layer and said charge generating layer contains a trisazo compound as defined in claim 1.

4,990,422
SENSITIZATION OF METHINE DYES BY AGGREGATED PYRYLIUM DYES

William J. Staudenmayer, Pittsford, and Michael T. Regan, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1989, Ser. No. 429,910
Int. Cl.[5] G03G 15/02
U.S. Cl. 430—59 14 Claims

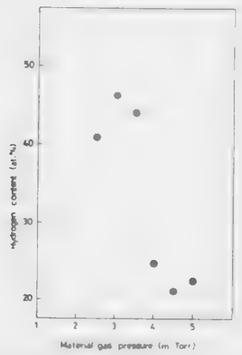


13. A reusable photoconductive element having sensitivity in the near infrared region comprising in combination successive layers of:
(a) a substrate;
(b) an electrically conductive layer;
(c) a charge barrier layer; and
(d) a photoconductive charge generation layer that comprises in combination a mixture of at least one methine dye, at least one aggregated pyrylium dye, at least one electron donor, and at least one polymeric binder.

4,990,423
PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY

Takashi Hayakawa, Nara; Shiro Narikawa, Kashihara, and Kunio Ohashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1989, Ser. No. 368,807
Claims priority, application Japan, Jun. 30, 1988, 63-164480
Int. Cl.[5] G03G 5/082
U.S. Cl. 430—85 22 Claims



1. A photosensitive member for electrophotography comprising a conductive substrate and a photoconductive layer, said photoconductive layer being an amorphous silicon germanium containing a member selected from the group consisting of hydrogen, halogen and mixtures thereof a greater than 40 atomoic %.

4,990,424
TONER AND DEVELOPER COMPOSITIONS WITH SEMICRYSTALLINE POLYOLEFIN RESIN BLENDS

John G. Van Dusen, Walworth; Timothy J. Fuller, West Henrietta, and Suresh K. Ahuja, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

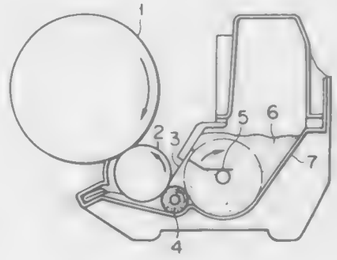
Filed Aug. 12, 1988, Ser. No. 231,428
Int. Cl.[5] G03G 9/083, 9/087
U.S. Cl. 430—106.6 56 Claims

54. A toner composition which comprises a blend of a semicrystalline polyolefin homopolymer with a melting point of from about 50° C. to about 100° C. and a second polymer component, and pigment, wherein the pigment is carbon black or magnetite.

4,990,425
TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

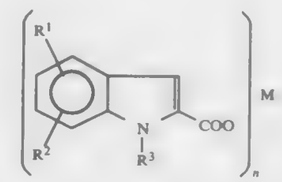
Toshiki Nanya, Mishima, and Kimitoshi Yamaguchi, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1989, Ser. No. 334,202
Claims priority, application Japan, Apr. 11, 1988, 63-88586; Oct. 28, 1988, 63-272015
Int. Cl.[5] G03G 13/22, 9/08
U.S. Cl. 430—110 12 Claims



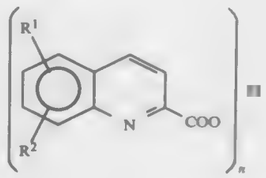
1. A dry-type toner comprising as the main components a resin component, a coloring agent and a negative charge controlling agent in an effective amount which is selected from the group consisting of:
(i) a metallic salt of indolecarboxylic acid having the formula (I):

(I)

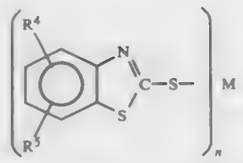


wherein R^1 and R^2, which may be the same or different, each represent hydrogen, a halogen, a nitro group, a carboxy ester group, a hydroxyl group, a sulfonamide group, a cyano group, an alkyl group having 1 to 8 carbon atoms, or an alkoxyl group having 1 to 8 carbon atoms; R^3 represents hydrogen or an alkyl group having 1 to 8 carbon atoms; M represents a metal element selected from the group consisting of Zn, Co, Ni, Fe, Cr, Al and Te; and n is a number equivalent to the valence number of the metal represented by M;
(ii) a metallic salt of quinolinecarboxylic acid having the formula (II):

(II)



wherein R^1, R^2, M and n are respectively the same as previously defined in formula (I); and
(iii) a metallic salt of benzothiazole derivatives having the formula (III):



wherein R^4 and R^5, which may be the same or different, each represent hydrogen, an alkyl group having 1 to 10 carbon atoms, an amino group having 1 to 10 carbon atoms or an alkylamino group having 1 to 10 carbon atoms; M represents a metal element selected from the group consisting of Zn, Co, Ni, Fe and Te; and n is a number equivalent to the valence number of the metal represented by M.

4,990,426

DI- AND TRICATIONIC NEGATIVE CHARGE CONTROL AGENTS FOR ELECTROPHOTOGRAPHIC DEVELOPERS

Arthur F. Diaz, San Jose; Adolfo R. Gutierrez, Gilroy, and Dennis R. McKean, Cupertino, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1990, Ser. No. 463,564
Int. Cl.[5] G03G 9/08
U.S. Cl. 430—110 17 Claims

1. A negatively charged toner composition comprising resin particles and a charge-control agent, in which said charge-control agent is a salt of a diammonium or triammonium cation and an anion selected from the group consisting of large metal complex anions and aromatic anions.

4,990,427

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Toshitaro Kohri, Higashiosaka; Hitoshi Kato, Itami; Kunio Takahashi, Itami, and Junji Machida, Itami, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 598,454, Apr. 9, 1984, abandoned. This application Jun. 21, 1985, Ser. No. 747,377
Claims priority, application Japan, Apr. 8, 1983, 58-62459; Apr. 9, 1983, 58-62573
Int. Cl.[5] G03G 9/08
U.S. Cl. 430—110 4 Claims

1. In a toner for developing electrostatic latent images in an image forming machine by thermal fixation when a toner carrying substrate is passed between a pair of heated rollers, which toner comprises a high viscosity thermoplastic resin capable of forming an image by thermal fixation selected from the group consisting of styrene-acrylic copolymer resins, polyester resins, methacrylic resins and derivatives thereof and a black coloring material as main components, the improvement wherein said black coloring material consisting essentially of cupric oxide of 0.5–10μ average diameter in amounts of 1–30 weight parts relative to 100 weight parts of said thermoplastic resin, and carbon black being present in a weight ratio of 1/15–1 relative to said cupric oxide.

4,990,428

PHOTOSENSITIVE PLANOGRAPHIC PRINTING PLATE

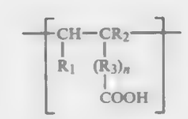
Shigeki Shimizu, Atsugi, and Hiroshi Ide, Sagamihara, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 275,602, Nov. 23, 1988, abandoned, which is a continuation of Ser. No. 39,784, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 784,097, Oct. 4, 1985, abandoned. This application Mar. 12, 1990, Ser. No. 492,255
Claims priority, application Japan, Oct. 23, 1984, 59-222811
Int. Cl.[5] G03C 1/492
U.S. Cl. 430—276 3 Claims

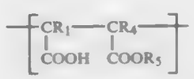
1. A photosensitive planographic printing plate, comprising:

(A) an aluminum or aluminum alloy plate having an anodic oxidation layer 4 to 40 mg/dm^2 in dry thickness which has pores of a size of from 350 to 1000Å in average diameter in an amount of less than 350 pores/μ^2, said layer being obtained by anodic oxidation in an electrolyte of phosphoric acid or in an electrolyte containing not less than 10 wt.% phosphoric acid; and

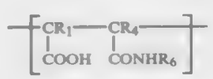
(B) a layer of a photopolymerizable photosensitive composition overlaid on the aluminum or aluminum alloy plate and comprised of 1) 20 to 60% by weight of a polymer having a molecular weight ranging from 1,000 to 100,000 and having pendant residues consisting of carboxylic acid residues or carboxylic acid anhydride residue constituted by units represented by the following formulae I to IV



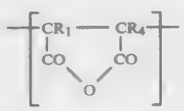
I



II



III



IV

wherein R_1 and R_4 are hydrogen or alkyl, R_2 is hydrogen, methyl, alkylcarbamoyl, or arylcarbamoyl, R_3 is alkylene of 1 to 7 carbon atoms, optionally substituted with phenylene or hydroxyl, R_5 is hydrogen or optionally substituted alkyl, aryl or cycloalkyl, R_6 is optionally substituted alkyl, aryl, or cycloalkyl and n is an integer of 0 to 1, 2) 80 to 40% by weight of an additional polymerizable unsaturated compound and 3) 1 to 10% by weight of a photopolymerization initiator.

4,990,429

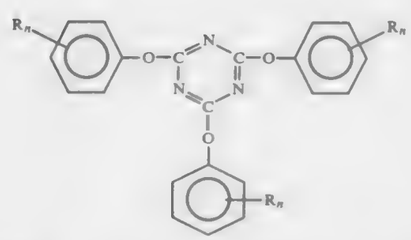
PROCESS FOR THE PRODUCTION OF NEGATIVE RELIEF COPIES UTILIZING REVERSAL PROCESSING

Paul Stahlhofen, and Hans W. Frass, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 224,725, Jul. 27, 1988, Pat. No. 4,889,788. This application Oct. 18, 1989, Ser. No. 423,251
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725949
Int. Cl.[5] G03F 7/40, 7/022
U.S. Cl. 430—325 13 Claims

1. A process for the production of negative relief copies, comprising, in order, the steps of:

providing a copying material comprising a support with a layer of a photosensitive composition comprising, in admixture, a polymeric binder which is insoluble in water and soluble in aqueous-alkaline solutions present in an amount sufficient to form a uniform film; a photosensitive 1,2-quinonediazide or a photosensitive mixture comprising a compound which splits off acid upon exposure to light and a compound containing at least one acid-cleavable C-O-C group; and a symmetric triazine-alkyl(aryl)ether as a thermal-hardening substance comprising a compound of the general formula I



wherein

R denotes alkyl, allyl, alkoxy, alkoxycarbonyl, alkoxycarbonyl, alkenyl, each having 1 to 4 carbon atoms in the alkyl or alkenyl group, aryloxy, halogen or a nitro group and n is 1 to 3 and

where in the photosensitive compound or mixture is present in an amount sufficient to render exposed areas soluble in developer and the thermal-hardening substance is present in an amount sufficient to cause hardening of exposed areas under the action of heat;

imagewise exposing the photosensitive layer of the copying material to light;

heating the exposed layer;

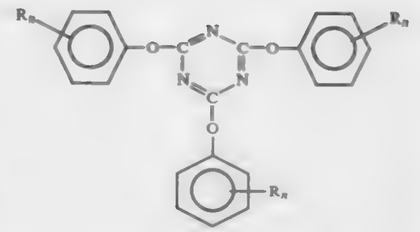
cooling the exposed layer;

overall exposing the layer to light; and

developing the layer with an aqueous-alkaline developer.

8. A process for the production of negative relief copies, comprising, in order, the steps of:

providing a copying material comprising a support with a layer of a photosensitive composition comprising, in admixture, a polymeric binder which is insoluble in water and soluble in aqueous-alkaline solutions present in an amount sufficient to form a uniform film; a photosensitive 1,2-quinonediazide or a photosensitive mixture comprising a compound which splits off acid upon exposure to light and a compound containing at least one acid-cleavable C-O-C group; and a symmetric triazine-alkyl(aryl)ether as a thermal-hardening substance comprising a compound of the general formula I



wherein R denotes alkyl, allyl, alkoxy, alkoxycarbonyl, alkoxycarbonyl, alkenyl, each having 1 to 4 carbon atoms in the alkyl or alkenyl group, aryloxy, halogen or a nitro group and n is 1 to 3, and

wherein the photosensitive compound or mixture is present in an amount sufficient to render exposed areas soluble in developer and the thermal-hardening substance is present in an amount sufficient to cause hardening of exposed areas under the action of heat;

imagewise exposing the photosensitive layer of the copying material to light;

heating the exposed layer;

cooling the exposed layer;

imagewise exposing the previously unexposed areas to light to produce additional exposed areas; and

developing the layer with an aqueous-alkaline developer.

4,990,430

PROCESS FOR RETOUCHING DYE IMAGES

John W. Harder, and Paul A. Burns, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.J.

Filed Dec. 19, 1989, Ser. No. 452,907
Int. Cl.[5] G03C 7/40, 7/32
U.S. Cl. 430—359 8 Claims

1. A method of retouching a dye image comprising selective removal of a portion of a dye image from an exposed and processed photographic silver halide element comprising a support bearing a dye image from a dye-forming coupler and a primary amine photographic color developing agent, wherein the dye-forming coupler: (a) contains no ionizable group that is retained as part of a dye formed upon oxidative coupling, (b) has a structure such that the Log P of the coupler is greater than 4 and is derived from a four-equivalent coupler that has a Log P less than 8, and (c) has a coupling reactivity that enables formation of maximum image density of at least 0.6; said method comprising the step of contacting the dye image with an aqueous acidic organic solvent solution of a inorganic or organic acid and a water miscible organic solvent for a time and at a temperature sufficient to selectively dissolve and remove a portion of the dye image from the photographic element.

4,990,431

METHODS OF FORMING STABLE DISPERSIONS OF PHOTOGRAPHIC MATERIALS

Pranab Bagchi, Webster; James T. Beck, and Lia A. Crede, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1989, Ser. No. 297,005
Int. Cl.[5] G03C 7/26, 7/32
U.S. Cl. 430—372 29 Claims

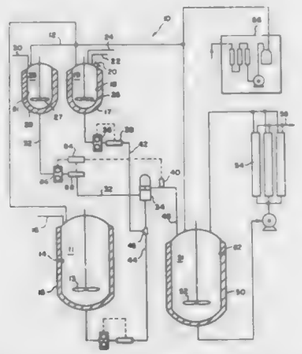
1. A method of preparing aqueous dispersions of a photographic material comprising

continuously providing a first solution comprising water and a surfactant,

continuously providing a second solution comprising a solvent, base, and photographic material,

continuously mixing said first and said second solutions, and

immediately neutralizing with an acid solution the mixed solutions to precipitate particles of said photographic



material as a fine particle colloidal dispersion of said photographic material.

4,990,432

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL HAVING A REFLECTIVE BASE AND AN ANTIHALATION LAYER HAVING A SPECIFIED THICKNESS

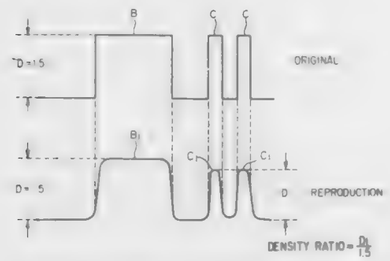
Hajime Komatsu, Koganei; Susumu Ohkawachi, Odawara; Yasuo Tosaka, Sagamihara; Bunzo Ueda, and Keiichi Hoshimo, both of Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 94,251, Sep. 4, 1987, abandoned. This application Nov. 24, 1989, Ser. No. 440,484

Claims priority, application Japan, Sep. 4, 1986, 61-208521; Sep. 4, 1986, 61-208524; Sep. 4, 1986, 61-208525

Int. Cl.[5] G03C *1/84, 7/00, 1/435*

U.S. Cl. 430—378 3 Claims



1. A method of forming a color photographic image comprising the steps of:

a. imagewise exposing to light a silver halide color photographic light-sensitive material comprising a light reflective support having a light transmission density of not more than 0.8, having thereon, a photographic component comprising, in order of proximity to said support, at least one antihalation layer having a thickness within the range of 1 to 3 μm, a silver halide emulsion layer containing a cyan coupler, a silver halide emulsion layer containing a magenta coupler, and a silver halide emulsion layer containing a yellow coupler;

b. developing said photographic material with a color developing solution; and

c. treating said photographic material with a solution having a fixing ability.

4,990,433

METAL-CONTAINING INDOANILINE COMPOUND AND OPTICAL RECORDING MEDIUM EMPLOYING THE COMPOUND

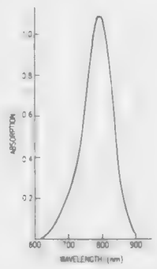
Katsuhira Yoshida, and Yuji Kubo, both of Kochi, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 100,264, Sep. 23, 1987, Pat. No. 4,873,332. This application Jul. 11, 1989, Ser. No. 378,041

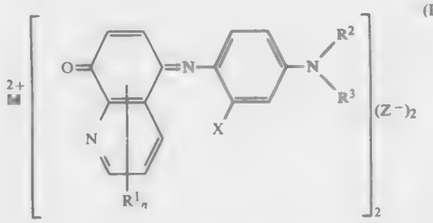
Claims priority, application Japan, Mar. 14, 1987, 62-59777

Int. Cl.[5] G03C *1/00*

U.S. Cl. 430—495 10 Claims



1. An optical recording medium comprising a substrate and a recording layer containing a dye formed on the substrate wherein the recording is effected by irradiation of a laser beam to occur a thermal deformation of the recording layer and the reproduction is done by reading a difference in the reflectance between the deformed portion and the undeformed portion, said dye being a metal-containing indoaniline compound having the formula:



wherein M is a metal atom selected from the group consisting of Ni, Cu or Co, R^1 is a hydrogen atom, a halogen atom or a methyl group, n is 1 or 2, X is a hydrogen atom or a lower alkyl group each of R^2 and R^3 is a lower alkyl group, and Z^- is an anion.

4,990,434

SUBBED POLYESTER FILM SUPPORT CARRYING CARBON BLACK ANTIHALATION LAYER

Etienne A. Van Thillo, Essen, and Jan J. Priem, Mortsel, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 26, 1989, Ser. No. 412,489

Claims priority, application European Pat. Off., Sep. 27, 1988, [redacted]

Int. Cl.[5] G03C *1/815*

U.S. Cl. 430—510 7 Claims

1. Photographic element comprising a dimensionally stable hydrophobic transparent biaxially stretched polyester film support, at least one light-sensitive silver halide emulsion layer, and at the side of said support opposite to that of said light-sensitive silver halide emulsion layer or layers, in the order given:

a layer of a water-soluble polymer binder essentially consisting of poly-N-vinyl pyrrolidone, and

an antihalation layer comprising carbon black dispersed in a water-insoluble alkali-soluble copolymer binder essentially consisting of a copolymer of 1 to 65% by weight of a C_1–C_4 alkyl methacrylate, 10 to 79% by weight of a C_1–C_8 alkyl acrylate, and 10 to 50% by weight of acrylic acid and/or methacrylic acid.

4,990,435

SILVER HALIDE PHOTOGRAPHIC ELEMENT, PHOTOGRAPHIC COATING COMPOSITION AND PROCESS TO PREPARE AN AQUEOUS DISPERSION OF A HYDROPHOBIC COMPOUND

Angelo Vallarino; Mauro Besio, and Lorenzo Vittore, all of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1986, Ser. No. 940,903

Claims priority, application Italy, Dec. 20, 1985, 23302 A/85

Int. Cl.[5] G03C *5/18*

U.S. Cl. 430—546 22 Claims

1. A silver halide photographic element comprising a base and, coated on the based, one or more hydrophilic colloidal layers at least one of which is a silver halide emulsion layer and at least one other of said hydrophilic colloidal layers containing photographically useful hydrophobic compounds loaded on loading polymer particles, characterized by the fact that said loading polymer for at least 70% of its weight comprises;

(a) repeating units derived from the polymerization of an ethylenic monomer containing a sulfonic or sulfonate group which monomer is capable of forming hydrophilic homopolymers, said units comprising from 0.5 to 1.5% by weight of said polymer,

(b) repeating units derived from the polymerization of an N-3-oxo-alkyl-substituted acrylamide, said units comprising from 5 to 25% by weight of said polymer, and

(c) repeating units derived from the polymerization of acrylic acid ester monomers having a TG lower than 0° C., said units comprising at least 43.5% by weight of said polymer, the remaining weight percentage, from zero to 30%, being formed by repeating units derived from inert monomers and/or cross-linking monomers.

4,990,436

CYAN DYE-FORMING COUPLERS AND PHOTOGRAPHIC RECORDING MATERIALS CONTAINING SAME

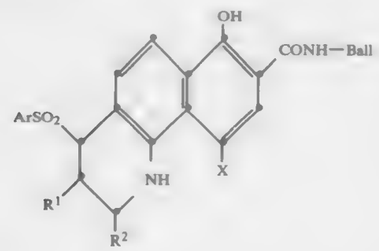
Philip T. S. Lau, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1990, Ser. No. 469,008

Int. Cl.[5] G03C *7/34*

U.S. Cl. 430—552 10 Claims

1. A photographic recording material comprising a support and a photosensitive silver halide emulsion which has associated therewith a cyan dye-forming coupler having the structural formula:



wherein:

Ar is an aryl group having from 6 to 10 carbon atoms which may be substituted;

R^1 and R^2, which may be the same or different, represent hydrogen or an alkyl group having from 1 to 20 carbon atoms;

Ball is an organic ballasting group capable of rendering the coupler compound non-diffusible during development in alkaline processing solution; and

X is hydrogen or a coupling-off group.

4,990,437

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshifumi Iijima, Kokubunji; Kenji Kumashiro; Syoji Matsuzaka, both of Hachioji, and Hiroshi Kashiwagi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 857,071, Apr. 29, 1986, abandoned. This application Jun. 20, 1989, Ser. No. 370,105

Claims priority, application Japan, Apr. 30, 1985, 60-92690

Int. Cl.[5] G03C *7/38, 1/005*

U.S. Cl. 430—558 33 Claims

1. A silver halide photographic light-sensitive material having at least one silver halide emulsion layer, said silver halide emulsion layer comprising a magenta coupler represented by formula I and negative type silver halide grains having a core-shell structure which consists of:

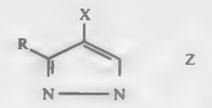
(a) an inner core consisting essentially of silver bromide or silver iodobromide; and

(b) a plurality of shells consisting essentially of silver bromide or silver iodobromide, wherein said plurality of shells comprises:

(i) an outermost shell containing 0 to 10 mol % of silver iodide;

(ii) a high iodide-containing shell provided inside said outermost shell having a silver iodide content at least 6 mol % higher than that of said outermost shell; and

(iii) an intermediate shell provided between said outermost shell and said high iodide-containing shell having a silver iodide content at least 3 mol % higher than that of said outermost shell, and at least 3 mol % lower than that of said high iodide-containing shell;



I

wherein Z represents a group of non-metallic atoms necessary to complete a nitrogen-containing heterocyclic ring which may have a substituent, X represents a hydrogen atom, a halogen atom or a monovalent group which is, upon reaction with an oxidation product of a color developing agent, capable of being released from the coupler residue, and R represents a hydrogen atom, a halogen atom or a monovalent group.

4,990,438

DIRECT POSITIVE LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Keiji Ogi; Eiichi Sakamoto, and Tomomi Yoshizawa, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 10, 1989, Ser. No. 419,141

Claims priority, application Japan, Oct. 13, 1988, 63-260339

Int. Cl.[5] G03C *1/02*

U.S. Cl. 430—567 26 Claims

1. A direct positive light-sensitive photographic material having at least one silver halide emulsion layer containing inner latent image type silver halide grains not previously fogged, which gives a direct positive image after image exposure by surface development after application of fogging treatment or while applying fogging treatment, wherein said inner latent image type silver halide grains comprise 80 mole % or more of silver chloride, and the silver halide emulsion layer or a hydrophilic colloid layer adjacent thereto contains at least

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one active halide type or active vinyl type gelatin hardener, and at least one compound represented by the formula (I) or (II) shown below:

Formula (I)



wherein Z_1 represents a group of atoms necessary for forming a 5- or 6-membered heterocycle containing at least one of carbon atom and nitrogen atom, which heterocycle may be fused with carbon ring; Y represents an aliphatic group or an aromatic group,

Formula (II)

wherein Z_2 represents a group of atoms necessary for forming at least one selected from the group consisting of oxadiazole, thiadiazole, triazole, tetrazole, triazine, benzoimidazole, naphthoimidazole, benzoxazole and naphthoxazole ring; M represents hydrogen atom, an alkali metal atom, ammonium group or a precursor group.

4,990,439

SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL

Kazuyoshi Goan, and Takuji Hasegawa, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,167

Claims priority, application Japan, Aug. 3, 1988, 63-193928; Aug. 30, 1988, 63-217138

Int. Cl.[5] G03C *1/02, 1/72*

U.S. Cl. 430—569 13 Claims

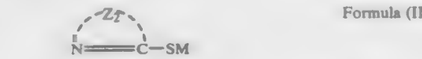
1. A silver halide light sensitive photographic material having a support and, provided thereon, hydropholic colloidal layers including at least one silver halide light-sensitive emulsion layer, said silver halide emulsion layer comprising a silver halide emulsion (I) prepared by adding a high molecular weight floculant to silver halide emulsion (II) under at least one of Conditions (1) through (3):

Condition (1): a temperature of said silver halide emulsion (II) is at least 30° C. when adding said flocculant:

Condition (2): pH and pAg of said silver halide emulsion (II) are at least 2 and at least 5, respectively, when adding said flocculant; and

Condition (3): a concentration of silver halide grains contained in said silver halide emulsion (II) is at least 20% by weight when adding said flocculant;

said silver halide emulsion (II) being prepared by adding a water-soluble silver salt solution and a water-soluble halide solution to a protective colloid solution, said hydrophilic colloidal layers being hardened with a vinyl sulfone hardener of Formula (II):



[II]

wherein R represents a hydrogen atom or a lower alkyl group; Z represents an n-valent group having at least one of oxygen, nitrogen, and sulfur; m is 1 or 2; and n is 2 or 3, and

wherein said flocculant is a modified gelatine flocculant having amino groups of which at least 50% are substituted.

4,990,440

PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING GELATINE

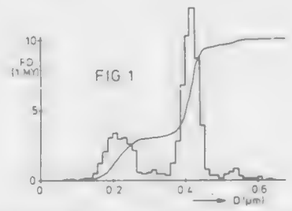
Franz Moll, Leverkusen; Bruno Mücke, Bergisch Gladbach; Walter Pätzold, and Klaus Wagner, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,419

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, 3828311

Int. Cl.[5] G03C *1/10, 1/34*

U.S. Cl. 430—640 4 Claims



1. Photographic silver halide emulsion containing gelatine, in which the gelatine has a cysteine content of less than 10 ppm and a gold number of ≧23 μmol/g.

4,990,441

PROCESS FOR SEPARATING 2-KETO-L-GULONIC ACID FROM A FERMENTED MEDIUM

Jean-Pierre Barthole, Elbeuf; Jean Filippi, Le Peage de Roussillon; Aurelia Jaeger-Seddik, Paris; Isidore Le Fur, Thiais, and Jean-Yves Pommier, Paris, all of France, assignors to Rhone-Poulenc Sante, Antony, France

Filed Sep. 11, 1989, Ser. No. 405,126

Claims priority, application France, Sep. 13, 1988, 88 11902

Int. Cl.[5] C12P *7/60;* C07C *51/42, 59/347*

U.S. Cl. 435—138 1 Claim

1. A process for separating 2-keto-L-gulonic acid from a fermented medium containing the calcium salt of 2-keto-L-gulonic acid which comprises separating the insolubles from the fermented medium by ultrafiltration, filtration in the presence of a flocculating agent and a filtration additive, or centrifugation in the presence of a flocculating agent, concentrating the medium obtained by evaporation under reduced pressure or by reverse osmosis, removing inorganic cations from the concentrated medium by adding to the said medium substantially the stoichiometric quantity of sulphuric acid to precipitate most of the calcium sulphate, removing calcium sulphate and then contacting the said medium with a cation-exchange resin in the hydrogen form, then removing residual strong acid anions by contact with an anion-exchange resin in the hydroxyl form, and then concentrating the medium under reduced pressure and allowing the 2-keto-L-gulonic acid to crystallize out or extracting the 2-keto-L-gulonic acid from the medium with a hydrocarbon solvent having an aliphatic amine of more than 20 carbon atoms dissolved therein, and then re-extracting into an aqueous solution of hydrochloric acid or nitric acid or sulphuric acid, and then isolating the 2-keto-L-gulonic acid by evaporating of the aqueous extract.

4,990,442

ASSAY FOR AN ANALYTE ON A SOLID POROUS SUPPORT

G. B. Del Campo, Milan, Italy, assignor to Chemetron, Milan, Italy

Filed Dec. 14, 1987, Ser. No. 132,877

Claims priority, application Italy, Apr. 6, 1987, 19998 A/87

Int. Cl.[5] G01N *33/53, 33/543, 33/544;* B01D *39/00*

U.S. Cl. 435—7.5 26 Claims

1. An assay for determining analyte, comprising:

contacting a support with sample containing an analyte, said support being essentially free of a binder which recognizes said analyte, said support being an amphiphillic support, said support reversibly binding protein by essentially only hydrogen bonding; fixing analyte on the support; subsequent to the fixing and prior to a subsequent determining of analyte, washing the support to remove proteins and haptens other than analyte fixed on the support; and determining analyte on the support.

4,990,443

HAPTEN-PROTEIN CONJUGATES AND METHODS OF USE IN IMMUNOASSAYS

Erasmus Huber, Garching; Christian Klein, Weilheim; Gunter Pappert, Tutzing, and Klaus Hallermayer, Munich, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

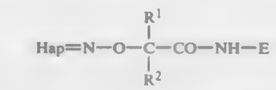
Filed Jan. 24, 1989, Ser. No. 301,582

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802060; Sep. 29, 1988, 3833149

Int. Cl.[5] C12Q *1/54;* G01N *33/535*

U.S. Cl. 435—7.9 9 Claims

1. Steroid-hapten-protein conjugate of the formula:



wherein Hap is a steroid hapten residue, R^1 and R^2, which can be the same or different are hydrogen or alkyl radicals containing from 1 to 7 carbon atoms and E—N—H is a protein residue bound via an ε-amino group of a lysine residue with the proviso that when one of R^1 and R^2 is hydrogen the other is not.

4,990,444

GAMMA-GLUTAMYLTRANSPEPTIDASE, ITS PREPARATION AND ITS USE

Werner Aretz, Königstein/Taunus, and Klaus Sauber, Schwalbach am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,338

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701221

Int. Cl.[5] C12Q *1/48;* C12N *1/20, 9/10*

U.S. Cl. 435—15 2 Claims

1. A method of hydrolyzing alpha-keto-adipinyl-or glutaryl-7-amino-cephalosporanic acid which comprises incubating alpha-keto-adipinyl- or glutaryl-7-amino-cephalosporanic acid with gamma-GTP which can be obtained by fermentation of bacteria and, furthermore, has the following characteristics

a molecular weight range of 20,000 to 60,000

an isoelectric point of pH 5.0 to 6.5

a pH optimum of 6.5 to 10 with L-gamma-glutamyl paranitroanilide as substrate

a K_m of 9 to 36 microM at pH 8

the ability to hydrolyze adipinyl- or glutaryl-monoamino compounds.

4,990,445

STABLE REAGENT AND KINETIC ASSAY FOR ALPHA-AMYLASE

Sandra M. Poudrier, and Mark T. Oyen, both of San Diego, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 20, 1988, Ser. No. 146,015

Int. Cl.[5] C12Q *1/40, 1/00*

U.S. Cl. 435—22 26 Claims

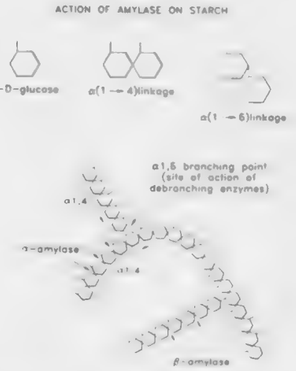
18. A reagent for assaying the amount of α-amylase in a test sample comprising per liter of reagent:

a. at least about 1 gram of a polysaccharide having glucose molecules connected primarily through α(1→4) linkages;

b. from about 0.01 to about 0.1 moles of phosphate ions;

c. at least about 200 International Units of maltose phosphorylase;

d. at least about 1 millimole of a coenzyme selected from the group consisting of β-nicotinamideadenine dinucleotide,



β-nicotinamide-adenine dinucleotide phosphate, and mixtures thereof;

e. at least about 500 International Units of glucose-6-phosphate dehydrogenase;

f. at least about 100 International Units of β-D-phosphoglucomutase; and,

g. at least about 0.1 millimoles of fructose-1,6-diphosphate.

4,990,446

PROMOTERS FOR THE EXPRESSION OF FOREIGN GENES IN YEAST, PLASMIDS COMPRISING THEM, AND USE THEREOF FOR THE PRODUCTION OF POLYPEPTIDES

Jacques Oberto, Steenokkerzeel, and John R. N. Davison, Brussels, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Dec. 5, 1985, Ser. No. 804,928

Claims priority, application Belgium, Dec. 6, 1984, 0214123

Int. Cl.[5] C12N *15/00, 1/16, 9/24;* C07H *15/12;* C12P *21/02*

U.S. Cl. 435—69.1 20 Claims

1. A promoter capable of ensuring expression in yeast of genes coding for heterologous polypeptides, said promoter comprising: a DNA fragment, or mutants or sub-fragments thereof wherein said mutants or subfragments retain the promoter function, said promoter comprising a nucleotide sequence beginning with an EcoRI site and selected from the group of sequences consisting of SEQUENCE ONE (as shown in FIG. 3, nucleotides No. 1-735), SEQUENCE TWO (as shown in FIG. 13), and SEQUENCE THREE (as shown in FIG. 14), and comprising another restriction site which immediately follows said sequences.

4,990,447

PROCESS FOR THE PURIFICATION OF SERUM ALBUMIN

Boudewijn W. König; Michiel N. Hamers, both of Amsterdam, and Cornelis J. van der Laken, Leiden, all of Netherlands, assignors to Gist-Brocades NV, Delft, Netherlands

Continuation-in-part of Ser. No. 210,824, Jun. 24, 1988, abandoned. This application Mar. 1, 1989, Ser. No. 317,818

Int. Cl.[5] C07K *3/28;* C12N *15/14*

U.S. Cl. 435—71.1 25 Claims

1. A method for producing purified recombinant serum

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albumin at least substantially free of contaminants from a host microorganism comprising:

growing in a medium microorganisms transformed with an expression construct comprising a structural gene encoding serum albumin, whereby serum albumin is expressed;

isolating a product medium as a clarified fermentation broth or cell lysate;

making the product medium alkaline to produce a precipitate without the addition of additional agents and separating, said alkaline medium from said precipitate;

changing the pH of said alkaline medium to about physiologic pH to provide an aqueous phase comprising concentrated serum albumin and chromatographing said aqueous phase with a lipophilic immobile phase and eluting the albumin by adding as desorbens a water soluble lipid anion to said aqueous phase; and

isolating purified serum albumin at least substantially free of contaminants from said microorganism.

4,990,448

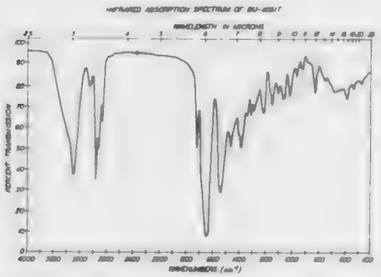
BU-4061T

Masataka Konishi, Kawasaki; Minoru Hanada, and Yuji Nishiyama, both of Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

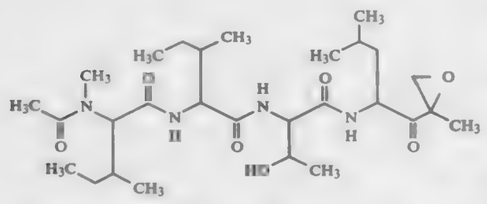
Filed Aug. 4, 1989, Ser. No. 389,479

Int. Cl.[5] C12P *13/00*; C12N *1/00*

U.S. Cl. 435—106 **2 Claims**



1. A process for producing BU-4061T having the formula



which comprises cultivating actinomycete strain Q996-17 (ATCC-53904) or a BU-4061T-producing mutant or variant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of BU-4061T is produced by said organism in said culture medium and then recovering the BU-4061T from the culture medium.

4,990,449

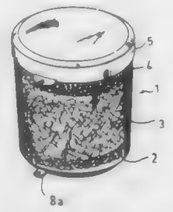
COMPOST-CONTAINING CARTIDGE FOR BIOLOGICAL REGENERATION OF AN AGUATIC MEDIUM

Jacques Caissel, 9 rue du Sénéchal, 31000 Toulouse, France

Filed Apr. 19, 1989, Ser. No. 340,388

Int. Cl.[5] C12N *11/00*; C02F *3/00*; C12M *1/40*

U.S. Cl. 435—174 **6 Claims**



1. A cartridge for the biological regeneration of an aquatic aquarium medium comprising a receptacle containing an organic compost including nithrophilic bacteria of the azobacter family and produced by the complete fermentation of a mixture of animal manures and vegetable wastes, said receptacle including means allowing the passage of water into said receptacle, through said compost in said receptacle and out of said receptacle, said means allowing the passage of water comprising two faces of said receptacle permitting passage of water from one face toward the other, a water permeable layer adjacent each of said faces for retaining said compost, and said compost being interposed between said layers.

4,990,450

METHOD OF PRODUCING ENDO-α-N-ACETYLGALACTOSAMINIDASE FROM MICROORGANISMS

Tatsurokuro Tochikura, Muko; Hidehiko Kumagai; Kenji Yamamoto, both of Otsu, and Setsu Kadowaki, Kyoto, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed May 2, 1988, Ser. No. 189,135

Claims priority, application Japan, May 7, 1987, 62-112059

Int. Cl.[5] C12N *9/24*; C12P *19/44*; C12R *1/05*

U.S. Cl. 435—200 **2 Claims**

1. A method of producing endo-α-N-acetyl-galactos-aminidase comprising the steps of growing a microorganism having all of the identifying characteristics of *Alcaligenes* sp. F-1906 and isolating endo-α-N-acetylgalactosaminidase from the culture of said microorganism.

4,990,451

PROCESS FOR THE PREPARATION OF INULASE

Toyohiko Nakamura, Miyazaki; Toshio Takizawa, Kanagawa; Yoshihiro Kamo, Kanagawa, and Hidemasa Hidaka, Kanagawa, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 23,323, Mar. 9, 1987, abandoned. This application Jan. 18, 1990, Ser. No. 467,285

Claims priority, application Japan, Mar. 7, 1986, 61-48575

Int. Cl.[5] C12N *9/26*

U.S. Cl. 435—201 **4 Claims**

1. A process for preparing endoinulase, consisting of cultivating *Aspergillus niger* M(T) 114 (FERM BP-1289) and capable of producing inulase, and recovering the inulase produced and accumulated in the culture medium by organic solvent precipitation, wherein inulase having a high exo activity is first precipitated at a low concentration of a water-soluble organic solvent and removed, and then inulase having a high endo activity is precipitated at a high concentration of the water-soluble organic solvent and recovered.

4,990,452

COMBINING MUTATIONS FOR STABILIZATION OF SUBTILISIN

Philip N. Bryan, Silver Spring, and Michael W. Pantoliano, Germantown, both of Md., assignors to Genex Corporation, Gaithersburg, Md.

Continuation-in-part of Ser. No. 180,757, Apr. 12, 1988, which is a continuation-in-part of Ser. No. 34,964, Apr. 6, 1987, and a continuation-in-part of Ser. No. 34,965, Apr. 6, 1987, each is a continuation-in-part of Ser. No. 828,545, Feb. 12, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 180,756

Int. Cl.[5] C12N *15/00, 9/34, 9/54, 9/56*

U.S. Cl. 435—222 **2 Claims**

1. A thermally stable subtilisin coded for by a mutant BPN' gene comprising the following amino acid substitutions:

phenylalamine at amino acid position 50;

alanine at amino acid position 169;

cysteine at amino acid position 206;

lysine at amino acid position 217;

serine at amino acid position 218; and

asparagine at amino acid position 76.

4,990,453

MODIFIED PSEUDOMONAS PUTIDA CREATINE AMIDINOHYDROLASE

Günther Schumacher, and Peter Buckel, both of Bernried, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,485

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715841; Feb. 3, 1988, 3803175

Int. Cl.[5] C12N *15/00, 9/36, 9/96, 9/99*

U.S. Cl. 435—231 **2 Claims**

1. A modified *Pseudomonas putida* creatine amidinohydrolase characterized by having valine at amino acid position 109 and haivng enhanced stability in the presence of detergent and higher temperatures as compared to creatine amidinohydrolase not having valine at amino acid position 109.

4,990,454

YH206 CELL LINE AND MONOCLONAL ANTIBODY PRODUCED BY IT

Akira Yachi; Kohzoh Imai; Takao Endo; Yuji Hinoda; Takafumi Yamashita, and Hideo Fujita, all of Sapporo, Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 798,276, Nov. 12, 1985, abandoned. This application Jan. 12, 1990, Ser. No. 463,810

Int. Cl.[5] C12N *5/00*; A61K *35/14*; C07K *3/00, 15/00*

U.S. Cl. 435—240.27 **2 Claims**

1. A cell line having all the identifying characteristics of YH206.

4,990,455

NOVEL HUMAN TNF POLYPEPTIDE MUTANTS AND DNA'S ENCODING SAID MUTANTS

Junichi Yamagishi, Nara; Hitoshi Kawashima, Osaka; Ryuji Furuta, Shiga; Hirotada Kotani, Osaka, and Katuhisa Nakata, Nara, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 22, 1987, Ser. No. 64,609

Claims priority, application Japan, Jun. 20, 1986, 61-145575

Int. Cl.[5] C12P *21/00*; C12N *15/00*; C07H *15/12*

U.S. Cl. 435—69.5 **10 Claims**

2. A DNA having a base sequence encoding a polypeptide having an amino acid sequence represented by formula [I] in which the proline at position 115 is replaced by Leu, His, Ser, Gly, Thy or Asp:

Ser	Ser	Ser	Arg	Thr	Pro	Ser	Asp	Lys	Pro
Val	Ala	His	Val	Val	Ala	Asn	Pro	Gln	Ala
Glu	Gly	Gln	Leu	Gln	Trp	Leu	Asn	Arg	Arg

-continued

Ala	Asn	Ala	Leu	Leu	Ala	Asn	Gly	Val	Glu
Leu	Arg	Asp	Asn	Gln	Leu	Val	Val	Pro	Ser
Glu	Gly	Leu	Tyr	Leu	Ile	Tyr	Ser	Gln	Val
Leu	Phe	Lys	Gly	Gln	Gly	Cys	Pro	Ser	Thr
Ile	Val	Leu	Leu	Thr	His	Thr	Ile	Ser	Arg
Ile	Ala	Val	Ser	Tyr	Gln	Thr	Lys	Val	Asn
Leu	Leu	Ser	Ala	Ile	Lys	Ser	Pro	Cys	Gln
Arg	Glu	Thr	Pro	Glu	Gly	Ala	Glu	Ala	Lys
Pro	Trp	Tyr	Glu	Pro	Ile	Tyr	Leu	Gly	Gly
Val	Phe	Gln	Leu	Glu	Lys	Gly	Asp	Arg	Leu
Ser	Ala	Glu	Ile	Asn	Arg	Pro	Asp	Tyr	Leu
Asp	Phe	Ala	Glu	Ser	Gly	Gln	Val	Tyr	Phe
Gly	Ile	Ile	Ala	Leu					[I].

4,990,456

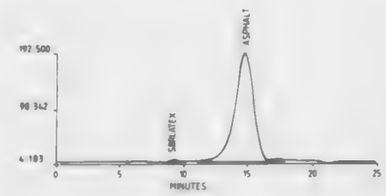
ANALYSIS OF ASPHALT

Dennis A. Loucks, Bright's Grove, and Frederick P. Seguin, Sarnia, both of Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Oct. 31, 1988, Ser. No. 264,868

Int. Cl.[5] G01N *33/00*

U.S. Cl. 436—139 **13 Claims**



1. A process for determining the low gel polymer content in a polymer modified asphalt, bitumen, tar or a mixture thereof essentially consisting of asphalt, bitumen, tar or a mixture thereof having an average molecular weight less than $10^{4.5}$ and polymeric components having an average molecular weight of at least 10^3 comprising:

(a) dissolving polymer modified asphalt in a suitable solvent;

(b) passing a sample of the resulting solution through a gel permeation chromatograph in which one or more chromatograph columns comprise a controlled pore glass column in which the glass particles have a size from 80/120 mesh to 200/400 mesh and a maximum pore size in the range 75 to 120A; and

(c) detecting and quantifying the low gel polymer and the asphalt portions of the solution as they leave the chromatograph column.

4,990,457

WHOLE BLOOD DRY ANALYSIS ELEMENT

Mitsutoshi Tanaka, and Takaki Arai, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1989, Ser. No. 333,430

Claims priority, application Japan, Apr. 5, 1988, 63-83679

Int. Cl.[5] G01N *31/22*

U.S. Cl. 436—170 **18 Claims**

1. A dry analysis element for the determination of a component in erythrocyte-containing blood which comprises at least two water permeable layers which include a reagent layer and a porous spreading layer having a liquid-accepting face, the reagent layer being arranged on the side opposite to the liquid-accepting face for the porous spreading layer, and containing a reagent composition capable of producing an optically detectable substance in the presence of an analyte in at least one of the water permeable layers, said porous spreading layer containing a compound selected from the group consisting of cholic acids, deoxycholic acids, and salts thereof, said com-

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pound being present in an amount effective to substantially prevent analysis errors due to variation in the hematocrit value of a blood sample.

8. In a method for the analysis of a component in an erythrocyte-containing blood sample wherein a droplet size sample of the blood is introduced to a dry analysis element and the quantity of the component is determined by optical analysis, the improvement which comprises said element having at least two water permeable layers which include a reagent layer and a porous spreading layer having a liquid-accepting face, the reagent layer being arranged on the side opposite to the liquid-accepting face of the porous spreading layer, and containing a reagent composition capable of producing an optically detectable substance in the presence of an analyte in at least one of the water-permeable layers, said porous spreading layer containing a compound selected from the group consisting of cholic acids, deoxycholic acids, and salts thereof, said compound being present in an amount effective to substantially prevent analysis errors due to variation in the hematocrit value of a blood sample.

4,990,458

DERIVATIZATION OF ORGANIC COMPOUNDS DURING THEIR ANALYSIS OR DETERMINATION

Jack M. Rosenfeld, Hamilton, Canada, assignor to McMaster University, Hamilton, Canada

Continuation-in-part of Ser. No. 633,959, Jul. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 367,941, Apr. 13, 1982, abandoned. This application Sep. 22, 1987, Ser. No. 141,983

Int. Cl.[5] **C07C** *67/00, 67/10;* **G01N** *30/02, 33/00*

U.S. Cl. 436—174 **22 Claims**

1. A process for converting an organic compound, having a reactive group, dissolved at a concentration of 50 μg/ml or less in an aqueous solution into a derivative thereof which is suitable for analysis or determination by techniques requiring the presence in the derivative of a detectable radical selected from the group consisting of a chromophore, a fluorophore and an electrophore, which process comprises contacting said organic compound in said aqueous solution at a temperature in the range of 15°–40° C. in substantially non-acidic conditions with a derivatizing agent capable of reacting with said reactive group in the presence of a catalyst to introduce said detectable radical into the organic compound, said catalyst being a water-insoluble, non-ionic macroreticular resin capable of absorbing the organic compound and the derivative from aqueous solution, and said resin being selected from the group consisting of styrene-divinylbenzene copolymers and cross-linked methacrylate copolymers.

4,990,459

IMPURITY MEASURING METHOD

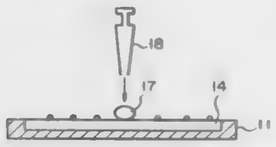
Ayako Maeda, Kawasaki; Mokuji Kageyama, Yokohama; Shintaro Yoshii, Tokyo, and Masanobu Ogino, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1989, Ser. No. 339,825

Claims priority, application Japan, Apr. 25, 1988, 63-102199

Int. Cl.[5] **G01N** *1/00*

U.S. Cl. 436—178 **6 Claims**



1. An impurity measuring method comprising the steps of: dropping a drop of a solution to the surface of a hydrophobic object to be measured on the surface of said object to be measured;

moving said drop dropped on the surface of said object to be measured so that said drop is kept in contact with the surface of said object to be measured;

recovering said drop after the movement; and

analyzing said recovered drop by chemical analysis to determine the type and content of an impurity absorbed on the surface of said object to be measured.

4,990,460

FABRICATION METHOD FOR THIN FILM FIELD EFFECT TRANSISTOR ARRAY SUITABLE FOR LIQUID CRYSTAL DISPLAY

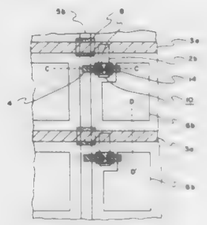
Hiroaki Moriyama, Tokyo, Japan, assignor to NEC Corporation, Japan

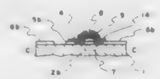
Filed Jan. 29, 1990, Ser. No. 471,960

Claims priority, application Japan, Jan. 27, 1989, 1-19137; Jan. 27, 1989, 1-19139

Int. Cl.[5] **H01L** *31/0392, 31/0376, 21/283, 21/033*

U.S. Cl. 437—40 **16 Claims**





1. A method of fabricating a thin film field effect transistor array comprising the steps of:

forming a transparent conductive film on a substrate;

forming on said substrate a plurality of drain bus lines, a plurality of gate electrodes, and a plurality of pixel electrodes consisting of said transparent conductive film by selectively removing said transparent conductive film using a first photo-mask pattern;

forming an insulating film thereafter;

forming a first semiconductor thin film on said insulating film;

forming an impurity doped second semiconductor thin film on said first semiconductor thin film;

forming a plurality of islands consisting of a laminated film of said insulating film, said first semiconductor thin film, and said second semiconductor thin film covering at least each of said plurality of gate electrodes by removing said first semiconductor thin film, said second semiconductor thin film, and said insulating film using a second photo-mask pattern;

forming a metal film thereafter;

forming a plurality of gate bus lines, a plurality of source electrodes, and a plurality of drain electrodes consisting of said metal film by selectively removing said metal film using a third photo-mask pattern, said gate bus lines being respectively connected to said gate electrodes, said plurality of source electrodes and said plurality of drain electrodes being formed on said second semiconductor thin film on both sides of said plurality of gate electrodes such that one group of said plurality of source electrodes and said plurality of drain electrodes being respectively connected to said plurality of drain bus lines while the other

of said plurality of source electrodes and said plurality of drain electrodes being connected to said plurality of pixel electrodes; and

removing said second semiconductor thin film existing between each pair of said source electrode and said drain electrode.

4,990,461

METHOD OF MAKING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING RESISTANCE ELEMENTS

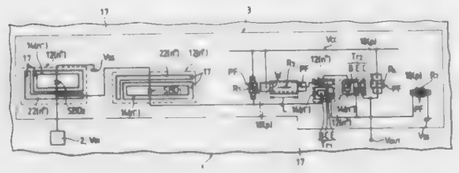
Kazunori Onozawa, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 386,696

Claims priority, application Japan, Aug. 12, 1988, 63-201451

Int. Cl.[5] **H01L** *27/00*

U.S. Cl. 437—47 **6 Claims**



1. A method of fabricating a semiconductor integrated circuit device having resistance elements, comprising the steps of:

(1) preparing a semiconductor substrate having a main plane, said semiconductor substrate having a first region in which resistance elements are to be formed, a second region in which MISFETs are to be formed and a third region in which bipolar transistors are to be formed;

(2) forming said resistance elements by introducing an impurity of a first conductivity type into the main plane of said first region;

(3) forming a thin insulator film on the main plane of said first region and on a surface of said resistance elements;

(4) depositing a conductor film, which is to become a gate electrode material of said MISFET, on the entire surface of the main plane of said semiconductor substrate;

(5) forming a gate electrode and a protective film on said insulator film by etching selectively said conductor film for patterning; and

(6) forming a diffusion layer region having a high concentration, which is to become part of a collector region of said bipolar transistor, by introducing an impurity of a second conductivity type opposite to said first conductivity type onto the main plane of said third region; wherein said protective film has a function of preventing said impurity for forming said diffusion layer region from being emitted onto said semiconductor substrate and being introduced into said resistance elements.

4,990,462

METHOD FOR COPLANAR INTEGRATION OF SEMICONDUCTOR IC DEVICES

John W. Sliwa, Jr., Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 12, 1989, Ser. No. 337,223

Int. Cl.[5] **H01L** *21/304*

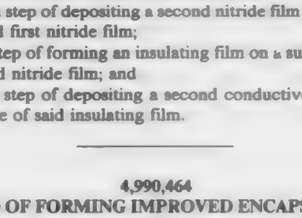
U.S. Cl. 437—51 **42 Claims**

1. A method for coplanar integration of semiconductor IC devices comprising:

(a) providing segments having at least one edge having an abutting portion capable of abutting against a similar edge of a neighboring segment, each segment having on a top surface thereof at least one of the items selected from the group consisting of circuits, circuit elements, sensors, and input/output connections;

(b) arranging said segments on the surface of a flotation liquid such that the top surfaces of each segment are substantially coplanar;

(c) allowing said segments to be pulled together so as to mate abutting edges of neighboring segments to form a superchip;



(d) forming solid microbridges between neighboring segments to mechanically secure said superchip; and

(e) forming electrical interconnections between neighboring segments so as to interconnect various of said circuits, circuit elements, sensors, and input/output connections.

4,990,463

METHOD OF MANUFACTURING CAPACITOR

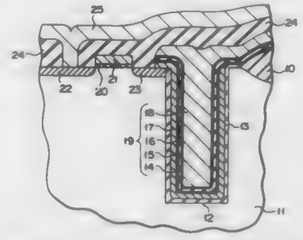
Seiichi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 29, 1989, Ser. No. 373,289

Claims priority, application Japan, Jul. 5, 1988, 63-167607

Int. Cl.[5] **H01L** *21/70*

U.S. Cl. 437—52 **13 Claims**



1. A method of manufacturing a capacitor, comprising:

a first step of nitriding a surface of a first conductive layer, to form a first nitride or oxynitride film;

a second step of depositing a second nitride film on a surface of said first nitride film;

a third step of forming an insulating film on a surface of said second nitride film; and

a fourth step of depositing a second conductive layer on a surface of said insulating film.

4,990,464

METHOD OF FORMING IMPROVED ENCAPSULATION LAYER

Helmut Baumgart, Mahopac, N.Y., and Andre Martinez, Derry, N.H., assignors to North American Philips Corp., New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,606

Int. Cl.[5] **H01L** *21/20*

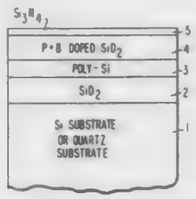
U.S. Cl. 437—83 **14 Claims**

1. A method of manufacturing a silicon-on-insulator (SOI) semiconductor device comprising the steps of

forming a layer of SiO_2 on a substrate

forming a relatively thin poly-silicon or α-Si film on said layer of SiO_2

encapsulating said poly-silicon film with a composite structure of a doped layer of SiO_2 deposited on said poly-silicon film and a layer of Si_3N_4 deposited on said doped layer of SiO_2.



4,990,465

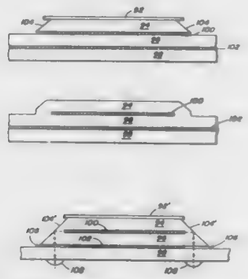
METHOD OF FORMING A SURFACE EMITTING LASER

Zong-Long Liau, Arlington, and James N. Walpole, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 211,888, Jun. 27, 1988, Pat. No. 4,894,840, which is a continuation of Ser. No. 693,207, Jan. 22, 1985, Pat. No. 4,718,070. This application Nov. 1, 1989, Ser. No. 430,519

Int. Cl.[5] H01L *21/20, 21/203*

U.S. Cl. 437—120 **14 Claims**



1. The method of forming a surface emitting laser comprising the steps of:

(a) forming an active region in a semiconductor body with a light emitting edge at one longitudinal end of said region;

(b) forming a smooth light reflective surface in said body adjacent the longitudinal end of said region for redirecting light emitting from said edge in a direction normal to said active region; and

(c) forming a lens in said body in the path of said reflected light for collimating said light.

4,990,466

METHOD FOR FABRICATING INDEX-GUIDED SEMICONDUCTOR LASER

Chan-Long Shieh, Plainsboro, N.J.; Joseph I. Mantz, Pipersville, Pa., and Reinhard W. H. Engelmann, Pennington, N.J., assignors to Siemens Corporate Research, Inc., Princeton, N.J.

Filed Nov. 1, 1988, Ser. No. 265,644

Int. Cl.[5] H01L *21/20, 21/265*

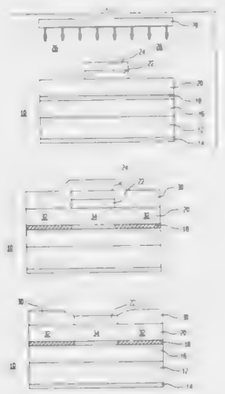
U.S. Cl. 437—129 **17 Claims**

1. A method of fabricating an optical waveguide in a selected portion of a quantum well heterostructure region in a semiconductor body, comprising the steps of:

(a) masking a first portion of a surface of said semiconductor body corresponding substantially with said selected portion of a quantum well heterostructure region so as to provide shielding thereto:

(b) exposing unmasked portions of said surface of said semiconductor body to a sputter etch;

(c) coating said surface with a layer of silicon dioxide; and



(d) subjecting said semiconductor body to heat treatment, wherein said semiconductor body comprises:

a first layer of gallium arsenide;

a second layer of aluminum gallium arsenide overlying said first layer;

4,990,467

METHOD OF PREVENTING RESIDUE ON AN INSULATOR LAYER IN THE FABRICATION OF A SEMICONDUCTOR DEVICE

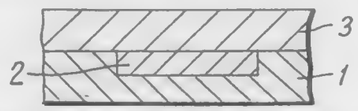
Chuljin Lee, Suwon, and Euisong Kim, Anyang, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 12, 1989, Ser. No. 378,660

Claims priority, application Rep. of Korea, Aug. 11, 1988, 88-10249

Int. Cl.[5] H01L *21/443*

U.S. Cl. 437—192 **4 Claims**



1. A method for the fabrication of a semiconductor device comprising the steps of doping of impurity on a substrate to form an impurity doped region on said substrate, depositing an insulator layer on said substrate, depositing a photoresist resin on said insulator layer in order to form a contact hole, said contact hole being formed by etching the insulator layer using the photoresist resin as a mask, selectively depositing a tungsten film in said contact hole so that the tungsten film is located only inside said contact hole-, and removing the photoresist resin after selectively depositing the tungsten film in said contact hole to simultaneously remove tungsten residue deposited on the photoresist resin so that tungsten film is deposited only inside said contact hole-.

4,990,468

FLUOROPHOSPHATE OPTICAL GLASS

Masayuki Komiya; Masaaki Otsuka; Naruhito Sawanobori, all of Yono, and Shinobu Nagahama, Kasukabe, all of Japan, assignors to Sumita Optical Glass, Inc., Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 414,385

Claims priority, application Japan, Oct. 6, 1988, 63-252350

Int. Cl.[5] C03C *3/247, 4/00*

U.S. Cl. 501—44 **6 Claims**

1. A fluorophosphate optical glass having a refractive index (nd) of 1.54 to 1.60, an Abbe number (νd) of 68 to 75 and a relative partial dispersion of at least 0.537, which has a chemical composition (% by weight) comprising:

$Al(PO_3)_3$	15–32%
$Ba(PO_3)_2$	0–10%
$Sr(PO_3)_2$	0–10%
$Ca(PO_3)_2$	0–10%
$Mg(PO_3)_2$	0–10%
sum of metaphosphates	20–32%
BaF_2	20–70%
SrF_2	5–40%
CaF_2	0–15%
MgF_2	0–10%
AlF_3	0–5%
GdF_3	0–5%
sum of fluorides	55–75%
Gd_2O_3	5–22%
La_2O_3	0–7%
Y_2O_3	0–10%
Yb_2O_3	0–10%
sum of rare earth oxides	5–22%

4,990,469

REFRACTORY MATERIAL AND PROCESS FOR PRODUCTION OF THE SAME

Michel Dussaulx, Meckenheim/Merl, and Francisco Lorenzo, Bornheim/Roisdorf, both of Fed. Rep. of Germany, assignors to Norton GmbH, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,163

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739571; Dec. 17, 1987, 3742862

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—89 **9 Claims**

1. A silicon nitride bonded silicon carbide product consisting essentially of 15% to 27% by weight of silicon nitride, 63% to 82% by weight of silicon carbide, from more than 0% to about 2% by weight of iron oxide, and from more than 0% to about 9% by weight of aluminum oxide, said product having a density of at least about 2.7 g/cm^3 and a bending strength of at least about 160 MPa, wherein the bonded silicon carbide particles are made up of a coarse fraction and a fine fraction.

4,990,470

HIGH-STRENGTH AND HIGH-TOUGHNESS SINTER AND PROCESS FOR PRODUCING THE SAME

Takemi Yamamura; Toshihiro Ishikawa; Makoto Tamura; Masaki Shibuya, all of Ogushi; Kiyohito Okamura, Ibaragi, and Mitsuhiko Sato, Ooarai, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Oct. 31, 1988, Ser. No. 265,254

Claims priority, application Japan, Nov. 5, 1987, 62-279884; Nov. 5, 1987, 62-279885; Nov. 5, 1987, 62-279886; Feb. 5, 1988, 63-26198; Feb. 5, 1988, 63-26199; Feb. 5, 1988, 63-26200; Sep. 8, 1988, 63-225197

Int. Cl.[5] C04B *35/36*

U.S. Cl. 501—91 **4 Claims**

1. A high-strength and high-toughness sinter comprising a crystal agglomerate maintaining a fibrous shape and composed of crystals of SiC and MC_{1-x} wherein M is Ti and/or Zr and x is a number of 0 or more but less than 1, wherein the sections of crystals of SiC and MC_{1-x} wherein M is Ti and/or Zr and x is a number of 0 or more but less than 1, wherein the sections of at least part of the fibers of said crystal agglomerate are deformed into a polygonal shape.

4,990,471

PROCESS FOR PRODUCING SILICON NITRIDE

Mukesh K. Jain; Sadashiv Nadkarni, both of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Oct. 26, 1988, Ser. No. 262,605

Int. Cl.[5] C04B *35/58*

U.S. Cl. 501—97 **18 Claims**

1. A process for preparing silicon nitride, which comprises:

producing a uniform dispersion of finely divided silica particles in a carbon-containing polymer, wherein the ratio of silica to polymer in the dispersion is such that, upon carbonization of the polymer, the weight ratio of silica to carbon is about 2.5–5:1;

heating the polymer/silica dispersion in a nonoxidizing atmosphere to carbonize the polymer; and

heating the resulting carbonized product to a temperature in the range of 1300–1800°C in a nonoxidizing nitrogen-containing atmosphere in contact with about 1 to 2% by weight (based on the weight of said silica) of a metal oxide selected from the group consisting of oxides of aluminum, boron and yttrium capable, in the reaction conditions, of reducing the amount of silicon carbide formed as a undesired by-product.

4,990,472

Patent Not Issued For This Number

4,990,473

ZIRCONYL PHOSPHATE CERAMICS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Ernst Gugel; Isfried Petzenhauser, both of Roedental, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 364,845

Int. Cl.[5] C04B *35/48*

U.S. Cl. 501—102 **12 Claims**

1. Zirconyl phosphate ceramics having high strength and high heat shock resistance, which consist of zirconyl phosphates, zirconium phosphates or both, together with detectable amounts of antimony but which amount is less than 0.5% by weight.

4,990,474

PROCESS FOR PREPARING A ZIRCONIUM DIOXIDE PRECURSOR

Maurizio Castellano, Turin, Italy, assignor to Enitricerche S.p.A., Milan, Italy

Filed Nov. 3, 1989, Ser. No. 431,649
Claims priority, application Italy, Nov. 11, 1988, 22590 A/88
Int. Cl.[5] C04B 35/48
U.S. Cl. 501—103 10 Claims

1. Process for preparing a precursor of zirconium dioxide by means of the hydrolysis with water of zirconium tetrachloride, characterized in that:

zirconium tetrachloride is dispersed in an inert, liquid organic vehicle, with a surfactant being used in order to obtain a stable dispersion,

to said stable dispersion water is added in an amount from about 30 to about 100 times as large as the stoichiometric amount needed to hydrolyze zirconium tetrachloride in order to form an emulsion, with or without a co-surfactant in order to form a microemulsion, and hydrolyze zirconium tetrachloride to cause the zirconium dioxide precursor to precipitate; and

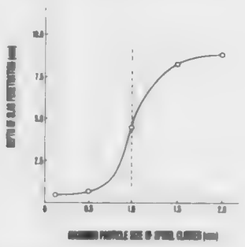
thereafter recovering said precipitated precursor.

4,990,475

ALUMINA-SPINAL MONOLITHIC REFRACTORIES

Osami Matsumoto; Toshihiro Isobe, both of Hyogo; Teruyuki Nishitani, and Takashi Genba, both of Aichi, all of Japan, assignors to Harima Ceramic Co. Ltd., Hyogo and Nippon Steel Corporation, Tokyo, both of, Japan

Filed Mar. 16, 1990, Ser. No. 495,714
Claims priority, application Japan, Aug. 29, 1987, 62-216167
Int. Cl.[5] C04B 35/02, 35/04
U.S. Cl. 501—120 8 Claims



1. An alumina-spinel monolithic refractory consisting essentially of 50–90 percent by weight of alumina clinker, 5–40 percent by weight of $MgO\text{-}Al_2O_3$ spinel clinker not larger than 1 mm in particle size and 1–25 percent by weight of alumina cement.

4,990,476

HYDROCARBON CONVERSION CATALYST FOR USE IN SELECTIVELY MAKING MIDDLE DISTILLATES

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 196,942, Apr. 4, 1988, Pat. No. 4,879,019, which is a division of Ser. No. 28,654, Mar. 20, 1987, Pat. No. 4,762,813, which is a continuation-in-part of Ser. No. 793,567, Oct. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 669,919, Feb. 8, 1985, Pat. No. 4,610,973, which is a continuation-in-part of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Mar. 31, 1989, Ser. No. 332,517
Int. Cl.[5] B01J 21/16, 29/06
U.S. Cl. 502—68 30 Claims

1. A process for making a hydrocarbon conversion catalyst which comprises:

(a) extruding a mixture of at least one inorganic refractory oxide component selected from the group consisting of a pillared clay and a delaminated clay and a crystalline aluminosilicate zeolite having cracking activity to form extrudates, wherein said zeolite is selected from the group consisting of Y zeolites, modified Y zeolites, X zeolites and modified X zeolites; and

(b) calcining said extrudates in the presence of steam at a water vapor partial pressure greater than about 2.0 p.s.i.a. under conditions such that the unit cell size of said crystalline aluminosilicate zeolite is reduced to a value between about 24.20 and about 24.45 Angstroms.

12. A process as defined by claim 1 wherein said extrudates are calcined under conditions such that the unit cell size of said crystalline aluminosilicate zeolite is reduced to a value between about 24.20 and 24.39 Angstroms.

29. A catalyst composition prepared by the process of claim 12.

4,990,477

OLEFIN POLYMERIZATION CATALYST COMPONENT, PROCESS FOR PRODUCTION THEREOF, OLEFIN POLYMERIZATION CATALYST, AND PROCESS FOR POLYMERIZING OLEFINS

Mamoru Kioka, Iwakuni; Masao Nakano, Yamaguchi, and Akinori Toyota, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 13, 1989, Ser. No. 406,466
Claims priority, application Japan, Sep. 13, 1988, 63-228955; Sep. 13, 1988, 63-228956
Int. Cl.[5] C08F 4/656
U.S. Cl. 502—107 21 Claims

8. A process for producing a catalyst component (X″) for olefin polymerization, which comprises treating an olefin polymerization catalyst (X) formed from (A) a solid titanium catalyst component comprising magnesium, titanium, halogen and an electron donor as essential ingredients prepared by contacting a magnesium compound selected from magnesium compounds having no reducibility and magnesium compounds having reducibility, a tetravalent titanium compound represented by $Ti(OR)_gX_{4-g}$ in which R represents a hydrocarbon group, X represents a halogen atom and g is a number from 0 to 4 and an electron donor, (B) an organoaluminum compound catalyst component, and as required (C) an electron donor, with an alpha-olefin by preliminarily polymerizing the alpha-olefin in an amount of 0.1 to 500 g per gram of the solid titanium catalyst component (A) in the presence of said catalyst (X) and thereafter contacting the treated catalyst (X′) with at least 0.1 mole, per gram-atom of titanium in the treated catalyst (X′) of oxygen, at a temperature of −30° to 100° C. for a period of 1 minute to 100 hours.

4,990,478

SILANE-MODIFIED SUPPORTED POLYOLEFIN CATALYST TO PRODUCE A BROADENED MOLECULAR WEIGHT DISTRIBUTION PRODUCT

Charles R. Hoppin, and Benjamin S. Tovrog, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 21, 1989, Ser. No. 410,663
Int. Cl.[5] C08F 4/649
U.S. Cl. 502—125 16 Claims

1. In an olefin polymerization catalyst system comprising a solid, hydrocarbon-insoluble, supported titanium, magnesium halide component containing an electron donor; an alkyl aluminum compound; and an organosilane compound, the improvement comprising selecting the organosilane compound from the group consisting of branched C_3–C_{10} alkyl-t-butoxydimethoxysilanes.

4,990,479

PROCESS FOR POLYMERIZING OLEFINS AND POLYMERIZATION CATALYST THEREFOR

Naoshi Ishimaru, Yamaguchi; Mamoru Kioka, and Akinori Toyota, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,547
Claims priority, application Japan, Jun. 17, 1988, 1-149503; Jan. 24, 1989, 1-14595; Mar. 2, 1989, 63-50871
Int. Cl.[5] C08F 4/649
U.S. Cl. 502—125 3 Claims

1. An olefin polymerization catalyst formed from

(A) a solid titanium component which contains magnesium, titanium, halogen and an electron donor as the essential components prepared by contacting of a magnesium compound with a titanium compound and an electron donor, said magnesium compound having been for a time in a liquid condition during preparation of said solid titanium component;

(B) an organoaluminum compound; and

(C) an organosilicon compound represented by the following formula

$$SiR^{21}R^{22}_m(OR^{23})_{3-m}$$

wherein R^{21} represents a cyclopentyl group, a cyclopentyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, an alkyl group having 2 to 4 carbon atoms substituted by a cyclopentyl group or a cyclopentyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a cyclopentenyl group, a cyclopentenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a cyclopentadienyl group, a cyclopentadienyl group substituted by 1 to 4 alkyl groups having 1 to 4 atoms, an indenyl group, an indenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, an indanyl group, an indanyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a tetrahydroindenyl group, a tetrahydroindenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a fluorenyl group or a fluorenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms;

R^{22} and R^{23} are identical or different and each represents a hydrocarbon group; and

$0 \leqq m < 3$.

4,990,480

BIPHASIC RARE EARTH ALUMINUM BORATES AND PROCESS FOR THEIR PREPARATION

Melvin L. Luetkens, Jr., Batavia, and Larry C. Satek, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 29, 1989, Ser. No. 330,608
Int. Cl.[5] B01J 21/02, 23/10
U.S. Cl. 502—204 58 Claims

1. A biphasic crystalline material comprising aluminum, boron, oxygen and at least one element of atomic number less than 89 selected from the group consisting of Group IIIB of the Periodic Table having an X-ray diffraction pattern comprising significant lines substantially as described in Table I and in Table II.

4,990,481

CATALYST FOR STEAM REFORMING

Nobuhiro Sato, Aichi; Kozo Ohsaki, Chiba; Katsutoshi Kikuchi, Chiba; Yoshitsugu Hirota, Chiba; Toru Numaguchi, Chiba, and Noboru Mochiduki, Chiba, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 345,430
Claims priority, application Japan, May 20, 1988, 63-123221; Apr. 10, 1989, 1-89993
Int. Cl.[5] B01J 21/04, 23/74
U.S. Cl. 502—335 11 Claims

1. A catalyst for a steam reforming process comprising a porous aluminum oxide carrier and a material selected from the group consisting of nickel and nickel oxide, said porous aluminum oxide carrier being α-alumina and having a pore volume of not less than 0.2 ml/g for pores having a pore diameter of from 0.1 to 0.5 micron, a pore volume of not less than 0.05 ml/g for pores having a pore diameter greater than 0.5 micron and a purity of not less than 98% by weight, said material being impregnated in said carrier in an amount of from 3 to 20% by weight, said % by weight being determined on a nickel oxide basis.

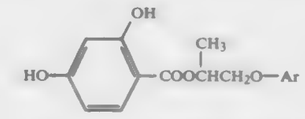
4,990,482

HEAT-SENSITIVE RECORDING MATERIAL

Kazunori Nigorikawa; Masato Satomura, and Mitsuyuki Tsurumi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1989, Ser. No. 325,829
Claims priority, application Japan, Mar. 18, 1988, 63-64971
Int. Cl.[5] B41M 5/18
U.S. Cl. 503—209 12 Claims

1. A heat-sensitive recording material which comprises a support having provided thereon a transparent heat-sensitive layer comprising color former-containing microcapsules and at least one color developer, wherein said at least one color developer contains the following compound.



wherein Ar represents a substituted or unsubstituted aryl group.

4,990,483

THERMOSENSITIVE RECORDING MATERIAL

Atsuo Goto, Tsukuba, Japan, assignor to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Oct. 11, 1989, Ser. No. 419,841
Claims priority, application Japan, Oct. 13, 1988, 63-259169
Int. Cl.[5] B41M 5/18
U.S. Cl. 503—226 7 Claims

1. A thermosensitive recording material comprising a support; an undercoat layer comprising a first layer in an amount of 1 g/m^2 or more formed on the support containing a pigment and an adhesive and a second layer in an amount of 1 g/m^2 or more formed on the first layer, comprising an urea-formaldehyde resin and an adhesive; and a thermosensitive recording layer, provided on the undercoat layer, containing an adhesive, a dye precursor and a developer capable of developing the color of the dye precursor when heated.

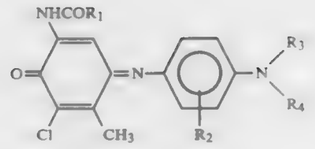
4,990,484

HEAT TRANSFER SHEETS

Masayuki Nakamura, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Sep. 8, 1989, Ser. No. 404,408
Claims priority, application Japan, Sep. 12, 1988, 63-226426
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 3 Claims

1. A heat transfer sheet comprising a base sheet and a dye carrier layer formed on one side of said base sheet, said dye carrier layer comprising a binder and a mixture of at least one dye expressed by the following general formula (I) with at least one other sublimable dye showing a maximum absorption wavelength at from 560 to 700 nm and having a molecular weight of at least 345:



(I)

wherein:

R_1 to R_4 each a C_1 to C6 alkyl group, a cycloalkyl group or a phenyl group, provided that R_2 may be a hydrogen atom or an alkoxy group and R_3 and R_4 may form together a ring.

4,990,485

HEAT TRANSFER IMAGE-RECEIVING SHEET

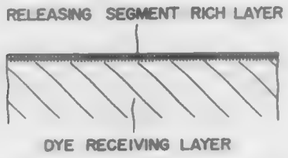
Noritaka Egashira; Yoshinori Nakamura; Kenichiro Suto, and Masaki Kutsukake, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Nov. 13, 1989, Ser. No. 434,991

Claims priority, application Japan, Nov. 10, 1988, 63-282589; Jun. 21, 1989, 1-158748; Jun. 21, 1989, 1-158749; Sep. 14, 1989, 1-237239

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 12 Claims



1. A heat transfer image-receiving sheet comprising:

a substrate sheet; and

a dye receiving layer formed on a surface of said substrate sheet, said dye receiving layer comprising a graft copolymer including a main chain and at least one releasing segment graft-bonded thereto, said at least one releasing segment comprising at least one segment selected from the group consisting of polysiloxane segments, fluorinated carbon segments, and long chain alkyl segments.

4,990,486

THERMAL TRANSFER IMAGE RECEIVING MATERIAL

Tetsu Kamosaki, Kanagawa, and Toshiaki Inaba, Ishikawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 9, 1989, Ser. No. 433,869

Claims priority, application Japan, Nov. 11, 1988, 63-285172; Feb. 27, 1989, 63-43126

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 5 Claims

1. A thermal transfer image receiving material comprising a support having thereon at least one dye imaging receiving layer containing a polyester resin, said polyester resin containing units derived from dicarboxylic acid components and diol components, said units derived from dicarboxylic acid components comprising units containing an anionic $SO_3^{\ominus}$ group in an amount of from 0.1 to 20 mol % of the total units derived from dicarboxylic acid components, and said units derived from diol components comprising units containing a phenylene group, wherein said anionic $SO_3^{\ominus}$ groups and phenylene groups are contained in the linear chain portion of the resin.

4,990,487

SUPERCONDUCTIVE OPTOELECTRONIC DEVICES

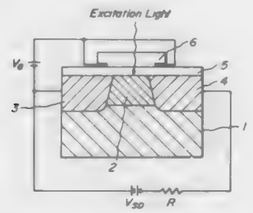
Taizo Masumi, Yokohama, Japan, assignor to The University of Tokyo, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 320,131

Claims priority, application Japan, Mar. 11, 1988, 63-57844; Aug. 12, 1988, 63-201655

Int. Cl.[5] H01J *40/14;* H01B *12/00;* H01L *39/12*

U.S. Cl. 505—1 13 Claims



1. A superconductive optoelectronic device, comprising a substrate, a photoconductive gate region formed on the substrate, and a source region and a drain region formed on the substrate at opposite sides of the gate region, respectively, so as to face toward each other across the gate region, and means for supplying bias voltage between said source region and drain region, said source and drain regions being made of a superconductive material, said gate region being made of a superconductive photoconductive-material selected from the Y-Ba-Cu-O, Ca-Sr-Bi-Cu-O, Ba-Pb-Bi-O and La-Cu-O systems, which gate material is photoconductive at a temperature below the critical temperature for superconductivity of said superconductive material, whereby an electric current flowing between said source region and drain region is controlled in accordance with the intensity of light incident upon the gate region.

4,990,488

SUPERCONDUCTORS BI-SR-CU-O

Hans-Georg von Schnering, Aidlingen; Winfried Becker, Kelkheim; Martin Schwarz, Königstein/Taunus; Leonhard Walz, Rastatt; Elfi Waldschmidt, Bad Camberg, and Joachim Adam, Butzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,779

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739886

Int. Cl.[5] C01F *11/02;* C01G *3/02, 29/00*

U.S. Cl. 505—1 5 Claims

1. A black crystal composition having the empirical composition $Bi_2Sr_yCu_{3-y+k}O_f$ where

k denotes a number between −0.05 and +0.05 and

y denotes a number between 1 and 2.5, and

f is approximately 6+k having a superconducting transition temperature T_c for superconductivity of at least about 40K and a principal phase which crystallizes in the orthorhombic system.

4,990,489

READ ONLY MEMORY DEVICE INCLUDING A SUPERCONDUCTIVE ELECTRODE

Yoji Mashiko, and Tadashi Nishioka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,802

Claims priority, application Japan, Jul. 6, 1987, 62-167049

Int. Cl.[5] G11C *11/44*

U.S. Cl. 505—1 13 Claims

1. A read only memory device, comprising:

an array of memory cells, each cell including:

an active element having an input/output portion;

a first electrode electrically connected to said input/output portion, said first electrode arranged in an insulating film; and

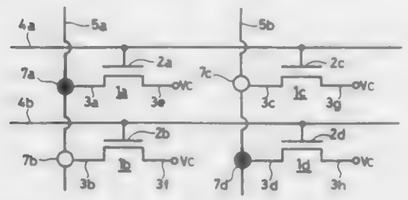
a second electrode arranged overlapping with said first electrode so as to be geometrically connected to the same at an intersection;

said insulating film having a hole at a position corresponding to said intersection, said second electrode connected to said first electrode through said hole;

at least one of said first and second electrodes being formed of a ceramics system high temperature superconductor selectively operating at a superconducting state; and

said at least one of said first and second electrodes formed of the ceramics system high temperature superconductor operating at a non-superconducting state for at least one of said memory cells and having a high resistance region for insulating said first and second electrodes from each other at said intersection corresponding to a prescribed stored data,

wherein data output from an addressed memory cells is determined by the superconducting or non-superconducting state of the ceramics system superconductor electrode.



4,990,490

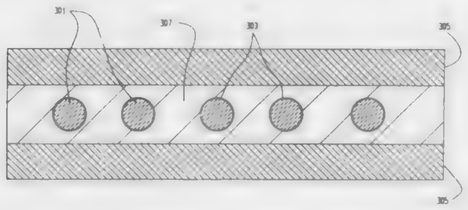
ELECTRICAL SUPERCONDUCTING CERAMIC FIBER DEVICES

Viren M. Pathare, Shrewsbury, and John W. Halloran, Hopkinton, both of Mass., assignors to CPS Superconductor Corp., Milford, Mass.

Filed Jun. 3, 1988, Ser. No. 202,964

Int. Cl.[5] C22C *00/00;* H01L *00/00*

U.S. Cl. 505—1 6 Claims



1. A process for producing an electrical conductor, comprising the steps of:

(i) providing at least one sintered superconducting ceramic fiber having a metallization coating sintered thereon;

(ii) providing at least one composite sheet having a cladding metal outer layer and a conductive adherent inner layer;

(III) manipulating at least one composite sheet to provide generally opposing inner layers of the adherent;

(iv) feeding at least one eramic fiber between the opposing layers; and

(v) sandwiching the fed fiber(s) between the opposing layers to form an electrical conductor.

4,990,491

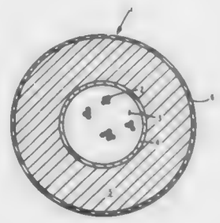
INSULATION FOR SUPERCONDUCTORS

George R. Wagner, Murrysville, and Adolphus Patterson, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1988, Ser. No. 212,842

Int. Cl.[5] B32B *3/00*

U.S. Cl. 505—1 3 Claims



1. A superconducting cable comprising:

at least two wire strands, each consisting of a superconductor having an operating temperature below 250 degrees Kelvin;

a cladding consisting essentially of nickel disposed about at least one of said strands; and

an adherent coating of 1.5–20.0 micron thickness of nickel oxide formed on the outer surface of said cladding, said nickel oxide having 0.7 to 0.99 stoichiometric oxygen, to be electrically insulating at the operating temperature of said superconductor, whereby high thermal conductivity strand insulation capable of withstanding strand to strand voltages of greater than 50 volts is provided to substantially eliminate coupling currents between the strands, and whereby nickel oxide having areas thereof semiconducting due to containing more than stoichiometric oxygen is avoided.

4,990,492

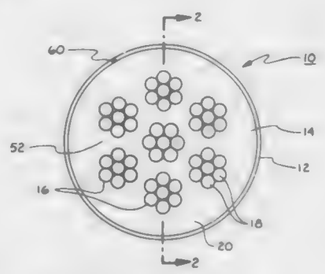
STRESS CONTROLLING SUPERCONDUCTOR WIRE

Richard L. Creedon, San Diego, and Yen-Hwa L. Hsu, Solana Beach, both of Calif., assignors to General Atomics, San Diego, Calif.

Filed Jan. 3, 1989, Ser. No. 293,227

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 3 Claims



1. A superconductor wire comprising:

a thin-walled tube extending from a first end to a second end;

a plurality of superconductor filaments disposed within the lumen of said tube for transmitting electricity from said first end to said second end of said tube; and

a solid filler contained in said tube and surrounding said filaments to provide support for said filaments, said filler being a solder selected from the group consisting of alloys of lead bismuth, silver, in drum or mixtures thereof and

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said filler being a material capable of being heated to a liquified state within said tube.

4,990,493

PROCESS OF MAKING AN ORIENTED POLYCRYSTAL SUPERCONDUCTOR

Kenneth W. Lay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,296
Int. Cl.[5] B01L *39/12*; H01F *1/10*
U.S. Cl. 505—1 45 Claims

1. A process for producing a superconductive sintered body which comprises providing a matrix powder selected from the group consisting of $YBa_2Cu_3O_{7-y}$, $LaBa_2Cu_3O_{7-y}$, and a combination thereof wherein y ranges from zero to about 1, providing $LnBa_2Cu_3O_{7-y}$ seed crystals where Ln is selected from the group consisting of Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb, those combinations thereof wherein the seed crystals have a preferred axis of magnetization which is parallel to the c-axis, or those combinations thereof wherein the seed crystals have a preferred axis of magnetization which is perpendicular to the c-axis, and wherein y ranges from zero to about 1, said seed crystals having an average particle size at least about twice as large as the average particle size of said matrix powder, forming a mixture of said matrix powder and seed crystals, said seed crystals ranging from about 1% by volume to about 50% by volume of said mixture, applying an aligning magnetizing field to said mixture to at least substantially align said seed crystals along their preferred axis of magnetization, forming the resulting aligned material into a compact wherein said seed crystals are substantially aligned along their preferred axis of magnetization, sintering said compact in an oxidizing atmosphere at a temperature ranging from about 900° C. to below the melting point of said mixture producing a sintered body having an open porosity ranging from zero to about 20% by volume of said body, and cooling said body in an oxidizing atmosphere at a rate which produces a superconductive body.

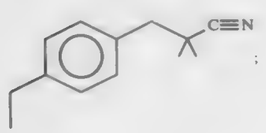
4,990,494

1,1-DIMETHYL-1-NITRILO OR HYDROXYLAMINO-3-(ALKYL PHENYL)-SUBSTITUTED PROPANES, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

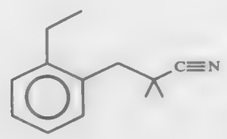
Anubhav P. S. Narula, Hazlet; John J. De Virgilio, Freehold, both of N.J., and Eleanor Fox, New York, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Feb. 2, 1990, Ser. No. 474,545
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—6 16 Claims

1. The mixture of nitriles having the structures:

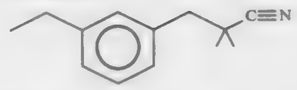


;



and

-continued



3. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and perfumed polymers comprising the step of intimately admixing with said consumable material an aroma augmenting of enhancing quantity of at least one compound defined according to claim 1.

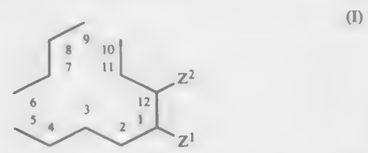
4,990,495

OXYGEN CONTAINING MACROCYCLIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS PERFUMING INGREDIENTS

Wolfgang K. Giersch, Bernex, and Karl-Heinrich Schulte-Elte, Onex, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Nov. 14, 1989, Ser. No. 436,403
Claims priority, application Switzerland, Dec. 23, 1988, 4791/88
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—8 4 Claims

1. A method to confer, enhance, improve or modify the odor properties of a perfuming composition or perfumed product, which method comprises adding to said composition or product a fragrance effective amount of a compound of formula



(I)

werein the symbol Z^1 stands for an oxygen atom or an OH group, the dotted lines indicate the location of an endocyclic single or double bond in positions 4 and 8 of the ring and of an exocylic carbon-oxygen single (Z^1=OH) or double (Z^1=O) bond in position 1, the wavy lines define a C—C bond of E or Z configuration when the bond in positions 4 and 8 is a double bond, and the symbol Z^2 stands for a group OR^3, wherein R^3 represents a linear or branched alkyl radical, containing from 1 to 6 carbon atoms.

4,990,496

USE OF CYCLOALIPHATIC KETONES AS PERFUMING AND FLAVORING INGREDIENTS

Charles Fehr, Versoix, and José Galindo, Les Avanchets, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Feb. 3, 1989, Ser. No. 305,815
Claims priority, application Switzerland, Feb. 5, 1988, 418/88; Sep. 15, 1988, 3441/88
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—24 15 Claims

1. Method to confer, modify or improve the organoleptic properties of foodstuffs, beverages and infusion or decoction products, which comprises the step of adding thereto a flavor effective amount of (−)-(1S)-1-(2′,2′,6′-trimethyl-2′-cyclohexen-1′-yl)-2-buten-1-one.

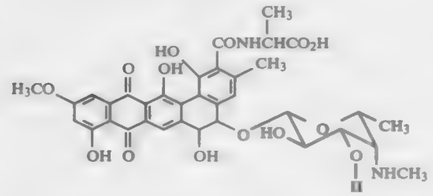
4,990,497

ANTIFUNGAL ANTIBIOTICS

Toshikazu Oki, 4-20-10 Shodo, Sakae-ku, Yokohama; Kyoichiro Saitoh, 2-8-19 Numama, Zushi; Kozo Tomatsu, 5-8-14 Tateishi, Katsushika-ku, Tokyo; Koji Tomita, 5-2-3 Kami-yhoga, Setagaya-ku, Tokyo; Masataka Konishi, 7-5-7 Arima, Miyamae-ku, Kawasaki; Takeo Miyaki, 5-18-24 Tsunashima-Nishi, Kohoku-ku, Yokohama; Mitsuaki Tsunakawa, 2-10-3, and Maki Nishio, 3-13-1-403, both of Koyama, Shinagawa, all of Japan

Division of Ser. No. 115,273, Nov. 2, 1987, Pat. No. 4,870,165, which is a continuation-in-part of Ser. No. 10,058, Feb. 2, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 366,573
Int. Cl.[5] C12P *17/56*; C07H *15/24*; A61K *31/70*
U.S. Cl. 514—27 3 Claims

1. An antibiotic having the formula



(D)

or a base salt, acid addition salt or internal salt thereof, or ester of the carboxylic acid group.

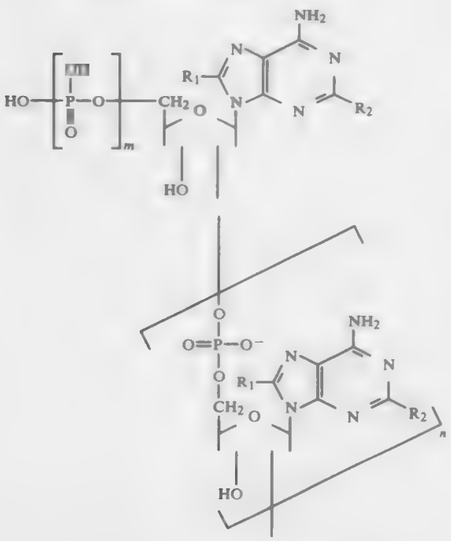
4,990,498

2- AND 8-AZIDO(2′-5′)OLIGOADENYLATES AND ANTIVIRAL USES THEREOF

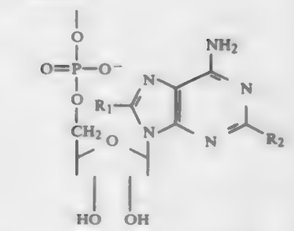
Robert J. Suhadolnik, Roslyn, Pa., assignor to Temple University-of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Apr. 26, 1988, Ser. No. 186,414
Int. Cl.[5] C07H *17/02*
U.S. Cl. 514—47 24 Claims

1. A compound of the formula



-continued



wherein m is an integer from 0 to 3, n is an integer from 0 to 3, and each R_1 and each R_2 is, independently of each other R_1 and R_2, hydrogen or N_3, provided at least one R_1 or R_2 is N_3; and water soluble salts thereof.

22. A method of controlling a viral infection in mammals comprising administering an antiviral effective amount of a compound according to claim 1.

4,990,499

ANTI-HERPES SIMPLEX VIRUS ACTIVITY OF 5-ALKOXYMETHYL-2′-DEOXYCYTIDIMES AND THEIR 5-MONOPHOSPHATES

Vidya S. Gupta; Guy Tourigny; Philip J. Aduma, and Allan L. Stuart, all of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatchewan, Canada

Filed Dec. 12, 1989, Ser. No. 448,944
Claims priority, application Canada, Sep. 29, 1989, 615352
Int. Cl.[5] A61K *31/70*; C07H *19/067, 19/073, 19/173*
U.S. Cl. 514—49 22 Claims

3. A method of combating infections caused by Herpes simplex virus, in a patient in need thereof said method comprising of administering to a patient an effective amount of a 5′-alkoxymethyl-2′-deoxycytidine wherein the alkoxy group contains up to 4 carbon atoms, or a 5′-monophosphate thereof, or a pharmaceutically acceptable salt or N^4-acylated prodrug thereof, wherein the acyl group is derived from an alkanoic acid having 3 to 7 carbon atoms.

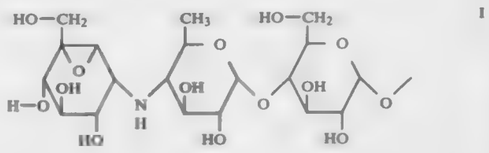
4,990,500

OXIRANE PSEUDOOLIGOSACCHARIDES, A PROCESS FOR THEIR PREPARATION, THEIR USE AND PHARMACEUTICAL PREPARATIONS

László Vértesy, Eppstein/Taunus; Joachim Betz, Frankfurt am Main; Hans-Wolfram Fehlhaber, Idstein, and Karl Geisen, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 83,807
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627421
Int. Cl.[5] A61K *31/70, 7/40*; C12P *19/26*
U.S. Cl. 514—54 11 Claims

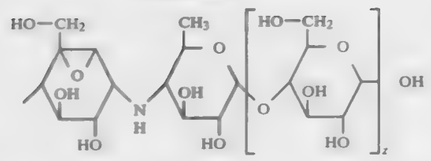
1. An oxirane-pseudooligosaccharide of the formula I



I

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-continued



in which z is zero or 1, and its physiologically acceptable salts with acids.

5. A method for treating diabetes, prediabetes or adiposis in a host which comprises administering to said host an effective amount of an oxirane-pseudooligosaccharide as claimed in claim 1 for said treatment, with or without a pharmaceutically acceptable carrier.

4,990,501

FILM FORMING COMPOSITION FOR TOPICAL USE

Frazer K. E. Imrie, Reading, United Kingdom, and Ken James, Grove, England, assignors to Sempernova PLC, Reading, England

PCT No. PCT/GB86/00333, § 371 Date Mar. 26, 1987, § 102(e) Date Mar. 26, 1987, PCT Pub. No. WO86/07255, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 11, 1986, Ser. No. 23,859

Claims priority, application United Kingdom, Jun. 13, 1985, 8514978

Int. Cl.[5] A61K *7/48, 47/00, 31/70*

U.S. Cl. 514—54 **15 Claims**

1. A composition for application to human or animal tissue surfaces, said composition comprising water and a film forming component at least partially soluble or dispersible in said water, and said film forming component comprising a sucrose ester or mixture of sucrose esters, wherein the quantity of sucrose ester or mixture of sucrose esters is 40% to 80% (w/w) of the composition excluding the water.

4,990,502

LOW MOLECULAR WEIGHT HEPARINS OF REGULAR STRUCTURE, THEIR PREPARATION AND THEIR BIOLOGICAL USES.

Jean-Claude Lormeau, Maromme; Maurice Petitou, Paris Cedex, and Jean Choay, Paris, all of France, assignors to Sanofi, S.A., Paris, France

Filed Apr. 15, 1988, Ser. No. 181,969

Claims priority, application France, Apr. 16, 1987, 87 05457

Int. Cl.[5] A61K *31/725;* **C08B** *37/10*

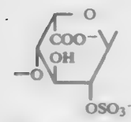
U.S. Cl. 514—56 **18 Claims**

1. A composition of heparins of low molecular weight and their pharmaceutically acceptable salts, which composition is almost completely lacking anticoagulant activity and essentially consists of fragments lacking repeating disaccharide sequences of non-sulfated uronic acid glucosamine N-sulfate, the fragments having the following general Formula I:

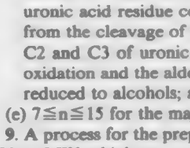
$$R—(X—Y)_n—R \qquad (I)$$

in which

(a) X is selected from the group consisting of a sulfated iduronic acid residue of Formula II:

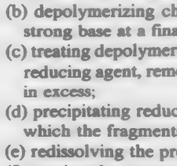


and a non-sulfated uronic acid residue which is selected from the group consisting of D-glucuronic acid and L-iduronic acid and which is ring-opened between the carbon atoms at positions 2 and 3 of Formula III:



wherein X is the non-sulfated uronic acid residue to the extent of at least about one residue per every two fragments;

(b) Y is a D-glucosamine residue of Formula IV:



wherein R_1 is selected from the group consisting of a hydrogen atom and a —SO_3— group, R_2 is selected from the group consisting of a —SO_3— group and a —CO—CH_3 group wherein R2 is a —SO_3— group for at least 90% of all occurrences of R_2 in the composition, R_3 is selected from the group consisting of a —SO_3— group and a hydrogen atom, wherein R_3 is a —SO_3— group for at least 70% of all occurrences of R_3 in the composition;

(c) R is selected from the group consisting of a hydrogen atom and a residue:

wherein R_1 and R_2 and R_3 are as defined above, and R4 is selected from the group consisting of a hydrogen atom and a uronic acid residue;

(d) R′ is selected from the group consisting of a hydrogen atom, an unmodified uronic acid residue, and a modified uronic acid residue containing aldehyde groups resulting from the cleavage of the bond between the carbon atoms C2 and C3 of uronic acid during the course of periodic oxidation and the aldehyde functions of which have been reduced to alcohols; and

(e) $7 \leqq n \leqq 15$ for the majority of the fragments.

9. A process for the preparation of compositions of heparins of low MW which comprises the steps of:

(a) treating an aqueous solution of heparin at a final concentration of 0.5 to 5% (wt/v) with periodic acid at a final concentration of 0.5 to 4% (wt/v) at a pH between 4.5 and 6.5 and at a temperature between 0° and 10° C.;

(b) depolymerizing chains of heparin thus obtained with a strong base at a final molarity of the base of 0.1 to 0.3N;

(c) treating depolymerization fragments thus obtained with a reducing agent, removing excess reducing agent when it is in excess;

(d) precipitating reduced fragments obtained in a solvent in which the fragments are insoluble;

(e) redissolving the precipitate to form an aqueous solution;

(f) treating the aqueous solution, to which a mineral salt has been added with alcohol in order to fractionate and remove low molecular weight fragments;

(g) recovering the fragments in the form of a salt with a strong base and converting the salt corresponding to the strong base into a pharmaceutically acceptable salt.

4,990,503

HETEROCYCLIC BISPHOSPHONIC ACID DERIVATIVES

Yasuo Isomura; Makoto Takeuchi, and Tetsushi Abe, all of Ibaraki, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

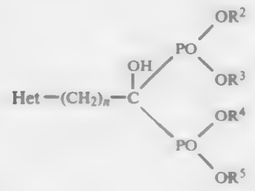
Filed Aug. 7, 1989, Ser. No. 390,090

Claims priority, application Japan, Aug. 12, 1988, 63-201535; Aug. 12, 1988, 63-201536

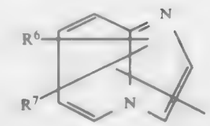
Int. Cl.[5] C07D *471/04;* **A61K** *31/675*

U.S. Cl. 514—80 **7 Claims**

1. Heterocyclic bisphosphonic acid derivatives represented by the formula:



in which Het represents



wherein R^6 and R^7 may be the same or different, each represents a hydrogen atom, a lower alkyl group, a halogen atom or a hydroxyl group,

R^2, R^3, and R^5 may be the same or different, and each represents a hydrogen atom or a lower alkyl group,

"n" is 0 or 1,

or pharmaceutically acceptable salts thereof.

4,990,504

AZETIDINE DERIVATIVES TO TREAT MEMORY AND LEARNING DISORDERS

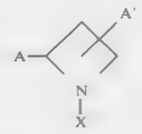
Alan P. Kozikowski, Pittsburgh, Pa.; Jarda T. Wroblewski, Kensington, and Erminio Costa, Chevy Chase, both of Md., assignors to FIDIA-Georgetown Institute for the Neurosciences, Washington, D.C.

Continuation-in-part of Ser. No. 74,958, Jul. 17, 1987 Pat. No. 4,946,839. This application Jun. 24, 1988, Ser. No. 210,917

Int. Cl.[5] A61K *31/395*

U.S. Cl. 514—210 **6 Claims**

1. A method of treating memory disorders or learning disorders in a mammal which comprises administering to said mammal a therapeutically effective amount of a compound having the formula:



wherein A and A′ are the same or different and selected from the group consisting of



and wherein R and R′ are the same or different and selected from the group consisting of hydrogen, lower alkyl, benzyl, and an amino acid; n=1–6; X is hydrogen, an acyl group or a benzyl group; or a pharmaceutically acceptable salt thereof.

4,990,505

PHENETHANOLAMINE COMPOUNDS

Ian F. Skidmore, Welwyn; Lawrence H. C. Lunts, Broxbourne; Harry Finch, Hitchin; Alan Naylor, Royston, and Ian B. Campbell, Blanes, all of England, assignors to Glaxo Group Limited, London, England

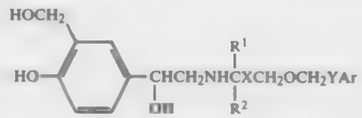
Continuation of Ser. No. 141,063, Jan. 5, 1988, abandoned, which is a continuation of Ser. No. 71,703, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 724,030, Apr. 17, 1985, abandoned. This application Apr. 18, 1989, Ser. No. 339,608

Claims priority, application United Kingdom, Apr. 17, 1984, 8409909; Apr. 17, 1984, 8409910; Oct. 17, 1984, 8426206; Oct. 17, 1984, 8426197

Int. Cl.[5] A61K *31/55;* **C07D** *267/10*

U.S. Cl. 514—211 **23 Claims**

1. A compound of formula (I)



(I)

wherein

Ar represents a phenyl group optionally substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, —$(CH_2)_qR$, —$O(CH_2)_rR^{10}$ and —NO_2,

or Ar represents a phenyl group substituted by an alkylenedioxy group having the formula —$(OCH_2)_pO$—; where

R is selected from the group consisting of hydroxy, C_{1-6} alkoxy, —NR^3R^4, —NR^5COR^6, $NR^5SO_2R^7$, —COR^8, —SOR^9, —SR^9, SO_2R^9 and —CN;

R^1 and R^2 are each independently selected from the group consisting of hydrogen and C_{1-3} alkyl, providing that the sum total of carbon atoms in R^1 and R^2 is not greater than 4;

R^3 and R^4 are each independently selected from the group consisting of hydrogen and C_{1-4} alkyl or —NR^3R^4 forms a saturated heterocyclic amino group which is selected from pyrrolidino, piperidino, hexamethylenimino, piperazino, N-methylpiperazino, morpholino, homomorpholino and thiamorpholino;

R^5 is selected from the group consisting of hydrogen and C_{1-5} alkyl;

R^6 is selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, phenyl and —NR^3R^4;

R^7 is selected from the group consisting of C_{1-4} alkyl, phenyl and —NR^3R^4;

R^8 is selected from the group consisting of hydroxy, C_{1-4} alkoxy and —NR^3R^4;

R^9 is selected from the group consisting of hydrogen, C_{1-4} alkyl and phenyl;

R^{10} is selected from the group consisting of hydroxy and C_{1-4} alkoxy;

X is selected from the group consisting of C_{1-7} alkylene, C_{2-7} alkenylene and C_{2-7} alkynylene;

Y is selected from the group consisting of a bond, C_{1-6} alkylene, C_{2-6} alkenylene and C_{2-6} alkynylene, providing that the sum total of carbon atoms in X and Y is 2–10 and when X represents C_{1-7} alkylene and Y represents a bond

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or C_{1-6} alkylene, then the group Ar is a substituted phenyl group, providing further that when the phenyl group is substituted by only one or two substituents selected from the group consisting of halogen atoms, C_{1-3} alkyl and C_{1-3} alkoxy, it contains at least one additional substituent which is different from those substituents;

p is an integer 1 or 2

q is an integer from 0 to 3; and

r is an integer 2 or 3;

and physiologically acceptable salts and solvates thereof.

20. A method of treating a patient suffering from premature labor, depression, congestive heart failure, an inflammatory or allergic skin disease, glaucoma or a condition in which there is an advantage in lowering gastric acidity such as gastric or peptic ulceration which method comprises administering to said patient an effective amount of compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof.

4,990,506

3-(ACYLAMINOMETHYL)IMIDAZO(1,2-a)PYRIDINE DERIVATIVES AND THEIR APPLICATION IN THERAPY

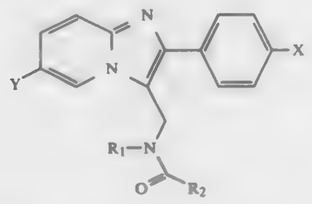
Pascal George, Vitry Sur Seine; Claudie Giron, Antony, and Jacques Froissant, Moree, all of Belgium, assignors to Synthelabo, Paris, France

Division of Ser. No. 204,748, Jun. 10, 1988, Pat. No. 4,891,371, which is a continuation of Ser. No. 10,703, Feb. 4, 1987, Pat. No. 4,767,755. This application Oct. 24, 1989, Ser. No. 425,870

Int. Cl.[5] C07D *471/04;* A61K *31/44*

U.S. Cl. 514—212 **2 Claims**

1. A compound of the formula



in which

R_1 denotes hydrogen, linear or branched C_1–C_4 alkyl, or benzyl;

R_2 denotes linear or branched C_1–C_6 alkyl, cyclohexyl, trichloromethyl, 1-propenyl, allyl, phenyl, 4-chlorophenyl, or benzyl, or R_1 and R_2 together denote a C_3–C_5 aliphatic chain;

X denotes optionally esterified carboxy of formula -COOR in which R denotes hydrogen or C_1–C_6 alkyl; cyano; optionally mono- or dialkylated aminocarbonyl of formula $—CONR_3R_4$ in which R_3 and R_4 independently denote hydrogen or C_1–C_4 alkyl or together denote a chain of formula $—(CH_2)_2—Z—(CH_2)_2—$ in which Z denotes a direct bond, oxygen, sulphur, or a divalent group of formula $—CH_2—$, —NH— or —N(C_1–C_4 alkyl)—; or a group of formula



in which Z denotes a direct bond, oxygen, sulphur, or a divalent group of formula $—CH_2—$, —NH— or —N(C_1–C_4-alkyl)-; and

Y denotes hydrogen, halogen or methyl;

or a pharmaceutically acceptable acid addition salt.

4,990,507

N-CONTAINING HETEROCYCLIC COMPOUNDS, AND COMPOSITION COMPRISING THE SAME

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Kimio Esumi, Kobe; Atsushi Kuno, Osaka; Hiroyoshi Sakai, Uji; Kazuhiro Maeda, Yamatotakada, and Yoshie Sakamoto, Yonago, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

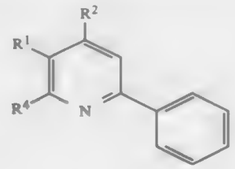
Continuation-in-part of Ser. No. 184,195, Apr. 21, 1988, Pat. No. 4,857,527, which is a continuation-in-part of Ser. No. 940,923, Dec. 12, 1986, Pat. No. 4,831,030. This application Jan. 9, 1989, Ser. No. 294,743

Claims priority, application United Kingdom, Dec. 21, 1985, 8530602; Japan, Jun. 11, 1987, 62-145996; Oct. 5, 1987, 62-251771; South Africa, Sep. 15, 1988, 88/6889

Int. Cl.[5] C07D *401/12, 213/82, 213/75;* A61K *31/44*

U.S. Cl. 514—227.8 **5 Claims**

5. A pharmaceutical composition as a therapeutic agent for ischemic disease comprising a compound of the formula:



wherein

R^1 is carbamoyl substituted with morpholino (lower) alkyl, thiomorpholino(lower)alkyl or lower alkylamino(lower-)alkyl; or ureido substituted with lower alkylamino(lower-)alkyl; and

R^2 is phenyl substituted with nitro, and

R^4 is lower alkyl; or

R^2 is lower alkyl, and

R^4 is phenyl substituted with nitro;

with proviso that R^1 is carbamoyl substituted with thiomorpholino(lower)alkyl or lower alkylamino(loweralkyl; or ureido substituted with lower alkylamino(lower)alkyl when R^4 is lower alkyl; or its salt, as an active ingredient, in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,990,508

PYRIDONE CARBOXYLIC ACID DERIVATIVES AND SALTS THEREOF, PROCESS FOR PRODUCING THE SAME AND ANTIBACTERIAL AGENTS COMPRISING THE SAME

Hirokazu Narita; Yozo Todo, both of Toyama; Jun Nitta, Toda; Hiroyasu Takagi, Toyama; Fumihiko Iino, Toyama; Mikako Miyajima, Toyma; Yoshikazu Fukuoka, Toyma, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

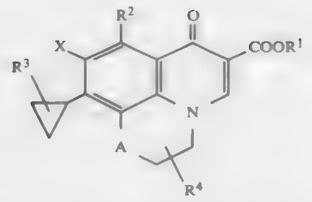
Filed Apr. 13, 1989, Ser. No. 337,656

Claims priority, application Japan, Apr. 23, 1988, 63-100628; Mar. 28, 1989, 1-75873

Int. Cl.[5] A61K *31/54, 31/535, 31/475;* C07D *265/34*

U.S. Cl. 514—228.2 **50 Claims**

1. A pyridone carboxylic acid derivative represented by the following formula or a pharmaceutically acceptable salt thereof:



wherein R^1 represents a hydrogen atom or a pharmaceutically acceptable carboxyl-protecting group; R^2 represents a hydrogen atom, a halogen atom, an alkoxy group, a pharmaceutically acceptable protected or unprotected hydroxyl group, a pharmaceutically acceptable protected or unprotected amino group, a pharmaceutically acceptable protected or unprotected lower alkylamino group or a di-lower alkylamino group; R^3 represents at least one group selected from the group consisting of hydrogen atom, lower alkyl group, pharmaceutically acceptable protected or unprotected amino group, pharmaceutically acceptable protected or unprotected lower alkylamino group, di-lower alkylamino group, pharmaceutically acceptable protected or unprotected carboxyl group, pharmaceutically acceptable protected or unprotected amino-lower alkyl group, pharmaceutically acceptable protected or unprotected lower alkylamino-lower alkyl group, di-lower alkylamino-lower alkyl group and pharmaceutically acceptable protected or unprotected hydroxy-lower alkyl group; R^4 represents at least one group selected from the group consisting of hydrogen atom, lower alkyl group, halogeno-lower alkyl group, pharmaceutically acceptable protected or unprotected hydroxyl-lower alkyl group, lower alkylidene group and a group forming a cycloalkane ring with the carbon atom to which R^4 bonds; X represents a halogen atom; and A represents an oxygen or sulfur atom of a lower alkyl-substituted or unsubstituted imino group.

4,990,509

SULFONAMIDE ANTI-ARRHYTHMIC AGENTS

John E. Arrowsmith, Deal; Peter E. Cross, Canterbury, and Geoffrey N. Thomas, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

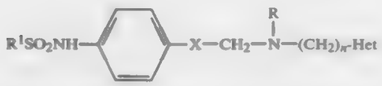
Division of Ser. No. 37,309, Apr. 9, 1987, Pat. No. 4,863,948. This application Jun. 2, 1989, Ser. No. 360,517

Claims priority, application United Kingdom, Apr. 16, 1986, 8609331

Int. Cl.[5] A61K *31/40, 31/42, 31/50;* C07D *209/46*

U.S. Cl. 514—247 **8 Claims**

1. A sulfonamide compound of the formula:



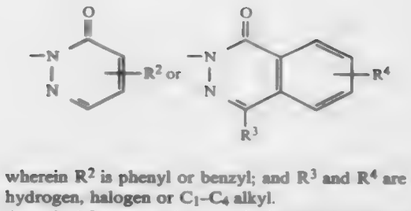
or a pharmaceutically acceptable salt thereof, wherein

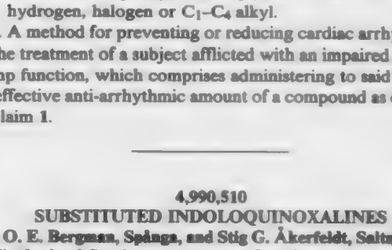
R and R^1 are each C_1–C_4 alkyl;

X is $—CH_2—$, —CO— or —CH(OH)—;

n is two, three or four; and

"Het" is a nitrogen-containing heterocyclic group of the formula:





wherein R^2 is phenyl or benzyl; and R^3 and R^4 are each hydrogen, halogen or C_1–C_4 alkyl.

7. A method for preventing or reducing cardiac arrhythmias in the treatment of a subject afflicted with an impaired cardiac pump function, which comprises administering to said subject an effective anti-arrhythmic amount of a compound as claimed in claim 1.

4,990,510

SUBSTITUTED INDOLOQUINOXALINES

Jan O. E. Bergman, Spånga, and Stig G. Åkerfeldt, Saltsjö-Duvnäs, both of Sweden, assignors to Leif Lundblad, Rhode St. Genese, Belgium

PCT No. PCT/SE87/00019, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987, PCT Pub. No. WO87/04436, PCT Pub. Date Jul. 30, 1987

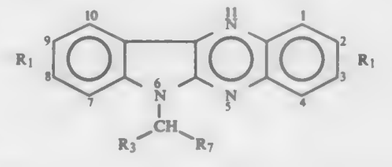
PCT Filed Jan. 19, 1987, Ser. No. 102,147

Claims priority, application Sweden, Jan. 21, 1986, 8600260

Int. Cl.[5] C07D *487/04;* A61K *31/495*

U.S. Cl. 514—250 **13 Claims**

1. An indoloquinioxaline of formula I



wherein

R^1 represents one or more similar or different substituents in the positions 1–4 or 7–10, selected from the group consisting of halogen, lower alkyl or alkoxy group having not more than 4 carbon atoms, trifluoromethyl group and trichloro methyl group;

R_7 is a group $—(CH_2)_n—R_2$ wherein R_2 represents NH_2, NHR_4 or NR_5R_6 wherein R_4, R_5 and R_6 independently are lower alkyl and n is an integer of from 1 to 4 and

R_3 represents hydrogen or a lower alkyl or cycloalkyl group having not more than 4 carbon atoms,

and physiologically acceptable addition products of the compounds with acids and halogen adducts.

7. An antiviral composition comprising an antivirally effective amount of a substituted indolquinoxaline according to claim 1 wherein said indolquinoxaline is substituted with phosphonoformic acid, in a pharmaceutically acceptable carrier.

4,990,511

AMIDE COMPOUNDS, THEIR PRODUCTION AND USE

Terumi Nakajima; Koichi Shudo, both of Tokyo, and Giichi Goto, Toyono, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

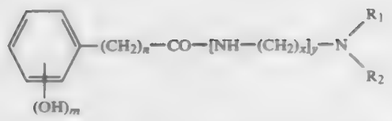
Filed Aug. 2, 1989, Ser. No. 388,676

Claims priority, application Japan, Aug. 3, 1988, 63-194246

Int. Cl.[5] A61K *31/495, 31/445, 31/535;* C07D *295/10*

U.S. Cl. 514—255 **8 Claims**

1. A compound of the formula:



wherein R_1 and R_2 each is hydrogen atom, an alkyl group optionally substituted with a halogen, hydroxyl, amino, or oxo group or an acyl group optionally substituted with a halogen, hydroxyl, amino, or oxo group or



is a cyclic amino group formed by elimination of a hydrogen atom from NH in 5- to 24- membered cyclic amine represented by



in which ring constituting atoms are C, N, O, S, or combination thereof optionally substituted on N with a lower alkyl group, an aryl group, an aralkyl group, or an acyl group and optionally substituted on C with a lower alkyl group, an acyl group, a lower alkylidene group, an oxo group, or a thioxo group, m is 2 such that the positions of the OH group are 2,4- or 3,4- on the benzene ring, n is an integer of 0 to 4, x is an integer of 2 to 6 and y is an integer of 0 to 3, or a salt thereof.

8. The use of a compound as defined in claim 1, or a pharmaceutically acceptable salt thereof for the prevention of the sequelae of cerebral apoplexy in a warm-blooded animal comprising administering to the animal an effective amount of the compound.

4,990,512

PYRIDYL-PYRIMIDONES

Trevor R. Perrior, Barkham; Alan J. Whittle, Twyford, and David J. Tapolczay, Reading, all of England, assignors to Imperial Chemical Industries PLC, London, England

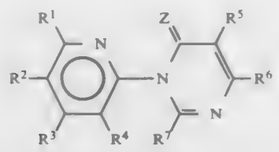
Filed Jul. 27, 1989, Ser. No. 385,446

Claims priority, application United Kingdom, Aug. 4, 1988, 8818561

Int. Cl.[5] C07D *401/04*; A01N *43/54*

U.S. Cl. 514—269 **9 Claims**

1. A compound of formula (I):



(I)

wherein R^1 and R^3 are independently selected from hydrogen; halogen; nitro; cyano; or lower alkyl, lower alkoxy, lower alkylthio or cycloalkyl any of which can be optionally substituted by halogen;

R^2 is hydrogen; halogen; nitro; cyano; lower alkyl, lower alkoxy or lower alkylthio any of which may be optionally substituted with halogen; or $S(O)_nR^8$, where R^8 is lower alkyl, halo lower alkyl or cycloalkyl and n is 0, 1 or 2;

R^4 is hydrogen; halogen; nitro; cyano; or lower alkyl, lower alkoxy or lower alkythio any of which may be optionally substituted with halogen;

R^5 is hydrogen; halogen; nitro; cyano; lower alkyl, lower alkoxy, lower alkylthio any of which can be optionally substituted with halogen; or NR^9R^{10} where R^9 and R^{10} are independently selected from hydrogen, lower alkyl or cycloalkyl;

R^6 is hydrogen; halogen; nitro; cyano; lower alkyl, lower alkoxy or lower alkylthio any of which can be optionally substituted with halogen; or $S(O)_nR^8$;

R^7 is hydrogen; halogen; nitro; cyano; lower alkyl; lower alkoxy or lower alkylthio any of which is optionally substituted with halogen; $S(O)_nR^8$; or NR^9R^{10}; and

Z is oxygen or sulphur.

7. A method of killing or controlling insect pests which method comprises applying to the pest or to a locus thereof an effective amount of a compound of formula (I) as defined in claim 1.

4,990,513

ANTIHYPOXIC DRUG AND METHOD OF ITS APPLICATION

Ani I. Genova; Milka P. Nikolova; Maria G. Todorova; Alexander P. Monov; Nikola G. Alexandrov; Rumen K. Nikolov; Violeta H. Andonova; Nadejda I. Zoneva; Yosif N. Nisimov; Snejana G. Vitkova; Nikola G. Boyadjiev; Anastasia M. Stoyanova; Keranka N. Savova; Nevena L. Firkova, and Slava N. Spasova, all of Sofia, Bulgaria, assignors to S O "Pharmachim" , Sofia, United Kingdom

Filed Feb. 3, 1987, Ser. No. 10,369

Int. Cl.[5] A61K *31/505*

U.S. Cl. 514—274 **4 Claims**

1. An anti-hypoxic therapeutic composition in unit dosage form consisting essentially of an effective amount of 2-oxo-pyrrolidine-1-acetamide and orotic acid, or the pharmaceutically acceptable salts thereof, in a weight ratio of about 20:1.

4,990,514

NON-PARTICULATE, NON-FLOWABLE, NON-REPELLANT INSECTICIDE-BAIT COMPOSITION FOR THE CONTROL OF COCKROACHES

Francis J. Bruey, Bloomfield, N.J., assignor to The Clorox Company, Oakland, Calif.

Filed Apr. 27, 1987, Ser. No. 42,500

Int. Cl.[5] A01N *37/52, 43/50, 43/54, 43/62*

U.S. Cl. 514—275 **7 Claims**

1. A solid, non-particulate, non-repellant, insecticidal bait comprising by weight 0.25 to 5% of a non-repellant insecticide compound, a liquid food attractant, and a water-soluble binder material comprising a natural or synthetic glue and an emulsifier, said bait composition having a long pot life and being readily flowable during said pot life, and being non-flowable after being poured and hardened.

4,990,515

BENZO[1,8]NAPHTHYRIDINE DERIVATIVES AS ANTIMICROBIALS

Michel Antoine, Paris; Michel Barreau, Montgeron; Jean-Francois Desconclois, Paris; Philippe Girard, Arpajon, and Guy Picaut, Chevilly Larue, all of France, assignors to Rhone-Poulenc Sante, France

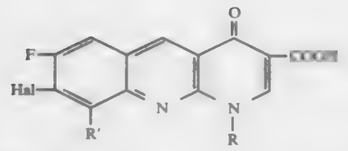
Filed Jan. 16, 1990, Ser. No. 465,316

Claims priority, application France, Jan. 16, 1989, 89 00430; Jul. 28, 1989, 89 10219

Int. Cl.[5] A01N *43/42*

U.S. Cl. 514—292 **8 Claims**

1. A new benzo[b][1,8]naphthyridine derivative, comprising a compound of the formula:



in which:

R represents a hydrogen atom, an alkyl or fluoroalkyl radical, a cycloalkyl radical containing 3 to 6 carbon atoms, or an alkoxy or alkyl radical or radical including trimethylsilyl, trityl, benzhydryl, tetrahydropyrannyl, formyl, acetyl, chloroacetyl, trichloroacetyl, trifluoroacetyl, methoxycarbonyl, ethoxycarbonyl, t.butoxycarbonyl, trichloroethoxycarbonyl, ethoxymethyl and methoxymethyl, and either Hal represents a fluorine, chlorine or bromine atom and R′ represents a hydrogen atom, or the symbols Hal and R′ simultaneously represent fluorine atoms, it being understood that the alkyl radicals cited above are straight-chain or branched and contain 1 to 4 carbon atoms, or a metal salt or addition salt with nitrogenous bases thereof.

8. An antimocrobial composition comprising an effective amount of at least one derivative according to claim 1, in which R is defined as in claim 1 with the exception of representing a radical including trimethylsilyl, trityl, benzhydryl, tetrahydropyrannyl, formyl, acetyl, chloroacetyl, trichloroacetyl, trifluoroacetyl, methoxycarbonyl, ethoxycarbonyl, t.butoxycarbonyl, trichloroethoxycarbonyl, ethoxymethyl and methoxymethyl, in the pure form or in combination with one or more compatible diluents or adjuvants.

4,990,516

AMELIORATING AGENT FOR DYSMNESIA

Mitsuo Ohashi; Fukutaro Taga, and Takashi Hirayama, all of Saitama, Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

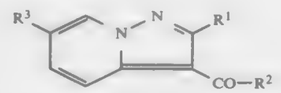
Filed Nov. 13, 1989, Ser. No. 434,409

Claims priority, application Japan, Nov. 11, 1988, 63-285217

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—299 **1 Claim**

1. A method for treating dysmnesia in a patient comprising administering to the patient an antidymnesia effective amount of the composition comprising pyrazolo [1,5-a]pyridine derivatives having the formula:



wherein R^1 and R^2 are independently hydrogen or a lower alkyl of 1–4 carbons, R^3 in hydrogen or a lower alkyl of 1–3 carbons or a lower alkoxy of 1–3 carbons, and a pharmaceutically acceptable carrier therefore.

4,990,517

7-(1-PYRROLIDINYL)-3-QUINOLONE- AND -NAPHTHYRIDONECARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS AND FEED ADDITIVES

Uwe Petersen, Leverkusen; Thomas Schenke, Bergisch-Gladbach; Andreas Krebs, Odenthal-Holz; Klaus Grobe; Michael Schriewer, both of Odenthal; Ingo Haller, Wuppertal; Karl G. Metzger, Wuppertal; Rainer Endermann, Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

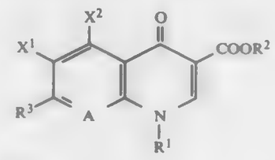
Filed Jun. 30, 1989, Ser. No. 375,434

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824072; Mar. 1, 1989, 3906365

Int. Cl.[5] A61K *31/44, 31/47*; C07D *471/04, 215/56*

U.S. Cl. 514—300 **14 Claims**

1. A 7-(pyrrolidinyl)-3-quinolone- or -naphthyridonecarboxylic acid derivative of the formula



(I)

in which

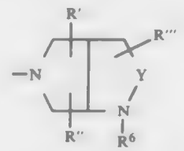
X^1 represents halogen,

X^2 represents hydrogen, amino, alkylamino having 1 to 4 carbon atoms, dialkylamino having 1 to 3 carbon atoms per alkyl group, hydroxyl, alkoxy having 1 to 4 carbon atoms, mercapto, alkylthio having 1 to 4 carbon atoms, arylthio or halogen,

R^1 represents alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, 2-hydroxyethyl, 2-fluoroethyl, methoxy, amino, methylamino, ethylamino, dimethylamino or phenyl which is optionally substituted by 1 or 2 fluorine atoms,

R^2 represents hydrogen, alkyl having 1 to 4 carbon atoms or (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl,

R^3 represents a radical of the structure



wherein

R^6 represents H, optionally hydroxyl-substituted C_1–C_4-alkyl, as well as phenyl, benzyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-acyl, (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl, or C_3–C_6-cycloalkyl,

R′ represents H, CH_3 or phenyl,

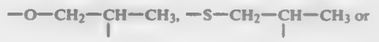
R″ represents H, CH_3 or phenyl,

R‴ represents H or CH_3,

Y represents O, CH_2, CH_2CH_2 or CH_2—O, it being possible for the CH_2—O group to be linked to the nitrogen either via O or via CH_2, and

A represents N or C—R^8, wherein

R^8 represents H, halogen, methyl, cyano, nitro, hydroxyl or methoxy or, together with R^1, forms a bridge having the structure



-continued

$-CH_2-CH_2-CH(CH_3)-$

or an addition product thereof with water, an acid or an alkali.

4,990,518

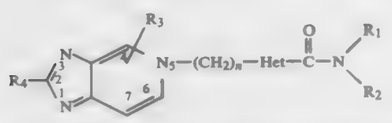
PHARMACOLOGICALLY ACTIVE HETEROARYL SUBSTITUTED IMIDAZO (4,5-c) PYRIDINES

Ish K. Khanna, Vernon Hills, and Richard M. Weier, Lake Bluff, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 13, 1989, Ser. No. 406,674
Int. Cl.[5] A61K *31/44;* C07D *471/04*
U.S. Cl. 514—303 14 Claims

1. A compound of the formula

I



or a pharmaceutically acceptable acid addition salt thereof or isomers thereof: wherein

R_1 and R_2 are each independently selected from hydrogen; straight or branched chain alkyl of 1 to 15 carbon atoms; cycloalkyl having 3 to 8 carbon atoms; cycloalkyl which can be substituted once or more by alkyl of 1 to 6 carbon atoms; phenyl; phenyl which can be substituted once or more by alkyl of 1 to 6 carbon atoms or halogen; straight or branched alkenyl having 3 to 15 carbon atoms with the proviso that the double bond of the alkenyl group cannot be adjacent to the nitrogen,

Het is a heteroaromatic ring having 5 atoms wherein said atoms are selected from carbon, nitrogen, oxygen or sulfur and wherein any of the carbon atoms can be optionally substituted with a substituent independently selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkoxy wherein the alkyl portion is 1 to 6 carbon atoms and halogen selected from bromo, fluoro, or chloro with the proviso that the carboxamide and imidazopyridine groups cannot be adjacent to each other and a nitrogen hetero atom of the heteroaryl ring is substituted by hydrogen or alkyl of 1 to 6 carbon atoms or HET is pyridine wherein any of the carbon atoms can be substituted with a substituent independently selected from the group consisting of alkyl of 1 to 6 carbon atoms; alkoxy wherein the alkyl portion is 1 to 6 carbon atoms and halogen selected from bromo, fluoro or chloro with the proviso that the carboxamide and imidazopyridine groups cannot be adjacent to each other,

n is an integer from 1 to 5,

R_3 is a group substituted at one or more of the 4, 6 or 7 positions of the pyridine ring said groups being independently selected from hydrogen, alkyl of 1 to 6 carbon atoms; halogen wherein the halogen is selected from bromo, fluoro, or chloro; or alkoxy wherein the alkyl portion is 1 to 6 carbon atoms.

R_4 is hydrogen or alkyl of 1 to 4 carbon atoms.

4,990,519

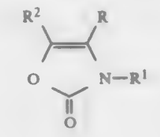
METHOD OF USING QUINOLYLOXAZOLE-2-ONES AS PROTEINKINASE C INHIBITORS

Winton D. Jones; George P. Claxton, both of Cincinnati, Ohio; Richard C. Dage; Hsien C. Cheng, both of Cincinnati, Ohio, and Phillip J. Robinson, Fitzroy, Australia, assignors to Merrell Dow Pharmaceuticals, Cincinnati, Ohio

Division of Ser. No. 411,439, Sep. 22, 1989, abandoned, which is a division of Ser. No. 261,435, Oct. 24, 1988, Pat. No. 4,886,811. This application Feb. 23, 1990, Ser. No. 484,581
Int. Cl.[5] A61K *31/42*
U.S. Cl. 514—314 2 Claims

1. A method of treating asthma which comprises administering to a patient in need thereof a compound of the formula

I



wherein

R and R^1 are each independently selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_1–C_3 alkylphenyl wherein the phenyl ring is optionally substituted with one, two or three of the substituents selected from the group consisting of fluorine, chlorine, bromine, C_1–C_4 alkyl, and C_1–C_4 alkoxy nitro and trifluoromethyl; and

R^2 is a 2-, 3-, or 4-quinolyl group optionally substituted with one, two or three of the substituents selected from the group consisting of fluorine, chlorine, bromine, C_1–C_4 alkyl, or C_1–C_4 alkoxy, nitro and trifluoromethyl; or

R^2 is a 5-, 6-, 7-, or 8-quinolyl group;

or a pharmaceutically-acceptable salt thereof, in an amount necessary to effect a bronchodilatory result.

2. A method of producing a bronchodilatory effect, in a patient in need thereof through the administration of a pharmaceutically-effective amount of a compound of claim 1, Formula 1.

4,990,520

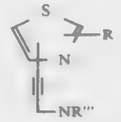
2-,4- OR 5-SUBSTITUTED THIAZOLE DERIVATIVES

Eugene J. Trybulski, Park Ridge, N.J., and Herbert J. Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Feb. 2, 1990, Ser. No. 474,573
Int. Cl.[5] A61K *31/425, 31/445;* C07D *417/06, 277/28*
U.S. Cl. 514—326 21 Claims

1. A compound selected from those of the Formulae:

I



wherein R is selected from hydrogen or $(C_1$–$C_6)$ alkyl; NR‴ is selected from NR″ and NR′ where NR′ is selected from amino, $(C_1$–$C_6)$alkylamino, $(C_1$–$C_6)$dialkylamino, pyrrolidinyl, piperidinyl and NR″ is $(C_1$–$C_6)$trialkylamino; and the pharmaceutically acceptable acid addition salts thereof "and wherein NR″ is $(C_1$–$C_6)$ trialkylamino the accompanying anion is a halide".

20. A method of treating central cholinergic disfunction in a mammal which comprises administering to said animal an effective amount of the compound selected from those of claim 1.

4,990,521

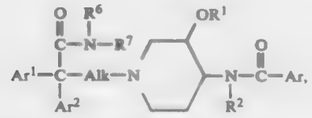
4-(ACYLAMINO)PIPERIDINE-BUTANAMIDE DERIVATIVES

Georges H. P. Van Daele, Turnhout; Freddy F. Vlaeminck, Lille; Francois M. Sommen, Wortel, and Michel A. J. De Cleyn, Merksplas, all of Belgium, assignors to Janssen Pharmaceutica, Beerse, Belgium

Continuation of Ser. No. 57,451, May 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 882,067, Jul. 3, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 405,575
Int. Cl.[5] A61K *31/445*
U.S. Cl. 514—327 15 Claims

1. A method of treating warm-blooded animals suffering from diarrhea, which method comprises the systemic administration to warm-blooded animals of an amount effective in treating diarrhea of a compound having the formula:

(I)



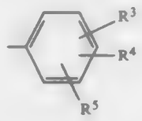
an N-oxide form, a pharmaceutically acceptable acid-solution salt, or a possible stereoisomeric form thereof, wherein

R^1 is a member selected from the group consisting of hydrogen, $C_{1\text{-}6}$alkyl, aryl $C_{1\text{-}6}$alkyl; $C_{1\text{-}6}$alkylcarbonyl, amino$C_{1\text{-}6}$alkyl, and mono- and di($C_{1\text{-}6}$alkyl)amino$C_{1\text{-}6}$alkyl;

R^2 is a member selected from the group consisting of hydrogen and $C_{1\text{-}6}$alkyl;

Ar is a radical of the formula;

(a-1)



wherein R^3, R^4, and R^5 are each independently selected from the group consisting of hydrogen, $C_{1\text{-}6}$alkyl, $C_{1\text{-}6}$alkyloxy, halo, hydroxy, cyano, nitro, amino, mono- and di($C_{1\text{-}6}$alkyl)amino, aminocarbonyl, arylcarbonylamino, $C_{1\text{-}6}$alkylcarbonylamino, $C_{1\text{-}6}$alkylcarbonyl, $C_{1\text{-}6}$alkylcarbonyloxy, aminosulfonyl, $C_{1\text{-}6}$alkylsulfinyl, $C_{1\text{-}6}$alkylsulfonyl, Cl-6 alkylthio, mercapto, C3-6 alkynyloxy, C3-6 alkenyloxy, aryl $C_{1\text{-}6}$alkyloxy, aryloxy, and $C_{1\text{-}6}$alkyl substituted with up to 4 halo atoms;

Alk is $-CH_2-CH_2$ - or $-CH_2-CH(CH_3)-$;

Ar^1 and Ar^2 are, each independently, phenyl or halophenyl;

R^6 and R^7 are each independently hydrogen, $C_{1\text{-}6}$alkyl, phenylmethyl, or 2-propenyl;

wherein aryl is member selected from the group consisting of phenyl being optionally substituted with up to 3 substituents each independently selected from the group consisting of halo, hydroxy, $C_{1\text{-}6}$alkyl, $C_{1\text{-}6}$alkyloxy, aminosulfonyl, $C_{1\text{-}6}$alkylcarbonyl, nitro, trifluoromethyl, amino, aminocarboxyl, and phenylcarbonyl, said phenylcarbonyl being optionally substituted with up to 3 halo atoms.

4,990,522

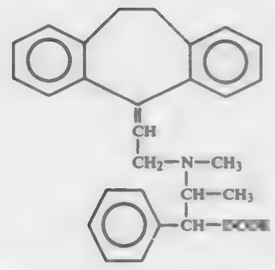
ESTERIFIED EPHEDRINE DERIVATIVES WITH PROLONGED ANTIULCER ACTIVITY

Federico Butelman, Milan, Italy, assignor to Etablissement Texcontor, Italy

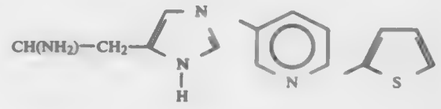
Division of Ser. No. 254,220, Oct. 6, 1988, Pat. No. 4,935,444. This application Mar. 2, 1990, Ser. No. 487,277
Claims priority, application Italy, Oct. 23, 1987, 22407 A/87
Int. Cl.[5] C07D *213/55, 333/38, 233/66;* A61K *31/44*
U.S. Cl. 514—356 2 Claims

1. Esterified ephedrine derivatives of general formula:

(I)



wherein R is selected from the group consisting of:



4,990,523

TREATMENT OF CHRONIC INFLAMMATORY JOINT DISEASE WITH ARYLSULFONAMIDES

Joseph C. Nolan, and Richard J. Barrett, both of Midlothian, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Jun. 19, 1989, Ser. No. 367,873
Int. Cl.[5] A61K *31/41*
U.S. Cl. 514—363 4 Claims

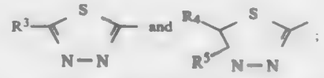
1. A method of treating joint degeneration associated with chronic arthritis in a living animal which comprises internally administering to said animal an effective amount for treating joint degeneration associated with chronic arthritis of an arylsulfonamide having the formula:

$Z-SO_2NR^1R^2$

wherein

R^1 and R^2 are members selected from the group consisting of hydrogen, loweralkyl, loweralkenyl, cycloalkyl, phenyl and loweralkylphenyl;

Z is an aryl group selected from the group consisting of



R^3 is a member selected from the group consisting of hydrogen, aminosulfonyl, loweralkylcarbonylamino, 2-haloacetylamino, 2-trihaloacetylamino, phenylcarbonylamino, phenylsulfonylamino, p-acetylaminophenylsulfonylamino, halophenylsulfonylamino, dihalophenylsulfonylamino, p-aminophenylsulfonylamino and toluylsulfonylamino;

R^4 is a member selected from the group consisting of acetylimino, 2-haloacetylimino, 2-trihaloacetylimino and phenylcarbonylimino;

R^5 is a member selected from the group consisting of hydrogen, loweralkyl and phenylloweralkyl; and

the pharmaceutically acceptable salts which are formed as the result of an acid addition to a basic amine group, when said amine group is present or metal salts of carboxy groups when said carboxy groups are present.

4,990,524

2-THIAZOLONES IN A METHOD OF TREATING A GASTRIC ULCER

Péter Bod, Gyömro; Kálmán Harsányi, Budapest; Ferenc Trischler, Budapest; Eva Fekecs, Budapest; Béla Hegedüs, Budapest; Elemér Ezer, Budapest; Judit Matuz, Budapest; Katalin Séghy, Budapest; László Szporny, Budapest; György Hajós, Budapest, and Krisztina Székely, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

PCT No. PCT/HU88/00079, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO89/05804, PCT Pub. Date Jun. 29, 1989

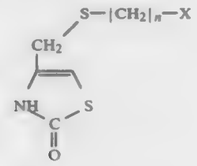
PCT Filed Dec. 13, 1988, Ser. No. 397,488

Claims priority, application Hungary, Dec. 14, 1987, 5633/87

Int. Cl.[5] A61K *31/425;* **C07D** *777/34*

U.S. Cl. 514—369 **4 Claims**

1. A method of treating a gastric ulcer condition in an affected subject which comprises the step of administering to said subject a therapeutically effective amount of a compound of the Formula (I)



(I)

wherein

X is a —CN, —$CONH_2$, —CO_2H, or —CO_2R group;

R is a C_1 to C_5 alkyl group; and

n is 0, 1 or 2, with the proviso that when X stands for CO_2H or CO_2R, n is other than 0.

4,990,525

SYNERGISTIC MICROBICIDAL COMBINATIONS CONTAINING 3-ISOTHIAZOLONE AND COMMERICAL BIOCIDES

Jemin C. Hsu, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 289,066, Dec. 22, 1988, Pat. No. 4,906,651. This application Dec. 1, 1990, Ser. No. 444,571

Int. Cl.[5] A01N *43/32, 43/80*

U.S. Cl. 514—372 **5 Claims**

1. A microbicidal composition comprising a synergistic mixture the first component of which is a 3:1 ratio of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one and the second component of which is 5-bromo-5-nitro-1,3-dioxane wherein the ratio of first component to second component is in the range of from about 6.5:1 to 1:250.

4,990,526

LEUKOTRIENE ANTAGONISTS, COMPOSITIONS AND METHODS OF USE THEREOF

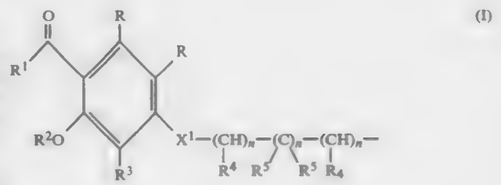
Robert N. Young, Senneville; Jacques-Yves Gauthier, and Richard Frenette, both of Laval, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 746,203, Jun. 8, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 872,309

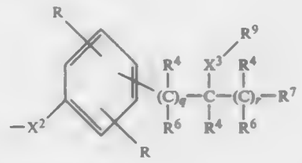
Int. Cl.[5] C07D *247/04;* **A61K** *31/41, 31/19;* **C07F** *57/46*

U.S. Cl. 514—381 **9 Claims**

1. A compound of the formula:



(I)



wherein:

each R is independently H, OH, lower alkyl, lower alkenyl, trifluoromethyl, lower alkoxy; phenyl, phenyl substituted by alkyl of 1 to 3 carbon atoms or by halogen, benzyl, phenethyl, halogen, $N(R^4)_2$, —(C═O)R^1, CH_2OR^4,CN, SR^{10}, SOR^{10}, SO_2R^{10}, or nitro;

R^1 is H, lower alkyl, or lower alkoxy;

R^2 is H, lower alkyl, R^4CO, or R^4OCH_2;

each R^3 is independently lower alkyl or lower alkenyl;

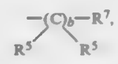
each R^4 is independently H or lower alkyl;

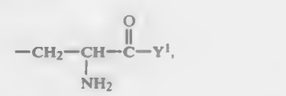
each R^5 is independently H, OR^2, lower alkyl, or both R^5's may be combined to create a doubly bonded oxygen (═O) or a $=C(R^4)_2$ group;

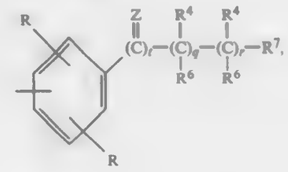
each R^6 is independently H, OH, or lower alkyl;

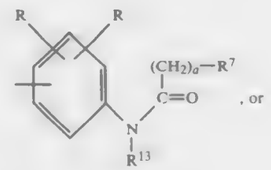
each R^7 is independently $COOR^4$ or tetrazolyl;

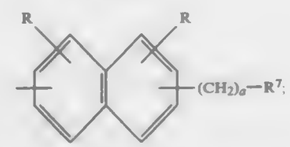
R^9 is R^3,











each R^{10} is independently OH; $N(R^4)_2$; CF_3; lower alkyl; lower alkoxy; phenyl; or phenyl substituted by one or more alkyl or alkoxy groups of 1 to 3 carbon atoms, halogen, hydroxy, $COOR^4$, CN, formyl or lower alkylacyl;

R^{13} is H or R^{10};

X^1, X^2 and X^3 are each independently O, S, SO, SO_2, S(O)═NR^4, NR^4, $NCOR^1$, NCN, or $NCONHR^4$;

Y^1 is OH or the N-terminus of an amino acid such that Y^1H is an essential amino acid:

Z is O, H and OH, or H and R^4;

each a is independently O to 4;

each b is independently 1 to 6;

each n is independently 0 to 6;

each q is independently 0 to 4;

each r is independently 0 to 1; or the pharmaceutically acceptable salts thereof, with the proviso that at least one R^7 is COOH or tetrazolyl and that when R^7 is COOH then:

R is not CN;

R^1 is not lower alkoxy; and

R^{10} is not lower alkoxy or phenyl substituted by CN or $COOR^4$ but may be carboxyphenyl.

7. A method of preventing the synthesis, the action or the release of SRS-A and the leukotrienes C_4, D_4, E_4 and B_4 in mammals, which comprises administering to said mammal an effective amount of a compound of claim 1.

4,990,527

FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

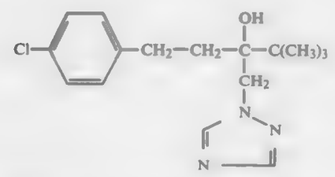
Division of Ser. No. 330,331, Mar. 29, 1989, Pat. No. 4,933,337, which is a division of Ser. No. 193,437, May 12, 1988, Pat. No. 4,845,111, which is a continuation of Ser. No. 89,698, Aug. 26, 1987, abandoned, which is a division of Ser. No. 801,549, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 646,591, Aug. 31, 1984, abandoned. This application Mar. 2, 1990, Ser. No. 487,680

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333411

Int. Cl.[5] A01N *43/38, 43/64*

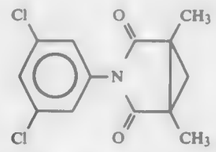
U.S. Cl. 514—383 **2 Claims**

1. A fungicidal composition comprising a synergistic fungicidally effective amount of



(i)

or an addition product thereof with an acid or metal salt, and (II) a dicarboximide derivative of the formula



wherein the synergistic weight ratio of (i):(ii) is between about 1:0.5 and 1:50.

4,990,528

MIXTURE OF FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Helmut Kaspers, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Wolfgang Krämer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 22,454, Mar. 6, 1987, Pat. No. 4,888,349, which is a continuation of Ser. No. 649,463, Sep. 11, 1984, abandoned, which is a division of Ser. No. 468,729, Feb. 22, 1983, Pat. No. 4,514,402. This application Aug. 24, 1989, Ser. No. 398,113

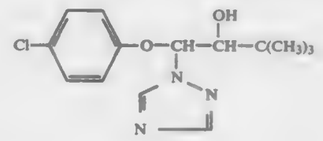
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208142

Int. Cl.[5] A01N *43/64, 47/28*

U.S. Cl. 514—383 **2 Claims**

1. A fungicidal composition comprising a synergistic fungicidally effective amount of a mixture of

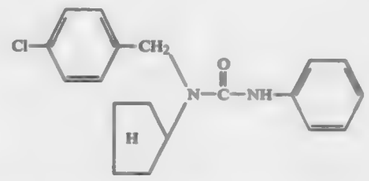
a 1,2,4-triazole derivative of a phenoxyetheralkanol of the formula



(Ib)

and

a phenylurea of the formula



(IV)

wherein the synergistic weight ratio of (*Ib*) to (IV) is from about 1:1 to 1:50.

4,990,529

PYRAZOLONE DERIVATIVES FOR TREATING CEREBROVASCULAR DISEASES

Hiroyuki Yamashita; Makoto Odate; Hajime Iizuka, all of Kanagawa; Hiroshi Kawazura, Chiba; Yoshio Shiga, Chiba, and Hiroshi Namekawa, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Japan

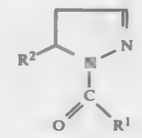
Division of Ser. No. 206,812, Jun. 15, 1988, Pat. No. 4,839,376. This application Apr. 6, 1989, Ser. No. 334,249

Claims priority, application Japan, Jun. 17, 1987, 62-148919

Int. Cl.[5] A01N *43/56;* **A61K** *31/415;* **C07D** *231/06, 471/02*

U.S. Cl. 514—406 **1 Claim**

1. A 2-pyrazoline derivative represented by the formula (A):



(A)

wherein R^1 is a pyridyl, pyridyl, pyrazyl or an alkoxyl group; and R^2 is a hydrogen atom, an alkyl, a pyridyl, a furyl, phenyl or a substituted phenyl group.

4,990,530

INDOMETHACIN INJECTIONS AND THEIR PRODUCTION METHOD

Hiroshi Takenaka, Kyoto; Masatoshi Hasegawa, Takatsuki, and Shu Matsuda, Ibaraki, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Filed Aug. 2, 1989, Ser. No. 388,474
Claims priority, application Japan, Aug. 8, 1988, 63-197627
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—420 **9 Claims**

1. A method for producing an injectable substantially anhydrous sodium indomethacin composition, the water-content of which is not more than 4%, which consists essentially of converting a lower alkanol solution or a lower alkanone solution of indomethacin to a solution of sodium indomethacin by addition thereto of 1–2 equivalents of an aqueous solution of sodium hydrogen carbonate or an aqueous solution of sodium carbonate, and lyophilizing the thus-obtained solution to remove most of the water, followed by heating at 10° C. to 60° C.

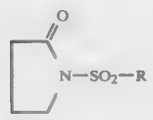
4,990,531

DERIVATIVES OF 1-ARYLSULPHONYL-2-PYRROLIDINONE AND THEIR USE AS MEDICAMENTS

Giulio Galliani; Fernando Barzaghi, both of Monza, Italy; Michel Fortin, Paris, France; Carlo Gorini, and Emilio Toja, both of Milan, Italy, assignors to Roussel Uclaf, Paris, France

Filed Feb. 24, 1989, Ser. No. 315,170
Claims priority, application Italy, Feb. 26, 1988, 19560 A/88
Int. Cl.[5] A61K *31/40;* **C07D** *207/48*
U.S. Cl. 514—425 **4 Claims**

1. A therapeutic composition for the treatment of a patient suffering from muscle spasms, comprising an antispasmodically effective amount of a compound of Formula (I)



(I)

in which R represents the radical



in which R_1 is in the 3 or 4 position on the phenyl nucleus, and represents a linear, branched or cyclic alkyl or alkenyl, containing up to 8 carbon atoms, or R_1 represents the radical



in which R_2 and R_3, identical or different, each represent a hydrogen atom, a linear alkyl or alkenyl, containing up to 8 carbon atoms, or R_1 represents NO_2, or OR', R' representing hydrogen, a linear, branched or cyclic alkyl containing up to 8 carbon atoms, phenyl or naphthyl, or R_1 is an SR_4 or $S(O)R_5$ radical, R_4 and R_5 representing a linear, branched or cyclic alkyl or alkenyl, containing up to 8 carbon atoms, or R represents naphythyl, optionally substituted by an R_1 radical, as defined above, and a pharmacologically acceptable carrier.

4,990,532

EXTERNAL PREPARATIONS

Shinji Yamamoto, Fukuoka, Japan, assignor to Sansho Seiyaku Co., Ltd., Fukuoka, Japan

Filed Apr. 22, 1988, Ser. No. 184,527
Claims priority, application Japan, Apr. 30, 1987, 62-108226
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—460 **8 Claims**

1. A composition for external application to skin containing, as an active ingredient, a sublimate of kojic acid, said sublimate comprising a pure white powder having a melting point of 154.4° C., a purity of 100%, a color tone (3%) absorbance of 0.002 at 420 nm, a turbidity (3%) absorbance of 0.002 at 570 nm and a pH of 4.57, and an incipient as a carrier for said active ingredient.

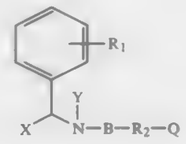
4,990,533

BENZOIC ACID AND BENZOIC ACID ESTER DERIVATIVES HAVING ANTI-INFLAMMATORY AND ANALGESIC ACTIVITY

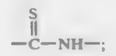
Michael F. Rafferty, and Graham Johnson, both of Ann Arbor, Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

Division of Ser. No. 811,567, Dec. 20, 1985. This application Nov. 10, 1986, Ser. No. 928,932
Int. Cl.[5] A61K *31/24, 31/415, 31/41;* **C07C** *335/14*
U.S. Cl. 514—533 **2 Claims**

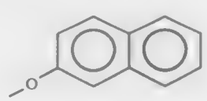
1. A compound of the formula



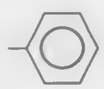
wherein :
(a) R_1 is COOR' wherein R' is H or lower alkyl of one to four carbons, inclusive;
(b) B is



(c) X and Y are independently H or lower alkyl of one to four carbons, inclusive;
(d) R_2 is alkylene, alkenylene, alkynylene branched or linear chains of 1 to 11 carbons, inclusive;
(e) Q is CH_3, COOH, Br, NH_2, H, cyclohexyl,

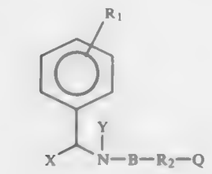


or

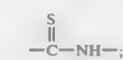


or nontoxic, pharmaceutically acceptable acid addition or base salt thereof.

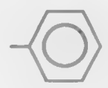
2. A pharmaceutical composition comprising an effective amount of a compound of the formula:



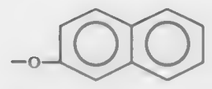
wherein
(a) R_1 is COOR, wherein R' is H or lower alkyl of one to four carbons, inclusive;
(b) B is



(c) X and Y are independently H or lower alkyl of one to four carbons, inclusive;
(d) R_2 is alkylene, alkenylene, alkynylene branched or linear chains of 1 to 11 carbons, inclusive;
(e) Q is CH_3, COOH, Br, NH_2, H, cyclohexyl,



or



of nontoxic pharmaceutically acceptable acid addition or base salt thereof; and a pharmaceutically acceptable carrier.

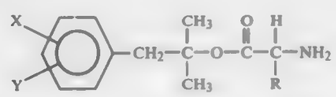
4,990,534

ARALKYL ESTERS AND PROCESSES FOR THEIR PREPARATION

Gerd M. Hallnemo; Thomas Högberg; Ulf H. Lindberg; Bengt C. J. Ulff, all of Södertälje, and Sven Ove Ögren, Nykvarn, all of Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

PCT No. PCT/SE88/00271, § 371 Date Jan. 24, 1989, § 102(e) Date Jan. 24, 1989, PCT Pub. No. WO88/09327, PCT Pub. Date Dec. 1, 1988
PCT Filed May 24, 1988, Ser. No. 305,728
Claims priority, application Sweden, May 27, 1987, 8702228; Nov. 9, 1987, 8704372
Int. Cl.[5] A61U *31/24*
U.S. Cl. 514—534 **1 Claim**

1. A method for exerting an effect on the central nervous system of mammals by potentiating cholinergic responses comprising administering to a patient having mental disturbances an amount effective to potentiate the cholinergic response of a compound or a pharmaceutically acceptable salt having the formula:



wherein X and Y are halogen, CF_3 or hydrogen provided that both X and Y are not hydrogen.

4,990,535

PHARMACEUTICAL COMPOSITION COMPRISING LORATADINE, IBUPROFEN AND PSEUDOEPHEDRINE

Wing-Kee P. Cao, Princeton; Winston A. Vadino, Whitehouse Station, and Imtiaz A. Chaudry, Deaville, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 3, 1989, Ser. No. 346,687
Int. Cl.[5] A61K *31/19, 31/205*
U.S. Cl. 514—556 **12 Claims**

1. A sustained release pharmaceutical composition comprising a coated tablet wherein the tablet coating comprises an antihistaminic-effective amount of loratadine or 6-chloro-6,11-dihydro-11-(4-piperidylidene)-5H-benzo[5,6]cycloheptа[1,2-b]pyridine and a hydrophilic polymer and the tablet core comprises an analgesic-effective amount of ibuprofen, a decongestant-effective amount of pseudoephedrine or a pharmaceutically acceptable salt thereof and a swellable hydrophilic polymer, and wherein the tablet coating and the tablet core further comprise pharmaceutically acceptable excipients.

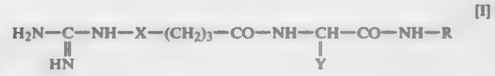
4,990,536

IMMUNOPOTENTIATOR AND SPERGUALIN-RELATED COMPOUND THEREFOR

Takeji Sakassi, Urawa; Tsugio Tomiyoshi, Tokyo; Keiko Watanabe, Kawaguchi; Kyuichi Nemoto, Tokyo; Tetushi Saino, Yono, and Yoshihisa Umeda, Otsu, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo and Takara Shuzo Co., Ltd., Kyoto, both of, Japan

Filed Mar. 16, 1990, Ser. No. 494,613
Claims priority, application Japan, Apr. 3, 1989, 1-81633
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—563 **9 Claims**

1. A use for the preparation of an immunopotentiator of a spergualin-related compound represented by the following general formula [I] or a pharmacologically acceptable salt thereof:



[I]

wherein
X represents



or $-(CH_2)_n-$,
Y represents a hydrogen atom or a hydroxyl or hydroxymethyl group,
n is an integer of 3 or 5, and
R represents $-(CH_2)_4-R_1$ (wherein R_1 is $-NH_2$ or $-OH$), $-(CH_2)_3-R_2$ (wherein R_2 is $-COOH$ or $-CHO$), $-(CH_2)_4-NH-(CH_2)_3-OH$ or $(CH_2)_4-NH-(CH_2)_2-R_2$ (wherein R_2 is as defined above).

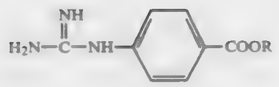
4,990,537

ANTI INFLUENZA AGENT

Akira Okuyama, Tokyo; Akira Someya, Soka; Takashi Murai, Ichikawa, and Nobuo Tanaka, Tokyo, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

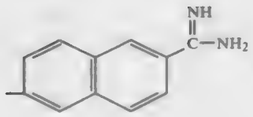
Filed Jun. 21, 1989, Ser. No. 369,029
Claims priority, application Japan, Jul. 11, 1988, 63-172270; Oct. 25, 1988, 63-269058
Int. Cl.[5] A61K *31/155, 31/235*
U.S. Cl. 514—634 **5 Claims**

1. An influenza treatment composition which comprises a p-guanidinobenzoic acid derivative of the formula:

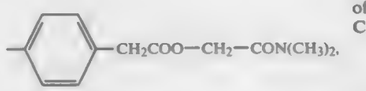


(I)

wherein R is



or



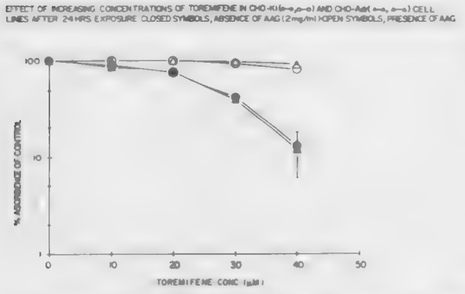
or its non-toxic salt as an active ingredient, in admixture with a pharmaceutically acceptable carrier the amount of said p-guanidinobenzoic acid derivative being effective to treat said influenza.

4,990,538

USE OF TOREMIFENE AND ITS METABOLITES FOR THE REVERSAL OF MULTIDRUG RESISTANCE OF CANCER CELLS AGAINST CYTOTOXIC DRUGS

Adrian L. Harris, 83 Kingston Road, Oxford OX2 64J, Great Britain; Lauri V. M. Kangas, Pasantie 3 B, 21280 Raisio, Finland, and Michael W. DeGregorio, 93 Leatherman Trail, Hamden, Conn. 06518

Filed Aug. 23, 1989, Ser. No. 397,551
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—648 3 Claims



1. A method for reversing the multidrug resistance of cancer cells to a cytotoxic drug in the treatment of cancer with the cytotoxic drug, which comprises administering a multidrug resistance reversal effective amount of toremifene, N-demethyltoremifene or 4-hydroxytoremifene, or a non-toxic pharmaceutically acceptable salt thereof, to a patient having multidrug resistant cancer cells when treating the patient with the cytotoxic drug.

4,990,539

PREPARATION OF STYRENE POLYMER FOAM PARTICLES

Klaus Hahn, Kirchheim; Uwe Guhr, Gruenstadt; Roland Gellert, and Wolf-Dieter Back, both of Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 17, 1989, Ser. No. 437,662
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842305
Int. Cl.[5] C08J *9/12*
U.S. Cl. 521—60 2 Claims

1. A process for preparing styrene polymer foam particles from 10 to 30 kg/m^3 in density, which comprises expanding styrene polymer particles which, per kg, contain from 0.7 to 3 moles of a blowing agent mixture composed of 60 to 90 mol % of water and 10 to 40 mol % of one or more than one C_4- or C_5-hydrocarbon with the aid of microwaves.

4,990,540

EXPANDABLE STYRENE POLYMER OF HIGH OIL RESISTANCE AND PREPARATION THEREOF

Klaus Hahn, Kirchheim; Uwe Guhr, Gruenstadt; Hans Hintz, Ludwigshafen, and Roland Gellert, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 451,773
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1989, 3901329
Int. Cl.[5] C08J *9/18, 9/20*
U.S. Cl. 521—56 3 Claims

1. An expandable styrene polymer of high oil resistance, containing
(a) from 50 to 83% by weight of polystyrene,
(b) from 17 to 50% by weight of a styrene-soluble styrene-acrylonitrile copolymer in which the level of acrylonitrile is not less than 5% by weight, based on the sum of (a) and (b),
(c) from 3 to 10% by weight, based on the sum of (a) and (b), of a C_3–C_6–hydrocarbon as blowing agent, and optionally
(d) customary additives in effective amounts.

4,990,541

WATER ABSORBENT LATEX POLYMER FOAMS

Steven F. Nielsen, Charlotte, N.C., and Dai W. Kim, Chatham, N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 9, 1989, Ser. No. 434,376
Int. Cl.[5] C08J *9/28*
U.S. Cl. 521—70 12 Claims

1. A water absorbent latex polymer foam prepared by the process of:
a. preparing a foamable latex polymer material;
b. foaming said latex polymer material;
c. blending a water absorbent polymer with the latex foam material; and
d. drying the latex foam material containing the water absorbent polymer within its structure to form a water absorbent latex polymer foam.

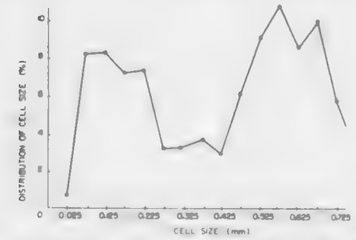
4,990,542

EXTRUDED SYNTHETIC RESIN FOAM AND ITS MANUFACTURING METHOD

Shigeru Motani, Hirakata; Tadayuki Saito, Osaka, and Toshiya Ito, Hokkaido, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 1, 1989, Ser. No. 388,147
Claims priority, application Japan, Aug. 2, 1988, 63-193717; Jun. 30, 1989, 1-170928
Int. Cl.[5] C08J *9/10*
U.S. Cl. 521—79 8 Claims

1. A method for preparing an extruded synthetic resin foam composed cells having substantially two sizes, one of the sizes being not more than about 0.25 mm and the other size being from about 0.4 to about 1 mm, wherein the cells with sizes not more than about 0.25 mm occupy from about 10 to about 80 percent of a sectional area of the foam, comprising the steps of:
A. forming a mixture of (a) a synthetic resin, (b) a granular material having hydroxyl groups on the surface, having a particle size of not more than about 1,000 nm, and having



about 10% to about 70% by weight of the weight of absorption of water, a C_1 to C_4 alcohol or mixtures thereof, and (c) a cell controlling agent;
B. incorporating a foaming agent selected from halogenated hydrocarbons, saturated hydrocarbons, and mixtures thereof into the mixture under pressure; and
C. extruding the mixture to form a foam.

4,990,543

LIGHTWEIGHT FLEXIBLE INIDE FOAM AND METHOD OF PRODUCING SAME

David G. Wernsing, Littleton; Royce M. Feagans, Morrison; Daniel E. Near, and John Sznopek, both of Littleton, all of Colo., assignors to Manville Corporation, Denver, Colo.

Filed Jul. 13, 1989, Ser. No. 379,496
Int. Cl.[5] C08J *9/02*
U.S. Cl. 521—129 7 Claims

1. A process for producing a light weight open cell foam comprising the steps of reacting in the absence of a solvent, a polyisocyanate having at least two functional groups per molecule and a mixture of a difunctional acid and a difunctional anhydride in the presence of a tertiary amine hydrazine catalyst, generating carbon dioxide in situ, interrupting the reaction when the theoretical amount of carbon dioxide generated is from about 10% to about 80%, transferring the reaction mass after the interruption step to a second stage and completing the carbon dioxide generation and forming a polyimide and polyamide foam product having a density less than 6 pounds per cubic foot and wherein the ratio of imide to amide group in the final product is no greater than 19 to 1.

4,990,544

GASKET COMPOSITION COMPRISING FIBRILLATED PTFE

Hiroshi Asaumi, Kamakura; Zenji Shimura, Odawara; Takehiro Yoshida, Tokyo; Kenji Tadakuma, Chigasaki; Shinzaburo Suzuki, Yokohama; Norio Takada, Tokyo; Kenichi Nakamura, Yokohama, and Takene Hirai, Tokyo, all of Japan, assignors to Nichias Corporation, Tokyo, Japan

Division of Ser. No. 106,254, Oct. 9, 1987, Pat. No. 4,839,221.
This application May 1, 1989, Ser. No. 346,566
Claims priority, application Japan, Jan. 9, 1987, 62-1841; Mar. 12, 1987, 62-57613; Apr. 3, 1987, 62-81244; Apr. 3, 1987, 62-81243; Jun. 26, 1987, 62-157847
Int. Cl.[5] C08K *3/34, 3/00;* F16J *15/00, 15/12*
U.S. Cl. 521—145 7 Claims

1. A gasket of a composition comprising a fibrillated polytetrafluoroethylene resin and a fine inorganic powder having an average particle size of not larger than 100 μm and containing at least 30% by weight of a clay mineral, based on the total weight of the inorganic powder, said composition being characterized in that the polytetrafluoroethylene resin is at least 5% by weight and the fine inorganic powder is at least 40% by weight, based on the total amount of the polytetrafluoroethylene resin and the fine inorganic powder; the total amount of the polytetrafluoroethylene resin and the fine inorganic powder is at least 80% by weight based on the entire amount of the composition; and the fibrillated polytetrafluoroethylene resin and the fine inorganic powder are mutually uniformly dispersed and mixed with each other, said composition having an average pore size not larger than 0.15 μm.

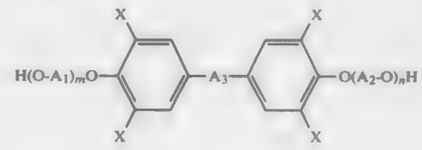
4,990,545

ARTICLES WITH POLYURETHANE RESIN HAVING MEMORY SHAPE CHARACTERISTICS AND METHOD OF UTILIZING SAME

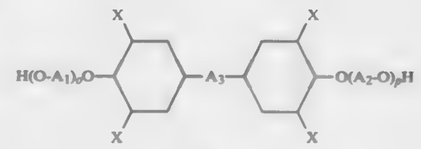
Kouzi Houral; Yoshio Kobayashi, and Katsuhiko Ikegami, all of Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Sep. 1, 1989, Ser. No. 401,862
Claims priority, application Japan, Sep. 5, 1988, 63-221970; Sep. 27, 1988, 63-243704; Oct. 18, 1988, 63-262478; Nov. 8, 1988, 63-282149; Nov. 15, 1988, 63-288503; Mar. 30, 1989, 1-81171
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—171 42 Claims

1. A thermoplastic article characterized with a memory shape comprising a polyurethane resin obtained by reacting an organic polyisocyanate with at least one polyol selected from the group consisting of



(1)



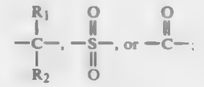
(2)

and

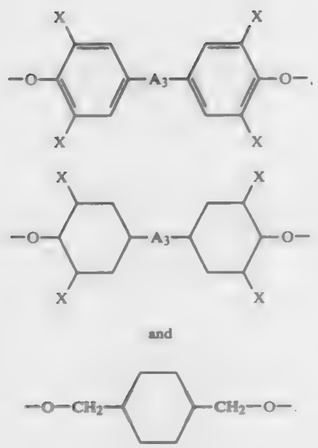


(3)

wherein:
A_3 is



and R_1, R_2 are each hydrogen, an alkyl group having 1～3 carbon atoms, fluorine, or chlorine;
A_1 and A_2 are each an alkylene group having 2～4 carbon atoms;
m and n are each a positive integer satisfying $2 \leqq m+n \leqq 10$
o and p are each 0 or a positive integer satisfying $0 \leqq o+p \leqq 10$
q and r are each 0 or a positive integer satisfying $0 \leqq q+r \leqq 10$
X is hydrogen, or a methyl group;
and wherein at least about 15% by weight in the polyurethane resin comprises at least one ring component shown by the following



and

wherein A_3 and X are as defined above.

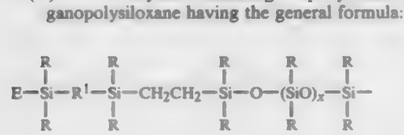
4,990,546

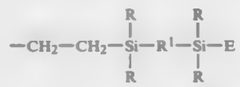
UV-CURABLE SILPHENYLENE-CONTAINING EPOXY FUNCTIONAL SILICONES

Richard P. Eckberg, Saratoga Springs, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Mar. 23, 1990, Ser. No. 499,922
Int. Cl.[5] C09F *303/02*; C08G *77/00, 77/06, 77/04*
U.S. Cl. 522—170 24 Claims

1. A UV radiation curable composition comprising
(A) a silarylene-containing epoxy-functional diorganopolysiloxane having the general formula:





wherein E represents an epoxy-functional organic radical having from 2 to 20 carbon atoms; R is individually a lower alkyl radical having 1 to 8 carbon atoms; R^1 is a divalent aromatic organic radical having 6 to 14 carbon atoms; and x is a value of from 0 to about 100; and
(B) a catalytic amount of a onium salt photocatalyst or a combination of onium salt photocatalysts.

4,990,547

ANTIFOULING COMPOSITION

Pavel Stovicek, Coquitlam, Canada, assignor to Waitomo Industrial Investments Ltd., Surrey, Canada

Continuation-in-part of Ser. No. 153,010, Feb. 8, 1988, Pat. No. 4,866,106. This application Jan. 31, 1989, Ser. No. 304,769
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] C08K *5/19*
U.S. Cl. 424—405 6 Claims

1. An antifouling coating composition comprising a partially-crosslinked polymer selected from a vinyl acetate homopolymer; a vinyl acetate-acrylic copolymer; a vinyl acetate-ethylene copolymer; and an acrylic-polyvinyl chloride copolymer; and

a non-metallic algicide consisting essentially of a quaternary ammonium compound having methyl groups and two alkyl groups alone or in combination with a second quaternary ammonium compound having methyl groups, an alkyl group and a benzyl group, said algicide being encapsulated in said polymer and being capable of being leeched from said composition during submersion.

4,990,548

POLYURETHANE/UREA FOAMS EMPLOYING IMINO/ENAMINE FUNCTIONAL COMPOUNDS

Herbert R. Gillis, Sterling Heights, Mich.; Malcolm Hannaby, Leuven, Belgium; Jan W. Leensiag, Neerijse, Belgium, and Alain Parfondry, Evere, Belgium, assignors to ICI Americas Inc., Wilm, Del. and Imperial Chemical Industries plc, Millbank, England

Filed Aug. 30, 1989, Ser. No. 400,646
Claims priority, application United Kingdom, Mar. 11, 1987, 8705601
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—163 10 Claims

1. A method for the preparation of polymeric foams which comprises reacting an organic polyisocyanate under foam-forming conditions with an imino-functional or enamine-containing compound having a molecular weight of at least 1000, to about 12,000.

4,990,549

GLASS FIBER REINFORCED POLYESTER MOLDING COMPOUND WITH IMPROVED PHYSICAL STRENGTH PROPERTIES

Ann M. Delvin; Robert R. Gallucci, both of Mount Vernon; Keith N. Gray, Newburgh, all of Ind., and Ronald M. Harris, Coral Springs, Fla., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 16, 1989, Ser. No. 421,581
Int. Cl.[5] C08K *9/04*
U.S. Cl. 523—209 33 Claims

1. A thermoplastic resin composition comprising:
(a) a polyester resin; and
(b) a glass fiber reinforcing agent treated with a sizing agent comprising a di- or tri-functional cyanurate or isocyanurate, wherein the functionality comprises functional groups capable of chemically bonding to said polyester resin.

32. A thermoplastic resin composition comprising:
(a) a polyester resin; and
(b) a glass fiber reinforcing agent treated with a sizing agent comprising a di- or tri-epoxy functional cyanurate or isocyanurate.

4,990,550

FIBER-REINFORCED POLYMER COMPOSITION AND METHOD OF PRODUCING SAME

Kunio Iwanami; Kissho Kitano, both of Ooi; Kiyotada Narukawa, Tokorozawa; Kenichi Aoki, Yokohama; Yukihiko Yagi, Ooi; Masato Sakuma, Urawa; Takashi Mikami, Komae; Masami Esaki, Toyota; Fumio Kato, Kariya; Koji Egashira, Oobu, and Hiroyuki Wakabayashi, Kariya, all of Japan, assignors to Tonen Sekiyukagaku Kabushiki Kaisha, Tokyo and Nippondenso Co., Ltd., Aichi, both of, Japan

Filed Mar. 20, 1989, Ser. No. 325,812
Claims priority, application Japan, Mar. 18, 1988, 63-65453; Mar. 18, 1988, 63-65454; Mar. 18, 1988, 63-65455; Mar. 18, 1988, 63-65456; Apr. 28, 1988, 63-106864; Jul. 12, 1988, 63-173518; Jul. 12, 1988, 63-173519; Jul. 12, 1988, 63-173520; Jul. 12, 1988, 63-173521; Jul. 12, 1988, 63-173522
Int. Cl.[5] C08K *7/14*
U.S. Cl. 523—214 18 Claims

1. A fiber-reinforced polymer composition comprising a blend of (a) 50–70 weight % of a polyamide resin in a continuous matrix phase with (b) 30–50 weight % of (i) a polyolefin having uniformly dispersed domain phases having an average size of 0.5–5 μm and (ii) an unsaturated carboxylic acid-modified polyolefin, wherein the amount of said modified polyolefin is 0.1–20 weight %, and the molar ratio of end amino groups in said polyamide resin to carboxyl groups in said unsaturated carboxylic acid-modified polyolefin is 10–1000; and (c) 5–50 parts by weight, per 100 parts by weight of the total composition, of glass fibers.

4,990,551

ABSORBING POLYMER

Georg Häubl, Linz, and Willibald Scheuchenstuhl, St. Oswald, both of Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria

Filed Oct. 13, 1989, Ser. No. 427,683
Claims priority, application Austria, Oct. 14, 1988, 2559/88
Int. Cl.[5] C08L *1/00, 1/26*; C08G *63/48*
U.S. Cl. 524—30 10 Claims

1. A water absorbing polymer consisting of a polymer a and a polymer b, comprising polymer a being present in an amount of 10 to 99 percent by weight and being a polyvinyl alcohol wherein a part of the hydroxy groups may be esterified or etherified or a polysaccharide wherein a part of the hydroxy groups may be esterified or etherified, or a mixture of these, and polymer B being present in an amount of 1 to 90 percent by weight and being a maleic anhydride homo- or copolymer having a hydrolysis time of 5 to 120 minutes, the anhydride groups being opened and 0.005 to 5% of the acid functions in polymer A and the remaining acid functions being present as free acid groups, as salts or as acid amide groups.

4,990,552

FLAME RETARDANT SILICONE OIL COMPOSITION

Shigeru Mori; Satoshi Kuwata, and Motohiko Hirai, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,084
Claims priority, application Japan, Jan. 26, 1988, 63-15174
Int. Cl.[5] C08K *5/41*
U.S. Cl. 524—176 8 Claims

1. In a flame-retardant silicone oil composition adapted for use as an electric insulation oil consisting essentially of a silicone oil and a flame retardant therefor, the improvement wherein the silicone oil is
(a) an organopolysiloxane represented by the average unit formula

$$R_aSiO_{(4-a)/2},$$

in which R is a substituted or unsubstituted monovalent hydrocarbon group and the subscript a is a positive number in the range from 1.8 to 2.3, from 0.1 to 30% by moles of the groups denoted by R in a molecule being vinyl groups and wherein the silicone oil is rendered flame retardant by the presence in the composition of, per 100 parts by weight of the silicone oil;
(b) from 0.0001 to 0.1 part by weight as platinum of a platinum compound soluble in an organic solvent; and
(c) from 0.001 to 10 parts by weight or an alkynyloxy-containing compound selected from the group consisting of
(c-1) alkynols,
(c-2) alkyne diols, and
(c-3) alkynyloxy-substituted organosilicon compounds.

4,990,553

BASING CEMENT CONTAINING SILICON ETHER

John D. Carhan, Newtonville; David H. Fox, and Emery G. Audesse, both of Beverly, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Apr. 6, 1988, Ser. No. 178,178
Int. Cl.[5] C08K *5/54*
U.S. Cl. 524—261 14 Claims



1. A basing cement composition comprising an insulating binder, an inert filler material, a processing agent, and silicone ether having the formula:

$$-[(RO)_nSiO_{(4-n)/2}]_m-$$

wherein n is 1, 2, or 3; m is greater than or equal to 2; and each R represents a carbon containing organic group which may be the same or be different, said silicone ether being present in said basing cement composition in an amount greater than 0 and less than or equal to about 5 weight percent.

4,990,554

POLYOLEFIN COMPOSITION

Manabu Nomura; Ryozo Tomonatsu, and Toshifumi Shimazaki, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 128,747, Dec. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 869,785, Jun. 2, 1986, abandoned. This application May 23, 1989, Ser. No. 355,604
Claims priority, application Japan, Jun. 6, 1985, 60-123311
Int. Cl.[5] C08K *7/04*; C08L *23/12, 23/14*
U.S. Cl. 524—423 10 Claims

1. A polyolefin resin composition comprising polyolefin and an inorganic filler which comprises (A) 75–97% by weight of a polyolefin composition containing (a) 90–65 parts by weight of polymer composition comprising a crystalline polypropylene component and an ethylene-propylene random copolymer and having an ethylene content e more than 7% by weight and/or a propylene homopolymer and (b) 10–35 parts by weight of a polyethylene having a melt index of not lower than 10 g/10 minutes, said melt index being from 1.0 to 50 times as high as that of the component (a) and (B) 25–3% by weight of a fibrous inorganic filler having an average fiber diameter of 0.1–0.8 μm and an aspect ratio of 20–60.

4,990,555

PREPARATION OF HYDROXY TERMINATED POLYSILOXANES

Brian R. Trego, Dinas Powys, Wales, assignor to Dow Corning S.A., Seneffe, Belgium

Continuation-in-part of Ser. No. 254,018, Oct. 6, 1988, abandoned. This application Jan. 18, 1990, Ser. No. 467,062
Claims priority, application United Kingdom, Oct. 24, 1987, 8724956
Int. Cl.[5] C08K *3/26*
U.S. Cl. 524—424 11 Claims

1. A method of preparing a polysiloxane by chain extension of a silicon compound having chain terminating units including

a silicon-bonded hydroxyl group, which method comprises bringing about condensation of the silicon-bonded hydroxyl groups in the absence of filler at a temperature of less than 50° C. in presence of water and in presence of an acidic condensation catalyst of the formula RSO_3H in which R represents an alkyl, aryl or alkaryl group which group may be halogenated, and water being present to an extent of less than 7 moles per mole of acidic condensation catalyst.

4,990,556

SILICONE RUBBER OR GEL PARTICLES CONTAINING MINERAL OIL

Koji Shimizu, Ichihara, and Mitsuo Hamada, Kisarazu, both of Japan, assignors to Dow Corning Toray Silicone Ltd., Tokyo, Japan

Filed Apr. 17, 1990, Ser. No. 510,344
Claims priority, application Japan, Apr. 19, 1989, 1-99164
Int. Cl.[5] C08K *5/01*
U.S. Cl. 524—475 10 Claims

1. A composition comprising particles of a cured silicone material having an average particle diameter of from 0.1 to 20,000 micrometers and containing from 0.5 to 70 percent, based on the weight of said particles. of a mineral oil capable of migrating out of said particles at a controlled rate, where said material is a rubber or a gel

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4,990,557

MECHANICALLY COMPATIBLE POLYURETHANE/POLYOLEFIN THERMOPLASTIC POLYMERIC BLENDS

Bling-lin Lee, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 1, 1988, Ser. No. 226,588
Int. Cl.[5] C08L *75/04;* C08K *3/40*
U.S. Cl. 524—494 18 Claims

1. A polymeric blend composition, comprising:

a mechanically compatible blend of a thermoplastic polyurethane elastomer having a Shore D hardness of at least 40 and a polyolefin, said polyolefin being a homopolymer or a copolymer made from one or more olefin monomers having from 2 to 6 carbon atoms and one double bond, the amount of said polyolefin being from about 3.5 parts to about 20 parts by weight per 100 parts by weight of said thermoplastic polyurethane elastomer, and said polyolefin having a melt index of from about 1 to about 50 grams/10 min.

4,990,558

GRAFT COPOLYMER COMPOSITIONS

Anthony J. DeNicola, Jr., Newark, and Paul D. Tatarka, Bear, both of Del., assignors to Himont Incorporated, Wilmington, Del.

Filed Mar. 26, 1990, Ser. No. 499,115
Int. Cl.[5] C08L *51/06, 53/02*
U.S. Cl. 524—504 23 Claims

1. A composition comprising, by weight:

(a) about from 60 to 95 percent of a graft copolymer comprising about from 10 to 65 percent by weight of a styrene polymer grafted onto a backbone of a propylene polymer material, and

(b) about from 40 to 5 percent of a rubber component comprising (1) about from 20 to 100 percent by weight of (i) at least one monoalkenyl aromatic hydrocarbon-conjugated diene block copolymer, (ii) at least one block copolymer which is a hydrogenated product of (i), or (iii) a mixture of at least one (i) block copolymer with at least one (ii) block copolymer; and (2) from about 80 to 0 percent by weight of an olefin copolymer rubber.

22. A composition of claim 1 further comprising, per 100 parts by weight of (a) and (b), up to about 80 parts by weight of one or more additives selected from the group consisting of fillers, reinforcing agents, and inorganic powders.

4,990,559

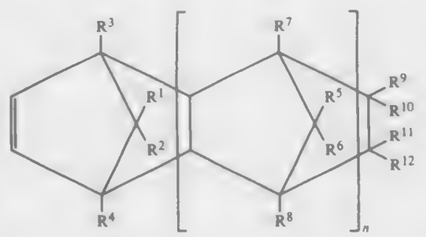
THERMOPLASTIC RESIN COMPOSITION

Takeshi Shiraki, Yamaguchi; Kunie Hiroshige, and Iwatosi Suzuki, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,288
Claims priority, application Japan, Feb. 14, 1989, 1-34618
Int. Cl.[5] C08L *23/04, 45/00*
U.S. Cl. 524—518 15 Claims

1. A thermoplastic resin composition composed of [A] 5 to 90% by weight of a linear polyolefin having an intrinsic viscosity [η], measured in decalin at 135° C., of 1.0 to 15.0 and a crystallinity of at least and formed substantially of from 8 to 40% of an ultrahigh-molecular-weight polyolefin having an intrinsic viscosity [η], determined at 135° C., of 10 to 40 dl/g and to 92% of a low-molecular-weight to high-molecular-weight polyolefin having an intrinsic viscosity [η], measured in decalin at 135° C., of 0.1 to 5.0 dl/g, and [B] 95 to 10% by weight of at least one type of cyclo-olefin resin having an intrinsic viscosity, measured in decalin at 135° C., of 0.05 to 10 dl/g and a softening temperature of at least 70° C. and selected from ring-opened polymers and ring-opened copolymers derived from cyclo-olefins represented by the following formula [I],

[1]



wherein n is 0 or a positive integer, R^1 to R^{12}, independently from each other, represent an atom or a group selected from the class consisting of a hydrogen atom, halogen atoms and hydrocarbon groups, R^9 to R^{12} may be linked to each other to form a monocyclic or polycyclic group which may have a double bond, and R^9 and R^{11}, or and R^{12}, may each form an alkylidene group, hydrogenated products of said polymers or copolymers, and addition polymers of ethylene with the cyclo-olefins of formula [I].

4,990,560

CURABLE ORGANOPOLYSILOXANE COMPOSITION

Masayuki Ikeno, Annaka, and Hironao Fujiki, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,589
Claims priority, application Japan, Sep. 7, 1988, 63-224326
Int. Cl.[5] C08K *5/24*
U.S. Cl. 524—731 8 Claims

1. A curable organopolysiloxane composition which comprises, as a uniform blend:

(A) a combination of two vinyl-containing organopolysiloxanes consisting of

(A-1) from 1% to 99% by weight of a first vinyl-containing diorganopolysiloxane having a viscosity in the range from 300 to 100,000 centipoise at 25° C. and represented by the general formula

$$Vi—SiR_2—O—SiR_2—O_pSiR_2—Vi,$$

in which Vi is a vinyl group, R is a substituted or unsubstituted monovalent hydrocarbon group free from aliphatic unsaturation having 1 to 10 carbon atoms and the subscript p is a positive integer, and

(A-2) from 99% to 1% by weight of a second vinyl-containing diorganopolysiloxane having a viscosity in the range from 300 to 100,000 centipoise at 25° C. and represented by the general formula

$$Vi—SiR_2—O—SiR_2—OSiR_2—Me,$$

in which Vi and R each have the same meaning as defined above, Me is a methyl group and the subscript q is a positive integer;

(B) an organohydrogenpolysiloxane represented by the average unit formula

$$R_aH_bSiO_{(4-a-b)/2},$$

in which R has the same meaning as defined above, the subscript a is a positive number not exceeding 3 and the subscript b is a positive number not exceeding 2 with the proviso that a+b is smaller than 4, and having at least three hydrogen atoms directly bonded to the silicon atoms in a molecule in an amount sufficient to provide from 0.8 to 2.0 moles of the hydrogen atoms directly bonded to the silicon atoms per mole of the vinyl groups in the component (A); and (C) a catalytic amount of a compound of a metal selected from the group consisting of platinum, palladium and rhodium.

4,990,561

WAX COMPOSITION AND PREPARATION METHOD THEREOF

Hiroshi Yoshioka, Tokyo, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,456
Claims priority, application Japan, Jan. 20, 1989, 1-12266
Int. Cl.[5] C08K *5/04*
U.S. Cl. 524—763 18 Claims

1. A wax composition prepared by polymerizing a mixture of at least one macromonomer selected from methylpolysiloxane(meth)acrylate macromonomers containing one (meth)acryl group and three or more methylsiloxy groups in a molecule with one or more of a vinylic polymerizable monomer(s) which is able to copolymerize with the macromonomers using a radical producing agent in the presence of a dimethylpolysiloxane and/or methylphenylpolysiloxane together with an organic wax, in which said dimethylpolysiloxane and/or methylphenylpolysiloxane is from 20 to 80 parts by weight, that of said organic wax is from 5 to 75 parts by weight, and that of the mixture comprizing the macromonomer and the vinylic polymerizable monomer is from 5 to 50 parts by weight.

4,990,562

BLENDS OF ETHYLENE VINYL ALCOHOL COPOLYMER AND AMORPHOUS POLYAMIDE, AND MULTILAYER CONTAINERS MADE THEREFROM

Richard T. Chou, and Gedeon I. Deak, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 88,261, Aug. 24, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 301,473
Int. Cl.[5] C08L *29/04, 77/00, 77/02, 77/10*
U.S. Cl. 525—58 13 Claims

1. A blend consisting essentially of about 50 to about 95 percent by weight of an ethylene vinyl alcohol copolymer having a copolymerized ethylene content of about 20 to about 60 mole percent and a degree of saponification of at least about 90%, and about 5 to about 50 percent by weight of a polyamide blend consisting essentially of about 30 to about 90 percent by weight of at least one amorphous polyamide having a glass transition temperature as measured in the dry state of about 80° C. to about 160° C. and about 10 to about 70 percent by weight of at least one semicrystalline polyamide which is miscible with the ethylene vinyl alcohol copolymer as evidenced by the presence of a single glass transition temperature or a depressed melting point as measured by differential scanning calorimetry.

4,990,563

WATER SOLUBLE SILATED POLYVINYL ALCOHOL

Arjun C. Sau, Newark, Del., assignor to Aqualon Company, Wilmington, Del.

Filed Sep. 25, 1989, Ser. No. 411,812
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—61 2 Claims

1. A water soluble silated polyvinyl alcohol homopolymer or copolymer having a degree of silyl substitution between 0.005 and 0.5 where the silated polyvinyl alcohol is further substituted with hydroxyethyl.

4,990,564

THERMOPLASTIC MOLDING MATERIALS

Christof Taubitz, Wachenheim; Horst Reimann, Worms; Klaus Boehlke, Hesshelm; Hermann Gausepohl, Mutterstadt, and Christoph Plachetta, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,552
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742444
Int. Cl.[5] C08L *77/00, 71/04*
U.S. Cl. 525—66 8 Claims

1. A thermoplastic molding material containing, as essential components,

(A) 5–95% by weight of a partially aromatic copolyamide, comprising:

(A_1) 20–90% by weight of units derived from terephthalic acid and hexamethylenediamine

(A_2) 0–50% by weight of units derived from ε-caprolactam and

(A_3) 0–80% by weight of units derived from adipic acid and hexamethylenediamine, with the proviso that the amount of units of component (A_2) or (A_3) or mixtures thereof is not less than 10% by weight based on the composition of (A) and that the partially aromatic copolyamide (A) has a triamine content of less than 0.5% by weight,

(B) 5–95% by weight of a polyphenylene ether,

(C) 0–45% by weight of a vinylaromatic polymer derived from styrene, chlorostyrene, α-methylstyrene, p-methylstyrene or mixtures thereof and

(D) 0–40% by weight of a toughened rubber.

4,990,565

TRANSPARENT POLYBLENDS

William G. Blasius, Jr., North Haven, Conn., assignor to Polysar Financial Services S.A., Fribourg, Switzerland

Filed Aug. 23, 1989, Ser. No. 397,395
Int. Cl.[5] C08L *53/02, 51/04*
U.S. Cl. 525—71 12 Claims

1. A polymer blend comprising:

(A) from 10 to 40 parts by weight of a graft copolymer formed by the free radical polymerization of a monomer mixture comprising:

(i) from 45 to 70 weight percent of one or more C_{1-2} alkyl acrylates, methacrylates, or a mixture thereof;

(ii) from 25 to 50 weight percent of one or more C_{8-12} vinyl aromatic monomers which are unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine atom;

in the presence of

(iii) from 5 to 30 weight percent of a polymer of one or more C_{4-6} conjugated diolefins, said polymer having a molecular weight of from 20,000 to 150,00; and

(iv) either (a) from 0.05 to 0.15 weight percent of a chain transfer agent if initiator is present in an amount of less than 1.0 parts by weight per 100 parts of monomer and conjugated diolefin; or (b) the absence of a chain transfer agent if initiator is present in an amount of at least 1.0 parts by weight per 100 parts of monomer; and

(B) from 90 to 60 parts by weight of a graft terpolymer formed by the polymerization of a mixture comprising:
(i) from 25 to 75 weight percent of one or more C_{8-12}, vinyl aromatic monomers which are unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine atom;
(ii) from 10 to 50 weight percent of one or more methacrylate esters which form homopolymers having a Tg greater than 40° C.,
(iii) from 7 to 30 weight percent of one or more acrylate esters which form homopolymers having a Tg less than 35° C.; in the presence of:
(iv) from 2 to 20 weight percent of a di- or tri- block copolymer of the formula C-D or C-D-C
wherein C is a homopolymer block of a C_{8-12} vinyl aromatic monomer which is unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine atom; and D is a homopolymer block of a C_{4-6} conjugated diolefin which is unsubstituted or substituted by a chlorine atom; said block copolymer having a molecular weight of at least 75,000.

4,990,566

CROSSLINKED POLYMER COMPOSITIONS, A PROCESS FOR THEIR PRODUCTION AND MOULDED ARTICLES OBTAINED

Marius Hert, Verneuil en Halatte, France, assignor to Norsolor, Cedex, France

Filed Apr. 17, 1989, Ser. No. 338,662
Claims priority, application France, Apr. 18, 1988, 88 05066
Int. Cl.[5] C08L *35/00, 33/04, 23/26*
U.S. Cl. 525—179 **14 Claims**

1. Polymer composition based on a mixture of:
15 to 50% by weight of a propylene polymer; and
50 to 85% by weight of a flexible ethylene copolymer,
characterized by the fact that the said flexible ethylene copolymer is a terpolymer (A) comprising:
from 83 to 92.7 mol % of ethylene,
from 7 to 14 mol % of at least one alkyl (meth)acrylate, whose alkyl group has from 1 to 8 carbon atoms; and
from 0.3 to 3 mol % of at least one unsaturated dicarboxylic anhydride; or
a mixture comprising, for 100 parts by weight, at least 70 parts by weight of the terpolymer (A) and at most 30 parts by weight of at least one copolymer (B) selected from ethylene copolymers comprising:
from 86 to 93 mol % of ethylene; and
from 7 to 14 mol % of at least one copolymerizable monomer selected from alkyl (meth)acrylates whose alkyl group has from 1 to 8 carbon atoms; and
ethylene copolymers comprising:
92 to 98 mol % of ethylene; and
from 2 to 8 mol % of at least one C_3–C_{10} α-olefin, the said ethylene/α-olefin copolymers having a density in the range of 0.875 to 0.905, the said terpolymer (A) having undergone at least a partial dynamic crosslinking, using a crosslinking agent containing at least one functional group capable of reacting with the anhydride functional group of the said terpolymer (A).

4,990,567

MOLDED AMIDE RESIN PRODUCT AND METHOD FOR ITS PREPARATION

Yo Isegawa, and Makoto Watanabe, both of Yokkaichi, Japan, assignors to Mitsubishi Kasei Polytec Company, Tokyo, Japan

Continuation of Ser. No. 120,983, Nov. 16, 1987, abandoned. This application Jun. 18, 1990, Ser. No. 539,386
Claims priority, application Japan, Aug. 28, 1986, 61-214480; Nov. 18, 1986, 61-272793; Nov. 18, 1986, 61-274792
Int. Cl.[5] C08L *77/00, 77/02*
U.S. Cl. 525—183 **6 Claims**

1. A method for preparing a molded amide resin product, comprising the steps of:
(a) adding a polymerizing catalyst to a ω-lactam and heating and the mixture produced to form a ω-lactam melt A;
(b) adding a polymerization cocatalyst to an ω-lactam and heating the mixture produced to form an 107 -lactam melt B;
(c) dispersing by dry blending a modified polyolefin in particulate form into a polyamide, said modified polyolefin being selected from the group consisting of (i) polyolefins or olefindiene copolymers graft-polymerized with maleic anhydride, (ii) ethylene/ α,β-unsaturated carboxylic acid copolymers, and (iii) mixtures thereof, wherein 0–100% of the carboxylic acid groups in said ethylene/α,β-unsaturated carboxylic acid copolymer are neutralized with a metal ion, and wherein said polyamide is soluble in a molten ω-lactam, to form a polyamide/modified polyolefin mixture;
(d) adding said polyamide/modified polyolefin mixture to said melt A or melt B;
(e) mixing the melt A and melt B produced from step (d), such that the polyamide having the modified polyolefin dispersed therein is present in an amount of 1 to 50% by weight relative to 100% by weight of the total of A and B and the polyamide having the modified polyolefin dispersed therein, and
(f) injecting the mixture so produced into a mold, followed by molding.

4,990,568

THERMOPLASTIC POLYOLEFIN AND ETHYLENE COPOLYMERS WITH OXIDIZED POLYOLEFIN

Robert E. Benefield, Zachary, and Charles E. Boozer, Baton Rouge, both of La., assignors to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation of Ser. No. 8,633, Jan. 29, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 319,954
Int. Cl.[5] C08L *23/16, 23/12*
U.S. Cl. 525—232 **17 Claims**

1. A fabricated plastic article having a surface which provides an improved bonding relationship with a paint coating in which the article is fabricated of a composition consisting essentially of a substantially uniform admixture of 30–75 parts by weight of thermoplastic polypropylene resin, 70–25 parts by weight of a polymer selected from the group consisting of (a) a copolymer of ethylene and a C_3–C_{16} mono-olefin, (b) an interpolymer of ethylene, a C_3–C_{12} mono-olefin and a polyene, and (c) 4–15 parts by weight of an oxidized or carboxylated polyethylene.

4,990,569

RUBBER-MODIFIED STYRENE RESIN COMPOSITION

Yasushi Okamoto, and Tetsuo Uno, both of Chiba, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,599
Claims priority, application Japan, Jul. 23, 1987, 62-185281; Oct. 9, 1987, 62-256014; Oct. 16, 1987, 62-262439; Jan. 29, 1988, 63-20004
Int. Cl.[5] C07L *47/00, 51/04*
U.S. Cl. 525—232 **6 Claims**

1. A rubber-modified styrene resin composition comprising:
(1) a resin matrix having an intrinsic viscosity (η) of at least 0.65; and
(2) soft component particles dispersed in said resin matrix, said soft component particles comprising
(a) an elastomer present in an amount of from 5.0 to 10.0% by weight based on said resin composition, and
(b) occlusions of said resin matrix dispersed in said elastomer;
where said soft component particles have an average particle size of from 0.2 to 2.6 microns, and a particle size distribution having two maxima, one in a range less than 0.8 microns and the other in a range not less than 0.8 microns.

4,990,570

CURABLE RUBBER COMPOSITION

Yoshiomi Saito, Yotukaido; Akio Fujino, and Atsumi Ikeda, both of Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 364,339
Claims priority, application Japan, Jun. 9, 1988, 63-142067
Int. Cl.[5] C08L *9/02, 51/04;* **C08K** *5/09*
U.S. Cl. 525—254 **9 Claims**

1. A curable rubber composition comprising (a) 100 parts by weight of an ethylenically unsaturated nitrile/conjugated diene type highly saturated rubber in which the content of conjugated diene units in the polymer chain is not higher than 30% by weight, (b) 10 to 100 parts by weight of a zinc salt of methacrylic acid, (c) 5 to 50 parts by weight of silicic anhydride and (d) 0.2 to 10 parts by weight of an organic peroxide.

4,990,571

COMPOSITE RESIN PARTICLES AND PREPARATION THEREOF

Tadafumi Miyazono; Akio Kashihara, both of Osaka, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 40,477, Apr. 20, 1987, Pat. No. 4,833,189. This application Mar. 13, 1989, Ser. No. 322,057
Claims priority, application Japan, Apr. 18, 1986, 61-090828
Int. Cl.[5] C08F *275/00*
U.S. Cl. 525—274 **3 Claims**

1. A process for preparing composite resin particles comprising:
a first step of effecting an emulsion polymerization of a monomer mixture of
(i) a polyfunctional monomer having one or more mono-substituted or 1,1-di-substituted ethylenic bonds and one or more 1,2-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds,
(ii) a crosslinking monomer having in its molecule 2 or more α,β-ethylenically unsaturated bonds which are reactive with said mono-substituted or 1,1-di-substituted ethylenic bonds of the polyfunctional monomer, or a combination of two compounds each having a mutually reactive functional group and one or more α,β-ethylenically unsaturated bonds which are reactive with said mono-substituted or 1,1-di-substituted ethylenic bonds of the polyfunctional monomer, and
(iii) other α,β-ethylenic monomer which are reactive with said mono-substituted or 1,1-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds of the polyfunctional monomer, and
a second step of effecting a graft polymerization between said particulate materials of crosslinked polymer and a monomer mixture of a polymerizable aromatic compound which is selectively reactive with 1,2-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds, a metal-containing monomer and other α,β-ethylenically unsaturated compounds with the former two, thereby forming substantially linear metal-containing polymer chains on said crosslinked particulate materials.

4,990,572

COMPOSITE RESIN PARTICLES AND PREPARATION THEREOF

Tadafumi Miyazono; Akio Kashihara, both of Osaka, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 40,477, Apr. 20, 1987, Pat. No. 4,833,189. This application Mar. 13, 1989, Ser. No. 322,056
Claims priority, application Japan, Apr. 18, 1986, 61-090828
Int. Cl.[5] C08F *30/04, 269/00, 273/00, 275/00*
U.S. Cl. 525—286 **4 Claims**

1. A process for preparing composite resin particles comprising:
a first step of effecting an emulsion polymerization of a monomer mixture of
(i) a polyfunctional monomer having one or more mono-substituted or 1,1-di-substituted ethylenic bonds and one or more 1,2-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds,
(ii) a crosslinking monomer having in its molecule 2 or more α,β-ethylenically unsaturated bonds which are reactive with said mono-substituted or 1,1-di-substituted ethylenic bonds of the polyfunctional monomer, or a combination of two compounds each having a mutually reactive functional group and one or more α,β-ethylenically unsaturated bonds which are reactive with said mono-substituted or 1,1-di-substituted ethylenic bonds of the polyfunctional monomer, and
(iii) other α,62 -ethylenic monomers which are reactive with said mono-substituted or 1,1-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds of the polyfunctional monomer, to obtain particulate materials of crosslinked polymer still having 1,2-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds remaining in a free state in the crosslinked polymer,
a second step of effecting a graft polymerization between said particulate materials and a monomer mixture of a polymerizable aromatic compound which is selectively reactive with 1,2-di-substituted, 1,1,2-tri-substituted or 1,1,2,2-tetra-substituted ethylenic bonds and other α,β-ethylenically unsatruated compounds than the polymerizable aromatic compound, thereby forming substantially linear polymer chains on said crosslinked particulate materials, and
a third step of treating said thus obtained material with a metallic compound selected from halogenide, oxide or hydroxide of a metal to introduce the metal element into the linear polymer chains of the above-mentioned material through an esterification or ester-exchange reaction between them.

4,990,573

METHOD FOR PREPARING POLYBUTADIENE ENDOWED WITH IMPROVED PROCESSABILITY CHARACTERISTICS

Piero Andreussi, Milan; Renzo Bianchi, Melegnano, and Mario Bruzzone, San Donato Milanese, all of Italy, assignors to Enichem Elastomeri S.p.A., Palermo, Italy

Filed Feb. 13, 1990, Ser. No. 479,399
Claims priority, application Italy, Feb. 17, 1989, 19484 A/89
Int. Cl.[5] C08F *2/06, 6/06*
U.S. Cl. 525—332.3 **8 Claims**

1. Method for preparing polybutadiene with a high content of 1,4-cis-structure, endowed with characteristics of improved processability and of improved resistance to cold flow, which method consists of polymerizing butadiene, in solution in a hydrocarbon solvent, in the presence of a catalytic system comprising at least one metal belonging to the group of the rare earths and of adding PCl_3 to the polymeric solution before the polymerization is quenched and when the Mooney viscosity is higher than 25.

4,990,574

PROCESS FOR PRODUCTION OF MODIFIED RESIN

Mikio Yamada, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Mar. 2, 1989, Ser. No. 318,014
Claims priority, application Japan, Mar. 2, 1988, 63-48960
Int. Cl.[5] C08F 8/42
U.S. Cl. 525—371 2 Claims

1. A process for producing a modified ionomer resin which comprises mixing ionomer resin, wherein 10–60 % of the whole carboxylic acid moieties are neutralized with sodium ions, with basic zinc carbonate under melting conditions to further neutralize 10–40 % of the whole carboxylic acid moieties with zinc ions.

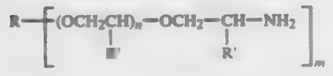
4,990,575

NOVEL OLEFIN-TERMINATED UREAS FROM POLYOXYALKYLENE AMINES AND ISOCYANATES

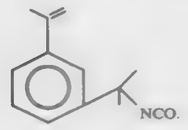
Jiang-Jen Lin, Houston, and George P. Speranza, Austin, both of Tex., assignors to Texaco Chemical Co., White Plains, N.Y.

Filed Sep. 20, 1989, Ser. No. 410,162
Int. Cl.[5] C08G 18/83
U.S. Cl. 525—403 9 Claims

1. A composition useful in cross-linking vinyl monomers comprising the reaction product of a polyoxyalkylene polyamine having the formula:



wherein R is the nucleus of an oxyalkylation susceptible polyhydric alcohol containing 2 to 12 carbon atoms and 2 to 3 hydroxyl groups, R′ is hydrogen or methyl, n is a number having an average value of 0 to 50 and m is an integer having a value of 2 to 3 and isopropenyl dimethylbenzyl isocyanate, having the formula:



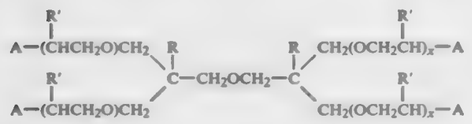
4,990,576

TETRAMINES BY AMINATION OF POLYOXYALKYLENE GLYCOLS

Michael Cascurida, Austin, and Jiang-Jen Lin, Houston, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 31, 1989, Ser. No. 429,672
Int. Cl.[5] C08G 65/28, 65/32
U.S. Cl. 525—409 7 Claims

1. A compound of the formula:



wherein:
R is alkyl of from 1 to 5 carbon atoms,
R′ is selected from the group consisting of hydrogen, the methyl radical and the ethyl radical,
x ranges from 2 to about 50,
A is —NH_2 or —OH, and wherein at least one of the A substituents is —NH_2.

4,990,577

LIQUID COATING COMPOSITION OF (METH)ACRYLOYL COMPOUND AND BLOCKED UNSATURATED CARBONYL COMPOUND/AMINO COMPOUND ADDUCT

Arie Noomen, Voorhout; Paul M. Vandevoorde, Sassenheim; Tamme Barteis, Tholen; Gerardus J. W. M. Maters, Bergen op Zoom, and Winsenty L. S. Pilaszek, Tholen, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 844,412, Mar. 26, 1986, abandoned. This application Feb. 10, 1989, Ser. No. 309,449
Claims priority, application Netherlands, Mar. 29, 1985, 8500951
Int. Cl.[5] C08G 12/06, 73/02; C08L 61/22, 63/10
U.S. Cl. 525—454 10 Claims

1. A liquid coating composition based on
(A) a compound having at least two acryloyl groups or methacryloyl groups, and
(B) an amino compound having at least one primary amino group which is blocked with an aldehyde or ketone containing not more than 10 carbon atoms, characterized in that the amino compound comprises an adduct of number average molecular weight 300–1500 of:
(1) an α,β-ethylenically unsaturated carbonyl compound, and
(2) an amino compound having
(i) at least one primary amino group, and
(ii) an amino, hydroxyl or mercaptan group reacting by addition to the α,β-ethylenically unsaturated carbonyl compound;
wherein (A) and (B) are present in an amount such that the ratio of the number of equivalents of ethylenically unsaturated double bonds to the number of equivalents of aminohydrogen is in the range of from 0.3 to 3.0.

4,990,578

POLYOL-POLYCARBONATES AND PROCESS FOR PREPARING THEM

Alberto Greco, and Gabriele Lugli, both of Milan, Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Filed Jun. 19, 1989, Ser. No. 367,557
Claims priority, application Italy, Jun. 23, 1988, 21080 Z/88
Int. Cl.[5] C08L 75/00
U.S. Cl. 523—456 9 Claims

1. Polyol-polycarbonate having a hydroxy functionality comprised within the range of from 2.2 to 4, a molecular weight comprised within the range of from 750 to 2500 and a glass transition temperature (Tg) equal to, or lower than, −30° C., obtained by means of the reaction, under transesterification conditions, of
(a) an organic carbonate;
(b) a saturated aliphatic α,ω-glycol containing from 4 to 12 carbon atoms in its molecule; and
(c) tris-(hydroxyethyl)-isocyanurate,
by operating with a ratio of the hydroxy groups contained in the (b) and (c) reactants, to the carbonate ester groups contained in the (a) reactant, which is comprised within the range of from 1.1:1 to 2:1, and with a molar ratio of the (b) reactant to the (c) reactant, which is comprised within the range of from 2:1 to 10:1.

4,990,579

REACTION OF 2° BETA-HYDROXYALKLAMINE WITH POLYISOCYANATE TO PRODUCE (POLY)-2-HYDROXYALKYLUREA CROSSLINKER

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Dec. 21, 1988, Ser. No. 287,072
Claims priority, application Austria, Dec. 21, 1987, 3372/87
Int. Cl.[5] C08L 63/02; C08G 59/40
U.S. Cl. 525—528 10 Claims

1. Cationic paint binders comprising in combination a (poly)-2-hydroxyalkylurea crosslinking agent which is the reaction product of an organic polyisocyanate blocked with a secondary beta-hydroxyalkylamine and having reactive -NCO functional groups at temperatures of as low as 140° C., and a paint binder carrying nitrogen-basic groups and having functional groups reactive at said temperatures with said -NCO functional groups.

4,990,580

PROCESS FOR PRODUCTION OF STYRENE POLYMERS

Nobuhide Ishihara; Masahiko Kuramoto, and Michitake Uoi, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 141,589, Jan. 7, 1988, abandoned. This application Sep. 7, 1989, Ser. No. 405,083
Claims priority, application Japan, Jan. 22, 1987, 62-11447
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[5] C08F 4/642, 12/08
U.S. Cl. 526—160 10 Claims

1. A process for producing a styrene polymer having a syndiotactic configuration which comprises polymerizing a styrene mounted by the use of a catalyst comprising
(a) a titanium compound represented by the following formulae (I) and (II), and
(b) methylaluminoxane, and further in the presence of hydrogen,
Formula (I):

$$TiR^1_aR^2_bR^3_cX^1_{4-(a+b+c)} \quad (I)$$

Formula (II)

$$TiR^1_dR^2_eX^1_{3-(d+e)} \quad (II)$$

wherein R′, R^2 and R^3 are each a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an alkylaryl group having 6 to 20 carbon atoms, an arylalkyl group having 6 to 20 carbon atoms, an acyloxy group having 1 to 20 carbon atoms, a cyclopentadienyl group, a substituted cyclopentadienyl group having 5 to 20 carbon atoms, or an indenyl group, X′ is a halogen atom, a, b and c are each an integer of 0 to 4, and d and e are each an integer of 0 to 3.

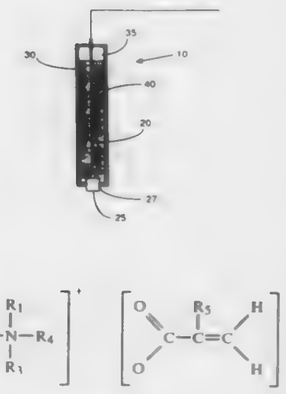
4,990,581

CONDUCTIVE POLYMERS AND METHOD OF PREPARATION THEREOF

Albert D. Poulin, New Bedford, Mass., assignor to Skeptikos Technology, Inc., Chamblee, Ga.

Filed Mar. 10, 1988, Ser. No. 166,230
Int. Cl.[5] C08L 27/00; H01B 1/00
U.S. Cl. 526—208 11 Claims

1. A conductive acrylic polymer comprising a copolymer of tettraalkylammonium acrylate and an unsaturated o-phthalate polyester styrene, said ammonium acrylate having the following formula:



wherein:
R_1, R_2, R_3, and R_4 are alkyl groups of from 3 to 18 carbon atoms; and
R_5 is a hydrogen or an alkyl group of from 1 to 3 carbon atoms.

4,990,582

FLUORINE CONTAINING SOFT CONTACT LENS HYDROGELS

Joseph C. Salamone, 49 Cloutman's La., Marblehead, Mass. 01915

Continuation-in-part of Ser. No. 888,047, Jul. 18, 1986, abandoned. This application Mar. 5, 1987, Ser. No. 22,270
Int. Cl.[5] C08F 18/20
U.S. Cl. 526—245 28 Claims

1. A clear hydrogel contact lens polymeric material having good surface resistence, high tensile and tear strength, high oxygen permeability, good optical clarity and consisting essentially of the free radical polymerization product of (a) about 15 to about 25.0 parts by weight of a fluorine-containing monomer, (b) about 2.5 to about 81.0 parts by weight of a material selected from the group consisting of mono- or di-hydroxyalkyl or alkylene oxide acrylates or mathacrylates, (c) about 10 to about 50.0 parts by weight of an N-vinyl lactam, and (d) about 5 to about 35.4 percent by weight of added sulfonic acid monomers or salts thereof,
said product having a DK value of at least 35 at 35° C. and a wet water of hydration of at least 30 percent.

4,990,583

COPOLYMERS CONTAINING ISOCYANATE AND ACID ANHYDRIDE GROUPS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS A BINDER COMPONENTS

Christian Wamprecht, Neuss; Josef Pedain, Cologne, and Harald Blum, Wachtendonk, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 305,744
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804589
Int. Cl.[5] C08F 122/04
U.S. Cl. 526—271 4 Claims

1. Copolymers having a weight average molecular weight, determined by the gel permeation chromatography method, of from 1500 to 75,000 of olefinically unsaturated compounds containing chemically incorporated moieties capable of under-

going an addition reaction with hydroxyls wherein the copolymers contain, as hydroxyl reactive groups, both

(i) from 0.3 to 7.0% by weight of free isocyanate groups and

(ii) from 1 to 25% by weight of acid anhydride groups, calculated as $C_4H_2O_3$,

in a chemically bound form.

4,990,584

PIEZOELECTRIC OR PYROELECTRIC MATERIAL

Manabu Kishimoto; Kenji Nakajima, and Iwao Seo, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

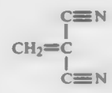
Continuation of Ser. No. 105,289, Oct. 7, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 275,628

Claims priority, application Japan, Oct. 9, 1986, 61-240762; Feb. 6, 1987, 62-25679

Int. Cl.[5] C08F *20/42*

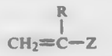
U.S. Cl. 526—300 **19 Claims**

1. A piezoelectric or pyroelectric material prepared by molding a vinylidene cyanide copolymer prepared by copolymerizing vinylidene cyanide of formula (I)



(I)

and a vinyl compound represented by formula (II)



(II)

wherein Z is hydrogen or a saturated hydrocarbon group having from 1 to 6 carbon atoms; with the provisos that when z is hydrogen, R is $C_nH_{2n+1}COO$—, wherein n represents 0 or an integer of from 4 to 9, and when Z is a saturated hydrocarbon group, R is CH_3COO—, or a group having a benzene ring, and then polarizing said molded vinylidene cyanide polymer.

4,990,585

HEXENE-¼-METHYLPENTENE-1 RANDOM COPOLYMER AND PROCESS FOR PRODUCING THE SAME

Takashi Kawata, Mie; Hideo Katsumata, Yokkaichi, and Kenya Makino, Kuwana, all of Japan, assignors to Japan Synthetic Rubber Company, Ltd., Tokyo, Japan

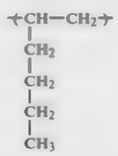
Continuation of Ser. No. 130,621, Dec. 9, 1987, abandoned. This application Aug. 21, 1989, Ser. No. 396,826

Claims priority, application Japan, Dec. 13, 1986, 61-295765

Int. Cl.[5] C08F *210/14*

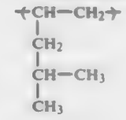
U.S. Cl. 526—348.5 **2 Claims**

1. A hexene-¼-methylpentene-1 random copolymer composed of 65 to 90% by weight of the following recurring unit (A) and 35 to 10% by weight of the following recurring unit (B) and having a polystyrene-reduced number average molecular weight of 20,000 to 500,00:



(A)

-continued



(B)

wherein said copolymer has a maximum value of the endothermic peak determined by a differential scanning calorimeter ranging from −35° C. to −20° C.

4,990,586

POLYURETHANES OF IMPROVED CHARACTERISTICS BIOCOMPATIBLE UREA-MODIFIED POLYURETHANE FROM CASTOR OIL

Barton C. Case, Simi Valley, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Continuation of Ser. No. 488,377, Feb. 28, 1990, abandoned, which is a continuation of Ser. No. 152,768, Feb. 5, 1988, abandoned. This application Jul. 17, 1990, Ser. No. 554,964

Int. Cl.[5] C08G *18/10, 18/36*

U.S. Cl. 528—64 **21 Claims**

1. A method for the preparation of a non-foamed biocompatible urea-modified polyurethane, said method comprising reacting a polyisocyanate with castor oil in the presence of di(3-ethyl-4-aminophenyl)methane said di(3-ethyl-4-aminophenyl)methane being the sole diamine present.

2. A method for the preparation of a non-foamed biocompatible urea-modified polyurethane, said method comprising reacting (a) a prepolymer prepared by a reaction between a polyisocyanate and castor oil with (b) a castor oil mixture comprising di(3-ethyl-4-aminophenyl)methane dissolved in castor oil, said di(3-ethyl-4-aminophenyl)methane being the sole diamine present.

4,990,587

METHOD OF PREPARING TOUGHENED EPOXY POLYMERS

Steven J. Shaw, Saffron Walden, and David A. Tod, Ware, both of England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom and Northern Ireland, Whitehall, England

PCT No. PCT/GB88/00477, § 371 Date Jan. 4, 1990, § 102(e) Date Jan. 4, 1990, PCT Pub. No. WO88/10276, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 22, 1988, Ser. No. 457,688

Claims priority, application United Kingdom, Jun. 26, 1987, 8714978

Int. Cl.[5] C08L *63/00, 63/10*

U.S. Cl. 528—113 **13 Claims**

1. A method of preparing a toughened epoxy polymer from an epoxy resin formulation, said formulation comprising a mixture of 100 parts by weight of an epoxy resin, from 12.5 to 25 parts by weight of a liquid carboxyl-terminated elastomer and from 0.5 to 15 parts by weight of curing agent, said curing agent being selected from non-aromatic heterocyclic amines and salts thereof having selectivity for a carboxy-epoxide reaction, characterised in that the method comprises curing the formulation in two stages, the first stage comprising curing the formulation at a temperature of at lest 135° C. for less than 2 hours to provide a partly cured formulation comprising phase-separated rubbery particles in an epoxy resin matrix, and the second stage comprising curing the formulation for a further period until the epoxy resin matrix is cured.

4,990,588

TEMPERATURE RESISTANT AROMATIC POLYETHERS

Joachim Kaebel; Werner Ude, and Joachim Vetter, all of Darmstadt, Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 308,110

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3804988

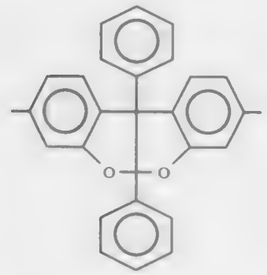
Int. Cl.[5] C08G *8/02, 79/02*

U.S. Cl. 528—125 **4 Claims**

1. An aromatic polyether, resistant to high temperature, having a reduced viscosity greater than 0.25 dl/g and consisting essentially of the repeating structural unit

$$[(A-O)_a(B-O)_b(C-O)_c],$$

wherein A, B and C are ether-linked in uniform or statistical order, and wherein A is 5a,10b-diphenyl-coumarano[2',3',2,3-]coumaran of the formula



linked in the 3- and 8- positions, B has the formula



wherein n is 0 or 1 and X is at least one member selected from the group consisting of =CO and $=SO_2$, and C is at least one further aromatic unit free of phosphine oxide groups, wherein the molar ratios of the groups A, B, and C are such that (a+c):b=1:1 to 1:100 and a:c=100.0 to 1:99.

4,990,589

POLY(ARYLENE ETHER KETONES)

Ian D. H. Towle, Cirencester, and Patrick J. Horner, Swindon, both of England, assignors to Raychem Limited, England

Filed Nov. 3, 1988, Ser. No. 266,416

Claims priority, application United Kingdom, Nov. 4, 1987, 8725886

Int. Cl.[5] C08C *2/00; C08G 8/02, 14/00*

U.S. Cl. 528—125 **25 Claims**

1. A crystalline thermoplastic (arylene ether ketone) polymer having repeat units of the general formula

$$—Ar—O—Ar—Z—$$ (I)

wherein

(a) each —O— is ether oxygen and each Z independently is imide, amide, ester, azo, quinoxaline, benzimidazole, benzoxazole, benzothiazole, sulphone, sulphide, or methylene and at least 25% of the Z groups are —CO— groups,

(b) each Ar moiety independently is selected from substituted and unsubstituted phenylene and substituted and unsubstituted polynuclear aromatic moieties having no two adjacent methylene carbon atoms forming part of the polymer backbone chains,

(c) at least some of the non-terminal Ar moieties comprise aryl-aryl moieties in which two or more aryl rings forming part of the polymer backbone chain are fused and/or directly single bonded together, and/or twice bonded together to form a cyclic linking structure with more than 4 atoms in the cyclic linking structure,

(d) at least some of the Ar moieties independently are monosubstituted with substantially inert pendant substituent groups other than iodo, the substitutent comprising not more than two aryl rings, if any, and/or at least some of the fused ring aryl-aryl moieties project form, or form kink in, the polymer backbone chain by virtue of each such aryl-aryl moiety being asymmetrical about a straight line passing through those two of its atoms whereby it is bonded to the remainder of the backbone chain, with the proviso that in homopolymers where the Ar moieties are unsubstituted, any naphthyl moiety constituting the aryl-aryl moieties is an 1,4-, 1,8- or 2,8-naphthyl moiety and any anthracenyl moiety constituting the aryl-aryl moieties is a 1,4- or 1,5anthracenyl moiety, and in homopolymers where any Ar moieties are substituted as aforesaid, any napththyl moiety constituting the aryl-aryl moieties is a 2,6- or 2,7-naphthyl moiety, and

(e) the size, number, and position of the substituent group and/or asymmetry of the asymmetrical aryl-aryl moieties are limited to retain at least 2% crystallinity in the bulk polymer after annealing between its glass transition temperature and its crystalline melting temperature.

4,990,590

ANIONIC SLURRY SEAL EMULSIFIERS

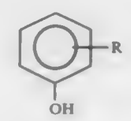
Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 334,480, Apr. 7, 1989. This application Nov. 27, 1989, Ser. No. 441,602

Int. Cl.[5] C08G *8/04;* C08J *95/00;* C07D *241/02*

U.S. Cl. 528—129 **18 Claims**

1. A paving slurry seal mixture of an aqueous bituminous emulsion and mineral aggregate capable of being worked comprising: a densely graded mineral aggregate passing through no. 4 and at least 80% retained on 200 mesh screen; from about 8% to about 20% of an oil in water type emulsion, based on the weight of the mineral aggregate, wherein the emulsion is comprised of from about 60% to about 70% bitumen, based on the weight of the emulsion, from about 0.5% to about 2% of an anionic emulsifier based on the weight of the emulsion, and water to make up 100% by weight of the emulsion; and from about 4% to about 16% water, based on the weight of the mineral aggregate, added to form a slurry of the aggregate and the emulsion; wherein the emulsifier is the reaction product of (1) acrylic acid reacted with (2) the reaction product of (a) an alkyl phenol of the general form



where R represents a linear or branched alkyl group,

(b) an aldehyde, and (c) a polyamine wherein the ratio of alkyl phenol to formaldehyde is less than 3 and the ratio of alkyl phenol to polyamine is less than 1.

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4,990,591

ANIONIC SLURRY SEAL EMULSIFIERS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 7, 1989, Ser. No. 334,480
Int. Cl.[5] C08G 8/04; C08J 95/00; C07D 241/02
U.S. Cl. 528—129 12 Claims

1. A composition of matter comprising the reaction product of (1) acrylic acid reacted with (2) the reaction product of (a) an alkyl phenol of the general form (b) an aldehyde, and (c) a polyamine.

4,990,592

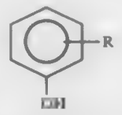
ANIONIC SLURRY SEAL EMULSIFIERS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 334,480, Apr. 7, 1989. This application Nov. 27, 1989, Ser. No. 441,603
Int. Cl.[5] C08C 8/04; C08J 95/00; C07D 241/02
U.S. Cl. 528—129 22 Claims

1. A bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an anionic emulsifier comprising the reaction product of (1) acrylic acid reacted with (2) the reaction product of

(a) an alkyl phenol of the general form



where R represents a linear or branched alkyl group,

(b) an aldehyde, and (c) a polyamine, and water to make up 100% by weight.

4,990,593

WATER-DISSIPATABLE POLYESTER RESINS AND COATINGS PREPARED THEREFROM

William W. Blount, Surgoinsville, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 474,190, Feb. 1, 1990, which is a division of Ser. No. 258,295, Oct. 14, 1988, Pat. No. 4,910,292. This application Jul. 13, 1990, Ser. No. 552,970
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 9 Claims

1. A process for the preparation of a water-dissipatable polyester having carbonyloxy linking groups in the linear molecular structure wherein up to 80% of the linking groups are carbonylamido linking groups, the polymer having an ASTM D 4287 viscosity of from about 5 P to about 50 P at 200° C., the polymer comprising the reaction products of reactants (a), (b), (c), (d), and (e) or the ester or esteramide forming derivatives thereof, wherein all stated mole percentages are based on the total of all acid, hydroxyl and amino group containing reactants being equal to 200 mole %, and wherein the polymer contains proportions of acid-group containing reactants (100 mole % acid) to hydroxy- and amino-group containing reactants (100 mole % base) such that the value of EQ (base) divided by EQ (acid) is between 0.5 and 2.0, as follows:

(a) at least one difunctional dicarboxylic acid which is not a sulfomonomer;

(b) from about 2 to about 25 mole % of at least one difunctional sulfomonomer containing at least one metallic sulfonate group or nitrogen-containing non-metallic sulfonate group attached to an aromatic or cycloaliphatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;

(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —$C(R^1)_2$—OH groups;

(d) from zero to about 40 mole % of difunctional reactant selected from hydroxycarboxylic acids having one —$C(R^1)_2$—OH group, aminocarboxylic acids having one —NRH group, amino-alcohols having one —$C(R^1)_2$—OH group and one —NRH group, or mixtures of said difunctional reactants; and

(e) greater than 10 mole % of a multifunctional reactant containing at least three functional groups selected from the group consisting of hydroxyl, carboxyl, and a mixture thereof,

wherein each R in the (c) and (d) reactants is, independently, a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, and each R^1 in the (c) reactant is, independently, a hydrogen atom, an alkyl of 1 to 4 carbon atoms, or an aryl group of 6 to 10 carbon atoms comprising

(i) contacting the total amount of reactant (b) (100%) to be reacted with sufficient base functionality (hydroxy- and amino-containing reactants) selected from reactants (c), (d) and (e) and sufficient acid functionality selected from reactants (a) and (e) in the presence of a catalytic amount of a catalyst under conditions such that substantially all of the acid functionality of reactant (b) is esterified and an intermediate reaction product is formed which has a ratio of EQ(base) to EQ(acid) calculated from the reactants reacted in Step (i) of between 2 and 4, and

(ii) contacting the intermediate reaction product formed by Step (i) with all remaining reactants in the presence of a catalytic amount of a catalyst such that the desired water-dissipatable polyester is formed.

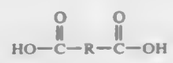
4,990,594

PRODUCING A COPOLYESTER FROM A LOWER DIALKYL ESTER OF TEREPHTHALIC ACID, A GLYCOL AND A DICARBOXYLIC ACID

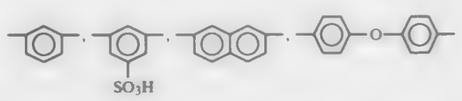
Anthony W. Cooke, and Monika E. Bader, both of Charlotte, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Mar. 7, 1990, Ser. No. 489,583
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 18 Claims

1. In a process for making a copolyester from a lower dialkyl ester of a terephthalic acid, a dicarboxylic acid having the formula



wherein R is selected from the group consisting of



and—$(CH2)_n$—where n=2–12 and a glycol comprising the steps of:

a. reacting said lower alkyl ester of terephthalic acid and glycol by an ester interchange reaction to produce a first monomer and alcohol;

b. removing said alcohol during said ester interchange reaction;

c. reacting a mixture of dicarboxylic acid and glycol by a direct esterification reaction to produce a second monomer and water;

d. polymerizing a mixture of said first and second monomers by a polycondensation reaction to produce said copolyester and glycol; and

e. removing said glycol during said polycondensation reaction;

wherein the improvement comprises: adding an effective catalytic amount of manganese and lithium before or during said ester interchange reaction and said direct esterification; and adding an effective catalytic amount of antimony at or before the beginning of the polycondensation reaction.

4,990,595

PROCESS FOR LOWERING THE MELT VISCOSITY OF AROMATIC POLYCARBONATES, AROMATIC POLYESTER CARBONATES AND AROMATIC AND/OR ARALIPHATIC POLYESTERS WITH SUPER-CRITICAL GASES

Hans-Joachim Traechkner, Krefeld; Karl-Dieter Löhr, Alpen; Wolfgang Weinert, Krefeld; Claus Wulff, Krefeld; Wolfgang Arit, Krefeld, and Hanns-Ingolf Paul, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1989, Ser. No. 393,724
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 3829293
Int. Cl.[5] C08G 63/64, 63/91
U.S. Cl. 528—483 4 Claims

1. Process for lowering the melt viscosity of aromatic polycarbonates, aromatic polyester carbonates or mixtures thereof with each other, characterised in that the polycarbonates, polyester carbonates, polyesters or mixtures thereof with each other are treated in the molten state with supercritical gases under pressure.

4,990,596

SYNTHETIC PEPTIDE PRODUCING ANTIBODIES OF ENHANCED BINDING TO HUMAN LDH-C_4

Erwin Goldberg, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Feb. 16, 1989, Ser. No. 311,477
Int. Cl.[5] C07K 7/08
U.S. Cl. 530—327 1 Claim

1. A synthetic peptide compound capable of producing antibodies of enhanced binding to the lactate dehydrogenase enzyme of human semen, which consists essentially of the N-terminal to C-terminal sequence represented by:

Glu-Lys-Leu-Ile-Glu-Asp-Asp-Glu-Asn-Ser-Gln-Cys

wherein Asn, Asp, Cys, Gln, Glu, Ile, Leu, Lys, and Ser respectively are asparagine, aspartic acid, cysteine, glutamine, glutamic acid, isoleucine, leucine, lysine, and serine.

4,990,597

PROCESS FOR THE PURIFICATION OF PLACENTAL TISSUE PROTEIN PP4

Hartmut Löbermann, Schallstadt, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 222,998
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724726
Int. Cl.[5] C07K 3/18, 3/20, 3/22
U.S. Cl. 530—392 10 Claims

1. A process for the purification of PP4, which comprises contacting a PP4-containing solution, in the presence of calcium ions, with a carrier-bound saccharide polysulfate or a sulfated sugar, removing the supernatant liquid, and eluting PP4.

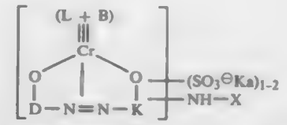
4,990,598

FIBRE-REACTION 1:1 CHROMIUM COMPLEX AZO OR AZOMETHINE DYES HAVING A BIDENTATE CHELATING GROUP AND A MONOFUNCTIONAL NEUTRAL LIGAND

Hans U. Schütz, Hans Huber-Strasse 23, 4053 Basle, Switzerland; Ulrich Schlesinger, Hermann Sautter 5, 7851 Binzen, and Gerhard Back, Hammerstrasse 5, 7850 Lörrach, both of Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,214
Claims priority, application Switzerland, Nov. 7, 1983, 5987/83
Int. Cl.[5] C09B 62/08, 62/24, 62/40, 62/50
U.S. Cl. 534—619 3 Claims

1. A chromium complex of the formula



in which B is acetylacetone, benzoylacetone, ethyl acetoacetate, 2-hydroxyacetophenone, 2-hydroxybenzophenone, 1-phenyl-3-methyl-4-benzolypyrazol-5-one, 1-phenyl-3-methyl-4-acetylpyrazol-5-one or salicylaldehyde, L is water, D is benzene which contains the oxygen atom in the o-position relative to the azo bridge and is unsubstituted or substituted by sulfo, nitro, chlorine and —NH-X or is naphthalene which contains the oxygen atom in the o-position relative to the azo bridge and is unsubstituted or substituted bys ulfo, nitro and —NH-X, K is naphthalene which, in addition to —NH-X is substituted by 1 to 2 sulfo groups, the radical —NH-X being bonded to the naphthalene nucleus either directly or via phenylamino, or is 1-phenyl-3-methylpyrazol-5-one where the group —NH-X is bonded to the phenyl ring or is 1-(2', 2''-disulfostilbene)-3-methylpyrazol-5-one where the group —NH-X is bonded in the 4''-position, X is α,β-dibromopropionyl, α-bromoacryloyl or 2,6-difluoro-5-chloropyrimidinyl, and Ka is an alkali metal cation.

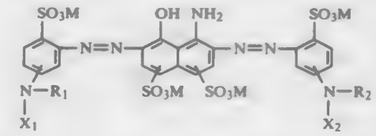
4,990,599

2,7-DIPHENYLAZO-1-AMINO-8-HYDROXYNAPHTHALENE DISAZO DYES CONTAINING TWO FIBER-REACTIVE GROUPS

Dieter Mäusezahl, Biel-Benken, and Peter Loew, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 247,208, Sep. 21, 1988, Pat. No. 4,917,705. This application Dec. 20, 1989, Ser. No. 453,643
Claims priority, application Switzerland, Sep. 21, 1987, 3625/87
Int. Cl.[5] C09B 62/01; D06P 1/38, 3/10
U.S. Cl. 534—634 5 Claims

1. A reactive dye of the formula



where each M is a cation, R1, and R2are independently of each other hydrogen or C1-C4-alkyl and one of the radicals X1 or X2 is 2,4,5-trichloropyrimidin-6-yl or chloroacetyl and the other radical X1 or X2 is 2,4,5-trichloropyrimidin-6-yl, 2,4-difluoro-5-chloropyrimidin-6-yl, 2,3-dibromopropionyl, 2-bromoacryloyl or chloroacetyl.

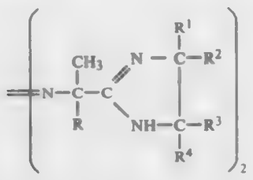
4,990,600

AZOAMIDINE COMPOUNDS HAVING A C-ALKYLATED IMIDAZOLINE RING AND SALTS THEREOF

Motoaki Tanaka; Tsutomu Miyagawa, and Kazuo Shiraki, all of Saitama, Japan, assignors to Wako Pure Chemical Industries Ltd., Osaka, Japan

Continuation of Ser. No. 364,499, Jun. 9, 1989, abandoned, which is a continuation of Ser. No. 85,155, Aug. 14, 1987, abandoned. This application Feb. 27, 1990, Ser. No. 488,425
Claims priority, application Japan, Aug. 28, 1986, 61-202098; May 7, 1987, 62-110977
Int. Cl.[5] C08F *4/04*; C07C *245/04*
U.S. Cl. 534—751 **15 Claims**

1. A cyclic azoamidine compound having the formula:



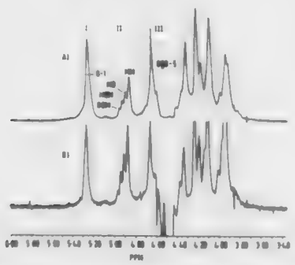
wherein R represents methyl or ethyl and any one of each of any two of R^1, R^2, R^3 and R^4 represents lower alkyl having one to four carbon atoms while each of the rest represents hydrogen, or a salt thereof.

4,990,601

MODIFICATION OF ALGINATES OR OTHER URONIC ACID COMPOUNDS BY TREATMENT WITH CO_2

Gudmund Skjak-Braek, Trondheim; Trygve Eklund, Nesbru; Kurt O. Von Husby, Drammen; Bjarne J. Kvam, Haugesund, and Olav Smidsrod, Trondheim, all of Norway, assignors to Protan S/A, Drammen, Norway

PCT No. PCT/NO87/00065, § 371 Date Aug. 16, 1988, § 102(e) Date Aug. 16, 1988, PCT Pub. No. WO88/02758, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 6, 1987, Ser. No. 206,345
Claims priority, application Norway, Oct. 17, 1986, 864147
Int. Cl.[5] C08B *37/04*
U.S. Cl. 536—3 **9 Claims**



1. A method for producing at least partial epimerization of a uronic acid containing compound, comprising the steps of:

providing a uronic acid containing compound in solid form; and

treating said uronic acid containing compound with CO_2 under supercritical conditions thereby achieving at least partial epimerization of said uronic acid containing compound, wherein the critical point of CO_2 is pcrit=73.83 bar and tcrit=31° C.

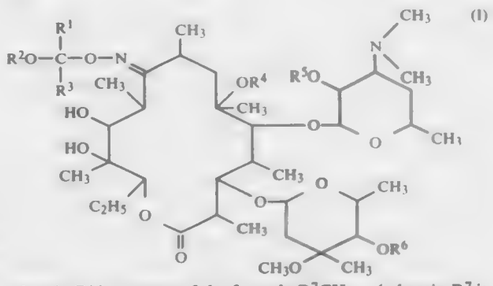
4,990,602

ERYTHROMYCIN A DERIVATIVES

Shigeo Morimoto; Takashi Adachi, both of Kitakatsushika; Tohru Matsunaga, Ageo; Masato Kashimura; Toshifumi Asaka, both of Ageo; Yoshiaki Watanabe, Kodaira; Kaoru Sota, Tokorozawa, and Kazuto Sekiuchi, Ageo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Continuation of Ser. No. 132,258, Dec. 14, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 283,387
Claims priority, application Japan, Dec. 17, 1986, 61-300653
Int. Cl.[5] C07H *17/08*
U.S. Cl. 536—7.4 **3 Claims**

1. An Erythromycin A derivative represented by the formula:



(I)

wherein R′ is a group of the formula R^7CH_2— (wherein R^7 is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms) or a group of the formula R^8O (wherein R^8 is an alkyl group having 1 to 6 carbon atoms), R^2 is R^8, a cycloalkyl group having 5 to 7 carbon atoms, a phenyl group or an aralkyl group, or R^2 and R^7 together form an alkylene group having 2 or 3 carbon atoms, R^3 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a phenyl group or an aralkyl group, or R^3 and R^7 together form an alkylene group having 3 to 5 carbon atoms or an alkylene group having 3 to 5 carbon atoms and substituted by 1 to 3 alkyl groups having each 1 to 3 carbon atoms, or R^2 and R^3 together form an alkylene group having 3 or 4 carbon atoms, R^4 is an alkyl group having 1 to 3 carbon atoms, R^5 is a substituted silyl group of formula $—SiR^9R^{10}R^{11}$ (wherein R^9, R^{10} and R^{11} are the same or different, and each is a hydrogen atom, an alkyl group having 1 to 15 carbon atoms, a phenyl substituted alkyl group in which the alkyl moiety has 1 to 3 carbon atoms, a phenyl group, a cycloalkyl group having 5 to 7 carbon atoms or an alkenyl group having 2 to 5 carbon atoms, with the proviso that at least one of R^9, R^{10} and R^{11} is other than hydrogen atom), and R^6 is a hydrogen atom or R^5.

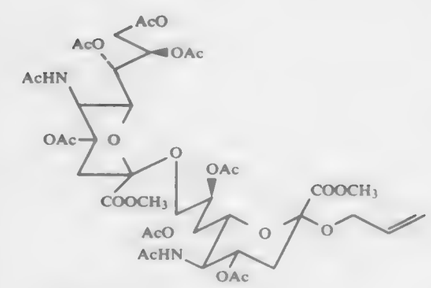
4,990,603

SIALIC ACID DERIVATIVES AND PROCESS THEREFOR

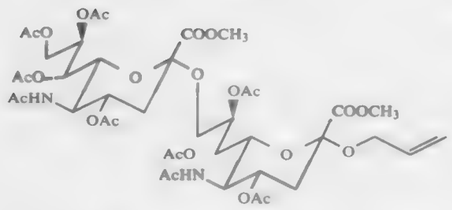
Tomoya Ogawa, Musashino; Mamoru Sugimoto, Niiza; Masaaki Numata, Kawagoe; Shoji Yoshimura, Irums; Masayoshi Ito, Kunitachi, and Yoshiyasu Shitori, Tokyo, all of Japan, assignors to Mect Corporation, Tokyo, Japan

Filed Jun. 30, 1987, Ser. No. 68,205
Claims priority, application Japan, Jul. 4, 1986, 61-157646; Jul. 4, 1986, 61-157647; Jul. 4, 1986, 61-157648
Int. Cl.[5] C07G *3/00*; C08B *37/00*; C07H *19/00*
U.S. Cl. 536—17.4 **11 Claims**

1. A process for producing ganglioside GD_3 having the general formulae (8) and (9):

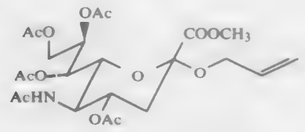


(8)



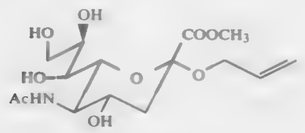
(9)

(a) deacetylating a compound (3) having the following formula (3):



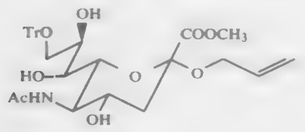
(3)

, to produce a compound (4) having the following formula (4):



(4)

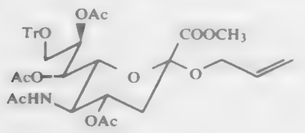
(b) tritylating said compound (4), to produce a compound (5) having the following formula (5):



(5)

wherein Tr is a trityl group,

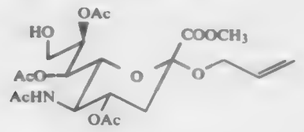
(c) acetylating said compound (5), to produce a compound (6) having the following formula (6):



(6)

wherein Tr is defined above,

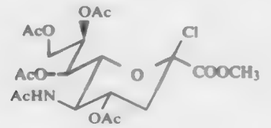
(d) detritylating said compound (6), to produce a compound (7) having the following formula (7):



(7)

, and then

(e) reacting said compound (7) with a compound (2) having the following formula (2):



(2)

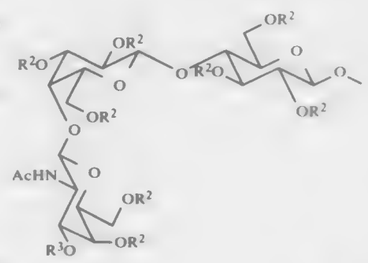
4,990,604

ASIALOGANGLIOSIDE RELATED COMPOUNDS

Tomoya Ogawa, Tokyo; Mamoru Sugimoto, Niiza; Yoshiyasu Shitori, Tokyo; Toshio Horisaki, Wako, and Tadami Shinuchi, Kyoto, all of Japan, assignors to Rikagaku Kenkyusho, Wako; Kanto Ishi Pharmaceutical Co., Ltd., Tokyo and Teikoku Chemical Industry Co., Ltd., Osaka, all of, Japan

Filed Feb. 24, 1986, Ser. No. 832,574
Claims priority, application Japan, Apr. 2, 1985, 60-69743
Int. Cl.[5] C07H *5/06*
U.S. Cl. 536—17.9 **6 Claims**

1. An asialoganglioside related compounds of the formula (I):



(I)

wherein R^1 is benzoyl, R^2 is acetyl, R^3 is acetyl or 2, 3, 4, 6-tetra-O-acetyl-β-galactopyranosyl, R^7 and R^8 are individually alkyl having 1 to 30 carbon atoms and Ac is acetyl.

VOL 1123 ISS 1 FEB 5 1991 UMI

4,990,605

METHOD OF MANUFACTURING ALKYLOLIGOGLYCOSIDES

Harald Lueders, Recklinghausen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,600

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729842

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[5] C07H *1/00, 3/00, 15/00;* C07G *3/00*

U.S. Cl. 536—18.5 12 Claims

1. A method of manufacturing light-colored alkyloligoglycosides and alkylglycosides, comprising the steps of:

(i) preparing a neutral or alkaline starting compound mixture, comprising alkylglycosides, alkyloligoglycosides or mixtures thereof and an alcohol solvent;

(ii) contacting said mixture with activated carbon at a temperature from 10°–140° C.;

(iii) separating said activated carbon from said contacted mixture;

(iv) removing said alcohol solvent from said alkylglycosides, alkyloligoglycosides or mixtures thereof; and

(v) bleaching said alkylglycosides, alkyloligoglycosides or mixtures thereof with a peroxide compound.

4,990,606

STABLE SULPHO-ADENOSYL-L-METHIONINE (SAME) SALTS, PARTICULARLY SUITABLE FOR PARENTERAL USE

Fedrico Gennari, Truccazzano, Italy, assignor to Bioresearch Spa, Liscate, Italy

Division of Ser. No. 732,287, May 9, 1985. This application May 30, 1990, Ser. No. 530,784

Claims priority, application Italy, May 16, 1984, 20938 A/84

Int. Cl.[5] C07H *19/167;* A61K *31/70*

U.S. Cl. 536—26 2 Claims

1. Stable sulpho-adenosyl-L-methionine (SAMe) salts characterised by the general formula:

$$SAMe.n(CH_2)_m(SO_3H)_2 \quad (I)$$

where n can vary between the limits of 1 and 2 inclusive and m can vary from 3 to 12.

4,990,607

ALTERATION OF GENE EXPRESSION IN PLANTS

Fumiaki Katagiri; Eric Lam, both of New York, and Nam-Hai Chua, Scarsdale, all of N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,533

Int. Cl.[5] C07H *21/04;* C21N *5/00, 15/00;* C12P *21/02*

U.S. Cl. 536—27 12 Claims

1. A chimeric plant gene which comprises:

(a) a 5' promoter which functions in plant cells to cause the production of mRNA;

(b) a structural coding sequence which codes for the production of mRNA encoding the ASF-1 protein; and

(c) a 3' non-translated region which comprises a polyadenylation signal which causes the addition of polyadenylate nucleotides to the mRNA.

4,990,608

DIAPHRAGM WALL CONSTRUCTION GELATIN COMPOSITION

José Zapico, Val de Reuil, France, assignor to Aqualon Company, Wilmington, Del.

Filed Jun. 7, 1989, Ser. No. 362,587

Int. Cl.[5] C08B *11/00, 11/20, 11/193*

U.S. Cl. 536—84 5 Claims

1. A modified polysaccaride composition for diaphragm wall construction, characterized in that the composition comprises a carboxymethylcellulose (CMC) with a degree of substitution (D.S.) of at least 0.5 or a hydroxyethylcellulose (HEC) with a molar substitution (M.S.) between 1.8 and 2.5 wherein a 1% solids solution of either CMC or HEC gives a viscosity of at least 1000 CPS at 25° C. and a mixture of the CMC or HEC in water produces at least 10% by weight gelatinous particles.

4,990,609

SULFOETHYL CELLULOSE OF HIGH SOLUTION QUALITY AND A PROCESS FOR ITS PRODUCTION

Dieter Herzog; Klaus Balser, and Klaus Szablikowski, all of Walsrode, Fed. Rep. of Germany, assignors to Wolff Walsrode AG, Walsrode, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,078

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742104

Int. Cl.[5] C08B *11/00;* C07H *15/04*

U.S. Cl. 536—92 10 Claims

1. In the preparation of a sulfoethyl cellulose by reacting cellulose with a sulfoethylating agent, the improvement which comprises effecting the reaction by

(a) grinding the cellulose,

(b) combining the ground cellulose with the sulfoethylating agent,

(c) adding alkali and

(d) raising the temperature to effect the reaction.

4,990,610

METHOD FOR PREPARING HIGH POTENCY SUCRALFATE

Nick V. Lazaridis, Wilmington, N.C.; Moo K. Park, Fayetteville, N.Y., and Yousry Sayed, Wilmington, N.C., assignors to Applied Analytical Industries, Inc., Wilmington, N.C.

Continuation-in-part of Ser. No. 236,167, Aug. 25, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,028

Int. Cl.[5] C07H *11/00, 13/12;* A61K *31/715*

U.S. Cl. 536—118 17 Claims

3. The method of preparing sucralfate comprising adding sucrose octasulfate ammonium salt to at least 8 equivalents of aluminum chlorohydrate in an alcoholic solvent at ambient temperature.

4,990,611

AGAROSE PURIFICATION METHOD USING GLYCOL

Richard B. Provonchee, Camden, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 17, 1987, Ser. No. 86,751

Int. Cl.[5] C08B *37/12;* C07H *1/06*

U.S. Cl. 536—127 24 Claims

1. A method for recovering a purified agarose from agar or agarose which comprises

dissolving agar or agarose in a lower alkylene glycol at elevated temperature but below the decomposition temperature of the agar or agarose, the glycol being selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol and trimethylene glycol;

cooling the agar- or agarose-containing glycol solution to a temperature effective to induce precipitation of a purified agarose product; and

recovering the precipitated agarose product.

4,990,612

16α-METHYLATION PROCESS

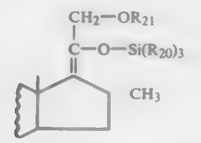
Verlan H. VanRheenen, Portage, and Joel E. Huber, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 870,364, Jun. 4, 1986, abandoned, Continuation-in-part of Ser. No. 724,380, Apr. 18, 1985, Pat. No. 4,704,455, Continuation-in-part of Ser. No. 618,986, Jun. 11, 1984, abandoned. This application Dec. 5, 1988, Ser. No. 342,430

Int. Cl.[5] C07J *9/00*

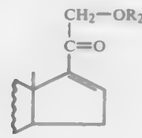
U.S. Cl. 540—89 9 Claims

1. A process for the preparation of a $\Delta^{17(20)}$-steroid of the formula



(II)

which comprises starting with a 16-unsaturated corticoid of the formula



(I)

and

(1) contacting the 16-unsaturated corticoid (I) with a methylating agent in the presence of a copper catalyst and a silylating agent where

R_{20} is alkyl of 1 thru 4 carbon atoms or phenyl, the R_{20}'s can be the same or different;

R_{21} is a hydrogen atom, —CO—R_{21}' or —Si(R_{121})$_3$;

R_{21}' is alkyl of 1 thru 4 carbon atoms or phenyl;

R_{121} is alkyl of 1 thru 4 carbon atoms or phenyl, the R_{121}'s can be the same or different.

4,990,613

(1R,5S,6S)-2-[(6,7-DIHYDRO-5H-PYRAZOLO[1,2-A][1,2,4]TRIAZOLIUM-6-YL)]THIO-6-[R-1-HYDROXYETHYL]-1-METHYL-CARBAPENEM-3-CARBOXYLATE AND INTERMEDIATE THEREFOR

Toshi Kumagai; Hiroshi Matsunaga; Yoshisuke Machida; Yunosuke Nagase; Muneo Hikida, and Yoshimitsu Nagao, all of Shiki, Japan, assignors to Lederle Japan, Ltd., Tokyo, Japan

Division of Ser. No. 357,350, May 26, 1989, Pat. No. 4,925,935, which is a division of Ser. No. 130,121, Dec. 8, 1987, Pat. No. 4,866,171. This application Feb. 26, 1990, Ser. No. 484,913

Claims priority, application Japan, Apr. 11, 1987, 62-89016

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 540—350 2 Claims

1. (1R,5S,6S)-6-[R-1-hydroxyethyl]-1-methyl-2-[1,2-diiminomethyl)-4-pyrazolidinyl]-thio-carbapenem-3-carboxylic acid.

4,990,614

N-HETEROCYCLIC AMIDES

Terumi Nakajima; Koichi Shudo, both of Tokyo, and Giichi Goto, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

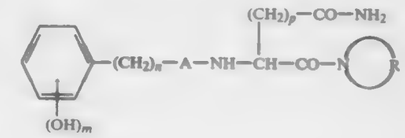
Filed Oct. 5, 1988, Ser. No. 253,679

Claims priority, application Japan, Oct. 6, 1987, 62-251862; Jun. 23, 1988, 63-155475

Int. Cl.[5] C07D *211/16, 241/04, 243/08, 257/02, 259/00*

U.S. Cl. 540—474 32 Claims

1. A compound of the formula:



wherein



(I) represents a cyclic amino group of 6- to 24-membered ring having 2 to 6 nitrogen atoms in the ring, A represents a methylene group or a carbonyl group, m represents an integer of 1 to 3, n represents an integer of 0 to 4 and p represents an integer of 1 to 2, or a pharmaceutically acceptable salt thereof.

4,990,615

TRIPHENDIOXAZINE AND TRIPHENDITHIAZINE DIRECT DYESTUFFS

Hermann Henk, Colonge; Wolfgang Harms, and Peter Wild, both of Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

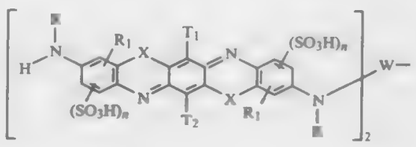
Filed Sep. 12, 1989, Ser. No. 405,908

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832531

Int. Cl.[5] C09B *19/00, 19/02, 21/00;* D06P *1/40*

U.S. Cl. 544—76 5 Claims

1. A triphendioxazine or triphendithiazine direct dyestuff of the formula



(I)

in which

R is H, unsubstituted C_1–C_4-alkyl or C_1–C_4-alkyl substituted by —CH_3, —C_2H_5, —Cl, —OCH_3, —OC_2H_5- or —COOH,

R_1 is H, CH_3, C_2H_5, Cl, OCH_3, OC_2H_5 or COOH,

T_1, T_2 are H; Cl; Br; unsubstituted C_1–C_4-alkyl, unsubstituted C–C_4-alkoxy; C_1–C_4-alkyl or C_1–C_4-alkoxy substituted by OCH_3, OC_2H_5 or O—SO_3H; phenyl; phenoxy; or phenyl or phenoxy substituted by Cl, Br, CH_3, C_2H_5, OCH_3 or OC_2H_5,

n is 0, 1, 2,

W is a bridge member and

X is oxygen or sulphur.

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4,990,616

ZINC STEARATE AS A FLOW PROMOTING ADDITIVE FOR TRIETHYLENEDIAMINE

Thomas W. Panunto, Telford, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 17, 1989, Ser. No. 324,846
Int. Cl.[5] B01J *2/30*; C07D *487/08*
U.S. Cl. 544—351 6 Claims

1. In a method for improving the flowability of triethylenediamine by admixing with a stearate salt as a flow promoting additive, the improvement which comprises admixing 200 to 1,000 ppm zinc stearate.

4,990,617

N-OXIDE PRODRUG DERIVATIVES OF 3-HYDROXY MORPHINANS AND PARTIAL MORPHINANS AND DERIVATIVES

George A. Boswell, and Melvyn J. Myers, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 103,213, Oct. 1, 1987, abandoned, which is a division of Ser. No. 803,222, Dec. 2, 1985, Pat. No. 4,722,928. This application Jul. 27, 1989, Ser. No. 391,406
Int. Cl.[5] C07D *221/26, 221/28, 487/08*
U.S. Cl. 546—44 2 Claims

1. A compound selected from the group consisting of an N-oxide derivative of naloxone, naltrexone, nalbuphine, nalmefene, pentazocine, butorphanol, and buprenorphine.

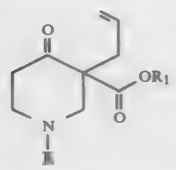
4,990,618

PROCESS FOR THE PRODUCTION OF 4,5,6,7-TETRAHYDROTHIENO-[3,2-C]-PYRIDINES

Jacques Gosteli, Basel, and Aleksander Warm, Visp, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 409,743, Sep. 20, 1989. This application May 2, 1990, Ser. No. 517,729
Claims priority, application Switzerland, Sep. 23, 1988, 3539/88
Int. Cl.[5] C07C *211/22, 211/44*
U.S. Cl. 546—221 2 Claims

1. 4-Oxo-3-(2-propenyl)-piperidine-3-carboxylic acid ester of the formula:



wherein R is hydrogen, a formyl group, an acetyl group or a benzoyl group or is a benzyl group, whose aromatic ring R is selected from the group consisting of hydrogen, formyl, acetyl, benzoyl, and benzyl, whose aromatic ring is optionally substituted by halogen, and R_1 is an alkyl group with 1 to 4 C atoms.

4,990,619

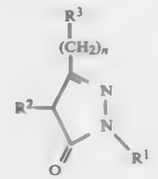
PYRAZOLINE DERIVATIVES

Yasuhiro Morinaka, Tsuchiura; Hiroyoshi Nishi, Ibaraki; Toshiaki Watanabe, Yokohama; Satoshi Yuki, Sendai; Hiroko Sakurai, Yokohama; Yoshio Hayashi, Ushiku, and Nobuko Fukushima, Hachioji, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

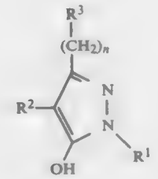
Division of Ser. No. 123,237, Nov. 20, 1987, Pat. No. 4,906,644. This application Dec. 18, 1989, Ser. No. 451,526
Claims priority, application Japan, Nov. 20, 1986, 61-277363; Nov. 20, 1986, 61-277364
Int. Cl.[5] C07D *401/14*
U.S. Cl. 546—256 1 Claim

1. A pyrazolone derivative of the following general formula:

(Ia')



(Ia'')



wherein R^1 represents a pyridyl group, R^2 is a hydrogen atom or an alkyl group, and R^3 is a pyridyl group and n is zero or one, or a pharmaceutically acceptable salt thereof.

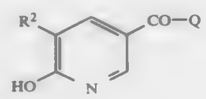
4,990,620

HALOGEN SUBSTITUTED PYRIDYLALKYL KETONES

Hans Lindel, Leverkusen, and Werner Hallenbach, Langenfield, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 215,683, Jul. 6, 1988, Pat. No. 4,927,938. This application Jan. 24, 1990, Ser. No. 469,614
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723070
Int. Cl.[5] C07D *213/64*
U.S. Cl. 546—298 3 Claims

1. A compound of the formula



in which
Q is alkyl or halogen, and
R^2 is halogen.

4,990,621

CERTAIN PROPENE DERIVATIVES AS INTERMEDIATES FOR THE PREPARATION OF PESTICIDAL SILANE DERIVATIVES

Hans H. Schubert, Frankfurt am Main; Gerhard Salbeck, Hofheim am Taunus; Walter Lüders, Hessenstamm; Werner Knauf, Eppstein, and Anna Walter-dorfer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

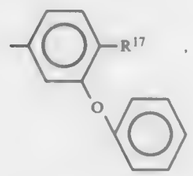
Division of Ser. No. 211,155, Jun. 22, 1988, Pat. No. 4,864,027, which is a continuation of Ser. No. 922,734, Oct. 24, 1986, abandoned. This application May 30, 1989, Ser. No. 359,098
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538139; May 31, 1986, 3518354
Int. Cl.[5] C07D *213/64*; C07C *43/215, 43/225, 25/13*
U.S. Cl. 546—302 5 Claims

1. A compound of the formula

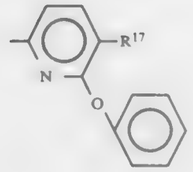


wherein R^4 is H, R^5 is a radical of the

(A)

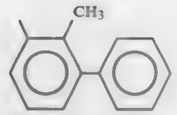


(B)



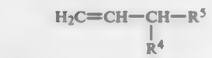
or

(C)



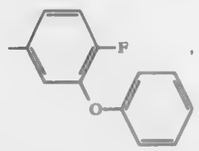
and R^{17} is halogen.

3. A compound of formula



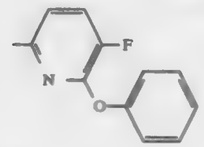
wherein R^4 is hydrogen and R^5 is a radical of the formula

(A)



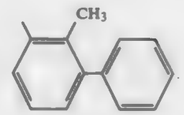
-continued

(B)



or

(C)



4,990,621

PROCESS FOR THE PREPARATION OF 2-CHLORO-5-CHLOROMETHYLPYRIDINE

Klaus Jelich, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 447,145
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842359
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.
Int. Cl.[5] C07D *213/26*
U.S. Cl. 546—345 13 Claims

1. A process for the preparation of 2-chloro-5-chloromethylpyridine, of the formula (I),

(I)

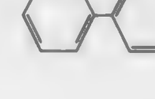


comprising (a) reacting in a first step nicotinic acid of the formula (II)

(II)

with phosphorus pentachloride, (b) reacting in a second step the resulting 3-trichloromethylpyridine from the first step, of the formula (III),

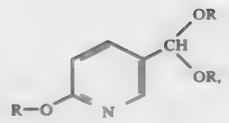
(III)



with an alkali metal alkoxide of the formula (IV)

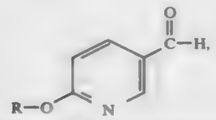
R - O - M (IV)

in which
R represents alkyl and
M represents an alkali metal cation,
(c) reacting in a third step the resulting pyridine ether acetal from the second step, of the formula (V)



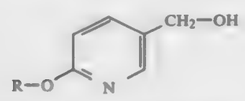
(V)

in which R has the abovementioned meaning, with water, (d) hydrogenating in a fourth step the resulting pyridine aldehyde from the third step, of the formula (VI)



(VI)

p0 in which R has the abovementioned meaning, with molecular hydrogen in the presence of a hydrogenation catalyst, and finally (e) reacting in a fifth step the resulting pyridylmethanol from the fourth step, of the formula (VII)



(VII)

in which R has the abovementioned meaning, with a chlorinating agent in the presence of a diluent.

4,990,623

SULFONATED 2-(2'-HYDROXYARYL)-2H-BENZOTRIAZOLES AND/OR SULFONATED AROMATIC FORMALDEHYDE CONDENSATES

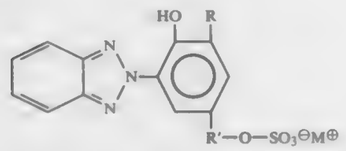
Morris B. Berenbaum, 59 Crest Dr., Summit, N.J. 07901; John H. Bonfield, 183 Lyons Dr., Basking Ridge, N.J. 07920; Charles J. Cole, 11560 Teterling Rd.; Paul W. Harris, 11410 Chalkley Rd., both of Chester, Va. 23831; Thomas P. J. Izod, 112 Victoria Dr., Basking Ridge, N.J. 07920; Harry E. Ulmer, Rte. 2, Box 3, Cameron, S.C. 29030; Frederick R. Hopf, 350 Parsippany Rd., Parsippany, N.J. 07054; James T. Yardley, 40 Macculloch Ave., Morristown, N.J. 07960, and Karen M. Bland, 144 Heritage La., Hamburg, N.J. 07419

Continuation-in-part of Ser. No. 111,873, Oct. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 889,705, Jul. 28, 1986, abandoned, and a continuation-in-part of Ser. No. 74,487, Jul. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 904,433, Sep. 8, 1986, abandoned. This application Jul. 24, 1989, Ser. No. 384,234

Int. Cl.[5] **C07D** *249/20*

U.S. Cl. 548—260 **5 Claims**

1. A sulfonated 2-(2'-hydroxyaryl)-2H-benzotriazole selected from the group consisting of the following chemical structure



wherein R is a secondary alkyl, tertiary alkyl group, R' is a polyether chain of 5 to 69 carbon atoms, and M is hydrogen, ammonium or a metal ion which does not result in a highly colored benzotriazole.

4,990,624

INTERMEDIATES ANHYDRIDES USEFUL FOR SYNTHESIZING ETHERIMIDES

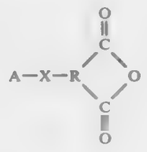
Clyde H. Sheppard, Bellevue, Wash., and Hyman R. Lubowitz, Rolling Hills Estates, Calif., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 16,703, Feb. 20, 1987, Pat. No. 4,851,495. This application Jun. 30, 1988, Ser. No. 213,739

Int. Cl.[5] **C07D** *491/052*

U.S. Cl. 548—431 **30 Claims**

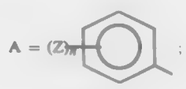
1. An anhydride of the formula:



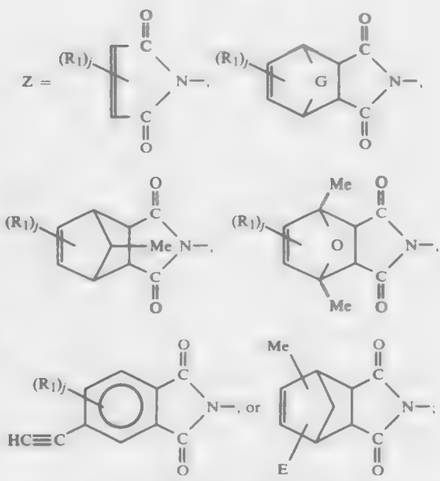
wherein

X=—O— or —S—;

R=a trivalent $C_{(6-13)}$ aromatic organic radical;



n = 1 or 2;

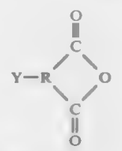


R_1=any of lower alkyl, lower alkoxy, aryl, or substituted aryl;

j=0, 1, or 2; and

G=—CH_2—, —O—, —S—, or —SO_2—,

the anhydride being formed by reacting A—XH with a substituted phthalic anhydride of the formula:



wherein Y=halo- or nitro-.

4,990,625

PROCESS FOR SYNTHESIS OF N,N-DISUBSTITUTED HYDRAZONE

Tetsuo Arita, Shiki; Minoru Mabuchi, Tokyo; Shoji Umehara, Fuchu, and Kiyoshi Sakai, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 110,569, Oct. 15, 1987, abandoned, which is a continuation of Ser. No. 797,791, Nov. 14, 1985, abandoned, which is a continuation of Ser. No. 525,175, Aug. 22, 1983, abandoned. This application Dec. 5, 1989, Ser. No. 445,930

Claims priority, application Japan, Aug. 31, 1982, 57-150023

Int. Cl.[5] *C07C 249/16; C07D 209/82*

U.S. Cl. 548—444 **12 Claims**

1. A continuous process for synthesizing an N,N-disubstituted hydrazone of high purity in high yields comprising:

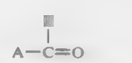
(a) adding an aqueous solution of sodium nitrite to a solution having one part by weight of an N,N-disubstituted amine selected from the group consisting of N-phenyl-N-α-naphthylamine and N-phenyl-N-β-naphthylamine dissolved in 3 to 30 parts by weight of an organic acid to form by nitrosation a mixture containing a nitrosated N,N-disubstituted amine product;

(b) adding a reducing agent to said mixture containing said nitrosated product to reduce the nitrosated product to a N,N-disubstituted hydrazine;

(c) conducting step (b) within a temperature range sufficient to provide a controlled reducing rate while preventing substantial oxidation of the N,N-disubstituted hydrazine;

(d) adding a carbonyl compound to the mixture containing the N,N-disubstituted hydrazine to thereby form by condensation the N,N-disubstituted hydrazone; and

(e) conducting step (d) within a temperature range sufficient to prevent substantial oxidation of the N,N-disubstituted hydrazine, wherein said carbonyl compound having the formula



wherein A is a substituted or unsubstituted aromatic hydrocarbon or aromatic heterocyclic group, and B is a hydrogen atom, an alkyl group, an aryl group, or a substituted or unsubstituted aromatic heterocyclic group.

4,990,626

PROCESS FOR PREPARING BISIMIDES PRODUCTS

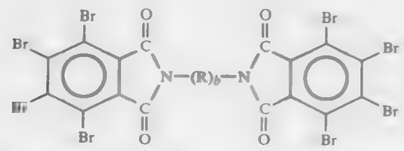
Donald O. Hutchinson; Ali M. Dadgar, and Keith G. Anderson, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 4, 1989, Ser. No. 332,984

Int. Cl.[5] **C07D** *209/48*

U.S. Cl. 548—462 **20 Claims**

1. A process for preparing a bisimide product which principally contains a bisimide of the formula,



wherein R is an alkylene radical containing 1 to 6 carbon atoms and b is 1 or 0, said process comprising:

(a) providing, in a reaction vessel, a solution containing tetrabromophthalic anhydride and a solvent, which solvent contains at least about 15 wt % of a mono-, di- or tricarboxylic acid having a dissociation constant not higher than 1.0×10^{-3} at 25° C.;

(b) forming, at a temperature within the range of from 140° C. to about 200° C., a reaction mass by adding to said solution, a diamine of the formula,

$H_2N—(R)_b—NH_2$,

a diamine salt formed by the partial or total diamine neutralization of a mono-, di- or tri- carboxylic acid having a dissociation constant not higher than 1.0×10^{-3} at 25° C., or a mixture of said diamine and said diamine salt, said formation of said reaction mass resulting in the production of a bisimide precipitate and water which become components of the reaction mass;

(c) retaining in the reaction mass, during its formation, at least a substantial portion of the water produced during such formation;

(d) terminating said addition of the diamine, diamine salt or mixture when the molar ratio of said tetrabromophthalic anhydride initially present in the solution to said diamine and/or diamine salt added is within the range of from about 1:9:1 to 2.1:1;

(e) after the termination of said addition, cooking said reaction mass for a period of time at a temperature within the range of from about 140° C. to about 200° C. so as to obtain an increase in the average sphericity of the particles comprising said bisimide precipitate, said sphericity being defined as the ratio of the surface area of a sphere having a volume of the particle being measured to the surface area of that particle, said reaction mass comprising water, said mono-, di or tri-carboxylic acid and said bisimide precipitate during said cooking period; and

(f) recovering, as said bisimide product, the cooked bisimide precipitate from the remainder of said reaction mass, which remainder comprises water and said mono-, di-, or tri-carboxylic acid.

4,990,627

POLYETHERIMIDES AND THEIR PRODUCTION

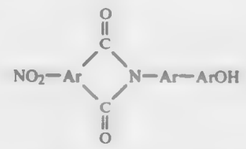
Gene C. Robinson, and G. Patrick Stahly, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 27, 1988, Ser. No. 290,583

Int. Cl.[5] **C07D** *209/48*

U.S. Cl. 548—473 **6 Claims**

1. A compound of the formula



wherein the groups —Ar—Ar— are unsubstituted or substituted 1-4-phenylene; unsubstituted or substituted 4,4'-biphenylene; unsubstituted or substituted 1,4-naphthylene; unsubstituted or substituted 1,5-naphthylene; or unsubstituted or substituted 4,4'-terphenylene the substituents on the same or different rings of said group —AR—AR and are alkyl, haloalkyl, alkoxy, cycloalkoxy, aryl, halo, aralkyl, mercapto, alkylthio, or arylthio and the group AR—NO_2 is phenyl unsubstituted or substituted with alkyl, haloalkyl, alkoxy, cycloalkoxy, aryl, halo, aralykyl, mercapto, alkylthio or arylthio.

4,990,628

CATALYTIC PREPARATION OF THIOLACTAMS

Alan D. Eastman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 1, 1990, Ser. No. 486,710

Int. Cl.[5] **C07D** *207/267, 211/76, 223/10*

U.S. Cl. 548—543 **20 Claims**

1. In a process for reacting at least one lactam with hydrogen

sulfide so as to produce at least one thiolactam, the improvement which comprises employing a catalyst comprising (i) alumina as support material and (ii) at least one Group VIII metal or compound thereof deposited on said support material.

4. A process in accordance with claim 1, wherein said at least one lactam is a N-alkyl-2-pyrrolidone with the alkyl group containing 1–3 carbon atoms, and the thiolactam is a N-alkyl-2-thiopyrrolidone with the alkyl group containing 1–3 carbon atoms.

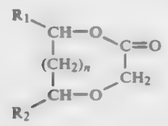
4,990,629

PROCESS FOR PRODUCING LACTONES

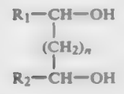
Yoshie Souma, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 292,856
Int. Cl.[5] C07D *321/00, 319/12*
U.S. Cl. 549—267 6 Claims

1. A process for producing a cyclo-1,4-dioxa-2-one of the formula



wherein R_1 and R_2 are each a hydrogen atom or an alkyl group and n is an integer of 0 to 10, which comprise reacting a diol of the formula



with formaldehyde and carbon monoxide in the presence of a strong acid and a copper (I) or silver carbonyl complex as the catalyst.

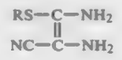
4,990,630

2,3-DIAMINOACRYLONITRILE DERIVATIVES AND PROCESS FOR MAKING THE SAME

Katsunori Mikuma; Nobuhiro Umeda, both of Kurashiki; Tomio Yagihara, and Isami Hamamoto, both of Odawara, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

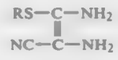
Continuation-in-part of Ser. No. 189,245, Apr. 11, 1988, abandoned. This application Aug. 28, 1989, Ser. No. 398,969
Claims priority, application Japan, Aug. 13, 1986, 61-189807; Sep. 1, 1986, 61-205581; Jul. 8, 1987, 62-170638
Int. Cl.[5] C07D *307/64, 307/91;* C07C *253/10, 255/08*
U.S. Cl. 549—460 5 Claims

1. A 2,3-diaminoacrylonitrile derivative having the formula



wherein R represents on C_{1-18} alkyl group (which may be substituted by unsubstituted or substituted phenyl groups, halogen atoms, C_{1-4} alkoxycarbonyl groups, C_{1-2} alkoxycarbonyl C_{1-2} alkylthio groups, hydroxy groups, mercapto groups or heterocyclic groups containing oxygen and sulfur atoms); an C_{3-15} alkenyl group; a C_{5-6} cycloalkyl group; a naphthyl group; a benzofuranyl group; or a phenyl group (which may be substituted by halogen atoms, C_{1-4} alkyl groups, cycloalkyl groups, nitro groups, unsubstituted or substituted phenyl or phenoxy groups).

2. A process for the production of a 2,3-diaminoacrylonitrile derivative or salts thereof having the formula



which comprises reacting hydrogen cyanide with a compound having the formula RSSR in the presence of a base at 0°–40° C., wherein the molar ratio of RSSR: base: hydrogen cyanide is at least 1:1:1; wherein R represents an C_{1-18} alkyl group (which may be substituted by unsubstituted or substituted phenyl groups, halogen atoms, C_{1-4} alkoxycarbonyl groups, carboxy groups, C_{1-2} alkoxycarbonyl C_{1-2} alkylthio groups, hydroxy groups, mercapto groups or heterocyclic groups containing oxygen and sulfur atoms); an C_{3-15} alkenyl group; a C_{5-6} cycloalkyl group; a naphthyl group; a benzofuranyl group; or a phenyl group (which may be substituted by halogen atoms, C_{1-4} alkyl groups, cycloalkyl groups, nitro groups, unsubstituted or substituted phenyl or phenoxy groups).

4,990,631

PROCESS FOR THE PREPARATION OF 2,2-DIALKOXY CYCLIC ORTHO ESTERS DERIVED FROM LACTONES

Karol Alster, Farum, Denmark, assignor to Alza Corporation, Palo Alto, Calif.

Filed May 30, 1990, Ser. No. 530,759
Int. Cl.[5] C07D *307/20*
U.S. Cl. 549—476 18 Claims

1. A process for the preparation of 2,2-di-C_{1-6}alkoxy cyclic ortho esters derived from lactones which comprises:

(a) reacting tri-C_{1-6}alkyl orthoformate with boron trifluoride to give di-C_{1-6}alkoxymethylium tetrafluoroborate;

(b) reacting di-C_{1-6}alkoxymethylium tetrafluoroborate with a lactone to give O-C_{1-6}alkyllactonium tetrafluoroborate; and

(c) reacting O-C_{1-6}alkyllactonium tetrafluoroborate with C_{1-6}alkoxide, or with C_{1-6}alkanol and a base to give the 2,2-di-C_{1-6}alkoxy cyclic ortho ester;

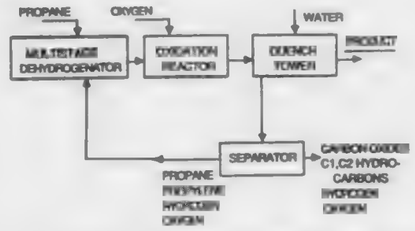
wherein, steps (a) and (b) are conducted in the absence of solvents, other than the reactants themselves.

4,990,632

PROCESS FOR THE PRODUCTION OF OXIDES

Ramakrishnan Ramachandran, Allendale; Donald L. Maclean, Annandale, and Donald P. Satchell, Jr., Summit, all of N.J., assignors to The BOC Group, Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 215,858, Jul. 6, 1988, Pat. No. 4,849,538, which is a continuation-in-part of Ser. No. 172,112, Mar. 23, 1988, abandoned. This application Jul. 6, 1989, Ser. No. 376,338
Int. Cl.[5] C07D *301/04, 301/08, 301/10*
U.S. Cl. 549—523 17 Claims



1. A process for the production of alkylene oxides comprising:

(a) forming an alkene from a gaseous alkane in a catalytic dehydrogenator;

(b) introducing said alkene stream and an oxygen source selected from the group consisting of pure oxygen, air or a gas enriched in oxygen relative to air into a suitable oxidation reactor for reaction in the presence of an oxidation catalyst at about 100° to 500° C. 0 to 1000 psig, and a residence time from a few seconds up to 1 hour to produce a gaseous effluent containing said oxide;

(c) quenching said gaseous effluent in a liquid to form a liquid phase containing said oxide and a gas phase;

(d) recovering said oxide from said liquid phase;

(e) introducing the gas phase quench effluent under pressure into a pressure swing adsorption unit to thereby form (i) a waste stream and (ii) a gaseous stream comprising said unreacted alkane, alkene, a minor amount of oxygen, and nitrogen when air or oxygen-enriched air is introduced as the oxygen source into the reactor in step (b);

(f) introducing said gaseous stream into a catalytic selective oxidation reactor to remove substantially all of the remaining oxygen in said stream; and

(g) recycling said oxygen-depleted effluent to the beginning stage of the dehydrogenator.

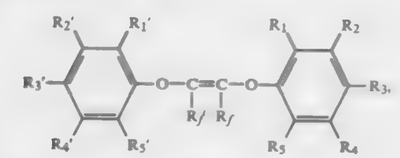
4,990,633

FLUORINATED BISARYLOXY-SUBSTITUTED ALKENES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Michael Negele, Cologne; Dietmar Beilefeldt, Ratingen; Thomas Himmler, Cologne, and Albrecht Marhold, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,595
Claims priority, application Fed. Rep. of Germany, May 25, 1988, 3817626
Int. Cl.[5] C07C *43/205;* C07D *303/04, 303/34, 303/36*
U.S. Cl. 549—551 6 Claims

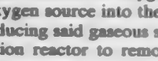
1. A fluorinated bis aryloxy-substituted alkene compound of the formula (I)



in which

R_1 and R_1' independently of one another represent a C_1- to C_6-perfluoroalkyl radical or R_f and R_f' together represent a C_2- to C_4-perfluoroalkylene radical and

R_1 to R_5 and R_1' to R_5' independently of one another represent hydrogen, C_1- to C_{12}-alkyl, C_2- to C_6-alkenyl and/or C_2- to C_6-alkinyl, which are unsubstituted or substituted with OCN—, R_6O—, H_2N—, R_6SO_3— and/or R_6OOC— groups, with R_6=hydrogen or C_1- to C_6-alkyl or unsubstituted C_5- to C_7-cycloalkyl or C_5- to C_7-cycloalkyl substituted by C_1- to C_6-alkyl, C_2- to C_6-alkenyl, C_1- to C_4-haloalkyl, halogen, NH_2, COOH, OH, unsubstituted phenyl or phenyl substituted by one or more of NO_2, NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br, and where the alkinyl groups may also contain trimethyl silyl substituents, C_1- to C_4-haloalkyl, C_1- to C_4-epoxyalkyl, C_1- to C_4-hydroxyalkyl, unsubstituted phenyl or phenyl substituted by one or more of NO_2, NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br, $-OR_7$, with R_7=hydrogen, C_1- to C_6-alkyl, C_1- to C_4-hydroxyalkyl, C_1- to C_4-epoxyalkyl, $-(-CH_2)_m-(-O-(-CH_2)_m-)_n-OH$ with m=1 to 4 and n=1 to 8, unsubstituted phenyl or phenyl substituted by one or more of NO_2, NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br, or unsubstituted benzyl or benzyl substituted by one or more of NO_2, NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br, CN, SO_3X, with X=hydrogen, sodium or potassium, S-C_1- to C_6-alkyl, SO_2—halogen, unsubstituted C_5- to C_7-cycloalkyl or C_5- to C_7-cycloalkyl substituted by C_1- to C_6-alkyl, C_2- to C_6alkenyl, C_1- to C_4-haloalkyl, halogen, NH_2, COOH, OH, unsubstituted phenyl or phenyl substituted by one or more of NO_2NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br, carbonyl-R_8, with R_8=hydrogen, C_1- to C_6-alkyl, unsubstituted C_5- to C_7-cycloalkyl or C_5- to C_7-cycloalkyl substituted by C_1- to C_6-alkyl, C_2- to C_6-alkenyl, C_1- to C_4-haloalkyl, halogen, NH_2, COOH, OH, unsubstituted phenyl or phenyl substituted by one or more of NO_2NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br, C_1- to C_6-alkoxy, C_5- to C_7-cycloalkoxy or OY with Y=hydrogen, sodium or potassium, or



, with R_9=C_1- to C_6-alkyl to C_4-haloalkyl, unsubstituted phenyl or phenyl substituted by one or more of NO_2, NH_2, NCO, COOH, CHO, OH, SO_3H, F, Cl or Br or hydrogen and with R_{10}=hydrogen or C_1- to C_4-alkyl, where the compound is excluded in which R_1 to R_5 and R_1' to R_5' represent hydrogen and R_f and R_f' together represent —(—CF_2—)$_3$—.

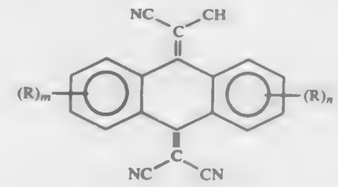
4,990,634

NOVEL TETRACYANOANTHRAQUINODIMETHANE DERIVATIVES AND PROCESS FOR PRODUCING SAME

Toshio Mukai, 2-1-2, Tsunogoro, Sendai-shi, Miyagi; Yoshiro Yamashita; Takanori Suzuki, both of Miyagi; Yutaka Akasaki, Kanagawa; Katsuhiro Sato, Kanagawa; Naoya Yabuuchi, Kanagawa; Hiroyuki Tanaka, Kanagawa, and Katsumi Nukada, Kanagawa, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Toshio Mukai, Miyagi, both of, Japan

Filed Sep. 14, 1987, Ser. No. 95,797
Claims priority, application Japan, Sep. 12, 1986, 61-214062; Sep. 12, 1986, 61-214063; Sep. 24, 1986, 61-223766; Sep. 24, 1986, 61-223767; Oct. 22, 1986, 61-249541
Int. Cl.[5] C07C *50/16, 50/06, 97/18*
U.S. Cl. 552—210 3 Claims

1. A tetracyanoanthraquinodimethane derivative represented by formula (I)



wherein R represents a dialkylamino group wherein the alkyl moiety is a lower alkyl group; and n is 1 and m represents 0 or 1 such that m+n is 1 or 2.

4,990,635

SYNTHESIS OF 6-METHYLENE DERIVATIVES OF ANDROSTA-1,4-DIENE-3,17-DIONE

Antonio Longo, and Paolo Lombardi, both of Milan, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Filed Jan. 6, 1989, Ser. No. 294,016
Int. Cl.[5] C07J *1/00*
U.S. Cl. 552—526 2 Claims

1. A process for the preparation of the compound of formula (I)

4,990,636

PROCESS FOR THE PRODUCTION OF ALPHA-6-DEOXYTETRACYCLINES AND HYDROGENATION CATALYST USEFUL THEREIN

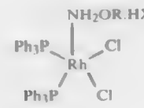
Jagmohan Khanna; Kiran Bala, and Inder P. S. Grover, all of New Delhi, India, assignors to Ranbaxy Laboratories Limited, India

Division of Ser. No. 263,721, Oct. 28, 1988, Pat. No. 4,902,447. This application Feb. 9, 1990, Ser. No. 477,571

Int. Cl.[5] C07F *15/00, 9/00*

U.S. Cl. 556—23 6 Claims

1. A coordination compound useful as a hydrogenation catalyst, and having the formula:



(I)

wherein

Ph is phenyl;

R is hydrogen or C_1–C_4 alkyl; and

X is chloro, bromo or iodo.

4,990,637

1-BENZYLSULPHONYL-3-HETEROARYL-(THIO)UREA HERBICIDES

Christa Fest, Wuppertal; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Hans-Jochem Riebel, Wuppertal; Ernst Kysela, Bergisch-Gladbach; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Robert H. Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

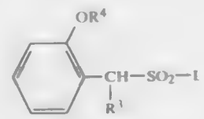
Division of Ser. No. 268,419, Nov. 8, 1988, Pat. No. 4,927,454, which is a division of Ser. No. 130,772, Dec. 9, 1987, Pat. No. 4,806,147. This application Jan. 30, 1990, Ser. No. 472,520

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642824

Int. Cl.[5] C07C *303/00*

U.S. Cl. 562—41 7 Claims

1. A 2-halogenoalkoxybenzylsulphonyl derivative of the formula



in which

R^3 represents hydrogen or alkyl,

R^4 represents halogenoalkyl,

L represents —N=C=O, —N=C=S, $-NH_2$, Cl, OH or OM, and

M represents an alkali metal.

4,990,638

WATER-SOLUBLE ANTIMONY (V) COMPOUNDS

Charles J. Besecker, Cleveland, and William A. Marritt, Cleveland Hts., both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 21, 1987, Ser. No. 135,206

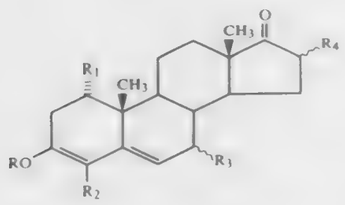
Int. Cl.[5] C07F *9/90*

U.S. Cl. 556—64 21 Claims

1. A new compound, tri- or tetrahydrocarbylammonium hexahydroxyantimonate, having the formula

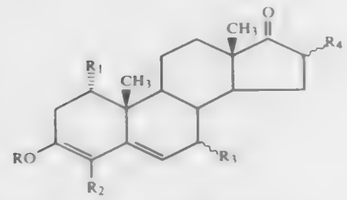
$$[R_3R'N]Sb(OH)_{6-x}O_{x/2} \quad (I)$$

wherein each of R_1 and R_3, independently, is hydrogen or C_1–C_6 alkyl; R_2 is hydrogen, halogen or C_1–C_6 alkyl, and R_4 is hydrogen or fluorine; the process comprising reacting a compound of formula (II)



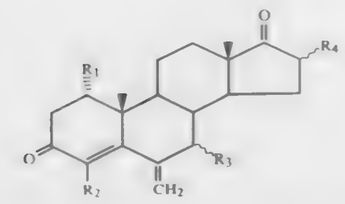
(II)

wherein R_1, R_2, R_3, and R_4, are defined above and R is a lower alkyl group, with a 30% to 40% aqueous formaldehyde solution and to 1 to 2 equivalents of the hydrohalic salt of an amine of formula (III),



(III)

wherein R_a is lower alkyl and R_b is aryl in an organic solvent, at a temperature ranging from 30° C. to 50° C., so as to obtain a compound of formula (IV)



(IV)

wherein R_1, R_2, R_3, and R_4, are defined above and then dehydrogenating a compound of formula (IV), thus obtained.

wherein each R contains 1–10 C atoms and is independently selected from alkyl, aralkyl and alkylaralkyl, R′ is H or R, and wherein x is an indeterminate number of moles of H_2O.

4,990,639

NOVEL RECOVERY PROCESS

Ludger Bexten, Hünxe, and Dieter Kuples, Duisburg, all of Fed. Rep. of Germany, assignors to Hoechst AG, Werk Ruhrchemie, Fed. Rep. of Germany

Continuation of Ser. No. 72,923, Jul. 14, 1987, abandoned. This application Nov. 16, 1989, Ser. No. 438,572

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3626536

Int. Cl.[5] C07F *15/00*

U.S. Cl. 556—136 9 Claims

1. A process for the recovery of rhodium from aqueous solutions of rhodium complex compounds comprising adding a stoichiometric excess of a water-soluble salt of an organic carboxylic acid of 7 to 22 carbon atoms to an aqueous solution of a rhodium complex compound having a pH of 4 to 8, treating the solution with an oxidant at 50 to 200° C. to form water-insoluble rhodium compound and separating the rhodium compound therefrom.

4,990,640

BENZENE-INSOLUBLE ORGANOALUMINUM OXY-COMPOUNDS AND PROCESS FOR PREPARING SAME

Toshiyuki Tsutsui; Mamoru Kioka, and Akinori Toyota, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,435

Claims priority, application Japan, Sep. 14, 1988, 63-231205; Sep. 14, 1988, 63-231206; Sep. 14, 1988, 63-231207; Dec. 26, 1988, 63-328730; Mar. 28, 1989, 1-75608; Mar. 28, 1989, 1-75610

Int. Cl.[5] C07F *5/06*

U.S. Cl. 556—181 10 Claims

1. An organoaluminum oxy-compound insoluble or sparingly soluble in benzene having:

(A) less than 10% in terms of Al atom of Al component dissolving in benzene kept at 60° C., and

(B) less than 0.09 of a (D_{1260}/D_{1220}) ratio of an absorbance (D_{1260}) at 1260 cm^{-1} to an absorbance (D_{1220}) at 1220 cm^{-1}, both obtained by infrared spectrophotometry.

4,990,641

ORGANOSILICON COMPOUND AND ITS PREPARING METHOD

Keiji Kabeta, Gunma, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

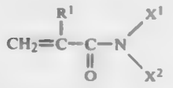
Filed Jul. 7, 1989, Ser. No. 376,834

Claims priority, application Japan, Jul. 8, 1988, 63-170475; Jul. 8, 1988, 63-170476

Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—419 9 Claims

1. An orgonosilicon compound of general formula (I):



(I)

in which R^1 is a hydrogen atom or a methyl group, X^1 and X^2 each independently are $—CH_2CH=CH_2$ or $—(CH_2)_3SiR^2_nY_{3-n}$, provided at least one of them is $—(CH_2)_3SiR^2_nY_{3-n}$, R^2 is a substituted or non-substituted monovalent hydrocarbon group, Y is an alkoxy group or a halogen atom, and n is zero, 1 or 2.

4,990,642

PROCESS FOR PREPARING OXIMOSILANES

Horst Häring, Martinistrasse 82, D-8900 Augsburg 21, Fed. Rep. of Germany, assignor to Horst Haring, Ausberg, Fed. Rep. of Germany

PCT No. PCT/DE88/00049, § 371 Date Mar. 31, 1989, § 102(e) Date Mar. 31, 1989, PCT Pub. No. WO88/05778, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 2, 1988, Ser. No. 273,859

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 3703484

Int. Cl.[5] C07F *7/10, 7/18*

U.S. Cl. 556—422 4 Claims

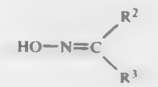
1. Process for the formation of oximosilanes of the general formula (I)

$$R^1_a\,Si(O—N=R^2R^3)_{4-a} \quad (I)$$

wherein R^1 represents a straight-chain or branched alkyl residue having between 1 and 18 carbon atoms, a straight-chain or branched alkenyl residue having between 2 and 18 carbon atoms, an aryl or aralkyl residue optionally substituted with one or more members of the group consisting of halogens, nitro groups, amino groups and alkyl residues having between 1 and 4 carbon atoms, or a straight-chain or branched alkoxy-residue having between 1 8 carbon atoms, a is an integer of 0 to 3 , and R^2 and R^3, independently of each other, represent straight-chain or branched alkyl residues having between 1 and 18 carbon atoms, optionally substituted with halogens, nitro groups, amino groups and alkyl residues having between 1 and 4 carbon atoms by a reaction of an acyloxysilane with an oxime in molar excess, comprising reacting an acyloxysilane of the general formula (II)

$$R^1_a\,Si(OCOR^4)_{4-a} \quad (II)$$

wherein R^1 and a have the above-indicated significations and R^4 represents straight-chain or branched alkyl residues having between 1 and 18 carbon atoms, straight-chain or branched alkenyl residues having between 2 and 18 carbon atoms or aryl or aralkyl residues which may be substituted with halogens, nitro groups, amino groups and alkyl residues having between 1 and 4 carbon atoms, with a ketoxime of general formula (III)



(III)

wherein R^2 and R^3 have the above significations, in the absence of an acid acceptor, while distilling off carboxylic acid, released from the acyloxysilane of the general formula (II).

4,990,643

METHOD FOR PREPARING CARBOXY FUNCTIONAL SILICONES

Frank J. Traver, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 22, 1990, Ser. No. 542,272

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—439 8 Claims

1. A method of preparing carboxy functional silicones, comprising the steps of:

(1) addition reacting a mixture of ingredients comprising:

(A) an organoacyloxysilane having the general formula:

$$(I)\ R_3SiOOC(R^1)_xCH=CH_2$$

wherein R and R^1 are monovalent hydrocarbon radicals free of aliphatic unsaturation, and x is a number in the range from about 0 to about 30;

(B) an organohydrogenpolysiloxane having a hydride concentration of 0.01 to about 100 mole percent and a viscosity of about 2 to about 1 million centipoise at 25° C.; and

(C) an amount of a precious metal or a precious metal-containing catalyst effective for promoting an addition reaction between components (1) and (2);

wherein components are present in a molar ratio of about 1:1; and

(2) hydrolyzing the addition reaction product formed in step (1).

4,990,644

SULFONIUM COMPOUND AND ACYLATING AGENT

Katsushige Kouge, Yamaguchi, Japan, assignor to Sanshin Kagaku Kogyo Co. Ltd., Yamaguchi, Japan

Filed Mar. 8, 1989, Ser. No. 320,656

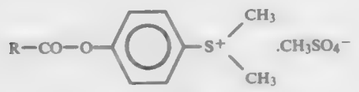
Claims priority, application Japan, Mar. 8, 1988, 63-55856

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] C07C *141/02*

U.S. Cl. 558—20 **1 Claim**

1. A sulfonium compound represented by the general formula:



where R represents 9- fluorenylmethoxy group.

4,990,645

HYDROCYANATION PROCESS

Gary L. Back; Harvey J. Batey; John C. Caton, all of Victoria; Robin L. Kump, Orange; Charles F. O'Brien, III, and Jacques D. Robinson, both of Victoria, all of Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1990, Ser. No. 544,625

Int. Cl.[5] C07C *253/10*

U.S. Cl. 558—335 **6 Claims**

1. A process for the preparation of adiponitrile by the hydrocyanation of pentenenitrile using a zero-valent nickel catalyst and a triarylborane promoter in which solid catalyst degradation precipitate fouls the reactor and related equipment and is contained in the product fluid which comprises recycling a portion of the solid catalyst degradation precipitate to the reactor, and controlling the HCN concentration in the product stream leaving the reactor so that the HCN concentration does not exceed about 2500 ppm.

4,990,646

PREPARATION OF HALOGENATED QUINOLONECARBOXYLIC ACIDS

Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 209,751, Jun. 21, 1988, Pat. No. 4,914,228, which is a division of Ser. No. 29,939, Mar. 24, 1987, Pat. No. 4,782,156, which is a division of Ser. No. 754,563, Jul. 12, 1985, Pat. No. 4,680,401. This application Jan. 19, 1990, Ser. No. 467,630

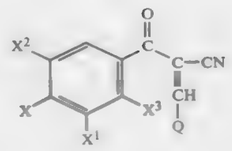
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426483

Int. Cl.[5] C07C *255/37, 255/42, 255/40*

U.S. Cl. 558—405 **6 Claims**

1. 2,4-Dichloro-5-fluorobenzoylacetonitrile.

2. A compound of the formula



in which

X^1 and X^2 each independently is hydrogen or halogen,

X and X^3 are halogen, and

Q is methoxy or cyclopropylamino.

4,990,647

PROCESS FOR THE PREPARATION OF UNSYMMETRIC BIARYL COMPOUNDS

Thomas Himmler, Cologne, and Rudolf Braden, Odenthal-Scheuren, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

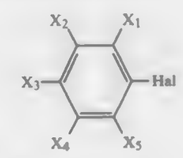
Filed Apr. 24, 1989, Ser. No. 342,501

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816120

Int. Cl.[5] C07C *253/14*; C07D *207/34*

U.S. Cl. 558—414 **13 Claims**

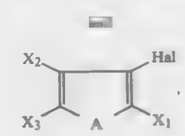
1. A process for the preparation of unsymmetric biaryl compounds, in which a chloroaromatic compound is coupled with a differently substituted iodo-, bromo- or chloroaromatic compound, said chloroaromatic compound and said differently substituted aromatic compound are a halogenoaromatic selected from the group consisting of



(II)



(III)



(IV)

in which

Hal represents chlorine for the chloroaromatic compound and iodine, bromine or chlorine for the differently substituted aromatic compound, and

X_1 to X_5 are identical or different and independently of one another represent hydrogen, C_1- to C_6-alkyl, C_6- to C_{14}-aryl, fluorine, C_1- to C_6-alkoxy, C_1- to C_6-alkylthio, C_1- or C_2- fluoroalkyl having 1 to 5 fluorine atoms, C_1- or C_2-fluoroalkoxy having 1 to 5 fluoro atoms, phenoxy, C_1- to C_{18}-alkylamino, C_2- to C_{36}-dialkylamino, C_6- to C_{14}-arylamino, C_{12}- to C_{18}-diarylamino, C_2- to C_{18}-carboxyalkyl, C_7- to C_{10}-carboxyaryl, formyl, cyano, C_1- to C_{18}-alkylsulphinyl, C_1- to C_{18}-alkylsulphonyl, C_6- to C_{14}-arylsulphinyl, C_6- to C_{14}-arylsulphonyl, OCO—C_1- to C_{18}-alkyl or OCO—C_6- to C_{14}-aryl, wherein OCO—C_1- to C_{18}-alkyl and OCO—C_6- to C_{14}-aryl radicals cannot be in the orthoposition relative to the halogen atom and wherein any two adjacent radicals from the group X_1 to X_5 together can also represent one of the groupings —CH-

2—CH_2—CH_2—, —CH_2—CH_2—CH_2—CH_2—, —CH=CH—CH_2—, —CH=CH—CH=CH—, —O—CH-2—O— or —O—CH_2—CH_2—O—, in which in each case one or more or all of the hydrogen atoms may or may not be replaced by fluorine, one or more or all of the hydrogen atoms of the groupings —CH_2—CH_2—CH_2— and CH_3—CH_2—CH_3= CH_2 may or may not be replaced by chlorine and

A represents oxygen, sulphur or NR, where R=C_1- to C_{10}-alkyl, benzyl, phenyl having 6 to 20 C atoms, formyl or acetyl, comprising reacting the chloroaromatic compounds with a metal in the presence of a catalytic amount of a nickel compound selected from the group consisting a nickel (II) halide, a nickel (II) slat of an organic acid having 1 to 18 carbon atoms, a nickel (II) complex and a nickel (O) complex, said catalytic amount of nickel compound being 0.1 to 25 mole % based on the sum of the two halogenoaromatics, a promoter selected from the group consisting of halides of alkali metals, alkaline earth metals, zinc, magnesium and manganese and a phosphorous-containing ligand and wherein the reaction is conducted at a temperature of 0° to 250° C. and at a pressure of 0.1 to 1 bar, whereby the desired product is obtained in a yield of at least about 40%.

4,990,648

PROCESS FOR PRODUCING AN ALKYLTHIOBENZOATE

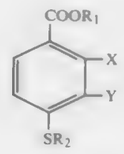
Richard W. Brown, Richmond, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 290,018, Dec. 22, 1988, Pat. No. 4,925,970. This application Jan. 3, 1990, Ser. No. 460,432

Int. Cl.[5] C07C *321/28, 69/75*

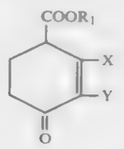
U.S. Cl. 560—18 **11 Claims**

1. A process for production of an alkylthiobenzoate having the formula

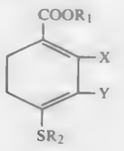


in which R_1 is C_1–C_6 alkyl; R_2 is C_1–C_4 alkyl; X is C_1–C_4 alkyl or C_1–C_4 haloalkyl; and Y is hydrogen, halogen or C_1–C_4 alkyl, comprising the steps of

(a) reacting a cyclohexenone having the formula



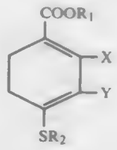
with a mercaptan having the formula R_2SH to produce a cyclohexadiene thioether having the formula



and

(b) dehydrogenating the product of step (a).

11. A compound having the formula



in which R_1 is C_1–C_6 alkyl; R_2 is C_1–C_4 alkyl; X is C_1–C_4 alkyl or C_1–C_4 haloalkyl; and Y is hydrogen, halogen or C_1–C_4 alkyl.

4,990,649

AZULENESQUARIC ACID DYES THAT CONTAIN URETHANE GROUPS

Wolfgang Schrott, Ludwigshafen; Peter Neumann, Mannheim; Michael Schmitt, Ludwigshafen; Sibylle Brosius, Mannheim; Klaus D. Schomann, Ludwigshafen, and Harald Kuppelhamier, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

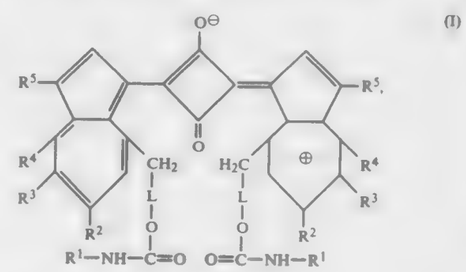
Filed May 2, 1989, Ser. No. 347,439

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816068

Int. Cl.[5] C07C *271/12, 271/28, 271/24*; C09B *69/00*

U.S. Cl. 560—25 **4 Claims**

1. An azulenesquaric acid dye having the formula:



(I)

where

L is C_1–C_{12}-alkylene or C_1–C_{12}-alkylene substituted by phenyl,

R^1 is C_1–C_{20}-alkyl, C_5–C_7-cycfoalkyl, phenyl or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R^2, R^3, R^4 and R^5 are identical or different and are each independently of the others hydrogen or C_1–C_{12}-alkyl, C_1–C_{12} alkyl, substituted by halogen, C_1–C_4-alkoxy, phenyl, phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, C_1–C_{12}-alkoxycarbonyl or cyano, with the proviso that when R^5 is hydrogen the positions of the substituents CH_2—L—O—CO—NHR^1 and R^4 on an azulene ring also are within a ring in either or both of the azulene rings.

4,990,650

AROMATIC DERIVATIVE AND PREPARATION METHOD THEREOF

Atsuo Hazato, Hino, and Seizi Kurozumi, Kokubunji, both of Japan, assignors to Teijin Limited, Osaka, Japan

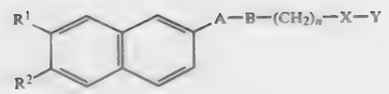
Continuation of Ser. No. 138,130, Dec. 28, 1987. This application May 29, 1990, Ser. No. 529,769

Claims priority, application Japan, Dec. 26, 1986, 61-308519

Int. Cl.[5] C07C *279/00*

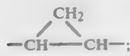
U.S. Cl. 560—48 **9 Claims**

1. An aromatic derivative having the formula (I):

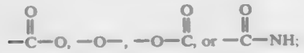


(I)

wherein R^1 and R^2 independently represent a hydrogen atom, hydroxyl, or OR^3 wherein R^3 is C_1–C_{10} alkyl; A in A—B represents —CH=CH— and B in A-B represents



n is an integer of 2 to 4; X represents a group



and Y represents a hydrogen atom, alkyl having 1 to 5 carbon atoms which may be substituted with aryl; alkenyl having 2 to 5 carbon atoms which may be substituted with aryl or aryl substituted with at least one C_1–C_5 alkoxy; aryl which may be substituted with at least one carboxyl group, C_1–C_5 alkoxycarbonyl group, or C_1–C_5 alkoxy group; provided that, when R^1 and R^2 are both hydrogen, the moiety —A—B—$(CH_2)_n$—X—Y does not represent



wherein n=2 to 4 and R^4 is hydrogen or C_1–C_5 alkyl.

4,990,651

PROCESS FOR PRODUCING CARBOXYLIC ACID ESTERS

Hideo Ikarashi; Yoshio Kawai; Seiji Nagasawa, and Hiroyuki Hirayama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,730
Claims priority, application Japan, May 16, 1988, 63-116970
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—103 10 Claims

1. In a process for producing carboxylic acid ester which comprises reacting, in the presence of a catalyst, carboxylic acid amide and formic acid ester, or carboxylic acid amide, alcohol and carbon monoxide, the improvement wherein the catalyst is an alkali metal alcoholate or alkaline earth metal alcoholate.

4,990,652

INTERMEDIATES FOR PREPARING MULTIFUNCTIONAL THIADIAZOLE LUBRICANT ADDITIVES

James P. King, Upper Gwynedd, and Sameeh S. Toukan, Phoenixville, both of Pa., assignors to Atochem North America, Inc., Philadelphia, Pa.

Division of Ser. No. 244,608, Sep. 6, 1988, Pat. No. 4,902,804, which is a continuation of Ser. No. 783,728, Oct. 8, 1985, abandoned. This application Nov. 21, 1989, Ser. No. 439,759
Int. Cl.[5] C07C *69/40, 229/22*
U.S. Cl. 560—192 5 Claims

1. 4-Tridecyl monoester 2-bromo-succinic acid.

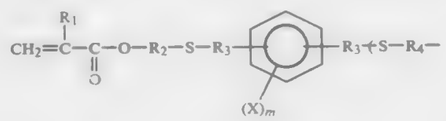
4,990,653

SULFUR-CONTAINING ACRYL OLIGOMER COMPOSITION

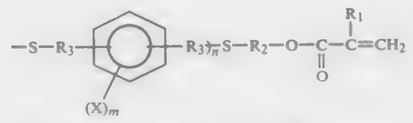
Seiichiro Hayakawa, and Shoji Ichihara, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,809
Claims priority, application Japan, Apr. 4, 1988, 63-82638
Int. Cl.[5] C07C *69/52*
U.S. Cl. 560—221 5 Claims

1. A sulfur-containing acryl oligomer composition represented by formula (I):



(I)



wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each represents an alkylene group having from 1 to 12 carbon atoms; R_4 represents an alkylene group having from 1 to 12 carbon atoms, an oxydialkylene group having from 2 to 12 carbon atoms, or an aralkylene group having from 6 to 20 carbon atoms; X represents a chlorine, bromine or iodine atom; m represents 0 or an integer of from 1 to 4; and n represents an average degree of oligomerization of greater than 0 up to 10 inclusive.

4,990,654

PRODUCTION OF ACETATE ESTERS FROM ALCOHOLS USING RHODIUM COMPLEX CATALYSTS

Richard W. Wegman, South Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 796,495, Nov. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 641,206, Aug. 16, 1984, abandoned. This application Jan. 4, 1990, Ser. No. 462,888
Int. Cl.[5] C07C *67/36, 69/14*
U.S. Cl. 560—232 2 Claims

1. Process for the production of a mixture of methyl acetate and ethyl acetate which comprises catalytically reacting a mixture of methanol and ethanol, and carbon monoxide in contact with a homogeneous catalyst system consisting essentially of (a) a rhodium component selected from the group consisting of rhodium metal and a rhodium compound, (b) a phosphorus containing ligand



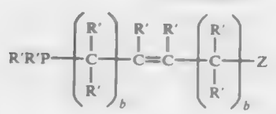
represented by the formulas:

(V)



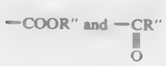
or

-continued



(VI)

and (c) a halogen containing compound as a promoter, wherein R′ is —H or an aryl, aralkyl or alkaryl group having from 6 to 10 ring carbon atoms and the alkyl moiety of said aralkyl or alkaryl group having from 1 to 10 carbon atoms, or an alkyl group having from 1 to 10 carbon atoms, and wherein one or more of said R′ groups can be substituted with a Z group but where no more than 3 of said R′ groups in the molecule are so substituted, where a is an integer from 0 to 4, b is an integer from 0 to 3, and Z is a member selected from the group consisting of:



wherein R″ is R′ and said reaction is carried out at a reaction temperature of up to about 130° C. and a reaction pressure of up to about 250 psig.

4,990,655

ALCOHOLS PRODUCTION BY HYDROGENATION OF CARBOXYLIC ACIDS

Melanie Kitson, Staines, and Peter S. Williams, Hull, both of England, assignors to BP Chemicals Limited, London, England

Division of Ser. No. 150,453, Jan. 29, 1988, Pat. No. 4,804,791, which is a continuation of Ser. No. 65,677, Jun. 18, 1987, abandoned, which is a continuation of Ser. No. 849,050, Apr. 7, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 282,053
Claims priority, application United Kingdom, Apr. 13, 1985, 8509530
Int. Cl.[5] C07C *67/00, 69/003*
U.S. Cl. 500—265 10 Claims

1. A process for the production of either ethanol from acetic acid or propanol from propionic acid together with the coproduction of the corresponding ester in each case which process comprises contacting either acetic acid or propionic acid in the vapor phase with hydrogen at elevated temperature and pressure in the range from 1 to 150 bar in the presence of a catalyst essentially consisting of (i) a noble metal of Group VIII of the Periodic Table of Elements, and (ii) rhenium, and either (a) increasing the proportion of coproduced corresponding ester by operating at low conversions per pass or by introducing an acidic function component in to the catalyst, or (b) increasing the proportion of alcohol by cofeeding water or by operating at high conversions per pass.

4,990,656

POLYAMINE SUBSTITUTED DITHIOCARBAMATE AND PROCESS FOR PRODUCING THE SAME

Clarence R. Bresson, Bartlesville, Okla., and Harold W. Mark, Summerville, N.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 214,948, Jul. 5, 1988, abandoned, which is a division of Ser. No. 115,392, Nov. 2, 1987, Pat. No. 4,806,234. This application Jan. 26, 1990, Ser. No. 470,773
Int. Cl.[5] C07C *155/06*
U.S. Cl. 562—27 10 Claims

1. A compound represented by the formula

wherein R_1 and R_2 are each an aminohydrocarbyl group, R_3 is a hydrocarbyl group, M is selected from the group consisting of an alkali metal and an alkaline earth metal, and x is 1 or 2.

4,990,657

PROCESS FOR THE PREPARATION OF AROMATIC ACID

Norbert Bluthe, Villeurbanne, and Robert Perron, Charly, both of France, assignors to Rhone Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 78,115, Jul. 27, 1987, abandoned. This application May 19, 1989, Ser. No. 355,852
Claims priority, application France, Jul. 25, 1986, 86 10991; Jul. 25, 1986, 86 10992; Jul. 25, 1986, 86 10993
Int. Cl.[5] C07C *51/10*
U.S. Cl. 562—406 17 Claims

1. A process for the preparation of an aromatic acid comprising the step of combining an aromatic halide having at least one iodine or bromine substituent bonded directly to the aromatic ring system with:
   a. a water-immiscible organic solvent,
   b. a palladium-based catalyst,
   c. a phosphine or a phosphite palladium-complexing agent,
   d. a tertiary nitrogen-containing organic base,
   e. water and
   f. carbon monoxide,

wherein the process is performed in a two-phase liquid medium and in the substantial absence of a phase transfer agent to produce said aromatic acid wherein a —COOH group is bonded directly to the aromatic ring system and wherein the partial pressure of carbon monoxide is not higher than 5 bars.

4,990,658

PROCESS FOR PREPARING IBUPROFEN AND ITS ALKYL ESTERS

Barbara C. Stahly; Rosny W. Lin, both of Baton Rouge, and E. E. Atkinson, Jr., Greenwell Springs, all of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 18, 1989, Ser. No. 451,563
Int. Cl.[5] C07C *51/14*
U.S. Cl. 562—406 41 Claims

1. A process for preparing ibuprofen or an ester thereof which comprises carbonylating a 1-halo-1-(4-isobutylphenyl)ethane with carbon monoxide in a neutral or acidic medium containing at least about 1 mol of water or of a C_1 to about C_6 linear or branched aliphatic alcohol per mol of 1-halo-1-(4-isobutylphenyl)ethane at a temperature between about 10° C. and about 200° C. and a carbon monoxide pressure of at least about one atmosphere in the presence of (a) a palladium compound in which the palladium has a valence of 0–2 and (b) at least one acid-stable ligand.

4,990,659

PROCESS FOR THE MANUFACTURE OF DERIVATIVES OF BENZOIC ACID

Dukka Jihad; Zoran Amikam, and Yoel Sasson, all of Jerusalem, Israel, assignors to Gadot Petrochemical Industries Ltd., Haifa and Yissum Research Development Company of the Hebrew University, Jerusalem, both of, Israel

Continuation of Ser. No. 216,411, Jul. 7, 1988, abandoned. This application Jul. 20, 1989, Ser. No. 384,064

Claims priority, application Israel, Jul. 23, 1987, 83293; Apr. 5, 1988, 85976

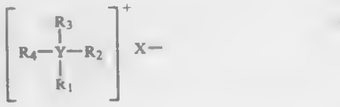
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

Int. Cl.[5] C07C *51/16*

U.S. Cl. 562—416 22 Claims

1. A process for the manufacture of a derivative of benzoic acid from a toluene derivative by a liquid phase oxidation of said toluene derivative using an oxygen-containing gas, being carried out in the presence of a phase transfer catalyst selected from the group consisting of a quaternary onium salt and a crown ether, and traces of a polar solvent able to solubilize the catalyst, the polar solvent being water, the toluene derivative selected from the group consisting of a sulfonated toluene or an alkyl toluene, an aryl toluene, an aralkyl toluene, a halo-toluene, a nitrotoluene, an alkoxy toluene, an aryl-oxy toluene and combinations thereof, the process being characterized in that the oxidation reaction occurs in the presence of a catalytic system comprising:

(a) A quaternary onium salt having the general formula:



wherein: R_1 is alkyl and R_2, R_3 and R_4 may be the same or different, selected from an alkyl, a hydroxyalkyl, an aryl or an aralkyl group, R_1, R_2, R_3 and R_4 having a total number of carbon atoms from 17 to 58,

Y may be nitrogen or phosphorus, and

X is selected from F^-, C^-, Br^-, OH^-, CH_3, COO^- and HSO^-_4 provided that when BR^- is absent from the system a bromide or bromine is added;

(b) a transition metal salt, the molar ratio between (a) and (b) being from 0.25:1 to 1.5:1.

4,990,660

PREPARATION OF AROMATIC HYDROXYCARBOXYLIC ACIDS

Peter Neumann, Mannheim, and Ulrich Eichenauer, Frankfurt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 287,034

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743517

Int. Cl.[5] C07C *315/00*

U.S. Cl. 562—427 10 Claims

1. A process for the preparation of an aromatic hydroxycarboxylic acid of the formula (I):

$$(HO—)_nA—COOH \qquad (I)$$

wherein n is 1 or 2, and A is a radical selected from the group consisting of naphthalene, biphenyl, diphenyl ether, diphenyl sulfide and diphenyl sulfone and said radicals substituted by halogen, nitro, carboxyl and hydroxylsulfonyl, which comprises oxidizing:

(a) an acylated aromatic compound of the formula (II):

$$(R^1—CO—O—)_nA—CO—R^2 \qquad (II)$$

wherein R^1 and R^2 are identical or different and independently of one another are each C_1–C_4-alkyl or C_1–C_4-alkyl substituted with halogen, C_1–C_4-alkoxy or C_1–C_4-alkanoyloxy; with substantially pure oxygen or a mixture of oxygen and an inert gas in the presence an effective amount of a salt of vanadium, manganese, iron or cobalt as a catalyst and propionic acid as a solvent at a temperature of from about 20° C. to 250° C., to form a carboxylic acid of the formula (III):

$$(R^1—CO—O—)_nA—COOH \qquad (III)$$

wherein R^1, n and A are as defined above, and then

(b) subjecting the acyl group or groups to either hydrolysis or transesterification to eliminate the acyl group or groups to form said aromatic hydroxy carboxylic acid.

4,990,661

PROCESS FOR THE PREPARATION OF BENZOIC ACID DERIVATIVES

Uwe Petersen, Leverkusen; Michael Schriewer, Odenthal; Ernst Kysela, Bergisch-Gladbach, and Klaus Grohe, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

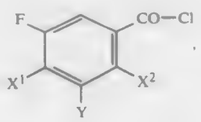
Division of Ser. No. 90,888, Aug. 28, 1987, Pat. No. 4,851,160. This application Mar. 29, 1989, Ser. No. 330,396

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631906

Int. Cl.[5] C07C *63/04*

U.S. Cl. 562—493 9 Claims

1. A process for the preparation of a compound of the formula

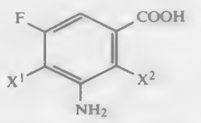


(I)

in which

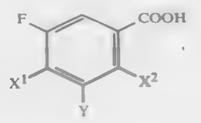
X^1 and X^2 each independently is chlorine or fluorine, and

Y is chlorine, bromine, fluorine or iodine, comprising subjecting a compound of the formula



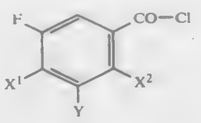
(II)

to a Balz-Schiemann reaction thereby to produce a carboxylic acid of the formula



(Ia)

and reacting the carboxylic acid (Ia) with a chlorinating agent to produce an acyl chloride of the formula



(Ib)

4,990,662

PROCESS FOR PREPARATION OF ALPHA, BETA-UNSATURATED ACIDS

Gary P. Hagen, Glen Ellyn, and Ruth A. Montag, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 946,986, Dec. 29, 1986, Pat. No. 4,943,659, which is a continuation of Ser. No. 785,326, Oct. 7, 1985, abandoned, which is a continuation of Ser. No. 632,018, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 412,914, Aug. 30, 1982, abandoned. This application Jul. 27, 1987, Ser. No. 78,375

The portion of the term of this patent subsequent to Jul. 24, 2007, has been disclaimed.

Int. Cl.[5] C07C *51/353, 51/377, 57/04, 57/26, 57/42*

U.S. Cl. 562—599 14 Claims

1. In a process for making an alpha, beta-ethylenically unsaturated carboxylic acid by contacting formaldehyde and a saturated monocarboxylic acid at vapor-phase condensation conditions over a particulate catalyst comprising a minor amount of alkali metal ion and a major amount of porous silica gel, wherein said catalyst loses said alkali metal ion with consequent decrease in catalyst activity, the improvement consisting of maintaining said catalyst activity by incorporating a volatile or soluble compound of said alkali metal ion in a gaseous feed stream to said process, said feed stream containing at least said saturated monocarboxylic acid, and depositing at least some alkali metal ion contained in said gaseous feed stream on said catalyst.

4,990,663

PROCESS FOR PREPARING HALOGENATED AROMATIC AMINES

Yu-Wei Chang, Wilmington, Del., and Robert L. Seagraves, Pennsville, N.J., assignors to E. I Du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1989, Ser. No. 351,696

Int. Cl.[5] C07C *209/00, 227/44*

U.S. Cl. 564—5 9 Claims

1. A composition consisting essentially of 3,4-dichloroaniline plus an amount effective to stabilize said dichloroaniline of ethanolamine, 1-amino-2-propanol, 3-amino-1-propanol, 2-methoxyethylamine, 3-methoxy-1-propyl-amine, diethanolamine or triethanolamine.

4. In a process for minimizing the formation of dechlorinated products during the preparation of 3,4-dichloroaniline by the platinum-catalyzed hydrogenation of 3,4-dichloro-1-nitrobenzene, the improvement consisting essentially of hydrogenating 3,4-dichloro-1-nitrobenzene in the presence of ethanolamine, 1-amino-2-propanol, 3-amino-1-propanol, 2-methoxyethylamine, 3-methoxy-1-propyl-amine, diethanolamine or triethanolamine.

7. A process for imparting storage stability to 3,4-dichloroaniline consisting essentially of adding thereto an amount effective to stabilize said dichloroaniline of ethanolamine, 1-amino-2-propanol, 3-amino-1-propanol, 2-methoxyethylamine, 3-methoxy-1-propyl-amine, diethanolamine or triethanolamine.

4,990,664

ETHANOLAMINE DERIVATIVES

Ian F. Skidmore, Welwyn; Alan Naylor, Royston; Harry Finch, Letchworth; Lawrence H. C. Lunts, Broxbourne; Ian B. Campbell, Dane End, and Peter C. North, Royston, all of England, assignors to Glaxo Group Limited, London, England

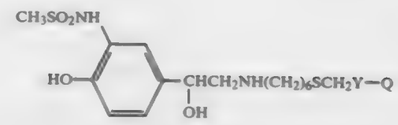
Filed Aug. 10, 1988, Ser. No. 230,357

Claims priority, application United Kingdom, Aug. 11, 1987, 8718938

Int. Cl.[5] C07C *309/04, 233/65;* A61K *31/18, 31/165*

U.S. Cl. 564—99 4 Claims

1. A compound of formula (I)



(I)

or a physiologically acceptable salt or solvate thereof, wherein

Y represents a C_{1-3} alkylene chain,

Q represents a phenyl group, optionally substituted by —$CONR^{15}R^{16}$, and

R^{15} and R^{16} each represent a hydrogen atom or a C_{1-4} alkyl group.

4,990,665

DIARYLNITRONES

Bruce F. Griffing, Schenectady, and Paul R. West, Ballsto34 Spa, both of N.Y., assignors to MicroSi, Inc., Phoenix, Ariz.

Division of Ser. No. 836,287, Mar. 5, 1986, Pat. No. 4,859,789, which is a continuation-in-part of Ser. No. 675,918, Nov. 28, 1984, which is a division of Ser. No. 536,923, Sep. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 438,194, Nov. 1, 1982, abandoned. This application Jul. 17, 1989, Ser. No. 380,934

Int. Cl.[5] C07C *251/48*

U.S. Cl. 564—265 1 Claim

1. The compound α-(4-diethylaminophenyl)-N-phenylnitrone.

4,990,666

RACEMIZATION OF OPTICALLY ACTIVE AMINO ALCOHOLS

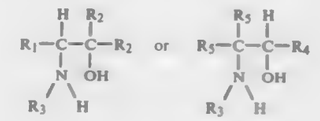
Stephen G. Harsy, Mt. Airy, Md., assignor to W. R. Grace & Co.-Conn, New York, N.Y.

Filed Feb. 4, 1987, Ser. No. 18,255

Int. Cl.[5] C07C *209/00, 209/88*

U.S. Cl. 564—362 28 Claims

1. A process of racemizing optically active mixtures of amino alcohols represented by either the formula:



or

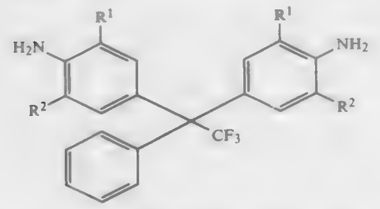
wherein R_1 and R_4 each independently represents an alkyl or cycloalkyl group; R_2 each represents a hydrogen atom; R_3 represents a hydrogen atom or an alkyl group, and R_5 represents the same group select from hydrogen, alkyl or cycloalkyl, said process consisting essentially of contacting in a reaction zone a solution consisting essentially of an inert liquid having from 1 to 50 weight percent of the amino alcohol mixture therein with Raney cobalt under a hydrogen pressure of from about 10 to 50 atmospheres and at a temperature of from 100° C. to 175° C. for a sufficient period of time to cause the racemization.

4,990,667
ALKYLATED 1,1-BIS(4-AMINOPHENYL)-1-PHENYL-2,2,2-TRIFLUOROETHANES

William F. Burgoyne, Jr., Emmaus, and Michael Langsam, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 29, 1990, Ser. No. 471,916
Int. Cl.[5] C07C *321/00*
U.S. Cl. 564—335 4 Claims

1. A diamine having the structural formula:



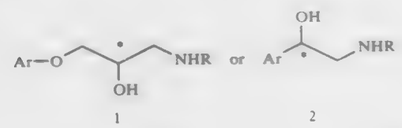
wherein R^1 and R^2 are independently methyl, ethyl, or isopropyl groups.

4,990,668
OPTICALLY ACTIVE ARYLOXYPROPANOLAMINES AND ARYLETHANOLAMINES

Khuong H. X. Mai, Waukegan; Ghanshyam Patil, Vernon Hills, and William L. Matier, Libertyville, all of Ill., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

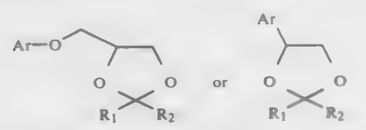
Filed Dec. 4, 1985, Ser. No. 804,407
Int. Cl.[5] C07C *215/08, 217/54*
U.S. Cl. 564—349 7 Claims

1. A method of preparing a racemic or chiral aryloxypropanolamine (1) or chiral arylethanolamine (2) of the formula

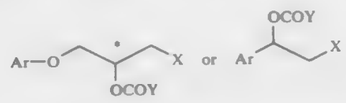


1 2

wherein Ar is aryl, substituted aryl, heteroaryl, or aralkyl and R is alkyl, aryl, aralkyl, or EG wherein E is a straight or branched chain alkylene of from 1 to about 6 carbon atoms and wherein G is $-NR_2COR_3$, $-NR_2CONR_3R_4$, $-NR_2SO_2R_3$, $-NR_2SO_2NR_3R_4$, or $-NR_2COOR_5$, where R_2, R_3, R_4, and R_5 may be the same or different and may be hydrogen, alkyl, alkoxyalkyl, alkoxyaryl, cycloalkyl, alkenyi, alkynyl, aryl, heteroaryl, or aralkyl, except that R_3 and R_5 are not hydrogen when G is $-NR_2SO_2R_3$ or $-NR_2COOR_5$, or R_3 and R_4 may together with N form a 5- to 7-membered heterocyclic group, which method comprises: reacting a selected racemic or chiral dioxolane of the formula



wherein Ar is defined as above and R_1 and R_2 are each independently hydrogen, loweralkyl, cycloloweralkyl, or R_1 and R_2 together with the carbon atom form a 3 to 6 member cycloalkyl group or aryl group, with a solution of HX, wherein X is chloro, bromo or iodo, in an organic acid of the formula Y-COOH wherein Y is hydrogen, loweralkyl or cycloalkyl to prepare a racemic or chiral compound of the formula



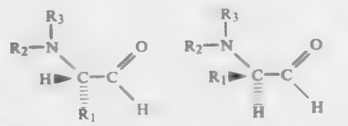
wherein X and Y are as defined above, and reacting said compound with a selected amine to prepare the desired aryloxypropanolamine or arylethanolamine.

4,990,669
OPTICALLY ACTIVE ALPHA-AMINO ALDEHYDES, PROCESS FOR THE PREPARATION THEREOF, AND THE USE THEREOF FOR THE STEREOSELECTIVE PREPARATION OF OPTICALLY ACTIVE BETA-AMINO ALCOHOLS

Manfred T. Reetz, and Mark W. Drewes, both of Marburg, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1988, Ser. No. 172,046
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711911
Int. Cl.[5] C07C *237/10, 211/27;* C07D *403/06, 209/44*
U.S. Cl. 564—391 4 Claims

1. An optically active α-amino aldehyde of one of the formulae



in which

R_1 is unsubstituted C_1–C_{12} alkyl, C_1–C_{12} alkyl substituted by amino, hydroxyl, benzyloxy, benzylmercapto, a carbamoyl group, an imidazolyl-4 group, or an indolyl-3 group, vinyl, unsubstituted benzyl, benzyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, benzyloxy, or halogen, unsubstituted phenyl, or phenyl substituted by hydroxyl, C_1–C_4-alkyl or C_1–C_4-alkoxy, wherein said R_1 is not alkyl substituted by hydroxyl and at the same time by three benzyloxy groups, and

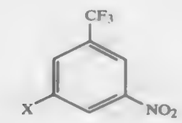
R_2 and R_3 are an unsubstituted benzyl group or a substituted benzyl group, or together form an unsubstituted phenylene-(1-2)-bis-methylene group or a substituted phenylene-(1,2)-bis-methylene group, or R_2 is an unsubstituted benzyl radical or a substituted benzyl radical, wherein the substituents for the substituted benzyl and substituted phenylene-(1, 2-bis-methylene are C_1–C_4-alkyl, C_1–C_4-alkoxy, benzyloxy, or halogen.

4,990,670
METHOD OF MAKING 1,1'-OXYBIS (3-NITRO-5-TRIFLUOROMETHYL)-BENZENE

Jeffrey S. Stults, and Henry C. Lin, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 17, 1989, Ser. No. 394,986
Int. Cl.[5] C07C *43/00, 209/00*
U.S. Cl. 564—417 15 Claims

1.



where "X" is selected from the group consisting of NO_2, Cl, and F, with an alkali metal fluoride selected from the group consisting of potassium fluoride, cesium fluoride, and mixtures thereof, in an organic solvent in the presence of water.

4,990,671
METHOD FOR MAKING AMINOPHENOLS AND THEIR AMIDE DERIVATIVES

Neil Dunski, St. Louis County, and Henry J. Buehler, Affton, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 182,533, Apr. 18, 1988, abandoned. This application Dec. 7, 1989, Ser. No. 449,240
Int. Cl.[5] C07C *231/02, 209.38*
U.S. Cl. 564—418 8 Claims

1. A method for making N-acylated dialkyl aminophenol, comprising the steps of:

(a) reducing dialkyl nitrosophenol to dialkyl aminophenol by catalytic hydrogenation under catalytic conditions in an aprotic solvent reaction medium to form a reaction mixture; and

(b) thereafter acylating the dialkyl aminophenol without isolation from said reaction mixture.

4,990,672
PROPYLENE-LINKED POLYETHYLENE POLYAMINES AND A PROCESS FOR MAKING SAME

Thomas A. Johnson, Orefield, Pa., and Ismail O. Abdalmuhdi, Princeton, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 30, 1989, Ser. No. 359,059
Int. Cl.[5] C07C *85/12, 85/20, 209/00*
U.S. Cl. 564—490 7 Claims

1. In a catalytic process for the hydrogenation of a cyanoethylated polyamine containing an ethylene linkage, wherein said polyamine containing the ethylene linkage is contacted with a hydrogenation catalyst in the presence of hydrogen under hydrogenation conditions, the improvement for producing a propylene-linked polyamine containing an ethylene linkage which comprises carrying out the hydrogenation of the cyanoethylated polyamine containing an ethylene group in the presence of a hydrogenation catalyst selected from the group consisting of palladium, platinum and rhodium which contains from about 2–6 active metal by way of the catalyst including support, at a temperature of from 50–150° C., a pressure of 50–2000 psig and for a time for effecting reductive alkylation.

4,990,673
PROCESS FOR THE PREPARATION OF 4,4'-DINITRODIPHENYLAMINE

Wolfgang Tronich, Eppstein/Taunus, and Peter Hess, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 16, 1989, Ser. No. 437,685
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1987, 3739014
Int. Cl.[5] C07C *209/00*
U.S. Cl. 564—406 4 Claims

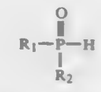
1. A process for the preparation of 4,4'-dinitrodiphenylamine which comprises reacting 1 mole of 4-chloronitrobenzene with about 1 to about 3 moles of potassium cyanate in the presence of about 0.5 to about 5 moles of water in dimethylsulfoxide at temperatures of about 150° C. to about 170° C.

4,990,674
SYNTHESIS OF ALIPHATIC AROMATIC PHOSPHINE OXIDES

Mohan S. Saran, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

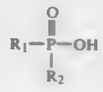
Filed Jun. 14, 1989, Ser. No. 366,120
Int. Cl.[5] C07F *9/02*
U.S. Cl. 568—14 19 Claims

1. A method of making a phosphine oxide having the general formula

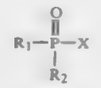


where R_1 is aromatic and R_2 is aliphatic, comprising

(1) reacting the phosphinic acid

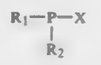


with a halogenating agent to produce the phosphoryl halide



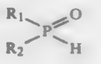
where X is halogen;

(2) reducing said phosphoryl halide to the phosphinous halide

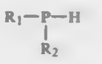


using as the reducing agent about one mole of trichlorosilane per mole of said phosphoryl halide;

(3) hydrolyzing said phosphinous halide with water to produce the phosphine oxide



as the major product and the phosphine



the minor product; and

(4) adding sufficient oxidizing agent to oxidize said phosphine to the corresponding phosphine oxide.

4,990,675

PROCESS FOR THE PRODUCTION OF DISULFIDES

Michael Sauerbier, Altrip; Karl Nützel, Neulussheim, and Kurt Schilling, Schwetzingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,861

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 3814163

Int. Cl.[5] C07C *319/24*

U.S. Cl. 568—26 6 Claims

1. A process for the production of diorganodisulfides by oxidation of mercaptans wherein the mercaptan is reacted with halogenated hydrocarbons containing 1 to 6 carbon atoms which contain at most two hydrogen atoms at a temperature from 0° to 100° C. in the presence of alkali hydroxide or alkaline earth hydroxide and, optionally, a phase transfer catalyst.

4,990,676

PROCESS FOR PREPARING CHIRAL SULPHOXIDES

Stephen G. Davies, Oxford, England, assignor to British Petroleum Company p.l.c., London, England

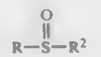
Filed Feb. 17, 1989, Ser. No. 311,819

Claims priority, application United Kingdom, Feb. 24, 1988, 8804339; Nov. 8, 1988, 8826144

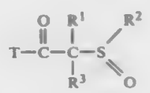
Int. Cl.[5] C07C *315/04*

U.S. Cl. 568—27 7 Claims

1. A process for preparing a single enantiomer of a sulphoxide having the formula:



which comprises reacting a single enantiomer of the molecule:



wherein

T is the moiety (Cp)Fe(CO)(Z)—where Cp is selected from (eta[5]—CH_5H_5) and a C_1 to C_3 alkyl substituted derivative thereof;

Z is a ligand having the formula $(R^4)_2X\ R^5$ in which X is selected from phosphorus and arsenic, R^4 is selected from phenyl and phenoxy, and R^5 is selected from phenyl, phenoxy, C_1 to C_{12} alkyl group and alkoxy;

R^1 to R^2 are independently selected from C_1 to C_{12} alkyl, C_6–C_{10} aryl and vinyl; and

R^3 is selected from hydrogen, C_1 to C_{12} alkyl, C_6 to C_{10} aryl and vinyl,

with a carbanion of formula F^- where R is selected from C_1–C_{10} alkyl and C_6–C_{12} aryl.

4,990,677

FUNGICIDAL AND PLANT GROWTH-REGULATING AZOLYLMETHYL-CYCLOPROPYL DERIVATIVES

Klaus Stroech, Solingen; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

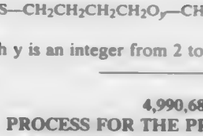
Division of Ser. No. 206,403, Jun. 14, 1988, Pat. No. 4,913,727. This application Feb. 12, 1990, Ser. No. 479,143

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720755; Apr. 19, 1988, 3812967

Int. Cl.[5] C07C *317/20, 323/17*

U.S. Cl. 568—29 4 Claims

1. A propanol derivative of the formula



in which

R represents halogen, alkyl with 1 to 6 carbon atoms phenyl optionally substituted by halogen, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, alkyl with 1 to 4 carbon atoms and/or alkoxy with 1 to 4 carbon atoms and/or alkoxy with 1 to 4 carbon atoms or represents the grouping —Y—R^2,

wherein

Y represents oxygen, sulphur, SO or SO_2 and

R^2 represents phenyl which is optionally substituted by halogen, halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, alkyl with 1 to 4 carbon atoms and/or alkoxy with 1 to 4 carbon atoms Hal represents chlorine, bromine or iodine,

Z represents halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkoxy with 1 or 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkylthio with 1 to 2 carbon atoms and 1 to 5 halogen atoms or phenyl which is optionally substituted by alkyl with 1 or 2 carbon atoms and/or halogen, or represents phenoxy which is optionally substituted by alkyl with 1 to 2 carbon atoms and/or halogen and

m represents the number 0, 1, 2 or 3.

4,990,678

PURIFICATION OF HALOGENATED AROMATIC SULFONES OR KETONES

Melvin D. Herd, Bartlesville, Okla.; Albert G. Holba, Plano, Tex., and Jimmie J. Straw, Nowata, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 8, 1989, Ser. No. 447,932

Int. Cl.[5] C07C *315/06, 49/80*

U.S. Cl. 568—34 21 Claims

1. A process for purifying a compound having the structure X-Ar-Y-Ar'-Y-Ar-X, wherein X is a halogen, Y is —SO_2— or —CO—, and Ar and Ar' are the same or different and are aromatic radicals of 6 to 14 carbon atoms by pressurized recrystallization comprising:

(a) contacting said compound with a solvent having a normal boiling point less than about 225° C. to form a mixture wherein said solvent is selected from the group consisting of halogenated hydrocarbons, ketones, carboxylic acids having no more than 7 carbon atoms, lactams, amides, hydrocarbons, and mixtures thereof,

(b) heating said mixture to a temperature above the normal boiling point of said solvent in a closed system having a pressure of at least the vapor pressure of said mixture at said temperature to form a solution,

(c) cooling said solution to recrystallize said compound, and

(d) recovering said compound.

4,990,679

POLY(TETRAHYDROFURAN)

Jean-Pierre Wolf, Marly, Switzerland, and Frans Setiabudi, Bad Krozingen, Fed. Rep. of Germany, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

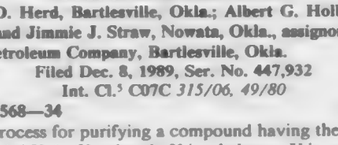
Filed Nov. 22, 1989, Ser. No. 441,138

Claims priority, application Switzerland, Nov. 23, 1988, 4350/88-9; Sep. 7, 1989, 3247/89-7

Int. Cl.[5] C07C *321/04*

U.S. Cl. 568—62 7 Claims

1. A poly(tetrahydrofuran)-dithiol of the formula I



in which y is an integer from 2 to 30.

4,990,680

PROCESS FOR THE PREPARATION OF 2,4-DIHYDROXYBENZOPHENONE

Peter Neumann, Mannheim, and Alexander Aumueller, Deidesheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 11, 1990, Ser. No. 463,365

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1989, 3904371

Int. Cl.[5] C07C *45/45*

U.S. Cl. 568—322 13 Claims

1. A process for the preparation of 2,4-dihydroxybenzophenone comprising reacting resorcinol with benzotrichloride in water, wherein the reaction mixture contains a surfactant or a dispersing or emulsifying agent in a concentration of from 0.05 to 5%, by weight of the water, wherein said surfactant or dispersing or emulsifying agent are C_8–C_{20}-alkenols, C_8–C_{20}-alkanols, polyvinylalcohols, fatty acids, fatty acid esters, adducts of ethylene oxide with C_1–C_{20}-alkylphenols, with C_1–C_{20}-alkanols, with C_2–C_8-alkanedoils, with C_2–C_8-alkenediols, with C_3–C_8-alkanetriols, with C_{10}–C_{25}-alkanoic or C_{10}–C_{25}-alkenoic acids, with amides of C_{10}–C_{25}-alkanoic or C_{10}–C_{25}-alkenoic acids, or with aliphatic or cycloaliphatic amines, acidic phosphoric acid esters or sulfuric acid half-esters of said alkenols, alkanols and ethylene oxide adducts, esters of phosphorous acid, phosphonates, phosphinates, alkylnaphthalenesulfonic acids, sulfosuccinic acid esters, C_5–C_{20}-alkylbenzenesulfonic acids, polystyrenesulfonic acid, C_{10}–C_{20}-alkanesulfonic acids, C_{10}–C_{80}-alkenesulfonic acids, mono-C_8–C_{20}-alkyl-tri-C_1–C_4-alkylammonium salts, di-C_8–C_{20}-alkyl-di-C_1–C_4-alkylammonium salts or C_{10}–C_{20}-alkylpyridinium salts.

4,990,681

METHOD FOR REMOVING HYDROGEN FLUORIDE FROM MIXTURES COMPRISING AROMATIC KETONES

Thomas A. Curtis, 100 Pinewood Rd. #310, Virginia Beach, Va. 23451; Timothy R. Ryan, 4914 Overbrook Cir., Corpus Christi, Tex. 78413, and Daniel D. Lindley, 23 Am Vogelsang, D6239 Eppstein 3, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,055

Int. Cl.[5] C07C *45/80*

U.S. Cl. 568—324 20 Claims

1. A method of separating hydrogen fluoride (HF) from a mixture comprising HF complexed with an aromatic ketone in which the keto carbon atom is directly bonded to an aromatic ring carbon atom, by adding a carboxylic acid anhydride to the mixture while maintaining the mixture a conditions sufficient to sustain a reaction between the anhydride and the HF to form the corresponding acyl fluoride and carboxylic acid, and separating said acyl fluoride from said mixture.

4,990,682

PROCESS FOR THE PREPARATION OF 5-CHLORO-2-PENTANONE

Manfred Kaufhold, Marl, and Werner Otte, Dorsten, both of Fed. Rep. of Germany, assignors to Huels AG, Marl, Fed. Rep. of Germany

Filed Nov. 21, 1989, Ser. No. 439,688

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903029

Int. Cl.[5] C07C *45/59*

U.S. Cl. 568—386 6 Claims

1. A process for the preparation of 5-chloro-2-pentanone from levulinic ester, comprising the steps of:

(a) ketalizing a levulinic ester having the formula CH_3—CO—CH_2—CH_2—COOR, in which R is CH_3, C_2H_5, C_3H_7, or C_4H_9, with ethylene glycol and removing water with an azeotropic solvent,

(b) purifying the ketal prepared by distillation to a chlorine content ≦ 10 ppm,

(c) hydrogenating the purified ketal with a hydrogenation catalyst that has been treated with an 0.001–0.5 normal alcoholic alkali metal hydroxide solution, 0.001–0.5 normal alcoholic alkaline earth metal hydroxide solution or mixture thereof, to obtain 3-(2-methyl-1, 3-dioxolan-2-yl) propan-1-ol, and

(d) reacting the 3-(2-methyl-1, 3-dioxolan-2-yl) propan-1-ol with hydrochloric acid to obtain 5-chloro-2-pentanone.

4,990,683

PROCESS FOR PREPARING 3-PYRROLIDINOLS

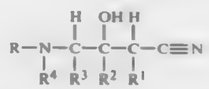
Young S. Lo, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 923,544, Oct. 27, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 141,740

Int. Cl.[5] C07C *255/12, 255/36*

U.S. Cl. 558—390 4 Claims

1. A compound selected from the group having the formula:



wherein

R is selected from the group consisting of

loweralkyl (1–8 C),

loweralkenyl (2–8 C),

cycloalkyl (3–9 C),

cycloalkyl-loweralkyl (4–13 C),

phenyl-loweralkyl (7-–C), or

$(Y)_{1-3}$-substituted-phenyl-loweralkyl (7–14 C);

R^1, R^2 and R^3 are selected from hydrogen, loweralkyl (1–8 C), or loweralkenyl (2–8 C);

R^4 is hydrogen or an amine protecting radical selected from

benzyl,

diphenylmethyl,

α-methylbenzyl,

benzyloxycarbonyl,

diphenylmethoxycarbonyl,

β, β, β,-trichloroethoxycarbonyl,

isobutoxycarbonyl or t-butyloxycarbonyl;

Y is selected from loweralkyl, loweralkoxy, halo or trifluoromethyl;

either R or R^4 must include an aromatic ring;

and the optical isomers and acid addition salts thereof.

4,990,684

PREPARATION OF PHENYLACETALDEHYDES

Wolfgang Hoelderich, Frankenthal; Norbert Goetz, Worms, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

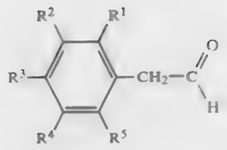
Filed Jul. 12, 1989, Ser. No. 378,984

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824725

Int. Cl.[5] C07C *45/41, 45/51*

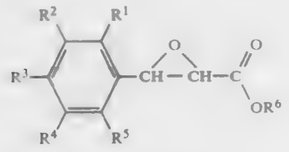
U.S. Cl. 568—435 10 Claims

1. A process for preparing a phenylacetaldehyde of the formula I



(I)

where each of R^1 to R^2 is independently of the others hydrogen, halogen, unsubstituted or halogen-substituted alkyl, alkenyl, alkoxyl, alkylthio or cycloalkyl, which comprises heating a glycidic ester of the formula II



(II)

where each of R^1 to R^5 is as defined above and R^6 is tert-butyl or i-propyl, in a gas phase or liquid-phase conversion of II to I in the presence of a zeolite or a phosphate or phosphoric or boric acid on a carrier material or an acidic metal oxide as a catalyst, the temperature in the gas-phase being from 100 to 500° C. and the temperature in the liquid-phase being from 50 to 200° C.

4,990,685

PROCESS FOR THE PREPARATION OF AQUEOUS FORMALDEHYDE SOLUTIONS

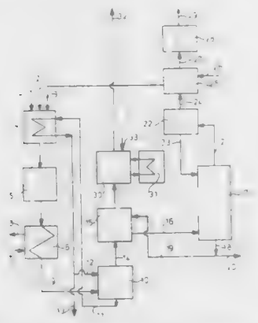
Heinz-Jürgen Alpers; Karl-Heinz Dietz, both of Krefeld; Bernd-Ulrich Schenke, Bottrop, and Reinhard Thiel, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 27, 1989, Ser. No. 371,786

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824360; Oct. 8, 1988, 3834323

Int. Cl.[5] C07C *45/29, 45/38*

U.S. Cl. 568—491 12 Claims



1. A process for the preparation of aqueous formaldehyde solutions comprising the steps of

(a) reaction of a methanol/water/air mixture in vapor form at an elevated temperature over a catalyst and

(b) absorption of the reaction mixture from (a) in one or more successive absorption stages, with the formation of a methanol-containing aqueous formaldehyde solution,

wherein the methanol/water mixture required for the reaction is evaporated by indirect heating by means of a formaldehyde solution removed from the absorption stages.

4,990,686

PROCESS FOR THE PURIFICATION OF CRUDE 2,2-BIS-(3,5-DIMETHYL-4-HYDROXYPHENYL)-PROPANE

Günter Rauchschwalbe, Leverkusen; Heinz-Ulrich Blank, Odenthal, and Volkmar Handschuh, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 27, 1989, Ser. No. 457,419

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1989, 3900680

Int. Cl.[5] C07C *37/84*

U.S. Cl. 568—724 15 Claims

1. A process for the purification of crude 2,2-bis-(3,5-dimethyl-4-hydroxyphenyl)-propane (= tetramethylbisphenol A=TMBPA) by recrystallization from aqueous solutions of alcohols, wherein a C_1–C_4-monalcohol with a water content of 2 to 40% by weight relative to the total weight of alcohol and water is used in an amount of from 50 to 250% by weight relative to the amount of TMBPA, and the operation is carried out at a temperature of 65 to 150° C.

4,990,687

PREPARATION OF 4-METHYL-2-CYCLOHEXYLPHENOL

Alfons Klein, Duesseldorf; Helmut Fiege, Leverkusen; Lothar Puppe, Burscheid, and Werner Jeblick, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1989, Ser. No. 436,156

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1988, 3839853

Int. Cl.[5] C07C *39/17, 37/11*

U.S. Cl. 568—743 17 Claims

1. In the process for preparing 4-methyl-2-cyclohexylphenol by alkylation of p-cresol with cyclohexanol or cyclohexene in the liquid phase, the improvement which comprises effecting the alkylation in the presence of 1–10% by weight, based on the amount of p-cresol, of a large pore, acidic zeolite by adding the cyclohexanol or cyclohexene to the p-cresol initially introduced.

4,990,688

REMOVAL OF CYCLOHEXANOL

Hans-Juergen Gosch, Durkheim, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 383,057

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829142

Int. Cl.[5] C07C *29/86*

U.S. Cl. 568—810 6 Claims

1. In a process for removing cyclohexanol from an aqueous solution containing cyclohexanol and an aromatic sulfonic acid by extraction, the improvement comprising bringing the solution into contact with an extractant comprising a mixture of:

(a) one or more liquid aliphatic, cycloaliphatic or aromatic ethers which are inert under extraction conditions, and

(b) one or more phenols.

4,990,689

2,4-BIS(2-HYDROXYHEXAFLUORO-2-PROPYL)-FLUOROBENZENE AND METHOD OF PREPARING SAME

Masamichi Maruta, and Takayuki Nishimiya, both of Kawagoe City, Japan, assignors to Central Glass Company, Limited, Ube City, Japan

Filed Jun. 20, 1989, Ser. No. 368,585

Claims priority, application Japan, Jun. 23, 1988, 63-155717

Int. Cl.[5] C07C *33/46, 33/24*

U.S. Cl. 568—812 4 Claims

1. 2,4-bis(2-hydroxyhexafluoro-2-propyl)fluorobenzene.

4,990,690

PROCESS FOR PREPARING AROMATIC POLYHYDRIC ALCOHOL

Yuji Onda; Fumisada Kosuge, and Masaru Tunoda, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 11, 1989, Ser. No. 350,395

Claims priority, application Japan, May 20, 1988, 63-122051

Int. Cl.[5] C07C *27/04, 29/132*

U.S. Cl. 568—814 16 Claims

1. In a process for preparing an aromatic polyhydric alcohol represented by the general formula $Ar(CH_2OH)_{m'+n'}$ by catalytic hydrocracking of an aromatic carboxylic acid ester in the presence of a copper-chromite-type catalyst at a temperature of 60°–200° C. and under a hydrogen partial pressure of 100–400 Kg/cm^2G, an improvement which comprises using an ester represented by the general formula $Ar(COOR)_{m'}(CH_2OH)_{n'}$ as raw material wherein:

Ar is selected from the group consisting of benzene ring, naphthalene ring, anthracene ring, phenanthrene ring and biphenyl ring,

R is independently selected from normal and branched alkyl groups having 6–13 carbon atoms,

m' is an integer of at least 1,

n' is zero or a positive integer, and

$m'+n'$ satisfies the relationship $m'+n' \geqq 2$.

4,990,691

HIGHER CARBOXYLIC ACID TRIESTER OF ADAMANTANE TRIOL AND LUBRICATING OIL CONTAINING THE SAME

Kosaku Honna, Sodegaura, and Hiromichi Seiki, Ichihara, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

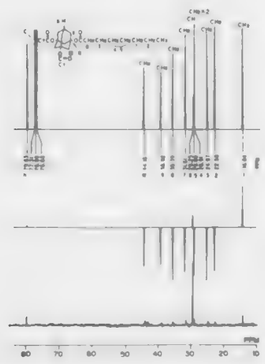
Division of Ser. No. 413,537, Sep. 27, 1989, Pat. No. 4,963,792.

This application Feb. 21, 1990, Ser. No. 482,650

Claims priority, application Japan, Oct. 12, 1988, 63-254997; Jan. 26, 1989, 1-17253

Int. Cl.[5] C07C *35/22, 35/00*

U.S. Cl. 568—818 16 Claims



1. A process for producing an adamantane triol which comprises hydrolyzing a tribromoadamantane compound in the presence of a pyridine compound.

4,990,692

REMOVAL OF CYCLOHEXANOL

Hans-Juergen Gosch, Bad Duerkheim, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

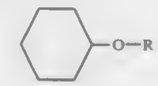
Filed Jul. 21, 1989, Ser. No. 383,058

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829143

Int. Cl.[5] C07C *29/04, 29/74*

U.S. Cl. 568—835 6 Claims

1. A process for removing cyclohexanol from an aqueous solution containing it and an aromatic sulfonic acid by extraction with one or more cyclohexyl ethers liquid under extraction conditions and having the formula



I

where R is alkyl of from 1 to 16 carbon atoms, cycloalkyl of from 5 to 8 carbon atoms, aralkyl of from 7 to 10 carbon atoms or phenyl, which may each additionally have substituents which are inert under the reaction conditions.

4,990,693

NOVEL SUBSTANCES KS-504A, KS-504B, KS-504D AND KS-504E AND PROCESS FOR THEIR PREPARATION

Satoshi Nakanishi; Koji Yamada; Katsuhiko Ando, all of Machida; Isao Kawamoto, Hiratsuka; Toru Yasuzawa; Hiroshi Sano, both of Machida; Noriaki Hirayama, Zama; Hiroshi Kase, Koganei; Joji Goto, and Etsuyo Shimizu, both of Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co. Ltd., Tokyo, Japan

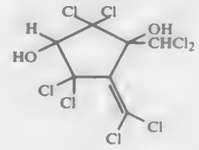
Continuation of Ser. No. 181,702, Apr. 14, 1988, Pat. No. 4,912,132. This application Jan. 16, 1990, Ser. No. 465,892

Claims priority, application Japan, Apr. 15, 1987, 62-92815

Int. Cl.[5] C07C *35/06*

U.S. Cl. 568—838 2 Claims

1. A compound represented by the formula (II):



(II)

4,990,694

OPTICALLY ACTIVE DIMETHYL HEPTANEDIOLS

Akira Tai, Minoo, and Takashi Sugimura, Himeji, both of Japan, assignors to Wako Pure Chemical Industries Ltd., Osaka, Japan

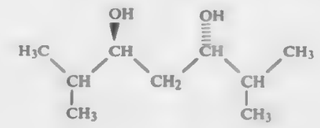
Filed Feb. 22, 1990, Ser. No. 482,928

Claims priority, application Japan, Feb. 27, 1989, 64-46293

Int. Cl.[5] C07C *31/20*

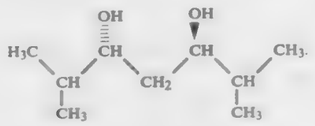
U.S. Cl. 568—852 2 Claims

1. (3S, 5S)-(−)-2,6-dimethyl-3,5-heptanediol expressed by the following formula:



VOL
1123
ISS
1
FE
5
1991
UMI

2. (3R, 5R)-(+)-2,6-dimethyl-3,5-heptanediol expressed by the following formula:



4,990,695

PROCESS FOR PURIFYING CRUDE GLYCEROL

Thomas Buenemann, Zevenhuizen; Johannes C. Oudejans, Zevenaar, both of Netherlands; Pietro Gamba, and Aldo Rampi, both of Cremona, Italy, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Aug. 9, 1989, Ser. No. 391,280

Claims priority, application European Pat. Off., Aug. 9, 1988, [redacted]

Int. Cl.[5] C07C *29/76, 31/22*

U.S. Cl. 568—869 10 Claims

1. A process for purifying crude glycerol in aqueous solution, comprising the steps of obtaining the crude glycerol from oils and fats by saponification, hydrolysis or methanolysis, and microfiltrating over a filter material having a pore size in the range of from 1×10^{-6} to 1×10^{-8} m on a ceramic support.

4,990,696

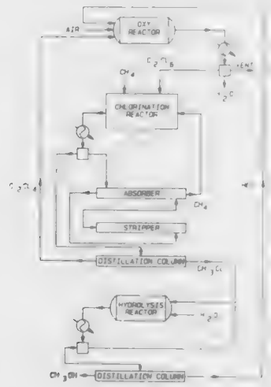
METHYL ALCOHOL PROCESS

John E. Stauffer, 6 Pecksland Rd., Greenwich, Conn. 06831

Continuation-in-part of Ser. No. 297,298, Jan. 13, 1989, which is a continuation-in-part of Ser. No. 40,839, Apr. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 793,534, Oct. 31, 1985, abandoned. This application May 29, 1990, Ser. No. 530,033

Int. Cl.[5] C07C *29/124, 31/04, 17/10, 17/158*

U.S. Cl. 568—893 8 Claims



1. A process for the production of methyl alcohol from methane comprising the following steps operated in tandem;

first, subjecting perchloroethylene to oxychlorination with hydrogen chloride and oxygen in the presence of an oxychlorination catalyst to give reaction products consisting essentially of hexachloroethane and water;

second, isolating said hexachloroethane from the reaction products of the first step and reacting it with methane feedstock in the vapor phase to produce predominantly methyl chloride, perchloroethylene and hydrogen chloride, separating said perchloroethylene and hydrogen chloride from the reaction products and recycling the perchloroethylene and hydrogen chloride thus separated to the first step; and

third, subjecting the methyl chloride from the second step to hydrolysis with water to produce methyl alcohol and hydrogen chloride, separating said methyl alcohol and hydrogen chloride from the reaction products, and recycling the hydrogen chloride to the first step.

4,990,697

PROCESS FOR PRODUCING HOMOALLYL ALCOHOLS

Tsumoru Renge, Hyogo; Osamu Yamada, Hasaki, and Katumi Omura, Kamisu, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

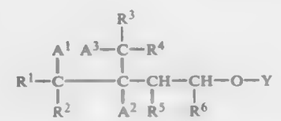
Filed Oct. 16, 1989, Ser. No. 422,049

Claims priority, application Japan, Oct. 26, 1988, 63-271452

Int. Cl.[5] C07L *29/60*

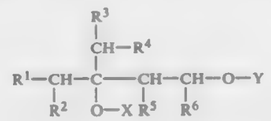
U.S. Cl. 568—903 11 Claims

1. A process for producing homoallyl alcohols of the general formula (I)



(I)

in which either A^1 or A^3 represents a hydrogen atom, the other represents a single bonding along with A^2; R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different and independently represents a hydrogen atom, or an alkyl or alkenyl group with or without being substituted with an hydroxyl group or an alkoxyl group; and Y represents a hydrogen atom, an alkyl group or an alkenyl group, by the dehydration of 1,3-glycols of the general formula (II)



(II)

in which R^1, R^2, R^3, R^4, R^5 and R^6 independently represents as defined above, and X and Y are the same or different and independently represents a hydrogen atom, an alkyl group or an alkenyl group, characterized in:

(a) that the reaction is carried out in the presence of γ-alumina catalyst;

(b) that the homoallyl alcohols of the general formula (I) and the compounds of the general formula (III)

X—OH (III)

in which X represents as defined above, are distilled off from the reaction zone during the reaction;

(c) that the temperature of the reaction zone is 130°–250° C.

4,990,698

METHOD FOR PRODUCING ALKADIENOLS

Keisuke Wada, Yokohama; Keiichi Sato, Tokyo; Yukio Kasori, Yokkaichi, and Yoko Misu, Tokyo, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,574

Claims priority, application Japan, Sep. 26, 1988, 63-240269; Jun. 14, 1989, 1-151337

Int. Cl.[5] C07C *29/36, 29/46, 33/02, 31/36*

U.S. Cl. 568—909.5 23 Claims

1. In a method for producing alkadienols by the reaction of a conjugated alkadiene and water in the presence of carbon dioxide and a catalyst composed of a palladium compound and a phosphine or a phosphite soluble in an organic solvent, the improvement comprising depositing a palladium complex from at least a part of liquid reaction product obtained by said reaction, and feeding said deposited palladium complex into said reaction system.

4,990,699

PERFLUOROALKYLATION PROCESS

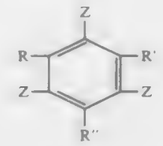
G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 17, 1988, Ser. No. 258,650

Int. Cl.[5] C07C *205/06*

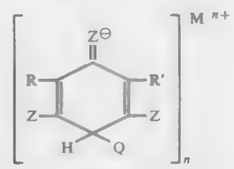
U.S. Cl. 568—933 19 Claims

1. A process which comprises thermally decomposing a salt of a perfluoroalkanoic acid in the presence of an aromatic compound of the formula



(I)

where Z is a nitro or a trifluoromethylsulfonyl group and R, R′ and R″ are, independently, hydrogen, C_1 to C_4 linear or branched alkyl, methoxy, phenoxy, ethoxy or the group —C-(O)OR_2 where R_2 is C_1 to C_4 linear or branched alkyl at least one of R, R′ and R″ being a hydrogen atom; such that a perfluoroalkylated Meisenheimer complex of the formula



(II)

where Q is a perfluoroalkyl group; M is a metallic cation that is sodium, potassium, cesium, calcium, magnesium, barium, aluminum, silver, mercury (II), zinc, or thallium (III); n is a number corresponding to the valence of M and Z, R and R′ are as previously defined, is formed therefrom.

4,990,701

HALOGEN EXCHANGE FLUORINATION

Wendel R. Cassel, Newark; Richard E. Fernandez, Bear, both of Del., and Frederick W. Mader, Kennett Square, Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1990, Ser. No. 497,067

Int. Cl.[5] C07C *17/20*

U.S. Cl. 570—170 11 Claims

1. A process for the halogen exchange fluorination of a saturated halocarbon having at least one replaceable halogen other than fluorine to a fluorinated hydrocarbon having at least one more fluorine in the molecule than the saturated halocarbon which comprises the following steps: (1) intimately contacting the saturated halocarbon with an anhydrous molten composition containing at least 50 mole % of a compound having the formula KF.nHF wherein KF is potassium fluoride, HF is hydrogen fluoride and "n" is a number from about 0.5 to about 3, at a temperature within the range of about 30° C. up to a temperature below the decomposition temperature of said halocarbon or said fluorinated hydrocarbon, whichever is lower, at a pressure and for a time sufficient to yield at least one reaction product of said fluorinated hydrocarbon having at least one more fluorine in the molecule than said saturated halocarbon and a residual molten composition at least partially depleted in its fluoride content and enriched in its other-than-fluoride halide content; (2) isolating and recovering the fluorinated reaction product from the residual molten composition.

4,990,702

HALOGEN EXCHANGE FLUORINATION

Richard E. Fernandez, Bear; Wendel R. Cassel, Newark, both of Del., and Frederick W. Mader, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1990, Ser. No. 480,605

Int. Cl.[5] C07C *17/20*

U.S. Cl. 570—170 14 Claims

1. A process for the halogen exchange fluorination of a saturated halocarbon having at least one replaceable halogen other than fluorine to a fluorinated hydrocarbon having at lest one more fluorine in the molecule than the saturated halocarbon which comprises the following steps: (1) intimately contacting the saturated halocarbon with an anhydrous molten composition containing at least 50 mole % of a compound or compounds having the formula MF.nHF wherein "M" is at least one of cesium or rubidium, HF is hydrogen fluoride and "n" is a number from about 0.5 to 3, at a temperature within the range of about 30° C. up to a temperature below the decomposition temperature of said halocarbon or said fluorinated hydrocarbon, whichever is lower, at a pressure and for a time sufficient to yield at least one reaction product or said fluorinated hydrocarbon having at least one more fluorine in the molecule than said saturated halocarbon and a residual molten composition at least partially depleted in its fluoride content and enriched in its other-than-fluoride halide content; (2) isolating and recovering the fluorinated reaction product from the residual molten composition.

4,990,703

NOVEL TETRAHYDRONAPHTHALENE AND INDANE DERIVATIVES

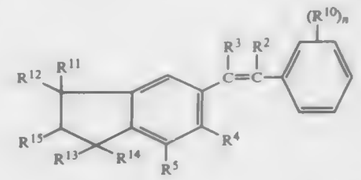
Michael Klaus, Weil am Rhein, Fed. Rep. of Germany; Peter Loeliger, Muttenz; Peter Mohr, Basel, both of Switzerland, and Ekkehard Weiss, Inzlingen, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 49,916, May 15, 1987, Pat. No. 4,870,219. This application May 11, 1989, Ser. No. 350,426

Int. Cl.[5] C07C *21/24*

U.S. Cl. 570—189 5 Claims

1. A compound of the formula:



wherein n is an integer from 1 to 3; R^2 and R^3 are hydrogen, lower alkyl containing from 1 to 6 carbon atoms, trifluoromethyl or halogen with one of R^2 and R^3 being hydrogen, lower alkyl containing from 1 to 6 carbon atoms or trifluoromethyl; R^4 and R^5 are hydrogen, alkyl containing from 1 to 10 carbon atoms, alkoxy containing from 1 to 10 carbon atoms or halogen; R^{11}, R^{12}, R^{13} and R^{14} are hydrogen or methyl; R^{10} is fluorine, chlorine, iodine, o-bromo or meta-bromo; and R^{15} is hydrogen, oxo, lower alkyl containing from 1 to 6 carbon atoms, loweralkanoyloxy containing from 2 to 6 carbon atoms, benzoyloxy, hydroxy or lower alkoxy containing from 1 to 6 carbon atoms, wherein halogen is any one of chlorine, fluorine, bromine, or iodine.

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4,990,704

HALOETHYLATION OF AROMATIC HYDROCARBONS

Barbara C. Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 10, 1989, Ser. No. 418,629
Int. Cl.[5] C07C *17/14*
U.S. Cl. 570—195 9 Claims

1. In a process for haloethylating, a monoalkylbenzene wherein the alkyl group contains 1 to 6 carbon atoms, monomethylnaphthalene or monoalkylanthracene where the alkyl group contains 1 to 12 carbon atoms by reacting it with hydrogen chloride or hydrogen bromide and acetaldehyde at a temperature from about +10° C. in the presence of hydrogen sulfate to form a 1-halophenylethane, 1-halonaphthylethane, or 1-haloanthracenylethane; the improvement which comprises increasing the yield of said 1-halophenylethane, 1-halonaphthalenylethane or 1-haloanthracenylethane providing at least two moles of hydrogen sulfate per mole of acetaldehyde and less than 1.5 moles of hydrogen sulfate per mole of said monoalkylbenzene, monomethylnaphthalene or monoalkylanthracene.

4,990,705

PREPARATION OF 4-BROMOBIPHENYL

Alain Nonn, Sainte Foy Les Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 24, 1989, Ser. No. 341,812
Claims priority, application France, Apr. 22, 1988, 88 05331
Int. Cl.[5] C07C *17/12, 25/18*
U.S. Cl. 570—206 18 Claims

1. A process for the preparation of 4-bromobiphenyl, comprising reacting biphenyl with bromine in a solvent reaction medium which comprises at least one organosulfur compound, amide or nitrile, which is inert relative to the bromine.

4,990,706

PROCESS FOR PRODUCING PARA-DICHLOROBENZENE

Eugene Laukonen, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 30, 1989, Ser. No. 373,965
Int. Cl.[5] C07C *17/12, 25/08*
U.S. Cl. 570—208 16 Claims

1. In a process for producing para-dichlorobenzene comprising reacting benzene, chlorobenzene, or a mixture thereof initially present in an organic feedstock with chlorinating agent in the presence of zeolite L to produce an organic reaction product comprising said para-dichlorobenzene and having an x-value greater than that of said organic feedstock, the improvement wherein said zeolite L is zeolite L which has previously been used as catalyst for the catalytic chlorination of benzene, chlorobenzene, or a mixture thereof and which has thereafter been contacted with steam.

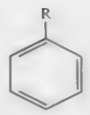
4,990,707

PROCESS FOR THE RING CHLORINATION OF AROMATIC HYDROCARBONS

Franz-Josef Mais, Duesseldorf, and Helmut Fiege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 427,264
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 3837574; Nov. 5, 1988, 3837575
Int. Cl.[5] C07C *17/12*
U.S. Cl. 570—210 17 Claims

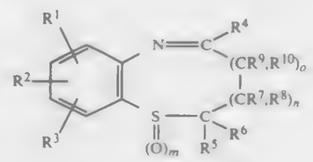
1. A process for the ring chlorination of aromatic hydrocarbons of the formula



in which

R denotes straight-chain or branched C_1–C_{12}-alkyl or C_3–C_8-cycloalkyl

in the presence of Friedel-Crafts catalysts and in the presence of co-catalysts in liquid phase, wherein the chlorinating agent is selected from the group comprising chlorine and sulphur chloride, at a reaction temperature of from about zero to about 100° C., and wherein the co-catalysts used are cycloicbenzo-fused imines of the formula



in which

R^1 and R^2, independently of one another, denote hydrogen, hydroxyl, amino, cyano, halogen, nitro, carboxyl, halocarbonyl, carboxyamide, alkoxycarbonyl, alkyl, aryl, alkoxy, aryloxy, acyloxy, alkylthio, arylthio, acylthio, acyl, thioacyl or acylamino,

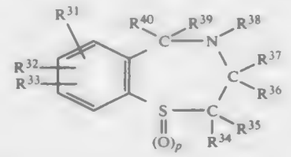
R^3 represents hydrogen or chlorine and can be a fused saturated, unsaturated or aromatic isocyclic or heterocyclic 5- to 8-membered ring with one of the radicals R^1 and R^2, when substituted adjacently, and together with the substituted carbon atoms,

R^4 denotes hydrogen, alkyl, aryl, halogen, alkylthio, arylthio, alkoxy, aryloxy amino, hydrazino, alkylhydrazino or phenylhydrazino,

m, n and o, independently of one another are 0 or 1 and

R^5, R^7 and R^9, independently of one another, denote hydrogen, alkyl, alkoxy, phenyl, acyloxy, cyano, halogen, carboxyl, alkoxycarbonyl, phenoxy or acyl and

R^6, R^8 and R^{10}, independently of one another denote hydrogen, alkyl or halogen, R^5 and R^7 or R^7 and R^9 can be a saturated, unsaturated or aromatic isocyclic or heterocyclic 5–8-membered ring together with the substituted C atoms and R^6 and R^8 or R^8 and R^{10} together can form a double bond and R^5 and R^6 can represent together doubly bound oxygen, sulphur, or R^{11}-substituted nitrogen in which R^{11} denotes alkyl, aryl, acyl, alkylamino or arylamino, or benzo[f]-1,4-thiazepines of the formula



in which

R^{31} and R^{32}, independently of one another, denote hydrogen, hydroxyl, amino, cyano, halogen, nitro, C_1–C_8-alkyl, unsubstituted or R^{31}- and R^{32}-substituted phenyl (with the exception of repeated substitution by R^{31}- and R^{32}-substituted phenyl), C_1–C_8-alkoxy, phenoxy, C_1–C_8-acyloxy, C_1–C_8-acyl or C_1–C_8-alkoxycarbonyl,

R^{33} represents hydrogen or chlorine and can be a fused saturated, unsaturated or aromatic isocyclic or heterocyclic 5–8-membered ring with one of the radicals R^{31} or R^{32} and together with the substituted C atoms,

R^{34}, R^{36} and R^{40}, independently of one another, denote hydrogen, C_1–C_8-alkyl, unsubstituted or R^{31}-and R^{32}-substituted phenyl (with the exception of repeated substitution by R^{31}- and R^{32}-substituted phenyl), C_1–C_8-acyl, C_1–C_8-alkoxycarbonyl, cyano, halogen, carboxyl, C_1–C_8-alkoxy, C_1–C_8-alkylthio, phenylthio, benzylthio, phenoxy or C_1–C_8-acyloxy,

R^{35}, R^{37} and R^{39}, independently of one another, denote hydrogen, C_1–C_8-alkyl, halogen, C_1–C_8-alkoxy or C_1–C_8-alkylthio,

R^{38} denotes hydrogen, C_1–C_8-alkyl, unsubstituted or R^{31}-and R^{32}-substituted phenyl (with the exception of repeated substitution by R^{31}- and R^{32}-substituted phenyl), C_1–C_8-acyl, C_1–C_8-thioacyl, halogenocarbonyl or C_1–C_8-alkoxycarbonyl and

P represents the number zero or one, the substituent pairs R^{34} and R^{35}, R^{36} and R^{37}, and R^{39} and R^{40}, independently of one another, can be doubly bound oxygen, sulphur or R^{38}-substituted nitrogen and the substituent pairs R^{35} and R^{36} and R^{38} and R^{39}, independently of one another, can be a double bond and the substituent pairs R^{34} and R^{37}, and R^{38} and R^{39}, independently of one another, can be 3-to 5-membered alkylene in which 1 or 2 C atoms can be replaced by oxygen, sulphur or R^{38}-substituted nitrogen and R^{40} can be hydrazino, C_1–C_8-alkylhydrazino or phenylhydrazino.

4,990,708

PROCESS FOR THE PREPARATION OF DIBROMOMETHANE

Jeane Segall; Leonard M. Shorr, and Michel Adda, both of Haifa, Israel, assignors to Bromine Compounds Limited, Beer-Sheva, Israel

Filed May 11, 1989, Ser. No. 350,398
Claims priority, application Israel, May 12, 1988, 86357
Int. Cl.[5] C07C *17/10*
U.S. Cl. 570—253 8 Claims

1. A process for the preparation of dibromomethane, in which gaseous methyl bromide is reacted with bromine at a reaction temperature of at least 300° C., and a molar ratio of CH_3Br:Br_2 of at least 10:1.

4,990,709

C2-C5 OLEFIN OLIGOMERIZATION BY REDUCED CHROMIUM CATALYSIS

Margaret M. Wu, Belle Mead, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 28, 1989, Ser. No. 345,061
Int. Cl.[5] C10L *1/16*
U.S. Cl. 585—10 30 Claims

1. A process for the preparation of liquid hydrocarbons suitable as lubricant basestocks from a mixture of C_2–C_5 alpha-olefins, comprising:

contacting said mixture under oligomerization conditions, at reaction temperature of about 0° C. to 250° C. and at a pressure from 0.1 Atm to about 5,000 psig with a chromium catalyst on a porous support, which catalyst has been treated by oxidation at a temperature of 200° C. to 900° C. in the presence of an oxidizing gas and then by treatment with a reducing agent at a temperature and for a time sufficient to reduce the chromium of said catalyst to a lower valence state, whereby liquid olefin oligomers are produced.

4,990,710

TIN-CONTAINING MICROPOROUS CRYSTALLINE MATERIALS AND THEIR USE AS DEHYDROGENATION, DEHYDROCYCLIZATION AND REFORMING CATALYSTS

Ralph M. Dessau, Edison, N.J.; Ernest W. Valyocsik, Yardley, and James C. Vartuli, West Chester, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,198
Int. Cl.[5] C07C *5/02*
U.S. Cl. 585—277 9 Claims

1. A process for dehydrogenation of an aliphatic compound containing at least 6 carbon atoms comprising producing an aromatic compound by contacting the aliphatic compound, under dehydrogenation conditions with a non-acidic catalyst consisting essentially of 0.1 to 20 weight percent platinum; 0.1 to 20 weight percent tin and the remainder being a microporous crystalline silicate.

4,990,711

SYNTHETIC POLYOLEFIN LUBRICANT BLENDS HAVING HIGH VISCOSITY INDICES

Catherine S. H. Chen, Berkely Heights, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,436
Int. Cl.[5] C07C *2/08, 7/00, 2/10*
U.S. Cl. 585—302 27 Claims

1. A multi-stage process producing synthetic lubricant hydrocarbons by oligomerizing lower olefin feed at elevated temperature and pressure which comprises

contacting the lower olefin in a primary reactor stage under oligomerization conditions with a medium pore shape-selective siliceous zeolite catalyst having acid cracking activity to produce a substantially linear olefin, intermediate-range hydrocarbon;

contacting at least a portion of the primary stage effluent in a secondary reactor stage with an acid catalyst to produce a lubricant range hydrocarbon basestock having kinematic viscosity of about 2 to 6 cS at 100° C.;

hydrogenating at least a portion of said hydrocarbon basestock; and

blending the hydrogenated basestock with at least one other hydrogenated lubricant range synthetic poly(alpha-olefin) having a kinematic viscosity of at least 20 cS to provide a lubricant blend composition, wherein said poly(alpha-olefin) has a branch ratio less than 0.19, a number average molecular weight of about 300 to 30,000, weight average molecular weight between 300 and 150,000, molecular weight distribution between 1.00 and 5, viscosity index greater than 130 and pour point below −15° C.

4,990,712

INTEGRATED CRACKING, ETHERIFICATION AND OLEFIN UPGRADING PROCESS

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 18, 1990, Ser. No. 524,948
Int. Cl.[5] C07C *41/06, 2/00*
U.S. Cl. 585—324 12 Claims

1. A process for upgrading light olefinic crackate gas from a hydrocarbon cracking comprising the sequential steps of:

(a) compressing and cooling a C_4− cracking process product stream to provide an ethene-rich vapor stream and a first condensed C_3+ aliphatic stream;

(b) deacidifying said ethene-rich vapor stream and said first condensed C_3+ aliphatic stream by countercurrently contacting said ethene-rich vapor stream and said first condensed C_3+ aliphatic stream with acid absorbant;

(c) countercurrently contacting said deacidified ethene-rich vapor stream and said deacidified condensed C_3+ ali-

phatic stream with a C_5+ liquid sorbent stream comprising a cracking gasoline under superatmospheric pressure in an absorber column to sorb a major portion of C_2+ components;
(d) recovering a methane-rich overhead stream from said absorber column;
(e) recovering an absorber bottom stream from said absorber column containing C_2+ components; (f) fractionating said absorbes bottom stream in a first fractionator to evolve an overhead stream rich in C_2–C_5 aliphatics and a C_5+ cracking gasoline bottom stream;
(g) mixing at least a portion of said overhead stream of step (f) above with an amount of a primary alcohol sufficient to etherify the C_4–C_6 olefins contained in said overhead stream;
(h) contacting said mixture of step (g), above, with an acid etherification catalyst under etherification conversion conditions to form a product mixture containing high-octane gasoline rich in ethers as well as unconverted oxygenate and C_4- aliphatic hydrocarbons;
(i) fractionating said high octane gasoline product mixture of step (h) above, in a second fractionator into an overhead stream containing unconverted oxygenate and C_4- aliphatics and a bottom stream containing ether-rich high octane gasoline; and
(j) contacting said second fractionator overhead stream with a zeolite having a Constraint Index between about 1 and about 12 under aliphatic/alcohol conversion conditions to upgrade the unconverted oxygenate and aliphatics contained in said second fractionator overhead stream to C_5+ gasoline.

4,990,713

PROCESS FOR THE PRODUCTION OF HIGH VI LUBE BASE STOCKS

Quang N. Le, Cherry Hill, N.J.; Robert A. Ware, Wyndmoor, Pa., and Stephen S. Wong, Medford, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 7, 1988, Ser. No. 267,888
Int. Cl.[5] C07C *2/58*
U.S. Cl. 585—332 **17 Claims**

1. A process for producing a high VI, low pour point lubricant product which comprises reacting an isoparaffinic hydrocarbon having a boiling range from about 330° F. to about 700° F. produced by the isomerization of a waxy paraffinic hydrocarbon feedstock over a zeolite beta isomerization catalyst with an olefinically unsaturated hydrocarbon reactant comprising a distillate fraction having a boiling range from about 330° F. to 650° F. produced by the oligomerization of lower molecular weight olefins over an intermediate pore size zeolite oligomerization catalyst at a molar ratio of from 1:5 to 5:1 to form a 650° F.+ lubricant product, said reacting occurring in the presence of a free radical initiator comprising an organic peroxide compound.

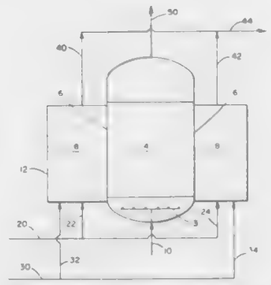
4,990,714

COMBUSTIVE MEMBRANE REACTOR AND PARAFFIN UPGRADING PROCESS

Margaret Nemet-Mavrodin, Cherry Hill, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed May 4, 1989, Ser. No. 347,307
Int. Cl.[5] C07C *7/144, 2/76, 2/00*
U.S. Cl. 585—407 **13 Claims**

1. A process for upgrading a hydrocarbon feedstream containing C_2–C_6 paraffins comprising the steps of:
(a) maintaining a reaction zone containing a zeolite catalyst, said reaction zone being provided with a selectively permeable membrane capable of transferring at least a portion of the hydrogen by-product evolved in said reaction zone while substantially retaining hydrocarbon reactants and products within said reaction zone;
(b) charging said feedstream containing C_2–C_6 paraffins to said reaction zone under conversion conditions sufficient to convert at least a portion of said C_2–C_6 paraffins to aromatics and by-product hydrogen;
(c) decreasing the hydrogen partial pressure within said reaction zone by transferring at least a portion of said by-product hydrogen through said selectively permeable membrane to a combustion zone, said combustion zone being separated from said reaction zone by said selectively permeable membrane to restrict mass transport between said reaction zone and said combustion zone to moieties not larger than hydrogen molecules, said hydrogen transfer being effected by maintaining a hydrogen partial pressure differential between said reaction zone and said com-



bustion zone such that the hydrogen partial pressure within said reaction zone exceeds the hydrogen partial pressure within said combustion zone;
(d) charging an oxygen-containing fluid to said combustion zone at a rate sufficient to provide a stoichometric excess of oxygen and to combust at least a portion of said by-product hydrogen to enhance diffusion of hydrogen across said selectively permeable membrane by continuously converting hydrogen diffused from said reaction zone to said combustion zone into combustion products comprising moieties larger than hydrogen molecules; and
(e) indirectly transferring thermal energy from said combustion zone to said reaction zone.

4,990,715

ZEOLITE CATALYSTS SUITABLE FOR HYDROCARBON CONVERSION

Thomas Knox, Surrey, England, assignor to The British Petroleum Company p.l.c., Brittance House MoorLane, England

Filed Jan. 26, 1989, Ser. No. 302,482
Claims priority, application United Kingdom, Feb. 11, 1988, [redacted]112
Int. Cl.[5] C07C *2/52*
U.S. Cl. 585—417 **8 Claims**

1. A process for producing aromatic hydrocarbons, which comprises bringing a catalyst composition comprising a crystalline aluminosilicate having a molar ratio of silica to alumina of at least 5:1, said aluminosilicate carrying gallium and silver, into contact with a C_2–C_{12} hydrocarbon feedstock at elevated temperature.

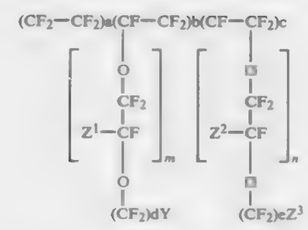
4,990,716

PREPARATION OF DIPHENYLMETHANES

Gregory F. Schmidt, and Paul D. Williams, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 9, 1989, Ser. No. 364,730
Int. Cl.[5] C07C *2/02*
U.S. Cl. 585—426 **7 Claims**

1. A process for producing a diphenylmethane which comprises contacting o-xylyl halide with benzene or toluene in the presence of a catalytic amount of a normally solid, insoluble perfluorosulfonic acid polymer represented by the formula:



wherein:
Y is SO_3H, or any group convertible to SO_3H;
each Z^1, Z^2, and Z^3 is independently F, Cl, Br, CF_3, CF_2Cl, or fluorinated alkyl;
the ratio of a/b varies from about 2 to about 50:
c is 0 or greater than 0:
m and n are independently 0 to 4: and
d and e are independently 2 to 5.

4,990,717

MONOALKENYLATION OF ALKYLBENZENES IN A FIXED CATALYST BED

David L. Sikkenga, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 16, 1989, Ser. No. 438,335
Int. Cl.[5] C07C *2/72*
U.S. Cl. 585—429 **21 Claims**

1. A method for the production of a monoalkenylated benzene which comprises the steps of
contacting an alkylbenzene and C_4 to C_5 conjugated diene reactant admixture with a fixed, porous catalyst bed containing an alkali metal catalyst on a solid particulate support for a time period sufficient to react said diene with said alkylbenzene to produce a monoalkenylated benzene as reaction product in a mixture of reactants and reaction products wherein the temperature of the catalyst bed is maintained below the boiling point of the monoalkenylated benzene product and at about the boiling point of the alkylbenzene such that an alkylbenzene vapor-liquid equilibrium is maintained within the catalyst bed and wherein separation by distillation of the reactants and reaction products present in said mixture of reactants and reaction products is initiated in said catalyst bed;
separating said mixture from said catalyst bed and recovering the produced monoalkenylated benzene from said mixture of reactants and reaction products.

4,990,718

AROMATIC ALKYLATION WITH ALPHA-OLEFIN DIMER

Bruce P. Pelrine, Trenton, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 3, 1989, Ser. No. 332,146
Int. Cl.[5] C07C *2/64, 15/10*
U.S. Cl. 585—455 **16 Claims**

1. A process for the production of mono-alkylbenzenes containing C_{12}–C_{28} alkyl group from alpha-olefin dimer, comprising,
contacting a C_6–C_{14} alpha olefin with a supported solid reduced metal oxide catalyst under oligomerization conditions at a temperature of about 90° to 250° C., said metal oxide comprising a lower valence form of at least one Group VIB metal to produce lubricant range hydrocarbon product oligomers having a branch ratio of about 0.10 to 0.19 and a viscosity index of at least about 130 and a C_{12}–C_{28} olefin dimer;
separating the oligomers and recovering the dimer,
reacting benzene or substituted benzene with the dimer, or mixture of said dimers, in contact with acidic shape selective metallosilicate catalyst under alkylating conditions whereby said mono-alkylbenzenes are produced.

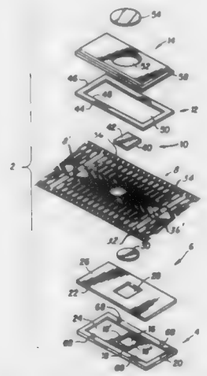
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4,990,719

HERMETICALLY SEALED CHIP CARRIER WITH METAL COVER HAVING PRE-POURED GLASS WINDOW

John O. Wright, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 13, 1989, Ser. No. 381,622
Int. Cl.[5] H05K *5/06*
U.S. Cl. 174—52.4 15 Claims



1. A hermetically sealed chip carrier, comprising:
a pre-molded base comprising plastic and including a recessed portion bounded by a first peripheral wall;
a first epoxy B-stage preform having a first surface which engages said base and is adhered thereto, and an opposite second surface, said first epoxy B-stage preform including an open area through which said first peripheral wall extends, and a die pad engaging area within said open area;
a lead frame having a first side which engages said opposite second surface and is adhered thereto, and an opposite second side, said lead frame having a die pad adjacent said open area and adhered to said opposite second surface at said die pad engaging area;
a chip having a first area which engages and is adhered to said die pad and an opposite second area, said chip being electrically connected to said lead frame;
a second epoxy B-stage preform having a lower surface which engages said lead frame and said base and is adhered thereto, and an opposite upper surface, said second epoxy B-stage preform including a peripheral edge portion and an open central portion;
a metal cover bonded to said pre-molded base and electrically insulated from said lead frame by said peripheral edge portion, said metal cover having an aperture therethrough adjacent said chip, a pre-poured ultra violet glass window enclosing said aperture; and
means associated with said pre-molded base for aligning said lead frame relative to said pre-molded base.

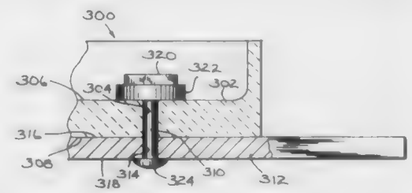
4,990,720

CIRCUIT ASSEMBLY AND METHOD WITH DIRECT BONDED TERMINAL PIN

Lance R. Kaufman, 7345 East Acoma, Scottsdale, Ariz. 85260

Continuation-in-part of Ser. No. 469,350, Jan. 24, 1990, which is a continuation-in-part of Ser. No. 180,476, Apr. 12, 1988, Pat. No. 4,902,854. This application Feb. 12, 1990, Ser. No. 478,467
Int. Cl.[5] H01L *23/02*
U.S. Cl. 174—524 19 Claims

1. An electric circuit assembly comprising:
an electrically insulating refractory substrate having an aperture extending therethrough between first and second surfaces;
an electrically conductive terminal pin in said aperture directly bonded to said substrate by placing said pin in contact with said substrate, heating said pin and said substrate to a temperature below the melting point of said pin to form a eutectic with said pin which wets said pin and said substrate, and cooling said pin and said substrate, with said pin bonded to said substrate;
an electrically conductive lead frame having an aperture extending therethrough between first and second surfaces, said lead frame being directly bonded to said substrate by



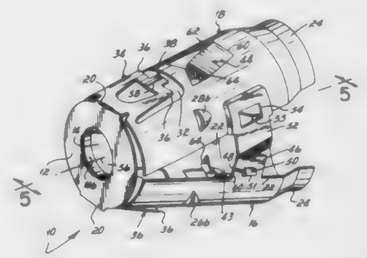
placing said first surface of said lead frame in contact with said second surface of said substrate, heating said lead frame and said substrate to a temperature below the melting point of said lead frame to form a eutectic with said lead frame which wets said lead frame and said substrate, and cooling said lead frame and said substrate, with said lead frame bonded to said substrate, and with said aperture in said lead frame aligned with said aperture in said substrate, and with said pin in said apertures.

4,990,721

ARMORED CABLE CONNECTOR

Robert K. Sheehan, Cincinnati, Ohio, assignor to Corecon Corporation, Cincinnati, Ohio

Filed Jan. 12, 1990, Ser. No. 464,457
Int. Cl.[5] H02G *3/06*
U.S. Cl. 174—65 R 35 Claims



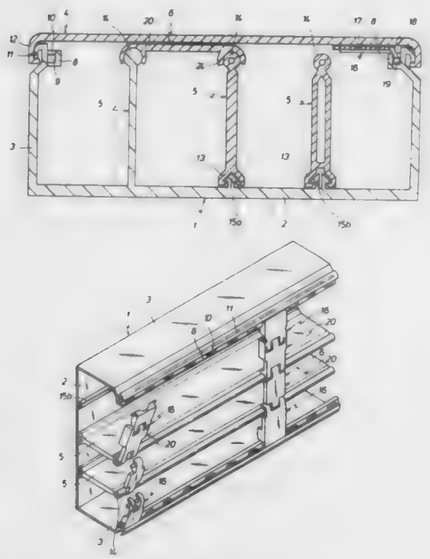
1. A connector for mounting an electrical conduit of any size within a range of sizes to a junction box wall, comprising:
a one piece member having a center support and a pair of wings extending from said center support, said wings being normally urged apart in an open position, said wings being pivotable toward one another into a second position;
yieldable means normally unflexed and extending from at least a first of said wings and toward a second of said wings for engaging an exterior wall of an electrical conduit situated between said yieldable means and said second wing, said yieldable means flexing towards said first wing after engaging the conduit exterior wall as the wings are pivoted from said open position to said second position, whereby to accommodate an electrical conduit of any size within a range of sizes defined by characteristics of the connector;
means for retaining said wings in said second position; and
junction box engaging means for mounting the connector to a junction box.

4,990,722

DUCTING FOR ELECTRICAL CONDUCTORS AND THE LIKE WITH STIFFENING ARRANGEMENT AND CORRESPONDING CLAMP

Juan M. Benito Navazo, Barcelona, Spain, assignor to Aparellaje Electrico S.A., Barcelona, Spain

Filed Apr. 2, 1990, Ser. No. 502,681
Claims priority, application Spain, Apr. 14, 1989, 8901308
Int. Cl.[5] H02G 3/04
U.S. Cl. 174—97 11 Claims



1. In a ducting for electrical conductors and the like with a stiffening arrangement, the ducting being of the type comprising a base wall; two side walls having the top ends thereof provided with first coupling means; and intermediate longitudinal partition members each provided with an upper terminal formation; and the stiffening arrangement comprising stiffening clamps provided at the ends thereof with second coupling means engageable with said first coupling means; the improvement wherein said upper terminal formations have a constant section and each stiffening clamp comprises at least two parts, such that between every two adjacent parts there is a transverse gap forming lengths which are jointly disposed in meandering line form, each adjacent pair of parts being attached together by lateral flaps fixedly attached to each of said adjacent parts and in that each part, in the proximity of another adjacent part, is provided with at least one engaging member adapted removably to engage an upper terminal formation, with the engaging members of adjacent parts forming transverse alignments which are mutually separated by portions of said transverse gap.

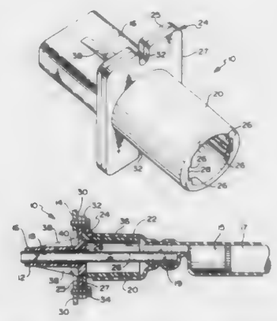
11. A stiffening clamp for ducting for electrical conductors and the like, the ducting being of the type comprising a base wall; two side walls each of which is provided with an inner edge having a tubular member provided at the top thereof with spaced apart apertures; and intermediate longitudinal partition members each provided with an upper terminal formation; said clamp having end parts each of which is provided with a pair of oppositely extending bosses adapted to be inserted in said apertures, said clamp being generally flat, rigid and elongate and adapted to extend transversally across the inner edges of both side walls; said clamp further comprise at least two pars so that between each pair of adjacent parts there is a transverse gap forming lengths which are jointly disposed in meandering line form, each adjacent pair of parts being attached together by lateral flaps fixedly attached to each of said adjacent parts; and each part, in the proximity of another adjacent part being provided with a clip portion adapted retentively to surround an upper terminal formation, with the clip portions of adjacent parts forming transverse alignments, which are mutually separated by lengths of said transverse gap.

4,990,723

BULKHEAD CONNECTOR

Rick P. Ziberna, Chicago, and Timothy D. Kaptur, Crestwood, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1990, Ser. No. 461,954
Int. Cl.[5] H01B 17/26
U.S. Cl. 174—152 R 24 Claims



1. A bulkhead connector assembly for supporting a bus bar as it passes through a bulkhead, said assembly comprising;

a rectangular portion having a substantially rectangular cross section and including a rectangular passageway extending therethrough;

a circular portion having a substantially circular cross section and including a circular passageway extending therethrough and in communication with said rectangular passageway of said rectangular portion;

a mounting flange integral with said rectangular and circular portions and disposed intermediate of said rectangular and circular portions for mounting said assembly to a bulkhead;

said assembly characterized by said circular passageway of said circular portion having a plurality of shoulders within said circular passageway, said shoulders defining a rectangular passage within said circular passageway which substantially corresponds to said rectangular passageway of said rectangular portion for mounting and supporting a bus bar as it passes through a bulkhead.

4,990,724

METHOD AND APPARATUS FOR ELECTRICALLY INTERCONNECTING OPPOSITE SIDES OF A FLEX CIRCUIT

Anthony B. Suppelsa, and Keith D. Soldner, both of Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1989, Ser. No. 446,229
Int. Cl.[5] H05K 1/00, 3/00
U.S. Cl. 174—261 8 Claims

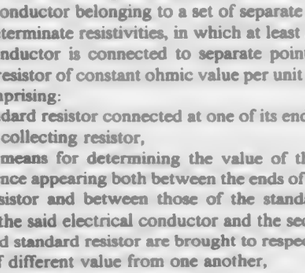
1. A method of interconnecting circuit traces on first and second sides of a flex circuit comprising the steps of:

providing a tab in the flex circuit having at least one circuit trace including a contact area on its first side,

folding the tab so that the contact area on its first side overlies the flex circuit second side, and

electrically interconnecting said contact area and a contact area on the flex circuit second side to interconnect circuit traces on said first and second sides of the flex circuit.

5. A flexible circuit having electrically interconnected first and second sides comprising:



a tab formed from the flexible circuit having a circuit trace on its first side,

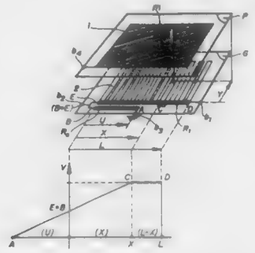
the tab being folded so that a portion of said circuit trace overlies and is electrically interconnected to a circuit trace on the second side of the flex circuit.

4,990,725

DEVICE FOR LOCATING THE UNKNOWN POSITION OF AN ELECTRICAL CONDUCTOR BELONGING TO A SET OF SEPARATE CONDUCTORS AND A TOUCH SENSITIVE PANEL COMPRISING SUCH DEVICES

Francois Mizzi, La Celle Saint Cloud, France, assignor to Aid 3 Group Ltd., London, England

Filed Jun. 19, 1989, Ser. No. 367,687
Claims priority, application Switzerland, Jul. 13, 1988, 2673/88
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—18 14 Claims



1. A device for locating the unknown position of a specific electrical conductor belonging to a set of separate conductors of any indeterminate resistivities, in which at least a first point of each conductor is connected to separate points of a first collecting resistor of constant ohmic value per unit length, said device comprising:

(a) a standard resistor connected at one of its ends to a point of the collecting resistor,

(b) first means for determining the value of the potential difference appearing both between the ends of the collecting resistor and between those of the standard resistor when the said electrical conductor and the second end of the said standard resistor are brought to respective potentials of different value from one another,

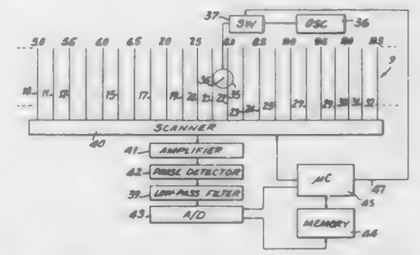
(c) other means for determining the value of the distance separating the said conductor of unknown position and an origin point, predefined on the collecting resistor, on the one hand as a function of a constant characteristic of the value of the standard resistor and of the specific resistance per unit length of the collecting resistor, and on the other hand, from the values of the potential differences determined by said first means.

4,990,726

DIGITIZED CONTROLLER FOR POSITION LOCATOR

Daniel G. Lasley, Newtown, Conn., assignor to Summagraphics Corporation, Seymour, Conn.

Filed Nov. 7, 1989, Ser. No. 432,798
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—19 9 Claims



1. In a digitizer tablet comprising an array of grid wires, a pointing device whose position is to be located with respect to the array, means for energizing the grid wires or pointing device, and means for addressing the wires in a sequence thereby deriving from the wires and pointing device time-related induced analog voltages correlated to grid wire locations, the improvement comprising:

(a) means for sampling the analog voltages;

(b) means for determining a pair of sampled values derived from wires located under opposite sides of the pointing device;

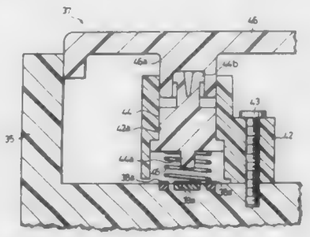
(c) means for interpolating between the pair of sampled values determined in (b) to determine substantially the exact location of the pointing device relative to the array.

4,990,727

HORN SWITCH

Satoshi Ohno, Inazawa, and Tetsushi Hiramitsu, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Division of Ser. No. 236,182, Aug. 25, 1988, Pat. No. 4,899,020.
This application Nov. 17, 1989, Ser. No. 437,604
Claims priority, application Japan, Oct. 19, 1987, 62-159837; Dec. 26, 1987, 62-330986
Int. Cl.[5] H01H 9/00
U.S. Cl. 200—61.54 8 Claims



1. A horn switch comprising:

a base plate attached to a pad portion,

a horn contact attached to a horn button on the pad portion and moving in relation to movements of a horn button,

a contact member disposed on the horn contact opposite the base plate, the contact member being electrically connected to the horn contact,

a biasing member in contact with the base plate and the horn

contact so as to urge the horn contact towards a position spaced apart from the base plate, the biasing member being electrically connected to the contact member,

a first electrode disposed on the base plate and electrically connected to the biasing member, and,

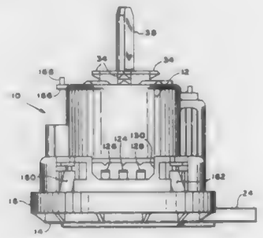
a second electrode disposed on the base plate, the second electrode coming into contact with the contact member when the horn button is pressed to establish an electrical connection between the first electrode, biasing member, horn contact, contact member and second electrode.

4,990,728

PRESSURE SWITCH AND SUB-ASSEMBLY THEREFOR

Ronald S. Joyce, Palatine, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 12, 1989, Ser. No. 350,883
Int. Cl.[5] H01H *35/34*
U.S. Cl. 200—83 P 5 Claims



1. A pressure switch assembly comprising:

(a) housing means defining a pressure chamber formed in part by a flexible diaphragm and defining an inlet communicating with said chamber, said inlet adapted for connection to receive a fluid pressure signal;

(b) snap-acting switch means disposed in said housing means for actuation by said diaphragm in response to a predetermined pressure in said chamber;

(c) spring means operative to apply a preload on said diaphragm;

(d) annular cam means associated with said housing means and disposed for rotary movement with respect to said housing means by user rotation thereof;

(e) lever means mounted on said housing for pivoted movement about a fulcrum on said housing means and contacted by said cam means for movement in response to said rotary movement of said cam means, said lever means having bifurcated portions thereof nested about the inner periphery of said annular cam means;

(f) cap means disposed on one reaction end of said spring means and registered against the bifurcated portions of said lever means such that said user rotation of said cam means moves said lever means for varying said bias.

4,990,729

TEACHING CONSOLE PANEL FOR ROBOT

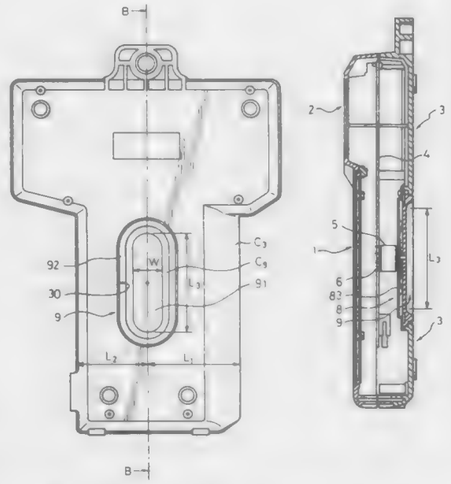
Kenichi Toyoda, Hino; Nobutoshi Torii, Hachioji; Susumu Ito, Hino, and Akira Tanaka, Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/00096, § 371 Date Oct. 3, 1988, § 102(e) Date Oct. 3, 1988, PCT Pub. No. WO88/06078, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 3, 1988, Ser. No. 265,863
Claims priority, application Japan, Feb. 20, 1987, 62-35824
Int. Cl.[5] H01H *9/02*
U.S. Cl. 200—293.1 5 Claims

1. A teaching console panel for a robot having front back and side portions comprising:

a switch disposed within said console panel;

a pressing plate operably coupled to said switch having an elliptical recess disposed within a surface of said console panel back portion, wherein said elliptical recess simultaneously accommodates fingers of a panel user for touching said pressing plate when said console panel is gripped by said user; and



an inclined face portion for accommodating thereon the palm of said user, wherein said inclined face portion is disposed on a longitudinally straight edge portion of said console panel back portion.

4,990,730

ILLUMINATED PUSH-BUTTON SWITCH

Kenji Shinohara, Osaka, and Takashi Niwa, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 6, 1989, Ser. No. 375,887
Claims priority, application Japan, Mar. 20, 1987, 62-67185; Mar. 23, 1987, 62-69540; Apr. 2, 1987, 62-50360
Int. Cl.[5] H01H *9/16*
U.S. Cl. 200—314 2 Claims

1. An illumination type push button switch, comprising a switch case, first and second split-type switch bases, a push button projecting from the switch case, and an inner switch element within the switch case which is switched by depressing the push button and a display unit for displaying input information by means of illumination of the push button, which further comprises

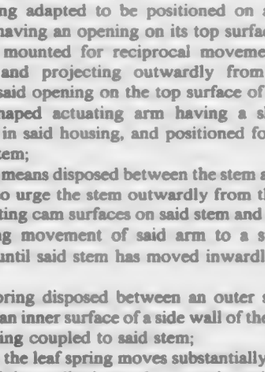
an input/output flexible wiring board electrically connected to the inner switch element and the display unit; and

a reinforcing fixing board which is fitted to a connection portion of the flexible board and which is supported by the first split-type switch base;

wherein the inner switch element and the display unit are mounted on the fixing board so as to be connected to the flexible board at their mounted positions.

wherein the first split-type switch base has formed thereon an engagement portion which engages a free end of the display unit and an engagement recess which engages with the second split-type switch base; and

wherein the second split-type switch base has a wall surface



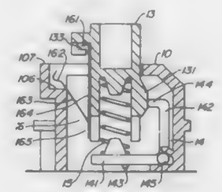
opposing the first split-type switch base which is formed with a convex engagement portion which engages with the engagement recess on the first split-type switch base through the fixing board.

4,990,731

PUSHBUTTON SWITCH WITH TACTILE AND AUDITORY CONFIRMATION OF OPERATION

Win Wu; Ben Liao, and Lung-Sherng Hsieh, all of Taipei, Taiwan, assignors to Acer Incorporated, Taiwan, China

Filed Jul. 28, 1989, Ser. No. 386,099
Int. Cl.[5] H01H *13/14, 3/12*
U.S. Cl. 200—521 2 Claims



1. A pushbutton switch with tactile and auditory confirmation of operation comprising:

(a) a housing adapted to be positioned on a switch, said housing having an opening on its top surface;

(b) a stem mounted for reciprocal movement within the housing and projecting outwardly from the housing through said opening on the top surface of said housing;

(c) an L-shaped actuating arm having a shaft pivotally mounted in said housing, and positioned for engagement by said stem;

(d) a spring means disposed between the stem and the actuating arm to urge the stem outwardly from the housing;

(e) cooperating cam surfaces on said stem and actuating arm preventing movement of said arm to a switch closing position until said stem has moved inwardly a given distance;

(f) a leaf spring disposed between an outer surface of the stem and an inner surface of a side wall of the housing, said spring being coupled to said stem;

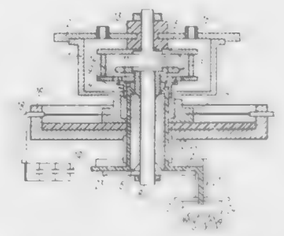
(g) wherein the leaf spring moves substantially as the stem is depressed inwardly beyond a certain point, causing a tactile feel and a click sound for the operator.

4,990,732

DISCHARGE DEVICE FOR MAGNETIC-PULSE WORKING AND WELDING OF METALS

Daniil A. Dudko, ulitsa A.Barbjusa, 22/26, kv. 113, and Vyacheslav A. Chudakov, ulitsa A.Barbjusa, 22/26, kv. 48, both of Kiev, U.S.S.R.

PCT No. PCT/SU87/00031, § 371 Date Nov. 16, 1988, § 102(e) Date Nov. 16, 1988, PCT Pub. No. WO88/06937, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 19, 1987, Ser. No. 274,806
Int. Cl.[5] B23K *13/01;* H01T *1/20*
U.S. Cl. 219—9.5 6 Claims



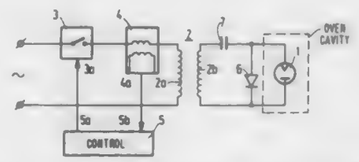
1. A discharge device for magnetic-pulse working and welding of metals, comprising: a body with current-supply elements and a discharge chamber accomodating a first working electrode and a second working electrode and an igniter electrode, said electrodes being arranged coaxially, an insulating sleeve being placed between the working electrodes, one of said working electrodes being electrically connected to a positive terminal of a capacitor bank, while the other working electrode is connected to a negative terminal of the capacitor bank through an inducter, characterized in that the discharge chamber is secured to said body said first working electrode is connected via current supply elements to said negative terminal of said capacitor bank and comprises a current-carrying portion connected to a working portion of the first working electrode, being T-shaped, while said second working electrode is separated from the first working electrode by an insulating sleeve and arranged coaxially with the first working electrode, said second working electrode being in the shape of a sleeve, one end of which faces the working portion of the first working electrode and is provided with projections on the outside and inside so as to form a developed working portion of the second working electrode and an igniter electrode is disposed between the working portions of the working electrodes and secured to a cover of the gas-discharge chamber in an insulated condition, said igniter electrode being in the shape of a slotted ring.

4,990,733

MICROWAVE OVEN WITH IMPROVED MICROWAVE POWER CONTROL

Bo G. Joelsson, Åby, and Mats Idebro, Norrköping, both of Sweden, assignors to U.S. Philips Corp., New York, N.Y.

Filed Feb. 2, 1989, Ser. No. 305,880
Claims priority, application Sweden, Feb. 2, 1988, 8800323
Int. Cl.[5] H05B *6/68*
U.S. Cl. 219—10.55 B 5 Claims



1. In a microwave oven of the type for heating food and

having an oven cavity, a microwave source for generating microwaves in the oven cavity, and a power supply for supplying electrical power to operate the microwave source, the improvement comprising:

sensing means for sensing a physical parameter of the electrical power supplied to said microwave source which has a value which changes when the generation of microwave power starts; and

control means in said power supply for switching off the electrical power to said microwave source at the end of a time interval measured from the start of microwave power generation indicated by a change in the parameter sensed by said sensing means.

4,990,734

APPARATUS FOR PREPARING FILTERED COFFEE BY USE OF MICROWAVE ENERGY

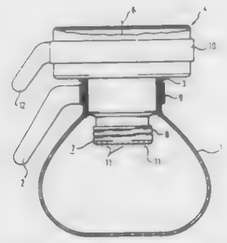
Paul Hirsch, Karl-Theodor-Strasse 91, D-8000 München, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,585

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742507

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **13 Claims**



1. Apparatus for preparing filtered coffee by use of microwave energy comprising:

a vessel for containing said filtered coffee, said vessel having a vessel opening formed therein;

a container including a single compartment for receiving and retaining a non-heated coffee mixture of coffee grounds and water, said container including an outlet adapted to be received by said vessel opening to pass said coffee mixture therethrough to said vessel;

means to heat said coffee mixture through exposure to microwave energy; and

filter means disposed across said outlet, said filter means having a resistance to flow which is slight enough that said heated coffee mixture passes through said filter to emerge as said filtered coffee.

4,990,735

UNIFORMITY OF MICROWAVE HEATING BY CONTROL OF THE DEPTH OF A LOAD IN A CONTAINER

Claude P. Lorenson; Bryan C. Hewitt, both of Kingston; Richard Keefer, Peterborough, and Melville D. Ball, Kingston, all of Canada, assignors to Alcan International Limited, Montreal, Canada

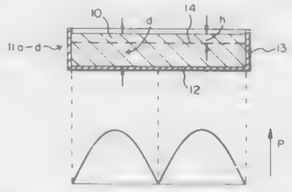
Filed Jun. 1, 1989, Ser. No. 359,589

Claims priority, application Canada, Feb. 13, 1989, 590860

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **24 Claims**

1. A product comprising a container and a load located therein or thereon for heating by microwave energy, said product in combination with means for generating at least one mode of said energy of an order higher than a fundamental mode determined by boundary conditions defined by lateral dimensions of at least one of said container and said load, wherein the depth of the load in the container is such that, upon irradiation of the product with microwave energy, the



power absorbed by the load from said higher order mode is at or near a maximum value relative to the fundamental mode.

4,990,736

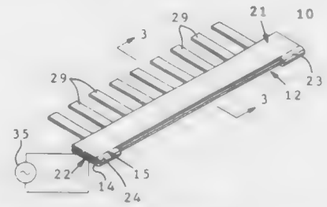
GENERATING ELECTROMAGNETIC FIELDS IN A SELF REGULATING TEMPERATURE HEATER BY POSITIONING OF A CURRENT RETURN BUS

Homer E. Henschen, Carlisle; Michael J. McKee, New Cumberland, and Joseph M. Pawlikowski, Lancaster, all of Pa., assignors to AMP, Incorporated, Harrisburg, Pa.

Filed Nov. 29, 1988, Ser. No. 277,170

Int. Cl.[5] H05B *6/00*

U.S. Cl. 219—10.75 **13 Claims**



1. A self-regulating heater comprising:

a substrate of a first material, said substrate having length, width and thickness dimensions wherein said length and width dimensions are very much larger than said thickness dimension, said first material having a relatively low electrical resistance and a relatively low magnetic permeability, said substrate begin folded to define first and second spaced parallel sections joined by a fold section, said fold section being an approximately 180 ° bend about a fold line (A) extending generally parallel to said length dimension and transversely of said width dimension;

said first section including a first surface layer of a second material having a predetermined depth and fixedly disposed on an inwardly-facing surface of said first section, said second material having an electrical resistance substantially greater than said relatively low electrical resistance, and a magnetic permeability which is substantially higher than said relatively low magnetic permeability at temperatures below the Curie temperature of said second material but substantially the same as said relatively low magnetic permeability at temperatures above said Curie temperature, said heater being adapted to be actuated by passing a constant amplitude alternating current therethrough at a predetermined frequency, and wherein said predetermined depth corresponds to approximately one skin depth; and

said second section also including a surface layer of said second material of said predetermined depth fixedly disposed on an inward-facing surface of said second surface.

4,990,737

INITIAL HOLE MACHINING DEVICE FOR A WIRE-CUT ELECTRIC DISCHARGE MACHINE

Haruki Obara, Toyama, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

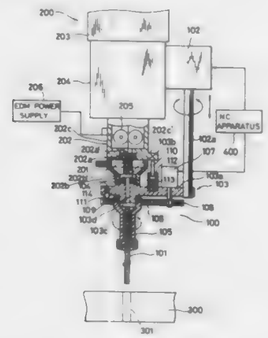
PCT No. PCT/JP89/00089, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO89/07033, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 30, 1989, Ser. No. 391,569

Claims priority, application Japan, Feb. 8, 1988, 63-25747

Int. Cl.[5] B23H *7/02, 7/10, 9/14*

U.S. Cl. 219—69.11 **4 Claims**



1. An initial hole machining device for use in a wire-cut electric discharge machine having a wire guide for guiding a wire electrode, comprising:

a body detachably mounted to said wire guide,

wherein said body is movable perpendicular to said wire electrode between a first initial hole machining position in which said body is mounted to said wire guide coaxial with the wire electrode, and a second set-aside position in which said body is spaced from said wire guide;

an initial hole machining electrode connected to said body; and

means for moving said body and initial hole machining electrode between the first position and the second position.

4,990,738

WIRE ELECTRODE FEEDING DEVICE IN WIRE CUT ELECTRIC DISCHARGE MACHINE

Atsushi Taneda, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/00425, § 371 Date Feb. 27, 1990, § 102(e) Date Feb. 27, 1990, PCT Pub. No. WO89/11372, PCT Pub. Date Nov. 30, 1989

PCT Filed Apr. 20, 1989, Ser. No. 457,797

Claims priority, application Japan, May 18, 1988, 63-121313

Int. Cl.[5] B23H *7/10*

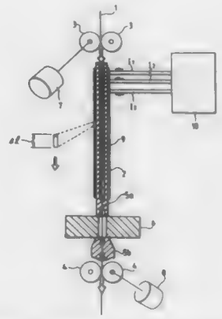
U.S. Cl. 219—69.12 **7 Claims**

1. In a wire cut electric discharge machine in which a wire electrode is allowed to penetrate a workpiece with a small gap therebetween, and while said wire electrode and said workpiece being moved relatively to each other along a machining locus, a machining voltage is applied across said wire electr de and said workpiece, so that said workpiece is machined with the electric discharge energy,

a wire electrode feeding device, by comprising:

a plurality of magnetic field generating coils arranged on a path along which said wire electrode is introduced into said workpiece; and

current supplying means for supplying currents different in phase from one another to said magnetic fields generating coils,



said wire electrode being driven by the electromagnetic induction caused by the shifting magnetic fields which are produced by said magnetic field generating coils.

4,990,739

PLASMA GUN WITH COAXIAL POWDER FEED AND ADJUSTABLE CATHODE

Isidor Zaplatynsky, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 7, 1989, Ser. No. 376,488

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.47 **4 Claims**

1. An arc plasma gun comprising,

a housing in the form of an elongated insulator having oppositely disposed end faces and an axial bore forming a chamber extending therethrough between a forward end face and a rear end face, said chamber having a forward portion adjacent to said forward end face having a major diameter and a rear portion adjacent to said rear end face having a smaller diameter.

an anode having an opening therein,

a metal base mounted on said forward end face, said base having a rearwardly facing boss extending into said forward portion of said axial bore for mounting said anode with said opening in substantial alignment with said chamber,

an elongated cathode assembly extending into said chamber from the rear and face of said housing toward said anode whereby an arc may be generated, said cathode assembly comprising

a base portion adjacent to said rear end face,

an elongated body portion extending from said base portion through said rear portion of said chamber into said forward portion, and

a cathode mounted on an end of said body portion opposite said base portion,

at least one passage in said housing in communication with a source of ionizable gas for supplying the same to said anode and cathode to maintain an arc,

a bore extending through said cathode in communication with a source of ceramic powders in a feed gas for feeding said powders to said arc, and

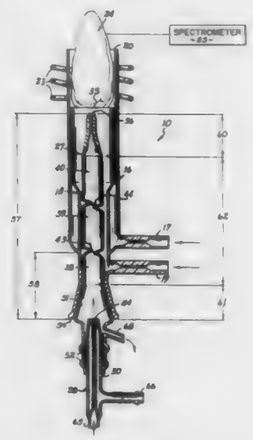
a plurality of threaded members extending from said rear end face for operable engagement with said base portion of said cathode assembly whereby said elongated body portion and said cathode are selectively moved in said axial bore toward and away from said anode for optimizing the performance of said gun.

4,990,740

INTRA-MICROSPRAY ICP TORCH

Gerhard A. Meyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 6, 1989, Ser. No. 320,002
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.52 22 Claims



1. An ICP torch comprising:

means for generating a high temperature ionized gas in a plasma region at one end of the torch;

multichamber particle discrimination means having first and second ends, the first end extending through said torch and terminating adjacent said plasma region;

a nebulizer mounted to said second end and adapted to propel a pressurized mixture of aerosol and sample particles through said multichamber particle discrimination means toward said plasma region;

impaction means positioned within said multichamber particle discrimination means and located within said torch, said impaction means adapted to divert flow of said pressurized mixture while enroute to said plasma region, thereby to produce a filtering effect to promote introduction into said plasma region of sample particles in the form of a fine mist wherein said multichamber particle discrimination means further comprises;

a preshaped tube concentrically mounted within said torch;

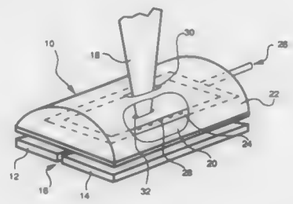
said impaction means being directed radially inward to define adjacent chambers of said tube and to block a line of sight between said chambers.

4,990,741

METHOD OF LASER WELDING

Ralph J. Moores, Thousand Oaks, and Daniel S. Gnanamuthu, Westlake Village, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1990, Ser. No. 477,409
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.64 12 Claims



1. A method of joining first and second metallic components along a weld path, comprising the steps of:

providing a beam of coherent electromagnetic energy having sufficient power to melt the first and second components;

providing a low turbulent flow of an inert shielding gas over a weld region along a portion of the weld path;

focusing the beam on the weld region such that the beam energy is linearly distributed in the direction of the weld path with an intensity sufficient to form a pool of molten metal in the weld region; and

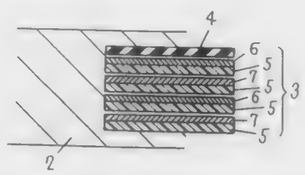
establishing relative motion between the components and the beam to cause the weld region to move along the weld path, thereby joining the first and second components along the weld path.

4,990,742

METHOD OF MAKING LAMINATED FILM CAPACITORS

Yukio Nishikawa, Ikeda; Yuji Uesugi, Osaka; Kunio Oshima, Matsue, and Shinichi Suzawa, Shimane, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1989, Ser. No. 436,786
Claims priority, application Japan, Nov. 15, 1988, 63-287991
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 4 Claims



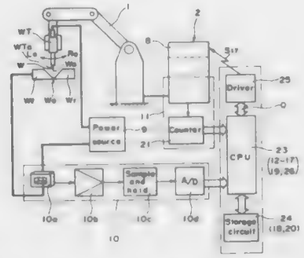
1. A method of making a laminated film capacitor comprising a plurality of dielectric layers and a corresponding number of film electrodes which are alternately laminated one above the other with peripheral edges of both of the dielectric layers and film electrodes being exposed to the outside of the capacitor through a peripheral cut side face defined in such capacitor, each of the dielectric layers being made of material having a lower UV laser beam absorptivity than that of material for each of the film electrodes, which method comprises a step of radiating a UV laser beam to the peripheral cut side face to preferentially remove the peripheral edges of the film electrodes which are situated adjacent to the peripheral cut side face of the capacitor.

4,990,743

CONTROL METHOD FOR TRACING A WELD LINE IN A WELDING APPARATUS

Katsuya Kugai, Osaka; Hideyuki Yamamoto, Kobe, and Yusuke Niimura, Osaka, all of Japan, assignors to Daihen Corporation, Osaka, Japan

Filed Nov. 17, 1989, Ser. No. 438,677
Claims priority, application Japan, May 10, 1989, 64-118176
Int. Cl.[5] B23K *9/127*
U.S. Cl. 219—124.34 12 Claims



1. A control method in a welding apparatus for enabling a welding torch to trace a weld line while oscillating said welding torch in left and right directions solidly crossing said weld line by detecting a change in an electric signal responsive to changes in an arc length and a wire extension, comprising the steps of:

detecting said electric signal as a first detecting signal when said welding torch moves in the right direction for a first time interval of the right half of the amplitude of the oscillation;

detecting said electric signal as a second detecting signal when said welding torch moves in the left direction for the first time interval;

generating a first comparative signal by comparing the first detecting signal with the second detecting signal;

detecting said electric signal as a third detecting signal when said welding torch moves in the left direction for a second time interval of the left half of the amplitude of the oscillation;

detecting said electric signal as a fourth detecting signal when said welding torch moves in the right direction for the second time interval;

generating a second comparative signal by comparing the third detecting signal with the fourth detecting signal;

calculating a difference between respective levels of the first and second comparative signals; and

moving the center of the oscillation in such a direction that the calculated difference becomes small so as to enable said welding torch to trace said weld line;

wherein the calculated difference used for determining the direction in which the center of the oscillation is to be moved is set so that the sight of the calculated difference at an oscillation frequency lower than a predetermined frequency is different from the sign of the calculated difference at the oscillation frequency equal to or higher than the predetermined frequency.

4,990,744

UNDER FLOOR COVERING HEATING SYSTEMS

Jonathan Willner, Toronto, Canada, assignor to Nuheat Inc., Toronto, Canada

Filed Jul. 17, 1989, Ser. No. 380,312
Claims priority, application Canada, Nov. 15, 1988, 583591
Int. Cl.[5] H05B *3/26*
U.S. Cl. 219—213 17 Claims

1. An under floorcovering heating system for positioning below a floorcovering, each of the systems comprising

(a) a heat conducting substrate;

(b) solid conductor resistance heating wire positioned within the substrate in a serpentine manner for heating the substrate, the wire covered by at least one layer of material providing electrical insulation and strong mechanical strength, jacketed by an electrically conductive "self-healing" strong layer of material for the purposes of grounding the protecting the system or pad; and



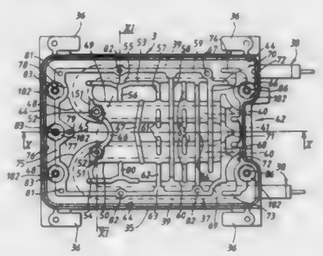
(c) electrical connecting means for connecting the resistance wire to a source of electricity including means connected to the jacketed conductive material for grounding the said system.

4,990,745

STEAM GENERATORS

Peter W. Bayles, Newton Ayclisse, and Philip Million, Howden-le-Wear, both of England, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 13, 1989, Ser. No. 365,936
Claims priority, application United Kingdom, Jun. 15, 1988, 8814206
Int. Cl.[5] F22B *1/28*
U.S. Cl. 392—386 30 Claims



1. A steam generator, comprising:

a body of heat conductive material, the body being recessed to form a chamber;

an electric heating element located within the chamber and having a series of spaced, parallel limbs embedded in spaced, raised parts of the floor of the chamber to form channels between adjacent raised parts;

barriers dividing up some at least of the channels into separate sections and allowing communication between the sections via passages which pass over the raised parts;

a water inlet chamber located between the adjacent raised parts and in communication with the passages;

a plurality of steam outlets also in communication with the passages;

the steam outlets being nozzles whose entrances are located above the floor of the chamber;

the body being recessed at one end to form a recess and a thermally responsive element being located in the recess; and

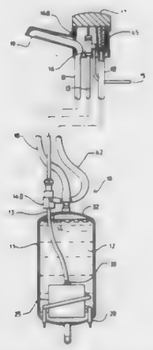
the recess having an inner wall with an opening through which is exposed a part of the heating element.

4,990,746

ELECTRIC WATER HEATER UTILIZING TRAPPED AIR TO PROVIDE EXPANSION SPACE

Brian W. Hammond, Coltishall, United Kingdom, assignor to Heatrae Sadia Heating Limited, Hurrican Way, United Kingdom

Filed Feb. 10, 1989, Ser. No. 309,283
Claims priority, application United Kingdom, Feb. 11, 1988, 8803181; Aug. 4, 1988, 8818552
Int. Cl.[5] H05B *1/00;* F24H *1/18;* B67D *5/62*
U.S. Cl. 392—441 20 Claims



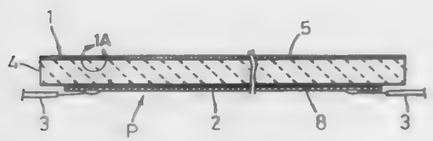
1. A heater having a vessel with an inlet means by which liquid can be fed into the vessel, a permanently open outlet through which liquid may flow to a point of delivery, the inlet means comprising a supply conduit connected to a liquid supply, mixing means associated with the supply conduit to mix gas with the liquid flowing along the supply conduit, control means to control the flow of gas to the mixing means and thus to restrict the amount of gas available for mixing with the liquid as liquid flow along the supply conduit increases, a gas trap provided within the vessel at an open end of the supply conduit to collect gas passing with the liquid from the supply conduit, the gas trap including means to release the gas collected therebyi into the vessel, at least when the liquid flow along the supply conduit is stemmed, the release of gas providing an expansion space in the vessen into which liquid in the vessel can expand during subsequent heating, the expansion space being vented from the vessel.

4,990,747

CERAMIC HEATING PLATE

Jiro Kondo, Kobe, Japan, assignor to Kabushiki Kaisha I.P.D., Japan

Filed Nov. 4, 1988, Ser. No. 267,432
Claims priority, application Japan, Nov. 5, 1987, 62-169722[U]
Int. Cl.[5] H05B *3/24*
U.S. Cl. 392—435 3 Claims



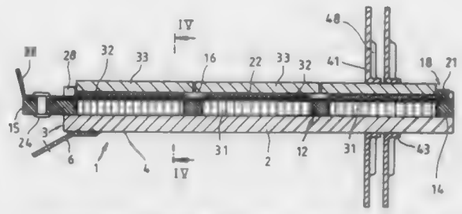
1. A ceramic heating plate comprising:
a planar body including a ceramic substratum sintered together with a far-infrared ceramic layer on the top surface thereof; and
means for heating said substratum;
wherein said far infrared ceramic layer contains a single layer of ceramic particles which emit far infrared radiation when heated, each of said particles being in contact with said ceramic substratum and also having an area exposed at the outside surface of said far infrared ceramic layer so that far infrared rays are radiated outside directly from the exposed areas of the particles.

4,990,748

APPARATUS FOR HEATING GASES

Roland Starck, Bellheim, Fed. Rep. of Germany, assignor to Fritz Eichenauer GmbH & Co. KG, Kandel, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 337,084
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 3902206
Int. Cl.[5] F24H *7/00;* H05B *1/00, 3/02*
U.S. Cl. 392—485 22 Claims



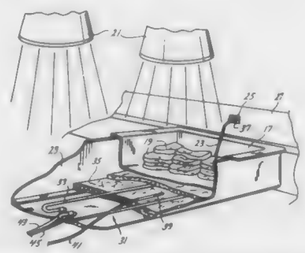
1. Apparatus for heating gases with a heating unit having a mounting part, at least one PTC component inserted in the mounting part, at least one insulating frame surrounding the at least one PTC component, at least one contact plate and at least one insulating support, the at least one contact plate resting on at least one flat side and being covered by the at least one insulating support, and heat emission lamellas resting in a clamping manner on said heating unit , said lamellas including openings surrounding the heating unit said openings being bounded by two facing tongues bent out of a plane of the lamellas, wherein a connection area of the two tongues to a body of the respective lamellas are spaced at a distance corresponding to a height of the heating unit, and wherein an internal spacing of ends of the respective tongues is less than the height of the heating unit.

4,990,749

TEMPERATURE CONTROLLER FOR A FOOD MERCHANDISER

Michael E. Devine; Michael D. Grassmuck, both of Bridgeton; Mason E. Laster, Jr., St. Louis, and Nai H. Mak, Clayton, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.

Filed May 5, 1989, Ser. No. 348,677
Int. Cl.[5] H05B *3/48*
U.S. Cl. 219—385 33 Claims



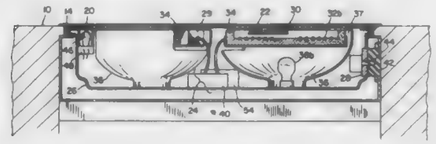
1. Apparatus for controlling food temperatures in a food warming cabinet having at least one food holding zone comprising:
first means for sensing a temperature representative of the temperature of the food product;
first temperature producing means forming a primary heat source;
second means for sensing a temperature representative of an operating condition of the apparatus; and
controller means connected to receive sensed input signals from said first and second means, and being constructed and arranged for controlling the operation of said first temperature producing means in response to the sensed input signals, said controller means including means for selecting a set point value forming an ideal temperature condition for the food product and first determining means for detecting when the temperature sensed by said first sensing means is below a minimum temperature for a predetermined time.

4,990,750

INDEPENDENTLY POWERED SAFETY DEVICE

Thomas J. Martel, North Reading, and John S. Sklenak, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 9, 1989, Ser. No. 438,817
Int. Cl.[5] H05B *3/68*
U.S. Cl. 219—453 7 Claims



1. A removable cooktop assembly, adapted to be removably positioned in a counter top compartment and removably mated with a power source of said compartment, said assembly comprising:
a cooktop surface adapted for supporting a cooking utensil;
means positioned under said cooktop surface for providing heat to said cooking utensil;
means responsive to said cooktop surface being above a predetermined temperature for providing an electrical signal; and
means responsive to said electrical signal for providing a visual indication of said cooktop surface being above said predetermined temperature when said cooktop assembly is removed from said compartment and disconnected from said power source.

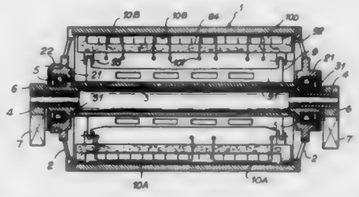
4,990,751

DRIER DRUM, IN PARTICULAR FOR PAPERMAKING MACHINES

Jean P. Nous, Franqueville-St-Pierre, France, assignor to S.E.M.T.I. Societe a Responsabilite Limitee, Grand-Quevilly, France

Filed Sep. 25, 1989, Ser. No. 411,697
Int. Cl.[5] B21B *27/08;* H05B *3/02*
U.S. Cl. 219—469 9 Claims

1. A drier drum, in particular for papermaking machines, for textile machines and the like, comprising a drum cylinder, end flanges carrying said drum cylinder, drive means mechanically coupled to at least one of said flanges to rotate it, and heating means, characterized in that the drum comprises a fixed refractory material cylindrical sleeve covered with a heat reflecting coating disposed coaxially inside said drum cylinder and heating means comprising main electrical heating elements of elongate shape adapted to be energized continuously during functioning thereof and profile correcting electrical heating elements of elongate shape adapted to be energized selectively, at least some of the main heating elements being longer than any



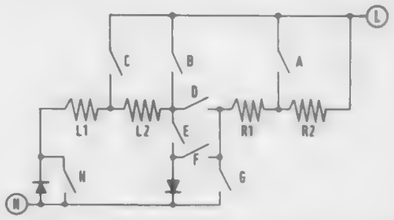
of the profile correcting heating elements and said electrical heating elements being carried by said cylindrical sleeve.

4,990,752

CONTROLLABLE ELECTRIC HEATER

Peter W. Worrall, Ferryhill Co., and Peter W. Crossley, Nevilles Cross, both of United Kingdom, assignors to Electrolux Limited, Durham, United Kingdom

Filed Feb. 24, 1989, Ser. No. 315,018
Claims priority, application United Kingdom, Feb. 26, 1988, 8804602; Sep. 9, 1988, 8821152.9
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—501 5 Claims



1. A controllable AC electric heating assembly comprising:
(a) an electric heating element group having a free connection point and a common connection point;
(b) a resistor group connected at one end to said electric heating element group common connection point and having at an opposite end a free connection point;
(c) first and second half-wave rectifiers connected in reverse polarity at an assembly common point, and each said rectifier having a free connection point;
(d) a pair of terminals for connection to an external AC power source, one said terminal being connected to said assembly common point and the other said terminal being a free terminal; and
(e) a switch means connected to said electric heating element group free connection point, said resistor group free connection point, said rectifier free connection points, and said free terminal and having:
(i) a first configuration in which said electric heating element and said resistor group are connected in series with one of said half-wave rectifiers so that said electric heating element group and said resistor group are energized by half-wave rectified AC voltage;
(ii) a second configuration in which said resistor group is connected in series with one of said half-wave rectifiers and said electric heating element group is connected in series with the other of said half-wave rectifiers, so that said resistor group and said electric heating element group are individually energized by a half-wave rectified AC voltage; and
(iii) a third configuration in which said half-wave rectifiers are each bypassed, and said electric heating element group and said resistor group are connected in series so

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that said electric heating element group and said resistor group are energized by a full wave AC voltage.

4,990,753

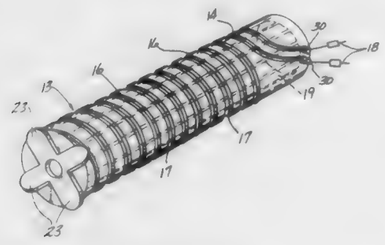
SHEATH LOCK MEANS FOR HEATED HANDGRIP

James M. Hollander, HC 64 Box 242, Lebanon, N.H. 03766

Continuation-in-part of Ser. No. 229,271, Aug. 8, 1988, Pat. No. 4,937,429. This application May 14, 1990, Ser. No. 522,636

Int. Cl.[5] H05B *3/18*

U.S. Cl. 219—505 6 Claims



1. A hand grip device comprising:
an inner electrical insulating sleeve,
an outer protective, electrical insulating sheath,
a bare heating wire disposed between the sheath and the sleeve,
the inner sleeve being formed on its exterior surface with a first pattern of continuous helical lands and grooves,
the outer sheath being formed on its interior surface with a second pattern of continuous helical lands and grooves,
the land and grooves of the first and second patterns being threadedly engaged whereby said sheath and said sleeve are relatively rotatable and separable, and
lock means incorporated in said handgrip whereby said relative rotation is precluded.

4,990,754

APPARATUS FOR TRANSMITTING HEAT UNDER VACUUM BY GRAINS

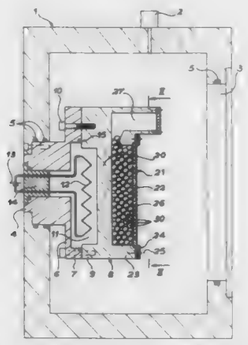
Bernard Bechevet, Claix; Claude Calvat, Saint Egreve; Bernard Rolland, Meylan, and Bruno Valon, Grenoble, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed May 3, 1989, Ser. No. 346,731

Claims priority, application France, May 20, 1988, 88 06781

Int. Cl.[5] H05B *3/06*

U.S. Cl. 219—530 5 Claims



1. Apparatus for transmitting heat from a thermal source to an object, the apparatus comprising an enclosure, means for creating vacuum in the enclosure, a circumferential support in the enclosure for receiving the object, means for clamping an edge of the object on the support, the thermal source comprising a wall, wherein the wall, the support and the object when received on the support define a cavity, and the apparatus further comprises heat conducting balls which fill the cavity between the wall and the object.

4,990,755

HEATABLE SHEET ASSEMBLY

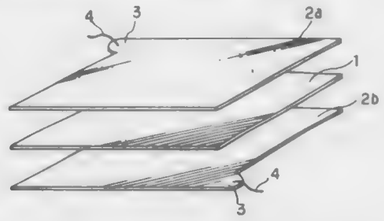
Makoto Nishimura, 3-10-10, Omori Nishi, Ota-ku, Tokyo, Japan

Filed May 26, 1989, Ser. No. 358,402

Claims priority, application Japan, Dec. 6, 1988, 63-158041[U]

Int. Cl.[5] H05B *3/38*

U.S. Cl. 219—553 11 Claims



1. A heatable sheet assembly comprising a sheet to be electrically heated, said sheet being selected from the group consisting of a sheet of carbon fibers and pulp produced by paper making technique, and a sheet of carbon fibers and pulp produced by paper making technique and impregnated with a resin, electrically conductive metal foils applied to both surfaces of said sheet and an electrical terminal attached to each of said metal foils, said sheet of carbon fibers and pulp containing at least carbon fibers of a first group having a length of not less than 3 mm and less than 5 mm and carbon fibers of a second group having a length of longer than 5 mm and not longer than 10 mm, and at least one of said metal foils having a multiplicity of through-holes.

4,990,756

APPARATUS AND METHOD FOR EMULATING BAR CODES

James D. Hoemann, Englewood, Colo., assignor to Telsor Corporation, Englewood, Colo.

Filed Jul. 25, 1988, Ser. No. 224,561

Int. Cl.[5] G06K *7/08, 7/01*

U.S. Cl. 235—462 41 Claims



1. An apparatus for use in translating a first signal representative of a symbol in a non-bar code symbology into a second signal representative of said symbol in a bar code symbology, comprising:
first means for providing a first signal representative of a symbol in a non-bar code symbology; and
second means for receiving said first signal, translating said first signal into a corresponding second signal representative of said symbol in a bar code symbology, and transmitting said second signal to a device that is responsive to signals representative of said symbol in said bar code symbology;
wherein said first means includes means for providing a carrier signal and means for providing information that relates to said symbol and that is used to modulate said carrier signal to produce said first signal.

4,990,757

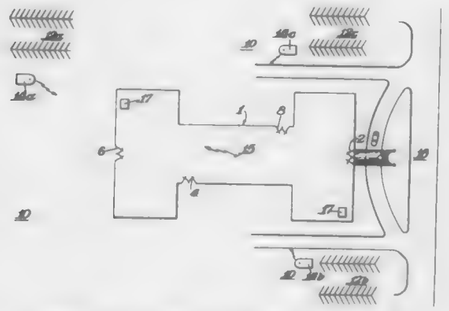
METHOD AND APPARATUS FOR VEHICLE STORAGE AND RETRIEVAL

Glen J. Edwards, Tuckahoe, N.J.; James R. Nelson, Kennett Square, Pa., and Richard R. Wier, Jr., Wilmington, Del., assignors to Valet Parking Associates, Inc., Wilmington, Del.

Filed Dec. 22, 1988, Ser. No. 288,264

Int. Cl.[5] G07B *15/02*

U.S. Cl. 235—384 14 Claims



1. A method for storage and retrieval of vehicles near a building having multiple entrances and a large parking area adjacent the building comprising:
(a) deposit of the vehicle with a greeter at a first building entrance;
(b) identification of the vehicle and person depositing the vehicle with a common identification code;
(c) transfer of the vehicle from the first building entrance to an identifiable portion of the parking area where the vehicle is stored under the control of a control attendant;
(d) communication of the vehicle identification code and building entrance to which the vehicle is to be delivered to the control attendant;
(e) delivery of the vehicle from the parking area to the communicated building entrance.

4,990,758

CARD CONNECTOR

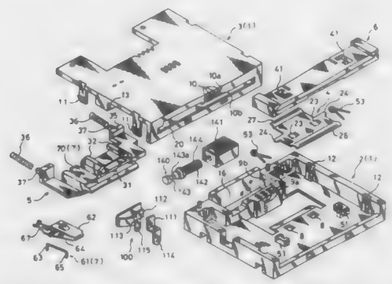
Yasuji Shibano, Izumisano; Toshio Sazaki, Yao, and Akira Yamamoto, Yamatotakada, all of Japan, assignors to Hosiden Electronics Co., Ltd., Yao, Japan

Filed Mar. 24, 1989, Ser. No. 328,546

Claims priority, application Japan, Apr. 4, 1988, 63-83440; Apr. 4, 1988, 63-83441

Int. Cl.[5] G06K *7/08*

U.S. Cl. 235—449 8 Claims



1. In a card connector having a slider adapted to be pushed from the advance position into the retreat position thereof by a card when the card is inserted into a set position along a card inserting and removing passage, an engagement pin adapted to be engaged with said slider to hold the same at said retreat position, and springs for normally biasing said slider in the advancing direction,
said card connector comprising:
card detector means for detecting that the card has been inserted into said set position;
card posture judging means for detecting that the card is not in a normal posture after the insertion of the card into said set position has been detected by said detector means; and
an actuator for disengaging said engagement pin from said slider if said card posture judging means detects that the card has not been inserted in said normal posture.

4,990,759

CHIP CARD STRUCTURE

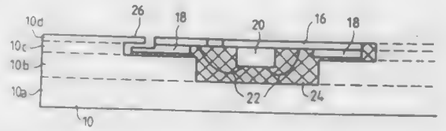
Jean-Pierre Gloton, Aix en Provence, and Gérard Coiton, Venelles, both of France, assignors to Gemplus Card International, Aix en Provence, France

Filed Dec. 16, 1988, Ser. No. 285,712

Claims priority, application France, Dec. 22, 1987, 87 17902

Int. Cl.[5] G06K *19/06*

U.S. Cl. 235—492 6 Claims



1. A flat chip card having a cavity provided in the body of the card and a micromodule housed in this cavity, said micromodule comprising an integrated circuit of a given size, connected to a set of bare connection terminals, larger in size than said circuit and flush with the plane of the upper surface of the card when the micromodule is mounted in the cavity; a card wherein the edges of the cavity have at least one overhanging zone or overhang partially covering an edge of the set of connection terminals of the micromodule so as to limit the movement of this micromodule towards the outside of the cavity.

4,990,760

IC CARD HAVING MEANS FOR PROTECTING ERRONEOUS OPERATION

Nobuhiro Tomari, and Kougi Tanagawa, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,390

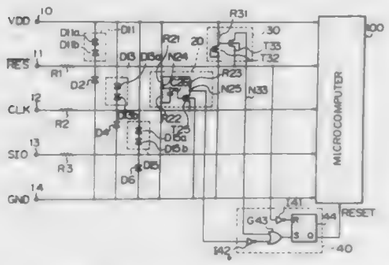
Claims priority, application Japan, May 13, 1988, 63-114709

Int. Cl.[5] G06K *19/06*

U.S. Cl. 235—492 6 Claims

1. An IC card having means for protecting erroneous operation comprising:
a plastic card having a plurality of terminal pads located on the surface thereof, said plurality of terminal pads including a positive power supply terminal pad, a ground terminal pad, a resetsignal input terminal pad, and a clock signal input terminal pad;
an IC chip locating in said plastic IC card and being connected to said plurality of terminal pads;
a potential reducing circuit connected between said positive power supply terminal pad and said resetterminal pad; and
means for protecting erroneous operation of said IC chip comprising a first circuit for detecting incomplete contact

between said power supply terminal pad and an external devise to output a detecting signal, and a second circuit



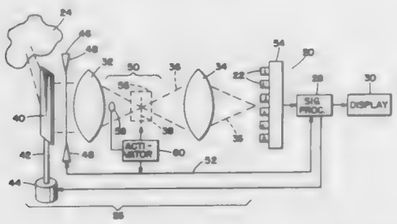
for generating a reset signal to stop operation of said IC chip in response to said detecting signal.

4,990,761

PLURAL ARC RADIATION PROTECTOR

David B. Cohn, Torrance; Michael P. Hasselbeck, Redondo Beach, and Gregory R. Sasaki, Long Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 30, 1988, Ser. No. 277,814
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—202.1 9 Claims



1. In a receiving system including means for detecting radiation and means for directing rays of radiation along a path from a scene being viewed by the receiving system toward the detecting means, a radiation protection system disposed on said path, said radiation protection system comprising:

an electrode assembly with electrodes disposed about said radiation path, said electrodes being arranged for generation of electric discharge arcs directed across said path;

power means having an output terminal and a return terminal for supplying a voltage of sufficient magnitude to generate arcs between pairs of said electrodes, said electrodes being arranged in series between the output terminal and the return terminal of said power means;

a set of capacitors, individual ones of the electrodes being connected by respective ones of said capacitors to the return terminal of said power means;

means for activating said power means to generate a first arc between a first pair of electrodes of said series of electrodes; and wherein

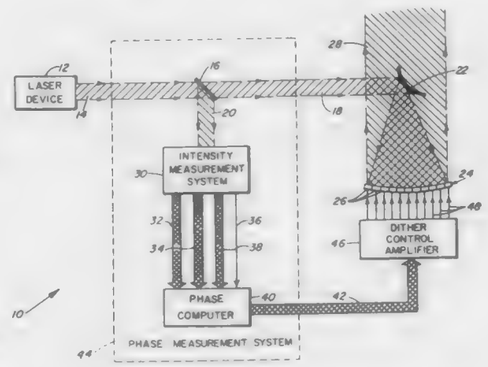
a first of said capacitors connected to said first pair of electrodes is charged by electric current of said first arc to a potential of sufficient magnitude to strike a second arc between a second pair of electrodes of said series of electrodes, subsequent ones of said capacitors being charged sequentially by electric current in said arcs to initiate sequentially an array of arcs, said arcs blocking said radiation rays from reaching said detecting means.

4,990,762

LASER BEAM PHASE MEASUREMENT AND CONTROL SYSTEM

Leonard S. Taylor, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 21, 1981, Ser. No. 332,796
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.8 5 Claims



1. A phase measurement and control system, including a laser device for generating a main laser beam, for measuring the phase variations of the main laser beam in a plane transverse thereto, and for controlling the aiming and focusing of an outgoing main laser beam in response to the phase variations in the main laser beam to correct for the time-varying phase thereof, which comprises:

a main laser beam splitter disposed transverse to the main laser beam for dividing the main laser beam into a main laser beam sample and the outgoing main laser beam;

a beam spreader disposed symmetrically and on the optical axis of the outgoing main laser beam;

a multi-dither mirror having a plurality of mirror segments being capable of individual control for varying the curvature of said multi-dither mirror, said beam spreader being symmetrically deposed on the optical axis of said multi-dither mirror so as to spread out the outgoing main laser beam onto said multi-dither mirror for forming an aimed and focused outgoing main beam;

an intensity measurement system disposed in the path of the main laser beam sample for measuring field intensity profile information of the main laser beam in the plane transverse thereto;

a phase computer operatively connected to said intensity measurement system for processing the field intensity profile information into a drive current profile indicative of the time-varying phase profile of the main laser beam, said phase computer operating according to a predetermined algorithm; and

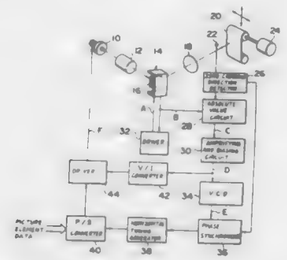
a dither control device interfacing said phase computer via a phase profile bus and said multi-dither mirror via a plurality of mirror segments control lines for converting the phase profile information into a corresponding drive current profile, each of said plurality of mirror segments control lines being operatively connected to corresponding ones of said plurality of mirror segments of said multi-dither mirror, such that in response to phase variations of the main laser beam, the curvature of said multi-dither mirror changes thereby controlling the aiming and focusing of the outgoing main laser beam.

4,990,763

LIGHT BEAM RECORDER HAVING BEAM DURATION AND INTENSITY CONTROLLED IN ACCORDANCE WITH SCANNING SPEED

Hidetoshi Shinada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 26, 1989, Ser. No. 343,313
Claims priority, application Japan, Apr. 27, 1988, 63-105328
Int. Cl.[5] G01J *1/32*
U.S. Cl. 250—205 14 Claims



1. A light beam recorder comprising:

a light source, for generating a light beam;

means for modulating said light source with recording information;

means including an oscillating mirror for scanning said modulated light beam, generated from said light source, in a sequence of scans over a recording medium;

means for directly detecting the speed of said mirror during a scan of said light-beam; and

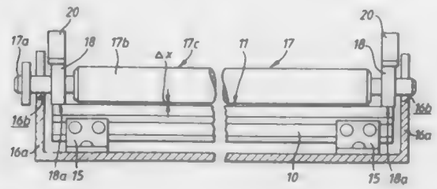
control means responsive to said means for detecting for establishing for each scan the timing of irradiating the recording medium with said light beam and shortening the duration of irradiation with the light beam in accordance with said recording information as the scanning speed is increased, and for intensifying said light beam as the scanning speed increases.

4,990,764

APPARATUS AND METHOD FOR INFORMATION FROM AN INFORMATION CARRIER

Toshiyuki Yokochi, and Shuko Fujita, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 19, 1989, Ser. No. 299,190
Claims priority, application Japan, Jan. 20, 1988, 63-5408[U]; Mar. 9, 1988, 63-31435[U]
Int. Cl.[5] H01J *40/14*; H04N *1/21*
U.S. Cl. 250—208.1 22 Claims



20. A method for reading information from an information carrier, the method comprising the steps of:

transporting the information carrier in a first direction;

radiating light toward said transported information carrier through a transparent medium;

detecting light reflected from said information carrier through said transparent medium;

reading information from said information carrier based on said detected light;

guiding said information carrier through a space defined by said guide means and said transparent medium at a predetermined distance above said transparent medium; and

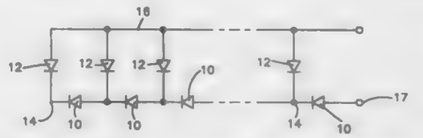
controlling said space to achieve a resolution above a predetermined level with respect to the information read.

4,990,765

METHOD AND MEANS FOR PROCESSING AN ANALOG SIGNAL FROM A DIODE ARRAY

Miroslav Ondris, and Allen A. Endres, both of Chagrin Falls, Ohio, assignors to Stemcor Corporation, Cleveland, Ohio

Filed Nov. 22, 1989, Ser. No. 440,779
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.2 24 Claims



1. A method for determining an illumination state of an "n"-point photodiode array having a plurality of addressing diodes, a plurality of unions, said unions connecting said addressing diodes in series relationship, and "n" photoresponsive means each having two terminals, one of said terminals each being connected to successive unions and the other being connected to a terminus, said method comprising:

applying a swept voltage between said series of addressing diodes and said terminus thereby producing a current in series relationship with said voltage;

converting said current to a first signal proportional in amplitude thereto;

differentiating said first signal to provide a second signal;

sampling the amplitude of said second signal at each of "n" times during the voltage sweep to provide "n" amplitude values; and

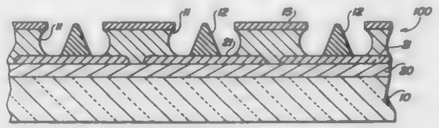
converting each of said amplitude values to a digital value, wherein said digital values represent the illumination state of said "n"-point photo diode array.

4,990,766

SOLID STATE ELECTRON AMPLIFIER

Robert A. Simms, Phoenix, Ariz., and Charley B. Burgett, Santa Barbara, Calif., assignors to Murasa International, Long Beach, Calif.

Filed May 22, 1989, Ser. No. 354,714
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—213 VT 49 Claims



1. A solid state electron amplifier including in combination:

a substrate;

a conductor on said substrate;

an electron emitter cathode member with an enlarged base and a pointed tip;

variable impedance means in series electrical circuit with said conductor and the base of said cathode member;

an anode member spaced a predetermined distance from said emitter cathode member;

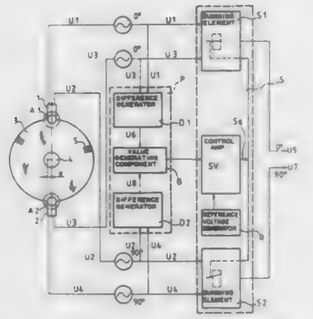
means for applying an electrical bias voltage between said conductor and said anode member.

4,990,767

POSITION MEASURING APPARATUS WITH MULTIPLE SCANNING LOCATIONS

Alfons Ernst; Walter Schmitt, and Norbert Huber, all of Traunreut, Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 222,833
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726260
Int. Cl.[5] G01D *5/38;* G01P *3/486*
U.S. Cl. 250—231.16 7 Claims



1. In a position measuring apparatus including a measurement embodiment, and a plurality of scanning devices arranged to scan said measurement embodiment at a plurality of different scanning locations, each of said scanning devices generating scanning signals corresponding to each of said scanning locations, wherein the improvement comprises:

evaluating circuit means including a testing circuit for evaluating said scanning signals from said scanning locations and detecting the occurrence of predefined conditions from said scanning signals; and

weighting means for unequally weighting said scanning signals from said different scanning locations when said testing circuit evaluates said scanning signals and detects the occurrence of at least one of the following conditions (a) the phase displacement between said scanning signals from said different scanning locations exceeds a predetermined tolerance range, and (b) the amplitude of the sum of the signals from said different scanning locations exceeds a predetermined tolerance range.

4,990,768

ELECTRONIC APPARATUS INCLUDING PHOTOELECTRIC SWITCH

Mutsuo Ito, Kameoka; Masato Hara, Kyoto; Satoru Shimokawa, Mukou, and Ichiro Kondo, Kusatsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

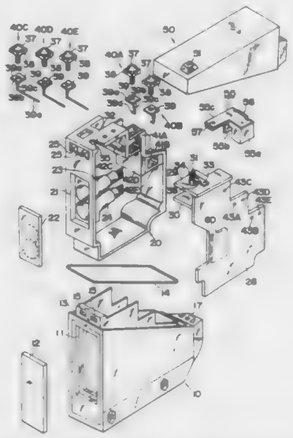
Filed Nov. 9, 1989, Ser. No. 433,787
Claims priority, application Japan, Nov. 11, 1988, 63-147910[U]; Nov. 11, 1988, 63-147911[U]; Nov. 11, 1988, 63-147912[U]; Nov. 11, 1988, 63-147913[U]; Nov. 11, 1988, 63-147914[U]; Nov. 11, 1988, 63-147915[U]; Nov. 11, 1988, 63-147916[U]; Nov. 11, 1988, 63-147917[U]
Int. Cl.[5] H01J *5/02*
U.S. Cl. 250—239 8 Claims

1. An electronic apparatus comprising:

a case body (10) having an opening in an upper side thereof, an annular groove (13) provided on the outer periphery of the opening and an engaging hole (15) in a portion of the case above the annular groove;

an annular sealing ring (14) inserted into said annular groove;

a frame (20) for supporting printed circuit boards (28,29,30) on which electronic circuitry is mounted, said frame being formed to include a terminal base provided on the side of the opening of said case body, said frame having a resilient projection (25) for mating with the engaging hole of said case body from an inner side thereof; and



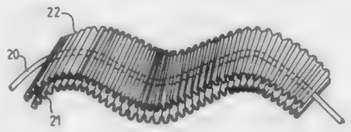
a main body cover (50) provided with an inwardly directed projection (52) for mating with the engaging hole (15) of said case body from an outer side thereof, said main body cover covering said opening by mating the projection with the engaging hole of said case body.

4,990,769

CONTINUOUS CABLE FIBER OPTICAL PRESSURE SENSOR

Jean-Pierre Hazan, Sucy-en-Brie; Michel Steers, La Queue-en-Brie; Gilles Delmas, Epinay Sous Senart, and Jean-Louis Nagel, Limeil-Brevannes, all of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 21, 1989, Ser. No. 410,764
Claims priority, application France, Sep. 27, 1988, 88 12596
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.10 15 Claims



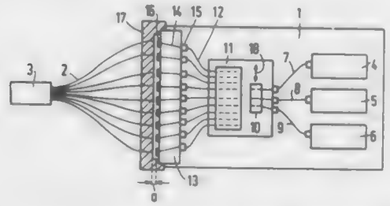
1. A fiber-optical rigid or semi-rigid pressure sensor, comprising a pressure member which encloses the optical fiber in a sandwich-like fashion in order to modify its optical properties as a function of a pressure applied to the sensor, wherein the pressure sensor is formed by a continuous cable which can be buried and which comprises at least one optical fiber which, when buried, is capable of detecting, along its entire length, components of a pressure applied to a surface zone of the ground, the pressure member having a repetitive structure in a longitudinal direction which is formed by an upstream structure and a downstream structure which are situated in front of and behind the optical fiber, viewed in the direction from the zone of the ground surface where the pressure is applied towards the optical fiber, the width of the upstream structure being at least approximately 1 cm, the pressure member being such that it enables the cable to be wound upon itself in a longitudinal direction and, when unwound, to be bent in a direction transverse to the longitudinal direction.

4,990,770

MEASURING ARRANGEMENT FOR TESTING A PLURALITY OF LIGHT WAVEGUIDES

Rainer Hemmann, Cologne, and Volker Riech, Leverkusen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Oct. 5, 1988, Ser. No. 253,791
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, 3735399
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.24 7 Claims



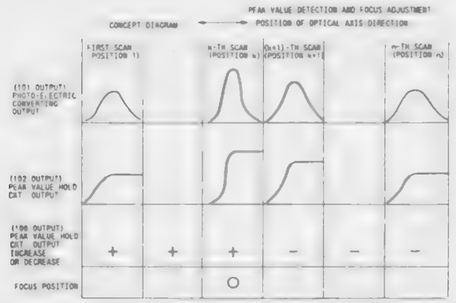
1. A measuring arrangement for testing a plurality of light waveguides by means of an optical measuring device having an optical measuring input to which each light waveguide can be successively coupled via an optical selector, wherein the measuring device (4, 5, 6) and the selector (11) are integrated parts of a uniform testing device (1), the selector and the measuring device being interiorly located in said device (1) so that only coupling points for the light waveguides to exterior connection elements are accessible outside the testing device.

4,990,771

SCANNING OPTICAL APPARATUS HAVING FOCUS POSITION DETECTOR

Kazuo Minoura, Yokohama, and Isamu Shimoda, Zama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 353,786, May 18, 1989, abandoned. This application May 11, 1990, Ser. No. 522,070
Claims priority, application Japan, May 19, 1988, 63-123624
Int. Cl.[5] G02B *26/08;* H01J *3/14*
U.S. Cl. 250—236 26 Claims



16. A scanning method in a scanning optical apparatus comprising:

the step of moving a part of optical means for converging a light beam emitted from a light source unit to an initial position;

the step of scanning the light beam emitted from said light source unit on light receiving means a plurality of times through said optical means and deflecting means while moving said part of said optical means in the direction of the optical axis of said optical means; and

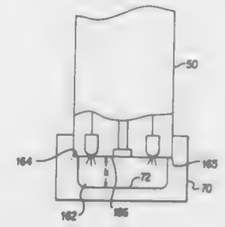
the step of processing a signal from said light receiving means to thereby adjust and determine the position of said part of said optical means.

4,990,772

APPARATUS AND METHOD FOR CALIBRATING A NEAR-INFRARED INTERACTANCE PROBE

Robert D. Rosenthal, Gaithersburg, Md., assignor to Futrex, Inc., Gaithersburg, Md.

Continuation of Ser. No. 252,548, Oct. 3, 1988, Pat. No. 4,928,014. This application Apr. 11, 1990, Ser. No. 507,542
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.
Int. Cl.[5] G01N *21/55*
U.S. Cl. 250—252.1 2 Claims



1. An apparatus for calibrating a probe for near-infrared interactance quantitative analysis, the calibrating apparatus comprising a near-infrared-opaque body, means defining a cavity in the body having a bottom portion with a predetermined geometrical shape, and means for positioning a near-infrared interactance light probe having a near-infrared source and detector within the cavity of the body with the bottom portion of the cavity spaced away from said source and said detector a distance that provides the bottom portion of the cavity with a reflectance value that corresponds to an interactance calibration value for which the probe is being calibrated, so as to reflect sufficient near-infrared radiation emitted from said source to said detector for calibrating the probe for use in an interactance mode.

4,990,773

METHOD FOR DETERMINING THE PRODUCIBILITY OF A HYDROCARBON FORMATION

Irwin R. Supernaw, and Dipak C. Kothari, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 1, 1988, Ser. No. 278,316
Int. Cl.[5] G01N *21/64, 21/62*
U.S. Cl. 250—255 10 Claims

1. A method of evaluating a sample of an underground formation to determine the producibility of any hydrocarbons present in the formation, which comprises:

solvating a known volume of sample in a known volume of a polar solvent which will solvate asphaltenes;

solvating a known volume of said sample in a known volume of an aliphatic solvent which will solvate paraffinics and naphthenics found in underground hydrocarbons without substantially solvating asphaltenes, said sample volume equal to polar solvent sample volume, said aliphatic solvent volume equal to polar solvent volume;

quantitatively measuring the emission fluorescence below about 400 nm of both solvated samples at an excitation wavelength at which most petroleum compounds fluoresce; and

determining the producibility of any hydrocarbon present in the sample by calculating the ratio of the emission fluorescence of said polar solvent sample to said aliphatic solvent sample and comparing said ratio to previous correlations drawn from known samples,

said previous correlations drawn between known produci-

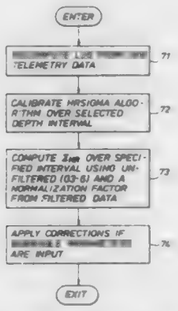
bility of samples and the ratios of the emission fluorescence of the known samples in said polar solvent to the emission fluorescence of the known samples in said aliphatic solvent.

4,990,774

TECHNIQUE FOR OBTAINING HIGH VERTICAL RESOLUTION FORMATION CAPTURE CROSS SECTIONS FROM PULSED NEUTRON LOGS

Harry D. Smith, Jr.; Dennis F. Wyatt, Jr., both of Houston, and Michael P. Smith, Spring, all of Tex., assignors to Halliburton Logging Services Inc., Houston, Tex.

Filed Jun. 8, 1989, Ser. No. 363,009
Int. Cl.[5] G01V 5/10
U.S. Cl. 250—269 14 Claims



1. A method for measuring high vertical resolution earth formation thermal neutron capture cross sections of earth formations in the vicinity of a well borehole, comprising the steps of:

(a) repetitively emitting in a well borehole relatively short duration bursts of fast neutrons which are rapidly moderated by interaction with nuclei of materials in the borehole and surrounding earth formations and slowed to thermal energy, creating repetitive time dependent distributions of the thermal neutron population in the borehole and surrounding earth formations;

(b) detecting, as a function of depth, in the borehole during time intervals between said repetitive bursts of fast neutrons, radiations representative of the thermal neutron population in the borehole and surrounding earth formations in at least two time subintervals subsequent to each burst of fast neutrons and generating at least two count rate signals representative of said thermal neutron populations during said at least two time subintervals;

(c) filtering said count rate signals to reduce statistical fluctuations in subsequent computations;

(d) combining said at least two filtered count rate signals according to a predetermined relationship to obtain a neutron die-away based measurement of the formation thermal neutron capture cross section Σ_F;

(e) selecting at least one of said at least two filtered gate count rate signals, or a sum of selected filtered count rate signals, to obtain a combined gate count rate signal G, and using a predetermined functional relationship f(G) between G and the previously determined filtered formation capture cross section Σ_F to obtain as a function of depth a normalization parameter C_o;

(f) obtaining a combined count rate signal G' from said at least one of said at least two count rate signals in step (b), prior to filtering in step (c), in a manner analogous to obtaining filtered count rate signal G;

(g) determining from f(G') and the normalization parameter C_o in step (e) a high resolution thermal neutron capture cross section Σ_{HR} with the approximate vertical resolution of the count rate signals in step (b); and

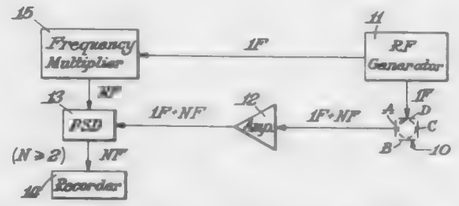
(h) recording Σ_{HR} as a function of borehole depth to produce an enhanced depth resolution measurement of thermal neurtron capture cross section, relative to the Σ_F measurement in step (d).

4,990,775

RESOLUTION IMPROVEMENT IN AN ION CYCLOTRON RESONANCE MASS SPECTROMETER

Alan L. Rockwood, Amesburg, Mass.; Ying Pan; D. P. Ridge, both of Newark, Del., and John Wronka, Haverhill, Mass., assignors to University of Delaware, Newark, Del.

Continuation of Ser. No. 203,311, Jun. 6, 1988, abandoned. This application Dec. 12, 1989, Ser. No. 453,037
Int. Cl.[5] H01J 49/38
U.S. Cl. 250—291 7 Claims



7. An ion cyclotron resonance mass spectrometer having electrodes placed so as to provide orbiting ions with a fundamental frequency, comprising:

two pairs of electrodes symmetrically placed with respect to each other to provide first and third electrodes as a pair of second and fourth electrodes as a pair;

means for inducing voltages in said electrodes; and

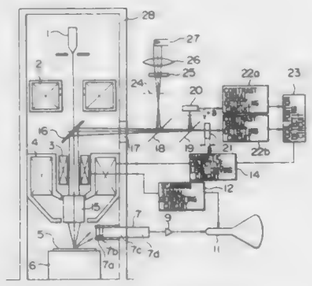
means for adding the voltages at the first and third electrodes and subtracting the voltages of the second and fourth electrodes from the sum of the voltages of the first and third electrodes so that the odd harmonics are reduced and selected even harmonics predominate in detecting of signals from the orbiting ions.

4,990,776

ELECTRON MICROSCOPE

Satoru Fushimi, and Hiroya Koshishiba, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,645
Claims priority, application Japan, Aug. 28, 1987, 62-212731
Int. Cl.[5] H01J 37/26
U.S. Cl. 250—310 6 Claims



1. An electron microscope comprising:

an objective lens capable of changing a focal position of an electron beam;

projection means for projecting a light and shade pattern having a light-permeable portion and a light-shielding portion onto the surface of a specimen through said objective lens; and

detecting means for optically reflecting the projected pattern and detecting the projected pattern projected onto the surface of the specimen for enabling focusing of the electron beam onto the specimen.

4,990,777

ROD ASSEMBLY FOR MULTIPOLE MASS SPECTROMETERS

James W. Hurst, San Jose, Calif.; Robert M. Smith, and John M. Horth, both of Evergreen, Colo., assignors to Finnigan Corporation, San Jose, Calif.

Filed Mar. 2, 1990, Ser. No. 487,629
Int. Cl.[5] H01J 49/00
U.S. Cl. 250—292 3 Claims



1. A rod assembly for use in multipole mass spectrometers comprising:

a plurality of aligned and spaced rods;

a plurality of rod mounting assemblies spaced along said plurality of rods for engaging and supporting said rods in spaced relationship;

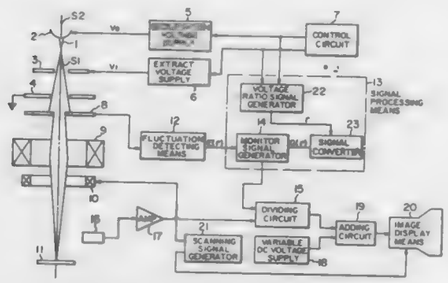
each of said mounting assemblies comprising a ceramic ring having first and second faces, a metal ring secured to each of said faces in coaxial alignment with the ceramic rings and metal brackets extending between each of said rings and said rods to engage and support alternate rods from each of said metal rings.

4,990,778

SCANNING ELECTRON MICROSCOPE

Setsuo Norioka, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,825
Claims priority, application Japan, Sep. 30, 1988, 63-247093
Int. Cl.[5] H01J 37/256, 37/28
U.S. Cl. 250—310 4 Claims



1. A scanning electron microscope comprising:

(a) an emitter tip maintained at voltage V0 for accelerating an electron beam emitted from the emitter tip;

(b) an anode maintained at ground potential;

(c) extraction electrode maintained at voltage V1 being arranged between the emitter tip and the anode;

(d) fluctuation detecting means for detecting the current intensity of the electron beam passing through the anode by using a detecting element arranged between the emitter tip and a specimen to be irradiated by the electron beam and generating the signal E(r);

(e) a signal processing means for processing the signal E(r) so that the processed signal level is maintained at a constant level when the ratio of V0/V1 is varied;

(f) an electron optical system for focusing the electron beam passing through the anode and scanning the electron beam over the specimen surface;

(g) a detector for detecting the signal from the specimen yielded by the electron beam scanning;

(h) display means in synchronization with the electron beam scanning for displaying a scanning image; and

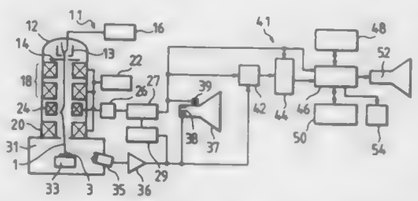
(i) means for supplying the signal corresponding to the ratio of the output signal of the detector and the output of the signal processing means to the display means as a scanning image signal.

4,990,779

METHOD AND APPARATUS FOR EVALUATING STRAINS IN CRYSTALS

Yasunari Yoshitomi, Kitakyushu; Kunitetu Ohta, Sagamihara, and Shuichi Funaki, Nakahara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 361,925
Int. Cl.[5] G01N 23/203
U.S. Cl. 250—310 8 Claims



1. A method of evaluating the strains in crystals comprising the steps of:

irradiating beams of electrons on the surface of a specimen of a crystalline substance, the surface of the specimen being scanned with the electron beams whose angle of incidence ranges from an angle smaller than the Bragg angle to a larger one;

determining the intensity of secondary or back-scattered electrons discharged from the surface of the specimen;

forming an electron channeling pattern containing several pseudo-Kikuchi lines by recording the intensity of the secondary or back-scattered electrons in synchronism with the scanning signals of the electron beams;

determining the sharpness of the electron channeling pattern; and

evaluating the strain in the crystalline substance on the basis of a change in the sharpness of the electron channeling pattern.

4,990,780

METHOD FOR DETERMINING FUEL AND ENGINE OIL COMSUMPTION USING TUNABLE DIODE LASER SPECTROSCOPY

Peter S. Lee, Troy; Richard F. Majkowski, Southfield, and Richard M. Schreck, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1989, Ser. No. 367,906
Int. Cl.[5] G01N 21/59
U.S. Cl. 250—343 2 Claims

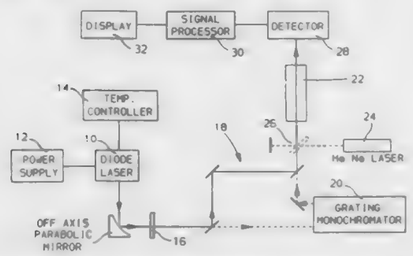
1. A method for evaluating fuel and engine oil consumption on a near real-time basis in an internal combustion engine comprising the steps of:

treating the fuel or engine oil with a substance with a non-radioactive organobromine tracer isotope either in its natural abundance or enriched;

continuously collecting combusted gaseous samples com-

prising hydrogen bromide from the exhaust gases generated by the internal combustion engine;

maintaining each of said combusted gaseous sample at a pressure where distinction between an absorption line of said tracer isotopic specie and the absorption lines of related isotopic species is discernible,



transmitting monochromatic radiation through each of said gaseous samples at the frequency of an absorption line for said tracer isotopic specie,

while concurrently detecting the intensity of a spectral line for said tracer isotopic specie in each of the samples so as to determine fuel and engine oil consumption in the internal combustion engine on a near real-time basis.

4,990,781

SPECTROSCOPICALLY OPERATING INFRARED HYGROMETER

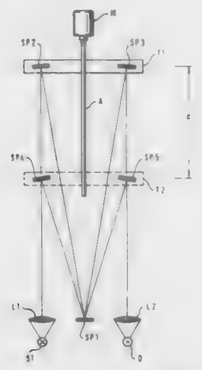
Theodor Heller, Worthsee/Etterschlag, Fed. Rep. of Germany, assignor to Deutsche Forschungs-und Versuchsanatalt fur Luft-und Raumfahrt E.V., Cologne, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 276,603

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740212

Int. Cl.[5] G01N *25/56;* **G01J** *5/06, 5/08, 5/62*

U.S. Cl. 250—347 **2 Claims**



1. In an apparatus for calibrating a spectroscopically operating infrared hygrometer having a beam source, a detector, a lens arrangement disposed in front of the beam source and the detector for focusing beams generated by the beam source, the improvement comprising:

pairs of rotating mirrors being fixed in two parallel planes which are at a fixed distance (d) from each other,

a common fixed mirror, for reflecting the beams to the lens arrangement placed in front of the detector,

wherein the beams are directed by the fixed mirror to the detector, and

wherein a succession of short signal pulses in which amplitudes of harmonic waves are also evaluated and blanked out during the pauses in order to improve the signal to noise ratio is obtained.

4,990,782

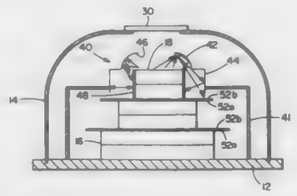
RADIATION SHIELD FOR THERMOELECTRICALLY COOLED INFRARED DETECTORS

William H. Wellman, and Russell D. Granneman, both of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 23, 1989, Ser. No. 370,556

Int. Cl.[5] G01J *5/08*

U.S. Cl. 250—352 **26 Claims**



1. A radiation shield for reflecting radiation originating from a cooled surface region away from the surface region, comprising:

first substantially uncooled reflector means for being positioned relative to the surface region and having an interior surface shape corresponding to a toric segment for reflecting any radiation originating from the surface region away from the surface region; and

second substantially uncooled reflector means optically coupled to said first reflector means for guiding radiation originating from the surface region and reflecting from said first reflector means away from both said first reflector means and the surface region.

4,990,783

RANGE INSENSITIVE INFRARED INTRUSION DETECTOR

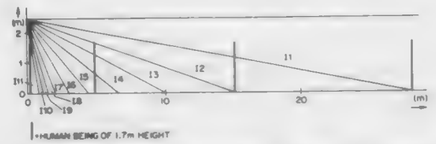
Kurt A. Muller, Stafa, and Hansjurg Mahler, Hombrechtikon, both of Switzerland, assignors to Cerberus A.G., Switzerland

Filed Sep. 19, 1989, Ser. No. 409,142

Claims priority, application Switzerland, Sep. 22, 1988, 3508/88

Int. Cl.[5] G01J *5/08;* **G08B** *13/18*

U.S. Cl. 250—353 **7 Claims**



1. In a passive infrared intrusion detector for forming a continuous curtain-like zone of protection without a gap and capable of substantially uniform infrared radiation sensitivity across the entire field of coverage of the detector, comprising an infrared sensor for detecting a change in infrared radiation impinged on the infrared sensor by an intruder, a plurality of optical means mounted in front of said infrared sensor for receiving said infrared radiation from the body of said intruder and focusing said infrared radiation on said infrared sensor, and an evaluation means coupled to said infrared sensor for actuating a signal when said infrared sensor detects said radiation change, wherein the improvement comprises:

said plurality of optical means arranged to receive infrared radiation emanated from a plurality of angular regions of space, said angular regions of space defining an overlapping pattern of zones of coverage blanketing a corridor-like room to be monitored,

each of said optical means extending over a selected solid angle as viewed from said infrared sensor optical means,

said selected solid angle of each of said optical means having an extent varying with the range of the corresponding zone of coverage in such manner the sum of radiation impinging upon the infrared sensor from an infrared radiation emanating object from all of said optical means is constant, independent of said object's range from the infrared detector, wherein said optical means are constructed in such manner that said solid angles are a function of the range of said zone of coverage from the infrared detector, said solid angles of those optical means corresponding to the zones of coverage having the greatest range and of those optical means corresponding to the zones of coverage having the least range from the infrared detector have the largest extent and said solid angles of those optical means corresponding to the zones of view having middle ranges have the smallest extent.

4,990,784

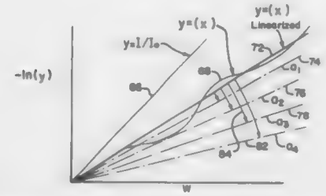
NONLINEAR AVERAGING COMPENSATED MEASUREMENTS

John R. Dukes, and Mason L. Thompson, both of Worthington, Ohio, assignors to Process Automation Business, Inc., Columbus, Ohio

Filed Aug. 25, 1989, Ser. No. 399,224

Int. Cl.[5] G01N *23/00*

U.S. Cl. 250—358.1 **20 Claims**



1. A method for controlling an industrial process by measuring the average intensity of radiant energy emanating from a process material, the material having a non-uniform distribution of a particular variable in a given portion of the material, the variable interacting with incident radiant energy from a source to nonlinearly influence the measured emanating intensity attributable to said given portion, wherein the method comprises:

directing a source of radiant energy having a reference intensity Io into one portion of the process material such that the source radiation interacts with the material and produces a radiant energy pattern that emanates from the material at an instantaneous intensity I;

positioning a sensor to detect the instantaneous intensity I of radiant energy emanating from the process material;

determining an index Z commensurate with the degree of nonuniformity of the variable in said portion of the material; and

generating a process control signal from a quantitative relationship among I, Io, and said index Z.

4,990,785

RADIATION IMAGING APPARATUS AND METHODS

K. William Logan, Boone County, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Jul. 3, 1989, Ser. No. 375,361

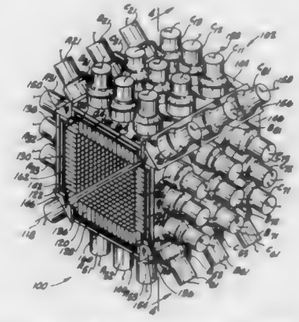
Int. Cl.[5] G01T *1/20, 1/202*

U.S. Cl. 250—368 **33 Claims**

1. Radiation imaging apparatus comprising:

first and second means for producing scintillations in response to bombardment by ionizing radiation, each said scintillation producing means having a surface bordered in part by an edge, the edge of the first means adjacent the edge of the second means;

joining means located between the edges of the first and second means for transmitting light emitted from the edges of the first and second means as a result of scintillations produced by the first and second means;



means for converting light transmitted from the surface of the scintillation means and light transmitted by the joining means to electrical outputs including a plurality of scintillation sensing units on the first and second scintillation producing means and on the joining means.

4,990,786

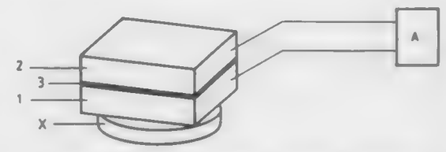
METHOD AND APPARATUS FOR DETERMINING THE ACTUAL ARTIFICIAL AEROSOL ALPHA ACTIVITY CONCENTRATION IN THE AIR

Hans-Jurg Kreiner, Munich, and Eberhard Frenzel, Erlangen, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,532

Int. Cl.[5] G01T *1/16, 7/00, 1/18, 1/185*

U.S. Cl. 250—380 **4 Claims**



1. A method of determining the actual concentration of artificial aerosol alpha activity in air by employing an electronic evaluation system and first and second proportional counter tubes separated by a foil, comprising the following steps:

(a) a filter is disposed in a stream of air flow and is thereby covered with dust, no artificial aerosol alpha activity being present;

(b) the radiation of natural nuclides is measured by means of the first and second counter tubes in pulses per second, and respective count rates alpha$_1$ and alpha$_2$ are determined;

(c) that ratio alpha$_1$/alpha$_2$ is plotted graphically against alpha$_2$ and corresponding constant values a_1 and a_2 are determined for each counter tube in accordance with the least square fit method;

(d) the filter is disposed in a stream of air containing natural and artificial radioactive aerosols and thereby forming a radioactive dust coating thereon; the counter tubes are arranged with the second counter tube above the first counter tube, separated by the separating foil, so that the

lower counter tube is adjacent to the filter and measures the radiation of both natural and artificial nuclides (count rate alpha$_1$) while the upper counter tube measures only the radiation of natural nuclides (count rate alpha$_2$);

(e) the air volume V in cubic meters flowing through the filter during the measurement time is measured; and

(f) the resulting artificial aerosol alpha activity concentration C, in becquerels per cubic meter, is calculated in accordance with the formula

$$C = \frac{1}{V} \cdot \frac{1}{eta} [alpha_1 - (\sigma_1 \cdot alpha_2 + \sigma_2)\, alpha_2]$$

in which eta is the sensitivity of the lower counter tube expressed as a decimal fraction.

4,990,787

RADIONUCLIDE GENERATOR SYSTEM AND METHOD FOR ITS PREPARATION AND USE

Jean-Luc Vanderheyden, and Fu-Min Su, both of Seattle, Wash., assignors to NeoRx Corporation, Seattle, Wash.

Filed Sep. 29, 1989, Ser. No. 416,221

Int. Cl.[5] C01G *47/00*

U.S. Cl. 250—432 PD 11 Claims

1. A method of preparing a generator for producing a daughter radionuclide from a parent radionuclide, comprising:

irradiating an irradiation target comprising an insoluble aluminum salt of a precursor isotope of the parent radionculide at high neutron flux levels to obtain an irradiated aluminum salt of the parent radionuclide, and

disposing the irradiated aluminum salt in an elutable container.

4,990,788

APPARATUS EMITTING AN ELECTROMAGNETIC RADIATION

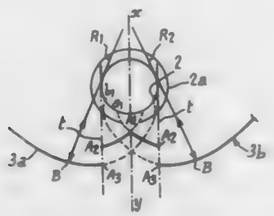
Ari Rabl, Montgeron; Denis Clodic, Paris, and Robert Dehausse, Joinville Le Pont, all of France, assignors to A.R.M.I.N.E.S., Paris, France

Filed Nov. 22, 1988, Ser. No. 275,000

Claims priority, application France, Nov. 25, 1987, 87 16360

Int. Cl.[5] G02B *5/10*; F21V *7/04, 7/12, 7/20*

U.S. Cl. 250—504 R 6 Claims



1. In an apparatus emitting an electromagnetic radiation, particularly infrared, comprising:

at least one cylindrical source of rays and a reflector for reflecting these rays emitted in the direction of a target defined as extending between two ends, the cylindrical source, the reflector and the target being symmetrical with respect to the same plane of symmetry of the emitter apparatus, so that the reflector is constituted by two halves of the same cross-section located on either side of the plane of symmetry containing the longitudinal axis of the source;

the cross-section of a half reflector, located on one side of the plane of symmetry, comprises, starting from this plane of symmetry, a first curved part constituted by at least one arc of involute to a circle or by an arc of circle extending from the plane of symmetry to an end located on a first extreme ray tangential to the source and passing through a first end of the target which is located on the other side of the plane of symmetry, and a second curved part joined tangentially to the first curved part and of such shape that all the tangential rays emitted from the cylindrical source and falling on this second curved part are reflected towards a first end of the target located on the other side of the plane of symmetry, this second curved part terminating at an extreme point located on a second extreme ray tangential to the source and passing through the second end of the target which is located on the first side of the plane of symmetry; and

a single cylindrical source of rays, wherein the first curved part is constituted by two arcs of different involutes to the "emitter" circle formed by the same cross-section of the cylindrical source, namely a first arc of involute to a circle extending between a first end located in the plane of symmetry and at a distance from the outer envelope of the cylindrical source and a second end, this first arc of involute to a circle forming part of an involute to a circle starting from a point, on the outer surface of the cylindrical source, which is located on the opposite side of the plane of symmetry, and a second arc of involute to a circle forming part of another involute to a circle starting from a point located, on the outer surface of the cylindrical source, beyond the first point of departure, the second end of the first arc of involute to the circle and the first end of the second arc of involute to the circle being distant from each other and aligned along the same tangent to the cylindrical source, which tangent is parallel to the plane of symmetry, so that the space arranged between these ends constitutes an opening for the passage of cooling air.

4,990,789

ULTRA VIOLET RAYS GENERATOR BY MEANS OF MICROWAVE EXCITATION

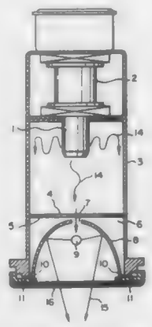
Osamu Uesaki, 11-8, Kasukabe, Higashi 5-chome, Kasukabe-shi, Saitama Prefecture, Japan

Filed Oct. 3, 1989, Ser. No. 416,309

Claims priority, application Japan, May 10, 1988, 63-130728[U]

Int. Cl.[5] H05B *41/24*

U.S. Cl. 250—504 R 4 Claims



1. An ultra violet rays generator which generates ultra violet rays by means of microwave excitation, comprising:

a microwave generator for generating microwaves from a microwave antenna coupled thereto;

a microwave cavity directly connected to said microwave generator so that said antenna extends into said cavity;

an ultra violet ray (UV) reflector detachably secured in said microwave cavity, said reflector having a window formed in the upper part thereof through which microwaves can be transmitted and a light transmitting base having an interference film formed thereon; and

an ultra violet lamp disposed under said window and near the inside of said reflector.

4,990,790

METHOD FOR DISCRIMINATING AUTHENTICITY OF A BILL USING POLARIZATION AND AN APPARATUS THEREFORE

Kenzou Yoshihara, Kounosu, Japan, assignor to Nippon Conlux Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,261

Claims priority, application Japan, Oct. 28, 1988, 63-270977

Int. Cl.[5] G06K *5/00*

U.S. Cl. 250—556 20 Claims



1. A method for discriminating authenticity of a bill, comprising steps of:

(a) irradiating unpolarized light onto the bill at a predetermined angle of incidence;

(b) detecting an amount of reflected light from the bill, said reflected light containing a polarized component which is produced when the light is reflected on a surface of the bill;

(c) detecting an amount of the reflected light from which said polarized component is eliminated; and

(d) detecting a degree of brilliance of the surface of the bill on the basis of the amount of said reflected light detected by said step (b) and that detected by said step (c), to thereby discriminate the authenticity of the bill.

4,990,791

MULTI-DIMENSIONAL LASER DOPPLER VELOCIMETER

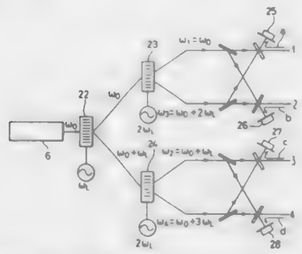
Hisami Nishi, Nishinomiya, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 13, 1989, Ser. No. 435,086

Claims priority, application Japan, Nov. 14, 1988, 63-287079

Int. Cl.[5] G01P *3/36*

U.S. Cl. 250—561 10 Claims



1. A multidimensional laser Doppler velocimeter using the reference beam method for emitting not less than two probe beams to an object to be measured at a predetermined angle to multi-dimensionally measure a velocity or displacement vector of the object due to Doppler shift of beams reflected by the object, comprising:

laser beam source for generating a laser beam having a single frequency,

frequency shifting means for dividing said laser beam into a plurality of beams, and for shifting the frequency of said laser beam by a predetermined frequency difference, one of the beams having the same frequency as that of said laser beam and the other each having different frequencies,

beam splitting means for splitting each of the beams into a probe beam and a reference beam, the probe beam being used together with the reference beam whose frequency is different from that of the probe beam,

photodetecting means on which a light beam is incident to obtain a detection current, and

a bandpass filter means through which said detection current passes for eliminating a crosstalk component from said detection current,

wherein the probe beam is radiated to the object to produce a scattered beam from the object, the scattered beam being directed to the photodetecting means, and

the reference beam is directed through the beam splitting means to the photodetecting means thereby mixed with the scattered beam.

4,990,792

METHOD FOR THE APPLICATION AND READING OF, AND BOTTLE WITH OPTICALLY READABLE CODE MARKS

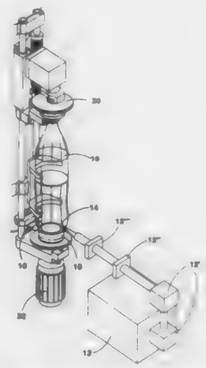
Matthias Frei, Wettingen, Switzerland, assignor to Elpatronic AG, Zug, Switzerland

Filed Jul. 21, 1989, Ser. No. 383,875

Claims priority, application Switzerland, Aug. 9, 1988, 03004/88

Int. Cl.[5] G06K *7/10*

U.S. Cl. 250—566 13 Claims



1. A method of applying optically readable code marks to the surface of bottles, particularly of plastics material, by producing depressions in the surface, characterized by applying each code mark to the surface of the bottle by means of a laser such that the bottom of each code mark is constructed in the form of a diffusely scattering reflector with controlled reflectivity.

4,990,793

MEASUREMENT OF DEGREE OF INTERMINGLING AND MEASURING APPARATUS THEREFOR

Burkhard Bönigk, Königsbrunn, and Ingolf Jacob, Untermeitingen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1989, Ser. No. 342,289

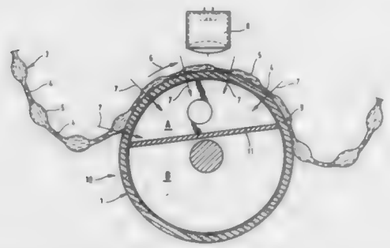
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3814745; Aug. 17, 1988, 3827866

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—571 16 Claims

1. A method for measuring the degree of intermingling of yarns where an optical sensor is used to register intermingling and non-intermingled yarn sections, which comprises perform-

ing a measurement of yarn properties on a yarn which has been laid with no or minimal tension onto a moving support which



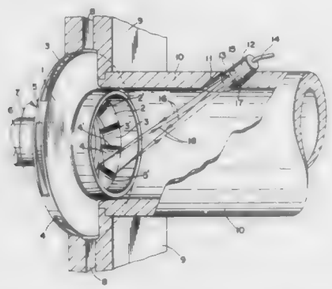
transports the yarn past an optical sensor at a predetermined, constant speed and at a distance for measuring the yarn properties.

4,990,794

SENSING-MEASURING DEVICE FOR CONTINUOUS DETERMINATION OF CAVITATION IN DYNAMIC PUMPS

Marco Ferrari, Campi Bisenzio, and Pierluigi Nava, Florence, both of Italy, assignors to Nuovopignone-Industrie Meccaniche E Founderia, Florence, Italy

Filed Feb. 21, 1990, Ser. No. 482,546
Claims priority, application Italy, Feb. 22, 1989, 19519 A/89
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—573 **2 Claims**



1. A sensing-measuring device for the continuous determination of cavitation in dynamic pumps comprising a series of blades and a suction nozzle, characterised by consisting of an optical probe mounted in proximity to said suction nozzle of the pump, said probe comprising a light emitter and an optical sensor which are positioned inclined at an angle to each other in such a manner as to perfectly centre on the leading edge of said blades.

4,990,795

PARTICLE COUNTER WITH PHOTOINTENSITY COMPENSATION

Riichiro Suzuki, and Yoshihiro Kubo, both of Miyanohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Jul. 19, 1989, Ser. No. 382,548
Claims priority, application Japan, Jul. 30, 1988, 63-191282
Int. Cl.[5] G01N *15/06, 21/49, 21/85*
U.S. Cl. 250—574 **6 Claims**

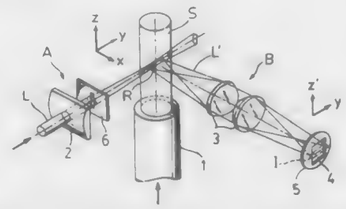
1. A particle counter for measuring the concentration and particle-size distribution of minute particles contained in a fluid that is flowing in a first direction comprising:

an irradiating optical system for producing scattered light by irradiating the minute particles from a second direction that is substantially perpendicular to the first direction including:

an irradiating means for providing a laser beam;

a first lens means for flattening the laser beam so that it is short in the first direction and long in the second direction;

a photointensity-compensating means for converting the distribution of integrated photointensity values of the flattened laser beam into a square pattern, the minute particles being irradiated by the flattened and compensated laser beam, and



a detecting optical system having an axis that is substantially perpendicular to the first and the second directions including:

a second lens means for focusing the scattered light from a section of the fluid and for forming a real image thereof, and

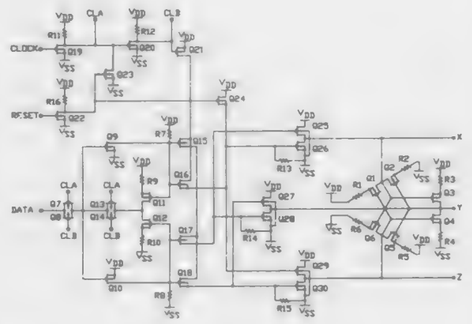
a slit member detecting means having a detecting slit thereon, the perimeter of the detecting slit cutting the real image of the scattered light in the second direction but not in the first direction so as to reduce the influence of aberration and dislocation of focus in the detecting optical system.

4,990,796

TRISTABLE MULTIVIBRATOR

Edgar D. Olson, 2020 Artesia Blvd. #25, Redondo Beach, Calif. 90278

Filed May 3, 1989, Ser. No. 347,080
Int. Cl.[5] H03K *3/353, 21/00, 23/60, 23/64*
U.S. Cl. 307—279 **19 Claims**



A tristable multivibrator comprising:

a first input line connected to a first output line;

a second input line connected to a second output line;

a third input line connected to a third output line;

a first switch connected to the first input and output lines on one side, connected to a first resistor in series with and between the first switch and a first source of electric potential on another side, and connected to the third input and output lines such that when the third input line is at an electric potential sufficiently different than that of the first source of electric potential, the first switch turns on and allows transmission of electric potential from the first source of electric potential to the first input and output lines, and vice-versa such that when the third input line is not at an electric potential sufficiently different than that of the first source of electric potential, the first switch turns off and prevents transmission of electric potential from the first source of electric potential to the first input and output lines, thereby controlling transmission of electric potential from the first source of electric potential to the first input and output lines;

a second switch connected to the first input and output lines on one side, connected to a second resistor in series with and between the second switch and a second source of electric potential on another side, and connected to the second input and output lines such that when the second input line is at an electric potential sufficiently different than that of the second source of electric potential, the second switch turns on and allows transmission of electric potential from the second source of electric potential to the first input and output lines, and vice-versa, thereby controlling transmission of electric potential from the second source of electric potential to the first input and output lines;

a third switch connected to the second input and output lines on one side, connected to a third resistor in series with and between the third switch and the first source of electric potential on another side, and connected to the first input and output lines such that when the first input line is at an electric potential sufficiently different than that of the first source of electric potential, the third switch turns on, and vice-versa, thereby controlling transmission of electric potential from the first source of electric potential to the second input and output lines;

a fourth switch connected to the second input and output lines on one side, connected to a fourth resistor in series with and between the fourth switch and the second source of electric potential on another side, and connected to the third input and output lines such that when the third input line is at an electric potential sufficiently different than that of the second source of electric potential, the fourth switch turns on, and vice-versa, thereby controlling transmission of electric potential from the second source of electric potential to the second input and output lines;

a fifth switch connected to the third input and output lines on one side, connected to a fifth resistor in series with and between the fifth switch and the first source of electric potential on another side, and connected to the second input and output lines such that when the second input line is at an electric potential sufficiently different than that of the first source of electric potential, the fifth switch turns on, and vice-versa, thereby controlling transmission of electric potential from the first source of electric potential to the third input and output lines; and

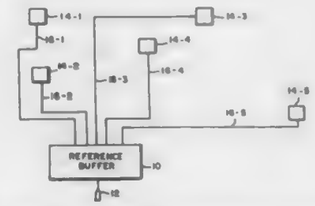
a sixth switch connected to the third input and output lines on one side, connected to a sixth resistor in series with and between the sixth switch and the second source of electric potential on another side, and connected to the first input and output lines such that when the first input line is at an electric potential sufficiently different than that of the second source of electric potential, the sixth switch turns on, and vice-versa, thereby controlling transmission of electric potential from the second source of electric potential to the third input and output lines.

4,990,797

REFERENCE VOLTAGE DISTRIBUTION SYSTEM

Peter Real, Groveland; David H. Robertson, Somerville; Theodore Tewksbury, Boston, and Christopher W. Mangelsdorf, Reading, all of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 26, 1989, Ser. No. 412,416
Int. Cl.[5] H03K *3/01, 19/086*
U.S. Cl. 307—296.6 **3 Claims**



1. A system for distributing a reference voltage from a reference input terminal to a remote location on an integrated circuit substrate, comprising:

a. means for generating from the reference voltage a precise current directly proportional to the reference voltage;

b. means for conveying the precise current to the remote location; and

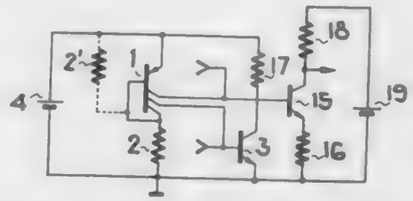
c. means at the remote location for receiving the precise current and for generating therefrom a remote reference voltage for use at the remote location.

4,990,798

CIRCUIT ARRAY FOR SETTING THE OPERATING POINT OF A TRANSISTOR

Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,427
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811950
Int. Cl.[5] H03K *3/01;* **H03F** *3/04*
U.S. Cl. 307—296.6 **30 Claims**



1. In an integrated circuit including a first transistor and circuit means for setting the operating point of said first transistor, with said circuit means including current-inverting (current mirror) circuit means having a current inverting transistor connected to receive an input current and whose output provides the base current of said first transistor; the improvement comprising a pinch resistor connected in series with the base-emitter path of said current inverting transistor and determining said input current of said current inverting circuit means.

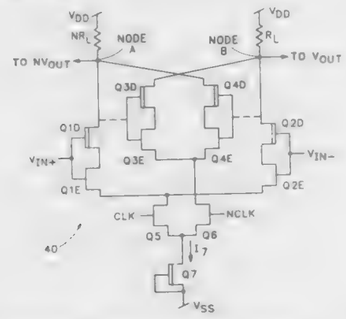
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4,990,799

LOW-HYSTERESIS REGENERATIVE COMPARATOR

Frederick G. Weiss, 17810 NE. Courtney Rd., Newberg, Oreg. 97132

Filed Dec. 26, 1989, Ser. No. 457,121
Int. Cl.[5] H03K *3/26, 3/29, 5/153;* H03F *3/45*
U.S. Cl. 307—355 21 Claims



1. A regenerative comparator, comprising:

a differential amplifier pair of first and second sets of transistors, each set of the pair including a first transistor having a drain, a source, a gate, and a first dimension value and a second transistor having a drain, a source, a gate, and a second dimension value, the first transistor being a depletion mode transistor, the second transistor being an enhancement mode transistor, the gates of the first and second transistors of each set being coupled together to receive a differential input voltage, the drains of the first transistor of each set forming a differential current output, the source of the first transistor being coupled to the drain of the second transistor in a bootstrap cascode arrangement, the sources of the second transistor of each set being coupled together at a first source node, and the magnitudes of the first and second dimension values being selected such that the drain-to-source voltage of the second transistor is limited by the first transistor to a predetermined value and is isolated from large voltage variations at the drain of the first transistor;

a differential regenerative pair of first and second sets of transistors, each set of the pair including a third transistor having a drain, a source, a gate, and a third dimension value and a fourth transistor having a drain, a source, a gate, and a fourth dimension value, the third transistor being a depletion mode transistor, the fourth transistor being an enhancement mode transistor, the gates of the third and fourth transistors of each set being coupled together and to the drain of the respective first transistor, the drains of the third transistor of each set being cross-coupled to the differential current output, the source of the third transistor being coupled to the drain of the fourth transistor in a bootstrap cascode arrangement, the sources of the fourth transistor of each set being coupled together at a second source node, and the magnitudes of the third and fourth dimension values being selected such that the drain-to-source voltage of the fourth transistor is limited by the third transistor to a predetermined value and is isolated from large voltage variations at the drain of the third transistor; and

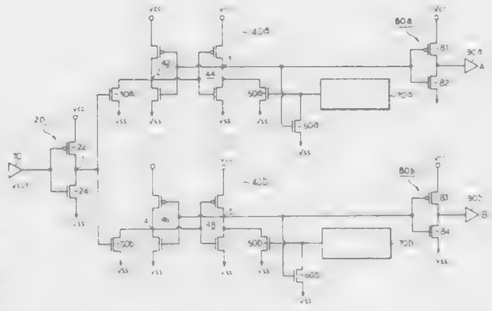
clock means having a first output coupled to the first source node and a second output coupled to the second source node for switching between a first state and a second state, during the first state the differential amplifier pair of transistors is on and the differential regenerative pair of transistor is off, and during the second state the differential amplifier pair of transistors is off and the differential regenerative pair of transistors is on.

4,990,800

MODE SELECTOR FOR USE IN SEMICONDUCTOR MEMORY DEVICE

Dong-Jae Lee, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Japan

Filed Dec. 30, 1988, Ser. No. 292,353
Claims priority, application Rep. of Korea, Dec. 30, 1987, 1987-15350
Int. Cl.[5] H03K *17/687*
U.S. Cl. 307—465 20 Claims



1. A mode selecting circuit for selecting a single operational mode in a semiconductor memory device having a plurality of operation modes, comprising:

a first voltage supplying terminal for receiving a source supply voltage;

a second voltage supplying terminal for receiving a ground reference potential;

an input terminal for receiving as an input signal the voltage of said source supply delayed by a specified time;

a mode selecting pad to which a mode selection signal may be supplied;

an output terminal;

a first node;

a second node;

a third node;

first inverting means for providing a first inverted signal by inverting the input signal, said first inverting means being connected between said input terminal and said first node;

first switching means responding to the first inverted signal of said first node, for providing a conducting channel between said second voltage supplying terminal and said second node;

second switching means responding to the mode selection signal of said mode selecting pad for providing a conducting channel between said second voltage supplying terminal and said third node;

latching means connected between said second and third nodes, for latching a voltage state according to switching of said first switching means and said second switching means;

an insulating gate field effect transistor having a channel connected between said mode selecting pad and said second voltage supplying terminal, and a gate connected with said third node; and

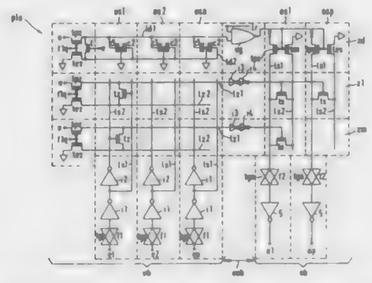
second inverting means connected between said output terminal and said third node, for inverting the voltage state of said third node.

4,990,801

INTERNAL TIMING CIRCUIT FOR A CMOS PROGRAMMABLE LOGIC ARRAY

Knut Caesar, Gundelfingen, and Helmut Haeringer, Niederwinden, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jun. 15, 1989, Ser. No. 366,830
Claims priority, application European Pat. Off., Jun. 28, 1988, 88110267.7
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—469 18 Claims



1. A programmable logic array employing non-overlapping first and second clock phases and comprising:

AND plane means for realizing a plurality of minterms, said AND plane means receiving a plurality of input signals during the first clock phase and evaluating said minterms with said input signals during the inverted first clock phase, an output signal being provided for each one of said evaluated minterms, said AND plane means having internal capacitances which correspond to said minterms and which delay the time required to evaluate said minterms;

a delay row having first and second dummy row conductors, timing signal means for applying a timing signal during the inverted first clock phase to the input of said first dummy row conductor, and a plurality of capacitors consisting of a first group and a second group, said first group of capacitors being connected between said first dummy row conductor and a reference potential, said second group of capacitors being connected between said second dummy row conductor and the reference potential, the capacitance of said plurality of capacitors being selected to delay the output of said timing signal on said first dummy row conductor for a time at least as long as the time required to evaluate said plurality of minterms;

gate means, responsive to the output of said first dummy row conductor, for generating an enabling signal; and

OR plane means, responsive to said enabling signal generated by said gate means, for selectively adding the output signals provided by said AND plane means to any number of a plurality of output conductors, the signals on said output conductors being output during the second clock phase.

4,990,802

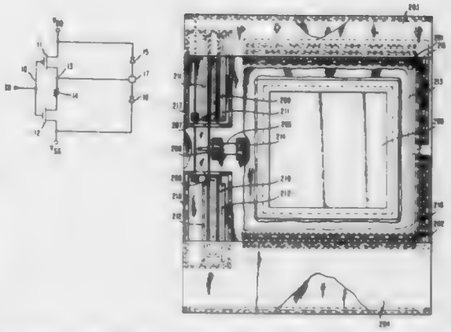
ESD PROTECTION FOR OUTPUT BUFFERS

Yehuda Smooha, South Whitehall Twp., Lehigh County, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 275,048, Nov. 22, 1988, abandoned.
This application Jun. 19, 1990, Ser. No. 541,183
Int. Cl.[5] H03K *19/003, 19/007, 19/094, 17/08*
U.S. Cl. 307—482.1 6 Claims

1. An integrated circuit comprising at least two levels of metal conductors and an output buffer having a p-channel transistor and an n-channel transistor having their drains coupled to a common buffer output node, and a bondpad connected to an external conductor,

characterized in that said integrated circuit further comprises a resistor having a resistance of greater than 1 ohm connected between the drain of said n-channel transistor and said bondpad, and still further comprises voltage clamping means connected to said bondpad,



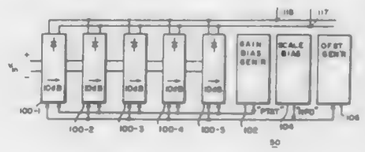
wherein said resistor is a polysilicon or silicide resistor, and wherein the drain of said p-channel transistor is directly connected to said bondpad by means of a metal conductor.

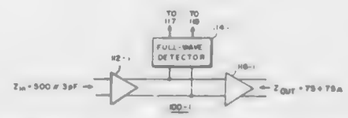
4,990,803

LOGARITHMIC AMPLIFIER

Barrie Gilbert, Beaverton, Oreg., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Mar. 27, 1989, Ser. No. 328,966
Int. Cl.[5] G06F *7/556;* G06G *7/24;* H03K *3/26*
U.S. Cl. 307—492 6 Claims





1. A logarithmic converter for supplying in response to an instantaneous input signal an output signal representing a corresponding logarithmic value thereof, the performance of the converter being characterized at least in part by a log intercept value and by a log slope, and comprising:

a. a plurality of gain stages, each having

(i) a transistor amplifier which has an input and an output, and

(ii) a full-wave detector having an input and an output, the

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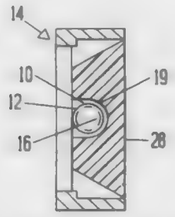
input of the full-wave detector being connected to receive the output of the transistor amplifier;
b. a first one of the amplifiers being connected to receive at its input the input signal;
c. each other amplifier being connected to receive at its input the output from another one of the amplifiers;
d. the full-wave detectors each supplying a current output and the current outputs of all of the detectors being summed to provide the converter's output; and
e. stabilization means operatively associated with each amplifier to cause the gain of the amplifier to be substantially insensitive to temperature variations and variations in production tolerances of the amplifier transistors.

4,990,804

SELF-LUMINOUS LIGHT SOURCE

Rhett C. McNair, 4081 G E. LaPalma, Anaheim, Calif. 92807

Filed Oct. 10, 1989, Ser. No. 419,389
Int. Cl.[5] H01L *31/04;* F21K *2/00*
U.S. Cl. 250—493.1 17 Claims



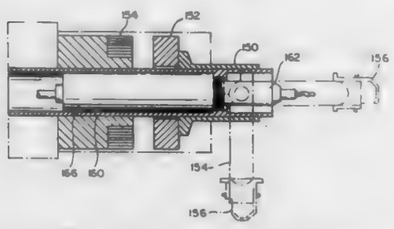
1. An illumination source remote from electrical or combustible energy sources which comprises:
(a) a beta-emitter to radiate beta particles and contained within a sealed enclosure;
(b) a phosphor that absorbs beta radiation and emits radiation of a wave length from about 100 to 600 nanometers within invisible light spectrum located in a position within said illumination source to receive radiation of beta particles from said beta-emitter.
(c) a light emitting surface located at a position to receive said radiation emitted by said phosphor, and formed of a plastic filled with a fluorescent dye having an excitation wavelength from about 100 to 600 nanometers and an emission wavelength within the visible light spectrum.

4,990,805

LOW VOLTAGE ELECTROMAGNETIC PULSE ACTUATOR

Peter B. Zieve, 5766-27th Ave. NE., Seattle, Wash. 98105

Division of Ser. No. 54,587, May 27, 1987. This application Aug. 3, 1989, Ser. No. 389,322
Int. Cl.[5] H02K *33/00*
U.S. Cl. 310—27 8 Claims



1. An electromagnetic pulse actuator, comprising:
an electromagnetic actuator means, including (a) a driver having a first portion which is receptive to the establishment of magnetic field eddy currents therein and a second portion which includes a first work assembly means to accomplish riveting or other high-force impact work and (b) a coil which is positionable in close proximity to said first portion of said driver, wherein the actuator means has a configuration defining an axially open center area;
a source of stored charge defining a selected voltage, adapted to produce a current pulse through the actuator coil when connected thereto;
control means for selectively connecting the stored charge to the coil, thereby producing a current pulse in the coil which in turn produces a magnetic force pulse large enough to propel the driver forward with sufficient momentum to accomplish the desired high force impact work; and
a second work assembly means positioned in the open center area of said actuator means for accomplishing additional work other than high force impact work, such as drilling.

4,990,806

PULSE MOTOR

Hiroshi Kikuchi; Jiro Tanuma; Tadashi Kasai, and Masayuki Ishikawa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 350,721
Claims priority, application Japan, May 10, 1988, 63-11473
Int. Cl.[5] H02K *37/14*
U.S. Cl. 310—49 A 13 Claims



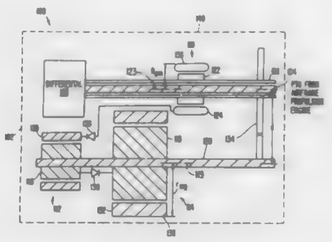
1. A pulse motor comprising:
a rotor having a permanent magnet divided and magnetized along the outer periphery thereof;
a drive coil surrounding the outer periphery of the rotor;
an annular inner yoke having a plurality of magnetic poles positioned between said rotor and said drive coil, said inner yoke surrounding the outer periphery of the rotor;
an annular outer yoke comprising two parts, said outer yoke surrounding the entirety of said rotor, drive coil and inner yoke;
a flange having a bearing for supporting the rotor, said flange being integrally mounted to one of the two parts of the outer yoke; and
a motor mounting plate having a bearing for supporting the rotor mounted to the other of the two parts of the outer yoke;
wherein said inner and at least one of the outer yokes are each provided with at least one aperture for restraining an eddy current.

4,990,807

INTEGRATED DRIVE GENERATOR HAVING MAGNET GENERATOR ON SECOND SHAFT

Wayne A. Flygare, and Richard C. Welch, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 19, 1989, Ser. No. 409,397
Int. Cl.[5] H02K *19/26*
U.S. Cl. 310—68 D 23 Claims



1. An integrated drive generator for generating constant frequency alternating current which is driven by a drive shaft at variable rotational speeds comprising:
a constant speed drive having a first input coupled to the drive shaft and an output which rotates at a fixed rotational velocity in response to the drive shaft rotating at a variable velocity and which drives a first drive shaft at a fixed rotational velocity and a second drive shaft at a fixed rotational velocity;
an alternating current generator for generating the constant frequency alternating current having a rotor mounted on the first shaft with an outside periphery having a first radius farthest from an axis of rotation of the first shaft;
an exciter having a rotor mounted on the first shaft, electrically coupled to a field winding of the alternator, for supplying electrical power to the field winding;
a generator, having a rotor mounted on the second shaft, electrically coupled to the exciter, for supplying electrical power to a field winding of the exciter with an outside periphery having a second radius farthest from an axis of rotation of the second shaft; and wherein
a sum of the first and second radii is greater than a distance between axes of rotation of the shafts.

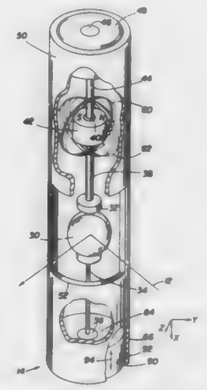
4,990,808

SYMMETRICAL RESONANT SCANNER AND DRIVE

Dean R. Paulsen, Watertown, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Continuation-in-part of Ser. No. 14,998, Feb. 17, 1987, Pat. No. 4,878,721. This application Jan. 30, 1989, Ser. No. 303,941
Int. Cl.[5] H02K *3/28;* G02B *26/10*
U.S. Cl. 310—113 12 Claims

1. A rotational mechanical system comprising
a rotational structure arranged for rotational motion about an axis and comprising a driver magnet,
two coils arranged in fixed positions relative to said magnet and adapted to cooperate magnetically with said magnet,
one of said coils inclined at a first coil angle to the axis of rotation,
the other of said coils inclined at a second coil angle to the axis of rotation,



the one coil being used to drive the magnet and the other coil being used to sense the motion of the magnet.

4,990,809

VARIABLE RELUCTANCE MOTOR

Richard J. Artus, Bristol; Anthony E. Balestro, Avon; Allen R. Perrins, Branford, and Peter Senak, Jr., Bristol, all of Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed Apr. 27, 1987, Ser. No. 43,092
Int. Cl.[5] H02K *1/14*
U.S. Cl. 310—192 13 Claims



1. A variable reluctance motor, comprising:
a rotor supported for rotation about an axis of rotation;
a cylindrical stator assembly means having a plurality of independent stator segments circumaxially arranged about said axis of rotor rotation, each of said independent stator segments including one first and two second salient pole members, said two second pole members being in spaced relation with and disposed at opposite sides of said first pole member, said first pole member having a pole face and a first plurality of teeth on said pole face, each of said second pole members having a pole face and a second plurality of teeth on said pole face;
non-magnetic spacing means located between adjacent ones of said independent stator segments for maintaining said adjacent independent stator segments in a spaced apart and non-contacting relationship with one another, said spaced apart relationship of said stator segments creating a plurality of radially inwardly projecting channels disposed around the periphery of said stator assembly means with each of said channels extending fully from the outer circumference to the inner circumference of said stator

assembly means to essentially magnetically isolate and completely physically isolate said independent stator segments from one another and with one second pole of one independent stator segment and one second pole of an adjacent independent stator segment being located on opposite sides of each channel, and

a plurality of electrically energizable windings disposed one for one on said first pole members of said plurality of independent stator segments;

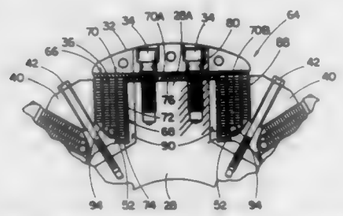
said rotor including a variable reluctance member coaxial with said axis of rotor rotation and having a third plurality of teeth for coaction with said teeth of said first and second pole members.

4,990,810

COIL CARRIER FIXTURE AND FIELD COIL CARRIER ASSEMBLY

Brian L. Newhouse, Apollo, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1989, Ser. No. 381,352
Int. Cl.[5] H02K *1/22, 3/46, 3/00*
U.S. Cl. 310—194 16 Claims



1. A coil carrier fixture for mounting an annular field coil, said fixture comprising:

(a) a base having a continuous tubular wall with opposite upper and lower ends, a lower annular flange connected to, extending about and projecting outwardly from said lower end of said tubular wall, and an upper end wall extending across said tubular wall and connected to said upper end of said tubular wall;

(b) a lid separate from said base, said lid having an inner central portion disposable in substantially flush engaging relation with said upper end of said tubular wall and said upper end wall of said base for detachable attachment of said lid to said upper end wall of said base, said lid also having an outer peripheral portion defining an upper annular flange extending about and projecting outwardly from said upper end of said tubular wall of said base and spaced above said lower annular flange thereof when the lid is attached on the base; and

(c) means for detachably attaching said lid central portion to said upper end wall of said base;

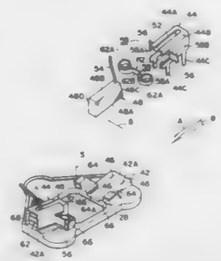
(d) said tubular wall and lower annular flange of said base and said upper annular flange of said lid defining an external cavity in which the annular field coil can be confined about the exterior of said tubular wall of said base and between said lower and upper annular flanges of said respective base and lid and into and from which the field coil can be inserted and removed by detachment of said lid from said base.

4,990,811

BRUSH HOLDING STRUCTURE FOR MOTOR

Masashi Nakata, Koeai, and Tetsuro Shimmura, Toyohashi, both of Japan, assignors to Asmo Co., Ltd, Shizuoka and Nippondenso Co., Ltd., Aichi, both of, Japan

Filed Mar. 9, 1990, Ser. No. 491,106
Claims priority, application Japan, May 16, 1989, 1-122398
Int. Cl.[5] H02K *5/14, 13/10;* H01R *39/39*
U.S. Cl. 310—239 19 Claims



1. A brush holding structure for a motor, in which a brush is guided into contact with a commutator supported in a motor case, the structure comprising:

(a) an insulator plate secured to the motor case and having a hole formed in a central part thereof for passage of the commutator;

(b) a guide surface formed on said insulator plate to incline in a radial direction of the commutator within a plane including an axis of rotation thereof for allowing a bottom face of the brush to slide on said surface;

(c) a plate-like spring provided at both ends thereof with coil portions for winding up and at an intermediate part thereof with a pressing portion for pressing a rear face of the brush to bias the brush to the commutator;

(d) spring receiving portions raised on said insulator plate for mounting of said respective spring coil portions thereon; and

(e) a holder fixedly attached to said insulator plate for receiving the brush, said holder being in a plate-like shape which has a top portion corresponding to a top face of the brush and a pair of leg portions respectively corresponding to both side faces of the brush, and with intermediate portions interconnecting said pressing portion and coil portions of said plate-like spring being disposed between said leg portions of the holder and the sides of the brush, said leg portions being inserted between said spring seat portions of said insulator plate for prevention of spreading of said leg portions.

4,990,812

SOLENOID TYPE ELECTRIC GENERATOR

Joong Nam, 206-40, jeongneung-dong, Seongbuk-gu, Seoul, Rep. of Korea 136-102

Filed Nov. 21, 1989, Ser. No. 439,346
Claims priority, application Rep. of Korea, Apr. 8, 1989, 1989-4627
Int. Cl.[5] H02K *1/06, 3/42*
U.S. Cl. 310—261 15 Claims

10. A solenoid type electric generator comprising:

a shaft;

a cylindrical case having an annular step in the middle thereof for being attached concentrically on said shaft, said annular step separating said case into first and second length portions;

a stator comprising:

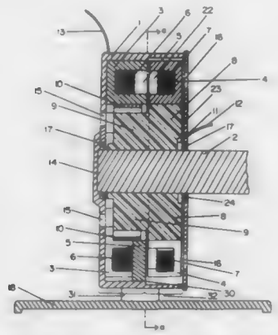
a first plurality of channel shaped magnetic blocks each having a slot defined by a channel and attached on an inner circumferential surface of the first length portion of said case at predetermined uniform angular intervals;

an output coil wound in a short solenoidal form through the slots of said first plurality of channel shaped magnetic blocks; and

a plurality of magnetic short circuit blocks each disposed between said channel shaped magnetic blocks and attached on the inner circumferential surface of the first length portion of said case so as to rigidly support said output coil; and

a rotor comprising:

a cylindrical supporter concentrically installed on said shaft in the space within the second length portion of said case;



a second plurality of channel shaped magnetic blocks each having a slot defined by a channel and attached around said cylindrical supporter at predetermined uniform angular intervals and having outward faces, said second plurality of channel shaped magnetic blocks and said first plurality of channel shaped magnetic blocks being identical in number and in their relative positions;

a field coil wound in a short solenoidal form through the slots of said second plurality of channel shaped magnetic blocks; and

a plurality of fill members respectively press-fitted into the slots of said second plurality of channel shaped magnetic blocks for preventing displacement of said field coil and for maintaining said field coil at least a predetermined distance from said first plurality of channel blocks.

4,990,813

ROLLING TRIBOELECTRIC GENERATOR

Gabriel L. Paramo, Madrid, Spain, assignor to Universidad Nacional de Educacion a Distancia, Madrid, Spain

Filed Oct. 26, 1989, Ser. No. 427,875
Claims priority, application Spain, Oct. 28, 1988, P8803198
Int. Cl.[5] H02N *1/00*
U.S. Cl. 310—309 20 Claims



1. A rolling-type triboelectric generator for obtaining electromotive forces without using external charge sources, comprising:

a plurality of wide active components having external surfaces, at least one of said active components having an external surface which is mutually rollable on an external surface of another of said active components;

a plurality of wide electrical charge collecting components having electrically conducting surfaces, said electrically conducting surfaces of said charge collecting components being arranged for mutual rolling on wide external surfaces of respective active components;

said active components comprising respective materials occupying different positions in the triboelectric series, and serving as triboelectrification generators of positive and negative electrical charges in equal quantity separated in the components of different materials and having unequal electrostatic potentials; and

said collecting components comprising at least two collecting bodies having solid electrically conducting portions at least at the surfaces thereof which are arranged for said mutual rolling on said respective active components; and

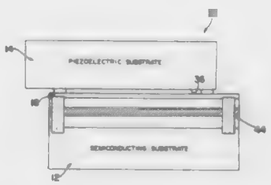
means coupled to said collecting components for transferring electrical charges generated by said mutual rolling from solid electrically conducting portions at the surfaces of said at least two collecting bodies to external terminals.

4,990,814

SEPARATED SUBSTRATE ACOUSTIC CHARGE TRANSPORT DEVICE

William J. Tanski, Glastonbury, and Donald E. Cullen, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 13, 1989, Ser. No. 434,230
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 R 11 Claims



1. A separated substrate charge transport device comprising:

an acoustic charge transport element formed in a major surface of a semiconducting substrate, including

a charge transport channel formed in said semiconducting substrate to have a major dimension extending along said substrate major surface, said channel for receiving electrical charges and providing lateral and vertical confinement thereof;

a first electrode means formed on said semiconducting substrate surface for injecting electrical charges into said transport channel;

a second electrode means formed on said semiconducting substrate surface and electrically configured with said transport channel for receiving modulation signals and altering an electrical potential barrier height in said transport channel in accordance with said modulation signals;

a third electrode means configured with said transport channel for sensing said injected charge and generating an electrical signal indicative thereof;

a fourth electrode means configured with said transport channel at an end thereof distal to said first electrode means for electrically removing said injected charge; and

a surface acoustic wave (SAW) element formed on a major surface of a piezoelectric substrate, said SAW element including a transducer means formed in said SAW ele-

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ment major surface for launching along a propagation axis surface acoustic waves characterized by an evanescent electric field extending outward from said piezoelectric substrate surface; and

a spacer means adapted to receive at opposed ends thereof said semiconducting and piezoelectric substrates, respectively, said spacer means for locating said substrates such that said major substrate surfaces oppose one another and said evanescent electric field penetrates said charge transport channel allowing said injected charge to propagate with said surface acoustic waves.

4,990,815

ROBOT GRIPPER CONTROL SYSTEM USING PYDF PIEZOELECTRIC SENSORS

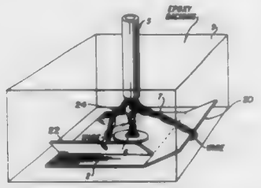
Douglas K. Lindner, 510 Sunrise Dr., Blacksburg, Va. 24060; Richard O. Claus, Rte. 3, Box 138, Christiansburg, Va. 24073, and Michael F. Barsky, 301 Wall St., Blacksburg, Va. 24060

Filed Jul. 11, 1989, Ser. No. 378,052

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—316 **14 Claims**



1. A robot gripper system, comprising:

a gripper mechanism used to engage an object;

a motor for operating the gripper mechanism;

first force sensor means for providing a force signal proportional to the amount of force applied by the gripper mechanism to the object;

a second sensor for providing a slip signal proportional to movement of the object relative to the gripper system; and

a control circuit that receives the force signal and a slip signal and controls the gripper motor.

4,990,816

PIEZOELECTRIC CAPSULE WITH RESILIENT CONDUCTING HOLDING MEANS

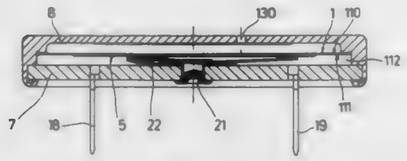
Pierre Causse, Dole; Peter Graham, Bonneville; Bernard Maury, Bonneville, and Jean-Claude Walter, Bonneville, all of France, assignors to Horlogerie Photographique Francaise, Bonneville, France

Filed Feb. 23, 1990, Ser. No. 483,922

Claims priority, application France, Feb. 27, 1989, 89 02930

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—324 **12 Claims**



1. An electroacoustic capsule with piezoelectric membrane, in which:

the membrane is formed of a thin disk on which is fixed a piezoelectric ceramic layer covering the central zone of the disk and the two faces of which are metallized and form respectively an internal electrode and an external electrode,

the membrane is housed in a case formed of a base body and a lid, fixed axially one to the other along a closed periphery, the base body comprising a first wall substantially parallel to the disk with which it forms a rear acoustic cavity, the lid comprising a second wall substantially parallel to the disk with which it forms a front acoustic cavity,

the case comprises a peripheral step inside said closed periphery, against which step a first periphery face of the membrane is held applied by holding means,

a first and second electric connection terminals are insulated electrically and mounted on the base body

the first electric connection terminal is connected electrically to the internal electrode by first electric connection means,

the second electric connection terminal is connected electrically to the external electrode by second electric connection means,

resilient electrically conducting means are inserted between the membrane and the case, bearing both against a portion of the membrane connected electrically to one of the internal or external electrodes, and against a portion of the case connected electrically to the corresponding electric connection terminal, so that the resilient electrically conducting means participate in the electric connection between said internal or external electrode and the corresponding electric connection terminal; wherein

said second periphery face of the membrane is free, separated from the case by a space free of any seal;

said resilient electrically conducting means resiliently urge the membrane in the direction of the peripheral inner step of the case and hold it against said inner peripheral step so that they provide simultaneously by themselves, without using an annular seal, the function of holding the first periphery face of the membrane against the step of the case.

4,990,817

CHIP TYPE ELECTRONIC PART

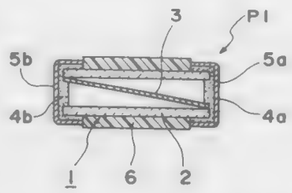
Mitsuro Hamuro, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokako, Japan

Filed Jun. 30, 1986, Ser. No. 880,317

Claims priority, application Japan, Jul. 8, 1985, 60-151081

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—348 **4 Claims**



1. A chip type electronic part which comprises:

a chip main body of a rigid material having a cylindrical external shape having a circular cross-section;

cap terminals having a circular cross-section and mounted on the opposite ends of said chip main body and extending along part of the length of the outer cylindrical surface of said chip main body and in contact therewith; and

a separate outer covering member having a rectangular cross-section and positioned against and covering the outer peripheral surface of said chip main body where the surface is not covered by said cap terminals range for converting the chip type electronic part with a cylindrical external shape of the chip main body to a chip type part with a shape for enabling the coverted chip type part to be adhered to a flat surface.

4,990,818

METHOD OF MAKING A TRANSDUCER FROM A BOULE OF LITHIUM TETRABORATE AND TRANSDUCER SO MADE

Arthur Ballato, Long Branch, and John A. Kosinski, Wall Township, Monmouth County, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1989, Ser. No. 425,539

Int. Cl.[5] H01K *41/08*

U.S. Cl. 310—360 **2 Claims**

1. In a transducer including a lapped and polished plate of lithium tetraborate with metallic electrodes deposited on the major surfaces of the plate and the plate mounted in an evacuated sealed enclosure, the improvement of providing the plate with a doubly rotated orientation of $\phi \simeq 17°$ to $21°$ and $\theta \simeq 54°$ to $58°$ where doubly rotated orientations are described by the IEEE notation widely known in the art as $(YXwl)\phi/\theta$.

4,990,819

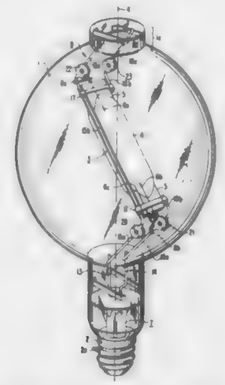
HID LAMP HAVING A CANTED ARC TUBE AND FRAME WITH ROTARY LOCKING JOINTS

William R. Narby, Hammondsport, N.Y.; Charles S. Webster, Carlisle, Mass., and Philip H. Wilson, Campbell, Mass., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 6, 1989, Ser. No. 433,064

Int. Cl.[5] H01J *61/34, 9/26*

U.S. Cl. 313—25 **19 Claims**



1. A high pressure discharge lamp, said lamp comprising an outer envelope defining a lamp axis and having a bulbous portion and a neck portion extending from the bulbous portion; a stem press sealing said neck portion in a gas tight manner; a discharge vessel disposed within said bulbous portion and energizable for emitting light; and a frame assembly for supporting said discharge vessel at a predetermined angle with respect to said lamp axis comprising a first frame section extending from said press seal through said neck portion and a second frame section canted with respect to the lamp axis for holding said discharge vessel, wherein the improvement comprises:

a rotary locking joint joining said two frame sections, said joint comprising two rotary members each secured to a respective frame section, joining means for rotatably joining said two members for rotation of said frame sections from a first position permitting insertion of said first and second frame sections through said neck portion to a second position for holding said discharge vessel at said predetermined angle, and locking means for locking said rotary members with said discharge device at said predetermined angle.

4,990,820

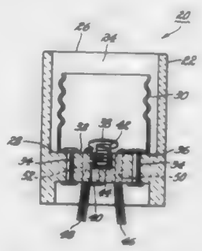
CORROSION RESISTANT SOCKETS FOR ELECTRIC LAMPS

Albert L. Suster, Chagrin Falls, and Rolf S. Bergman, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 164,145, Mar. 4, 1988, Pat. No. 4,914,345. This application Dec. 7, 1989, Ser. No. 447,296

Int. Cl.[5] H01J *5/54*

U.S. Cl. 313—49 **12 Claims**



1. A socket for an electric lamp wherein said socket comprises a housing or base of electrically insulative material containing at least one cavity for receiving a metal base portion of said lamp wherein said cavity has a metal portion within which makes electrical contact with a corresponding or mating metal portion of said metal base portion of said lamp and which is fabricated from a high copper content copper alloy comprising copper in an amount of at least about 94 wt. % along with at least one other metal selected from the group consisting essentially of Cd, Zn, Fe, P, Zr, Sn, Co, Si, Al, Cr and mixture thereof.

4,990,821

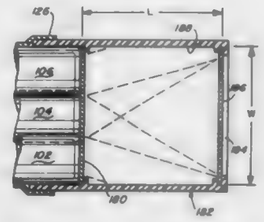
MULTICOLOR PICTURE ELEMENT WITH MERGED COLORS

Ronald G. Blaisdell, Saugus; Joseph V. Lima, Salem, and Robert Y. Pai, Hamilton, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jun. 27, 1988, Ser. No. 221,538

Int. Cl.[5] H01J *5/16, 61/30, 61/40*

U.S. Cl. 313—112 **13 Claims**



1. A lamp assembly for use as a picture element in an information display system, comprising:

low pressure arc discharge lamp means for selectively generating multiple colors, said lamp means having electrical leads extending from a first end thereof and a second end for output of light of different colors from discrete regions thereof;

a diffuser having a predetermined area; and

means for mounting said diffuser in a spaced relationship to

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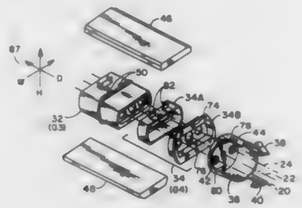
the second end of said lamp means at a distance therefrom selected such that the light from each different color region of said lamp means substantially fills the area of said diffuser, the distance between said diffuser and the second end of said discharge lamp means being at least as great as the maximum dimension of said diffuser, whereby the light outputs from said lamp means are merged at said diffuser.

4,990,822

FOCUSING ELECTRODE ASSEMBLY FOR A COLOR CATHODE RAY TUBE ELECTRON GUN

Kenneth A. Guzowski, Hoffman Estates, and Andrew C. Derr, Western Springs, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 29, 1989, Ser. No. 459,033
Int. Cl.[5] H01J *29/51*
U.S. Cl. 313—414 17 Claims



12. For use in a color cathode ray tube having a three-beam unitized, in-line electron gun, said gun having a series of hollow, rectangular-in-cross-section electrodes for the side-by-side accommodation of the three beams, a two-element anode electrode coupled to an anode voltage for said gun, comprising:

a first cup-shaped element having an electrode face with a single, horizontally elongated aperture for receiving said three beams, said horizontally elongated aperture element having general shape of a dog bone, with two outer beams passing through expanded ends of said horizontally elongated aperture, and center beam passing through narrower, central area of said horizontally elongated aperture; and

a second cup-shaped element having an apertured electrode face with three circular apertures therein, and having flange means extending outwardly from its open end for attachment to rear face of a convergence cup, said second cup-shaped element nested into said first cup-shaped element and having a cup draw effective to provide a predetermined distance between the faces of said first cup-shaped element and said second cup-shaped element when in nested relationship, whereby critical focusing and convergence of said gun can be adjusted by adjustment of said cup draw.

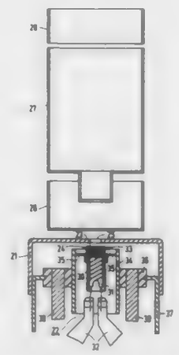
4,990,823

ELECTRON GUN AND METHOD OF MANUFACTURING AN ELECTRON GUN, AND DISPLAY TUBE COMPRISING SUCH AN ELECTRON GUN

Erland C. J. Swaving, and Paul J. Van Rijswijck, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,983
Claims priority, application Netherlands, Sep. 22, 1988, 8802344
Int. Cl.[5] H01J *9/18, 29/46*
U.S. Cl. 313—446 11 Claims

1. An electron gun for generating an electron beam, comprising a cathode unit comprising a cathode shaft which is surrounded by a heat reflection screen, which cathode shaft is secured to a holder containing electron-emitting material having an emissive surface, characterized in that a connection piece is secured to the head end of the cathode shaft, the holder being provided on said connection piece and the cathode shaft being suspended in the heat reflection screen by suspension



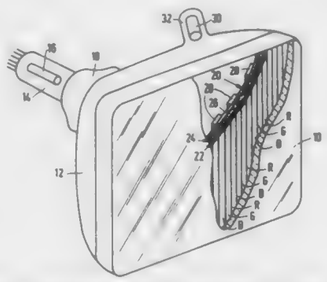
wires, a part of which is secured to the head end of the heat reflection screen, and another part is secured between the connection piece and the holder.

4,990,824

COLOR CATHODE RAY TUBE HAVING INTERFERENCE FILTER WITH DIFFERENT PASS BANDS

Leendert Vriens; Johannes C. N. Rijpers, both of Eindhoven, Netherlands; Albert A. Comberg, Aachen, Fed. Rep. of Germany; Johannes H. M. Wilting, Eindhoven, Netherlands; Aart A. Van Gorkum, Eindhoven, Netherlands, and Franciscus A. Vollenbroek, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,997
Claims priority, application United Kingdom, Apr. 3, 1987, 8707975
Int. Cl.[5] H04N *5/72*
U.S. Cl. 313—474 18 Claims



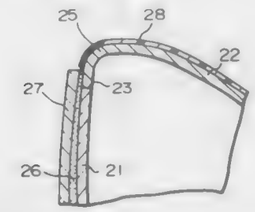
1. A colour cathode ray tube comprising an envelope having a faceplate, an optical multilayer interference filter having a high transmission for light rays which make an angle smaller than 20°–35° to the normal on the filter on the internal surface of the faceplate and a cathodoluminescent layer covering the interference filter, characterised in that the optical interference filter comprises contiguously arranged stripe-like modified quarter wavelength multi-layer dielectric filter elements adapted to pass red, green and blue light produced by the cathodoluminescent layer, in that the filter elements for blue and green light respectively comprise short wave pass filters, and in that the filter elements for red light comprise band pass filters.

4,990,825

CATHODE RAY TUBE HAVING STRESS RESISTANT FRAME

Keitaro Tsukui; Junko Itoh, both of Amagasaki, and Koji Nakamura, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 405,275
Claims priority, application Japan, Sep. 20, 1988, 63-236047
Int. Cl.[5] H01J *29/86, 29/87*
U.S. Cl. 313—482 34 Claims



1. A cathode ray tube including a panel having a rectangular face plate and formed of glass and a funnel constituting a side wall interposed between the panel and a neck incorporating an electron gun disposed in face-to-face relation with said face plate, said cathode ray tube comprising:

a stress resistant frame made of metal and having an L-shaped bend and including a groove in the inner side of said L-shaped bend for imparting resiliency to said stress resistant frame, said stress resistant frame interconnecting said panel and said funnel,

whereby said stress resistant frame is adapted to reinforce said cathode ray tube against a tensile stress occurring due to a reduction in internal pressure of said cathode ray tube.

4,990,826

LOW VOLTAGE GAS DISCHARGE DEVICE

Franklin H. Cocks, 5 Learned Pla., Durham, N.C. 27705, and Peter W. Farner, 3715 Lorraine, Kalamazoo, Mich. 49008

Filed Oct. 27, 1989, Ser. No. 428,109
Int. Cl.[5] H01J *61/067, 61/32, 61/42*
U.S. Cl. 313—485 12 Claims



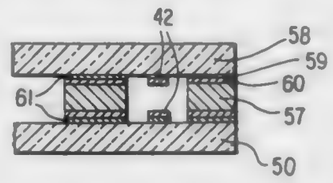
1. A gas-discharge device which comprises a glass into which is cut at least one channel, said channel being provided with evacuation and gas filling means and hermetically sealed to both front and back glass plates, said channel being also provided with a plurality of electrode pairs such that a voltage can be applied across the the channel to cause a glow discharge to occur, said glow discharge being visible through at least one of the front and back plates.

4,990,827

MICRO SECONDARY ELECTRON MULTIPLIER

Wolfgang Ehrfeld; Herbert Moser, both of Karlsruhe, and Dietrich Münchmeyer, Stutensee, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,607
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3709298
Int. Cl.[5] H01J *43/18*
U.S. Cl. 313—533 27 Claims



1. A secondary electron multiplier, comprising:

an insulating substrate plate having a surface;

a plurality of discrete dynodes attached to the surface of the substrate plate, each dynode including at least a first layer of a first metal and a second layer of a second metal this is different from the first metal, with the first and second layers being disposed at different distances from the surface of the substrate plate; and

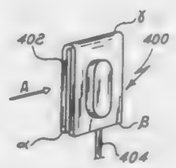
electrical conductor paths attached to the substrate plate, the electrical conductor paths being connected to the dynodes.

4,990,828

MERCURY VAPOR RELEASING GETTER TAPE USEFUL IN THE MANUFACTURE OF COLD CATHODES FOR FLUORESCENT LAMPS

Elio Rabusin, Milan, Italy, assignor to SAES Getter SpA, Milan, Italy

Filed Jul. 5, 1989, Ser. No. 375,732
Claims priority, application Italy, Sep. 12, 1988, 21900/88
Int. Cl.[5] H01J *7/10, 7/18, 7/20*
U.S. Cl. 313—546 5 Claims



1. A metallic tape supporting a mercury vapour releasing material admixed with a non-evaporable getter metal in a continuous series of depressions within said tape the depressions forming successive pairs of individual depressions each pair of depressions being separated by a distance greater than the distance separating the individual depressions.

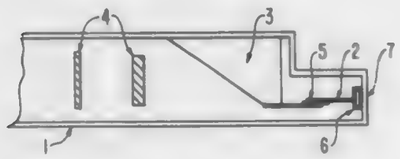
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4,990,829

HIGH FREQUENCY DISCHARGE APPARATUS WITH HOLLOW WAVEGUIDE INPUT SECTION

C. Paul Christensen, Greenbelt, Md., assignor to Potomac Photonics, Inc., Lanham, Md.

Filed Apr. 21, 1989, Ser. No. 341,384
Int. Cl.[5] H01J *7/46, 19/80;* H05B *31/26*
U.S. Cl. 315—39 16 Claims



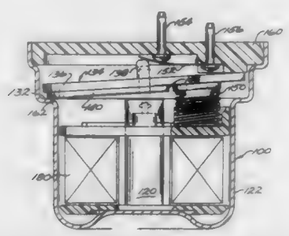
1. A high-power, high-frequency microwave discharge apparatus, having a power level of at least a few hundred kilowatts and which is excited with an electromagnetic field of at least two hundred megahertz, comprising:
a ground plane;
a discharge electrode having a longitudinal axis parallel to said ground plane;
a dielectric discharge tube positioned between said electrode and said ground plane;
a hollow waveguide for guiding the high-power, high-frequency electrical wave from a source toward said discharge electrode;
waveguide transition means coupled to said discharge electrode for transferring said high-frequency electromagnetic fields propagating in said hollow waveguide to said discharge electrode; and
at least one obstacle in said hollow waveguide.

4,990,830

CURRENT SENSING RELAY

Stephen P. Geisbecker, East Walpole, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 25, 1990, Ser. No. 543,599
Int. Cl.[5] H05B *41/00;* H01H *50/24, 50/30, 51/06*
U.S. Cl. 315—106 8 Claims



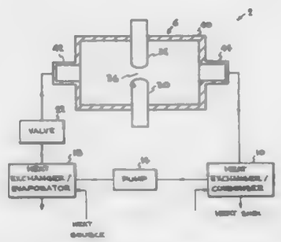
1. A relay for disconnecting fluorescent lamp filaments from an associated filament circuit comprising;
(a) a generally cup shaped housing having a bottom wall and a depending cylindrical side wall, the side wall having a free distal end portion formed with an annular ledge lying in a plane parallel with the bottom wall;
(b) a magnetic flux producing means disposed within the housing, the flux producing means having a center post extending essentially from the bottom wall upwardly to a point slightly below said plane;
(c) actuator means including a coin member of relatively high magnetic permeability disposed within the housing and movable toward the magnetic flux producing means; and
(d) a plurality of switches within the housing, each switch including a movable contact and a stationary contact terminal, the actuator means normally biasing each movable contact into engagement with its associated contact terminal to maintain each of the switches in the normally closed state,
(e) spring means mounted within the housing to place an upward bias on the actuator means, the actuator means including a plastic disc, the coin member attached to the bottom of the plastic disc, the coin member having an edge received on a given point of the ledge in the normal at rest position and tilting upwardly therefrom along a selected longitudinal axis, the coin member extending from the given point of the ledge to a point beyond the center post but short of the ledge on the diametrically opposite side on said axis, upon energization of the flux producing means the coin being pivotable on said edge at the given point of the ledge, until the coin member moves through the said plane with the pivot shifting to two points on the ledge disposed on opposite sides of said axis.

4,990,831

SPARK GAP SWITCH SYSTEM WITH CONDENSABLE DIELECTRIC GAS

William J. Thayer, III, Kent, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1988, Ser. No. 256,839
Int. Cl.[5] H01J *7/24*
U.S. Cl. 315—111.01 21 Claims



1. A spark gap switch system capable of operating at a high pulse rate comprising:
(a) a spark gap switch comprising:
(1) an insulated housing;
(2) a purging gas entrance port in a wall of said housing;
(3) a gas exit port in another wall of said housing; and
(4) a pair of spaced apart electrodes each having one end thereof within said housing and defining a spark gap therebetween;
(b) an easily condensable insulating gas flowing through said switch housing from said entrance port to said exit port to purge hot gases from said housing;
(c) condensing means for condensing said insulating gas after it exits from said housing;
(d) pump means for recirculating said condensed insulating gas as a liquid back to said housing; and
(e) vaporizing means to vaporize at least a portion of said condensed insulating gas back into a vapor prior to flowing said insulating gas back into said housing.

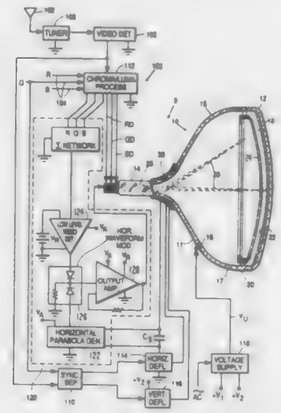
4,990,832

COLOR DISPLAY SYSTEM

Loren L. Maninger, and Frank M. Koch, both of Lancaster, Pa., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed May 22, 1990, Ser. No. 526,754
Int. Cl.[5] H01J *29/58*
U.S. Cl. 315—382.1 5 Claims

1. In a color display system including a cathode-ray tube having an electron gun for generating and directing three electron beams along paths toward a screen of said tube, said gun including electrodes comprising a beam-forming region, electrodes for forming a prefocus lens and electrodes for forming a main focusing lens, and said system including a magnetic field deflection yoke, the improvement comprising



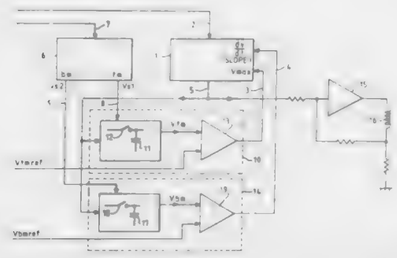
means for applying a dynamic signal to one of said electrodes forming a prefocus lens when electron beam current drops below a predetermined level, said dynamic signal being a maximum voltage at no deflection of the electron beams and decreasing to a minimum at maximum horizontal deflection of the electron beams.

4,990,833

SELF-ADAPTING VERTICAL SCAN CIRCUIT FOR RASTER-SCANNED CATHODE RAY TUBE DISPLAYS

Andrew J. Morrish, Eastleigh, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1990, Ser. No. 507,928
Claims priority, application United Kingdom, Apr. 15, 1989, [illegible]
Int. Cl.[5] G09G *1/04;* H03K *4/08, 4/80*
U.S. Cl. 315—398 10 Claims



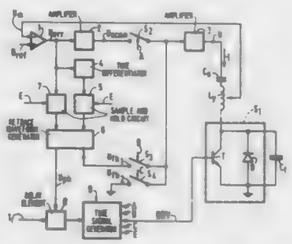
1. An apparatus for controlling the vertical scan of a display having a scan frequency signal and an active video time signal, the duration of which corresponds to the active video time comprising:
means for generating a deflection voltage signal;
means for generating signal pulses (Vs1 and Vs2) indicating when active video time has started and ended;
means for storing the deflection voltage (Vtm) at the start of active video time;
means for comparing said stored deflection voltage (Vtm) to a reference voltage (Vtmref) and subsequently to control the deflection voltage on flyback such that a desired relationship is maintained between the two voltages;
means for storing the deflection voltage (Vbm) at the end of active video time; and
means for comparing said stored deflection voltage (Vbm) to another reference voltage (Vbmref) and subsequently to modify the deflection voltage signal such that a desired relationship is maintained between the two voltages.

4,990,834

LINE DEFLECTION CIRCUIT ARRANGEMENT FOR A PICTURE DISPLAY DEVICE

Age J. Van Dalfsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1989, Ser. No. 446,498
Claims priority, application Netherlands, Dec. 23, 1988, 8803154
Int. Cl.[5] H01J *29/70;* G09G *1/04*
U.S. Cl. 315—411 18 Claims



1. A circuit arrangement for use in a picture display device, which generates an essentially sawtooth-shaped line deflection current through a deflection coil, said circuit comprising, in a series circuit;
(a) a trace capacitor;
(b) said line deflection coil which forms a resonant circuit with said trace capacitor;
(c) a bidirectionally conducting, line frequency controlled switch which conducts during a trace time and does not conduct during a retrace time; and
(d) a source voltage providing AC and DC voltage components to said circuit;
wherein the sum of the DC voltage component of said source voltage and a DC voltage developed by said source voltage across said trace capacitor has a value at least 5 times greater than said AC component.

4,990,835

AUTOMOTIVE MOTOR-DRIVEN DEVICE CONTROLLING AND DRIVING SYSTEM

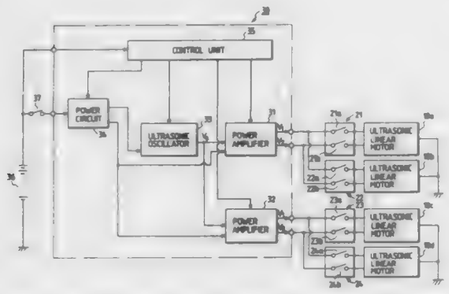
Kazumasa Ohnishi, Nagaoka, and Tadao Noguchi, Iwaki, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,905
Claims priority, application Japan, Jun. 27, 1989, 1-164580
Int. Cl.[5] H02N *2/00*
U.S. Cl. 318—116 1 Claim

1. A control and drive system for controlling and driving a plurality of ultrasonic linear motors for driving automotive motor driven devices, each ultrasonic linear motor comprising an elastic vibratory member and vibration elements attached to the vibratory member, and capable of generating longitudinal and flexural vibrations in the vibratory member to generate a driving force in said vibratory member by combination of the longitudinal and flexural vibrations, for driving a respective automotive motor driven device, said control and drive system comprising:
a power circuit connected through an ignition switch to the battery mounted on an automobile;
a single ultrasonic oscillator connected to the power circuit

for generating voltage signals having frequencies in the ultrasonic range;

a plurality of power amplifiers each at least having one input terminal connected to the output terminal of the power circuit and at least one other input terminal connected to



the output terminal of the ultrasonic oscillator, and having output terminals connected through motor control switches to the ultrasonic linear motors; and

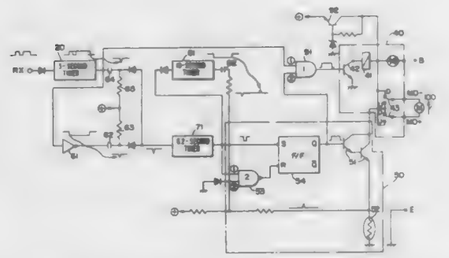
a control unit connected to the battery, the power circuit, the ultrasonic oscillator and the power amplifiers to control said plurality of ultrasonic linear motors.

4,990,836

MOTORIZED AUTOMOBILE ANTENNA CONTROL DEVICE

Kazuhiko Nakase, and Kazufumi Sato, both of Tokyo, Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 281,177
Claims priority, application Japan, Dec. 8, 1987, 62-310079
Int. Cl.[5] H02P *1/22*
U.S. Cl. 318—285 **3 Claims**



1. A motorized automobile antenna control device for controlling a motorized automobile antenna comprising:

a means for causing said motorized automobile antenna to be raised when a power supply of a radio receiver is switched on;

a means for causing said motorized automobile antenna to be lowered when said power supply is switched off; and

a means for preventing said means for causing said motorized automobile antenna to be lowered from operating for a predetermined period of time of two to ten seconds after said power supply is switched off;

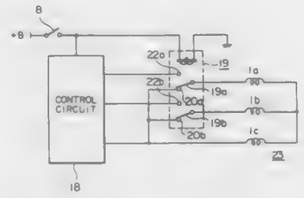
whereby lowering of said motorized automobile antenna is prevented for said predetermined period of time after said power supply of said radio receiver is switched off to thereby prevent abnormal operation of said motorized automobile antenna caused by a starter of said motor vehicle being turned on.

4,990,837

DYNAMIC BRAKING APPARATUS FOR A MOTOR

Chikato Ishitobi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 21,490, Mar. 4, 1987, abandoned. This application Oct. 25, 1989, Ser. No. 427,953
Claims priority, application Japan, Jun. 3, 1986, 61-48939
Int. Cl.[5] H02P *3/12*
U.S. Cl. 318—375 **3 Claims**



1. A control apparatus for a motor having m stator windings where m is an integer greater than one, said control apparatus comprising:

a power source for providing power;

a first switch for alternatively applying or removing power;

a control circuit coupled between the power source and the m stator windings for controlling the application of power to said m stator windings;

a second switch coupled between the control circuit and (m−1) of said m stator windings, the other stator winding being coupled to the control circuit independently of the second switch, said second switch including (m−1) switch contacts respectively connected in series with said (m−1) stator windings and responsive to the first switch, said (m−1) switch contacts (1) moving to a first position connecting said control circuit to said (m−1) stator windings and supplying power between the control circuit and said (m−1) stator windings when the first switch applies power and (2) moving to a second position connecting said (m−1) stator windings to said other stator winding and to each other when the first switch removes power wherein each of said m stator windings are short circuited to each of the other m stator windings, thereby switching said motor into a dynamic braking mode.

4,990,838

MOVEMENT TRAJECTORY GENERATING METHOD OF A DYNAMICAL SYSTEM

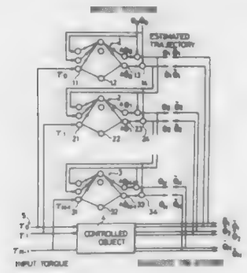
Mitsuo Kawato, Kyoto; Yoshiharu Maeda, Shizuoka; Yoji Uno, and Ryoji Suzuki, both of Tokyo, all of Japan, assignors to ATR Auditory and Visual Perception Research Laboratories, Kyoto, Japan

Filed Jan. 3, 1990, Ser. No. 462,531
Claims priority, application Japan, Jan. 5, 1989, 64-768
Int. Cl.[5] G06F *15/20*
U.S. Cl. 318—568.10 **12 Claims**

1. A method for generating a time trajectory of a controlled object comprising the steps of:

generating said time trajectory of said controlled object in a network by using conditions for estimating the movement trajectory comprising at least one of a movement time, a start point, an end point and a via-point of the trajectory, and obstacles to the movement; and

using a criterion for ensuring smoothness of the movement trajectory by minimizing evaluation functions in integration for a movement time obtained by square of a function of movement comprising at least one of the third derivative of position with respect to time, time change of torque, and time change of force.

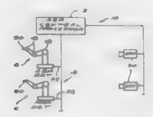


4,990,839

MODULAR ROBOTIC SYSTEM

William J. Schonlau, 28127 Ridgepoint Ct., Rancho Palos Verdes, Calif. 90274

Filed Dec. 9, 1988, Ser. No. 281,625
Int. Cl.[5] G05B *13/00*
U.S. Cl. 318—568.1 **11 Claims**



1. A modular robotic system for displacing an end effector through a prescribed path of motion, comprising:

an arm set defined by an assembled plurality of modular components including a plurality of active members each having a drive portion and a driven portion movable with respect thereto, said arm set being adapted to carry said end effector;

a control station including means for transmitting an end effector position signal;

cable means coupled between said control station and each of said active members for communicating said end effector position signal to said active members, said cable means being coupled to said active members; and

microprocessor means mounted on-board each of said active members for receiving and interpreting said end effector position signal and for responding thereto to operate said drive portion for displacing said driven portion through an individualized displacement, whereby the combination of individual displacements of said driven portions of said active members displaces said end effector to a prescribed destination point;

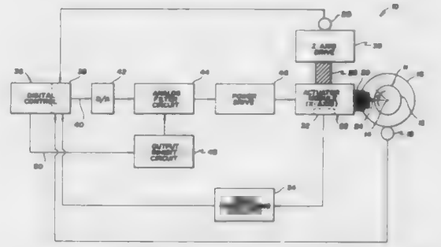
said drive portion of each of said active members including a drive motor having an output shaft, and said driven portion of each of said active members comprises a driven sleeve coupled to said output shaft, and further wherein said microprocessor means is responsive to said end effector position signal to operate said drive motor to rotate said output shaft in a selected direction and magnitude.

4,990,840

METHOD AND SYSTEM FOR CONTROLLING A MACHINE TOOL SUCH AS A TURNING MACHINE

Kenneth F. Migda, Sterling Heights, Mich., assignor to The Cross Company, Fraser, Mich.

Continuation of Ser. No. 363,447, Jun. 6, 1989, abandoned, which is a continuation of Ser. No. 157,877, Feb. 19, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 517,396
Int. Cl.[5] G05B *19/25*
U.S. Cl. 318—571 **10 Claims**



1. A method for controlling the position of a tool (24) movable relative to a surface of a workpiece (11) rotatable about a rotational axis (14) in a machining operation, said method comprising the steps of: generating an angular position signal representative of the angular position of the workpiece; generating an initial control signal as a function of the angular position signal; generating a tool position feedback signal representative of the position of the tool; generating a final control signal as a function of the initial control signal and the tool feedback signal to control the position of the tool as a function of tool position wherein the improvement comprises:

the tool position feedback signal is a function of a series of discrete signals representative of a position of the tool and wherein the method further comprises the step of digitally filtering the tool position feedback signal;

generating a velocity compensation signal derived from the current angular position of the workpiece; and

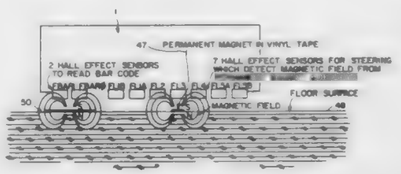
modifying the final control signal so that the final control signal is a function of the velocity compensation signal and the filtered tool position feedback signal.

4,990,841

MAGNETICALLY GUIDED VEHICLE

Mark Elder, Boulder, Colo., assignor to Apogee Robotics, Fort Collins, Colo.

Filed Sep. 19, 1989, Ser. No. 409,063
Int. Cl.[5] G05D *1/00*
U.S. Cl. 318—587 **9 Claims**



1. An improved guidance system, comprising:

(a) a tape having permanent magnet material incorporated therein, said tape being attachable to a floor surface, said tape, when attached to said floor surface, defining a desired guide path;

(b) a device adapted to travel over said floor surface along said guide path, said device having a guidance system, comprising:

(i) at least three Hall effect sensors arranged in a linear

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array, said device being oriented with respect to said guide path such that said array is maintained, by operation of said guidance system, substantially perpendicular to said guide path;

(ii) a controller electrically connected to said sensors and receiving first signals therefrom indicative of the position of said array with respect to said tape, each said sensor being electronically connected to said controller via a corresponding sub-circuit including a comparator which compares said first signals with a variable reference signal, said controller varying said reference signal from a first high voltage downwardly in stepped fashion until said first signals exceed said reference signal whereupon said first signals are transmitted to said controller;

(iii) motive means on said device for moving said device along said guide path, said controller emitting second signals to control said motive means;

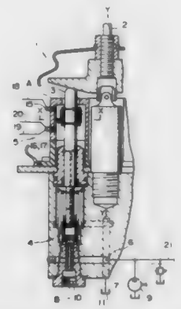
(c) a code on said floor surface, said guidance system having a code reader adapted to read said code when said device travels thereover, said code reader sending third signals to said controller indicative of said code, said third signals accessing a memory means of said controller wherein information is stored regarding specifics of said guide path, said controller comparing said information with said first signals to verify movements of said device along said guide path.

4,990,842

OPERATION CONTROL METHOD AND DEVICE FOR CONSTRUCTION MACHINE

Satoshi Miyaoka, Hiroshima, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 14, 1990, Ser. No. 479,999
Claims priority, application Japan, Feb. 14, 1989, 1-35802
Int. Cl.[5] F16D *31/02*
U.S. Cl. 318—590 6 Claims



1. An operation control method for a remote control system in a construction machine in which an operating lever is operated to generate a signal proportional to an operation quantity of said operating lever and operate said construction machine according to said signal the operation control method using as said operating lever a single lever, said signal comprising a plurality of signals including hydraulic and electric signals proportional to the operation quantity of said single lever, said method comprising the steps of:

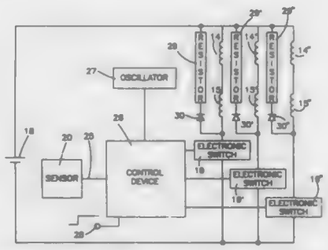
simultaneously generating said plural signals including generating the electric signals by sensing movement of said operating lever by the operation of said single lever, and supplying said plural signals to various control devices.

4,990,843

RELUCTANCE MOTOR

Lars G. Moren, Huddinge, and Bengt G. Hedlund, Stockholm, both of Sweden, assignors to Electrolux Mecatronik Aktiebolag, Malmo, Sweden

PCT No. PCT/SE89/00355, § 371 Date Feb. 21, 1990, § 102(e) Date Feb. 21, 1990, PCT Pub. No. WO90/00325, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 20, 1989, Ser. No. 465,145
Claims priority, application Sweden, Jun. 27, 1988, 8802394
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—701 3 Claims



1. A reluctance motor comprising a stator (**11**) having three pairs of poles (**1,1'**; **2,2'**; **3,3'**) provided with windings (**14**, **15**) and a rotor (**12**) made from soft magnetic material and having four poles (**13**) which are disposed diametrically opposite each other in pairs, the windings (**14,15**) in each stator pole pair (**1,1'**; **2,2'**; **3,3'**) being connectable to a DC source (**18**) under the control of a control device (**26**) responsive to a signal from a sensor device (**20**) which, during the movement of the rotor, is arranged to indicate the position of the rotor poles, characterized in that the sensor device (**20**) includes a sensor (**21**) which cooperates with a disc (**23**) rotating with the rotor, said disc having twelve wings equally distributed and each having the shape of a sector of a circle, the peripheral extension of which corresponds wit the corresponding extension of the gap between two wings, said sensor during one turn of the rotor (**12**) emitting to the control device (**26**) a train of rectangular pulses, said pulse train having at least as many pulses as correspond to the number of stator poles, the wings (**22**) of the disc (**23**) rotating with the rotor (**12**) being so disposed with respect to the rotor poles (**13**) that a flank in the pulse train appears when a rotor pole is about to turn in over a stator pole, said control device (**26**), at the start of the motor initially positioning said rotor with said sensor being disabled, said sensor then being enabled wherein said control device (**26**) in response thereto connects the stator pole pairs (**1,1'**; **2,2'**; **3,3'**) to the Dc source (**18**) in the order corresponding to the desired direction of rotation of the rotor (**12**), said control device (**26**) being arranged during the course of positioning first to connect a predetermined one of the stator pole pairs (**1,1'**; **2,2'**; **3,3'**) to the DC source (**18**) and thereafter to connect a predetermined one of the remaining stator pole pairs, the connecting time period for the respective pole pair being so long as to permit the completion of the transient period of the rotor movement.

4,990,844

DC BRAKING OF INVERTER-DRIVEN AC MOTORS

David J. Gritter, Racine, and David M. Messersmith, Kenosha, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

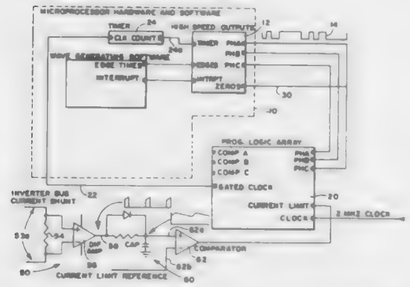
Filed Oct. 18, 1989, Ser. No. 423,811
Int. Cl.[5] H02P *3/18*
U.S. Cl. 318—762 4 Claims

1. A method for braking an inverter-driven induction motor having at least three phases, in which an inverter drive has a PWM waveform generator, and has a first group of main switches connected from each phase with a first polarity of DC bus and a second group of main switches connected from each

phase with a second polarity of DC bus, the switches being controllable by commands, comprising the steps of:

stopping the PWM waveform generator;

starting a first mode of braking by turning on the main switches, in the first switch group, of two phases, and turning on the main switch, in the second switch group, of a third phase;



monitoring the current and, when a predetermined current limit is reached, turning off all phase commands;

maintaining the main switches in their respective on or off states even after the current of the drive decreases below the current limit;

repeating the above cycle at a predetermined rate to establish an average braking torque in the motor.

4,990,845

FLOATING CURRENT SOURCE

John C. Gord, Los Angeles County, Calif., assignor to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.

Filed Dec. 18, 1989, Ser. No. 428,179
Int. Cl.[5] G05F *3/08, 3/16*
U.S. Cl. 323—312 4 Claims



1. A floating current source, comprising:

two field effect transistors FET's, one of said FETs defining a reference FET (FET-R) and the other defining a floating output FET, FET-O;

FET-R having its gate connected to a reference voltage VR, and its source connected to receive an input current from an input current source and to generate a gate-to-source voltage which when applied as a gate-to-source voltage to FET-O will generate an output current in FET-O equal to the input current or a multiple thereof; and

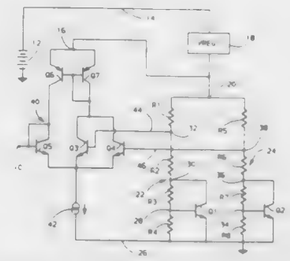
circuit means for applying source of FET-O a voltage equal to the gate-to-source voltage of FET-R, including a series circuit having two matching resistors, R1 and R2, means for generating a voltage V1 across R1 substantially equal to the gate-to-source voltage at FET-R, means for generating a substantially equal voltage V2 across R2, and means for applying V2 across the gate and source of FET-O.

4,990,846

TEMPERATURE COMPENSATED VOLTAGE REFERENCE CIRCUIT

Paul E. Buck, Russiaville; Robert J. Campbell, Noblesville; Debra E. Poppas, Kokomo; John R. Shreve, Kokomo, and Richard J. Voss, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 26, 1990, Ser. No. 498,511
Int. Cl.[5] G05F *3/22*
U.S. Cl. 323—314 7 Claims



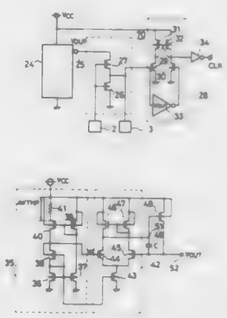
1. A reference voltage developing circuit for developing a temperature dependent multiple slope reference voltage comprising, a first circuit comprising the base and emitter of a first transistor for developing a voltage the magnitude of which varies with changes in temperature and which responds to changes in the base-emitter voltage of said first transistor with changes in temperature, said first circuit including means operative to provide a first voltage that has a first slope, a second circuit comprising the base and emitter of a second transistor for developing a voltage the magnitude of which varies with changes in temperature and which responds to changes in the base-emitter voltage of said second transistor with changes in temperature, said second circuit including means operative to provide a second voltage that has a second slope that is different from said first slope, and voltage selector means coupled to said first and second circuits for providing an output voltage which corresponds to only one of said first and second voltages.

4,990,847

MICROCOMPUTER

Yoshiyuki Ishimaru, and Akio Kiji, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,639
Claims priority, application Japan, Dec. 19, 1988, 63-321568
Int. Cl.[5] G05F *3/24*
U.S. Cl. 323—314 3 Claims



1. A microcomputer comprising a step-down regulator for stepping down the voltage of a CPU operation power source

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to a low voltage, an oscillator including an oscillating element and input and output side pads connected thereto and capable of oscillation according to a low voltage output of said step-down regulator and a level shifter for stepping up the output voltage of said oscillator up to said voltage of said CPU operation power source.

4,990,848

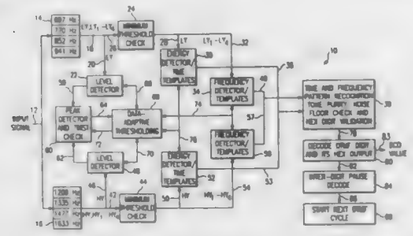
DTMF RECEIVER

John L. W. So, Norcross, Ga., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 325,621, Mar. 20, 1989, abandoned, which is a continuation of Ser. No. 206,156, Jun. 13, 1988, Pat. No. 4,833,399. This application Jan. 22, 1990, Ser. No. 471,655

Int. Cl.[5] G01R *23/14*

U.S. Cl. 324—79 R **42 Claims**



1. Apparatus for recognizing a pattern in an input signal, comprising:

a digital filter for generating a temporal energy signal and a plurality of spectral energy signals for each of a plurality of predetermined sampling periods in response to receiving said input signal;

a time-domain test template generator for receiving said temporal energy signal and operable to generate a time-domain test template in response thereto;

a frequency-domain test template generator for receiving said spectral energy signals operable to generate a frequency-domain test template in response thereto; and

a pattern recognizer coupled to said test template generators for comparing at least one time-domain reference template to said time-domain test template and for comparing at least one frequency-domain reference template to said frequency-domain test template, said recognizer indicating recognition of a pattern upon a predetermined match of said templates; and

wherein said time-domain test template generator comprises an accumulator for accumulating said temporal energy signals for each of a plurality of time intervals, each interval comprising a plurality of said sampling periods.

4,990,849

Patent Not Issued For This Number

4,990,850

METAL DETECTOR WITH TWO MAGNETIC FIELD TRANSDUCERS CONNECTED IN OPPOSING RELATIONSHIP AND THEIR SENSING DIRECTIONS ORTHOGONAL TO THE MAGNETIC FIELD

Jan V. Votruba, Port Jefferson Station, N.Y., assignor to Fonar Corporation, Melville, N.Y.

Filed Jul. 17, 1987, Ser. No. 74,901

Int. Cl.[5] G01N *27/72;* **G01R** *33/00, 33/06;* **G08B** *13/24*

U.S. Cl. 324—225 **2 Claims**

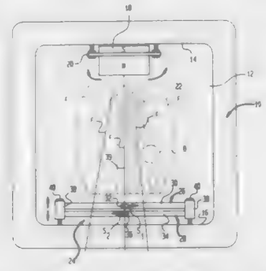
1. Apparatus for detecting the presence of ferromagnetic material in a predetermined detection zone comprising:

magnetic field producing means for providing a detection magnetic field extending through said detection zone;

transducer means including first and second transducers disposed adjacent one another for producing, respectively, a first signal directly related to the magnetic field component in a first sensing direction and a second signal directly related to the magnetic field component in a second sensing direction opposite to said first sensing direction, whereby an increase in magnetic field component in said first sensing direction will increase said first signal and decrease said second signal and whereby said first and second transducers will be exposed to substantially the same environmental conditions;

signal processing means for providing an output signal related to the difference between said signals, said signal processing means including means for amplifying said first and second signals, said output signal or both;

means for mounting said transducers so that said sensing directions are substantially orthogonal to the direction of a magnetic field prevailing in the vicinity of said transducers while said magnetic field is in a predetermined rest



state, said mounting means including means for mounting said transducers so that said sensing directions are substantially orthogonal to said detection magnetic field in the absence of ferromagnetic material within said detection zone; and

nuling means for adjusting said output signal to a predetermined null value when there is no ferromagnetic material in said detection zone, whereby a change in said output signal from said null value will indicate the presence of ferromagnetic material in said detection zone, said nulling means including means for adjusting said output signal to substantially a zero value and for adjusting the relative orientation of said transducers and said detection magnetic field.

4,990,851

TRANSIENT ELECTROMAGNETIC METHOD FOR DETECTING IRREGULARITIES ON CONDUCTIVE CONTAINERS

Brian R. Spies, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 291,632, Dec. 29, 1988, Pat. No. 4,929,898, which is a continuation-in-part of Ser. No. 134,368, Dec. 17, 1987, Pat. No. 4,843,320. This application Jan. 4, 1990, Ser. No. 461,033

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[5] G01N *27/90;* **G01R** *33/12;* **G01B** *7/10*

U.S. Cl. 324—240 **27 Claims**

4. A method of detecting irregularities on electrically conductive walls of container means, comprising the steps of:

(a) providing transmitting antenna means and transmitter means connected with said transmitting antenna means;

(b) providing receiving antenna means and receiver means, said receiving antenna means comprising plural receiving antennas, said receiving means being connected with each of said receiving antennas;

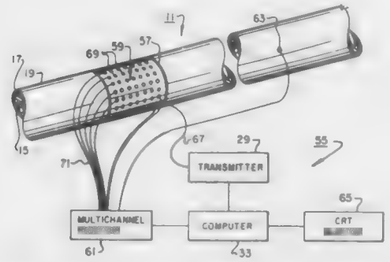
(c) placing said transmitting antenna means in proximity to that portion of the container means wall which is to be investigated for irregularities;

(d) placing said receiving antenna means

being placed near said transmitting antenna means, said individual receiving antennas being distributed over said container means wall portion in a predetermined spatial relationship with one another;

(e) providing an abruptly changing current to said transmitting antenna means from said transmitter means so as to induce current into said investigated container means wall portion;

(f) detecting the presence of and the decay of said induced current in said investigated container means wall portion with said receiving antennas and said receiver means to produce plural received signals, said plural received signals being obtained simultaneously by said receiving an-



tennas and said receiver means, each of said received signals having intermediate and late time ranges;

(g) examining said intermediate and late time ranges of each of said received signals to determine the respective decays of said received signals, and comparing the decays of the respective received signals to the decay of a reference signal obtained from a reference container means wall portion of known thickness, wherein said received signal decays from said investigated container means wall portion gives an indication of the thickness of the investigated container means wall portion and the presence or absence of irregularities on the investigated container means wall portion can be determined;

4,990,852

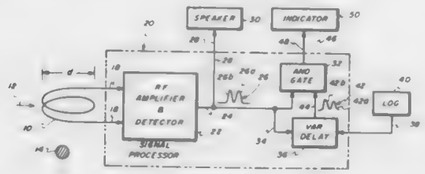
AUTOMATIC CLASSIFIER FOR ELECTRIC WIRE DETECTOR

James L. Kirkland, Panama City, Fla., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1973, Ser. No. 395,321

Int. Cl.[5] G01V *3/08;* **G01R** *19/00*

U.S. Cl. 324—326 **10 Claims**



1. Apparatus for detection and classification of an elongated, electrically conductive object such as a wire having a portion running generally in a predetermined direction and lying in a first plane, said apparatus comprising:

a search coil having a predetermined loop diameter and adapted to be moved at a selected speed in a plane substantially parallel to said first plane and along a path that is anticipated will cross said object, said search coil being subject to radio frequency electromagnetic coupling with said object, said coupling being characterized by first and second peaks of coupling when leading and trailing limbs, respectively, of said coil are in overlying relation to said object, said peaks being separated by a time interval that is a predetermined function of said predetermined loop diameter and said selected speed;

radio frequency amplifier and detector means, for providing detected signals having first and second amplitude peaks corresponding to peak coupling between said object and the leading and trailing limbs of said search coil;

AND gate means, having first and second input connections;

delay means, connected between said radio frequency amplifier and detector means and said first input connection, for delaying application of said detected signals to said first input connection for a delay period corresponding to said time interval;

said second input connection being connected to receive said detected signals directly from said amplifier and detector means, whereby upon substantial coincidence of said first and second amplitude peaks at said first and second input connections, said AND gate means provides an output signal; and

utilization means, coupled to said AND gate means for effecting a predetermined physical response to said output signal.

4,990,853

PROTECTIVE DEVICE PERMITTING MORE SPECIALLY THE USE OF PROBE IN LARGE DIAMETER WELLS

Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Continuation of Ser. No. 69,174, Jul. 2, 1987, Pat. No. 4,929,915. This application Oct. 23, 1989, Ser. No. 424,926

Claims priority, application France, Feb. 27, 1987, 87 02757

Int. Cl.[5] G01V *3/20, 3/28*

U.S. Cl. 324—347 **12 Claims**



1. A protective device for a logging probe having a longitudinal axis and having an exterior surface with a small diameter relative to a well in which the probe is to operate, said device comprising a rigid tubular-like casing adapted to be connected to the exterior surface of the probe and acting to enlarge the effective diameter of the exterior surface of the probe in comparison with the well diameter, fastening means for locating said rigid casing coaxially on the probe and for fastening the casing circumferentially around the probe on at least one level of said exterior surface of the probe, said rigid casing having an exterior surface longitudinally surrounding at least the exterior surface of the probe arranged around an active part of said probe for carrying out the logging measurement, said casing being capable of transmitting a signal emitted and/or received by said probe without substantial attenuation on the signal,

wherein the exterior surface of the casing is spaced from the exterior surface of the probe and from the active part of the probe thereby enlarging the effective diameter of the probe and the fastening means for the casing are located on the probe so that mechanical stresses occurring in the well are applied and transmitted along the exterior surface of said casing without adversely acting on the exterior surface of the probe arranged around the active part of said probe.

4,990,854

PROCESS AND DEVICE FOR AUTOMATICALLY DETECTING THE RESPONSE VOLTAGE OF AN ELECTROMAGNETIC COMPONENT, IN PARTICULAR AN ELECTROVALVE

Eckehart Friz, Ebersbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

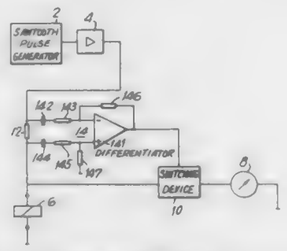
PCT No. PCT/DE87/00416, § 371 Date Mar. 28, 1989, § 102(e) Date Mar. 28, 1989, PCT Pub. No. WO88/02491, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 12, 1987, Ser. No. 348,666

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633113

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—418 **4 Claims**



1. Process for automatically detecting the response voltage of an electromagnetic valve having a coil connected in series with a measuring resistor, comprising the steps of

applying an increasing testing voltage across the series connection of the measuring resistor and the coil of the electromagnetic valve;

measuring the change of the voltage drop across the coil of the electromagnetic valve and indicating the instantaneous measured voltage value;

differentiating the voltage drop across the measuring resistor to produce a switching signal when current flowing through the series connection decrease due to the response of the electromagnetic valve;

stopping by means of the switching signal the indication of the instantaneous measured voltage value;

said increasing testing voltage being a staircase-shaped voltage produced by controlling a digital-to-analog converter by a free-running binary counter; and

the instantaneous measured voltage being indicated by means of an indicating device which is controlled by means of a second counter.

4,990,855

CONDUCTIVITY PROBE FOR USE IN THE PRESENCE OF HIGH INTENSITY NUCLEAR RADIATION

Leonard W. Niedrach, and Dale F. Taylor, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1989, Ser. No. 368,680

Int. Cl.[5] G01N *27/26*

U.S. Cl. 324—449 **9 Claims**

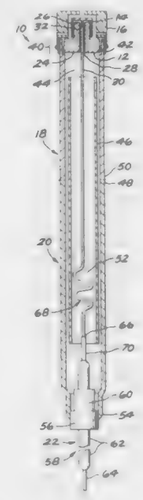
1. An electrical conductivity sensor designed to withstand high temperatures, pressures and nuclear radiation,

an alumina insulator having a base region with an external attachment surface, and an integrally formed post with an external attachment surface, the post extending from the base region and having a channel extending through the post and base for conveying a conductor insulatively through the insulator;

a first metallic coating intimately adhered to the external attachment surface of the post, and a second metallic coating intimately adhered to the base external attachment surface, the first and second metallic coatings being formed to accept a braze bond;

a central electrode formed from a select metal exhibiting a coefficient of thermal expansion compatible with the alumina insulator and resistant to corrosion in a boiling water reactor, the central electrode having a concave interior surface with a third metallic coating intimately adhered thereto for accepting a braze bond, the central electrode being positioned over the external attachment surface and brazed thereto in a compressive seal;

sleeve means formed of a first select metal exhibiting a coefficient of thermal expansion compatible with the alumina insulator and resistant to corrosion in a boiling water reactor, the sleeve means having an acceptance portion with a fourth metallic coating intimately adhered thereto



for accepting a braze bond, the acceptance portion being in compressive sealed brazed connection with the base external attachment surface of the insulator and insulatively separated from the central electrode, the sleeve means having a first internal channel extending along the lengthwise extent thereof;

a counter-electrode formed from a select metal resistive to corrosion in a boiling water reactor, the counter-electrode being attached with an electrically conducting bond to the sleeve means and extending over the central electrode at a fixed spaced distance, the counter-electrode containing a plurality of openings to permit a continuous exchange of fluid to fill the gap between the central electrode and the counter-electrode;

a conductor connected in electrical contact with the interior surface of the central electrode and insulatively extending therefrom through the channel in the insulator and insulatively extending through the first internal channel in the sleeve means; and

positioning and signal transfer means for operatively supporting the sleeve means and conveying signals to and from the conductor and the sleeve means.

4,990,856

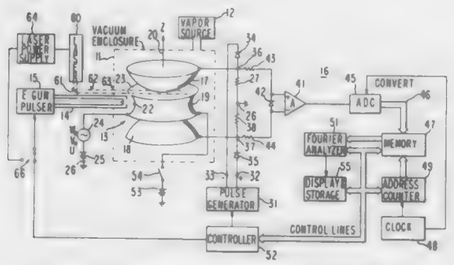
MASS ANALYSIS APPARATUS AND METHOD

Weston A. Anderson, Palo Alto, and James T. Arnold, Sunnyvale, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 300,142, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 832,284, Feb. 21, 1986, abandoned. This application Oct. 3, 1989, Ser. No. 418,789

Int. Cl.[5] G01N *27/62*

U.S. Cl. 324—464 **31 Claims**



1. A method of analyzing a gas sample having plural species comprising the steps of:

decomposing molecules, molecular fragments and atoms of the sample into ions;

applying a trapping field to the ions so that the ions are confined in a fixed volume of space about an equilibrium plane;

disturbing the ions so that the ions have coherently oscillating components at right angles to the equilibrium plane at frequencies that are a function of the masses of the species of the ions and amplitudes that are a function of the numbers of ions of each species; and

analyzing the frequencies and amplitudes of the oscillations after said step of disturbing is completed.

4,990,857

INSULATION TESTING APPARATUS OF A REFRIGERATING MACHINE

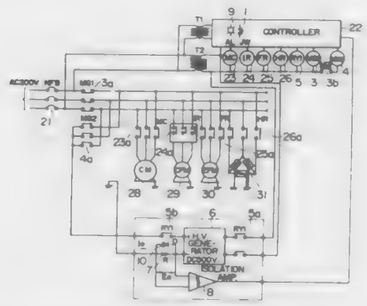
Kanji Isomichi; Hiroshi Ogawa, both of Nagoya; Nobuhiro Funahashi, and Toshio Yamashita, both of Aichi, all of Japan, assignors to Mitsubishi Juko Gyo k.k., Tokyo, Japan

Continuation of Ser. No. 295,836, Jan. 11, 1990, abandoned. This application Jan. 22, 1990, Ser. No. 467,273

Claims priority, application Japan, Jan. 18, 1988, 63-7950

Int. Cl.[5] G01R *31/12*

U.S. Cl. 324—551 **8 Claims**



1. A self testing refrigeration machine, comprising:

a plurality of electrical devices including a compressor device, a blower device, and a resistor type electric heater device;

each of said devices including a power connecting terminal and a frame as well as insulation;

an internal power line for connecting said terminals to an electric drive source;

a plurality of control relays each having a contact connecting each of said power terminals to said internal power line;

a device actuating controller for operating said control relays to affect operation of said electrical devices;

a self-diagnosis switch in said controller;

means for separating said internal power line from said electric drive source in response to said self diagnosis switch;

a test voltage generator connected to said frames and having a high DC voltage source and a series resistor connected in series with said high DC voltage source;

means for forming a plurality of closed loop circuits and including said series resistor, said internal power line, said contact of one of the electrical devices, and the frame of one of said electrical devices;

means for applying a high DC voltage source to said closed loop circuits from said high DC voltage generating means; and

testing means is said controller for energizing each of said control relays in turn so as to apply a high DC voltage to each of said electrical devices in turn through the contact of one of said control relays and for measuring the voltages thus generated across said series resistor by electric currents produced by said high voltage, so as to test the insulation of each of said electrical devices.

4,990,858

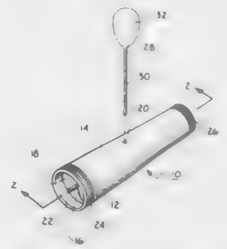
COAXIAL MICROWAVE ASBORPTION DIAGNOSTIC

Harold R. Garner, Encinitas, Calif., assignor to General Atomics, San Diego, Calif.

Filed May 25, 1989, Ser. No. 357,333

Int. Cl.[5] G01R *27/04, 27/26*

U.S. Cl. 324—639 **25 Claims**



1. A diagnostic device for examining a sample which comprises:

a substantially cylindrical-shaped body defining a longitudinal axis and formed with a passageway substantially perpendicular to said axis for receiving said sample therein, said body comprising an outer conductor layer, a conductor rod having a first end and a second end positioned along said axis, and a dielectric material connecting said layer with said rod to allow a sample holder in said passageway to contact said rod, said dielectric material and said layer;

means electrically connected with said first end of said rod to propagate a preselected input microwave power through said body along said axis;

means electrically connected with said second end of said rod for receiving an output microwave power; and

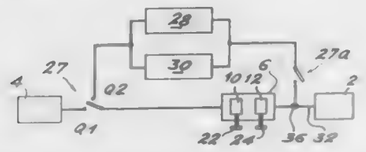
means for comparing said output microwave power with said input microwave to examine said sample.

4,990,859

PROCESS AND APPARATUS FOR DETERMINING THE IMPEDANCE OF THE DISCHARGE IN A PLASMA REACTOR SYSTEM COMPRISING A TUNING BOX AND APPLICATION TO THE REGULATION OF THE IMPEDANCE OR THE IONIC CURRENT IN SUCH REACTOR

Bernard Bouyer, Grenoble; Bernard Andries, Thones; Guillaume Ravel, Annecy, and Louise Peccoud, Claix, all of France, assignors to Commissariat a L'Energie Atomique, France

Filed Jun. 23, 1989, Ser. No. 370,608
Claims priority, application France, Jun. 24, 1988, 88 08514
Int. Cl.[5] G01R *27/28*
U.S. Cl. 324—649 6 Claims



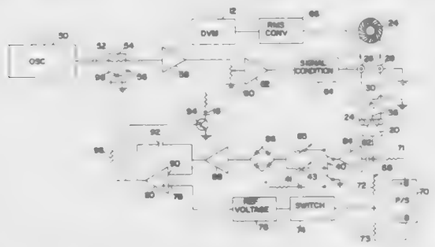
1. A method for determining the impedance of the discharge in a high frequency plasma reactor system comprising a tuning box having variable capacitors, the method comprising the steps of:
(1) establishing a relationship between the operational positions of the variable capacitors on the one hand and the impedance of the discharge on the other;
(2) determining the respective positions of the variable capacitors; and
(3) determining the impedance of the discharge in dependence on these respective positions and by means of the established relationship.

4,990,860

APPARATUS FOR MEASURING THE NUMBER OF TURNS OF A TOROIDAL COIL

Meredith P. Peterson, Burlington, Mass., assignor to Third Wave Instruments, Inc., Burlington, Mass.

Filed Sep. 20, 1989, Ser. No. 409,825
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—726 20 Claims



1. Apparatus for measuring the number of turns of a toroidal coil comprising
structure adapted to receive the coil to be tested,
circuitry for energizing the coil to be tested including an oscillator for generating an AC signal for application to the coil under test, and a voltage control connected in circuit between said oscillator and the coil under test for varying the voltage applied to the coil under test;
circuitry for establishing a secondary circuit through a toroidal coil on said coil receiving structure,
circuitry connected to said secondary circuit establishing circuitry including circuitry responsive to the voltage induced in said secondary circuit establishing circuitry by said coil energizing circuitry, a reference voltage source, comparator circuitry responsive to said reference voltage source and said circuitry responsive to the voltage induced in said secondary circuit establishing circuitry for varying said voltage control, and circuitry for stabilizing said voltage control when signals to said comparator from said reference voltage source and from said circuitry responsive to the voltage induced in said secondary circuit establishing circuitry are equal; and
an output responsive to the AC signal applied to the coil for providing an indication of the number of turns on the coil as a function of the AC signal applied to the coil being measured.

4,990,861

ELECTRON ACCELERATOR OF THE MICROTRON TYPE

Gerardis J. Ernst and Wilhelmus J. Wiheman, Hengelo, both of Lonser, Netherlands, assignor to Ultra-Centrifuge Nederland N.V., Almelo, Netherlands

Filed Feb. 6, 1989, Ser. No. 306,067
Claims priority, application Netherlands, Feb. 10, 1988, 8800325
Int. Cl.[5] H05H *13/00*
U.S. Cl. 328—233 4 Claims



1. An electron accelerator of the microtron type, comprising a vacuum chamber having two spaced apart, nearly parallel, flat pole pieces, between which a static, substantially homogeneous magnetic field is maintainable, a microwave resonating cavity interposed between the pole pieces in the vacuum chamber, means for supplying electrons and injecting them into the accelerator, said electrons moving in circular orbits in a plane parallel to the pole pieces under the influence of the homogeneous magnetic field and undergoing acceleration at each crossing of the microwave resonating cavity, as well as means for withdrawing the electrons from the accelerator after they have been sufficiently accelerated, characterized in that the means for injecting electrons comprise means for injecting the electrons through one of the pole pieces, at an angle to the circular orbits of the electrons, injecting an electron beam provided by an external source of electrons, as well as a deflecting magnet interposed between the pole pieces for deflecting the injected beam into the plane of the circular orbits of the electrons.

4,990,862

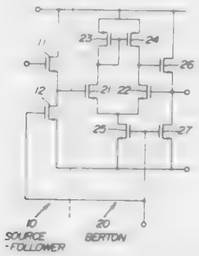
OUTPUT STAGE FOR SOLID-STATE IMAGE PICK-UP DEVICE

Tadakuni Narabu; Yasuhito Maki, and Tetsuya Kondo, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 14,544, Feb. 13, 1987, abandoned. This application Jan. 19, 1988, Ser. No. 145,292
Claims priority, application Japan, Feb. 24, 1986, 61-37333; Jan. 22, 1987, 62-11357; Jan. 22, 1987, 62-11356
Int. Cl.[5] H03F *3/45, 3/16*
U.S. Cl. 330—253 30 Claims

1. An output circuit for a solid-state image pick-up device comprising:
an amplifier circuit connected to said solid-state image pick-up device for amplifying an output signal of said solid-state image pick-up device, said amplifier circuit including

a NMOS transistor having a gate connected to an output of said solid-state image pick-up device, and a drain connected to a power source, said NMOS transistor being switched between a conductive state and a non-conductive state by said output signal of said solid-state image pick-up device applied to said gate for outputting an output signal from the source of said NMOS transistor; and
a buffer amplifier circuit in a voltage follower configuration connected to at least one of an input side and an output side of said amplifier circuit, said buffer amplifier circuit having a gain of substantially 1 and outputting a constant DC level output signal, said buffer amplifier including



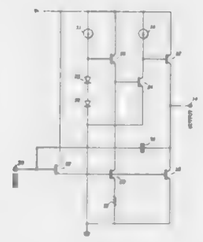
first, second and third NMOS transistors and first and second PMOS transistors, said first NMOS transistor having a gate connected to said source of said NMOS transistor of said amplifier circuit, said first, second and third NMOS transistors and said first and second PMOS transistors cooperating with each other for forming an operational amplifier to output an output signal from a drain of said second NMOS transistor, said third NMOS transistor having a gate connected to said drain of said second NMOS transistor and a drain connected to the power source for outputting the output signal of said buffer amplifier from the source thereof.

4,990,863

AMPLIFIER OUTPUT STAGE

David M. Susak, Chandler, and Byron G. Bynum, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 20, 1990, Ser. No. 481,268
Int. Cl.[5] H03F *3/30*
U.S. Cl. 330—265 10 Claims



1. An amplifier output stage for providing load current at an output thereof responsive to an input signal supplied at an input thereof comprising:
a first transistor having a collector coupled to the output for sourcing current thereto, a base coupled to a first supply voltage terminal, and an emitter coupled to said first supply voltage terminal;
a second transistor having a collector coupled to the output for sinking current therefrom, a base, and an emitter coupled to a second supply voltage terminal;
a third transistor having a collector, a base coupled to said base of said second transistor, and an emitter coupled to said second supply voltage terminal;
a fourth transistor having a collector coupled to said first supply voltage terminal, a base coupled to the input, and an emitter coupled to said base of said third transistor;
a fifty transistor having a collector coupled to said base of said first transistor, a base coupled to said collector of said third transistor, and an emitter coupled to said second supply voltage terminal; and
a sixth transistor having a collector coupled to said first supply voltage terminal, a base coupled to said first supply voltage terminal and to said second supply voltage terminal, and an emitter coupled to said base of said fifth transistor.

4,990,864

CURRENT AMPLIFIER CIRCUIT

Stephen C. Kwan, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 7, 1990, Ser. No. 477,140
Int. Cl.[5] H03F *3/04*
U.S. Cl. 330—288 23 Claims

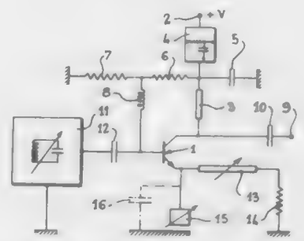
1. An amplifier circuit, comprising:
(a) a first transistor comprising a base, an emitter and a collector;
(b) a second transistor sized N times larger than said first transistor to determine the gain of said amplifier, where N is any predetermined factor, comprising a base, a collector and an emitter, said bases of said first and second transistors being coupled together;
(c) a current buffer circuit coupled to said bases of said first and second transistors and operable to supply base drive current to said first and second transistors; and
(d) circuitry for applying a voltage proportional to absolute temperature between said emitters of said first and second transistors.

4,990,865

TRANSISTOR MICROWAVE OSCILLATOR HAVING ADJUSTABLE ZONE OF POTENTIAL INSTABILITY

Michel Martheli, Jouy le Moutier, France, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 14, 1990, Ser. No. 493,919
Claims priority, application France, Mar. 15, 1989, 89 03411
Int. Cl.[5] H03B *5/18*
U.S. Cl. 331—99 3 Claims



1. A microwave oscillator including at least one transistor (1), characterized in that the bias circuit for the transistor comprises, in the emitter circuit of a bipolar transistor or in the source circuit of a transistor of the FET type, a tunable reactive circuit (13, 15, 16) suitable for adjusting the transistor's zone of potential instability, said tunable reactive circuit being constituted by a length of transmission line (13) connected in series in the bias circuit (13, 14) and by a capacitance (15, 16) connected in parallel from the radiofrequency point of view

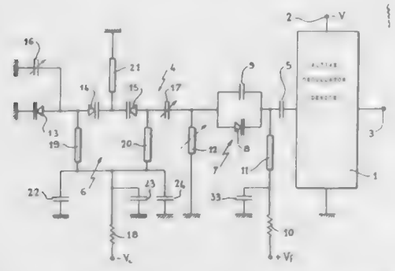
between ground and the emitter or source electrode of the transistor (1).

4,990,866

VOLTAGE CONTROLLED MICROWAVE OSCILLATOR USING A VARACTOR AS INDUCTANCE

Michel Marthelí, Jouy le Moutier, France, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 14, 1990, Ser. No. 494,211
Claims priority, application France, Mar. 15, 1989, 89 03412
Int. Cl.[5] H03B *5/12, 5/18*
U.S. Cl. 331—99 6 Claims



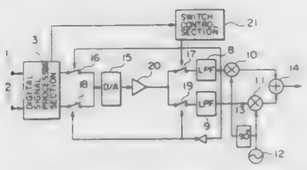
1. A voltage controlled microwave oscillator, said oscillator comprising an active circuit (1) including a transistor or the like, which is adjusted to be potentially unstable in a determined frequency band, and at least one tuning circuit (4) whose phase must be adjusted to compensate the phase of the active circuit (1), the oscillator being characterized in that the tuning circuit (4) includes at least one parallel resonant circuit (13, 16) constituted by an adjusting capacitance (16) and a varactor (13) connected in parallel, the assembly constituted by said varactor (13) and its housing being designed to operate normally at frequencies considerably less than the frequencies of the oscillator such that, at the operating frequencies of the oscillator, said assembly behaves as an inductance and not as a capacitance, by virtue of the parasitic inductances intrinsic to the housing of said varactor (13) dominating.

4,990,867

MODULATOR

Koji Ogura, Yokohama, and Mutsumu Serizawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 10, 1990, Ser. No. 521,367
Claims priority, application Japan, May 10, 1989, 1-116877
Int. Cl.[5] H03C *3/00*
U.S. Cl. 332—102 5 Claims



1. In a modulator for converting two digital signals for an I channel and a Q channel in the base band into analog signals and for modulating a component of the signals whose phase is the same as a carrier and another component of the signals whose phase is orthogonal to the carrier, comprising:

signal connection means for connecting the two signals of said I channel and said Q channel to one signal train by time-sharing and multiplexing them;

a digital/analog converter for converting a signal connected by said signal connection means into a analog signal; and

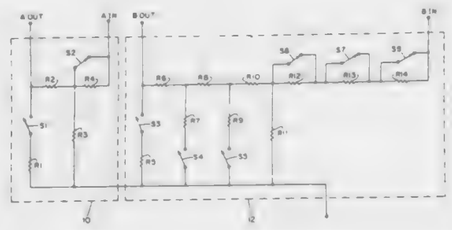
signal separation means for separating an output analog signal converted by said digital/analog converter to two analog signals of said I channel and said Q channel.

4,990,868

MODIFIED PROGRESSIVE IMPEDANCE LADDER NETWORK

Dan Barbour, Woodridge, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 287,612, Dec. 10, 1988, abandoned, which is a continuation of Ser. No. 129,410, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 835,701, Mar. 3, 1986, abandoned. This application Sep. 6, 1989, Ser. No. 405,089
Int. Cl.[5] H03H *7/24*
U.S. Cl. 333—81 R 1 Claim



1. A modified progressive impedance ladder network comprising:

a first group having a first group input and a first group output and a second group having a second group input and a second group output, and said first group connected to said second group via a common terminal;

said first group having a first resistive element connected between said common terminal and a terminal of a first switch, another terminal of said first switch connected to said first group output, a third resistive element connected between said common terminal and a terminal of a second switch, another terminal of said second switch connected to said first group input, second and fourth resistive elements connected in series between said first group input and said first group output, a juncture of said second and fourth resistive elements connected to a juncture of said third resistive element and said second switch;

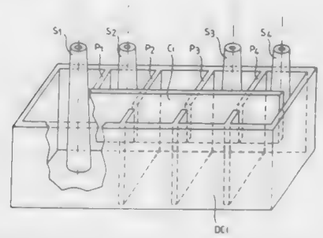
said second group having a fifth resistive element connected between said common terminal and a terminal of a third switch, another terminal of said third switch connected to said second group output, sixth, eighth, tenth, twelfth, thirteenth and fourteenth resistive elements connected in series between said second group output and said second group input, a seventh resistive element connected in series with a fourth switch between said common terminal and a juncture of said sixth and eight resistive elements, a ninth resistive element connected in series with a fifth switch connected between said common terminal and a juncture of said eighth and tenth resistive elements, an eleventh resistive element connected between said common terminal and juncture of said tenth resistive element and twelfth resistive element, a sixth switch connected in parallel to said twelfth resistive element, a seventh switch connected in parallel to said thirteenth resistive element and an eight switch connected in parallel across said fourteenth resistive element; said second group input connected to a juncture of said eighth switch and said fourteenth resistive element opposed from a juncture of said thirteenth and fourteenth resistive elements.

4,990,869

UHF BANDPASS FILTER

Pierre Chantean, La Haye Malherbe, and Eric De Silva, Louviers, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1989, Ser. No. 430,743
Claims priority, application France, Nov. 4, 1988, 88 14425
Int. Cl.[5] H01P *1/201, 1/205*
U.S. Cl. 333—203 20 Claims



1. A bandpass filter having an input and an output and at least two resonators, each of which is disposed within respective cavities, said filter comprising:

(a) an assembly comprising two molded half shells forming said cavities and at least one cavity wall, a first half shell being formed into a plurality of inductive elements;

(b) a printed circuit board coupled to said input, said output and at lest one of said resonators and extending between at least two of said cavities;

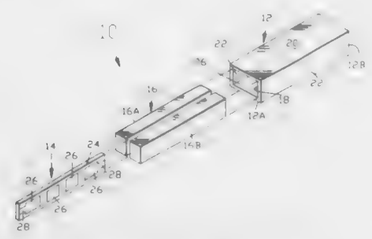
wherein each of said resonators is formed by a respective inductive element and a capacitor disposed between said respective inductive element and a second half shell.

4,990,870

WAVEGUIDE BANDPASS FILTER HAVING A NON-CONTACTING PRINTED CIRCUIT FILTER ASSEMBLY

John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1989, Ser. No. 432,437
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] H01P *1/207*
U.S. Cl. 333—208 15 Claims



1. A waveguide bandpass filter, comprising:

a hollow tubular waveguide section having a plurality of walls for propagating electromagnetic signals in a dominant waveguide propagation mode; and

a printed circuit filter assembly spaced in nonconductive relation from said waveguide walls for dividing and transforming the dominant waveguide propagation mode of said waveguide section into a transformed propagation mode other than said dominant waveguide propagation mode along a pair of opposite ones of said waveguide walls so as to provide bandpass filtering of the signals;

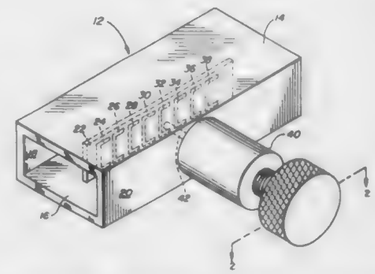
said printed circuit filter assembly including an elongated dielectric substrate positioned in said waveguide section between said pair of waveguide walls and having a surface plane that is oriented orthogonal to said pair of waveguide walls, and an array of conductive elements on said dielectric substrate , said elements being spaced in non-conductive relation from one another and from said pair of waveguide walls.

4,990,871

VARIABLE PRINTED CIRCUIT WAVEGUIDE FILTER

John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1988, Ser. No. 236,695
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] H01P *1/20*
U.S. Cl. 333—209 9 Claims



1. An apparatus for selectively varying the cutoff frequency of energy propagating in the dominant waveguide TE_{10} mode in a waveguide having first and second broadwalls connecting first and second narrow walls comprising:

filter means for filtering signals propagated in said waveguide propagation mode comprising:

a dielectric substrate having a surface plane that is oriented orthogonally to said waveguide broadwalls,

a plurality of conductive elements lying in said surface plane of said dielectric substrate, there being no conductive contact between said conductive elements and said waveguide walls, each of said conductive elements having a length of approximately $\lambda/2$ where λ is the wavelength at the operating frequency of said waveguide; and

means for selectively varying the position of said dielectric substrate between said first and second narrow walls.

4,990,872

VARIABLE REACTANCE CIRCUIT PRODUCING NEGATIVE TO POSITIVE VARYING REACTANCE

Kazuhisa Ishiguro, and Mikio Yamagishi, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 13, 1988, Ser. No. 206,272
Claims priority, application Japan, Jun. 17, 1987, 62-150606; Jun. 17, 1987, 62-150607
Int. Cl.[5] H03H *11/48*
U.S. Cl. 333—213 8 Claims

6. A reactance circuit for preventing oscillation and spurious resonance form occurring comprising:

a first variable reactance circuit for operating as a positive reactance,

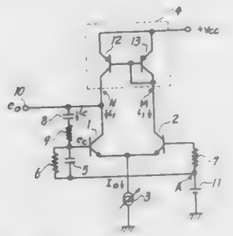
a second variable reactance circuit for operating as a negative reactance,

the first and the second variable reactance circuits being connected to an output terminal in common,

the first variable reactance circuit comprising first and sec-

ond transistors each having an emitter, a collector and a base, a variable current source connected to the emitters of the first and the second transistors, and a first reactance element connected between the base and the collector of the first transistor, the emitters of the first and second transistors being connected to each other in common and to the variable current source,

the second variable reactance circuit comprising third and fourth transistors each having an emitter, a collector and a base, a variable current source connected to the emitter of the third and the fourth transistors, a second reactance element connected between the base of the third transistor



and a reference potential, and a capacitor and a resistor connected in series between the collector and the base of the third transistor, the emitters of the third and fourth transistors being connected to each other in common and to the variable current source, and

a load connected to collectors of the first, second and fourth transistors and also to a power source, collectors of the first and third transistors being connected to the output in common to provide an output reactance, whereby

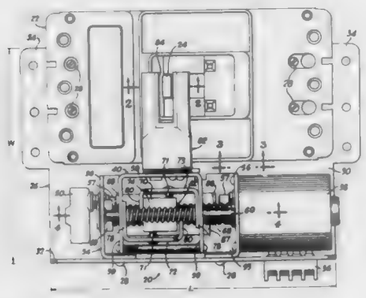
the output reactance is variable from a negative value of reactance to a positive value of reactance dependent upon operation of said first and second reactance circuits.

4,990,873

REVERSE SWITCHING MEANS FOR MOTOR OPERATOR

Kurt A. Grunert, Beaver, and Charles R. Paton, New Brighton, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 30, 1989, Ser. No. 374,370
Int. Cl.[5] H01H *3/00*
U.S. Cl. 335—68 14 Claims



1. A circuit breaker comprising:

a housing;

a pair of separable main contacts, carried in said housing;

an operating mechanism within such housing, operatively coupled to said pair of separable main contacts;

an operating handle extending outwardly from said housing, operatively coupled to said operating mechanism, said operating handle being placed in an on position or alternatively in an off position for causing said separble main contacts to be accordingly closed or opened respectively;

driving means operatively coupled to said operating handle for movement through a span of travel for driving the operating handle to its on position or alternatively to its off position on command; and

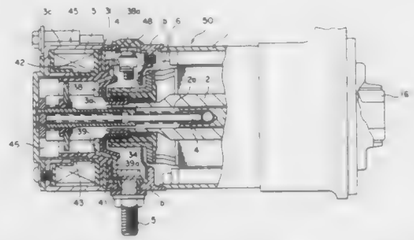
damping means for damping mechanical oscillations in said driving means at the end of said span of travel in each direction.

4,990,874

CORE AND CONTACT ASSEMBLY FOR A COAXIAL ENGINE STARTER

Shigeru Shiroyama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,208
Claims priority, application Japan, Mar. 30, 1989, 1-83180
Int. Cl.[5] H01H *51/08*
U.S. Cl. 335—126 1 Claim



1. A core and contact assembly for a solenoid switch comprising a casing containing therein a coil bobbin in which an excitation coil is wound, and a plunger slidably inserted into a bushing mounted to the inner circumference of said coil bobbin, wherein a core is disposed at an axial end portion of said casing, and a movable contact supported by said plunger is adapted to engage two stationary contacts, said core and contact assembly comprising an attractive force generating portion formed as a circumferential belt on one surface of said core, a recess formed in said attractive force generating portion, a resinous mold portion for insulatably securing said stationary contacts with respect to said core, and a cover axially extending from the interior of said recess for surrounding around said stationary contacts.

4,990,875

SWITCHING APPARATUS WITH CONTACTS CONTROLLABLE BY AN ELECTROMAGNET

Pierre Lemarquand, Velars/Ouche, and Christian Pichard, Asnieres Les Dijon, both of France, assignors to La Telemecanique Electrique, France

Filed Mar. 3, 1989, Ser. No. 318,289
Claims priority, application France, Mar. 4, 1988, 88 02751
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—131 11 Claims

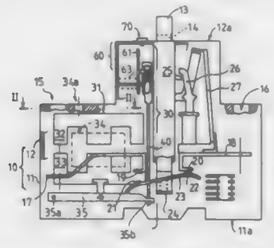
1. A circuit breaker with remote control, said circuit breaker comprising:

(i) a movable contact support supporting at least one movable contact and is mounted for translation in a first direction;

(ii) at least one fixed contact cooperating with said movable contact;

(iii) remotely controlled electromagnet means comprising an electromagnet having a coil, a fixed magnetic circuit and a mobile armature, said remotely controlled electromagnet means further comprising first energizing means for supplying to the coil an energizing current which attracts the armature into engagement with the fixed magnetic circuit and maintains the engagement of the armature with the fixed magnetic circuit, second energizing means for supplying to the coil pulses of current each of which attracts the armature into engagement with the fixed magnetic circuit without maintaining the engagement and switch control means having a first condition in which the coil is connected to the first energizing means and a second condition in which the coil is connected to the second energizing means;

(iv) a movable assembly mounted for translation parallel to said direction from a first position to a second and a third positions, said movable assembly cooperating with said movable contact to engage the movable contact with the fixed contact in the first position of said movable assembly and disengage the movable contact from the fixed contact in a second position of said movable assembly;



(v) means coupling said armature to said movable assembly for moving the movable assembly into said third position when the armature is engaged with the fixed magnetic circuit and for moving the movable assembly into its second position when the armature is disengaged from the fixed magnetic circuit;

(vi) locking means for locking the movable assembly into its first position when the latter is displaced from its second to its first position, said locking means being so arranged that the movable assembly is released when it is displaced from its first to its third position;

(vii) biasing means for returning the movable assembly into its second position when the movable assembly is released; and

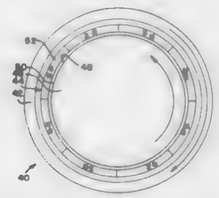
(viii) lock control means for enabling the locking means when the switch control means is in its second condition and for disabling the locking means when the switch control means is in its first condition.

4,990,876

MAGNETIC BRUSH, INNER CORE THEREFOR, AND METHOD FOR MAKING SUCH CORE

Ashok K. Agarwala, Penfield, and Bijay S. Saha, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 15, 1989, Ser. No. 408,351
Int. Cl.[5] H01F *1/00, 3/00*
U.S. Cl. 335—297 9 Claims



1. A magnetic brush useful in electrophotographic apparatus, the magnetic brush comprising an outer sleeve, which is made of non-magnetic material, and an inner core, which is disposed within the outer sleeve to permit relative rotation of the inner core and the outer sleeve, the inner core comprising a shaft made from a magnetic material and having a generally cylindrical surface and a magnetic layer covering said surface, the magnetic layer comprising a plasma-sprayed alloy of iron, neodymium, and boron wherein the inner core comprises a bonding layer between the generally cylindrical surface of the shaft and the magnetic layer.

4,990,877

PASSIVE SHIMMING ASSEMBLY FOR MR MAGNET

Jay F. Beneach, Gaithersburg, Md., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,303
Int. Cl.[5] H01F *7/00*
U.S. Cl. 335—301 4 Claims



1. A passive shim assembly for a magnet having a central bore comprising:

plurality of axially extending guide rails bonded directly to the bore of the magnet and equally spaced circumferentially;

a plurality of arcuately shaped drawers slidably mounted between adjacent channel pieces; and

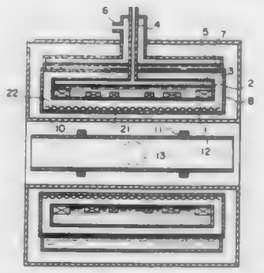
a plurality of stacks of predetermined length arcuate strips of magnetic flux conducting material demountably secured to each of said drawers, said strips extending in the circumferential direction.

4,990,878

SUPERCONDUCTING MAGNET DEVICE

Moriaki Takechi, and Tatsuya Ono, both of Ako City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 27, 1989, Ser. No. 385,541
Claims priority, application Japan, Jul. 27, 1988, 63-185565
Int. Cl.[5] H01F *7/00*
U.S. Cl. 335—301 10 Claims



1. A superconducting magnet device comprising:

cylindrical superconducting coil means for generating a static magnetic field;

pulsating magnetic field generating coil means provided on the inner diameter side of said superconducting coil means;

a cooling tank accommodating said superconducting coil means therein in a cooled, superconductive state;

thermal shielding tank means surrounding said cooling tank and cooling the tank from the outside thereof, said thermal shielding tank means including an inner cylinder portion,

an outer cylinder portion and end plates disposed at the two sides thereof for connecting said inner cylinder portion and said outer cylinder portion, said inner cylinder portion being made of a superconducting material and being located between said superconducting coil means and said pulsating magnetic field generating coil means;

a thermal insulating vacuum tank surrounding said thermal shielding tank means and thereby restricting the entry of heat from the outside thereof.

4,990,879

MAGNETIC BLOCK WITH ADJUSTABLE MAGNETIZATION FOR PRODUCING A PERMANENT MAGNETIC FIELD IN A ZONE OF INTEREST

Guy Aubert, Grenoble, France, assignor to Centre National de la Recherche Scientifique, Paris, France

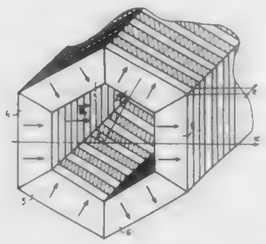
PCT No. PCT/FR87/00391, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO88/02922, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 13, 1987, Ser. No. 353,645

Claims priority, application France, Oct. 17, 1986, 86 14416

Int. Cl.[5] H01F *7/02*

U.S. Cl. 335—306 13 Claims



1. A magnetic block with adjustable magnetization, said block being part of a set of blocks, said set of blocks constituting a structure of a magnet designed for the production of a permanent magnetic field (B_0) in a zone of interest (V) of said magnet, said magnetic block comprising determined proportions (x) of permanently magnetizable material and of non-magnetizable material, wherein the proportion of magnetizable material in said block is such that the absolute value of a demagnetizing excitation (H_d) that prevails in a given place of said structure is at the most equal to the cut-off excitation (H_{c0}) of said magnetizable material.

4,990,[illegible]

TRANSFORMER CLIP

Guy D. Albert, Raleigh, N.C., assignor to Alcatel NA, Inc., Hickory, N.C.

Filed Jul. 24, 1989, Ser. No. 384,741

Int. Cl.[5] H01F *15/02, 27/26*

U.S. Cl. 336—65 11 Claims

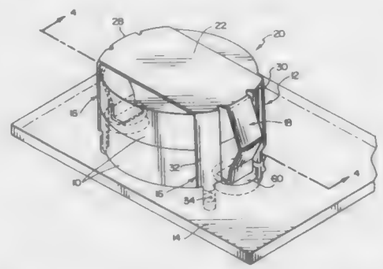
1. An apparatus of single-piece construction for assembling and mounting electronic components, which are of the type including multiple separable sections, to a board used to hold electronic components, said apparatus comprising:

a body formed of a thin, flat metallic material for engaging a top component surface opposite a bottom component surface that is to engage said board;

two spring arms formed integrally with said body and extending downwardly alongside said component;

a finger attached to each of said spring arms for engaging said bottom component surface, said spring arms adapted to provide a spring force through said fingers and said body to compress said component sections together; and

mounting means including at least two legs formed integrally with said body and extending downwardly along-side said component for engaging and mounting to said



board, whereby the apparatus may be used to assemble said component sections and mount them to the board.

4,990,881

IGNITION COIL WITH PERMANENT MAGNET

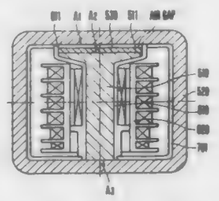
Shinji Ooyabu, Obu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 9, 1989, Ser. No. 364,065

Claims priority, application Japan, Jul. 28, 1988, 63-186814; Sep. 27, 1988, 63-241582

Int. Cl.[5] H01F *17/06, 27/24*

U.S. Cl. 336—110 8 Claims



1. An ignition coil comprising an iron core forming a closed magnetic circuit through an air-gap portion provided at a portion of said iron core, a primary coil wound around an exciting part iron core of said iron core for exciting said iron core upon energization thereof, a secondary coil wound around said primary coil concentrically, and a permanent magnet inserted in said air-gap portion of said iron core, the direction of magnetization of which is opposite to the direction of magnetization of said iron core to be caused by the energization of said primary coil,

characterized in that said ignition coil is constructed to satisfy the following conditions:

$$0.6 \text{ mm} < l_m < 1.8 \text{ mm}$$

$$2 < S_M/S_F < 6$$

$$1.5 < S_G/S_F < 4.5$$

where l_M is the thickness of said permanent magnet, S_M is the cross-sectional area of said permanent magnet, S_F is the cross-sectional area of said exciting part iron core of said iron core and S_G is the cross-sectional area of a permanent magnet supporting portion of said iron core.

4,990,882

PUSH-BUTTON ACTUATED OVERLOAD PROTECTION SWITCH

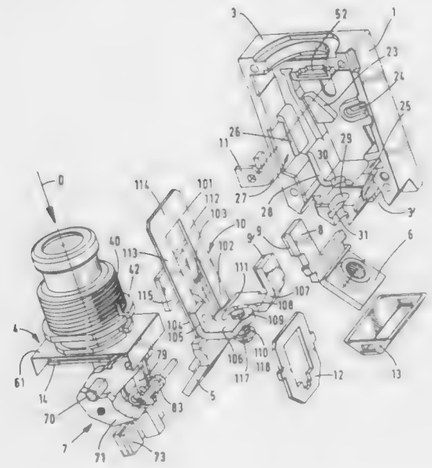
Josef Peter, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Mar. 5, 1990, Ser. No. 487,887

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, 8904063[U]

Int. Cl.[5] H01H *71/16*

U.S. Cl. 337—66 13 Claims



1. An excess current protection switch with manual actuation and bimetal controlled automatic tripping, the switch comprising:

a housing having an opening on its bottom side;

two stationary mating contacts mounted within the housing;

a contact bridge movable between a contact closing position and a contact opening position relative to the two mating contacts;

a switch latch attached to the movable contact bridge for holding the contact bridge in and out of engagement with the two mating contacts;

a push button for tripping the switch latch and causing the contact bridge to move between the contact closing and opening positions;

a connecting piece comprising a plate, one of the two mating contacts extends from one side of the plate, a connecting flap extending from an opposite side of the plate, and a slit passing through the center of the plate, transversely to the plane of the plate and defining a constriction between the connecting flap and the side of the plate from which the mating contact extends; and

a bimetallic tripping device, kinematically connected with the switch latch, said bimetallic tripping device including a substantially U-shaped self-heating bimetal having a base member constituting a deflectable end of the bimetal and two arm portions extending from the base member so that the free end of one arm portion is fastened to an end of a connecting lug held within the housing and the free end of the other arm portion is fastened to the connecting piece, whereby the bimetal is electrically connected in series with the path of the current through the switch and the bimetallic tripping device releases the switch latch from the contact closing position when the current flowing through the bimetal causes the base member to deflect, wherein the connecting flap can be rotated by an adjustment screw charging the center of the plate from the bottom side of the housing so as to adjust the response value of the bimetal.

4,990,883

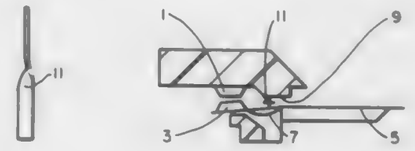
ACTUATOR WHICH CAN BE LOCKED WHEN EXPOSED TO A HIGH TEMPERATURE

Jesus Escobar, Newark, and Donald Wilkerson, East Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 9, 1989, Ser. No. 364,668

Int. Cl.[5] H01H *37/22, 37/52, 61/08, 71/18*

U.S. Cl. 337—357 12 Claims



1. An electrical switch having at least three positions:

(i) an open switch position;

(ii) a closed switch position; and

(iii) a locked open switch position;

said switch comprising:

(a) a first electrical contact;

(b) a support member;

(c) a moveable arm element comprising a second electrical contact, which second contact is moveable from said open switch position to said closed switch position in response to an event; and

(d) a component comprising heat-recoverable shape memory alloy having an initial austenitic phase transformation temperature A_s, at least a part of which component, on its first exposure to a temperature above A_s, moves to a position such that said component is interposed between said support member and said element whereby said switch is fixed in the locked open switch position even on subsequent exposure to temperatures below A_s.

4,990,884

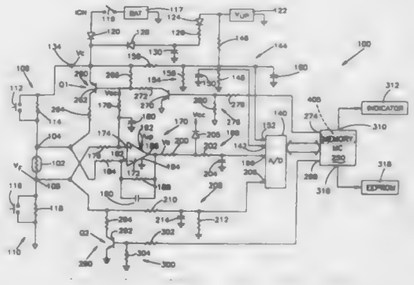
METHOD AND APPARATUS FOR TESTING AN AIRBAG RESTRAINT SYSTEM

Roger A. McCurdy, Troy; Dana A. Stonerook, Plymouth, both of Mich.; Richard J. Mann, Los Angeles, Calif.; Edward J. Abeska, Ferndale, and Jeffrey R. Rochette, Livonia, both of Mich., assignors to TRW Inc., Lyndhurst, Ohio

Filed Dec. 12, 1989, Ser. No. 449,718

Int. Cl.[5] B60R *21/32*

U.S. Cl. 340—438 26 Claims



1. An apparatus for testing the operativeness of a storage capacitor in an airbag restraint system of the type including a squib, a first inertia switch connected to one terminal of the squib and to the storage capacitor, a second inertia switch connected to the other terminal of the squib and to electrical ground, means for connecting the capacitor to a source of

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electrical energy so as to charge the capacitor to a voltage value of such magnitude that, if the capacitor's capacitance is greater than a predetermined value, a sufficient electrical potential would be available to fire the squib from the capacitor's stored electrical energy when the first and second inertia switches close, said apparatus comprising:

means for monitoring the voltage value across the capacitor at a time T_0, said voltage value across the capacitor at time T_0 being equal to $V_C(T_0)$;

means for partially discharging said capacitor starting from the time T_0 for a predetermined time period ending at a time T_1;

means for monitoring the voltage value of the charge remaining across said capacitor at time T_1, the monitored voltage value across the capacitor at time T_1 being a voltage value equal to $V_C(T_1)$;

means for determining a value according to algorithm

$$\frac{V_C(T_0) + V_C(T_1)}{V_C(T_0) - V_C(T_1)};$$

means for comparing said determined value against a predetermined limit and for providing a signal indicative of the comparison; and

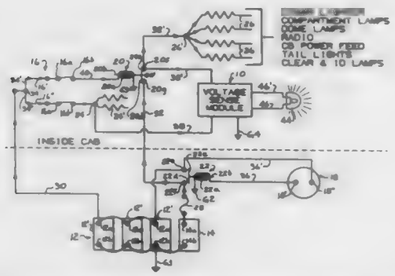
means for providing a failure indication to the vehicle operator if the comparing means indicates that said determined value is less than said predetermined limit.

4,990,885

AUXILIARY BATTERY MONITOR

W. Thomas Irick, New Haven, and Michael R. Singer, Fort Wayne, both of Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Oct. 11, 1989, Ser. No. 419,989
Int. Cl.[5] B60Q 1/00
U.S. Cl. 340—455 14 Claims



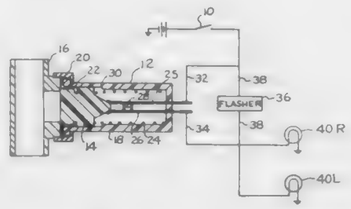
1. A voltage differential monitor for use within a vehicle electrical system of the type which includes primary battery means and auxiliary battery means, the primary battery means functioning as an electrical power source for operating the engine of the vehicle and supplied with charging voltage by an alternator, the auxiliary battery means functioning as an electrical power source for accessories at least during downtime of the engine of the vehicle, said monitor comprising voltage sensing input means coupled respectively to said auxiliary battery means and to said primary battery means, voltage comparison means coupled to said input means, switch means coupled to said switch means, said voltage comparison means being constructed and arranged, when said charging voltage is present, to automatically direct an output signal to said switch means when the voltage of said primary battery means exceeds the voltage of said auxiliary battery means by a predetermined voltage differential and said switch means constructed and arranged to energize said alarm means upon receipt of said signal from said voltage comparison means whereby the operator of the vehicle is made aware of the existence of a specific voltage differential condition relative to said auxiliary battery means.

4,990,886

VEHICLE BRAKE INDICATOR SYSTEM

James Stanulis, 3360 Justis St., Virginia Beach, Va. 23464

Filed Dec. 18, 1989, Ser. No. 451,597
Int. Cl.[5] B60Q 1/44
U.S. Cl. 340—467 1 Claim



1. An automotive alarm circuit comprising a first brake switch (10) closable in response to depression of a brake pedal: a lamp alarm system (40R, 40L) at the rear end of a vehicle; a second switch (12) responsive to vehicle deceleration associated with an abnormally high rate of depression of the brake pedal; a flasher 36; and circuit connections between the lamp alarm system and the flasher and the switches, whereby the lamp alarm system provides the following vehicle with one visible signal when the brake pedal is lightly depressed, and a second visible signal when the brake pedal is depressed at an abnormally high rate; said flasher and said second switch being in electrical parallelism with one another; said flasher and said second switch being in series between the first brake switch and said lamp system, whereby the flasher controls the lamp system when the second switch is open, and the second switch controls the lamp system when the second switch is closed;

said second switch being a liquid pressure-responsive switch having an operating connection with the vehicle brake line, whereby a step increase in brake line pressure is required to operate said second switch; said second switch comprising a cup-shaped housing (18) having an end wall and an open mouth portion, with said mouth portion being sealably connected to the brake line, a piston (14) slidably mounted within said housing for movement toward or away from the brake line, a compression coil spring (24) biasing said piston toward the brake line, and two deflectable switch arms (25, 26) extending through the end wall of the housing into the space circumscribed by the coil spring; said piston being aligned with said switch arms to deflect said arms when the piston is moved away from the brake line.

4,990,887

VEHICLE BRAKE LIGHT SYSTEM

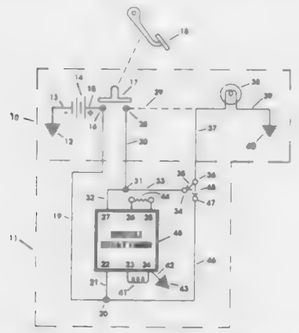
Robert Lee, 5925 N. Union Blvd., Colorado Springs, Colo. 80918

Filed Nov. 15, 1989, Ser. No. 436,689
Int. Cl.[5] B60Q 1/44
U.S. Cl. 340—479 12 Claims

2. In a vehicle having conventional brake lights, a brake pedal, and a brake pedal switch operated by said brake pedal, a method of using a brake delay lighting system connected between said brake pedal switch and said brake lights for alerting traffic trailing its vehicle to a slowed condition of the vehicle, said method comprising the steps of:

(a) energizing said brake lights on movement of said brake pedal; and

(b) maintaining the energizing of said brake lights for as long as said brake pedal is engaged, and continuing to energize said brake lights for a preset period of time beyond an occasion of disengagement of said brake pedal and movement to its original condition.

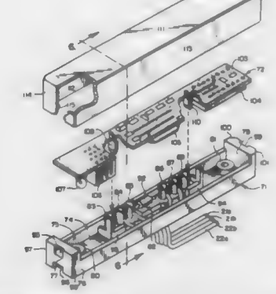


4,990,888

UNITARY ALARM SENSOR AND COMMUNICATION PACKAGE FOR SECURITY ALARM SYSTEM

William R. Vogt, Rockaway; Leonard Noonan, Stanhope, both of N.J., and John E. Seeley, Warminster, Pa., assignors to Baker Industries, Inc., Parsippany, N.J.

Filed Feb. 25, 1986, Ser. No. 832,624
Int. Cl.[5] G08B 29/00, 26/00
U.S. Cl. 340—506 15 Claims



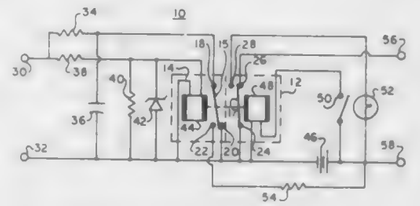
13. A transponder assembly for use in a security alarm system in which a controller communicates with separately addressable transponders, said transponder assembly including at least one circuit board, a sensor transducer mounted on said circuit board, circuit means, mounted on said circuit board, for communicating between the sensor transducer and the controller, a unitary housing, including a cover and a base, substantially enclosing the circuit board, the sensor transducer, and the circuit means, said base and cover including male and female connector means for establishing an electrical connection when the base and cover are mated, to identify separation of the base and cover by interruption of the electrical connection, in which the male connector means comprises a pair of flag-like connectors, spaced apart by a given distance, and said female connector means comprises a pair of cylindrical female connectors spaced apart by said given distance, each of said cylindrical female connectors defining a slit for receiving one of the flag-like connectors when the cover is assembled to the base.

4,990,889

FLARE SIMULATOR AND TEST CIRCUIT

Robert A. Lebsock, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1989, Ser. No. 351,112
Int. Cl.[5] G08B 29/00
U.S. Cl. 340—515 6 Claims



1. A squib simulator and dispensing equipment tester comprising:

first and second input terminals for receiving an input pulse from said dispensing equipment;

a load connected in shunt across said first and second input terminals for simulating a squib;

a latching relay having a single pole contact assembly;

indicator means having one end connected to said single pole contact assembly;

a power source connected in series between another end of said indicator means and second input terminal;

a threshold circuit connected in shunt across said first and second input terminals, said threshold circuit connected to said latching relay that energizes said latching relay to switch contact positions when said input pulse is of sufficient amplitude and duration turning on said indicator means; and

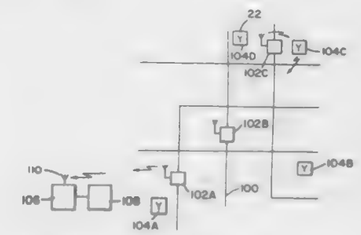
switch means connected to said power source and said latching relay for energizing said latching relay to switch contact positions upon closure of said switch means turning off said indicator means.

4,990,890

VEHICLE SECURITY SYSTEM

Lionel L. Newby, 104 Nicholson Road, Sunward Park, Boksburg, 1460, Transvaal, South Africa

Filed Feb. 28, 1989, Ser. No. 317,120
Claims priority, application South Africa, May 2, 1988, 88/3103; Jun. 16, 1988, 88/4296
Int. Cl.[5] G08B 1/08; B60T 7/16
U.S. Cl. 340—539 3 Claims



1. A vehicle security system, comprising:

(a) a plurality of security stations which are respectively positioned at strategic locations within an area to be monitored and trough or in which vehicles can move, each security station including:

(1) a station transmitter, and

(2) a station receiver; and

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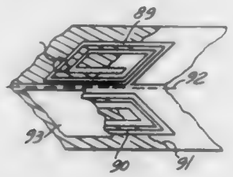
(b) the following elements included within each vehicle which is to be monitored:
(1) memory means for storing identification data relating to the vehicle,
(2) a vehicle transmitter connected to the memory means,
(3) a vehicle receiver,
(4) detection means which is adapted to detect an unauthorized act which is carried out on the vehicle and which then actuates the vehicle transmitter, and
(5) an immobilizer;
wherein a signal is emitted by a vehicle transmitter of a particular vehicle in which the unauthorized act is carried out, the signal including the identification data on the particular vehicle; and
wherein the signal from the particular vehicle is received by the station receiver of a particular one of the security stations when the particular vehicle is within a predetermined range of the particular security station; and
(c) a base station which polls the security stations at time intervals, the station transmitter of the particular security station transmitting information to the base station when polled, which information includes at least the particular vehicle's identification data and the location of the particular security station; wherein the station transmitter of the particular security station is then actuated by a signal from the base station to transmit a first signal to the vehicle, which first signal is received by the vehicle receiver of the vehicle and is used to actuate the immobilizer of the vehicle to thereby stop the vehicle within the predetermined range of the security station;
wherein the security station which is the particular security station substantially determines the location of the vehicle within the area to be monitored.

4,990,891

IDENTIFICATION DEVICE IN THE FORM OF A TAG-LIKE STRIP AFFIXABLE TO AN ARTICLE

Max-E. Reeb, Helfensteinstrasse 7, D-7336 Uhingen, Fed. Rep. of Germany

Continuation of Ser. No. 28,893, Mar. 23, 1987, abandoned, which is a division of Ser. No. 513,970, Jun. 29, 1983, Pat. No. 4,694,283. This application Dec. 18, 1987, Ser. No. 135,547
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3144208
Int. Cl.[5] G08B *13/18*
U.S. Cl. 340—572 38 Claims



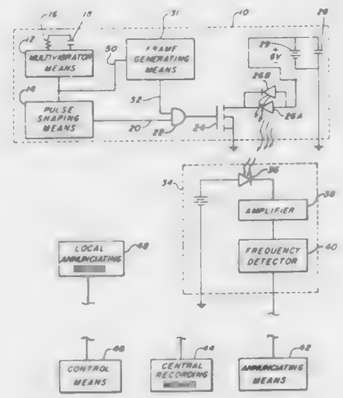
1. An identification device in the form of a tag-like strip affixable to an article, comprising at least an inductive member formed of flat conductor strips and a capacitive member formed of superposed flat conductor strips and a dielectric layer interposed therebetween and forming, together with said inductive member, a resonant circuit, wherein said flat conductor strips (**89, 107,112; 90, 108, 113; 109, 112, 114; 110, 113, 115**), in a manner so as to form striplines having distributed line inductances and distributed line capacitances, in mutual alignment, oppose one another in a first and a second plane and wherein said flat conductor strips form a first (clockwise-wound) multi-turn conductive spiral pattern (**89, 107, 112; 109, 112, 114**) and a second (counter-clockwise-wound) multi-turn conductive spiral pattern (**90, 108, 113; 110, 113, 115**) in said respective first and second plane, and wherein at least a first end portion (**107, 114; 108, 115; 112; 113**) belonging to a specific turn of said first multi-turn conductive spiral pattern in said first plane is superposed to the corresponding specific turn of said second multi-turn conductive spiral pattern in said second plane, and wherein the dielectric is arranged at least in spaces between mutually superposed flat conductor strips (between **89** and **90**; **107** and **108**; **112** and **113**, **114** and **115**).

4,990,892

PERSONNEL LOCATOR SYSTEM

Barnie L. Guest, Jacksonville, Fla.; Leslie C. Laney, Jackson, Miss., and Dennis K. Fredrickson, Jacksonville, Fla., assignors to Westcom, a division of Westside Communications of Jacksonville, Inc., Jacksonville, Fla.

Filed Aug. 7, 1989, Ser. No. 396,895
Int. Cl.[5] G08B *23/00, 5/22*
U.S. Cl. 340—573 32 Claims



1. A personnel locator system installable on a premises comprising at least one portable communication unit adapted to be carried by an individual and monitored at appropriate locations about the premises, said system including:
means for generating pulses defining a pulse train wherein said pulses occur at a predetermined frequency;
means for determining discrete time intervals defining burst periods, wherein groups of said burst periods define a burst spectrum;
infrared means for transmitting said pulse train generated by said means for generating pulses during selected ones of said burst periods; and
means responsive to said pulse train transmitted during said selected ones of the burst periods for producing a signal responsive thereto.

4,990,893

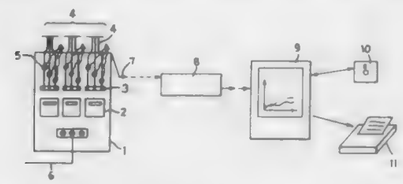
METHOD IN ALARM SYSTEM, INCLUDING RECORDING OF ENERGY CONSUMPTION

Czeslaw Kiluk, Frihetsvagen 63, Nacka 131 47, Stockholm, Sweden

PCT No. PCT/SE88/00221, § 371 Date Nov. 14, 1989, § 102(e) Date Nov. 14, 1989, PCT Pub. No. WO88/08596, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 29, 1988, Ser. No. 435,452
Claims priority, application Sweden, Apr. 29, 1987, 8701789
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—573 17 Claims

1. Method for an alarm system, intended in particular for the monitoring of service apartments and the like for elderly and/or handicapped persons, characterized in that the system is connected to the energy supply system of the apartment, or to a part thereof, for the purpose of recording the distribution of energy consumption during certain periods, in that the result of the recordings is produced in the form of a cumulative record-

ing exhibiting an average distribution pattern, in that the actual distribution pattern is recorded and is compared with the recorded average distribution pattern, and in that an alarm is



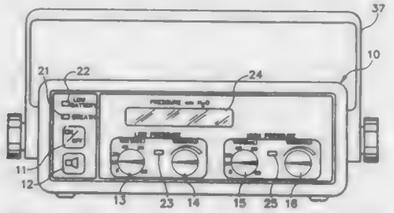
produced if, at the end of or during a period, the values for the average distribution pattern and the actual distribution pattern differ by a predetermined amount.

4,990,894

VENTILATOR MONITOR AND ALARM APPARATUS

Thomas C. Loescher, Encinitas, and Robert O. Rowland, Hemet, both of Calif., assignors to Hudson Respiratory Care Inc., Temecula, Calif.

Filed Nov. 1, 1989, Ser. No. 430,309
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—573 19 Claims



1. A monitor and alarm apparatus for monitoring a respiratory circuit comprising:
(a) first pressure sensing means for sensing pressure in said respiratory circuit, and electronic circuit means cooperating therewith for turning said apparatus on in response to pressure sensed by said first pressure sensing means,
(b) second pressure sensing means for continuously sensing the breathing cycle pressure of a user in said circuit independent of said first pressure sensing means,
(c) first alarm enabling means for creating an alarm condition in response to pressure sensed by said first pressure sensing means being below a selected low pressure limit for a preselected period of time,
(d) second alarm enabling means including adjustable low pressure threshold setting means for creating an alarm condition in response to said breathing cycle pressure sensed by said second pressure sensing means failing to pass through said low pressure threshold within a preselected period of time, and
(e) alarm means actuated by said first and second alarm enabling means.

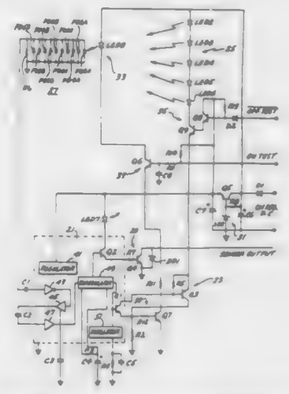
4,990,895

METHOD AND APPARATUS FOR TESTING PHOTOELECTRIC CIRCUITS

Scott M. Juds, Everett, Wash., assignor to Opcon, Inc., Everett, Wash.

Continuation-in-part of Ser. No. 222,562, Jul. 21, 1988, abandoned. This application May 15, 1989, Ser. No. 351,793
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—635 44 Claims

1. A method of testing a photoelectric sensor that includes at least one operational light source and at least one light detector having, respectively, a light radiation pattern and a field of view aligned with one another for sensing the presence or absence of objects located in both said operational light radiation pattern and said light detector field of view and producing an output signal that is in a first state if light is detected by said light detector and a second state if light is not detected by said light detector, said method comprising the steps of:
controlling the output of said light detector so as to cause said photoelectric sensor to place said output signal in said first state if predetermined parts of said photoelectric sensor are operating correctly regardless of whether an object is located in both said operational light source light radiation pattern and said light detector field of view;



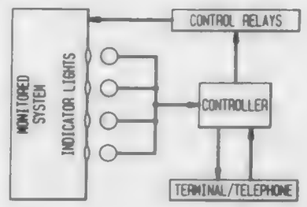
testing the output of said photoelectric sensor to determine if said output is in said first state; and
controlling the state of a binary pass/fail output signal such that the binary pass/fail output signal is in a pass state if the output of said photoelectric sensor is in said first state when the output of said photoelectric sensor is tested and the binary pass/fail output signal is in a fail state if the output of said photoelectric sensor is not in said first state when the output of said photoelectric sensor is tested.

4,990,896

LIGHT RESPONSIVE DEVICE FOR MONITORING ON-LINE INDICATOR LIGHTS

William F. Gray, 1212 Ingleside Ave., McLean, Va. 22101

Filed May 9, 1989, Ser. No. 349,482
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—641 35 Claims



22. A light responsive device comprising:
(a) a housing fabricated from a black plastic member and having first and second surfaces; an internal recess communicating with a light access port in the first surface; and a clear, plastic rod disposed within a hole in said housing, the hole being adjacent the recess and traversing said housing and ending in an upper observation port in said second surface and in a lower observation port in said first surface, the upper observation port in the second surface

being connected with the lower observation port in the first surface through a light path including the clear plastic rod;

(b) a photovoltaic device located in the recess within the housing and responsive to light, from a light source surrounded by a receiving surface, reaching it through the light access port, generating an electric current proportional to the light intensity, said black plastic housing member providing a substantially opaque enclosure that permits no significant access of ambient light to the photovoltaic device through said housing when the housing is attached to said receiving surface;

(c) leads for conducting said current from the photovoltaic device; and

(d) a double-sided adhesive, clear, plastic strip adhered to the first surface of the housing providing adhesive to attach the housing to the receiving surface.

4,990,897

METHOD AND APPARATUS FOR DETECTING AND RECOGNIZING IMPACTS BY MEASURING IMPEDANCE VARIATION

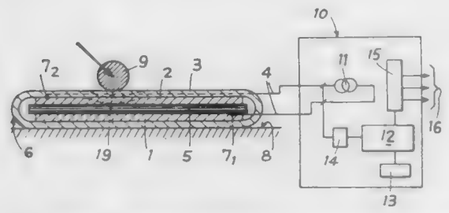
Alain R. Beyma, Marseille, and Manuel J. Garcia, 2, Avenue Pacifique Rovali, 13830 Roquefort la Bedoule, both of France, assignors to Manuel J. Garcia, La Bedoule, France

Filed May 24, 1989, Ser. No. 356,796

Claims priority, application France, May 30, 1988, 88 07319

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—665 **9 Claims**



1. A method of detecting and recognizing impacts received by a surface, comprising:

providing at least two layers of electrically conductive material disposed in contact with each other in order to constitute a sensor, said surface being covered therewith;

connecting outer surfaces of said layers to a corresponding terminal of an electronic system including at least one constant current generator, said current then flowing through said layers, a microprocessor associated with at least one memory and suitable, in particular, for measuring the potential difference at the terminals of said sensor, and various input/output interfaces;

calculating the rate of change of the impedance of said sensor, which impedance changes when the sensor is subjected to physical phenomena which differs from an initial situation of the sensor before impact, said rate of change of impedance being directionally proportional to the derivative of the measured potential difference;

storing during an initial learning stage in said memory of the electronic system, the "rest" impedance value of the sensor corresponding to a said initial situation, and on each change in said impedance during a utilization stage, said microprocessor which is appropriately programmed for the purpose addresses a given signal via an output interface whenever said rate of change exceeds a given threshold;

storing during said initial learning stage, each of said rates of change in said memory of the system in association with the nature of the known phenomenon which would give rise to said change and each of said rates of change being specific thereto for said surface;

associating each time during said initial learning stage and then during said utilization stage, the value of the rate of change of the impedance that is calculated and stored with a duration, during which the said rate of change may remain constant, together with the derivatives of the rate of change between the "rest" state of the sensor and its return to said state; and

establishing a classification and a selection amongst the phenomena which may cause the impedance to change, said microprocessor being programmed so that during the utilization stage it addresses a given signal to an output interface only for preselected characteristics of change of said impedance.

4,990,898

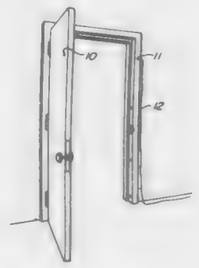
SURFACE-MOUNT INTRUSION DETECTION SWITCH HOUSING

Teddy R. Greene, 2171 Research Dr., Livermore, Calif. 94550

Continuation-in-part of Ser. No. 277,162, Nov. 29, 1988, Pat. No. 4,903,010. This application Dec. 5, 1989, Ser. No. 446,033

Int. Cl.[5] G08B *23/00*

U.S. Cl. 340—693 **5 Claims**



1. A switch unit for use in an intrusion detection system for mounting in a door or window assembly, said switch unit having switch wires for connection to said intrusion detection system, comprising:

a generally cylindrical hollow housing member formed with a threaded exterior wall and having an end cap formed to received a screw driver for screwing said generally cylindrical hollow housing member directly into said door or window assembly;

a switch fixed within said generally cylindrical hollow housing member for detecting movement of said door or window assembly;

wherein said end cap is further formed with a laterally projecting positioning member for positioning said switch unit against a surface of said door or window assembly, whereby said switch unit is adapted to be threadably installed in said door or window assembly to a depth determined by said laterally projecting positioning member; and

wherein said end cap is formed to define a passageway from said generally cylindrically hollow housing member to the exterior of said end cap and said switch wires pass through said passageway, whereby said switch wires are positioned to be mounted on the surface of said door or window assembly when said switch unit is mounted therein.

4,990,899

MOTORCYCLE DATA DISPLAY APPARATUS

Yonatan Gerlitz, Herzliya, and Dan Moran, Ramat Gan, both of Israel, assignors to Rasaat, Ramat Gan, Israel

Filed Apr. 7, 1989, Ser. No. 334,548

Claims priority, application Israel, Apr. 7, 1988, 86001

Int. Cl.[5] G02B *27/10*

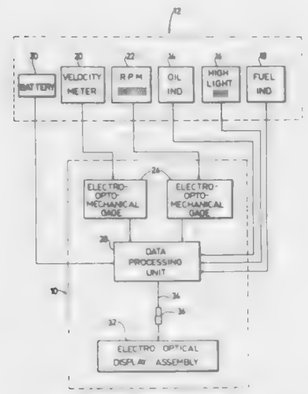
U.S. Cl. 340—705 **4 Claims**

1. Motorcycle visual display apparatus for use with a motorcycle having first display instruments indicating operating parameters such as speed and motor RPM comprising:

signal processing means having an input associated with the motorcycle instruments,

a motorcycle rider's crash helmet having a second instrument means including a transparent element having a curved portion;

a visual display surface positioned on said curved portion of said transparent element in the motorcycle rider's instantaneous field of view, said visual display surface being



formed by a dichroic type coating formed on the inward facing surface of said curved portion, causing said curved portion to be reflective for a given wavelength bank of light, and

visual display means having a solid state light source for receiving output data from said signal processing means and for projecting said data onto said visual display surface within said given wavelength band of light, thereby to cause said data to be reflected to the eyes of the motorcycle rider and to be perceived by the motorcycle rider as if it appeared from infinity.

4,990,900

TOUCH PANEL

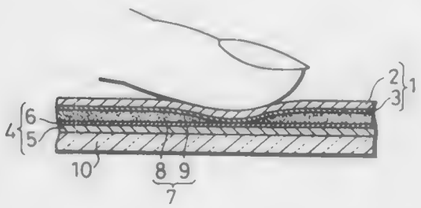
Hiroshi Kikuchi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,448

Claims priority, application Japan, Oct. 1, 1987, 62-149259[U], Oct. 1, 1987, 62-149257[U]

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—712 **3 Claims**



1. In a touch panel having a panel body formed by transparent upper and lower electrodes spaced a predetermined distance, said touch panel being mounted on a front surface of a display device to detect a coordinate at a depressed position on said upper electrode; the improvement comprising a transparent insulating liquid material filled between said upper and lower electrodes and a coloring agent containing pigment or dyestuff dispersed in said liquid material.

4,990,901

LIQUID CRYSTAL DISPLAY TOUCH SCREEN HAVING ELECTRONICS ON ONE SIDE

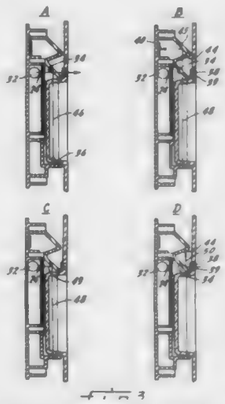
John L. Beiswenger, Salem, Wis., assignor to Technomarket, Inc., Buffalo Grove, Ill.

Continuation-in-part of Ser. No. 89,138, Aug. 25, 1987, Pat. No. 4,847,666. This application Dec. 13, 1988, Ser. No. 283,627

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—712 **18 Claims**



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applied data generated by the application program for display on the flat panel display apparatus;

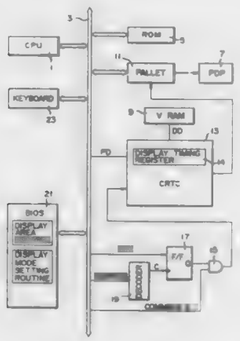
means for coupling the control means to the flat panel display apparatus;

first memory means for storing a plurality of sets of display timing signal generating parameters corresponding to the plurality of different display resolutions;

display resolution selecting means for selecting a desired display resolution;

second memory means for storing a set of received display timing signal generating parameters as the designated set of display timing signal generating parameters;

setting means responsive to the display resolution selecting means for reading out a desired set of display timing signal generating parameters, corresponding to the desired display resolution, from the first memory means and for



supplying the desired set of display timing signal generating parameters to the second memory means as the designated set of display timing signal generating parameters; and

inhibition means, coupled to the control means, for permitting the setting means to alter the designated set of display timing signal generating parameters stored in the second memory means, when both (1) the desired set of display timing signal generating parameters is different from the set of display timing signal generating parameters stored in the second memory means and (2) the designated set of display timing signal generating parameters has not been altered since the desired application program has been executed, and for inhibiting alteration of the designated set of display timing signal generating parameters under other conditions.

4,990,903

METHOD FOR STORING CHINESECHARACTER DESCRIPTION INFORMATION IN A CHARACTER GENERATING APPARATUS

Kuo-Young Cheng, Taipei, and Jen-Tsun Yang, Tainan Hsien, both of Taiwan, assignors to Bestfont Ltd., St. Helier, Channel Islands

Continuation-in-part of Ser. No. 923,311, Oct. 27, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,345

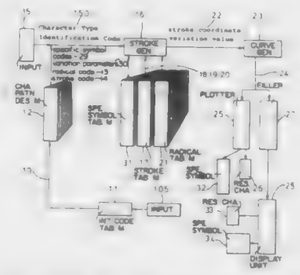
Int. Cl.[5] G09G *5/26*

U.S. Cl. 340—731 **3 Claims**

1. A method for storing Chinese character description information for use in a character generating apparatus, said method comprising the steps of:

(1) constructing a stroke table for Chinese characters having a character type identification code designated thereto, and each stroke of the characters for each character type identification code being defined by coordinates of stroke height, width and curvature points for providing stroke description information therewith and having a stroke code associated with each stroke, said character type identification code, said stroke codes and said coordinates being systematically stored in a stroke table memory of said character generating apparatus through a software program,

(2) constructing a character radical table for Chinese characters having a character type identification code designated thereto and a plurality of common radicals defined therewith, each radical being assigned a radical code and stroke codes defining the strokes making up each radical in the radical table; said character type identification code and said radical and stroke codes being systematically stored in a radical table memory of said character generating apparatus through a software program;



(3) preparing character pattern description information for Chinese characters, each character including a character code, a character radical code based on said character radical table, and stroke codes based on said stroke table; said character code, character radical code, and stroke codes being systematically stored in a character pattern description memory of said character generating apparatus through a software program; and

(4) constructing identification values for variation parameters which control the width of strokes stored in said stroke table and the size of radicals stored in said radical table of Chinese characters for input into said character generating apparatus to produce required characters; so that characters in different patterns can be quickly produced in high resolution.

4,990,904

DISPLAY MODE SWITCHING SYSTEM FOR FLAT PANEL DISPLAY APPARATUS

Hiroki Zenda, Hamura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 17, 1988, Ser. No. 208,130

Claims priority, application Japan, Jun. 19, 1987, 62-152703; Oct. 31, 1987, 62-276068; Oct. 31, 1987, 62-276069; Oct. 31, 1987, 62-276071

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

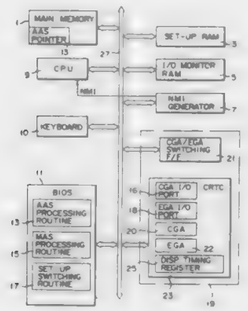
Int. Cl.[5] G09G *5/00*

U.S. Cl. 340—771 **21 Claims**

1. A display mode switching system for a flat panel display apparatus and an optional CRT display apparatus, each operable in a selected one of a plurality of display modes in accordance with a corresponding display timing parameter, each display timing parameter corresponding to a specified resolution, the system comprising:

display timing parameter memory means for storing a display timing parameter corresponding to one of the plurality of display modes;

designating means for designating one of the plurality of display modes as a selected display mode; and



means for setting, in said display timing parameter memory means, the display timing parameter corresponding to the selected display mode.

4,990,905

METHOD OF DRIVING A DISPLAY DEVICE AND A DISPLAY DEVICE SUITABLE FOR SUCH METHOD

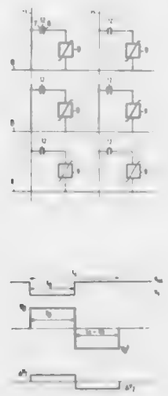
Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 67,652, Jun. 29, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,403

Claims priority, application Netherlands, Jul. 10, 1986, 8601804

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—805 **18 Claims**



1. A method of driving a display device which includes an electro-optical display medium between two supporting plates, a system of picture elements arranged in rows and columns with each picture element being constituted by picture electrodes provided on the facing surfaces of the supporting plates and a system of row and column electrodes, the method comprising, selecting a row of picture elements during a row selection period by applying a selection voltage thereto via the row electrodes by means of non-linear switching elements connected in series with the picture element and presenting a data signal thereto during said row selection period via the column electrodes, characterized in that the data signal, during a row selection period, changes its polarity with respect to a reference voltage determined by the average value of the minimum data voltage in a first period and the maximum data voltage in a second period such that the data signal comprises a sub-signal of positive polarity and a sub-signal of negative polarity wherein the energy content of the sub-signal having a positive polarity with respect to the reference voltage is substantially identical to that of the sub-signal having a negative polarity with respect to the reference voltage.

4,990,906

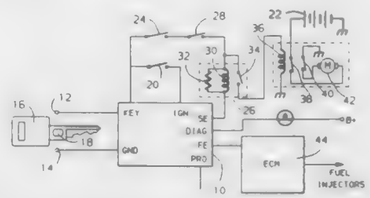
PROGRAMMABLE VEHICLE ANTI-THEFT SYSTEM

Curtis N. Kell, Flora, Ind.; R. Clark Griffin, Dayton, Ohio; John M. Dikeman, Kokomo, Ind., and Mario D. Nemirovsky, Goleta, Calif., assignors to Delco Electronics Corporation, Kokoma, Ind.

Filed Nov. 29, 1988, Ser. No. 277,276

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.310 **10 Claims**



1. A programmable security system for a device having a lock operable by a key, comprising erasable memory means for storing a code associated with a valid key and for storing a key status code indicative of whether the previous attempt to operate the lock was initiated with a valid key or an invalid key, means for reading an input key code in response to a predetermined step in the operation of the lock by said key, means for comparing the input key code with the stored key code to permit operation of the device when the input key code matches the stored key code and the key status code indicates that the previous attempt to operate the lock was initiated with a valid key.

4,990,907

METHOD AND APPARATUS FOR DATA TRANSFER

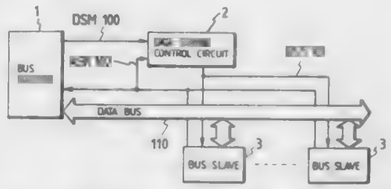
Masami Jikihara, Yamato; Shigeo Tsujioka, Yokohama; Hiromichi Enomoto, Hadano; Tetsuya Mochida, and Masataka Kobayashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Microsoftware Systems, Inc., Yokohama, both of, Japan

Filed Aug. 11, 1988, Ser. No. 231,000

Claims priority, application Japan, Aug. 19, 1987, 62-204066

Int. Cl.[5] H04Q *3/00*; **H04J** *3/02*

U.S. Cl. 340—825.5 **7 Claims**



1. A data transfer method of a hand shake system using a data bus between a bus master and a bus slave, a data strobe signal from said bus master to said bus slave, and a data confirmation signal from said bus slave to said bus master, said method comprising the steps of:

asserting said data confirmation signal on a data confirmation signal line by said bus slave for a data transfer between said bus master and said bus slave;

negating said data strobe signal on a data strobe signal line

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by said bus master in response to said assertion of the data confirmation signal from said bus slave;

confirming negation of said data confirmation signal from said bus slave to said bus master; and

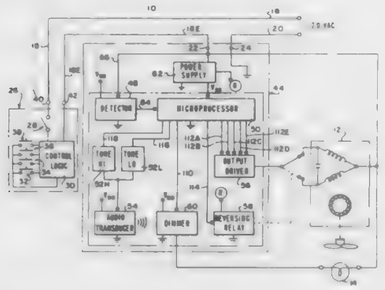
starting a next data transfer between said bus master and said bus slave by asserting said data strobe signal after confirming the negation of said data confirmation signal.

4,990,908

REMOTE POWER CONTROL FOR DUAL LOADS

Michael Tung, 10 F-1 No. 181 Fu Shing North Road, Taipei, Taiwan

Filed Mar. 23, 1989, Ser. No. 327,899
Int. Cl.[5] G08C *19/00*; F24F *3/056*
U.S. Cl. 340—825.630 3 Claims



1. A power control system for use in combination with AC wiring installed between a switch location and a remote fixture of the type having plural electrical loads, said AC wiring having an active power conductor and a neutral power conductor which make AC power available to said plural loads, said power control system comprising a control signaling unit mountable at said switch location and a receiver mountable on said remote fixture, said control signaling unit including:

a manually operable main power switch having switched and unswitched terminals connectable in series electrical relation with said active power conductor;

a plurality of manually operable mode select switches, each mode select switch having an open circuit operating state and a closed circuit operating state;

a control logic circuit having a plurality of input terminals coupled to said mode select switches, respectively, and having an output terminal for generating a repetitive count pulse which transitions between first and second logic levels after a predetermined number of count intervals, the number of count intervals between successive count pulses uniquely corresponding with the operation of a selected one of said mode select switches in a predetermined one of said operating states;

a gate controlled power switch having a control gate terminal, an input power terminal connectable to the switched terminal of said power switch and having an output power terminal connectable to an extension of the active power conductor which conducts power to said remote fixture, said gate controlled power switch being operable in a closed circuit conducting mode in response to the application of a turn-off signal to said control gate terminal, and being operable in an open circuit non-conducting mode in response to the application of a turn-off signal to said control gate terminal;

a bypass rectifier connected in parallel circuit relation across said gate controlled power switch for conducting predetermined polarity half cycles of said AC power waveform and blocking the opposite polarity half cycles of said AC power waveform;

a power switch gate circuit having an input terminal coupled to the output terminal of said control logic circuit and having an output terminal coupled to the gate terminal of said gate controlled power switch, said power switch gate circuit being responsive to a predetermined one of said first and second count pulse logic levels for applying a turn-on signal to the gate terminal of said gate controlled power switch, and being responsive to the other count pulse logic level to apply a turn-off signal to the gate terminal of said gate controlled power switch;

a zero state detector having an input terminal and an output terminal, said detector input terminal being coupled to the output terminal of said logic gate controlled power switch for generating a trigger pulse in response to each zero cross transition of the AC power waveform on the output terminal of the gate controlled power switch, and for generating a command pulse in response to a zero state condition of the output AC power waveform on the output terminal of the gate controlled power switch; and,

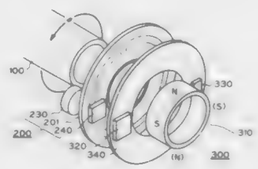
said receiver having an input terminal connected to the output terminal of the zero state detector, said receiver including programmable control means having stored program instructions for controlling the application of power to one or more of said plural loads in response to coded commands corresponding with the number of command pulses generated between trigger pulses.

4,990,909

REVOLUTION COUNTER USING A MAGNETIC BUBBLE DEVICE FOR MULTI-TURN ABSOLUTE ENCODER

Toshitugu Ueda; Fusao Kohsaka; Toshi Iino; Kunio Kazami; Hiroshi Nakayama; Yoshiaki Kudou, and Yasuhiro Sakamaki, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,359
Claims priority, application Japan, Sep. 30, 1988, 63-247877; Jun. 30, 1989, 1-168341; Jul. 6, 1989, 1-79739[U]; Jul. 20, 1989, 1-85259[U]; Jul. 25, 1989, 1-87094[U]
Int. Cl.[5] H03M *1/22*
U.S. Cl. 341—15 11 Claims



1. In a multi-turn absolute encoder comprising a turn detector for detecting number of turns of a rotary shaft and shaft angle encoder for measuring turning angle of said rotary shaft, said shaft angle encoder comprising a code plate: the improvement comprising

a magnetic bubble element for sequentially transferring magnetic bubbles on a transfer pattern in accordance with a turn of a driving magnetic field; and

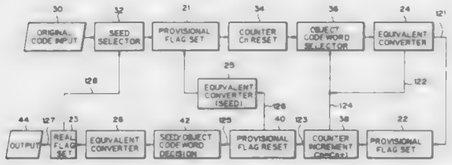
a permanent magnet turning together with said code plate and for generating said driving magnetic field, so that said turn detector detects the number of turns of said rotary shaft from positions of said magnetic bubbles on said transfer pattern in said magnetic bubble element.

4,990,910

VARIABLE LENGTH CODE CONVERSION SYSTEM

Yasuhiro Takishima, and Hitomi Murakami, both of Saitama, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1990, Ser. No. 480,447
Claims priority, application Japan, Feb. 21, 1989, 64-3924
Int. Cl.[5] H03M *7/40*
U.S. Cl. 341—67 2 Claims



1. A variable length code conversion system for generating a new codeword from an original codeword without increasing average bit length so that a shorter codeword coincides with a rear part of another codeword which is longer than said shorter codeword, said variable length code conversion system comprising:

(a) input means for reading original codewords together with occurrence probability of each codeword;

(b) a seed selector for successively selecting each of a plurality of short codewords with high occurrence probability as each of a plurality of seed words;

(c) an object codeword selector for successively selecting each of a plurality of object codewords in said original codewords so that each of said object codewords is longer than said selected seed word;

(d) a first equivalent converter for successively exchanging a node or leaf of each selected object codeword with a node or leaf which is located on a same level of a tree structure of the variable length code as that of said selected object codeword, and which has a rear portion equal to the seed word;

(e) a counter for counting a number of coincidences between rear portions of said selected object codewords and the seed word when all said selected object codewords are exhausted;

(f) a second equivalent converter for exchanging the seed word with a node or a leaf on the same level in said tree structure as that of the seed word, and resetting said counter;

(g) control means for activating said object codeword selector, to successively reselect each of said plurality of object codewords; and said first equivalent converter, to successively re-exchange the node or leaf of each reselected object codeword and said counter to count the number of coincidence between said rear portions of said selected object codewords and the seed word so that said number of coincidences from said counter is a maximum and for activating said seed selector to select another seed; and

(h) an output means for providing a new codeword from said control means when all the seeds selected by the seed selector are exhausted.

4,990,911

SAMPLING FREQUENCY CONVERTER

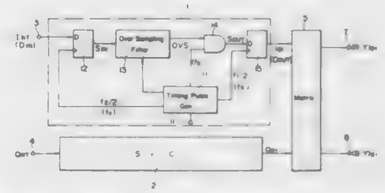
Tadao Fujita, Kanagawa; Jun Takayama, Tokyo; Takeshi Ninomiya, Kanagawa; Yoshikazu Kurose, Kanagawa, and Yoshiaki Inaba, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 332,899
Claims priority, application Japan, Apr. 8, 1988, 63-086678
Int. Cl.[5] H03M *1/86*
U.S. Cl. 341—123 6 Claims

1. A sampling frequency converter for converting sampled input data having an input sampling frequency into sampled output data having a different output sampling frequency, comprising:

over-sampling means supplied with said sampled input data for increasing the sampling frequency of said sampled input data by a factor n to provide over-sampled data;

means for generating a timing pulse having said output sampling frequency;



output data extractor means for periodically extracting data from said over-sampled data in response to said timing pulse; and

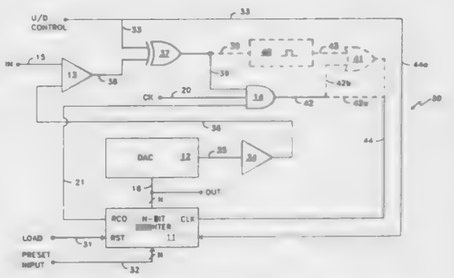
control means for controlling the timing of said timing pulse to control the phase of said sampled output data.

4,990,912

DIGITAL PEAK/VALLEY DETECTOR

Anthony P. Selwa, Brownsburg, Ind., assignor to Wavetek RF Products, Inc., Indianapolis, Ind.

Filed Oct. 21, 1988, Ser. No. 260,819
Int. Cl.[5] H03M *1/00*
U.S. Cl. 341—132 22 Claims



15. A method for determining a digital peak value of an analog input signal comprising the steps of:

presetting a counter means for varying a digital signal to a minimum value;

converting said digital signal to an analog signal;

comparing said analog signal with said analog input signal;

transmitting an adjusting signal to said counter means if said analog input signal has a value greater than a value of said analog signal; and

incrementing said digital signal of said counter means if said adjusting signal is transmitted thereto.

4,990,913

ANALOG TO DIGITAL CONVERTER FOR HIGHLY DYNAMIC SIGNALS, USING A VARIABLE REFERENCE VOLTAGE TO FLOATING DECIMAL POINT OUTPUT

Claude Beauducel, Henonville, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jan. 23, 1989, Ser. No. 299,313
Claims priority, application France, Jan. 21, 1988, 88 00764
Int. Cl.[5] H03M *1/18*
U.S. Cl. 341—139 11 Claims

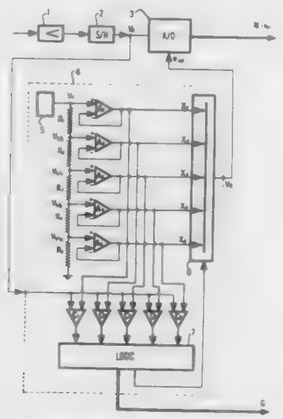
1. An acquisition device for sampling and digitizing highly dynamic signals, comprising sampling means for sampling the

signals; an analog to digital converter having a signal input connected to said sampling means and having a reference input, for digitizing a signal sample from said sampling means by comparing the amplitude of the sample with a reference voltage applied to said reference input; and selection means for generating a reference voltage as a function of the amplitude of the signal to be digitized, said selection means including:

a stabilized voltage source for providing a stabilized D.C. voltage of fixed amplitude;

a single voltage divider coupled between the stabilized voltage source and a fixed reference voltage level for providing a plurality of stabilized secondary voltages;

a plurality of comparators, each of said comparators having a first input connected to said sampling means to receive the signal sample therefrom, a second input connected to said voltage divider to receive a uniquely associated one of the secondary voltages therefrom, and an output for providing a comparator output signal indicative of the



comparison of the signal sample with the associated secondary voltage;

a logic circuit connected to the outputs of said comparators for providing a control signal indicative of the provided comparator output signals; and

a switching circuit having a plurality of signal inputs, a control input, and an output, each of said signal inputs connected to the junction of said single voltage divider and the second input of a uniquely associated one of said plurality of comparators to receive the associated one of the secondary voltages from said single voltage divider, said control input connected to said logic circuit to receive the control signal therefrom, said switching circuit responsive to the received control signal for selecting one of the received secondary voltages for application by said switching circuit output to said analog to digital converter reference input as a reference voltage, causing said analog to digital converter to provide a digital output indicative of the amplitude of the signal sample.

4,990,914

METHOD AND APPARATUS FOR INTERPOLATIVE A/D CONVERSION

Charles H. Giancarlo, San Francisco, Calif., assignor to Siemens Akteingesellschaft, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 445,006, Nov. 29, 1982, abandoned. This application Mar. 29, 1988, Ser. No. 174,597

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1981, 3147409

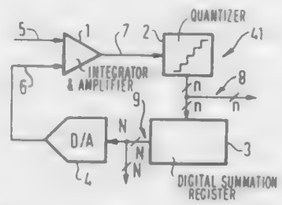
Int. Cl.[5] H03M *3/04*

U.S. Cl. 341—143 **11 Claims**

1. A method using a delta modulator for converting an analog input signal to a digital output signal, comprising the steps of:

(a) forming in an analog summing circuit an analog difference signal between said analog input signal and an analog estimate signal of said analog input signal;

(b) integrating and amplifying in an analog integrator said analog difference signal, forming an analog integrated difference signal;



(c) quantizing in a quantizer said analog integrated difference signal, forming a digital quantized signal having a bit width equal to n;

(d) summing said digital quantized signal in a digital summation register having a bit width equal to N, wherein N>n, forming a digital estimate of said analog input signal;

(e) converting in a digital-to-analog converter said digital estimate to form said analog estimate of said input signal.

4,990,915

SIGNAL PROCESSING DEVICE SUCH AS A DIGITAL FILTER UTILIZING REDUNDANT BINARY EXPRESSION AND OPERATING METHOD THEREFOR

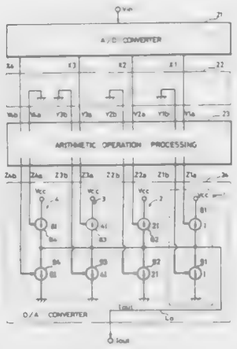
Harufusa Kondoh, and Hiromi Shimada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1989, Ser. No. 435,859

Claims priority, application Japan, Dec. 2, 1988, 63-306532

Int. Cl.[5] H03M *1/66*

U.S. Cl. 341—144 **15 Claims**



1. A signal processing device for converting a digital input signal containing a plurality of digits expressed by the redundant binary expression into an analog signal, wherein

said digital input signal containing a plurality of digits is expressed in the redundant binary expression in which each digit has first and second binary bits each represented as a logic, said device comprising:

a plurality of current supplying means each being provided in correspondence to each digit of said digital input signal and responsive to the signals of each digit to supply the current, the output of each of said current supplying means being connected together at an output node of said D/A converter, each said current supplying means including

current increasing means connected to said output node and responsive to said first binary bit to supply a current of a predetermined value to said output node,

current decreasing means connected to said output node and responsive to said second binary bit to subtract the current of said predetermined value from said output node, and

current setting means connected to said current increasing means and said current decreasing means for establishing said predetermined value of the output current of said current increasing means and said current decreasing means,

said predetermined value established by said current setting means in each of said current supplying means being set to values increasing responsive to the function of the powers of 2 for each of said current supplying means.

4,990,916

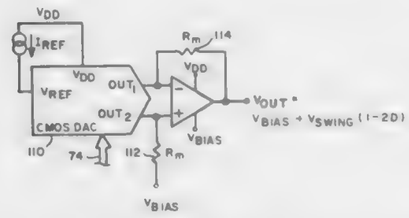
SINGLE-SUPPLY DIGITAL-TO-ANALOG CONVERTER FOR CONTROL FUNCTION GENERATION

John M. Wynne, Dooradoyle, and Michael Byrne, Ballysheedy, both of Ireland, assignors to Analog Devices, BV, Limerick, Ireland

Filed Jan. 30, 1990, Ser. No. 472,364

Int. Cl.[5] H03M *1/66*

U.S. Cl. 341—147 **3 Claims**



1. A circuit for producing the function $V_{out} = V_{bias} + V_{swing}(1-2D)$, where D represents the decimal or fractional equivalent of a digital code and may range in value between zero and one, and V_{bias} and V_{swing} are input variables, the circuit comprising:

a. a digital-to analog converter (DAC) having a reference voltage input, an analog ground terminal, a digital input port for receiving said digital code, and an analog output terminal;

b. an operational amplifier having inverting and non-inverting inputs and an output;

c. the DAC output being provided to the non inverting input of the operational amplifier through a resistor of resistance R;

d. the non inverting input of the operational amplifier also being connected to one lead of a resistor of resistance 2R, the other lead of said resistor being connected to receive the input voltage V_{bias};

e. means for supplying a voltage $V_{swing}/2$ to the inverting input of the operational amplifier through an incremental resistance R;

f. the output of the operational amplifier being connected to the inverting input of the operational amplifier through a resistor of resistance 2R; and

g. the reference voltage input of the DAC being connected to receive the input voltage V_{swing}.

4,990,917

PARALLEL ANALOG-TO-DIGITAL CONVERTER

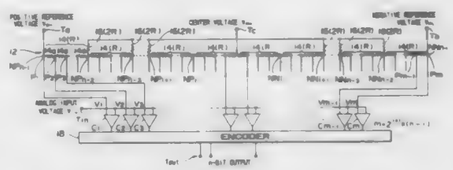
Takayuki Kobdaka, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamatsu, Japan

Filed Mar. 7, 1989, Ser. No. 319,621

Claims priority, application Japan, Mar. 8, 1988, 63-54046

Int. Cl.[5] H03M *1/36*

U.S. Cl. 341—159 **1 Claim**



1. A parallel analog-to-digital converter comprising:

(a) reference-voltage generating means for generating a plurality of individual reference voltages, wherein said reference voltage generating means comprises a resistor ladder network that is made up of first resistors of predetermined value and second resistors having values which are multiples of said predetermined value, wherein each of said first resistors comprises a plurality of resistors of the same value connected serially, each connecting point of said resistors of the same value producing said individual reference voltage;

(b) a plurality of comparator means for comparing each of said individual reference voltages with an analog input voltage; and

(c) encoding means for encoding outputs of said comparator means into digital data corresponding to said analog input, whereby said reference-voltage generating means divides a fundamental reference voltage into exponential reference voltages according to an exponential scale, and further divides each voltage between two consecutive exponential reference voltages into a plurality of said individual reference voltages.

4,990,918

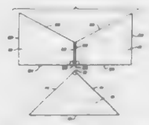
RADAR REFLECTOR TO ENHANCE RADAR DETECTION

David G. Michelson, and Helmut H. Lanziner, both of North Vancouver, Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Dec. 21, 1989, Ser. No. 455,701

Int. Cl.[5] H01Q *15/18*

U.S. Cl. 342—7 **5 Claims**



1. A radar reflector to enhance radar detection in one plane comprising

a trihedral corner reflector arrangement having three planar faces at right angles to each other, a first planar face substantially triangular in shape having a right angle representing a common vertex,

second and third planar faces joined at inner edges of the second and third planar faces to form a center line extend-

ing from the common vertex and each joined to the first planar face at straight sides extending from the common vertex such that the reflector is symmetrical about the center line, the center line being shorter than the two straight sides,

the trihedral corner reflector arrangement being rotationally asymmetric about a boresight which makes equal angles with each of the three planar faces,

the shape of the planar faces being such that radar cross section response in a first plane containing the boresight and being perpendicular to the center line is greater than radar cross section response in a second plane containing the boresight and the center line, and

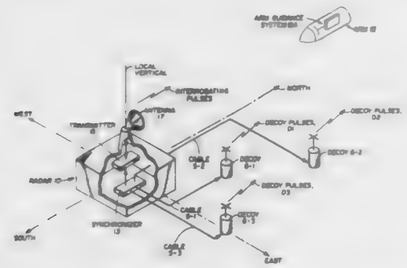
the reflector arrangement mountable on a surface without need for additional supporting structure.

4,990,919

MISSILE DECOY SYSTEM

David V. Manoogian, Lynnfield, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 23, 1989, Ser. No. 425,259
Int. Cl.[5] H04K 3/00; G01S 7/38
U.S. Cl. 342—13 2 Claims



1. A method of protecting a pulse radar from an ARM missile attempting to home on interrogating pulses emitted by such radar, the duty factor and amplitudes of the interrogating pulses being known, such method comprising the steps of:

(a) siting a plurality of decoys at different locations in the vicinity of the pulse radar, each one of the decoys being adapted, when actuated, to emit pulses having duty factors less than the duty factor of the interrogating pulses and amplitudes normally greater than the amplitudes of the interrogating pulses;

(b) sequentially actuating, when each one of the interrogating pulses is generated in the pulse radar, a selected set of decoys in the plurality of decoys to form a composite covering pulse overlapping the then emitted one of the interrogating pulses; and

(c) changing, at the time each successive one of the interrogating pulses is generated, the sequence in which the decoys in each selected set are actuated, thereby to change the composite covering pulse overlapping each one of the successively emitted interrogating pulses.

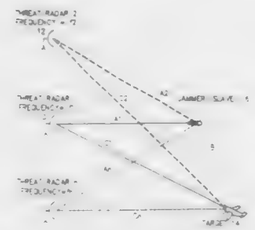
4,990,920

ELECTRONIC COUNTERMEASURE SYSTEM

Royden C. Sanders, Jr., Burton Hwy., Wilton, N.H. 03086

Filed Apr. 6, 1983, Ser. No. 483,946
Int. Cl.[5] G01S 7/38
U.S. Cl. 342—14 12 Claims

1. A radar jamming system comprising a target vehicle and a slave vehicle, a master threat radar detection system in the target vehicle and a slave transmitter system in the slave vehicle, a data link between the target vehicle and the slave vehicle, a threat analyzer carried by the target vehicle, said threat analyzer being capable of measuring the distance between the target vehicle and slave vehicle, means for calculating a suitable time delay signal and doppler shift for masking the target vehicle, said signals being transmitted to said slave vehicle by said data link, and means carried by said slave vehicle under



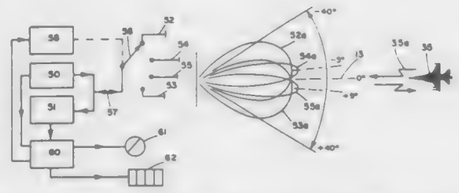
control of the data link for generating and transmitting a radar pulse having the calculated time delay and doppler shift so that said pulse is coincident in both time and frequency with the target signal.

4,990,921

MULTI-MODE MICROWAVE LANDING SYSTEM

John P. Chisholm, Olympic Valley, Calif., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 1, 1987, Ser. No. 45,911
Int. Cl.[5] G01S 1/14, 13/80, 13/93
U.S. Cl. 342—35 15 Claims



1. A system for providing ground derived approach guidance for an aircraft for guiding the aircraft along an approach path toward a landing site, comprising:

ground based means located near the landing site for transmitting signals toward an aircraft approaching the landing site;

a plurality of ground based fixed beam directional antennas disposed near the landing site oriented so that the fixed beams for the antennas overlap along the approach path;

means for receiving signals received by said plurality of antennas from an aircraft in response to signals transmitted for the ground based transmitting means and comparing the relative amplitudes of the received signals to determine the position of the aircraft relative to the approach path;

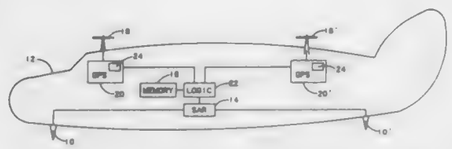
a transmitter located on board the aircraft, said transmitter being responsive to signals received from the ground based transmitting means for generating a reply transmission in response thereto for receipt by said fixed beam antennas, wherein said ground based transmitting means includes means for transmitting pulses and wherein said transmitter on board the aircraft is responsive to each pulse received from said ground based transmitting means for transmitting a plurality of pulses in response to each received pulses, wherein said receiving and comparing means is operative to receive a different one of said plurality of pulses on each of said plurality of antennas and to compare the amplitude of said received pulses.

4,990,922

SYSTEM AND METHOD FOR MEASURING OCEAN SURFACE CURRENTS AT LOCATIONS REMOTE FROM LAND MASSES USING SYNTHETIC APERTURE RADAR

Lawrence E. Young, La Canada; Jeffrey M. Srinivasan; Thomas K. Meehan, both of Glendale; Timothy N. Munson, La Crescenta; George H. Purcell, Jr., Pasadena; Jess B. Thomas, and Courtney B. Duncan, both of La Canada, all of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 14, 1990, Ser. No. 493,190
Int. Cl.[5] G01S 13/86, 13/89
U.S. Cl. 342—52 8 Claims



1. In a system for measuring ocean surface currents from an airborne platform using a radar system having two spaced radar antennas wherein one radar antenna is driven with a radar signal and return signals from an ocean surface are detected by both radar antennas and radar data from signals from the radar antennas is used by computational logic to derive measurements of currents on the ocean surface, the improvement with which to determine the position, orientation, and velocity of the platform for use by the computational logic comprising:

(a) first satellite-based global position determination system means including a first GPS antenna carried by the platform at a first location for determining the position of said first antenna from signals from orbiting navigational satellites and for outputting a first signal containing GPS data reflecting said position of said first antenna;

(b) second satellite-based global position determination system means including a second GPS antenna carried by the platform at a second location displaced from said first antenna for determining the position of said second antenna from signals from said orbiting navigational satellites and for outputting a second signal containing GPS data reflecting said position of said second antenna; and,

(c) the computational logic including logic for determining from said GPS data contained in said first signal and said second signal the position, orientation, and velocity of the platform, wherein said first satellite-based global position determination system means and said second satellite-based global position determination system means comprise separate GPS receivers which share a common frequency standard.

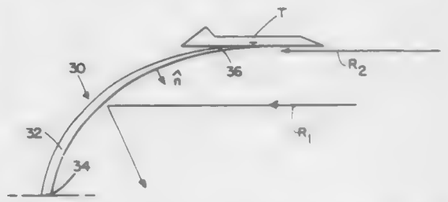
4,990,923

TEST PYLON HAVING LOW RADAR CROSS SECTION

Thomas P. Delfeld, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 29, 1989, Ser. No. 375,142
Int. Cl.[5] G01S 7/40
U.S. Cl. 342—165 9 Claims

1. A pylon for supporting a test target during a radar cross section measurement, said pylon comprising an elongated support extending upwardly from a base to a tip on which said test target is mounted, said support being inclined in a first direction toward an interrogating radar signal, substantially the entire length of said support, including said tip curving smoothly in said first direction with said support being



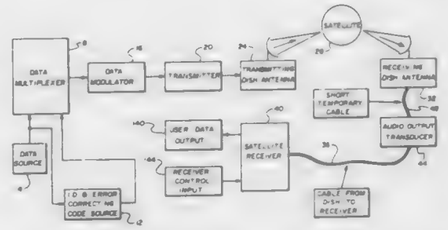
smoothly faired to said test target at said tip so that said pylon has a relatively low radar cross section.

4,990,924

SATELLITE LOCATING SYSTEM

John W. G. McMullen, Provo, Utah, and Gregory A. Magin, Ocala, Fla., assignors to Creative Digital, Inc., Orem, Utah

Filed Jul. 20, 1989, Ser. No. 382,226
Int. Cl.[5] H01Q 3/00; H04B 7/185
U.S. Cl. 342—359 12 Claims



1. In a satellite communication system having a receiving station which comprises an antenna for receiving radio signals relayed by a satellite at which the antenna is aimed, said signals including signal identification data for identifying said satellite, circuit means located near the antenna for operating upon the received signals, signal processing means located remotely from the antenna for processing signals received from the circuit means, power supply means for producing electrical power, and cable means for carrying power from the power supply means to the circuit means and for carrying received radio signals from the circuit means to the signal processing means,

a system for aiding a user in aiming the antenna toward the satellite comprising

means for modulating the power in a predetermined manner in response to a first control signal,

a processor unit responsive to receipt of the signal identification data for supplying a first control signal to said modulating means, and

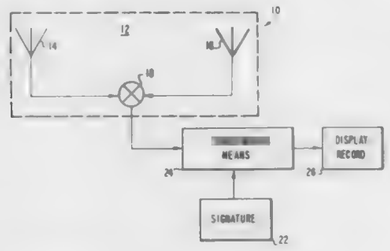
transducer means connectable into said cable means adjacent the circuit means for receiving modulated power from the modulating means and for producing an audible signal whose characteristics are determined by the modulated power.

4,990,925

INTERFEROMETRIC RADIOMETER

Charles R. Edelsohn, and Carl A. Wiley, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 7, 1984, Ser. No. 607,848
Int. Cl.[5] G01S 5/02
U.S. Cl. 342—424 13 Claims



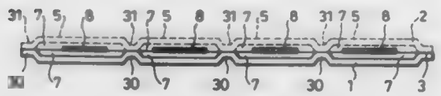
1. A radiometer for reconstructing the radiation distribution of a scene of noncoherent multiple emitters comprising:
an interferometer further comprising; first and second antennas, each of the antennas producing individual time records in response to radio frequency emissions from the scene and means coupled to the first and second antennas for combining the individual time records to produce an interferemeter time record of the scene, said interferometer also having a predetermined fringe pattern with a series of sensitivity lobes with different widths;
scanning means for effecting determinable relative movement between said fringe pattern and said scene so that a predetermined plurality of said lobes scan said scene;
signature means for providing a signature of said determinable scanning motion relative to said predetermined fringe pattern; and
transform means for reconstructing said distribution from said interferometer time record according to a function of said signature, said function being selected so that its resultant is a reconstruction of the radiation distribution of said scene.

4,990,926

MICROWAVE ANTENNA STRUCTURE

Takashi Otsuka, and Junichi Kajikuri, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,728
Claims priority, application Japan, Oct. 19, 1987, 62-263157; Oct. 27, 1987, 62-270757; Nov. 27, 1987, 62-299416; Nov. 30, 1987, 62-301917
Int. Cl.[5] H01Q 1/38, 3/02
U.S. Cl. 343—700 MS 13 Claims



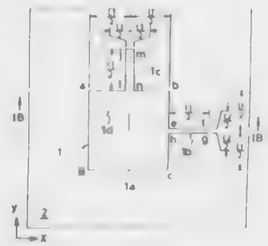
1. A suspended line feed type planar antenna comprising a substrate sandwiched between a top plate and a bottom plate, said top plate having a plurality of spaced openings defining radiation elements, a corresponding plurality of radiators formed on said substrate in alignment with said openings, respectively, and feeding means for feeding said radiators, a first portion of said top and bottom plates being each formed of a flat plate with substantially no protrusions and a second portion of said top and bottom plates having protrusions deformed by press-treatment at corresponding locations on said top and bottom plates at a plurality of positions, by deforming small areas of said top and bottom plates, said protrusions extending between said top plate and said substrate and between said bottom plate and said substrate, said substrate being supported by said protrusions, and said protrusions occupying a minor proportion of the surface area of said top and bottom plates.

4,990,927

MICROSTRIP ANTENNA

Kiyokazu Ieda, Tokyo; Yuichi Murakami, Kanagawa, and Takashi Nakamura, 3680-15, Honjyo, Gifu City, Gifu Pref., all of Japan, assignors to Takashi Nakamura, Gifu and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Mar. 27, 1989, Ser. No. 328,641
Claims priority, application Japan, Mar. 25, 1988, 63-071015; Mar. 25, 1988, 63-071016
Int. Cl.[5] H01Q 1/38
U.S. Cl. 343—700 MS 5 Claims



1. A microstrip antenna comprising:
a dielectric plate member having two major surfaces and a thickness which is small compared to a wavelength of electromagnetic radiation,
a rectangular radiation conductive plate member connected along one major surface of said dielectric plate member,
a grounding conductive plate member connected along the other major surface of said dielectric plate member,
an electric power supply point connected to the rectangular radiation conductive plate member through the dielectric plate member, and
said rectangular radiation conductive plate member including first and second portions defined as line loads respectively extending from the middle of each of two adjacent sides of said rectangular radiation conductive plate member and in the same plane as said rectangular radiation conductive plate member, said first and second portions being sized so as to be resonant, and such that said microstrip antenna resonates at four different frequencies.

4,990,928

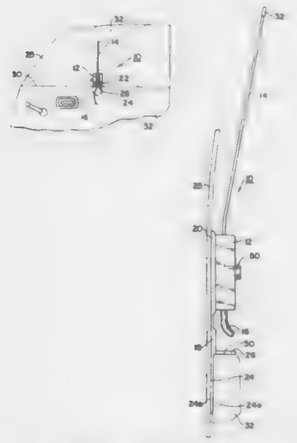
PORTABLE ANTENNA FOR MOUNTING ON INSIDE OF MOTOR VEHICLE

Herbert R. Blaese, 3314 Olcott Ave., Chicago, Ill. 60634

Filed Jan. 2, 1990, Ser. No. 459,939
Int. Cl.[5] H01Q 1/320, 1/120, 9/00
U.S. Cl. 343—713 3 Claims

2. A portable antenna for mounting adjacent the lower window ledge of a motor vehicle which comprises:
a housing;
a radiator having a distal end and a proximal end, the proximal end being located within the housing and the distal end being located outside of the housing;
an electrical cable coupled to the housing;
a support member coupled to the housing, the support member extending generally in the opposite direction of the radiator and having a generally planar portion for insertion and retention between the side window and the lower window ledge of the door frame of a motor vehicle with the radiator being located on the inside of the vehicle;

said support member having a flange extending from its front with a portion of the flange being oriented so that when the support member is retained between the side



window and the door frame of a motor vehicle, the flange can be positioned to rest on the window ledge of the door frame.

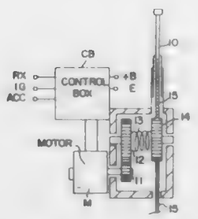
4,990,929

MOTOR-DRIVEN AUTOMOBILE ANTENNA WITH TIMER CIRCUIT

Kazuhiko Nakase, Tokyo, and Yuzo Yamamoto, Kanagawa, both of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 285,050
Int. Cl.[5] H01Q 1/320, 1/100; G05B 19/310
U.S. Cl. 343—715 5 Claims





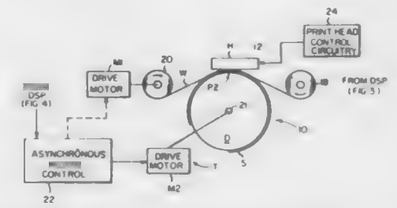
1. A motor driven antenna for automobiles comprising:
a vertical driving means for driving a rod antenna of said motor driven antenna in a vertical direction;
a motor for driving said vertical driving means;
a positive temperature coefficient resistor provided in series with said motor for sensing motor current;
a power transistor provided in series with said motor for turning said motor ON or OFF in response to an input trigger pulse;
a timer which sets a time equal to an amount required for said rod antenna to be fully extended from its minimum length plus a predetermined additional time;
a relay circuit for controlling the direction of current of said motor, said relay circuit comprising:
a relay which is only energized during said time set by said timer after a power switch of an automobile radio changes from OFF to ON; and
relay contact means for controlling direction of current to said motor such that current is supplied to said motor to cause said motor to drive said vertical driving means in an antenna extending direction only when said relay is energized; and
a control circuit for supplying said input trigger pulse to said power transistor in response to said timer, said motor current sensed by said resistor and said power switch for said automobile radio such that said power transistor is turned ON when said power switch for said automobile radio changes from OFF to ON or ON to OFF, said power transistor is turned OFF when said timer reaches said set time and said power transistor is turned OFF when said sensed current exceeds predetermined value.

4,990,930

HIGH SPEED THERMAL PRINTING APPARATUS

Christopher A. Ludden, Fairport, and David A. Johnson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,226
Int. Cl.[5] G01D 9/03, 15/10; H04N 1/21; B41J 2/325
U.S. Cl. 346—1.1 12 Claims



1. A continuous-tone thermal printer comprising:
(a) a transport mechanism for advancing print medium along a predetermined path through a print zone;
(b) means for contacting said print medium with a dye-bearing donor web at said print zone;
(c) an elongated thermal print head extending transverse to said path at said print zone, said head contacting said donor web and comprising a plurality of printing elements, each of said printing elements being selectively energized for a variable length of time within a maximum time interval during which pixels of a line of image information are printed by causing dye to transfer from said donor web to said print medium, the density of each pixel being proportional to the length of time each printing element is selectively energized;
(d) means for determining the maximum pixel density to be printed in each image line and for producing a control signal when such maximum pixel density has been printed in each image line at a time less than said maximum time interval; and
(e) transport control means for controlling said transport mechanism to advance said print medium at a substantially constant velocity while the density of any pixel in an image line is increasing and, in response to said control signal, to increase the velocity of said print medium relative to said print head in order to locate said print medium at the start of the succeeding image line before said maximum time interval has expired.

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12. A thermal printing process for producing continuous tone images, one line at a time, on a print medium each image line comprising a plurality of picture elements (pixels) which can incrementally vary in density up to a predetermined maximum density, said process comprising the steps of:

(a) advancing a print medium along a predetermined path through a print zone;

(b) contacting said print medium with a dye-bearing donor web at said print zone;

(c) contacting said donor web with a print head extending transverse to said path at such print zone, said print head comprising a plurality of heating elements, each of said heating elements being selectively energizable for a variable length of time within a maximum time interval during which such pixels of a line of image information are printed by causing dye to transfer from said donor web to said print medium, the density of each pixel being proportional to the length of time each heating element is energized;

(d) determining the maximum pixel density to be printed in each image line and producing a control signal when such maximum pixel density has been printed in each image line at a time less than said maximum time interval; and

(e) advancing said print medium at a substantially constant velocity while the density of any pixel in an image line is increasing and, in response to said control signal, increasing the velocity of said print drum relative to said print head in order to locate said print medium at the start of the succeeding image line before said maximum time interval has expired.

4,990,931

IMAGE FORMING METHOD AND APPARATUS THEREFOR

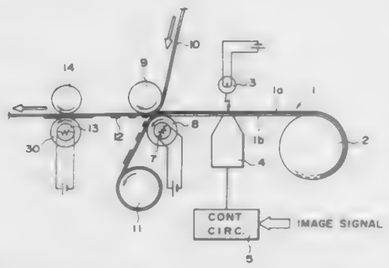
Tadashi Sato, Kokubunji, and Shinnosuke Taniishi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 927,876, Nov. 7, 1986, abandoned. This application Jul. 20, 1989, Ser. No. 383,259

Claims priority, application Japan, Nov. 8, 1985, 60-248886

Int. Cl.[5] G01D *15/10*; G03G *13/01*

U.S. Cl. 346—1.1 24 Claims



17. An image-forming apparatus for a method wherein a transferable portion formed in a transfer recording layer of a transfer recording medium is transferred to a transfer-receiving medium to form a transferred image thereon, said transfer recording layer being solid at room temperature and being capable of causing an irreversible change in transfer characteristic thereof when provided with plural kinds of energies, said apparatus comprising:

heating means for imparting heat energy to the transfer recording layer to heat the layer to an elevated temperature, illumination means for imparting light energy to the transfer recording layer at the elevated temperature, thermal transfer means for transferring the transferable portion formed in said transfer recording layer, and fixing means for fixing the transferred image on the transfer-receiving medium; at least one of said heating means and said illumination means being driven based on image signals, whereby a non-transferable portion int he transfer recording layer is formed corresponding to the portion of the transfer recording layer imparted with both heat and light and a transferable portion in the transfer recording layer corresponding to the portion of the transfer recording layer to which said image signals are not applied and wherein the transferable portion of the transfer recording layer is thermally transferred to the transfer receiving medium to leave an image corresponding to the transferable portion on the transfer receiving medium.

4,990,932

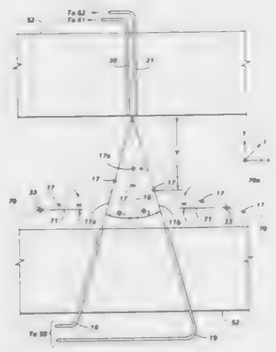
INK DROPLET SENSORS FOR INK JET PRINTERS

Robert D. Houston, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1989, Ser. No. 412,361

Int. Cl.[5] G01D *15/18*; H01J *5/16*

U.S. Cl. 346—45 6 Claims



1. A differential signal generating optical sensor for sensing the position of ink droplets passing thereby relative to the droplets' deflection voltage in the horizontal direction and in absolute value in the vertical direction, comprising:

means for directing a first beam of light from a first substrate on one side of a droplet trajectory to coplanar receiving apertures of a first pair of receiving channels located in a second substrate on the opposite side of the droplet trajectory and thereby creating a differentially detected zero-crossing optical axis at a predetermined angle Φ_1 with respect to a perpendicular line from the midpoint between said coplanar receiving apertures, the angle Φ_1 being determined about said perpendicular line and from said second substrate, the first and second substrates being parallel to each other, each aperture of the first pair of channels being respectively coupled to first and second photodetectors, each

photodetector producing an output signal upon receipt of light;

means for directing a second beam of light from the first substrate to said coplanar receiving apertures of the first pair of receiving channels located in the second substrate thereby creating a differentially detected zero-crossing optical axis at a second predetermined angle Φ_2 with respect to the perpendicular line from the midpoint between coplanar receiving apertures of the first pair of channels, the angle Φ_2 being determined about said perpendicular line and from said second substrate, the first and second beams of light being on opposite sides and in a plane containing the perpendicular line;

first differential circuitry for receiving the output signals from the first and second photodetectors and, in response thereto, for determining a deflection voltage V

for directing a subsequent droplet along the desired trajectory; and

controller means for receiving the output signals from the first and second photodetectors and for calculating the vertical (Y) droplet positions in response thereto of that droplet trajectory.

4,990,933

COLOR THERMAL PRINTER

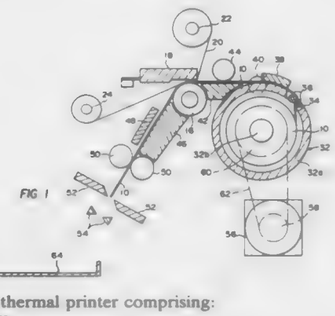
Atsushi Hatakeyama; Wayne F. Niskala, and Seishi Ohmori, all of Tokyo, Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1990, Ser. No. 534,064

Claims priority, application Japan, Feb. 15, 1990, 1-35245

Int. Cl.[5] G01D *15/10*; B41J *2/315*

U.S. Cl. 346—76 PH 2 Claims



1. A color thermal printer comprising:

a platen roller;

a printing section having a platen roller and a movable thermal print-head which is arranged in opposition to the platen roller and which is movable between open and printing positions;

an ink donor film overlaid on a print receiver and having a multiplicity of colored inks, which is moved in unison with the movement of the print receiver through a transfer section formed by a gap between the platen roller and the open thermal print-head;

a drum arranged in the vicinity of the printing section which can be controllably rotated in two directions, the drum having a wall provided with an aperture, receiver support means provided in the interior of the drum for mounting a roller of print receiver so that the print receiver passes through such aperture;

gripper means located exterior to the drum which rotates together with the drum and is switchable between clamping the print receiver against the drum and releasing the print receiver;

means coupled to the drum for rotating the drum to transport the print receiver through the transfer section;

wherein when the receiver is being wound on said support means, the print-head is in a closed position and presses the donor film and receiver against the platen roller and the gripper means clamps the receiver to the drum so that colored ink is electively transferred to the receiver while the print receiver is being moved in contact with the drum.

4,990,934

RECORDING HEAD HAVING A HEAT DISSIPATING ELECTRICALLY INSULATING LAYER DISPOSED BETWEEN RECORDING AND RETURN ELECTRODES

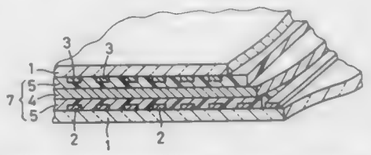
Yukihisa Takeuchi; Toshikazu Hirota; Shigeki Okada, and Natsumi Shimogawa, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Sep. 6, 1989, Ser. No. 407,432

Claims priority, application Japan, Sep. 9, 1988, 63-226799

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH 16 Claims



1. A recording head operable to apply an electric current, having at least a plurality of recording electrodes and at least one return circuit electrode, which are held in contact with a sheet having at least an electrically resistive layer which generates heat upon energization thereof through said recording and return circuit electrodes said recording head comprising:

an insulating layer including an electrically insulating material and at least one metallic sheet positioned in said electrically insulating material, said insulating layer being disposed between an array of said plurality of recording electrodes and said at least one return circuit electrode, so as to form a multi-layer structure which includes said recording electrodes, said at least one return circuit electrode and said insulating layer;

said recording electrodes and said at least one return circuit electrode being formed of an electrically conductive material which has a higher degree of wear resistance than that of said insulating layer.

4,990,935

THERMAL HEAD

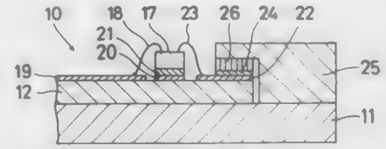
Shuichi Takemoto, Chiryu; Ryohei Yabuno, and Masami Ishii, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 17, 1988, Ser. No. 258,855

Claims priority, application Japan, Oct. 16, 1987, 62-262322

Int. Cl.[5] G01D *15/10*; H01C *1/012*

U.S. Cl. 346—76 PH 15 Claims



1. A thermal head comprising:

a substrate of insulating material;

a plurality of heat elements arranged on said substrate;

a common electrode coupled to a first end of each of said plurality of heat elements;

a plurality of gold patterns, each gold pattern coupled to a second end of each of said plurality of heat elements; and

electrically conductive protection means selectively disposed on each of said plurality of gold patterns for protecting said gold patterns from damage due to the formation of electrical contacts thereto.

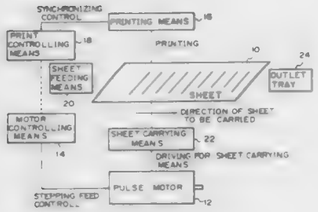
VOL 1123 ISS 1 FEB 5 1991 UMI

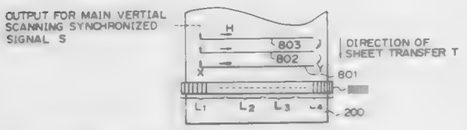
4,990,936

IMAGE FORMING DEVICE

Nobuyuki Hayashida, Hachioji, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 30, 1989, Ser. No. 357,813
Claims priority, application Japan, May 30, 1988, 63-131929
Int. Cl.[5] G01D *15/24, 15/14*
U.S. Cl. 346—134 7 Claims





1. An image forming device which comprises:
an image bearing member,
an image forming means for forming an image on said image bearing member and provided with a plurality of dot registering devices arranged in one line, a longitudinal direction thereof being perpendicular to a direction along which said image bearing member moves, so as to cross a whole width thereof and driven in accordance with a video signal provided thereto,
a pulse motor for feeding said image bearing member,
a motor controller for controlling said pulse motor in accordance with a pulse supplied thereto,
a counting means for counting a number of pulses required by said pulse motor to feed said image bearing member a distance corresponding to a lateral width of one line of said dot registering devices.
a means for generating a video signal requiring signal to cause a video signal to be supplied to said image forming means at time intervals corresponding to said number of pulses counted by said counting means.

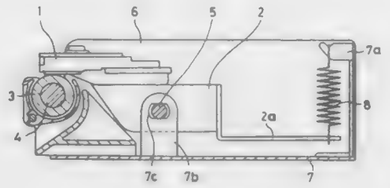
4,990,937

DEVICE FOR SUPPORTING A PRINT HEAD

Mitsuo Tashiro, and Akira Matsushima, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 478,599
Claims priority, application Japan, Apr. 24, 1989, 1-104279
Int. Cl.[5] G01D *15/16*
U.S. Cl. 346—139 R 13 Claims

1. In a printer, the combination comprising:
an elongated print head operable to effect one-line printing on a platen;
a support plate means mounting said print head;
an elongated support shaft on said support plate means, said support shaft having a central portion and end portions;
pivot support means for pivotably supporting said central portion of said support shaft;
shaft support means supporting said end portions of said support shaft, said shaft support means having elongated grooves elongated in a direction parallel to a diametrical line of said platen which extends through the point of contact of said platen by said printer; and
two biasing means connected to said support plate means at two longitudinally spaced locations of said support plate means such that said two biasing means bias said support plate means at said two longitudinally spaced locations in



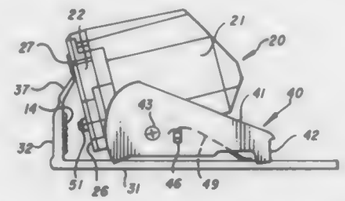
a pivotal direction to cause said print head to impinge against said platen, said end portions of said shaft being displaceable in said elongated grooves to thereby provide substantially uniform impingement of said print head against said platen along the longitudinal length of said print head.

4,990,938

PRINTER NEST FOR POSITIONING INK JET PRINT/CARTRIDGE

John M. Brandon, Beavercreek; Richard J. Ratermann, Centerville; Michael A. Walters, Kettering, and David P. Schenck, Miamisburg, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,825
Int. Cl.[5] B41J *2/175, 2/05*
U.S. Cl. 346—140 R 5 Claims



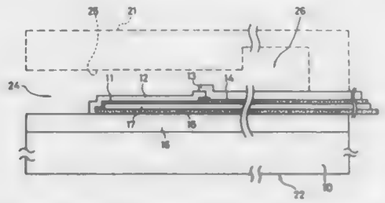
1. In ink jet printing apparatus including a carriage having a plurality of nest devices and associated knife edge portions, adapted for use with insertable print/cartridges having detent portions accurately located vis a vis their orifice array, an improved nest device construction comprising:
(a) a U-shaped member having a handle and arms spaced to receive a print/cartridge therebetween and being mounted on said carriage for rotation, on an axis extending through central regions of said arms, between insert and retain positions, said arms comprising interior pinch surfaces for slidably engaging an inserted print/cartridge during rotation of said member and a bottom lip edge that extends inwardly to initially support a print/cartridge in an insert position; and
(b) spring means located between the arms of said member for contacting the bottom rear surface of an inserted print cartridge and tilting its front face into engagement with associated knife edge portion.

4,990,939

BUBBLE JET PRINTER HEAD WITH IMPROVED OPERATIONAL SPEED

Takuro Sekiya, Yokohama; Kyuhachiro Iwasaki, Fujisawa; Takashi Kimura, and Tomoaki Nakano, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 24, 1989, Ser. No. 398,237
Claims priority, application Japan, Sep. 1, 1988, 63-218889; Dec. 8, 1988, 63-310904; Aug. 9, 1989, 1-207529
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R 11 Claims



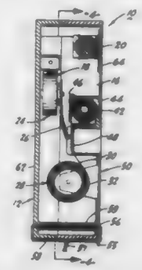
1. A printer head of a bubble jet printer apparatus for ejecting a droplet of ink from an orifice by a dilational force of a bubble formed in the ink as a result of heating, comprising:
a base plate comprising a substrate and a thermally insulating layer provided on the substrate so as to cover at least a part thereof in correspondence to where the ink is heated, said thermally insulating layer having a thickness which does not prevent quick dissipation of heat to the substrate;
an ink chamber provided on the base plate for accepting the ink;
means for supplying the ink to the ink chamber;
an ink passage provided on said base plate in communication with the ink chamber at a first end thereof and to the orifice at a second end thereof for passing the ink from the ink chamber to the orifice; and
heating means provided on the thermally insulating layer in correspondence to said ink passage for heating the ink therein to form said bubble, said heating means comprising:
a first electrode strip provided on the thermally insulating layer so as to extend to the ink chamber along the ink passage,
an electrical insulator layer provided so as to cover the first electrode strip except for a first end thereof away from the ink chamber and a second end thereof close to the ink chamber, said electrical insulator layer having a front end facing the orifice such that the first end of the first electrode strip is exposed at the front end of the electrical insulator layer,
a resistance strip provided on the electrical insulator layer with a first end thereof in contact with said first end of the first electrode strip and extending along the electrical insulator layer toward the ink chamber, covering the front end of the electrical insulator layer, such that the resistance strip acts as a heat source generating heat in response to an electric current flowing therethrough between the first end and the rear end thereof,
a second electrode strip provided on the electrical insulator layer in contact with a second end of the resistance strip and extending to the ink chamber along the electrical insulator layer,
a heater protective film provided on the resistance strip for protecting the resistance strip from corrosion, and
an electrode protective film provided on the second electrode strip for protecting the second electrode strip from corrosion;
wherein said substrate has a thermal conductivity which is at least twenty times greater than that of the thermally insulating layer.

4,990,940

DISENGAGEMENT AND RETRIEVAL MECHANISM FOR A RECORD

John Betts, Modesto, Calif., assignor to Deltatrak, Inc., Modesto, Calif.

Filed Oct. 17, 1989, Ser. No. 422,781
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—145 6 Claims



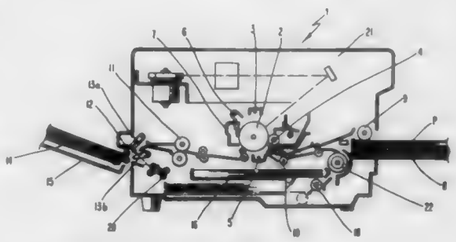
1. A mechanism for the disengagement of a strip record used in conjunction with a clock drive for advancing a recording strip from a source, including an environmental measuring device linked to a stylus for marking the recording strip comprising:
a. a housing having an interior and an exterior portion, the stylus positioned within said interior portion of said housing;
b. a holder for the recording strip marked by the stylus, said holder including a roller capable of being linked to the clock drive;
c. an element connected to said recording strip holder;
d. means for fixing said element relative to said housing such that said connected recording strip holder lies at the interior portion of said housing, the recording strip and the stylus are brought together to permit marking of the recording strip by the stylus, and said roller links to the clock drive for movement therewith;
e. means for removing said element and connected recording strip holder relative to said housing by movement of the recording strip away from the stylus to preclude marking of the recording strip by the stylus, and to preclude linkage of the roller and the clock drive.

4,990,941

DUPLEX PRINT APPARATUS

Yoshihisa Kawai, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

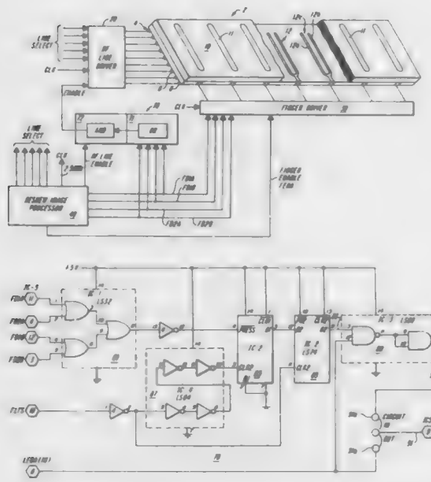
Filed Mar. 31, 1988, Ser. No. 176,184
Claims priority, application Japan, Apr. 2, 1987, 62-82573; Apr. 2, 1987, 62-82574
Int. Cl.[5] G03G *15/00*
U.S. Cl. 346—153.1 31 Claims



1. A duplex print apparatus comprising:

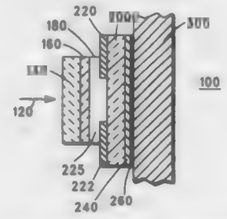
an image data supply means for supplying image data to be printed;
an image forming means including;
a sheet feed means for feeding a sheet on which said image data are printed,
a print means for printing said supplied image data on said fed sheet,
a store means for reversing and storing said printed sheet, and
a paper refeed means for refeeding said stored sheet to said print means in stored order,
a first control means for controlling said image data supply means in order to output said image data for a plurality of pages;
a second control means for controlling said image forming means in order to print said image data of odd pages outputted from said image data supply means according to the control by said first control means on the sheet fed from said sheet feed means and to store it in said store means;
a third control means for controlling said image data supply means in order to output said image data for a plurality of pages in the same order done by said first control means; and
a fourth control means for controlling said image forming means in order to print said image data of even pages outputted from said image data supply means according to the control by said third control means on said sheet fed by said paper refeed means.

4,990,942
PRINTER RF LINE CONTROL
Roger H. Therrien, Hanover, Mass., and John R. Rumsey, Oxnard, Calif., assignors to Delphax Systems, Randolph, Mass.
Filed Apr. 4, 1990, Ser. No. 504,541
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—155 **6 Claims**



1. A printhead assembly comprising
a printhead having any array of mutually spaced first and second electrode sets, each electrode of the first set crossing plural electrodes of the second set,
control means for actuating an electrode of the first set together with a selected group of electrodes of the second set at locations corresponding to desired image points, and
means for inhibiting actuating of the electrode of the first set when no electrodes of the second set correspond to desired image points.

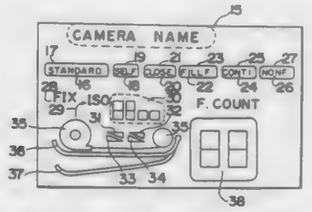
4,990,943
PLZT LASER MODULATOR
James R. Phillips, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 3, 1989, Ser. No. 375,555
Int. Cl.[5] G02F *1/03, 1/07*
U.S. Cl. 350—392 **14 Claims**



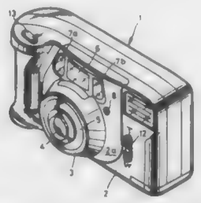
1. A PLZT laser light modulator with improved heat dissipation capability comprised of:
a PLZT element having at least first and second substantially planar side;
first electrode means substantially covering said first planar side for reflecting light and conducting heat from said PLZT element, said first electrode means being deposited on said first substantially planar side;
heat sink means coupled to said first electrode means for dissipating heat energy in said PLZT element that is coupled to said heat sink means through said first electrode means; and
second and third electrode means for carrying an electric charge to establish an electric field in said PLZT element, said second and third electrode means being deposited on said second substantially planar side and having an included opening between said second and third electrodes to permit laser light to pass through said PLZT element, reflect off said first electrode means, and exit said PLZT element through said included opening between said second and third electrode.

4,990,944
CAMERA INCLUDING A LENS COVER
Kouji Yamamoto, Sakai; Shinji Tominaga, Osaka; Akira Yamanaka, Sakai; Hiroshi Ueda, Nara, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 170,166, Mar. 18, 1988, abandoned, which is a division of Ser. No. 797,510, Nov. 13, 1985, abandoned. This application Nov. 30, 1988, Ser. No. 278,330
Claims priority, application Japan, Nov. 14, 1984, 59-173261; Dec. 28, 1984, 59-197143; Feb. 27, 1985, 60-28848; Mar. 8, 1985, 60-33950; Mar. 12, 1985, 60-35963; Mar. 12, 1985, 60-35962; Mar. 27, 1985, 60-45491; Mar. 27, 1985, 60-45490; Mar. 28, 1985, 60-46677; Mar. 28, 1985, 60-46678; Mar. 28, 1985, 60-46676
Int. Cl.[5] G03B *1/00, 17/02, 17/18*
U.S. Cl. 354—173.1 **3 Claims**

1. A camera including a lens cover and provided with a plurality of picture taking modes, said camera comprising:
output means for outputting a signal representing that the lens cover is opened or closed,
selecting means for selecting one of the plurality of picture taking modes,
sending means for sending a photographic film,
display means for including a first display portion for displaying the picture taking mode selected by said selecting means and a second display portion for displaying information of the photographic film loaded in the camera,
first control means for controlling the operation of the camera according to the picture taking mode selected by said selecting means,
inhibiting means for inhibiting said first control means from controlling the operation of the camera while said output means outputs the signal representing that the lens cover is closed,
second control means for making said first display portion display the picture taking mode selected by said selecting means while said output means outputs the signal representing that the lens cover is opened, and for inhibiting said first display portion from displaying the picture taking mode selected by said selecting means while said output means outputs the signal representing that the lens cover is closed,
third control means for keeping said second display portion displaying the information of the photographic film independent of the signal outputted by said output means, and
fourth control means for enabling said sending means to send the photographic film independent of the signal outputted by said output means.

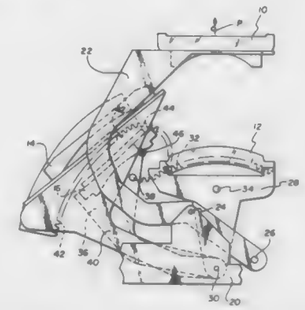


4,990,945
CAMERA OF CHANGEABLE FOCAL LENGTH
Michio Cho; Tokuji Sato; Ko Aosaki, and Yasuhiro Nishitani, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 10, 1989, Ser. No. 392,374
Claims priority, application Japan, Aug. 13, 1988, 63-202129; Sep. 16, 1988, 63-231519
Int. Cl.[5] G03B *1/18*
U.S. Cl. 354—195.12 **13 Claims**



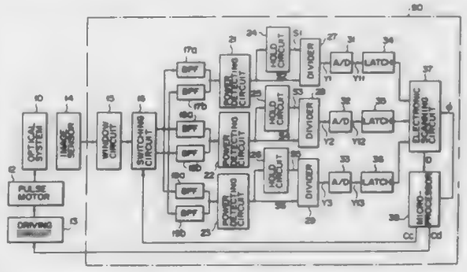
1. A camera with a lens system that is changeable as to focal length and which is driven by driving means so as to change the focal length thereof, said driving means comprising:
first lens shifting means for shifting at least one component lens of said lens system stepwise to predetermined positions in a direction parallel to the optical axis of said lens system, said first lens shifting means comprising driving means including a first driving motor for linearly moving said at least one component lens and stopping means for stopping said first driving motor when said at least one component lens reaches any one of said predetermined axial positions; and
second lens shifting means comprising a second driving motor for shifting at least another component lens of said lens system stepwise with respect to said at least one component lens in said direction according to said predetermined stepwise axial positions, thereby changing the focal length of said lens system.

4,990,946
VIEWFINDER
Richard A. Gates, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 12, 1990, Ser. No. 492,003
Int. Cl.[5] G03B *13/10*
U.S. Cl. 354—222 **5 Claims**



1. A viewfinder for selectively producing normal, tele, and panoramic viewing in a photographic camera, comprising:
a plurality of lens frames;
a plurality of pivotally mounted arms for supporting said lens frame;
cam means for selectively positioning at least a first two of said arms to position their respective lens frames into a viewing position; and
gear means coupling at least a second two of said arms for positioning the lens frame supported by one of said second to arms into a viewing position and simultaneously positioning the lens frame supported by the other of said second two arms out of a viewing position.

4,990,947
AUTOMATIC FOCUSING APPARATUS
Yasuhiro Komiya, Tokyo, and Tatsuo Nagasaki, Yokohama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 28, 1989, Ser. No. 458,166
Claims priority, application Japan, Jan. 9, 1989, 1-2483; Dec. 8, 1989, 1-317738
Int. Cl.[5] G03B *13/00*
U.S. Cl. 354—402 **11 Claims**



1. An automatic focusing apparatus comprising:
an optical system, having a predetermined focal plane and an optical axis, for forming an optical image of an object;

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driving means for moving said optical system in a direction of the optical axis;

storage means for storing MTF (Modulation Transfer Function) ratios defocus amounts, focusing directions, and focusing states corresponding to the MTF ratios said MTF ratios being ratios of first MTF values corresponding to a plurality of first spatial frequencies at a first position near the focal plane to second MTF values corresponding to a plurality of second spatial frequencies at a second position near the focal plane;

an image sensor for detecting the optical image of the object formed by said optical system while a position of said image sensor relative to said optical system is changed by said driving means, and outputting image signals;

spatial frequency component extracting means for extracting a plurality of spatial frequency components corresponding to the plurality of spatial frequencies from the image signals output from said image sensor;

calculating means for extracting spatial frequency components in two different focusing states of said optical system from the plurality of spatial frequency components extracted by said spatial frequency component extracting means, and calculating a ratio between the spatial frequency components in different focusing states at every common frequency;

defocus detecting means for comparing the spatial frequency component ratios calculated by said calculating means with the MTF ratios stored in said storage means, determining a focusing state of said optical system, and detecting a defocus amount and a focusing direction in the determined focusing state; and

driving control means for calculating an amount and a direction of movement of said optical system on the basis of the defocus amount and the focusing direction detected by said defocus detecting means, and outputting the calculation result to said driving means.

4,990,948

FLEXIBLE PRINTED CIRCUIT BOARD

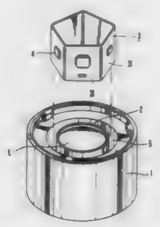
Takahide Sasaki; Jun Terashima, and Haruhiko Yamanouchi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 136,346, Dec. 22, 1987. This application Feb. 14, 1989, Ser. No. 309,859

Claims priority, application Japan, Dec. 27, 1986, 61-200451; Dec. 27, 1986, 61-200452

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—485 **14 Claims**



1. An optical apparatus having an area arranged for the passage of light therethrough, comprising:

a member of substantially tubular shape having a larger diameter than that of said area, both of which are provided in said optical apparatus;

a flexible printed circuit board having a band-like shape and being disposed along a circumferential direction around an optical axis of said optical apparatus between said area and said member, and including:

at least one flat portion formed by folding said flexible printed circuit board along a line in a substantially axial direction with respect to the optical axis; and

a plurality of chip-like circuit elements mounted on said flexible printed circuit board, at least one of said elements being mounted on said flat portion,

wherein said flat portion has a width in the circumferential direction larger than a width of said at least one of said chip-like circuit elements, and part of said flat portion being located on both sides of said element in the circumferential direction; and

wherein said plurality of chip-like circuit elements are disposed in a region of a substantially tubular shape between said area and said member.

4,990,949

IMAGE RECORDING APPARATUS HAVING A TENSION DEVICE IN THE WIND-UP PATH

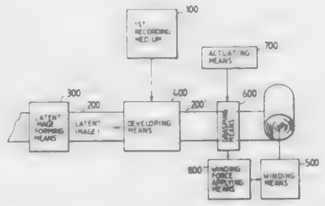
Takashi Tomizawa, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 17, 1988, Ser. No. 272,259

Claims priority, application Japan, Nov. 17, 1987, 62-175162[U]

Int. Cl.[5] G03B *27/72*

U.S. Cl. 355—27 **4 Claims**



1. A picture image recording apparatus for recording an image of an original on a first recording medium with the use of a second recording medium, said second recording medium being in the form of an elongated, web-like continuous sheet, said apparatus comprising:

means for forming a latent image corresponding to the image of the original on said second recording medium;

means for developing said latent image on said second recording medium and forming a visiblele image on said first recording medium;

means for winding said second recording medium subjected to latent image development;

means for grasping a portion of said second recording medium subjected to latent image development with a grasping force of a predetermined value;

means for actuating said grasping means; and

means for applying a winding force to said winding means to apply a tension of a predetermined value to said second recording medium subjected to latent image development, said winding force being determined on the basis of said grasping force.

4,990,950

PHOTOGRAPHIC PRINTING SYSTEM

Kanji Tokuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1989, Ser. No. 416,625

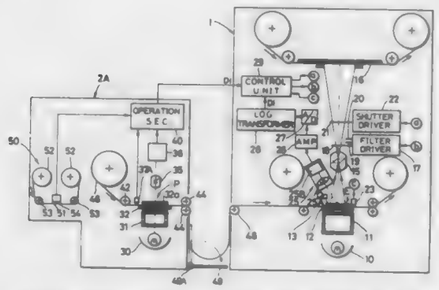
Claims priority, application Japan, Oct. 3, 1988, 63-247527; Oct. 3, 1988, 63-247530; Oct. 5, 1988, 63-251658

Int. Cl.[5] G03B *27/80*

U.S. Cl. 355—38 **17 Claims**

1. A photographic printing system for automatically determining an exposure correction value used in a printer to correct an exposure effected based on large area transmittance densities (LATD), said system comprising:

a data reading device for reading exposure correction data for a frame of a photographic film, said data reading device comprising a tape reader for reading a coded pattern indicating a rough exposure correction value recorded in a paper tape, and means for inputting said rough exposure correction value manually, after visual inspection;



an image sensor, disposed between said printer and said data reading device, for measuring a number of points of said frame of said photographic film and outputting density data of said frame accordingly; and

a data operation unit for calculating said exposure correction value for said frame based on said data from said data reading device and said image sensor.

4,990,951

IMAGE FORMING APPARATUS HAVING FUNCTION FOR CONTROLLING SHUTTER BY A PULSE

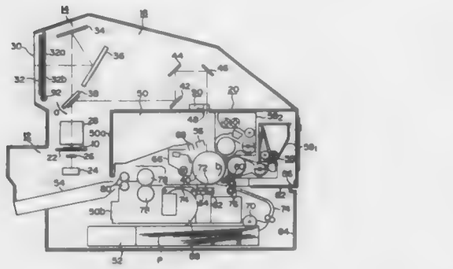
Takeshi Sanbayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

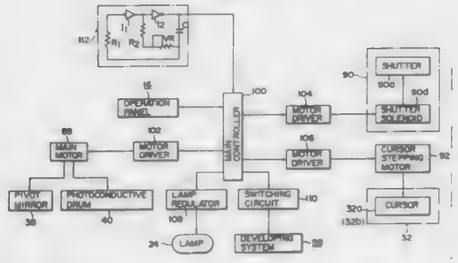
Filed Jun. 29, 1988, Ser. No. 213,306

Claims priority, application Japan, Jun. 30, 1987, 62-163074

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—40 **44 Claims**





1. An apparatus for forming an image on an image carrier in accordance with an original, comprising:

means for illuminating the original;

means for projecting an image of the original illuminated by said illuminating means;

means for generating data representing an image formation region of the image of the original projected by said projecting means, including:

first and second inverters connected in series with each other to form a series circuit, a first resistor and a capacitor connected in series with each other between two ends of the series circuit made up of said first and second inverters, and a second resistor and a variable resistor connected in series with each other, between a node of said first and second inverters and a node of said first resistor and said capacitor;

means for directing light from the original, which is illuminated by said illuminating means, onto the image carrier;

means for permitting the passage of the light directed by said directing means for a period of time in accordance with the data generated by said generating means so as to form on the image carrier an image corresponding to the original image projected by said projecting means.

4,990,952

IMAGE FORMING APPARATUS

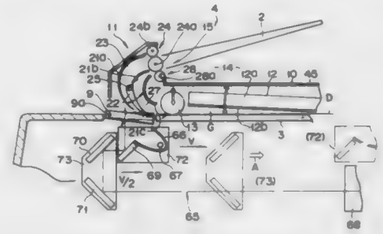
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 5, 1990, Ser. No. 461,527

Claims priority, application Japan, Jan. 26, 1989, 1-17002

Int. Cl.[5] G03B *27/50*

U.S. Cl. 355—50 **21 Claims**



1. An image forming apparatus comprising:

a document table on which a document is to be placed, said document table having first and second end portions opposite each other;

exposure means, movable between said first and second end portions along said document table, for projecting light onto said document table to scan a document placed on said document table from said first end portion to said second end portion; and

means for feeding a document onto said document table and positioning the document table, with one end of the document aligned with said first end portion of said document table;

wherein said feeding means includes an elongate positioning member located close to said first end portion of said document table and aligned with said first end portion, said positioning member being movable between a first position wherein it feeds a document onto said document table and a second position wherein one end of a document table is capable of abutting the positioning member.

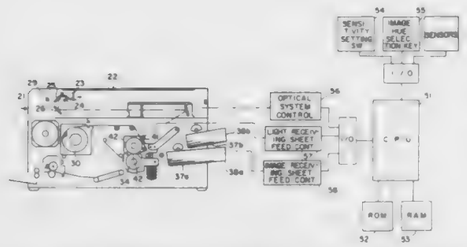
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4,990,953

COPYING APPARATUS

Yoshiaki Ibuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1989, Ser. No. 358,783
Claims priority, application Japan, May 27, 1988, 63-130865; Jun. 3, 1988, 63-138099
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—69 5 Claims



1. In a copying apparatus in which an original is scanned by an optical system to form a copy image on a light receiving sheet, and the copy image is transferred on an image receiving sheet, said apparatus comprises:

a density level setting means for setting the density level of the copy image; and

an illuminance adjusting means for adjusting both the luminous intensity and scanning speed of said optical system, in accordance with the density level,

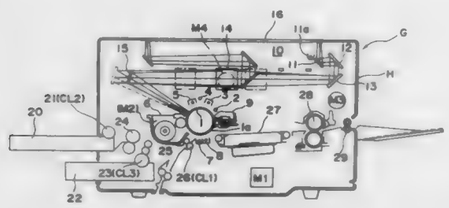
further comprising an input means for inputting the luminous intensity of said optical system, and said adjusting means adjusts the scanning speed of said optical system and the speed of the process for forming the copy image in accordance with the sensitivity of said light receiving sheet and also with the luminous intensity.

4,990,954

IMAGE FORMING APPARATUS HAVING DETACHABLE DATA STORAGE UNIT

Kimihiko Higashio, and Masazumi Ito, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 5, 1988, Ser. No. 253,587
Claims priority, application Japan, Oct. 6, 1987, 62-251791
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—200 8 Claims



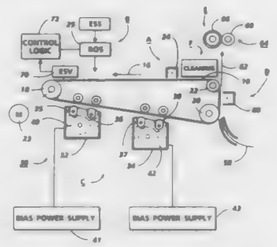
1. A copying apparatus comprising: an image forming device for forming an image on a copy paper by designating one functioning mode of a plurality of functioning modes, a memory device which is detachable with respect to the image forming device and which stores a plurality of data associated with the plurality of functioning modes for setting the functioning mode of said image forming device, with the respective functioning modes being adapted to correspond to predetermined identification symbols, a mode selection device for selecting one of the functioning modes and the associated data stored in the memory device when said memory device is mounted with respect to said image forming device, and a display control means for displaying the identification symbol corresponding to the selected functioning mode on a display device that also displays information pertaining to the data associated with the selected functioning mode.

4,990,955

WHITE LEVEL STABILIZATION FOR TRI-LEVEL IMAGING

Jerome E. May; Delmer G. Parker, both of Rochester, and Howard M. Stark, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 10, 1989, Ser. No. 335,343
Int. Cl.[5] G03G *15/04, 15/01*
U.S. Cl. 355—208 7 Claims



1. A method of creating tri-level images on a charge retentive surface, said method including the steps of:

uniformly charging said charge retentive surface;

exposing said uniformly charged surface to form charged-area images, discharged-area images and white discharge areas;

generating signals representative of the white discharge level on said charge retentive surface;

utilizing said signals for controlling said exposing step for maintaining said white discharge level at a predetermined level

said step of exposing comprising exposing said uniformly charged surface to a three level raster output scanner to form tri-level images spaced apart by an inter-document white discharge level area; and

said signal generating step comprising monitoring the inter-document white discharge level voltage level and generating an output signal representing said white discharge level voltage.

5. Apparatus for creating tri-level images on a charge retentive surface, said apparatus comprising:

means for uniformly charging said chargere tentive surface;

means for exposing said uniformly charged surface to form charged-area images, discharged-area images and white discharge level areas;

means for generating signals representative of the white discharge level on said charge retentive surface;

means for utilizing said signals for controlling said exposing means for maintaining said white discharge level at a predetermined level

said exposing means comprising means for exposing said uniformly charged surface to a three-level raster output scanner to form trilevel images spaced apart by an inter-document white discharge level area; and

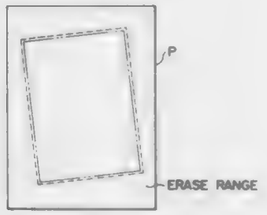
said signal generating means comprising means for monitoring the inter-document white discharge level voltage and generating output signals representing said white discharge level voltage.

4,990,956

IMAGE FORMING APPARATUS

Yasuhiro Iwata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,200
Claims priority, application Japan, Apr. 7, 1988, 63-85961; Apr. 22, 1988, 63-99522
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—218 27 Claims



1. An image forming apparatus comprising:

means for carrying an original thereon;

cover means movable between a first position in which cover means covers the original and the carrying means and a second position in which the cover means leaves exposed the original and the surrounding portion of the carrying means;

image forming means for forming on an image carrier a first copy image corresponding to an image of the original on the carrying means and a second copy image corresponding to an image surrounding the original; and

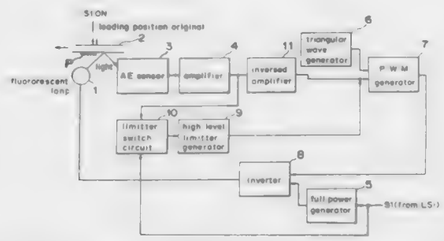
means for preventing the formation of the second copy image when the cover means is positioned in the second position.

4,990,957

AUTOMATIC EXPOSURE DEVICE

Yasushi Nakanishi; Atsushi Narukawa, both of Yamatokooriyama; Masakiyo Okuda, Kashiwara; Masanori Mori, Mie, and Yukio Nakai, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1989, Ser. No. 359,289
Claims priority, application Japan, May 31, 1988, 63-135317
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—228 9 Claims



1. An automatic exposure control device operatively connected to a light source driven by an electric power supply, comprising:

means for illuminating the light source so as to emit light to an original document, which will reflect the light;

light sensing means for sensing the light reflected from the original document;

control means for controlling the power supply to the light source based ion a signal representing an amount of light reflected from the original document sensed by the light sensing means;

light start up determining means for determining the amount of light emitted from the light source based on a signal of the light sensing means; and

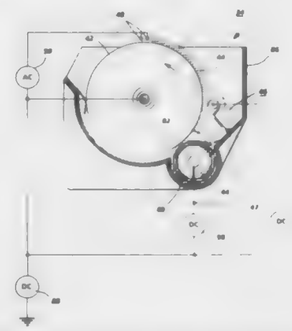
upper limit setting means operatively associated with the power supply for setting an upper limit level of power supplied to the light source based on the output of the light start up determining means.

4,990,958

RELOAD MEMBER FOR A SINGLE COMPONENT DEVELOPMENT HOUSING

Grace T. Brewington, Fairport, and John M. Scharr, Farmington, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1989, Ser. No. 456,399
Int. Cl.[5] G03G *15/06, 21/00*
U.S. Cl. 355—245 5 Claims



1. Apparatus for developing latent electrostatic images on a charge retentive surface with developer comprising toner, said apparatus comprising:

a donor structure for depositing toner on said charge retentive surface;

a toner mover supported for movement through a supply of toner to thereby stir up said toner;

means for establishing an electrostatic field between said donor structure and said toner mover for effecting toning of said donor structure with the stirred up toner;

means contacting said toner mover for enabling reloading of said donor roll structure in a single revolution thereof notwithstanding the presence of a high stress development condition.

4,990,959

ONE-COMPONENT DEVELOPING APPARATUS WITH IMPROVED TONER LAYER REGULATING MEMBER

Takashi Yamamuro; Kazuo Terao, and Kiyoshi Shigehiro, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,494
Claims priority, application Japan, Jul. 29, 1988, 63-190043
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 9 Claims

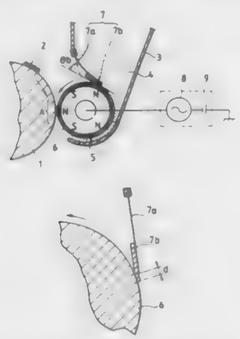
1. A one-component developing apparatus comprising:

a developer carrier disposed in opposition to an electrostatic latent image receiving member; and

a toner amount restricting member pressed so as to be in contact with said developer carrier,

wherein said toner amount restricting member includes a support member made of a plate spring having tensile strength not smaller than 15 kgf/mm^2 and yield strength not smaller than 10 kgf/mm^2, and a soft elastic member disposed on said support member at a portion thereof to be pressed into contact with said developer carrier, said soft

elastic member being attached on said support member so as to project from a forward end of said support member, and whereby a layer of toner with improved uniformity is



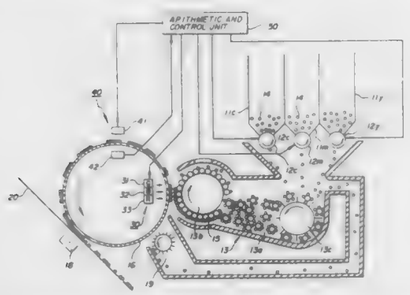
formed on said developer carrier by said toner amount restricting member and charged so that said layer of toner is made to adhere on an electrostatic latent image to make the electrostatic latent image visible.

4,990,960

METHOD AND DEVICE FOR MEASURING DENSITIES OF DIFFERENT TONERS CONSTITUTING A MIXTURE

Yoshinobu Umetani, Nara, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 9, 1990, Ser. No. 491,026
Claims priority, application Japan, Mar. 10, 1989, 1-58939
Int. Cl.[5] G03G *21/00, 15/01*
U.S. Cl. 355—246 12 Claims



1. A method of measuring the densities of different kinds of photo-sensitive toners which constitute a photo-sensitive toner mixture and each of which becomes conductive by being exposed to a different kind of light, each light having a predetermined range of wavelengths,

wherein said method comprises the steps of:

uniformly charging said photo-sensitive toner mixture;

selectively projecting different kinds of light onto the charged photo-sensitive toner mixture, said different kinds of light being of the wavelengths to which the respective kinds of photo-sensitive toners contained in said photo-sensitive toner mixture are sensitive;

separating the discharged photo-sensitive toner from the charged photo-sensitive toners in the exposed photo-sensitive toner mixture; and

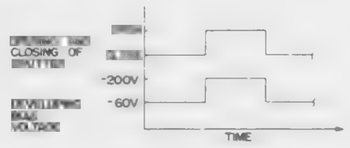
determining the amount of said charged photo-sensitive toners.

4,990,961

ELECTROPHOTOGRAPHIC APPARATUS WITH VARIABLE BIAS VOLTAGE

Yukihiko Ueno, Hirakata; Yasutaka Maeda, Ikoma; Etsuzi Nukushina, Nara; Tsuyoshi Miyamoto, Osaka; Kyouichi Takata, Yamatokoriyama, and Hiromi Washio, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1989, Ser. No. 337,610
Claims priority, application Japan, Apr. 15, 1988, 63-93852
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 3 Claims



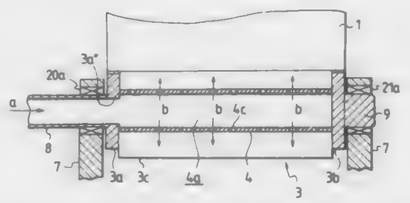
1. An electrophotographic apparatus comprising: a developer unit that has a magnetic developing roller for applying toner to electrostatic latent image areas formed on the surface of a photoconductor and that has a shutter which is closed to regulate the distribution of the toner to the photoconductor, a developing bias voltage for controlling adherence of the toner to the photoconductor being applied to said developer unit; and a bias voltage applying means for applying, when said shutter of said developer unit is closed, a developing bias voltage of a level between 0 V and the developing bias voltage applied when said shutter is opened.

4,990,962

WET TYPE DEVELOPING DEVICE PROVIDING CONTROLLED AMOUNT OF DEVELOPING LIQUID

Motoshi Kishi, Suzuka, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 5, 1990, Ser. No. 488,959
Claims priority, application Japan, Apr. 11, 1989, 1-42900[U]; Aug. 31, 1989, 1-102551[U]
Int. Cl.[5] G03G *15/10*
U.S. Cl. 355—256 7 Claims



1. A wet type image developing device including a developing roller for supplying a developing liquid to an electrostatic latent image surface on a photosensitive member secured on a rotary drum, the device comprising;

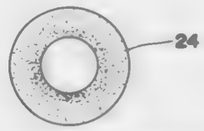
the developing roller having an inner tubular member defining therein an internal space, and an outer tubular member disposed over the inner tubular member, the developing liquid being pressurizingly introduced into the internal space, and the outer tubular member being expandable radially outwardly upon introduction of the developing liquid into the internal space to provide surface pressure contact of the outer tubular member with the photosensitive member, the liquid being transudeable from the outer tubular member radially outwardly to supply the liquid over the latent image surface, the outer tubular member being shrinkable radially inwardly upon suspension of the liquid supply to provide separation of the outer tubular member from the photosensitive member.

4,990,963

DEVELOPING MEMBER COMPOSED OF CONDUCTIVE PARTICLES IN A DIELECTRIC MATERIAL AND HAVING A VARIABLE VOLUME RESISTIVITY

Masashi Yamamoto; Yuji Enoguchi; Toshiya Natsuhara, and Fumio Masuda, all of Osaka, Japan, assignors to Minolta Camera Co., Ltd. Semi Center, Osaka, Japan

Filed Jul. 18, 1988, Ser. No. 221,044
Claims priority, application Japan, Jul. 16, 1987, 62-177754
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—259 7 Claims



1. In a developing apparatus for developing an electrostatic latent image formed on a photosensitive member with a monocomponent developer, said apparatus comprising:

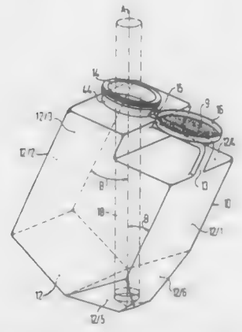
a developing member adapted to be disposed adjacent to the photosensitive member, and said developing member retaining the monocomponent developer on a surface to develop the latent image, said developing member being formed of a dielectric material of a predetermined thickness in which conductive particles are dispersed and having a volume resistivity which increases in the direction of said thickness toward said surface.

4,990,964

TONER DELIVERY SYSTEM HAVING A MULTI-FUNCTIONAL TONER CONTAINER FOR NON-MECHANICAL PRINTER AND COPIER MEANS

Erich Kraehn, Karlsfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

PCT No. PCT/DE87/00440, § 371 Date Mar. 24, 1989, § 102(e) Date Mar. 24, 1989, PCT Pub. No. WO88/02504, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 25, 1987, Ser. No. 348,668
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1986, 3633606
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—260 10 Claims



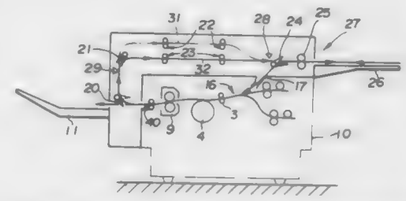
1. A toner delivery system for delivering toner to a printer or copier means, comprising: a toner container having a filling and emptying opening, a holding mechanism of a printer or copier means being interchangeably fastenable to said filling and emptying opening of said toner container to hold said toner container in a toner removal position, a suction nozzle mounted in said printer or copier means and defining a toner passageway into said printer or copier means, said toner container comprises a funnel-shaped floor that forms a lowest collecting region for the toner, the filling and emptying opening and the collecting region are arranged relative to one another such that, when the toner container is fastened in the holding mechanism in the removal position wherein the collecting region forms the lowest region of the toner container, said suction nozzle mounted in the printer or copier device is displaceable into the collecting region; and in that at least one container wall of the toner container is fashioned as a supporting surface for the toner container.

4,990,965

IMAGE FORMING APPARATUS HAVING DUPLEX UNIT

Yukitoshi Kiya, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,294
Claims priority, application Japan, Apr. 15, 1988, 63-92958; May 16, 1988, 63-116809; Jan. 25, 1989, 1-15849
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—319 12 Claims



1. A duplex unit for reversing a side of a recording sheet comprising:

a reversing part for successively reversing sides of incoming recording sheets and for outputting reversed recording sheets; and

a stack part for stacking the reversed recording sheets from said reversing part in an arbitrary stack arrangement,

said stack part including output means for successively outputting the reversed recording sheets within the arbitrary stack arrangement in a first-in-first-out sequence;

wherein said stack part has a plurality of transport paths for respectively holding one reversed recording sheet, said arbitrary stack arrangement being made up of the reversed recording sheets in said transport paths, said output means successively outputting the reversed recording sheets in said transport paths in an arbitrary sequence;

wherein said output means includes means for outputting the reversed recording sheets at a transport speed dependent on a size of each of the reversed recording sheets.

4,990,966

IMAGE FORMING APPARATUS

Yukiti Sindo, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1989, Ser. No. 443,513
Claims priority, application Japan, Dec. 1, 1988, 63-302283
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—321 9 Claims

1. An image forming apparatus using an electrophotographic process, comprising:

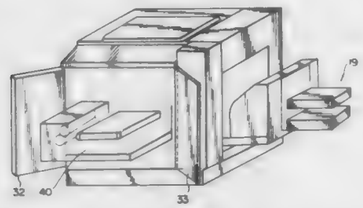
an image carrier;

paper feeding means provided in a paper feeding section which is located at one of laterally opposite sides of a body of said image forming apparatus and which comprises a means for holding a plurality of paper cassettes;

image transferring means provided in an image transferring section for transferring a toner image formed on said image carrier to a paper sheet which is fed from said paper feeding section;

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image fixing means provided in an image fixing section for fixing the toner image transferred to the paper sheet;
paper transporting means for transporting the paper sheet fed from said paper feeding means along a paper transport path which extends to a paper discharging section via said image transferring section and said image fixing section, said image transferring means, said image fixing means and said paper transporting means constituting a transport unit;



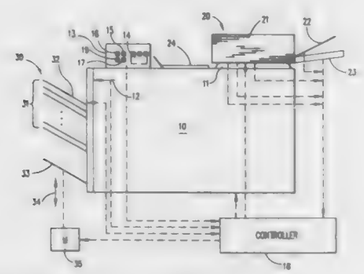
first guide means extending in a lateral direction in said body for guiding said entire paper feeding section such that said section is slidable outward in a direction opposite to an intended direction of paper transport and inward in said intended direction of paper transport; and
second guide means extending in a longitudinal direction in said body for guiding said transport unit which is slidable inward and outward perpendicularly to the intended direction of paper transport.

4,990,967

COPYING METHOD AND APPARATUS

Donald F. Colglazier, Longmont; James H. Hubbard, Boulder, both of Colo.; Michael L. Morris, Fruit Heights, Utah, and Robert T. Ritchie, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1989, Ser. No. 396,205
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—323 20 Claims



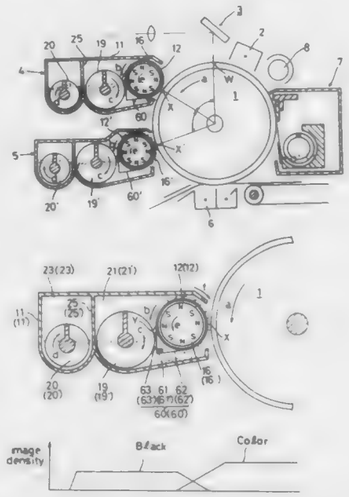
10. Copier apparatus, comprising;
original document feeding means for receiving a multi-sheet original document set to be copied, said document feeding means being selectively capable of operating in
(1) a recirculating automatic document feed (RADF) mode in which said document feeding means is adapted to receive said multi-sheet original document set for copying,
(2) an automatic document feed (ADF) mode in which said document feeding means is adapted to receive said multi-sheet original document set for copying,
(3) a semi automatic document feed (SADF) mode in which said document feeding means is adapted to receive said multi-sheet document set, one sheet at a time, for copying,
(4) a manual feed mode in which said document feeding means is adapted to receive said multi-sheet original document set, one sheet at a time, for copying,
multi function copy sheet receiving means including
(1) a collator having at a plurality of individual bins, each bin of which is adapted to receive the sheets that comprise one copy set, wherein similar-image copy sheets are delivered one sheet to each of a number of said collator bins prior to copying of the next sheet of said multi-sheet original document set, and
(2) stacker bin means capable of holding a plurality of copy sets in a unitary stack,
and control means operable to select use of said collator when said multi-sheet original document set is copied using said ADF, SADF or manual document feed modes, and operable to select use of said stacker bin means when said multi-sheet original document set is copied using said RADF document feed mode.

4,990,968

MULTI-COLORED IMAGE FORMING APPARATUS

Yasuhiro Kusuda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 26, 1988, Ser. No. 224,347
Claims priority, application Japan, Jul. 28, 1987, 62-189864
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 9 Claims



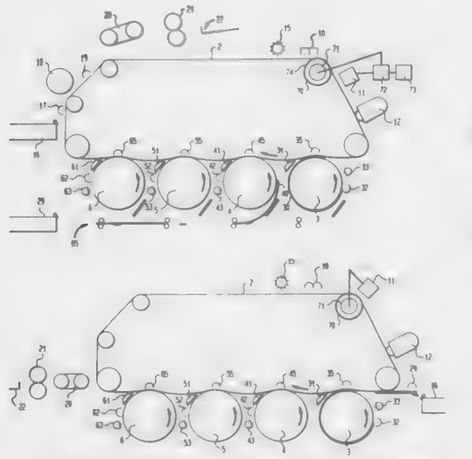
9. A multi-colored image forming apparatus with a plurality of developing units having different colored developers, said multi-colored image forming apparatus comprising;
a document table on which an original document is placed;
a photoconductive member;
scanning means for scanning the original document from a scanning start position to a scanning end position;
means for forming an electrostatic latent image on the photoconductive member by projecting the image scanned by said scanning means onto the photoconductive member;
first and second deveioping units for developing the electrostatic latent image formed on the photoconductive member, each of said first and second developing units including a rotatable sleeve, a multi-pole magnetic member rotatably provided in said sleeve and a scraper means for scraping the developer material from the peripheral surface of the sleeve;
position designating means movable along the document table at least between the scanning start position and the scanning end position;
means for detecting arrival of said scanning means at the point designated by said designating means during scanning and for generating developing switch signal;
first drive means for rotating the sleeve of the first developing unit;
second drive means for rotating the sleeve of the second developing unit, wherein the rotational speed of the sleeve of the second developing unit is lower than that of the sleeve of the first developing unit;
third drive means for rotating the magnetic member of the first developing unit in the same direction as the sleeve of the first developing unit;
fourth drive means for rotating the magnetic member of the second developing unit in the same direction as the sleeve of the second developing unit;
first control means for controlling said third drive means to stop the rotation of the magnetic member of the first developing unit in response to the developing switch signal; and
second control means for controlling said fourth drive means to start the rotation of the magnetic member of the second developing unit in response to the developing switch signal.

4,990,969

METHOD AND APPARATUS FOR FORMING MULTICOLOR IMAGES

Alan E. Rapkin, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1990, Ser. No. 459,906
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—327 26 Claims



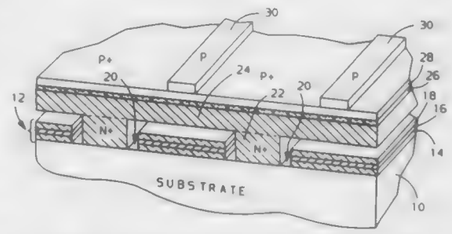
1. A method of forming a multicolor image comprising:
forming a series of primary toner images on a primary imaging member,
transferring each of said primary toner images to separate secondary imaging members,
creating a master on each of said secondary imaging members defined by said transferred primary toner image,
utilizing said masters to create separate transferable images of different color on each of said secondary imaging members, and
transferring said transferable images of different color to said primary imaging member or to a receiving sheet carried by said primary imaging member in registration to form a multicolor image.

4,990,970

LIGHT EMITTING SEMICONDUCTOR HAVING A REAR REFLECTING SURFACE

Brian K. Fuller, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 466,108, Jan. 16, 1990, Pat. No. 4,971,926.
This application Mar. 23, 1990, Ser. No. 498,113
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 3 Claims



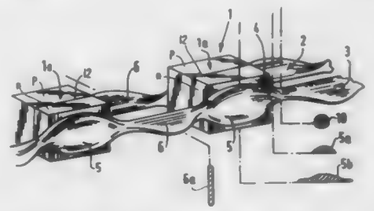
1. A light emitting semiconducting structure comprising:
a substrate of appropriate material, conductivity, and cystallographic orientation;
patterned regions of a reflecting structure, said reflecting structure comprising a metal reflecting layer intermediately disposed between two dielectric layers;
epitaxially grown material from said substrate, said epitaxially grown material being provided continuously in at least one channel which contacts said substrate and laterally over said reflecting structure to form an active region; and
appropriate electrical contacts sufficient to provide a light emitting semiconductive structure overlaying said epitaxially grown active region.

4,990,971

LIGHT EMITTING DIODE NETWORK

René Le Creff, Sens, France, assignor to Valeo Vision, Cedex, France

Filed Sep. 8, 1989, Ser. No. 404,450
Claims priority, application France, Sep. 23, 1988, 88 12436
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 20 Claims



1. A light emitting diode network comprising:
A plurality of light emitting dioses arranged in a row, each of the plurality of light emitting diodes comprising a semiconductor crystal having first and second regions of first and second conductivity types respectively, said first and second regions defining an electroluminescent junction therebetweem, a surface of said first region of said semiconductor crystal of each of said pluralitry of light emitting dioses facing outwardly relative to a first side of the row, a surface of said second region of said semiconductor crystal of each of said plurality of light emitting diodes

facing outwardly relative to a second side of the row opposite the first side of the row; and,

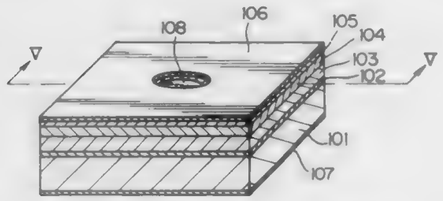
first and second electrical conductors respectively connecting said first regions of said plurality of diodes together and said second regions of said plurality of diodes together, each of said first and second electrical conductors having alternating first and second flat portions, each of said first flat portions extending at an angle relative to each of said second flat portions.

4,990,972

SEMICONDUCTOR LIGHT EMITTING DEVICE

Shiro Satoh, Ogawara, and Noriaki Onodera, Sendai, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,868
Claims priority, application Japan, Sep. 14, 1988, 63-228483
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 5 Claims



1. A semiconductor light emitting device comprising:

a semiconductor substrate of a first conductivity type having an azimuth plane (100);

an electric current blocking layer stacked on one main face of said substrate and including a semiconductor of a second conductivity type opposite to the first conductivity type;

an opening formed in said electric current blocking layer by wet etching through a substantially square mask substantially inclined by 45° with respect to a direction [011] so as to reach said one main face of said substrate and mainly defined by a side face surrounded by a face approximately composed of a zone plane (100);

a first semiconductor layer of the first conductivity type stacked on said electric current blocking layer and a portion of said one main face of said substrate on which said opening is formed;

a second semiconductor layer stacked on said first semiconductor layer and forming a hetero-junction together with said first semiconductor layer;

a semiconductor layer for electrode of the second conductivity type stacked on said second semiconductor layer;

a window formed in said semiconductor layer for electrode so as to correspond to said opening and to reach said second semiconductor layer, said window being formed in a flat shape composed of a substantially circular or rectangular shape, a size of said window being substantially less than that of said opening;

a first electrode metallic layer formed on said semiconductor layer for electrode except said window; and

a second electrode metallic layer formed on another main face of said substrate;

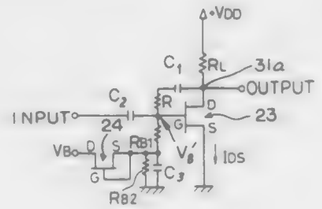
said opening being formed in such a manner that portions of said first semiconductor layer and said second semiconductor layer corresponding to said opening function as a light emitting region and a light generated from the light emitting region is outputted through said window in a direction substantially perpendicular to said semiconductor substrate when an electric current flows between said first electrode metallic layer and said second electrode metallic layer through said opening.

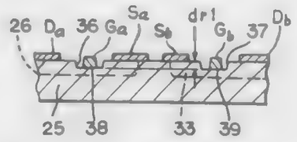
4,990,973

METHOD OF PRODUCING AN MMIC AND THE INTEGRATED CIRCUIT PRODUCED THEREBY

Takahide Ishikawa, and Kazuhiko Nakahara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 289,210, Dec. 22, 1988, Pat. No. 4,921,814.
This application Nov. 15, 1989, Ser. No. 436,615
Claims priority, application Japan, Dec. 28, 1987, 62-335886
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 4 Claims





1. An MMIC comprising:

a semi-insulative substrate,

a first doped region in the substrate comprising an amplifier MESFET having source and drain regions connected by a channel, a second doped region comprising a diffusion resistance having at least a doped channel and located in the substrate near the amplifier MESFET,

simultaneously etched recesses crossing each of the channels of precisely the same depth,

a gate electrode in the recess of the amplifier MESFET, and

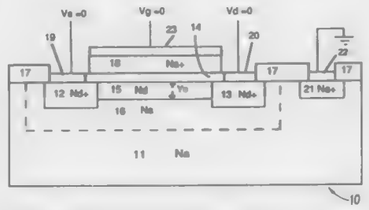
means interconnecting the diffusion resistance with the gate electrode in voltage divider fashion connected to increase gate bias with increasing levels of amplifier MESFET saturation current and decrease gate bias with decreasing levels of amplifier MESFET saturation current, thereby to compensate for changes in saturation current level of the amplifier MESFET caused by variations in depth of the gate recess.

4,990,974

FERMI THRESHOLD FIELD EFFECT TRANSISTOR

Albert W. Vinal, Cary, N.C., assignor to Thunderbird Technologies, Inc., Cary, N.C.

Filed Mar. 2, 1989, Ser. No. 318,153
Int. Cl.[5] H01L *29/780, 29/100, 29/400*
U.S. Cl. 357—23.3 114 Claims



1. A field effect transistor comprising:

a semiconductor substrate of first conductivity type having a first surface, and being doped at a first dopant density;

source and drain regions of second conductivity type in said substrate at said first surface;

a channel of said second conductivity type in said substrate at said first surface, between said source and drain regions, said channel being doped at a second dopant density and having a predetermined depth from said first surface;

a gate insulating layer on said substrate at said first surface adjacent said channel, at least said first and second dopant densities and said predetermined depth being selected to produce zero static electric field perpendicular to said first surface at said first surface between said channel and said gate insulating layer; and

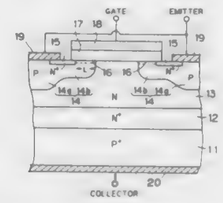
source, drain and gate contacts for electrically contacting said source and drain regions and said gate insulating layer, respectively.

4,990,975

INSULATED GATE BIPOLAR TRANSISTOR AND METHOD OF MANUFACTURING THE SAME

Hiroyasu Hagino, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,629
Claims priority, application Japan, Dec. 16, 1988, 63-318943
Int. Cl.[5] H01L *29/10, 29/00*
U.S. Cl. 357—23.4 7 Claims



1. An insulated gate bipolar transistor comprising:

a first conductivity type first semiconductor layer having first and second major surfaces;

a second conductivity type second semiconductor layer formed on said first major surface of said first semiconductor layer;

a first conductivity type well region formed on said second semiconductor layer, said well region comprising a relatively deep first semiconductor region and a relatively shallow second semiconductor region which are adjacent to each other, said second semiconductor region having an impurity dose amount of about 2×10^{14} to 5×10^{14} cm^{-2} and a depth of about 4 to 10 μm;

a second conductivity type third semiconductor region formed on said well region;

an oxide film formed on a portion of a surface of said send semiconductor region between surfaces of said third semiconductor region and said second semiconductor layer, said oxide film having a thickness of about 600 to 1000 Å;

a control electrode formed on said oxide film;

a first electrode formed on said third semiconductor region; and

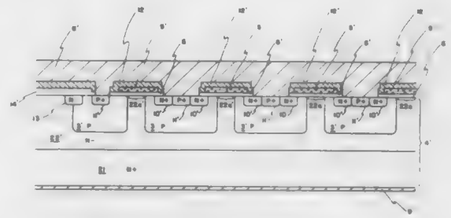
a second electrode formed on said second major surface of said first semiconductor layer.

4,990,976

SEMICONDUCTOR DEVICE INCLUDING A FIELD EFFECT TRANSISTOR HAVING A PROTECTIVE DIODE BETWEEN SOURCE AND DRAIN THEREOF

Masayuki Hattori, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 22, 1988, Ser. No. 274,918
Claims priority, application Japan, Nov. 24, 1987, 62-297011
Int. Cl.[5] H01L *29/10, 29/78*
U.S. Cl. 357—23.4 9 Claims



1. A semiconductor device comprising;

a semiconductor substrate of one conductivity type;

a first semiconductor region of the other conductivity type formed in a main surface of said semiconductor substrate;

a second semiconductor region of said one conductivity type formed in a surface of said first semiconductor region;

a gate electrode formed on a portion of said first semiconductor region, said portion located between said second semiconductor region and said semiconductor substrate;

a third semiconductor region of said one conductivity type formed in said main surface of said semiconductor substrate and said surface of said first semiconductor region, said third semiconductor region having higher impurity concentration than said semiconductor substrate and said third semiconductor region being in contact with both said semiconductor substrate and said first semiconductor region to form a Zener diode;

a first electrode connected to said first and second semiconductor region; and

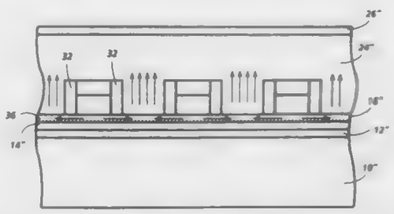
a second electrode connected to said semiconductor substrate.

4,990,977

HIGH CURRENT THIN FILM TRANSISTOR

Michael Hack, Mountain View; John G. Shaw, Portola Valley, both of Calif., and Michael Shur, Golden Valley, Minn., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1988, Ser. No. 174,652
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 17 Claims



1. A thin film transistor comprising a substrate, gate electrode means overlying said substrate, gate dielectric means overlying said gate electrode means, source electrode means overlying said gate dielectric means, substantially undoped non-single crystal semiconductor means overlying said gate dielectric means and surrounding said source means, drain electrode mean contiguous with said semiconductor means and

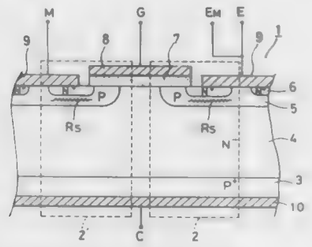
spaced from said gate dielectric means, the thickness of said semiconductor means substantially defining the source to drain separation distance and electrically conducting blocking means located adjacent to said source electrode means, said blocking means being separated from said gate dielectric means by a portion of said semiconductor means, and said blocking means cooperating with said gate electrode means for providing an electrostatic shield so as to prevent a drain field from reaching said source electrode means through said portion of said semiconductor means in the OFF sate of said transistor, and wherein source to drain current flow through said semiconductor means, in the ON state of said transistor, is controlled by said gate electrode means inducing a conducting channel through said portion of said semiconductor means for overcoming the blocking effect of said electrostatic shield.

4,990,978

SEMICONDUCTOR DEVICE

Hisao Kondoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 89,516, Aug. 26, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,861
Claims priority, application Japan, Jun. 8, 1987, 62-142713
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 5 Claims



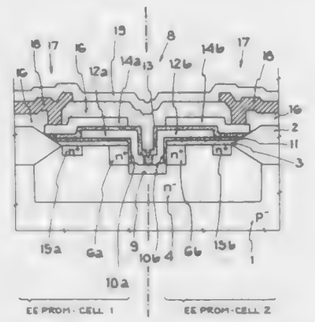
1. A semiconductor device comprising:
a first conductivity type semiconductor substrate having first and second major surfaces;
a second conductivity type semiconductor layer formed on said first major surface of said semiconductor substrate;
a first conductivity type first region formed in a surface of said semiconductor layer;
a first conductivity type second region formed in the surface of said semiconductor layer;
a second conductivity type third region formed in each surface of said first and second regions;
a first electrode formed on said second major surface of said semiconductor substrate;
a second electrode formed on adjacent surfaces of said first and third regions,
an insulation film formed on said each surface of said first and second regions between the surfaces of said semiconductor layer and said third region;
a control electrode formed on said insulation film for controlling main current on the semiconductor device flowing between said first and second electrodes;
a third electrode formed on adjacent surfaces of said second and third regions; and, means for monitoring current flowing through said third electrode in order to monitor said main current.

4,990,979

NON-VOLATILE MEMORY CELL

Joachim Otto, Unterschleisscheim, Fed. Rep. of Germany, assignor to Eurosil Electronic GmbH, Eching, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 350,722
Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816358
Int. Cl.[5] H01L *29/68, 29/06;* G11C *11/34*
U.S. Cl. 357—23.5 10 Claims



1. In a non-volatile memory cell array including a plurality of non-volatile memory cells which are formed at a surface of a semiconductor substrate and which each includes spaced source and drain zones formed in said surface, a trench provided in said surface adjacent the side of said drain zone facing away from the channel zone, a tunnel through dielectric layer disposed on said surface and covering at least the side walls of said trench, and a floating-gate electrode, as the memory electrode, disposed on said dielectric layer and extending into said trench; the improvement wherein:
said drain zone of at lest two of said non-volatile memory cells are disposed adjacent a single said trench and said floating-gate electrodes of said at lest two memory cells extend into said signal trench so that tunnel current can flow horizontally to the semiconductor surface between a respective said drain zone and the associated one of said floating-gate-electrodes.

4,990,980

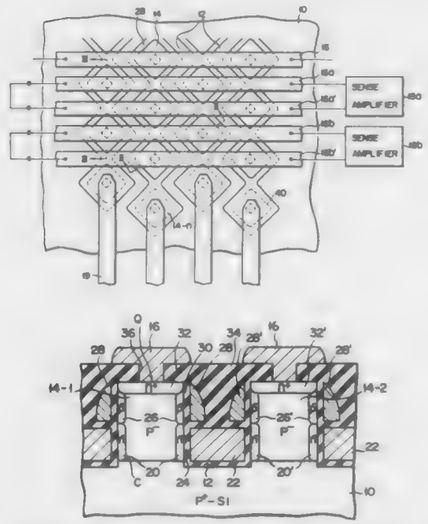
SEMICONDUCTOR MEMORY DEVICE

Masashi Wada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 837,881, Mar. 10, 1986, abandoned. This application Aug. 7, 1989, Ser. No. 390,510
Claims priority, application Japan, Apr. 16, 1985, 60-80619
Int. Cl.[5] G11C *11/404;* H01L *27/108*
U.S. Cl. 357—23.6 11 Claims

1. A semiconductor substrate of a first conductivity type, having a surface in which intersecting grooves are formed to define a plurality of island portions each of which has sidewalls and a top surface region between said intersecting grooves, said grooves having a bottom surface; and
(b) an array of memory cells which are formed in said surface of said substrate, and each of which comprises,
(i) a capacitor buried in the grooves surrounding one island layer, and comprising a capacitor electrode layer insulatively provided over a bottom surface of said grooves, and a first semiconductor layer of a second conductivity type formed in a bottom portion of said straight vertical sidewalls so as to face said capacitor electrode layer, and
(ii) a transistor comprising a gate electrode layer formed in said grooves so as to be insulatively stacked over said capacitor electrode layer, said gate electrode layer

facing a corresponding side surface region of said island portion;
wherein the gate electrodes of the transistors of adjacent memory cells are continuously and integrally formed so that gate electrodes of adjacent transistors are in direct contact;
wherein said memory cells included in said cell array include



two neighboring cells defined by intersecting ones of said grooves, wherein a corner of one of said two neighboring cells is adjacent a corner of the other of said two neighboring cells such that the grooves defining said adjacent corners of said two neighboring cells lie in pair of straight lines crossing at said adjacent corners, the gate electrodes of said two neighboring cells directly contacting each other at said adjacent corners.

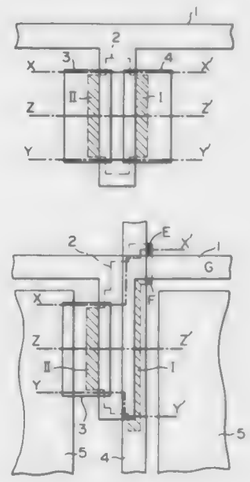
4,990,981

THIN FILM TRANSISTOR AND A LIQUID CRYSTAL DISPLAY DEVICE USING SAME

Yasuo Tanaka, Koganei; Haruo Matsumaru, Tokyo; Hideaki Yamamoto, Tokorozawa; Toshihisa Tsukada, Musashino; Ken Tsutsui, Tokyo, and Yoshiyuki Kaneko, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 296,811
Claims priority, application Japan, Jan. 29, 1988, 63-17074
Int. Cl.[5] H01L *29/78, 27/10*
U.S. Cl. 357—23.7 20 Claims

1. A thin film transistor comprising:
a substrate;
a gate insulating layer;
a source electrode; and
a drain electrode,
wherein said semiconductor layers and said gate electrode are disposed in an overlapping arrangement, with respect to a plan view thereof, and are separated via said gate insulating layer, said semiconductor layer being dimensioned to have an area with respect to said plan view thereof greater than an area of said gate electrode, said gate electrode of said overlapping arrangement being insulatedly overlapped by said semiconductor layer and overlapped by said source and drain electrode, and
wherein at least one of said source and drain electrodes is disposed to cover an area of said semiconductor layer



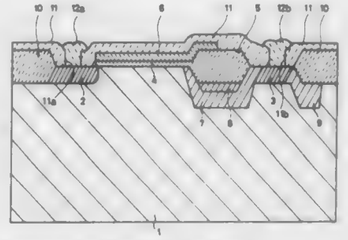
corresponding to a portion thereof not overlapped by said gate electrode, with respect to said plan view.

4,990,982

SEMICONDUCTOR DEVICE OF HIGH BREAKDOWN VOLTAGE

Kayoko Omoto, and Kazuaki Miyata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 156,435, Feb. 16, 1988, abandoned. This application Oct. 26, 1989, Ser. No. 428,017
Claims priority, application Japan, Aug. 25, 1987, 62-210577
Int. Cl.[5] H01L *29/68, 29/78*
U.S. Cl. 357—23.800 8 Claims



1. A semiconductor device comprising:
a semiconductor substrate of one conductivity type having a main surface,
first and second source/drain regions of the opposite conductivity type formed spaced apart from each other on the main surface of said semiconductor substrate, said first source/drain region comprising a surface portion and a contiguous buried portion positioned below a portion of said main surface of said substrate located between said surface portion of said first source/drain region and said second source/drain region,
a first gate oxide film deposited between said first and second source/drain regions on the main surface of said semiconductor substrate,
a thick second gate oxide film overlying said buried portion

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of said first source/drain region and extending from said first gate oxide film to said surface portion of said first source/drain region,

said buried portion of said first source/drain region continuing and extending from the surface portion of said first source/drain region on that side where said second gate oxide film is deposited to the lower side of, and in contact with a lower surface of, the second gate oxide film and, said buried portion of said first source/drain region having a two-layered structure of (i) a lower first doped layer in contact and contiguous with said surface portion having low impurity concentration and of the opposite conductivity type and (ii) an upper second doped layer located on and surrounded by said first doped layer whereby said second doped layer is separated from said surface portion by said first doped layer, said second doped layer of the opposite conductivity type and having an impurity concentration higher than that of the first doped layer, said buried portion of said first source/drain region extending below a lower surface of said surface portion of said first source/drain region, and

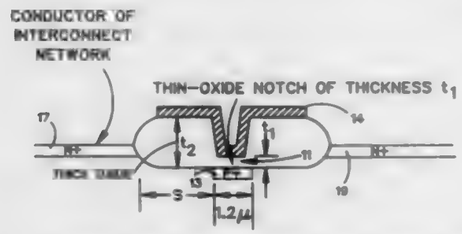
a gate electrode extending from said first gate oxide film to the second oxide film and formed between the second source/drain region and the first source/drain region.

4,990,983

RADIATION HARDENED FIELD OXIDES FOR NMOS AND CMOS-BULK AND PROCESS FOR FORMING

Frank Z. Custode, Norco, and John G. Poksheva, Whittier, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 926,319, Oct. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 736,153, May 20, 1985, abandoned. This application Dec. 7, 1987, Ser. No. 130,914
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.11 6 Claims



1. An NMOS device having hardened field isolation comprising, in combination:

a P doped substrate,

an N doped source and drain in the substrate;

a P doped channel between the source and drain;

a gate over the channel;

a field oxide region in and above the substrate and surrounding the device;

said field oxide region having thick portions and a thin portion relative to the rest of the region which thin portion surrounds the ice and at least is partly embedded in the substrate, and

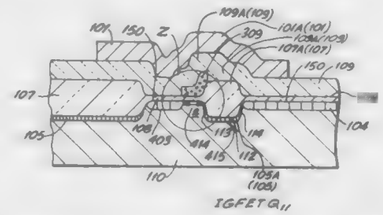
a highly P degenerated doped region in the substrate directly beneath and against the thin field oxide portion also surrounding the device.

4,990,984

SEMICONDUCTOR DEVICE HAVING PROTECTIVE ELEMENT

Kazuhiro Misu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,582
Claims priority, application Japan, Nov. 27, 1987, 62-300606
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.13 8 Claims



1. A semiconductor device having a protective transistor for protecting an internal circuit from an excess voltage applied to an input terminal, said transistor comprising:

a source region formed in a major surface of a semiconductor substrate of a first conductivity type and having a second conductivity type opposite to said first conductivity type, said source region being connected to an earth potential line;

a drain region formed in said major surface of said semiconductor substrate and having said second conductivity type, said drain region being connected to said input terminal through a protective resistor element;

a first channel region abutted against said source region and having a value of a threshold voltage;

a second channel region provided between said first channel region and said drain region and abutted against said first channel region and against said drain region, said second channel region having a channel length between said first channel region and said drain region;

a thick insulating layer formed on said first channel region, said thick insulating layer having a bottom depressed from said major surface in which said source and drain regions are formed such that said first channel region under said bottom is depressed from said major surface, a first side wall facing said source region and a second side wall facing said second channel region;

an insulating film having a thickness less than that of said thick insulating layer and formed on said second channel region;

an impurity region of said second conductivity type having an island-like configuration and formed in said substrate of said first conductivity type;

a polycrystalline silicon electrode formed on said insulating film above said second channel region, said silicon electrode being connected to said impurity region so as to connect said silicon electrode to said substrate through an PN junction between said impurity region and said substrate and to maintain said silicon electrode in a floating state;

an inter-ply insulating layer covering said silicon electrode above said second channel region and covering said thick insulating layer above said first channel region; and

a gate electrode connected to said input terminal and formed on said inter-ply insulating layer above said first and second channel region,

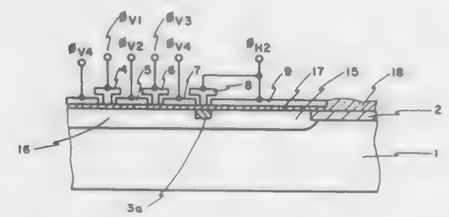
said channel length of said second channel region being such that when an abnormal excess voltage at a level equal to or more than said value of said threshold voltage of said first channel region is through said input terminal, a depletion layer from said drain region reaches to said second side wall of said thick insulating layer facing said second channel region, and when a normal operation voltage is applied to said gate electrode, a depletion layer from said drain region is absent at said second side wall.

4,990,985

CHARGE COUPLED DEVICE HAVING A PARALLEL-SERIAL CONVERTING PORTION

Takao Kamata, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 20, 1988, Ser. No. 222,064
Claims priority, application Japan, Jul. 21, 1987, 62-182741
Int. Cl.[5] H01L *29/78, 27/14*
U.S. Cl. 357—24 4 Claims



4. A CCD area image sensor comprising:

a semiconductor substrate;

a plurality of photo-detector elements formed in said semiconductor substrate so as to form rows and columns of said elements, said photo-detector elements accumulating changes in accordance with irradiated light;

a plurality of first electrodes overlying said plurality of first channels via an insulator film to form a plurality of vertical shift-registers;

means for transferring charges accumulated in said photo-detector elements to said vertical shift-registers;

a second channel formed in said semiconductor substrate in contact with respective one ends of said first channel regions;

a plurality of second electrodes formed on said second channel to form a horizontal shift-register, predetermined electrodes of said second electrodes extending to cover respective end parts of said first channels including said one ends of said first channels; and

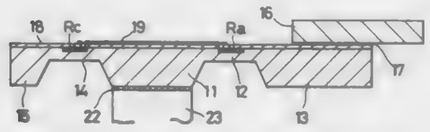
barrier regions formed in said respective end parts of said first channels, said barrier regions being the same conductivity type as said first and second channels and having an impurity concentration which is different from a concentration of said first and second channels, and each of said barrier regions forming a barrier for preventing charges in said second channel from going to said first channels.

4,990,986

SEMICONDUCTOR ACCELERATION SENSOR

Koichi Murakami, Yokosuka; Yukitsugu Hirota, Kamakura; Mikio Bessho, and Masahiro Tsugai, both of Amagasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 30, 1989, Ser. No. 400,535
Claims priority, application Japan, Sep. 2, 1988, 63-218517
Int. Cl.[5] H01L *29/84, 29/66, 29/06*
U.S. Cl. 357—26 12 Claims



1. A semiconductor acceleration sensor, comprising:

a semiconductor substrate;

a mounting portion formed in said substrate;

a first cantilevered beam for acceleration detection;

a second cantilevered beam for temperature compensation;

said first beam and said second beam formed in said substrate on opposite sides of said mounting portion, respectively, so that said first beam, said mounting portion and said second beam are aligned in order along a straight line;

a first weight formed at an end of said first beam;

first strain sensing means for said acceleration detection; and

second strain sensing means for said temperature compensation;

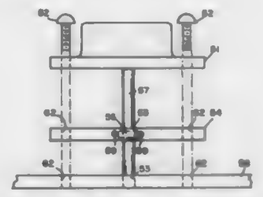
said first and second strain sensing means formed in approximately the same layout in surface portions of said first and second beams, respectively.

4,990,987

OVER-TEMPERATURE SENSOR AND PROTECTOR FOR SEMICONDUCTOR DEVICES

R. Wayne Boucher, Dayton, Ohio, and William J. Shannon, Portland, Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1986, Ser. No. 943,105
Int. Cl.[5] H01L *23/34, 23/36*
U.S. Cl. 357—28 1 Claim



1. In combination with a heat generating semiconductor device that is susceptible to damage when overheated, said combination comprising:

a semiconductor package and means to provide power to said semiconductor in said package;

a mounting tab extending from said semiconductor package, said mounting tab forming a heat sink, said mounting tab being disposed in a heat receiving relationship to said semiconductor whereby to be heated by heat generated by said semiconductor;

a PTC thermistor attached to said mounting tab, said PTC thermistor being in a heat receiving relationship with said mounting tab, said PTC thermistor having an anomoly temperature below the temperature which would cause damage to said semiconductor during its operation, whereby said PTC thermistor changes its resistance in response to the changes in temperature occurring in said semiconductor;

means electrically insulating said semiconductor from said PTC thermistor;

means to detect changes in resistance in said PTC thermistor due to an approach of said anomoly temperature, whereby to detect changes in the operating temperature of said semiconductor; and

means to turn off the power to said semiconductor upon detection of a predetermined resistance in said PTC thermistor indicative of a predetermined operating temperature of said semiconductor which would damage said semiconductor.

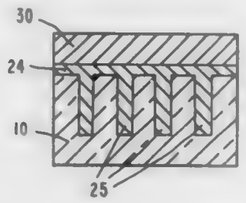
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4,990,988

LATERALLY STACKED SCHOTTKY DIODES FOR INFRARED SENSOR APPLICATIONS

True-Lon Lin, Cerritos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 9, 1989, Ser. No. 363,815
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 6 Claims



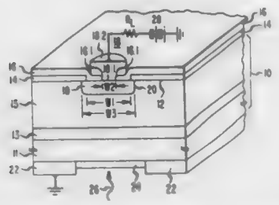
1. An infrared sensor comprising a plurality of laterally stacked Schottky diodes, each diode comprising a Schottky barrier metal formed in an opening in a silicon substrate, each said opening having a diameter ranging from about 50 to 200 Å and a depth ranging from about 1 to more than 100 μm.

4,990,989

RESTRICTED CONTACT PLANAR PHOTODIODE

Mahmoud A. ElHamamsy, New York, N.Y.; Stephen R. Forrest, Torrance, Calif., and John R. Zuber, Piscataway, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 767,613, Aug. 20, 1985, Pat. No. 4,894,703, which is a continuation-in-part of Ser. No. 359,988, Mar. 19, 1982, abandoned. This application Jan. 12, 1990, Ser. No. 464,505
The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 6 Claims



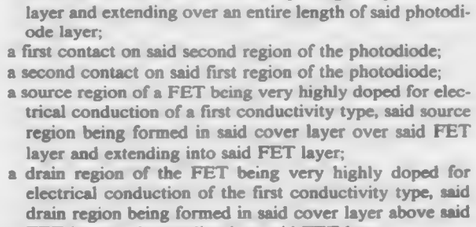
1. A two-terminal, planar photodiode comprising
a Group III-V compound semiconductor body having a first major surface and an opposite major surface,
a first silicon nitride single layer formed on said first surface, said first layer having a first opening therein for introducing a dopant into said body to form a p-n junction which intersects said surface at points recessed from the edge of said first opening.
a second silicon nitride layer formed so as to contact said first layer along its entire length, said second layer having a second opening which lies within said first opening,
a single electrical contact to said first surface, said contact including: a pedestal portion formed in said second opening so as to have an interface with said second layer and positioned remote from the points where said junction intersects said surface, and a cap portion overlapping said pedestal portion so as to seal said interface, said pedestal portion being positioned sufficiently remote from said points so as to reduce stress induced at said points, and
a second electrical contact to said opposite major surface, at least one of said contacts being adapted to permit lightwaves to be detected to be incident on said body.

4,990,990

MONOLITHICALLY INTEGRATED WAVEGUIDE-PHOTODIODE-FET COMBINATION

Helmut Albrecht, Munich, and Reiner Trommer, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

PCT No. PCT/DE88/00184, § 371 Date Dec. 4, 1989, § 102(e) Date Dec. 4, 1989, PCT Pub. No. WO88/08205, PCT Pub. Date Oct. 20, 1988
PCT Filed Mar. 23, 1988, Ser. No. 445,693
Int. Cl.[5] H01L *27/14, 33/00, 29/161*
U.S. Cl. 357—30 8 Claims



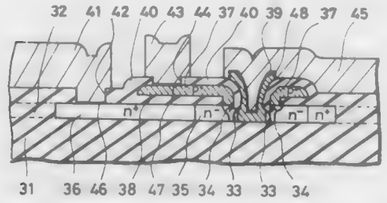
1. A monolithically integrated waveguide-photodiode-FET combination, comprising:
a carrier substrate of III–V semiconductor material;
a photodiode layer of a semiconductor material formed on said carrier substrate, said photodiode layer being lightly doped for electrical conduction of a first conductivity type;
a waveguide layer of a semiconductor material formed on said carrier substrate abutting said photodiode layer, said waveguide layer being lightly doped for electrical conduction of the first conductivity type;
a FET layer of a semiconductor material formed on said carrier substrate, said FET layer being lightly doped for electrical conduction of the first conductivity type, said photodiode layer and said waveguide layer and said FET layer being grown positioned next to one another to form a planar surface;
a cover layer of a semiconductor layer grown on said planar surface;
a first region of a photodiode being very highly doped for electrical conduction of the first conductivity type; said first region being formed in said cover layer over said photodiode layer and extending into said photodiode layer;
a second region of the photodiode being highly doped for electrical conduction of a second conductivity type, said second region being formed in said cover layer over said photodiode layer and extending into said photodiode layer;
a third region of the photodiode being doped for electrical conduction of said first conductivity type and being formed in said carrier substrate adjoining said photodiode layer and extending over an entire length of said photodiode layer;
a first contact on said second region of the photodiode;
a second contact on said first region of the photodiode;
a source region of a FET being very highly doped for electrical conduction of a first conductivity type, said source region being formed in said cover layer over said FET layer and extending into said FET layer;
a drain region of the FET being very highly doped for electrical conduction of the first conductivity type, said drain region being formed in said cover layer above said FET layer and extending into said FET layer;
a channel region of the FET being highly doped for electrical conduction of the first conductivity type and extending into said FET layer;
a gate region of the FET being formed in said cover layer;
a source contact on said source region;
a drain contact on said drain region;
a gate contact on said gate region;
a parting region separating the photodiode and the FET from one another; and
a passivation layer covering a portion of said cover layer not covered by said contacts.

4,990,991

BIPOLAR TRANSISTOR AND METHOD OF MANUFACTURING THE SAME

Tatsuhiko Ikeda; Kazuyuki Sugahara; Shigeru Kusunoki, and Kyusaku Nishioka, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 115,049
Claims priority, application Japan, Dec. 1, 1986, 61-287325
Int. Cl.[5] H01L *29/72, 27/01, 27/02, 29/04*
U.S. Cl. 357—34 3 Claims



1. A bipolar transistor for achieving high-speed operation comprising:
a semiconductor substrate having at least a surface part being finished as an insulation layer;
a first conductivity type monocrystal silicon layer formed on an element region of said semiconductor substrate;
an insulation film for inter-element isolation formed on an isolation region of said semiconductor substrate for isolating adjacent ones of said monocrystal silicon layer;
a second conductivity type diffusion layer and a first conductivity type diffusion layer formed in said monocrystal silicon layer by transverse diffusion in sequence from a hole defined in a part of said monocrystal silicon layer to reach said insulation layer of said semiconductor substrate; and
electrode extracting layers connected to said monocrystal silicon layer, said second conductivity type diffusion layer and said first conductivity type diffusion layer respectively while being isolated from each other.

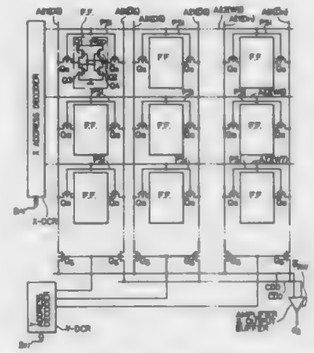
4,990,992

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Makio Uchida, Fuchu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 41,759, Apr. 21, 1987, Pat. No. 4,782,465, which is a continuation of Ser. No. 635,210, Jul. 27, 1984, abandoned. This application Oct. 5, 1988, Ser. No. 253,673
Claims priority, application Japan, Jul. 27, 1983, 58-135815
Int. Cl.[5] H01L *27/02, 29/04*
U.S. Cl. 357—41 8 Claims

1. A semiconductor integrated circuit device comprising:
a plurality of word lines extending in a first direction;
a plurality of data lines extending in a second direction which is perpendicular to said first direction;
first means for selecting a word line from said plurality of word lines and which applies a signal to the selected word line;
a second means for selecting a pair of data lines from said plurality of data lines;
sub-word lines extending in said first direction and being substantially parallel to said word lines, and at least two sub-word lines connected to each of said plurality of word lines; and



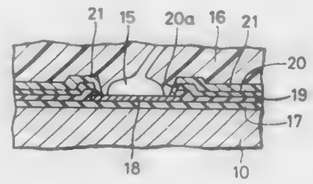
each of said sub-lines being connected to a plurality of memory cells, each memory cell being connected to one of said data lines and the signal from said first means being supplied to said at least two sub-word lines substantially simultaneously.

4,990,993

RESIN-MOLDED SEMICONDUCTOR DEVICE USING POLYMIDE AND NITRIDE FILMS FOR THE PASSIVATION FILM

Kazuhiro Tsurumaru, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 109,160, Oct. 16, 1987, abandoned, which is a continuation of Ser. No. 837,757, Mar. 10, 1986, Pat. No. 4,733,289, which is a continuation of Ser. No. 670,812, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 256,110, Apr. 21, 1981, abandoned. This application Jun. 26, 1989, Ser. No. 372,184
Claims priority, application Japan, Apr. 25, 1980, 55-54137
Int. Cl.[5] H01L *29/34, 23/48, 23/29*
U.S. Cl. 357—54 26 Claims



1. A semiconductor device comprising:
a semiconductor substrate having a main surface in which a desired circuit is formed;
a wiring layer having a bonding pad, said wiring layer overlying an insulating film overlying said main surface of said semiconductor substrate, a main surface of said bonding pad having a bonding portion and a peripheral portion;
a nitride film overlying said insulating film and said wiring layer including said bonding pad, said nitride film having a hole for exposing said bonding portion;
a polyimide resin formed on said nitride film, said polyimide resin and said nitride film each overlying said peripheral portion, said polyimide resin also having a hole for exposing said bonding portion, such that the bonding portion is exposed within a common hole provided by the hole through the polyimide resin and the hole through said

nitride film, said common hole being bounded by a face which is arranged to expose said bonding portion, which face is formed by at least an edge face of said polyimide resin;

a metal wire bonded to said bonding portion of the main surface of said bonding pad, a remaining part of the bonding pad being left uncovered by the metal wire and the polyimide resin; and

a sealing resin formed to cover said metal wire and said polyimide resin, so as to provide improved adherence between the nitride film and sealing resin through the polyimide resin, as compared to adherence between the nitride film and sealing resin without the polyimide resin therebetween, whereby clearances between the sealing and polyimide resins, and between the polyimide resin and nitride film, are avoided, said sealing resin forming a seal for the circuit, to thereby provide a resin-sealed semiconductor device.

4,990,994

ELECTRODE STRUCTURE FOR SILICON CARBIDE SEMICONDUCTORS

Katsuki Furukawa, Sakai; Akira Suzuki, Nara; Mitsuhiro Shigeta, Nara, and Atsuko Uemoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 208,847, Jun. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 910,482, Sep. 23, 1986, abandoned. This application Sep. 5, 1989, Ser. No. 403,016
Claims priority, application Japan, Sep. 24, 1985, 60-211661
Int. Cl.[5] H01L *23/54, 23/48*
U.S. Cl. 357—67 **5 Claims**



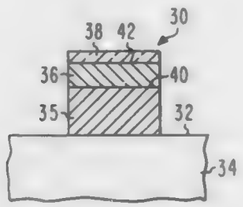
1. In an electrode structure for a silicon carbide single-crystal semiconductor in which the surface of the silicon carbide single-crystal is laminated with an electrode layer, the improvement in which the silicon carbide single-crystal has surface irregularities and the electrode layer comprises a metal layer of titanium, chromium or molybdenum and an electrically conductive protective layer of aluminum, copper and/or nickel formed thereon, to provide an ohmic electrode.

4,990,995

LOW REFLECTANCE CONDUCTOR IN AN INTEGRATED CIRCUIT

Jer-shen Maa, Plainsboro Township, Middlesex County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 8, 1987, Ser. No. 93,655
Int. Cl.[5] H01L *23/48, 29/46, 29/62, 29/64*
U.S. Cl. 357—67 **4 Claims**



1. In an integrated circuit, a low reflectance conductor having a reflectance of less than about 40% comprising:

(a) a conductive layer;

(b) a layer of refractory metal overlying said conductive layer and having a thickness of greater than about 300 angstroms; and

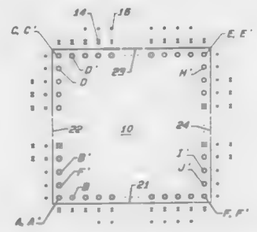
(c) a layer of refractory metal oxide overlying said layer of refractory metal and having a thickness of between about 100 angstroms and about 200 angstroms.

4,990,996

BONDING PAD SCHEME

Niraj Kumar, Milpitas, and Steven R. Boyle, Santa Clara, both of Calif., assignors to Zilog, Inc., Campbell, Calif.

Filed Dec. 18, 1987, Ser. No. 134,921
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—68 **3 Claims**



3. The combination of an integrated circuit package and an integrated circuit die sealed in the package, the package comprising a plurality of bonding posts surrounding the die, the die being rectangular and having a first side and a second side adjacent to the first side, the die having integrated thereon:

an integrated circuit having circuit nodes including a first circuit node;

a plurality of bonding pads disposed along the sides of the die, including a first pad accessible for wire bonding with a post on the first side of the die and a second pad accessible for wire bonding with a post on the second side of the die; and

first coupling means for coupling both the first and second pads to the first circuit node so that external connection to either of the first and second pads achieves the same function as external connection to the other of the first and second pads,

wherein the first pad is connected to a bonding post in the package, the first node being coupled to a bonding post in the package only through the first pad,

and wherein the plurality of bonding pads further includes a first corner pad located on the corner between the first and second sides of the die, the first corner pad being distinct from the first and second pads and being connected to a bonding post in the package, the first corner pad being coupled to a first corner pad one of the circuit nodes, the first corner pad one of the circuit nodes being coupled to a bonding post in the package only through the first corner pad.

4,990,997

CRYSTAL GRAIN DIFFUSION BARRIER STRUCTURE FOR A SEMICONDUCTOR DEVICE

Kenji Nishida, Isagi, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 14, 1989, Ser. No. 337,999
Claims priority, application Japan, Apr. 20, 1988, 63-97762
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **6 Claims**

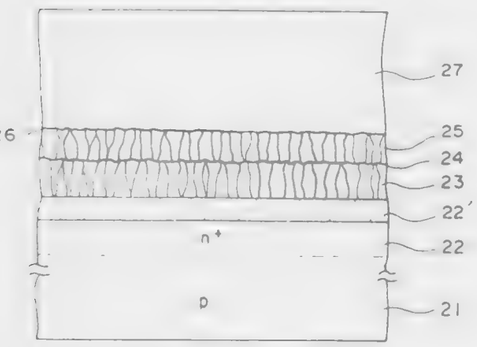
1. A contact structure for connecting a semiconductor portion of a semiconductor device to a metal electrode used in the semiconductor device, said contact structure preventing reaction between the semiconductor portion of a semiconductor device and the metal electrode, said contact structure comprising:

a semiconductor layer forming the semiconductor portion of the semiconductor device, said semiconductor layer including a component element and having a top major surface;

a metal electrode used in the semiconductor device for wiring, said metal electrode including a component element and having a bottom major surface;

a first barrier layer of an electrically conductive material including at least one component element, said first barrier layer having an upper major surface and a lower major surface and provided on the top major surface of the semiconductor layer for preventing the component element of said semiconductor layer and the component element of said metal electrode from being transported therethrough, said first barrier layer having a microstructure wherein a plurality of grains of said electrically conductive material, each defined by a grain boundary, are assembled to each other;

an interface region formed in the first barrier layer as a part of the first barrier layer along the upper major surface of the first barrier layer, said interface region having an upper major surface coincident to the upper major surface



of the first barrier layer and consisting essentially of a material which contains all the component elements forming the material of said first barrier layer but substantially free from said component element forming said semiconductor layer, said interface region having a microstructure which is different from the microstructure of the first barrier layer; and

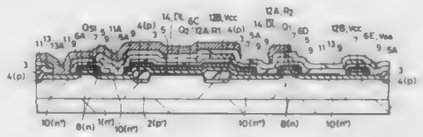
a second barrier layer having a lower major surface and an upper major surface, said second barrier layer including a material substantially identical to that of the first barrier layer and having a microstructure including a plurality of grains of the material forming the second barrier layer each defined by a grain boundary, said second barrier layer provided on the upper major surface of the first barrier layer and under the lower major surface of the metal electrode so as to be sandwiched between the first barrier layer and the metal electrode, said second barrier layer provided with respect to the first barrier layer such that the grains in the second barrier layer are located generally in correspondence to the grain boundary in the first barrier layer, said microstructure of said interface region for preventing said component element of said semiconductor layer and said component element of said metal electrode from being transported across the interface region.

4,990,998

SEMICONDUCTOR DEVICE TO PREVENT OUT-DIFFUSION OF IMPURITIES FROM ONE CONDUCTOR LAYER TO ANOTHER

Atsuyoshi Koike, Kokubunji; Shuji Ikeda, Koganei, and Kouichi Nagasawa, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 875,674, Jun. 18, 1986, Pat. No. 4,803,534. This application Feb. 7, 1989, Ser. No. 306,906
Claims priority, application Japan, Jun. 21, 1985, 60-134018
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **24 Claims**



1. A semiconductor device comprising:

a first conductor layer being comprised of a polycrystalline silicon film into which is diffused an impurity for lowering the resistance thereat;

an insulating film being formed on said first conductor layer and having a contact hole at a predetermined portion of said insulating film above said first conductor layer;

a stopper layer being provided on said first conductor layer at least at said predetermined portion where said contact hole is formed; and

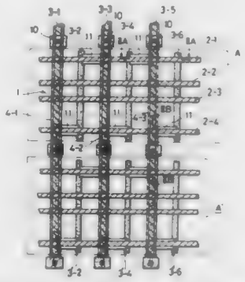
a second conductor layer being comprised of a polycrystalline silicon film provided on an upper side of said insulating film and electrically connected to said first conductor layer through said contact hole and said stopper layer, said second conductor layer having a predetermined portion thereof provided as a resistance element, wherein said stopper layer is such that it inhibits the impurity contained in said first conductor layer from being diffused into said second conductor layer.

4,990,999

SEMICONDUCTOR MEMORY DEVICE USING HIGH-DENSITY AND HIGH-SPEED MOS ELEMENTS

Motohiro Oishi; Kunio Matsudaira, both of Ikeda; Keiji Fukumura, Toyonaka, and Shigemi Sasada, Takarazuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 3, 1989, Ser. No. 416,494
Claims priority, application Japan, Oct. 20, 1988, 63-266576
Int. Cl.[5] H01L *29/44, 27/10*
U.S. Cl. 357—71 **7 Claims**



1. A semiconductor memory device comprising:

a plurality of diffusion lines formed on a semiconductor substrate so as to extend at intervals and parallel with each

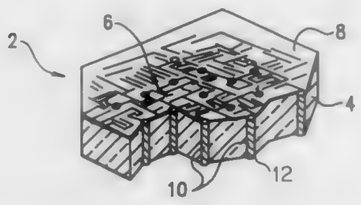
other, each of said diffusion lines constituting a bit line of the memory device;
a first insulating film formed on said semiconductor substrate in order to cover each of said diffusion lines;
a plurality of polysilicon lines formed on said first insulating film so as to extend at intervals and intersect each of said diffusion lines, each of said polysilicon lines constituting a word line of the memory device;
a second insulating film formed on said first insulating film in order to cover each of said polysilicon lines; and
a plurality of metal wiring lines formed on said second insulating film so as to be positioned over every second one of said diffusion lines and to extend respectively along the corresponding diffusion line positioned underneath the metal wiring line, each of said metal wiring lines being electrically connected to said corresponding diffusion line through at least one contact hole penetrating said first insulating film and said second insulating film;
one region which is underneath one intersection of one diffusion line and one polysilicon line constituting a source region of one MOS transistor, another region which is underneath another intersection of another diffusion line adjacent to said one diffusion line and said one polysilicon line constituting a drain region of said one MOS transistor, a portion of said one polysilicon line which is between said source region and said drain region constituting a gate of said one MOS transistor.

4,991,000

VERTICALLY INTERCONNECTED INTEGRATED CIRCUIT CHIP SYSTEM

Robert L. Bone, 24035 Rail Clr., Laguna Niguel, Calif. 92677, and W. E. Armstrong, 27571 Cenajo, Mission Viego, Calif. 92691

Filed Aug. 31, 1989, Ser. No. 401,255
Int. Cl.[5] H01L *23/16, 39/02, 23/48, 29/44*
U.S. Cl. 357—75 **13 Claims**



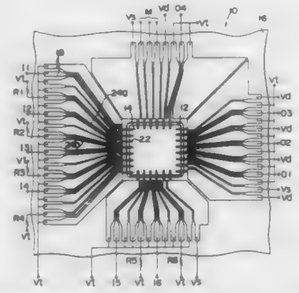
1. An integrated circuit (IC) assembly, comprising:
(a) a substrate having an electrical interconnect circuit on one side,
(b) a plurality of IC chips, each chip encompassing a substantially smaller area than the substrate and comprising:
(1) a chip body having opposed sides,
(2) an IC on one side of the chip body, and
(3) a plurality of electrically conductive chip feedthroughs electrically contacting respective locations on the IC on said one side of the chip body and extending through the chip body to its opposite side, and
(c) means mechanically mounting said chips on said substrate with their respective ICs visually exposed and facing away from the substrate, said mounting means establishing electrical connections between said chip feedthroughs and selected locations on the substrate interconnect circuit, said substrate interconnect circuit electrically interconnecting at least some of said IC chips.

4,991,001

IC PACKING DEVICE WITH IMPEDANCE ADJUSTING INSULATIVE LAYER

Chiaki Takubo, Yokohama; Kazutaka Saito, and Toshio Sudo, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 31, 1989, Ser. No. 331,286
Claims priority, application Japan, Mar. 31, 1988, 63-79695
Int. Cl.[5] H01P *5/08;* **H01L** *23/50, 21/60*
U.S. Cl. 357—80 **16 Claims**



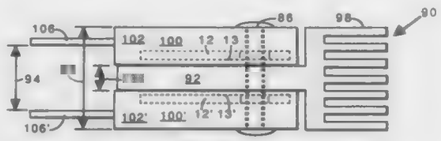
1. A tape-automated bonding substrate for a semiconductor IC chip having signal terminals, said substrate comprising:
(a) an insulative layer base film having a peripheral end;
(b) a conductive thin-film layer formed on said base film to define a wiring line pattern, said pattern comprising,
feedthrough type signal transmission wiring lines connected to said signal terminals of said IC chip, each of which includes a contact portion to which a corresponding one of said signal terminals of said IC chip is directly connected, first terminal pads receiving external high-speed signals and second terminal pads to which external impedance matching and adjusting resistors are connected, said first and second terminal pads being arranged along said peripheral end of said substrate; and
(c) insulative layer means deposited on said substrate to at least partly cover said feedthrough type signal transmission wiring lines, said insulative layer means having a selected thickness to change the impedance of said feedthrough type signal transmission wiring lines to a desired target value.

4,991,002

MODULAR POWER DEVICE ASSEMBLY

Randall K. Frank, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Feb. 14, 1990, Ser. No. 479,924
Int. Cl.[5] H01L *23/02, 39/02, 23/16, 29/44*
U.S. Cl. 357—81 **13 Claims**



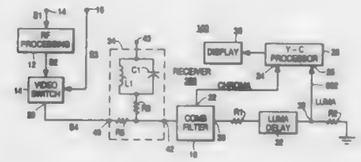
1. A power semiconductor module comprising:
a plurality of pre-packaged semiconductor devices, each having a planar first face for heat removal and external electrical connection leads extending from a second face; and
a heat conductive plate for receiving the plurality of pre-packaged semiconductor devices, wherein the planar first faces of a first portion of the plurality of pre-packaged semiconductor devices are in thermal contact with a first face of the heat conductive plate not overhung by any other portion of the heat conductive plate and the planar first faces of a second portion of the plurality of pre-packaged semiconductor devices are in thermal contact with an opposed second face of the heat conductive plate not overhung by any other portion of the heat conductive plate, and wherein the external electrical connection leads of the pre-packaged semiconductor devices all extend in a common direction.

4,991,003

RECEIVER WITH CORRECTION FOR COMB FILTER FREQUENCY RESPONSE

Gene K. Sendelweck, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 20, 1989, Ser. No. 341,017
Int. Cl.[5] H04N *9/64*
U.S. Cl. 358—35 **3 Claims**



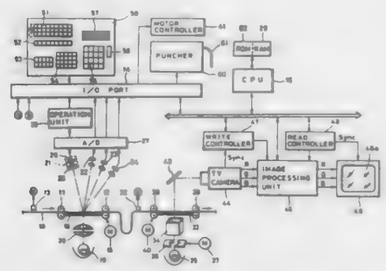
1. A television receiver, comprising:
a source having an output providing a video to be displayed;
a display having an input for receiving said video signal;
a circuit path including a comb filter and a delay line connected in the order named between said output of said source and said input of said display; and
a comb filter correction circuit in said path for correcting amplitude variations of said comb filter, said correction circuit exhibiting frequency dependent impedance variations; wherein:
said circuit path includes first coupling means coupling said correction circuit between said output of said source and an input of said comb filter and includes second coupling means coupling an output of said delay line to said input of said display for preventing said impedance variations of said comb filter correction circuit from causing reflections in said delay line.

4,991,004

FILM PREVIEWER WHICH SIMULTANEOUSLY DISPLAYS A 110 AND A 135 FRAME

Ryoichi Hayashi, and Yoshiaki Sakamoto, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1989, Ser. No. 305,599
Claims priority, application Japan, Feb. 5, 1988, 63-25114; Feb. 5, 1988, 63-25115
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—76 **8 Claims**



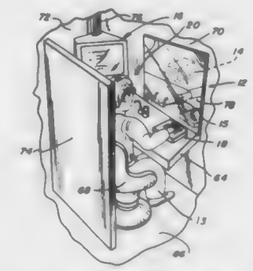
1. A method of displaying images of a plurality of picture frames of a color photographic film on image display means, the images being picked up by image pickup means, the method comprising the steps of:
picking up image data for a picture frame of a 135 type color photographic film on which images have been taken in a full size format by removing every second pixel in both the vertical and horizontal directions, picking up image data for a picture frame of a 110 type color photographic film on which images have been taken by picking up all the pixels within a specific area of said image pickup area, and picking up image data for a picture frame of a half size format on said 135 type color photographic film by removing every second pixel in the vertical direction, and switching the vertical and horizontal addresses to read said image data rotated by 90 degrees;
writing said picked-up image data into an image memory;
reading said image data from said image memory;
supplying said read-out image data to said image display means; and
displaying of the images of said plurality of picture frames in a matrix arrangement in accordance with said read-out image data.

4,991,005

GLASS FRAME VIEWING ASSEMBLY AND METHOD OF USE

Ethel L. Smith, Box 1988, Colorado Springs, Colo. 80901

Filed Oct. 27, 1989, Ser. No. 427,518
Int. Cl.[5] H04N *7/18, 5/76*
U.S. Cl. 358—93 **5 Claims**



1. A glass frame viewing assembly usable by an operator in selecting eyeglass frames, comprising:
(a) a video taping assembly including a video camera assembly connected to a video recorder assembly with said video camera assembly positioned to record pictures of a head portion of the operator having glass frames thereon;
(b) a video display assembly connected to said video taping assembly to display the recorded pictures on a main display screen to be observed by the operator;
(c) a main control panel assembly connected to said video taping assembly and said video display assembly and positioned adjacent the operator for ease of control in recording pictures, rewinding, and playing the pictures on said main display screen;
(d) an operator booth assembly having a support table member;
(e) an operator support chair positioned adjacent to said support table member;
(f) a display mirror member positioned adjacent said support table member; and
(g) said display mirror having said video camera assembly positioned on a side opposite the operator and operable to record pictures through said display mirror member while said operator is viewing self in said display mirror member;
whereby the operator is positioned in said support chair member so as to have himself displayed in said display mirror member for trying on the glass frames and having

VOL 1123 ISS 1 FEB 5 1991 UMI

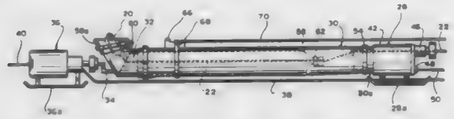
said video camera assembly operable to record pictures of the operator facing the display mirror member in various positions to adequately display the glass frames being inspected.

4,991,006

APPARATUS USING AN EVERTED HOSE FOR INSPECTING THE INTERIOR OF A LATERAL PIPELINE

Eric Wood, Castletown, Great Britain, assignor to Insituform Licensees, B. V., Amsterdam, Netherlands

Filed Mar. 8, 1990, Ser. No. 490,714
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—100 **20 Claims**



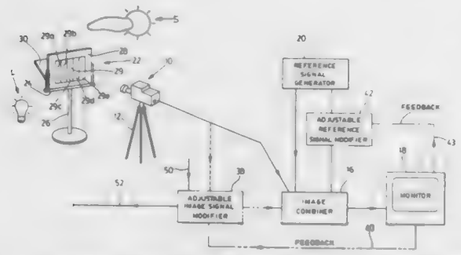
1. Apparatus for inspecting a lateral pipe from a main pipe, said apparatus comprising a support adapted to be moved along said main pipe to the location of said lateral pipe, a conduit on said support for movement with said support into substantial registration with said lateral pipe, a camera with a cable operatively connected thereto, and a carrier hose, said carrier hose extending through said conduit with its leading end sealingly secured to the leading end of said conduit and its trailing end within said conduit, said camera cable extending from an external station along said carrier hose with said camera located adjacent the leading end of said carrier hose and with the trailing end of said carrier hose secured to said cable, and means for exerting fluid pressure between said carrier hose and said conduit while said camera and camera cable are permitted to move forwardly relative to said conduit, whereby said exertion of fluid pressure everts said carrier hose forwardly from said conduit and causes said camera with its cable to be projected out from said conduit into and along said lateral pipe.

4,991,007

IMAGE EVALUATION OF AT LEAST ONE CHARACTERISTIC OF AN OBJECT, AND METHOD OF EVALUATION

Ferrand D. E. Corley, 80 Kleins Crescent, Kleinsberg, Ontario, Canada L0G 1C0

Filed May 5, 1989, Ser. No. 347,675
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—106 **20 Claims**



1. An image evaluation system for evaluating at least one characteristic of image signals, said characteristic being selected form the colour, brightness, tonal scale, geometric linearity, sharpness and position of said image, and comprising:

a test target having a first predetermined visual appearance for a selected one of said predetermined visual image characteristics;

an imaging device for generating a test image signal representing an image of said test target when said test target is illuminated under predetermined lighting conditions and for generating subsequent image signals representing images of at least one scene illuminated under the same predetermined lighting conditions;

a reference image signal generator adapted to generate a reference image signal representing a reference image having a second predetermined visual appearance for said selected one of said predetermined visual image characteristics and said second predetermined visual appearance having a predetermined relationship to said first predetermined visual appearance of said test target;

a signal-combining means adapted to receive said test image signal and said reference image signal and to combine said signals into a combined signal; and,

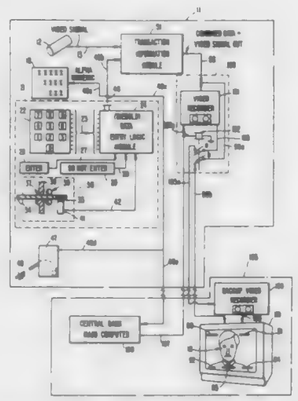
a monitor connected to said signal-combining means so as to receive said combined signal therefrom, thereby said monitor will display said predetermined image characteristic of said image of said test target and of said reference image adjacent to one another to permit comparison of said image of said test target and said reference image on said monitor.

4,991,008

AUTOMATIC TRANSACTION SURVEILLANCE SYSTEM

Donald Nama, San Juan Capistrano, Calif., assignor to Intec Video Systems, Inc., Laguna Hills, Calif.

Filed Dec. 1, 1988, Ser. No. 278,359
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—108 **4 Claims**



1. An automatic teller machine transaction surveillance system comprising:

a camera positioned to receive an image of an individual involved in a financial transaction with an automatic teller machine that can be manually manipulated by said individual to enter financial transaction data in said automatic teller machine,

said camera providing a signal representative of said image,

said automatic teller machine including a transaction information data entry means and a transaction information means, said transaction data entry means providing a transaction data signal to a display means and a coded transaction data signal directly to a physically remote data processing, storage and sending means at a central bank,

said transaction data entry means including a manually operated key pad electrically coupled to a data entry logic means, said key pad manipulateable to enter a personal identification number of said individual as well as financial transaction data, said data entry means providing said financial transaction data signal to said display means, while simultaneously providing said coded transaction data signal to said central bank data processing, storage and sending means, said coded transaction data signal including said personal identification number.

said transaction data entry means further including a credit card reading means electrically coupled to said data entry logic means, said credit card reading means providing individual credit card identification data which forms a portion of said financial transaction data, said coded transaction data signal further including said credit card identification data, signal further including said credit card identification data,

a transaction receipt printer,

said transaction information means electically coupled to said camera,

said data processing, storage and sending means receiving a nd decoding said coded transaction data signal, said data processing storage and sending means providing a financial transaction data signal absent said credit card and personal identification number data to said transaction receipt printer and said transaction information means,

said transaction information means receiving said camera inmage signal froms said camera and said financial transaction data signal via said data processing, storage and sending means,

said transaction information means combining said camera image signal and said financial transaction data signal to thereby provide a combined camera image and transaction signal,

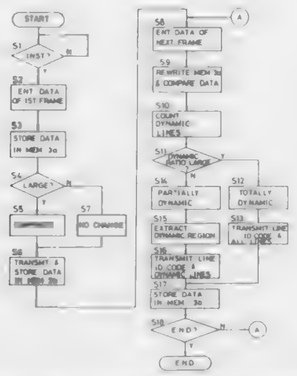
recording means electrically coupled to receive and record from said transaction information means said combined camera image and financial transaction data signal for later visual monitoring.

4,991,009

DYNAMIC IMAGE TRANSMISSION SYSTEM

Koichi Suzuki, Yokohama, and Noboru Murayama, Machida, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 7, 1989, Ser. No. 376,861
Claims priority, application Japan, Jul. 8, 1988, 63-168961; Jul. 8, 1988, 63-168962
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—135 **24 Claims**



1. A dynamic image transmission system comprising:

input means for inputting image data of an input image;

memory means for storing the image data successively input from said input means and for storing transmitting image data which is to be transmitted;

detecting means for detecting each dynamic line in which corresponding picture element data of two successive frames stored in said memory means differ by more than a predetermined data change quantity;

transmission means for transmitting the image data stored in said memory means to a transmission path as the transmitting image data; and

control means for controlling operations of said detecting means and said transmission means during an image transmission mode so that image data related to a first frame of the input image is transmitted as the transmitting image data but only the image data of each dynamic line is transmitted as the transmitting image data with respect to second and subsequent frames;

said transmission means transmitting the image data of each frame by an interlace dependent on a number of dynamic lines within the frame.

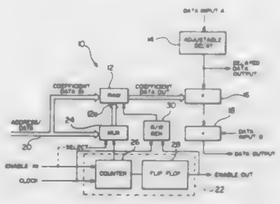
4,991,010

DUAL-MODE IMAGE INTERPOLATION FILTER OPERABLE IN A FIRST MODE FOR STORING INTERPOLATION COEFFICIENTS AND IN A SECOND MODE FOR EFFECTING TELEVISION STANDARDS CONVERSION AT A PIXEL RATE

Keith R. Hailey, Amersham Buckinghamshire, and John J. Storey, Hertfordshire, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1989, Ser. No. 435,867
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 **6 Claims**





1. An interpolation filter for transforming an input sequence of digital image signals into an output sequence of interpolated digital signals according to a computational algorithm applied in a plurality of interconnected computational stages arranged in parallel with the outputs thereof summed to form the output sequence of digital signals, the improvement wherein at least one of the computational stages comprises:

a random access coefficient memory having a input for serially storing interpolation coefficients and a high speed parallel output, both controlled by an address line;

multiplier means responsive to the output of said coefficient memory and to the input sequence of digital image signals for generating the product of a digital input signal and a stored interpolation coefficient;

address generator means for providing a sequence of loading addresses for loading a set of interpolation coefficients into said random access coefficient memory, said address generator means responding to an enable input to begin said sequence and generating an enable output at the end of said sequence;

multiplexer means for selectively routing either the sequence of loading addresses or a sequence of read addresses to the address line of said random access coefficient memory; and

means for switching said multiplexer means to provide a selected one of two modes for operating said coefficient memory, a first mode in which a set of interpolation coefficients are serially input and stored in said memory under control of the loading addresses and a second mode in which the stored coefficients are addressed under control of the read addresses and output to said multiplier means at the sequential rate by which said image signals are applied to said multiplier means, whereby in the first mode a series of interconnected computational stages are loaded in serial and in the second mode the series of interconnected computational stages are concurrently addressed such that selected interpolation coefficients are applied to consecutive digital signals.

4,991,011

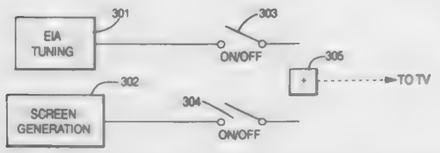
INTERACTIVE TELEVISION TERMINAL WITH PROGRAMMABLE BACKGROUND AUDIO OR VIDEO

Lee R. Johnson, Lawrenceville, and Elizabeth A. Smith, Cumming, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 289,218, Dec. 23, 1988. This application Apr. 20, 1989, Ser. No. 340,967

Int. Cl.[5] H04N *7/04, 7/10, 5/50*

U.S. Cl. 358—141 **7 Claims**



1. Apparatus for use in a television terminal for selectively providing a background video or audio signal or both for accompanying display of a screen of textual information in the foreground, the apparatus comprising

tuning means for tuning a predetermined background channel, the predetermined background channel comprising a video signal, or an audio signal, or both a video and audio signal;

teletext generating means for generating information for foreground display;

switching means coupled to the tuning means and the teletext generating means for selectively switching the output of the tuning means as a background video or audio, or both video and audio for the foreground output of the teletext generating means; and

control means, responsive to selection of a particular screen of textual information for display, for controlling the switching means and the tuning means.

4,991,012

TELEVISION RECEIVER DISPLAYING MULTIPLEX VIDEO INFORMATION ON A VERTICALLY OBLONG DISPLAY SCREEN AND AN INFORMATION DISPLAYING METHOD THEREOF

Toshihiko Yoshino, Ikeda, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

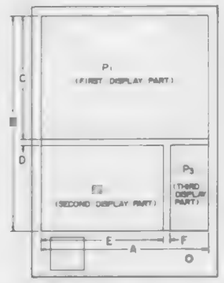
Filed Apr. 25, 1989, Ser. No. 342,890

Claims priority, application Japan, Apr. 28, 1988, 63-106360

Int. Cl.[5] H04N *5/272, 5/278*

U.S. Cl. 358—183 **4 Claims**

1. A television receiving for displaying multiplex video information on a screen, said receiver comprising means for arranging a single CRT display having an aspect ratio of approximately 4:3 in an attitude in which its display screen is vertically oblong, means for dividing the entire area of said display screen to provide a horizontally oblong display part defining a first display area having an aspect ratio of approximately 4:3, means for dividing the remaining area of said display screen to provide another area having an aspect ratio of approximately 4:3, and means for utilizing the final remaining area of said display screen to define a third display area, wherein video information is displayed on one of said first



display area and said second display area, and information related to or supplementing the video information displayed on said one of said first and second display area is displayed on the other of said first and second display area respectively.

4,991,013

PICTURE-IN-PICTURE TELEVISION APPARATUS WITH SYNC CONTROLLED MEMORY ADDRESSING

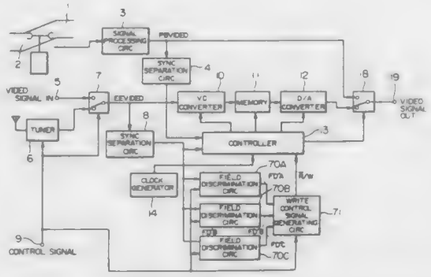
Jun Kobayashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 336,804

Claims priority, application Japan, Apr. 15, 1988, 63-91417

Int. Cl.[5] H04N *5/45*

U.S. Cl. 358—183 **6 Claims**



1. An apparatus for producing a signal for controlling storage of a plurality of video signals from different display signal sources in a memory, the order of storage of said video signals of different display signal sources being determined by a switching control signal, each of said video signals having a vertical sync signal, the apparatus comprising:

means for separating the vertical sync signal from each of said video signals, each of said vertical sync signals having pulses recurrent with a predetermined repetition period;

means for generating a reference signal having pulses recurrent with a period twice said predetermined repetition period of said vertical sync signals and assuming a relatively high level and a relatively low level alternately with a duty factor of 50%;

means connected with said sync signal separating means and with said reference signal generating means for phase comparing said separated vertical sync signals with said reference signal to determine pulses in said vertical sync signals which assume either a relatively high level when said reference signal assumes a relatively high level or a relatively low level when said reference signal assumes a relatively low level; and

means connected with said phase comparing and determining means for generating a write enable signal having pulses each rising with a different one of said determined pulses in said vertical sync signals and lasting for a duration identical with said predetermined repetition period of said vertical sync signals.

4,991,014

KEY SIGNAL PRODUCING APPARATUS FOR VIDEO PICTURE COMPOSITION

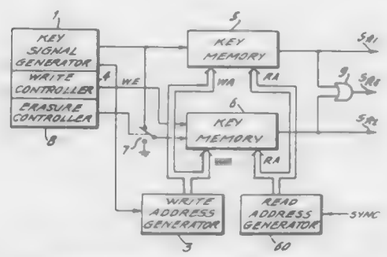
Hiroshi Takahashi, and Takayuki Iijima, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Feb. 19, 1988, Ser. No. 159,240

Claims priority, application Japan, Feb. 20, 1987, 62-37330

Int. Cl.[5] H04N *5/275*

U.S. Cl. 358—183 **12 Claims**



1. A key signal producing apparatus comprising:

key signal generating means for generating a key signal which specifies a video composition made up of a plurality of video signals;

first memory means for receiving said key signal delivered from said key signal generating means, for storing said key signal in synchronism with a speed of said key signal, and for delivering said stored key signal from said first memory means to output it as a first output key signal; and

second memory means for receiving said key signal delivered from said key signal generating means, for selectively stored said key signal in synchronism with a speed of said key signal, and for delivering said stored key signal from said second memory means to output it as a second output key signal.

4,991,015

METHOD AND CIRCUIT ARRANGEMENT FOR IDENTIFYING THE PRESENCE OR ABSENCE OF AT LEAST ONE FREQUENCY OF A KNOWN VALUE IN AN INPUT SIGNAL COMPOUND OF A PLURALITY OF FREQUENCIES

Richard Stepp, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 399,976, Aug. 29, 1989, abandoned. This application Jul. 5, 1990, Ser. No. 548,202

Claims priority, application European Pat. Off., Aug. 31, 1988, 88114224

Int. Cl.[5] H04N *5/60, 7/04;* **G01R** *23/16;* **H04B** *1/16*

U.S. Cl. 358—198 **10 Claims**

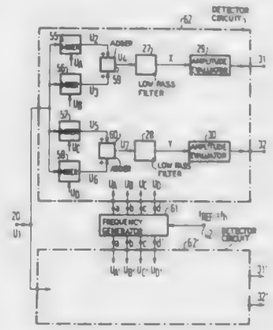
1. A method for identifying presence or absence of a frequency of interest of a known value in an input signal composed of a plurality of frequencies, comprising the steps of:

supplying the input signal to one input of each of four mixers;

deriving four switch signals from a reference frequency, said four switch signals each being of a frequency substantially identical to said frequency of interest and having a fixed phase relationship;

mixing said four switch signals with said input signal in each of said four mixers to produce mixer product signals;

adding pairs of said mixer product signals to one another to suppress undesired sideband signal components and increase signal components of said frequency of interest, said adding step producing adding output signals having basic components at 90° phase angles relative to one another;



filtering said adding output signals to substantially remove AC signal components; and

amplitude evaluating DC voltage components of signals from said filtering step to determine the presence or absence of said frequency of interest.

4,991,016

CONTROL METHOD FOR A FRAME TRANSFER SENSOR IN AN IMAGE PICK-UP DEVICE TO OBTAIN BLACK LEVEL INFORMATION IN A PICTURE SIGNAL, AND IMAGE PICK-UP DEVICE SUITABLE FOR USE OF SAID METHOD

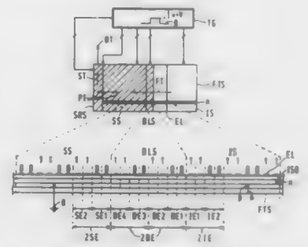
Albert J. P. Theuwissen, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Nov. 18, 1988, Ser. No. 274,089

Claims priority, application Netherlands, Nov. 27, 1987, 8702846

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.31 **4 Claims**



1. A control method for controlling a frame transfer sensor in an image pick-up device to obtain black level information in a picture signal, the sensor including an image section comprising sensor image elements arranged in rows and columns for converting incident radiation into charge packets corresponding to picture information, a sensor black level section coupled to the image section, a storage section coupled to the black level section for storing picture information, the storage section comprising sensor storage elements arranged in rows and columns, and a parallel-in, series-out shift register section coupled to the storage section and comprising at least one row of sensor shift register elements, said black level, storage and register sections being shielded from radiation, and the device for performing the control method including a time signal generator for applying clock pulse signals to control electrodes

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of the sensor so that after a picture information integration period a frame information transfer via the columns is effected from the image section to the storage section, and thereafter row after row and periodically a parallel information shift in the storage section and a parallel information transfer from the storage section to the shift register section is effected, between which parallel information transfers the shift register section each time performs a serial information shift to an output of the sensor for supplying the picture signal comprising picture information and black level information associated with the sensor elements, and the control method characterized in that:

the time signal generator applies said clock pulse signals to control electrodes of the sensor for obtaining a frame information transfer in accordance with the accordion principle, so that during the frame information transfer period information shifts are locally effected with an opening, a transporting and a closing phase, the opening phase including an enlargement of the sensor element areas in the column direction, the transporting phase including a shift in the column direction of the enlarged sensor element areas and the closing phase including a reduction in the column direction of the enlarged sensor element areas at the appointed locations,

said time signal generator applying additional clock pulse signals to control electrodes of the sensor black level section comprising sensor elements arranged in rows and columns in order to obtain a black level reference, said additional clock pulse signals occurring after the frame information transfer period and effecting a transporting phase and a closing phase in accordance with the accordion principle during a black level generation period in the said sensor section, with a shift in the black level reference occurring in the direction from the image section to the storage section.

4,991,017

RECEIVER FOR TELEVISION AND TELETEXT SIGNALS, INCLUDING A TELETEXT DECODER AND AN ADAPTIVE WAITING TIME REDUCTION CIRCUIT

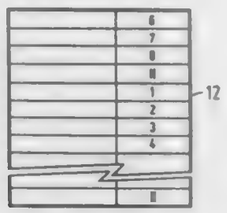
Thomas A. M. Raaijmakers, Goirle, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 3, 1990, Ser. No. 460,461

Claims priority, application Netherlands, Jan. 19, 1989, 8900121

Int. Cl.[5] H04N *7/08*

U.S. Cl. 358—147 **20 Claims**



1. A receiver for television and teletext signals, comprising:

an operating system for generating a page number of a teletext page desired by a user;

a teletext decoder having a first input for receiving the teletext signals, a second input for receiving page numbers of teletext pages, and a picture signal output, said decoder being adapted to search and store the teletext pages corresponding to the received page numbers;

a page number memory for storing at least two page numbers;

a control circuit coupled to the page number memory, the operating system and the teletext decoder and being adapted to apply the page numbers stored in the page number memory and page numbers generated by the operating system to the teletext decoder, to select for display the teletext page having the page number generated by the operating system, and to store page numbers generated by the operating system in the page number memory; and

a display screen, coupled to the picture signal output of the teletext decoder, for displaying the teletext page selected for display; said control circuit including means for assigning an order of precedence to the page numbers in the page number memory, which order of precedence is related to the sequence in which these page numbers are generated by the operating system.

4,991,018

TELETEXT DECODER WITH IMPROVED PROCESSOR WHICH DETERMINES THE BEGINNING AND END OF A TELETEXT PAGE

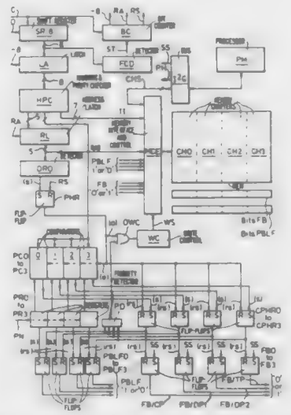
Andrew K. Davies, Purley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 104,324, Oct. 2, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 453,035

Claims priority, application United Kingdom, Oct. 3, 1986, 8623821

Int. Cl.[5] H04N *7/04*

U.S. Cl. 358—147 **16 Claims**



10. A method for identifying an end of a teletext page which is one of a plurality of different teletext pages, the method comprising the following steps:

(a) allotting a first portion of a multi-page memory to a first teletext page;

(b) selecting a first teletext page;

(c) when the first page is found, first storing a first found signal and the first teletext page in the first portion;

(d) second storing a second found signal and a second teletext page in a second portion of the multi-page memory;

(e) identifying a beginning of the second page in response to the second stored found signal; and

(f) identifying an end of the first page by changing a state of the stored first found signal in response to the second stored found signal.

4,991,019

DIGITAL VIDEO SIGNAL PROCESSING SYSTEM

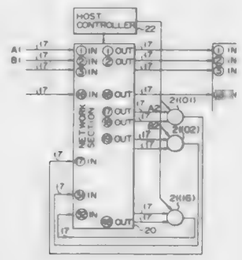
Kazumasa Enami; Nobuyuki Yagi; Ryoichi Yajima; Kiyomasa Kanai; Shigemi Mikami, all of Tokyo; Nobuyuki Sasaki, Kawasaki; Kazuhiro Harukawa, Yokohama; Kouji Hoshino, Yokohama, and Yuji Konno, Yokohama, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Feb. 9, 1989, Ser. No. 308,306

Claims priority, application Japan, Feb. 12, 1988, 63-30391; Feb. 12, 1988, 63-30392; Feb. 12, 1988, 63-30393; Mar. 4, 1988, 63-51205; Mar. 4, 1988, 63-51206; Mar. 4, 1988, 63-51207; Mar. 17, 1988, 63-61987; Mar. 17, 1988, 63-61988; Mar. 17, 1988, 63-61989; Mar. 17, 1988, 63-61990

Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—160 **12 Claims**



1. A digital video signal processing system comprising:

a plurality of programmable processor units each having a pair of inputs receiving video signals and each for processing the video signals applied to said pair of inputs in accordance with a program and outputting the result of the processing;

a network section having first inputs receiving the output signals from said plurality of programmable processor units and second inputs receiving a plurality of video signals from exterior, first outputs provided corresponding to said inputs of said plurality of programmable processor units and a plurality of second outputs for providing final output signals, said network section being capable of programmably supplying the signals received at said inputs to said plurality of programmable processor units and capable of providing any of the input signals as a final output signal; and

the types of data processings by said programmable processor units and connection patterns of said programmable processor units as set up by said network section being both altered freely.

4,991,020

IMAGING SYSTEM FOR PROVIDING SEPARATE SIMULTANEOUS REAL TIME IMAGES FROM A SINGEL IMAGE SENSOR

Robert Zwirn, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 17, 1989, Ser. No. 311,785

Int. Cl.[5] H04N *5/00, 5/33*

U.S. Cl. 358—160 **12 Claims**

1. An imaging system for providing separate simultaneous real time images from a single image sensor, said imaging system comprising:

means for providing a first set of electrical signals in response to electromagnetic energy received thereby from a scene;

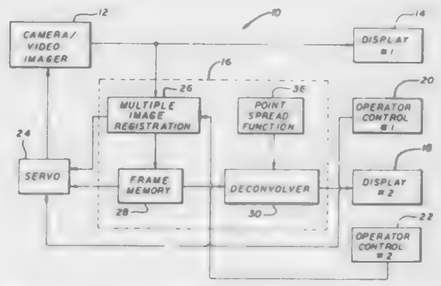
first display means directly connected electrically to said sensor for displaying a first image representative of said first set of electrical signals;

processing means for processing said first set of electrical signals to provide a second set of electrical signals and

second display means for displaying a second image representative of said second set of electrical signals.

12. A method for providing separate simultaneous real time images from a single image sensor including the steps of:

providing a first set of electrical signals in response to electromagnetic energy received thereby from a scene;



displaying in a first display, directly connected electrically to said sensor, a first image representative of said first set of electrical signals;

processing said first set of electrical signals to provide a second set of electrical signals and

displaying in a second display a second image representative of said second set of electrical signals.

4,991,021

DIGITAL VIDEO SIGNAL COMPENSATION CIRCUIT

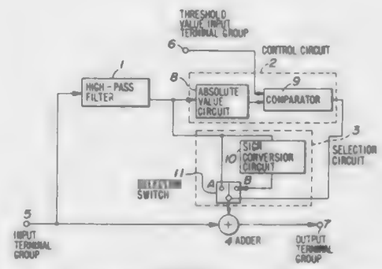
Hidemitsu Nikoh, and Munenori Kobayashi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 19, 1989, Ser. No. 367,686

Claims priority, application Japan, Jun. 22, 1988, 63-155511

Int. Cl.[5] H04N *5/208*

U.S. Cl. 358—162 **3 Claims**



1. A digital video signal compensation circuit, comprising:

a high-pass filter for passing a high frequency component of a digital video signal applied to a first input terminal;

a control circuit including an absolute value circuit and a comparator;

said absolute value circuit producing an absolute value signal of said high frequency component; and

said comparator determining whether said high frequency component is an edge component or a noise component in accordance with the comparison of said absolute value signal with a threshold signal applied to a second input terminal, thereby producing a control signal;

a sign conversion circuit for converting a sign of said high frequency component to produce a sign-converted high frequency component;

a selection switch for passing a selected one from said high frequency component and said sign-converted high frequency component dependent on said control signal; and

an adder for adding said digital video signal and said selected

one to produce an output digital video signal supplied from an output terminal to a following stage;

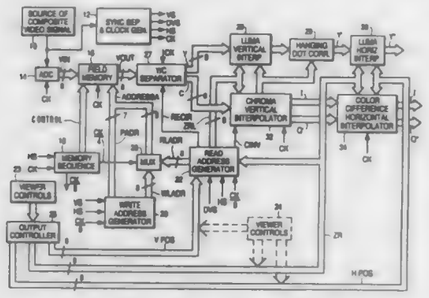
wherein an addition is carried out in said adder, where said high frequency component is said edge component, and a subtraction is carried out, where said high frequency component is said noise component, whereby an aperture compensation and a noise cancellation of said digital video signal are performed in a common circuit.

4,991,022

APPARATUS AND A METHOD FOR AUTOMATICALLY CENTERING A VIDEO ZOOM AND PAN DISPLAY

Barth A. Canfield; David L. McNeely, and David J. Duffield, all of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 20, 1989, Ser. No. 340,931
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—180 9 Claims



1. In a video signal processing system including means for producing a magnified image representing a portion of an active video part of a source image, means for selecting the portion of the source image to be magnified comprising:

first viewer control means for establishing a center point of the selected portion in at least a first coordinate direction;

second viewer control means for adjusting a magnification factor for scaling the selected portion to produce said magnified image;

means responsive to adjusted magnification factors for generating limit values; and

means, responsive to said limit values for adjusting the position of said center point to prevent display of portions as said source image outside of said active video part.

4,991,023

MICROPROCESSOR CONTROLLED UNIVERSAL VIDEO MONITOR

Gary H. Nicols, Auburn, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 22, 1989, Ser. No. 355,729
Int. Cl.[5] H04N *5/68, 5/57*
U.S. Cl. 358—242 22 Claims

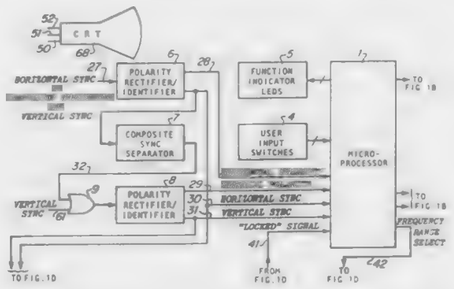
1. In a video monitor producing a video display, a device for allowing a user to adjust parameters of the video monitor, the device comprising:

switches, available to the user for manipulation;

control lines for adjusting parameters;

digital-to-analog converting means, coupled to the control lines, for placing analog voltage signals on the control lines;

processor control means, coupled to the switches and the digital-to-analog converting means, for receiving input from manipulation of the switches, and for directing the digital-to-analog converting means as to the voltage levels of the analog voltage signals placed on the control lines;



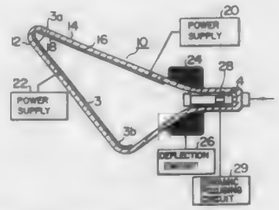
wherein the parameters include video display vertical size and video display horizontal size.

4,991,024

CRT DISPLAY DEVICE

Eiichi Yamazaki, Ichihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 558,279, Dec. 5, 1983, abandoned. This application May 12, 1986, Ser. No. 862,179
Claims priority, application Japan, Dec. 8, 1982, 57-213915
Int. Cl.[5] H04N *5/64*
U.S. Cl. 358—255 7 Claims



1. A compact CRT display device having a direct view CRT including a phosphor plane deposited on an inner surface of a bulb, an electron gun structure arranged to face said phosphor plane for emitting electron beams to said phosphor plane and deflection means for deflecting said electron beams, wherein said phosphor plane of aid bulb inclines too a vertical plane and deflection means for deflecting said electron beams, wherein said phosphor plane of aid bulb inclines to a vertical plane normal to a center axis of said electron gun structure, a side of said bulb facing said phosphor plane inclined to said phosphor plane, a transmissive window for passing a light from said phosphor plane externally of the device at said side of said bulb, and a casing for accommodating said CRT, said casing having an opening arranged in a plane facing said transmissive window and a hood extending from an end of said opening opposite to said electron gun structure at an acute angle to and over said transmissive window, such that reflection of external light beams from a position behind the hood and a substantial amount of external light reflected by said transmissive window is not seen by an observer facing the transmissive window;

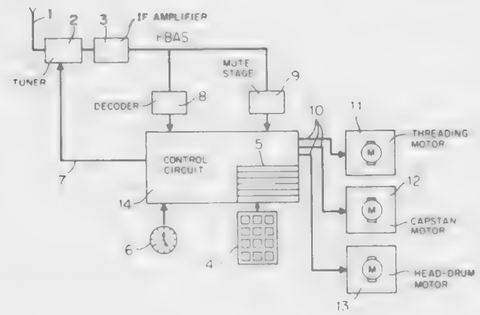
wherein a transparent electroconductive film is deposited on an inner surface of said transmissive window.

4,991,025

ARRANGEMENT FOR AUTOMATICALLY SWITCHING A VIDEORECORDER ON AND OFF IN THE ABSENCE OF A CODE SIGNAL BUT IN PRESENCE OF A FBAS SIGNAL

Norbert Eigeldinger, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, VS-Villingen, Fed. Rep. of Germany

Continuation of Ser. No. 26,550, Mar. 2, 1987, abandoned. This application May 26, 1989, Ser. No. 357,674
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524270
Int. Cl.[5] H04N *9/491*
U.S. Cl. 358—310 1 Claim



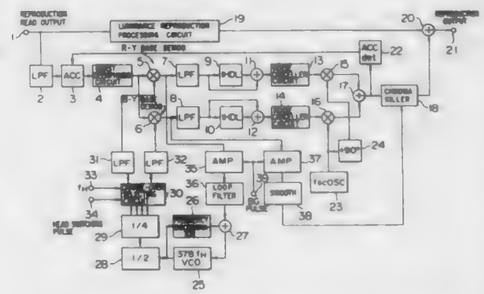
1. An arrangement for automatically switching on and off the recording system of a videorecorder having a real-time calendar clock, a memory, and a data comparator; means for entering reference data in form of the time and date corresponding to the commencement of a desired television-program as a reference value for storage in said memory; a data line source; means for receiving a cyclically simultaneously transmitted static actual value in form of an identification signal in a data line within a corresponding television signal for the duration of the program; comparing means connected to said means for receiving said transmitted static actual value and for comparing said identification signal with the stored reference data, said comparing means switching on said recording system when said identification signal coincides with said stored referenced data; means for activating reception of said actual-value identification signal and its comparison with the stored-reference data at a predetermined advanced time interval prior to the instant of real time corresponding to the stored reference time and to the stored reference date; means for testing for the presence of the data line and means for testing for the presence of a color television signal; said means for testing for the presence of the data line being connected to said data line source; means for comparing the stored reference time with the real time present in the calendar clock; said means for testing the presence of said data line activating said means for testing for the presence of a color television signal upon detecting absence of the data line; said means for testing for the presence of a color television signal activating said means for comparing the stored reference time with the real time present in the calendar clock upon detecting the presence of a color television signal and switching on the videorecorder when the stored reference time coincides with the real time present in the calendar clock; motor means for driving said videorecorder; means for measuring a predetermined time interval for switching off said motor means; and means for switching off said motor means subsequent to said predetermined interval of time in the absence of a transmitted color television signal and switching the videorecorder over to standby so that the next stored point of switch-on time can be tested for.

4,991,026

CHROMINANCE SIGNAL REPRODUCING APPARATUS FOR VIDEO TAPE RECORDER

Osamu Takase; Hikaru Masui, both of Yokohama; Shigeyuki Itoh, Katsuta, and Yoshizumi Watatani, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 13, 1988, Ser. No. 243,849
Claims priority, application Japan, Sep. 21, 1987, 62-234884
Int. Cl.[5] H04N *9/79*
U.S. Cl. 358—328 10 Claims



1. A video signal reproducing apparatus for reproducing a frequency-modulated luminance signal and a down-covered chrominance signal comprising:

carrier generating means for generating a carrier wave having a lower frequency than that of a color subcarrier of a color video signal;

multiplication means for demodulating a reproduced down-converted chrominance signal and for providing R-Y and B-Y chrominance component output signals in a baseband;

comb-shaped filter means for filtering said output signals of said multiplication means to suppress crosstalk components;

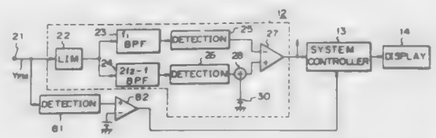
phase control means for comparing a burst level of said R-Y chrominance component signal and a reference value to control a phase of said carrier wave.

4,991,027

CIRCUIT FOR DETECTING A VIDEO MODE

Hajime Enoki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1989, Ser. No. 324,758
Claims priority, application Japan, Mar. 29, 1988, 63-075517
Int. Cl.[5] H04M *9/491*
U.S. Cl. 358—330 29 Claims



17. Video signal reproducing apparatus for recovering a luminance signal that is frequency modulated in either a first mode or a second mode, the first and second modes having different frequency bands with respectively different carrier frequencies, comprising:

playback means for playing back a composite video signal including chrominance and FM luminance signals from a record medium;

separating means coupled to said playback means for separating the composite video signal into a chrominance signal and an FM luminance signal;

chrominance processing means for receiving and processing the separated chrominance signal;

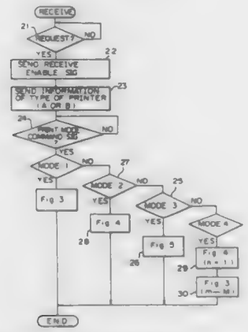
adjustable FM demodulating means for receiving and demodulating the separated FM luminance signal;
de-emphasis means coupled to said FM demodulation means for de-emphasizing the demodulated luminance signal; and
mode detecting means for detecting whether the FM luminance signal was recorded in the first or second mode, said mode detecting means comprising:
first detecting means for producing a first output signal when a particular frequency component normally provided in one of said frequency bands is detected in the FM luminance signal;
second detecting means for producing a second output signal when a different frequency component approximately equal to the difference between twice a predetermined frequency normally included in the other of said frequency bands and the particular frequency in said one frequency band is detected in the FM luminance signal;
means for supplying the FM luminance signal to said first and second detecting means;
signal sensing means coupled to said first and second detecting means and responsive to said first and second output signals for producing a mode identifying signal indicative of the mode in which the luminance signal was frequency modulated; and
means for applying said mode identifying signal to said FM demodulating means to adjust the operation thereof in accordance with the frequency band occupied by the FM luminance signal.

4,991,028

COMMUNICATION TERMINAL DEVICE

Nobuaki Kokubu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 46,158, May 5, 1987, Pat. No. 4,860,110.
This application Jun. 6, 1989, Ser. No. 362,015
Claims priority, application Japan, May 6, 1986, 61-104182
Int. Cl.[5] H04N *1/32*
U.S. Cl. 358—403 11 Claims



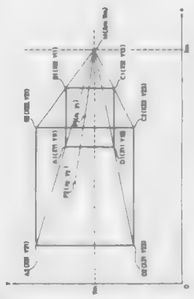
1. A sending apparatus comprising:
(a) first sending means for sending information divided into a plurality of blocks; and
(b) second sending means for sending data for designating an order of utility of the plurality of blocks of information sent through said first sending means.

4,991,029

STILL PICTURE PROCESSING METHOD AND/OR APPARATUS

Kazuo Motoki; Kazunori Yasuda; Shyunsuke Takano; Satoru Maeda; Susumu Orikasa; Munehiro Yoshikawa, all of Kanagawa; Yasushi Noguchi, Saitama; Mari Sugiura, Kanagawa; Akihiko Tao, Kanagawa, and Kosuke Yoshimura, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 403,200
Claims priority, application Japan, Sep. 7, 1988, 63-223694; Sep. 12, 1988, 63-228175; Sep. 28, 1988, 63-243343; Sep. 28, 1988, 63-243344
Int. Cl.[5] H04N *1/393*
U.S. Cl. 358—451 8 Claims



1. A method of processing original still picture data which represents an original still image and is stored in a video memory and storing processed still picture data representing the original still image after having been changed in size in a predetermined location of the video memory, the method comprising the steps of:
(a) setting an XY orthogonal coordinate system on the video memory;
(b) setting a reference line on the video memory parallel to one of the X and Y axes of the orthogonal coordinate system and passing through a point of intersection of hypothetical lines, each of which is to connect corresponding pixels of the original and changed in size still images;
(c) moving α replications of each pixel data on a line of the original still image parallel to the reference line and furthest from the reference line to addresses of the video memory forming a line of the changed in size still image, where α is a real, positive number other than zero; and
(d) repeating the preceding step for pixel data on lines of the still image parallel to the reference line and next furthest from the reference line and the succeeding lines, to thereby store the processed still picture data representing the changed in size still image in the video memory.

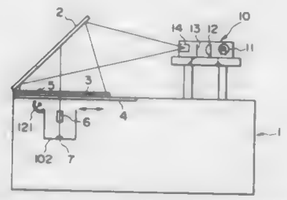
4,991,030

IMAGE READING APPARATUS CAPABLE OF READING A PROJECTED IMAGE AND HAVING MEANS FOR DIFFUSING THE PROJECTED LUMINOUS FLUX

Hiroshi Sato, Yokohama; Michitaka Setani, Kawasaki; Kazuyuki Kondo, Kawasaki; Takeshi Kuwayama, Yokohama; Tokihide Ebata, Tanashi, and Haruo Tsunoi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1987, Ser. No. 70,193
Claims priority, application Japan, Jul. 7, 1986, 61-103985[U]; Jul. 25, 1986, 61-174983; Aug. 9, 1986, 61-187436; Nov. 6, 1986, 61-264208; Nov. 17, 1986, 61-273507; Nov. 17, 1986, 61-273508
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—474 51 Claims

1. An image reading apparatus having a first operating mode wherein an original mounted on an original mounting plate is illuminated and light reflected from the illuminated original is read, and a second operating mode wherein an original not mounted on the original mounting plate is illuminated and light from the illuminated original is projected onto the original mounting plate and read, said apparatus comprising:



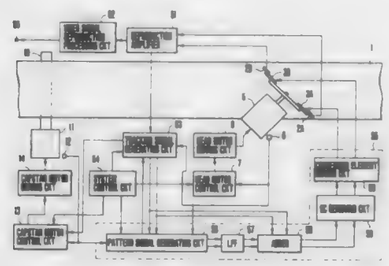
a lens array for image-forming image information light at an image reading portion of the apparatus; and
diffusion means for diffusing the light flux, the image light diffused by said diffusing means in the second mode being image-formed at the reading portion by said lens array and reading of the original is carried out.

4,991,031

ROTATING HEAD TYPE REPRODUCING APPARATUS

Nobutoshi Takayam, Kanagawa; Hiroo Edakubo; Susumu Kozuki, both of Tokyo; Masahiro Takei, and Kenichi Nagasawa, both of Kanagawa, all of Japan, assignors to Canon Kabushika Kaisha, Tokyo, Japan

Continuation of Ser. No. 699,852, Feb. 8, 1985, abandoned. This application Jan. 13, 1988, Ser. No. 145,656
Claims priority, application Japan, Feb. 10, 1984, 59-23998; Mar. 15, 1984, 59-50711; Mar. 17, 1984, 59-51754; Mar. 17, 1984, 59-51755; Mar. 21, 1984, 59-53951; Mar. 22, 1984, 59-55329
Int. Cl.[5] H04N *5/78*
U.S. Cl. 360—10.2 17 Claims



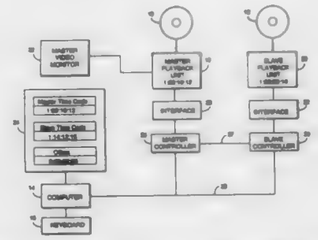
1. A rotating head type reproducing apparatus arranged to reproduce a recorded signal by tracing one after another, with rotating heads, many recording tracks formed on a record bearing medium at a given track pitch, comprising:
(a) moving means for moving the record bearing medium in a direction crossing the recording tracks;
(b) shifting means for shifting the positions of said rotating heads in a direction crossing their rotation plane;
(c) means for generating a pulse signal in response to the record bearing medium moving action of said moving means;
(d) means for generating a timing signal related to the rotation of said rotating heads;
(e) a first counter element for counting said pulse signal, the counted value of said first counter element being arranged to return to an initial data every time a predetermined number of the pulse signal is counted;
(f) tracking error signal generating means for generating a tracking error signal by detecting a positional error of said rotating heads in relation to one of said many recording tracks based on a reproduced output signal of said rotating heads;
(g) adjusting pulse generation means for generating adjusting pulses by using said timing signal;
(h) gate means for gating said adjusting pulses based on said tracking error signal to adjust the counted value of said first counter element, an output of said gate means being supplied to said first counter element;
(i) a second counter element arranged to read a data corresponding to the counted value of the first counter element at a timing related to said timing signal and to count the pulse signal; and
(j) control means which forms a control signal for controlling the shifting means by using a control value of said second counter element.

4,991,032

SYNCHRONIZATION OF RECORDINGS

Andrew Staffer, Thornhill, Canada, assignor to Soundmaster International Inc., Markham, Canada

Filed Jan. 25, 1988, Ser. No. 148,053
Int. Cl.[5] H04N *5/782*; G11B *27/10*
U.S. Cl. 360—14.3 4 Claims



1. A control system for synchronizing sequential retrieval and playback by a slave playback unit of a slave audio stored on a slave magnetic recording tape with sequential retrieval and playback by a master playback unit of a master video recording at variable relative retrieval speeds permitting one of either compression or expansion of the playback of the slave audio recording relative to the playback of the master video recording, the master playback unit generating a master time code identifying sequentially spaced-apart portions of the master recording, the slave playback unit generating a slave time code identifying sequentially spaced-apart portions of the slave recording, the control system comprising:
means permitting an operator to specify a relationship for transformation of the slave time code into a virtual slave time code in which the relationship comprises a scaling of the slave time code according to a scale factor and in which the relationship specifying means permit the operator to specify the magnitude of the scale factor:
means for transforming the slave time code into a virtual slave time code according to the specified relationship;
code comparator means for comparing the master time code with the virtual slave time code and in response generating a virtual offset representing the offset existing between the master time code and the virtual slave time code;
offset selection means for permitting an operator to select the magnitude of an offset reference to be maintained between the master time code and the virtual slave time code;
offset comparator means for comparing the virtual offset with the operator-selected offset reference and in response generating an error signal representing the difference therebetween; and,
control means for receiving said error signal and in response adjusting the rate of retrieval and playback of the slave recording by the slave playback unit such that the opera-

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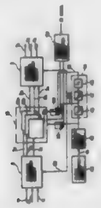
tor selected offset reference is maintained between the master time code and the virtual slave time code, thereby synchronizing sequential retrieval and playback of the slave audio recording with the master video recording at a speed related to the speed of retrieval and playback of the master video recording by said scale factor.

4,991,033

SIGNAL PROCESSING METHOD AND DEVICE FOR DIGITAL SIGNAL REPRODUCTION APPARATUS

Kazuyuki Takeshita, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,117
Claims priority, application Japan, Sep. 30, 1987, 62-243703
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—32 **21 Claims**



1. A signal processing device for use in a digital signal reproduction apparatus which reproduces digital signals in a record medium in which plural channels of digital signals are recorded thereon in plural tracks, said digital signals being reproduced by plural reproduction heads associated with said plural tracks, said signal processing device comprising:

address signal generation means for generating a write-in address signal and a read-out address signal;

memory means comprising m (where m is an integer not less than 2) memories for writing and reading, in response to said write-in address signal and said read-out address signal, digital signals which are read out in parallel from plural tracks of said record medium by said plural reproduction heads, time-divided for every associated reproduction heads, and multiplexed with a multiplexing factor of n (where n is an integer not less than 2), said memories respectively storing signals supplied from an identical reproduction head in identical addresses, each of said memories storing signals supplied from respective reproduction heads in different addresses.

4,991,034

DC RESTORATION CIRCUIT FOR RESTORING AND COMPENSATING A LOW FREQUENCY COMPONENT LOST IN A DIGITAL SIGNAL

Kenichi Sato, Ougaki, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Dec. 9, 1988, Ser. No. 281,731
Claims priority, application Japan, Dec. 11, 1987, 62-314977; Dec. 14, 1987, 62-315753; Dec. 14, 1987, 62-315754
Int. Cl.[5] G11B *5/02, 5/00, 5/09*
U.S. Cl. 360—67 **25 Claims**

1. A direct current restoration circuit compensating for a low frequency component in a digital signal, comprising:

input means for receiving a digital signal having a low frequency component cut off,

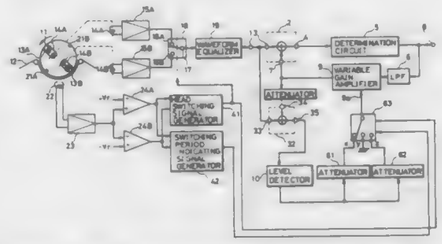
first adder means having a first input terminal receiving said digital signal received by said input means, a second input terminal and an output terminal,

second adder means having a first input terminal receiving said digital signal received by said input means, a second input terminal and an output terminal,

data determination means receiving an output from said output terminal of said first adder means for determining the digital signal,

filter means receiving an output of said data determination means for extracting a low frequency component therein,

variable gain amplifier means having a control terminal, for amplifying said extracted low frequency component according to the gain changed depending on a level of a signal applied to said control terminal,



an output of said variable gain amplifier means being applied to the second input terminal of said first adder means and the second input terminal of said second adder means, and

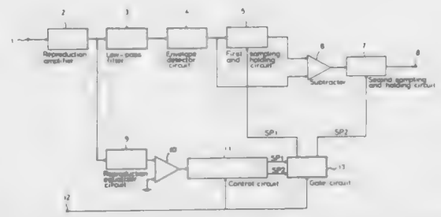
level detector means for detecting a level of a signal from the output terminal of said second adder means, to apply a signal corresponding to said level to the control terminal of said variable gain amplifier means.

4,991,035

REPRODUCING A RECORDING FROM A ROTARY HEAD TYPE TAPE RECORDER WITH TRACKING CONTROL

Tetsuya Taki, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 18, 1988, Ser. No. 273,283
Claims priority, application Japan, Nov. 20, 1987, 62-294538
Int. Cl.[5] G11B *15/467, 5/53*
U.S. Cl. 360—70.00 **5 Claims**



1. A method of reproducing a recording from a rotary head type tape recorder comprising the steps of:

helically scanning a moving magnetic tape, wound on a rotary drum at a predetermined angle, by a pair of rotary magnetic heads each having plus or minus azimuth, said rotary magnetic heads disposed on said rotary drum separated from each other by 180° at a peripheral edge of said drum;

successively generating tracks in a guard bandless manner on said magnetic tape during recording, each of said tracks having a width smaller than a gap width of each of said heads;

forming ATF areas on each of said tracks at starting and terminal ends thereof, in each of said ATF areas at least (i) a synchronizing signal as a sampling reference signal and (ii) a pilot signal as a tracking signal are recorded in a pattern repeated over a period of several tracks in which frequency and recording length of each signal vary;

sampling, at the time of reproduction, crosstalk components of said pilot signals from two tracks adjacent to a trace track, based on detecting said synchronizing signals of said trace track at the starting and terminals ends thereof;

generating a tracking control signal proportional to a difference in level between said crosstalk components;

holding said tracking control signal until a next sampling is carried out; and

controlling the tape movement based on said tracking control signal, therein to achieve tracking control of said heads, wherein when reproducing a magnetic tape which has been recorded in a long-time mode in which a tape travelling speed and a drum revolution speed are respectively set to $\frac{1}{n}$ of a standard travelling speed and $\frac{1}{n}$ of a standard revolution speed, said method further comprising the steps of

setting the tape travelling speed to $\frac{1}{n}$ of said standard travelling speed, and setting the drum revolution speed to said standard revolution speed;

setting a number of traces for every continuous two tracks of the magnetic tape to four traces;

for every said four traces, stopping said sampling at said terminal end of the second trace and stopping said sampling for the third and fourth traces; and

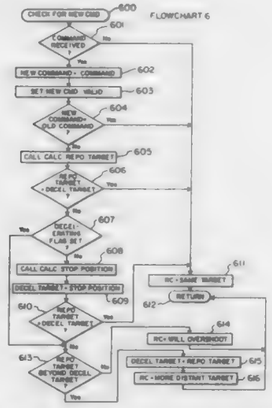
repeating three samplings at starting and terminal ends of the first trace and at a starting end of the second trace to achieve track control.

4,991,036

MOVING DATA STORAGE MEDIA MODE/DIRECTION CHANGE OPTIMIZATION

John T. O'Brien, Lafayette, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 204,080, Jun. 8, 1988, abandoned. This application Jul. 23, 1990, Ser. No. 556,765
Int. Cl.[5] G11B *15/44, 15/18*
U.S. Cl. 360—71 **28 Claims**



1. In a tape drive including a tape transport for directionally reading/writing data records on a magnetic tape, where a predefined magnetic tape repositioning operation is executed by said tape transport at the conclusion of the presently executing data record read/write operation to position said magnetic tape such that said tape transport completes its magnetic tape acceleration to perform a subsequent read/write operation at a location on said magnetic tape substantially at the end of said presently read/written data record, a magnetic tape repositioning control apparatus in said tape drive system comprising:

means for storing a tape drive control command received subsequent to the receipt of said presently executing data record read/write operation and prior to the completion of said presently executing data record read/write operation, inclusive of said predefined magnetic tape repositioning operation; and

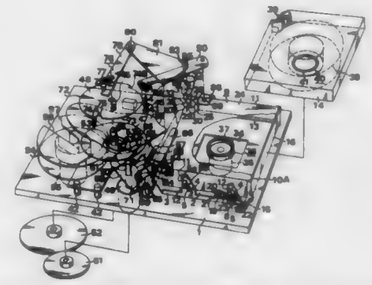
means of modifying said repositioning operation to position, in a single step, said magnetic tape for immediate execution of said subsequently received tape drive control command upon the completion of said modified repositioning operation.

4,991,037

APPARATUS FOR MANIPULATING A MAGNETIC TAPE CARTRIDGE AND THE MAGNETIC TAPE CONTAINED THEREWITHIN

Munetaka Shimizu, and Ryoichi Umezawa, both of Tokyo, Japan, assignors to Copal Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 27,616, Mar. 18, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 339,904
Claims priority, application Japan, Mar. 26, 1986, 61-67590; Mar. 28, 1986, 61-68548; Mar. 28, 1986, 61-68549; Mar. 28, 1986, 61-68550; Mar. 28, 1986, 61-68551; Mar. 28, 1986, 61-68552
Int. Cl.[5] G11B *15/67*
U.S. Cl. 360—71 **3 Claims**



1. A tape drive within an openable housing for receiving a magnetic tape cartridge having a magnetic tape therewithin, said tape having a leader block at one end of said tape, comprising:

a. a motor for providing rotary motion via an output shaft of said motor;

b. means, operative responsively to rotation of said output shaft, for

i. opening said housing for insertion of said cartridge thereinto and thereafter closing said housing responsively to further rotation of said output shaft after said cartridge has been inserted into said housing;

c. means, operative responsively to rotation of said output shaft, for moving said housing, with said cartridge therewithin, from a cartridge insertion/ejection position into a tape withdrawal/rewind position at which a reel within said cartridge is drivingly engaged by a second motor and a leader block at one end of said tape is pivotally engaged by a lever means, for selective withdrawal of said tape from said cartridge and rewind of said tape thereinto; and moving said housing and said cartridge therewithin from said tape withdrawal/rewind position to said cartridge insertion/ejection position after said tape has been rewound into said cartridge opening said housing;

d. means, operative responsively to rotation of said output shaft, for said lever means operating responsively to said output shaft rotation for pivotally engaging and thereafter moving said leader block and said tape attached thereto, when said housing and cartridge are at said tape withdrawal/rewind position, along a preselected path passing adjacent a tape read/write head to a position at which said leader block engages a take up reel for winding of said tape thereon upon rotation of said take up reel, said lever means pivotally engaging said leader block while said tape is wound onto or off of said take-up reel;

c. cam means for guiding said lever means in a manner that said leader block and said tape attached thereto move along said preselected path;

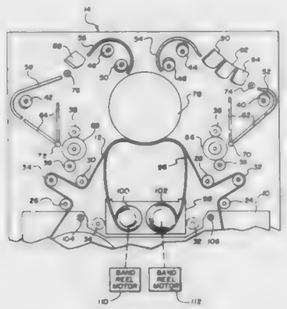
f. means, operative responsively to rotation of said output shaft in a direction opposite to said first direction, for ejecting said cartridge from said housing after said housing moving means has moved said housing and said cartridge therewithin from said tape withdrawal/rewind position to said cartridge insertion/ejection position and has opened said housing.

4,991,038

AUTOMATIC THREADING OF A WEB USING A FLEXIBLE THREADING BAND

Frederic F. Grant, Bellflower, and Vincent J. Piarulli, Simi Valley, both of Calif., assignors to Datatape Incorporated, Pasadena, Calif.

Filed Nov. 21, 1988, Ser. No. 274,900
Int. Cl.[5] G11B *15/61*
U.S. Cl. 360—85 9 Claims



4. Magnetic tape record/reproduce apparatus comprising:
a magnetic head assembly;
means for receiving a tape container having a long strip of magnetic tape which is wound on supply and takeup reels and which has a tape segment spanning said reels;
a plurality of tape transport elements arranged together with said magnetic head assembly, external to a received tape container, to transport tape from the tape container along a transport path past said magnetic head assembly and back to said container;
band means for supplying a flexible threading band which is movable into engagement with said magnetic tape; and
drive means for causing said threading band to be emitted from said band means to engage said tape segment spanning said reels of said tape container, to expand said band in the form of a loop toward said transport elements, such that the band loop conforms to the shape of the predetermined transport path when said band expands to bring the magnetic tape into operative contact with said magnetic head assembly and said transport elements.

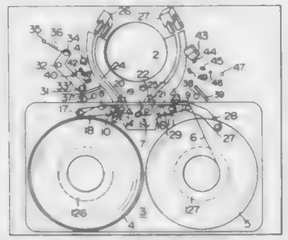
4,991,039

APPARATUS FOR DETECTING TAPE-END

Nobuyuki Kaku, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1989, Ser. No. 426,240
Claims priority, application Japan, Oct. 28, 1988, 63-270641
Int. Cl.[5] G11B *15/61, 15/02*
U.S. Cl. 360—85 8 Claims

1. An apparatus for detecting a tape-end, comprising,
a tape cassette including a magnetic tape wound on reels received in the tape cassette, and tape-ends arranged between the reels and magnetic tape respectively so that the magnetic tape is connected to the reels through the tape-ends,
a magnetic head drum on which the magnetic tape is loaded,
a tape loading device which draws out the tape from the tape cassette and which loads the magnetic tape onto a head surface of the magnetic head drum,
tape-end detectors for detecting the tape ends on tape paths between the magnetic head drum and the reels, and



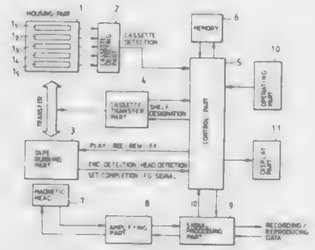
loading controlling means including a loading phase measuring instrument which measures a phase of the tape loading device during loading operation when at least one of the tape-end detectors detects the tape end, the loading controlling means generating control signals for controlling the loading operation of the tape loading device in accordance with the measured phase.

4,991,040

TAPE RECORDER WHICH DISPLAYS UNRECORDED TIME ON MAGNETIC TAPES

Nobutoshi Fukuda, and Tomoyasu Yamada, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,417
Claims priority, application Japan, Aug. 16, 1988, 63-202643; Aug. 16, 1988, 63-202644
Int. Cl.[5] G11I *15/68*
U.S. Cl. 360—92 16 Claims



1. A tape recorder which records/reproduces information on a plurality of recording tape cassettes each containing a magnetic tape therein, comprising;
a housing for housing the plurality of recording tape cassettes;
tape transducing means for recording information on or reproducing information from a selected one of the recording tape cassettes when said selected recording tape cassette is transferred from said housing to a tape running means;
transfer means for transferring said selected recording tape cassette between said housing and said tape running means;
a memory having respective memory locations for storing data corresponding to an amount of unrecorded tape remaining on each of said recording tape cassettes;

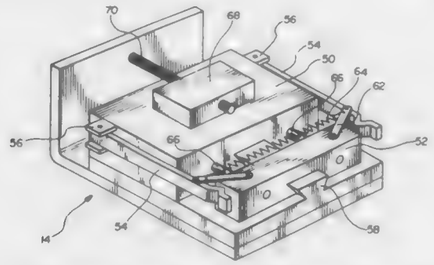
a display for displaying said stored data; and
control means for causing said display to display said stored data, said control means being operable for causing said display to display the stored data when each of the plurality of tape cassettes is housed in said housing and none of the plurality of recording tape cassettes is transferred to said tape running means.

4,991,041

APPARATUS FOR MOVING A CASSETTE BETWEEN STORAGE AND RECEIVING LOCATIONS

Frederic F. Grant, Bellflower, Calif., assignor to Datatape Incorporated, Pasedena, Calif.

Filed Jun. 2, 1989, Ser. No. 360,956
Int. Cl.[5] G11B *15/68*
U.S. Cl. 360—92 1 Claim



1. In a magnetic tape cassette system having a cassette storage location and a cassette receiving location, magnetic tape cassette handling apparatus comprising:
pushing means located adjacent to said cassette storage location for pushing a cassette;
a slide member spaced from said pushing means;
a pair of clamping members for clamping a cassette, said clamping members being pivotally mounted on said slide member and being pivotally linked to said pushing means;
means for biasing said clamping members together;
means for movably mounting said pushing means and said slide member; and
actuating means coupled to said slide member for causing said slide member and said pushing means (1) to move in a first direction wherein said pushing means moves a cassette between a storage location and said cassette receiving location, wherein said pushing means and said slide member are spaced apart and said clamping members are retracted out of clamping engagement with said cassette, and (2) to move in a second opposite direction, wherein said pushing means and said slide members are moved adjacent to one another and said clamping members are extended to clamp a cassette located at said receiving location, so as to move said cassette between said receiving location and a cassette storage location.

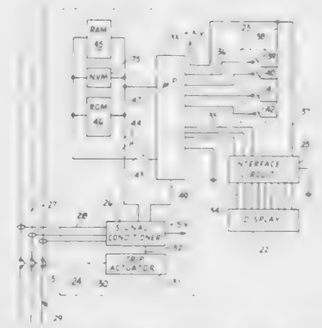
4,991,042

DIGITAL CIRCUIT INTERRUPTER WITH KEYPAD DATA ENTRY AND DISPLAY

Cheryl M. Tokarski, Cheshire, and Robert J. Danek, Andover, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 19, 1990, Ser. No. 495,666
Int. Cl.[5] H02H *3/04*
U.S. Cl. 361—93 10 Claims

1. An electronic circuit interrupter comprising:
a molded plastic interrupter case and a molded plastic interrupter cover;
a pair of separable contacts within said interrupter case arranged to automatically separate upon occurrence of an overcurrent condition through said contacts;
an electronic trip unit within said interrupter cover and arranged for electrical connection with an associated electric power distribution circuit, said electronic trip unit including a microprocessor;
a keypad and display unit within a recess formed within said interrupter cover, said keypad and display unit being connected with said trip unit to input operational setpoints to said microprocessor, said operational setpoints determining said automatic separation;



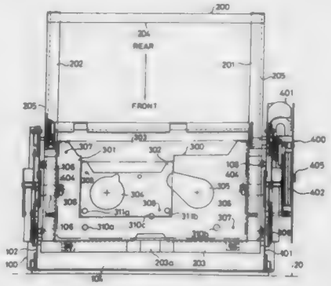
a ROM connected with said microprocessor storing operating programs for said microprocessor;
a RAM connected with said microprocessor storing said operational setpoints controlling said automatic separation of said contacts; and
an NVM connected with said microprocessor storing setpoint values, said setpoint values being displayed and augmented without effecting said automatic contact separation.

4,991,043

TAPE CASSETTE LOADING SYSTEM

Mitsuo Harumatsu, Tokyo; Hiromichi Hirayama, Yokosuka; Mitsuhiko Hara, Kawasaki, and Masato Mihara, Hiratsuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 12, 1988, Ser. No. 256,910
Claims priority, application Japan, Oct. 15, 1987, 62-260584
Int. Cl.[5] G11B *5/008, 15/00*
U.S. Cl. 360—94 14 Claims



1. A tape cassette loading system of a magnetic recording and reproducing apparatus for loading and unloading a magnetic tape contained in a tape cassette on and from a guide drum of the magnetic recording and reproducing apparatus carrying magnetic heads comprising:
cassette loading means adapted for holding a first tape cassette having a first size and further adapted for holding a second tape cassette having a second size smaller than said

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first size, said cassette loading means assuming successively a first state in which the tape cassette held on the cassette loading means is located substantially outside of a body of the magnetic recording and reproducing apparatus, a second state in which the tape cassette held on the cassette loading means is located fully inside the body of the magnetic recording and reproducing apparatus at a level substantially the same as the level of the tape cassette in said first state of the cassette loading means, a third state immediately below the second state in which the magnetic tape in the second tape cassette is ready for loading on the guide drum, and a fourth state further below said third state in which the magnetic tape in the first tape cassette is ready for loading on the guide drum of the apparatus;

first driving means driven by a motor and which is movable between first, second, third and fourth positions for driving said cassette loading means between said first state and said second state, between said second state and said third state and between said third state and said fourth state, said first position, second position, third position and fourth position of said first driving means respectively corresponding to said first state, second state, third state and fourth state of said cassette loading means;

reel drive means carrying a first reel disk for driving a supply reel of the first or second tape cassette held on the cassette loading means, a second reel disk for driving a take up reel of the first tape cassette, and a third reel disk for driving a take up reel of the second tape cassette held on the cassette loading means, said reel drive means assuming a first state in which said second reel disk is in a position for engagement with the first tape cassette held on the cassette loading means and a second state in which said third reel disk is in a position for engagement with the second tape cassette held on the cassette loading means;

second driving means driven by a motor and is movable between a first position and second position for driving said reel drive means between said first state and second state respectively corresponding with said first and second positions of said second driving means;

tape loading means disposed at a vicinity of the guide drum between the guide drum and the cassette loading means and carrying a plurality of members which are movable for drawing out the magnetic tape from the first tape cassette when said first tape cassette is held on the cassette loading means or for drawing out the magnetic tape from the second tape cassette when said second tape cassette is held on the cassette loading means, said members being movable between a first state for engagement with the magnetic tape in the first tape cassette on the cassette loading means and a second state for engagement with the magnetic tape in the second tape cassette on the cassette loading means;

third driving means driven by a motor and which is movable between a first position and a second position for driving said plurality of members between said first state and said second state respectively in correspondence with said first and second positions of the third driving means;

first detection means for detecting the placement of the tape cassette on the cassette loading means and for producing an output signal indicating the type of the tape cassette placed thereon indicating whether the tape cassette is the first tape cassette or the second tape cassette;

second detection means for producing an output signal indicating the state of the cassette loading means by detecting the position of the first driving means;

third detection means for producing an output signal indicating the state of the reel drive means by detecting the position of the second driving means;

fourth detection means for producing an output signal indicating the state of the tape loading means by detecting the position the third driving means; and

a controller electrically connected to an operation key of the magnetic recording and reproducing apparatus to be operated by a user for receiving a command from the user, said controller being further connected to said first, second, third and fourth detection means for receiving the output signals from the first, second, third and fourth detection means and discriminating the type of the tape cassette on the cassette loading means and the state of the cassette loading means, reel drive means and the tape loading means on the basis of said output signals, said controller further connected to the motors of said cassette loading means, reel drive means and tape loading means for controlling the energization of the motors responsive to the output signals from the first, second, third and fourth detection means so that the state of the cassette loading means is changed from said first state to said fourth state successively passing through said second and third states, that the state of the reel drive means is set to said first state of the reel drive means, and that the state of the tape loading means is set to said first state of the tape loading means responsive to the command by the user commanding the loading of the tape cassette when it is discriminated in said first detection means that the first tape cassette is placed on the cassette loading means, said controller further controlling the energization of the motors of said first, second and third driving means on the basis of the output signals from said first, second, third and fourth detection means so that the state of the cassette loading means is changed from said first state to said third state after passing through said second state, that the reel drive means is set to said second state of the reel drive means, and that the tape loading means is set to said second state of the tape loading means responsive to the command by the user commanding the loading of the tape cassette when it is discriminated that the second tape cassette is placed on the cassette loading means on the basis of the output signal from said first detection means, said controller further controlling the energization of the motors of said first, second and third driving means on the basis of the output signals from said first, second, third and fourth detection means so that the state of the cassette loading means is changed to said first state from said fourth state successively passing through said third and second states responsive to the command by the user commanding the unloading of the tape cassette when the cassette loading means is in the fourth state, and that the state of the cassette loading means is changed to said first state from said third state after passing through said second state responsive to the command by the user commanding the unloading of the tape cassette when the cassette loading means is in the third state.

4,991,044

DISK DRIVE ASSEMBLY WITH AN AUTO-EJECTOR DRIVEN BY THE ASSEMBLY MOTORS

Kaoru Yanamoto; Toshiro Ohta, both of Kanagawa; Hideaki Hotta, Tokyo, and Akira Kadonaga, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,567

Claims priority, application Japan, Sep. 5, 1987, 62-222561; Feb. 3, 1988, 63-023058

Int. Cl.[5] G11B *17/04, 5/016*

U.S. Cl. 360—99.07 4 Claims

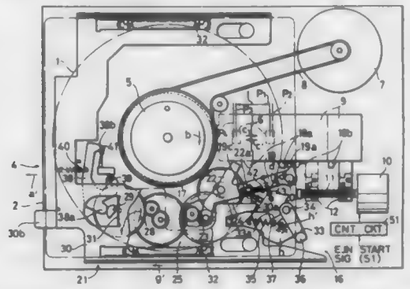
1. An auto-ejector for ejecting a disk-like recording medium from a disk recording and/or reproducing apparatus, which has a disk driving motor for driving a turntable on which the disk-like recording medium is mounted; a head driving motor for driving a carrier, whereby record/playback heads are carried substantially in the radius direction of the disk-like recording medium mounted on the turntable; and ejection means for ejecting the disk-like recording medium from the apparatus,

the auto-ejector comprising:

control means for controlling the head driving motor and causing it to start at an ejection signal to displace the heads beyond a record/playback range thereof;

transmission means for selectively transmitting the power of the disk driving motor to the ejection means to eject the disk-like recording medium from the apparatus; and

trigger means operatively connected to control the transmission means and actuated by the carrier when the heads are displaced beyond the record/playback range thereof to thereafter cause the transmission means to transmit the power of the disk driving motor to the ejection means.



4,991,045

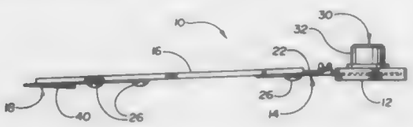
SUSPENSION ASSEMBLY

Gary R. Oberg, Darwin, Minn., assignor to Hutchinson Technology, Inc., Hutchinson, Minn.

Filed Dec. 21, 1987, Ser. No. 135,936

Int. Cl.[5] G11B *5/49, 21/16*

U.S. Cl. 360—104 19 Claims



1. A suspension arm assembly comprising:

(a) a base plate member constructed of a non-metallic composite plastic material;

(b) a spring element joined to said base plate, said spring element being substantially resilient adjacent to said base plate;

(c) a load beam element constructed of a non-metallic composite plastic material, said load beam element being joined at one end to said spring element and having a free end spaced from said one end, said load beam element being substantially rigid along its length to present a loading force at said free end; and

(d) a flexure member fastened to said free end of said load beam element, said fixture including a load protuberance which contacts said load beam.

4,991,046

SELF ALIGNED LAPPING GUIDE FOR INDUCTIVE RECORD HEADS

Steven J. Adamson, Poway, and Harry S. Edelman, La Jolla, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1989, Ser. No. 353,305

Int. Cl.[5] G11B *5/187, 5/127*

U.S. Cl. 360—122 10 Claims

1. In a thin-film inductive magnetic head structure of the type that comprises

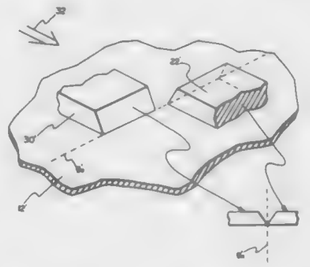
A. a substrate

B. first and second layers on said substrate and forming first and second poles spaced apart to define a transducer gap therebetween, and

C. first non-magnetic layer means that supports the first of said magnetic pole layers, said non-magnetic layer means being inclined toward, and in the vicinity of, said transducer gap, the improvement of a complementary structure to the side of said head structure, said complementary structure comprising

a. a layer of electrically conductive material and

b. second non-magnetic, non-electrically conducting, layer means disposed over said layer of electrically conductive material, said second non-magnetic, non-electrically conducting layer means being so inclined



toward said transducer gap that it, when projected, forms with a projection of the incline of said first non-magnetic layer means, a V-like groove, the apex of which coincides with a gap depth defining edge of said layer of electrically conductive material, whereby as said complementary structure is worn away, as by lapping or wear, the conductivity of said layer of conductive material correspondes as an accurate analog of the depth of said gap.

4,991,047

TAPE GUIDES AND METHOD OF MANUFACTURING THE SAME

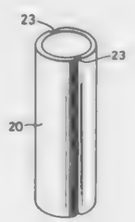
Haruo Shiba, Komoro; Masatoshi Okamura; Takashi Namioka, both of Saku, and Takayuki Kohama, Yokohama, all of Japan, assignors to TDK Corporation, Tokyo and Sanshin Kogyo Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Nov. 8, 1988, Ser. No. 268,418

Claims priority, application Japan, Nov. 9, 1987, 62-280986; Sep. 2, 1988, 63-218394

Int. Cl.[5] G11B *15/60*

U.S. Cl. 360—130.21 11 Claims



1. A tape guide for a magnetic tape cassette which comprises one half of a thin-walled cylindrical metal tube divided along a plane including the longitudinal axis of the tube, and a support post around which said half is fitted securely.

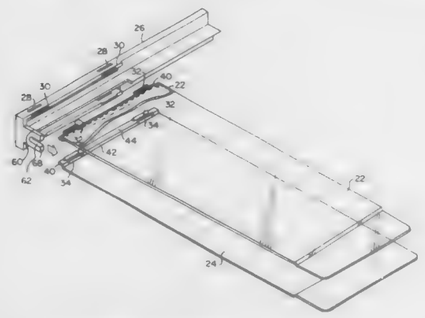
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4,991,048

DISC CARTRIDGE CASING WITH SHUTTER SLIDABLY FITTED THEREIN TO UNCOVER A PICK-INSERTING HOLE

Masaru Ikebe, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Oct. 13, 1988, Ser. No. 257,431
Claims priority, application Japan, Oct. 15, 1987, 62-156644[U]; Oct. 15, 1987, 62-156646[U]
Int. Cl.[5] G11B *23/03*
U.S. Cl. 360—133 **12 Claims**



1. A disc cartridge comprising:
- a casing comprising an upper casing member and a lower casing member joined together to define a space therein, said casing having at least one pickup inserting hole;
- a disc mounted in said casing so as to be rotatable therein; and
- a shutter having a substantially U-shape and comprising upper and lower shutter plates and a slider for connecting said upper and lower shutter plates to each other, said shutter being slidably fitted on said casing for covering and uncovering said pickup inserting hole;
- each of said shutter plates having a section thereof connected to said slider, said connected section being stepped such that it includes a downwardly extending vertical portion and a horizontal portion outwardly extending from a lower end of said vertical portion;
- said slider having respective sections connected to each of said shutter plates, said respective connected sections of said slider each having an inner surface and an end surface and having at least one hole and at least one projection for engagement with said stepped connected portion of each of said shutter plates;
- said stepped connected section of each of said shutter plates having at least one projection and at least one hole respectively engaged with said hole and projection of said slider; and wherein
- connection between said slider and each of said shutter plates can be carried out through engagements between respective said holes and projections of said slider and shutter plate by abutting said inner surface and said end surface of said slider respectively against said horizontal portion and vertical portion of said stepped connected section of said shutter plate.

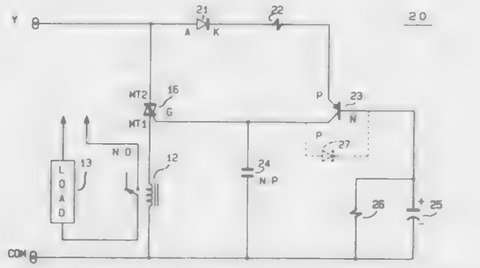
4,991,049

ANTI-SHORT-CYCLE CIRCUIT

Andrew S. Kadah, 5000 Henneberry Rd., Manlius, N.Y. 13104

Filed Oct. 12, 1989, Ser. No. 420,310
Int. Cl.[5] H02H *11/00*
U.S. Cl. 361—28 **15 Claims**

1. Protective circuit for delaying energization of a load when a voltage is applied until a predetermined time period has elapsed following a previous de-energization, comprising
- a triac having a first power electrode connected to a first ac conductor, a second power electrode connected to a load device which is in turn connected to a second ac conductor, and a gate electrode;
- a transistor having a base, electrode, an emitter electrode coupled to said first ac conductor, and a collector electrode connected to the gate of said triac;



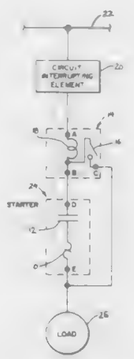
- a latching capacitor connected between the gate of said triac and said second ac conductor; and
- a capacitor timing circuit coupled between the base of said transistor and said second ac conductor.

4,991,050

METHOD AND DEVICE FOR PROTECTING STARTERS FROM FAULT CURRENTS

Gustave E. Heberlein, Jr., Delafield, and Terrance D. Nelson, Cudahy, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 18, 1989, Ser. No. 408,900
Int. Cl.[5] H02H *9/02*
U.S. Cl. 361—57 **4 Claims**



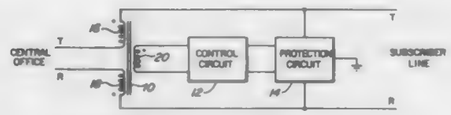
4. In a series circuit including fault current intolerant elements and a first circuit interrupting means activated by a current above a predetermined level, the improvement which comprises:
- a current sensing means for detecting current flow through the fault current intolerant elements;
- a protective shunting switch means connected in parallel with the fault current intolerant elements and in series with the first circuit interrupting means and being responsive to the current sensing means for conducting current around said fault current intolerant elements prior to the current through the fault current intolerant elements rising above the predetermined level; and
- a second circuit interrupting means connected in series with both the first circuit interrupting means and the protective shunting switch means for interrupting the current when the current through the second circuit interrupting means rises above the predetermined level.

4,991,051

PROTECTION ARRANGEMENTS FOR COMMUNICATIONS LINES

Francis Y. Hung, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 12, 1986, Ser. No. 906,466
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—57 **41 Claims**



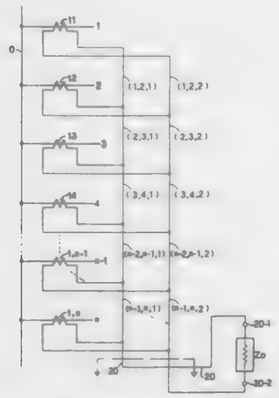
1. A protection arrangement comprising:
- a transformer having two similar primary windings and a secondary winding, said primary windings having corresponding ends with respect to which currents flowing in the same direction in the two primary windings induce current in the secondary winding and equal currents flowing in opposite directions in the two primary windings substantially do not induce current in the secondary winding;
- protection means connected between said corresponding ends to the two primary windings; and
- control means responsive to induced current in the secondary winding of the transformer for triggering the protection means to provide a short circuit in the presence of excessive currents flowing in the same direction in the two primary windings;
- the protection means being arranged automatically to terminate said short circuit in response to termination of said excessive currents.

4,991,052

DIFFERENTIAL PROTECTIVE RELAY APPARATUS

Makoto Terada, Tokyo, and Yosuke Tsujikura, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,109
Claims priority, application Japan, Jan. 18, 1989, 64-7714
Int. Cl.[5] H02H *2/08*
U.S. Cl. 361—65 **7 Claims**



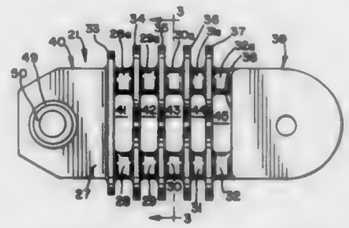
1. A differential protective relaying apparatus comprising:
- a plurality of lines connected to a bus bar;
- a current transformer provided in each of said lines;
- a differential circuit connecting each of secondary windings of the respective current transformers in parallel;
- a first switching over circuit for changing an impedance of said differential circuit from a first value into a second value depending upon a terminal voltage of the differential circuit;
- a second switching over circuit for changing said impedance from said second value into a third value depending upon the terminal voltage of said impedance;
- a plurality of voltage detecting elements for detecting said terminal voltage of said differential circuit and said terminal voltages of said impedance; and,
- an interlock circuit for tripping a circuit breaker which is constituted by a judgment logic sequence connection of contacts that are switched by the output of said voltage detecting elements respectively.

4,991,053

SURGE ARRESTER WITH DRAINING INSULATIVE BRACKET

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Corporation, Chicago, Ill.

Filed Jul. 24, 1989, Ser. No. 384,276
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—117 **5 Claims**



4. In combination with a surge arrester for protecting a high voltage electrical power system comprising a polymeric weathershed housing having a bore, said housing being adapted to be mounted in a generally vertical orientation, and an arrester element disposed within said bore, an elongated insulative bracket having an elongated axis extending between first and second end portions and a midportion having first and second spaced apart support means for interconnecting said first and second end portions, said first end portion of said insulative bracket being attached to said arrester element such that said elongated axis of said bracket extends in a generally horizontal orientation and said midportion of said insulative bracket including draining means for draining liquid through said midportion, said draining means being disposed between said first and second support means and extending through said midportion transversely to said longitudinal axis of said bracket.

4,991,054

TIME-DELAY OUTDOOR LIGHTING CONTROL SYSTEMS

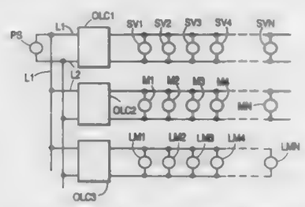
Jeff Walters, Marshfield, Mass., assignor to Pacific Scientific Company, Weymouth, Mass.

Filed May 13, 1988, Ser. No. 194,418
Int. Cl.[5] H01H *47/26*
U.S. Cl. 361—165 **34 Claims**

1. A control, comprising:
- a switch for use in an electric line;
- operating means for operating said switch and responsive to

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ambient light in a first light range at a slower rate than to ambient light in a second light range dimmer then the first



light range and ambient light in a third light range brighter than the first light range.

4,991,055

METHOD FOR MANUFACTURING MULTILAYER CERAMIC CAPCITORS

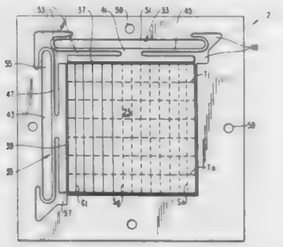
Antonius G. Marneffe, Geldrop; Frederik G. A. Persoon, and Gerard J. Scholten, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 145,681, Jan. 14, 1988, Pat. No. 4,849,855, which is a continuation of Ser. No. 770,374, Aug. 29, 1985, abandoned, which is a division of Ser. No. 646,679, Sep. 4, 1984, Pat. No. 4,562,628. This application Apr. 6, 1989, Ser. No. 334,742

Claims priority, application Netherlands, Apr. 25, 1984, 8401320

Int. Cl.[5] H01G *4/10, 7/00*

U.S. Cl. 361—321 4 Claims



1. A device for carrying out a method of manufacturing multilayer ceramic capacitors, in which electrode layers of electrode material are locally applied to sheets of dielectric ceramic material, the sheets provided with electrode layers are stacked and compressed to form a laminated plate and this plate is then subdivided into separate capacitor elements in such a manner that successive electrode layers are exposed to opposite end faces of the capacitor elements, after which the capacitor elements are sintered and are provided with an electrically conducting layer on the said end faces, characterized in that the plate is subdivided into separate capacitor elements by notching the plate along division lines on both sides simultaneously in such a manner that along the notched division lines a spontaneous rupture occurs through the remaining thickness of the plate, characterized by an upper die and a lower die which can be displaced relative to each other and each comprise two notching blocks and a notching member, which device is further characterized by a carriage which can be displaced between the two dies and serves as a carrier for a frame which has a central quadrangular opening of which two adjacent walls at right angles to each other are of resilient construction.

4,991,056

CASE FOR ELECTRONIC UNITS

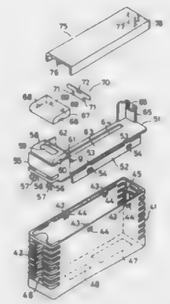
Norio Shimizu; Yuichi Watanabe, and Hitoshi Manta, all of Tokyo, Japan, assignors to Koyo Electronics Industries Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,878

Claims priority, application Japan, Sep. 29, 1988, 63-126217[U]; Sep. 29, 1988, 63-126218[U]; Oct. 31, 1988, 63-141212[U]

Int. Cl.[5] H02B *1/08;* H05K *7/00*

U.S. Cl. 361—380 3 Claims



1. A case for electronic units comprising:
a box-type case proper including an opening formed at a front thereof, and a plurality of engaging holes formed in both side walls and at least one of the vertical walls thereof in the vicinity of said opening;
a panel including an indicator section portion formed on one side of an upper surface thereof, a locking portion formed on the other side of said upper surface, and a terminal board mounting portion formed between said indicator section and said locking portion, a plurality of lock pieces formed on a lower part of said indicator section to depend therefrom, and a plurality of projections formed on each of two lower sides of said terminal board mounting portion for engagement with corresponding ones of said engaging holes of said case proper;
an indicator section cover for covering a part of said indicator section of said panel; and
a cover including a projecting piece formed at one end thereof so as to be fitted into a hole formed in said indicator section of said panel or said indicator section cover, and a locking member formed on a lower side of the other side thereof so as to be locked in said locking portion of said panel.

4,991,057

HOUSING FOR RECEIVING ELECTRIC ASSEMBLIES

Peter Kriegisch, Leonberg, and Wolfgang Pickel, Stuttgart, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 272,492, Nov. 16, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 535,288

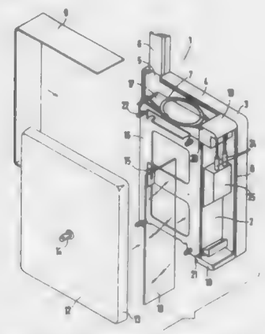
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738896

Int. Cl.[5] H05K *7/16*

U.S. Cl. 361—391 8 Claims

1. Extensible modular housing for at least two communication network termination units, said housing comprising
a vertical base plate which forms a first side of the housing,
at least two chassis modules into each of which at least one termination unit may be plugged,
first holding means for connecting a first said chassis module to said base plate,

auxiliary holding means for connecting a second said chassis module to the first chassis module,
sidewall means for covering the top, rear, bottom and front of said first and second chassis modules, the lateral extent of said sidewall means being dependent on the width and number of said chassis modules within said housing,
a cover plate which forms a second side of the housing,
locking means for locking the cover plate to the second chassis module, and



retaining means for securely retaining the sidewall means between the cover plate and the base plate when the cover plate is locked to the second chassis module,
whereby the interior space of the housing may be protected against unauthorized access and
whereby the thus-protected interior space may be increased by adding one or more additional said chassis modules between said first and second chassis modules and increasing the lateral extent of said sidewall means.

4,991,058

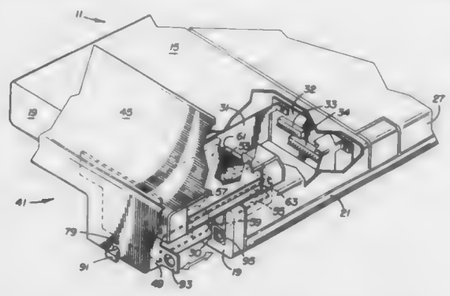
CARD HOUSING ATTACHMENT FOR A PORTABLE COMPUTER

Lee A. Watkins, San Jose; Scott K. Smader, Cupertino, and Harold S. Long, Santa Clara, all of Calif., assignors to Grid Systems Corporation, Fremont, Calif.

Filed Nov. 9, 1989, Ser. No. 434,807

Int. Cl.[5] H05K *7/16*

U.S. Cl. 361—391 8 Claims



1. A card housing attachment attached to a portable computer of the kind having an outer protective case comprising a top side and a back side, a bus within the case, a battery tray compartment having an opening in a back side of said case and connectors at the inner end of said battery tray compartment for connecting auxiliary devices to said bus of said portable computer, said card housing attachment comprising,
card housing means for enclosing and mounting a selected add-on card adapted to be received within said card housing means and in a location on said top side of said case and near to said back side of said case,
battery compartment slide-in means which are constructed to slide into and out of said battery tray compartment opening and to interfit closely with the interior wall structure of said battery tray compartment,
spacing and support means for holding said card housing means and said battery compartment slide-in means in a fixed spaced apart relation so that the underside of said card housing means will slide across and then be disposed above said top side of said case as said battery compartment slide-in means are progressively inserted into said battery compartment opening, and
interconnect means for connecting an add-on card adapted to be received within said card housing means in operative association with said bus of said portable computer.

4,991,059

ELECTRIC COMPONENT

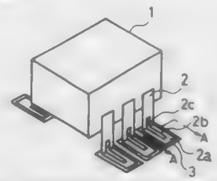
Tomohito Kiyose, Kanagawa, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,597

Claims priority, application Japan, Sep. 22, 1987, 62-145070[U]

Int. Cl.[5] H01L *23/50*

U.S. Cl. 361—405 5 Claims



1. An electric component to be mounted on a surface of a printed circuit board, which comprises:
a component body;
at least a pair of leads extending outwardly downwardly and then laterally at a bent portion from opposite sides of said component body to form a lateral bonding portion; and
means extending on said bonding portion up to and including at least said bent portion for receiving molten solder to provide more surfaces to which said molten solder is able to adhere, thus providing reliable soldering.

4,991,060

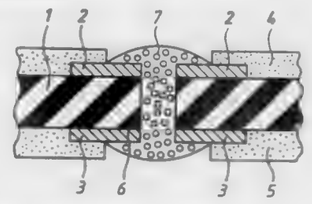
PRINTED CIRCUIT BOARD HAVING CONDUCTORS INTERCONNECTED BY FOAMED ELECTROCONDUCTIVE PASTE

Shin Kawakami; Satoshi Haruyama, and Hirotaka Okonogi, all of Saitama, Japan, assignors to Nippon CMK Corporation, Japan

Filed Nov. 24, 1989, Ser. No. 441,078

Int. Cl.[5] H05K *1/18*

U.S. Cl. 361—410 4 Claims



1. A printed circuit board comprising:
an insulating substrate having a pair of opposed major surfaces and a through-hole extending therethrough from one major surface to the other major surface;
a first conductor disposed on one major surface of the substrate in the region of the through-hole;

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a second conductor disposed on the other major surface of the substrate in the region of the through-hole; and

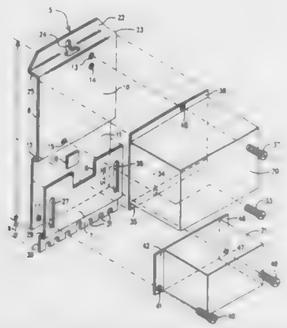
a foamed electroconductive paste disposed in the through-hole and extending outwardly thereof and overlying portions of the first and second conductors in the region of the through-hole, the foamed electroconductive paste electrically interconnecting the first and second conductors and being effective to absorb external shocks applied to the substrate.

4,991,061

ADJUSTABLE STARTER BASEPLATE ASSEMBLY

Casey J. Strange, Muncie, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 22, 1989, Ser. No. 411,062
Int. Cl.[5] H05K *5/00*
U.S. Cl. 361—417 **12 Claims**



1. An adjustable baseplate assembly for mounting electrical components provided with mounting holes in one of any number of housing enclosures having mounting openings arranged in different patterns, said baseplate assembly comprising,

a generally rectangular support plate member having a first mounting surface on a face thereof adjacent one end of the support plate member and a second mounting surface on the face thereof adjacent the other end of the support plate member, said support plate member having a first set of threaded holes placed at predetermined locations on the first mounting surface thereof said first set of threaded holes being arranged in a pattern aligned with at least two of the mounting holes of a first electrical component, said support plate member also having a first set of mating (openings placed at predetermined locations on the second mounting surface thereof and arranged in a pattern which aligns with at least two of the mounting holes of a second electrical component, said support plate member further having at least one mounting opening adjacent said one end thereof;

a generally rectangular adjustable extension plate member having a mounting surface on a face adjacent one end thereof which engages said support plate member, and a free end opposite the one end, said free end having at least one mounting opening therein, said mounting surface having a second set of mating openings arranged in a pattern which aligns with at least two mounting holes in the second electrical component, said other end of said support plate member and said one end of the extension plate member overlapping one another with one member between the other electrical component and the other member, said mating openings of said one member providing adjustment of overlap of the extension plate member relative to the support plate member to align said at least one mounting opening in each of the support plate member and the extension plate member with mounting openings in a selected one of said housing enclosures, the mating openings of the other of said members being a second set of threaded holes;

first fastening means securing said first electrical component to said baseplate assembly through the mounting holes of said first electrical component to at least two of the threaded holes of the first set of threaded holes in said support plate member,

second fastening means securing said second electrical component to said baseplate assembly and securing the extension plate member to the support plate member with at least one mounting opening in said support plate member and said at least one mounting opening in the extension plate member aligned with mounting openings in said selected housing enclosure, said second fastening means extending through the mounting holes in the second electrical component, the mating openings in said one member and into at least two of the threaded holes in said second set of threaded holes in the other member; and

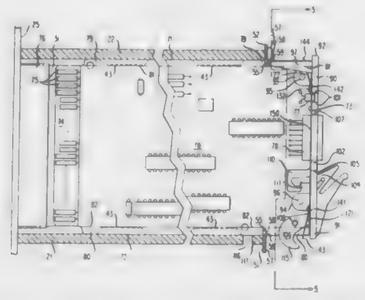
a third set of fasteners securing said baseplate assembly to said selected housing enclosure extending through said at least one mounting opening in said support plate member and said at least one mounting opening in said extension plate member and into mounting openings in the selected housing enclosure with which at least one mounting opening in each of the support plate member and the extension plate member are aligned.

4,991,062

EMI REDUCING CIRCUIT CARD APPARATUS

Kinhquoc Nguyenngoc, Montclair, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 16, 1989, Ser. No. 352,795
Int. Cl.[5] H05K *9/00*
U.S. Cl. 361—424 **8 Claims**



8. Circuit card apparatus adapted to reduce electromagnetic interference ("EMI") comprising:

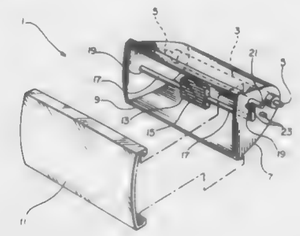
housing means enclosing a circuit card storage bay bounded at its rear by a backplane and at its top and bottom by upper and lower shelves and open at the front to access from the exterior of such means by way of a front opening provided by such means and extending vertically between said shelves and horizontally between side margins for such opening spaced from each by greater than the spacing between such shelves, electroconductive means providing a grounded closed-loop, electromagnetic wave energy path peripherally surrounding said opening, said means including electroconductive regions providing parts of said path which are disposed laterally opposite each other on the front of such upper and lower shelves, respectively, to border said opening, and which have outwardly facing metallized contact surfaces, an array of vertically oriented plug-in circuit cards inserted into said space from the front thereof to be removably held in said space in horizontally spaced side-to-side relation, each of said circuit cards comprising a vertical insulative board extending longitudinally inwards from the front of said space towards the rear thereof, electronic circuitry distributed over said board, and a vertical insulative faceplate having front and back sides and fastened to said board at its front such that the back side of such plate is longitudinally outwards of said contact surfaces, said board and said faceplate fastened thereto together forming a board-faceplate assembly, and at least one of said circuit cards further comprising electroconductive shunt means borne by said board-faceplate assembly at the front thereof to be disposed rearward of the back side of the faceplate of such card, said shunt means having vertically spaced contact surfaces in engagement with said contact surfaces of said regions, and said shunt means providing by virtue of such engagement a low-resistance shunt between said regions.

4,991,063

PHOTOGRAPHIC FLASH APPARATUS

Jeffrey R. Stoneham, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 18, 1990, Ser. No. 539,491
Int. Cl.[5] F21Y *13/04*
U.S. Cl. 362—18 **11 Claims**



1. An improved photographic flash apparatus wherein a flash tube produces a brilliant flash of light, a reflector concentrates the light produced by said flash tube into a beam having a particular angle of coverage and redirects the light toward a subject to be illuminated, and an optical element is positioned crosswise of the beam to change the angle of coverage of the beam from that effected by said reflector, and wherein the improvement comprises:

means for supporting said optical element for movement only within the beam, but out of its position crosswise of the beam to permit said reflector to restore the beam substantially to the angle of coverage effected by the reflector.

4,991,064

SILHOUETTE LIGHTPIPE ILLUMINATION FOR VEHICLE INSTRUMENTATION

James M. Clem, Macy, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 5, 1989, Ser. No. 446,248
Int. Cl.[5] G01D *11/28*
U.S. Cl. 362—27 **6 Claims**

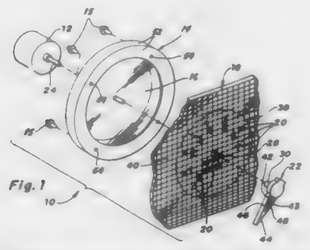


Fig. 1

1. Motor vehicle instrument panel display apparatus adapted to be viewed by a vehicle occupant during both high and low ambient lighting conditions, comprising:

instrument panel mounted film means including a translucent display region and bright opaque graphic symbols formed on a surface of said display region which faces toward the viewing occupant so that in high ambient lighting conditions, the occupant perceives the bright opaque graphic symbols against the translucent display region; and

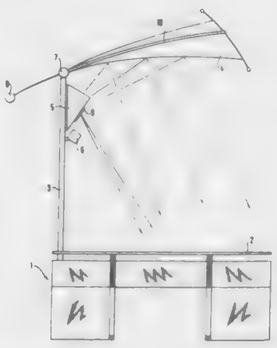
lightpipe means defined by an internally transparent element having an opaque reflective coating over at least a portion thereof, and light source means adapted to internally illuminate said element for emitting diffuse light from a central region thereof onto the surface of the film means which faces away from the occupant, at least in the vicinity of said . translucent display region, so that when said light source is illuminated during low ambient lighting conditions, the occupant perceives the graphic symbols in silhouette against the lighted translucent display region of said film means.

4,991,065

LIGHTING SYSTEM

Hartmut S. Engel, Schloss Heutingsheim, 7141 Freiberg am Neckar, Fed. Rep. of Germany

Filed Jun. 21, 1989, Ser. No. 369,106
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820926
Int. Cl.[5] F21V *13/00*
U.S. Cl. 362—33 **17 Claims**



1. An illuminating system, in particular for the uniform illumination of restricted working surfaces, including at least one light source and at least one reflector associated with the at least one light source, comprising:

a table having a working surface;

the reflector being formed as a large area reflector, said reflector at least partially spanning said working surface, said large area reflector including a frame covered with a reflecting material under tension;

a vertical carrier upon which said large area reflector is held, and upon which said table is secured to;

the at least one light source which radiates towards the large area reflector is mounted on said vertical carrier in the region between the working surface of said table and the large area reflector;

said large area reflector being formed as a triangular sail;

and one end of said sail having a bar and a tensioning member extending from the bar to an apex of said sail remote from the bar to mount said sail adjacent its apex on said vertical support.

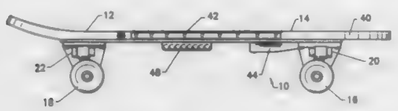
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4,991,066

SKATEBOARD LIGHTING ADAPTOR KIT

Gregory L. McCowan, 2808 Monticello Ave., Oakland, Calif. 94619

Filed Oct. 30, 1989, Ser. No. 429,040
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 9 Claims



1. A skateboard lighting kit adapted for use on a conventional skateboard having a deck with sides and with an underside having front and rear wheel assemblies mounted thereto comprising:

a power pack mountable to the underside of the skateboard deck,

at least one side light on each side of the skateboard deck,

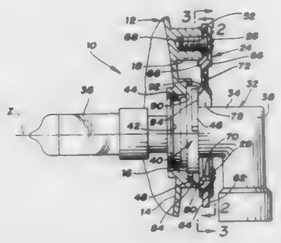
electronic connection means electronically connecting the power pack with the side lights for selectively lighting said side lights on activation, wherein the electronic connection means includes at least one level sensing switch lighting one or the other or both of the side lights depending on the orientation of the skateboard deck, the side lights signaling a turn by extinguishing one of the side lights while lighting the other.

4,991,067

HEADLAMP ASSEMBLY

William E. Nagengast, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1989, Ser. No. 394,918
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 4 Claims



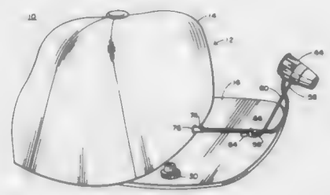
1. In combination, a vehicle headlamp assembly including a reflector the front portion of which is formed with a cavity having a parabolic reflecting surface and a circular opening formed in said reflecting surface for receiving the light bulb of a replaceable light bulb assembly, a plurality of circumferentially equally spaced locator receiving portions formed on the rear of said reflector and surrounding said circular opening, a retainer for receiving said replaceable light bulb assembly secured to said locator receiving portions surrounding said circular opening, said retainer having a configuration of a ring the opposed sides of which are formed with locator means which register with said locator receiving portions for positioning said retainer relative to said circular opening, and a plurality of circumferentially spaced press portions formed on said retainer on the opposed sides thereof for engaging and pressing a portion of said light bulb assembly towards said opening when said light bulb assembly is located within said retainer, the arrangement being such that either side of said retainer can be secured to said projections in any rotational position of said retainer and permit said light bulb assembly to be properly located within said circular opening relative to said reflecting surface.

4,991,068

LAMP ATTACHMENT FOR HAT

Scott A. Mickey, 7358 Riverside Pl., Orlando, Fla. 32810

Filed Feb. 14, 1990, Ser. No. 480,063
Int. Cl.[5] F21L *15/14*
U.S. Cl. 362—106 9 Claims



1. A combination hat and spot light, the hat having a crown, a bill extending from the crown, a liner circumscribing at least a portion of an edge of the crown, and an adjustable strap operatively associated with the crown for adjusting the hat to various different head sizes, the liner comprising a strip of material having an upper edge, a lower edge, and first and second ends, the lower edge being securely fastened to a bottom edge of the crown with the upper edge laying against an inner surface of the crown, the first and second ends being attached to respective ends of the adjustable strap, the combination including:

a hermetically sealed push button switch mounted to the bill of the hat near an edge thereof;

first and second battery holders each located respectively on opposite sides of the crown of the hat between the crown and the liner;

first and second wires extending from the push button switch and continuing through an opening in one of the crown and the liner, the first wire being connected to one end of the first battery holder and the second wire extending in a direction away from said first wire and terminating in a first wire connector located between the crown and the liner;

a third wire originating from one end of the second battery holder, said wire extending around said crown between the crown and liner and being connected to another end of the first battery holder for effecting a series electrical circuit between said first and second battery holders;

a high intensity xenon lamp having first and second electrical connections for coupling electrical power to the lamp;

first and second wires connected respectively to the first and second electrical connections on said lamp, said wires extending along and being clamped to an upper surface of the bill, said wires extending through an aperture in the crown adjacent the bill, the first wire from the lamp being connected to another end of the second battery holder, the second wire from the lamp being coupled to the second wire from the switch at the first wire connector;

a lamp support comprising a relatively stiff support rod having a first end bent so as to be located in a plane parallel to the bill of the hat for attachment thereto, another portion extending in an upwardly angled direction from the first end, and a second end extending substantially normal to a plane defined by the first end and the another portion; and

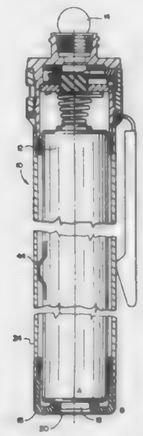
connection means attached to an outer surface of the lamp for receiving the second end of the lamp support, the connection means comprising an outer non-resilient tube bonded to the lamp and an inner resilient tube inserted into the outer tube, the second end of the lamp support being press-fit into the inner tube to establish a pivotable connection between the lamp and the lamp support and having a fit such that the lamp is retained in any angular orientation into which it is manually positioned.

4,991,069

END CAP FOR RECHARGEABLE BATTERY INSTRUMENT HANDLE

Robert G. Tiller, Auburn, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed May 21, 1990, Ser. No. 525,996
Int. Cl.[5] F21L *11/00*
U.S. Cl. 362—183 9 Claims



1. An end cap for closure of the end of a rechargeable battery handle for medical diagnostic instruments, such as an ophthalmoscope, which comprises:

a cup member having, on the open end thereof, means for cooperative attachment to an instrument handle;

a hole cut in the bottom of the cup member;

a diode member having anode and cathode contacts;

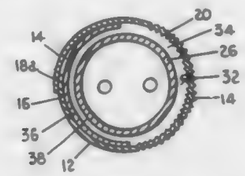
said diode being positioned in said cup so that one contact extends out through the hole in the bottom of the cup member and the other extends inwardly in said cup member to contact a battery in the instrument handle when said cup member is attached to an instrument handle.

4,991,070

SLEEVE FOR A LIGHT ELEMENT

Henry R. Stob, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Jul. 12, 1989, Ser. No. 379,330
Int. Cl.[5] F21Y *13/04*
U.S. Cl. 362—223 19 Claims



1. In a sleeve adapted to be mounted on a light element to protect said element and intercept light emitted therefrom, said sleeve comprising a tube adapted to telescopically receive said element and means carried by said tube for reflecting light emitted from said element, the improvement wherein:

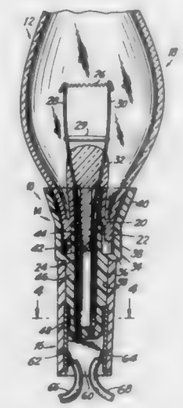
said tube is adapted to be mounted on and supported by said element for free rotation relative thereto to permit adjustment of said reflecting means about said element thereby to control the direction of reflected light, and further comprising means carried by said tube opposite said reflecting means for diffusing light reflected therefrom.

4,991,071

LIGHT STRING SET

Robert J. Braasch, Northfield, Ill., assignor to Noma International, Inc., Forest Park, Ill.

Filed Apr. 14, 1989, Ser. No. 339,409
Int. Cl.[5] F21V *21/00*; H05B *37/00*
U.S. Cl. 362—249 4 Claims



1. A lamp assembly, comprising:

(A) a light bulb symmetrical about a longitudinal axis, and including

(i) a bulbous envelope having an interior base seal and an annular skirt extending axially beyond the base seal,

(ii) a projection extending axially from the base seal through and past the skirt,

(iii) a filament within the envelope, and

(iv) a pair of wire leads connected across the filament and extending axially from the base seal through and past the skirt;

(B) a holder assembled to the bulb, and including

(i) a husk for receiving the skirt, said husk having a base wall, a cylindrical part extending axially from the base wall, and a frusto-conical part extending axially from the cylindrical part,

(ii) a tubular, hollow sleeve centrally located on the base wall, said sleeve having an interior axially-extending sleeve portion within the husk for receiving the projection and the wire leads, and an exterior axially-extending sleeve portion outside of the husk for receiving the wire leads, and

(iii) a hollow key plug of non-circular cross-section extending axially away from the exterior sleeve portion, said key plug having curved side walls and a pair of apertures through which the wire leads pass and are bent into engagement with the curved side walls upon assembly of the holder to the bulb; and

(C) a socket for axially receiving the holder assembled to the bulb in a push-in manner, and including

(i) a hollow, cylindrical entry portion for snugly receiving the exterior sleeve portion,

(ii) a hollow keyway of complementary contour to the key plug for snugly receiving the same in a keyed relationship, and

(iii) a pair of spaced-apart electrical terminals within the keyway and making respective electrical connections to

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the bent wire leads upon reception of the holder into the socket.

4,991,072

RADIATION PROJECTOR FOR PRODUCING A HOMOGENEOUS FLUX

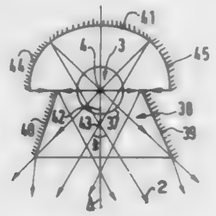
Pierre Malifaud, 95 Boulevard Jourdan, 75014 - Paris, France

Continuation of Ser. No. 222,380, Jul. 20, 1988, abandoned, which is a continuation of Ser. No. 120,220, Nov. 12, 1987, abandoned, which is a continuation of Ser. No. 840,852, Mar. 18, 1986, abandoned. This application Oct. 13, 1989, Ser. No. 423,546

Claims priority, application France, Mar. 19, 1985, 85 04047

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—297 2 Claims



1. A method of illuminating, a given mean plane of utilization located at a distance d from a larger section of the reflective surfaces of an optical radiation projector device of the type comprising a source of radiation and adapted to produce on said given plane of utilization an illumination having a so-called aperture angle of predetermined value, said device including a reflector having an axis of symmetry passing through said source and including a front part on one side of said source that is closet to said plane of utilization and a rear part on the opposite side of said source, said device including means for making the radiation illuminating the plane of utilization as homogeneous as possible within said aperture angle, said method comprising the steps of:

in said reflector, disposing two reflective surfaces so as to face each other with dimensions and positions in space for which the geometric characteristics of the shapes in sections relative to a plane of symmetry substantially satisfy the following equations:

$$(b-a)/h=tg\gamma$$

$$h/b=\cot g(2\nu-\beta)$$

where

β is the mean half-angle of an angle extending between two intersecting planes in which said reflecting surfaces extend, the value of which is on the order of 0.52 times the aperture angle,

a is the perpendicular distance between the axis of symmetry and the point of closest approach of each of said reflective surfaces with respect thereto,

b is the perpendicular distance between the axis of symmetry to each reflective surface corresponding to the largest distance between these points,

h is the distance on the axis of symmetry between the smaller section and the larger section of the reflective surfaces,

β is the trigonometrical angle measured in an anti-clockwise direction and defined by a line parallel to said axis of symmetry and originating at a point situated at the edge of each said reflective surface at the large end thereof and constituting a reflection of a vector corresponding to radiation from said source at said point and forming an angle the value of which is determined so as to be as near as possible to one half that of the said aperture angle of said device, said value being determined by the equation:

$$tg\beta=b/d$$

in which d is the distance between the larger section of said reflective surfaces and said mean plane of utilization.

4,991,073

LIGHTING LENS

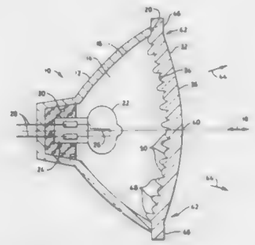
Robert E. Levin, So. Hamilton, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Division of Ser. No. 320,351, Mar. 8, 1989.

This application Jun. 4, 1990, Ser. No. 533,224

Int. Cl.[5] F21V *5/04*

U.S. Cl. 362—309 16 Claims



1. A lighting lens comprising:

(a) light transmissive plate having a first side and a second side, an optical center point, and an optical edge,

(b) a multiplicity of first lenticules, each having a centerline and a first aspherical contour with a continuous, monotonically decreasing curvature from the centerline of the lenticule, formed on the first side of the plate, and

(c) a multiplicity of second lenticules each having a second contour formed on the first side of the plate and intermixed with the first lenticules.

4,991,074

LIGHTING LAMP

Yasuo Kobayashi; Yasuo Hirasawa; Churyo Kodama; Katsumi Miyazaki; Takao Higashi, all of Tokyo; Masami Yanagisawa, and Akinori Sei, both of Shizuoka, all of Japan, assignors to Tomoegawa Paper Co., Ltd. and Hitachi Ltd., both of Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,514

Claims priority, application Japan, Jul. 26, 1989, 1-191390

Int. Cl.[5] F21S *13/00*

U.S. Cl. 362—457 6 Claims



1. A lighting lamp having a display sheet laminated on the surface of a bulb thereof, said display sheet comprising a support having laminated thereon a light-susceptible layer including an active layer containing at least one of a dye and a pigment capable of coloring, fading, or discoloring by the action of an active light and an adhesive layer formed on the surface of the light-susceptible layer such that the portion corresponding to at least the display portion thereof is exposed, and being laminated on the surface of the bulb by the adhesive layer.

4,991,075

LOW-SWITCHING LOSS DC-DC CONVERTER

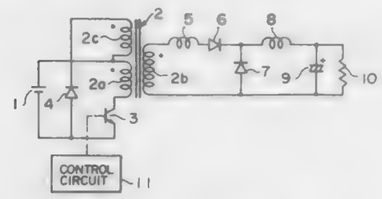
Akira Saitou; Osamu Takahashi; Seigou Tsukada; Yasuyuki Sohara; Hideki Tsuruse, all of Sagamihara, and Hidehiko Sugimoto, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1990, Ser. No. 475,979

Claims priority, application Japan, Feb. 14, 1989, 1-34061; Nov. 15, 1989, 1-296667

Int. Cl.[5] H02M *3/24*

U.S. Cl. 363—15 6 Claims



1. A DC—DC converter comprising:

a switching element having a rise time t_{on} and a fall time t_{off};

a control means for controlling the switching operation of said switching element;

a transformer having a primary winding and a secondary winding, said primary winding being connected to a DC power source through said switching element, and having an open inductance L_M;

an inductance means having an inductance L connected to said secondary winding of said transformer; and

a rectifying means for rectifying the output from said secondary winding of said transformer;

assuming that the voltage applied to said primary winding of said transformer is E, the load current flowing through said transformer is I_D, and the sum of the stray capacitance of said switching element and the distributed capacity of said windings of said transformer is C1, the following relational expressions being established:

$$L>(E/I_D)\,t_{on}$$

and

$$L_M>4\,t_{off}^2/\pi^2\,C1.$$

4,991,076

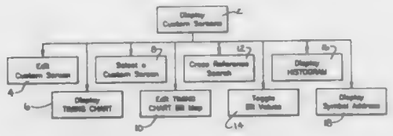
METHOD AND APPARATUS FOR CREATING CUSTOM DISPLAYS FOR MONITORING LADDER LOGIC PROGRAMS

Scott C. Zifferer, Mequon, and Joseph J. Menter, Jr., Milwaukee, both of Wis., assignors to ICOM Inc., West Allis, Wis.

Filed Jun. 30, 1989, Ser. No. 373,826

Int. Cl.[5] G05B *9/02, 11/02, 19/42*

U.S. Cl. 364—147 18 Claims



1. A computer-implemented system for monitoring elements of a ladder logic program executing in a programmable logic controller, comprising:

(a) monitor means for displaying custom screens and timing charts on the computer, wherein the custom screens display changing element values in the ladder logic program using numeric representations, and wherein the timing charts display changing element values in the ladder logic program using transition representations; and

(b) editor means, coupled to the monitor means, for developing the custom screens and the timing charts on the computer, for entering new element values at the computer while the custom screens are displayed, and for communicating the new element values to the ladder logic program executing in the programmable logic controller.

4,991,077

PROGRAMMABLE OPERATOR'S CONSOLE

Kikuo Kawasaki, Kanagawa; Sigeo Kawasima, Chiba; Takasi Miyata, and Kenji Fujita, both of Saitama, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

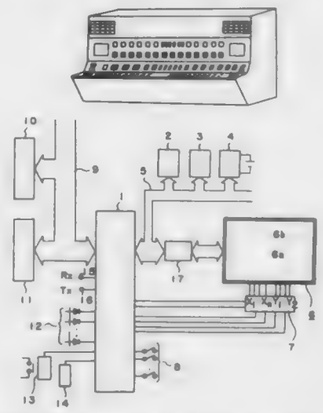
PCT No. PCT/JP87/00546, § 371 Date Jun. 3, 1988, § 102(e) Date Jun. 3, 1988, PCT Pub. No. WO88/01088, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 27, 1987, Ser. No. 188,391

Claims priority, application Japan, Jul. 29, 1986, 61-176692; Jul. 29, 1986, 61-176693; Jul. 29, 1986, 61-176694

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—188 13 Claims



1. A programmable operator's console for controlled interactive presentation of limited fields of information from a data base representative of data relating to one or more of control, test, operational results or monitoring of one or more external apparatuses, such presentation being reconfigurable so as to enable an operator to effectively oversee such data base while viewing only selected limited fields of information, comprising:

first means for coupling said console to an external apparatus to be controlled;

display means, further comprising display screen means and a plurality of overlaying transparent touch-sensitive switching means, for displaying in superimposed relation to said switching means a plurality of switch frames, switch function labels and control, test, operational or functional data in reconfigurable visual presentations;

a central processing unit, coupled to said first and display means, for providing to said display means configured visual display information, including switch functions and switch labels, responsive to data from one or both of said external apparatus and transparent switching means, and for providing control data to said external apparatus;

and storage means, coupled to said central processing unit, for storing data indicative of information to be displayed, including switch regions and switch labels;

whereby, particular transparent switching means are assigned different functions depending on information to be

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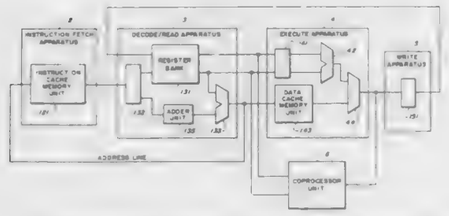
displayed in switch and display configurations selected for ease of comprehension of limited fields of information, while permitting an operator to oversee and control a data base including different categories of information.

4,991,078

APPARATUS AND METHOD FOR A PIPELINED CENTRAL PROCESSING UNIT IN A DATA PROCESSING SYSTEM

Neil C. Wilhelm, Menlo Park, Calif., and Judson S. Leonard, Waban, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 29, 1987, Ser. No. 101,983
Int. Cl.[5] G06F *09/38*
U.S. Cl. 364—200 30 Claims



1. A central processing unit of a data processing system, said central processing unit comprising:

instruction cache memory unit for storing sequences of instructions;

decode/read means coupled to said instruction cache memory unit, said decode/read means including;

an instruction register for receiving instructions from said instruction cache memory unit,

an operand register bank for storing operands and for retrieving operands in response to address portions from said instruction register,

an adder unit for receiving address portions from said instruction register, and

a first arithmetic logic unit for receiving signal groups from said operand register bank unit and said adder unit, said arithmetic logic unit providing addresses, wherein said addresses are applied to said instruction cache memory unit, said instruction cache memory unit providing a next sequential instruction of a currently executing sequence of instructions from said instruction cache memory unit to said instruction register during a first time period, said instruction register providing control signals determining a distribution and a processing of at least one data operand according to said next sequential instruction, said operand register bank providing operands in response to address portions from said instruction register and said first arithmetic logic unit providing addresses during a second time period;

execute means including;

a latch circuit for storing at least one operand from said operand register bank,

a second arithmetic logic unit receiving said at least one operand from said latch circuit, said second arithmetic logic unit providing a processed operand,

a data cache memory unit providing an operand in response to addresses from said first arithmetic logic unit, and

multiplexer unit for receiving a processed operand from said second arithmetic logic unit and a stored operand from said data cache memory unit, said second arithmetic logic unit processing said at least one data operand in accordance with control signals from said instruction register or said data cache memory unit retrieving one stored operand during a third time period; and

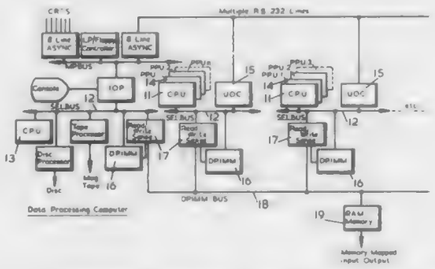
write means for transferring a processed data operand resulting from said processing said at least one data operand or a stored operand from said data cache memory unit to a designated location in said operand register bank in response to control signals from said instruction register during a fourth time period; wherein said instruction cache memory unit, said decode/read means, said execute means and said write means are pipeline subsystems of said central processing unit, said central processing unit using a load/store operational procedure.

4,991,079

REAL-TIME DATA PROCESSING SYSTEM

James C. Dann, Caterham, United Kingdom, assignor to Encore Computer Corporation, Marlborough, Mass.

Continuation of Ser. No. 710,229, Mar. 11, 1985, abandoned. This application Aug. 30, 1989, Ser. No. 401,511
Claims priority, application United Kingdom, Mar. 10, 1984, 8406322; Aug. 14, 1984, 8420617
Int. Cl.[5] G06F *13/00*
U.S. Cl. 364—200 46 Claims



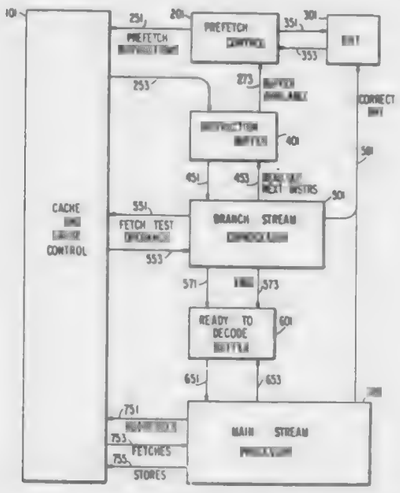
1. A real-time data processing system, comprising at least two processing nodes, a local data store in respect of each processing node, each local data store being partitioned into sections a first one of which is reserved for the storage of non-shared data local to the respective processing node and a second one of which is reserved for the storage of data to be shared between processing nodes, a data link interconnecting the processing nodes, generating means at each processing node for generating a read/write message including an address and data to be written to that address whenever that processing node writes to an address in the second section of the local data store, transmitting means for transmitting each generated write message via the data link to each of the processing nodes, allocating means for allocating to each address in the second sections of the local data stores a respective processing node which is to be a master processing node for that address, preventing means for preventing data being written to any address in the second section of a local data store other than by the allocated master processing node, said allocating an preventing means including an address range comparator in respect of each processing node for comparing the address of a data write message generated by that processing node with a preset range of addresses and for transferring the data write message to the data link only if the compared address is within the preset range, each processing node including a latch into which each data write message is loaded, a first in first out register connected to the output of the latch, a detector for detecting a successful writing of data to the data store local to the processing node, an AND gate connected to the detector and address range comparator and controlling the latch such that the content of the latch is transferred to the register when the compared address is within range and successful writing of data is detected, and a transmitter connected to the register for transmitting messages stored in the register over the data link.

4,991,080

PIPELINE PROCESSING APPARATUS FOR EXECUTING INSTRUCTIONS IN THREE STREAMS, INCLUDING BRANCH STREAM PRE-EXECUTION PROCESSOR FOR PRE-EXECUTING CONDITIONAL BRANCH INSTRUCTIONS

Philip G. Emma, Danbury, Conn.; James H. Pomerene, Chappaqua; Rudolph N. Rechtschaffen, Scarsdale, both of N.Y., and Frank J. Sparacio, North Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1986, Ser. No. 839,312
Int. Cl.[5] G06F *9/38, 9/28*
U.S. Cl. 364—200 18 Claims



1. A computing apparatus for executing program instructions in instruction sequences, said instruction sequences including a first type of instructions, which include conditional branch instructions, and a second type of instructions, different from said first type, outcomes of execution of said conditional branch instructions determining choices among alternative ones of said instruction sequences, said computing apparatus comprising:

memory means for storing said program instructions and data;

prefetching means for prefetching said program instructions from said memory means and forming said instruction sequences, said prefeteching means including means for making preliminary guesses as to said outcomes of execution of said conditional branch instructions;

pre-executing means, comprising means for receiving said instruction sequences from said prefetching means and preexecuting ones of said first type of instructions and means for adjusting said prefetching means in accordance with outcomes of pre-execution of ones of said first type of instructions so as to maximize a percentage of said preliminary guesses which are correct, said pre-executing means further comprising means for removing, from said instruction sequences, prefetched instructions based on an incorrect preliminary guess, in accordance with said outcomes of pre-execution of said ones of said first type of instructions;

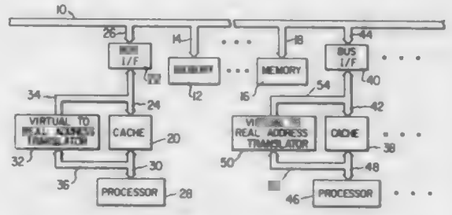
buffer means for storing said instruction sequences without said prefetched instructions based on said incorrect preliminary guess, from said buffer means in advance of when they are needed by said main processing means, said main processing means executing said program instructions and processing said data accordingly.

4,991,081

CACHE MEMORY ADDRESSABLE BY BOTH PHYSICAL AND VIRTUAL ADDRESSES

Patrick W. Bosshart, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 89,032, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 666,853, Oct. 31, 1984, abandoned. This application Jun. 16, 1989, Ser. No. 368,140
Int. Cl.[5] G06F *12/08*
U.S. Cl. 364—200 9 Claims



1. A cache memory system having, in combination:

(a) a bus for receiving an address for desired data, said address having a plurality of bits including a least significant bit portion comprised of a predetermined number of least significant bits and a most significant bit portion comprised of the remaining or most significant bits, the least significant bit portion of said address being common for all corresponding virtual addressed and physical addressed data,

(b) a data memory for storing system data,

a switching element for transferring data from the data memory,

(c) a tag memory having a virtual tag memory portion for storing the most significant bit portions of said virtual addresses associated with said stored data and a physical tag memory portion for storing the most significant bit portions of said physical addresses associated with said stored data, said stored virtual and physical most significant bit portions are addressed by the least significant bit portion of said received address for output from said tag memory when said received least significant bit portion corresponds to the least significant bit portion of the said address associated with data stored in said data memory;

(d) address select means for selecting said stored virtual most significant bit portion when said received address is virtual and said stored physical most significant bit portion when said received address is physical; and

(e) a comparison circuit responsive to said address select means for comparing said selected most significant bit portion to the most significant bit portion of said received address and providing an output to control said switching element for transfer of said selected data from said data memory.

4,991,082

VIRTUAL STORAGE SYSTEM AND METHOD PERMITTING SETTING OF THE BOUNDARY BETWEEN A COMMON AREA AND A PRIVATE AREA AT A PAGE BOUNDARY

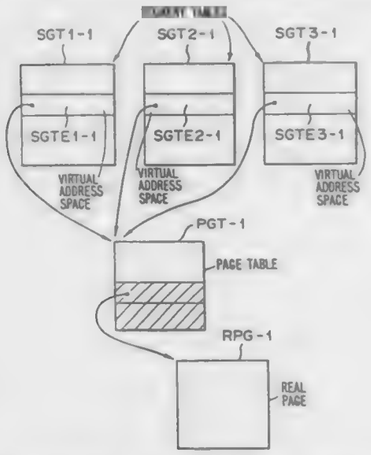
Yasufumi Yoshizawa, Tachikawa; Taketoshi Sakuraba; Toshiaki Arai, both of Yokohama; Toshiyuki Kinoshita, Sagamihara; Minoru Shibamiya, Yokohama, and Takashige Kubo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1986, Ser. No. 924,028
Claims priority, application Japan, Oct. 28, 1985, 60-239360
Int. Cl.[5] G06F *12/08*
U.S. Cl. 364—200 18 Claims

1. A method of managing storage areas in a computer which, in response to virtual addresses designated in programs run on the computer, accesses a real storage device divided into a

plurality of real pages, wherein the virtual addresses correspond to a plurality of virtual address spaces, each of said virtual address spaces being divided into a plurality of segments, each segment comprising a number of virtual pages, each virtual address space including a system common area and a private area, said computer including an address translator for translating virtual addresses into real addresses of the real storage device, said address translator having a plurality of page tables, for associating virtual pages of the virtual address spaces to real pages, and a plurality of segment tables, one segment table required for each virtual address space, for associating the segments of the virtual address space to page tables provided for the virtual address space; said method comprising the steps of:

(a) preparing for each virtual address space a boundary page table corresponding to a boundary segment having an area boundary of the system common area and the private area, the boundary page table including first locations, for holding first address transformation information common to the virtual address spaces for associating virtual pages belonging to the system common area within the boundary segment of the virtual address space to real pages commonly allocated to all virtual address spaces, and



further including second locations, for holding second address transformation information for the corresponding virtual address space for associating virtual pages belonging to the private area within the boundary segment to real pages privately allocated to that virtual address space;

(b) determining real pages common to the virtual address spaces and to be fixedly allocated to predetermined virtual pages belonging to the system common area within the boundary segment of each of the virtual address spaces and being allocatable to a program on demand, before a program issues a virtual page allocation demand for the predetermined virtual pages so as to set appropriate address transformation information, required for allocation of the determined real pages to the predetermined virtual pages, into the boundary page table for each of the virtual address spaces; and

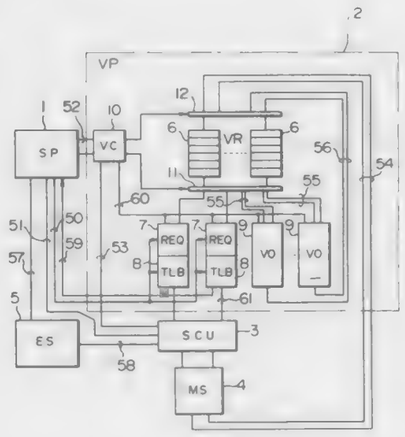
(c) dynamically allocating the predetermined virtual pages in the system common area within the boundary segment for one of the virtual address spaces to a program so that an available part of the predetermined virtual pages is allocated or deallocated to the program in response to a demand therefrom for allocation or deallocation, while the determined real pages remain fixedly allocated to the predetermined virtual pages.

4,991,083

METHOD AND SYSTEM FOR EXTENDING ADDRESS SPACE FOR VECTOR PROCESSING

Tomoo Aoyama, Hadano, and Shun Kawabe, Machida, both of Japan, assignors to Hitachi, Ltd. and Hitachi Computer Engineering Co., Ltd., both of Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,300
Claims priority, application Japan, Sep. 9, 1987, 62-225896
Int. Cl.[5] G06F *15/347, 12/02*
U.S. Cl. 364—200 16 Claims



1. A method of extending a logical address space of a vector processor including a main storage, an extended storage, a scalar processing unit, and a vector processing unit which includes a vector instruction execution controller, vector registers, vector operators, requestors, and at least one address translator having an address translation table for each requestor, said method comprising the steps of:

(a) suspending a main storage reference request from said requestor through use of logic circuitry comprising the address translator and stopping the operation of said requestor through use of the translator if a reference result to said address translation table at the location corresponding to a block of said main storage to be referred to based on a logical address generated by said requestor is an indication of an address area not located on said main storage;

(b) issuing an external interruption processing request from said vector processing unit to said scalar processing unit through use of the translator in response to said unlocated address area indication at step (a);

(c) executing an external interruption processing by said scalar processing unit in response to said interruption processing request to transfer data from said extending storage into a memory area of said main storage at the location corresponding to said main storage reference request, and changing said unlocated address area indication by said address translation table into a located address area indication; and

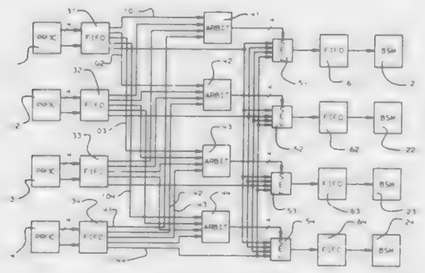
(d) setting by said scalar processing unit of an actual address of said main storage with respect to said reference request in said address translation table which has been suspended, and issuing by said scalar processing unit of an instruction to release the suspension of said main storage reference request to said address translator to thus execute the release operation.

4,991,084

N×M ROUND ROBIN ORDER ARBITRATING SWITCHING MATRIX SYSTEM

William K. Rodiger, Kingston; Jon E. Thorson, Poughkeepsie, and Yee-Ming Ting, Port Ewen, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1988, Ser. No. 152,779
Int. Cl.[5] G06F *13/14, 13/18, 13/00, 15/16*
U.S. Cl. 364—200 9 Claims



1. A N×M switching matrix system with arbitration comprising:

M outputs ports;

N data inputs and request inputs from different sources, each request input associated with a data input and indicating which of M output ports the associated data is to be applied;

M arbitrators and M gating means, each arbitrator and associated gating means is coupled between said N data inputs and request inputs and a different one of said M output ports; and

each of said arbitrator and gating means being responsive to said data inputs and request inputs for gating data input simultaneously to the requested output port when there is no contending request inputs for the same output port and for when there is contending request inputs for the same output port storing and sequencing the associated data inputs from said different sources to the associated output port on a round robin basis while simultaneously applying the non contending data inputs to the other output ports.

4,991,085

PERSONAL COMPUTER BUS INTERFACE CHIP WITH MULTI-FUNCTION ADDRESS RELOCATION PINS

Robert M. Pleva, Livermore, and Robert W. Catlin, Santa Clara, both of Calif., assignors to Chips and Technologies, Inc., San Jose, Calif.

Filed Apr. 13, 1988, Ser. No. 181,138
Int. Cl.[5] G06F *13/12, 13/14, 13/42*
U.S. Cl. 364—200 5 Claims

1. An integrated circuit for use in connecting a peripheral device to a microchannel bus, said microchannel bus including command and status lines, a channel reset line, bus arbitration control lines, including a preempt line, a arbitrate/grant line and four arbitration bus priority level (ARB) lines, address lines, data lines, a refresh line, and a channel ready line, said integrated circuit comprising:

command decode means, coupled to said command and status lines, for generating memory read, memory write, I/O read and I/O write output signals;

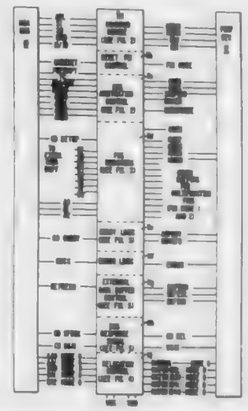
a plurality of programmable option select (POS) registers;

register control logic means, coupled to a plurality of said command and status lines, for generating read and write signals for said POS registers;

a plurality of multifunction pins;

a plurality of comparators having first inputs coupled to selected ones of said POS registers, second inputs coupled to a group of pins of a first portion of said multifunction pins, and outputs coupled to a second portion of said multifunction pins; and

pin mode control means, responsive to a pin mode input, for coupling said first portion of said multifunction pins to said second comparator inputs and coupling said comparator outputs to said second portion of multifunction pins in



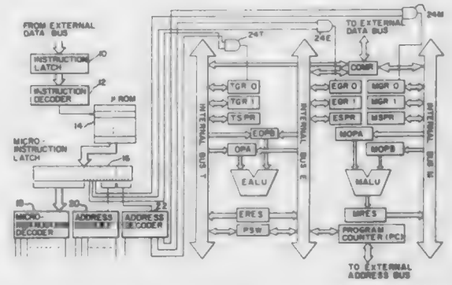
a first mode, for providing a first number of said POS register read and write signals to a first number of said multifunction pins in place of a first member of said comparator outputs in a second mode, and for providing a second number, greater than said first number, of said POS register read and write signals to said multifunction pins in a third mode.

4,991,086

MICROPROGRAM CONTROLLED MICROPROCESSOR HAVING A PLURALITY OF INTERNAL BUSES AND INCLUDING TRANSFER REGISTER DESIGNATION SYSTEM

Shingo Kojima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,197
Claims priority, application Japan, Jul. 9, 1987, 62-172142
Int. Cl.[5] G06F *3/00, 9/06, 13/00*
U.S. Cl. 364—200 4 Claims



1. A microprogram controlled microprocessor comprising:

first, second and third internal data buses;

a first arithmetic logic unit having a pair of inputs respectively coupled to a pair of operand registers coupled to the first internal data bus and an output coupled to an operation result register coupled to the first internal data bus;

a second arithmetic logic unit having a pair of inputs respec-

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tively coupled to a pair of operand registers coupled to the second and third internal data buses and an output coupled to an operation result register coupled to the second and third internal data buses;

first, second and third scratch pad registers coupled to the first, second and third internal data buses, respectively;

first, second and third general registers coupled to the first, second and third internal data buses, respectively;

a microprogram read only memory for storing a microprogram;

a microinstruction latch, coupled to the microprogram read only memory, for latching a microcode from the microprogram read only memory;

at least one address decoder, coupled to the microinstruction latch, for generating a set of write signals for internal registers;

wherein there are previously created some number of source register sets each designating one source register for each of the internal data buses and some number of destination register sets each designating one destination register for each of the internal data buses, and then, one of the source register sets and one of the destination register sets is selected when an interregister transfer is executed,

wherein at least one register of the scratch pad and general registers coupled to each of the first, second and third internal data buses includes an AND gate having an output coupled to a write signal input of the at least one register itself and a first input coupled to receive a corresponding write signal from the address decoder, and wherein an internal bus transfer inhibit flag is included in a transfer register designation field of a microcode latched in the microinstruction latch and is inputted to a second input of the AND gate of the register coupled to the corresponding internal bus for inhibiting writing to the register designated by the transfer inhibit flag.

4,991,087

METHOD OF USING SIGNATURE SUBSETS FOR INDEXING A TEXTUAL DATABASE

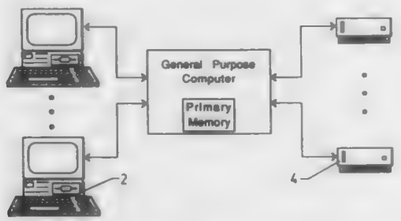
Forbes J. Burkowski, 65 Margaret Avenue South, Waterloo, Ontario, Canada N2J 2C8, and Marke S. Krebs, 46 Garnet Avenue, Toronto, Ontario, Canada M6G 1V5

Filed Aug. 18, 1988, Ser. No. 233,601

Claims priority, application United Kingdom, Aug. 19, 1987, 8719573

Int. Cl.[5] **G06F** *15/40*

U.S. Cl. 364—200 **14 Claims**



1. A method of operating a computer system to store and retrieve information in a database, said computer system having data processing means, memory means and data storage means capable of containing data records, said method comprising the steps of:

(a) storing the database on the data storage means;

(b) during loading, said system automatically creating for the database a signature file which is divided into subsets, mapping a word signature to a particular subset during creation of the file and storing said signature file subsets on said data storage means;

(c) during retrieving, after the signature file is created, entering at least one query word into the system;

(d) said system automatically creating a signature for each query word entered into the system;

(e) scanning for a word signature and retrieving the corresponding data from said database in response to a query word by using the same mapping information that was used to store the word signature in a particular subset, said system matching the signature of a query word with at least one signature in one subset of said signature file if such an appropriate word signature exists in this subset.

4,991,088

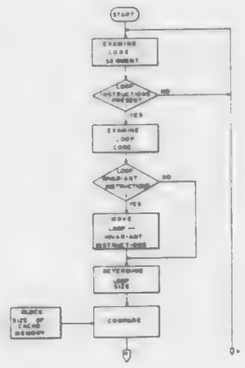
METHOD FOR OPTIMIZING UTILIZATION OF A CACHE MEMORY

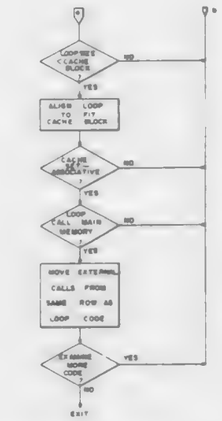
Edward O. K. Kam, Fremont, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Nov. 30, 1988, Ser. No. 277,871

Int. Cl.[5] **G06F** *9/30, 13/00, 12/00*

U.S. Cl. 364—200 **5 Claims**





1. A method of optimizing utilization of a cache memory unit in a computer system running a compiled computer program having loop instructions, said computer system having a main memory unit, which has an array of blocks of a predetermined block size, and having a cache memory unit with a multiplicity of blocks of said predetermined size, comprising the steps of:

storing a set of compiled loop instructions of a compiled computer program in said main memory unit;

locating a set of compiled loop instructions which is stored in the main memory unit and which is smaller than the predetermined block size of said cache memory unit;

denoting the memory boundaries of said identified set of compiled loop instructions within said main memory unit;

moving the instructions of said located set of compiled loop instructions so that said instructions are stored within the boundaries of one of said predetermined blocks of said main memory unit;

loading said identified set of compiled loop instructions into said cache memory unit; and

running said identified set of loop instructions in said computer system;

thereby optimizing operation of said cache memory unit when said identified set of compiled loop instructions is loaded into said cache memory unit and the identified set of loop instructions is run in said computer system and cache misses are avoided for said identified set of loop instructions.

4,991,089

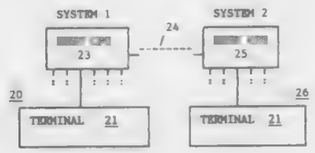
METHOD FOR ESTABLISHING CURRENT TERMINAL ADDRESSES FOR SYSTEM USERS PROCESSING DISTRIBUTED APPLICATION PROGRAMS IN AN SNA LU 6.2 NETWORK ENVIRONMENT

David U. Shorter, Lewisville, Tex., assignor to IBM Corp., Armonk, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,279

Int. Cl.[5] **G06F** *13/14*

U.S. Cl. 364—200 **5 Claims**



1. A method for controlling the processing of host originated conversation requests for known Users of an SNA type network that processes distributed application programs in accordance with LU 6.2 protocols in which a conversation is selectively established between portions of a distributed application program, one portion being stored and executed at one of plurality of Intelligent Work Stations (IWSs) which is selectively connectable to said network and another portion being stored at a host processor, said processor having a Virtual Machine Pool Manager (VMPM) for creating a pool of virtual machines and for managing the assignment of each machine to process the said another portion, said assignment being terminated and said assigned virtual machine being returned to said pool at the time that a processed conversation is terminated, said method preventing a host originated conversation request addressed to a first user having a specific USERID from being processed by an assigned virtual machine unless specifically authorized by said first user designating the ID of one said IWS to which said host originated conversation requests are to be sent, while permitting a conversation request by said first user originating from an IWS to be processed by a virtual machine assigned by said VMPM, said method comprising the following steps,

(A) providing a second distributed application program having one portion resident at said first IWS and the counterpart portion resident on said host to authorize the processing by an assigned said virtual machine of host originated conversation requests addressed to said first user,

(B) invoking at said first IWS said one portion of said second application program to transmit an ALLOCATE verb requesting a conversation with said counter part portion, said ALLOCATE verb including said USERID and the ID of said first IWS at which said first user is currently located,

(C) processing said ALLOCATE conversation request at said host including the steps of,

(1) creating an Identification Control Block Entry (ICBE) data structure for storing the said USERID of said first user and said first IWS ID, and

(2) appending said ICBE onto a chain of ICBEs at a location in storage that is accessible to each said virtual machine to permit said first IWS ID and said first USERID user to be determined by each virtual machine assigned to process a host originated request for a conversation with said first USERID,

(D) processing with an assigned virtual machine a host originated request for a conversation with said first USERID, including the step of

(1) scanning said chain of ICBEs to determine the IWS ID at which said specified User is currently located, and

(2) transmitting said request only if said IWS ID is determined in said step of scanning.

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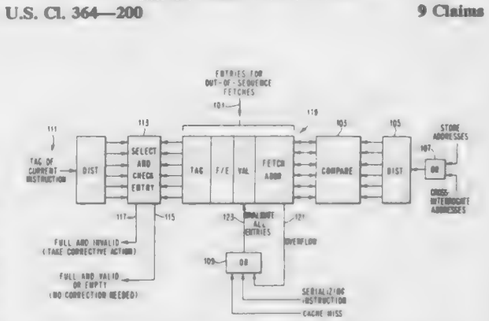
POSTING OUT-OF-SEQUENCE FETCHES

Philip G. Emma, Danbury, Conn.; Joshua W. Knight, III, Mohegan Lake; James H. Pomerene, Chappaqua; Rudolph N. Rechtschaffen, Scarsdale, N.Y., and Frank J. Sparacio, North Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1987, Ser. No. 51,792

Int. Cl.[5] **G06F** *11/06, 11/28*

U.S. Cl. 364—200 **9 Claims**



1. In a computer having means to fetch operands and execute instructions in accordance therewith, apparatus for monitoring out-of-sequence fetches of operands, comprising:

a stack having N entries for holding the addresses of the last M out of sequence fetches, where M is less than or equal to N, each of said addresses having associated therewith a valid bit and a full/empty bit, said full/empty bit being set to full when there is an entry in said stack for the address;

comparison means for comparing addresses in said stack with a predetermined test address;

means for setting invalid the valid bit of addresses that are equal to said test address; and

tag means for associating an address in the stack with an instruction it represents and means for deleting said address when an operand is handled in its proper sequence, said tag means including

means for selecting an entry in said stack corresponding to a current instruction; and

means for checking the full/empty bit and the valid bit for the associated address and signaling that corrective action is required when the full/empty bit is set to full and the valid bit is set to invalid.

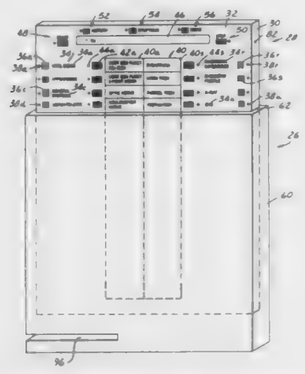
VOL 1123 ISS 1 FE 5 1991 UMI

4,991,091

SELF-CONTAINED EXAMINATION GUIDE AND INFORMATION STORAGE AND RETRIEVAL APPARATUS

Gregory Allen, 411 S. Woodward #526, Birmingham, Mich. 48011

Filed Aug. 23, 1988, Ser. No. 235,154
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.02 37 Claims



1. Self-contained examination guide and information storage apparatus comprising:

a flat rectangular enclosure having a flat front panel with parallel side edges,

first display means on said front panel disposed along at least one side edge of said panel bearing fixed indicia associated with a plurality of general examination categories,

a plurality of means individually disposed on said panel adjacent to associated ones of said first display means and individually permanently associated with said general examination categories for selecting among said general examination categories,

second display means position on said front panel between said side edges, said second display means being distinct from said first display means and including a plurality of individually alterable display segments,

means within said enclosure responsive to said category-selecting means for displaying a plurality of specific examination indicia at said display segments, said plurality of specific examination indicia being coordinated with each said general examination category,

a plurality of means individually disposed on asid panel adjacent to an associated display segment for selectively identifying specific examination indicia of interest, and

means within said enclosure responsive to said selectively-identifying means for storing specific examination indicia associated with each said general examination category.

4,991,092

IMAGE PROCESSOR FOR ENHANCING CONTRAST BETWEEN SUBREGIONS OF A REGION OF INTEREST

Fred Greensite, Newport Beach, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Aug. 12, 1988, Ser. No. 231,830
Int. Cl.[5] G06F *15/68*
U.S. Cl. 364—413.13 32 Claims

1. A method for processing an image, said image comprising a plurality of pixels representing a region of interest partitioned into a plurality of voxels, said method comprising the steps of:

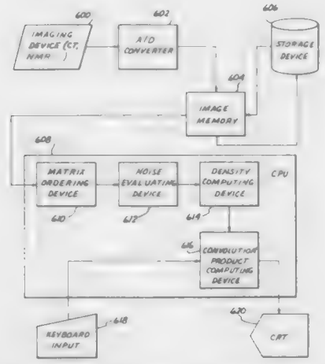
providing a plurality of multidimensional signals, each of said signals being associated with each of said voxels, said plurality of voxels being mapped into said plurality of signals in a signal space by a mapping M;

computing a density function representative of the frequency of occurrence of each of said multidimensional signals in said signal space; and

assigning a tone value to each of said plurality of voxels in accordance with said density function

2. A method for processing an image, said image comprising a plurality of pixels representing a region of interest partitioned into a plurality of voxels, comprising the steps of:

providing a plurality of multidimensional signals, each of said multidimensional signals comprising a plurality of parameters containing information about said region of interest, each of said signals being further associated with each of said voxels, said plurality of voxels being mapped into said plurality of signals in a signal space by a mapping



M, said mapping M being a multidimensional random variable having a density function;

computing said density function representative of the frequency of occurrence of each of said multidimensional signals in said signal space;

convolving said density function with a resolution function so as to provide a real valued probability density function defined for each of said plurality of voxels;

assigning a tone value to each of said plurality of voxels corresponding to the value of said probability density function for each of said voxels; and

displaying a tone level image wherein each voxel is represented by a pixel with said assigned tone value.

4,991,093

METHOD FOR PRODUCING TOMOGRAPHIC IMAGES USING DIRECT FOURIER INVERSION

Wayne Roberge, Hopewell, and Brian Flannery, Clinton, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 160,011, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 767,902, Aug. 21, 1985, abandoned. This application Aug. 8, 1989, Ser. No. 390,936
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.15 7 Claims

1. A method for examining at least a portion of an object using penetrating radiation directed from a variety of view angles about a rotation axis through the object comprising:

(a) transmitting incident radiation from an external source through portions of the object having sharp density variations in a plurality of coplanar rays so that said radiation is attenuated as it passes through said object,

(b) detecting said attenuated transmitted radiation after it has passed through the object,

(c) determining the projection data from said attenuated transmitted radiation and said incident radiation for said rays, and

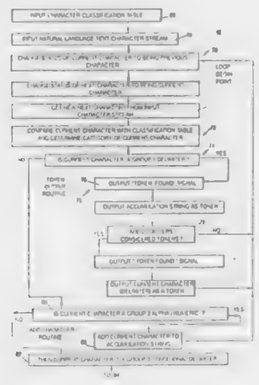
(d) inverting said projection data to generate the distribution of the attenuation coefficients wherein said inverting step includes the Direct Fourier Inversion Method such that the projection data are padded and the Fourier coefficients are filtered, wherein said Direct Fourier Inversion Method can generate said distribution of attenuation coefficients for an object having sharp density variation such as in a Shepp-Logan target.

4,991,094

METHOD FOR LANGUAGE-INDEPENDENT TEXT TOKENIZATION USING A CHARACTER CATEGORIZATION

Joel L. Fagan, Silver Spring; Michael D. Gunther, Gaithersburg; Paul D. Over, Germantown; Greg Passon, Germantown; Chien C. Tseo, Germantown; Antonio Zamora; Elena M. Zamora, both of Chevy Chase, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1989, Ser. No. 344,341
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—419 15 Claims



1. A computer method for isolating words from an input stream of characters forming natural language text, the method comprising the steps of:

storing in a data processor a character classification table which describes each character in a character code as being either a delimiter character, an alpha/numeric character or a conditional delimiter character which assumes a function of a delimiter character when it occurs in predefined character contexts;

inputting to said data processor an input stream of characters which are members of said character code, the input stream forming natural language text;

building in said data processor a string of alpha/numeric characters to form a word from said input stream of characters produced by said inputting step;

isolating in said data processor three consecutive characters from said inputting step of said input stream, as a previous character, a current character and a next character;

accessing in said data processor said character classification table in response to said isolating step, to determine if said current character is a delimiter character, an alpha/numeric character or a conditional delimiter character;

appending in said data processor said current character to said string when said character classification table identifies it as an alpha/numeric character in said accessing step;

signaling an output signal from said data processor that said string is a complete word when said character classification table identifies said current character as a delimiter character in said accessing step;

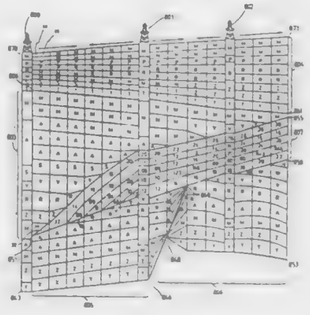
analyzing in said data processor said previous character, said current character and said next character to determine if said current character assumes the function of a delimiter character when said character classification table identifies said current character as a conditional delimiter character in said accessing step.

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PROCESS FOR THREE-DIMENSIONAL MATHEMATICAL MODELING OF UNDERGROUND GEOLOGIC VOLUMES

Donald C. Swanson, Houston, Tex., Stratamodel, Inc., Houston, Tex.

Continuation of Ser. No. 890,467, Jul. 25, 1986, Pat. No. 4,821,164. This application Nov. 21, 1988, Ser. No. 274,484
Int. Cl.[5] G01V *1/00*
U.S. Cl. 364—421 14 Claims



1. A method using a stored program processor to model an actual geologic volume having critical bounding surfaces and inclined, stacked layers of sedimentary deposits, which comprises:

(a) composing a model volume analogous to the actual volume wherein the model volume comprises layers of cells arranged in vertical columns of cells, which layers of cells are inclined and stacked analogous to the layers of deposits in the actual volume;

(b) assigning coordinates to corners of such cells to locate the cells systematically within the model volume; and

(c) assigning attributes from locations within the actual volume into cells which correspond positionally within the model volume to the positions of the attributes in the actual volume.

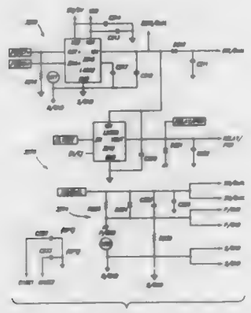
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SHUTDOWN RELAY DRIVER CIRCUIT

Thomas Glowczewski, Washington Township, Macomb County, and Keith B. Carle, Hartland, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 188,609, Apr. 29, 1988, abandoned.
This application Jun. 21, 1990, Ser. No. 541,450
Int. Cl.[5] B60K *41/04*
U.S. Cl. 364—424.1 1 Claim



1. In an automatic transmission control system having a plurality of gears for transmitting power from a prime mover to a load device over desired ranges of torque and speed, and an assembly of friction elements with hydraulic fluid associated therewith, the friction elements for selectively disengaging and engaging the gears from the prime mover, where the control system includes means for sensing the input and output speeds of the transmission and generating signals representative thereof, means for sensing the power demand on the prime mover and generating signals representative thereof, means for providing an indication of a manually selected mode of operation for the transmission and generating signals representative thereof, and means for controlling the flow of hydraulic fluid associated with the operation of the friction elements, an electronic controller including a communications interface to provide a communications link to other microcomputer based devices, a plurality of interface circuits to receive and transmit signals from various means for providing input signals to the electronic controller, a micro core including a microcomputer unit (MCU), a watchdog/reset circuit to monitor the proper functioning of the MCU and to cause a reset of the MCU in response to predetermined voltage conditions, a memory for storing the application or operating program used by the MCU, and an interface chip for addressing and routing signals throughout the electronic controller, and a shutdown relay driver circuit to disconnect electrical power to the means for controlling the flow of hydraulic fluid associated with the operation of the friction elements under predetermined conditions, the shutdown relay driver circuit comprising:

a self protecting high side switch chip responsive to a control signal from the watchdog/reset circuit to cause a supply voltage to be transmitted to an output port of said self protecting high side switch chip;

a shutdown relay electrically connected to the output port of said self protecting high side switch chip to cut power off to the means for controlling the flow of hydraulic fluid associated with the operation of the friction elements in response to supply voltage transmitted to said output port of said self protecting high side switch chip to allow the means for controlling the flow of hydraulic fluid associated with the operation of the friction elements to achieve a predetermined configuration to control the automatic transmission;

means to clamp the back emf of the means for controlling the flow of hydraulic fluid associated with the operation of the friction elements when said shutdown relay is open; and

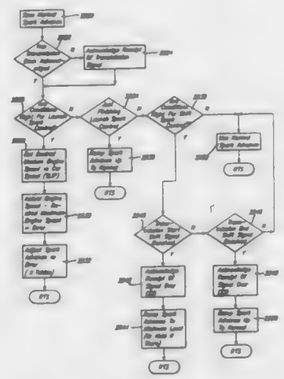
a pull down resistor to ensure that its output voltage is pulled to ground regardless of the electrical state of the means for controlling the flow of hydraulic fluid associated with the operation of the friction elements.

4,991,097

METHOD OF STALL TORQUE MANAGEMENT FOR AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Francis M. Fodale, Southfield; Howard L. Benford, Bloomfield Hills, and Maurice B. Leising, Clawson, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,597
Int. Cl.[5] B60K *41/18;* F02P *5/145;* G05D *17/02*
U.S. Cl. 364—424.1 4 Claims



4. In a vehicle having an engine and throttle means and a transmission system including an input member, torque converter assembly for transmitting torque between the engine and the input member, an output member, a gear assembly for changing the ratio of torque between the input member and the output member, a plurality of friction elements for shifting the gear assembly, a fluid actuating device being movable to engage or disengage at least one friction element, at least one solenoid-actuated valve for directing fluid flow between a fluid source and the fluid actuating device for moving the fluid actuating device, a plurality of sensors for providing signals indicative of measurement data, an engine controller and transmission controller having memory for processing and storing the signals and predetermined values and providing output signals, a method of controlling engine torque from a vehicle engine to an electronically controlled transmission in response to a launch or break-away condition of the transmission, said method comprising the steps of:

sensing a speed of the engine;

sensing a speed of the output member;

saving in memory of an engine controller a normal spark advance setting;

determining whether a control signal has been acknowledged by the engine controller from a transmission controller;

acknowledging receipt of the control signal by the engine controller to the transmission controller if the engine controller has not yet acknowedged receipt of the control signal;

determining whether predetermined conditions are right for launch spark control to control engine speed directly;

selecting a desired maximum engine speed based on the output speed of the transmission if the conditions are right for launch spark control;

calculating an error term equal to the difference between the actual engine speed and a desired maximum engine speed;

driving the error term to zero by adjusting the spark advance based on the error term;

determining whether the launch spark control is just finishing if the predetermined conditions are not right for launch spark control; and

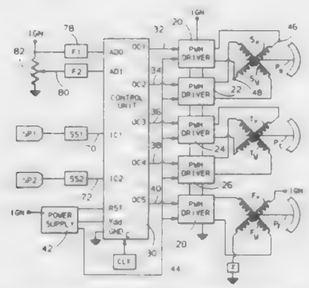
returning the spark advance to the normal spark advance setting saved in memory if the launch spark control is just finishing.

4,991,098

COMPUTER-BASED CONTROLLER AND BIPOLAR PWM DRIVER ARRANGEMENT FOR AIR CORE GAUGE CONTROL

Maurice L. Dantzler, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1988, Ser. No. 275,879
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—424.01 4 Claims



1. Drive apparatus for an air core gauge, comprising in combination:

driver means for applying a bipolar direct voltage to at least one coil of said gauge to energize the coil with current of like polarity, the driver means alternately reversing the polarity of the applied voltage, and therefore the polarity of the energizing current, according to a PWM duty cycle control signal defining the percentage of time that voltage of one polarity is applied to said coil as compared to voltage of an opposite polarity; and

computer-based control means for (1) synchronously receiving and processing input data related to a parameter to be displayed by said gauge, (2) determining a desired current for said coil for producing a desired deflection of said gauge, (3) generating a PWM duty cycle value in relation to said desired current such that duty cycles in the range of 0%–50% define a full range of desired current of said one polarity, and duty cycles in the range of 50%–100% define the full range of desired current of said opposite polarity, and (4) scaling the PWM duty cycle value into the range of (DELTA)% to (100-DELTA)% to form said PWM duty cycle control signal for said driver means, the term DELTA being defined in relation to the time required by said computer-based control means to receive and process said input data.

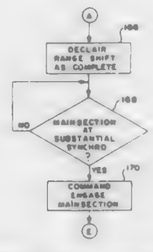
4,991,099

CONTROL SYSTEM/METHOD FOR CONTROLLING SHIFTING OF A RANGE TYPE COMPOUND TRANSMISSION USING INPUT SHAFT AND MAINSHAFT SPEED SENSORS

Ronald K. Markyvech, Allen Park, and Thomas A. Genise, Dearborn, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 19, 1989, Ser. No. 368,500
Int. Cl.[5] B06K *41/08;* G06F *15/20*
U.S. Cl. 364—424.1 9 Claims

1. A control system for controlling the shifting of a compound transmission (10) comprising the multiple speed main transmission section (12) connected in series with a multiple speed auxiliary transmission section (14), said main transmission section having a selectable neutral position and said auxiliary transmission section shiftable to a selected one of said multiple auxiliary section ratios, said transmission comprising an input component comprising an input shaft, an input gear (24) adapted to be rotationally fixed to said input shaft, at least one countershaft (26) carrying a plurality of countershaft gears (40,42,44,46) thereon, one of said countershaft gears constantly meshed with said input gear and a plurality of mainshaft gears (50,52,54,65) constantly meshed with other of said countershaft gears; a connection component comprising a mainshaft (28) and a plurality of first mainshaft clutch members (60,62,64) and a second mainshaft clutch member (92) rotationally fixed to said mainshaft, said connecting component independently rotatable of said input component; and an output component comprising an output shaft, said output component independently rotatable of said connection component; said mainshaft gears selectively clutchable one at a time to said mainshaft by first clutch means including said first clutch members; said output component drivingly engageable and disengageable to



said mainshaft by second clutch means including said second mainshaft clutch member; said control system comprising:

a first sensor (98) for providing a first input signal indicative of transmission input shaft (16) rotational speed, a second sensor (102) for providing a second input signal continuously indicative of mainshaft (26) rotational speed and a controllable transmission actuator (112, 70, 96) for controlling shifting of the transmission, said control system characterized by;

means (120, 124/132) for selecting an upshift or a downshift from a currently engaged transmission ratio or from neutral to a selected ratio, and providing a third input signal indicative of said selection; and

a central processing unit (106) for receiving said first, second and third input signals and for processing the same in accordance with predetermined logic rules to issue command output signals, said central processing unit including means to determine and store the initial speed (OS initial) and rate of change of speed (dOS/dt) of the output shaft (90) as functions of the engaged auxiliary section ratio and the value of the second input signal.

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METHOD FOR COMPUTING A VALUE OF SPEED FROM A PULSE SIGNAL

Mitsuru Matsui, Gumma, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gumma, Japan

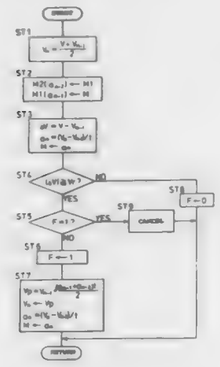
Filed Oct. 21, 1988, Ser. No. 260,977
Claims priority, application Japan, Oct. 21, 1987, 62-265888
Int. Cl.[5] G01P *3/04*
U.S. Cl. 364—426.04 8 Claims

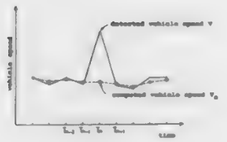
1. A method for obtaining a current vehicle speed value from a detected vehicle speed value, said current vehicle speed value being for use in a vehicle speed control process, and ensuring accurate operation of said vehicle speed control process, said method comprising the steps of:

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computing a predicted current vehicle speed value from a previously computed vehicle speed value;

substituting the resulting predicted value for a current vehicle speed value computed from a current detected vehicle speed value if said current detected vehicle speed value falls outside a predetermined range of values; and





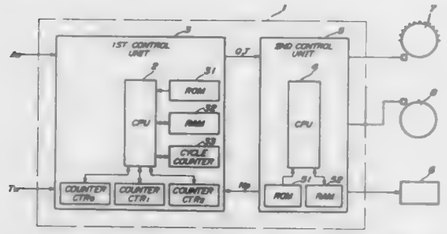
producing a cancel signal for aborting said vehicle speed control process when said current detected vehicle speed value continues to fall outside said predetermined range of values for more than a certain time period.

4,991,101

DATA COMMUNICATION CONTROL SYSTEM

Masataka Ishikawa, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 195,120, May 17, 1988, abandoned.
This application Mar. 28, 1990, Ser. No. 501,422
Claims priority, application Japan, Jun. 19, 1987, 62-152880
Int. Cl.[5] F02D *41/30*; G06F *15/20*
U.S. Cl. 364—431.05 8 Claims



1. In a data communication control system including a first control unit having microcomputer and a second control unit having a microcomputer, said second control unit including means for carrying out a first interrupt processing which starts in accordance with a first timing signal having a first period, and a second interrupt processing which starts in accordance with a second timing signal having a second period, said second control unit includes means responsive to said second interrupt processing to receive data transferred from said first control unit, wherein said first interrupt processing has priority over said second interrupt processing;

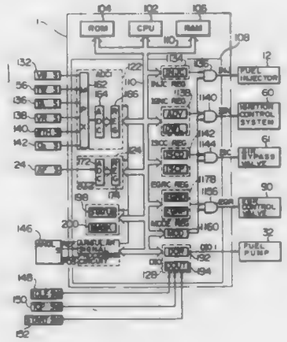
the improvement wherein said first control unit includes means for generating said second timing signal in a manner such that adjacent ones of said second timing signal have values of said second period different from each other, whereby at least one of said adjacent ones of the second timing signal can occur at a time which does not conflict with the first interrupt processing so as to enable the second control unit to carry out the second interrupt processing.

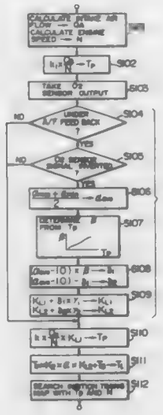
4,991,102

ENGINE CONTROL SYSTEM USING LEARNING CONTROL

Masahide Sakamoto; Takeshi Atago; Junichi Ishii, all of Katsuta; Matsuo Amano, Hitachi, and Nobuo Kurihara, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,815
Claims priority, application Japan, Jul. 9, 1987, 62-171378; Jul. 20, 1987, 62-180668
Int. Cl.[5] F02M *51/00*; F02B *3/04*; F02D *41/26*
U.S. Cl. 364—431.06 20 Claims





11. A method of controlling fuel injection in an internal combustion engine by an engine control system which determines a target air-fuel ratio for controlling said internal combustion engine, said method comprising the steps of:

(a) detecting intake air flow amount and engine speed;

(b) detecting oxygen concentration of exhaust gas of the engine to determine an actual air-fuel ratio;

(c) determining an air-fuel ratio error between the actual air-fuel ratio and said target air-fuel ratio;

(d) storing in a memory secular information indicating changes in input/output characteristics of an air flow amount detector and fuel injectors of the engine;

(e) determining a first compensation factor for compensating for changes in input/output characteristics of said air flow amount detected using said secular information stored in said memory and said air-fuel ratio error;

(f) determining a second compensation factor for compensating for changes in input/output characteristics of said fuel injectors using said secular information stored in memory and said air-fuel ratio error;

(g) calculating a basic fuel injection amount using said first compensation factor, detected engine speed and detected intake air flow amount;

(h) calculating a required fuel injection amount for reducing an error in the air-fuel using the basic fuel injection amount, the second compensation factor and the air-fuel ratio error; and

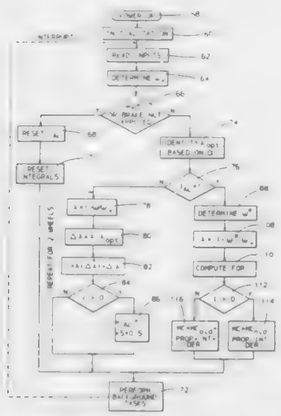
(i) generating a drive signal indicating said required fuel injection amount and applying said drive signal to said fuel injectors.

4,991,103

REAR WHEEL ANTI-LOCK BRAKE CONTROLLER

William C. Lin, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1989, Ser. No. 430,033
Int. Cl.[5] B60T *8/32*
U.S. Cl. 364—426.02 4 Claims



1. A wheel lock control method for a vehicle having left and right rear wheels for transporting the vehicle over a roadway having varying coefficients of friction, each wheel having a brake responsive to a brake pressure for braking the wheel, the method comprising the steps of:

measuring the speeds ω_r and ω_f of the rear wheels;

sensing an incipient lockup condition of either of the rear wheels;

increasing a value of a rear wheel reference speed toward ω_r at a predetermined rate when ω_r is less than ω_f;

increasing the value of the rear wheel reference speed toward ω_f at a predetermined rate when ω_f is less than ω_r; and

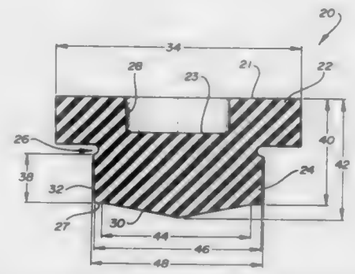
modulating the brake pressure to the brakes of the rear wheels when an incipient lockup condition of one of the rear wheels is sensed based upon the value of the rear wheel reference speed so as to prevent a wheel lockup condition.

4,991,104

COMPUTER GENERATED STOPPER

Henry F. Miller, Clifton, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 320,915, Mar. 7, 1989, abandoned, which is a continuation of Ser. No. 155,432, Feb. 12, 1988, abandoned, which is a division of Ser. No. 947,311, Dec. 29, 1986, Pat. No. 4,741,446. This application Mar. 19, 1990, Ser. No. 496,111
Int. Cl.[5] G06F *15/46*; B65D *47/36*
U.S. Cl. 364—476 3 Claims



1. A method for generating a stopper profile and for generating stoppers from said profile, for sealing containers, from a three-dimensional axisymmetrical computer model, characterized by

(a) selecting in a first selecting step an elastomeric material for said profile;

(b) selecting in a second selecting step a linear modulus for said profile;

(c) selecting in a third selecting step a poissons ratio for said profile;

(d) selecting in a fourth selecting step the desired boundary conditions for said profile;

(e) selecting in a fifth selecting step the desired loading conditions for said profile, including selecting the bottom surface of said stopper profile to have continuous compressive stresses along the entire extent thereof upon insertion of the resulting stopper into a container, and selecting the outer surface of the resulting stopper which is to be in engagement with the walls of the container into which it is inserted to have continuous compressive radial stresses along the entire length thereof with the container walls;

(f) using the information from said five recited selecting steps and generating a three-dimensional axisymmetrical computer model for said profile;

(g) utilizing said three-dimensional axisymmetrical computer model from said generating step to generate a stopper profile;

(h) utilizing, in a second generating step, said generated stopper profile for making a stopper mold; and

(i) utilizing in a third generating step, said mold for forming a plurality of stoppers for sealing containers.

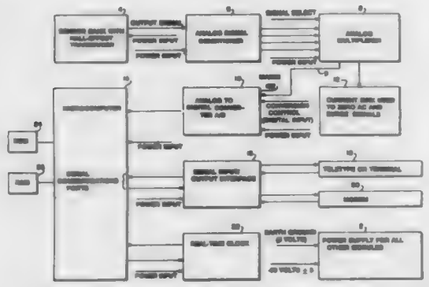
VOL 1123 ISS 1 FEB 5 1991 UMI

4,991,105

MICROPROCESSOR CONTROLLED GROUND SYSTEM MONITOR

LeRoy G. Pimental, Brockway, Pa., assignor to Accu-Scan, Inc., DuBois, Pa.

Filed Dec. 21, 1988, Ser. No. 287,202
Int. Cl.[5] G06F *15/56*; H04M *1/00*
U.S. Cl. 364—483 **29 Claims**



1. For use with electrical equipment having a ground system including a plurality of ground conductors, a ground system monitor comprising:

means for monitoring current on each of said plurality of ground conductors;

processing means for comparing signals indicative of the current on each of said ground conductors with a predetermined threshold;

means for coupling signals indicative of the monitored current on each of said ground conductors to said processing [illegible]

said processing means including means responsive to said means for comparing to initiate generation of a report indicating the current on said ground conductors; and

output means responsive to said processing means for producing said report.

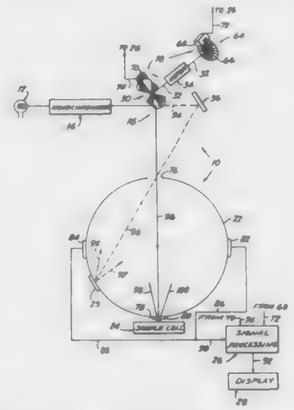
4,991,106

METHOD AND APPARATUS FOR ALIGNING AND ANALYZING SAMPLE AND CONTROL SIGNALS

John Francis X. Judge, Yorktown Heights, N.Y., assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 2, 1983, Ser. No. 471,357
The portion of the term of this patent subsequent to Nov. 5, 2003, has been disclaimed.
Int. Cl.[5] G01R *29/02, 23/16*
U.S. Cl. 364—486 **34 Claims**

1. In apparatus for processing a multiplexed, sample analysis results analog data signal which comprises different information-bearing segments arranged serially in time, and changing at determinable signal transition points, said processing performed through use of a digital control signal which is generated attendant the generation of said analog data signal, the improvements comprising, means for receiving and processing said multiplexed analog data signal and said digital control signal, said means comprising means to align said digital control signal in time with said data signal transition points whereby, the information in each of said data signal segments



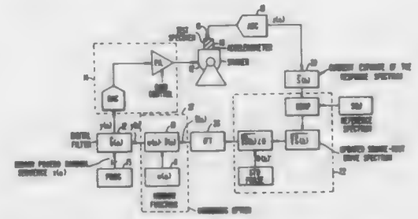
are separately identified and calculated for calculation of the sample analysis results.

4,991,107

VIBRATION CONTROL SYSTEM

Edwin A. Sloane, Los Altos, Calif., assignor to Schlumberger Technologies Limited, Hampshire, England

Filed Dec. 15, 1988, Ser. No. 283,445
Int. Cl.[5] G01N *29/00*
U.S. Cl. 364—508 **3 Claims**



1. A vibrational control system that includes a shaker table for transferring vibrational energy to a device under test (DUT), where the shaker table is energized by a drive signal received from a driver and where the power spectrum of the drive signal is determined by a randomized drive data sequence received by the driver, said system comprising:

a transducer, coupled to the DUT, for indicating a vibrational energy spectral density of the DUT;

an equalizer, coupled to said transducer, for generating an equalized drive data sequence that indicates the difference between the vibrational energy spectral density of DUT and a reference power spectral density, where the power spectral density of the equalized drive data sequence approximates the reference power spectral density;

means for multiplying the equalized drive data sequence by a window function to generate a windowed drive data sequence;

a binary pseudo-random number generator for providing a pseudo-random sequence of numbers;

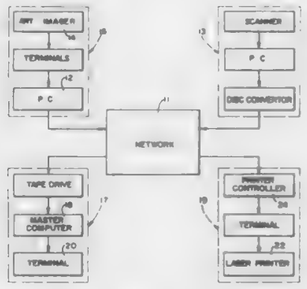
a digital filter, having inputs for receiving said windowed drive data sequence and said pseudo-random number sequence with the impulse response of said digital filter being the windowed drive data sequence, for digitally convolving said pseudo-random sequence and said windowed drive data sequence to generate the randomized drive data sequence characterized by a random amplitude distribution and constant average power.

4,991,108

DATA PROCESSOR PRINTER ARRANGEMENT

Cecil C. Hamilton, 12 Murray Hill Dr., Atco, N.J. 08004

Filed Oct. 6, 1989, Ser. No. 418,338
Int. Cl.[5] G06F *3/00*
U.S. Cl. 364—514 **10 Claims**



1. A system for printing both text and graphics of print shop quality from data processor information, comprising in combination:

art-imager means formed to scan at least one graphic display and convert said graphic display into machine readable signals;

first data processing means connected to said art-imager means and formed to receive and monitor said machine readable signals whereby a user of said system can determine that said machine readable signals satisfactorily represent said graphic display, said first data processing means further formed to process said machine readable signals to provide signals which represent an enhancement of said graphic display and further formed to store said signals which represent an enhancement of said graphic display;

text receiving means formed to receive text information and convert said text information into machine readable signals;

second data processing means formed to provide control signals and to receive said machine readable signals and formed to arrange said machine readable signals into page makeup forms;

laser printer means formed to receive said machine readable signals and formed to respond to said machine readable signals to print both text and graphic displays; and

network means connected to: (1) said first data processing means; (2) said text receiving means; (3) said second data processing means; and (4) said laser printer means, whereby machine readable signals can be transmitted from said first data processing means and from said text receiving means to said second data processing means and whereby said laser printer means is enabled to receive said machine readable signals from said second data processing means to print both text and graphics.

4,991,109

IMAGE PROCESSING SYSTEM EMPLOYING PSEUDO-FOCAL PLANE ARRAY

Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

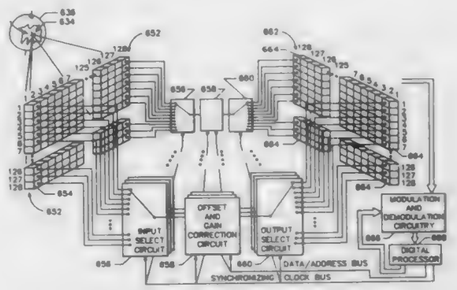
Continuation-in-part of Ser. No. 901,115, Aug. 28, 1986, Pat. No. 4,809,194. This application Feb. 27, 1989, Ser. No. 316,065
Int. Cl.[5] G06F *15/66, 15/70*
U.S. Cl. 364—518 **19 Claims**

15. An image processing system, comprising:

a focal plane array of image detectors, each of said detectors producing an output signal representing a pixel of image data;

a pseudo-focal plane array of storage elements respectively associated with said image detectors for temporarily storing said image data;

means for transferring said image data from said focal plane array to said pseudo-focal array;



a plurality of modulators respectively associated with said storage elements for respectively modulating the image data stored in said pseudo-focal plane array of storage elements;

means for combining the modulated image data; and

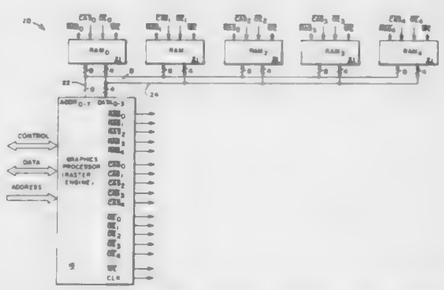
means for demodulating said combined modulated data.

4,991,110

GRAPHICS PROCESSOR WITH STAGGERED MEMORY TIMING

Marc R. Hannah, Menlo Park, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Filed Sep. 13, 1988, Ser. No. 243,788
Int. Cl.[5] G06F *13/40*
U.S. Cl. 364—518 **5 Claims**



1. In a graphics display system having a host processor which provides instructions for providing an image to be displayed, an apparatus for providing pixel information for a raster scan display having pixels arranged in a plurality of horizontal lines to form said raster scan display, comprising:

a plurality of memories;

a graphics processor coupled to said memories;

an address bus coupled to said graphics processor and said memories for coupling a row address and a column address from said graphics processor to said memories for accessing locations in said memories;

a data bus coupled to said graphics processor and said memories for coupling data between said graphics processor and said memories;

said graphics processor providing a separate row address strobe (RAS) signal and a separate column address strobe (CAS) signal to each of said memories and said graphics

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processor providing a write enable signal coupled to all of said memories for writing data into said memories;

said graphics processor providing a separate row address on said address bus sequentially for each of said memories; said graphics processor providing said RAS signals in said staggered fashion to coincide with presence of its corresponding row address to strobe said separate row address into its corresponding memory in said staggered fashion; then, said graphics processor providing a first column address on said address bus and data on said data bus, wherein said first column address for each of said plurality of memories maps into consecutive pixels of said horizontal lines on said display and said separate row addresses map a line having a slope on said display; said processor strobing all CAS signals to strobe in said first column address and data to said memories;

wherein staggering the strobing of either said RAS or CAS signals causes said memories to be accessed in a staggered fashion to transfer data between said graphics processor and said memories, such that overall data transfer rate is faster than a memory cycle of one of said memories.

4,991,111

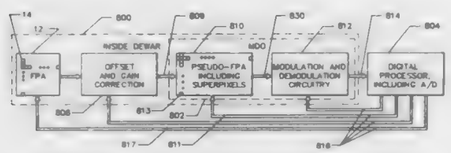
REAL-TIME IMAGE PROCESSING SYSTEM

Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 901,115, Aug. 28, 1986, Pat. No. 4,809,194. This application Feb. 27, 1989, Ser. No. 316,067

Int. Cl.[5] G06F *15/66, 15/70*

U.S. Cl. 364—518 **25 Claims**



10. A real-time image processing system, comprising:

a pseudo focal plane array of image storage devices, each of said storage devices storing and producing a signal representing a pixel of image data;

a plurality of modulators respectively associated with the storage devices and each operative for modulating the signal produced by a corresponding storage device in accordance with a preselected modulation characteristic which is a function of at least one predetermined characteristic of at least one of said pixels in said array of storage devices;

means for combining the modulated signals modulated by said modulators to produce a composite signal having individual modulator components;

means for demodulating said composite signal to derive said one or more predetermined characteristics; and,

processing means for processing said predetermined characteristics derived by said demodulating means.

4,991,112

GRAPHICS SYSTEM WITH GRAPHICS CONTROLLER AND DRAM CONTROLLER

Jean-Michel Callemyn, Nogent Sur Marne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1988, Ser. No. 289,292

Claims priority, application France, Dec. 23, 1987, 87 18041

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—518 **11 Claims**

1. A graphics system comprising in combination:

(a) A dynamic random access memory (DRAM) for storing display information words;

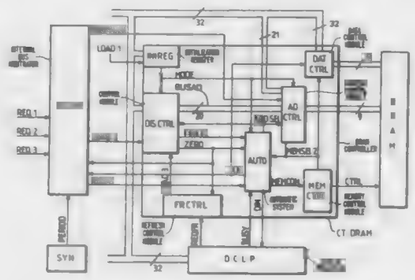
(b) a control microcomputer which provides first single address memory access requests;

(c) a graphic controller which comprises:

(i) a microcomputer interface for coupling said graphics controller to said control microcomputer;

(ii) a graphics processor which provides second single address memory access requests;

(iii) a display processor which provides third single address memory access requests, first multi-address memory access requests and second multi-address memory



access requests, and which comprises a synchronization generator for interfacing said graphics controller to a graphics display;

(d) first arbitrating means for receiving said first, second and third single address memory access requests and for selecting therefrom a preselected request; and

(e) a DRAM controller comprising second arbitrating means for receiving said preselected request, and said first and second multi-address memory access requests and for selecting therefrom an executable request for processing in said DRAM.

4,991,113

THERMAL TRANSFER PRINTER WITH IMAGE DATA PROCESSING

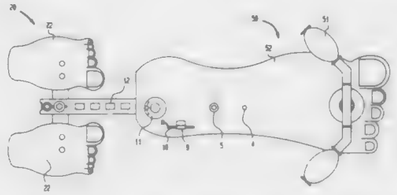
Hiroyuki Kurokawa, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Apr. 3, 1989, Ser. No. 332,807

Claims priority, application Japan, Apr. 5, 1988, 63-83931

Int. Cl.[5] C06K *15/00*

U.S. Cl. 364—519 **13 Claims**



1. A printer of the thermal transfer type for reproducing an original gradated image comprised of individually gradated image elements into the form of a printed gradated image having an image density determined by the number of printed image elements per unit section, the printer comprising: receiving means for receiving successively an input train of gradated image bit data corresponding to the individually gradated image elements; converting means for successively converting the received input train of gradated image bit data into an output train of binary image bit data according to the image density of the original image to be reproduced, said converting means including memory means for storing a plurality of conversion tables each having a different content to be referenced

with when the input train of gradated image bit data is converted into an output train of binary image bit data, and selecting means for selecting one of said plurality of conversion tables; and printing means operative according to the output train of the binary image bit data to selectively print the individual image elements so that the image density of the printed image is represented in terms of the number of printed image elements per unit section.

4,991,114

PRINTER COMPRISING DISPLAY MEANS FOR DISPLAYING OPERATION STATE THEREOF

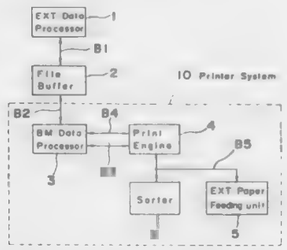
Motomi Kawamura; Yukio Tadauchi; Yoshikazu Ikenoue; Takashi Morikawa, and Ikunori Yamaguchi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1989, Ser. No. 442,640

Claims priority, application Japan, Nov. 30, 1988, 63-304828

Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—519 **10 Claims**



1. A printer for printing data received from an external data processor, comprising:

receipt means for receiving data sent from said external data processor;

storage means for temporarily storing the data received by said receipt means;

processing means for developing image data, responsive to the data stored in said storage means;

print means for printing the image data developed by said processing means on printing paper;

first detection means for detecting that said receipt means is in operation and for outputting a first detection signal when detecting it;

second detection means for detecting that said process means is in operation and for outputting a second detection signal when detecting it;

first display means for displaying that said receipt means is in operation, responsive to the first detection signal; and

second display means for displaying that said processing means is in operation, responsive to the second detection signal.

4,991,115

METHOD OF MAPPING GEOMETRIC ENTITIES FROM A CONTINUOUS PLANE TO A DISCRETE PLANE

Thomas L. Guthrie, Huntington Beach, and Paul K. Stephenson, Anaheim, both of Calif., assignors to Excellon Industries, Inc., Torrance, Calif.

Filed May 16, 1989, Ser. No. 352,562

Int. Cl.[5] G06K *15/00*

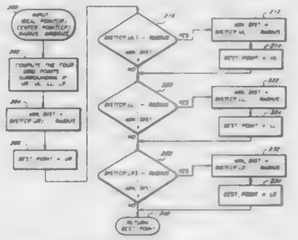
U.S. Cl. 364—520 **5 Claims**

1. A method for generating a pixel at the corner of a rectangle generated by a laser raster-scanning photoplotter on a light sensitive material so that a side of the rectangle is substantially tangential to a circle generated by said photoplotter on said light sensitive material, said circle having a calculated center and a calculated radius in a continuous coordinate system, said method comprising the steps of:

providing an ideal location for said pixel on said light sensitive material, said ideal location being at a calculated location at said calculated radius from said calculated center of said circle in said continuous coordinate system, said ideal location being defined by a pair of orthogonal coordinate dimensions from an origin in said continuous coordinate system, said origin of said continuous coordinate system corresponding to the origin of a pixel coordinate system; and

selecting a plurality of pixels to represent said pixel, said step of selecting said plurality of pixels comprising the steps of:

converting each coordinate dimension of said pair of coordinate dimensions to a number representing the number of pixels from the origin of said pixel coordinate system to said ideal location, said number comprising a whole number, and further comprising a fractional number of pixels when said coordinate dimension does not correspond to an exact number of pixels; and



rounding each of said numbers that includes a fractional number of pixels to the next higher and next lower integer number of pixels to provide up to two numbers for each coordinate, each different combination of numbers representing a potential representative pixel in said pixel coordinate system;

calculating the distance from each of said potential representative pixels to said calculated center of said circle;

comparing the calculated distances of said potential representative pixels with said calculated radius to said center of said circle and selecting as said pixel at the corner of said rectangle a potential representative pixel whose distance to the calculated center of said circle is closest to said calculated radius of said circle; and

outputting data representing said pixel to said laser photoplotter so that said laser photoplotter generates said corner of said rectangle on said photosensitive material.

4,991,116

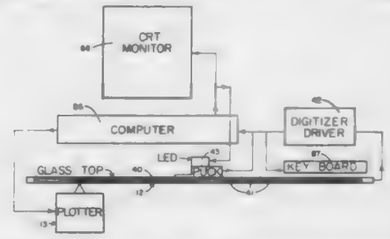
COMBINED DIGITIZER AND PLOTTER FOR COMPUTER AIDED DRAWING

Jack Hohner, N. 2321 Coleman Rd., Spokane, Wash. 99212

Filed Jan. 3, 1990, Ser. No. 460,540

Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—520 **13 Claims**



1. As input and display device for computer aided drawing that plots and edits an image on drawing media simultaneously upon input of drawing data to a central processing unit of a computer, comprising, in combination:

a peripherally defined casement having opposed front and back sides and a top with a rigid transparent top working surface, said casement defining a medial chamber carry-

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ing a plotter, and said top working surface being movably carried to allow access to its undersurface and to the medial chamber defined by the casement and having means for uniquely positioning and positionally maintaining drawing media on its undersurface;

a digitizer having a digitizer field on the casement top working surface, and a puck for movement over the top working surface to input puck position relative to the top working surface to a computer; and

a plotter carried in the chamber defined by the casement, said plotter having a scribing and editing carriage carried by a plotter beam for motion parallel to the plotter beam and said plotter beam carried by linkage for motion perpendicular to the plotter beam, said plotter motion being controlled by computer generated signals and said scribing and editing carriage having scribing means and editing means operatively communicating with the under surface of drawing media carried on the underside of the top working surface.

4,991,117

FIGURE DATA DISPLAY METHOD AND SYSTEM

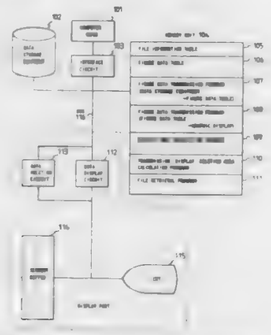
Kazuaki Iwamura, Hachiouji; Shigeru Kakumoto, Kodaira, both of Japan; Rita M. Harder, Bellport, N.Y., and Yasunori Emura, Hirakata, Japan, assignors to Hitachi, Ltd. and Hitachi Seiko, Ltd., both of Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,915

Claims priority, application Japan, Dec. 16, 1987, 62-316260

Int. Cl.[5] G06F *15/06*

U.S. Cl. 364—521 **22 Claims**



1. A figure data display system comprising:

first storage means for storing therein figure data to be displayed, said figure data being divided into a plurality of partial areas;

second storage means for registering therein figure area information comprising a plurality of blocks respectively corresponding to said partial areas, each one of said blocks having a field corresponding to at least a number of data transmissions, at least a fixed length data volume field and file information related to the partial area to which said one block corresponds, and said blocks each having a serial number and being arranged in a sequence according to the serial numbers and corresponding to a sequence of numbers which are respectively allocated to the corresponding partial areas;

searching means for searching for a number from among the serial numbers, said searching means retrieving a file information in said figure area information in order to perform said searching for said number from among the serial numbers;

means for calculating, according to the searched number, an address in said second storage means of a block corresponding to the searched number using said field corresponding to said number of data transmissions and said fixed length data volume field of said blocks; and

means for searching a partial area of the searched number according to said block corresponding to the searched number.

4,991,118

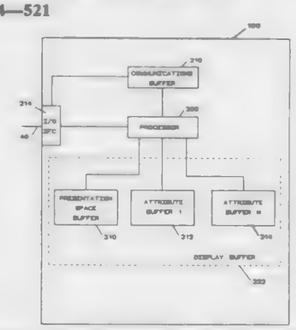
ENHANCED DATA STREAM PROCESSING IN A FIXED FUNCTION TERMINAL

Alex A. Akiyama, Tokyo, Japan; Leah J. H. Busboom, Oronoco, and William J. Maitland, Jr., Rochester, both of Minn., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 17, 1989, Ser. No. 338,997

Int. Cl.[5] G06K *1/00*

U.S. Cl. 364—521 **17 Claims**



1. An enhanced fixed function display, comprising:

a. means for receiving a data stream from a workstation controller;

b. means for parsing said data stream into a presentation space portion and a first attribute portion, wherein said first attribute portion further comprises only changed attributes;

c. means for placing said presentation space portion into a presentation space buffer; and,

d. means for placing said first attribute portion into a first attribute buffer.

4,991,119

PICTURE DISPLAY DEVICE INCLUDING A WAVEFORM GENERATOR

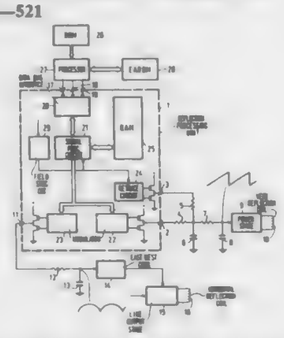
Willebrordus G. Traa, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,410

Claims priority, application Netherlands, Jan. 7, 1988, [redacted]

Int. Cl.[5] G09G *1/10;* **H04N** *3/22*

U.S. Cl. 364—521 **5 Claims**



1. A picture display device including a waveform generator for generating a plurality of periodical waveforms for addressing picture elements of a display screen, said waveforms being given by summation formulas each containing a plurality of adjusting parameters, said picture display device for adjusting

each desired waveform performing the following technical steps:

rendering a first parameter of the desired waveform zero;

determining the other parameters of the desired waveform for obtaining the desired waveform at given locations on the display screen;

based on the previous steps, computing a relationship between the other parameters and the first parameter of the desired waveform;

storing in storage means the values found upon determining the other parameters of the desired waveform, and the relationship between the other parameters and the first parameter of the desired waveform;

determining the first parameter for obtaining the desired waveform at other locations on the display screen; and

determining and storing in the storage means adjusted values of the parameters of the desired waveform at the other locations,

wherein the display device further comprises a processor coupled to the storage means and to the waveform generator for computing new values of the other parameters of the desired waveform upon activation of the picture display device with reference to a new value of the first parameter and the stored values of the parameters of the desired waveform and with reference to the stored relationship, and for applying the new values of the parameters to the waveform generator.

4,991,120

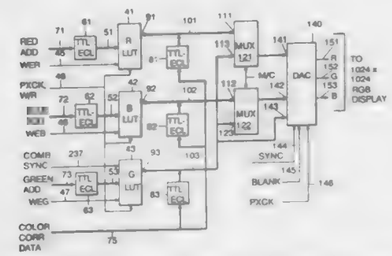
APPARATUS FOR INTERFACING VIDEO FRAME STORE WITH COLOR DISPLAY DEVICE

Joseph A. Vaiana, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1989, Ser. No. 357,831

Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—521 **10 Claims**



1. For use with a digital video data memory containing JxNxMx, K-bit digital codes, each K-bit code being associated with one of a plurality of J colors that are used to define the color contents of an NxM array of image components into which a color image has been subdivided, an apparatus for controllably generating pixel energization signals for application to a color display device having an NxM array of pixels, whereby said color image may be displayed by said color display device, comprising;

a plurality J of look-up table memories, each of which is capable of storing plural, K-bit, color correction codes representative of color correction values associated with one of said J colors;

first means, coupled to said plurality J of look-up table memories, for writing into each look-up table memory plural, K-bit, color correction codes;

second means, coupled to said plurality J of look-up table memories, for coupling, from said digital video data memory, to each respective look-up table memory, NxM, K-bit digital codes for a respective one of said J colors and accessing therefrom NxM, K-bit color correction codes, each of which accessed color correction code is associated with a respective one of the NxM pixels of said display device and wherein said second means further indludes means, coupled to said digital video data memory, for controllably coupling the NxM, K-bit digital codes, supplied therefrom, for a monochromatic mode of operation of said apparatus, to said third means, whereby said third means converts each of the NxM, K-bit digital codes coupled thereto by said second means into a respective pixel energization signal for controlling the excitation of one of the pixels of said NxM pixel array of said display device, so that upon controlling the excitation of the NxM pixels of said display device with NxM pixel energization signals converted by said third means, said display device displays said image in a monochromatic format; and

third means, coupled to said second means, for converting each of the NxM, K-bit color correction codes accessed by said second means from a respective one of said J look-up table memories into a respective pixel energization signal for controlling the excitation of one of the pixels of said NxM pixel array of said display device;

whereby, upon controlling the excitation of the NxM pixels of said display device with NxMxJ pixel energization signals converted by said third means, said display device displays said color image in a color-corrected format.

4,991,121

IMAGE DISPLAY SYSTEM

Nobuo Minoura; Satoshi Iwamatsu, and Katsuo Nakadai, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

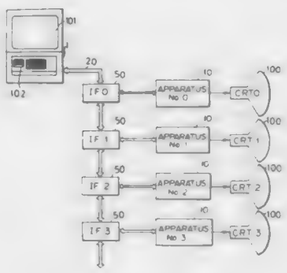
Continuation of Ser. No. 917,951, Oct. 14, 1986, abandoned.

This application May 15, 1989, Ser. No. 353,164

Claims priority, application Japan, Oct. 16, 1985, 60-228907; Feb. 28, 1986, 61-44681

Int. Cl.[5] G06F *15/366*

U.S. Cl. 364—521 **5 Claims**



1. An image display system comprising:

a plurality of display devices arranged in a matrix manner so as to form a complete screen;

a plurality of video signal reproducing apparatus respectively provided correspondingly to said plurality of display devices for outputting a video signal to said plurality of display devices, each of said video signal reproducing apparatus including a magnetic recording medium for storing video signals, rotation drive means for driving said magnetic recording medium to rotate constantly at a predetermined speed, drive means for moving a magnetic head in the radial direction of said magnetic recording medium, and control means for outputting control data for controlling said drive means in accordance with said control data for specifying the feed of said magnetic head so that said video signals stored in an arbitrary track can be output;

a computer for outputting to a bus line specification data for specifying one or more of said video signal reproducing apparatus and said control data to be given to said video signal reproducing apparatus to be specified by said speci-

fication data, so that said video signals can be output from each of said video signal reproducing apparatus; and

a plurality of interfaces provided correspondingly to said plurality of video signal reproducing apparatus for connecting said computer with said plurality of video signal reproducing apparatus, each of said interfaces including setting means for outputting data representing the video signal reproducing apparatus connected therewith, comparison means for comparing said specification data input therein through said bus line from said computer with said data of said setting means and for outputting a signal indicating whether both of said compared data are identical with each other, and control signal generation means for outputting to each of said video signal reproducing apparatus said control data input together with said specification data when a signal indicating that both of said data are identical with each other is output from said comparison means or when said specification data input from said computer specifies all of said video signal reproducing apparatus.

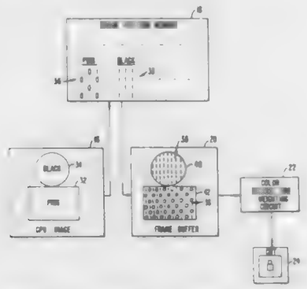
4,991,122
WEIGHTED MAPPING OF COLOR VALUE INFORMATION ONTO A DISPLAY SCREEN

Eugene T. Sanders, Oakland, Calif., assignor to General Parametrics Corporation, Berkeley, Calif.

Continuation of Ser. No. 105,947, Oct. 7, 1987, abandoned. This application Aug. 31, 1989, Ser. No. 401,580

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—521 **25 Claims**



12. An apparatus for mapping a source image into a display having a smaller number of display locations than said source image, comprising:

a frame buffer, each location of said frame buffer being assigned, in accordance with a predetermined pattern, to one of a plurality of color/gray scale values such that each color/gray scale value is assigned to a number of locations greater than the number of said display locations, said predetermined pattern intermixing said color/gray scale values such that each color/gray scale value for each display location is represented by a plurality of frame buffer locations separated by at least one location in either a row or column direction;

means for producing a plurality of color/gray scale patterns, each color/gray scale pattern being a bit pattern designed to produce a desired amount of said color or shade of gray when combined in accordance with said color/gray scale values and weights assigned to said frame buffer locations;

means for writing a representation of said source image into said frame buffer using said color/gray scale patterns such that a plurality of separate elements of said source image are mapped onto a block of proximate frame buffer locations used to represent a single display location; and

means for separately combining, to produce a total amount of each color/gray value, for each display location, from a block of proximate frame buffer locations corresponding to said display location, bits stored in locations which were assigned to said color/gray scale value, each bit being modified by its assigned weight, to produce said total amount of said color/gray scale value for said display location.

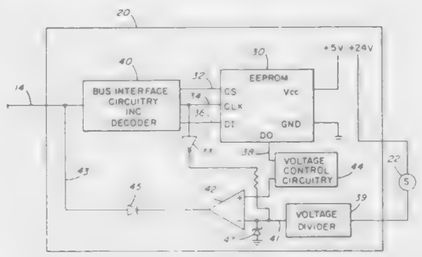
4,991,123
ALARM SYSTEM

Mario D. Casamassima, Mansfield, Mass., assignor to Cerberus A.G., Maennedorf, Switzerland

Filed Jan. 6, 1989, Ser. No. 293,999

Int. Cl.[5] G08B *25/00*

U.S. Cl. 364—550 **29 Claims**



1. A control system having a central processing unit coupled via a bus to a series of peripheral devices, the processing unit adapted to receive data from a first group of the peripheral devices, termed sensor units, and responding to the data received therefrom, comprising:

an Electronically Erasable Programmable Read Only Memory (EEPROM) associated with each sensor unit coupled to the bus, the EEPROM having a plurality of memory locations and programmed so as to respond to instructions in the form of binary op-codes sent over the bus from the processing unit to the sensor units;

the EEPROM programmed with zeros in all memory locations except for an identifying code in a section of memory unique to each EEPROM;

means within the processing unit for sending a read instruction to the EEPROMs over the bus; and

means within the processing unit for reading the data placed on the bus by the EEPROMs in response to a read instruction in order to determine which of said sensor units responded to the read instruction.

4,991,124
SYSTEM AND METHOD FOR ULTRASONIC DETERMINATION OF DENSITY

Bruce R. Kline, Starksboro, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Filed Oct. 11, 1988, Ser. No. 255,900

Int. Cl.[5] G01N *9/00;* **G06F** *15/52*

U.S. Cl. 364—558 **18 Claims**

15. A system for determining density, comprising:

a computer,

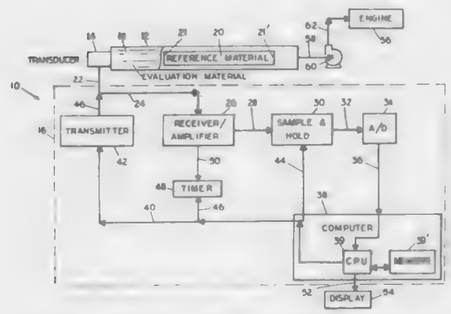
an ultrasonic transducer means,

a fuel tank,

a reference material, and

liquid fuel,

said computer being connected to said transducer, said transducer being connected to said tank, said tank enclosing said reference material and said liquid fuel, said computer comprising a memory and a central processing unit, said computer being connected to said transducer, said reference material having a first sound wave reflective planar side and a second sound wave reflective planar side, the plane of each of said sides being parallel, said first side comprising a forward face and a reverse face, said second side comprising a forward face, said transducer being positioned to transmit interrogation sound waves through said liquid fuel, each said face of said reference material, said reference material being positioned to reflect said interrogation sound waves to provide first, second and third reflected sound waves having a first, second and



third amplitude, whereby said first, second and third reflected sound waves are detected by said transducer means, and said transducer being adapted to send signals representative of said first, second and third amplitudes to said computer to determine the density of said liquid fuel.

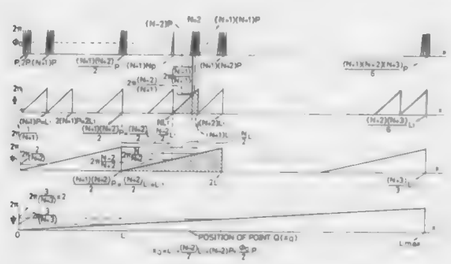
4,991,125
DISPLACEMENT DETECTOR

Souji Ichikawa, Sagamihara, Japan, assignor to Mitutoyo Corporation, Japan

Filed Apr. 19, 1989, Ser. No. 340,451

Int. Cl.[5] G01D *5/34;* **H03M** *1/22*

U.S. Cl. 364—560 **8 Claims**



1. An absolute position displacement detector comprising:

a first member provided with at least three periodic gratings including a minimum pitch grating as a reference grating, each of said gratings having a constant pitch, the constant pitch differing slightly relative to the pitch of said minimum pitch grating from one to the next of said at least three gratings;

a second member provided with a set of periodic gratings corresponding in number and pitch to said gratings of the first member;

means for detecting, with respect to each grating of said first member, primary signals formed by interaction between corresponding said gratings of the first and second members;

means for obtaining secondary signals by calculating phase differences between adjacent primary signals; and

means for obtaining a third signal by calculating phase differences between adjacent secondary signals,

whereby a position number of the secondary signal is determined from a value of the third signal, a position number of the primary signal is determined from a value of the secondary signal, and relative displacement between the first and second members is determined on the basis of the position number and value of the primary signal.

4,991,126
ELECTRONIC-AUTOMATIC ORIENTATION DEVICE FOR WALKERS AND THE BLIND

Lothar Reiter, Johann Strausgasse 27, A-1040 Vienna, Austria

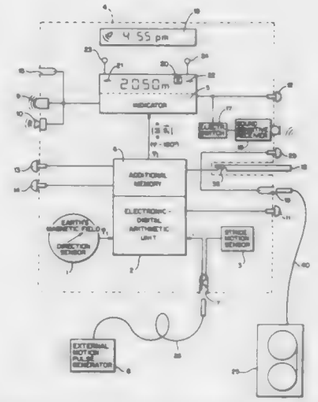
PCT No. PCT/AT87/00035, § 371 Date Nov. 4, 1988, § 102(e) Date Nov. 4, 1988, PCT Pub. No. WO87/07012, PCT Pub. Date Nov. 19, 1987

PCT Filed May 13, 1987, Ser. No. 286,958

Claims priority, application Austria, May 14, 1986, A1289/86; Apr. 22, 1987, A993/87

Int. Cl.[5] G01C *22/00*

U.S. Cl. 364—561 **8 Claims**



1. An electronic-automatic orientation device for individuals having a stride and locomoting from a starting point in a predetermined direction, comprising:

an earth's magnetic field direction sensor for generating an electrical direction signal according to the direction of an individual's progress;

a stride-motion sensor for producing motion signals;

An electronic arithmetic unit for receiving the signals from the direction sensor and the stride-motion sensor,

an indicator means;

said arithmetic unit generating a distance vector from the direction signal and the stride-motion signal, said stride-motion sensor having an electromechanical stride-motion converter for producing stride-counting pulses, said electronic arithmetic unit, when triggered by a stride-counting pulse, generating a stride vector proportional to a respective stride length, said stride vectors being continually summed to a resulting distance vector, the resulting distance vector having a value shown by said indicator means indicating a mementary distance to the starting point, a momentary opposite direction ($\psi - 180°$) of the resulting distance vector being given by said indicator means to indicate the momentary direction toward the starting point;

an electronic memory for storage of one or more distance vectors calculated in the said arithmetic unit and one or more memory keys for triggering a storage process of one or more momentary resulting distance vectors in an additional memory, means for resetting the arithmetic unit at a new starting point so that distance vectors from the new starting point have values which are summed and a momentary opposite direction ($\psi - 180°$) of a resulting distance vector back to this new starting point is given by said indicator means, one or more memory recall keys

being effective, upon reaching the new starting point, to recall the resulting distance vector stored at the previous starting point for transfer from said additional memory to said digital arithmetic unit whereby the momentary opposite direction ($\psi-180°$) of said stored resulting distance vector back to the previous starting point is given by said indicating means.

4,991,127

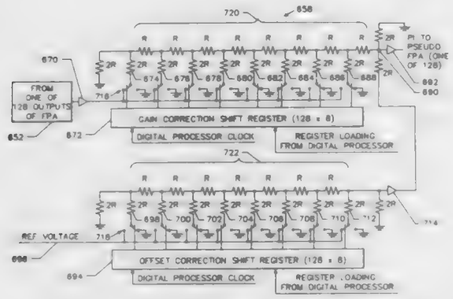
OFFSET AND GAIN CORRECTION SYSTEM FOR IMAGE DATA PROCESSING

Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 901,115, Aug. 28, 1986, Pat. No. 4,809,194. This application Feb. 27, 1989, Ser. No. 316,345

Int. Cl.[5] G06F *15/66, 15/68*

U.S. Cl. 364—571.04 **17 Claims**



11. An offset and gain correction system for correcting a plurality of image data signals produced by radiation-responsive image sensors, comprising:

means for storing a plurality of gain correction values;

means for storing a plurality of offset correction values;

gain correction means coupled with said gain correction storage means for altering each of said plurality of image data signals by predetermined gain correction values stored in said gain correction storing means; and

offset correction means responsive to said offset correction storage means for adding to each one of said plurality of gain corrected signals predetermined offset correction values stored in said offset correction storing means, to thereby provide a plurality of gain and offset corrected signals.

4,991,128

APPARATUS AND METHODS FOR SPECTRAL ANALYSIS OF ELECTRICAL MATERIALS, COMPONENTS AND DEVICES

William A. Evans, Swansea, Wales, and Alan Popplestone, Bexhill-on-Sea, England, assignors to National Research Development Corporation, London, England

Filed Aug. 4, 1988, Ser. No. 228,279

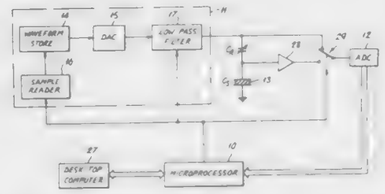
Claims priority, application United Kingdom, Aug. 6, 1987, 8718641

Int. Cl.[5] G01R *29/00*

U.S. Cl. 364—576 **10 Claims**

10. A method of analyzing the response of a circuit to signals of different frequencies, comprising the steps of generating a series of waveforms in which each waveform has a plurality of frequency components with frequencies in a geometric progression but no other significant frequency components, and the waveforms together having frequency components evenly spaced over a logarithmic spectrum,

applying the series of waveforms to a test circuit, and



repeatedly carrying out a respective Fourier analysis on signals received from the test circuit which result from the application of each of the said waveforms thereto.

4,991,129

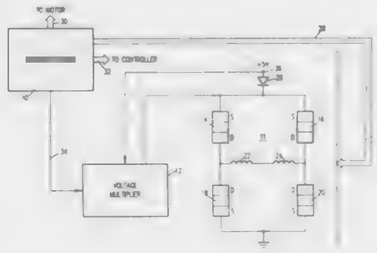
DUAL MODE ACTUATOR FOR DISK DRIVE USEFUL WITH A PORTABLE COMPUTER

Jack S. Swartz, San Jose, Calif., assignor to Areal Technology, Inc., San Jose, Calif.

Filed Jul. 25, 1989, Ser. No. 385,174

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—707 **9 Claims**



1. A portable computer having an associated disk drive including a magnetic head assembly and at least one rotatable magnetic disk comprising:

a dual mode actuator for positioning said magnetic head assembly;

a microcomputer coupled to said actuator for controlling the positioning of said head assembly relative to tracks on a disk surface;

means for supplying electrical power to said actuator;

a voltage multiplier coupled to said power supply means and between said microcomputer and said actuator for boosting the power to said actuator in one mode in response to a control signal from said microcomputer, said multiplier being inactive in a second mode.

4,991,130

NORMALIZATION CONTROL SYSTEM FOR FLOATING POINT ARITHMETIC OPERATION

Shingo Kojima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 25, 1989, Ser. No. 356,457

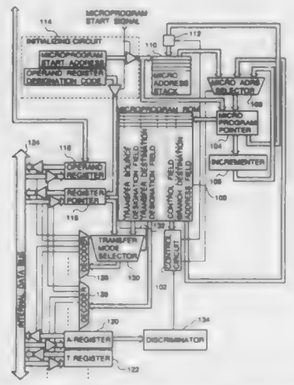
Claims priority, application Japan, May 25, 1988, 63-128843

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—715.04 **2 Claims**

1. A microprogram controlled microprocessor capable of normalizing a given data in a floating point representation includes a memory storing a microprogram, an address register for holding a microprogram start address, an operand register for holding a source operand, a temporary register for temporarily holding an operation data, a pointer for holding a code

indicative of the operand register at the time of starting the microprogram and for indicating a transfer source register in a transfer operation between internal registers, and a discriminator for discriminating whether or not an input source operand is a normalized number, the microprocessor operating on the basis of the microprogram to execute a given operation to the input source operand while causing the discriminator to discriminate whether or not the input source operand is a normal-



ized number, so that the microprogram is completed without a branch when the input source operand is a normalized number, and the microprocessor also operating, when the input source operand is an unnormalized number, to branch to a normalizing program and to cause a normalized operand to be held in the temporary register and a code indicative of the temporary register to be set to the pointer, and then, the microprocessor operating to re-execute the microprogram from the address designated by the address register.

4,991,131

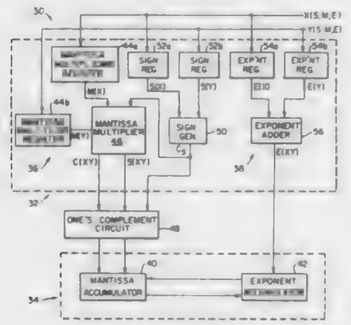
MULTIPLICATION AND ACCUMULATION DEVICE

I-Hau Yeh; Ye-O You, both of Taipei, and Wen-Zen Shen, Hsin Chu, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Oct. 6, 1987, Ser. No. 106,493

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—748 **35 Claims**



1. A multiplication device for forming in two's complement form the product of first and second N-bit input binary numbers, comprising:

a numerical binary offset generation means examining the bit length of one of said first and second input numbers and generating a numerical binary offset of the value $X=(4-2^{-(N-1)})$ wherein N is a positive integer and corresponds to the bit length of said first and second input numbers;

a partial product generating means receiving said first and second input binary numbers and generating therefrom, first and second sets of partial products;

a first addition means adding said binary offset and said first and second sets of partial products to form a product sum portion and a product carry portion; and

a second addition means adding said product sum portion and said product carry portion to form a resultant two's complement product.

4,991,132

APPARATUS FOR EXECUTING DIVISION BY HIGH-SPEED CONVERGENCE PROCESSING

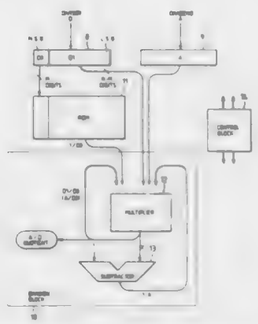
Hiroshi Kadota, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 15, 1988, Ser. No. 285,605

Claims priority, application Japan, Dec. 17, 1987, 62-319442; Feb. 12, 1988, 63-31232

Int. Cl.[5] G06F *7/52*

U.S. Cl. 364—765 **13 Claims**



1. A division apparatus for dividing a dividend A by a divisor D, each said divisor and dividend being a normalized numeric value expressed in a base R numeric system and having N effective digits, where N is an integer, with the most significant digit of said divisor being other than zero, the apparatus comprising:

means for deriving a first approximation value D_0 for said divisor D, where M high order digits of said value D_0 are respectively identical to M high order digits of said divisor and (N−M) low order digits of said value D_0 are each of identical predetermined fixed value and where M is an integer which is greater than zero and less than N, and a value D_1 which is the difference between said divisor D and said first approximation value D_0;

memory means having stored therein a table comprising $(R-1)\cdot R^{(M-1)}$ inverse values corresponding respectively to all possible values of said first approximation value D_0;

control means accessing said inverse value table in accordance with a value represented by said high order M digits of said divisor, to produce as output from said memory means a corresponding one of said inverse values and,

high-speed convergence division means coupled to receive said corresponding inverse value, said value D_1, and said dividend A, and comprising at least multiplier means having a computation precision corresponding to at least N effective digits

wherein said control means further controls said convergence division means to execute successive digital processing steps in accordance with a predetermined convergence division algorithm for obtaining a division quotient A/D.

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4,991,133

SPECIALIZED COMMUNICATIONS PROCESSOR FOR LAYERED PROTOCOLS

Gordon T. Davis; Robert E. Landa; Baiju D. Mandalia; Jan W. van den Berg, and David C. Van Voorhis, all of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,986
Int. Cl.[5] G06F *13/00*
U.S. Cl. 364—900 18 Claims



1. In a communication processor for efficient execution of data processes associated with layered communication protocols, said processor having discrete machine cycles of operation and cooperating with an external memory system containing programs of instructions and data related to said instructions, said data comprising header and frame information for said layered communication protocol processes and said instructions comprising at least instructions of first and second types, instructions of said first type pertaining to the processing of said header and frame information data, said instructions of said second type comprising instructions other than those of said first type, the improvement comprising:

means coupled to said external memory system for retrieving and decoding said instructions;

special purpose logic circuit means coupled to said retrieving and decoding means and said external memory system for performing processes designated by said instructions of said first type, said special purpose logic circuit means being adapted specifically for performing all operations required by each instruction of said first type in a single said machine cycle of operation of said processor; and

general purpose arithmetic logic circuit means coupled to said retrieving means and said external memory system for cooperating therewith to execute processes designated by retrieved instructions of said second type, said general purpose logic circuit means operating under control of said retrieving means for performing functions designated by individual instructions of said second type processor;

said instructions of said first type and the related operations of said special purpose logic circuit means being characterized further in that execution of each such instruction would have required multiple said machine cycles if performed via said general purpose arithmetic logic circuit means.

4,991,134

CONCURRENT SORTING APPARATUS AND METHOD USING FIFO STACKS

Michael Ivsin, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 175,077, Mar. 30, 1988, abandoned.
This application Feb. 20, 1990, Ser. No. 483,286
Int. Cl.[5] G06F *7/24, 7/07*
U.S. Cl. 364—900 26 Claims



1. A concurrent sorting apparatus, for sorting a stream of data elements, each represented by a data value, comprising:

a plurality of comparator stages where each stage includes a single input comparator and a multiple storage means having a successive series of storage locations,

said input comparator of each stage being responsive to the value of an input element for either passing the element on to the next stage or storing the element in the first storage location of the storage means of that stage depending on the value of the element, said storage means storing the element on a first in first out basis and for providing only the last stored element for comparison with an incoming element, and

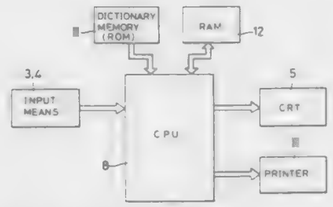
output comparison means coupled to an output of said storage means for said stages for comparing the data value of the elements out of the last storage location in adjacent stages and for passing down from stage to stage to the output the elements having the selective one of lesser or greater value depending on the desired order.

4,991,135

ELECTRONIC DICTIONARY

Motokazu Yoshimura, Nagoya; Tsuyoshi Nishibu, Gifu, and Seiko Ishikawa, Hekinan, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 13, 1985, Ser. No. 733,587
Claims priority, application Japan, May 18, 1984, 59-101387
Int. Cl.[5] G06F *7/00, 12/00*
U.S. Cl. 364—900 6 Claims



1. An electronic dictionary, comprising:

input means for entering input data consisting of at least one character;

display means for displaying said input data;

a dictionary memory storing multiple sets of word data representative of a multiplicity of different words having different numbers of characters, in an alphabetical order, said dictionary memory consisting of a plurality of divisions of equal storage capacity, each of said plurality of divisions having a plurality of memory locations in which the corresponding sets of word data are stored, each of said memory locations having a storage capacity which corresponds to the number of characters of the word represented by the set of word data stored therein, and each of said plurality of divisions having an end memory location storing no part of any of said multiple sets of word data if said end memory location is not large enough to store the next set of word data in alphabetical sequence following the last set of word data stored in the respective division;

search means connected to said dictionary memory and responsive to entry of said input data through said input means, for finding, in a binary search process, one of said plurality of divisions of the dictionary memory which is assigned to store the set word data representative of said input data entered through said input means, said search means sequentially scanning said one of the plurality of divisions to search the set of word data representative of said input data; and

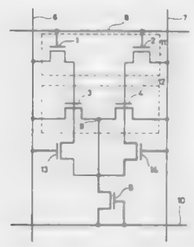
indicator means connected to said search means, for indicating whether said set of word data representative of said input data has been found or not.

4,991,136

SEMICONDUCTOR ASSOCIATIVE MEMORY DEVICE WITH MEMORY REFRESH DURING MATCH AND READ OPERATIONS

Masaaki Mihara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,884
Claims priority, application Japan, Jan. 29, 1988, 63-20762
Int. Cl.[5] G11C *15/00, 11/34, 7/00*
U.S. Cl. 365—49 4 Claims



1. A semiconductor memory device having a content addressable memory cell connected to a word line, a bit line, an inversion bit line and a match line, wherein:

said memory cell comprises:

first control means, including first and second transistors and a control terminal, for applying a first predetermined potential to said control terminal when said first transistor is in an active state and said bit line is at a first level or when said second transistor is in an active state and said inversion bit line is at said first level;

second control means for storing a level of said bit line on a gate capacitance of said first transistor and for storing a level of said inversion bit line on a gate capacitance of said second transistor when said word line is at an activation level;

a first semiconductor element connected between said control terminal and a gate of said first transistor;

a second semiconductor element connected between said control terminal and a gate of said second transistor;

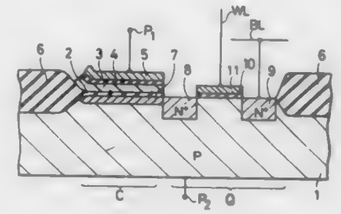
a third semiconductor element connected between said control terminal and said match line, which becomes conductive when said match line is at a second predetermined potential.

4,991,137

SEMICONDUCTOR MEMORY DEVICE

Tetsuro Matsumoto, Tachikawa, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Continuation of Ser. No. 174,974, Mar. 29, 1988, which is a division of Ser. No. 925,223, Oct. 31, 1986, Pat. No. 4,740,920, which is a division of Ser. No. 530,079, Sep. 7, 1983, Pat. No. 4,638,460. This application Dec. 11, 1989, Ser. No. 448,357
Claims priority, application Japan, Sep. 22, 1982, 57-163888
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—149 7 Claims



1. A semiconductor memory device comprising:

a first dynamic memory cell which includes a series connection comprising a switching MISFET and a storage capacitor coupled in series, said storage capacitor comprising a first electrode, a silicon nitride film, and a second electrode;

a second dynamic memory cell which includes a series connection comprising a switching MISFET and a storage capacitor coupled in series, said storage capacitor comprising a first electrode, a silicon nitride film, and a second electrode;

a first bit line which is coupled to one end of said series connection of said first dynamic memory cell;

a second bit line which is coupled to one end of said series connection of said second dynamic memory cell;

a differential amplifier means which is coupled to said first and second bit lines and which supplies a signal having one level of a predetermined high level and a predetermined low level to said first an second bit lines;

a first terminal which is coupled to said differential amplifier means and which is supplied with a first reference voltage having a first level substantially identical with said predetermined high level;

a second terminal which is coupled to said differential amplifier means and which is supplied with a second reference voltage having a second level substantially identical with said predetermined low level; and

a third terminal which is coupled to the other ends of said series connections of said first and second dynamic memory cells and which supplies a voltage which is greater than said second level but less than said first level to said other ends of said series connections of said first and second dynamic memory cells so that a voltage of said storage capacitors of said first and second dynamic memory cells to be stored between said first electrode and said second electrode has a smaller absolute value than an absolute value of said first level.

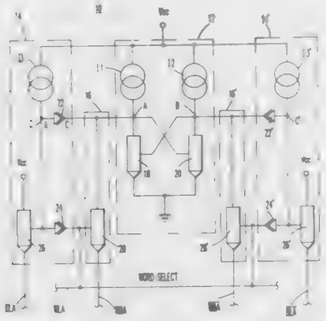
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4,991,138

HIGH SPEED MEMORY CELL WITH MULTIPLE PORT CAPABILITY

Joseph R. Cavaliere, Hopewell Junction, N.Y.; Alan K. Chan, Fort Lee, N.J., and Michel S. Michail, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1989, Ser. No. 331,989
Int. Cl.[5] G11C *11/36*
U.S. Cl. 365—154 **14 Claims**



1. A semiconductor memory cell responsive to a SELECT signal on a word line for outputting stored differential data signals, comprising:

latching means for storing differential data, said latching means including a transistor pair having cross-coupled base-collector terminals connected to operate in a bistable mode such that the on transistor is saturated; and

sensing means connected to each of the base-collector terminals in said transistor pair and responsive to said SELECT signal for sensing the stored differential data, said sensing means including

(a) a first diode having a cathode connected to the base-collector terminal, and

(b) a second diode having an anode connected to the anode of the first diode and a cathode connected to the word line;

the stored differential data being sensed at the commonly connected anodes of said first and second diodes.

4,991,139

SEMICONDUCTOR MEMORY DEVICE

Yasushi Takahashi, Tachikawa; Masamichi Ishihara, Hamura; Kazuhiko Kajigaya, Ohme, and Toshiyuki Sakuta, Hamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,022
Claims priority, application Japan, Aug. 7, 1987, 61-196203; Aug. 25, 1987, 62-211185; Oct. 19, 1987, 62-263495
Int. Cl.[5] B11C *29/00;* **G06F** *11/22*
U.S. Cl. 365—201 **12 Claims**

1. A semiconductor memory device comprising:

a plurality of data lines;

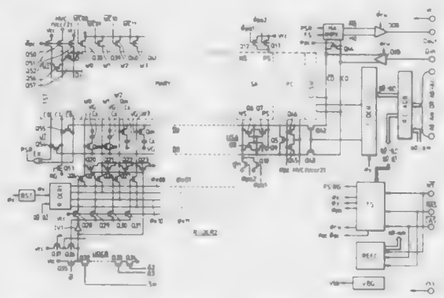
a plurality of memory cells provided corresponding to each data line;

a common data line coupled in common to the plurality of data lines;

a main amplifier coupled between the common data line and a data output terminal; and

detecting means coupled to the plurality of data lines,

wherein the detecting means includes a plurality of MOSFETs each having a gate connected to a respective data line, and wherein said detecting means further includes a



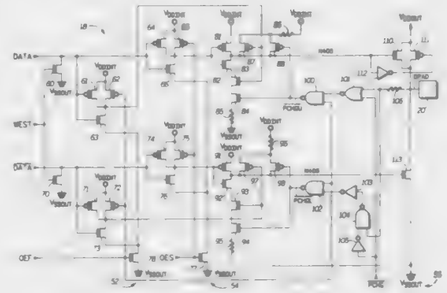
logic circuit for determining whether the data lines are substantially equal in potential.

4,991,140

INTEGRATED CIRCUIT MEMORY WITH IMPROVED DI/DT CONTROL

Karl L. Wang, and Ray Chang, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1990, Ser. No. 460,776
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—203 **13 Claims**



1. An integrated circuit memory comprising:

a plurality of memory cells located at intersections of a plurality of word lines and a plurality of bit line pairs, each memory cell selected by an enabled word line and an enabled bit line pair, and providing a pair of complementary bit line signals when selected;

row decoding means coupled to said word lines, for enabling a word line in response to a plurality of row address signals;

column decoding means coupled to said plurality of bit line pairs, for enabling a bit line pair in response to a plurality of column address signals;

address transition detection means, for providing first and second precharge signals in response to a change in logic state of either, at lest one of said plurality of row address signals and said plurality of column address signals, or at least one control signal, said second precharge signal being provided after said first precharge signal; and

output buffer means, coupled to said column decoding means and to said address transition detection means, for providing a data output signal at a voltage substantially between a logic high voltage and a logic low voltage in response to said second precharge signal and a sensed voltage on said data output signal, and for providing said data output signal at either said logic high voltage or said logic low voltage corresponding to a voltage on said

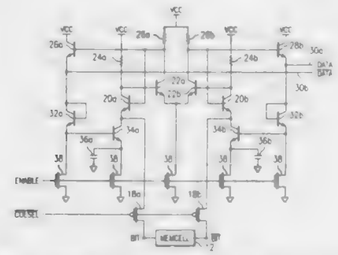
enabled bit line pair in response to a negation of said first precharge signal.

4,991,141

SENSE AMPLIFIER AND METHOD FOR SENSING THE OUTPUTS OF STATIC RANDOM ACCESS MEMORY CELLS

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 8, 1990, Ser. No. 477,088
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—207 **21 Claims**



6. A sense amplifier for use with a column of memory cells, each cell in the column having a pair of complementary outputs connected to respective bit lines of a pair of bitlines forming each column, comprising:

a first preamplifier transistor coupled to a first bitline of a column of memory cells;

a second preamplifier transistor coupled to a second bitline of a column of memory cells;

first and second emitter coupled amplifier transistors forming a differential amplifier, said first amplifier transistor coupled to said first preamplifier transistor, and said second amplifier transistor coupled to said second preamplifier transistor;

said amplifier transistors including first and second sense amplifier outputs;

a first feedback circuit providing a first feedback path from a said sense amplifier output to said first preamplifier transistor; and

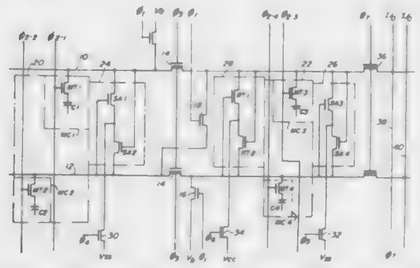
a second feedback circuit providing a second feedback path from another said sense amplifier output to said second preamplifier transistor.

4,991,142

DYNAMIC RANDOM ACCESS MEMORY WITH IMPROVED SENSING AND REFRESHING

Chen Y. Wang, San Jose, Calif., assignor to Samsung Semiconductor Inc., San Jose, Calif.

Filed Jul. 20, 1989, Ser. No. 382,581
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—208 **7 Claims**



1. A sense and restore circuit for a dynamic memory containing first and second memory cell arrays, each memory cell array having a plurality of memory cells attached to a bit line and complement bit line, each memory cell containing a storage capacitor for storing data and a storage transistor for transferring said data upon receipt of a word line address signal to either said bit line or said complement bit line, said sense and restore circuit comprising:

sensing means connected between said bit line and said complement bit line for sensing said data from one of said memory cells after receipt of said word address signal, said sensing means comprising:

a first pair of cross coupled n-channel transistors disposed between said first and second memory cell arrays and connected between said bit line and said complement bit line that are enabled with a first sensing signal, and

a second pair of cross coupled n-channel transistors connected between said bit line and said complement bit line that are enabled with a second sensing signal; and

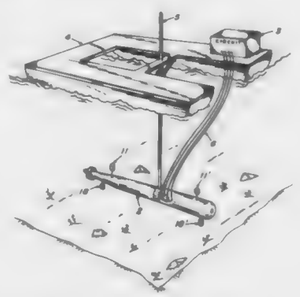
restoring means connected between said bit line and said complement bit line for restoring said data in said one memory cell upon receipt of a restoring signal that follows said second sensing signal, said restoring means comprising only one pair of cross coupled p-channel transistors connected between said bit line and said complement bit line.

4,991,143

MOBILE TARGET ACOUSTIC SYSTEM

Rene N. Foss, and Edward W. Early, both of Seattle, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1967, Ser. No. 694,026
Int. Cl.[5] H04K *3/00*
U.S. Cl. 367—1 **16 Claims**



1. An acoustic target simulator comprising

a receiver mounted on the simulator;

a transmitter mounted on the simulator;

circuit means connecting the receiver to the transmitter;

an evasive action programmer; and

an evasive action circuit connected to said receiver, transmitter and programmer operable upon receipt of a signal from the receiver to disconnect the receiver from the transmitter and to activate said evasive action programmer.

4,991,144

DOPPLERIZED ECHO REPEATER

Keith E. Geren, and Ray M. Marklnd, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

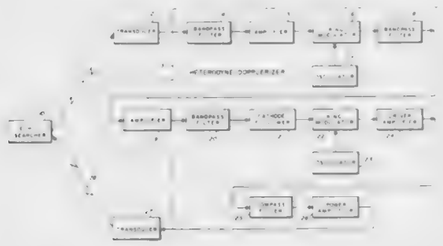
Filed Mar. 29, 1963, Ser. No. 269,211
Int. Cl.[5] H04K *3/00*
U.S. Cl. 367—1 **3 Claims**

1. A broadband dopplerized sonar echo repeater comprising in combination,

a first transducer,

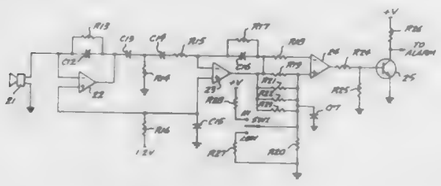
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a first bandpass filter coupled to the output of said first transducer,
a first amplifier connected to the output of said first bandpass filter,
a first ring modulator having a pair of inputs and an output, with one of the inputs thereof coupled to the output of said first amplifier,
a first oscillator coupled to the other input of said first ring modulator,
a second bandpass filter coupled to the output of said first ring modulator,
a second amplifier connected to the output of said second bandpass filter,
a third bandpass filter connected to the output of said second amplifier,



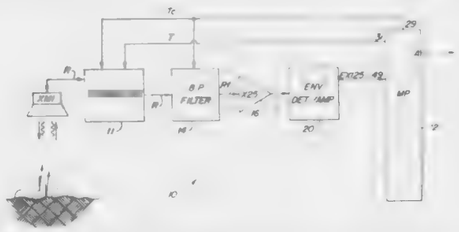
a cathode follower coupled to the output of said third bandpass filter,
a second ring modulator having a pair of inputs and an output, with one of the inputs thereof connected to the output of said cathode follower,
a second oscillator coupled to the other input of said second ring modulator,
a driver amplifier connected to the output of said second ring modulator,
a low pass filter connected to the output of said driver amplifier,
a power amplifier coupled to the output of said low pass filter, and
a second transducer connected to the output of said power amplifier.

4,991,145
INFRA-SONIC DETECTOR AND ALARM WITH SELF ADJUSTING REFERENCE
Steven G. Goldstein, Los Angeles; James E. Randall, Villa Park; Joseph A. Dattilo, Manhattan Beach, and Gary E. Vanyek, Huntington Beach, all of Calif., assignors to Rabbit Systems, Inc., Santa Monica, Calif.
Continuation-in-part of Ser. No. 288,530, Aug. 30, 1988, Pat. No. 4,890,265. This application Jun. 2, 1989, Ser. No. 361,027
Int. Cl.[5] G08B *13/22*
U.S. Cl. 367—94 **8 Claims**



1. An infra-sonic detector and alarm system for detecting intrusion in a monitored air space comprising:
a transducer for sensing air pressure variations in the monitored space and producing an electrical air pressure variation signal;
amplifier means for amplifying electrical air pressure variation signal;
bandpass filter means for passing only infra-sonic portions of the electrical air pressure variation signal between approximately 5 Hz and 12 Hz;
a self-adjustable reference circuit for providing a self-adjustable reference signal in response to slow air pressure variations due to atmospheric phenomena,
comparator means for comparing the instantaneous infra-sonic signal portions of the electrical air pressure variation signal to said self-adjustable reference signal for generating a trigger signal when said instantaneous infra-sonic portions exceed the self-adjustable reference signal; and
alarm means activated by said trigger signal.

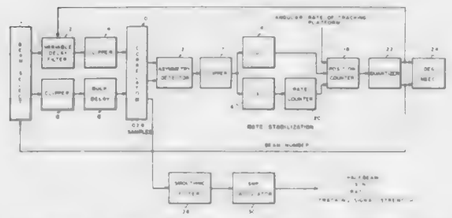
4,991,146
INTRUSION DETECTION SYSTEM
Bill J. Ransdell, Moline, Ill., and James J. Phelan, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Nov. 30, 1989, Ser. No. 443,684
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—98 **5 Claims**



1. A system for detecting intrusions into an area to be monitored, the system comprising:
means for periodically directing a transmit signal into the area so that a plurality of echo signals will be reflected from objects intruding into the area;
means for receiving echo signals reflected by an object or objects in the area;
means for generating a signature data array derived by cumulatively processing an initial set of signature echo signals, the means for generating a signature data array comprising means for generating and storing an initial signature data array having a plurality of data bits corresponding to segments of the echo signals, and means for comparing each signature echo signal segment to a signature threshold value and for replacing a corresponding initial data bit value with a flag value if said segment exceeds the threshold value; and
means for comparing non-signature data representing non-signature echoes received after reception of said signature echo signals to the signature data array and for generating an alarm signal when the non-signature data differs from signature data.

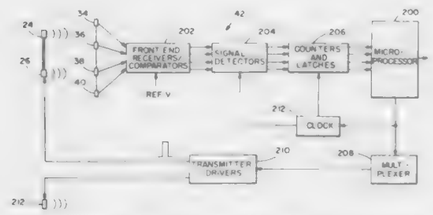
4,991,147
PREFORMED BEAM TRACKER
Winslow R. Remley, Fairfax Station, Va., and Michael N. Witlin, Vestal, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
• Filed Apr. 26, 1973, Ser. No. 355,347
Int. Cl.[5] G01S *3/80, 3/28*
U.S. Cl. 367—123 **6 Claims**

1. In a half-beam digital target tracking apparatus having means for generating target indicating signals comprising a plurality of half-beam pairs, the improvement comprising:
means for selecting half-beam pairs,
a variable delay digital filter for advancing or delaying the time registration of the signal content of one half-beam relative to the other half-beam,
error responsive means for sensing and averaging a difference in time registrations of the two half-beam signals by



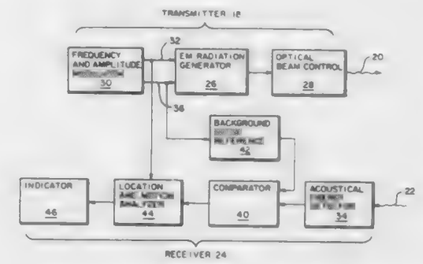
adjusting a delay synthesized by said variable delay digital filter,
and computing means for computing the direction to a particular target from a particular delay synthesized by the variable delay digital filter.

4,991,148
ACOUSTIC DIGITIZING SYSTEM
Ian R. Gilchrist, 2318 Springlake Dr., Timonium, Md. 21093
Filed Sep. 26, 1989, Ser. No. 412,885
Int. Cl.[5] G08C *21/00*
U.S. Cl. 367—124 **19 Claims**



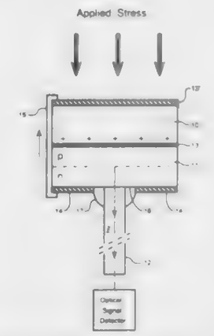
1. An acoustic position sensing apparatus for determining the position of an indicator in relation to a datum surface, said apparatus comprising:
acoustic point source transmission means on said indicator, for transmitting a sequence of periodic acoustic oscillations;
a plurality of acoustic receivers positioned about said datum surface for receiving said acoustic oscillations;
Comparator means connected to each acoustic receiver for converting said received acoustic oscillations to squared waves having logical up and down levels and step transitions therebetween;
Detection means coupled to each said comparator means for determining from at least a leading portion of a squared wave that said squared wave has resulted from an acoustic oscillation generated by said acoustic point source transmission means, and providing an output upon making such a determination, which is indicative of an occurrence of a step transition of said squared wave; and means responsive to said outputs from said detection means for finding the position of said indicator.

4,991,149
UNDERWATER OBJECT DETECTION SYSTEM
Bruce S. Maccabee, Sabillasville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 7, 1989, Ser. No. 447,321
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—128 **15 Claims**



1. A system for detecting an object within a surrounding medium in contact therewith, including a platform, signal energy emitting means mounted on the platform for transmission of radiation to the object through said surrounding medium, modulating control means connected to the signal energy emitting means for effecting generation of acoustical energy adjacent the object in response to absorption of the radiation therein unidirectionally transmitted from the platform, receiver means on the platform for detection of the acoustical energy generated adjacent the object and analyzer means operatively connected to the receiver means for indicating location of the object relative to the platform in response to said detection of the acoustical energy, said generation of the acoustical energy being effected by surface heat produced on the object in response to absorption therein of the transmitted radiation causing localized volumetric expansion of the surrounding medium in contact with the object.

4,991,150
ELECTROLUMINESCENT OPTICAL FIBER SHOCK SENSOR
Michael R. Wixom, 421 S. Seventh St., Apt. #1, Ann Arbor, Mich. 48103
Filed Aug. 10, 1989, Ser. No. 392,052
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—140 **31 Claims**



1. A dynamic mechanical stress transducer comprising a piezoelectric material and an electroluminescent material in electrical communication with the piezoelectric material, an optical fiber waveguide in optical communication with the electroluminescent material whereby the electrical response of

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the piezoelectric material to mechanical stress induces an electric current through the electroluminescent material causing the electroluminescent material to emit light at an intensity in proportion to the magnitude and rate of change of applied stress, said light guided through the optical fiber.

4,991,151

ELASTIC PULSE GENERATOR HAVING A DESIRED PREDETERMINED WAVE FORM

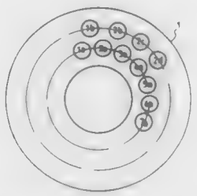
Jacques Dory, Coupvray, France, assignor to EDAP International, France

Continuation-in-part of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application Apr. 28, 1988, Ser. No. 187,177

Claims priority, application France, Apr. 28, 1987, 87 05980

Int. Cl.[5] H04R *1/02*

U.S. Cl. 367—150 **10 Claims**



1. An elastic pulse generator comprising:
(a) at least two transducer elements electrically isolated from each other and having different transfer functions,
(b) electric signal generator means driving said transducer elements for generating from each said transducer element an elastic signal beam, each said elastic signal beam having a different frequency spectrum,
(c) phase shifting means for mutually phase shifting each said elastic signal, and
(d) focusing means for focusing each said elastic signal beam at a common focal region.

4,991,152

ELECTROACOUSTIC TRANSDUCER, USABLE IN PARTICULAR AS A SOURCE OF ACOUSTIC WAVES FOR SUBMARINE APPLICATIONS

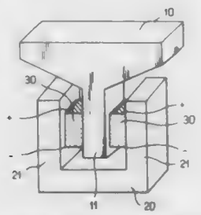
Michel Letiche, Antibes, France, assignor to Thomson CSF, Puteaux, France

Filed Jul. 7, 1989, Ser. No. 380,478

Claims priority, application France, Jul. 8, 1988, 88 09302

Int. Cl.[5] H04R *17/00*

U.S. Cl. 367—158 **11 Claims**



1. An electroacoustic transducer, comprising a radiating horn, a rear mass and a motor formed by at least one piezoelectric element interposed between said horn and said rear mass, and electrically excited so as to produce a vibration transmitted to the horn, in which said piezoelectric element is submitted to an electric field having a direction perpendicular to the main direction of polarization of the piezoelectric material so as to stress said piezoelectric material in accordance with a shear mode, wherein:
said horn and said rear mass are terminated one in the form of a rectilinear foot and the other in the form of a U accommodating said foot between rectilinear arms, said foot and said arms extending parallel to the longitudinal direction of the transducer, and
said motor comprises substantially parallelepipedal piezoelectric elements disposed between facing sides of the foot and of each arm, said piezoelectric elements being fitted with electrodes creating an electric field parallel to said longitudinal direction, and the shape of said piezoelectric elements being chosen so as to strain the piezoelectric material substantially in said longitudinal direction.

4,991,153

VIBRATION TYPE TRANSDUCER

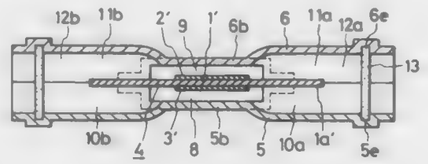
Michihiko Tsuruoka; Wataru Nakagama, and Naohiro Kounosu, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 129,308, Dec. 7, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,431

Claims priority, application Japan, Dec. 17, 1986, 61-300273; Apr. 24, 1987, 62-101624

Int. Cl.[5] H01L *41/04, 41/08*

U.S. Cl. 367—172 **6 Claims**



1. An apparatus for detecting the resonant frequency of a vibratory member in contact with a fluid, comprising:
a housing having an interior chamber;
a substantially planar vibratory member mounted in said housing, said vibratory member having opposite first and second sides and disposed in said interior chamber of the housing to define a first and second cavity, each of said first and second cavities having substantially the same volume;
means integral with said housing for establishing equal flow communication between the fluid in contact with said first and second sides; and
resonant frequency detection means responsive to said fluid contact and operatively coupled to said vibratory member for detecting the resonant frequency of said vibratory member.

4,991,154

TIMEPIECE

Norberto Perucchi, St. Blaise, Switzerland, assignor to Gianni Bulgari S.p.A., Rome, Italy

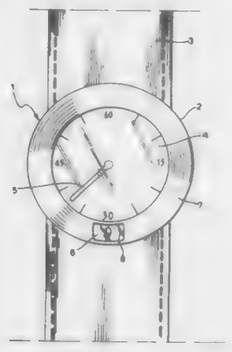
Filed Feb. 1, 1989, Ser. No. 304,450

Claims priority, application Italy, Feb. 1, 1988, 67062 A/88

Int. Cl.[5] G04B *19/00*

U.S. Cl. 368—76 **7 Claims**

1. A timepiece comprising a case, a timepiece mechanism situated within the case, and display means driven by the timepiece mechanism for displaying the hour and the minute at a given moment,
said display means comprising minute means of an analog type for displaying the minute at a given moment, the minute means being constituted by a hand rotated at the rate of one revolution per hour by the timepiece mechanism, while hour means for displaying the hour at a given moment are a digital type, the hour means comprising a rotating display member for displaying a figure indicative of the hour at a given moment and drive means for driving the display member which are adapted to rotate the display member in jerks at intervals of one hour, said drive means for rotating the display member for displaying the hour at a given moment comprises a spring device for storing, during the passing of the hour, the energy necessary for the hourly jerk of the display member, and a movable anchor device which is independent of the spring device, for preventing the rotation of the display member during the passing of the hour but enabling it to jerk into the new display position and subsequently stop at every change of hour, said spring device including:
a first gear rotated at the rate of one revolution per hour by the timepiece mechanism,



a second gear meshed with the first gear and having a larger diameter than the latter,
a ring gear connected to the member for displaying the hour at a given moment,
a third gear meshing with the ring gear and coaxial with the second gear,
a coil spring having one end connected to the second gear and its opposite end connected to the third gear,
an anchor mounted for pivoting between two end positions and provided with two stop members adapted to engage, in the two end positions respectively, engagement surfaces provided in equiangularly-spaced positions on the ring gear in order to stop the display member in the positions for displaying the hours at given moments, and
an eccentric transmission driven by the timepiece mechanism for causing the pivoting of the anchor.

4,991,155

TIMER

Ueda Ken, Soraku, Japan, assignor to Sharp Corporation, Osaka, Japan

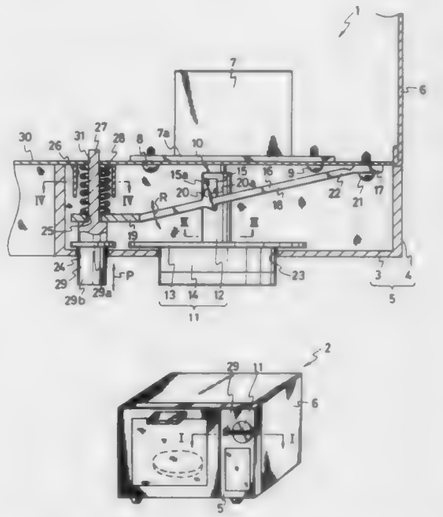
Filed Mar. 19, 1990, Ser. No. 495,891

Claims priority, application Japan, Mar. 20, 1989, 1-31657[U]

Int. Cl.[5] H01H *7/08;* **G04F** *8/00*

U.S. Cl. 368—107 **5 Claims**

1. A timer comprising:
a timer body which has an operating shaft capable of angularly rotating around an axis thereof from an original position, and outputs a continuous electrical signal only for a period of time during which the operating shaft returns from a desired angular position to the original position after the operating shaft has been rotated from the original position to the desired angular position,
a knob provided at one end of the operating shaft,
a push button capable of being pressed to a predetermined distance, and



driving means for rotating the operating shaft from the original position by an angle corresponding to a distance to which the push button is pressed.

4,991,156

ELECTRONIC TIME MEASURING APPARATUS INCLUDING PAST RECORD DISPLAY MEANS

Fusao Suga, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 29,531, Mar. 23, 1987, Pat. No. 4,831,605. This application Dec. 15, 1988, Ser. No. 284,938

Claims priority, application Japan, Mar. 25, 1986, 61-64879; Mar. 25, 1986, 61-64880

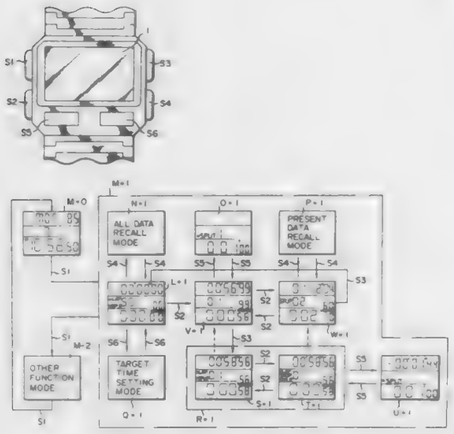
Int. Cl.[5] G04F *8/00*

U.S. Cl. 368—113 **8 Claims**

1. An electronic stop watch, comprising:
means for generating a reference clock signal;
elapsed time measuring means for obtaining elapsed time date by counting said reference clock signal;
start/stop control means for controlling said elapsed time measuring means so as to start or stop counting of said reference clock signal;
a first operation switch arranged to be operated while said elapsed time measuring means counts said reference clock signal under control of said start/stop control means;
memory means for storing a plurality of elapsed time data items, each obtained by operating said first operation switch while said reference clock signal is counted by said elapsed time measuring means, and a plurality of elapsed finish time data items, each obtained when said elapsed time measuring means stops counting said reference clock signal under the control of said start/stop control means;
clear means for clearing said elapsed time data obtained by said elapsed time measuring means;
a second operation switch; and
a display means for displaying at least one of best time data, worst time data, and average time data among said plurality of elapsed time data items, when said second operation switch is operated before said elapsed time data are cleared by said clear means, and for displaying at least one of best time data, worst time data, and average time data

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among said plurality of elapsed finish time data items stored in said memory means, when said second operation



switch is operated after said plurality of elapsed time data are cleared by said clear means.

4,991,157

OPTICAL INFORMATION STORAGE APPARATUS

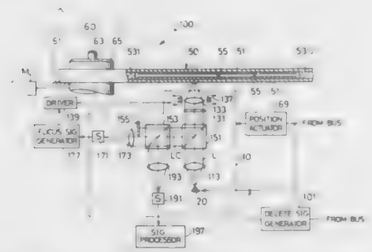
Junichi Ohtomo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 137,944, Dec. 28, 1987, Pat. No. 4,825,419. This application Mar. 9, 1989, Ser. No. 321,259

Claims priority, application Japan, Dec. 27, 1986, 61-311887

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—218 **12 Claims**



1. An apparatus for processing information recorded on an optical memory as information pits, comprising:

optical head means for extracting said information from said optical memory by utilizing changes in reflectivity due to said information pits; and

means for explicitly deleting said information by superimposing deletion pits upon said information pits on said optical memory, said deletion pits having different reflectivity from said information pits.

4,991,158

OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

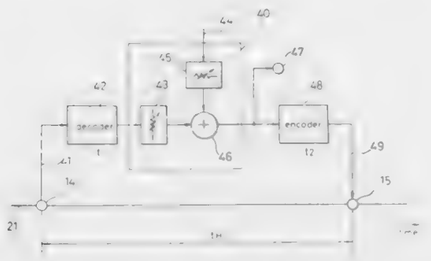
Akira Wada, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,523

Claims priority, application Japan, Mar. 11, 1988, 63-56173; May 31, 1988, 63-135143

Int. Cl.[5] G11B *13/04*

U.S. Cl. 369—13 **9 Claims**



1. An optical information recording and reproducing apparatus for recording and reproducing information optically against recording material, comprising:

means for generating a first light beam for reproducing and erasing information which is previously recorded in said recording material;

means for providing a second light beam for recording new information into said recording material; and

irradiation of said first light beam and said second light beam to an arbitrary particular point on said recording material being conducted in the order of said first light beam and subsequently said second light beam.

4,991,159

TIME DISPLAY DEVICE FOR AN APPARATUS FOR PLAYING INFORMATION RECORDED ON AN OPTICAL DISK

Haruhisa Tomoda, Neyagawa, and Yasuomi Shimada, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 4, 1987, Ser. No. 128,911

Claims priority, application Japan, Jan. 13, 1987, 62-5371; Jan. 13, 1987, 62-5372

Int. Cl.[5] G11B *31/00*

U.S. Cl. 369—19 **1 Claim**

1. A time display device for an apparatus for playing audio information recorded on an optical disk, said time display device comprising:

a playing time input means for specifying a total playing time of the apparatus;

a time storage means for storing said total playing time specified by said playing time input means;

a playing portion input means for specifying portions of the disk which are to be played by the apparatus;

a disk portions storage unit for storing said portions of the disk specified by said playing portion input means;

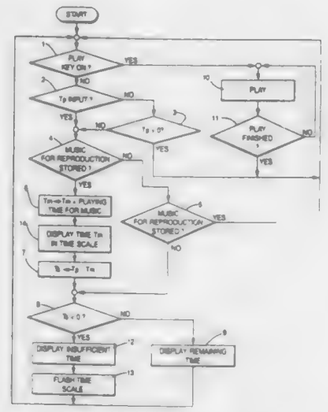
a time adding means for obtaining a sum of playing times of said portions of the disk specified by said playing portion input means;

a subtracting means for subtracting said sum of playing times of said portions of the disk specified by said playing portion input means from said total playing time specified by said playing time input means to thereby obtain a subtracted value;

a time display means for numerically displaying said subtracted value;

a time scale display means for converting said sum of playing times of said portions of the disk specified by said playing

portion input means into time scale display data, and for displaying said sum of playing times in a time scale manner in accordance with said time scale display data; and,



a means for repetitively turning on and off a portion of said time scale displayed by said time scale display means when said subtracted value is a negative value, wherein a length of said portion of said time scale is determined in accordance with an absolute value of said subtracted value.

4,991,160

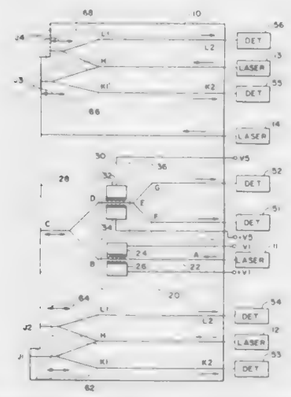
INTEGRATED OPTICAL DEVICE FOR MAGNETO-OPTICAL RECORDING AND READING HEAD

Zahirudeen Premji, Boulder, Colo., assignor to Nikon Precision Inc., San Bruno, Calif.

Continuation of Ser. No. 200,527, May 31, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 483,297

Int. Cl.[5] G11B *11/14, 7/125*

U.S. Cl. 369—44.12 **34 Claims**



1. An integrated optical device for magneto-optic recording and/or reading, comprising:

a substrate;

waveguide means provided on said substrate for transmitting a light energy beam and including one end portion exposed to the outside of said substrate, a first waveguide section lying along a surface of said substrate from said one end portion and a second waveguide section lying along said surface and branched from said first waveguide section;

means for supplying a polarized light energy beam into said first waveguide section toward said one end portion;

means for receiving a light energy beam entered from said one end portion and passed through said second waveguide section; and

means for controlling the light amount arriving at said light receiving means in response to the polarization.

4,991,161

APPARATUS FOR SUPPORTING OBJECTIVE LENS MOVABLY IN TWO ORTHOGONAL DIRECTIONS

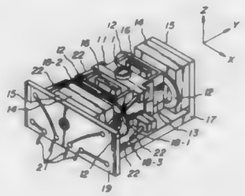
Tetsuo Ikegame, and Ichiro Ikari, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 29, 1989, Ser. No. 330,380

Claims priority, application Japan, Mar. 29, 1988, 63-75765

Int. Cl.[5] G02B *7/02;* **G11B** *7/00*

U.S. Cl. 369—44.150 **8 Claims**



1. An apparatus for supporting an objective lens for projecting a light beam onto an object movably at least in first and second orthogonal directions comprising

a lens holder to which the objective lens is secured such that an optical axis of the objective lens is aligned with said first direction;

a stationary member for supporting the lens holder; and

a first pair of resilient wires and a second pair of resilient wires arranged between the lens holder and the stationary member, said first pair of resilient wires being arranged closer to said object than said second pair of resilient wires, said resilient wires being extended not in parallel with each other such that the resilient wires or extensions of the wires intersecting with each other at points which are aligned with each other in the first direction, and said resilient wires being arranged symmetrically with respect to a plane which includes the optical axis of the objective lens and is perpendicular to the second direction or with respect to an axis which is perpendicular both to the optical axis of the objective lens and the second direction.

4,991,162

TESTING APPARATUS AND METHOD FOR OPTICAL DATA STORAGE MEDIUM

Koichi Tabe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 26, 1988, Ser. No. 238,365

Claims priority, application Japan, Aug. 29, 1987, 62-214155

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—58 **38 Claims**

1. A testing apparatus for detecting mechanical characteristics, including at least dynamic radial runout and acceleration of radial runout, of an optical data storage medium having a groove for storing data therein, comprising:

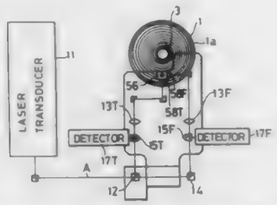
optical head means movable in tracking and focusing directions for tracing the groove of the optical data storage medium to pick up the data stored therein by using a first laser beam;

means for generating a second laser beam;

directing means for directing the second laser beam toward

the optical head means along a line of the tracking direction;

reflector means, mounted to the optical head means, for reflecting the second laser beam along the line of the tracking direction;



detector means for detecting the second laser beam reflected by the reflector means to detect a variation of the optical head means in the tracking direction indicating a mechanical characteristic of the optical data storage medium; and

means for processing the mechanical characteristic of the optical data storage medium on the basis of the variation detected by the detector means.

4,991,163

OPTICAL INFORMATION MEDIUM WITH SAMPLE MARK AREA AND MULTIPLE TRANSCRIPTION PREVENTION

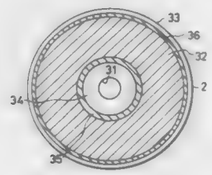
Nobuhiro Tokushuku, Yokohama; Hitoshi Yanagihara, Kamakura; Katashi Hazama, Zushi; Masaki Yoshii, Yokohama, and Naotake Ebinuma, Hayamamachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

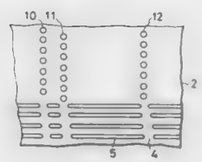
Filed Feb. 8, 1988, Ser. No. 153,004

Claims priority, application Japan, Feb. 27, 1987, 62-42522

Int. Cl.[5] G11B *7/24, 7/013*

U.S. Cl. 369—275.4 **8 Claims**





1. An injected molded optical information medium formed or injected soft material comprising an optical disc with first, second and third areas radially arranged so that said first and third areas are disposed respectively radially inwardly and radially outwardly of said second area, said second area being a sample mark area including at least one circumferentially extending track containing a plurality of spaced sample mark portions disposed along the track, each sample mark portion including at least two sample mark pits, one of the sample mark pits being slightly off-set on one side of the track, and the other of the sample mark pits being slightly off-set at an opposite side of the track and means for stopping movement of the soft injected material forming the optical information medium during injection molding so as to prevent multiple transcription of the sample mark pits in the sample area, said means for stopping movement being groove areas including a plurality of uneven tracks provided in said first and second areas.

4,991,164

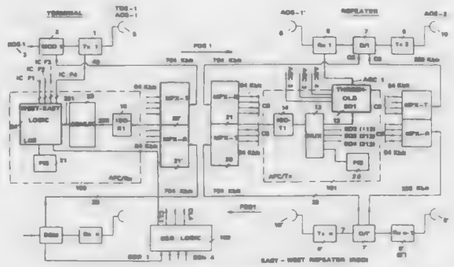
AUTOMATIC TRANSMIT POWER LEVEL CONTROL IN RADIO LINKS

Umberto Casiraghi, Biassono, and Luigi Vismara, Vimercate, both of Italy, assignors to Telettra-Telefonia Elettronica e Radio s.p.a., Italy

Filed Mar. 23, 1989, Ser. No. 262,617

Int. Cl.[5] H04J *1/6, 3/14*

U.S. Cl. 370—17 **5 Claims**



1. A transmit power control system for multiline radio links using microwave signal digital modulation, specifically multilevel QAM modulation, in each RF transmitter receives, from a respective receiver associated therewith and interfering receivers, signals indicating the levels of the useful signals received on that RF channel and sends said signals back to the associated transmitter in order to regulate the transmit power level, comprising:

means for deriving a first control signal for each RF channel in each receiver, and a second control signal for adjacent channels;

means for combining said first and second control signals to derive threshold signals;

means for multiplexing all the threshold signals of each of the receivers;

means for inserting a station identification signal in said multiplexer;

means for further multiplexing said multiplexed signal with other service signals;

means for inserting the twice multiplexed signal in the frame of the main information signal transmitted in the other direction of transmission;

means for receiving and twice demultiplexing the received signal;

means for processing the demultiplexed signal to derive a transmit power remote control signal protected from possible faults or malfunctions in the main digital channel and the station identification signal;

means for evaluating exceptional atmospheric precipitation conditions by statistical control of the bit error rate made on the receivers installed in the same station as the transmitters, the transmit power of which is controlled;

means for simultaneously deriving a transmit power local control signal in the same station having the receivers, the bit error rate information of which is processed; and

means for applying said control signals to the predistortion circuits of the power amplifiers of the transmitters.

4,991,165

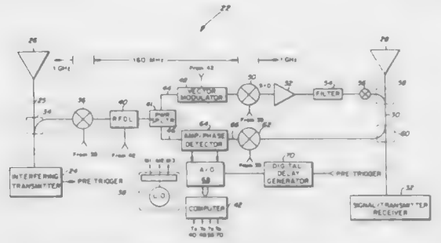
DIGITAL ADAPTIVE INTERFERENCE CANCELLER

Willard M. Cronyn, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 28, 1988, Ser. No. 251,142

Int. Cl.[5] H04B *1/56*

U.S. Cl. 370—32 **13 Claims**



1. An interference canceller for cancelling an interfering signal, $S_I(t)$, generated by an interfering source from a transmission link between an antenna and a receiver comprising:

first means for deriving a signal sample of said interfering signal $S_I(t)$;

second means operably coupled to said first means for injecting a cancelling signal $S_I(t)$ derived from said signal sample into transmission link;

third means operably coupled to said transmission link for sampling the residual signal $S_I(t)+S_J(t)$ in said transmission link; and

fourth means comprising a computer operably coupled for receiving the output of said third means and for providing a digital signal input to said second means for minimizing said residual signal $S_I(t)+S_J(t)$, wherein said computer is programmed to calculate, using a minimization algorithm, the correction coefficients needed to minimize said residual signal and is also programmed to input the signals corresponding to said correction coefficients to said second means.

4,991,166

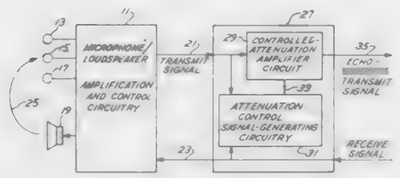
ECHO REDUCTION CIRCUIT

Stephen D. Julstrom, Chicago, Ill., assignor to Shure Brothers Incorporated, Evanston, Ill.

Filed Oct. 28, 1988, Ser. No. 264,145

Int. Cl.[5] H04M *9/08*

U.S. Cl. 370—32.1 **10 Claims**



1. An echo reduction circuit for accepting receive and transmit signals, where each of said signals exhibits a level, and responsively providing an echo-reduced transmit signal, comprising, in combination:

microphone signal level-measuring means for receiving said transmit signal, measuring said level exhibited by said transmit signal, and responsively providing a microphone level signal, said microphone signal level-measuring means defining attack and decay times for said microphone level signal, said attack and decay times providing audio frequency range filtering of said microphone level signal at a rate faster than a syllabic rate;

loudspeaker signal level-measuring means for accepting said receive signal, measuring said level exhibited by said receive signal, and responsively providing a loudspeaker level signal;

comparison means for receiving said microphone level and loudspeaker level signals and responsively providing a control signal having an instantaneous value dependent solely on the instantaneous values of said microphone level and loudspeaker level signals and independent of the prior values of said microphone level and loudspeaker level signals; and

controlled attenuation means for receiving said control and transmit signals and responsively providing said echo-reduced transmit signal, and having an attenuation value dependant solely on the instantaneous value of said control signal and independent of the prior values of said control signal.

4,991,167

VOICE CONTROLLED ATTENUATION ADJUSTMENT IN TELEPHONE TRANSMISSION CIRCUITS

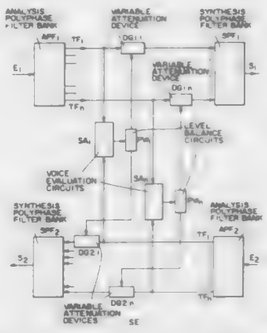
Udo Petri, Taunussein; Eberhard Hänsler, and Birger Hätty, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Telenorma Telefonbau und Normalzeit GmbH, Franfurt am Main, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 307,324

Claims priority, application United Kingdom, Aug. 22, 1987, 3728109

Int. Cl.[5] H04J *1/00*

U.S. Cl. 370—32.1 **2 Claims**



2. A device for providing voice controlled adjustments in a telephone transmission circuit comprising:

means for receiving a first signal propagating in a first direction and means for receiving a second signal propagating in a second direction,

a first analysis filter bank for decomposing said first signal into a first set of sub-band signals in a set of predetermined frequency sub-bands and a second analysis filter bank for decomposing said second signal into a second set of sub-band signals in said set of predetermined frequency sub-bands,

a plurality of first variable attenuation devices, one of which being associated with each of said first set of sub-band signals,

a plurality of second variable attenuation devices one of which being associated with each of said second set of sub-band signals,

a plurality of evaluation means for evaluating the first and second sub-band signals in each of said frequency sub-bands, each of said evaluation means comprising means for compressing the first sub-band signal and the second sub-band signal in a corresponding frequency sub-band, means for detecting voice and non-voice portions in the compressed first and second sub-band signals in the corre-

sponding frequency sub-band, and means for adjustably allocating a predetermined amount of attenuation between the particular one of said plurality of first variable attenuation devices associated with the corresponding frequency sub-band and the particular one of said plurality of second variable attenuation devices associated with the corresponding frequency sub-band in response to the voice and non-voice portions of the compressed first and second sub-band signals of the corresponding frequency sub-band, said allocation means being in communication with said particular one of said plurality of first attenuation devices and said particular one of said second plurality of attenuation devices, and

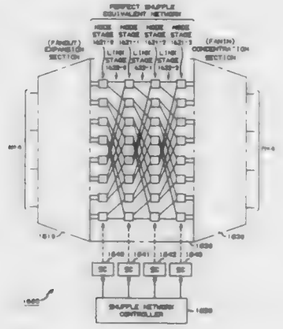
a first synthesis filter bank for recombining said first set of sub-band signals after said first set of sub-band signals has been attenuated by said plurality of first attenuation devices and a second synthesis filter bank for recombining said second set of sub-band signals after said second set of sub-band signals has been attenuated by said plurality of second attenuation devices.

4,991,168

CONCURRENT MULTI-STAGE NETWORK CONTROL ARRANGEMENT

Gaylord W. Richards, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 8, 1989, Ser. No. 349,011
Int. Cl.[5] H04Q *11/00*
U.S. Cl. 370—054 **42 Claims**



1. A method for use in an arrangement comprising a perfect shuffle equivalent network having a plurality of inlets and a plurality of outlets and comprising a plurality of at least four stages of nodes, and a plurality of at least three stages of links, each link stage for connecting the outputs of one of said nodes stages to the inputs of the successive one of said node stages, said arrangement further comprising a plurality of at least three means each for storing stage busy/idle information for an associated one of said stages of links, said methods comprising

combining stage busy/idle information concurrently from all of said storing means to hunt for an idle path from a specified one of said inlets through said network to a specified one of said outlets,

where each of said storing means comprises a plurality of addressable locations, said arrangement further comprising means for generating a plurality of inlets signals coded to represent any one of said plurality of inlets and a plurality of outlet signals coded to present any one of said plurality of outlets, and wherein said combining comprises

for each of said storing means, generating an address from predetermined ones of the inlet and outlet signals representing said specified inlet and said specified outlet, to address one of the storing means locations, and

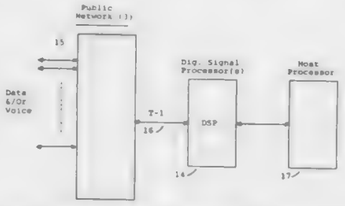
reading stage busy/idle information concurrently from all of the addressed storing means locations to hunt for a path from said specified inlet through idle links of all of said plurality of link stages to said specified outlet.

4,991,169

REAL-TIME DIGITAL SIGNAL PROCESSING RELATIVE TO MULTIPLE DIGITAL COMMUNICATION CHANNELS

Gordon T. Davis; Michael G. Ho Lung; Baiju D. Mandalia, all of Boca Raton; Roland J. Millas, Coral Gables; Oscar E. Ortega, Miami; Rafael J. Picon; Loran R. Queen, both of Boca Raton, all of Fla.; Richard H. Robinson, Dunwoody, Ga.; William R. Robinson, Jr., West Palm Beach; Leo A. Sharp, Jr., and Jan W. van den Berg, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,832
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—77 **14 Claims**



1. A system for providing information telecommunication services between an information handling center and multiple diversely equipped user terminals remotely linked to said center through parts of the public switched telephone network, said center being required to be able to process information contained in signals transferred to said center via said network and system, said system comprising:

at least one time division multiplexed high speed digital carrier trunk having a plurality of time channels assignable for carrying signals between said center and said remote user terminals via said network, and providing access for said center to said public telephone network; said trunk carrying digitized log PCM signal functions representing diverse types of information and having various different signal formats in accordance with diverse characteristics of equipment at said user terminals; said log PCM signal functions being incompatible in form with information signal processing requirements of said center, and therefore the information content of said signal functions is not directly processable by said center while said signal functions are in said log PCM forms; and

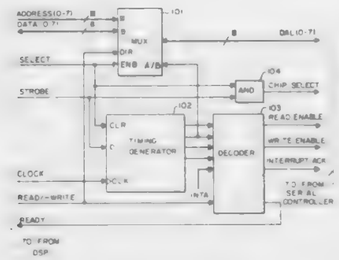
all-digital signal processing means coupling said center with said trunk for exchanging signals with time channels on said trunk in diverse signal forms compatible with requirements of equipment at said remote user terminals, for exchanging signals with said center in forms directly compatible with information processing requirements of said center but incompatible with signalling requirements of said remote user terminals, and for converting signals in transit between said center and said trunk channel into forms respectively compatible with said signalling requirements of said user terminals and said information processing requirements of said center.

4,991,170

CIRCUIT FOR INTERFACING A DIGITAL SIGNAL PROCESSOR TO A SERIAL INTERFACE CONTROLLER

Han Kem, Glendale, Ariz., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Jul. 17, 1989, Ser. No. 380,370
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—85.1 **11 Claims**



1. An interface circuit for connecting a processor means to a controller means, said processor means having an address bus and a data bus, said controller means having a multiplexed data and address bus, said interface circuit arranged to generate a plurality of control signals which defines the type of access being performed, said interface circuit comprising;

multiplexer means for converting said address bus and said data bus of said processor means to said multiplexed data and address bus of said controller means;

timing generator means arranged to receive a clock signal from said processor means, said timing generator means further arranged to track the number of cycles of said clock signal, and;

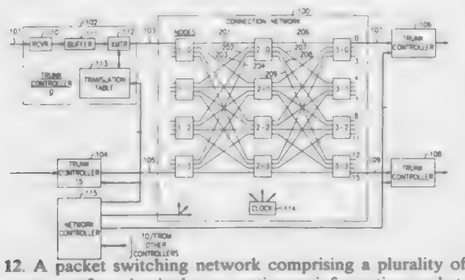
decoder means for decoding said number of cycles from said timing generator means and generating said plurality of control signals.

4,991,171

BROADCAST PACKET SWITCH NETWORK

Kari T. Teraslinna, Naperville, and Wing N. Toy, Glen Ellyn, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 26, 1989, Ser. No. 412,952
Int. Cl.[5] H04J *3/08*
U.S. Cl. 370—94.1 **12 Claims**



12. A packet switching network comprising a plurality of output ports for selectively connecting an information packet, including an information portion and a destination address identifying two of said output ports, to said identified output ports comprising:

an output stage of output nodes, each output node comprising a predetermined plurality of said output ports;

an intermediate network stage responsive to the destination address of said information packet for creating a first representation of said information packet by deleting a part of said destination address, for connecting said first representation to a first selected one of said output nodes which comprises a first one of said identified output ports, for creating a second representation of said information packet by deleting a part of said destination address, and for connecting said second representation to a second one of said output nodes which comprises the second one of said identified output ports; and

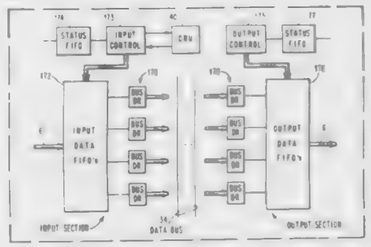
means in said first and said second selected output nodes individually responsive to the remaining parts of the destination address for connecting said information portion of said information packet to said identified output ports.

4,991,172

DESIGN OF A HIGH SPEED PACKET SWITCHING NODE

Israel Cidon, New York, N.Y., and Inder S. Gopal, Fort Lee, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,402
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—94.100 **3 Claims**



3. A method of switching variable size packets between asynchronous read/write FIFO memories of adapters, each of said adapters having access to a parallel communications bus, said method comprising the steps of:

(a) storing each of said packets into a FIFO memory of said memories of a source adapter of said adapters;

(b) for each source adapter of said adapters, reading packets from a corresponding FIFO memory of said memories onto said bus with one word being transmitted on said bus during only one bus clock cycle, with all words of the packet being transmitted on said bus in consecutive bus cycles, with at least one link address being stored in at least one designated word of said packet and with only one of said packets being transmitted on said bus at any time, each of said words being large enough so as to contain a complete link address, with only one of said adapters having control of said bus at any time, said one adapter having control of said bus for the duration of one or more full packets being transmitted on said bus;

(c) for each packet read on said bus, identifying a first and last word of each packet to identify the boundaries of each packet said first and last words being identified by corresponding flags;

(d) for each of said packets read on said bus, comparing in one bus block cycle a corresponding said link address in a corresponding said designated word of said each packet with link addresses in said adapters; and

(e) for each of said packets read on said bus, writing said each packet in each of said FIFO memories of said adapters where link addresses match said link address in said designated word of said each packet.

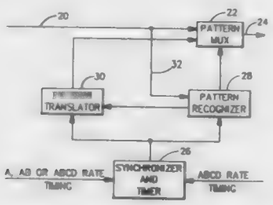
VOL 1123 ISS 1 FEB 5 1991 UMI

4,991,173

APPARATUS AND METHOD FOR MAPPING OF PCM SIGNALING AT SIGNALING RATE CONVERSION BOUNDARIES

Dale L. Krisher, Raleigh, N.C., assignor to Alcatel NA, Inc., Hickory, N.C.

Filed Oct. 17, 1988, Ser. No. 258,993
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.1 **15 Claims**



1. In a communications system, wherein binary coded signaling is transmitted over two or more transmission links, at least two of said transmission links having different signaling rates from each other, apparatus for providing controlled mapping of signaling across signaling rate conversion boundaries between links, comprising:

means for receiving a predetermined binary coded signaling pattern at a first signaling rate from a first transmission link;

means for providing in response to the received predetermined signaling pattern a predetermined, non-redundant binary coded signaling pattern at a second signaling rate; and

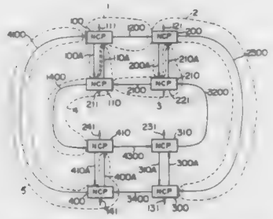
means for outputting to a second transmission link said predetermined non-redundant binary coded signaling pattern, said predetermined non-redundant binary coded signaling pattern having a corresponding relation to said received predetermined binary coded signaling pattern, so that for the received predetermined binary coded signaling pattern only one predetermined binary coded signaling pattern at said second rate is provided.

4,991,174

FAULT DIAGNOSTIC DISTRIBUTED PROCESSING METHOD AND SYSTEM

Kinji Mori, Yokohama; Shoji Miyamoto, Kawasaki, and Takeshi Shiraha, Nishinomiya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 938,442, Dec. 5, 1986, which is a continuation of Ser. No. 569,903, Jan. 11, 1984, abandoned. This application Mar. 28, 1989, Ser. No. 329,558
Claims priority, application Japan, Sep. 8, 1983, 58-165994
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—15.1 **22 Claims**



1. A method for processing data in a distributed processing system having a plurality of subsystems interconnected through at least one transmission path, said method comprising the steps of:

sending, in each subsystem, a diagnosing signal for diagnosing a fault on a transmission route including at least one other subsystem and said transmission path;

receiving, in each subsystem, a signal relating to said diagnosing signal from a transmission route;

detecting the presence of a fault based on the signal relating to said diagnosing signal received in each subsystem;

suppressing, in each subsystem, signal transmission to said transmission route which contains said fault upon detection of the fault;

sending, in each subsystem, a signal representing the fault to said transmission path; and

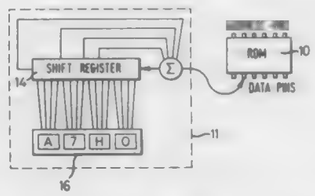
determining, in at least one subsystem, a fault location based on said fault representing signal.

4,991,175

SIGNATURE ANALYSIS

David Easingwood-Wilson, Balerno, Scotland, assignor to Hewlett-Packard, Wokingham

Continuation of Ser. No. 418,926, Oct. 6, 1989, abandoned, which is a continuation of Ser. No. 74,848, Jul. 17, 1987, abandoned. This application Mar. 9, 1990, Ser. No. 492,370
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—22.4 **3 Claims**



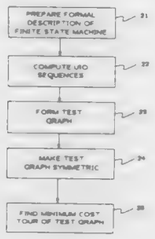
1. Apparatus having a digital signal processing capability, said apparatus comprising memory means and a self-test facility means capable of signature analysis, said apparatus configured such that pre-selected locations of said memory means have stored therein predetermined bits such that the value of the preselected locations plus the value of a result of an updated signature analysis of the remainder of the memory means equal a desired predetermined signature.

4,991,176

OPTIMAL TEST GENERATION FOR FINITE STATE MACHINE MODELS

Anton T. Dahbura, Chester; Krishan K. Sabnani, Berkeley Heights, and M. Umit Uyar, Sea Bright, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 7, 1989, Ser. No. 362,724
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—27 **1 Claim**



1. A method for developing test sequences for evaluating a design or operation of a finite state machine, said finite state machine characterized by a state diagram having states and original edges interconnecting the states, said method comprising the steps of:

evaluating unique input/output sequences for each state of said finite state machine so that the unique input/output sequence selected for each state exhibits a minimum cost among all unique input/output sequences evaluated for that state;

expanding said state diagram as a test graph including said states, said original edges, and a plurality of test edges interconnecting the states, said plurality of test edges for testing original edges of the state diagram;

evaluating said test graph for symmetry and, if not symmetric, duplicating selected test edges of said plurality to make said test graph symmetric with a minimum cost; and

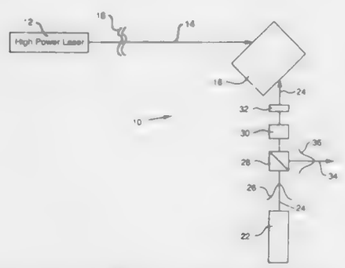
generating a tour of the symmetric test graph wherein each test edge is traversed at least once, so that said tour includes said test sequence for said finite state machine at a minimum cost.

4,991,177

LASER BEAM CLEAN-UP USING MUTUALLY PUMPED PHASE CONJUGATION

Tallis Y. Chang, Woodland Hills, and Pochi A. Yeh, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 2, 1990, Ser. No. 488,340
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—21 **17 Claims**



1. A laser beam modification system, comprising:

a first laser beam having first temporal characteristics and an undesired spatial profile;

a second laser beam having second temporal characteristics and a desired spatial profile;

nonlinear optical means for receiving said first and second laser beams and generating a phase conjugate output beam having said first temporal characteristics and said desired spatial profile; and

means for separating said phase conjugate output beam from said second laser beam.

4,991,178

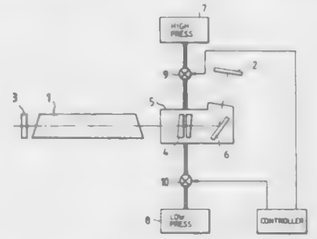
LASER APPARATUS

Koichi Wani; Yasuhiro Shimada; Hidehito Kawahara; Tadaaki Miki, and Yoshiro Ogata, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 249,904, Sep. 27, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 499,206
Claims priority, application Japan, Sep. 28, 1987, 62-243358; Sep. 28, 1987, 62-243359; May 31, 1988, 63-133329; May 31, 1988, 63-133330; Jun. 9, 1988, 63-142166; Jun. 13, 1988, 63-145141; Aug. 4, 1988, 63-194968; Aug. 4, 1988, 63-194969; Aug. 4, 1988, 63-194970; Aug. 4, 1988, 63-194971
Int. Cl.[5] H01S *3/11*
U.S. Cl. 372—32 **17 Claims**

1. In a laser apparatus including an optical resonator having a laser medium containing excimer gas, said resonator generating a laser light, the improvement comprising:

(a) a wavelength narrowing and selecting element comprising an optical element disposed along an optical axis of the apparatus for selecting in response to density of a gas contacting said selection element a given wavelength of the laser light by narrowing the spectral bandwidth and tuning the center wavelength of the laser light, the selected wavelength residing within a continuous gain bandwidth of the laser medium, said element comprising air space etalon means for selecting and tuning said center wavelength; and



(b) a sealed container housing the wavelength narrowing and selecting element,

wherein the gas in the sealed container differs from the laser medium gas, is at a different pressure from a gas pressure of the laser medium, and does not absorb the laser light, and

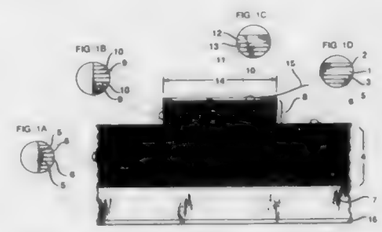
wherein said sealed container is separated from said resonator.

4,991,179

ELECTRICALLY PUMPED VERTICAL CAVITY LASER

Dennis G. Deppe, Bedminster; Russell J. Fischer, Berkeley Heights, both of N.J.; Kai-Feng Huang, Shenchu, Taiwan, and Kuochou Tai, North Plainfield, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 26, 1989, Ser. No. 343,760
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **28 Claims**



1. Apparatus comprising at least one electrically pumped vertical cavity laser consisting essentially of an active region within a cavity dependent for cavitation upon two Distributed Bragg Reflectors, each including successive pairs of high and low refractive index material, one of such DBRs being of n-type conductivity and the other being of p-type conductivity, together with means for electrically pumping, said means including passage of electrical current through at least a substantial number of such pairs in both DBRs

characterized in that the p-type DBR has a lesser number of such pairs but is supplemented by a metallic reflector and in that the DBR layer closest to the metallic reflector, referred to as the phase matching DBR layer, is adjusted in thickness relative to that of the next DBR layer of corresponding refractive index to accommodate effective thickness variation due to emission penetration into adjoining material, adjustment increasing reflectivity by

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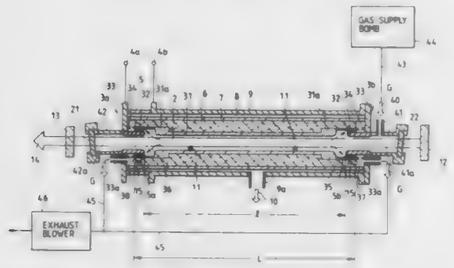
lessening destructive interference, to result in a "hybrid" reflector, in which laser cavity reflectivity is due to reflectivity of at least 98% at each cavity end.

4,991,180

METALLIC VAPOR LASER APPARATUS

Motoo Yamaguchi; Hiroyuki Sugawara; Akira Wada, all of Hitachi; Toshiharu Shirakura, Toka; Tuneyoshi Oohashi, Hitachiota, and Toshimichi Kichikawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1990, Ser. No. 525,344
Claims priority, application Japan, May 25, 1989, 1-131743
Int. Cl.[5] H01S *3/22*
U.S. Cl. 372—56 **11 Claims**



1. A metallic vapor laser apparatus which includes:
a cylindrical discharge tube having an internal space in which discharge occurs, the discharge tube having an outer peripheral surface and opposed ends, the discharge tube extending in an axial direction;
a heat-insulating material encompassing the outer peripheral surface of said discharge tube, the heat-insulating material having opposed ends corresponding to the opposed ends of the discharge tube;
electrodes each having a cylindrical portion coaxial with said discharge tube, and respectively disposed at the opposed ends of said discharge tube; and
a metal for a laser medium, disposed in said internal space, whereby a gas containing vapor of said metal is excited by said discharge to effect laser oscillation;
a gas inlet for introducing a buffer gas into the inside of the apparatus, provided at a position outside of said electrodes in the axial direction; and
at least one gas exhaust port for exhausting said buffer gas to the outside, provided in the proximity of at least one end of said heat-insulating material so that flow paths in which said buffer gas flows from the internal space to outside the discharge tube are provided between said discharge tube and said electrodes, thereby allowing a quantity of buffer gas introduced to be small.

4,991,181

CATALYST FOR CARBON MONOXIDE OXIDATION

Billy T. Upchurch, Virginia Beach; Irvin M. Miller, Newport News; David R. Brown, Norfolk; Patricia P. Davis, Newport News; David R. Schryer, Hampton; Kenneth G. Brown, Virginia Beach, and John D. Van Norman, Norfolk, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 298,150, Jan. 18, 1989. This application Nov. 30, 1989, Ser. No. 443,406
Int. Cl.[5] H01S *3/22*
U.S. Cl. 372—59 **7 Claims**

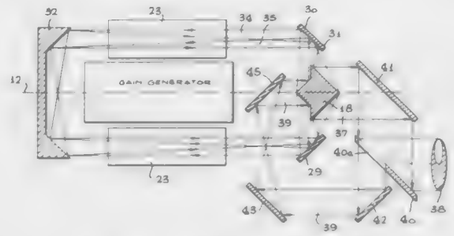
1. A process for the combination of CO and O_2 to form CO_2 comprising exposing a catalyst consisting essentially of about 1 to 40 percent by weight of a platinum group metal, about 1 to 90 percent by weight of a reducible metal oxide having multiple valence states selected from the group consisting of Sn, Mn, and Cu, and about 1 to 90 percent by weight of a compound which can bind water to its structure selected from the group consisting of silica gel, calcium chloride, magnesium sulfate, hydrated alumina, and magnesium perchlorate, to a CO and O_2 gas mixture.

4,991,182

OPTICAL RELAY IMAGING IN THE COMMON PASS ANNULAR LASER AMPLIFIER

Jerry D. Logan, Reseda, and Thomas R. Waite, Palmdale, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 22, 1989, Ser. No. 411,349
Int. Cl.[5] H01S *3/083*
U.S. Cl. 372—94 **5 Claims**



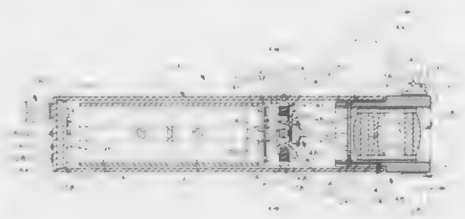
1. An annular ring resonator employing relay imaging to reduce crosstalk between the forward and reverse modes comprising:
a ring resonator having a gain medium, a laser beam, a scraper mirror which generates a sharp edged feedback beam when the feedback beam passes through the scraper mirror, a plurality of mirrors which reflect the feedback beam so as to relay image the sharp edged feedback beam onto an annular input mirror in the ring resonator.

4,991,183

TARGET ILLUMINATORS AND SYSTEMS EMPLOYING SAME

Brad E. Meyers, 17525 NE. 67th Ct., Redmond, Wash. 98052

Filed Mar. 2, 1990, Ser. No. 489,280
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—100 **9 Claims**



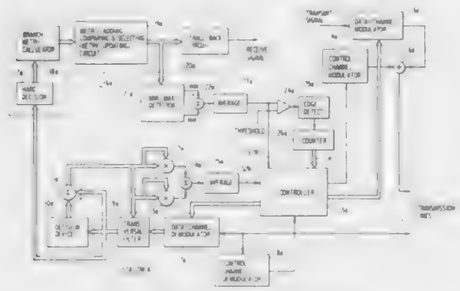
1. A device for illuminating a target or a part thereof, said device comprising: a casing; a laser for generating a beam of coherent energy, said laser being housed in said casing; a zoom lens; and means mounting said zoom lens in said casing on an output side of said laser such that said zoom lens is shiftable back-and-forth in said casing by an operator to change the width of the beam formed and projected by the lens to thereby control the size of the area impacted by the beam of coherent energy so as to maximize a proportion of the coherent energy reflected from the target that is captured by an optical device with an objective lens of a particular focal length.

4,991,184

DATA COMMUNICATION SYSTEM HAVING A SPEED SETTING VARIABLE WITH TRANSMISSION QUALITY FACTORS

Shinji Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 18, 1989, Ser. No. 452,071
Claims priority, application Japan, Dec. 16, 1988, 63-316468
Int. Cl.[5] H04L *1/16*
U.S. Cl. 375—8 **4 Claims**



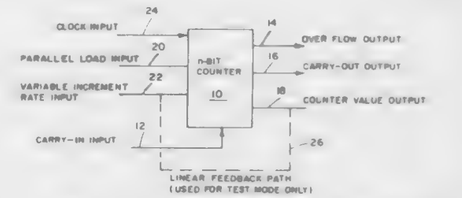
1. A data communication system comprising:
a first data-channel modulator having a variable speed setting connected to one end of a first transmission medium, and a second data-channel modulator having a variable speed setting connected to the other end ot the first transmission medium;
a first data-channel demodulator having a variable speed setting connected to one end of a second transmission medium, and a second data-channel demodulator having a variable speed setting connected to the other end of said transmission medium;
first signal-to-noise quality detector means for detecting a signal-to-noise ratio of said first transmission medium, and second signal-to-noise quality detector means for detecting a signal-to-noise ratio of said second transmission medium;
first error rate quality detector means for detecting an error rate of said first transmission medium, and second error rate quality detector means for detecting an error rate of said second transmission medium;
first out-of-sync quality detector means for detecting occurrences of out-of-sync condition on said first transmission medium, and second out-of-sync quality detector means for detecting occurrences of out-of-sync condition on said second transmission medium;
control means for deriving a speed setting command signal from a first set of output signals from said first signal-to-noise ratio quality detector means, said first error rate quality detector means and said first out-of-sync quality detector means as well as from a second set of output signals, and controlling the speed settings of said first data-channel modulator and said first data-channel demodulator according to said speed setting command signal;
a first control-channel modulator for modulating said speed setting command signal and transmitting the modulated command signal on said first transmission medium;
a second control-channel demodulator for demodulating the modulated speed setting command signal transmitted on said first transmission medium and controlling the speed settings of said second data-channel modulator and said second data-channel demodulator according to the demodulated speed setting command signal;
a second control-channel modulator for modulating output signals of said second signal-to-noise ratio quality detector means, said second error rate quality detector means and said second out-of-sync detector means and transmitting the modulated signals on said second transmission medium; and
a first control-channel demodulator for demodulating signals transmitted on said second transmission medium and supplying the demodulated signals to said control means as said second set of output signals.

4,991,185

METHOD OF TESTING N-BIT PROGRAMMABLE COUNTERS

David Hatten, Belvidere; Joe Foster, Rockford; Walter Fry, Rockford; Barry Drager, Rockford, and Abdul Rashid, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 3, 1990, Ser. No. 460,500
Int. Cl.[5] H03K *21/40*
U.S. Cl. 377—29 **16 Claims**



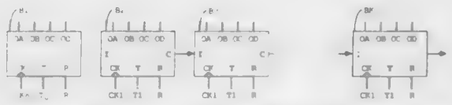
1. A method of testing an n-bit programmable counter, comprising the steps of:
resetting each bit of said counter to a 0 initial state;
loading a different state into a carry-in bit of said counter; and
iteratively doubling said counter until a carry-out bit of said counter assumes said different state to thereby allow said counter to be fully tested in n+1 iterations.

4,991,186

HIGH FREQUENCY CLOCK PULSE COUNTER

Hubert Payen, and Bernard Pain, both of Valence, France, assignors to Sextant Avionique, Meudon la Foret Cedex, France

Filed Nov. 22, 1989, Ser. No. 440,527
Claims priority, application France, Nov. 23, 1988, 88 15998
Int. Cl.[5] H03K *21/02, 21/10, 21/40*
U.S. Cl. 377—44 **6 Claims**

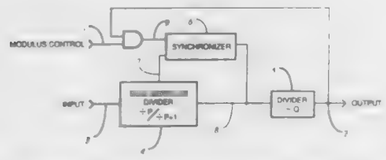


1. A counter comprising n one-bit cells receiving a clock signal having a frequency f to be counted and a transfer order at the time it is desired to read the counter, said counter being separated into lower rank p-cells and higher rank n-p cells wherein the p cells of the lower rank are operated at the frequency f and the n-p cells of the higher rank at the frequency $f/2^p$, wherein:
the p cells of the lower rank directly receive said clock signal at the frequency f and, when necessary, said transfer order synchronized with said clock signal,
the n-p cells of the higher rank receive:
as a signal at the frequency $f/2^2$, a delayed clock signal, delayed by at least two clock pulses at the frequency f and at the most by (2^p-2) clock pulses at the frequency f with respect to the output signal of the cell having the highest rank among the p cells of the lower rank, and
as a transfer signal, a pulse delayed with respect to aid

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transfer order so as to appear only during the following or present clock period which corresponds to a setting to "1" of all the first p cells.

4,991,187
HIGH SPEED PRESCALER
Barry W. Herold, Boca Raton, and Omid Tahernia, Coconut Creek, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 21, 1989, Ser. No. 382,592
Int. Cl.[5] H03K *23/48, 21/02*
U.S. Cl. 377—48 **5 Claims**



1. A high speed dual modulus prescaler circuit for selecting between two frequency-division factors in response to a first modulus control signal being in a first state or a second state, comprising:

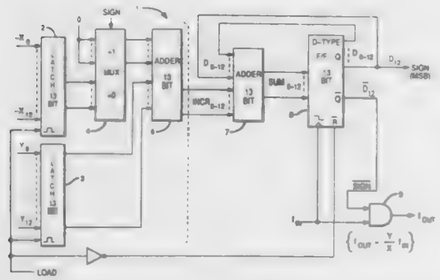
a first dual modulus divider having a first input for receiving a second modulus control signal, a second input for receiving a clock signal, and having an output;

a second divider having an input coupled to the output of said first dual modulus divider and having an output;

a synchronization circuit for producing said second modulus control signal having a first input coupled to the output of said first dual modulus divider, an output coupled to the first input of said first dual modulus divider for providing said second modulus control signal thereto and having a second input; and

first gating means for coupling the output of said second divider to the second input of said synchronization circuit when said first modulus control signal is in a first state, said first gating means having a first input for receiving said first modulus control signal, a second input coupled to the output of said second divider, and an output coupled to the second input of said synchronization circuit.

4,991,188
DIGITAL FREQUENCY DIVIDER
Luke A. Perkins, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio
Filed Dec. 12, 1988, Ser. No. 282,547
Int. Cl.[5] H03K *23/48*
U.S. Cl. 377—49 **12 Claims**



1. A digital frequency divider for receiving pulses at an input frequency f_{in} and providing pulses at an output frequency f_{out}, where $f_{out}=Y/X\ f_{in}$, comprising:

first means for providing, as a first means output, the numerical value of Y or the difference between Y and X;

second means for deriving the difference between the first means output and a stored number;

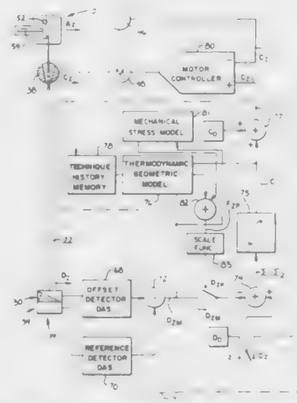
third means coupled to said first means, for providing the numerical value of X;

means for successively storing the difference derived by the second means and providing that difference as a stored number to the second means during a subsequent derivation of a difference in the second means, operable at a rate derived from f_{in}; and

means for generating f_{out} pluses depending upon the relative value of the stored number;

wherein the first means output depends on the value of the difference derived by the second means, X and Y are positive whole numbers, and the ratio of Y/X is defined by $0<Y/X<1$.

4,991,189
COLLIMATION APPARATUS FOR X-RAY BEAM CORRECTION
Jonathan C. Boomgaarden, Waukesha; Thomas L. Toth, Brookfield, and August O. Englert, Waukesha, all of Wis., assignors to General Electric Company, Milwaukee, Wis.
Filed Apr. 16, 1990, Ser. No. 509,598
Int. Cl.[5] G01N *23/00*
U.S. Cl. 378—4 **9 Claims**



1. A computed tomography system including an x-ray source for producing a fan beam of x-rays along a fan beam plane in response to an exposure technique, the fan beam plane being at deviation angle α from an imaging plane and intersecting a detector array at position D_z, comprising:

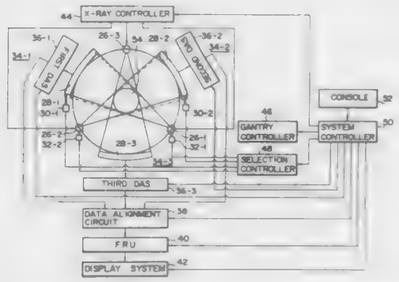
a collimator means having position C_z for controlling the alignment of the fan beam plane;

a z-axis offset detector positioned to intercept the fan beam for producing a position signal dependant on D_z;

an error calculation means for generating an error signal in response to the position signal; and

a collimator controller responsive to the error signal for changing the relative position C_z of the collimator with respect to the x-ray source and detector array so as to reduce the magnitude of the error signal.

4,991,190
ROTATE-ROTATE TYPE X-RAY COMPUTERIZED TOMOGRAPHIC IMAGING APPARATUS
Issei Mori, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 10, 1989, Ser. No. 391,931
Claims priority, application Japan, Aug. 15, 1988, 63-203015
Int. Cl.[5] A61B *6/00*
U.S. Cl. 378—9 **5 Claims**



1. A rotate-rotate type x-ray computerized tomographic imaging apparatus comprising:

a stationary body;

a rotational body arranged to rotate in said stationary body about an axis of rotation and having an insertion section in which a subject is inserted;

K x-ray sources arranged on said rotating body around said axis of rotation, where K is an integer greater than 1;

K multi-channel x-ray detectors arranged on said rotating body around said axis of rotation with each detector located opposite a corresponding source to form K source/detector pairs, with $K-1$ of said pairs adjustable between a symmetric condition in which said K pairs are angularly oriented symmetrically about said axis of rotation such that a first sample pitch of data is obtainable and an asymmetric condition in which said $K-1$ pairs are angularly oriented asymmetrically with respect to said axis of rotation such that a second sample pitch of data 1K of said first sample pitch of data is obtainable;

data processor means for collecting data from said K detectors and for processing image reconstruction from that data; and

controller means for controlling rotation of said body, data collection, and image reconstruction.

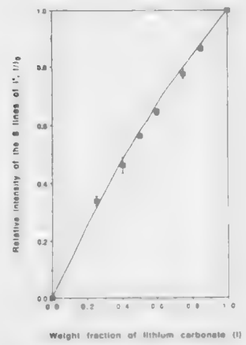
4,991,191
QUANTITATIVE ANALYSIS OF THE ACTIVE TABLE INGREDIENT BY POWER X-RAY DIFFRACTOMETRY
Raj G. Suryanarayanan, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.
Filed Feb. 5, 1990, Ser. No. 475,404
Int. Cl.[5] G01N *23/207, 31/00*
U.S. Cl. 378—75 **10 Claims**

1. A method for quantitatively analyzing a known crystalline ingredient in a first compressed tablet consisting essentially of a solid mixture of the crystalline ingredient and an excipient component, the method comprising:

irradiating the tablet with x-rays in a powder x-ray diffraction device and determining an intensity value, I, indicative of the quantity of diffracted x-rays at an angular range producing at least one x-ray diffraction line characteristic of said crystalline ingredient;

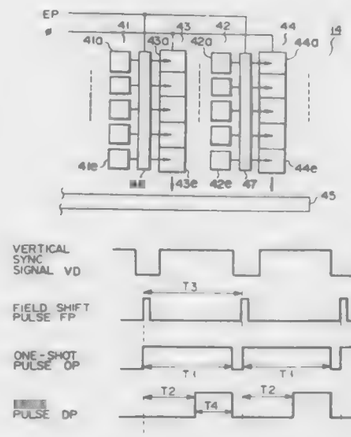
determining the ratio of said value I to a diffracted x-ray intensity value, I_0, obtained on a second compressed tablet consisting of said crystalline ingredient at said angular range; and

comparing the determined ratio I/I_0 to a set of predetermined standard values of said ratio for mixtures of said crystalline ingredient and said excipient component to



quantitate said crystalline ingredient in said first compressed tablet.

4,991,192
X-RAY IMAGING APPARATUS
Masayuki Nishiki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 26, 1989, Ser. No. 357,753
Claims priority, application Japan, Jun. 2, 1988, 63-136353
Int. Cl.[5] H05G *1/64, 1/22;* **H04N** *5/32*
U.S. Cl. 378—99 **5 Claims**



1. An X-ray imaging apparatus comprising:

X-ray generating means for irradiating a subject under examination with X rays;

image intensifier means for converting X rays transmitted through the subject to an optical image;

solid state image sensor means for detecting the optical image produced by said image intensifier means, said solid state image sensor means including charge storage sections for storing charges corresponding to the optical image and charge transfer sections for transferring the charges stored in said charge storage sections;

driver means for driving said solid state image sensor means;

X-ray control means for controlling said X-ray generating means to prevent an X-ray pulse from being emitted during the transfer of charges from said charge storage sec-

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tions to said charge transfer sections of said solid state image sensor means; and

a television monitor for visually displaying an image signal from said solid state image sensor means as an X-ray optical image.

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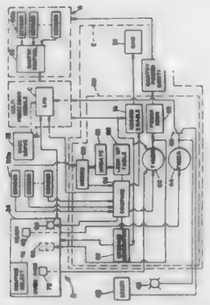
SYSTEM SAFETY MONITOR FOR CT SCANNERS

Robert A. Cecil, Solon; Nicholas C. Wislocki, Cleveland, and Micheal J. Petrillo, Euclid, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 25, 1988, Ser. No. 276,145

Int. Cl.[5] H05G *1/54*

U.S. Cl. 378—117 **18 Claims**



1. A medical diagnostic scanner system comprising:

a gantry means for receiving a subject, performing a non-invasive examination thereof, and generating electrical examination signals indicative of the non-invasive examination;

an image reconstruction means for processing the examination signals into operation-readable diagnostic information;

a central processor unit for controlling the image reconstruction means;

control panel for selectively controlling the gantry means, the central processor unit and the reconstruction means;

a system monitor means for selectively interconnecting and enabling the gantry means, the central processor unit, and the control panel;

a plurality of condition sensors for sensing operating conditions of system components;

an acceptable operating condition storage means for selectively storing acceptable operating conditions;

an operating condition comparing means for comparing the sensed operating conditions with the stored acceptable operating conditions;

a shut-down timing means for cutting off power to the gantry means after a selected duration, the shut-down timing means being operatively connected with the comparing means such that the comparing means causes the timing means to start timing the selected duration;

an override control means operatively connected with the timing means for enabling an operator to override the timing means during the selected duration and continue operating the gantry means in spite of a sensed unacceptable operating condition;

a recording means for making a recorded record of each override.

4,991,194

ROTATING ANODE FOR X-RAY TUBE

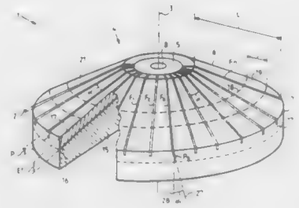
Michel Laurent, Plaisir; Pierre Noualhaguet, Issy Les Moulineaux, and Claude Mathieu, Versailles, all of France, assignors to General Electric CGR S.A., Paris, France

Filed Dec. 29, 1988, Ser. No. 291,765

Claims priority, application France, Dec. 30, 1987, 87 18367

Int. Cl.[5] H01J *35/08, 35/10*

U.S. Cl. 378—144 **6 Claims**



1. A rotating anode for an x-ray tube having an axis of symmetry, comprising:

a substrate;

a target in the form of a layer of emissive material formed on said substrate, said target having a predetermined thickness;

a plurality of radial slots carved into said target, said radial slots being equidistant and arranged symmetrically with respect to said axis of symmetry;

said radial slots being carved to a predetermined depth, wherein said predetermined depth is between $\frac{1}{3}$ to $\frac{2}{3}$ of the thickness of the target.

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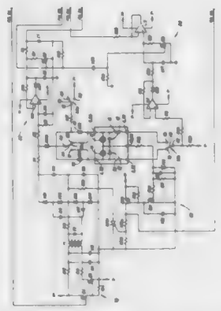
APPARATUS AND METHOD FOR TESTING A TELEPHONE CIRCUIT PROTECTOR

Lawrence O. Hilligoss, Ashland, Oreg., and Myron C. Butler, Edmond, Okla., assignors to Communications Manufacturing Company, Los Angeles, Calif.

Filed Mar. 16, 1990, Ser. No. 494,961

Int. Cl.[5] H04M *3/26*

U.S. Cl. 379—1 **12 Claims**



1. A telephone circuit protector test apparatus, which protector includes a voltage limiting circuit and a current limiting circuit, said test apparatus comprising:

means for providing a changing voltage to the voltage limiting circuit;

means for detecting a maximum magnitude of the voltage provided prior to the voltage limiting circuit operating to limit voltage;

means for providing a current to the current limiting circuit;

means for detecting current conducted through the current limiting circuit to a telephone circuit terminal of the protector; and

display means for visually displaying a value of the detected magnitude of the voltage and for visually indicating a response to said means for detecting current.

4,991,196

TESTING COMMUNICATIONS SYSTEMS

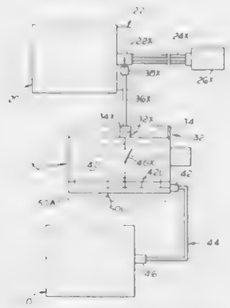
Peter E. Krebs, 131 Staunton Road, Headington, Oxford, Great Britain

Filed Jul. 11, 1989, Ser. No. 378,707

Claims priority, application United Kingdom, Jul. 12, 1988, 8816518; Aug. 27, 1988, 8820430; Sep. 21, 1988, 8822138; Jan. 24, 1989, 8901455

Int. Cl.[5] H04M *3/30*

U.S. Cl. 379—27 **13 Claims**



1. Test apparatus for installations having plural terminal units and line-pair connections therefor, such installations being of or for use within wider signalling systems, the test apparatus comprising off-line test equipment for parameters or conditions of said line-pair connections, and connection means of or for the off-line test equipment relative to said installation, the connection means comprising plural connectors as inputs to be made on a temporary basis for a limited number, normally less than all, of said connections to said terminal units, and multi-way switch means affording selection of said inputs one at a time for communication with other facilities of said off-line test equipment.

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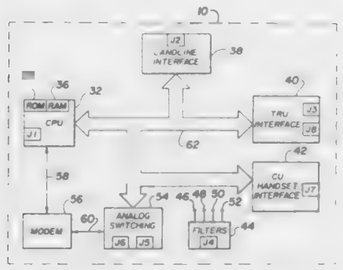
METHOD AND APPARATUS FOR CONTROLLING TRANSMISSION OF VOICE AND DATA SIGNALS

Walker C. Morris, Dallas, Tex., assignor to Intelligence Technology Corporation, Dallas, Tex.

Filed Sep. 1, 1988, Ser. No. 239,787

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—58 **21 Claims**



1. Apparatus for controlling the path of voice and data signals in a communications system which comprises at least a speaker phone, a cellular transmit/receive unit (TRU), a cellular (CU) handset and a computer having at least a communications software program, a keyboard and an I/O port for communications, said apparatus for controlling comprising:

analog switching means structured to receive voice signals and data signals from a plurality of different predetermined input sources and to route the received voice signals and data signals to different predetermined selectable destinations, said routing being determined by control signals received by said analog switching means;

landline interface means operatively connected to said analog switching means, said landline interface means being structured to be connected to a landline;

TRU interface means operatively connected to said analog switching means, said TRU interface means being structured to be connected to the cellular transmit/receive unit;

cellular interface means operatively connected to said analog switching means, said cellular interface means being structured to be connected to the cellular (CU) handset;

speaker phone interface means operatively connected to said analog switching means, said speaker phone interface means being structured to be connected to the speaker phone;

a modem operatively connected to said analog switching means; and

a central processing unit operatively connected to said analog switching means, landline interface means, TRU interface means, cellular interface means and said modem to receive sense signals therefrom and to send control signals thereto, said central processing unit being structured to be connected to the I/O port for communications of the computer.

4,991,198

INTERCONNECTION CONTROL METHOD IN CORDLESS TELEPHONE SYSTEM

Kazuyuki Tate, Nagoya; Ryoji Kawasaki, Tokyo; Noboru Saegusa, Tokyo; Yukihiro Shimura, Tokyo; Syoji Huse, Tokyo, and Koji Ono, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation; NEC Corporation, both of Tokyo and Kabushiki Kaisha Toshiba, Kanagawa, all of, Japan

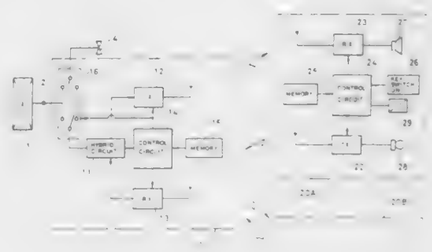
PCT No. PCT/JP88/00028, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO88/05620, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 14, 1988, Ser. No. 272,839

Claims priority, application Japan, Jan. 16, 1987, 62-7775

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—62 **7 Claims**



1. An interconnection control method in a cordless telephone system having a connection unit connected to a subscriber line and a plurality of radio telephone sets connected through a radio communication circuit to said connection unit, said method comprising:

a step of, when a call is issued from one of said radio tele-

phone sets, transmitting from said one radio telephone set to said connection unit a calling signal that contains a group identification code for identification of all the radio telephone sets to be connected with said connection unit and an individual identification code for identification of said one radio telephone set having issued the call;

a step of, in response to reception of said calling signal determining by said connection unit whether or not said group identification code contained in said calling signal coincides with associated one of said group identification codes preset with respect to said connection unit;

a step of transmitting a calling answer signal that contains said group identification code and said individual identification code from said connection unit to said one radio telephone set having issued the call when coincidence is determined at said determination step;

a step of establishing said radio communication circuit between said one radio telephone set and said connection unit after the transmission of said calling answer signal; and

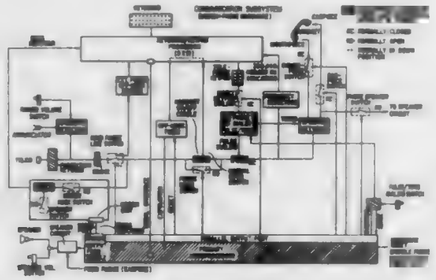
a step of transmitting said calling answer signal a plurality of times to forcibly set the radio telephone sets other than said one radio telephone set having issued the call in a wave reception mode.

4,991,199

COMPUTER AND TELEPHONE APPARATUS WITH USER FRIENDLY COMPUTER INTERFACE AND ENHANCED INTEGRITY FEATURES

Dilip J. Parekh, Los Angeles; Alfred S. Samulon, Malibu; Melvin M. Takata, Hermosa Beach; Morris L. Tucci, Van Nuys; Jim R. Vollmer, Encino, all of Calif.; Lawrence D. Weiss, New York, N.Y.; Douglas W. Caruthers, Redondo Beach; Charles T. Isatomi, Los Angeles, both of Calif.; Joseph C. Kawan, Hollywood; Shan Lee, Rowland Heights, both of Calif.; Harvey Marks, Canoga Park, and Sarkis A. Meguerdijian, Glendale, both of Calif., assignors to Transaction Technology, Inc., Santa Monica, Calif.

Filed May 5, 1988, Ser. No. 190,440
Int. Cl.[5] H04M *11/00*; G06F *11/00*
U.S. Cl. 379—97 7 Claims



1. A microcomputer with simplified user interface comprising a microprocessor computing unit and associated memory;

said microprocessor computing unit and said memory being mounted in a housing configured as a conventional telephone unit including an upper mounting structure and a base structure, a telephone handset mounted in a craddle on said upper mounting structure, a conventional twelve-key telephone keypad mounted on said upper mounting structure of said housing and a keyboard input device mounted in a concealed position within said base structure of said housing and movable to an open position for use by the operator of the microcomputer;

said microprocessor computing unit cooperating with and being responsive to instructions maintained in said memory and other instructions and data inputs received through a keyboard/keypad processor and a modem to perform computing and control functions, said keyboard-/keypad processor processing data inputs for said microprocessor computing unit received from said conventional telephone keypad, said keyboard input device and telephone electronics in said housing:

said instructions maintained in said memory of said microprocessor computing unit being received and updated through said modem from an external host computer over a telephone line, said keyboard/keypad processor also functioning to detect and evaluate telephone tone signals relating to telephone events received by said telephone electronics from the telephone line for said microprocessor computing unit;

said keyboard/keypad processor functioning to provide serial data inputs from said conventional telephone keypad, said keyboard input device and said telephone electronics to said microprocessor computing unit through a serial interface, said serial interface between said keyboard/keypad processor and said microprocessing computing unit being the data interface between the operator of said microcomputer and said microprocessor computing unit;

said conventional twelve-key telephone keypad also providing output to a telephone dialer;

said telephone electronics mounted in said housing being responsive to said telephone dialer when a switch means disconnects said microprocessor computing unit from said telephone electronics; and

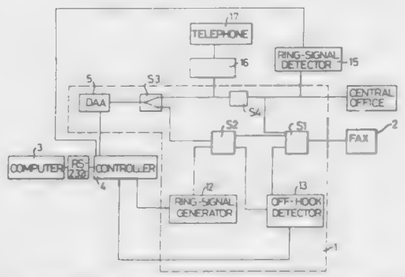
said switch means also automatically connecting said telephone electronics to telephone line power to provide standard telephone functioning in the absence of power to or input from said microprocessor computing unit and said memory.

4,991,200

INTERFACE DEVICE FOR THE INTERCOMMUNICATION OF A COMPUTER AND A FAX MACHINE

Paul Lin, 5 Fl., No. 25, Tunhwa S. Rd., Taipei City, Taiwan

Continuation-in-part of Ser. No. 102,101, Sep. 29, 1987, abandoned. This application Oct. 4, 1988, Ser. No. 253,230
Int. Cl.[5] H04N *1/00, 1/32*
U.S. Cl. 379—100 3 Claims



1. An interface device for the intercommunications any two of a computer, a fax machine, and a cable leading to one of a central office and a private branch exchange, said interface device being connected respectively to said computer, said fax machine and said cable, and comprising a simulating unit comprising a ring-signal generator for producing intermittent ring-signals to which said fax machine can be responsive when not busy, and an off-hook detector which detects the state of said fax machine, said device comprising a switching system to selectively interconnect any two of said computer, said fax machine and said cable, said switching system including a first selector switch which selectively connects said fax machine to any one of said cable and said computer;

said controller being disposed between said computer and said switching system, and having software for controlling said switching system and said ring-signal generator, which is so programmed that:

(a) when said controller receives information with a "print" command from said computer, said ring-signal generator will start to send ring-signals to said fax machine, and if said fax machine is detected by said off-hook detector to be in non-busy state, said ring-signal generator will stop sending ring-signals to said fax machine, while said computer and said fax machine will be connected and the information from said computer is printed out by said fax machine;

(b) when said fax machine is used to scan information and if the first selector switch connects said fax machine to said computer, the scanned information is transmitted to said computer if said fax machine is detected to be in the off-hook state;

(c) when said controller receives an information with a "send" command from said computer, the information from said computer will be sent to said cable;

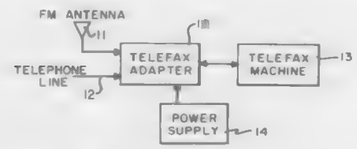
(d) when information is transmitted from said central office, said information will be transmitted to one of said computer and said fax machine depending on the state of said first selector switch, said device being characterized by that said switch system comprises, apart from said first selector switch, a second selector switch and a third selector switch and a normally-open switch, each of said first, second, and third selector switches having a first, second, third, fourth, fifth and sixth terminal, and each of the said selector switches having a first switching state in which said first terminal is connected to said third terminal and said second terminal is connected to said fifth terminal, and a second switching state in which said first terminal is connected to said fourth terminal and said second terminal is connected to said sixth terminal, said first and second terminal of said first selector switch being connected to said fax machine, said third terminal and fifth terminal of said first selector switch being connected to said cable, said fourth terminal of said first selector switch being connected to said first terminal of said second selector switch, said sixth terminal of said first selector switch being connected to said off-hook detector, said second terminal of said second selector switch being connected to said off-hook detector, said third and fourth terminals of said second selector switch being connected to said fourth and sixth terminals of said third selector switch, said sixth terminal of said second selector switch being connected to said ring generator, said third and fifth terminals of said third selector switch being connected to said normally-open switch and said cable, said first and second terminals of said third selector switch being connected to said controller.

4,991,201

SCA FACSIMILE ADAPTER

Ling-Yuan Tseng, 5th Fl., 1-1, Lane 3, Alley 128, ChinHwa Street, ChinMei, Taippei, Taiwan 11708

Filed Jun. 7, 1989, Ser. No. 362,567
Int. Cl.[5] H04N *1/32*
U.S. Cl. 379—100 22 Claims



1. A facsimile signal control system adapted to be connected between a facsimile machine and a telephone line, comprising:

means for receiving and demodulating RF signals received from an antenna;

means for establishing communication between the telephone line and the facsimile machine; and

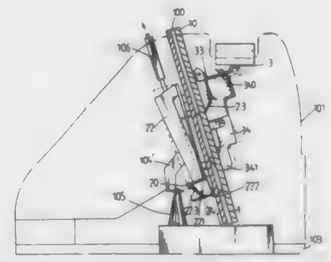
control means for terminating said telephone line communication in response to a detection of a receipt of said RF signals so as to establish communication between said receiving means and the facsimile machine, said control means being responsive to a detection of an absence of said RF signals for reestablishing communication between the telephone line and the facsimile machine.

4,991,202

COIN CALL TELEPHONE APPARATUS

Lih-Chuan Su, No. 1, Alley 33, Lane 788, Hsin Chuan Chih Rd., Tso Ying District, Kaohsiung, Taiwan

Filed Nov. 2, 1989, Ser. No. 430,450
Int. Cl.[5] H04M *1/02, 17/02*
U.S. Cl. 379—146 1 Claim



1. A coin call telephone apparatus, including a bottom block having mounted thereon a control device and covered with a casing,

wherein said control device includes:

a coin insertion mechanism, comprising a housing having a slot made thereon at the top for insertion therein of coins, a coin entrance at the bottom, and a track obliquely disposed in the middle to connect said coin slot to said coin entrance;

a coin slotting mechanism being set at the left lower side of said housing and generally comprised of a holder plate, a movable U-shaped plate mounted on said holder plate, a link rod coupled with said U-shaped plate at one lateral side having two circular recesses made thereon, a press button mounted on said casing to alternatively press on or leave from said U-shaped plate, a push plate connected to said link rod at the bottom and penetrating through an elongated transverse slot, a curved retainer frame connected to said holder plate at the bottom comprising a projecting end alternatively seated in either one of said two circular recesses of said link rod, and a rectangular rod connected to the middle part of said link rod and penetrating through a hole made on said housing to connect to a refunding mechanism; and

a coin refunding mechanism comprising a cradle turnably mounted on a round rod having a rectangular hole made thereon, a return spring mounted on said round rod, a refund plate having at the top a curved strip portion attached to one inner side of said rectangular hole and having at the bottom a stop plate portion inserted through a hole made on said track of said housing to prevent from dropping of coin through a refund hole, an elongated follower plate constantly pressed on said rectangular rod of said slotting mechanism to stop coin slotting operation;

characterized in that when said press button is pressed down, said U-shaped plate is simultaneously pressed to drive said link rod to move downward to further drive said curved retainer frame of said holder plate to move away from one recess to seat in the other recess so as to let

said link rod be kept in a downward position and the let said U-shaped plate turn downward to drive said push plate to protrude beyond said elongated transverse slot to further let inserted coin drop through the back side of said push plate to allow continuously insertion of coins without pressing down the control button again; when the hand set of the associated telephone apparatus is hung on said cradle after a call is finished or if the line is engaged, said refund plate is forced, by means of said curved strip portion, to turn rightward to force said stop plate portion of said refund plate to move rightward, to let said elongated follower plate press on said rectangular rod to further drive said push plate to return to original position so as to stop coin slotting operation and to let any coins remained in said track drop through said elongated exit into said refund slot for return.

4,991,203

LINE SWITCHING APPARATUS AND METHOD

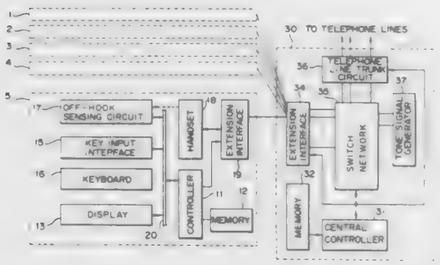
Katsuhiro Kakizawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1989, Ser. No. 351,046

Claims priority, application Japan, May 17, 1988, 63-121086; Jul. 4, 1988, 63-165133; Jul. 4, 1988, 63-165134

Int. Cl.[5] H04M *3/48*

U.S. Cl. 379—209 **24 Claims**



1. A line switching apparatus for performing line connection between an extension and a line, comprising:

receiving means for receiving a line-connection request signal from an extension;

discriminating means for determining whether a connection is possible to the line when the connection request signal is received from said receiving means;

sending means for sending a busy signal to the extension when said discriminating means determines that connection to the line is impossible;

detecting means for monitoring the status of the line during sending of the busy signal by said sending means, and detecting that the line is in a connectable state; and

alarm means for informing the extension of the fact that the line has been detected to be in the connectable state by said detecting means.

4,991,204

ADAPTIVE ROUTING CONTROL METHOD

Hisao Yamamoto; Kenichi Mase, both of Tokyo; Akiya Inoue, Iruma; Hiroo Itou, Musashino; Masato Suyama, and Yoshitaka Hoshi, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 433,949

Claims priority, application Japan, Dec. 5, 1988, 63-307474; Apr. 18, 1989, 1-98297

Int. Cl.[5] H04Q *3/54;* **H04M** *7/06, 3/36*

U.S. Cl. 379—221 **28 Claims**

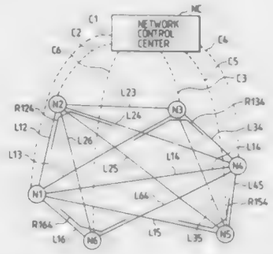
1. An adaptive routing control method for a telecommunications network in which a plurality of switching nodes are interconnected via links each composed of a plurality of trunks, one or more routes formed by one or more of said links are provided between each node pair made up of two arbitrary ones of said switching nodes, and at least one network control center is connected via a control signal link to each of said switching nodes, said method comprising:

a step wherein said network control center adaptively determines, for each said node pair, a set of available routes composed of routes which are set available based on the traffic volume in said telecommunications network and the trunk status of said links;

a step wherein said network control center sends said set of available routes to each switching node of each said node pair;

a step wherein each said switching node receives and stores said set of available routes sent from said network control center;

a step wherein each said switching node responds to each



call-connection request to select one of said routes from said set of available routes and perform a call-connection procedure based on trunk-status information obtained with respect to the most recent call-connections through respective said routes;

a step wherein, when a call requesting said switching node for connection is a call to a transited from one of the other switching nodes which is the originating node of the call to another of said switching nodes which is the terminating node of said call, said switching node acts as a transit node, is connected to said terminating node, and transfers to said originating node trunk-status information of said link which constitutes said selected available route; and

a step wherein upon each reception of said trunk-status information corresponding to said selected available route, said originating node stores and updates said trunk-status information.

4,991,205

PERSONAL IDENTIFICATION SYSTEM AND METHOD

Jerome H. Lemelson, 868 Tyner Way, Call Box 14-286, Incline Village, Nev. 89450

Continuation of Ser. No. 837,339, Feb. 28, 1986, abandoned, which is a continuation of Ser. No. 663,788, Oct. 23, 1984, abandoned, which is a continuation of Ser. No. 285,907, Jul. 23, 1981, abandoned, which is a continuation of Ser. No. 78,166, Sep. 24, 1979, abandoned, which is a division of Ser. No. 78,167, Sep. 24, 1979, which is a continuation-in-part of Ser. No. 225,173, Aug. 27, 1962, and Ser. No. 885,264, Mar. 10, 1978, which is a continuation-in-part of Ser. No. 458,879, Apr. 8, 1974, Pat. No. 3,943,563. This application Jun. 15, 1987, Ser. No. 62,378

Int. Cl.[5] H04N *7/167, 5/78;* **G06K** *5/00;* **H04M** *11/00*

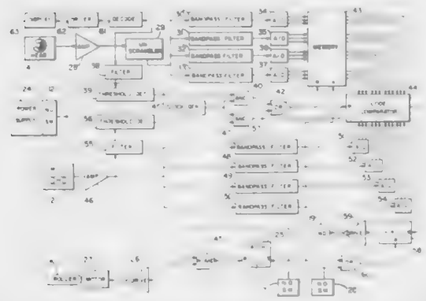
U.S. Cl. 380—5 **14 Claims**

1. A personal identification system comprising in combination:

(a) an identification recording area disposed on a hard copy record card member which includes visually readable print indicia thereon and may be carried by a person as identification documentation of said person, said recording area containing recorded scrambled information defining a physical characteristic of said person to identify said person carrying the record member,

(b) first means for reading said recorded scrambled information from said recording area and generating electrical signals representative of the scrambled information recorded therein,

(c) second means for processing said scrambled electrical signals to produce unscrambled electrical signals,



(d) third means including a variable display means and electrical control means for controlling operation of said display means,

(e) said third means being operable to receive from said second means said unscrambled electrical signals and employ same to display on said display means an image in a form permitting monitoring said display means to determine the true physical characteristics of the person recorded in the identification recording area on said hard copy record card member.

4,991,206

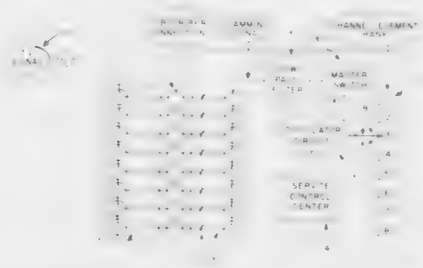
METHOD AND APPARATUS FOR JAMMING SELECTED TELEVISION PROGRAMS

Pierre Blais, Montreal, Canada, assignor to Electroline Equipment Inc., Quebec, Canada

Filed Sep. 30, 1988, Ser. No. 251,579

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—7 **13 Claims**



3. An apparatus for selectively preventing the viewability by multiple unauthorized subscribers, and allowing the viewability by multiple authorized subscribers, of, where M is an integer, from 1 to M selected television channels, each of which M selected television channels is respectively referred to as channel 1, channel 2, . . . channel M, and each of which M selected television channels is referred to in general as channel Z, where Z represents a number from 1 to M, wherein channel Z has a television signal and a unique carrier wave which has a unique carrier wave frequency, and wherein said television signal has a regularly spaced horizontal synchronization signal and is modulated onto said unique carrier wave, accordingly there are M television signals and M unique carrier waves, and wherein said multiple authorized and multiple unauthorized subscribers are each using a television signal circuit to receive the M television signals of the M selected television channels, which television signals are being transmitted over a controlled access medium to each subscriber's television signal circuit, and accordingly are being transmitted to multiple television signal circuits, which apparatus is comprised of:

(i) generating means for generating an oscillating signal having a duration longer than the duration of any of the regularly spaced horizontal synchronization signals of any of the M television signals;

(ii) M separate frequency generating circuits, each of which generates only one frequency, and each of which is referred to in general as frequency generating circuit Z, wherein frequency generating circuit Z is designed to generate a frequency that, when coupled with the generating means, causes the generating means to generate an oscillating signal having a duration longer than the duration of the regularly spaced horizontal synchronization signal of channel Z and a frequency higher than the unique carrier wave frequency of the carrier wave of channel Z, yet close enough to that carrier wave frequency to be confusing with that carrier wave to a television signal circuit;

(iii) a coupling means which is able to couple any of the M separate frequency generating circuits with the generating means for a period of time at least as short as 63.5 μS/M, thereby causing the generating means to generate a jamming signal which is referred to in general as jamming signal Z;

(iv) a combining means which receives jamming signal Z from the generating means and is able to combine jamming signal Z, for a period of time as little as approximately 63.5 μS/M, with the television signals going to the television signal circuits of the multiple unauthorized subscribers who are not authorized to view channel Z; and

(v) a service control means for starting and going through a cycle, which cycle consists of instructing the coupling means to couple, in turn, each of the M separate frequency generating circuits with the generating means for separate periods of approximately 63.5 μS/M each, thereby, in turn, for M periods of approximately 63.5 μS/M each, producing a different jamming signal Z, and in turn instructing the combining means to combine jamming signal Z with the television signal circuits of the multiple unauthorized subscribers who are not authorized to view channel Z, until each jamming signal Z has been combined one time with the television signal circuits of the multiple unauthorized subscribers who are not authorized to view channel Z, at which time the cycle ends, and continuing to start and go through the cycle every time the cycle ends.

4,991,207

ONE-WAY ADDRESS TRANSMISSION SYSTEM OF PCM MUSIC

Kenichi Shiraishi, Yokohama, and Hirokazu Kobayashi, Urawa, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,810

Claims priority, application Japan, Mar. 26, 1988, 63-70876

Int. Cl.[5] H04B *3/00;* **H04K** *1/02;* **H04L** *9/20*

U.S. Cl. 380—9 **3 Claims**

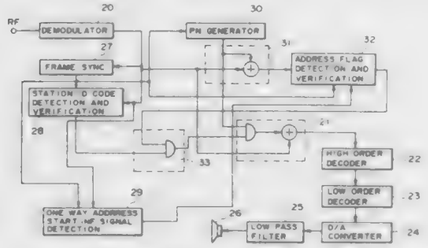
1. A one-way address transmission system of PCM music broadcasting comprising:

a broadcasting station for transmitting a PCM broadcasting signal of a sequence of frames, each frame including station identification data, scrambled music data and scrambled address flag data in PCM; and a receiver comprising:

(a) means for verifying the station identification data in the received broadcasting signal as a station code which represents a reproduction admissible station to the receiver to generate a station verification signal;

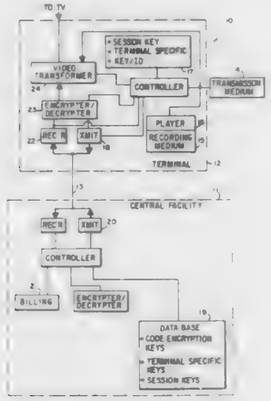
VOL 1123 ISS 1 FEB 5 1991 UMI

(b) means for descrambling the scrambled address flag data in the received broadcasting signal;
(c) means for verifying the descrambled address flag data as an address code which represents reproduction ad-



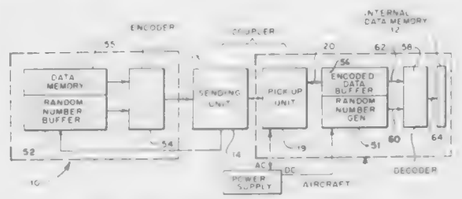
missible receivers to the station to generate a receiver verification signal; and
(d) means in response to both of the station verification signal and the receiver verification signal for descrambling the scrambled music data to reproduce a music.

4,991,208
VIDEO CONTROL SYSTEM HAVING SESSION ENCRYPTION KEY
Stephen S. Walker, Marlborough; Clarence M. Sidlo, and Melvin J. Teare, both of Framingham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Mar. 29, 1990, Ser. No. 501,684
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—20 **1 Claim**



1. A video system comprising:
a central facility;
a terminal; and
video program means for providing to said terminal a video program including a series of television fields including a first field containing both a random digital code encrypted according to a code encryption key and program identification data, and a second field containing an unintelligible video signal previously transformed from an intelligible video signal according to said random digital code,
said terminal including means to store terminal identification data and a terminal specific encryption key; and means to send to said central facility said program identification data and said terminal identification data,
said central facility including means for providing a session encryption key; means for encrypting said session encryption key according to said terminal specific encryption key; means for sending the encrypted session encryption key from said central facility to said terminal; a data base for storing and retrieving at least one code encryption key corresponding to the program identification data; means for encrypting said code encryption key according to said session encryption encryption key; and means for sending the encrypted code encryption key from said central facility to said terminal,
said terminal further including means for receiving the encrypted session encryption key from said central facility; decryption means for decrypting said session encryption key according to said terminal specific encryption key, means for receiving the encrypted code encryption key from said central facility; decryption means for decrypting said code encryption key according to said session encryption encryption key, and decrypting the encrypted random digital code of said first frame in accordance with said code encryption key; and means for transforming said unintelligible video signal of said second frame to said intelligible video signal using the decrypted random digital code.

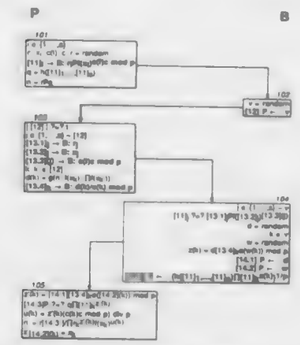
4,991,209
RANDOM LOCAL MESSAGE ENCRYPTION
Melvin Kolbert, Boca Raton, Fla., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Oct. 17, 1988, Ser. No. 258,349
Int. Cl.[5] H04L *9/28*
U.S. Cl. 380—28 **5 Claims**



1. A data encryption system for aircraft comprising:
a random number generator located on board the aircraft;
coupling means for transmitting the random number out through the aircraft skin to first buffer means in an external portable box;
means located in the box for storing fixed data to be encrypted;
encoding means located in the box for encoding the data with the random number in a predetermined encryption sequence;
second buffer means in the aircraft for storing the encrypted data after secure transmission thereto, back through the aircraft skin, by the coupling means;
decoding means in the aircraft for decoding the stored encrypted data in accordance with the encryption sequence; and
means in the aircraft for storing the data.

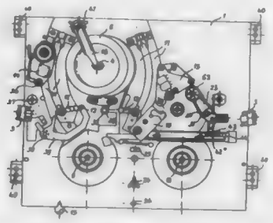
4,991,210
UNPREDICTABLE BLIND SIGNATURE SYSTEMS
David Chaum, 14652 Sutton St., Sherman Oaks, Calif. 91403
Filed May 4, 1989, Ser. No. 347,303
Int. Cl.[5] H04L *9/30*
U.S. Cl. 380—30 **4 Claims**

3. In public-key digital blind signature apparatus, the improvement comprising:
means for providing at least one candidate message by a providing party to a blind signature issuing party;
means for receiving at least one candidate message by said issuing party;
means for applying an exponent by said issuing party, that cannot readily be determined by said providing party, to at least one of said candidate messages received;
means for returning a resulting first signature including said exponent by said issuing party to said providing party; and



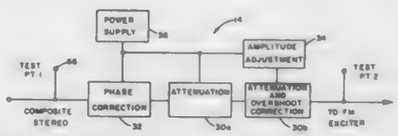
means for forming by said issuing party of a second digital signature using said at least one candidate message that is unlinkable to said first signature issued.

4,991,211
INTEGRATED DRIVING SYSTEM FOR SIGNAL-PROCESSING DEVICES
Heinrich Cap, St. Georgen-Peterzell; Georg F. Papst, and Edgar Zuckschwert, both of St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, Black Forest, Fed. Rep. of Germany
Continuation of Ser. No. 942,834, Dec. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 733,218, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 684,460, Dec. 21, 1984, abandoned. This application Aug. 25, 1989, Ser. No. 399,405
Claims priority, application Switzerland, Nov. 29, 1984, 5685/84
Int. Cl.[5] G11B *19/00, 33/00*
U.S. Cl. 360—84 **17 Claims**



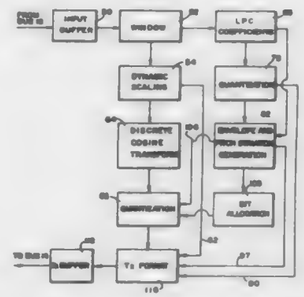
1. An integrated driving system for signal-processing devices, especially video and other pulse recording devices, comprising:
a device chassis formed of a metal and mounting active and passive drive elements including a plurality of motors, shafts, bearings and pins;
a cassette supporting plane defined by three reference points on the chassis;
a head drum mounting bore on and through the chassis, the head drum mounting bore having an axis that forms a specified angle with respect to the cassette supporting plane; and
a plurality of precisely positioned motor mounting flanges and a plurality of additional precisely positioned bores on and through the chassis receiving and mounting the shafts, bearings and pins of the active and passive drive elements,
the reference points, the bores, the motor mounting flanges and the chassis all being of a one-piece construction with integral portions of the chassis separating the precisely positioned bores, mounting flanges and reference points,
all bores, mounting flanges and reference points having been first formed with the chassis in a certain relationship to each other and thereafter having been precision machined in a single chucking step of the chassis in a machine tool to obtain a precisely adjusted relationship to each other, whereby these bores, flanges and reference points are positioned relative to each other with an extremely high degree of precision.

4,991,212
BROADCAST SIGNAL CONDITIONING METHOD AND APPARATUS
Frank Foti, 12540 Edgewater Dr. #1206, Lakewood, Ohio 44107
Filed Nov. 9, 1989, Ser. No. 433,760
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—14 **13 Claims**



1. Signal conditioning apparatus for use in frequency modulating a communications broadcast carrier signal comprising:
(a) an attenuation circuit for attenuating modulation radio signals within a frequency range and for transmitting modulation radio signals outside the frequency range; and
(b) a phase correction circuit coupled to the attenuation circuit to effect a phase adjustment on modulation radio signals transmitted by the attenuation circuit outside the frequency range to reduce phase distortion imposed on the modulation signals outside the frequency range due to transmission of said signals by the attenuation circuit.

4,991,213
SPEECH SPECIFIC ADAPTIVE TRANSFORM CODER
Philip J. Wilson, San Diego, Calif., assignor to Pacific Communication Sciences, Inc., San Diego, Calif.
Filed May 26, 1988, Ser. No. 199,015
Int. Cl.[5] G10L *9/04, 9/18*
U.S. Cl. 381—34 **8 Claims**



1. Apparatus for developing pitch information in relation to a given speech signal in a transform coder, which coder operates on a sampled time domain information signal composed of information samples by sequentially segregating groups of information samples into blocks, by transforming each block of

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samples from the time domain to a transform domain, and by generating an auto-correlation function of the transformed signal for each block, and which coder includes a data memory, said apparatus comprising,

pitch means for determining the pitch period and the pitch gain from said auto-correlation function;

striation means for determining the striation magnitude and energy from said pitch period and pitch gain;

reference means for retrieving from said data memory a reference pitch, model which model includes a number of data points wherein said data points are representative of a model pitch striation;

scaling means for generating a striation scaling factor in response to said magnitude and energy;

multiplication means for multiplying said striation scaling factor by each of said data points thereby generating a current pitch model having a number of adaptively determined points; and

sampling means for sampling said adaptively determined points which sampling establishes said pitch information.

4,991,214

SPEECH CODING USING SPARSE VECTOR CODEBOOK AND CYCLIC SHIFT TECHNIQUES

Daniel K. Freeman, and Ivan Boyd, both of Ipswich, England, assignors to British Telecommunications public limited company, United Kingdom

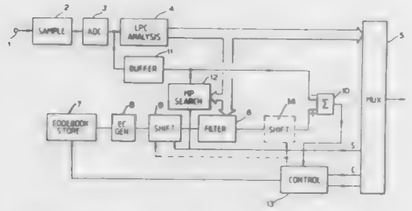
PCT No. PCT/GB88/00708, § 371 Date May 9, 1989, § 102(e) Date May 9, 1989, PCT Pub. No. WO89/02147, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 26, 1988, Ser. No. 358,350

Claims priority, application United Kingdom, Aug. 28, 1987, 8720389; Sep. 15, 1987, 8721667

Int. Cl.[5] G10L *7/02*

U.S. Cl. 381—38 **10 Claims**



1. A speech coder comprising:

means for generating filter information from frames of input speech signals, said means for generating filter information defining successive representations of a synthesis filter response, and outputting said filter information; and

means for generating frames of excitation information for successive frames of said input speech signals, eahc of said excitation frames including a series of pulses, said means for generating frames receiving said input speech frames and said filter information and comprising:

(a) a store of data defining a plurallity of representative excitation frames, each having a plurality of pulses and each representative frame representing a class of member excitation frames;

(b) means for selecting one of said member excitation frames, said selected excitation frame when applied to the input of a filter having said filter information producing a frame of synthetic speech resembling said input speech, and outputting data indentifying said selected excitation frame, said means for selecting including:

(i) means for identifying the position within said input speech frame of a single pulse which meets a preselected criterion,

(ii) selecting one of said stored representative excitation frames depending on the position of said identified single pulse, and

(iii) determining which of said member excitation frames within the class of said selected representative excitation frame that matches said input speech frame.

4,991,215

MULTI-PULSE CODING APPARATUS WITH A REDUCED BIT RATE

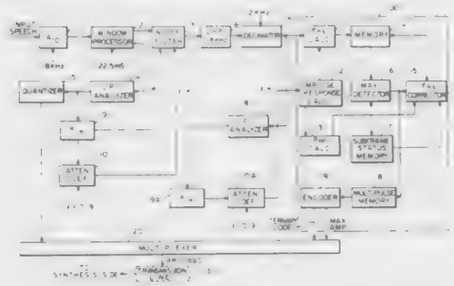
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 38,730, Apr. 15, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 421,314

Claims priority, application Japan, Apr. 15, 1986, 61-87423; May 27, 1986, 61-122689

Int. Cl.[5] G10L *7/02*

U.S. Cl. 381—38 **17 Claims**



1. A speech processing apparatus, comprising:

an analog-to-digital (A/D) converter for converting an analog input speech signal for each of a plurality of analysis frames having a predetermined time interval into a digitized sampled signal with a first sampling frequency:

first spectrum detecting means for detecting spectrum information of said digitized sampled signal in said analysis frames to produce a first spectrum signal representative of said spectrum information of said digitized sampled signal;

filter means for filtering said digitized sampled signal to produce a filtered speech signal which is weighted by said first spectrum signal and restricted within a first frequency band smaller than that of said input speech signal;

a decimator for converting said filtered speech signal into a decimated speech signal with a second sampling frequency smaller than that of said first sampling frequency;

second spectrum detecting means for detecting spectrum information of said decimated speech signal in said analysis frames to produce a second spectrum signal representative of said spectrum information of said decimated speech signal; and

multi-pulse developing means responsive to said decimated speech signal for developing a plurality of multi-pulses each having an amplitude and a location representative of speech exciting source information of said decimated speech signal.

4,991,216

METHOD FOR SPEECH RECOGNITION

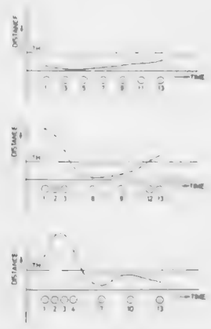
Satoru Fujii, and Katsuyuki Niyada, both of Sagamihara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 653,849, Sep. 24, 1984, abandoned. This application Mar. 23, 1990, Ser. No. 501,386

Claims priority, application Japan, Sep. 22, 1983, 58-175304; Mar. 27, 1984, 59-58706; Mar. 27, 1984, 59-58709

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—41 **8 Claims**



1. A method recognizing speech comprising the steps of:

(a) dividing speech sounds into continuous N frames each having a predetermined time period;

(b) analyzing speech sounds for each of said N frames so as to obtain spectrum information;

(c) extracting n frames from said N frames such that said n frames include frames noncontinuous in said continuous N frames wherein $n<N$, said noncontinuous n frames being extracted from a region where variation rate of distance determined by said spectrum information and a standard pattern is below a predetermined value; and

(d) recognizing phonemes or syllables of said speech sounds by calculating similarity between said spectrum information of said n frames and said standard patterns, which are produced using speech sounds from a number of speaking persons in advance.

4,991,217

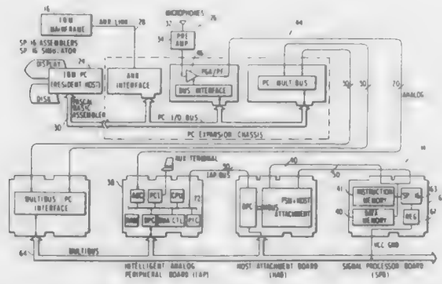
DUAL PROCESSOR SPEECH RECOGNITION SYSTEM WITH DEDICATED DATA ACQUISITION BUS

Mary A. Garrett, Ridgefield, Conn., and Gideon Shichman, New York, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 30, 1984, Ser. No. 676,754

Int. Cl.[5] G10L *5/06;* **G06F** *3/16*

U.S. Cl. 381—43 **9 Claims**



1. A real time data acquisition and processing system, comprising:

resident host processor means (24);

input means (32, 34, 46) for receiving data signals representing data to be processed, said input means including an amplifier (46) for amplifying said data signals, said amplifier having a gain programmable in accordance with gain control signals and a bandwidth programmable in accordance with bandwidth control signals, said input means being coupled to a communication bus means (30, 64) and said gain and bandwidth control signals being provided by said resident host processor means via said communication bus means;

signal processor means (62) for processing the amplified data signals and coupled to said resident host processor means via said communication bus means for exchanging communication signals with said resident host processor means serving as a resident host for said signal processor means; and

data acquisition bus means (38, 72) for forwarding said amplified data signals to said signal processor means independently of said communication bus means.

4,991,218

DIGITAL SIGNAL PROCESSOR FOR PROVIDING TIMBRAL CHANGE IN ARBITRARY AUDIO AND DYNAMICALLY CONTROLLED STORED DIGITAL AUDIO SIGNALS

Gregory Kramer, Garrison, N.Y., assignor to Yield Securities, Inc., Garrison, N.Y.

Continuation-in-part of Ser. No. 141,631, Jan. 7, 1988, Pat. No. 4,868,869. This application Aug. 24, 1989, Ser. No. 398,238

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] H03G *3/00*

U.S. Cl. 381—61 **25 Claims**

1. A digital audio signal processor comprising:

input means for receiving input digital signals having values representative of the instantaneous amplitudes of arbitrary complex input audio signals;

non-linear transformation means for translating on a real-time basis said input digital signals in accordance with a pre-determined translation map to produce output digital signals having a predetermined amplitude for each specified input digital signal amplitude;

output means for transmitting output digital signals having values representative of the instantaneous amplitudes of arbitrary output audio signals, whereby arbitrary input audio signals are non-linearly modified by said non-linear transformation means and outputted in a form suitable for being reproduced in audible form.

4,991,219

SOUND SIMULATION CHAMBER

John Isenhath, 1020 N. Augusta St., Staunton, Va. 24401

Filed Jan. 9, 1990, Ser. No. 462,211

Int. Cl.[5] H04R *1/02*

U.S. Cl. 381—90 **11 Claims**

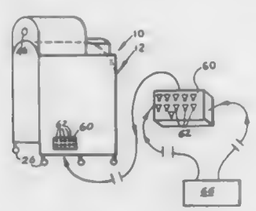
1. A sound simulation chamber comprising an enclosure,

said enclosure having a first side, a second side, a back wall in the shape of a part of a cylinder, a domed top, a lower edge and an open front,

a plurality of speakers mounted inside said enclosure,

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said speakers being wide band frequency speakers,
individual control means for at least some of said speakers whereby an operator can reproduce auditory sound likely to occur in active real-life hearing situations,
a first retractable front speaker supported on said first side of said enclosure adjacent said open front,
a second retractable front speaker supported on said second side of said enclosure adjacent said open front,
retractable means supporting said first retractable front speaker and said second retractable front speaker,
a first side speaker supported on said first side of said enclosure about three fourths distance from said lower edge to said top,



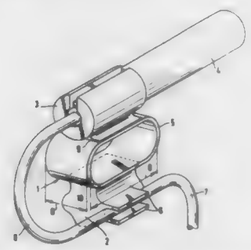
a second side speaker supported on said second side about three fourths distance from said lower edge to said top,
a first intermediate back speaker and said second intermediate back speaker being attached to said back wall spaced from said top and from said first side and said second side,
a first back top speaker attached to said back wall of said enclosure adjacent said top adjacent said front,
a second back top speaker attached to said back wall adjacent said top and adjacent said open front,
a shelf means supported on said top,
a slide projector supported on said top,
a control panel supported on said first side adjacent said lower edge.

4,991,220

MICROPHONE SUPPORT MEMBER

Konrad Wolf, Bad Vöslau, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H.

Filed Mar. 3, 1989, Ser. No. 319,412
Claims priority, application Austria, Mar. 7, 1988, A 593/88
Int. Cl.[5] H04R *1/02*
U.S. Cl. 381—169 **9 Claims**



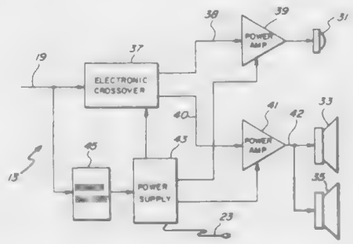
1. An elastic support member for a microphone, the support member adapted to be mounted between a tripod connecting piece and a clamping sleeve supporting the microphone, the support member comprising a single hose member shaped in the form of an elastic loop, the hose member having a width, a wall thickness and an inner diameter, the wall thickness being very thin in relation to the width, and the inner diameter being approximately twice the width.

4,991,221

ACTIVE SPEAKER SYSTEM AND COMPONENTS THEREFOR

James M. Rush, 1555 Mesa Verde Dr. E., Costa Mesa, Calif. 92626

Filed Apr. 13, 1989, Ser. No. 337,621
Int. Cl.[5] H03F *21/00*
U.S. Cl. 381—120 **27 Claims**



1. An active speaker system for reproducing audio signals in response to reception of line level signals, each system comprising at least one speaker enclosure, said speaker enclosure comprising;
a high frequency driver mounted in said enclosure;
a first power amplifier mounted inside said enclosure and connected to power said high frequency driver, said first power amplifier including a power output stage utilizing MOSFETs in a complimentary configuration;
a bass and midrange driver mounted in said enclosure;
a second power amplifier mounted inside said enclosure and connected to power said bass and midrange driver, said second power amplifier including a power output stage utilizing MOSFETs in a complimentary configuration;
a first transconductance equalizer connected to the output stage of said first power amplifier for equalizing the gain at high frequencies, providing a different gain to the P and N channel MOSFET devices in the output stage to compensate for their unequal transconductance.
a second transconductance equalizer connected to the output stage of said second power amplifier for equalizing the gain at high frequencies, providing a different gain to the P and N channel MOSFET devices in the output stage to compensate for their unequal transconductance;
an electronic crossover mounted inside said enclosure and connected to receive said line level signals and provide bass, midrange, and high frequency band signals to said first and second power amplifier; and
a power supply mounted inside said speaker enclosure for supplying power to said electronic crossover and said first and second power amplifier.

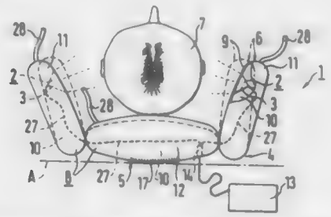
4,991,222

SOUND REPRODUCER

Hans W. Nixdorf, Pocking-Starnberg, Fed. Rep. of Germany

Continuation of Ser. No. 127,128, Dec. 1, 1987, abandoned. This application Mar. 28, 1990, Ser. No. 501,341
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3641067
Int. Cl.[5] H04R *5/02;* **A47C** *7/36*
U.S. Cl. 381—188 **14 Claims**

1. A sound reproducer arrangement adapted to be associated with the head of a person using same, comprising an inflatable cushion having a head-supporting central portion and at least one side portion, said central portion and said side portion being inflatable independently of each other; a sound source integrated in said side portion; and means for pivotally connecting said side portion to said central portion such that a plurality of obtuse angles can be formed between said side and central portions by varying the degree of inflation of said side portion.

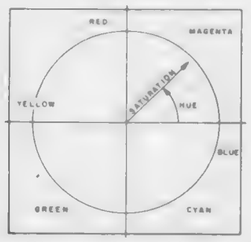


4,991,223

APPARATUS AND METHOD FOR RECOGNIZING IMAGE FEATURES USING COLOR ELEMENTS

William C. Bradley, San Diego, Calif., assignor to American Innovision, Inc., San Diego, Calif.

Filed Jun. 30, 1988, Ser. No. 213,725
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—17 **13 Claims**



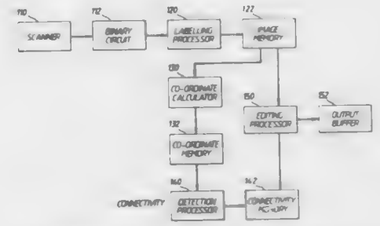
1. In a system which converts an image into a video signal by a predetermined scanning procedure, said image including colored features, said system producing a scan signal representing the product of said scanning, an improvement for identifying said features based upon their colors, the improvement comprising:
a color element converter for converting said scan signal into a plurality of conversion signals, two of said conversion signals corresponding to predetermined intensity-free color elements in color space, each of said conversion signals having a magnitude representing a value of the corresponding predetermined color element;
a value range circuit connected to said color element converter to receive said conversion signals for comparing the magnitude of each conversion signal against a plurality of predetermined value ranges of the color element corresponding to the conversion signal, and for providing a value range signal indicating a value range which contains the magnitude of said conversion signal;
color location means for storing a representation of a plurality of color locations in said image; and
a correlation circuit connected to said color location means and to said value range circuit for combining the value range signals produced by said value range circuit with said representation to produce a color location signal representing an edge of a feature occupying a color location and having a color including said two intensity-free color elements.

4,991,224

APPARATUS AND METHOD FOR LABELING CONNECTED COMPONENT IN A THREE-DIMENSIONAL IMAGE

Kazushige Takahashi, Yokohama, and Nobuo Sawada, Atsugi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 72,046, Jul. 10, 1987, abandoned. This application Oct. 19, 1989, Ser. No. 425,400
Claims priority, application Japan, Sep. 3, 1986, 61-207196
Int. Cl.[5] G06K *9/46*
U.S. Cl. 382—26 **10 Claims**



1. An apparatus for labeling connected components in a three-dimensional image, comprising:
input means for inputting a plurality of two-dimensional image planes of the three-dimensional image;
first labeling means, coupled to said input means, for labeling each two-dimensionally connected component in each twodimensional image plane, each two-dimensionally connected component including a plurality of pixels, and for generating labeled two-dimensional images in which each connected component is given an independent component code;
image memory means, coupled to the first labeling means, for storing said labeled two-dimensional images; and
second labeling means, coupled to the first labeling means, for three-dimensionally labeling each connected component in said three dimensional image, said second labeling means including:
calculation means for determining a number of representative points for each of said connected components in each two-dimensional plane, said number of representative points being substantially less than the plurality of pixels in a component, and said representative points denoted by coordinates,
detection means for detecting connectivities of the representative points of the connected components between adjacent two-dimensional image planes by comparing the coordinates of said representative points, and
editing means, coupled to said image memory means, for modifying the component code of each connected component in labeled two-dimensional image planes in accordance with the connectivities detected by said detection means.

4,991,225

SLIDABLE BATTERY HOLDER FOR SIMULATED PAGER WITH CONCEALED RADIO TRANSMITTER

Jack N. Holcomb, 1400 NW. 62nd St., Fort Lauderdale, Fla. 33307; Konrad K. Pangratz, Fort Lauderdale, and James E. Jesse, Pompano Beach, both of Fla., assignors to Jack N. Holcomb, Pompano Beach, Fla.

Filed Nov. 20, 1989, Ser. No. 438,246
Int. Cl.[5] H04B *1/38, 1/08*
U.S. Cl. 455—90 **13 Claims**

1. A slidable battery holder in a simulated pager, said simulated pager having a housing with an open end, a detachable end cap for closing said open end of the housing, the circuit components of a simulated pager in said housing, a radio trans-

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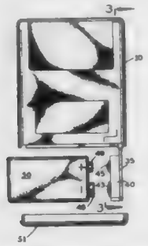
mitter in said housing, and a bracket in said housing supporting said simulated pager components and said transmitter;

said battery holder comprising:

a fixed part attached to said bracket and extending toward said open end of the housing, said fixed part of the battery holder presenting a guideway which has an open end facing toward said open end of the housing and which extends from said open end along said fixed part into said housing:

first and second electrically separate switch contacts mounted on said fixed part of the battery holder adjacent said guideway away from said open end of said guideway;

and a slidable part comprising a slide of dielectric material slidable along said guideway, first and second conductive strips on said slide positioned respectively to engage said first and second switch contacts when said slide is slid



along said guideway into said housing and to be spaced from said switch contacts when said slide is slid along said guideway out of said housing, and first and second battery contacts on said slide connected respectively to said first and second conductive strips, said battery contacts being shaped and dimensioned to engage the corresponding terminals of a battery;

said guideway being in said fixed part and having a substantially rectangular cross-section;

said slide being a dielectric body of substantially rectangular cross-section slidably received in said guideway and having opposite first and second major faces;

said conductive strips being on said first major face of said slide;

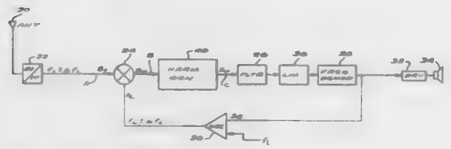
and said battery contacts being exposed beyond said second major face of said slide in the direction away from said first major face.

4,991,226

FM DETECTOR WITH DEVIATION MANIPULATION

James W. Bongiorno, P.O. Box 4835, Santa Barbara, Calif. 93140

Filed Jun. 13, 1989, Ser. No. 366,750
Int. Cl.[5] H04B *1/16, 1/26*
U.S. Cl. 455—200 **20 Claims**



20. An FM receiver comprising:

means for receiving an FM signal;

means for forming an IF signal from said FM signal;

said IF signal including a tuned carrier separated from at least one adjacent carrier by a corresponding input guard band;

a voltage controlled oscillator ("VCO");

guard band expansion means included in a forward signal path and including a harmonic generator and a mixer coupled to receive signals from said VCO, and for generating an expanded output signal, with the ratio between the bandwidth of a tuned output carrier and the the bandwidth of an adjacent expanded guard band being less than the ratio between the bandwidth of said tuned carrier and the bandwidth of said input guard band;

means for connecting said harmonic generator and said mixer in said guard band expansion means;

means for applying said IF signal to said guard band expansion means;

means for detecting the expanded output signal from said guard band expansion means; and

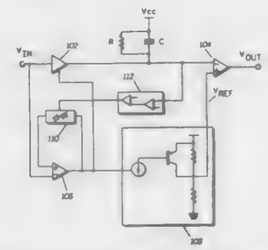
means for varying the frequency of said oscillator in accordance with the detected output.

4,991,227

SQUELCH CIRCUIT WITH VARIABLE SQUELCH TAIL AND VARIABLE HYSTERESIS

Walter H. Kehler, Jr., Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 11, 1988, Ser. No. 141,853
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—221 **5 Claims**



1. A squelch circuit for a radio receiver, said squelch circuit comprising in combination:

a buffer, the input of said buffer connecting to a squelch input signal, said squelch input signal having a magnitude indicative of the signal strength of a received radio signal, the signal at the output of said buffer being a voltage proportional to said squelch input signal when said buffer is enabled, said output of said buffer being in a high impedance mode when said buffer is disabled;

a timing circuit having a capacitor coupled to said output of said buffer, means for discharging said capacitor and means for isolating said squelch input signal from said timing circuit, when said buffer is disabled;

a first comparator, a first input of said first comparator being coupled to said output of said buffer;

a second comparator, a first input of said second comparator being coupled to said input of said buffer, the output of said comparator switching from a first state to a second state when said squelch input signal crosses a first predetermined threshold, said output of said second comparator being coupled to an enable input of said buffer, such that said buffer is enabled when said output of said second comparator is in said second state;

reference voltage means for establishing a first reference voltage at a second input of said first comparator when said output of said second comparator is in said first state, and for establishing a second reference voltage at said second input of said first comparator when said output of said second comparator is in said second state; and

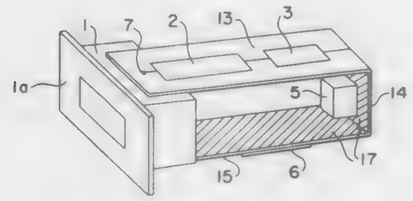
a hysteresis feedback circuit coupled between said output and a second input of said second comparator, such that said output of said second comparator switches from said second state to said first state when said squelch input signal crosses a second predetermined threshold, so that said second comparator has a first predetermined hysteresis.

4,991,228

MICROWAVE CONVERTER

Tomozo Ohta, Ikoma; Masao Miyazaki, Tenri, and Naoki Okamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 218,860, Jul. 14, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 500,215
Claims priority, application Japan, Jul. 15, 1987, 62-176881; Jul. 21, 1987, 62-181390
Int. Cl.[5] H04B *1/08*
U.S. Cl. 455—323 **19 Claims**



1. A compact microwave converter comprising:

a three dimensional body with a plurality of internal and external surfaces, wherein said internal surfaces constitute grounding surfaces;

circuit components mounted on two or more of said plural external surfaces; and

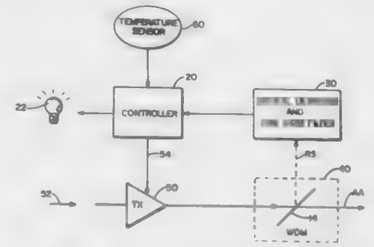
a local oscillator mounted on one of said internal surfaces such that said local oscillator is completely enclosed by said three dimensional body to shield it from external disturbances.

4,991,229

OPTICAL TRANSMITTER POWER MEASUREMENT AND CONTROL

Larry A. Nelson, and James W. Woods, both of Albuquerque, N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 3, 1989, Ser. No. 331,866
Int. Cl.[5] G02F *1/00*
U.S. Cl. 455—605 **22 Claims**



1. A fiber optic transmission system including a fiber optic link comprising:

(a) means for transmitting an optical signal having a concentration of energy at a particular wavelength;

(b) means for routing optical signals in response to the concentration of energy at the particular wavelength of the transmitted optical signal wherein the routing means is disposed to receive the transmitted optical signal and reflects a small portion of the transmitted optical signal;

(c) first means for receiving the reflected portion of the optical signal disposed to cooperate with the routing means, the receiving means further including a means for converting the reflected portion into a control signal;

(d) means for sensing temperature disposed to sense temperature variations in the first receiving means; and

(e) means for controlling the transmitting means adapted to receive the control signal and further being disposed so as to regulate the transmitting means responsively to the control signal, and wherein the controlling means further operates to regulate the power of the transmitting means as a function of temperature sensed by the temperature sensing means so as to maintain a preselected power margin in the fiber optic link.

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DESIGN PATENTS

GRANTED FEB. 5, 1991

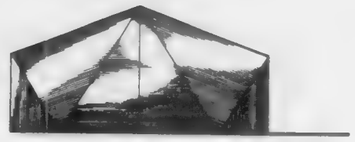
ERRATA

For CLASS	See PATENT NO.
D23-283	314,451

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314,271
HAT
Charles W. Huegy, 2 Mann St., Irvine, Calif. 92715
Filed Feb. 24, 1987, Ser. No. 18,126
Term of patent 14 years
U.S. Cl. D2—244

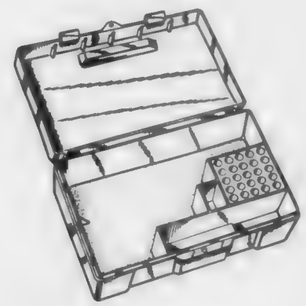




314,272
BOOT
Terri D. Laycock, R.R. 1, Box 73, Roann, Ind. 46974, assignor to Terri D. Laycock, Roann, Ind.
Filed May 9, 1988, Ser. No. 191,663
Term of patent 14 years
U.S. Cl. D2—273



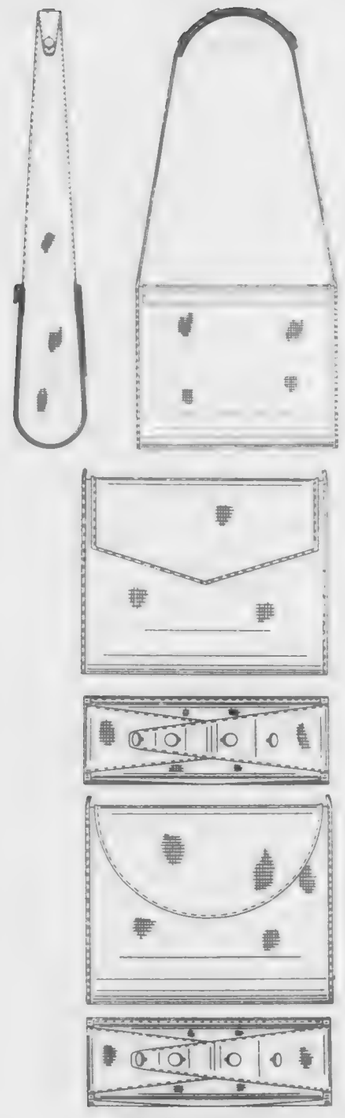
314,273
HANDGUN STORAGE BOX
William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio
Filed May 6, 1988, Ser. No. 191,657
Term of patent 14 years
U.S. Cl. D3—38



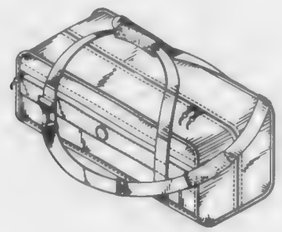
314,274
PURSE
Ellen E. Jantzen, 950 S. Flower St., Apt. 708, Los Angeles, Calif. 90015
Filed Apr. 21, 1987, Ser. No. 41,312
Term of patent 14 years
U.S. Cl. D3—52



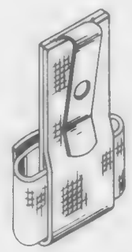
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314,276
LUGGAGE CASE
Mark B. Nordstrom, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 4, 1988, Ser. No. 165,671
Term of patent 14 years
U.S. Cl. D3—76



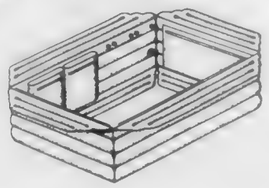
314,277
BELT ACCESSORY FOR GOLF CLUB
Dean K. Hackley, 4086 NE. 6 Ave., Ft. Lauderdale, Fla. 33334
Filed Jan. 27, 1988, Ser. No. 149,095
Term of patent 14 years
U.S. Cl. D3—104



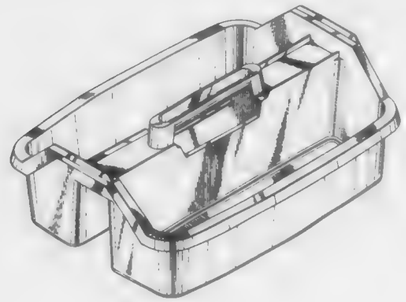
314,278
ANKLE POUCH FOR SURFERS
George B. Lanier, and George B. Lanier, Jr., both of 1126 Hampshire Ave. NE., Palm Bay, Fla. 32905
Filed Jan. 25, 1988, Ser. No. 147,920
Term of patent 14 years
U.S. Cl. D3—106



314,275
INFLATABLE INSERT FOR TRAVEL BAGS
Marshall Frey, Ossining, and Thomas Scheuer, East Williston, both of N.Y., assignors to Airelle Industries, Inc., Mount Vernon, N.Y.
Filed Dec. 30, 1987, Ser. No. 139,864
Term of patent 14 years
U.S. Cl. D3—54



314,279
TRAY FOR CARRYING TOOLS
Eric Hotchkiss, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 13, 1989, Ser. No. 297,267
Term of patent 14 years
U.S. Cl. D3—30.1



314,281
COMBINED PAINT ROLLER AND APPLICATOR UNIT
Ricardo Garcia, 240 NW. 49th Ave., #2, Miami, Fla. 33126
Filed Aug. 10, 1988, Ser. No. 230,377
Term of patent 14 years
U.S. Cl. D4—122



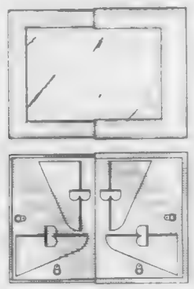
314,280
COMBINED DISPENSING CONTAINER AND BRUSH
Herbert Buecheler, Erkrath, and Georg Bosserhoff, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Aug. 27, 1987, Ser. No. 90,266
Claims priority, application World Int. Prop. O., Feb. 27, 1987, DM/008 252
Term of patent 14 years
U.S. Cl. D4—114



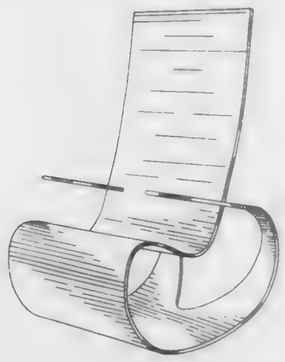
314,282
CLEANING BRUSH BLOCK AND HANDLE UNIT
Eric Gingras, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jan. 19, 1988, Ser. No. 145,182
Term of patent 14 years
U.S. Cl. D4—138



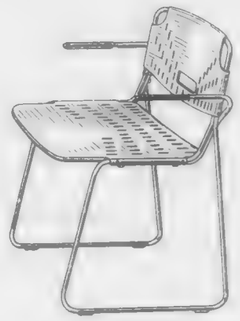
314,283
ADJUSTABLE PICTURE FRAME
Jonathan J. Grant, 11 Merriam St., Walla Walla, Wash. 99362
Filed Sep. 2, 1988, Ser. No. 240,043
Term of patent 14 years
U.S. Cl. D6—310



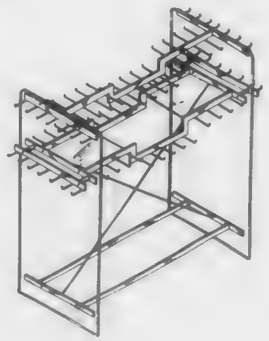
314,284
CHAIR
Robert A. Cohen, 2368 E. 26th St., Brooklyn, N.Y. 11229, assignor to Robert A. Cohen, Brooklyn, N.Y.
Filed Nov. 19, 1987, Ser. No. 122,420
Term of patent 14 years
U.S. Cl. D6—348



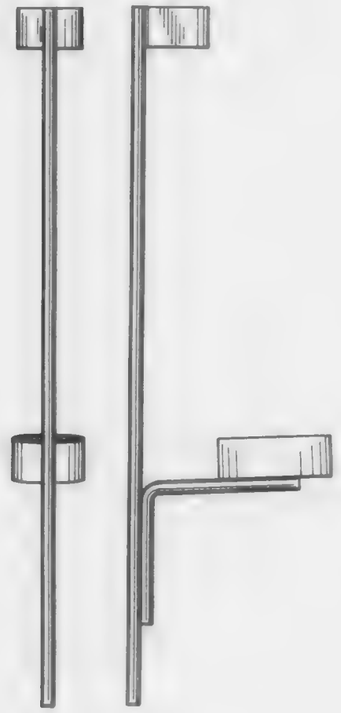
314,285
CHAIR
Paolo Favaretto, Via Lovarini N.31, 35100 Padova, Italy
Filed Jun. 29, 1984, Ser. No. 626,346
Claims priority, application Canada, May 30, 1984, 30-05-84-9
Term of patent 14 years
U.S. Cl. D6—373



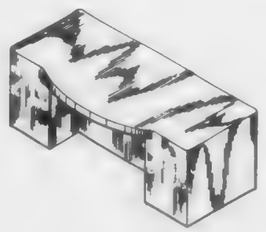
314,286
RACK
Marvin Glassenberg, 6857 N. Francisco, Chicago, Ill. 60645
Filed Oct. 8, 1987, Ser. No. 105,915
Term of patent 14 years
U.S. Cl. D6—411



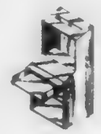
314,287
GUN STAND
Leslie A. Albright, Sr., Rte. #2, Janesville, Wis. 53545
Filed Aug. 10, 1987, Ser. No. 83,297
Term of patent 14 years
U.S. Cl. D6—417



314,288
DESK
William F. Andrews, 201 SE. 5th Ave., Delray Beach, Fla. 33444
Filed Oct. 26, 1987, Ser. No. 113,803
Term of patent 14 years
U.S. Cl. D6—422



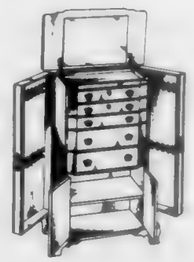
314,289
COMPUTER STAND
Joe Schaelling; Ken Webb, and Roger Krueger, all of Wichita Falls, Tex., assignors to Custom Metal Services, Inc., Wichita Falls, Tex.
Filed May 29, 1987, Ser. No. 55,746
Term of patent 14 years
U.S. Cl. D6—425



314,290
CHEST
Larry Powell, Los Angeles, Calif., assignor to L. Powell Co., Culver City, Calif.
Filed Sep. 20, 1988, Ser. No. 247,091
Term of patent 14 years
U.S. Cl. D6—432

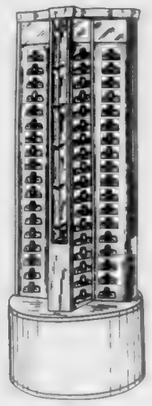


314,291
CHEST
Larry Powell, Los Angeles, Calif., assignor to L. Powell Co., Culver City, Calif.
Filed May 24, 1989, Ser. No. 356,388
Term of patent 14 years
U.S. Cl. D6—440

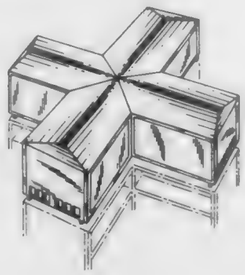


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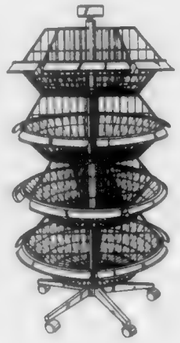
314,292
DISPLAY RACK FOR EYEGLASSES AND RELATED ACCESSORIES
Morton Nyman, 1615 W. 27th St., Miami Beach, Fla. 33140
Filed Jan. 28, 1987, Ser. No. 7,814
Term of patent 14 years
U.S. Cl. D6—457



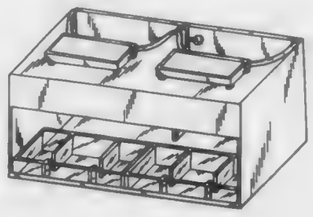
314,293
HEADER FOR A MERCHANDISING DISPLAY STAND OR THE LIKE
William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 5, 1986, Ser. No. 938,743
The portion of the term of this patent subsequent to Oct. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—455



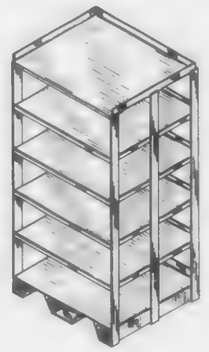
314,294
DISPLAY RACK
Franz L. Axhamre, Göteborg, Sweden, assignor to Axhamre Inredningar AB, Veddige, Sweden
Filed Jun. 5, 1987, Ser. No. 58,545
Claims priority, application Sweden, Dec. 17, 1986, 862988
Term of patent 14 years
U.S. Cl. D6—458



314,295
STAND FOR BEVERAGE SERVERS AND CONDIMENTS
David D. Boyd, Portland, Oreg., assignor to Boyd Coffee Company, Portland, Oreg.
Filed Aug. 28, 1987, Ser. No. 90,531
Term of patent 14 years
U.S. Cl. D6—467



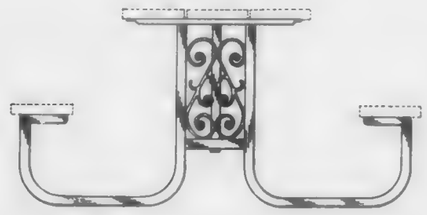
314,296
PORTABLE BEVERAGE DISPLAY UNIT
Harold Mason, Ames, Iowa, assignor to Ideal Beverage Trucks & Bodies, Inc., Ames, Iowa
Filed Jan. 4, 1988, Ser. No. 140,598
Term of patent 14 years
U.S. Cl. D6—479



314,297
TABLE
Steven Holl, New York, N.Y., assignor to Pace Collection, Inc., Long Island City, N.Y.
Filed May 6, 1988, Ser. No. 190,936
Term of patent 14 years
U.S. Cl. D6—484



314,298
END STANDARD FOR PICNIC TABLE
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Dec. 3, 1986, Ser. No. 937,245
Term of patent 14 years
U.S. Cl. D6—492



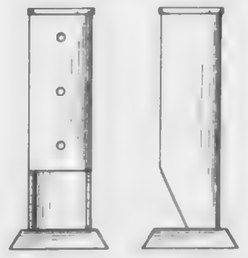
314,299
TABLE LEG
Niels Diffrient, Ridgefield, Conn., assignor to Howe Furniture Corporation, Trumbull, Conn.
Filed Apr. 14, 1988, Ser. No. 182,061
Term of patent 14 years
U.S. Cl. D6—495



314,300
CHAIR FRAME
Jun Kamahara, 2-17, Ihkura 4-chome, Sawaraku, Fukuoka-shi, Fukuoka-ken, Japan, assignor to Jun Kamahara, Fukuoka, Japan
Filed Mar. 22, 1988, Ser. No. 172,907
Claims priority, application Japan, Mar. 15, 1988, 63-010543
Term of patent 14 years
U.S. Cl. D6—500



314,301
TOILET TISSUE ROLL DISPENSER
Travis T. Cooke, 158 Indiana, Carleton, Mich. 48117
Filed Dec. 7, 1988, Ser. No. 281,239
Term of patent 14 years
U.S. Cl. D6—520

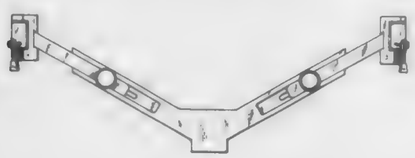


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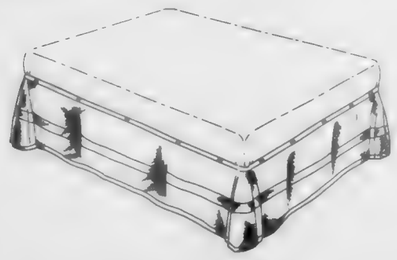
314,302
BASEBALL EQUIPMENT RACK
Albert E. Snow, 480-D Metler Road, R.R. #1, Ridgeville, Ontario L0S 1M0, Canada
Filed Mar. 29, 1989, Ser. No. 330,831
Claims priority, application Canada, Nov. 8, 1988, 08-11-88-2
Term of patent 14 years
U.S. Cl. D6—552



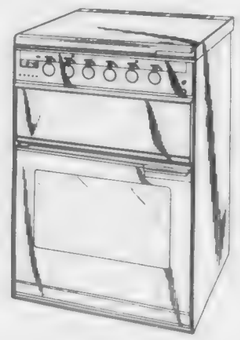
314,303
ARCHERY BOW HOLDER
James W. Glaspie, 31226 Kenady La., Cottage Grove, Oreg. 97424
Filed Apr. 14, 1989, Ser. No. 337,541
Term of patent 14 years
U.S. Cl. D6—552



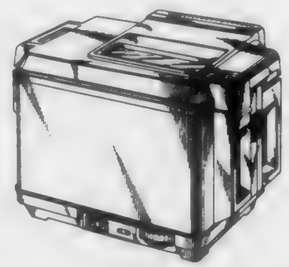
314,304
DUST RUFFLE FOR A BED
Marjorie Levine, 1520 I St., #301, Coronado, Calif. 92118
Filed Nov. 25, 1988, Ser. No. 276,328
Term of patent 14 years
U.S. Cl. D6—606

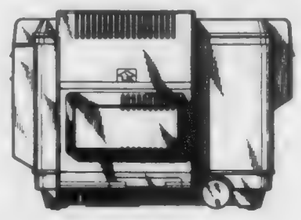


314,305
TWO CAVITY OVEN DOMESTIC COOKING APPLIANCE
Matthew G. Wright, Warrington, England, assignor to New World Domestic Appliances Limited, Warrington, England
Filed Dec. 20, 1988, Ser. No. 286,772
Claims priority, application United Kingdom, Jun. 22, 1988, 1051737
Term of patent 14 years
U.S. Cl. D7—340



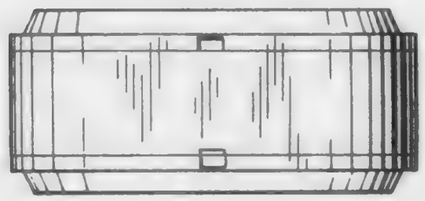
314,306
DEEP FRYER
Hans E. Slany, and Reinhard Renner, both of Esslingen, Fed. Rep. of Germany, assignors to ITT Corporation, New York, N.Y.
Filed Oct. 5, 1988, Ser. No. 253,737
Claims priority, application World Int. Prop. O., Apr. 18, 1988, DM/010772
Term of patent 14 years
U.S. Cl. D7—360





314,307
MICROWAVE OVEN COOKING CONTAINER
Kenneth J. Bush, Rte. 4, Box 326, Kings Mountain, N.C. 28086
Filed Feb. 19, 1988, Ser. No. 158,359
Term of patent 14 years
U.S. Cl. D7—505

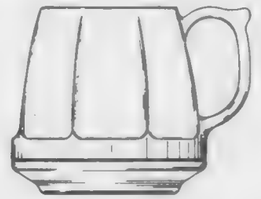




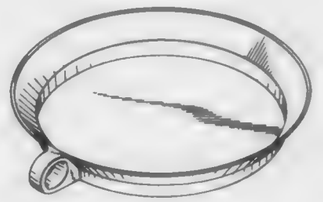
314,308
COMBINED BEVERAGE MUG AND TIMEPIECE
John H. Cogswell, 2420 S. Josephine, Denver, Colo. 80210
Filed Dec. 8, 1988, Ser. No. 281,483
Term of patent 14 years
U.S. Cl. D7—507

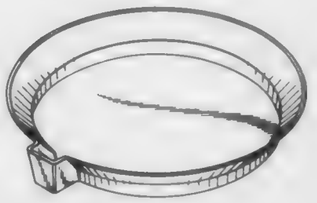


314,309
INSULATED DRINKING CUP
Christopher S. Thorp, Mystic, Conn., assignor to Dinex International, Inc., Norwich, Conn.
Filed May 2, 1988, Ser. No. 189,688
Term of patent 14 years
U.S. Cl. D7—536



314,310
BUFFET DINNER PLATE
Erna E. Pyle, 30 Drayton Ct., Blaine, Wash. 98230
Filed Oct. 27, 1987, Ser. No. 114,104
Term of patent 14 years
U.S. Cl. D7—543





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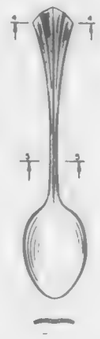
314,311
TOY LUNCH CARRIER
Linda D. Cunningham, 8613 Laverne Dr., Adelphi, Md. 20783
Filed Oct. 17, 1988, Ser. No. 258,979
Term of patent 14 years
U.S. Cl. D7—627



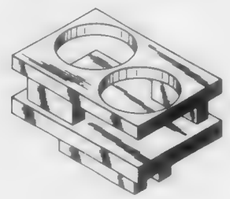
314,312
SPOON
Colin B. Richmond, Vernon Center, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Mar. 28, 1988, Ser. No. 174,546
Term of patent 14 years
U.S. Cl. D7—653



314,313
SPOON
Colin B. Richmond, Vernon Center, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Mar. 28, 1988, Ser. No. 174,547
Term of patent 14 years
U.S. Cl. D7—653



314,314
COMBINED DRINK AND CUP HOLDER
E. Raphe Shipman, P.O. Box 800865, Dallas, Tex. 75380
Filed Oct. 27, 1988, Ser. No. 263,136
Term of patent 14 years
U.S. Cl. D7—616



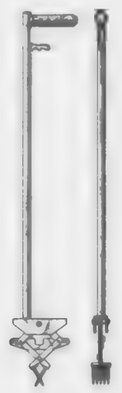
314,315
STRAINER
Arne Darnell, Karlshamn, Sweden, assignor to Hammarplast AB, Sweden
Filed Jul. 1, 1988, Ser. No. 215,436
Claims priority, application Sweden, Mar. 1, 1988, 88-0513
Term of patent 14 years
U.S. Cl. D7—667



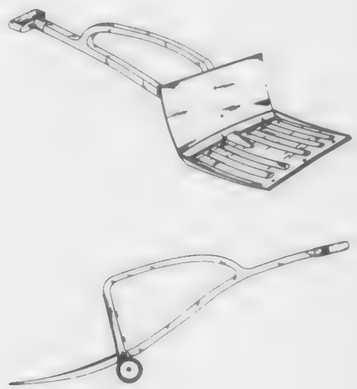
314,316
PEPPER MILL
J. T. Wu, No. 25, Hsin Ye Road, Tainan, Taiwan
Filed Dec. 9, 1988, Ser. No. 281,689
Term of patent 14 years
U.S. Cl. D7—679



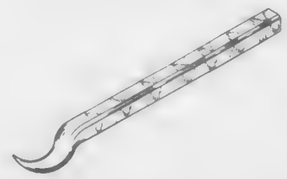
314,317
VEGETATION UPROOTING TOOL
John Thomson, 315 Hector Street, Bass Hill, New South Wales, Australia
Filed Jul. 3, 1989, Ser. No. 375,289
Term of patent 14 years
U.S. Cl. D8—5



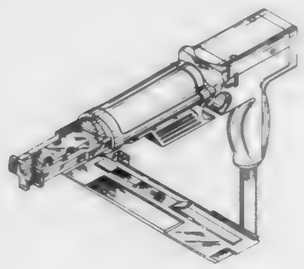
314,318
SHOVEL
Kaarlo A. Uimonen, 221 S. Geneva St., Apt. 203, Ithaca, N.Y. 14850
Filed Sep. 22, 1988, Ser. No. 247,583
Term of patent 14 years
U.S. Cl. D8—10



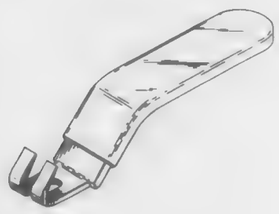
314,319
HOOK FOR EXTRACTING INSULATED WIRES FROM A SHIELDED CABLE
Ron F. Keller, San Jose, Calif., assignor to GTE Government Services Corporation, Stamford, Conn.
Filed Dec. 22, 1986, Ser. No. 945,451
Term of patent 14 years
U.S. Cl. D8—14



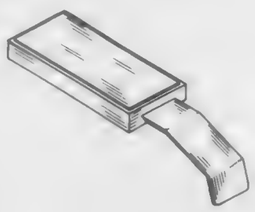
314,320
NAIL GUN
James R. Brosius, and Ralph C. Brosius, both of St. Louis, Mo., assignors to Eldorado Cartridge Corporation, Boulder, Colo.
Filed Aug. 6, 1987, Ser. No. 82,361
Term of patent 14 years
U.S. Cl. D8—67



314,321
CLIP REMOVER
Harry R. Johnston, Coatesville, Pa., assignor to One Twelve Incorporated, Coatesville, Pa.
Filed Jan. 21, 1988, Ser. No. 146,354
Term of patent 14 years
U.S. Cl. D8—89



314,322
TOILET SEAT LIFTING HANDLE
Gary Burghoff, 2001 Sombrero Beach Rd., Boot Key, Marathon, Fla. 33050
Filed May 1, 1987, Ser. No. 45,122
Term of patent 14 years
U.S. Cl. D8—307



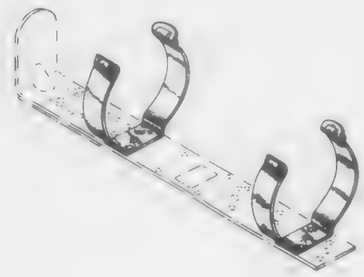
314,323
DOOR PULL
Michael J. Tremonti, Hawthorne, N.J., assignor to Hardware Design Inc., Fairfield, N.J.
Filed Nov. 22, 1988, Ser. No. 275,476
Term of patent 14 years
U.S. Cl. D8—316



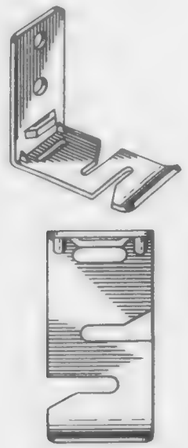
314,324
SPARK PLUG WIRE HARNESS
Randy J. Allison, Huntington Beach, Calif., assignor to Russell Performance Products, Paramount, Calif.
Filed Aug. 8, 1988, Ser. No. 229,329
Term of patent 14 years
U.S. Cl. D8—357



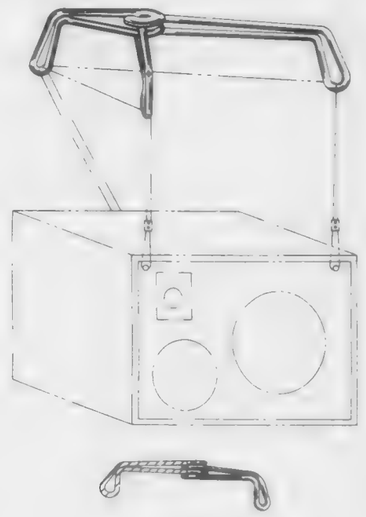
314,325
CLAMPING SET OF BRACKET ARMS FOR SUPPORTING TUBULAR OBJECTS
Theodore Zinylek, Jr., 140 Riverview Dr., and Michael P. Zinylek, 3 Brook La., both of Yardley, Pa. 19067
Filed Oct. 9, 1987, Ser. No. 106,490
Term of patent 14 years
U.S. Cl. D8—373



314,326
CABLE TIE BRACKET
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3
Filed Dec. 23, 1987, Ser. No. 137,004
Term of patent 14 years
U.S. Cl. D8—373



314,327
BRACKET FOR PENDANTLY SUPPORTING A SPEAKER
Boyd K. Temple, P.O. Box 20638, Roanoke, Va. 24018
Filed Dec. 30, 1987, Ser. No. 139,709
Term of patent 14 years
U.S. Cl. D8—373



314,328
FENCE POST ANCHOR
Dale L. Cobb, 2177 Mager Dr., Herndon, Va. 22071
Filed Sep. 2, 1988, Ser. No. 239,831
Term of patent 14 years
U.S. Cl. D8—373

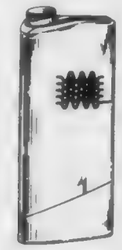


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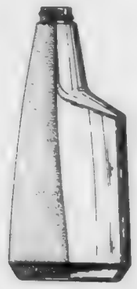
314,329
BRACKET HOLDER FOR SHELVES OR THE LIKE
David R. Kemp, Queensland, Australia, assignor to Dexion Australia Pty, Limited, Blacktown, Scotland
Filed May 4, 1988, Ser. No. 190,227
Claims priority, application Australia, Nov. 4, 1987, 4091/87
Term of patent 14 years
U.S. Cl. D8—381



314,330
BOTTLE
Emilio Ambasz, 632 Broadway, New York, N.Y. 10012
Filed Jan. 20, 1987, Ser. No. 4,683
Claims priority, application France, Jul. 18, 1986, 148
Term of patent 14 years
U.S. Cl. D9—373



314,331
BOTTLE
Edward J. Graboski, Mystic, Conn., assignor to Innopak Plastics Corporation, Chesterfield, Mo.
Filed Oct. 6, 1988, Ser. No. 254,490
Term of patent 14 years
U.S. Cl. D9—375



314,332
PERFUME BOTTLE
Giovanni Sgariboldi, Monza, Italy, assignor to Euroitalia S.R.L., Milan, Italy
Filed Dec. 4, 1986, Ser. No. 938,118
Claims priority, application Italy, Jun. 6, 1986, 22147B/86
Term of patent 14 years
U.S. Cl. D9—385



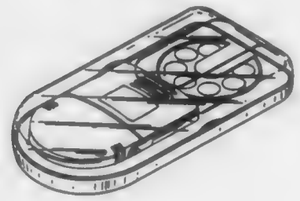
314,333
BOTTLE
Peter C. Hollingsworth, London, England, assignor to Reckitt & Colman Products Limited, London, England
Filed Oct. 20, 1988, Ser. No. 260,373
Claims priority, application United Kingdom, May 11, 1988, 1,050,675
Term of patent 14 years
U.S. Cl. D9—389



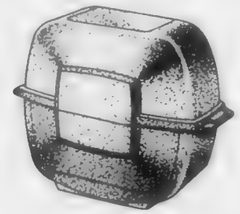
314,334
BOTTLE
Joel Desgrippes, Paris, France, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Sep. 22, 1988, Ser. No. 247,811
Claims priority, application United Kingdom, Mar. 25, 1988, 1049530
Term of patent 14 years
U.S. Cl. D9—403



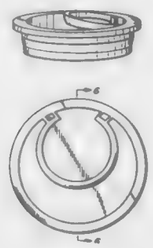
314,335
PRESENTATION BOX AND CONTENTS
Robert E. Newell, Pinner, and Paul K. Rand, Hitchin, both of England, assignors to Glaxo Group Limited, London, England
Division of Ser. No. 18,954, Feb. 25, 1987. This application Apr. 3, 1990, Ser. No. 504,429
Term of patent 14 years
U.S. Cl. D9—418



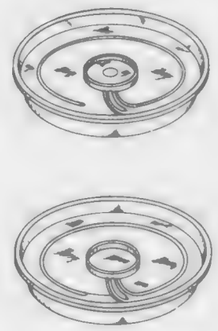
314,336
FOOD CONTAINER
Frank C. Madda, 1575 N. Barrington Rd., Hoffman Estates, Ill. 60194
Filed Jan. 31, 1986, Ser. No. 824,796
Term of patent 14 years
U.S. Cl. D9—426



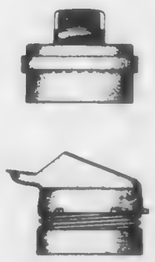
314,337
PULL RING CLOSURE FOR CONTAINER
Bernard W. Norton, Moraga, Calif., assignor to B. W. Norton Manufacturing, Inc., Hayward, Calif.
Filed Jul. 20, 1988, Ser. No. 221,774
Term of patent 14 years
U.S. Cl. D9—438



314,338
PULL TAB COVER
Lars-Erik Piltz, Konventsv. 3, Dalby, Sweden 240 10
Filed Aug. 16, 1988, Ser. No. 232,891
Claims priority, application Sweden, Feb. 16, 1988, 88-379; Feb. 16, 1988, 88-378
Term of patent 14 years
U.S. Cl. D9—438



314,339
COMBINED CLOSURE AND DISPENSER
Werner F. Dubach, Maur, Switzerland, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Apr. 13, 1987, Ser. No. 37,920
Claims priority, application Switzerland, Oct. 14, 1986, 115527
Term of patent 14 years
U.S. Cl. D9—447



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314,340
HOLDER FOR PUMP DISPENSER
Eric D. Waugh, 2076 Sherobee Rd., Ste. 1116, Mississauga, Ontario, Canada L5A 4C4
Filed Jan. 22, 1988, Ser. No. 146,760
Term of patent 14 years
U.S. Cl. D9—455



314,341
CLOCK
Janis Skrundens, 2190 Loring Pl., Bronx, N.Y. 10453
Filed Oct. 16, 1986, Ser. No. 919,779
Term of patent 14 years
U.S. Cl. D10—1



314,342
CLOCK
Kimio Hirota, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Dec. 21, 1987, Ser. No. 135,742
Claims priority, application Japan, Jun. 22, 1987, 25326
Term of patent 14 years
U.S. Cl. D10—19



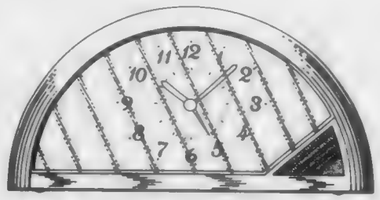
314,343
CLOCK
Keiko Mayuzumi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Dec. 15, 1987, Ser. No. 132,913
Claims priority, application Japan, Aug. 27, 1987, 62-35029
Term of patent 14 years
U.S. Cl. D10—24



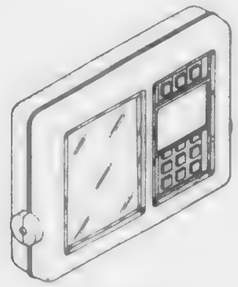
314,344
CLOCK
Seiji Odaka, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
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Claims priority, application Japan, Aug. 27, 1987, 62-35023
Term of patent 14 years
U.S. Cl. D10—25



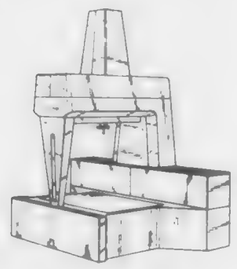
314,345
CLOCK
Motoyuki Suzuki, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Dec. 21, 1987, Ser. No. 135,743
Claims priority, application Japan, Jun. 22, 1987, 25328
Term of patent 14 years
U.S. Cl. D10—28



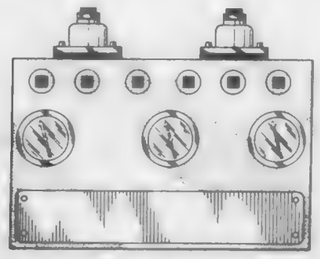
314,346
DEPTH SOUNDER
Earl W. Spencer, Montgomery; James Evans, Prattville, and William T. Mann, Eufaula both of Ala., assignor to Microsonics, Inc., Columbus, Ga.
Filed Jan. 19, 1988, Ser. No. 145,254
Term of patent 14 years
U.S. Cl. D10—46



314,347
MEASURING CENTER
Rolf Garnich, Esslingen/Zell; Gerhard Band, and Gunther Ross, both of Oberndorf, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany
Filed Oct. 28, 1988, Ser. No. 264,172
Claims priority, application Fed. Rep. of Germany, May 25, 1988, MR1351 OB
Term of patent 14 years
U.S. Cl. D10—46



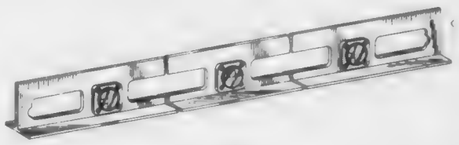
314,348
FUEL PRESSURE REGULATOR
Paul D. Sergi, 2351 Ravenna Rd., Hudson, Ohio 44236
Filed Apr. 18, 1988, Ser. No. 182,580
Term of patent 14 years
U.S. Cl. D10—49



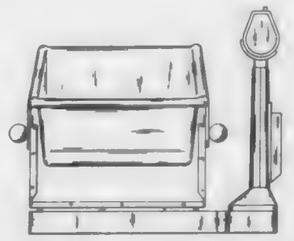
314,349
PROBE FOR ELECTRONIC CLINICAL THERMOMETER
Kenichi Kida, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 30, 1987, Ser. No. 103,263
Claims priority, application Japan, Jul. 31, 1987, 62-30901
Term of patent 14 years
U.S. Cl. D10—60



314,350
LEVEL
Randall J. Wright, 2000 Moraine End, Delafield, Wis. 53018
Filed Jul. 6, 1988, Ser. No. 215,911
Term of patent 14 years
U.S. Cl. D10—69

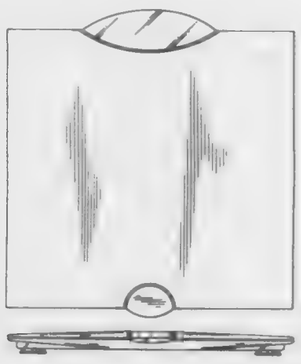


314,351
PEDIATRIC SCALE
Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.
Filed Aug. 8, 1988, Ser. No. 230,152
Term of patent 14 years
U.S. Cl. D10—91

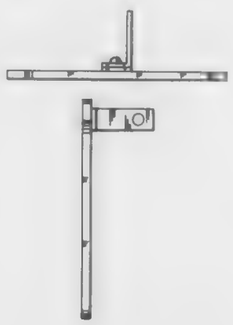


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314,352
BATHROOM SCALE
Thomas Gerlach, Altensteig, Fed. Rep. of Germany, assignor to Keter Plastic Ltd., Jaffa, Israel
Filed May 12, 1988, Ser. No. 192,889
Claims priority, application Israel, Nov. 12, 1987, 13100
Term of patent 14 years
U.S. Cl. D10—92



314,353
BICYCLE REFLECTOR
Dino Betti, 315 N. Main St., Hightstown, N.J. 08521
Filed May 21, 1987, Ser. No. 52,354
Term of patent 14 years
U.S. Cl. D10—111



314,354
TRAFFIC LIGHT
Hans G. Droschl, Rohrbachhohe 43, A-8010 Graz (Steiermark), Austria
Filed Jun. 23, 1988, Ser. No. 210,559
Claims priority, application Austria, Jan. 8, 1988, 16674
Term of patent 14 years
U.S. Cl. D10—115



314,355
NOVELTY CLOCK
Gary H. Aydelott, 803 Club Pkwy., Nashville, Tenn. 37221
Filed Dec. 2, 1987, Ser. No. 127,686
Term of patent 14 years
U.S. Cl. D10—125



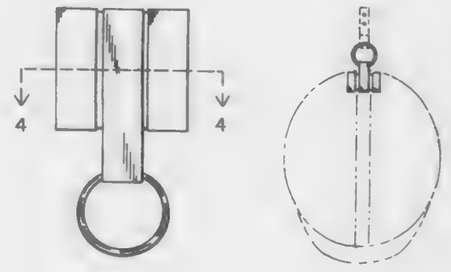
314,356
JEWELRY FINDING
Franklin A. Mason, 10469 Gramercy Pl., Riverside, Calif. 92505
Filed Apr. 18, 1988, Ser. No. 182,754
Term of patent 14 years
U.S. Cl. D11—1



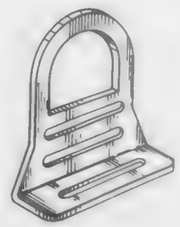
314,357
FIGURINE
Doris McDuffie, 210 Perry Town, New Bern, N.C. 28560
Filed Feb. 29, 1988, Ser. No. 161,602
Term of patent 14 years
U.S. Cl. D11—162



314,358
HARD HAT HANGER
Richard O. Holzworth, Box D, Shellsburg, Iowa 52332
Filed Sep. 21, 1988, Ser. No. 247,316
Term of patent 14 years
U.S. Cl. D11—200

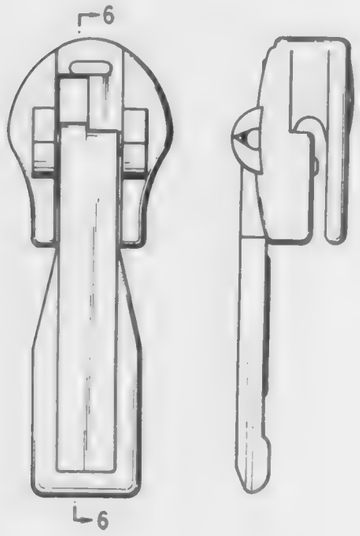


314,359
HANGER FOR HOOK AND LOOP FASTENING STRAP
Robert F. Viglianti, and Bart A. Barre, both of Mountainside, N.J., assignors to Bobart Systems, Inc., Westfield, N.J.
Filed Nov. 14, 1988, Ser. No. 271,761
Term of patent 14 years
U.S. Cl. D11—212

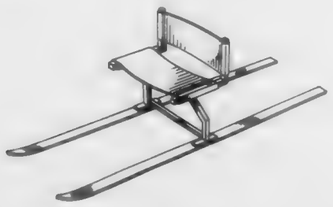


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314,360
SLIDER FOR SLIDE FASTENERS
Hiroo Minami, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Dec. 7, 1988, Ser. No. 281,006
Claims priority, application Japan, Aug. 12, 1988, 63-32247
Term of patent 14 years
U.S. Cl. D11—221



314,361
SKI CHAIR
Joshua L. Weiss, 6611 N. Central Ave., Phoenix, Ariz. 85012
Filed Oct. 4, 1988, Ser. No. 252,976
Term of patent 14 years
U.S. Cl. D12—9



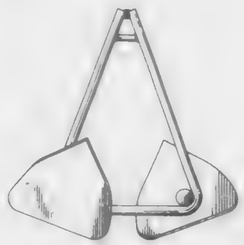
314,362
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed May 17, 1988, Ser. No. 195,282
Claims priority, application Japan, Nov. 19, 1987, 62-47360
Term of patent 14 years
U.S. Cl. D12—147



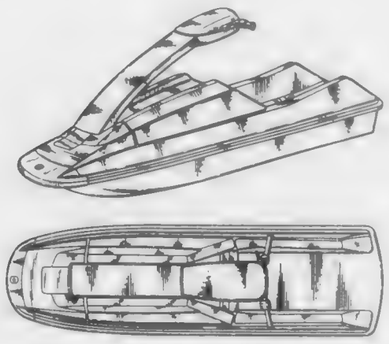
314,363
TIRE TREAD
Georges Adam, Bissen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 20, 1988, Ser. No. 211,527
The portion of the term of this patent subsequent to Nov. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



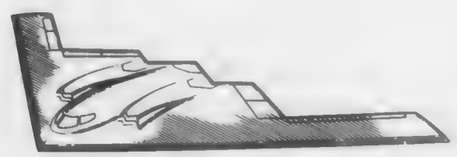
314,364
ANCHOR
William F. Spanner, Retriever Lodge, Tudor Close, Seaford, E. Sussex, BN25 2LU, England
Filed Aug. 21, 1989, Ser. No. 396,005
Term of patent 14 years
U.S. Cl. D12—215



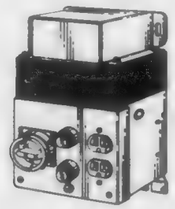
314,365
WATER SCOOTER
Keizi Nakagawa, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Aug. 9, 1989, Ser. No. 391,442
Term of patent 14 years
U.S. Cl. D12—307



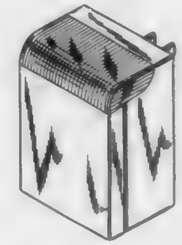
314,366
AIRCRAFT
Irving T. Waaland, Verdes Estates; John F. Cashen, Rancho Palos Verdes, and James E. Kinnu, Orange, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.
Filed Apr. 19, 1989, Ser. No. 341,106
Term of patent 14 years
U.S. Cl. D12—333



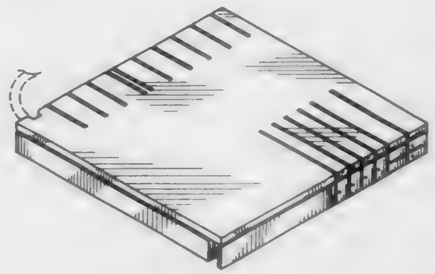
314,367
ELECTRONIC POWER SUPPLY HOUSING
Peter H. Burgher, Howell; Richard L. Holmes, Owosso, and John Boomer, Howell, all of Mich., assignors to Marelco Power Systems, Inc., Howell, Mich.
Filed Jan. 4, 1989, Ser. No. 293,511
Term of patent 14 years
U.S. Cl. D13—110



314,368
ELECTRICAL CONTROLLER
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed May 1, 1989, Ser. No. 346,209
Term of patent 14 years
U.S. Cl. D13—142

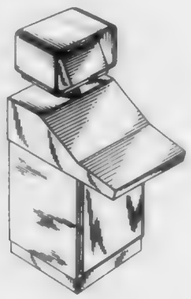


314,369
MULTIPLE STATION SURGE PROTECTOR
James E. Sacherman, Palo Alto, Calif., assignor to Curis Manufacturing Company, Inc., Jaffrey, N.H.
Filed Jan. 24, 1990, Ser. No. 470,043
Term of patent 14 years
U.S. Cl. D13—160

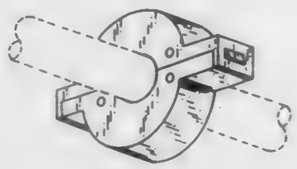


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314,370
CONTROL CONSOLE FOR THE OPERATION OF MACHINERY
Alfred Schott, Radebeul; Roland Reichenberger, Coswig; Volker Eichler, Weinboehla, and Horst Schulz, Dresden, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, Fed. Rep. of Germany
Division of Ser. No. 905,669, Sep. 8, 1986. This application Sep. 26, 1989, Ser. No. 412,864
Term of patent 14 years
U.S. Cl. D13—163



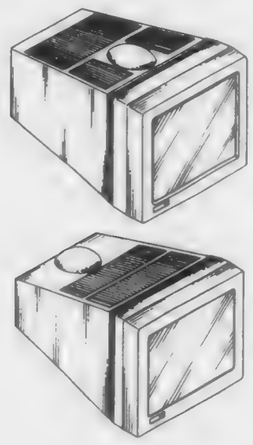
314,371
ABSORBER OF ELECTRIC NOISE
Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Japan
Division of Ser. No. 368,943, Jun. 13, 1989, abandoned, which is a continuation of Ser. No. 141,782, Jan. 11, 1988, abandoned. This application Aug. 2, 1989, Ser. No. 388,367
Term of patent 14 years
U.S. Cl. D13—199



314,372
PORTABLE COMPUTER
Walker C. Morris, Dallas, Tex., assignor to Intelligence Technology Corporation, Dallas, Tex.
Filed Nov. 14, 1988, Ser. No. 276,427
Term of patent 14 years
U.S. Cl. D14—106



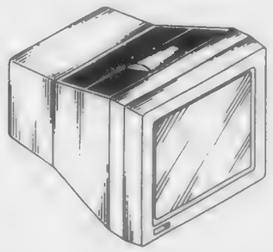
314,373
VIDEO DISPLAY
James E. Sacherman, Palo Alto, Calif., assignor to Wyse Technology Inc., San Jose, Calif.
Filed May 16, 1988, Ser. No. 194,582
Term of patent 14 years
U.S. Cl. D14—113



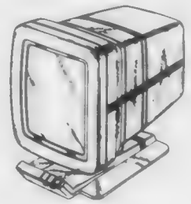
314,374
KEY TELEPHONE SET
Yoshio Sasaki; Hiroshi Ishizuka, both of Kawasaki; Iwamasa Nishikado, and Tsuneji Kimeda, both of Yokosuka, all of Japan, assignors to Nitsuko Limited and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan
Filed Oct. 22, 1986, Ser. No. 922,104
Claims priority, application Japan, May 13, 1986, 61-17645
Term of patent 14 years
U.S. Cl. D14—151



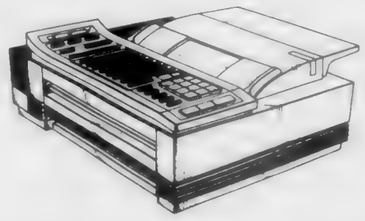
314,375
VIDEO DISPLAY
James E. Sacherman, Palo Alto, and Jonathan C. Burke, San Francisco, both of Calif., assignors to Wyse Technology Inc., San Jose, Calif.
Filed May 25, 1988, Ser. No. 198,382
Term of patent 14 years
U.S. Cl. D14—113



314,376
COMPUTER DISPLAY
Shinji Shibuya, Kodaira; Koushirou Adachi, Tokorozawa; Toosaku Hattori, Mito; Masahiro Okumura, Odawara; Kazutomo Kishimoto, Odawara; Youji Kouno, Odawara, and Kazuo Hoama, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 2, 1989, Ser. No. 317,794
Claims priority, application Japan, Sep. 5, 1988, 63-34815
Term of patent 14 years
U.S. Cl. D14—113

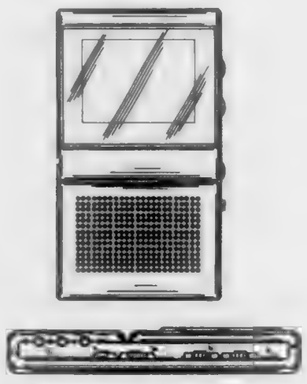


314,377
FACSIMILE TRANSMITTER-RECEIVER
Hiroaki Watanabe, Kawasaki, and Hiroshi Fushimi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 22, 1989, Ser. No. 454,844
Claims priority, application Japan, Jan. 30, 1989, 1-24156
Term of patent 14 years
U.S. Cl. D14—118

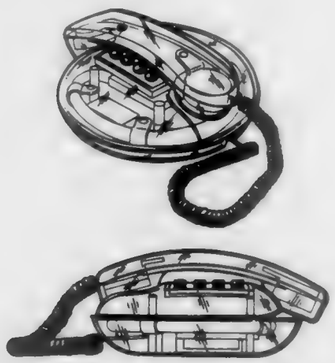


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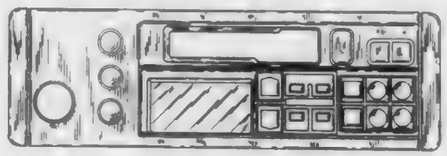
314,378
TELEVISION SET
Taisuke Saeki, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 17, 1987, Ser. No. 27,020
Term of patent 14 years
U.S. Cl. D14—126



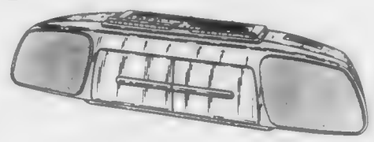
314,379
TELEPHONE SET WITH TRANSPARENT OUTER SURFACE AND NEON-LIGHT TUBE SURROUNDING THE BASE
Thomas Cheng, No. 6, Alley 49, Lane 149, Sec. 3, Nan Kang Rd., Taipei, Taiwan
Filed Sep. 5, 1989, Ser. No. 402,266
Term of patent 14 years
U.S. Cl. D14—151



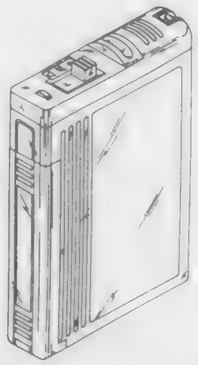
314,380
COMBINED CAR RADIO AND CASSETTE PLAYER
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 18,130, Feb. 20, 1987. This application Aug. 21, 1989, Ser. No. 397,156
Claims priority, application United Kingdom, Aug. 20, 1986, 1.036.227; Aug. 20, 1986, 1.036.228
Term of patent 14 years
U.S. Cl. D14—157



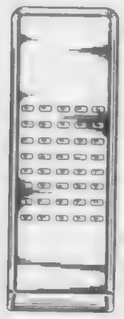
314,381
COMBINED RADIO AND CASSETTE RECORDER
Murray I. C. Camens, Singapore, Singapore, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 21, 1988, Ser. No. 288,754
Claims priority, application United Kingdom, Jul. 27, 1988, 1052616
Term of patent 14 years
U.S. Cl. D14—163



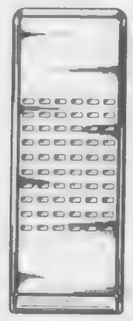
314,382
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, and Edward L. Ehmke, Wellington, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 6, 1988, Ser. No. 203,027
Term of patent 14 years
U.S. Cl. D14—191



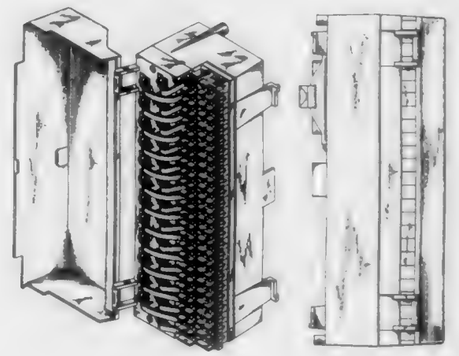
314,383
REMOTE-CONTROL TRANSMITTER
Herbert Hafner, Munich, Fed. Rep. of Germany, assignor to RUF GmbH & Co. KG Elektrotechnische Spezialfabrik, Munich, Fed. Rep. of Germany
Filed Mar. 16, 1987, Ser. No. 26,350
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1986, 16829
The portion of the term of this patent subsequent to Feb. 5, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—218



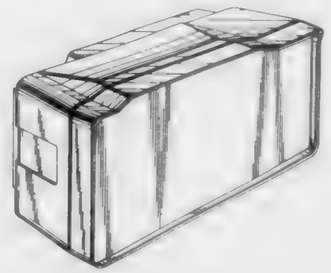
314,384
REMOTE CONTROL TRANSMITTER
Herbert Hafner, Munich, Fed. Rep. of Germany, assignor to RUF GmbH & Co. KG Elektrotechnische Spezialfabrik, Munich, Fed. Rep. of Germany
Filed Mar. 16, 1987, Ser. No. 26,351
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1986, 16829
The portion of the term of this patent subsequent to Feb. 5, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—218



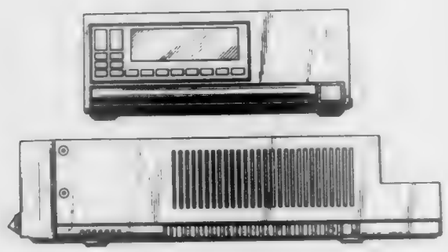
314,385
TELEPHONE NETWORK INTERFACE APPARATUS
Joel Karan, Millburn, and Thomas J. Collins, Wall Township, Monmouth County, both of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.
Filed Aug. 7, 1989, Ser. No. 390,679
Term of patent 14 years
U.S. Cl. D14—140



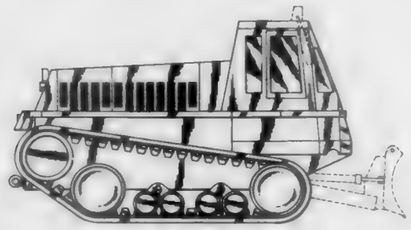
314,386
CONTROL HEAD FOR A TWO-WAY MOBILE RADIO
Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Aug. 22, 1988, Ser. No. 234,834
Term of patent 14 years
U.S. Cl. D14—257



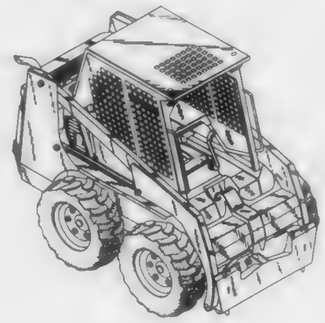
314,387
AUDIO TUNER
Farad Azima, Huntingdon, England, assignor to Mission International Limited, Cambridgeshire, England
Filed Apr. 26, 1988, Ser. No. 186,197
Claims priority, application United Kingdom, Apr. 5, 1988, 1049692
Term of patent 14 years
U.S. Cl. D14—265



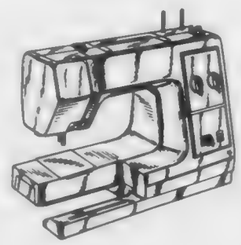
314,388
ENDLESS TRACK WORK VEHICLE
Thomas D. Brewer, Tremont; Robert R. Farris; John M. Parks, both of Peoria, and Gerald P. Simmons, Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Jan. 25, 1988, Ser. No. 148,396
Term of patent 14 years
U.S. Cl. D15—24



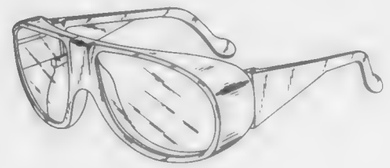
314,389
SKID STEER LOADER
Carman P. Lyness, Leonard; Joseph M. Mather, Lisbon; Larry E. Albright, Gwinner; Orlan J. Lorass, Lisbon, all of N. Dak., and William R. Worrell, Hopkins, Minn., assignors to Clark Equipment Company, South Bend, Ind.
Filed Jun. 13, 1988, Ser. No. 206,213
Term of patent 14 years
U.S. Cl. D15—25



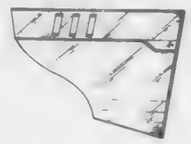
314,390
SEWING MACHINE
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Jun. 25, 1987, Ser. No. 67,221
Term of patent 14 years
U.S. Cl. D15—68



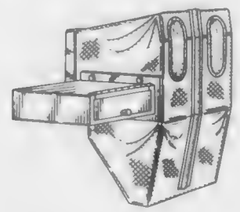
314,391
SAFETY GOGGLE
Herbert Nussbickl, Obersasbach, Fed. Rep. of Germany, assignor to Uvex Winter Optik GmbH, Furth/Bay, Fed. Rep. of Germany
Filed Feb. 9, 1987, Ser. No. 12,863
Claims priority, application Int'l Pat. Institute, Aug. 19, 1986, DM/007 375
Term of patent 14 years
U.S. Cl. D16—102



314,392
TEMPLE SIDE SHIELD FOR SURGICAL SPECTACLES
Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonkoma, N.Y.
Filed Apr. 4, 1988, Ser. No. 177,544
Term of patent 14 years
U.S. Cl. D16—123



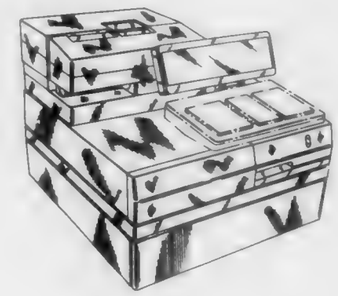
314,393
DAYLIGHT FILM LOADER
Norman E. Bender, Mentor, Ohio, assignor to Picker International, Inc., Highland Hts., Ohio
Filed Nov. 24, 1987, Ser. No. 124,773
Term of patent 14 years
U.S. Cl. D16—237



314,394
CAMERA NECK STRAP
Albert B. Cardwell, Rte. #1, Box 366, Stoneville, N.C. 27048
Filed Feb. 3, 1987, Ser. No. 10,580
Term of patent 14 years
U.S. Cl. D16—243



314,395
RETAIL TERMINAL OR SIMILAR ARTICLE
Donald L. Forsythe, Byesville, and David M. J. Allgeier, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 17, 1987, Ser. No. 75,152
Term of patent 14 years
U.S. Cl. D18—4

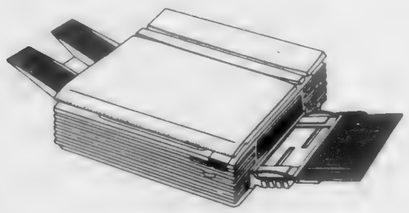


314,396
ELECTRONIC CALCULATOR
Masaki Hayashi, Koganei, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Aug. 11, 1988, Ser. No. 231,540
Term of patent 14 years
U.S. Cl. D18—7

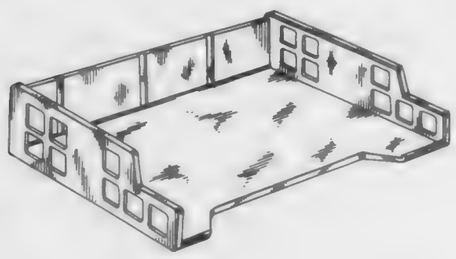


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314,397
COPYING MACHINE
Masanori Hashimoto, Yokohama; Tatsuo Okuda, Tokyo, Akira Ishida, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed May 11, 1988, Ser. No. 192,500
Claims priority, application Japan, Nov. 11, 1987, 62-046190
Term of patent 14 years
U.S. Cl. D18—37



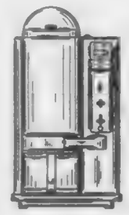
314,398
LETTER TRAY
Eric Aaldenberg, Bayside, and Barry Silberman, Great Neck, both of N.Y., assignors to Esselte Pendaflex, Garden City, N.Y.
Filed May 20, 1988, Ser. No. 196,344
Term of patent 14 years
U.S. Cl. D19—92



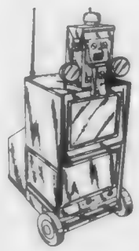
314,399
BOOKENDS
Andrzej L. Soporowski, Freeport, and Robert Hawes, Jr., Huntington Bay, both of N.Y., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Aug. 31, 1987, Ser. No. 91,734
Term of patent 14 years
U.S. Cl. D19—34.1



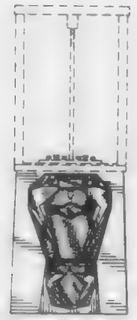
314,400
COFFEE VENDING MACHINE
Kendo Makihara, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 10, 1988, Ser. No. 166,165
Claims priority, application Japan, Sep. 21, 1987, 62-38420
Term of patent 14 years
U.S. Cl. D20—1



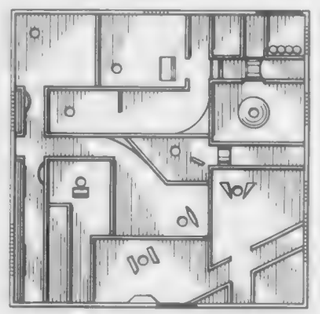
314,401
ROBOT NEWSPAPER VENDING MACHINE
Edward Lehman, Longmont, Colo., and Michael J. Smith, Merced, Calif., assignors to Lehman Communications Corporation, Longmont, Colo.
Filed Mar. 6, 1989, Ser. No. 318,936
Term of patent 14 years
U.S. Cl. D20—3



314,402
BASE FOR A COIN OPERATED BULK-VENDING MACHINE
Murray R. Kovens, Timonium, Md., assignor to A & A Company, Timonium, Md.
Filed Jun. 29, 1987, Ser. No. 67,202
Term of patent 14 years
U.S. Cl. D20—4



314,403
GAME BOARD
Lonnie L. Fain, Sr., 326 Lyle Ave., Springfield, Ohio 45505
Filed Sep. 2, 1988, Ser. No. 240,109
Term of patent 14 years
U.S. Cl. D21—11



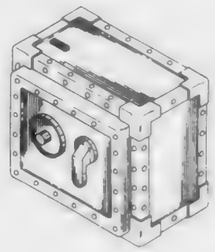
314,404
EDUCATIONAL SHOE TOY
Scott C. Sessa, Grand Rapids, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.
Filed Jan. 23, 1989, Ser. No. 299,323
Term of patent 14 years
U.S. Cl. D21—59



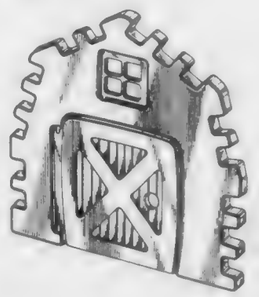
314,405
TOY BUILDING ELEMENT
Lotte M. Pedersen, Frederiksberg, and Berit Holmstrøm, Roskilde, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed May 9, 1989, Ser. No. 349,344
Term of patent 14 years
U.S. Cl. D21—108



314,406
TOY SAFE
Karl D. Lerch, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 11, 1988, Ser. No. 256,285
Term of patent 14 years
U.S. Cl. D21—109

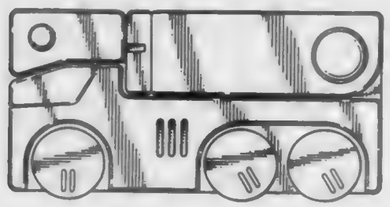


314,407
CONSTRUCTION TOY BARN BLOCK
Hope E. Wentling, Stow, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jun. 2, 1989, Ser. No. 360,718
Term of patent 14 years
U.S. Cl. D21—109



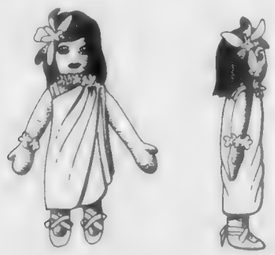
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314,408
TOY BLOCK VEHICLE
Hideki Tachikawa, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Jun. 2, 1989, Ser. No. 363,101
Claims priority, application Japan, Dec. 9, 1988, 63-48077
Term of patent 14 years
U.S. Cl. D21—134

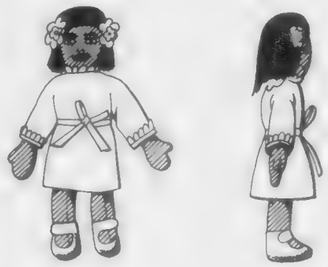


314,409
GRANDMA DOLL
Madeline Ziolkowski, 345 NW. 49th Ave., Plantation, Fla. 33317
Filed Oct. 19, 1988, Ser. No. 259,606
Term of patent 14 years
U.S. Cl. D21—171

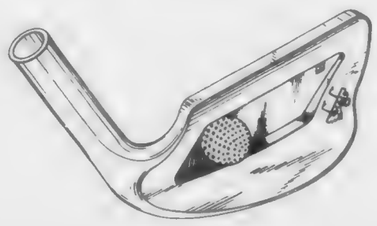
314,410
DOLL
Madeline Ziolkowski, 345 NW. 49th Ave., Plantation, Fla. 33317
Filed Oct. 19, 1988, Ser. No. 259,609
Term of patent 14 years
U.S. Cl. D21—180



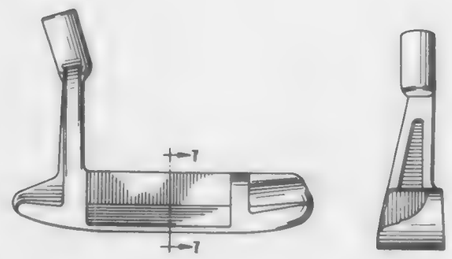
314,411
ISMA DOLL DESIGN
Madeline Ziolkowski, 345 NW. 49th Ave., Plantation, Fla. 33317
Filed Oct. 19, 1988, Ser. No. 259,617
Term of patent 14 years
U.S. Cl. D21—180



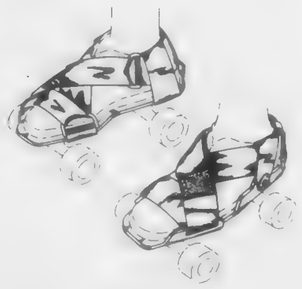
314,412
HEAD OF GOLF PUTTER
Kardy Nelson, 2nd Fl., No. 67, Alley 8, Lane 391, Sec. 3, Ho Ping E. Rd., Taipei, Taiwan
Filed Jun. 3, 1988, Ser. No. 202,061
Term of patent 14 years
U.S. Cl. D21—215



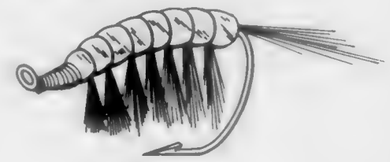
314,413
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Aug. 25, 1987, Ser. No. 89,259
Term of patent 14 years
U.S. Cl. D21—217



314,414
COMBINED ROLLER SKATE FOOTPLATE AND FASTENING THEREFOR
Joel K. Wendt, 635 Hudson Ave., Davis Island, Tampa, Fla. 33606
Filed Mar. 7, 1988, Ser. No. 165,198
Term of patent 14 years
U.S. Cl. D21—226



314,415
FISHING LURE
Michael Tucker, 1542 Youngsfield, Lakewood, Colo. 80215
Filed Feb. 25, 1988, Ser. No. 160,493
Term of patent 14 years
U.S. Cl. D22—128



314,416
REPLACEABLE BLADE BROADHEAD ARROW TIP
Leonard D. Rezmer, G-5265 W. Pierson Rd., Flushing, Mich. 48433
Filed Jan. 23, 1987, Ser. No. 6,446
Term of patent 14 years
U.S. Cl. D22—115

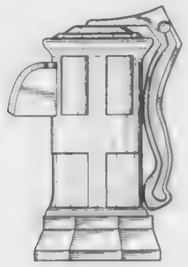


314,417
SOUND EMITTING BOBBER
Hubert G. Lovelady, and Douglas P. Hopkins, both of 4702 Lavender La., San Antonio, Tex. 78220
Filed Jan. 19, 1988, Ser. No. 123,998
The portion of the term of this patent subsequent to Jan. 22, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—146

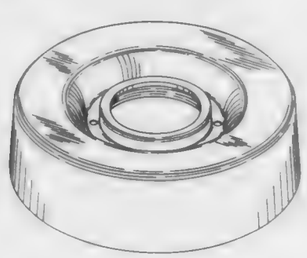


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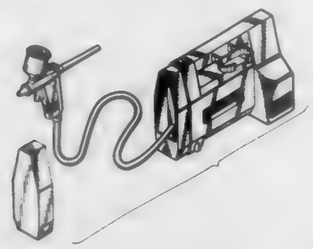
314,418
HOUSING FOR HOME WATER FILTERS
Cornelius N. Friesen, 30 High St., Suite 1603, Mississauga, Ontario, Canada L5G 1J8
Filed Dec. 3, 1987, Ser. No. 127,978
Term of patent 14 years
U.S. Cl. D23—209



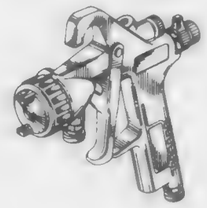
314,419
SPRINKLER PROTECTOR
Robert Rosenfeld, 10434 SW. 50th Pl., Cooper City, Fla. 33328
Filed Aug. 22, 1988, Ser. No. 235,483
Term of patent 14 years
U.S. Cl. D23—214



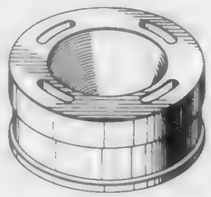
314,420
COMBINED SPRAY COMPRESSOR AND SPRAY GUN
Tsutomu Tomatsu, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Oct. 25, 1988, Ser. No. 262,364
Claims priority, application Japan, Apr. 26, 1988, 63-16964
Term of patent 14 years
U.S. Cl. D23—225



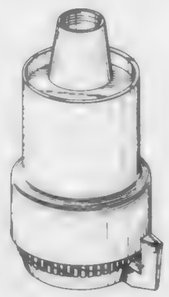
314,421
AIR SPRAY GUN
Hitoshi Tajima, and Shiro Sato, both of Oomagari, Japan, assignors to Iwata Air Compressor Mfg. Co., Ltd., Tokyo, Japan
Filed Aug. 17, 1988, Ser. No. 233,062
Term of patent 14 years
U.S. Cl. D23—226



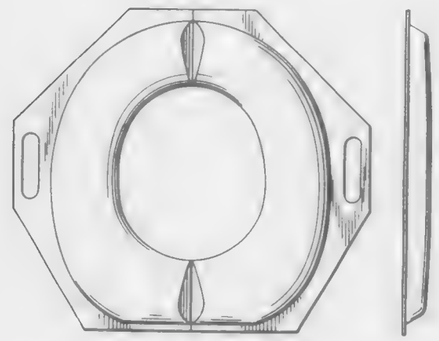
314,422
CLOTHES WASHER ADAPTER
Charles R. Adorjan, Davison, Mich., assignor to Fernco, Davison, Mich.
Filed Apr. 13, 1988, Ser. No. 185,765
Term of patent 14 years
U.S. Cl. D23—262



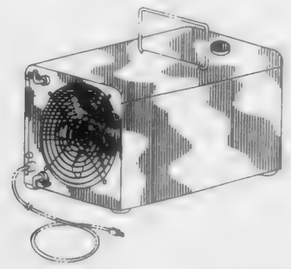
314,423
SHOWERHEAD BODY
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 3, 1986, Ser. No. 841,371
Term of patent 14 years
U.S. Cl. D23—229



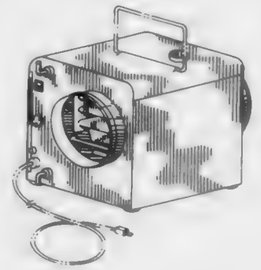
314,424
PORTABLE FOLDING TOILET SEAT
David C. Davenport, Box 13271, Norfolk, Va. 23506-0271, and Daniel W. Alexander, Box 13271, Norfolk, Va. 23454
Filed Feb. 2, 1989, Ser. No. 267,256
Term of patent 14 years
U.S. Cl. D23—311



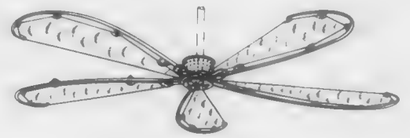
314,425
VENTILATING HEATER
Allan E. Beavers, 638 S. Surrey Ct., Grand Junction, Colo. 81401, and Robert A. Fulcher, 3329 N. Ridge Dr., Grand Junction, Colo. 81506
Filed Sep. 19, 1989, Ser. No. 409,592
Term of patent 14 years
U.S. Cl. D23—335



314,426
GAS HEATER
Allan E. Beavers, 638 S. Surrey Ct., Grand Junction, Colo. 81401, and Robert A. Fulcher, 3329 N. Ridge Dr., Grand Junction, Colo. 81506
Filed Oct. 23, 1989, Ser. No. 424,966
Term of patent 14 years
U.S. Cl. D23—339



314,427
CEILING FAN
Alexander B. Ignon, Malibu, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Oct. 5, 1988, Ser. No. 254,118
Term of patent 14 years
U.S. Cl. D23—377

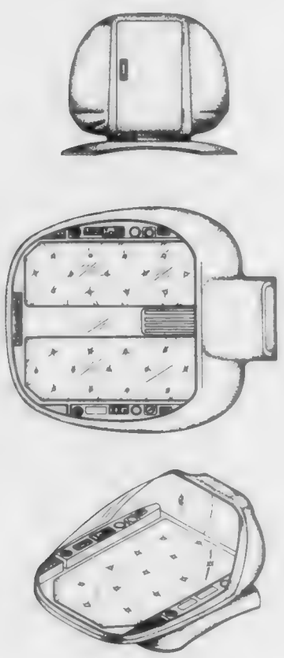


314,428
PORTABLE ELECTRICAL FAN
Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.
Filed Aug. 9, 1989, Ser. No. 391,327
Term of patent 14 years
U.S. Cl. D23—378

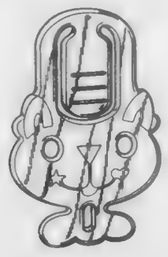


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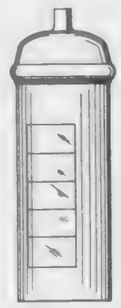
314,429
SUN TANNING BOOTH OR SIMILAR ARTICLE
Joseph M. Collier, 1365 Stuart St., Green Bay, Wis. 54301
Filed May 4, 1988, Ser. No. 190,232
Term of patent 14 years
U.S. Cl. D24—39



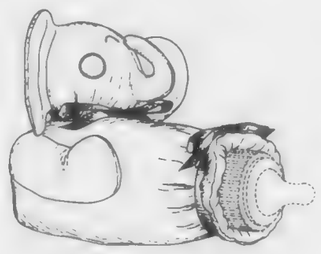
314,430
CLIP FOR USE WITH A PACIFIER
Jeanne M. Smith; Virginia A. Buechler, and Predrag Vukovic, all of 450 Cascade Dr., Fairfax, Calif. 94930
Filed Jul. 25, 1989, Ser. No. 385,211
Term of patent 14 years
U.S. Cl. D24—45



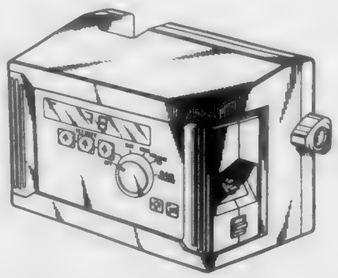
314,431
BABY BOTTLE
Susan K. Bielefeldt, 7948 Montara, Cucamonga, Calif. 91730
Filed Sep. 2, 1988, Ser. No. 240,224
Term of patent 14 years
U.S. Cl. D24—47



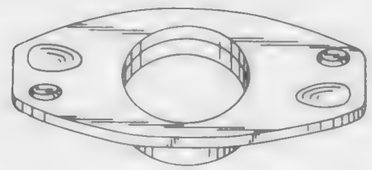
314,432
BABY BOTTLE HOLDER
Lisa Shaw, 5807 E. Long Pl., Englewood, Colo. 80112
Filed Mar. 29, 1988, Ser. No. 174,672
Term of patent 14 years
U.S. Cl. D24—48



314,433
COMBINED COMPACT POLE CLAMP HOUSING AND PUMP UNIT FOR FLUID DELIVERY
Mark G. Frantz, New York, N.Y., assignor to Frantz Medical Development, Ltd., New York, N.Y.
Continuation-in-part of Ser. No. 63,274, Jun. 16, 1987. This application Jun. 16, 1988, Ser. No. 208,013
Term of patent 14 years
U.S. Cl. D24—51



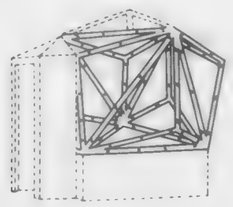
314,434
DRIP CHAMBER CAP
Dean Kamen, 44 Gage Rd., Bedford, N.H. 03102
Filed Feb. 19, 1987, Ser. No. 16,292
The portion of the term of this patent subsequent to Nov. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—52



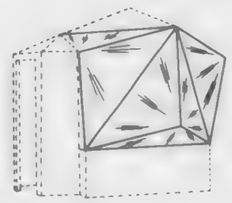
314,435
DUAL VENT FILTER FOR USE WITH INTRAVENOUS TUBING
John M. Unger, Lake Geneva, Wis.; Birendra K. Lal, Glendale Heights, and Thomas Kasting, McHenry, both of Ill., assignors to Baxter International, Inc., Deerfield, Ill.
Filed May 22, 1987, Ser. No. 54,166
Term of patent 14 years
U.S. Cl. D24—52



314,436
ENCLOSURE FOR A STUDIO
John R. Grindon, Hazelwood, Mo., assignor to P&W/LBP Master Partnership, Hazelwood, Mo.
Filed Mar. 5, 1987, Ser. No. 22,329
Term of patent 14 years
U.S. Cl. D25—13



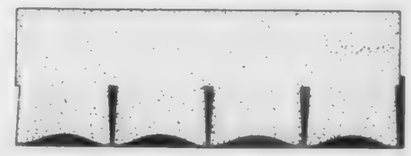
314,437
ENCLOSURE FOR A STUDIO
John R. Grindon, Hazelwood, Mich., assignor to P&W/LBP Master Partnership, Hazelwood, Mo.
Filed Mar. 5, 1987, Ser. No. 22,340
Term of patent 14 years
U.S. Cl. D25—13



314,438
EXTRUDED FRAME MEMBER FOR CONSTRUCTING GREENHOUSES AND THE LIKE
Leo J. Meyers, Pittsburgh, Pa., assignor to Sun Room Designs, Inc., Youngwood, Pa.
Filed Jan. 20, 1988, Ser. No. 146,122
Term of patent 14 years
U.S. Cl. D25—119

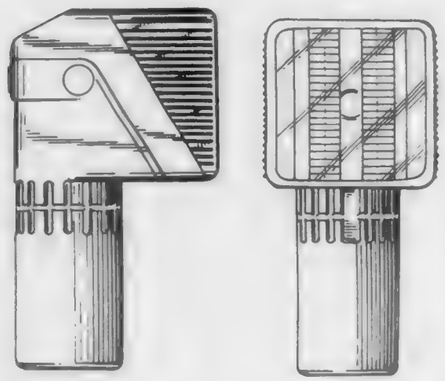


314,439
SHINGLE
Robert L. Jenkins, Coatesville; Husnu M. Kalkanoglu, Swarthmore; John R. Klein deceased, late of Malvern (by Helen B. Klein, Executrix); Michael J. Noone, Wayne; Kermit E. Stahl, North Wales, all of Pa., and Phillip H. Whitford, Casselberry, Fla., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Mar. 28, 1988, Ser. No. 174,022
Term of patent 14 years
U.S. Cl. D25—139



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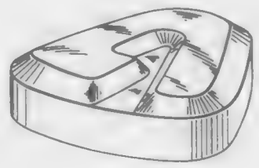
314,440
BICYCLE HEADLAMP
Jean-Claude Monier, Colombes, and Raymond Benoit, Saint-Marcel, both of France, assignors to Cipel, S.A., Lavallois-Perret, France
Filed Sep. 2, 1987, Ser. No. 92,289
Claims priority, application France, Apr. 2, 1987, 87 1949
Term of patent 14 years
U.S. Cl. D26—28



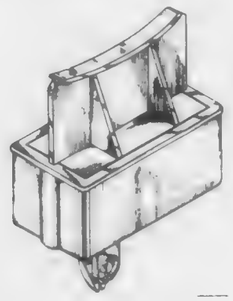
314,441
CAPSULE
Peter Greither, Hausen, CH-9533 Kirchberg, Switzerland
Filed Aug. 15, 1989, Ser. No. 393,768
Term of patent 14 years
U.S. Cl. D28—1



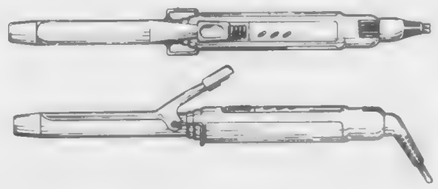
314,442
TABLET
Martin J. Shott, Dorking, and Lorraine Murphy, Horsham, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Nov. 28, 1988, Ser. No. 277,067
Claims priority, application United Kingdom, May 28, 1988, 1051118; May 28, 1988, 1051119
The portion of the term of this patent subsequent to May 31, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2



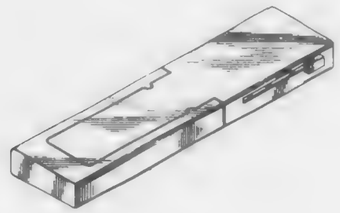
314,443
HAIR STREAKING APPLICATOR FOR BLEACH OR HAIR TINT
Anita F. Jones, 12198 Fox Point, Maryland Heights, Mo. 63043
Filed Aug. 25, 1988, Ser. No. 236,139
Term of patent 14 years
U.S. Cl. D28—20



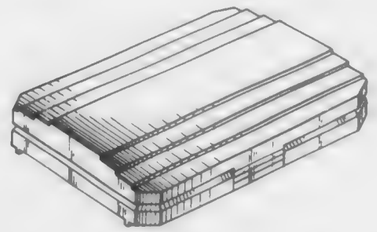
314,444
HAIR CURLER OR SIMILAR ARTICLE
Elizabeth Ho, Kowloon, Hong Kong, assignor to Windmere Corporation, Miami Lakes, Fla.
Filed Oct. 12, 1988, Ser. No. 257,030
Claims priority, application United Kingdom, Jun. 7, 1988, 1051334
Term of patent 14 years
U.S. Cl. D28—35



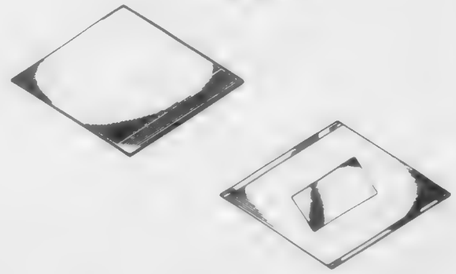
314,445
COSMETIC CONTAINER
Albert D. Addis, 22015 De La Guerra St., Woodland Hills, Calif. 91364
Filed Jun. 13, 1988, Ser. No. 205,910
Term of patent 14 years
U.S. Cl. D28—76



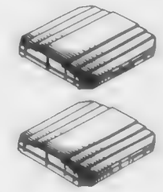
314,446
COMPACT CASE
Garfield G. Litton, Glen Rock, N.J., assignor to Revlon, Inc., New York, N.Y.
Filed Apr. 27, 1989, Ser. No. 344,155
The portion of the term of this patent subsequent to Feb. 5, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—78







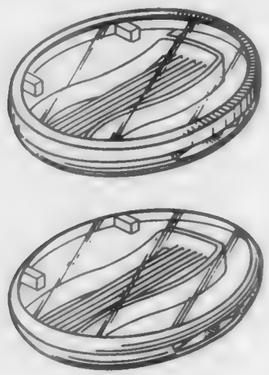
314,447
COMPACT CASE
Garfield G. Litton, Glen Rock, N.J., assignor to Revlon, Inc., New York, N.Y.
Filed Apr. 27, 1989, Ser. No. 344,346
The portion of the term of this patent subsequent to Feb. 5, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—78



314,448
COSMETIC CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Division of Ser. No. 128,473, Dec. 3, 1987, Pat. No. Des. 310,736. This application Oct. 23, 1989, Ser. No. 424,964
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, URA838/87
Term of patent 14 years
U.S. Cl. D28—78

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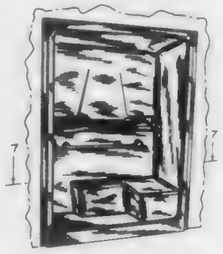
314,449
COSMETIC CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Aug. 24, 1988, Ser. No. 235,564
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, URA290/88; Mar. 14, 1988, URA400/88
Term of patent 14 years
U.S. Cl. D28—82



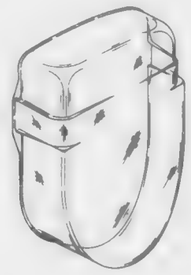
314,450
COSMETIC SAMPLER TEAR TAB
Hernando Sanchez, New York, N.Y.; Richard M. Franczak, Lawrence Harbor, N.J., and Menachem Futter, Staten Island, N.Y., assignors to Revlon, Inc., New York, N.Y.
Continuation of Ser. No. 98,279, Sep. 18, 1987. This application Oct. 12, 1988, Ser. No. 256,926
Term of patent 14 years
U.S. Cl. D28—99



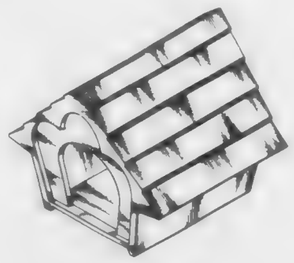
314,451
SHOWER STALL OR THE LIKE
Iain M. Smith, Vernon, Canada, assignor to Kohler Ltd/Ltee, Toronto, Canada
Division of Ser. No. 112,127, Oct. 26, 1987, Pat. No. D. 310,557.
This application Aug. 20, 1990, Ser. No. 569,668
Term of patent 14 years
U.S. Cl. D23—283



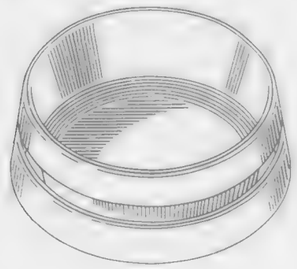
314,452
FACE SHIELD
Vito A. Accardi, Dix Hills, N.Y., assignor to Accardi Enterprises, Inc., Dix Hills, N.Y.
Filed May 2, 1988, Ser. No. 189,687
Term of patent 14 years
U.S. Cl. D29—17



314,453
PET SHELTER
Kenneth M. Dewing, 586 N. Dartmouth Way, Anaheim, Calif. 92807
Filed Jan. 15, 1988, Ser. No. 144,858
Term of patent 14 years
U.S. Cl. D30—108



314,454
PET DISH
Stephen K. Ahuna, 25101 Via Portola, Laguna Hills, Calif. 92677
Continuation-in-part of Ser. No. 347,326, May 4, 1989. This application Sep. 15, 1989, Ser. No. 407,788
Term of patent 14 years
U.S. Cl. D30—129



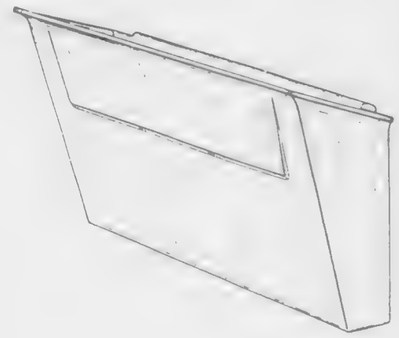
314,455
COUNTER-WEIGHTED PET TOY
Alan Morton, 825 N. Harbor Blvd., Fullerton, Calif. 92632
Filed Apr. 29, 1986, Ser. No. 858,267
Term of patent 14 years
U.S. Cl. D30—160

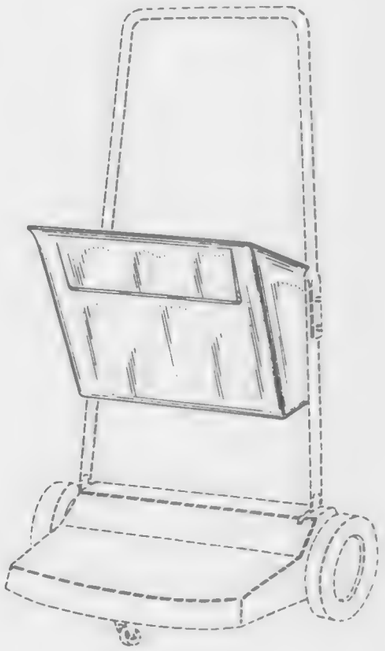


314,456
POOL SKIMMER
Edward I. Baitz, 5 Oak Street, Canterbury, Victoria, Australia
Filed Sep. 21, 1987, Ser. No. 98,672
Term of patent 14 years
U.S. Cl. D32—25



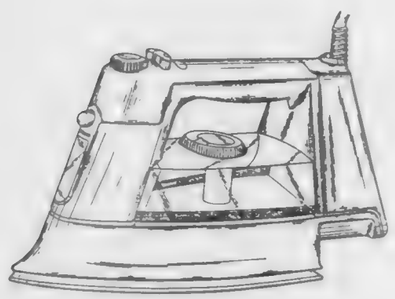
314,457
BASKET FOR A SWEEPER, OR THE LIKE
Robert C. Berfield, Jersey Shore, and Craig Seasholtz, Avis, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Dec. 12, 1986, Ser. No. 940,640
Term of patent 14 years
U.S. Cl. D32—25

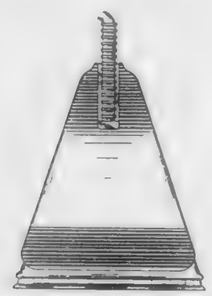


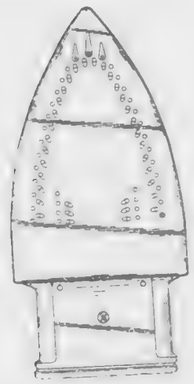


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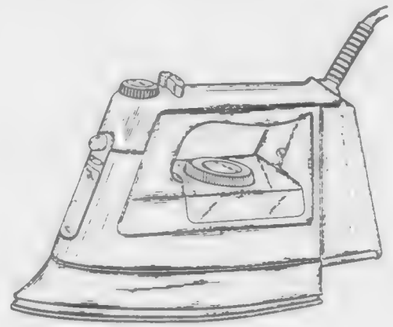
314,458
IRON
Ludwig Littmann, Königstein, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Jun. 28, 1988, Ser. No. 212,754
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1988, 73 MR 9652
The portion of the term of this patent subsequent to Jan. 29, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—70

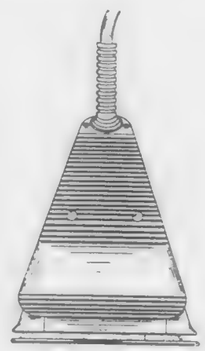


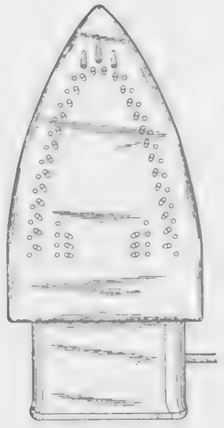




314,459
FLATIRON
Ludwig Littmann, Königstein, Fed. Rep. of Germany, assignor to Braun AG, Kronberg, Fed. Rep. of Germany
Filed Dec. 19, 1989, Ser. No. 452,947
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1989, M8904487.8
Term of patent 14 years
U.S. Cl. D32—70



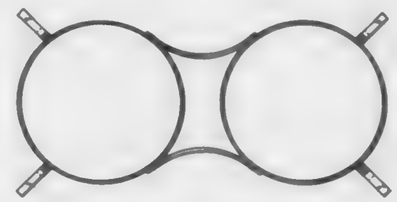




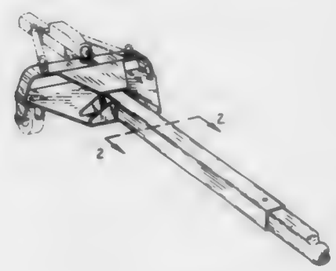
314,460
CARTRIDGE FOR AN IRON STAND AND WATER TANK UNIT
Pierre Paulin, Paris, France, assignor to Calor S.A., Lyons, France
Filed Jul. 18, 1988, Ser. No. 220,466
Claims priority, application France, Jan. 25, 1988, 88 0431
Term of patent 14 years
U.S. Cl. D32—71



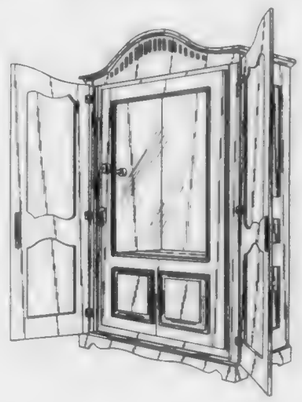
314,462
TRASH CAN HOLDER
Ray E. Durant, 2001 Ridge Rd., Zanesville, Ohio 43701
Filed Sep. 13, 1988, Ser. No. 243,938
Term of patent 14 years
U.S. Cl. D34—6



314,463
BOAT LAUNCHING DOLLY
Wayne E. Harms, 2252 1¼ Rd., Grand Junction, Colo. 81502
Filed Oct. 3, 1988, Ser. No. 251,877
Term of patent 14 years
U.S. Cl. D34—28



314,464
DISPLAY SAFE
Robert G. Justice, P.O. Box 3521, Enid, Okla. 73702
Filed Feb. 10, 1988, Ser. No. 154,600
Term of patent 14 years
U.S. Cl. D99—28



314,461
TRASH CAN HOLDER
Gerald P. Skalka, Washington, D.C., assignor to Victor Stanley, Inc., Dunkirk, Md.
Filed Jun. 15, 1988, Ser. No. 233,471
Term of patent 14 years
U.S. Cl. D34—5



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TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF FEBRUARY, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Lo, Young S., 4,990,683, Cl. 558-390.000.
Nolan, Joseph C.; and Barrett, Richard J., 4,990,523, Cl. 514-363.000.

A.R.M.I.N.E.S.: *See*—
Rabl, Ari; Clodic, Denis; and Dehausse, Robert, 4,990,788, Cl. 250-504.00R.

AB Profor: *See*—
Andersson, Thorbjorn; and Rydh, Niklas, 4,989,736, Cl. 206-631.300.

AB Volvo: *See*—
Janiszewski, Grzegorz, 4,989,712, Cl. 192-106.100.

Abbott Laboratories: *See*—
Vcelka, John L., 4,990,253, Cl. 210-359.000.

Abdalmuhdi, Ismail O.: *See*—
Johnson, Thomas A.; and Abdalmuhdi, Ismail O., 4,990,672, Cl. 564-490.000.

Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Method of discriminating coins. 4,989,714, Cl. 194-317.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Electromagnetic pickup. 4,989,574, Cl. 123-617.000.

Abe, Kunio: *See*—
Takenouchi, Youji; Nishiguchi, Katsuhiko; and Abe, Kunio, 4,990,319, Cl. 423-352.000.

Abe, Tetsushi: *See*—
Isomura, Yasuo; Takeuchi, Makoto; and Abe, Tetsushi, 4,990,503, Cl. 514-80.000.

Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, to TDK Corporation. Method for manufacturing piezoelectric buzzer. 4,989,302, Cl. 29-25.350.

Abeska, Edward J.: *See*—
McCurdy, Roger A.; Stonerook, Dana A.; Mann, Richard J.; Abeska, Edward J.; and Rochette, Jeffrey R., 4,990,884, Cl. 340-438.000.

Accu-Scan, Inc.: *See*—
Pimental, LeRoy G., 4,991,105, Cl. 364-483.000.

ACCU Science Corporation: *See*—
Fang, Paul Y., 4,989,604, Cl. 128-421.000.

Accuratio Systems, Inc.: *See*—
James, James R., Sr.; and Schleicher, John K., 4,989,472, Cl. 74-409.000.

Acer Incorporated: *See*—
Wu, Win; Liao, Ben; and Hsieh, Lung-Sherng, 4,990,731, Cl. 200-521.000.

Ach, William D.; Anderson, Edmund J.; Behrends, Lynn B.; Desrude, Wayne P.; and Klos, Gene J., to Honeywell Inc. Pallet transfer corner system. 4,989,721, Cl. 198-465.100.

Action Industries, Inc.: *See*—
Pine, James J., 4,989,914, Cl. 297-85.000.

Adachi, Takashi: *See*—
Morimoto, Shigeo; Adachi, Takashi; Matsunaga, Tohru; Kashimura, Masato; Asaka, Toshifumi; Watanabe, Yoshiaki; Sota, Kaoru; and Sekiuchi, Kazuto, 4,990,602, Cl. 536-7.400.

Adam, Joachim: *See*—
von Schnering, Hans-Georg; Becker, Winfried; Schwarz, Martin; Walz, Leonhard; Waldschmidt, Elfi; and Adam, Joachim, 4,990,488, Cl. 505-1.000.

Adams, Harold W., to Sultech, Inc. Process for destruction of toxic organic chemicals and the resultant inert polymer by-product. 4,990,404, Cl. 428-411.100.

Adams, John H.: *See*—
Sell, Frank E.; and Adams, John H., 4,989,393, Cl. 53-299.000.

Adamson, Mark C.: *See*—
Romerein, Robert L.; Adamson, Mark C.; and Nepovim, Zdenek J., 4,990,109, Cl. 439-801.000.

Adamson, Steven J.; and Edelman, Harry S., to Eastman Kodak Company. Self aligned lapping guide for inductive record heads. 4,991,046, Cl. 360-122.000.

Adda, Michel: *See*—
Segall, Jeane; Shorr, Leonard M.; and Adda, Michel, 4,990,708, Cl. 570-253.000.

Adimari, Louis J.; and Pentel, Jerry, to United States of America, Army. Tandem bomblet. 4,989,517, Cl. 102-388.000.

Adolph Coors Company: *See*—
Brossia, Charles E.; Talbott, Roblee L.; Peterson, Ronald B.; and Williams, Warren R., 4,989,434, Cl. 72-82.000.

Adomeit, Heinz-Dieter, to TRW Repa GmbH. Vertical adjustment means for a fitting of a safety-belt restraining system in motor vehicles. 4,989,901, Cl. 280-808.000.

Aduma, Philip J.: *See*—
Gupta, Vidya S.; Tourigny, Guy; Aduma, Philip J.; and Stuart, Allan L., 4,990,499, Cl. 514-49.000.

Advanced Micro Devices, Inc.: *See*—
Sliwa, John W., Jr., 4,990,462, Cl. 437-51.000.

AEG Olympia Aktiengesellschaft: *See*—
Schmidt, Uwe; and Kittel, Arthur, 4,990,007, Cl. 400-208.000.

AFA Products, Inc.: *See*—
Martin, Douglas S.; and Maas, Wilhelmus J. J., 4,989,790, Cl. 239-483.000.

AG Communication Systems Corporation: *See*—
Kem, Han, 4,991,170, Cl. 370-85.100.

AG Processing Technologies, Inc.: *See*—
Pecot, Michel; and Nulman, Jaim, 4,989,991, Cl. 374-133.000.

Agarwala, Ashok K.; and Saha, Bijay S., to Eastman Kodak Company. Magnetic brush, inner core therefor, and method for making such core. 4,990,876, Cl. 335-297.000.

Agency of Industrial Science & Technology: *See*—
Souma, Yoshie, 4,990,629, Cl. 549-267.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Moll, Franz; Mucke, Bruno; Patzold, Walter; and Wagner, Klaus, 4,990,440, Cl. 430-640.000.

Agfa-Gevaert, N.V.: *See*—
Terrell, David R.; Monbaliu, Marcel J.; Geelen, Carina; Verbeek, Guy P.; De Schrijver, Frans C.; and Van der Auweraer, Mark G., 4,990,421, Cl. 430-58.000.
Van Thillo, Etienne A.; and Priem, Jan J., 4,990,434, Cl. 430-510.000.

Aginfor AG fur Industrielle Forschung: *See*—
Guttinger, Frank, 4,990,072, Cl. 418-55.300.

AGR International, Inc.: *See*—
Davis, Michael W.; Weiland, Leonard J.; and Zanella, Mark F., 4,989,462, Cl. 73-862.530.

Ahmed, Syed M., to Hercules Incorporated. Electrorheological fluids. 4,990,279, Cl. 252-73.000.

Ahuja, Suresh K.: *See*—
Van Dusen, John G.; Fuller, Timothy J.; and Ahuja, Suresh K., 4,990,424, Cl. 430-106.600.

Aid 3 Group Ltd.: *See*—
Mizzi, Francois, 4,990,725, Cl. 178-18.000.

Aigner, Michael; Dersch, Wolfgang; Reichert, Dieter; Schwall, Horst; and Warth, Werner, to Boehringer Ingelheim KG. Process for the purification of thermolabile compounds by distillation. 4,990,222, Cl. 203-91.000.

Air Products and Chemicals, Inc.: *See*—
Burgoyne, William F., Jr.; and Langsam, Michael, 4,990,667, Cl. 564-335.000.
Johnson, Thomas A.; and Abdalmuhdi, Ismail O., 4,990,672, Cl. 564-490.000.
Miller, Jeremy P.; and Summers, John V., 4,989,416, Cl. 62-381.000.
Panunto, Thomas W., 4,990,616, Cl. 544-351.000.
Sunder, Swaminathan; Garg, Diwakar; and Dyer, Paul N., 4,990,372, Cl. 427-237.000.

AIRAX: *See*—
Dony, Dominique, 4,989,698, Cl. 188-300.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ieda, Kiyokazu; Murakami, Yuichi; and Nakamura, Takashi, 4,990,927, Cl. 343-700.0MS.
Nakagawa, Takashi, 4,990,074, Cl. 418-172.000.
Takemoto, Shuichi; Yabuno, Ryohei; and Ishii, Masami, 4,990,935, Cl. 346-76.0PH.
Toda, Hiroshi; Sawada, Masashi; Miyata, Hideyasu; and Takeuchi, Hiroaki, 4,989,924, Cl. 303-113.000.

Akao, Mutsuo; and Inoue, Koji, to Fuji Photo Film Co., Ltd. Core for web material. 4,989,802, Cl. 242-68.500.

Akasaki, Yutaka: *See*—
Mukai, Toshio; Yamashita, Yoshiro; Suzuki, Takanori; Akasaki, Yutaka; Sato, Katsuhiro; Yabuuchi, Naoya; Tanaka, Hiroyuki; and Nukada, Katsumi, 4,990,634, Cl. 552-210.000.

Akatsu, Kazuyuki: *See*—
Endo, Kazuo; Shudo, Nobuyasu; Kawaguchi, Chikakazu; Meguro, Yoshio; Fujimoto, Masahiko; Takisawa, Toshifumi; Inagaki, Masashi; Kato, Kenji; Utsumi, Shigeo; Tomitaka, Kichinojo; Watanabe, Shigeyuki; and Akatsu, Kazuyuki, 4,990,400, Cl. 428-331.000.

Akechi Ceramics Co., Ltd.: *See*—
Ando, Mitsuru; and Aoki, Takafumi, 4,989,762, Cl. 222-607.000.

Akerlund & Rausing Licens Aktiebolag: *See*—
Berg, Gunnar; Johansson, Torkel; and Sjogren, Bo, 4,989,394, Cl. 53-330.000.

AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See*—
Wolf, Konrad, 4,991,220, Cl. 381-169.000.

Akino, Tatsuo: *See*—
Tokumasu, Kenzo; Taki, Katsuo; Ootsuka, Ryotatsu; Nakamura, Masaaki; and Akino, Tatsuo, 4,989,841, Cl. 266-217.000.

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Akiyama, Alex A.; Busboom, Leah J. H.; and Maitland, William J., Jr., to International Business Machines Corp. Enhanced data stream processing in a fixed function terminal. 4,991,118, Cl. 364-521.000.
Akiyama, Shigeru: *See—*
Yokoyama, Yoshiharu; Akiyama, Shigeru; and Kamiya, Tsuyoshi, 4,989,573, Cl. 123-527.000.
Akizuki, Seiichi: *See—*
Gomyo, Yasutaka; Ito, Akira; Ishisaka, Toshiyuki; Miwa, Tetsurou; Hosokawa, Satoshi; Fujimori, Toshio; Ando, Hiroshi; Akizuki, Seiichi; and Yamaguchi, Katsutoshi, 4,989,455, Cl. 73-669.000.
Aktiebolaget Astra: *See—*
Hallnemo, Gerd M.; Hogberg, Thomas; Lindberg, Ulf H.; Ulff, Bengt C. J.; and Ogren, Sven Ove, 4,990,534, Cl. 514-534.000.
Aktiebolaget Bofors: *See—*
Lindberg, Sven, 4,989,494, Cl. 89-46.000.
Akzo N.V.: *See—*
Garske, Friedrich; and Kraft, Bernd, 4,990,206, Cl. 156-282.000.
Hoffman, Julie F.; and Jones, Lionel D., II, 4,989,623, Cl. 134-88.000.
Noomen, Arie; Vandevoorde, Paul M.; Bartels, Tamme; Maters, Gerardus J. W. M.; and Pilaszek, Winsenty L. S., 4,990,577, Cl. 525-454.000.
Alania, Larry J.: *See—*
Pallone, Thomas J.; Alania, Larry J.; Weber, William C., Jr.; and Farmer, Robert F., 4,990,192, Cl. 134-4.000.
Albert, Guy D., to Alcatel NA, Inc. Transformer clip. 4,990,880, Cl. 336-65.000.
Alberto-Culver Company: *See—*
Pallone, Thomas J.; Alania, Larry J.; Weber, William C., Jr.; and Farmer, Robert F., 4,990,192, Cl. 134-4.000.
Albrecht Baumer K.G., Spezialmaschinenfabrik: *See—*
Potzsch, Rolf, 4,989,488, Cl. 83-783.000.
Albrecht, Helmut; and Trommer, Reiner, to Siemens Aktiengesellschaft. Monolithically integrated waveguide-photodiode-FET combination. 4,990,990, Cl. 357-30.000.
Alcan International Limited: *See—*
Askew, Herbert F.; and Brown, Stephen C., 4,989,794, Cl. 241-16.000.
Jain, Mukesh K.; and Nadkarni, Sadashiv, 4,990,471, Cl. 501-97.000.
Lorenson, Claude P.; Hewitt, Bryan C.; Keefer, Richard; and Ball, Melville D., 4,990,735, Cl. 219-10.55E.
Alcatel NA, Inc.: *See—*
Albert, Guy D., 4,990,880, Cl. 336-65.000.
Krisher, Dale L., 4,991,173, Cl. 370-110.100.
Williams, Joseph C.; and Goodman, Sarah E., 4,989,946, Cl. 350-96.200.
Alcatel N.V.: *See—*
Kriegisch, Peter; and Pickel, Wolfgang, 4,991,057, Cl. 361-391.000.
Martheli, Michel, 4,990,865, Cl. 331-99.000.
Martheli, Michel, 4,990,866, Cl. 331-99.000.
Alder, Alex, to Ciba-Geigy Corporation. Process for the preparation of carbodiimides. 4,990,232, Cl. 204-157.810.
Alderson, Walter G., to Clive Investments Pty. Limited. Adjustable bracket for sliding doors. 4,989,296, Cl. 16-105.000.
Alexander, William; and Bertane, Mark, to American Colloid Company. Anti-friction composition containing MgO and method. 4,990,028, Cl. 405-184.000.
Alexandrov, Nikola G.: *See—*
Genova, Ani I.; Nikolova, Milka P.; Todorova, Maria G.; Monov, Alexander P.; Alexandrov, Nikola G.; Nikolov, Rumen K.; Andonova, Violeta H.; Zoneva, Nadejda I.; Nisimov, Yosif N.; Vitkova, Snejana G.; Boyadjiev, Nikola G.; Stoyanova, Anastasia M.; Savova, Keranka N.; Firkova, Nevena L.; and Spasova, Slava N., 4,990,513, Cl. 514-274.000.
Alfa-Laval AB: *See—*
Judge, John Francis X., 4,991,106, Cl. 364-486.000.
Alfred E. Mann Foundation for Scientific Research: *See—*
Gord, John C., 4,990,845, Cl. 323-312.000.
Alfred Kunz GmbH & Co.: *See—*
Ofenstein, Josef, 4,990,026, Cl. 405-8.000.
Allen-Bradley Company, Inc.: *See—*
Heberlein, Gustave E., Jr.; and Nelson, Terrance D., 4,991,050, Cl. 361-57.000.
Allen, Gregory. Self-contained examination guide and information storage and retrieval apparatus. 4,991,091, Cl. 364-413.020.
Allied-Signal: *See—*
Tervo, John N., 4,989,638, Cl. 137-614.010.
Allied-Signal, Inc.: *See—*
Das, Santosh K.; Chang, Chin-Fong; and Bye, Richard L., Jr., 4,990,197, Cl. 148-307.000.
Hoopes, Jay N.; Eick, Christopher D.; and Williamson, John R., 4,989,411, Cl. 60-734.000.
McAfee, David D., 4,989,627, Cl. 137-72.000.
Vandenberk, Theodorus A., 4,990,247, Cl. 210-130.000.
Alon, Gan: *See—*
Yecheskel, Herzel B.; Alon, Gan; and Beck, Eliezer, 4,989,297, Cl. 19-27.000.
Alpers, Heinz-Jurgen; Dietz, Karl-Heinz; Schenke, Bernd-Ulrich; and Thiel, Reinhard, to Bayer Aktiengesellschaft. Process for the preparation of aqueous formaldehyde solutions. 4,990,685, Cl. 568-491.000.
Alps Electric Co., Ltd.: *See—*
Kikuchi, Hiroshi, 4,990,900, Cl. 340-712.000
Ohnishi, Kazumasa; and Noguchi, Tadao, 4,990,835, Cl. 318-116.000.
Alster, Karol, to Alza Corporation. Process for the preparation of 2,2-dialkoxy cyclo ortho esters derived from lactones. 4,990,631, Cl. 549-476.000.
Alternative Resources Corporation: *See—*
Parent, Richard, 4,989,291, Cl. 15-315.000.
Aluminium Pechiney: *See—*
VanVoren, Claude; Coste, Benoit; Biarez, Jean; and Keime, Francois, 4,990,081, Cl. 425-330.000.
Aluminum Company of America: *See—*
James, Richard S., 4,990,059, Cl. 417-50.000.
Alza Corporation: *See—*
Alster, Karol, 4,990,631, Cl. 549-476.000.
Amalgamated Sugar Company, The: *See—*
Kearney, Michael M.; and Mumm, Michael W., 4,990,259, Cl. 210-659.000.
Amano, Matsuo: *See—*
Sakamoto, Masahide; Atago, Takeshi; Ishii, Junichi; Amano, Matsuo; and Kurihara, Nobuo, 4,991,102, Cl. 364-431.060.
Amaudric du Chaffaut, Benoit, to Institut Francais du Petrol. Centering device that can be engaged or disengaged, specifically for a drilling assembly. 4,989,679, Cl. 175-325.000.
American Colloid Company: *See—*
Alexander, William; and Bertane, Mark, 4,990,028, Cl. 405-184.000
American Cyanamid Company: *See—*
Trybulski, Eugene J.; and Brabander, Herbert J., 4,990,520, Cl. 514-326.000.
American Innovision, Inc.: *See—*
Bradley, William C., 4,991,223, Cl. 382-17.000.
American Standard Inc.: *See—*
Steffes, Rudolf; and Meyer, Harald, 4,989,640, Cl. 137-625.500.
American Sterilizer Company: *See—*
Monroe, Lawrence S., 4,989,848, Cl. 269-322.000.
American Ultra Air, Inc.: *See—*
Pacosz, Richard W., 4,990,313, Cl. 422-121.000.
Ametek, Inc.: *See—*
French, Alan P., 4,990,002, Cl. 388-833.000.
Amici, Francis R.; Fontaine, Brian; and Dubois, Craig, to Hasbro, Inc. Simulated nursing bottle for doll. 4,990,119, Cl. 446-267.000.
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Jihad, Dakka; Amikam, Zoran; and Sasson, Yoel, 4,990,659, Cl. 562-416.000.
Amoco Corporation: *See—*
Buttke, Robert D.; Boening, Robert E.; and Pickell, Frank W., 4,990,241, Cl. 208-143.000.
Hagen, Gary P.; and Montag, Ruth A., 4,990,662, Cl. 562-599.000.
Hoppin, Charles R.; and Tovrog, Benjamin S., 4,990,478, Cl. 502-125.000.
Luetkens, Melvin L., Jr.; and Satek, Larry C., 4,990,480, Cl. 502-204.000
Sikkenga, David L., 4,990,717, Cl. 585-429.000.
Amor, William H.: *See—*
Zupancic, Anton Z.; and Amor, William H., 4,989,849, Cl. 269-328.000.
Amorosi, Vincent G.: *See—*
Safabakhsh, Ali R.; and Amorosi, Vincent G., 4,990,051, Cl. 414-786.000.
AMP Incorporated: *See—*
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Chandler, Curtis S.; Foster, George H., Jr.; Lane, David; and Sigmon, Ned A., 4,990,094, Cl. 439-108.000.
Fortuna, Jon A., 4,990,107, Cl. 439-637.000.
Henschen, Homer E.; McKee, Michael J.; and Pawlikowski, Joseph M., 4,990,736, Cl. 219-10.750.
Karlovich, Robert J., 4,990,105, Cl. 439-578.000.
Myers, Ronald W., 4,990,102, Cl. 439-452.000.
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Wynne, John M.; and Byrne, Michael, 4,990,916, Cl. 341-147.000
Analog Devices, Inc.: *See—*
Gilbert, Barrie, 4,990,803, Cl. 307-492.000.
Real, Peter; Robertson, David H.; Tewksbury, Theodore; and Mangelsdorf, Christopher W., 4,990,797, Cl. 307-296.600.
Anders, Frank, Jr. Prone position orthopedic appliance for aligning the spine and the femorae. 4,989,591, Cl. 128-69.000.
Anderson, Alan D.; and White, Roland C., to Cooper Industries, Inc. Plier jaws. 4,989,479, Cl. 81-424.500.
Anderson, Conrad V., to Minnesota Mining and Manufacturing Company. Web-aligning apparatus. 4,990,215, Cl. 156-540.000.
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Ach, William D.; Anderson, Edmund J.; Behrends, Lynn B.; Desrude, Wayne P.; and Klos, Gene J., 4,989,721, Cl. 198-465.100.
Anderson, Gene F. Recycling the components of used single use human waste collecting and/or absorbing products. 4,990,244, Cl. 209-2.000.
Anderson, Keith G.: *See—*
Hutchinson, Donald O.; Dadgar, Ali M.; and Anderson, Keith G., 4,990,626, Cl. 548-462.000.
Anderson, Lewis B.: *See—*
Hudson, E. W., III; and Anderson, Lewis B., 4,989,836, Cl. 297-391.000.
Anderson, Paul A.: *See—*
Weiler, Gerhard H.; Ramrakhyani, Arjun; Anderson, Paul A.; and Leo, Frank N., 4,989,649, Cl. 141-1.000.
Anderson, Sara H.; Lutgen, Noel; and Foulard, Jean, to L'Air Liquide; Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude; and Liquid Air Corporation. Process for producing steel having a low content of nitrogen in a ladle furnace. 4,990,183, Cl. 75-555.000.

Anderson, Scott R.: *See—*
Miller, Alan L.; Coogan, James J.; Anderson, Scott R.; and Kozlowski, James, 4,989,686, Cl. 180-197.000.
Anderson, Weston A.; and Arnold, James T., to Varian Associates, Inc. Mass analysis apparatus and method. 4,990,856, Cl. 324-464.000.
Andersson, Lasse: *See—*
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Andersson, Thorbjorn; and Rydh, Niklas, to AB Profor. Packing container and blank for use in the manufacture thereof. 4,989,736, Cl 206-631.300.
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Ando, Mitsuru; and Aoki, Takafumi, to Akechi Ceramics Co., Ltd. Molten steel pouring nozzle. 4,989,762, Cl. 222-607.000.
Andonova, Violeta H.: *See—*
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Andreasson, Eva M.; Holmberg, Krister A.; Nystrom, Borje; Osterberg, Eva M.; and Egeli, Finn, to Berol Kemi AB; and Tendex Kjemi Service A/S. Surface active compound, a microemulsion containing said compound and the use thereof. 4,990,269, Cl. 252-8.554.
Andreussi, Piero; Bianchi, Renzo; and Bruzzone, Mario, to Enichem Elastomeri S.p.A. Method for preparing polybutadiene endowed with improved processability characteristics. 4,990,573, Cl. 525-332.300.
Andries, Bernard: *See—*
Bouyer, Bernard; Andries, Bernard; Ravel, Guillaume; and Peccoud, Louise, 4,990,859, Cl. 324-649.000.
Angelov, Georgi N.; Ivanov, Bogdan T.; Binbashiev, Ivan Y.; and Popsavova, Mariela P., to Institut po Technicheska Kibernet Ika i Robotika. Joint for assembling of sieve elements. 4,990,023, Cl. 403-408.100.
Angio Medical Corporation: *See—*
Lane, Joseph; Catsimpoolas, Nicholas; and Sinn, Robert S., 4,990,333, Cl. 424-551.000.
Angus, Philip A. Edging apparatus. 4,989,653, Cl. 144-117.00B.
Anliker, Roger L.; and Doescher, Robert D., to J. I. Case Company. Cab duct arrangment for service of air filters through a single access opening. 4,989,500, Cl. 98-211.000.
Anthony, Michael M.: *See—*
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Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, to Rhone-Poulenc Sante. Benzo[1,8]naphthyridine derivatives as antimicrobials. 4,990,515, Cl. 514-292.000.
Anton, Klaus; Datwyler, Peter; Gassmann, Ernst; Jordi, Peter E.; and Pericles, Nico, to Ciba-Geigy Corporation. Micro-flow cell. 4,989,974, Cl. 356-246.000
Anton Steinecker Maschinenfabrik GmbH: *See—*
Strippler, Kurt; Wasmuht, Klaus; and Maitner, Wolfgang, 4,990,346, Cl. 426-231.000.
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Fantozzi, Louis R.; Kessler, Lawrence; and Draxler, Richard. Compact infrared lens arrangement including at least three reflections. 4,989,928, Cl. 350-1.300.

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Farley, Daniel K. Sternal retractor. 4,989,587, Cl. 128-20.000.

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Farrier, Ernest G.: *See*—
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Fehr, Charles; and Galindo, Jose , to Firmenich S.A. Use of cycloaliphatic ketones as perfuming and flavoring ingredients. 4,990,496, Cl. 512-24.000.

Feild, Alexander R.: *See*—
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Fernandez, Richard E.; Cassel, Wendel R.; and Mader, Frederick W., to Du Pont de Nemours, E. I., and Company. Halogen exchange fluorination. 4,990,702, Cl. 570-170.000.

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Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., to Bayer Aktiengesellschaft. 1-benzylsulphonyl-3-heteroaryl-(thio)urea herbicides. 4,990,637, Cl. 562-41.000.

Feuchter, Wolfgang; and Gotz, Dieter, to Wilhelm Stahlecker GmbH. Brake for an open-end spinning rotor. 4,989,401, Cl. 57-88.000.

Fichtel & Sachs Industries, Inc.: *See*—
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Mais, Franz-Josef; and Fiege, Helmut, 4,990,707, Cl. 570-210.000.

Field, Leonard E. Boat hull having stepped underside. 4,989,534, Cl. 114-289.000.

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Finkenberg, John G. Diagnosis by intrasound. 4,989,613, Cl. 128-739.000.

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Goodman, Clarence R. Automotive boot. 4,989,884, Cl. 277-31.000.
Goodman, Ronald C. Gyroscopically stabilized sensor positioning system. 4,989,466, Cl. 74-5.220.
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Gordon, Roy G., to President and Fellows of Harvard College. Zinc oxyfluoride transparent conductor. 4,990,286, Cl. 252-518.000.
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Gosteli, Jacques; and Warm, Aleksander, to Lonza Ltd. Process for the production of 4,5,6,7-tetrahydrothieno-[3,2-c]-pyridines. 4,990,618, Cl. 546-221.000.
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Kinkner, Bruce E.; and Peck, Alan R., to Southwest Shooters Supply, Inc. Shotgun having interchangeable barrels. 4,989,359, Cl. 42-77.000.

Kinoshita, Tatsuya: *See*—
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Kinoshita, Toshiyuki: *See*—
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Kioka, Mamoru; Nakano, Masao; and Toyota, Akinori, to Mitsui Petrochemical Industries, Ltd. Olefin polymerization catalyst component, process for production thereof, olefin polymerization catalyst, and process for polymerizing olefins. 4,990,477, Cl. 502-107.000.

Kioka, Mamoru: *See*—
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Tsutsui, Toshiyuki; Kioka, Mamoru; and Toyota, Akinori, 4,990,640, Cl. 556-181.000.

Kirkland, James L., to United States of America, Navy. Automatic classifier for electric wire detector. 4,990,852, Cl. 324-326.000.

Kirschner, Kevin A. Video display terminal filter. 4,989,953, Cl. 350-311.000.

Kishi, Hideki; and Kago, Muneaki, to Yamaha Hatsudoki Kabushiki Kaisha. Locking device for steering mast of small watercraft. 4,989,532, Cl. 114-270.000.

Kishi, Motoshi, to Brother Kogyo Kabushiki Kaisha. Wet type developing device providing controlled amount of developing liquid. 4,990,962, Cl. 355-256.000.

Kishi, Satoru: *See*—
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Kishimoto, Manabu; Nakajima, Kenji; and Seo, Iwao, to Mitsubishi Petrochemical Co., Ltd. Piezoelectric or pyroelectric material. 4,990,584, Cl. 526-300.000.

Kitagawa, Seizou, to Fuji Electric Co., Ltd. Function separation type electrophotographic photoreceptor comprising arsenic, selenium and tellurium. 4,990,419, Cl. 430-58.000.

Kitamura, Hiroshi, to Toshiba Kikai Kabushiki Kaisha. Casting apparatus. 4,989,663, Cl. 164-312.000.

Kitano, Kissho: *See*—
Iwanami, Kunio; Kitano, Kissho; Narukawa, Kiyotada; Aoki, Kenichi; Yagi, Yukihiko; Sakuma, Masato; Mikami, Takashi; Esaki, Masami; Kato, Fumio; Egashira, Koji; and Wakabayashi, Hiroyuki, 4,990,550, Cl. 523-214.000.

Kitayama, Hirofumi: *See*—
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Kitson, Melanie; and Williams, Peter S., to BP Chemicals Limited. Alcohols production by hydrogenation of carboxylic acids. 4,990,655, Cl. 500-265.000.

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Kittle, Paul A., to Rusmar Incorporated. Membrane-forming foam composition and method. 4,990,373, Cl. 427-244.000.

Kiya, Yukitoshi, to Ricoh Company, Ltd. Image forming apparatus having duplex unit. 4,990,965, Cl. 355-319.000.

Kiyose, Tomohito, to Mitsubishi Denki K.K. Electric component. 4,991,059, Cl. 361-405.000.

Klaus, Michael; Loeliger, Peter; Mohr, Peter; and Weiss, Ekkehard, to Hoffmann-La Roche Inc. Novel tetrahydronaphthalene and indane derivatives. 4,990,703, Cl. 570-189.000.

Klein, Alfons; Fiege, Helmut; Puppe, Lothar; and Jeblick, Werner, to Bayer Aktiengesellschaft. Preparation of 4-methyl-2-cyclohexylphenol. 4,990,687, Cl. 568-743.000.

Klein, Christian: *See*—
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Kline, Bruce R., to Simmonds Precision Products, Inc. System and method for ultrasonic determination of density. 4,991,124, Cl. 364-558.000.

Kling, Wolfgang: *See*—
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Klinge, Alois: *See*—
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Knabe, Uwe; Klinge, Alois; Frundt, Hans-Joachim; and Geltenpoth, Ulrich, to Holstem und Kappert Aktiengesellschaft. Grate bar surface in pasteurizers. 4,989,725, Cl. 198-774.100.

Knauf, Werner: *See*—
Schubert, Hans H.; Salbeck, Gerhard; Luders, Walter; Knauf, Werner; and Waltersdorfer, Anna, 4,990,621, Cl. 546-302.000.

Knebel, Joachim; Ude, Werner; and Vetter, Joachim, to Rohm GmbH. Temperature resistant aromatic polyethers. 4,990,588, Cl. 528-125.000.

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Kneringer, Gunther; Reheis, Nikolaus; and Thalman, Walter, to Schwarzkopf Development Corporation. Process for the manufacture of a soldered joint. 4,990,402, Cl. 428-408.000.

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Koenigberg, Harold M.; and O'Neal, Dan J., to Hughes Aircraft Company. Collimated light optrode. 4,989,942, Cl. 350-96.180.

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Kohdaka, Takayuki, to Yamaha Corporation. Parallel analog-to-digital converter. 4,990,917, Cl. 341-159.000.

Kohno, Teruhisa, to Sumitomo Electric Industries, Ltd. Brake pressure control device for vehicles. 4,989,925, Cl. 303-116.000.

Kohri, Toshitaro; Kato, Hitoshi; Takahashi, Kunio; and Machida, Junji, to Minolta Camera Kabushiki Kaisha. Toner for developing electrostatic latent images. 4,990,427, Cl. 430-110.000.

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Koike, Atsuyoshi; Ikeda, Shuji; and Nagasawa, Kouichi, to Hitachi, Ltd. Semiconductor device to prevent out-diffusion of impurities from one conductor layer to another. 4,990,998, Cl. 357-71.000.

Kojima, Hajime; and Ono, Akihiko, to Kabushiki Kaisha N-Tech; and Nihon Taisanbin Kogyo Kabushiki Kaisha. Lubricant spray nozzle on a guide rail for glass bottle molds. 4,990,171, Cl. 65-169.000.

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Kojima, Shingo, to NEC Corporation. Microprogram controlled microprocessor having a plurality of internal buses and including transfer register designation system. 4,991,086, Cl. 364-200.000.

Kojima, Shingo, to NEC Corporation. Normalization control system for floating point arithmetic operation. 4,991,130, Cl. 364-715.040.

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Kokubu, Nobuaki, to Canon Kabushiki Kaisha. Communication terminal device. 4,991,028, Cl. 358-403.000.

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Kolblin, Karl; and Geiger, Peter, to Werner Thieme GmbH & Co. KG Maschinenfabrik. Screen printing machine. 4,989,510, Cl. 101-123.000.

Komatsu, Hajime; Ohkawachi, Susumu; Tosaka, Yasuo; Ueda, Bunzo; and Hoshimo, Keiichi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material having a reflective base and an antihalation layer having a specified thickness. 4,990,432, Cl. 430-378.000.

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Komiya, Masayuki; Otsuka, Masaaki; Sawanobori, Naruhito; and Nagahama, Shinobu, to Sumita Optical Glass, Inc. Fluorophosphate optical glass. 4,990,468, Cl. 501-44.000.

Komiya, Yasuhiro; and Nagasaki, Tatsuo, to Olympus Optical Co., Ltd. Automatic focusing apparatus. 4,990,947, Cl. 354-402.000.

Komotzki, Michael. Fastening arrangement for the entraining elements of chain conveyors. 4,989,724, Cl. 198-731.000.

Konda, Jiro, to Kabushiki Kaisha I.P.D. Ceramic heating plate. 4,990,747, Cl. 392-435.000.

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Kondoh, Harufusa; and Shimada, Hiromi, to Mitsubishi Denki Kabushiki Kaisha. Signal processing device such as a digital filter utilizing redundant binary expression and operating method therefor. 4,990,915, Cl. 341-144.000.

Kondoh, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,990,978, Cl. 357-23.400.

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Kouge, Katsushige, to Sanshin Kagaku Kogyo Co. Ltd. Sulfonium compound and acylating agent. 4,990,644, Cl. 558-20.000.

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Kozikowski, Alan P.; Wroblewski, Jarda T.; and Costa, Erminio, to FIDIA-Georgetown Institute for the Neurosciences. Azetidine derivatives to treat memory and learning disorders. 4,990,504, Cl. 514-210.000.

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Kraehn, Erich, to Siemens Aktiengesellschaft. Toner delivery system having a multi-functional toner container for non-mechanical printer and copier means. 4,990,964, Cl. 355-260.000.

Kraff, Manus C. Intraocular lens apparatus with haptics of varying cross-sectional areas. 4,990,159, Cl. 623-6.000.

Kraft, Bernd: *See*—
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Krall, Thomas J., to Owens-Illinois Plastic Products Inc. Plastic container with self-draining feature. 4,989,757, Cl. 222-111.000.

Kramer, Gregory, to Yield Securities, Inc. Digital signal processor for providing timbral change in arbitrary audio and dynamically controlled stored digital audio signals. 4,991,218, Cl. 381-61.000.

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Kranzle, Josef; and Jager, Anton. Rotatable nozzle in particular for high pressure cleaning apparatuses. 4,989,786, Cl. 239-240.000.

Krauss, Werner, to Ibau Hamburg Ingenieurgesellschaft Industriebau mbH. Silo for pulverulent and fine-grained bulk materials. 4,989,380, Cl. 52-197.000.

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Krebs, Peter E. Testing communications systems. 4,991,196, Cl. 379-27.000

Kreiner, Hans-Jurg; and Frenzel, Eberhard, to FAG Kugelfischer Georg Schafer (KGaA). Method and apparatus for determining the actual artificial aerosol alpha activity concentration in the air. 4,990,786, Cl. 250-380.000.

Kremer, Paul, to Ceodeux S.A. Valve arrangement for filling and emptying a gas container. 4,989,832, Cl. 251-291.000.

Kretchman, Gerald L., to Whirlpool Corporation. Dryer transition duct. 4,989,347, Cl. 34-133.000.

Kretchman, Gerald L.; Mulder, James R.; Eichman, Carl E.; and Czech, James I., to Whirlpool Corporation. Washer/dryer frame construction. 4,989,426, Cl. 68-3.00R.

Kriegisch, Peter; and Pickel, Wolfgang, to Alcatel N.V. Housing for receiving electric assemblies. 4,991,057, Cl. 361-391.000.

Krisher, Dale L., to Alcatel NA, Inc. Apparatus and method for mapping of PCM signaling at signaling rate conversion boundaries. 4,991,173, Cl. 370-110.100

Krishnakumar, Suppayan M.; Collette, Wayne N.; and Nahill, Thomas E., to Continental PET Technologies, Inc. Method and apparatus for injection molding of multilayer preforms. 4,990,301, Cl. 264-513.000.

Krishnan, Ramasamy, to Sun Chemical Corporation. Lithographic ink compositions. 4,990,185, Cl. 106-20.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
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Krouskop, Thomas A., to Research Development Foundation. Inflation control for air supports. 4,989,283, Cl. 5-453.000.

Krude, Werner, to GKN Automotive, Inc. Continuously variable transmission system having a variable diameter pulley with resiliently biased belt engaging members. 4,990,123, Cl. 474-50.000.

Krupp, Stephen P.; Knickerbocker, Edward N.; and Bieser, John O., to Dow Chemical Company, The. Improved spunbonding of linear polyethylenes. 4,990,204, Cl. 156-167.000.

Kubo, Susumu, to Kabushiki Kaisha Toshiba. Apparatus for performing group control on elevators utilizing distributed control, and method of controlling the same. 4,989,695, Cl. 187-101.000.

Kubo, Takashige: *See*—
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Kudo, Motohiro; and Tsuchiya, Yasuhiro, to Kabushiki Kaisha Toshiba. Two-cylinder rotary compressor having improved valve cover structure. 4,990,073, Cl. 418-60.000.

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Kuepper, Wilhelm, to W. Schlafhorst & Co. Apparatus for transporting yarn packages. 4,989,722, Cl. 198-475.100.

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Neidecker, Rudolf; and Kunz, Jacques, to Multi-Contact AG. Current bar arrangement. 4,990,098, Cl. 439-207.000.

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Saitou, Akira; Takahashi, Osamu; Tsukada, Seigou; Sohara, Yasuyuki; Tsuruse, Hideki; and Sugimoto, Hidehiko, to Mitsubishi Denki Kabushiki Kaisha. Low-switching loss DC-DC converter. 4,991,075, Cl. 363-15.000.
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Schilling, Peter, to Westvaco Corporation. Anionic slurry seal emulsifiers. 4,990,591, Cl. 528-129.000.

Schilling, Peter, to Westvaco Corporation. Anionic slurry seal emulsifiers. 4,990,592, Cl. 528-129.000.

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Susak, David M.; and Bynum, Byron G., to Motorola, Inc. Amplifier output stage. 4,990,863, Cl. 330-265.000.
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Yoshimura, Shoji, to Kabushiki Kaisha Kobe Seiko Sho. Radial load reducing device, and sliding bearing and screw compressor using the device. 4,989,997, Cl. 384-100.000.

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Yoshinaga, Akitoshi; and Sugawara, Mitsuru, to Kabushiki Kaisha Toshiba. Optical fiber alignment. 4,989,943, Cl. 350-96.180.

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Zhong, Xing X.; and Zhao, Yu Z. Unique grease lubricated ball bearing canned motor pump. 4,990,068, Cl. 417-423.800.

Ziberna, Rick P.; and Kaptur, Timothy D., to General Motors Corporation. Bulkhead connector. 4,990,723, Cl. 174-152.00R.

Zieve, Peter B. Low voltage electromagnetic pulse actuator. 4,990,805, Cl. 310-27.000.

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Bernardon, Jean-Michel: *See*—
Shroot, Braham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, Re. 33,533, Cl. 514-23.000.

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Shroot, Braham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, Re. 33,533, Cl. 514-23.000.

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Eustache, Jacques: *See*—
Shroot, Braham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, Re. 33,533, Cl. 514-23.000.

Hessberger, Gerhard: *See*—
Munz, Wolf-Dieter; and Hessberger, Gerhard, Re. 33,530, Cl. 204-192.120.

Ishii, Takatoshi, to Ascii Corporation. Display control system which produces varying patterns to reduce flickering. Re. 33,532, Cl. 340-793.000.

Leybold Aktiengesellschaft: *See*—
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Munz, Wolf-Dieter; and Hessberger, Gerhard, to Leybold Aktiengesellschaft. Process and apparatus for the coating of shaped articles by cathode sputtering. Re. 33,530, Cl. 204-192.120.

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Shroot, Braham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, to Centre International de Recherches Dermatologiques (CIRD). Polycyclic heterocyclic compounds, a process for their preparation and their use in human and veterinary medicine. Re. 33,533, Cl. 514-23.000.

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LIST OF PLANT PATENTEES

Ackerman, Stephen M., to Plant Sciences, Inc. Raspberry plant named PSI 79. 7,436, 2-5-91, Cl. 46.000.
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LIST OF STATUTORY INVENTION REGISTRATIONS

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Chou, David T.; Powell, Gail S.; and Timmons, Philip R., to Rhone-Poulenc Ag Company. Organophosphorus ester compounds of cyanohydrins as insecticides and nematicides. H888, 2-5-91, Cl. 514-112.000.
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George, Eric R., to Shell Oil Company. Reinforced polymer. H886, 2-5-91, Cl. 524-612.000.
Gottlieb, Milton S.; and Melamed, Nathan T., to United States of America, Air Force. Method and apparatus for increasing the angular aperture of an acousto-optic device. H884, 2-5-91, Cl. 350-358.000.
Hashimoto, Kazuo. Automatic illumination switching device. H891, 2-5-91, Cl. 381-43.000.
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Little, Malcolm E.; Wagner, Robert P.; and McCullough, William W., to United States of America, Army. Protective mask. H883, 2-5-91, Cl. 128-201.170.
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Nagashima, Akira, to Kioritz Corporation. Bearing device for a crankshaft. H885, 2-5-91, Cl. 384-457.000.
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206.23 4,989,598
207.18 4,989,599
372 4,989,600
399 4,989,601
419 D 4,989,602
4,989,603
421 4,989,604
422 4,989,605
637 4,989,606
[illegible] 4,989,607
653 A 4,989,608
[illegible] 4,989,609
695 4,989,610
4,989,611
721 4,989,612
739 4,989,613
752 4,989,614
774 4,989,615
777 4,989,616
785 4,989,617
[illegible] 4,989,618

CLASS 131

194 4,989,619
371 4,989,620

CLASS 132

245 4,989,621
301 4,989,622

CLASS 134

4 4,990,192
88 4,989,623
100 4,989,624

CLASS 135

22 4,989,625

CLASS 136

201 4,990,193

CLASS 137

13 4,989,626
72 4,989,627
78.3 4,989,628
202 4,989,629
240 4,989,630
269.5 4,989,631
343 4,989,632
[illegible] 4,989,633
363 4,989,634
527 4,989,635
557 4,989,636
599 4,989,637
614.01 4,989,638
614.17 4,989,639
625.11 4,989,641
625.37 4,989,642
625.5 4,989,640

CLASS 138

126 4,989,643

CLASS 139

116.2 4,989,644
4,989,645
192 4,989,646
383 A 4,989,647
4,989,648

CLASS 141

1 4,989,649
6 4,989,650

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CLASS 144

3 R 4,989,651
34 R 4,989,652
117 B 4,989,653
134 A 4,989,654
241 4,989,655

CLASS 148

1 4,990,194
11.5 F 4,990,195
12.4 4,990,196
4,990,182
4,990,197
4,990,198
429 4,990,199

CLASS 150

108 4,989,656

CLASS 151

399 4,989,657
533 4,989,658
534 4,989,659

CLASS 156

4,990,200
85 4,990,201
4,990,202
117 4,990,203
167 4,990,204
242 4,990,205
4,990,207
275.3 4,990,208
282 4,990,206
351 4,990,209
391 4,990,210
4,990,211
4,990,212
425 4,990,213
527 4,990,214
4,990,215
4,990,216
623 R 4,990,217
4,990,218

CLASS 160

4,989,660

CLASS 162

238 4,990,219

CLASS 164

24 4,989,661
58.1 4,989,662
312 4,989,663
361 4,989,664
363 4,989,665
467 4,989,666
519 4,989,667

CLASS 168

47 4,989,668
104.16 4,989,669
143 4,989,670

CLASS 166

53 4,989,671
196 4,989,672
250 4,989,673
268 4,989,674

CLASS 168

14 4,989,675

CLASS 172

438 4,989,676

CLASS 173

31 4,989,677

CLASS 174

52.4 4,990,719
65 R 4,990,721
97 4,990,722
152 R 4,990,723
261 4,990,724
524 4,990,720

CLASS 175

20 4,989,678
325 4,989,679
340 4,989,680
398 4,989,681

CLASS 178

18 4,990,725
19 4,990,726

CLASS 181

79.1 4,989,682
4,989,683
89.15 4,989,684
197 4,989,685
4,989,686
4,989,687

CLASS 183

4,989,688

CLASS 182

45 4,989,689
4,989,690
4,989,691
166 4,989,692
221 4,989,693

CLASS 187

101 4,989,695
121 4,989,694

CLASS 189

218 XL 4,989,696
4,989,697
300 4,989,698
322.14 4,989,699
322.17 4,989,701
322.18 4,989,700

CLASS 191

3.29 4,989,702
4 A 4,989,703
45 4,989,704
4,989,705
53 E 4,989,706
67 R 4,989,707
70.12 4,989,709
70.17 4,989,710
70.2 4,989,708
105 F 4,989,711
106.1 4,989,712
106.2 4,989,713

CLASS 194

317 4,989,714
4,989,715

CLASS 198

311 4,989,716
346.1 4,989,717
347.3 4,989,718
365 4,989,719
430 4,989,720
465.1 4,989,721
475.1 4,989,722
635 4,989,723
731 4,989,724
750 B1 4,143,760
774.1 4,989,725
836.1 4,989,727

CLASS 200

61.54 4,990,727
83 P 4,990,728
293.1 4,990,729
314 4,990,730
521 4,990,731

CLASS 201

139 4,990,220
241 4,990,221

CLASS 203

91 4,990,222

CLASS 204

28 4,990,223
4,990,226
29 4,990,224
44 4,990,225
59 R 4,990,227
4,990,228
147 4,990,231
157.81 4,990,232
192.12 Re.33,530
192.230 4,990,234
192.31 4,990,233
4,990,229
301 4,990,230
424 4,990,235
430 4,990,236

CLASS 206

4,989,728
222 4,989,729
362 4,989,730
386 4,989,731
554 4,989,732
570 4,989,733
575 4,989,734
621.6 4,989,735
631.3 4,989,736

CLASS 208

13 4,990,237
4,990,238
4,990,239
120 4,990,240
143 4,990,241
218 4,990,242
254 H 4,990,243

CLASS 209

2 4,990,244

CLASS 210

96.1 4,990,245
109 4,990,246
130 4,990,247
136 4,990,248
167 4,990,249
198.2 4,990,250
321.8 4,990,251
321.83 4,990,252
359 4,990,253
4,990,254
500.27 4,990,255
4,990,256
641 4,990,257
4,990,258
659 4,990,259
4,990,260
4,990,261
710 4,990,262
4,990,263
729 4,990,264
739 4,990,265
4,990,266

CLASS 211

193 4,989,737

CLASS 215

1 C 4,989,738
221 4,989,739
252 4,989,740

CLASS 219

9.5 4,990,732
10.55 B 4,990,733
10.55 E 4,990,734
4,990,735
10.75 4,990,736
69.11 4,990,737
69.12 4,990,738
121.47 4,990,739
121.52 4,990,740
121.64 4,990,741
121.69 4,990,742
124.34 4,990,743
213 4,990,744
385 4,990,749
453 4,990,750
4,990,751
4,990,752
4,990,753
530 4,990,754
553 4,990,755

CLASS 220

1.65 4,989,741
23.4 4,989,742
85 H 4,989,743
94 A 4,989,744
208 4,989,745
254 4,989,746
324 4,989,747
367 4,989,748
401 4,989,749
4,989,750
4,989,751
610 4,989,752

CLASS 221

121 4,989,753

CLASS 222

39 4,989,754
55 4,989,756
63 4,989,755
111 4,989,757
137 4,989,758
153 4,989,759
4,989,760
231 4,989,761
607 4,989,762
635 4,989,763

CLASS 223

102 4,989,764

CLASS 224

42.07 4,989,765
42.45 R 4,989,768
155 4,989,766
274 4,989,767

CLASS 225

20 4,989,769
103 4,989,770

CLASS 226

74 4,989,771
139 4,989,772

CLASS 228

118 4,989,776
122 4,989,773
157 4,989,774
218 4,989,775

CLASS 229

1.5 R 4,989,777
117.13 4,989,778
120.18 4,989,779
125.42 4,989,780

CLASS 235

384 4,990,757
449 4,990,758
462 4,990,756
492 4,990,759
4,990,760

CLASS 237

56 4,989,781

CLASS 238

10 R 4,989,782

CLASS 240

1 Re.33,531
77 4,989,783
114 4,989,784
227 4,989,785
4,989,786
346 4,989,787
429 4,989,788
433 4,989,789
483 4,989,790
579 4,989,791
4,989,792
696 4,989,793

CLASS 241

16 4,989,794
117 4,989,795
154 4,989,796
4,989,797

CLASS 242

18 R 4,989,798
55.3 4,989,800
55.530 4,989,801
68.5 4,989,802
4,989,803
4,989,799
107 4,989,804
107.1 4,989,805
199 4,989,806

CLASS 244

53 B 4,989,807
118.5 4,989,808
137.1 4,989,809
208 4,989,810

CLASS 248

4,989,811
170 4,989,812
183 4,989,813
185 4,989,814
225.2 4,989,815
231.6 4,989,816
231.91 4,989,817
332 4,989,818
476 4,989,819
523 4,989,820
529 4,989,821
632 4,989,822
4,989,823
674 4,989,824
676 4,989,825
4,989,826

CLASS 250

201.1 4,989,827
201.8 4,990,762
202.1 4,990,761
4,990,763
208.1 4,990,764
208.2 4,990,765
213 VT 4,990,766
227.10 4,990,769
227.24 4,990,770
231.16 4,990,767
236 4,990,771
239 4,990,768
252.1 4,990,772
255 4,990,773
4,990,774
291 4,990,775
292 4,990,777
310 4,990,776
4,990,778
4,990,779
343 4,990,780
347 4,990,781
352 4,990,782
353 4,990,783
358.1 4,990,784
368 4,990,785
4,990,786
432 PD 4,990,787
493.1 4,990,804
504 R 4,990,788
4,990,789
556 4,990,790
561 4,990,791
4,990,792
571 4,990,793
573 4,990,794
574 4,990,795

CLASS 251

4,989,828
129.07 4,989,829
129.11 4,989,830
149.7 4,989,831
209 4,989,833
291 4,989,832

CLASS 252

8.514 4,990,268
8.554 4,990,269
4,990,270
4,990,267
33.6 4,990,271
41 4,990,272
46.4 4,990,273
52 A 4,990,274
62.3 Q 4,990,275
62.54 4,990,276
69 4,990,277
70 4,990,278
73 4,990,279
95 4,990,280
4,990,281
301.4 F 4,990,282
309 4,990,283
4,990,284
502 4,990,285
518 4,990,286
4,990,287

CLASS 260

1 4,989,834
13.1 4,989,835

CLASS 260

54.5 4,989,846
400 4,990,288
410.8 4,990,289

CLASS 261

30 4,990,290

CLASS 264

4.7 4,990,291
23 4,990,292
40.1 4,990,293
41 4,990,294
65 4,990,295
162 4,990,296
211.14 4,990,297
261 4,989,837
291 4,990,298
297.4 4,990,299
328.6 4,990,300
513 4,990,301

CLASS 266

44 4,989,838
80 4,989,839
111 4,989,840
217 4,989,841
276 4,989,842
283 4,989,843

CLASS 267

64.24 4,989,844

CLASS 269

21 4,989,845
170 4,989,847
322 4,989,848
328 4,989,849

CLASS 270

1.1 4,989,850
41 4,989,851
4,989,852
58 4,989,853

CLASS 271

3.1 4,989,854
227 4,989,855

CLASS 272

52 4,989,856
70 4,989,857
4,989,858
4,989,859
127 4,989,860
129 4,989,861

CLASS 273

1.5 A 4,989,862
3 A 4,989,863
26 R 4,989,865
4,989,866
29 A 4,989,867
32.5 4,989,868
33 4,989,869
73 D 4,989,864
73 G 4,989,871
73 J 4,989,870
139 4,989,872
142 R 4,989,873
4,989,874
4,989,875
176 F 4,989,876
200 R 4,989,877
240 4,989,878
247 4,989,879
336 4,989,880
416 4,989,881

CLASS 277

11 4,989,882
25 4,989,883
31 4,989,884
80 4,989,885
4,989,886

CLASS 279

48 4,989,887

CLASS 280

30 4,989,888
4,989,889
42 4,989,890
47.38 4,989,891
4,989,892
625 4,989,893
690 4,989,894
731 4,989,895
732 4,989,896
743 4,989,897
777 4,989,898
4,989,899
808 4,989,900
4,989,901

CLASS 281

4,989,902
114 4,989,903
286 4,989,904
319 4,989,905

CLASS 282

17 4,989,906

CLASS 283

223 4,989,907
341.15 4,989,908

CLASS 284

119.3 4,989,909

CLASS 285

97.4 4,989,910
97.9 4,989,911
201 4,989,912
205 4,989,913

CLASS 287

4,989,914
378 4,989,915
391 4,989,836
439 4,989,916

CLASS 288

11 4,989,917
23 MD 4,989,918

CLASS 290

10 4,989,919

CLASS 291

63 PW 4,989,920

CLASS 303

91 4,989,921
100 4,989,922
109 4,989,923
113 4,989,924
116 4,989,925

CLASS 307

279 4,990,796
296.6 4,990,797
4,990,798
355 4,990,799
465 4,990,800
4,990,801
482.1 4,990,802
492 4,990,803

CLASS 310

27 4,990,805
49 A 4,990,806
4,990,807
113 4,990,808
192 4,990,809
4,990,810
239 4,990,811
261 4,990,812
309 4,990,813
313 R 4,990,814
316 4,990,815
324 4,990,816
4,990,817
4,990,818

CLASS 312

4,989,926
277 4,989,927

CLASS 313

25 4,990,819
49 4,990,820
112 4,990,821
414 4,990,822
446 4,990,823
474 4,990,824
482 4,990,825
485 4,990,826
533 4,990,827
546 4,990,828

CLASS 315

39 4,990,829
106 4,990,830
111.01 4,990,831
382.1 4,990,832
398 4,990,833
411 4,990,834

CLASS 318

116 4,990,835
285 4,990,836
375 4,990,837
568.1 4,990,839
568.10 4,990,838
571 4,990,840
587 4,990,841
590 4,990,842
701 4,990,843
762 4,990,844

CLASS 323

312 4,990,845
314 4,990,846
4,990,847

CLASS 324

79 R 4,990,848
225 4,990,850
240 4,990,851
326 4,990,852
347 4,990,853
418 4,990,854
449 4,990,855
464 4,990,856
551 4,990,857
639 4,990,858
649 4,990,859
726 4,990,860

CLASS 328

233 4,990,861

CLASS 330

253 4,990,862
265 4,990,863
288 4,990,864

CLASS 331

99 4,990,865
4,990,866

CLASS 332

102 4,990,867

CLASS 333

81 R 4,990,868
203 4,990,869
208 4,990,870
209 4,990,871
213 4,990,872

CLASS 335

68 4,990,873
126 4,990,874
131 4,990,875
297 4,990,876
301 4,990,877
4,990,878
306 4,990,879

CLASS 336

65 4,990,880
110 4,990,881

CLASS 337

66 4,990,882
357 4,990,883

CLASS 340

438 4,990,884
455 4,990,885
467 4,990,886
479 4,990,887
506 4,990,888
515 4,990,889
539 4,990,890
572 4,990,891
573 4,990,892
4,990,893
4,990,894
635 4,990,895
641 4,990,896
665 4,990,897
693 4,990,898
705 4,990,899
712 4,990,900
4,990,901
731 4,990,902
4,990,903
771 4,990,904
793 Re.33,532
805 4,990,905
825.310 4,990,906
825.5 4,990,907
825.630 4,990,908

CLASS 341

15 4,990,909
67 4,990,910
123 4,990,911
132 4,990,912
139 4,990,913
143 4,990,914
4,990,915
147 4,990,916
159 4,990,917

CLASS 342

7 4,990,918
13 4,990,919
4,990,920
35 4,990,921
52 4,990,922
165 4,990,923
359 4,990,924
424 4,990,925

CLASS 343

700 MS 4,990,926
4,990,927
713 4,990,928
715 4,990,929

CLASS 346

1.1 4,990,930
4,990,931
45 4,990,932
76 PH 4,990,933
4,990,934
4,990,935
134 4,990,936
139 R 4,990,937
140 R 4,990,938
4,990,939
145 4,990,940
153.1 4,990,941
155 4,990,942

CLASS 350

1.3 4,989,928
3.83 4,989,929
96.1 4,989,932
96.10 4,989,931
4,989,933
96.11 4,989,934
4,989,935
96.15 4,989,936
4,989,937
4,989,938
4,989,939
96.18 4,989,940
4,989,941
4,989,942
4,989,943
4,989,944
96.2 4,989,930
96.20 4,989,945
4,989,946
96.34 4,989,947
97 4,989,948
251 4,989,950
255 4,989,951
259 4,989,952
311 4,989,953
337 4,989,954
344 4,989,955
345 4,989,956
392 4,990,943
414 4,989,957
419 4,989,958
447 4,989,959
448 4,989,960
464 4,989,961
537 4,989,962
556 4,989,963
616 4,989,964
632 4,989,965
4,989,966

CLASS 351

165 4,989,967
206 4,989,968

CLASS 353

27 R 4,989,330

CLASS 354

173.1 4,990,944
195.12 4,990,945
222 4,990,946
402 4,990,947
485 4,990,948

CLASS 355

27 4,990,949
4,990,950
4,990,951
69 4,990,952
200 4,990,953
4,990,954
4,990,955
4,990,956
4,990,957
245 4,990,958
4,990,959
4,990,960
251 4,990,961
256 4,990,962
259 4,990,963
4,990,964
319 4,990,965
321 4,990,966
323 4,990,967
326 4,990,968
327 4,990,969

CLASS 356

4,989,969
73 4,989,970
73.1 4,989,971
121 4,989,949
225 4,989,972
239 4,989,973
4,989,974
307 4,989,975
315 4,989,976
338 4,989,977
343 4,989,978
345 4,989,979
357 4,989,980
394 4,989,981
4,989,982
423 4,989,983
445 4,989,984
4,989,985

CLASS 357

17 4,990,970
4,990,971
4,990,972
22 4,990,973
23.11 4,990,983
23.13 4,990,984
23.3 4,990,974
23.4 4,990,975
4,990,976
4,990,977
4,990,978
23.5 4,990,979
23.6 4,990,980
23.7 4,990,981
23 800 4,990,982
4,990,985
26 4,990,986
4,990,987
30 4,990,988
4,990,989
4,990,990
34 4,990,991
41 4,990,992
54 4,990,993
67 4,990,994
4,990,995
4,990,996
71 4,990,997
4,990,998
4,990,999
75 4,991,000
4,991,001
81 4,991,002

CLASS 358

35 4,991,003
76 4,991,004
93 4,991,005
100 4,991,006
106 4,991,007
108 4,991,008
135 4,991,009
4,991,010
141 4,991,011
147 4,991,017
4,991,018
4,991,019
4,991,020
162 4,991,021
4,991,022
183 4,991,012
4,991,013
4,991,014
4,991,015
213.31 4,991,016
242 4,991,023
255 4,991,024
310 4,991,025
328 4,991,026
330 4,991,027
403 4,991,028
451 4,991,029
474 4,991,030

CLASS 360

4,991,031
14.3 4,991,032
32 4,991,033
4,991,034
4,991,035
71 4,991,036
4,991,037
4,991,211
4,991,038
4,991,039
4,991,040
4,991,041
4,991,043
4,991,044
4,991,045
4,991,046
130.21 4,991,047
133 4,991,048

CLASS 361

28 4,991,049
57 4,991,050
4,991,051
4,991,052
93 4,991,042
117 4,991,053
165 4,991,054
321 4,991,055
4,991,056
391 4,991,057
4,991,058
405 4,991,059
410 4,991,060
417 4,991,061
424 4,991,062

CLASS 362

18 4,991,063
27 4,991,064
33 4,991,065
4,991,066
4,991,067
4,991,068
4,991,069
223 4,991,070
249 4,991,071
297 4,991,072
4,991,073
457 4,991,074

CLASS 363

15 4,991,075

CLASS 364

147 4,991,076
188 4,991,077
4,991,078
4,991,079
4,991,080
4,991,081
4,991,082
4,991,083
4,991,084
4,991,085
4,991,086
4,991,087
4,991,088
4,991,089
4,991,090
413.02 4,991,091
413.13 4,991,092
413.15 4,991,093
419 4,991,094
421 4,991,095
424.01 4,991,098
424.1 4,991,096
4,991,097
4,991,099
426.02 4,991,103
426.04 4,991,100
431.05 4,991,101
431.06 4,991,102
476 4,991,104
4,991,105
4,991,106
4,991,107
514 4,991,108
518 4,991,109
4,991,110
4,991,111
4,991,112
519 4,991,113
4,991,114
520 4,991,115
4,991,116
521 4,991,117
4,991,118
4,991,119
4,991,120
4,991,121
4,991,122
4,991,123
4,991,124
560 4,991,125
4,991,126
571.04 4,991,127
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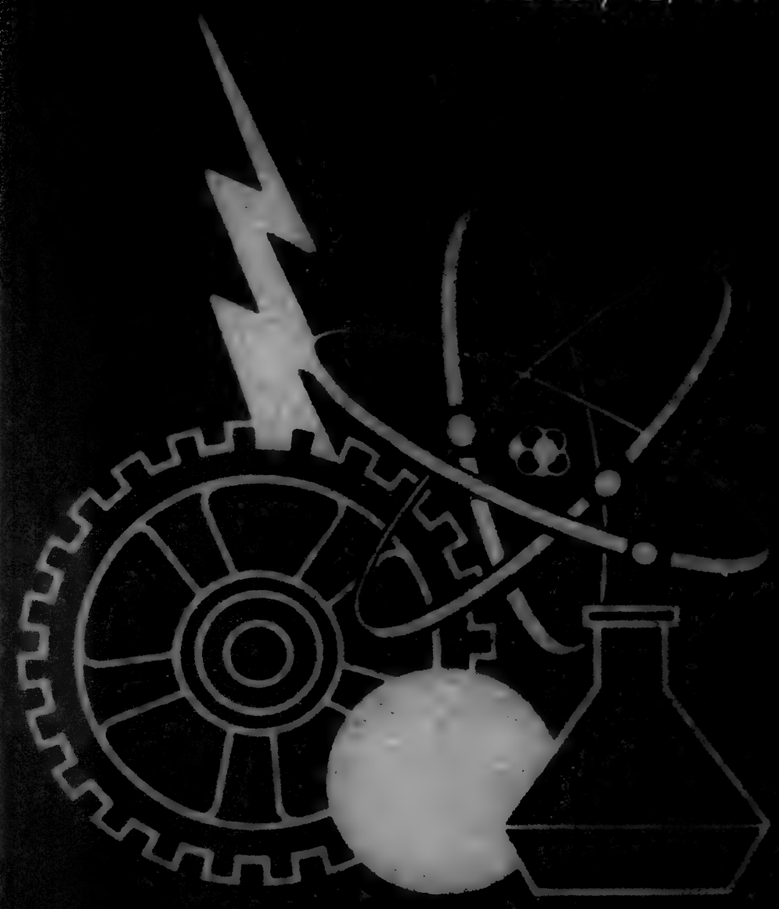
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[26] In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 14 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17,1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 566 on Jan 1, 1991.

International fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 6, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 9, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,723,322 through 4,724,545
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 7, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,429,419 through 4,430,758
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 2, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,656	07/084,554	4/26/88
(4,626,118)	(06/712,536)	(12/02/86)
Re. 32,896	07/029,455	3/28/89
(4,626,592)	(06/685,854)	(12/02/86)
4,360,938	06/341,626	11/30/82
4,360,968	06/286,835	11/30/82
4,360,971	06/260,929	11/30/82
4,360,987	06/245,198	11/30/82
4,360,989	06/282,818	11/30/82
4,361,000	06/269,151	11/30/82
4,361,002	06/250,222	11/30/82
4,361,014	06/245,477	11/30/82
4,361,015	06/223,270	11/30/82
4,361,036	06/223,334	11/30/82
4,361,065	06/234,001	11/30/82
4,361,066	06/273,788	11/30/82
4,361,100	06/254,876	11/30/82
4,361,108	06/234,208	11/30/82
4,361,112	06/228,251	11/30/82
4,361,135	06/224,233	11/30/82
4,361,143	06/255,900	11/30/82
4,361,161	06/299,497	11/30/82
4,361,168	06/312,628	11/30/82
4,361,178	06/229,030	11/30/82
4,361,181	06/339,863	11/30/82
4,361,231	06/245,008	11/30/82
4,361,233	06/340,558	11/30/82
4,361,236	06/231,385	11/30/82
4,361,246	06/217,252	11/30/82
4,361,265	06/276,786	11/30/82
4,361,267	06/233,537	11/30/82
4,361,272	06/251,213	11/30/82
4,361,275	06/297,192	11/30/82
4,361,306	06/237,747	11/30/82
4,361,309	06/275,507	11/30/82
4,361,312	06/263,161	11/30/82
4,361,316	06/245,587	11/30/82
4,361,322	06/264,161	11/30/82
4,361,330	06/227,769	11/30/82
4,361,333	06/243,509	11/30/82
4,361,335	06/257,247	11/30/82
4,361,366	06/239,901	11/30/82
4,361,377	06/224,054	11/30/82
4,361,388	06/218,200	11/30/82
4,361,390	06/227,978	11/30/82
4,361,404	06/251,366	11/30/82
4,361,424	06/230,900	11/30/82
4,361,425	06/267,129	11/30/82
4,361,430	06/265,295	11/30/82
4,361,433	06/247,000	11/30/82
4,361,437	06/235,123	11/30/82
4,361,440	06/297,641	11/30/82
4,361,442	06/249,444	11/30/82
4,361,447	06/381,277	11/30/82
4,361,449	06/299,956	11/30/82
4,361,458	06/234,360	11/30/82
4,361,467	06/322,020	11/30/82
4,361,480	06/288,149	11/30/82
4,361,514	06/234,979	11/30/82
4,361,518	06/331,696	11/30/82
4,361,527	06/313,450	11/30/82
4,361,529	06/254,406	11/30/82
4,361,530	06/260,928	11/30/82
4,361,543	06/372,409	11/30/82
4,361,551	06/260,711	11/30/82
4,361,558	06/256,205	11/30/82
4,361,561	06/304,665	11/30/82
4,361,568	06/258,363	11/30/82
4,361,569	06/296,291	11/30/82
4,361,575	06/276,703	11/30/82
4,361,578	06/321,954	11/30/82
4,361,582	06/293,586	11/30/82
4,361,620	06/255,562	11/30/82
4,361,644	06/236,234	11/30/82
4,361,645	06/231,268	11/30/82
4,361,664	06/279,659	11/30/82
4,361,665	06/273,840	11/30/82
4,361,670	06/260,623	11/30/82
4,361,703	06/246,234	11/30/82
4,361,709	06/265,600	11/30/82
4,361,711	06/332,036	11/30/82
4,361,713	06/277,483	11/30/82
4,361,722	06/231,437	11/30/82
4,361,739	06/218,744	11/30/82

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Patent Number	Serial Number	Issue Date
4,361,740	06/238,935	11/30/82
4,361,741	06/273,890	11/30/82
4,361,743	06/241,243	11/30/82
4,361,752	06/240,842	11/30/82
4,361,756	06/216,110	11/30/82
4,361,759	06/225,303	11/30/82
4,361,775	06/239,586	11/30/82
4,361,885	06/229,310	11/30/82
4,361,898	06/223,164	11/30/82
4,625,334	06/750,023	12/02/86
4,625,335	06/741,550	12/02/86
4,625,337	06/762,519	12/02/86
4,625,339	06/785,013	12/02/86
4,625,342	06/635,759	12/02/86
4,625,346	06/705,542	12/02/86
4,625,348	06/690,691	12/02/86
4,625,353	06/755,602	12/02/86
4,625,358	06/762,256	12/02/86
4,625,360	06/636,122	12/02/86
4,625,363	06/814,058	12/02/86
4,625,364	06/812,939	12/02/86
4,625,365	06/693,389	12/02/86
4,625,368	06/646,933	12/02/86
4,625,374	06/670,558	12/02/86
4,625,381	06/257,175	12/02/86
4,625,385	06/755,671	12/02/86
4,625,386	06/778,988	12/02/86
4,625,387	06/667,910	12/02/86
4,625,397	06/730,567	12/02/86
4,625,400	06/511,364	12/02/86
4,625,409	06/786,878	12/02/86
4,625,410	06/756,991	12/02/86
4,625,414	06/696,500	12/02/86
4,625,419	06/700,019	12/02/86
4,625,421	06/795,588	12/02/86
4,625,426	06/820,035	12/02/86
4,625,427	06/800,690	12/02/86
4,625,434	06/473,447	12/02/86
4,625,438	06/777,996	12/02/86
4,625,447	06/714,379	12/02/86
4,625,454	06/666,650	12/02/86
4,625,457	06/739,310	12/02/86
4,625,458	06/701,913	12/02/86
4,625,459	06/718,508	12/02/86
4,625,464	06/749,403	12/02/86
4,625,466	06/571,597	12/02/86
4,625,468	06/510,583	12/02/86
4,625,476	06/684,074	12/02/86
4,625,478	06/665,784	12/02/86
4,625,487	06/703,511	12/02/86
4,625,492	06/724,346	12/02/86
4,625,495	06/766,229	12/02/86
4,625,510	06/550,702	12/02/86
4,625,525	06/740,282	12/02/86
4,625,526	06/683,049	12/02/86
4,625,537	06/655,531	12/02/86
4,625,541	06/791,939	12/02/86
4,625,552	06/791,307	12/02/86
4,625,558	06/721,417	12/02/86
4,625,580	06/681,278	12/02/86
4,625,594	06/773,441	12/02/86
4,625,596	06/663,687	12/02/86
4,625,597	06/650,095	12/02/86
4,625,603	06/758,816	12/02/86
4,625,616	06/769,021	12/02/86
4,625,625	06/603,123	12/02/86
4,625,631	06/691,966	12/02/86
4,625,632	06/733,068	12/02/86
4,625,654	06/751,860	12/02/86
4,625,655	06/639,200	12/02/86
4,625,656	06/703,105	12/02/86
4,625,661	06/815,628	12/02/86
4,625,663	06/826,383	12/02/86
4,625,665	06/744,108	12/02/86
4,625,668	06/551,605	12/02/86
4,625,672	06/674,032	12/02/86
4,625,673	06/619,735	12/02/86
4,625,679	06/640,524	12/02/86
4,625,680	06/632,864	12/02/86
4,625,682	06/710,151	12/02/86
4,625,693	06/759,530	12/02/86
4,625,694	06/753,371	12/02/86
4,625,715	06/577,043	12/02/86
4,625,716	06/785,061	12/02/86
4,625,717	06/745,063	12/02/86
4,625,721	06/549,136	12/02/86
4,625,724	06/723,936	12/02/86
4,625,726	06/638,381	12/02/86
4,625,728	06/577,431	12/02/86
4,625,729	06/689,942	12/02/86
4,625,732	06/553,382	12/02/86
4,625,743	06/764,392	12/02/86
4,625,747	06/705,977	12/02/86
4,625,748	06/768,520	12/02/86
4,625,751	06/708,915	12/02/86
4,625,758	06/750,725	12/02/86
4,625,760	06/711,974	12/02/86
4,625,769	06/772,638	12/02/86
4,625,770	06/729,405	12/02/86
4,625,771	06/757,744	12/02/86
4,625,781	06/739,175	12/02/86
4,625,782	06/762,689	12/02/86
4,625,789	06/403,415	12/02/86
4,625,814	06/637,222	12/02/86
4,625,821	06/498,747	12/02/86
4,625,830	06/696,081	12/02/86
4,625,831	06/827,382	12/02/86
4,625,832	06/796,751	12/02/86
4,625,835	06/623,429	12/02/86
4,625,853	06/705,767	12/02/86
4,625,857	06/773,049	12/02/86
4,625,864	06/768,874	12/02/86
4,625,868	06/701,637	12/02/86
4,625,872	06/649,257	12/02/86
4,625,873	06/605,193	12/02/86
4,625,879	06/793,248	12/02/86
4,625,884	06/610,870	12/02/86
4,625,886	06/825,217	12/02/86
4,625,890	06/785,783	12/02/86
4,625,893	06/668,198	12/02/86
4,625,894	06/553,680	12/02/86
4,625,923	06/750,771	12/02/86
4,625,934	06/655,524	12/02/86
4,625,939	06/755,616	12/02/86
4,625,945	06/658,677	12/02/86
4,625,950	06/754,237	12/02/86
4,625,955	06/692,055	12/02/86
4,625,961	06/561,961	12/02/86
4,625,967	06/740,993	12/02/86
4,625,970	06/740,627	12/02/86
4,625,971	06/644,967	12/02/86
4,625,973	06/748,214	12/02/86
4,625,981	06/682,245	12/02/86
4,625,987	06/769,651	12/02/86
4,625,996	06/741,956	12/02/86
4,625,997	06/720,324	12/02/86
4,626,005	06/627,421	12/02/86
4,626,008	06/553,794	12/02/86
4,626,009	06/556,463	12/02/86
4,626,011	06/697,945	12/02/86
4,626,013	06/680,414	12/02/86
4,626,017	06/785,214	12/02/86
4,626,018	06/609,899	12/02/86
4,626,019	06/801,581	12/02/86
4,626,020	06/699,784	12/02/86
4,626,059	06/693,238	12/02/86
4,626,070	06/746,309	12/02/86
4,626,091	06/777,699	12/02/86
4,626,095	06/734,813	12/02/86
4,626,105	06/835,892	12/02/86
4,626,108	06/741,948	12/02/86
4,626,117	06/260,803	12/02/86
4,626,134	06/769,391	12/02/86
4,626,142	06/712,668	12/02/86
4,626,148	06/493,047	12/02/86
4,626,149	06/680,388	12/02/86

Patent Number	Serial Number	Issue Date
4,626,150	06/683,632	12/02/86
4,626,151	06/671,362	12/02/86
4,626,153	06/654,120	12/02/86
4,626,162	06/767,560	12/02/86
4,626,163	06/780,229	12/02/86
4,626,164	06/736,946	12/02/86
4,626,166	06/795,631	12/02/86
4,626,177	06/677,774	12/02/86
4,626,181	06/828,891	12/02/86
4,626,191	06/746,574	12/02/86
4,626,207	06/775,717	12/02/86
4,626,211	06/778,400	12/02/86
4,626,215	06/764,388	12/02/86
4,626,229	06/605,697	12/02/86
4,626,236	06/788,706	12/02/86
4,626,238	06/729,597	12/02/86
4,626,246	06/542,703	12/02/86
4,626,247	06/572,121	12/02/86
4,626,249	06/721,676	12/02/86
4,626,261	06/808,045	12/02/86
4,626,262	06/836,265	12/02/86
4,626,270	06/653,474	12/02/86
4,626,272	06/681,988	12/02/86
4,626,274	06/557,685	12/02/86
4,626,275	06/530,802	12/02/86
4,626,294	06/738,613	12/02/86
4,626,311	06/582,788	12/02/86
4,626,313	06/688,179	12/02/86
4,626,314	06/657,980	12/02/86
4,626,319	06/757,242	12/02/86
4,626,323	06/839,548	12/02/86
4,626,324	06/714,849	12/02/86
4,626,325	06/841,392	12/02/86
4,626,342	06/792,393	12/02/86
4,626,352	06/705,136	12/02/86
4,626,360	06/648,497	12/02/86
4,626,380	06/505,228	12/02/86
4,626,385	06/736,257	12/02/86
4,626,390	06/688,494	12/02/86
4,626,400	06/500,199	12/02/86
4,626,401	06/685,081	12/02/86
4,626,403	06/452,124	12/02/86
4,626,423	06/849,588	12/02/86
4,626,430	06/511,418	12/02/86
4,626,435	06/798,816	12/02/86
4,626,440	06/800,605	12/02/86
4,626,474	06/747,541	12/02/86
4,626,478	06/592,220	12/02/86
4,626,495	06/642,324	12/02/86
4,626,525	06/669,176	12/02/86
4,626,528	06/543,715	12/02/86
4,626,532	06/792,507	12/02/86
4,626,533	06/689,056	12/02/86
4,626,537	06/834,506	12/02/86
4,626,540	06/658,100	12/02/86
4,626,542	06/596,955	12/02/86
4,626,545	06/644,188	12/02/86
4,626,559	06/725,766	12/02/86
4,626,561	06/611,547	12/02/86
4,626,577	06/817,760	12/02/86
4,626,582	06/706,549	12/02/86
4,626,585	06/732,737	12/02/86
4,626,597	06/643,014	12/02/86
4,626,599	06/791,394	12/02/86
4,626,605	06/783,341	12/02/86
4,626,616	06/680,901	12/02/86
4,626,633	06/698,068	12/02/86
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4,626,708	06/572,338	12/02/86
4,626,718	06/442,897	12/02/86
4,626,742	06/593,578	12/02/86
4,626,746	06/747,168	12/02/86
4,626,753	06/662,591	12/02/86
4,626,766	06/753,108	12/02/86
4,626,777	06/590,908	12/02/86
4,626,779	06/713,476	12/02/86
4,626,780	06/697,518	12/02/86
4,626,786	06/556,034	12/02/86
4,626,790	06/721,976	12/02/86
4,626,792	06/569,637	12/02/86
4,626,793	06/817,781	12/02/86
4,626,808	06/265,782	12/02/86
4,626,832	06/609,686	12/02/86
4,626,833	06/678,058	12/02/86
4,626,834	06/657,333	12/02/86
4,626,839	06/551,812	12/02/86
4,626,840	06/540,999	12/02/86
4,626,845	06/820,599	12/02/86
4,626,849	06/748,694	12/02/86
4,626,851	06/669,318	12/02/86
4,626,865	06/548,263	12/02/86
4,626,867	06/662,059	12/02/86
4,626,874	06/751,527	12/02/86
4,626,887	06/637,026	12/02/86
4,626,900	06/563,035	12/02/86
4,626,906	06/592,822	12/02/86
4,626,933	06/524,426	12/02/86
4,626,950	06/650,752	12/02/86
4,626,966	06/777,690	12/02/86
4,626,986	06/827,678	12/02/86
4,627,004	06/433,842	12/02/86
4,627,007	06/584,808	12/02/86
4,627,011	06/500,153	12/02/86
4,627,028	06/578,946	12/02/86
4,627,029	06/591,939	12/02/86
4,627,035	06/618,167	12/02/86
4,627,044	06/657,551	12/02/86
4,627,067	06/446,743	12/02/86
4,627,069	06/613,335	12/02/86
4,627,073	06/655,720	12/02/86
4,627,074	06/449,146	12/02/86
4,627,076	06/776,186	12/02/86
4,627,088	06/643,458	12/02/86
4,627,091	06/481,383	12/02/86
4,627,092	06/465,872	12/02/86
4,627,095	06/600,127	12/02/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the Requester:indicated Gxamining groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,758,434, Re. S. N. 07/554,499, Filed July 19, 1990, Cl. 424/449, ARTICLE USEFUL FOR ADMINISTRATION OF PHARMACOLOGICALLY-ACTIVE SUBSTANCES TRANSDERMALLY, ORALLY OR BY MEANS OF IMPLANT, Agis Kydonieus, et al., Owner of Record: *Hercon Laboratories Corp., S. Plainfield, N.J.*, Attorney or Agent: Bruce E. Kramer, Ex. Gp.: 152

4,778,783, Re. S. N. 07/598,891, Filed Oct. 15, 1990, Cl. 512/2, METHOD USING A CREAM, GEL, OR THE LIKE FOR PROLONGING THE EFFECT OF PERFUME-FRAGRANCE ON A PERSON, Elizabeth Gondra, et al., Owner of Record: *Elizebeth Gondra, Wilmette, Ill.*, Attorney or Agent: None, Ex. Gp.: 126

4,780,759, Re. S. N. 07/602,796, Filed Oct. 24, 1990, Cl. 358/148, SAMPLING CLOCK GENERATION CIRCUIT OF VIDEO SIGNAL, Kenichi Matsushima, et al., Owner of Record: *Seiko Instruments & Electronics Ltd., Tokyo, Japan*, Attorney or Agent: Bruce L. Adams, Ex. Gp.: 262

4,792,130, Re. S. N. 07/628,717, Filed Dec. 10, 1990, Cl. 269/296, ADJUSTABLE SUPPORT FOR MARINE CRAFT, John

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C. Ardent, Owner of Record: *Inventor*, Attorney or Agent: James C. Weseman, Ex. Gp.: 323

4,835,852, Re. S. N. 07/625,045, Filed Dec. 10, 1990, Cl. 29/464, METHOD OF INSTALLATION OF HARDWARE, Timothy K. Asplund, et al., Owner of Record: *Inventor*, Attorney or Agent: William A. Bradock, Ex. Gp.: 326

4,913,770, Re. S. N. 07/629,837, Filed Dec. 19, 1990, Cl. 157/1.17, TIRE BEAD BREAKER, Douglas A. Sims, Owner of Record: *Freezone Pty. Ltd., South Perth, Australia*, Attorney or Agent: Harold W. Milton, Ex. Gp.: 323

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

De. 286,524, Reexam. No. 90/002,236, Requested Dec. 18, 1990, Cl. D12/154, ANTI-SKID CHAIN UNIT FOR VEHICLE TIRE, Ragnar Hardmark, Owner of Record: *Onspot AB., Linkoping, Sweden*, Attorney or Agent: Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 291, Requester: Lynn G. Foster, Salt Lake City, Utah

4,307,320, Reexam. No. 90/002,238, Requested Dec. 21, 1990, Cl. 313/474, PIGMENT COATED PHOSPHOR AND HIGH CONTRAST COLOR TELEVISION CATHODE RAY TUBE USING SAME, Noboru Kotera, et al., Owner of Record: *Kasei Optonix, Ltd., Odawara, Japan*, Attorney or Agent: Charles E. Miller, Pennie & Edmonds, New York, N.Y., Ex. Gp.: 264, Requester: Owner

4,314,665, Reexam. No. 90/002,244, Requested Dec. 17, 1990, Cl. 236/046, ELECTRONIC THERMOSTAT, Michael R. Levine, Owner of Record: *Honeywell, Inc., Minneapolis, Minn.*, Attorney or Agent: D.C. Toedt, Arnold, White & Durkee, Houston, Tex., Ex. Gp.: 344, Requester: Owner

4,688,529, Reexam. No. 90/002,240, Requested Dec. 26, 1990, Cl. 123/196, LUBRICATING SYSTEM FOR HORIZONTAL CYLINDER OVERHEAD VALVE ENGINE, Takashi Mitadera, et al., Owner of Record: *Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan*, Attorney or Agent: Leydig, Voit & Mayer, Washington, D.C., Ex. Gp.: 342, Requester: Owner

4,741,711, Reexam. No. 90/002,239, Requested Dec. 24, 1990, Cl. 439/620, MODULAR DISTRIBUTION FRAME INCLUDING PROTECTOR MODULES ADAPTED FOR BREAK ACCESS TESTING, Loren A. Singer, Jr., Owner of Record: *ADC Telecommunications, Inc., Minneapolis, Minn.*, Attorney or Agent: Merchant, Gould, Smith, Edell, Welter & Schmidt, Minneapolis, Minn., Ex. Gp.: 322, Requester: Krone AG, Berlin, Germany

4,828,399, Reexam. No. 90/002,241, Requested Dec. 31, 1990, Cl. 366/345, COMPOST HANDLING MACHINE, Thomas J. Pacentino, et al., Owner of Record: *International Process Systems, Inc., Glastonbury, Conn.*, Attorney or Agent: Scully, Scott, Murphy & Presser, Garden City, N.J., Ex. Gp.: 242, Requester: Owner

4,831,282, Reexam. No. 90/002,243, Requested Jan. 4, 1991, Cl. 307/443, CMOS INPUT CIRCUIT, Joseph H. Colles, Owner of Record: *Brooktree Corp., San Diego, Calif.*, Attorney or Agent: Ellsworth Roston, Roston & Schartz, Los Angeles, Calif., Ex. Gp.: 254, Requester: Martin C. Fliesler, Fliesler, Dubb, Meyer & Lovejoy, San Francisco, Calif.

4,905,189, Reexam. No. 90/002,242, Requested Jan. 4, 1991, Cl. 364/900, SYSTEM FOR READING AND WRITING INFORMATION, Michael J. Brunolli, Owner of Record: *Brooktree Corp., San Diego, Calif.*, Attorney or Agent: Ellsworth Roston, Roston & Schwartz, Los Angeles, Calif., Ex. Gp.: 232, Requester: Martin C. Fliesler, Fliesler, Dubb, Meyer & Lovejoy, San Francisco, Calif.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Jaco Pants, Inc., Thomasville, Ga., Reg. No. 554,847, for the mark "FAIRCHILD", Canc. No. 19,216.

Centurion Import & Export, Inc., Studio City, Calif., Reg. No. 1,342,780, for the mark "WET PAINT", Canc. No. 19,108.

Raleigh Manufacturers, Inc., New York, N.Y., Reg. No. 299,714, for the mark "WALL STREET", Canc. No. 19,139.

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

SURVEY OF REGISTERED PRACTITIONERS IN PATENT CASES

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 30, 1990 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names began with T through Z. Enclosed with the letter was a data sheet which should have been completed and returned to OED as soon as possible. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with T through Z and you did not receive a data sheet or of you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after mailing the data sheet to OED, please contact Shirley B. Rasheed at (703) 557-1728.

Dec. 24, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Filing of Certain Trademark Papers and Authorizations to Charge Deposit Accounts by Facsimile Tranmission

Effective Feb. 12, 1991, the Trademark Examining Operation (TMEO) and the Office if the Assistant Commissioner for Trademarks (A/C TM) will implement a pilot program to study the feasibility of accepting certain trademark documents by facsimile transmission (fax). The information gathered from this program and the pilot program currently in place for acceptance of certain patent documents by fax, *(See 1096 Official Gazette 30, November 15, 1989)*, will be evaluated for the purpose of drafting a rules package governing the fax procedure. The Trademark Trial and Appeal Board will not participate in the program at this time, but may consider accepting fax tranmissions at a later date.

Because this is a pilot program, only select documents will initially be accepted via facsimile transmission. These trademark documents include, but are not limited to: (1) Responses to Office Actions (but not those which include specimens of use and/or drawings; (2) Petitons to the Commissioner; (3) Letters of Protest; (4) Deposit Account Authorization; and (5) Requests for Reconsideration.

Documents Excluded from Fax Transmission

Any document to be filed with Trademark Trial and Appeal Board, including the notice of ex parte appeal, will *not* be accepted by fax transmission.

Any documents which include specimens, drawings or certifications or certified copies of forgien registrations or court orders, etc., will also *not* be accepted by fax transmission. Thus, the following documents will not be accepted by fax:

Trademark Applications;
Responses to Office Actions and Other Submissions which Include Specimens of Use and/or Drawings;
Section 8 Affidavits or Declarations;
Renewal Applications;
Statements of Use;
Amendments to Allege Use;
Certifications or Certified Copies of Foreign Registrations, and renewals thereof;
Section 7 Requests to Amend the Mark in a Registration:
Section 7 Applications for Voluntary Surrender of a Registration; and
Certified Copies of Court Orders.

When any trademark document explicitly excluded from the fax transmission procedure is received in the PTO via fax transmission, the document will not be considered as having been filed. The sender will be notified that the paper was improperly tranmitted by fax. It is impermissible to file papers by fax and submit the supporting exhibits by mail.

The fax machines will be attended betweeen the business hours of 8:30 a.m. and 5:00 p.m., East Coast Time, Monday through Friday, excluding holidays. Although the fax machines may normally be accessed 24 hours a day, there may be times, even during business hours, when reception is not possible due to equipment failure or maintenamce requirements. Accordingly, persons transmitting documents by fax are cautioned against relying on the availability of this service near the end of response periods or other deadlines.

A fax machine has been installed in the TMEO and in the A/C TM. The corresponding fax and telephone numbers are as follows:

Location	*Fax No.*	*Phone No.*
TMEO	(703) 308-0429	(703) 308-0928
A/C TM	(703) 557-8263	(703) 557-3061

Submissions by facsimile transmission to the TMEO or A/C TM should be transmitted to the location for which they are intended. Fax transmissions regarding trademarks will not be deemed to have been filed in the PTO, and will not be considered, if transmitted to any fax machines other than those identified above.

The Office will not formally acknowlege receipt of documents transmitted by fax. The Office facsimile machine will usually confirm to the sending unit that the transmission is complete.

Effect of Filing by Fax

Certain trademark papers and fees required to be filed in the PTO will be considered filed if they are transmitted to one of the above fax numbers. The date of receipt is the date that the transmission is completed as indicated by the date shown on the Office's facsimile transmission activity report. If that date is a Saturday, Sunday or Federal holiday within the District of Columbia, the document will be considered to be have been filed on the next business day.

Papers transmitted by fax may include a certificate of facsimile transmission, certifying the date of transmission. In the event the facsimile transmitted paper is misplaced or lost in the PTO, a copy of the paper, with Certificate of Facsimile Transmission attached thereto, will be evidence of filing by fax. The Certificate of Facsimile Transmission should be labeled as such and should appear on the paper or include a reference to the registration number or application serial number, and must include the following:

The date of facsimile transmission; and
The signature of the person certifying that the document is being facsimile transmitted on a certain date.

The Certificate of Facsimile Transmission should also include the fax number to which the transmission is directed. The person signing the Certificate should have a reasonable basis to expect that the entire paper will be transmitted by fax on or before the date indicated.

When possible, the Certificate should appear on the paper being transmitted. An example of a preferred Certificate of Facsimile Transmission for use with the paper being transmitted is as follows:

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper for <reg. or ser. no.> is being facsimile transmitted to the Patent and Trademark Office fax number _____on the date shown below.

_____
Type or print name of person signing certificate

_____ _____
Signature Date

If the Certificate of Facsimile Transmission is presented on a separate paper, it *must* identify the application or registration to which it relates.

In the event that the facsimile transmission is misplaced or lost in the Trademark Office, the submission will be considered filed as of the date of the transmission, if the party who transmitted the paper:

1) Informs the PTO of the previous facsimile transmission promptly after becoming aware that the submission has been misplaced or lost;

2) Supplies another copy of the previously transmitted submission with the Certificate of Transmission; and

3) Supplies a copy of the sending unit's report confirming transmission of the submission in question.

Items one through three above must be supported by an affidavit or declaration under § 2.20. The required evidence should be directed to the area in the Office where the misplaced or lost document was intended to be filed, e.g., the Law Office or Post Registration.

If all criteria above cannot be met, the only remedy available is a petition to the Commissioner comprised of a verified statement which attests on a personal knowledge basis to the previously timely transmission.

The above procedures for establishing that a misplaced or lost submission was filed in the PTO are *not* available for those submissions enumerated as exceptions to the 37 CFR 1.8 Certificate of Mailing procedures.

Requirements for Filing by Fax

- Each facsimile transmitted document must be legible.
- Each transmission should have a cover sheet which includes: the number of pages, and the name, the address, the fax number and the telephone number of the transmitting party.
- The preferred size of the document being transmitted is 8 1/2 inches by 11 inches, letter size or A4 paper. However, in no event will the Office accept a document being transmitted that is larger than 8 1/2 inches by 14 inches.
- Each transmission must be limited to papers relating to a single trademark application or registration. The application serial number, if one has been assigned, or the registration number must be referenced on each page of the transmission. If a serial number has not yet been assigned to an application, each page of the transmission must bear the name of the applicant and an identifier of the mark. The Office strongly recommends that applicants wait, if possible, until a serial number is assigned before filing a related document by fax.
- The document that is used as the original for the facsimile transmission must have an original signature and should be retained by the sender as evidence of the content of the facsimile transmission.

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PARTIES SHOULD NOT SUBMIT BY MAIL THE ORIGINAL OR ADDITIONAL COPIES OF THE DOCUMENT TRANSMITTED BY FAX, UNLESS SPECIFICALLY REQUESTED BY THE OFFICE.

Jan. 15, 1991 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

U.S. DEPARTMENT OF COMMERCE
Office of the Assistant Secretary and Commissioner of Patents and Trademarks

PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Agency: Patent and Trademark Office, Comerce
Action: Notice of Committee Charter Amendment
Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that an amendment of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law. The charter amendment was signed on December 3, 1990.

The charter has been amended as follows to: (1) broaden the topics that the Committee may address to include international trademark law, (2) allow the membership of the Committee to be drawn from a wider range of the trademark community rather than soley from the regular, associate and supplementary membership of the United States Trademark Association (USTA), (3) increase the number of members on the Committee fron 15 to 18, (4) provide for the direct selection of the members and appointment of the chairman of the Committee by the Assistant Secretary and Commissioner of Patents and Trademarks rather than by the president of the USTA, and (5) set the term of membership at two years.

For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 557-7464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4217.

Suuplementary Information: The Committee was first established in September 1970, and the latest charter renewal was signed on April 4, 1990. The charter amendment was approved on December 3, 1990, and provides for the following:

(1) The amendment broadens the objectives and duties of the Committee to specifically embrace international trademark law. The previous charter permitted the Committee to advise the Patent and Trademark Office only on the steps which could be taken to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government. Given the increased interest within the trademark community and the Patent and Trademark Office in international trademark law, especially in the Madrid Protocol and harmonization, it is desirable that the charter refer explicitly to international trademark law.

(2) Section 5(b)(2) of the Federal Advisory Committee Act requires that the membership of advisory committees be "fairly balanced in terms of the points of view represented...." The amendment furthers that goal by permitting the membership to be drawn from a wide range of the trademark community including users of the public search room, academia, members of the public at large, and the business community.

(3) The amendment increases the number of members on the Committee from 15 to 18. The increase was needed to permit additional members, from different sectors of the trademark community, to be added to the Committee without having to displace any of the current Committee members.

(4) Section 5(b)(2) of the Federal Advisory Committee Act requires that "the membership be fairly balanced in terms of the points of view represented..." The amendment futhers that goal by permitting the chairman to be appointed, and the members of the Committee to be selected by the Assistant Secretary and Commissioner of Patents and Trademarks.

(5) The charter of the Public Advisory Committee for Trademark Affairs did not set terms for members. In order to promote more orderly administration of the Committee, the amendment sets the terms of the members at two years. Members will serve at the discretion of the Assistant Secretary and Commissioner of Patents and Trademarks. Appointements, when vacancies occur, shall be for the remainder of the unexpired term.

Jan. 16, 1991 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

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PATENTS AVAILABLE FOR LICENSE OR SALE

4,702,704 TETRAHEDRAL CONDON STEREO TABLE, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, P.O. Box 747 Falls Church, Va. 22046
4,635,563 ADJUSTABLE SHELVING SYSTEM, James L. Young, Esq. Kinney & Lange, P.A. Suite 1500, 625 Fourth Ave., South, Minneapolis, Minn. 55415-1659
4,683,097 PROCESS OF MAKING A DUNNAGE RACK, James L. Young, Esq. Kinney & Lange, P.A. Suite 1500, 625 Fourth Ave., South, Minneapolis, Minn. 55415-1659
4,716,824 FOOD MARINATOR, James L. Young, Esq. Kin ney & Lange, P.A. Suite 1500, 625 Fourth Ave., South, Minneapolis, Minn. 55415-1659
4,956,915 SANITARY NAIL CLIPPING DEVICE, Charles A. Anderson, 2402 108th N.E., Norman, Okla. 73071
07/000,131 HAIR PROTECTION SHIELD, Julius C. Lienhard, 10307 Tingewood Terr., Richmond, Va. 23233

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 5
PATENT LAW FOREIGN FILING AMENDMENTS

Agency: Patent and Trademark Office, Commerce
Action: Notice of Final Rulemaking
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418. The rules reflect changes made to 35 U.S.C. 184 which specify that a license is not required to, file amendments, modifications, and supplements containing additional subject matter to a previously licensed foreign patent application if such amendments, modifications, and supplements do not change the general nature of the invention disclosed in the application in a manner which would require a corresponding United States patent application to be made available for national security inspection under 35 U.S.C. 181. These regulatory changes are applicable to most existing foreign filing license holders if their patent application did not undergo security inspection under 35 U.S.C 181. Also, under the rules, a retroactive foreign filing license may be granted in situations where a proscribed foreign filing occurred through error and without deceptive intent as opposed to the earlier standard of inadvertence.
Effective Date: Feb. 19, 1991.
Supplementary Information: A notice of proposed rulemaking was published in the *Federal Register* at 55 Fed. Reg. 24270-24275 (June 15, 1990) and at 1116 Official Gazette 21-25 (July 10, 1990). No oral hearing was held. Three written comments on the proposed rulemaking were received. The comments received and replies thereto are listed below.

The rules are intended to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418 (hereinafter the Act), which amended §§ 184, 185 and 186 of Title 35, United States Code, in order to simplify the procedures for United States inventors filing and prosecuting patent applications in foreign countries. The Office has not made any rule changes to implement the amendments to 35 U.S.C. 185 or 186 since these changes affect matters outside its jurisdiction.

Section 184 of Title 35 is intended to protect United States national security interests by preventing the disclosure of potentially sensitive inventions made in the United States to foreign nationals by the act of filing a patent application in foreign countries. An inventor may not apply for a foreign patent on an invention made in the United States until at least six (6) months after the inventor has filed a United States patent application unless the inventor receives a license from the Office permitting an earlier foreign filing. This six month period assures the Office the opportunity to screen applications for information the disclosure of which might be detrimental to the national security. Also, § 184, as originally enacted, authorized the Office to grant a retroactive license for an unlicensed foreign filing of a patent application if the foreign filing was inadvertent and if the disclosure of the subject matter in the application would not be detrimental to United States security interests.

The original regulatory implementation of 35 U.S.C. 184 required applicants to obtain a license not only for the original foreign patent application but also for the filing of almost any information in support of the application, thereby creating administrative problems for United States inventors seeking foreign patent protection. For example, foreign patent offices often demand that additional technical data, such as the melting point of a chemical, be added to a patent application. An additional foreign filing license was usually required before the inventor could submit modifications, amendments, or supplements to a previously licensed foreign patent application, regardless of how trivial the change might be.

Recognizing the problems involved in obtaining these additional licenses, the Office promulgated rules in 1984 (see § 5.15(a) and 49 Fed. Reg. 13456 (April 4, 1984)) to streamline the licensing procedure. The 1984 rule change provided that an inventor could obtain in applications, the disclosure of the content of which is not potentially detrimental to United States security interests, a license which permitted the foreign filing of modifications, amendments, and supplements without further licensing if such changes were within the scope or character of the originally licensed invention (§ 5.15(a)). The 1984 rule change, however, could not be made retroactive, and therefore had no effect on licenses granted under the old system. If an applicant wished to broaden a pre-April 4, 1984, foreign filing license to the scope allowed by § 5.15(a), this involved filing a separate petition under § 5.15(c) in each application.

The present Act clarifies the statutory basis for the current Patent and Trademark Office rules by providing that inventors, in most circumstances, are not required to obtain an additional license to file modifications, amendments, and supplements to their foreign applications for which a foreign filing license has been obtained under § 5.15(a). Unlike the previous Office rules, these rules broaden the scope of most existing licenses, provided that the conditions contained in the Act are met.

The Act and these rules also address difficulties associated with attempts to procure a retroactive foreign filing license. Some applicants faced loss of their patent rights due to improper foreign filings even though they believed, in good faith, that a license was not necessary for certain minor changes to their foreign application. Court decisions have held that supplemental information filed abroad was exempt from the license requirement *only* when it was recited *verbatim* in the United States patent application, or was so commonly known that it could have been said to have been expressly disclosed in the United States application. *In re Gaertner*, 604 F.2d 1348, 202 USPQ 714 (CCPA 1979). If a patent applicant did not obtain a foreign filing license from the Office, any corresponding United States patent was at risk of being held invalid under 35 U.S.C. 185 if technical information was added to the foreign application, even if the technical information was completely unrelated to United States security interests.

Loss of United States patent rights subsequent to an "inadvertent" unlicensed foreign filing could be avoided if a retroactive license was obtained under 35 U.S.C. 184. *Twin Disc, Inc. v. United States*, 10 Cl. Ct. 713, 231 USPQ 417 (Ct. Cl. 1986) and *Minnesota Mining and Manufacturing Co. v. Norton Co.*, 366 F.2d 238, 151 USPQ 1 (6th Cir. 1966), *cert. denied*, 385 U.S. 1005 (1967). While the *Gaertner* decision defined a broad range of circumstances under which a foreign filing license would be required, other court decisions made correction of licensing errors difficult by setting forth various strict interpretations of the standard of "inadvertence." *Compare Iron Ore Co. of Canada v. Dow Chemical Co.*, 177 USPQ 34 (D. Utah 1972), *aff'd*, 500 F.2d 189, 182 USPQ 520 (10th Cir. 1974) and *Reese v. Dann*, 391 F. Supp. 12, 185 USPQ 492 (D.D.C. 1975). An inventor could fail to meet the standard of "inadvertence" even if the information disclosed was not significant in nature and did not contain any sensitive national security information. For example, one decision suggested that the filing of information abroad was intentional because the inventor first considered the applicability of § 184. *Shelco, Inc. v. Dow Chemical Co.*, 322 F. Supp. 485, 168 USPQ 395 (N.D. Ill. 1970), *aff'd*, 466 F.2d 613, 173 USPQ 451 (7th Cir. 1972), *cert. denied*, 409 U.S. 876 (1972). Under the *Shelco* standard, if supplemental information had been filed abroad as a considered, willful act, even though done through error in the belief that the information disclosed abroad did not exceed the scope of the disclosure in the United States patent application, the filing would not be "inadvertent"; and, therefore, the subject information could not qualify for a retroactive license.

The Act addresses these problems, and the rules implement the intention of the Act. The Act changes the language of the statute to provide that an inventor may receive a retroactive license if the inventor can show that the premature filing of a foreign patent application, or the submission of supplemental information in support of a foreign patent application, was made "through error and without deceptive intent." This criterion is equivalent to that for reissue of a patent under 35 U.S.C. 251 to correct errors made without any deceptive intention. The reissue error requirement has been considered by the courts. See, e.g., *In re Weiler*, 790 F.2d 1576, 229 USPQ 673 (Fed. Cir. 1986) and *In re Wadlinger* 496 F.2d 1200, 181 USPQ 826 (CCPA 1974). The applicant for a retroactive license also must show that the foreign filing did not disclose any information detrimental to the national security and that diligence was exercised in seeking a retroactive license once the applicant became aware of the proscribed foreign filing.

The Act became effective on August 23, 1988, but it does not affect any final decision made by the Office or a court, nor the rights or liabilities of any party under a patent in a case pending before a court on the above date or under any subsequent patent deriving priority rights from such patent under 35 U.S.C. 120 or 121. Therefore, the retroactive effect of the Act and the rules is limited.

Comments on the Proposed Rules

Comment

One comment stated that the discussion in the proposed rulemaking of the modification of the standard for obtaining a retroactive license from inadvertence to "through error and without deceptive intent" should have included a reference to *In re Wadlinger*, 492 F.2d 1200, 181 USPQ 826 (CCPA 1974) rather than to *In re Weiler*, 790 F.2d 1576, 229 U8PQ 673 (Fed. Cir. 1986) The comment stated that *Wadlinger* was a more appropriate and illustrative case because it discusses more fully the meaning of the term "error" as encompassing "inadvertence, accident or mistake" and as having a very broad meaning. The comment also noted that *Wadlinger* was referenced in comments made in the hearing on the proposed legislation as indicative of the reissue standard being applied to retroactive license requests

Reply

A citation to *In re Wadlinger* has been added to the citation of *In re Weiler* in the discussion of the final rules. It was not the intent of the Office by citing the *Weiler* case to suggest that decisions on petitions for the grant of retroactive licenses would be limited by that case. Decisions are based on the particular facts in each case and the entire body of law with respect to the standard of "through error and without deceptive intent."

Comment

A comment stated that the Office should provide additional examples in the explanatory text in the final rule as to changes that may be made to foreign applications that have been licensed under 37 CFR 5.15(a) without obtaining any additional license. The comment pointed out that examples were given in the 1984 rulemaking.

Reply

The list of examples presented at the time that 37 CFR 5.15(a) was adopted in 1984 was not intended to be all-inclusive. The Office is not aware of any judicial decisions setting limits to

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changes that may be made under a § 5.15(a) license. Depending on the nature and the criticality, changes in temperature, portions, size, etc., outside of a previously disclosed value or range that do not change the general nature of the invention from what was previously disclosed are within the scope of a § 5.15(a) license. However, if the newly disclosed value or range does change the general nature of the invention from that of the originally disclosed value or range, then a separate license is required. Likewise, new species or subcombinations of a previously disclosed genus or combination would appear to require an additional license to include such a change in a foreign application.

Comment

One comment stated that the Office should provide clarification of the attorney's ability to make decisions as to whether or not the added subject matter, in his opinion, changes the general nature of the invention.

Reply

Not only does the attorney have the ability to make the decision as to whether or not the additional subject matter changes the general nature of the invention, the attorney has the responsibility to do so. The Office will not give advisory opinions on whether an additional license is necessary, and will treat any provisional requests for a prospective or retroactive license as a request for a license. The procedure of the Office resolving any questions as to the security inspection status of any changes to previously licensed material is intended to apply only to those changes that have been submitted to the Office, i.e., the Office will reply to any inquiry as to whether previously submitted subject matter underwent, or should have undergone, security review.

Comment

One comment questioned what would happen if an attorney on considered judgment, honestly believed that a supplement did not change the general nature of a licensed invention, but that judgment later proved to be erroneous.

Reply

The Act and the rules now provide for a retroactive license to be granted in situations where it can be shown that a filing was made without a license through error and without deceptive intent. Thus, a retroactive license could be sought under § 5.25.

Discussion Of Specific Rule Changes

Section 5.11(a), as amended, specifies when a license is required before filing any foreign application for patent, including any modifications, amendments and supplements or divisions thereof. Section 5.11(a) adopts the statutory definition of "application" in 35 U.S.C. 184. Also, the rule, as amended, clarifies that the provisions of this section apply only to inventions made in the United States as stated in 35 U.S.C. 184. However, where an improvement or modification to a foreign-origin invention is made in the United States, a license would be required for the additional subject matter. The language proposed for § 5.11(e)(3) has been redrafted for clarity but still provides that an inventor need not obtain a supplemental license to file modifications, amendments and supplements containing subject matter not disclosed in, or divisions of, a foreign application for which an initial foreign filing license was not required, as long as the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1 and the changes did not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. The need for a supplemental license depends on whether the changes altered the general nature of the invention, rather than the label applied to the changes, i.e., "Continuation", "Continuation In-Part", "Division", etc.

Authorized parties may determine whether a particular application was forwarded to the defense agencies for inspection under 35 U.S C. 181 either by reviewing the filing receipt to determine if a license is or was granted, in which case security inspection did not occur, or by reviewing the file wrapper to determine if an access acknowledgment under 35 U.S.C. 181 is present, in which case security inspection did occur. If verification of the security inspection status of an application is needed, the authorized parties may submit a written request therefor to the Office, directed to the attention of Licensing and Review. A written response from the Office will be issued. In the event Office records are not available, a *de novo* determination by the Office will be made of the need for defense agency inspection under the present national security standards. If security inspection was not required under 35 U.S.C. 181, then the provisions of the Act will convert a previously granted or implied license into one having the scope of proposed § 5.15(a).

Section 5.15(a), as amended, adopts the specific provisions of the Act and clarifies the existing rules by expressly stating that the license provisions of the paragraph are applicable to United States applications which were not required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The inspection provisions of 35 U.S.C. 181 delegate to the Commissioner of Patents and Trademarks the authority to decide which applications will be forwarded to United States defense agencies for national security inspection when the Government has no property interest in the invention. The fact that an application was forwarded to the defense agencies does not necessarily mean that the application was properly within the inspection scope of 35 U.S.C. 181. Thus, if an application was not required to be inspected but was inspected by mistake, it is eligible for such a license. The changes to the regulation expressly apply to modifications, amendments, and supplements to a previously licensed foreign application, and divisions thereof, provided the changes do not alter the general nature of the invention in a manner which would require a corresponding United States application to have been made available for inspection under 35 U.S.C. 181.

The language of § 5 15(a)(1) also has been clarified. If the filing of the foreign application was pursuant to a license granted under § 5.15 and issued prior to publication of the notice in the Federal Register at 49 Fed. Reg. 13456 (April 4, 1984) for subject matter which was not appropriate for inspection under 35 U.8.C. 181, the license is now expanded to cover amendments, modifications, and supplements thereto, or divisions thereof, which do not change the general nature of the invention in a manner which would require such application to be made available for security inspection under 35 U.S.C. 181. Also, paragraphs (a)(3) and (a)(4) of § 5.15 have been merged in order to more clearly define the type of subsequent changes to a previously licensed foreign patent application which may be filed without any additional license. In particular, it is made clear that these changes must not be such as to require the application to be made available for security inspection. Any questions about the security inspection status of any application or amendments, modifications, and supplements thereto, or divisions thereof, will be handled in the manner as described above.

Section 5.15(b), as amended, clarifies the existing rule by expressly stating that the license provisions of § 5.12(b) are applicable to United States applications which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The amendments also clarify the language of the paragraph and indicate that the more restrictive license under this paragraph includes authority to take actions in the foreign or international application, provided subject matter additional to that covered by the license is not involved Section 5.15(c), as amended, clarifies the existing rule by expressly stating that the granting of a § 5.15(a) scope to a license under § 5.15(b) and conversion provisions of this paragraph are only applicable to material submitted under § 5.13 or United States applications, which are not, or were not, required to be made available for inspection under 35 U.S.C. 181 and § 5.1.

Sections 5.15(e) and (f), as amended, substitute a reference to § 5.15(a)(3) rather than to § 5.15(a)(4) which has been eliminated as a separate paragraph. Paragraph (e) also has been amended to state that changes to the general nature of the invention, which would require the application to have been made available for inspection under 35 U.S.C. 181 and § 5.1, require a separate license.

Section 5.25(a), as amended, provides that the inventor may receive a retroactive license if the inventor can show that the premature filing of papers in a foreign patent office was made through error and without deceptive intent. This criterion is the same as that for "error without any deceptive intention" for reissue of a patent and replaces the previous standard of inadvertence. This section also has been amended to clarify that each country in which a proscribed filing occurred must be listed in a petition for retroactive license. Also, the rule has been amended to define a verified statement as being in the form of either an oath or a declaration. Finally, the rule has been clarified by

defining the period over which error without deceptive intent must be shown as being the time leading up to and including the proscribed foreign filing.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Acting Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the rules simplify the procedures for all United States inventors who file and prosecute applications in foreign countries.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rules contain a collection of information requirement subject to the Paperwork Reduction Act which has previously been approved by the Office of Management and Budget under Control No. 0651-0011 with an expiration date of March 31, 1993. The average time for each petition for license under § 51.12(b) or § 5.25 is estimated to be approximately thirty (30) minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the petition submission. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization, Washington, D.C. 20231, and the Office of Management and Budget, Washington, D.C. 20503 (Attention: Paperwork Reduction Project 0651-0011).

List Of Subjects

37 CFR Part 5
Classified information, Exports, Foreign relations, Inventions and patents.

For the reasons set forth in the preamble, 37 CFR Part 5 is amended as set forth below.

PART 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

1. The authority citation for Part 5 is revised to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U. S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

2. Section 5.11, paragraphs (a) and (e), are revised to read as follows:

§ 5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent including any modifications, amendments, or supplements thereto or divisions thereof or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if the invention was made in the United States and:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

* * * * *

(e) No license pursuant to paragraph (a) of this section is required:

(1) If the invention was not made in the United States, or

(2) If the corresponding United States application is not subject to a secrecy order under § 5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country, or

(3) For subsequent modifications, amendments and supplements containing additional subject matter to, or divisions of, a foreign patent application if:

(i) a license is not, or was not, required under paragraph (e)(2) of this section for the foreign patent application;

(ii) the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1; and

(iii) such modifications, amendments, and supplements do not, or did not, change the general nature of the invention in a manner which would require any corresponding United States application to be or have been available for inspection under 35 U.S.C. 181 and § 5.1.

* * * * *

3. Section 5.15, paragraphs (a), (b), (c), (e) and (f), are revised to read as follows:

§ 5.15 Scope of license.

(a) Applications or other materials reviewed pursuant to §§ 5.12 through 5.14, which were not required to be made available for inspection by defense agencies under 35 U.S.C. 181 and § 5.1, will be eligible for a license of the scope provided in this paragraph. This license permits subsequent modifications, amendments, and supplements containing additional subject matter to, or divisions of, a foreign patent application, if such changes to the application do not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. This license also covers the inventions disclosed in foreign applications which had been granted a license under this part prior to April 4, 1984, and which were not subject to security inspection under 35 U.S.C. 181 and § 5.1. Grant of this license authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal application papers in foreign countries or with international agencies;

(2) To make amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application; and

(3) To take any action in the prosecution of the foreign or international application provided that the adding of subject matter or taking of any action under paragraphs (a)(1) and (2) of this section does not change the general nature of the invention disclosed in the application in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 by including technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121 through 130; or

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(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Frograms, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Applications or other materials which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1 will be eligible for a license of the scope provided in this paragraph. Grant of this license authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to export and file all duplicate and formal papers in foreign countries or with foreign and international patent agencies and to make amendments, modifications, and supplements to, file divisions of, and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under § 5.12(b) pursuant to § 5.13 or § 5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (§ 1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. No such petition will be granted if the copy of the material filed pursuant to § 5.13 or any corresponding United States application was required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The change in the scope of a license will be effective as of the date of the grant of the petition.

* * * * *

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 or which involves the disclosure of subject matter listed in paragraphs (a)(3)(i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under § 5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(3)(i) or (ii) of this section is not introduced, and

(2) In the case where at least one of the licenses was obtained under § 5.12(b), additional subject matter is not introduced.

* * * * *

4. Section 5.25, paragraph (a), is revised to read as follows:

§ 5.25 Petition for retroactive license

(a) A petition for a retroactive license under 35 U.S.C. 184 shall be presented in accordance with § 5.13 or § 5.14 (a), and shall include:

(1) A listing of each of the foreign countries in which the unlicensed patent application material was filed,

(2) The dates on which the material was filed in each country,

(3) A verified statement (oath or declaration) containing:

(i) An averment' that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order,

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was filed abroad through error and without deceptive intent without the required license under § 5.11 first having been obtained, and

(4) The required fee (§ 1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of action through error and without deceptive intent. The showing of facts as to the nature of the error should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute error without deceptive intent should cover the period leading up to and including each of the proscribed foreign filings

* * * * *

Nov. 28, 1990

HARRY F. MANBECK, JR.
Assistant Secretary and Commissioner of Patents and Trademarks

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Service by Publication

A petition to cancel each of the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Charter Connection Inc., New York, N.Y., Reg. No. 1,559,075, for the mark "NEW LOGIC" and design, Canc. No. 19,000.

Polar Productions, Old Greenwich, Conn., Reg. No. 1,430,227, for the mark "PENGRINS", Canc. No. 18,888.

The Royal Manufacturing Co., Inc., Allentown, Pa., Reg. No. 586,407, for the mark "PRINCETON", Canc. No. 18,897.

Made-Rite Processing Corp., New York, N.Y., Reg. No. 659,567, for the mark "FILERITE", Canc. No. 18,936.

Gregory Allen Somers, Carrollton, Tex., Reg. No. 1,325,207, for the mark "U.S. TIRE WHOLESALE" and design, Canc. No. 18,941.

AMDA Computer Services, Inc., Scottsdale, Ariz., Reg. No. 1,366,413, for the mark "COMPANION", Canc. No. 18,946.

August G. St. John, dba American Institute of Marketing, Brick Town, N.J., Reg. No. 1,118,457, for the mark "AIM" and design, Canc. No. 19,120.

Elizabeth M. Borges, dba Bacio Di Amore, San Francisco, Calif., Reg. No. 1,500,089, for the mark "BACIO DI AMORE" and design, Canc. No. 19,297.

JEAN BROWN
Adminstrator of the Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

PATENT NOTICES

Certificates of Correction For Week of February 12, 1991

B14,203,130	4,849,661	4,876,312	4,891,888
D. 304,505	4,850,771	4,876,661	4,892,328
D. 309,200	4,851,334	4,876,750	4,892,821
D. 309,629	4,853,767	4,877,535	4,893,356
PP. 7,210	4,854,492	4,877,921	4,893,552
Re. 32,201	4,855,507	4,877,973	4,893,925
4,707,197	4,855,681	4,878,791	4,894,219
4,744,371	4,855,956	4,879,167	4,894,280
4,745,373	4,856,021	4,879,824	4,894,795
4,748,668	4,856,974	4,879,976	4,894,803
4,752,546	4,857,258	4,880,192	4,894,838
4,757,408	4,858,681	4,880,803	4,895,668
4,778,908	4,860,015	4,880,884	4,896,472
4,780,539	4,860,622	4,881,344	4,896,599
4,785,410	4,861,351	4,882,129	4,896,626
4,786,792	4,863,156	4,882,720	4,896,785
4,798,901	4,864,816	4,882,751	4,897,220
4,803,621	4,867,568	4,883,353	4,898,279
4,804,595	4,867,758	4,883,448	4,898,513
4,805,839	4,867,773	4,883,577	4,898,580
4,807,559	4,869,075	4,883,619	4,899,023
4,813,406	4,869,530	4,883,956	4,899,484
4,816,024	4,869,542	4,884,481	4,899,821
4,817,539	4,871,558	4,884,532	4,900,115
4,823,314	4,871,902	4,884,616	4,900,478
4,824,767	4,872,187	4,884,925	4,900,601
4,826,958	4,872,487	4,885,636	4,900,638
4,828,892	4,872,893	4,886,394	4,900,916
4,831,137	4,873,100	4,886,431	4,902,027
4,835,120	4,873,140	4,886,561	4,905,059
4,835,458	4,874,579	4,888,020	4,929,076
4,842,457	4,875,128	4,888,141	4,946,253
4,842,782	4,875,129	4,888,280	4,961,625
4,844,704	4,875,675	4,889,855	4,968,421
4,845,156	4,875,777	4,890,248	4,976,005
4,846,889	4,875,947	4,890,442	
4,847,437	4,876,192	4,891,701	

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SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Washington, D.C. 20231

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Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and Internal Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215
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Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Equal Employment Programs.
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Expiration of patents: The patents within the range of numbers indicated below expire during January 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,778,914 to 3,789,426 inclusive
Plant Patents	3,413 to 3,462 inclusive

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Patent Not Issued For This Number

Re. 33,534

Re. 33,535

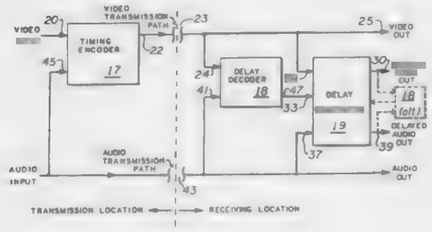
AUDIO TO VIDEO TIMING EQUALIZER METHOD AND APPARATUS

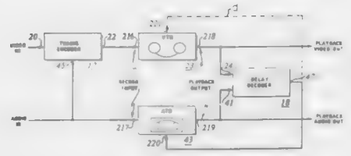
J. Carl Cooper, 1373 Sydney Dr., Sunnyvale, Calif. 94087

Original No. 4,703,355, dated Oct. 27, 1987, Ser. No. 776,592, Sep. 16, 1985. Application for reissue Oct. 23, 1989, Ser. No. 426,022

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—149 **48 Claims**





1. A delay system for an audio signal and a video signal comprising:

a timing encoder which develops a combination signal that includes said video signal and timing information generated from said audio signal;

a delay decoder responsive to said combination signal and to said audio signal, said delay decoder being operative to develop a delay signal representing the relative delay time between said combination signal and said audio signal by comparing the timing information of said combination signal with said audio signal; and

a delay generator responsive to said delay signal and operative to delay the least delayed of said combination signal and said audio signal by said relative delay time to resynchronize said combination signal with said audio signal.

48. A delay measurement method responsive to an audio signal and a combination of signals, comprising the steps of storing said combination of signals including an image signal and timing information derived from said audio signal on a common medium, and retrieving said audio signal and said timing information to measure the relative delay therebetween.

Re. 33,536

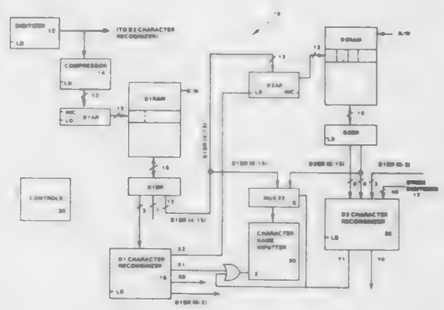
DUAL LEVEL PATTERN RECOGNITION SYSTEM

Patrick S. Wang, Lexington, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Original No. 4,521,909, dated Jun. 4, 1985, Ser. No. 538,858, Oct. 4, 1983. Application for reissue Dec. 23, 1986, Ser. No. 946,464

Int. Cl.[5] G06K *9/70*

U.S. Cl. 382—38 **6 Claims**



3. Apparatus for generating a machine readable signal indicating which one of a set of reference characters corresponds to a pattern, including

means for storing signals indicative of a set of reference fine n-dimensional array values, each reference fine array value corresponding to one of the reference characters,

means for storing signals indicative of a set of reference coarse m-dimensional array values, where m is less than n, each reference coarse array value being derived either from a signal one only of said reference fine array values (in which case it will be designated an unambiguous value), or from any one of a plurality of said reference fine array values (in which case it will be designated an ambiguous value),

means for measuring a workpiece pattern in each of n fields to provide a signal indicative of a workpiece fine n-dimensional array value and means for storing said last named signal,

means for forming a signal indicative of a workpiece coarse m-dimensional array value from said workpiece fine array value signal, first comparing means for comparing the signal of the workpiece coarse array value with the signals of the set of reference coarse array values to produce a signal indicating the identification of the workpiece pattern with either an unambiguous reference coarse array value or an ambiguous reference coarse array value, means responsive to a signal from said first comparing means indicative of identification with an unambiguous array value to generate a signal indicative of the reference character associated with the identified unambiguous array value, second comparing means responsive to a signal from said first comparing means indicative of identification with an ambiguous array value to compare signals indicative of values of a preselected subset of elements from the plurality of reference fine array values associated with the identified ambiguous coarse array value with the signals indicative of values of corresponding elements of the workpiece fine array, to generate a signal indicative of identification of the workpiece pattern with a particular one of the reference characters associated with the identified ambiguous value.

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Re. 33,537

ULTRAHIGH STRENGTH CARBON FIBERS

Tohru Hiramatsu, Matsuyama; Yohji Matsuhisa, Ehime, and Tomitake Higuchi, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Original No. 4,637,925, dated Jan. 20, 1987, Ser. No. 854,979, Apr. 23, 1986. Division of Ser. No. 746,687, Jun. 20, 1985, Pat. No. 4,600,572. Application for reissue Jan. 18, 1989, Ser. No. 298,581

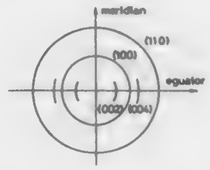
Claims priority, application Japan, Jun. 22, 1984, 59-127389; Jun. 22, 1984, 59-127390

Int. Cl.[5] **D01C** *5/06;* **D01F** *9/22*

U.S. Cl. 423—447.4 **5 Claims**

1. A process for producing an ultrahigh strength carbon fiber, which comprises the steps of:

electrochemically oxidizing an acrylic precursor based carbon fiber in an electrolyte solution comprising nitrate ions as the indispensable component and maintained at a temperature of at least 40° C. with an anode being said acrylic precursor based carbon fiber with a quantity of electricity of [about 100] *50* to 600 coulomb per gram of said fiber, followed by water washing and drying; heating the electrochemically oxidized carbon fiber in an inert or reductive atmosphere of about 600° to 1,000° C. to remove functional groups from said electrochemically oxidized carbon fiber.



PLANT PATENTS

GRANTED FEBRUARY 12, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,442

ROSE PLANT NAMED WESTERN SUNLIGHT

Harvey D. Davidson, #3 El Verano Rd., Orinda, Calif. 94563

Filed Dec. 26, 1989, Ser. No. 457,145

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—16 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized by its having large light orange to apricot colored single blooms with very high pointed centers and broad petals which sequentially flex back with unusually fine form; having rapid repeat bloom cycle and having glossy foliage with very distinctive serration on a vigorous disease resistant bush of moderate height.

7,443

PLUM CV. SUPLUMEIGHTEEN

John H. Weinberger, and Timothy P. Sheehan, both of Fresno, Calif., assignors to Sun World, Inc., Indio, Calif.

Continuation of Ser. No. 131,177, Dec. 10, 1987, abandoned. This application Jan. 22, 1990, Ser. No. 468,516

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new variety of plum tree, the variety being particularly distinguished and characterized by its early-ripening fresh quality fruit of unusually large size, round and slightly oblate in shape, having prominent lenticels, and red-purple skin color at maturity, substantially as herein shown and described.

7,444

KALANCHOE PLANT NAMED BIG SURPRISE

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Jul. 26, 1989, Ser. No. 385,162

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct plant of Kalanchoe named Big Surprise, as described and illustrated.

7,445

KALANCHOE PLANT NAMED WESTERN RED

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Jul. 26, 1989, Ser. No. 385,163

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct plant of Kalanchoe named Western Red, as described and illustrated.

7,446

CHRYSANTHEMUM PLANT NAMED DARK NEOGA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 18, 1989, Ser. No. 409,635

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Dark Neoga, as described and illustrated.

7,447

CHRYSANTHEMUM PLANT NAMED REDDING

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 2, 1989, Ser. No. 388,892

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—82 **1 Claim**

1. A new and distinct Chrysanthemum plant named Redding, as described and illustrated.

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ERRATA

For CLASS	See PATENT NO.
452-035	4,991,260
335-026	4,991,307
131-175	4,991,595
131-194	4,991,596
131-280	4,991,597
131-290	4,991,598
131-297	4,991,599
285-021	4,991,876
294-019	4,991,896
407-053	4,991,986
174-258	4,992,399
514-346	4,992,503
514-050	4,992,534

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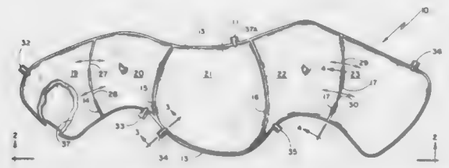
GENERAL AND MECHANICAL

4,991,230

SHOCK ABSORBING BODY PROTECTIVE PADS

Eugene J. Vacanti, 7700 Cahill Rd., Edina, Minn. 55435

Filed Aug. 25, 1989, Ser. No. 398,658
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 **2 Claims**



1. Shock absorbing body protective pads for use by athletes in contact sports and comprising:

(a) a pair of heat sealable plastic film members each having lateral edge surfaces and being arranged in generally superimposed relationship and sealed together, one to the other, along said lateral edge surfaces, and with a plurality of cooperating and interconnected chambers contoured to define an integral body protective pad formed from said pair of edge sealed plastic film members;

(b) each chamber comprising an enclosure with a foam pad constrainably retained therewith, and with the interior volume of at least two chambers being interconnected and in communication with one another through a port means common to said interconnected chambers, and with a plurality of generally rigid tubular exhaust ports communicating between said interconnected chambers and the ambient and being disposed along the said lateral edge surface of said interconnected chambers;

(c) one outer surface of each of said heat sealable film members being adapted to be in contact with the body of the wearer and comprising a layer of woven scrim and with the surface of each of said plastic film members opposed to said one outer surface being fusible and heat sealable;

(d) each of said foam pads comprising a reticulated open cell foam and having a volume substantially equal to the volume of the chamber it occupies and a configuration corresponding to and defining the configuration of its chamber;

(e) each of said interconnecting port means being disposed within the same formed between mutually adjacent chambers and common thereto, and with said mutually interconnected chambers collectively defining a pad segment;

(f) each pad segment having a pair of said generally rigid tubular exhaust ports coupled thereto, with the individual exhaust ports of each pair of exhaust ports being arranged along the lateral edge surfaces of said chamber and being disposed in oppositely disposed spaced apart realtionship; and

(g) each of said rigid tubular exhaust ports has opposed inner and outer ends, and wherein the inner end of each is disposed at an acute angle relative to the tubular axis.

4,991,231

KARATE TARGET PAD

Don D. Swift, 5707 Wallwood, Knoxville, Tenn. 37912

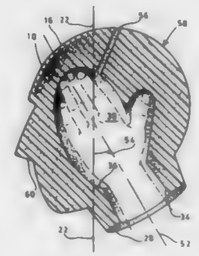
Filed Nov. 10, 1988, Ser. No. 269,489
Int. Cl.[5] A41D *13/10;* **A63B** *69/26*
U.S. Cl. 2—18 **7 Claims**

1. A karate target pad comprising:

a first portion configured to resemble a human head, said first portion having a forwardly disposed section defining facial features, said facial features including at least a pair of concaved areas provided in said forwardly disposed section to simulate eyes and a protruding portion to simulate a nose, said first portion also defining oppositely disposed first and second side sections;

a sleeve portion disposed with respect to said first portion so as to resemble a human neck;

a mitten-shaped opening provided in said pad for receiving the extended hand of a wearer, said opening extending through said sleeve portion and into said first portion, and being disposed such that as the extended hand of a wearer



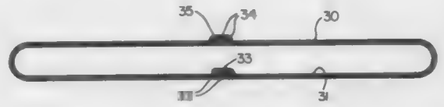
is received in said opening, the wearer's hand is oriented substantially perpendicular to said forwardly disposed section, with the palm of the wearer's hand facing said first side section, said opening also being aligned with respect to said pad such that when the forearm and hand of the wearer are extended at an angle of between 30 and 60 degrees relative to vertical, said head-shaped first portion is in an attitude substantially corresponding to a forwardly facing, eyes-level attitude of a human head.

4,991,232

SURGICAL GOWN AND METHOD OF MAKING SAME

Jeffrey L. Taylor, Cincinnati, Ohio, assignor to Standard Textile Company, Inc., Cincinnati, Ohio

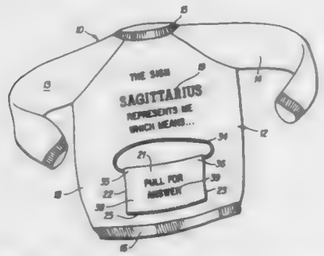
Filed Jun. 27, 1989, Ser. No. 371,989
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—51 **19 Claims**



1. In a hospital-type gown having a main body comprised of a front panel with a pair of side panels on opposite sides of said front panel and a pair of sleeves fastened to said panels and each terminating in a cuff at a terminal outer end thereof, the improvement in which said front panel and each of said sleeves comprises a plurality of plies, said plurality of plies serving as an improved barrier against liquids passing therethrough yet being breathable, said front panel and each of said sleeves is made of a woven fabric material, said plurality of plies of each sleeve consists of two tubular plies with each tubular ply being made from a single sheet disposed in tubular form and fastened by fastening means, said fastening means fastening each tubular ply is in the form of stitch means, said stitch means of each tubular ply extends longitudinally along its sleeve, and the stitch means of one tubular ply is circumferentially displaced relative to the stitch means of the other tubular ply such that any liquid penetrating any holes defined by stitch means of the outer tubular ply must travel circumferentially in order to penetrate any holes defined by stitch means of the inner tubular ply.

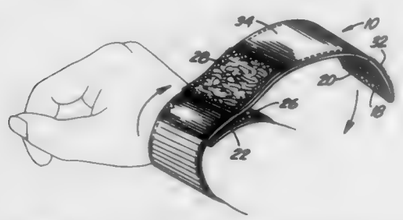
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4,991,233
GARMENT WITH INDICIA
Andrew Hall, P.O. Box 15183, Jersey City, N.J. 07305-5147
Filed Aug. 27, 1987, Ser. No. 89,062
Int. Cl.[5] A41B *1/18*
U.S. Cl. 2—115 8 Claims



1. Novelty garment comprising:
a panel with an exposed surface, the panel being divided into first and second sections,
first indicia on the first section;
second indicia on the second section, said second indicia bearing a relationship to the first indicia, and
movable means for normally covering only the second indicia leaving the first indicia exposed, the movable means having third indicia thereon instructing an observer to move the movable indicia so as to expose the second indicia.

4,991,234
BODY SUPPORT BAND
Bert Greenberg, 2030 S. Ocean Dr., Hallandale, Fla. 33009
Filed Oct. 10, 1989, Ser. No. 418,845
Int. Cl.[5] A41D *00/00*
U.S. Cl. 2—170 9 Claims



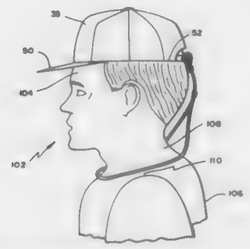
1. A flexible support band for encircling a portion of a wearer's body, said band comprising:
a single band having elastic portions and hook and loop fastener portions, said band having solely two end defining a starting end and a terminating end, and said band having a first surface and a second surface opposite to said first surface;
said first surface of said band having a plurality of one of said hook and loop fastener portions extending to said terminating end of said band and another one of said same fastener portions being intermediate between said starting and terminating ends of said band;
said second surface of said band having a plurality of the other one of said hook and loop fastener portions extending to said starting end of said band and another one of said same other fastener portions being intermediate between said starting and terminating ends of said band;
said band forming a convolute tubular support device encircling a body portion of the wearer, said first surface of said band constituting at said starting end an inner and inward facing end of said convolute tubular support device and said second surface of said band constituting at said terminating end an outer and outward facing end of said convolute tubular support device;
the intermediate band portion containing said one of said hook and loop fastener portions engaging the starting end portion of said band containing said other one of said hook and loop fastener portions, and said terminating end portion of said band containing said one of said hook and loop fastener portions engaging the intermediate band portion containing said other one of said hook and loop fastener portions;
whereby the engagement of said intermediate band portion with said starting end portion of said band constitutes a first engagement of said hook and loop fastener portions and the engagement of said terminating end portion of said band with said intermediate band portion constitutes a second engagement of said hook and loop fastener portions, said band being under tension when the second engagement of said hook and loop fastener portions is made.

4,991,235
NOVELTY HAT
Greg S. Warner, 302 N. Third, Bellevue, Iowa 52031
Filed Sep. 21, 1989, Ser. No. 410,274
Int. Cl.[5] A42B *1/22;* A63H *33/00*
U.S. Cl. 2—171.1 5 Claims



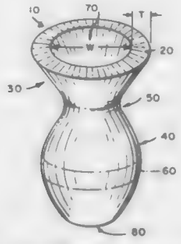
1. A novelty hat comprising:
a decorative, non-protective hat shell shaped in the form of a vehicle, said shell being formed of substantially rigid plastic and having a top wall, a front wall, a rear wall, opposite sidewalls, and a bottom opening substantially larger than a person's head, said shell forming a head cavity therein;
circular, adjustable headband having a variable circumference corresponding to a plurality of hat sizes;
headband securing means for detachably securing said headband to said hat shell within said head cavity, said headband securing means comprising a pair of hook member pads, having a plurality of hook members, attached to said opposite sidewalls of said hat shell within said head cavity, and a pair of eye member pads, having a plurality of eye members, attached to said headband in spaced relation to one another, said hook members of said pair of hook member pads retentively detachably engaging said eye members of said eye member pads for detachably retentively securing said headband within said hat shell; whereby the relative positions of said headband and said shell may be adjusted about an axis extending through said pair of hook member pads by detaching said pair of hook member pads from said pair of eye member pads, pivoting said shell relative to said headband about said axis, and reattaching said pair of hook member pads to said pair of eye member pads.

4,991,236
HAT RETAINING DEVICE
Steven W. Pritchett, 12117 Eddys Park Dr., Herndon, Va. 22070
Filed Nov. 3, 1989, Ser. No. 431,239
Int. Cl.[5] A42B *7/00*
U.S. Cl. 2—189 24 Claims



1. A hat retaining device comprising:
a first flexible head loop, said head loop being adapted to be fixed at a size sufficient to be slipped over a head of a hat wearer; and
hat holding means coupled to said head loop for coupling said head loop to a hat worn by said hat wearer, said hat holding means being so constructed and arranged to be attached to said hat in a manner permitting said head loop to loosely encircle a neck of said hat wearer near a base of said neck when said head loop is passed over said head and when said hat is positioned on said head.

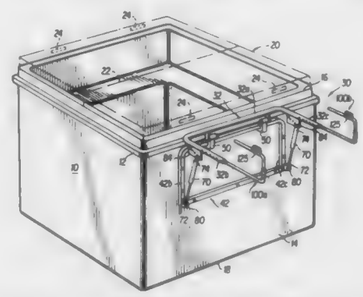
4,991,237
HONEYCOMED EXPANDABLE HAT
Kevin Dwyer, 1478 Main St., South Weymouth, Mass. 02190
Filed Jul. 26, 1989, Ser. No. 385,806
Int. Cl.[5] A42B *1/00*
U.S. Cl. 2—209.7 7 Claims



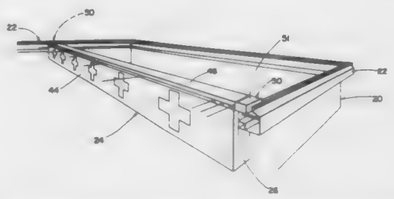
1. An open-ended annular expandable structure formed of a plurality of elongated lengths of sheet material joined together at spaced locations to form a resiliently expandable array of honeycomb cells which may be expanded at at least one end for use as a hat wherein the one end may be expanded to fit about heads of various sizes, wherein the structure has a bulbous configuration at one end and a conical configuration at another end, the bulbous and conical configurations being joined by a neck portion.

4,991,238
SPA COVER LIFT
Stephen Forrest, 6272 Guava Ave., Goleta, Calif. 93117
Filed Feb. 27, 1990, Ser. No. 185,500
Int. Cl.[5] E04H *4/00;* A47K *3/02*
U.S. Cl. 4—498 32 Claims

1. Apparatus for receiving the cover for a spa having a top and side walls, the apparatus comprising:
at least one movable member having first and second end portions, said movable member adapted to slidably receive said spa cover thereon and having means on said first end portion for receiving and retaining the spa cover thereon;
means at the second end portion of said movable member for pivotably securing said movable member to a side of the spa from an extended position substantially perpendicular to a side wall of the spa to a retracted position substantially parallel with the side wall of the spa;
means for displacing said movable member between said extended position and said retracted position with respect to the spa.



4,991,239
BULKHEADS FOR SWIMMING POOLS
John F. Corna, 1542 Northcrest Ave., Columbus, Ohio 43220, and Marcel H. Blais, 8085 Manitou Dr., Westerville, Ohio 43081
Continuation of Ser. No. 535,041, Sep. 23, 1983, abandoned, which is a continuation of Ser. No. 337,592, Jan. 7, 1982, abandoned. This application Jan. 21, 1986, Ser. No. 821,010
Int. Cl.[5] E04H *4/14*
U.S. Cl. 4—505 4 Claims



1. In a water-filled swimming pool, a moveable bulkhead having flotation means, extending between opposed rectilinear swimming pool vertical sidewalls having a gutter secured to each of said sidewalls that can be utilized as a supporting and guiding track means for said bulkhead; roller means secured to the upper opposite ends of said bulkhead for rolling engagement with said gutter, wherein the engagement between said roller means and said track means comprises the only support of said bulkhead, said bulkhead, including said flotation means, depending from said roller means in a vertical plane into the confines of said water-filled swimming pool vertical sidewalls; means to stabilize said bulkhead against unwanted movement comprising: jack means positioned between said gutter and said bulkhead to vertically lift said bulkhead and to shift the bulkhead load from said roller means to said jack means, whereby bulkhead resistance to vertical and horizontal movement is increased as a result of the shift of the load from said roller means to said jack means.

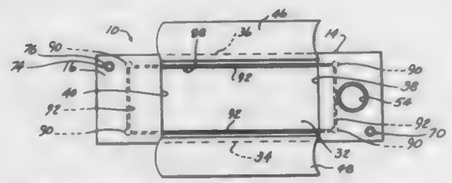
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,240

DISPOSABLE BATH

Vonnie M. Edwards, 1319 Fairwood Dr., Apt. 6G, Westland, Mich. 48185

Filed May 19, 1989, Ser. No. 354,351
Int. Cl.[5] A47K 3/024
U.S. Cl. 4—585 10 Claims



1. A disposable bath comprising:

a body formed of a water impervious, flexible material having separable planar top and bottom walls, and sealed side and end edges defining a flat, expandable hollow interior chamber;

a main aperture formed in the top wall of the body permitting access to the interior chamber in the body;

closure means mounted on the body for closing the main aperture in the top wall of the body;

a second aperture formed in the top wall of the body and spaced from the main aperture; and

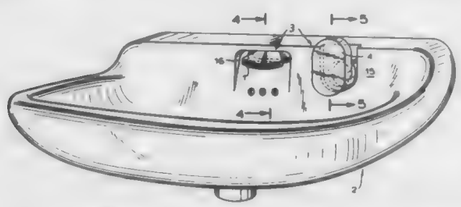
inlet means, formed in the body in fluid flow communication with the interior chamber in the body, for connecting a fluid supply to the interior chamber in the body for supplying fluid to and emptying fluid from the interior chamber; a support frame formed of a plurality of posts removably disposable in a spaced relationship within the interior chamber in the body between the top and bottom walls; and line means, connected to and extending between the posts for retaining the posts in a vertical orientation in the body.

4,991,241

COMBINATION SANITARYWARE AND FITTING

Konrad Bergmann, Wittlich, Fed. Rep. of Germany, and Axel Enthoven, Wijnegem, Belgium, assignors to Americand Standard Inc., New York, N.Y.

Continuation of Ser. No. 177,553, Apr. 1, 1988. This application Nov. 16, 1989, Ser. No. 437,865
Claims priority, application Austria, Jul. 29, 1987, 1923/87; Jul. 29, 1987, 1924/87
Int. Cl.[5] A47K 1/04
U.S. Cl. 4—619 4 Claims



1. In combination, an integrated sanitary fixture and plumbing fitting, said fixture including a sanitary fixture wall having spaced apart recesses, a first recess in which the spout of said fitting is housed, and a second recess in which the valve actuating means for controlling hot and cold water discharged through the spout is housed;

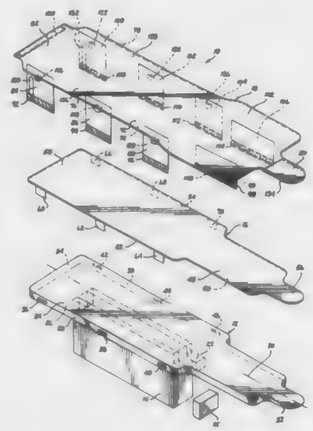
a valve assembly coupled to said valve actuating means and having hot and cold water inlet openings and a discharge opening, a jacket having a bottom, a conduit coupled intermediate said discharge opening and said spout via said jacket, said conduit being positioned proximate the bottom of said jacket, said conduit having a lower portion, a screen surrounding said conduit for water discharge therethrough, said conduit having openings in the lower portion thereof to direct water towards the bottom of said jacket, said spout having generally upper and lower spaced apart planar surfaces having edges which diverge outwardly from said conduit and define an arcuate shaped end to form a longitudinal passage that defines a spout opening in said passage, and said spout having a pattern flow means varying in height which decreases in the flow direction toward the spout end, whereby a generally uniform rate of flow is maintained while the water pattern discharged at the spout end is in the form of a waterfall, said spout being inclined downwards at an angle of about 75 degrees with respect to the sanitary fixture wall.

4,991,242

PATIENT TABLE COVER AND METHOD

Timothy E. Brown, 107 E. McKinley St., Tempe, Ariz. 85281

Filed Jun. 18, 1990, Ser. No. 539,562
Int. Cl.[5] A47G 9/00, 9/04
U.S. Cl. 5—60 6 Claims



1. A patient table assembly comprising:

a table top having a base;

a cushion connected to the table top;

said table top having a first side portion and a second side portion;

said cushion having a first side portion and a second side portion;

a cover having a first side portion and a second side portion;

first and second flaps respectively connecting the cushion and table top first side portions and the cushion and table top second side portions;

first and second sheets having outer edges joined to the cover side portions and folded under the cushion and having connectable inner edges; and

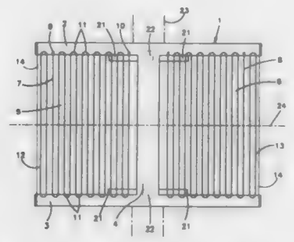
said first and second sheets respectively having first and second slots for passing therethrough respectively the first and second flaps.

4,991,243

RADIATION-PERMEABLE BODY SUPPORT

Robert Rottermann, Waedenswil, Switzerland, assignor to Rottermann AG, Switzerland

PCT No. PCT/CH87/00101, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/03004, PCT Pub. Date May 5, 1988
PCT Filed Aug. 17, 1987, Ser. No. 221,259
Claims priority, application Switzerland, Oct. 29, 1986, 4283/86-6
Int. Cl.[5] A61G 7/05; H05G 1/00
U.S. Cl. 5—60 5 Claims



1. A radiation-permeable body support having a body support surface as a part of the reclining surface in a patient's couch used in radiation therapy in which a radiation emitting apparatus moves in a first plane, comprising:

an H-shaped frame having two parallel lateral beams and a central beam interconnected between said two parallel lateral beams, said central beam extending transverse to the first plane and dividing the body support surface into two supporting surfaces lying in a second plane transverse to the first plane, said two parallel beams being in the same plane as said central beam and not connected by any frame parts other than said central beam; and

a transparent stringing being anchored solely to said two parallel lateral beams connected to one another by said central beam and forming at least one of said two supporting surfaces.

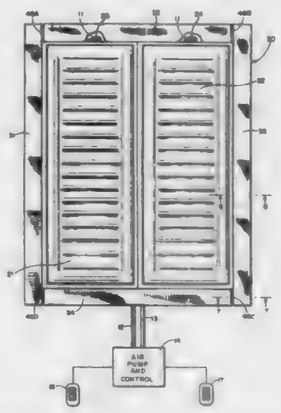
4,991,244

BORDER FOR AIR BED

Robert A. Walker, 11010 89th Ave. North, Maple Plain, Minn. 55369

Filed Jan. 5, 1990, Ser. No. 461,304
Int. Cl.[5] A47C 27/10
U.S. Cl. 5—400 16 Claims

8. An air bed for providing support for a body comprising: a base, air mattress means for accommodating air under pressure supported on the base, and border means surrounding an outer perimeter of the air mattress means, the border means having an upper wall and a lower wall joined to a pair of side walls to form a generally rectangular frame, each of the walls having means to comfortably support a resting body and to confine the air mattress means within the frame comprising a first top layer of block foam material sufficiently resilient to comfortably support the body, the first top layer mounted on a second bottom layer of block foam material having a width substantially the same as the width of the first layer and sufficiently firm to confine the air mattress means within the frame, each wall having casing means enclosing the first and second layers, the casing means having means operable to releasably hold the casing means in tight fitting relation around the first and second layers, the casing means enclosing the side walls having first fastening means and second fastening means secured to the casing means enclosing the upper and lower walls, said first



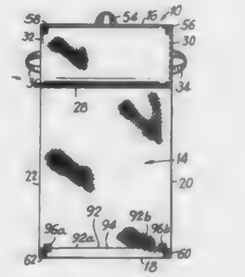
and second fastening means cooperating with each other to join the side walls to the upper walls.

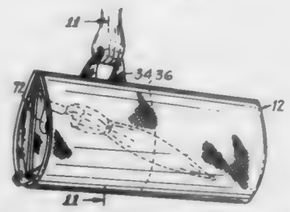
4,991,245

PORTABLE PILLOW/LOUNGE SET CONVERTIBLE TO AND FROM A TOTE BAG, AND METHOD

Jack Franco, Deal, N.J., assignor to Franco Manufacturing Co. Inc., Metuchen, N.J.

Filed Sep. 25, 1989, Ser. No. 411,995
Int. Cl.[5] A47G 9/06
U.S. Cl. 5—419 19 Claims





1. A portable lounge/pillow set convertible to and from a tote bag, comprising:

(a) an elongated sheet having end regions, side regions, a length extending along a longitudinal direction between the end regions of the sheet, and a width extending along a transverse direction between the side regions of the sheet, said length being greater than the width of the sheet, said sheet having a pillow pocket extending along

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the transverse direction along the width of the fabric sheet at one of the end regions thereof;

(b) a pillow removably mounted in the pillow pocket;

(c) a pair of handles, one attached at each side region of the sheet;

(d) said sheet having sheet portions integral and permanently attached with one another and foldable over and upon one another about transverse and longitudinal folds respectively parallel to the transverse and longitudinal directions to form at least one interior compartment for holding articles; and

(e) said handles being positioned in registry with each other after folding of the sheet portions about the longitudinal fold to form a convenient hand-grip for carrying the articles and wherein the sheet is folded only once about a single transverse fold before being folded only once about a single longitudinal fold to form a substantially flat tote bag having a plurality of said article-holding compartments.

4,991,246

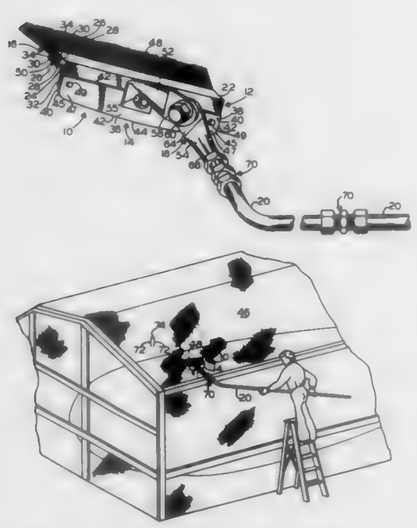
PINE NEEDLE CUTTER

Julius J. DeCicco, Spring Hill, Fla., assignor to The Julius J. DeCicco Trust, Spring Hill, Fla.

Filed Apr. 5, 1990, Ser. No. 504,886

Int. Cl.[5] B25F *1/00*

U.S. Cl. 7—158 **9 Claims**



1. A pine needle cutting apparatus comprising:

a tool head;

a cutting blade attached to said tool head, said cutting blade having opposing ends, a front portion, a rear portion, and a circumferential edge; said front portion of said blade having an arcuate portion adjacent each said end of said cutting blade, said circumferential edge defining the perimeter of said cutting blade; said circumferential edge of said front portion of said cutting blade, between said arcuate portions, being curved to a predetermined radius, and having a cutting edge formed thereon; and said circumferential edge of said arcuate portions having a radius between about $\frac{1}{4}$ inch and about $\frac{1}{2}$ inch and having a dull edge formed thereon;

a brush means attached to said tool head;

a handle connected to said tool head; and

a handle connecting means interposed between said tool head and said handle.

4,991,247

METHOD OF BALANCING A CONTAINER WHICH ROTATES ABOUT AN ESSENTIALLY HORIZONTAL AXIS

Lennart W. Castwall, Täby, Sweden; Jorma K. Poikonen, Naantali, and Pekka O. Aikuvaara, Turku, both of Finland, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

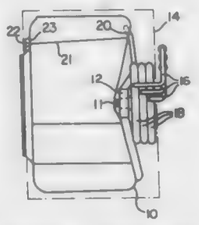
PCT No. PCT/SE89/00288, § 371 Date Feb. 5, 1990, § 102(e) Date Feb. 5, 1990, PCT Pub. No. WO89/12132, PCT Pub. Date Dec. 14, 1989

PCT Filed May 23, 1989, Ser. No. 460,188

Claims priority, application Sweden, May 30, 1988, 8802011

Int. Cl.[5] D06F *37/22*

U.S. Cl. 8—158 **6 Claims**



1. A method of balancing a container which rotates about an essentially horizontal axis (11), the container being provided with cavities (15) which are evenly distributed along the periphery thereof and have openings (20) via which selectively liquid can be introduced into the respective cavities, a sensor (24) being provided which senses vibrations caused by the rotation of the container and which emits an electrical signal the magnitude of which is a measure of the magnitude of the vibrations, characterized by the following steps:

the container (10) is brought to rotate at a first rotational speed and the sensor signal is read,

a predetermined amount of liquid is introduced in a randomly selected cavity (15) along the periphery of the container,

the sensor signal is again read and the value is compared with the previously read value,

if the value is lower than the previous one another dose of the predetermined amount of liquid is introduced in the selected cavity, while if the value is equal to or greater than the previous value the predetermined amount is introduced in the cavity that is next to follow along the said periphery,

the sequence of successive filling of liquid in the different cavities, and reading of the sensor signal is repeated until the sensor signal is lower than a predetermined, permissible value,

the container (10) is brought to rotate at a second rotational speed, greater than the first one,

the sequence of alternate filling of liquid in the different cavities, reading of the sensor signal and comparing of the actual value with the previous one is repeated for the different rotational speeds until the desired highest rotational speed has been reached and the sensor signal has a value lower than the predetermined permissible value.

4,991,248

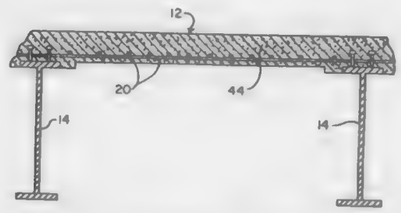
LOAD BEARING CONCRETE PANEL RECONSTRUCTION

John H. Allen, Boulder, Colo., assignor to Allen Research & Development Corp., Boulder, Colo.

Continuation-in-part of Ser. No. 193,948, May 13, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 299,618

Int. Cl.[5] E01C *7/00*

U.S. Cl. 14—73 **18 Claims**



17. A method of refurbishing a deteriorated concrete panel having an upper half having an upper surface which will come into contact with or be closely adjacent to loads which traverse said panel, and a lower half having a lower surface which is spaced from loads which traverse said upper half of said panel, said concrete panel initially having flexural reinforcement means distributed throughout its structure, wherein the method includes the steps of:

removing the portion of said upper half of said panel which is deteriorated, including substantially all flexural reinforcement means in said upper half, and all portions of said lower half of said panel which has a chloride content greater than 0.1% by volume; and then

replacing the upper half with an over layer of concrete which is substantially free of flexural reinforcement

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4,991,249

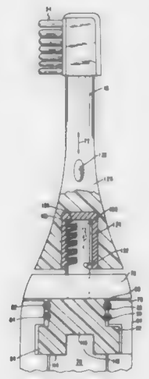
ULTRASONIC TOOTHBRUSH

Leonard W. Suroff, 12 Tompkins Ave., Jericho, N.Y. 11753

Filed Feb. 9, 1989, Ser. No. 308,798

Int. Cl.[5] A46B *13/02*

U.S. Cl. 15—22.2 **39 Claims**



1. An ultrasonic toothbrush apparatus comprising, in combination:

A. an exchangeable toothbrush member including;

(i) an elongated body portion having an oral contact portion extending outwardly from one distal end of said body portion,

(ii) the other end of said body portion being hollow and provided with a centrally disposed opening terminating in a contact surface,

(iii) at least one inwardly extending protrusion being disposed at the circumference of said centrally disposed opening to function as a keying guide means,

(iv) a plurality of threads divided into at least two sections disposed within said hollow body portion between said contact surface and said opening, said threaded hollow body portion being adapted to receive a mating threaded portion; and

B. an ultrasonic power member means for supplying vibratory energy in the ultrasonic range including;

(i) an elongated housing having an ultrasonic power source for supplying vibratory energy in the ultrasonic range disposed within said housing, said power source being adapted to be connected to a source of electrical energy and having a vibratory output end longitudinally extending at one end of said housing,

(ii) said one end having a distal edge and a longitudinally outwardly extending portion provided with a plurality of mating threads divided into at least two sections, and

(iii) a longitudinal channel extending from said distal edge of said one end extending portion towards the other end of said extending portion terminating in a connecting relatively short channel disposed transverse to said longitudinal channel,

wherein, when said hollow body portion threads and said housing extending portion mating threads engage, and said hollow body inwardly extending protrusion slidably engages said housing elongated member channel when said toothbrush member is rotated with respect to said power member means housing sufficient for said housing internally extending protrusion to be seated into said relatively short transverse channel, said body portion contact surface is in intimate contact with said distal edge of said housing extending portion, thereby efficiently transferring said vibratory energy from said ultrasonic power source to said toothbrush body portion.

4,991,250

CLEANING DEVICES

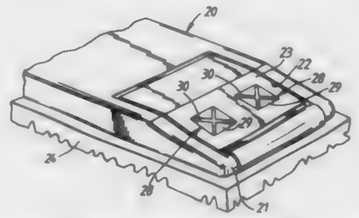
Ronald A. Young, London, Great Britain, assignor to Brute Limited, West Midlands, United Kingdom

Filed Nov. 21, 1989, Ser. No. 440,127

Claims priority, application United Kingdom, Nov. 22, 1988, 8827233; Feb. 13, 1989, 8903216

Int. Cl.[5] A47K *7/02*; A47L *13/46*

U.S. Cl. 15—228 **8 Claims**



1. A cleaning device alternatively usable as a sweep mop in a conventional wet or damp mopping operation, or in a wiping or polishing operation, comprising a mop pad holder having four end corners and attachment means for a mop pad having end tails and for the separate attachment of a sheet of wiping or polishing material, said attachment means comprising slots or apertures adjacent the ends of the holder so that the latter presents end bars around which end tails of the pad can respectively be wrapped, these end portions having complementary

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hook and loop type surfaces so that they adhere to themselves, and said apertures being effectively closed, after the mop pad is fitted, by hinged closure flaps which are respectively located within the apertures and press down on and thus maintain the hook an loop type attachments of the mop pad.

4,991,251

WIPER ARM, ESPECIALLY FOR WINDSHIELD WIPER SYSTEMS ON MOTOR VEHICLES

Bruno Egner-Walter, Heilbronn; Eckhardt Schmid, Brackenheim, and Wolfgang Scholl, Gemmrigheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

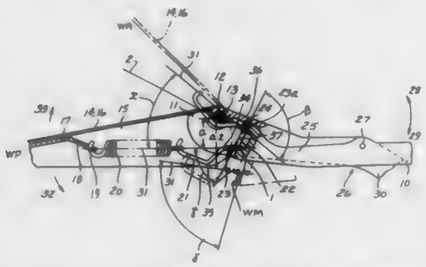
PCT No. PCT/EP87/00736, § 371 Date Dec. 20, 1988, § 102(e) Date Dec. 20, 1988, PCT Pub. No. WO88/08798, PCT Pub. Date Nov. 17, 1988

PCT Filed Nov. 27, 1987, Ser. No. 294,632

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714649

Int. Cl.[5] B60S *1/34*

U.S. Cl. 15—250.2 **15 Claims**



1. A wiper arm of a wiper system for a vehicle windshield comprising:

a fastening member having an end adapted for attachment to a wiper shaft;

a link mounted on said fastening member for pivotal movement of said link about a first axis transverse to the length of said fastening member;

a wiper rod attachment to said link and adapted to receive a wiper blade;

a lever mounted on said fastening member for pivotal movement of said lever about a second axis transverse to the length of said fastening member and at a point between said first axis and said end of said fastening member adapted for attachment to said wiper shaft, said lever having a first end adapted for attachment to an adjusting drive mechanism;

a guide unit at a second end of said lever;

and spring means having a first end connected to said wiper rod and a second end connected to said guide unit for: (a) urging a wiper blade attached to said wiper rod against a vehicle windshield while said spring means are in a wiper blade operating position to a first side of a dead center line and, (b) maintaining said wiper blade in a tilted position spaced from said vehicle windshield while said spring means are in a wiper blade replacement position to a second side of said dead center line opposite from said first side, said second end of said spring means movable along said guide unit when said wiper blade is moved to and from said vehicle windshield and said tilted position and said spring means move to and from said front side of said dead center line and said second side of said dead center line.

4,991,252

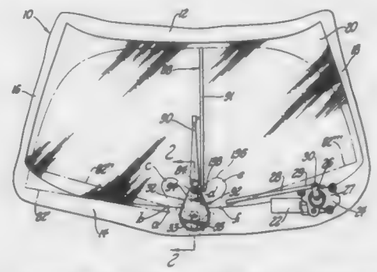
VARIABLE LENGTH WINDSHIELD WIPER ARM ASSEMBLY

John A. Budinski, Jamestown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1985, Ser. No. 774,081

Int. Cl.[5] B60S *1/26*

U.S. Cl. 15—250.21 **7 Claims**



6. A variable length windshield wiper arm assembly comprising, a base, means supporting said base on a stationary panel for angular oscillation through a wiping arc about a pivot axis of said panel, a blade support arm having an inboard end and an outboard end and a longitudinal axis therebetween, outboard guide means defining a slide bearing between said base and said support arm at a location on the latter between said inboard and said outboard ends thereof, a gear system having a rotary input member and a linear output member reciprocable along a linear output path at a rate of two linear strokes between end limits for each revolution of said input member, means mounting said gear system on said base with said linear output path coinciding with said support arm longitudinal axis, means connecting said linear output member to said support arm inboard end so that said linear output member cooperates with said outboard guide means in defining a linear path of motion for said support arm relative to said base coinciding with said support arm longitudinal axis while reciprocating said support arm relative to said base in linear strokes equal to the linear stroke of said output member, drive means on said stationary panel connected to said base including a transmission shaft, said drive means rotating said transmission shaft at a rate of about 720° for each angular stroke of said base through said wiping arc, and means connecting said transmission shaft to said rotary input member so that said output member and said support arm reciprocate at a rate of about four linear strokes for each angular stroke of said base through said wiping arc.

4,991,253

INDUSTRIAL CENTRAL-VACUUM SYSTEM

Ernst Rechsteiner, Uzwil, Switzerland, assignor to Steinemann AG, Flawil, Switzerland

Continuation-in-part of Ser. No. 204,193, Jun. 8, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 464,514

Claims priority, application Switzerland, Jun. 18, 1987, 02294/87-8

Int. Cl.[5] A47L *5/38*

U.S. Cl. 15—301 **9 Claims**

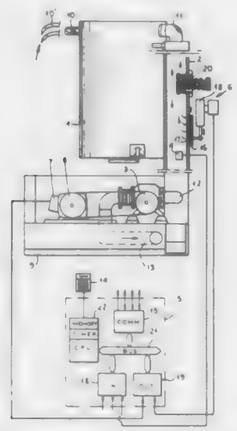
1. An industrial central vacuum system comprising:

a filter chamber having an intake port connectable to a plurality of intake nozzles and an output port;

a blower having an intake side and an output side and energizable for drawing in air at its intake side and expelling it at its output side;

a conduit connected between the intake side of the blower and the output port of the filter chamber;

a valve having an outer side opening to ambient pressure and an inner side opening into the conduit, whereby when the valve is open can ambient air be admitted directly into the conduit; and



control means connected between the blower and the valve for opening the valve prior to energizing and de-energizing the blower and for closing the valve a predetermined interval after energizing the blower.

4,991,254

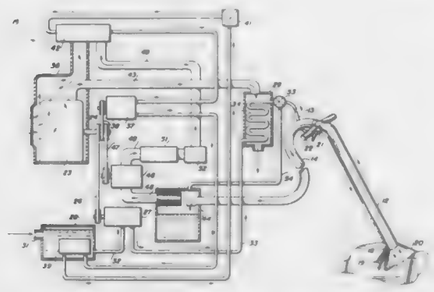
CLEANING SYSTEM

James R. Roden, Phoenix, and Michael J. Roden, Gilbert, both of Ariz., assignors to Professional Chemicals Corporation, Chandler, Ariz.

Continuation-in-part of Ser. No. 286,616, Dec. 19, 1988, Pat. No. 4,940,082. This application May 4, 1990, Ser. No. 519,000

Int. Cl.[5] A47L *11/34;* **F25B** *29/00*

U.S. Cl. 15—321 **9 Claims**



1. A cleaning system comprising cleaning liquid, a liquid heating system, a spray nozzle for spraying heated liquid onto a surface to be cleaned, a vacuum nozzle for retrieving liquid sprayed by said spray nozzle, a vacuum pump having an inlet and an outlet, means connecting the inlet of said vacuum pump to said vacuum nozzle for withdrawing liquid and air into said vacuum nozzle, and means connected to the outlet of said vacuum pump for conveying air leaving said pump to said liquid heating system to impart heat from said air to said cleaning liquid.

4,991,255

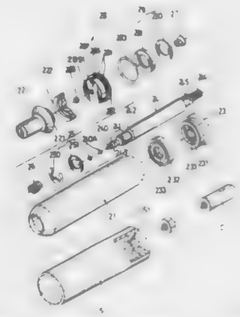
PNEUMATIC DOOR-CLOSER USABLE FOR LEFT-HINGED AND RIGHT-HINGED DOORS

James C. Liu, No. 308, Fu-Sheng Tsun, Hsin-Sheh Hsiang, Taichung Hsien, Taiwan

Filed Aug. 1, 1989, Ser. No. 388,143

Int. Cl.[5] E05F *3/00*

U.S. Cl. 16—70 **3 Claims**



1. A door-closer interposed between a door and a door frame, said door having a first side hinged to said door frame, and a second side opposite to and rotatable about said first side, said door-closer comprising:

an elongated horizontal support fixed on said door frame above said door;

a vertical pivot assembly positioned at one end of the support:

a generally L-shaped crank unit pivoted removably to said end of said support by means of said pivot assembly and including a long crank arm member and a short crank arm member which inclines at an angle with respect to said long crank arm member, said long crank arm member being connected at a joint portion of said L-shaped crank unit to one side of said short crank arm member and including a crank pin unit carried at an end of said long crank arm member;

a connector fixed on said door and having a slide slot formed therethrough in which said crank pin until of said long crank arm member is slideably received; and

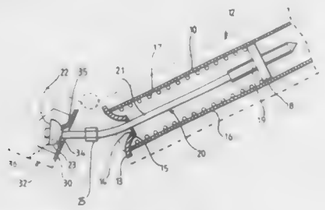
a door-closer body including an air cylinder filled with compressed air, and a piston rod extending through one end of said cylinder to connect pivotally with an end of said short crank arm member, the other end of said cylinder being mounted pivotally on the other end of said support, said cylinder including a piston body which is screwed movably on said piston rod so as to define in said cylinder a first and a second sealed chambers, said piston body including a central bore formed therethrough, a wedge-shaped groove formed in an inner surface of said piston body in communication with the second chamber, an axial passage formed through said piston body intercommunicating said first and second chambers, a spring-biased seal disposed in said second chamber and biased to close said axial passage, and a radial passage intercommunicating said wedge-shaped groove and said first chamber, said piston rod having a shoulder which is movable axially to seal entirely or partially said wedge-shaped groove by moving said piston rod relative to said cylinder and thereby regulated air flow between said first and second chambers;

whereby, when said door is alternatively hinged to said door frame at said second side instead of said first side thereof, said support and said crank unit can be rearranged the other way round in such a manner that said long crank arm member is connected to the other side of said short

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crank arm member so that said door-closer can still perform the same door closing function.

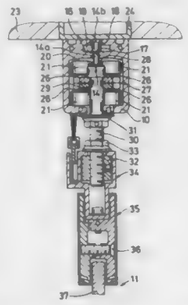
4,991,256
DOOR CLOSERS
Roger H. Jeynes, Birmingham, and John W. Sewell, Redditch, both of England, assignors to Samuel Heath & Sons, Birmingham, England
Filed Feb. 23, 1989, Ser. No. 315,623
Claims priority, application United Kingdom, Feb. 24, 1988, 8804317
Int. Cl.[5] E05F *1/00*
U.S. Cl. 16—78 12 Claims



1. A door closer, comprising:
a housing adapted for mounting within the thickness of a door and having a mouth at one end thereof;
an anchor plate adapted for mounting on a door frame at a position adjacent to said housing;
an elongate tension member comprising a flexible cable which terminates in an abutment member engaging behind said anchor member;
an externally threaded member secured to said cable at an end thereof within said housing;
an internally threaded member in threaded engagement with said externally threaded member and mounted within said housing such that rotation of said externally threaded member adjusts the axial position of said internally threaded member relative to said externally threaded member;
a spring member abutting said internally threaded member and operative to draw said anchor member and said housing towards one another, to thereby close the door relative to the frame; and
a collar fixedly secured to said cable at a position spaced from said anchor member, said collar being so dimensioned as to be capable of entering said mouth of said housing.

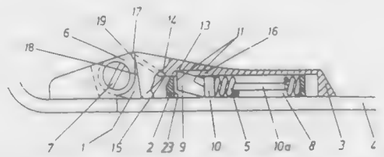
4,991,257
SLIDING DOOR APPARATUS
Peter Entebach, Bad Salzuflen, Fed. Rep. of Germany, assignor to DORMA - Glas Gesellschaft fuer Glastuer - Beschlaege und-Konstruktionen GmbH, Bad Salzuflen, Fed. Rep. of Germany
Filed Mar. 9, 1989, Ser. No. 322,099
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 8803188[U]
Int. Cl.[5] E05D *15/00*
U.S. Cl. 16—87 R 8 Claims

1. Sliding door apparatus for installation in a structural opening with overhead runway rails having runways in which guide rollers of the sliding doors are mounted in a displaceable arrangement, characterized in that cylindrical guide pins (14) are provided as guides on switches which project downwardly



into the runways (20) and which have centers that lie substantially on center lines of the runways (20).

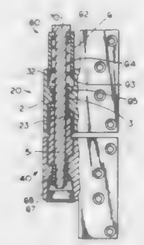
4,991,258
EYEGLASS SPRING HINGES
Günther Drlik, Pforzheim, Fed. Rep. of Germany, assignor to OBE-Werk Ohnmacht & Baumgartner GmbH & Co. KG, Ispringen, Fed. Rep. of Germany
Filed Jul. 18, 1990, Ser. No. 555,086
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1989, 3936725; Mar. 14, 1990, 4008086
Int. Cl.[5] G02C *5/22*
U.S. Cl. 16—228 18 Claims



1. In an assembly for use in eyeglasses, which assembly comprises
a bow having a forward end portion provided with a guide housing, which extends along said forward end portion and has a rearwardly facing interior stop face,
a rim-side hinge member,
a bow-side hinge member, which is hinged to said rim-side hinge member,
an elongate slider, which is rigid with said bow-side hinge member and is longitudinally slidably mounted in said housing,
a plunger, which is longitudinally slidably mounted in said slider behind said stop face,
a prestressed compression spring longitudinally extending in said slider behind said plunger and urging said plunger forwardly in said slider, and
a locking member, which is held in said slider between said plunger and said stop face and is urged by said plunger against said stop face under the force of said spring,
whereby said slider is extensible out of said housing against the force of said spring,
the improvement residing in that
said housing is formed in its interior with a recess, which has a forward end face which constitutes said stop face,
said slider is formed with a longitudinal slot, which has a closed rear end and is open toward said recess and contains said locking member, said plunger and said spring,
said locking member has a wedge-shaped forward end portion having a beveled forward end face and protruding from said slot into said recess, and

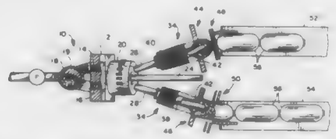
said locking member has a beveled rear end face which is engaged by said plunger and extends at such an angle that said plunger bearing on said rear end face under the force of said spring is arranged to urge said forward end portion of said locking member into said recess.

4,991,259
BUTT MOUNTED RISER HINGE
Burl Finkelstein, and Mel Lehto, both of Newnan, Ga., assignors to Kason Industries, Inc., Shenandoah, Ga.
Filed Aug. 24, 1989, Ser. No. 397,916
Int. Cl.[5] E05F *1/12*
U.S. Cl. 16—312 1 Claim



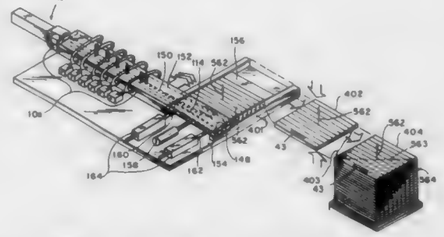
1. In a butt mounted rise hinge of the type having a pair of metallic barrels in which a substantially non-metallic cam assembly is housed, the improvement comprising said cam assembly having a cup-shaped female member that has a cylindrical interior side wall and a floor at least a portion of which is oriented obliquely with respect to said cylindrical side wall; a male member telescopically received in said female member and having a cylindrical side wall and an end at least a portion of which is oriented obliquely with respect to said cylindrical side wall in abutment with said female member floor; said female member floor having a cylindrical passageway therethrough located along the axis of said female member cylindrical sidewall; said male member having a cylindrical passageway therethrough; a metallic pin that extends through said female member floor passageway and said male passageway; a tubular sleeve slidably mounted to one of said barrels; a compression spring mounted in said sleeve operatively compressible between an end of said sleeve and said one barrel; and wherein said pin is threadedly mounted to said other barrel with a head of said pin holding said sleeve in a fixed position relative to said other barrel.

4,991,260
STUFFING METHOD AND APPARATUS
Joseph A. Nausedas, Oak Forest, Ill., assignor to Viskase Corporation, Chicago, Ill.
Continuation of Ser. No. 297,364, Jan. 17, 1989, abandoned. This application Dec. 1, 1989, Ser. No. 442,469
Int. Cl.[5] A22C *21/02, 11/02*
U.S. Cl. 452—35 20 Claims



1. A method of producing encased food products utilizing a stuffing machine having at least three stuffing horns comprising the steps of:
(a) positioning first and second stuffing horns of said machine in a stuffing position with a supply of casing on each wherein the first horn has a shorter casing supply than the second horn;
(b) cycling the flow of a food product to each horn in said stuffing position, first through one of said horns and then through the other to alternately draw forward and stuff casing from the supplies on said first and second horns;
(c) closing the stuffed casing from one of said supplies concurrent with the stuffing of casing from another of said supplies so that the production of encased products alternates between said first and second horns in said stuffing position;
(d) moving the first horn out of the stuffing position when its supply of casing is substantially exhausted;
(e) moving the second horn and its remaining supply of casing from its stuffing position and into the stuffing position vacated by the first horn; and
(f) moving a third horn having a supply of casing into the stuffing position vacated by the second horn.

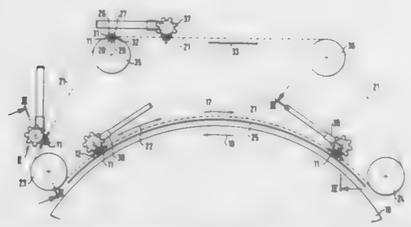
4,991,261
APPARATUS AND PROCESS FOR PNEUMATIC SEGMENTING OF COMPACTED FIBER WADS FOR CONTINUOUS PACKAGE LAYER FORMATION
Joseph E. Koskol, and Louis G. Rosanio, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 14, 1989, Ser. No. 324,532
Int. Cl.[5] B65H *61/00*
U.S. Cl. 19—1 6 Claims



1. A method of separating and forwarding a segment of compacted fibers from an advancing continuous length of compacted fibers, the segment and continuous length remaining connected by an extended length of fibers, comprising the steps of:
(a) advancing the continuous length through a channel;
(b) sensing when the continuous length's leading edge approaches the exit of the channel;
(c) jetting the continuous length with a pressurized fluid at a position spaced from the exit of the channel to separate a segment of compacted fiber from the continuous length forming separated ends of the segment and continuous length;
(d) stopping the jetting before the separated end of the continuous length advances beyond the jetting position; and
(e) sensing the separated end of the segment and applying fluid pressure to the separated end to advance the segment at a rate exceeding the advancing rate of the continuous length to thereby forward the segment away from the continuous length before the separated end of the segment reaches the exit of the channel.

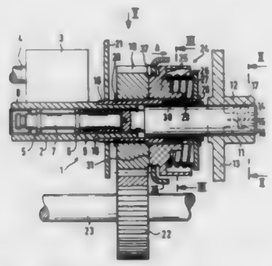
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4,991,262
LUBRICATING DEVICE FOR THE REVOLVING FLAT ARRANGEMENT OF A CARDING MACHINE
Erwin Brun, Dietwil; Peter Schmalz, Hochdorf, and Karl Papp, Ebikon, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland
Filed Oct. 6, 1989, Ser. No. 417,895
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1988, 3834041
Int. Cl.[5] D01G *15/24*; F16N *7/14, 15/02*
U.S. Cl. 19—111 35 Claims



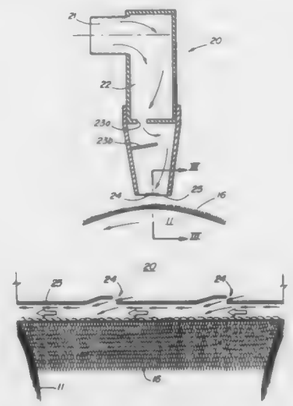
1. A lubricating device for a revolving flat arrangement of a carding machine wherein a respective chain is provided on each side of the carding machine, the chains engaging ends of revolving flats which move in a loop and are guided by stationary guides at least in an area of a card cylinder, with slide surfaces of the flats sliding along the guides, the lubricating device comprising at least one lubricant container and transfer system provided along each side of the revolving flat arrangement, the transfer system including a rotatable transfer element associated with the respective lubricant container and which contacts both lubricant and the slide surfaces for providing metered lubrication of the slide surfaces and a gear wheel driving the transfer element, the gear wheel being driven by a respective one of the chains, the revolving flats having internal and external slide surfaces at opposite ends thereof, one of the lubricant containers and transfer systems being provided for the internal slide surfaces and another of the lubricant containers and transfer systems being provided for the external slide surfaces, respectively.

4,991,263
SPINNING MACHINE DRAFTING UNIT ARRANGEMENT
Fritz Stahlecker, 7347 Bad Überkingen, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest
Filed Dec. 22, 1989, Ser. No. 455,187
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1988, 3844072
Int. Cl.[5] D01H *5/74*
U.S. Cl. 19—258 31 Claims



25. A bottom drafting roller for a sliver drafting arrangement of the type having a plurality of drafting units each including several top rollers and bottom rollers, said bottom drafting roller being formed as a hollow drafting roller body mountable on a stationary shaft and bearing means for rotatably drivably supporting said roller body on the stationary shaft.

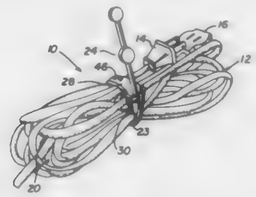
4,991,264
APPARATUS AND METHOD FOR USE IN-LINE WITH A CARD TO ENHANCE TENSILE STRENGTH IN NONWOVEN MATERIALS
John M. Greenway, Westwood, Mass., and Robert F. Hammann, North Smithfield, R.I., assignors to International Paper Company, Purchase, N.Y.
Filed Jan. 16, 1990, Ser. No. 466,088
Int. Cl.[5] D04H *1/70*
U.S. Cl. 19—296 20 Claims



1. A method for reorienting fibers in a carded nonwoven web of staple fibers, the web including machine and cross directions respectively corresponding to longitudinal and transverse web axes, comprising the steps of:
(a) supporting the fibers on a surface of a rotatable support cylinder such that the ends of said fibers are predominantly substantially radially outwardly oriented; and
(b) impacting the radially outwardly oriented portions of said fibers while supported on said rotatable cylinder with a uniform air flow which is not parallel to said machine direction to effect reorientation of said radially outwardly oriented portions of said fibers predominantly in the cross direction, said air flow having sufficient energy to reorient the fibers without displacing the fibers on the support cylinder.

4,991,265
CORD TIE DEVICE
Donald E. Campbell; Suzanne R. Darling, and Kristian R. Darling, all of Reno, Nev., assignors to Best Shot, Sparks, Nev.
Filed Nov. 20, 1989, Ser. No. 438,172
Int. Cl.[5] B65D *63/00*; F16G *11/00*
U.S. Cl. 24—16 PB 20 Claims

1. A cord tie device for retaining an elongated cord in a relatively neat and compact storage configuration, said tie device comprising:
an elongated strap including a plurality of relatively flexible and resilient strap segments separated by a plurality of enlarged and relatively stiff lock members; and
a head at one end of said strap, said head having a base member joined to a pair of wing members projecting outwardly from said base member and being folded over said base member and extending toward each other in spaced relation with said base member and terminating in free ends spaced from each other to define a slot having sufficient width to receive one of said strap segments, said base member and said wing members cooperatively defining an open-ended lock pocket having a relatively wide open end for removable reception of a selected one of said lock members, said lock pocket defining a pocket profile narrowing from said open end to a size smaller than the profile of said one lock member, said one lock member being receivable into said lock pocket by drawing said strap under tension about the cord and seating said one lock member into said lock pocket while said strap is maintained under tension, said open end of lock pocket opening in a direction generally toward said strap such that tension on said strap draws said one lock member into said lock pocket.

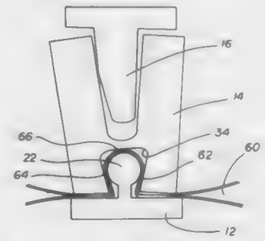


4,991,266
MECHANICAL INTERLOCK FOR OPEN CLAMP STRUCTURES
Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker AG Maschinen- und Apparatefabrik, Horgen, Switzerland
Filed Dec. 17, 1986, Ser. No. 942,695
Int. Cl.[5] F16L *33/02*
U.S. Cl. 24—20 R 18 Claims



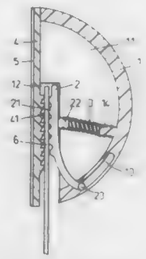
1. A mechanical connection for an open clamp structure which includes a metal clamping band having an outer band portion and an inner band portion, intended to mutually overlap in the closed condition of the clamp structure, the inner band portion being provided in the area near its end at least with an outwardly extending combined guide and support hook means punched-out of the inner band portion with inclined guide and support surface means formed by its rear edge facing away from the free end of the inner band portion and adapted to engage in a complementary aperture means provided in the outer band portion in the area near its end so as to guide the two band portions toward one another when closing the clamp structure and absorb circumferentially directed forces during the closing operation, characterized in that the rear edge forming the inclined guide and support surface means is non-reticular with a concavely curved portion adjoined rearwardly thereof by a convexly curved portion, as viewed in the axial direction of the clamp structure in side view thereof, so that the service life of the punching die used in punching-out the combined guide and support hook means is lengthened and the assembly of the clamp structure on an object to be fastened thereby is facilitated.

4,991,267
CLAMP FOR FLEXIBLE BAG
Curtis R. Apperson, Green Oaks, Ill.; Richard Finger, Metairie, La., and Robert A. Weisenbach, Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 8, 1990, Ser. No. 521,216
Int. Cl.[5] B65D *77/10*
U.S. Cl. 24—30.5 R 7 Claims



1. A clamp for sealingly dividing a flexible bag, said clamp comprising:
a sealing member having a longitudinal sealing surface;
a center member having a first face having a pair of longitudinally extending arms formed by a longitudinally extending undercut channel, said channel matingly engageable with said sealing surface and said flexible bag, and a second opposite face having a longitudinal groove;
a locking member having a longitudinal wedge engageable in said groove so as to inwardly deflect said arms so as to lock around said engaged sealing surface and flexible bag;
and means for pivotably joining said sealing member, said center member and said locking member.

4,991,268
MEMO CLIP
Ming-Chuan Ho, No. 83, Lane 43, Ming Chuan Rd., Kuei Jen Hsiang, Tainan Hsien, Taiwan
Filed May 30, 1990, Ser. No. 530,321
Int. Cl.[5] B42F *1/00*
U.S. Cl. 24—67.3 2 Claims

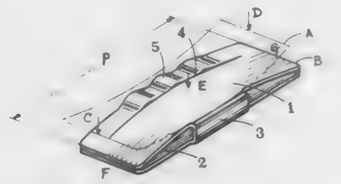


1. An improved memo clip comprising:
a main body having a concavity at its inner bottom, two grooves at two sides, two notches at two sides and a bolt at its concavity;
a pressing plate having several obtuse teeth on top portion, a bolt at its back and two lugs at its two bottom ends;
a back plate having a saw teeth plate;
a spring; and is characteristized by said spring has one end connected with said bolt of said pressing plate and the other end with said bolt of said main body to push said pressing plate against said back plate; and said two lugs placed in said two notches of said main body so that when paper is sticked into said memo clip, said two lugs will be

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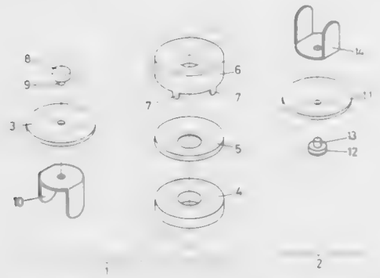
forced to slide backward and said spring will be forced to squeeze to let paper in and stay firmly.

4,991,269
CLIP
Akitada Kuroda, 2-13-4 Mitake Togo-Cho, Aichi-Gun, Aichi-Ken, Japan 470-01
Filed Mar. 13, 1987, Ser. No. 25,758
Int. Cl.[5] B42F *1/00*
U.S. Cl. 24—67.11 **3 Claims**



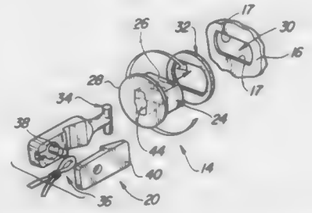
1. A spring clip comprising:
a holding portion (No. 1) made from resilient strip with at least one slit therein and at least one stamped portion near said slits, permitting turn over motion thereof;
a holding portion (No. 2) opposed to said holding portion (No. 1);
and a side wall portion which extends substantially parallel to said slits bridging the sides of said holding portion (No. 1) and a holding portion (No. 2), edges of said holding portion (No. 1) being turned inwardly when holding sheets and turned outwardly when releasing sheets.

4,991,270
MAGNETIC LOCK CLOSURE
Yoshihiro Aoki, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan
Filed Dec. 29, 1988, Ser. No. 291,786
Claims priority, application Japan, Jan. 27, 1988, 63-16302
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—303 **5 Claims**



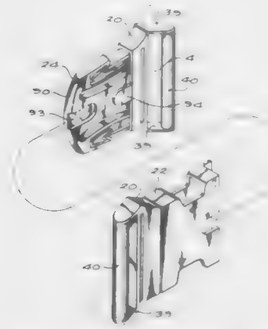
1. A magnetic lock closure device comprising first means for providing a magnetic attracting action and second means for being magnetically attracted by the first means, the first means having a first disk-like plate of a ferromagnetic material and a uniform-thickness annular permanent magnet having a central bore therethrough and placed on the first disk-like plate, the first disk-like plate having a first ferromagnetic rod at the center extending partially into the central bore through the permanent magnet and the second means having a second disk-like plate of a ferromagnetic material having a second ferromagnetic rod at the center extending partially into the central bore through the permanent magnet when the first and second means are to be coupled together, wherein said first means includes:
an annular ferromagnetic member having an inner surface in full contact with said annular permanent magnet and having a central bore connected to the central bore of the permanent magnet and having an increasing thickness in the direction extending outwardly from said central bore of said annular ferromagnetic member only to the outer peripheral edge of said annular permanent magnet to form a concave outer surface on the side remote from said permanent magnet;
said first ferromagnetic rod including a first base portion extending through said first disk-like plate;
first fastening means firmly held by said first base portion of said first ferromagnetic rod; and
nonmagnetic means for enveloping the peripheral edges of said first ferromagnetic disk-like plate, and said annular permanent magnet and the peripheral edge and concave surface of said annular ferromagnetic member; and wherein the second means further includes:
said second disk-like plate having an outwardly protruding surface on one side thereof and a depressed surface on the other side, said outwardly protruding surface being complementary in shape to and adapted to engage said nonmagnetic means covering the concave surface of said annular ferromagnetic member on said permanent magnet when said first and second means are to be coupled together;
said second ferromagnetic rod extending from said outwardly protruding surface of said second disk-like plate and including a second base portion extending through said second disk-like plate; and
second fastening means firmly held by said second base portion of said second ferromagnetic rod.

4,991,271
ANCHORAGE DEVICE
David J. Bauer, West Bloomfield, and Anthony J. DiSalvo, Allen Park, both of Mich., assignors to Tip Engineering Group, Inc., Farmington Hills, Mich.
Continuation of Ser. No. 170,994, Mar. 21, 1988, abandoned.
This application Dec. 1, 1989, Ser. No. 449,504
Int. Cl.[5] F16B *21/02*
U.S. Cl. 24—590 **2 Claims**



1. An anchorage for providing a securement feature for an internal space of an automobile body defined in part by a body panel, comprising:
an anchor base piece having a solid plug portion and a radially outward extending flange portion formed on one end thereof, said plug portion being oblong shaped in section with flattened sides on either side thereof;
an hole formed in a portion of said body panel defining in part said body internal space, said hole being shaped to be fit to receive said plug portion with said plug rotated into alignment therewith;
a compressible seal received about said plug portion and interposed between said flange portion and said body panel portion said flange portion being sufficiently stiff to be able to substantially compress said seal against said body panel portion;
a pair of circumferentially extending grooves formed into the periphery of said plug portion adjacent said flange portion, extending tangentially from either flattened side to accommodate limited rotation of said plug portion in said hole by the edge of said hole being received thereinto to secure said anchor base piece to said body panel portion, each of said pair of grooves being of greater axial width than the thickness of said body panel portion but substantially less than the combined thickness of said panel and said uncompressed seal;
an anchoring feature formed on said anchor base piece enabling securement of an item thereto, said anchoring feature comprises a keying bore formed in said anchor base piece, comprised of
a blade shaped entrance portion extending axially inward from the flange portion and arcuate recesses formed axially inwardly from said entrance portion and extending radially from said entrance portion, said keying bore adapted to receive a tee shaped piece having ends able to be rotated into said recesses to be anchored thereto.

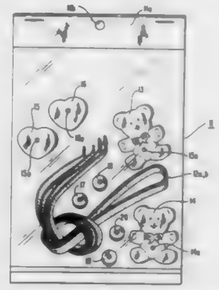
4,991,272
QUICK RELEASE BUCKLE
John E. Bianchi, 100 Calle Cortez, Temecula, Calif. 92390
Filed Aug. 9, 1988, Ser. No. 230,309
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—616 **3 Claims**



1. In a receptacle and clasp assembly comprising a hollow receptacle having an open end, a clasp receivable in said receptacle through its open end, and means for releasably latching said clasp within said receptacle, the improvement comprising
a pair of separate substantially identical bases;
and means for permanently latching one of said bases to either said receptacle or said clasp comprising:
interengageable channel and connection bar means on said bases on the one hand and on said receptacle and said clasp on the other hand and
interengageable ratchet joint elements on said bases on the one hand and on said receptacle and said clasp on the other hand;
said ratchet joint elements, when interengaged, being located entirely within said channels, and being inaccessible from the exterior thereof.

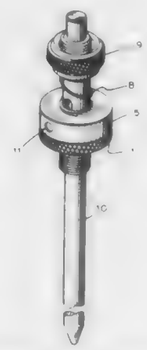
4,991,273
SHOELACE FASTENINGS, AND SHOES AND SNEAKERS INCLUDING THE SAME
Carolyn J. Huttle, 78 Southview Dr., Berkeley Heights, N.J. 07922
Filed Jul. 24, 1989, Ser. No. 383,605
Int. Cl.[5] A43C *1/00*
U.S. Cl. 24—712.1 **3 Claims**

1. A kit comprising decorative fastening means for laces in shoes in combination with an elastic shoelace having two ends;
said fastening means comprising a rigid flat member having substantially parallel surfaces;
at least one opening drilled through the thickness of said flat member for accommodating the ends of said lace threaded through said openings in opposite directions;
a pair of ring-shaped members contructed to be disposed in spaced-apart relation from opposite ends of said openings for accommodating the ends of said shoelaces threaded



through said openings in opposite directions for knotting or otherwise securing around said ring-shaped members, wherein said rigid flat member and said pair of ring-shaped members are constructed to be disposed as ornamentation against the upper surface of said shoes.

4,991,274
TOOL HOLDER FOR BURNISHING CUTTER
Ray Fortier, 148L LaBonne Vle Dr. West, East Patchogue, N.Y. 11772, and Joseph V. Roebuck, P.O. Box 681, Middle Island, N.Y. 11953
Filed Dec. 19, 1988, Ser. No. 285,711
Int. Cl.[5] B41C *1/045*; **B24B** *39/00*
U.S. Cl. 29—90.01 **1 Claim**



1. A flexible tool holder for a burnishing cutter, comprising
a main body arranged to be attached to a rotatable member of an engraving machine and having a rotary axis;
a tool holding element arranged to be connected with a cutting tool and movable relative to said main body in an axial direction;
spring means arranged to force said tool holding element downwardly, so that during burnishing said tool holding element together with the cutting tool connected therewith moves up and down in response to surface irregularities of an engraving material;
said main body is machined as a tubular member so that the cutting tool can pass through an interior of said main body, said tool holding element being machined as a ring having a central opening for fitting on said main body and a side hole for passing a tool fixing member, said main body having at least one hole which can be brought in

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alignment with said hole of said tool holding element so that the tool fixing member can also pass through the hole of the main body;

said main body having means for threadably attaching to said rotatable member at the lower end of said main body;

an adjusting means for adjusting a tension of said spring means, said spring means being located between said adjusting means and said movable tool holding element, said adjusting means being located at the opposite, upper end of said main body with respect to said lower end of said main body.

4,991,275

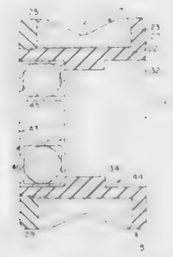
ROLLER ASSEMBLY

James H. Adams, Sr., Rochester, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 262,757, Oct. 26, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 481,651

Int. Cl.[5] B21B *27/00*

U.S. Cl. 29—123 **1 Claim**



1. A roller assembly of the type including a pair of bearings at either end thereof for journaling a roller for rotation about a longitudinal axis, said roller assembly comprising a ceramic member having an annular shape about the axis of rotation, said ceramic member having a first and a second end surface, said first and said second end surfaces being substantially flat and extending substantially perpendicular to the longitudinal axis, said ceramic member having an outwardly facing surface facing away from the longitudinal axis and an inwardly facing surface facing toward the longitudinal axis, said outwardly facing surface and said inwardly facing surface extending between said first and said second end surfaces, said outwardly facing surface joining said first end surface and joining said second end surface, a first chamfer and a second chamfer, said first chamfer being at the juncture of said first end surface and said outwardly facing surface, said second chamfer being at the juncture of said second end surface and said outwardly facing surface, said chamfers extend entirely around the periphery of said outwardly facing surface, a first and a second metal end flange, said first end flange including a first depression therein matching the contour of said first chamfer, said second flange including a second depression therein matching the contour of said second chamfer, said first flange including an arbor extending along the longitudinal axis inwardly of said inwardly facing surface, said arbor threadingly engaging said second flange, said first flange engaging said first chamfer, said second flange engaging said second chamfer, said threading engagement of said arbor with said second flange holding the ceramic member under a compressive force at said respective chamfers whereby said force extends both in an axial and in a radial direction, a first and second bearing assemblies, said first bearing assembly being journaled in said first flange and said second bearing assembly being journaled in said second flange.

4,991,276

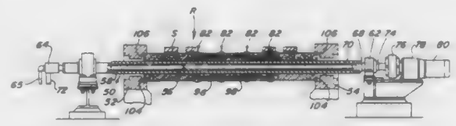
FLEXIBLE CONVEYANCE AND GUIDANCE ROLLER FOR USE IN METALWORKING FURNACE STRUCTURES

Francis H. Bricmont, McMurray, Pa., assignor to Bricmanage, Inc., McMurray, Pa.

Filed Jul. 31, 1989, Ser. No. 387,141

Int. Cl.[5] B21B *31/08*

U.S. Cl. 29—124 **16 Claims**



1. Roller apparatus for conveying and guiding a workpiece through a heating furnace, said apparatus comprising:

arbor means;

bearing means for rotatably supporting opposite ends of said arbor means;

wheel means spaced along the length of and secured externally to said arbor means, radially outermost surfaces of said wheel means serving to support a workpiece during conveyance thereof through said heating furnace, said wheel means including a base means joined by web portions to a rim means, said web portions being separated by openings for reducing the cross sectional area of said web means to impede the heat flow from said rim means to said base means, said base means including a plurality of angularly spaced base members, said base members each comprising a toe portion and a head portion;

weld metal connecting only said toe portions to said arbor means for permitting said head portions to slide relative to said arbor means in response to differential expansion and bending of said arbor means;

means for thermally insulating said arbor means, said means for thermally insulating substantially covering all portions of said arbor means between adjacent ones of said wheel means and between said wheel means and wall portions of said furnace; and

means for rotating said arbor means.

4,991,277

SYSTEM FOR MANUFACTURING SPRINGS

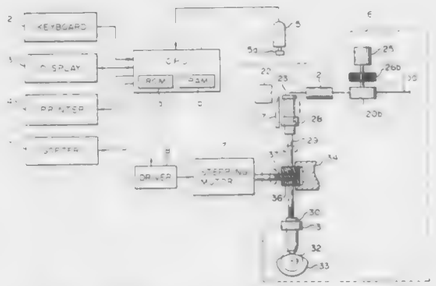
Reijiro Itaya, Tokyo, Japan, assignor to Kabushiki Kaisha Itaya Seisaku Sho, Tokyo, Japan

Continuation of Ser. No. 150,974, Feb. 1, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 442,417

Claims priority, application Japan, Feb. 20, 1987, 62-35840

Int. Cl.[5] B21F *35/00*

U.S. Cl. 29—173 **8 Claims**



1. A spring manufacturing system for producing springs having a desired free length, comprising:

feeding means for feeding a wire;

a coiling point means situated in the direction of feed for being contacted by the wire to forcibly bend the wire in a predetermine direction;

a pitch tool means reciprocating in a direction substantially perpendicular to a plane in which the wire is being bent for thrusting into contact with the wire by a set amount of thrusting motion such as to form a coil pitch in the wire, related to said desired free length, as the wire is being bent continuously by said coiling point means, said pitch tool means including a rod having at its one end a pitch tool adapted to engage said wire, and at its other end means to reciprocate said rod along said direction;

severing means for severing the wire in synchronization with the reciprocating motion of said pitch tool means;

means for selectively setting a control variable to one of a plurality of values, and generating a predetermined control signal related to the value of the control variable;

detecting means for detecting, for a particular spring, the amount of difference between an actual free length of a manufactured spring and the desired free length, and for generating a difference signal related thereto;

means for combining said predetermined control signal and said difference signal corresponding to said particular spring to generate a feedback signal;

manufacturing means for (a) manufacturing springs in a plurality of pre-manufacturing operation involving respectively producing a predetermined number of springs for each of said plurality of values of said control variable, and (b) thereafter manufacturing springs in a manufacturing operation based on an optimum value of said control variable obtained by said pre-manufacturing operation, said manufacturing means including adjusting means for adjusting a set amount of thrusting motion of said pitch tool means in accordance with said feedback signal, said adjusting measn including means to vary the length of said rod extending between said pitch tool and said reciprocating means to vary the distance therebetween for manufacturing a subsequent spring; and

analyzing measn responsive to said difference signal for identifying said optimum value of said control variable in accordance with a distribution of actual free lengths of the springs manufactured by said pre-manufacturing operation on the basis of each of said plurality of values of said control variable, and for providing said optimum value of the control variable to said manufacturing means for use in said manufacturing operation.

4,991,278

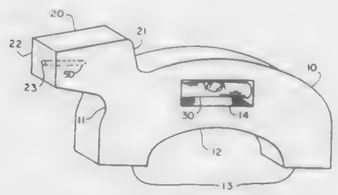
DEVICE FOR HANGING AND LEVELING WALL HANGINGS

Henry E. Hendrix, No. 3 Girard St., Fort Smith, Ark. 72901

Continuation of Ser. No. 267,931, Nov. 7, 1988, abandoned. This application Dec. 8, 1989, Ser. No. 449,083

Int. Cl.[5] B25B *27/20*

U.S. Cl. 29—278 **7 Claims**



1. A device for securing and leveling wall hangings to a wall, comprising a main body portion to be held in the palm and fingers of a user, the main body portion having two legs separated by a central cut-out portion of sufficient size to allow the user's fingers to fit between said legs, said legs defining a planar bottom surface and said main body portion containing a level indicating means disposed parallel to said bottom surface, and further comprising a head portion integrally connected to said main body portion by an upper cut-out portion therebetween and upwardly and outwardly extended from said upper cut-out portion, an elongated pin holding aperture disposed parallel to said bottom surface and defined within said head portion, said aperture has an open end to temporarily recieve a pin, a closed end positioned within said head portion, and a retaining means located therein at said closed end to temporarily abut one end of said pin when said pin is hand pressed into the wall hanging by exerting pressure against the device, and further such that said pin will be left in the wall hanging upon removal of the device.

4,991,279

CLAMPING ARRANGEMENT

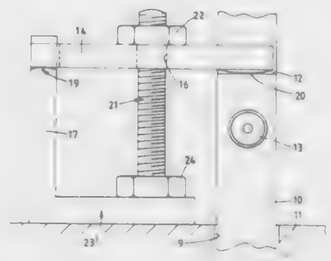
David J. Gaskell, Suffolk, Great Britain, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Dec. 5, 1988, Ser. No. 280,121

Claims priority, application United Kingdom, Dec. 5, 1987, 8728451

Int. Cl.[5] B23Q *1/00*

U.S. Cl. 29—281.1 **3 Claims**



1. A clamp for use when clamping a fuel injection nozzle within a bore of the cylinder head of an engine, comprising; an elongated beam element having forks at one end, said forks engageable with steps on the nozzle, an opposite end of said beam element engageable with a reaction member, said beam element having an aperture intermediate its ends, said reaction member being inclined to the longitudinal axis of the nozzle, a threaded member disposed in said aperture, said threaded member being engageable with the cylinder head, said beam element being formed from strip material and dimensioned so that an axial force applied to the nozzle is limited by elastic deformation of said beam element.

4,991,280

METHOD FOR REPLACING BOLTS ON CORE COMPONENTS IN NUCLEAR REACTORS

Gerd Reimer, Hoechstadt/Aisch; Reinhardt Strobel, Nuremberg; Lothar Werres, Langensendelbach; Alfred Gerstenhoefer, Nuremberg; Theo Kaeufl, Breitenbrunn; Anton Kautetzky, Forchheim, and Ulrich Krippner, Vincenzenbronn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1989, Ser. No. 389,068

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826400

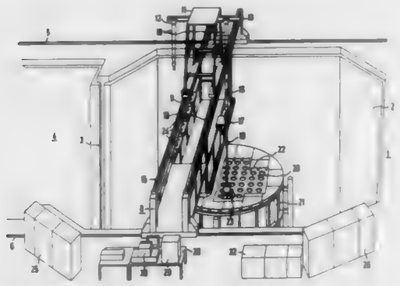
Int. Cl.[5] B23P *6/00, 19/04*

U.S. Cl. 29—402.06 **14 Claims**

1. Method for replacing a bolt in an installation site of a core component with two sides in a nuclear reactor, the bolt having a first end with a bolt head at one side of the core component and a second end with a screw thread and a nut secured to the screw thread at the other side of the core component, which comprises

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(a) machining away the second bolt end and the nut with an electroerosion machine to obtain a remaining bolt piece,
(b) catching machined-away bolt material with a filter for removing the machined-away bolt material,



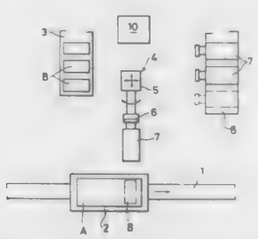
(c) subsequently ejecting the remaining bolt piece from the core component with a closed force system,
(d) re-machining the installation site of the bolt, and
(e) subsequently inserting a new bolt.

4,991,281

METHOD OF MODIFICATION OF PRODUCTION LINE APPARATUS

Yuzi Ikeda, and Ryo Niikawa, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,575
Claims priority, application Japan, Jun. 3, 1988, 63-135620
Int. Cl.[5] G05B *13/00*
U.S. Cl. 29—401.1 1 Claim



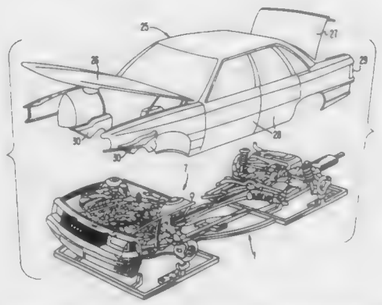
1. A method for modifying an existing production line apparatus for adaptation to a new type of workpiece, said apparatus comprising a standarized general-purpose member and a first special-purpose member which is exchangeable according to the type of workpiece to be handled, said method comprising the steps of:
(a) preparing, at a location other than a production line, a master apparatus standardized general-purpose member which is mechanically identical with the existing production line apparatus standardized general-purpose member;
(b) manufacturing a second special-purpose member that includes a memory means, and is compatible with a new type of workpiece;
(c) attaching said second special-purpose member to said master apparatus standardized general-purpose member and performing a trial operation;
(d) preparing programming data from said trail operation necessary for operating said second special-purpose member, said data including teaching data for the existing production line apparatus standardized general-purpose member;
(e) storing said programming data in said second special-purpose member memory means during said trial operation;
(f) detaching said second special-purpose member from said master apparatus standardized general-purpose member and exchanging said second special-purpose member with said first special-purpose member on said existing production line apparatus standardized general-purpose member; and
(g) operating the existing production line apparatus, having now incorporated said second special-purpose member, according to said programming data stored in said second special-purpose member memory means without further trail operation.

4,991,282

PROCESS FOR ASSEMBLING VEHICLES

Helmut Konig, Ingolstadt, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

Continuation of Ser. No. 212,834, Aug. 8, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 511,937
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603709
Int. Cl.[5] B23Q *17/00*
U.S. Cl. 29—407 4 Claims



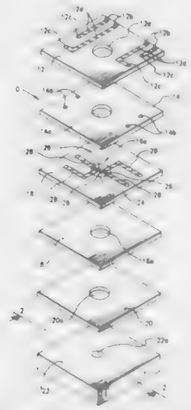
1. A method of assembling a vehicle having an integral body and components and subassemblies fastened to said integral body comprising:
positioning said components and subassemblies in their final positions relative to each other on an assembly frame;
interconnecting selected numbers of said components and subassemblies positioned on said assembly frame into operable conditions;
conducting operational tests on selected numbers of said components and subassemblies positioned on said assembly frame unimpeded by said integral body;
mixing required adjustments to selected numbers of said components and subassemblies positioned on said assembly frame unimpeded by said integral body;
vertically aligning said integral body and said assembly frame with said assembly frame disposed beneath said integral body;
displacing said integral body and said assembly frame vertically together to position said components and subassemblies in their final positions relative to said integral body;
fastening selected numbers of said components and subassemblies on said assembly frame onto said integral body; and
removing said assembly frame from beneath said integral body whereby said components and subassemblies will be fastened to said integral body in operative conditions.

4,991,283

SENSOR ELEMENTS IN MULTILAYER CERAMIC TAPE STRUCTURES

Gary W. Johnson, 14351 Miro Ct., Irvine, Calif. 92714, and William A. Vitriol, 1505 W. Rene Dr., Anaheim, Calif. 92802

Filed Nov. 27, 1989, Ser. No. 441,589
Int. Cl.[5] G01R *3/00*
U.S. Cl. 29—595 27 Claims



1. A method for fabricating a sensor structure comprising the steps of:
(a) providing a plurality of ceramic sheets, with at least one of said sheets being a thermally fusible ceramic tape sheet;
(b) configuring said fusible ceramic tape sheet so that at least one part thereof constitutes a sensor element;
(c) laminating the sheets together so that said fusible tape sheet has at least one of said ceramic sheets positioned above or positioned beneath it;
(d) heating the laminated structure to fuse the sheets into a sintered unitary ceramic structure;
the method further including between steps (a) and step (c), the steps of:
(e) attaching sensing means to the sensor element for producing an electrical signal in response to a physical, electrical or chemical change in the sensor element, and
(f) forming a metallization pattern of at least one electrically conductive member on at least one selected ceramic sheet other than said fusible ceramic tape sheet, said conductive member being configured to make electrical contact with said sensor element on said fusible tape sheet and to pass the electrical signal from said sensor element to one or more interconnect pads on the peripheral surface of said laminated ceramic structures.

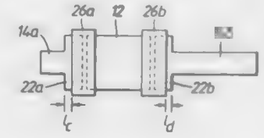
4,991,284

METHOD FOR MANUFACTURING THICK FILM CIRCUIT BOARD DEVICE

Shiro Ezaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 127,169, Dec. 1, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,903
Claims priority, application Japan, Dec. 3, 1986, 61-288102
Int. Cl.[5] H01L *17/06*
U.S. Cl. 29—620 11 Claims

1. A method for manufacturing a thick film circuit board device and monitoring the manufacture thereof, comprising the steps of:
forming a resistive layer in a prescribed pattern on an insulative base board;
forming a first conductive layer on the insulative base board adjacent to the resistive layer with a gap of predetermined width therebetween;
forming a second conductive layer in the gap and overlapping a portion of the resistive layer and the first conductive layer for establishing electrical contact between the resistive layer and the first conductive layer;
determining the alignment between said resistive layer and said first conductive layer by comparing the relative position of said resistive layer to adjacent portions of said first conductive layer;
determining the alignment between said first conductive layer and said second conductive layer by comparing the overlap of adjacent land portions of said first conductive layer and said second conductive layer;
wherein the alignment between said resistive layer and said first conductive layer is determined by comparing a gap



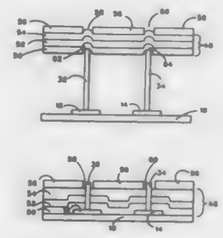
between an edge of said resistive layer and a first adjacent land portion of said first conductive layer with a gap between the opposite edge of said resistive layer and a second adjacent land portion of said first conductive layer, and
wherein the alignment between said first conductive layer and said second conductive layer is determined by comparing a length between an exposed edge of said first land portion of said first conductive layer and an adjacent parallel edge of a first portion of said second conductive layer overlapping both an end of a portion of said resistive layer and said first land portion, with a length between an exposed edge of said second land portion of said first conductive layer and an adjacent parallel edge of a second portion of said second conductive layer overlapping both the opposite end of said portion of said resistive layer and said second land portion.

4,991,285

METHOD OF FABRICATING MULTI-LAYER BOARD

Joseph M. Shaheen, La Habra, and John Simone, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 17, 1989, Ser. No. 437,879
Int. Cl.[5] H05K *3/36*
U.S. Cl. 29—830 12 Claims



1. A method of fabricating a multi-layer board, comprising the steps of:
fabricating a plurality of conductive posts on a first non-conductive layer;
aligning a template over the posts, the template including a

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plurality of holes extending therethrough, such that each of the posts lies beneath a hole in the template;

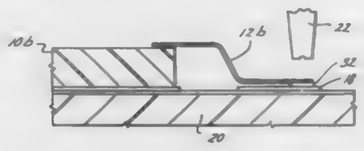
compressing a second non-conductive layer between the first non-conductive layer and the template with a force sufficient to drive the posts through the second non-conductive layer.

4,991,286

METHOD FOR REPLACING DEFECTIVE ELECTRONIC COMPONENTS

Alexander J. Russo, Cedar Park; Daniel M. Andrews, and Gregory E. Pitts, both of Austin, all of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Dec. 20, 1989, Ser. No. 453,726
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 7 Claims



1. A method of replacing a defective electronic component having a plurality of electrical leads bonded to electrical contacts of a support comprising,

cutting the electrical leads adjacent the bonds of the leads to the contacts leaving a stub bonded to each contact,

rebonding the stubs to the contacts,

replacing the defective component with a replacement electronic component having electrical leads, and

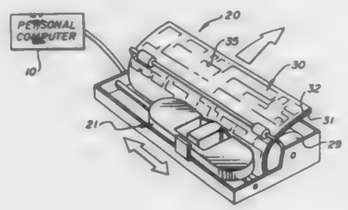
bonding the electrical leads of the replacement component to the electrical contacts of the support.

4,991,287

METHOD FOR FABRICATING PRINTED CIRCUIT BOARDS

Michael J. Piatt, Enon; Mark E. Brown, West Carrollton, and Michael A. Walters, Kettering, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1989, Ser. No. 456,432
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 3 Claims



1. A process for fabricating a printed circuit board comprising the steps of:

(a) producing, in a memory device, data representative in a raster-scan printing format of a designed area circuit pattern;

(b) under the control of such data, printing a mask pattern, corresponding to said circuit pattern, onto the metal surface of a metal coated dielectric substrate by:

(1) feeding said sheet on a print platen so that successive lines of its metal surface pass through a print zone;

(2) traversing a thermal print head across the print zone to address successive lines of the metal surface then at the print zone;

(3) supplying a solder coated support ribbon between the print head and said substrate so that the solder contacts such metal surface; and

(4) energizing the thermal print head during each traverse in accord with the raster-scan data whereby solder is transferred onto said metal surface selectively to form said mask pattern; and

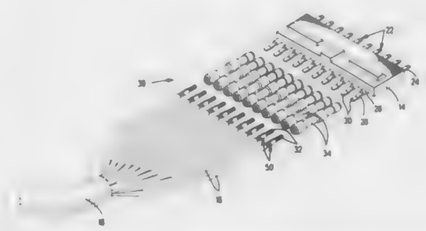
(c) etching said substrate to remove unmasked portions of said metal layer.

4,991,288

METHOD OF TERMINATING AN ELECTRICAL CONDUCTOR WIRE

James P. Scholz, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1989, Ser. No. 415,164
Int. Cl.[5] H01R *43/02*
U.S. Cl. 29—854 4 Claims



1. A method of joining first and second electrical conductor means, comprising the steps of:

providing a current source for generating a constant amplitude high frequency alternating current of known frequency;

preparing first and second termination sections of said first and second conductor means by exposing respective conductive portions thereof to be joined together and exposing an adjacent portion of said conductive portion of said conductor means spaced rearwardly from said first termination section;

forming a heater member having a length sufficient to extend around the circumference of said adjacent exposed portion, from a bimetallic heater means including a first layer of a first metal having low electrical resistance and minimal magnetic permeability and deposited on a major surface thereof a second layer of a second metal having a known Curie temperature, high electrical resistance and high magnetic permeability, said second layer having a thickness approximately equal to one skin depth of said second metal, given said known frequency;

wrapping said heater member around said adjacent exposed portion at a location spaced rearwardly from said first termination section and crimping said heater member to said adjacent exposed portion, thereby establishing an assured thermal connection therebetween;

selecting solder material having a nominal melting temperature slightly less than the Curie temperature of said second metal and selecting heat recoverable tubing of dielectric material having a nominal shrinking temperature slightly less than the Curie temperature of said second metal;

positioning said first and second termination sections together in paired, adjacent and coextending relationship, placing a preform of said solder material containing flux therefor at least adjacent said first and second termination sections, and placing a length of said heat recoverable tubing of sufficient diameter around said solder preform and said first and second termination sections, and enclosing said heater member and all exposed conductive portions of said first and second conductor means and at least insulated portions thereof with said tubing, thereby defining a pretermination assembly;

disposing said pretermination assembly within a coil of said current source and generating said constant amplitude high frequency alternating current in said heater member for a selected length of time,

thereby generating a current in said heater member, and thereby generating thermal energy such that the Curie temperature of said second metal is achieved and maintained, transmitting the thermal energy to said solder preform, thereby melting said solder preform, and forming an assured joint between said first and second termination sections, and transmitting the thermal energy to said tubing, and thereby shrinking said tubing such that said tubing conforms to outwardly facing surfaces of said joined first and second termination sections and tightly engages the insulated portions of both conductor means, thereby covering and completely surrounding the joint and all exposed conductive portions and the heater member with said dielectric material.

4,991,289

CRIMPING DIE AND CRIMPED ELECTRICAL CONNECTION THEREFROM

Jay L. French, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 23, 1989, Ser. No. 370,922
Int. Cl.[5] H01R *43/04*; B23P *19/00*
U.S. Cl. 29—863 7 Claims



1. A method for crimping a terminal member whereby an annular recess is formed, the method comprising the steps of:

selecting a pair of die members adapted to cooperate with each other member when positioned in opposing relationship therewith along a crimping axis, said two die members being reciprocally movable relative to each other along said axis during a stroke to apply crimping force to said electrical connection, each of said die members having an essentially hemispheric concave crimping surface with a selected desired radius so that upon completion of the crimping portion of a stroke, a symmetrical essentially cylindrical recess is defined having an axis orthogonal to said crimping axis; each of said die members further including a bifurcated plate section extending integrally from said crimping surface, said plate section having major surfaces facing along said recess axis and said plate section including edge surfaces defining a slot having an axis parallel to said cylindrical recess axis and having a bottom defined by said crimping surface, said edge surfaces extending initially tangentially outwardly from sides of said crimping surface, said plate sections of said opposing die members being parallel to each other and offset from each other along said cylindrical recess axis so that portions thereof pass by each other during a said stroke;

positioning a terminal member having an outer diameter at least larger than the diameter of said cylindrical recess and having a wire inserted therein between said opposing die members and parallel to said cylindrical recess axis; and

urging said opposing die members together along said crimping axis until said crimping stroke is completed and said crimping surfaces define a crimped electrical connection cylindrical in shape and having a diameter equal to said cylindrical recess diameter; whereby

an annular recess is formed in said crimped terminal.

4. A die set for crimping an electrical connection of a contact terminal member to an electrical conductor, each said die member being adapted to cooperate with the other die member when positioned in opposing relationship therewith along a crimping axis, said two die members being opposed and being reciprocally movable relative to each other along said axis during a stroke to apply crimping force to said electrical connection, comprising:

each said die member having a base section including an anvil extending from said base section and defining an essentially hemispheric concave crimping surface having a selected desired radius, said anvils being opposed so that upon completion of the crimping portion of a stroke, a symmetrical essentially cylindrical recess is defined having an axis orthogonal to said crimping axis, said cylindrical recess axis having a selected length, and each said anvil having a first portion along a first half of said recess axis and a second portion along a second half thereof;

each said die member further including a bifurcated plate section extending integrally from said first portion of said anvil normal to said recess axis, said plate section having major surfaces facing along said recess axis and said plate section including edge surfaces defining a slot having an axis parallel to said cylindrical recess axis and having a bottom defined by said crimping surface of said anvil, said edge surfaces extending initially tangentially outwardly from sides of said crimping surface, said plate sections of said opposing die members being parallel to each other and offset from each other along said cylindrical recess axis so that portions thereof pass by each other during a said stroke;

each said second anvil portion comprising a pedestal extending to said crimping surface from said base section and having generally vertical side surfaces, and said edge surfaces of said plate section of each said die member being divergent thereby receiving therebetween said second portion of said anvil of the other said die member; and

said die members including cooperating means to stop said crimping stroke upon completion of the crimping portion of said stroke, whereby

when a said contact terminal member with an outer diameter at least larger than the diameter of said cylindrical recess and having a conductor inserted therein, is placed between said opposing die members and parallel to said cylindrical recess axis, and said opposing die members are urged together, said edge surfaces of said plate sections initiate bulk deformation of side surfaces of said contact terminal member, and said crimping surfaces of said anvils define a crimped electrical connection cylindrical in shape and having a diameter equal to said cylindrical recess diameter.

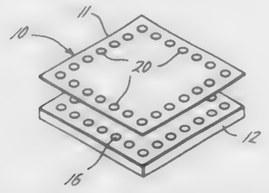
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,290

FLEXIBLE ELECTRICAL INTERCONNECT AND METHOD OF MAKING

Colin A. MacKay, Austin, Tex., assignor to Microelectronics and Computer Technology, Austin, Tex.

Continuation of Ser. No. 222,487, Jul. 21, 1988, Pat. No. 4,862,588. This application Jun. 16, 1989, Ser. No. 369,596
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] H01R *13/24*
U.S. Cl. 29—884 18 Claims



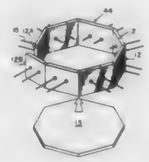
1. A method of making a flexible interconnect for connection between stacks of electronic components comprising,
forming a plurality of holes through a flexible insulating material,
depositing electrically conductive metal studs into said holes extending out of the top and bottom of the insulating material, and
electrically interconnecting at least some of the deposited studs by interconnects supported by the flexible material.

4,991,291

METHOD FOR FABRICATING A FOLD-UP FRAME

Richard A. Koepke, New Bedford, Mass., and George O. Koepke, Rochester, N.Y., assignors to Isotronics, Inc., New Bedford, Mass.

Filed Dec. 29, 1989, Ser. No. 458,959
Int. Cl.[5] H01R *43/16*
U.S. Cl. 29—884 10 Claims



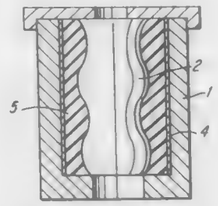
1. A method for fabricating fold-up frames having a predetermined configuration and having utility in forming flat packs for housing integrated circuit chips, comprising:
providing a piece of metallic stock having predetermined dimensions of length, width and thickness for fabricating said fold-up frames having said predetermined configuration;
milling at least one surface of said metallic stock lengthwise to form a plurality of grooves of predetermined angle therein, said plurality of grooves defining a plurality of sidewall members for said fold-up frames and a geometric shape of said predetermined configuration;
processing said milled metallic stock to form apertures in each of said plurality of sidewall members defining a fold-up frame and slicing said milled metallic stock to form a plurality of individual milled frames having free ends, each of said plurality of individual milled frames having a predetermined height corresponding to said predetermined configuration height of said fold-up frames;
folding each of said plurality of apertured, milled frames about each of said plurality of grooves thereof to form a folded frame having said free ends thereof disposed in abutting engagement in said predetermined configuration; and
securing said free ends of said folded frame together to fix said told-up frame in said predetermined configuration.

4,991,292

METHOD OF PRODUCING ELASTOMERIC STATORS FOR ECCENTRIC HELICAL PUMPS

Karl-Heinz Bostel, Laatzen, Fed. Rep. of Germany, assignor to Gummi-Jäger KG GmbH & Cie, Hanover, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 387,293
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1988, 3826033
Int. Cl.[5] B23P *15/00*; F01C *1/10*
U.S. Cl. 29—888.023 5 Claims



1. In a method of producing an elastomeric stator for an eccentric helical pump, including using a core to mold an elastomer to accurately form the stator having a cavity with a final cavity dimension deliberately prior to as well as independently of installation of the elastomeric stator in the eccentric helical pump and that subsequently serves for accommodating a pump rotor in said stator cavity, and shrinking the elastomer after the molding, the improvement in combination therewith comprising the steps of:
providing a unitary closed, hollow-cylindrical casing about said elastomer, said casing having a diameter;
molding said elastomer, thereby intentionally forming a stator with an oversized stator cavity having an initial cavity dimension larger than said final cavity dimension; and
reducing the initial cavity dimension to said final cavity dimension by reducing the diameter of said unitary closed, hollow-cylindrical casing, thereby permanently and uniformly deforming said casing and holding said elastomer uniformly therein accurately at the final dimension of said stator cavity for subsequent installing of the elastomeric stator with the pump rotor.

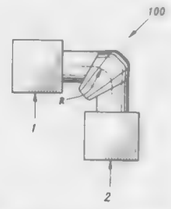
4,991,293

MEANS FOR PROVIDING VERY SMALL BEND RADII IN THE TUBE-LIKE STRUCTURES

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Aug. 2, 1989, Ser. No. 388,508
Int. Cl.[5] B21D *7/00*
U.S. Cl. 29—890.149 5 Claims

1. A method of manufacturing a tube-like structure comprising: forming an outwardly bulged annular portion in a tube having ends on both sides of said outwardly bulged annular portion, said ends having a diameter less than said outwardly bulged annular portion, bending said tube at said bulged annular portions, forming a bent configuration tube such that said annular portion has a portion substantially on an outer arc with said tube ends and a portion extending outwardly from an inner arc of said tube ends so that the radius of said bend is less than a radius which would be obtained from forming and bending a continuous diameter tube.

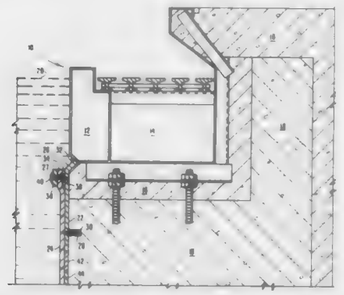


4,991,294

SWIMMING POOL LINER INSTALLATION METHOD

Jonathan A. Breiner, Indianapolis, and Michael T. Walsh, Zionsville, both of Ind., assignors to Recreonics Corporation, Indianapolis, Ind.

Continuation of Ser. No. 403,763, Sep. 6, 1989, abandoned. This application Apr. 13, 1990, Ser. No. 511,849
Int. Cl.[5] E04H *4/00*; B23P *19/04*
U.S. Cl. 29—897.34 19 Claims



15. A method for providing water-tight termination below normal water level of a flexible pool lining material for a swimming pool having a stainless steel gutter about its entire perimeter, comprising the steps of:
providing about the entire perimeter of the pool that is to be provided with a flexible pool lining material a continuous stainless steel flange immediately below the gutter such that the flange extends downwardly from the gutter flush with the pool wall;
sealing the flange to the gutter at the intersection of the flange and the gutter;
overlaying the flexible pool lining material onto the flange;
placing a water-tight gasket between the pool lining material and the flange; and
compressing the pool lining material and gasket between the flange and a compression strip secured to the flange about the entire perimeter of the pool with fastening means.

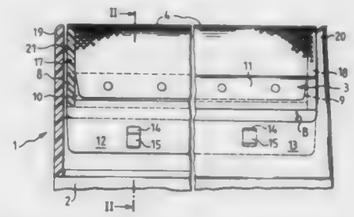
4,991,295

SHAVING HEAD FOR DRY SHAVING APPARATUS

Werner Messinger, Kronberg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 20, 1989, Ser. No. 410,363
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833179
Int. Cl.[5] B26B *19/06*
U.S. Cl. 30—43.92 7 Claims

1. A shaving head for dry shaving apparatus that includes a shaver housing, a reciprocating lower cutter assembly of suitable configuration, and spring means for urging said lower cutter assembly against a foil, comprising
a shaving head frame arranged on said shaver housing so as to be removable therefrom,
a circumferentially closed, box-shaped exchangeable frame of resilient material which is insertable into said shaving head frame, a shaving foil mounted in arched form on said exchangeable frame for cooperative relation with said



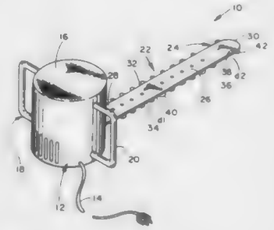
reciprocating lower cutter assembly which is urged against the foil by said spring means, means on at least two sides of said exchangeable frame for holding said exchangeable frame movably within limits in said shaving head frame and for guiding said exchangeable frame substantially vertically in the direction of action (arrow A) of said spring means, and cooperating holding and guiding means on associated surfaces of said shaving head frame.

4,991,296

HEDGE TRIMMER

Jerry S. Kohn, 26 Paladena Dr., Plainview, N.Y. 11083

Filed Jul. 18, 1989, Ser. No. 381,194
Int. Cl.[5] A01G *3/08*
U.S. Cl. 30—277.4 3 Claims



1. A hedge trimmer comprising:
(A) a motor unit which includes co-planar handles; and
(B) a blade mounted on said motor unit to be essentially perpendicular to a plane containing said handles and which is located intermediate to said handles, and which includes
(1) a body having a proximal end connected to said motor unit, a curved distal end and straight side edges connecting said proximal end to said distal end,
(2) a plurality of first teeth on said side edges and which are spaced apart from each other by a first distance,
(3) a plurality of second teeth on said side edges near said blade distal end and which are spaced apart from said first teeth a second distance which is three times greater than said first distance, two of said second teeth being located at the intersections of said blade body curved distal end and said blade body straight side edges, and
(4) a plurality of additional second teeth which are spaced apart from said two second teeth by said second distance.

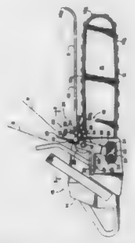
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,297

SAFETY GUARD FOR CHAIN SAW BAR

Myron C. Cain, 6254 Coast Hwy., North Bend, Oreg. 97459

Filed Sep. 18, 1989, Ser. No. 408,740
Int. Cl.[5] B27B *17/02*
U.S. Cl. 30—382 **16 Claims**



1. A chain saw guard for use on a chain saw having a motor housing, a drive motor contained in the housing, a saw chain guide bar mounted on the motor housing, and a saw chain driven by the drive motor and carried on the guide bar comprising:

a saw chain guard plate which extends from the housing forward over the guide bar;

a bracket for rotationally mounting said guard plate on the motor housing between an up position and a down position, said bracket being mounted on the housing to the same mounting as the chain guide bar, wherein said bracket is substantially vertically disposed on the chain saw and has rearwardly extending portion located intermediate the top and bottom thereof, and which further includes spring-biasing means located between the free end of said rearwardly extending portion of said bracket and said guard plate to bias said guard plate to said down position; and

limit means on said bracket for providing limited rotational movement of said guard plate relative to said bracket, including a first stop on said bracket for positioning said guard plate a predetermined height above said guide bar and a second stop on said bracket for limiting the upward movement of said guard plate to said up position, wherein said second stop is constructed and arranged to allow said guard to bypass said up position and with said guard in a raised position, to contact said guard plate thereby maintaining said guard plate in said raised position.

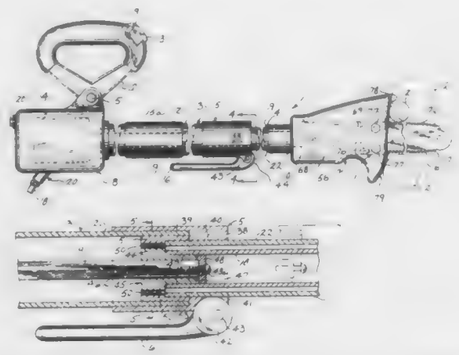
4,991,298

EXTENDIBLE TREE TRIMMING APPARATUS

Daniel A. Matre, Wauwatosa, Wis., assignor to David K. Caruso, Wauwatosa, Wis.

Filed Sep. 13, 1988, Ser. No. 243,983
Int. Cl.[5] A01G *3/08*
U.S. Cl. 30—392 **12 Claims**

1. An extendible tree trimming apparatus for manual manipulation and cutting of tree limbs, comprising an extendible power transmitting tubular unit having an upper end and a lower end, a power head secured to the lower end of said unit, a cutting blade unit connected to the upper end of said unit, said tubular unit includes a first assembly including a first outer tubular housing and a first shaft extending through said first housing, said first assembly having a lower end connected to said power head unit and including a separate connection of said first outer tubular housing and said first shaft to said power head unit, said tubular unit including a second assembly including a second outer tubular housing telescoped with said first outer tubular housing and a second shaft extending through said second housing and telescoped with said first shaft, said second assembly extending outwardly from said first assembly, said cutting blade unit being connected to said second outer tubular housing and having a blade connected to said second shaft, means releasably interconnecting said first housing to said second housing for locking of the first and second assemblies in telescoped position, a roller bearing coupling unit located within said first and second assemblies said roller bearing coupling unit including a roller bearing unit having an outer race secured to one of said first and second housings and having an inner race connected to the shaft of said housing secured to the outer race, and said roller bearing coupling unit including an interposed plurality of rotating bearing members



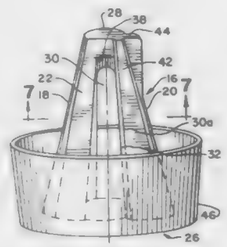
between said outer race and said inner race and rotatably supporting said shaft on said housing secured to the outer race, said outer race and said inner race being slidably engaged with said housing not secured to the outer race and said shaft of said housing not secured to said outer race and thereby said first and second assemblies being slidably mounted to each other by said roller bearing coupling unit.

4,991,299

UNIVERSAL CRAYON SHARPENER

Charles W. Dietterich, Brodheadsville; Gregory C. Yehl, Wescosville, and Harry J. Lidle, Jr., Macungie, all of, assignors to Binney & Smith Inc., Easton, Pa.

Filed Oct. 12, 1989, Ser. No. 420,583
Int. Cl.[5] B43L *23/00*
U.S. Cl. 30—453 **18 Claims**



1. An improved device for sharpening crayons and similar marking instruments inserted and rotated within the device comprising:

a hollow, conical sharpening housing with upper portions converging to form the apex of the housing and lower portions forming an opening at the base of the housing sized for receiving crayons of different diameters with the housing;

asymmetrical shaving means for removing a portion of the surface of crayons rotated within the sharpening housing, including at least two shaving means, the first shaving means extending from the opening at the base of the sharpening housing substantially to the apex of the housing and the second shaving means extending a portion of the distance from the opening at the base of the housing to the apex of the housing; and

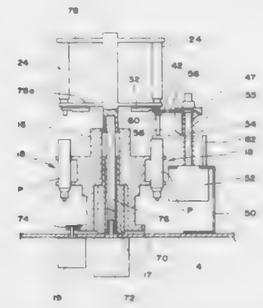
guide means comprising a guide wall extending from the terminus of the second shaving means substantially to the apex of the housing disposed to engage and maintain the leading portion of crayons in the proper sharpening position with respect to the asymmetrical shaving means.

4,991,300

LEAD AUTOMATIC SUPPLY DEVICE FOR X-Y PLOTTER

Isamu Takahashi, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 445,989
Claims priority, application Japan, Mar. 15, 1989, 1-63279
Int. Cl.[5] G01D *15/16*
U.S. Cl. 33—18.2 **1 Claim**



1. An automatic lead supply device for supplying leads to a plurality of writing instruments, said device comprising:

a writing implement stocker rotatably mounted in the device about an axis of rotation,

said writing implement stocker having writing implement holding means for detachably holding a plurality of writing instruments having expendable leads at respective positions lying along a first circular path centered at said axis of rotation;

first rotary drive means connected to said writing implement stocker for rotating said stocker about said axis of rotation;

a lead supply stocker rotatably mounted in the device about an axis of rotation and disposed over said writing implement stocker,

said lead supply stocker having a plurality of lead storage containers disposed at respective positions lying along a second circular path centered at the axis of rotation of said lead supply stocker,

said first and said second circular paths lying in a common cylindrical plane,

each of said lead storage containers having a bottom portion, and a lead fall hole extending through the bottom portion thereof for allowing leads stored in the respective lead storage containers to drop therefrom;

second rotary drive means connected to said lead supply stocker for rotating said lead supply stocker about the axis of rotation thereof;

opening/closing mechanism means disposed adjacent a lower end of the lead fall hole of each of said lead storage containers for selectively closing over and uncovering the lower end of the lead fall hole of each of said lead storage containers;

opening/closing control means operatively associated with said opening/closing mechanism means for controlling said opening/closing mechanism means to close over or to uncover the lower end of the lead fall hole of a selected one of said lead storage containers; and

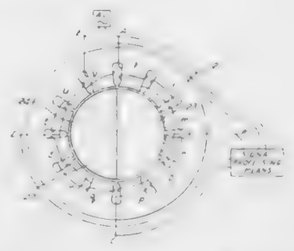
lead push-down mechanism means disposed between said lead storage containers and said writing implement holding means for pushing a lead dropping through the lead fall hole of one of said lead storage containers toward a writing implement held by said writing implement holding means once said opening/closing control means has controlled said opening/closing mechanism means to uncover the lower end of the lead fall hole of said one of said lead storage containers.

4,991,301

INDUCTIVE DISPLACEMENT SENSORS

Donald L. Hore, Bristol, United Kingdom, assignor to Radiodetection Limited, United Kingdom

PCT No. PCT/GB88/00141, § 371 Date Feb. 10, 1989, § 102(e) Date Feb. 10, 1989, PCT Pub. No. WO88/06716, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 26, 1988, Ser. No. 313,186
Claims priority, application United Kingdom, Feb. 27, 1987, 8704606; Aug. 3, 1987, 8718333
Int. Cl.[5] G01C *9/06*
U.S. Cl. 33—366 **13 Claims**



1. Apparatus for use in monitoring displacement along a displacement path, said apparatus comprising first and second members extending along said displacement path and separated by a constant spacing, said first member comprising a wound portion having a single winding which provides a multiplicity of serially connected coil portions arranged as wound salient poles disposed successively along said displacement path with the axes thereof intersecting said displacement path; said poles being wound so that alternate poles are of opposite polarity; said multiplicity of serially connected salient poles including a first terminal at one end of the series of poles, a second terminal at the other end of the series of poles, and a central tapping connection; said second member comprising an inductance varying means for providing, along with displacement path, regions of different effective permeability to alternating magnetic flux which affect the inductances of adjacent coil portions of said single winding; at least a portion of said inductance varying means being displaceable relative to said first member along said displacement path to effect displacement of the regions of different effective permeability relative to said coil portions of said single winding such that, for any relative position, the coil portions of one half of the length of the wound portion have higher inductance than the coil portions of the other half; the apparatus further including means for supplying an alternating electrical voltage across said first and second terminals so that, when alternating current is applied across said terminals and said relative displacement is effected, the voltage at the central tapping connection varies with a substantially linear analog characteristic for a displacement corresponding to one half of the length of the wound portion, and continued displacement in the same sense for a further half length restores the voltage to its original value in a symmetrical manner; said voltage providing analog electrical output data relating to said displacement.

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4,991,302

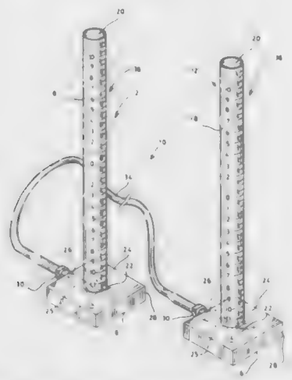
OPEN CIRCUIT LEVELING MEASURING SYSTEM

Aubrey W. Brewer, 6927 Twin Creek Rd., Knoxville, Tenn. 37920

Continuation-in-part of Ser. No. 161,984, Feb. 29, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 375,863

Int. Cl.[5] G01C *5/04, 9/22*

U.S. Cl. 33—367 6 Claims



1. An open circuit fluid leveling measuring system comprising:

first and further cooperating measuring instruments, each including a base portion having a bottom and an upright tube defining a chamber for containing a liquid, said tubes having a lower portion with an access opening communicating with the liquid and having an upper end portion defining an access opening to the atmosphere;

an operator actuated first valve means for selectively sealing said access openings in said lower end portions of said tubes and a second valve means in a body mounted in the access openings of said upper end portions of said tubes selectively venting said chamber of each said tube to the ambient atmosphere, whereby said operator can selectively seal said access openings of each of said tubes when said measuring system is not in use, notwithstanding the orientation of said tubes;

flexible means providing fluid communication via said access openings between said chambers of said tubes proximate said lower end portions of said tubes; and

indicia means carried by each said tube for determining the level of said liquid in each said tube whereby the relative level of said liquid in said tubes can be determined as displaced in selected and spaced locations.

4,991,303

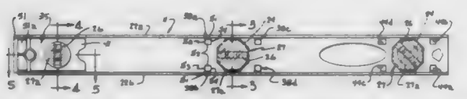
LEVEL WITH MULTI-POSITION VIAL HOLDER

David S. Marth, and John R. Bacher, both of Rockford, Ill., assignors to Dasco Pro, Inc., Rockford, Ill.

Filed Dec. 11, 1989, Ser. No. 448,340

Int. Cl.[5] G01C *9/24*

U.S. Cl. 33—379 5 Claims



1. A spirit level comprising, a frame having parallel working surfaces and a web interconnecting the working surfaces, the web having first and second sides and at least one vial opening therethrough of regular octagon configuration, the vial opening having a first pair of opposed parallel edges extending perpendicular to the working surfaces; a second pair of opposed parallel edges extending parallel to the working surfaces; and third and fourth pairs of opposed parallel edges extending at an angle of forty-five degrees to the working surfaces, first and second vial case members each having a window area and a marginal rim, the marginal rim on the first vial case member engaging the first side of the web outwardly of the opening and the marginal rim on the second vial case member engaging the second side of the web outwardly of the vial opening, wall means of octagonal configuration extending between and rigidly interconnecting the vial case members closely received in the vial opening, an elongated level vial, the vial case members having vial retainer means for engaging and holding the level vial with the vial extending perpendicular to one pair of opposed sides of the wall means, the vial case members being selectively positionable in the vial opening in web with said one pair of opposed sides of the wall means contiguous to either said first or said second, or said third pairs of opposed parallel edges of the vial opening to support the level vial on the frame with the level vial extending either parallel or perpendicular or at an angle of forty five degrees to the working surfaces, and means retaining the vial case members in engagement with opposite side sides of the web.

4,991,304

WORKPIECE INSPECTION METHOD

David R. McMurtry, Wotton-Under-Edge, United Kingdom, assignor to Renishaw, Gloucestershire, England

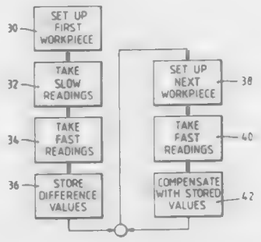
PCT No. PCT/GB88/00455, § 371 Date Jan. 26, 1989, § 102(e) Date Jan. 26, 1989, PCT Pub. No. WO88/09915, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 10, 1988, Ser. No. 305,727

Claims priority, application United Kingdom, Jun. 11, 1987, 8713715

Int. Cl.[5] G01B *5/03*

U.S. Cl. 33—505 11 Claims



6. A method of inspecting a series of identical workpieces, in which a workpiece sensing probe is moved into a position-sensing relationship with each workpiece and a position reading taken, the method comprising the following steps in any order in which (i) step (c) is performed after steps (a) and (b), and (ii) step (e) is performed after step (d):

(a) moving the probe into a position-sensing relationship with at least one surface point of one workpiece at a relatively slow speed, and taking a position reading;

(b) moving the probe into a position-sensing relationship with said surface point of said one workpiece at a relatively fast speed, and taking a position reading;

(c) recording a difference value representing the difference between the two readings of steps (a) and (b);

(d) moving the probe into said position-sensing relationship with another workpiece at a surface point corresponding to the surface point read on said one workpiece at said fast speed, and taking a position reading; and

(e) using said recorded difference value to compensate the reading taken in step (d), thereby reducing any probe and dynamic errors in said reading.

4,991,305

SPECTACLE-LENS-FRAME CONFIGURATION MEASURING APPARATUS AND ARTICLE CONFIGURATION MEASURING APPARATUS

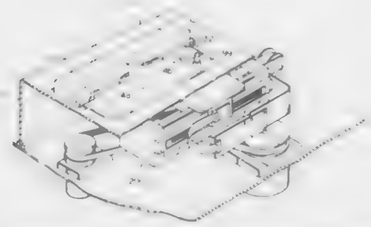
Tsuyoshi Saigo; Takeo Koseki, both of Nishitama; Noboru Okushi, Fussa, and Shuichi Sato, Oume, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,757

Claims priority, application Japan, May 30, 1988, 63-71484[U]; Jun. 2, 1988, 63-136460; Jun. 2, 1988, 63-136461

Int. Cl.[5] G01C *25/00;* G01B *7/28*

U.S. Cl. 33—507 18 Claims



1. An apparatus for measuring a configuration of each of a pair of lens frames of a spectacle framework comprising:

holding means for fixedly holding said pair of lens frames;

a measuring element arranged adjacent said holding means for horizontal and vertical movement relative to said pair of lens frames fixedly held by said holding means;

moving means associated with said measuring element for moving the same angularly about an optional reference point within one of said pair of lens frames, along an inner periphery of the lens frame, while causing said measuring element to be in contact with the inner periphery of the lens frame;

said moving means further comprising a rotary table rotatable about a vertical axis, a slide member mounted on said rotary table for rotation together with the same, but for horizontal sliding movement relative to said rotary table, said measuring element being mounted on said slide member for vertical movement relative thereto, and biasing means connected to said slide member for biasing the same to cause said measuring element to be in contact with the inner periphery of the lens frame;

first detecting means for detecting horizontal straight displacement of said measuring element from said reference point during the movement of said measuring element along the inner periphery of the lens frame to generate a signal representative of the horizontal straight displacement;

said first detecting means including a linear encoder comprising a scale fixedly mounted to said rotary table, a detector fixedly mounted to said slide member and slidable along said scale, an amplifier fixedly mounted to said rotary table, and a flexible cable through which said detector and said amplifier is connected, wherein said scale is elongated in shape and extends horizontally;

second detecting means for detecting vertical straight displacement of said measuring element from said reference point, during the movement of said measuring element along the inner periphery of the lens frame, to generate a signal representative of the vertical straight displacement;

third detecting means for detecting an angle θ of the angular movement of said measuring element about said reference point during the movement of said measuring element along the inner periphery of the lens frame, to generate a signal representative of the angle;

means connected to said first, second and third detecting means for calculating the configuration of the inner periphery of the lens frame on the basis of said signals from the respective first, second and third detecting means; and

a sleeve fixedly mounted on said slide member and having an axis extending vertically, wherein said measuring element includes an elongated stylus fitted in said sleeve for movement along the axis of said sleeve and for rotation about the axis of said sleeve, said stylus having a disc-shaped head engageable with the inner periphery of the lens frame, said second detecting means further comprising a CCD line image sensor and a light source arranged in opposed, but spaced relation to each other with a lower end portion of said elongated stylus positioned between said CCD line image sensor and said light source.

4,991,306

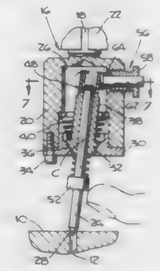
TACTILE CENTER LOCATOR

Antti P. Raiha, 8425 Sunnyside Rd., Sandpoint, Id. 83864

Filed Jun. 25, 1990, Ser. No. 542,894

Int. Cl.[5] G01D *21/00;* B23B *49/00*

U.S. Cl. 33—520 7 Claims



1. In a center locator cooperable with a machine tool having a machine axis;

(a) a probe having one end registrable with a cross hair, pilot hole or other marking on a work piece;

(b) a locator body having at one end means for releasably clamping the body to said machine tool;

(c) said body having means spaced from said one probe end supporting said probe for swivel movement about a center aligned with said machine axis;

(d) a plurality of links supported by said body for following the lateral movement of said probe at a place spaced from said swivel center, one of the links following the component of movement of the probe in one direction transverse to said machine axis, and another of said links following the component of movement of the probe in another direction transverse to said machine axis;

(e) a corresponding plurality of indicator members for each of said links; and

(f) means guiding said links for movement along said indicator members;

(g) said links and indicators having companion surfaces that are in flush relationship when said probe is in lateral alignment with said machine axis whereby alignment of said probe end with said machine axis can be determined by touch.

4,991,307

CARPET TILE CUTTER

Kenneth B. Higgins, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 11, 1989, Ser. No. 405,752

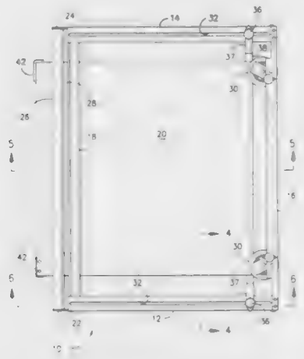
Int. Cl.[5] G01B *1/00*

U.S. Cl. 33—526 19 Claims

1. An apparatus to mark tiles accurately for cutting and placement in an area smaller than a standard tile comprising: a pair of tubular members spaced from one another, a first means interconnecting said tubular members at one end, a second

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means connected to each of said tubular members at the other end, biasing means in each of said tubular members biasing said second means outwardly from said first means, a wall abutment means mounted in operable association with said second means, a third means located between said tubular members to



support a tile and a fourth means located above said third means to accommodate a cutter means to cut a tile on said third means when said second mean is slid by said tubular members when said wall abutment means is forced against a wall member.

4,991,308

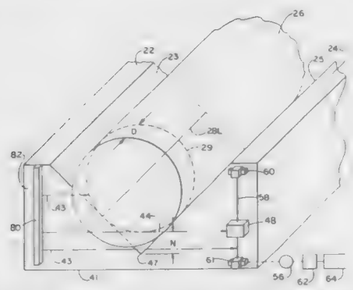
DIAMETER GAUGE

Charles W. Donaldson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 156,507, Feb. 16, 1988, Pat. No. 4,928,392. This application Jun. 19, 1989, Ser. No. 367,587

Int. Cl.[5] G01B *7/12, 11/08*

U.S. Cl. 33—555.1 **8 Claims**



1. Apparatus for measuring the outside diameter of a part having a circular cross section, comprising:

first and second arms extending outward from a common support, said arms including a pair of mutually facing, planar contact surfaces converging to define a dihedral angle, each of said contact surfaces being oriented to make contact at a line of tangency with said part when said part is positioned between said arms for a diameter measurement;

means for projecting light in a predetermined direction, said light projection means extending along one of said first and second arms to provide a substantially uniform light output throughout the length of said one arm to cause said light to be at least partially blocked by said part when the latter is in position for said diameter measurement;

means for locating an edge of a shadow cast by said part; and

means for determining the diameter of said part from the location of the edge of said shadow.

4,991,309

FINE POSITIONING DEVICE AND DISPLACEMENT CONTROLLER THEREFOR

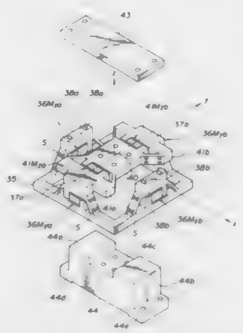
Kiyoshi Nagasawa, Ibaragi; Kozo Ono, Toride; Kojiro Ogata, Ishioka; Ken Murayama, Chiyoda, and Yoshihiro Hoshino, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Division of Ser. No. 94,294, Sep. 8, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 244,101

Claims priority, application Japan, Sep. 9, 1986, 61-210616; Sep. 9, 1986, 61-210618; Sep. 9, 1986, 61-210619; Nov. 4, 1986, 61-262437; Nov. 29, 1986, 61-283061; Nov. 29, 1986, 61-283062; Nov. 29, 1986, 61-283063; Mar. 31, 1987, 62-76269; Mar. 31, 1987, 62-76270

Int. Cl.[5] B23Q *16/00;* **G01B** *5/00*

U.S. Cl. 33—568 **6 Claims**



1. A fine positioning device comprising:

(a) a rigid support member;

(b) a first set of radial flexible-beam displacement mechanisms provided symmetrically to each other on the support member to produce angular displacements about a first axis;

(c) a second set of radial flexible-beam displacement mechanisms provided symmetrically to each other on the support member to produce angular displacements about a second axis which is perpendicular to the first axis;

(d) a third set of radial flexible-beam displacement mechanisms connected to either one of the first and second sets of radial flexible-beam displacement mechanisms to produce angular displacements about a third axis which is perpendicular to both the first and second axes; and

(e) a fine motion table fixed on the radial flexible-beam displacement mechanisms which are other than those connected to the radial flexible-beam displacement mechanisms for producing angular displacements about the third axis,

(f) wherein the first, second, and third axes all extend through a predetermined single common point located on or near a surface of the fine motion table.

4,991,310

BRAKE CHAMBER STROKE INDICATOR

Clifford T. Melia, 5617 Sundale Grove, Surrey, Canada V3S 4N9

Filed Nov. 30, 1989, Ser. No. 443,976

Claims priority, application Canada, Sep. 19, 1989, 611911

Int. Cl.[5] G01D *21/00;* **F16D** *66/02*

U.S. Cl. 33—609 **6 Claims**

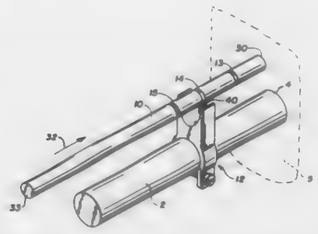
1. A brake stroke indicator for an air brake having an elongated brake pushrod that extends a linear distance from an actuator housing when the brake is applied, the length of said

distance depending upon the condition of said brake, said indicator comprising:

an elongated gauging probe having a first reference end and second end with distance indicator means spaced at intervals along the length of the probe;

a pushrod bracket, said bracket comprising a flange for engagement with said distance indicator means of longitudinally across said flange;

and means for fixedly attaching said bracket at a preselected



position along the length of said pushrod such that said flange extends in a plane transverse to the longitudinal axis of said pushrod whereby said gauging probe in slid longitudinally across said flange toward said actuator housing when the brake is applied, the distance between said actuator housing and said bracket, as measured by said probe, providing a measure of the travel distance of said brake pushrod to indicate brake wear, and said distance indicator means engaging on said flange providing definite stops to indicate various ranges of brake wear.

4,991,311

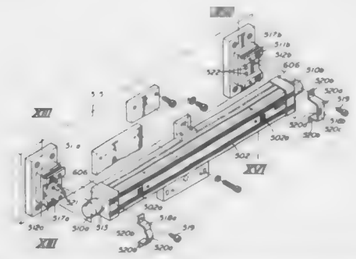
MOUNTING STRUCTURE FOR MAGNETIC LINEAR SCALE UNIT

Kazuo Nagaoka; Sadgo Wakabayashi; Yoshihiko Kanasugi, and Tadao Hatano, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 86,537, Aug. 18, 1987, Pat. No. 4,843,729. This application Jun. 26, 1989, Ser. No. 371,978

Int. Cl.[5] G01B *7/14, 11/04*

U.S. Cl. 33—708 **15 Claims**



1. A mounting structure for a linear scale assembly comprising:

a scale assembly including an elongated straight scale and a hollow box-shaped member surrounding said scale;

a first end connected to and extending from the first end of said scale, said first end member having a generally cylindrical periphery at least in part;

a second end member connected to and extending from the second end of said scale, said second end member having a generally cylindrical periphery at least in part;

a first mount secured to a mounting surface at an orientation corresponding to said first end member and defining a first mounting space for receiving said first end member;

a second mount secured to a mounting surface at an orientation corresponding to said second end member and defining a second mounting space for receiving said second end member;

projection means oriented between mating surfaces of said first and second end members and said first and second mounts for establishing multi-point contact therebetween for defining a center through which the axis of said scale extends and for reducing contact area between mating surfaces in order to permit relative movement of said scale relative to said mounts.

4,991,312

DOOR OPENING SYSTEM FOR WASHING MACHINES

Mauro Pambianchi, Bologna, Italy, assignor to I.L.S.A. Srl., Bologna, Italy

Filed Mar. 26, 1990, Ser. No. 499,004

Int. Cl.[5] F26B *13/10*

U.S. Cl. 34—45 **20 Claims**

1. A control device for controlling the opening of a loading and unloading door of a dry washing machine when internal thereof the machine reaches a predetermined maximum gas concentration, comprising:

a probe associated with said machine, said probe including two electrodes spaced from each other for measuring ohmic resistance of air interposed between said electrodes, the ohmic resistance being changeable and responsive to a concentration of the gas contained within the washing machine, said probe being adapted to measure the solvent concentration degree which is present at the time of measurement in the machine;

a first electronic circuit coupled with said probe for controlling the air circulation in said washing machine;

said probe being responsive to a value pre-fixed and when said value is reached, said probe activates said first electronic circuit for breaking the circuit and cuts off the air circulation inside the washing machine; and

a second electronic circuit coupled with said first electronic circuit for controlling an electrovalve which drives a linear variator with a pneumatic piston to disengage a shackle locking the loading and unloading door.

4,991,313

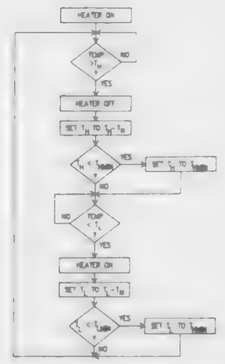
GRADUAL HEAT REDUCTION FOR A CLOTHES DRYER

Dan F. Joslin, Fort Dodge, Iowa, assignor to White Consolidated Industries, Inc., Webster City, Iowa

Filed Jan. 22, 1990, Ser. No. 467,921

Int. Cl.[5] F26B *21/06, 19/00*

U.S. Cl. 34—48 **6 Claims**



1. A method of gradual heat reduction for a clothes dryer having a heater and a dryer exhaust, said method comprising:

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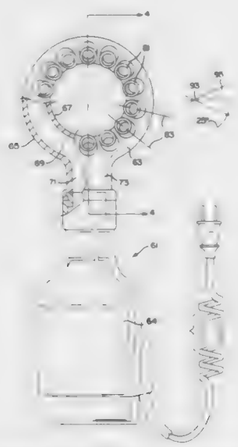
providing a series of exhaust temperature measurements;
deactivating the heater if the measurement is greater than a high limit and reducing the high limit by a high limit reduction factor;
preventing said high limit from being reduced below a minimum high limit;
activating the heater if the exhaust temperature is less than a low limit and reducing the low limit by a low limit reduction factor; and
preventing said low limit from being reduced below a minimum low limit, whereby a series of said high and low limits are utilized to decrease the temperature of a load in the dryer without a proportional increase in the time required to dry the load.

4,991,314

FLUID FLOW APPARATUS AND PROCESS

Donavan J. Allen, Taylors, S.C., assignor to Torus Corporation, Greenville, S.C.

Continuation of Ser. No. 157,053, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 124,051, Nov. 23, 1987, Pat. No. 4,836,702. This application Apr. 13, 1989, Ser. No. 338,489
Int. Cl.[5] A45D *20/12*
U.S. Cl. 34—98 **9 Claims**



9. An improved process for drying hair comprising the steps of:
(a) generating a generally conical flow of air under pressure about an opening adjacent a base of the cone;
(b) locating hair to be dried between an apex of the cone and the base of the cone so that said air reflects off said hair and returns towards said base of said cone and through said opening, while lifting hair towards said opening.

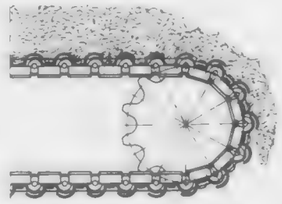
4,991,315

HORIZONTAL PELLET COOLER WITH IMPROVED SUPPORT TRAY

Glenn H. Falck, Montgomery, Pa., assignor to Sprout-Bauer, Inc., Muncy, Pa.

Continuation of Ser. No. 258,932, Oct. 17, 1988, abandoned. This application Feb. 21, 1990, Ser. No. 484,037
Int. Cl.[5] F26D *7/00*
U.S. Cl. 34—217 **3 Claims**

1. A pellet cooling apparatus for use in transporting hot, moist pellets through a heat exchange zone so as to bring the pellets in heat exchange contact with a cooling gas, comprising:
a. an endless traveling grate conveyor means having a substantially horizontal upper run, a descending turn-around end, a substantially horizontal lower run, and an ascending turn-around end disposed in sequence so as to define a continuous path;
b. housing means disposed about and enclosing said conveyor means, said housing means having an inlet through which pellets to be cooled may be deposited unto said conveyor means and an outlet through which cooled pellets may be discharged from said conveyor means;
c. drive means operatively associated with said conveyor means for moving said conveyor means in continuous travel about the continuous path within said housing;
d. a plurality of non-perforated material support trays mounted to said endless conveyor means in juxtaposed overlapping relationship to form a substantially continuous surface about the continuous path defined by said endless conveyor means, each of said material support trays comprising an elongated, laterally extending bi-lobed plate having a first laterally extending outwardly



projecting arcuate lobe along one lateral extent thereof, a second laterally extending outwardly projecting arcuate lobe along the other lateral extent thereof, and a substantially flat laterally extending mid-portion interconnecting said first lobe and said second lobe, said first lobe subscribing an arc of a circle of a first radius and said second lobe subscribing an arc of a circle of a second radius, said first radius being greater than said second radius, said juxtaposed material support trays disposed with the first lobe of one tray extending in overlapping spaced relationship concentrically over the second lobe of the other of said juxtaposed material support trays so as to define a cooling gas passageway therebetween; and
e. fan means operatively associated with said housing means for causing cooling gas to pass into said housing means, thence through the cooling gas passageways of said conveyor means and through the pellets deposited unto said conveyor means.

4,991,316

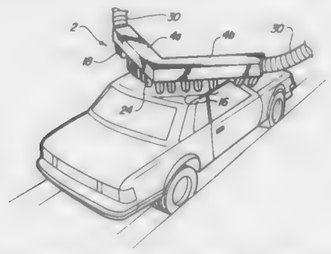
BLOWER MANIFOLD ASSEMBLY FOR VEHICLE DRYING

Lon Crotts, Summerfield, N.C., assignor to Bivens Winchester Corporation, Danville, Va.

Continuation of Ser. No. 90,233, Aug. 27, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,158
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—243 C **11 Claims**

1. An air-blowing apparatus for removing water from a vehicle surface comprising:
air supply means;
a V-shaped blower manifold means having a hollow interior;
means for transmitting the output of the air supply to the blower manifold means;
manifold outlet means distributed substantially along the entire length of said V-shaped manifold means;
said V-shaped manifold means being overall of a width at least approximately the width of a vehicle;
said manifold outlet means comprises a plurality of circular openings, arranged evenly in a common plane along the length of each arm of said V-shaped manifold means adjacent a workpiece;

said air channeling means removably fastened to said manifold outlet means to increase the efficiency of air flow to the workpiece; and
said air channeling means comprises a plurality of soft, flexi-



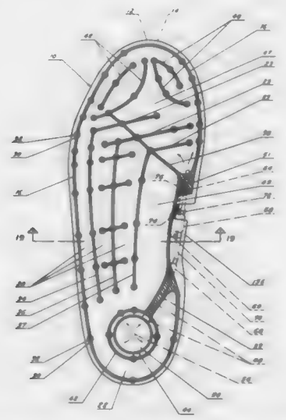
ble sock portions each having a large circular open end of slightly larger diameter than said manifold outlet means, removably fastened to annular flanges protruding from said manifold outlet means, and another smaller diameter open end adjacent the workpiece.

4,991,317

INFLATABLE SOLE LINING FOR SHOES AND BOOTS

Nikola Lakic, 45-191 Elm St., Indio, Calif. 92201

Continuation-in-part of Ser. No. 262,749, Oct. 28, 1988, which is a continuation-in-part of Ser. No. 54,189, May 26, 1987, Pat. No. 4,782,602, and Ser. No. 93,579, Sep. 4, 1987, Pat. No. 4,823,482, and Ser. No. 177,410, Apr. 4, 1988, Pat. No. 4,845,338. This application Mar. 14, 1989, Ser. No. 323,340
Int. Cl.[5] A43B *13/20, 13/38*
U.S. Cl. 36—44 **48 Claims**



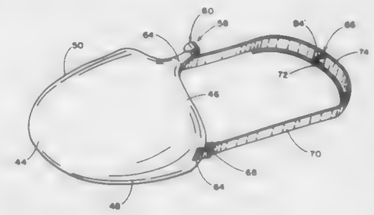
1. An inflatable lining for a shoe which comprises:
a. an air enclosure having flexible walls of plastic film and including a portion having the size and shape of the sole of said shoe with a sealed interior and with a plurality of discontinuous seams between its opposed surfaces disposed at preselected locations to subdivide said sealed interior into a plurality of interconnected zones having freedom of air flow therebetween; and
b. pressure inflation means comprising:
(1) a flexible and resilient bulb;
(2) an inlet port opening into said bulb;
(3) a discharge port communicating from said bulb to said sealed interior of said lining;
(4) a pair of check valves with one each of said check valves being positioned in a respective one of said inlet and discharge ports in opposite flow directions, whereby said bulb functions as a pump, to increase the pressure of air within said sealed interior of said lining; and
(5) a pressure control valve in communication with said sealed interior of said lining and adjustable to regulate the pressure of air within said lining, whereby the resiliency and softness of said lining can be adjusted.

4,991,318

FOOT SAFETY GUARD

Kevin S. Cornell, P.O. Box 96, Warquoit, Mass. 02536

Filed Dec. 20, 1989, Ser. No. 453,800
Int. Cl.[5] A43B *13/22*
U.S. Cl. 36—72 R **1 Claim**



1. A foot safety guard comprising:
(A) a one-piece protection body having
(1) a domed shape with a forward section, a rear section, side sections, a top surface and an undersurface,
(2) said body extending only over a vamp section and an instep section of a shoe and around a welt section and an outsole section of a shoe associated with the vamp and instep sections, said undersurface being immediately adjacent to the shoe when said body is in position on that shoe,
(3) a lip on said body, said lip surrounding only a peripheral portion of a shoe sole associated with the vamp and instep sections of the shoe covered by the body portion and being less that one inch wide as measured from said outsole with a remainder of said shoe sole being spaced from said lip and from said protection body,
(4) a neck portion on said body rear section, said neck portion being shaped to correspond to a neck section of the shoe and being located in a throat section of the shoe, said neck portion including
(a) a main portion which has a top surface, said neck portion top surface being an extension of said body top surface,
(b) a lower surface, and
(c) a shoelace hook which engages a lowermost shoelace of the shoe from beneath that lowermost shoelace when said protection body is in place on the shoe, said shoelace hook including
(i) a reverse bend section attached to said neck at an end of that neck which is remote from said body rear section, said reverse bend section being spaced from said body rear section, said reverse bend section extending upwards from said neck portion above said neck portion top surface and above said body top surface,
(ii) a forward section that is connected to said reverse bend section and which is spaced above said neck portion and above said body top surface and which extends towards said body rear section from said reverse bend section, said forward section having an end which is spaced from said body rear section, said forward section end being located closer to said body rear section that the lowermost shoelace of the shoe when the body is in place on that shoe, and
(iii) a break away line extending across said neck portion between the shoelace hook and said protec-

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tion body rear section, said neck portion being located near a midpoint of said body rear section,

(5) strap attaching holes defined through each side of said body adjacent to said rear portion, said holes being elongate and extending essentially parallel with said body rear section;

(B) anti-slip elements on said lip;

(C) anti-scuff thermal insulating elements on said body undersurface in position to be interposed between said body and the outer surface of the shoe;

(D) a one-piece strap connected at first and second end sections thereof to said protective body, said strap having an upper edge, a lower edge, and an arcuate welt-engaging lip on said strap lower edge in only a central portion of said strap; and

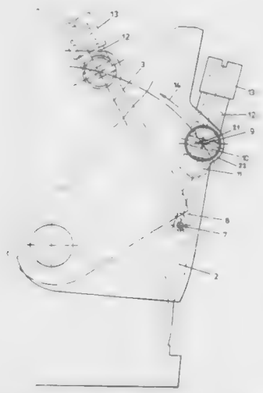
(E) first and second cinch fasteners on said first and second strap ends to hold said strap end sections against a remainder of the strap after said strap ends have been pulled through said protection body holes.

4,991,319

SKI SHOE

Johann Perner, Graz, Austria, assignor to Koflach Sport Gesellschaft m.b.H. & Co. KG, Eternitstrasse, Austria

Filed Sep. 11, 1989, Ser. No. 404,978
Claims priority, application Austria, Sep. 9, 1988, 2222/88
Int. Cl.[5] A43B *5/04, 5/16*
U.S. Cl. 36—117 **5 Claims**



1. A ski shoe having a shell and a cuff pivotally hinged to said shell, the shell and cuff being connected in their heel areas by a tension element comprising a spring and a tension member, said tension member being pivotally attached to said shell and extending slidably through a support surface, said spring having one end exerting a force on said support surface and an opposite end exerting an opposing force on said tension member, said support surface being pivotally supported on said cuff on an axis intersecting said tension member.

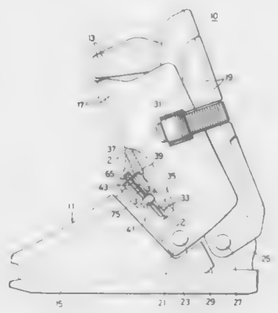
4,991,320

FORWARD PRESSURE EXERTING SKI BOOTS

Shinichi Iwama, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 377,471, Jul. 10, 1989, abandoned. This application Jul. 23, 1990, Ser. No. 559,508
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—119 **4 Claims**

1. Ski boots comprising an outer shell and an inner boot fitted into the outer shell and said outer shell being formed of a shell body, a front cuff which is mounted to the shell body to be tiltable forwardly and a rear cuff which is mounted to the shell body to be openable backwardly, wherein an elastic force generator is installed over an instep portion of the shell body and beneath an instep part of the front cuff to set an appropriate pressure to hold a skier's leg in a forwardly tilted form at an ankle part of the ski boots including said front and rear cuffs; said elastic force generator having an oblong hole disposed on



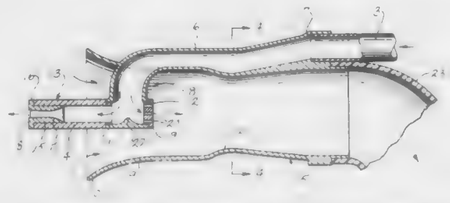
the instep portion of said shell body where the elastic force generator is overlapped by the inside of said front cuff instep part, thereby providing an elastic section on the instep portion of said shell body, defining said oblong hole therebetween and forming in the front cuff a mating part which presses the elastic section toward a toe end of said boot by mating with said elastic section when the boots are forwardly tilted.

4,991,321

PNEUMATIC DEVICE FOR EXCAVATING AND REMOVING MATERIAL

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Slinger, Wis.

Filed Jun. 21, 1990, Ser. No. 541,375
Int. Cl.[5] E02F *3/88*
U.S. Cl. 37—62 **23 Claims**



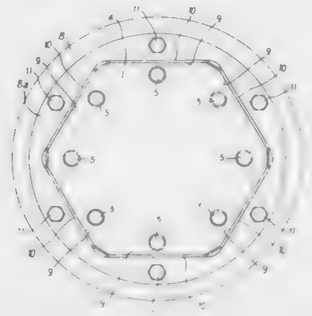
1. A high pressure pneumatic device for excavating and removing material, comprising a pressure tube having an inlet end connected to a source of air under pressure and having an outlet end, said air being discharged from said outlet end into contact with a material to dislodge said material, a removal tube having an entry end disposed adjacent the outlet end of the pressure tube and having an exit end disposed to deliver material, and aspirating means interconnecting said pressure tube and said removal tube for directing a portion of the air flowing in the pressure tube to the removal tube and causing a flow of air from the entry end of the removal tube to the exit end to thereby draw dislodged material through said removal tube.

4,991,322

DEVICE FOR AFFIXING CUTTER DRUMS TO AN APPARATUS INTENDED FOR CUTTING TRENCHES IN THE GROUND

Jean-Claude Detilleux, Les Ulis; Gilbert Ferre, Bondy; Philippe LeFort, Brunoy; André Ponsada, Rueil Malmaison; Jean-Pierre Schreiber, Mareil-sur-Mauldre, and Jean-Bernard Wittner, Clamart, all of France, assignors to Soletanche, Nanterre, France

Filed Jan. 12, 1990, Ser. No. 464,442
Claims priority, application France, Jan. 13, 1989, 89 00390
Int. Cl.[5] E02F *3/24*
U.S. Cl. 37—189 **5 Claims**



1. Device for fastening cutter drums on an apparatus designed to cut trenches in the ground comprising:

a driver which includes a revolving plate **4** disposed perpendicularly across an end of a shaft **7** on the driver, said plate having on its periphery a convex polygonal shape **9**:

a cutter drum **8** with a portion **8***a* including a central recess of concave polygonal shape **10** connected to and of slightly greater dimensions than the convex polygonal shape **9** of the plate **4**; and

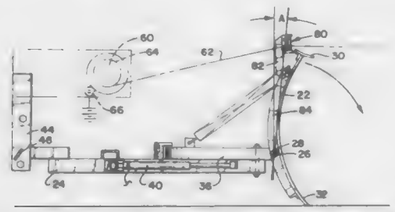
a holding means **11** uniting the cutter drum **8** to said plate **4** such that the rotational driving motion of the cutter drum **8** by the plate **4** is performed through said convex and concave polygonal shapes **9**, **10** which come into engagement one with the other.

4,991,323

COMBINED SNOW PLOW WINCH DEVICE

Ronald K. Benkler, Bloomington, Minn., assignor to Standard Marketing System U.S.A., Inc., Bloomington, Minn.

Filed Nov. 14, 1989, Ser. No. 436,309
Int. Cl.[5] E01H *5/04*
U.S. Cl. 37—235 **17 Claims**



6. In a snow plow and recovery device of the type having a vehicle mounted snow plow with a mouldboard mounted to a plow frame for pivotal movement against a biasing member about a generally horizontal pivot axis parallel to the mouldboard, and a vehicle mounted winch with a cable wound about a drum by a drum engaging drive means, said winch mounted generally between said vehicle and said mouldboard, the improvement comprising;

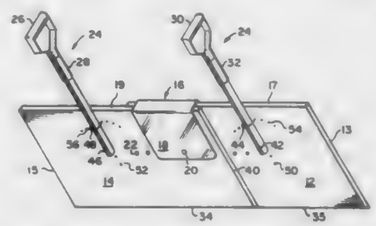
a cable guiding fairlead affixed to said mouldboard above said horizontal pivot axis with said axis located generally between said fairlead and said winch, whereby said mouldboard is free to move against said biasing member under the action of said cable when under load, and said fairlead guides said cable over said mouldboard.

4,991,324

SNOW REMOVAL DEVICE

Mark K. Fine, 150 Hillside Dr., Coopersburg, Pa. 18036; Michael L. Holben, 849 Robinwood Dr., Allentown, Pa. 18103

Filed Feb. 23, 1990, Ser. No. 184,420
Int. Cl.[5] E01H *5/02*
U.S. Cl. 37—284 **25 Claims**



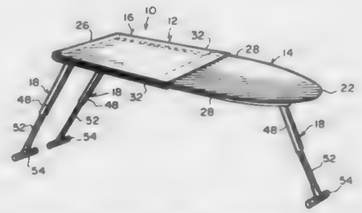
1. A snow removal device for manual use in plowing snow from a snow covered ground surface comprising a generally flat, planar composite working surface of at least two flat, planar component working surfaces, each having a ground engaging edge, an outside edge, an inside edge and a top edge, which component working surfaces are horizontally adjustably engaged one with the other to provide a range of extension of the width of the composite working surface, whereby said component working surfaces' respective inside edges overlap one another, said component working surfaces are temporarily fixed one to the other by fastening means which engages the component working surfaces to disengageably lock said component working surfaces into one of a plurality of said widths, and said composite working surface having one or more handles extending beyond said top edge of said composite working surface to facilitate manual operation by an individual during snow removal, wherein a handle is mounted on each of the two component working surfaces.

4,991,325

COLLAPSIBLE IRONING BOARD HAVING TELESCOPIC IRONING SURFACES, AND TELESCOPIC LEGS ATTACHED BY U-SHAPED BRACKETS AND V-SHAPED ARMED CONNECTORS

Carmine F. Teduschi, 616 Tower Mews, Oakdale, N.Y. 11769

Filed Jan. 18, 1990, Ser. No. 466,989
Int. Cl.[5] D06F *81/00, 81/02, 81/04, 81/10*
U.S. Cl. 38—138 **4 Claims**



1. A collapsible ironing board comprising:

(a) a platform comprising two extendable telescopic sections, wherein a front section sliding within a back section, each of the sections of said platform includes a pair of side

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flanges each having an inwardly facing lip, a pair of first stop members, each formed at a back end of each of the lips of said flanges on the front section, and a pair of second stop members, each formed at a front end of each of the lips of said flanges on the back section so that when the sections are extended said first stop members will connect said second stop members preventing the sections from disengaging from each other;

(b) three collapsible legs; and

(c) means for pivotally attaching one of said legs to a bottom surface of the front section of said platform near the front end thereof and for pivotally attaching said other two legs in a spaced apart relationship to a bottom surface of the back section of said platform near the back end thereof so that when said ironing board is not being used, the two sections of said platform are pushed together and said legs folded into a closed position allowing said ironing board in its reduced size to be stored away, said pivotally attaching means for each key includes a U-shaped channel bracket, and a connectors affixed to a top of each of said legs and having a pair of V-shaped arms pivotally connected to one of said U-shaped channel brackets so that when each leg is placed in an open position the V-shaped arms will bear against said U-shaped channel bracket for support.

4,991,326

AIR CLAMP FOR LAUNDRY HANDLING APPARATUS

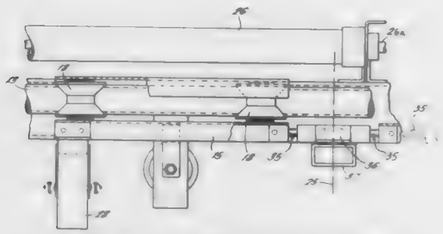
Henry J. Weir, The Willows, Woodcroft, Gwent, United Kingdom

Filed May 5, 1989, Ser. No. 347,986

Claims priority, application United Kingdom, Jun. 5, 1988, 8810683

Int. Cl.[5] D06F *67/04*

U.S. Cl. 38—143 **27 Claims**



1. A laundry article handling apparatus comprising:

fluid pressure operated means;

at least one article clamp connected to said fluid pressure operated means and having clamp closed and open positions respectively when said pressure operated means is pressurized and unpressurized;

clamp moving means for bodily moving said pressure operated means and said clamp connected thereto between an article receiving station and an article release station;

pressure outlet means disposed at said article receiving station and adapted for connection to a source of pneumatic pressure, said pneumatic pressure operated means having inlet means configured for releasable mechanical engagement with said outlet means when said clamp and said pressure operated means are moved to said article receiving station by said clamp moving means and having means for retaining the pneumatic pressure supplied thereto to hold an article in said clamp when said inlet means is disengaged from said outlet means by motion of said clamp and said pressure operated means away from said article receiving station;

release means at said article release station for releasing pneumatic pressure from said pressure operated means to allow said article to be released from said clamp; and actuating means at said release station for operating said release means.

4,991,327

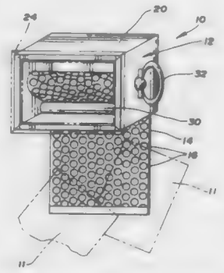
CARD DISPLAY

Frances R. Lane, 37072 Cochise, Mount Clemens, Mich. 48043

Filed May 24, 1989, Ser. No. 356,218

Int. Cl.[5] G09F *1/10*

U.S. Cl. 40—124 **4 Claims**



1. A wall hanging adapted for displaying a variable number of cards, said wall hanging comprising:

a housing having side walls and a back wall, one of the side walls having a slit therein and another of the side walls having a hole formed therein, said side walls forming a front opening, said front opening having a width and height substantially the same as that of the back wall;

a roller rotatably mounted in said housing and having one end thereof extending through said hole;

a card support strip attached at one end to said roller and having its other end extending through said slot;

a crank on the end of said roller extending through said hole and operable to rotate said roller to wind up said support strip onto said roller, said support strip being adapted to be manually pulled down;

a dowel fixed in said housing to one of said side wall and having a friction material thereon, the friction material being spaced from said roller but sufficiently close to said slot to maintain the said support strip at any position to which it is pulled down;

said card support strip having a plurality of perforations coextensive therewith; and

a fastener adapted to cooperate with a selected one of said perforations to display a selected one of said variable number of cards on said support strip.

4,991,328

STRUCTURES FORMED FROM JOINED ELEMENTS

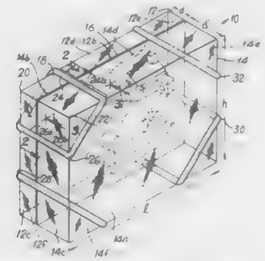
Jean-Pierre Rousseau, 96 Rue de Miromesnil, Paris, France 75008, and Nicolai Canetti, 329 Douglas Rd., Chappaqua, N.Y. 10514

Filed Apr. 28, 1989, Ser. No. 344,875

Int. Cl.[5] G09F *1/12*

U.S. Cl. 40—155 **3 Claims**

1. A display structure, comprising first and second plates, each of said plates having front and rear faces bounded by a plurality of side edges forming corners therebetween about peripheries of said plates, at least one of said faces on each of said plates being planar and adapted to be placed in a generally-abutting relation with the planar face of said other plate with the side edges of said plates being generally aligned; combination elastomeric bumper and tension means in the form of loops located at said corners embracing and surrounding the aligned portions of each of said plates about said corners, said loops maintaining said plates in compressive alignment and projecting outside and beyond the plate surfaces about the entirety of their lengths; and means located on the edges of at least one of said plates to retain said loops in the aligned portions-embracing and surrounding positions, said means comprising grooves in the aligned edges of at least one of said plates to accommodate a portion of said loops, said grooves



having a depth less than a diameter of said loops when said loops are maintaining said plates in said compressive alignment.

4,991,329

CANVAS STRETCHER RETAINING CLIP FOR PICTURE FRAMES

William G. Wilson, 3129 Lookaway Trail, Chattanooga, Tenn. 37406, assignor to William G. Wilson and David H. Turner, Chattanooga, Tenn.

Filed Oct. 12, 1989, Ser. No. 420,291

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—156 **6 Claims**

1. A clip means retaining a canvas stretcher frame having a polygonical outer peripheral configuration with a rabbet groove formed about a central opening of a decorative picture frame, said stretcher frame comprising a plurality of wooden bars having a first rearwardly extending edge forming the outer periphery of said stretcher frame and a second rearwardly extending edge spaced from said first edge and defining a front and rear face therebetween, said rabbet groove having the same polygonical configuration as the canvas stretcher and being defined by a rearwardly facing ledge for abutting a peripheral portion of the front face of the stretcher frame and an inwardly facing surface extending rearwardly from said ledge and facing the outer periphery of the stretcher frame, said outer periphery of the stretcher frame being spaced from said inwardly facing surface of said rabbet groove to define a clearance space therebetween, said clip comprising a resilient metallic wire rod having a circular cross sectional configuration of a diameter no greater than said clearance space, said rod having an elongated central body portion of a length greater than the distance between said first and second edges, said body having first and second ends, a first leg extending from said first end away from said body portion, a second leg extending from said second end, said first and second legs being disposed on the same side of a plane passing through said first and second ends of said body portion, said first and second legs being angularly inclined toward each other inwardly relative to said body portion, said first leg terminating at a pointed protuberance directed oppositely to said body portion and away from said second end for piercing said inwardly facing surface of said rabbet groove when said body portion has been positioned in overlaying relationship with said rear face of a bar, said second leg terminating in a retaining portion extending toward said first leg for forcibly abutting the second rearwardly extending edge of said bar, said protuberance and a portion of said first leg being adapted to be inserted into said clearance space with said central body portion disposed in overlaying relationship with said clearance space and thereafter rotated so that said body portion overlies said rear face, thereby to permit said body portion to be movable toward said rear face to forcibly abut said retaining portion with said second rearwardly extending edge to secure said bar within said rabbet.

4,991,330

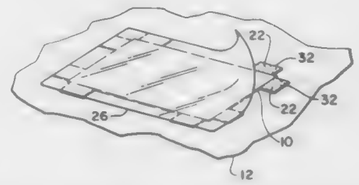
APPARATUS FOR MOUNTING PHOTOGRAPHS AND OTHER DOCUMENTS

Saeed M. Heidari, 27 Burgundy La., Middletown, Conn. 06457

Filed Aug. 3, 1989, Ser. No. 389,408

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—158.1 **11 Claims**



1. Apparatus for mounting an associated photograph on an associated mounting surface and to constrain movement of the associated photograph on the associated mounting surface so that the associated photograph is prevented from any substantial movement which comprises:

first means for affixing the associated photograph on the associated mounting surface comprising an element which is generally planar and has adhesive on the planar surfaces thereof, said first means having a generally rectilinear side thereof disposed in side abutting relationship with a small portion of one or more sides of the associated photograph;

second means for affixing the associated photograph on the associated mounting surface comprising an element which is generally planar and has adhesive on the planar surfaces thereof, said second means having a generally rectilinear side thereof disposed in side abutting relationship with a small portion of one or more sides of the associated photograph;

third means for affixing the associated photograph on the associated mounting surface comprising an element which is generally planar and has adhesive on the planar surfaces thereof, said third means having a generally rectilinear side thereof disposed in the side abutting relationship with a small portion of one or more sides of the associated photograph;

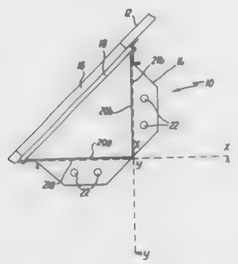
fourth means for affixing the associated photograph on the associated mounting surface comprising an element which is generally planar and has adhesive on the planar surfaces thereof, said fourth means having a generally rectilinear side thereof disposed in side abutting relationship with a small portion of one or more sides of the associated photograph; and

a clear plastic member extending over the associated photograph and said first, second, third and fourth means for affixing with the adhesive on one planar face thereof engaging said clear plastic member and the adhesive on the other planar face thereof engaging the associated mounting surface wherein there are substantial gaps between said first, second, third and fourth means to that

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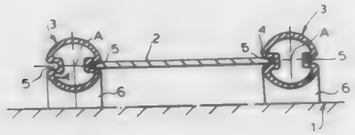
each of said means does not contact any other of said means.

4,991,331
DISPLAY ASSEMBLY
Roger A. James, Burton-on-Trent, England, assignor to R. A. James & Co. Limited, England
Filed Oct. 11, 1989, Ser. No. 419,665
Claims priority, application United Kingdom, Oct. 22, 1988, 8824817
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—443 10 Claims



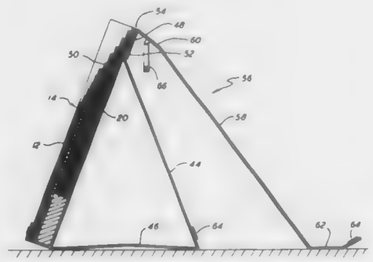
1. A display assembly comprising a housing:
a side of said housing through which said housing can be viewed internally,
a pair of two-way mirrors arranged in a substantially right-angled relationship and mounted in said housing with the mirrored sides defining the included angle and facing towards said viewing side,
a visual representation on said other side of each mirror, and a lamp located behind said other side of each mirror,
whereby when one of said lamps is lit, the respective representation is visible through the respective mirror and the mirror image of said same representation is visible on the other mirror.

4,991,332
SIGN BEARING INFORMATION OR INDICATING DIRECTION
Bernd Briissing, Ulm, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed Jul. 21, 1989, Ser. No. 384,739
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 8809955[U]
Int. Cl.[5] G09F *11/00*
U.S. Cl. 40—490 10 Claims



1. In an information-bearing and direction-indicating sign comprising at least one information carrier provided with an indicia selected from the group consisting of a printing, a pictogram and a direction-indicating symbol and a frame holding said information carrier, the improvement wherein each of said information carriers comprises a substantially rectangular plate and said frame comprises at least two longitudinally-extended members running substantially parallel to each other, which are provided with a plurality of opposing longitudinally-running receiving grooves, in which said information carriers are held edgewise and are removable, said longitudinally-extended members having a connecting piece at each end for attachment to a wall surface, said longitudinally-extended members comprising an extruded plastic pipe which has a substantially uniform wall thickness in a vicinity of said receiving grooves, said connecting piece being formed from an angular piece having first and second ends, said first end provided with a protruding uniting portion fitting an interior cross section of said plastic pipe, said second end being releasably insertable in a mounting piece rigidly attached to said wall surface.

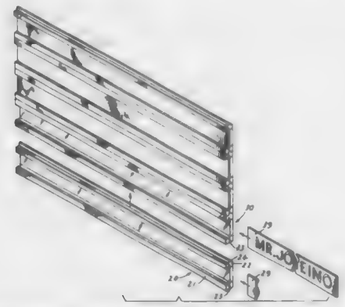
4,991,333
FURNITURE DESIGNING DISPLAY AND CARRYING CASE
Roderick G. McLean, Cazenovia, and Sandy W. Soroush, Brooklyn, both of N.Y., assignors to Harden Furniture, Inc., McConelsville, N.Y.
Filed May 15, 1989, Ser. No. 352,286
Int. Cl.[5] G09F *19/00*
U.S. Cl. 40—534 9 Claims



1. In a variable graphic display for selectively presenting a combination of design features of an object in a composite pictorial representation, a combination random access storage/display easel and carrying case adapted for storing a plurality of sets of design feature transparencies of an object and displaying one of each set in an overlapping pictorial presentation including:
a first display compartment adapted to receive one transparency from each set of design feature transparencies;
guide means disposed about said first display compartment to operatively engage at least two edges of transparencies placed therein to hold them in overlapping alignment;
a second storage compartment open at the top and having a front and back member, juxtaposed directly behind said first display compartment and adapted to receive therein a plurality of sets of transparencies;
said second storage compartment forming the back of the storage/display easel;
a plurality of sets of object element transparencies disposed in said second compartment each set including a variety of designs for a particular object element; and
a composite display of one transparency of each of said sets disposed in overlapping alignment in said first compartment to form a pictorial representation of the object
whereby individual custom designs of the object can be created by selectively choosing different individual transparencies from each set of transparencies in said second compartment and superimposing them in overlapping alignment in said first compartment.

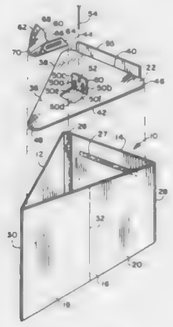
4,991,334
FILM STRIP HOLDER
Hanque F. D. Amundsen, Milwaukee, Wis., assignor to Poblocki & Sons, Inc., Milwaukee, Wis.
Filed Oct. 30, 1989, Ser. No. 428,977
Int. Cl.[5] G09F *13/04*
U.S. Cl. 40—568 9 Claims

4. A holder for retaining a negative film strip in light transmissive relation within a backlighted message directory display which comprises
a longitudinally extending holder extrusion, said extrusion comprising an upper opaque portion, a middle translucent



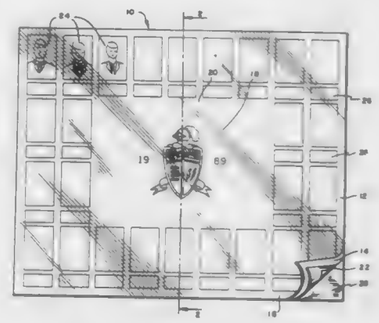
portion and a lower opaque portion, said upper and lower portions having complimentary internal grooves for retaining a negative film strip therebetween, and
means for engaging said holder member with upwardly and downwardly adjacent holder members.

4,991,335
COLLAPSIBLE TRIANGULAR MOBILE
Richard G. Krautsack, Arlington Heights, Ill., assignor to Comark Merchandising, Inc., Elk Grove Village, Ill.
Filed Mar. 31, 1989, Ser. No. 331,433
Int. Cl.[5] G09F *7/22, 1/08*
U.S. Cl. 40—617 4 Claims



1. A triangular mobile, comprising
a first non-creased wall;
second non-creased wall connected to said first non-creased wall;
a creased wall having a first wall portion connected to said first non-creased wall and a second wall portion connected to said second non-creased wall;
a compressional support member connected to said first non-creased wall for pivoting into engagement with said second non-creased wall and said creased wall to hold said triangular mobile in an open stable configuration, said compressional support having a tab comprising a pair of legs, a crossbar briding said legs and defining an aperture for accommodating a first support, and a tongue extending from said crossbar for engaging a second support; and
an automatically out-folding positive stop connected to said second non-creased wall and said creased wall to be engaged by said compressional support member when it engages said second non-creased wall and said creased wall.

4,991,336
PHOTOGRAPHIC COMPOSITE BOARD
Robert D. Lucke, 210 S. Mulnix St., Kirksville, Mo. 63501
Filed Jul. 11, 1989, Ser. No. 378,300
Int. Cl.[5] G09F *3/10*
U.S. Cl. 40—630 7 Claims



1. A composite board for mounting and displaying photographic and graphic articles comprising:
a cover layer of transparent plastic material having a non-glare outer surface and a highly polished inner surface;
a layer formed of at least one sheet of graphic material in interfacial contact with said cover layer and having an adhesive for bonding said graphic material to said inner surface of said cover layer;
a masking layer having a pressure sensitive adhesive on one layer thereof and in interfacial contact with and permanently bonded to said graphic material layer and to said inner surface of said cover layer, said masking layer being further defined by at least one opening therein;
at least one photograph in alignment with said one opening in said masking layer; and
a flexible plastic backing sheet having a pressure sensitive adhesive on an inner surface thereof in interfacial contact with said masking layer and said photograph and permanently bonded thereto, thereby laminating said photograph and said graphic material between said cover layer and said cover layer and said backing layer.

4,991,337
INEXPENSIVE DISPOSABLE IDENTIFICATION BRACELET
Laurie R. Solon, 6 Squire La., St. Charles, Kane County, Ill. 60174
Continuation-in-part of Ser. No. 225,379, Jul. 28, 1988. This application Sep. 6, 1988, Ser. No. 240,720
Int. Cl.[5] A61B *5/00*
U.S. Cl. 40—633 2 Claims



2. An identification bracelet comprising:
an elongated strip of thin but tough flexible material having first and second opposed ends and top and bottom opposed sides;
said top side having a surface that will receive and retain variable information written at a desired location thereon with a writing instrument or the like;
a first body of pressure sensitive adhesive on said top side adjacent said first end; and

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a second body of pressure sensitive adhesive on said bottom side adjacent said second end;

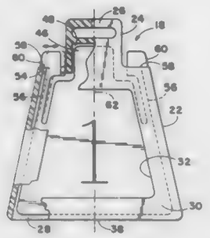
whereby variable information may be inscribed at said locations, the strip disposed about a limb of a wearer with said top side facing or remote from the wearer, the ends brought into superimposed relation with a part of said top side near said first end being subjacent a part of said bottom side near said second end and with said adhesive bodies facing each other and pressure applied to the strip oppositely of each body of adhesive to secure each end of the strip to the adjacent superimposed part of the strip.

4,991,338

GOLF CLUB HEAD COVER WITH IDENTIFICATION TAG

George H. Jones, 13460 SW. Fielding Rd., Lake Oswego, Oreg. 97034

Filed Jan. 5, 1989, Ser. No. 293,633
Int. Cl.[5] G09F *3/20*
U.S. Cl. 40—653 6 Claims



1. An identification tag for use in conjunction with a golf club cover or the like, comprising:

(a) a plurality of generally planar label plates each having a pair of label faces, at least one label face including a club-identifying mark;

(b) a labelled plate holder including a top and a pair of sidewalls defining an interior space and a label display window; and

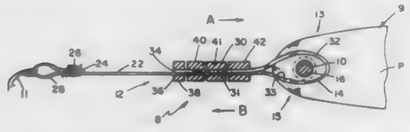
(c) latching means included in said label plate holder said latching means including a retainer shoulder defined by one of said sidewalls at a location adjacent said top, each of said label plates including a resiliently flexible catch support member and catch means, carried on said catch support member and latchingly engageable with said retainer shoulder, for holding said label plates in said holder in face to face parallel alignment with one another and having one of said club identifying marks of one of said label plates visibly located in alignment with said display window.

4,991,339

FISHING LURE COUPLING APPARATUS

Robert L. Gibson, 5471 Homestead La., Bay City, Mich. 48706

Filed Oct. 10, 1989, Ser. No. 419,015
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.49 57 Claims



1. Apparatus for drawing a fishing lure through water comprising:

draft line means including

adjustable loop means having adjustable eyelet means adjustable between a reduced size for coupling to said lure and an enlarged size removed from said lure;

pin means for attachment to lure for receiving said loop means when said eyelet means is in said reduced size;

said pin means including a shaft mountable on said lure and means for inhibiting transverse movement of said loop means, in said reduced size, on said pin means including an enlarged head on said shaft over which said loop means passes when said eyelet means is in said enlarged size; and

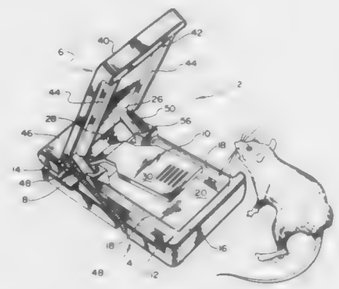
means for mounting said pin means on said lure for transverse movement relative thereto between a rest position in which said head is adjacent said lure and a removed, line receiving position.

4,991,340

ANIMAL TRAP

Walter C. Schildt, 1707- 69th Ave., N., #240, Brooklyn Center, Minn. 55430

Filed Mar. 23, 1990, Ser. No. 498,808
Int. Cl.[5] F01M *23/26*
U.S. Cl. 43—81 18 Claims



1. An improved animal trap, which comprises:

(a) a first jaw;

(b) a second jaw pivotaly mounted to the first jaw for movement between an open position in which the jaws are spaced apart, and a closed position in which the jaws are closed against one another; and

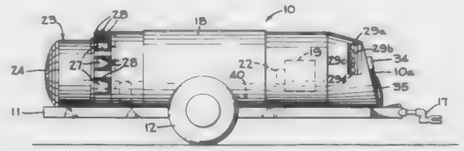
(c) a single continuous spring for closing the jaws, said spring encircling the jaws and being retained on the first and second jaws at attachment points selected in relation to a pivot point for the second jaw such that the spring exerts no closing force on the second jaw in the open position of the jaws.

4,991,341

CONTROL SYSTEM FOR UNIFORM SPRAYING OF PLANTS

Barry D. Douglas, Mountain View, Calif., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 145,173, Jan. 19, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 414,622
Int. Cl.[5] A01C *13/00*
U.S. Cl. 47—1.7 4 Claims



1. A control system for providing uniform spraying of plants

by a vehicle having a source of liquid product , said system comprising:

a plurality of spray nozzle means arranged on one side of said vehicle;

a pump connected to supply product under pressure to said plurality of spray nozzles;

a plurality of first valves, each of which is interposed between one of said spray nozzle means and said pump, the open ones of said valve defining a total flow requirement;

a flow control valve interposed between said pump and said plurality of first valves;

a bypass line; and

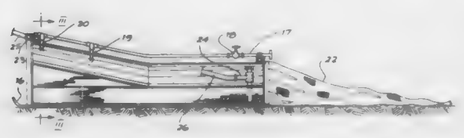
said flow control flow valve being adjustable to direct to said first valves that portion of the output from said pump necessary to supply the total requirement of the open ones of said first valves with the remaining portions of the pumps'output being returned to said source through said bypass line.

4,991,342

STEAM TREATMENT OF CROPS

Molly V. Maher, and Robert J. Maher, both of Forbes, Australia, assignors to Riyate Pty. Limited, Australia

Division of Ser. No. 880,176, Jun. 30, 1986, Pat. No. 4,873,772, which is a continuation-in-part of Ser. No. 583,385, Feb. 24, 1984, Pat. No. 4,604,857. This application Mar. 23, 1989, Ser. No. 327,595
Claims priority, application Australia, Feb. 25, 1983, 12434/83
Int. Cl.[5] A01G *13/06;* A01D *14/02*
U.S. Cl. 47—1.7 5 Claims



1. A method of treating crop subsequent to cutting the crop and allowing said crop to fall on the ground, said method comprising the further step of subjecting the crop that is laying on the ground to steam treatment for a sufficient time to allow some of the steam to penetrate the structure of the leaf of the crop plant without moving, mechanically handling or disturbing the crop before steaming is commenced.

4,991,343

PROCESS FOR PREVENTING THE SPREAD OF VEGETATION

Thomas R. Wait, 9350 Longmeadow Cir., Boynton Beach, Fla. 33437

Filed Oct. 18, 1989, Ser. No. 423,751
Int. Cl.[5] A01G *1/00;* E02D *27/00*
U.S. Cl. 47—33 12 Claims

1. A process for preventing the spread of vegetation from one area to another, comprising the steps of:

(a) providing a flexible, in-ground plastic, vegetation-encroachment barrier comprised of at least a first wall and a second wall, wherein:

(1) each of said first wall and said second wall comprises a bottom portion and a top portion and has a thickness of from about 0.05 to about 0.09 inches;

(2) said vegetation-encroachment barrier is comprised of means for attaching said bottom portions of said first wall and said second wall to each other;

(3) the bottom portion of said first wall is attached to the bottom portion of said second wall, and the top portion of said first wall is contiguous with and separable from the top portion of said second wall;

(4) said first wall and said second wall are so configured that, when the bottom portion of said first wall is contiguous with the bottom portion of said second wall, and when the top portion of said first wall is contiguous with the top portion of said second wall, a chamber is defined by said first wall, which chamber is intermediate between the tops of said walls and the bottoms of said walls;

(b) providing a means for separating vegetation;

(c) disposing said means for separating vegetation between said first wall and said second wall and, simultaneously, separating said top of said first wall from said top of said second wall; and

(d) moving said means for separating vegetation between said first wall and said second wall.

7. A flexible plastic, vegetation-encroachment barrier comprised of at least a first wall and a second wall, wherein:



(a) each of said first wall and said second wall comprises a bottom portion and a top portion and has a thickness of from about 0.05 to about 0.09 inches:

(b) said vegetation-encroachment barrier is comprised of means for attaching said bottom portions of said first wall and said second wall to each other;

(c) the bottom portion of said first wall is contiguous with the bottom portion of said second wall, and the top portion of said first wall is contiguous with and separable from the top portion of said second wall; and

(d) said first wall and said second wall are so configured that, when the bottom portion of said first wall is cintiguous with the bottom portion of said second wall, and when the top portion of said first wall is contiguous with the top portion of said second wall, a chamber is defined by said first wall, which chamber is intermediate between the tops of said walls and the bottoms of said walls.

4,991,344

APPARATUS FOR HOLDING PLANTS, POTS OR THE LIKE

Raymond M. Carney, Mobile, Ala.

Filed Jul. 28, 1986, Ser. No. 890,168
Int. Cl.[5] A47G *7/02;* F16M *11/20*
U.S. Cl. 47—39 4 Claims

1. An apparatus of adjustable size for hanging potted plants and holding potted plants comprising:

(a) a hollow center post formed of at least two similarly-shaped hollow pieces, said pieces being joined together by inserting said pieces into suitably adapted connecting means;

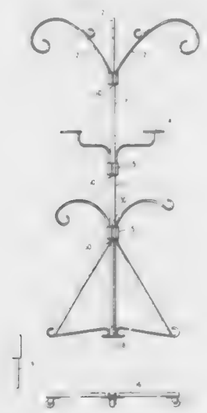
(b) said connecting means also having a plurality of integrally formed peripheral openings adapted to hold, by insertion into said openings, a plurality of functional radially extending arms, said radially extending arms being mountable in either the top or bottom of said openings;

(c) said radially extending arms being adapted for hanging potted plants via hook-shaped means or being adapted for holding potted plants via a supporting plate,

said apparatus capable of being vertically elongated by addition of further hollow pieces and a corresponding number of connecting means, and the overall configura-

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tion of said apparatus being adaptable to hold a specific number of potted plants by inserting a specific number of



said radially extending arms into said openings in said connecting means.

4,991,345

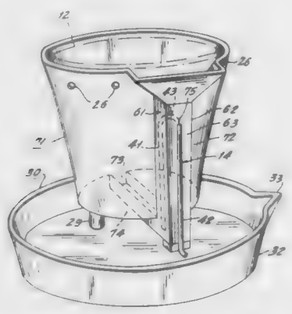
APPARATUS AND METHOD FOR PLANT CARE

Joseph S. Bloch, 276 Greenway Rd., Lido Beach, N.Y. 11561

Filed Oct. 6, 1989, Ser. No. 417,887

Int. Cl.[5] A01G *9/02*

U.S. Cl. 47—79 **9 Claims**



1. Planter apparatus including:

a first container for holding a planting medium, said first container having perforations at its bottom;

a basin disposed below said perforations to catch plant nourishing liquid that drains from said first container through the perforations thereof;

and selectably operable drain means through which liquid is withdrawn from said basin to a level that is substantially below the perforations; said drain means including a siphon tube having a bend intermediate an inlet and an outlet, which bend is normally disposed above both said inlet and said outlet at an elevation approximately that of planting medium disposed within said first container; said inlet being in communication with said basin and being substantially below the perforated bottom of the first container; said outlet normally being disposed outside of said first container and below said inlet.

4,991,346

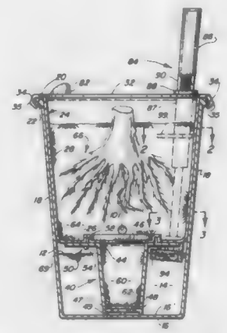
SUPPORT AND WATERING ASSEMBLY FOR A PLANTING POT

Jose A. Costa, Jr., 22290 SW. 162nd Ave., Gould, Fla. 33170, and Julian Gutierrez, 6205 SW. 116th St., Miami, Fla. 33156

Continuation-in-part of Ser. No. 332,512, Apr. 3, 1989, which is a continuation-in-part of Ser. No. 243,500, Sep. 12, 1988. This application Aug. 7, 1989, Ser. No. 390,386

Int. Cl.[5] A01G *27/00*

U.S. Cl. 47—80 **8 Claims**



1. An assembly designed to contain and provide water to the root system of a plant, comprising:

a. an outer container having a base and surrounding side walls defining a hollow interior and terminating in an open mouth oppositely disposed to said base,

b. a planting pot dimensioned and configured to be disposed in said outer container and including a bottom disposed in spaced relation to said base,

c. a capillary container connected to said bottom and disposed in depending relation therefrom towards said base,

d. a liquid reservoir maintained within said outer container and defined by a sufficient quantity of liquid to submerge a lower end of said capillary container and having an upper level of the liquid reservoir maintained beneath and in spaced relation to said bottom of said planting pot,

e. said capillary container filled with a transfer medium and including said lower end being apertured and defining fluid communication between the liquid reservoir and the capillary container interior,

f. said bottom of said planting pot being apertured and including connecting means removably attaching said capillary container to said bottom in aligned communicating relation between said apertured bottom in aligned communicating relation between said apertured bottom of said planting pot and an open upper end of said capillary container,

g. said connecting means including a flange member secured to and extending radially outward from said open upper end of said capillary container and removably engageable with an under surface of said bottom of said planting pot wherein said flange member comprises a plurality of receiving apertures formed therein and each disposed to removably receive one of a plurality of connector elements therein, said plurality of connector elements formed on an under surface of said bottom of said planting pot,

h. said connecting means further including an upwardly directed protrusion formed on said flange and a congruently configured receiving channel disposed and dimensioned to removably receive said protrusion therein in frictional engagement therewith,

i. the transfer medium within the interior of said capillary container disposed in contact with soil supporting the root system of a plant within said planting pot, and

j. said capillary container and planting pot relatively disposed to said hollow interior of said outer container to define transfer of liquid from said liquid reservoir by capillary action from the hollow interior through said transfer medium to the root system within said planting pot.

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OPENING/CLOSING MECHANISM FOR THE USE IN CIRCULAR-ARC SHAPED SLIDING DOORS

Akiyoshi Takimoto; Kenzo Ono, and Yuichi Noguchi, all of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 29, 1990, Ser. No. 530,478

Continuation of Ser. No. 398,994, Aug. 28, 1989, abandoned.

Claims priority, application Japan, Sep. 1, 1988, 63-216396; Sep. 1, 1988, 63-114034

Int. Cl.[5] E06B *3/34*

U.S. Cl. 49—40 **8 Claims**



1. An opening/closing mechanism for use in a double-sliding type circular-arc shaped door including a pair of left and right door bodies each having a circular-arc horizontal sectional shape, and a transverse door frame having a circular-arc horizontal sectional shape and including circular-arc guide rails on which the door bodies are mounted for guiding the door bodies, respectively, in such a way as to generate circular-arc shaped moving loci, respectively, said door bodies being slidably movable under the transverse frame, in opposite directions relative to each other relative to a door abutment line, which passes through a circumferentially central part of the transverse frame and a the center of the circular-arc of guide rails such that the door can be opened and closed, said mechanism comprising:

a drive pulley mounted on one circumferential side end of said transverse door frame and a single pulley mounted on another side end of said transverse door frame and connected to a means for driving said driven pulley;

a single endless belt being twisted by an angle of 180 degrees in a vicinity of turning end portions and wound between and around the drive pulley and the driven pulley so that one of inner circular-arc shaped portions of the belt on one side and one of outer circular-arc shaped portions thereof on the other side, which are defined, respectively, relative to the door abutment line, is movable in such a way as to generate circular-arc shaped loci having equal radius to each other and each of the loci being concentric with the center of the moving locus defined by each of said door bodies; and

inner and outer guide means arranged whereby contact with the outer surfaces of the inner circular-arc shaped portions of the endless belt and the inner surfaces of the outer circular-arc shaped portions thereof, respectively, wherein one of said pair of door bodies is connected to one of the inner circular-arc shaped portions of said endless belt on one side another of said door bodies being connected to one of the outer circular-arc shaped portions of said endless belt on the other side.

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POWER WINDOW APPARATUS

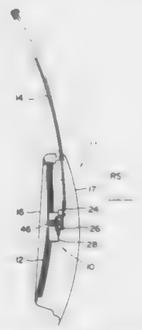
Kengo Yamamura, Shizuoka, and Tsutomu Saito, Toyohashi, both of Japan, assignors to Asmo Co., Ltd., Shizuoka and Nippondenso Co., Ltd., Aichi, both of, Japan

Filed Oct. 5, 1989, Ser. No. 417,466

Claims priority, application Japan, Jul. 31, 1989, 1-199062

Int. Cl.[5] E05F *15/08*

U.S. Cl. 49—349 **13 Claims**



1. A power window apparatus disposed in a space between a door inner panel and a door outer panel of a door for moving a window glass between an open and a close position, comprising:

driving means secured to said window glass and having a rotary shaft;

a rack stationarily disposed so as to extend in the opening and closing direction of said window glass;

a pinion drivingly connected to said rotary shaft for rotating in meshing engagement with said rack;

guide means for guiding said pinion gear along said rack while maintaining the meshing engagement between said pinion and said rack; and shifting means for shifting at least the lower end portion of said window glass toward said door outer panel when said window glass has been moved to a position near the fully closed position and including an inclined rack provided at an upper end portion of said rack, said inclined rack having a pitch line continuous from the pitch line of said rack and inclined towards said door outer panel.

4,991,349

INSULATING WINDOW FOR MOBILE HOMES

Timothy H. Barthelemy, 1734 Oak Rd., Grand Tierra Addition, Saint Cloud, Minn. 56301

Filed Aug. 22, 1988, Ser. No. 234,488

Int. Cl.[5] E06B *3/32*

U.S. Cl. 49—61 **7 Claims**



1. An insulated auxiliary storm window assembly with improved heat insulating properties for use on the inside wall of mobile homes, trailers and other portable shelter units and usable in combination with an existing window and window molding to reduce heat loss from the window and molding and

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obtain a tight sealing relationship where substantial expansion and contraction changes are encountered and where the shelter unit may undergo substantial vibration due to travel and weather forces, comprising:

a frame entirely surrounding and enclosing said existing window and window molding and attachable to the inside wall of the portable shelter unit;

a glass window unit having an outer periphery;

retaining means for attaching said window unit to said frame;

said frame including a first fastening flange confronting said inside wall and extending generally inwardly from said frame and a second fastening flange confronting said inside wall extending generally outwardly from said frame;

mounting means for attaching said first and second flanges to said inside wall;

a first gasket intermediate said periphery of said window unit and said frame;

a second gasket intermediate said first flange and said inside wall of said shelter unit;

a third gasket intermediate said second flange and said inside wall of said shelter unit;

said frame includes an upper member, a lower member and left and right side members;

said upper and lower members and said left and right side members include:

a wall confronting panel intermediate said first fastening flange and said second fastening flange with a flat inner surface which is spaced from and confronting said inside wall;

first, second and third support members projecting from said wall confronting panel, said first support member spaced from said second support member and said second support member spaced from said third support member;

a first interposed partition intermediate said first support member and said third support member and intersecting said second support member, forming a first insulating, sag resisting chamber and a second insulating, sag resisting chamber to trap dead air therein, said first insulating, sag resisting chamber bounded by said wall confronting panel, said first support member, said second support member and said first interposed partition, and said second insulating, sag resisting chamber bounded by said wall confronting panel, said second support member, said third support member and said first interposed partition; and

a second interposed partition intermediate said second support member and said third support member, a third insulating, sag resisting chamber to trap dead air therein being bounded by said first interposed partition, said second support member, said third support member and said second interposed partition.

4,991,350

ELECTROMAGNETICALLY CONTROLLED CAT FLAP

Christopher P. Kirk, Middlesex, United Kingdom, assignor to Pet Mate Limited, Twickenham, United Kingdom

Filed Sep. 1, 1989, Ser. No. 402,810

Claims priority, application United Kingdom, Jul. 16, 1988, 8816980

Int. Cl.[5] E06B *11/00*

U.S. Cl. 49—169 **8 Claims**

1. A pet door comprising:

a frame, an aperture defined by the frame, the frame being adapted to be mounted in a generally upright attitude to control passage of a small animal through the aperture and whereby the frame has upper and lower members joined by lateral members,

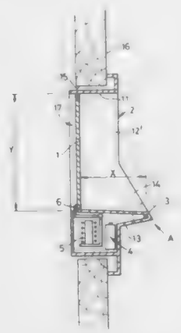
a single closure defined by a flap, the flap being pivotally mounted in the frame near said upper member so as to close said aperture when hanging in a rest position and being pivotable from said rest position to permit passage of said animal through said aperture, said aperture being entirely open apart from said flap,

catch means on the frame movable between a first position obstructing movement of the flap in at least one direction and a second position not obstructing said movement of the flap,

electrically operable means for displacing the catch means between said first and second positions,

a source of electrical energy,

circuit means interconnecting said source and said electrically operable means and



a plurality of switch means included in said circuit means in such a way that closure of any one of said switch means will cause actuation of said electrically operable means, each said switch means being of a type which is normally open but which closes in response to the approach thereto of a magnetised or magnetisable element, said plurality of switch means being arranged in an array extending circumferentially of the aperture in a portion of said frame members remote from said flap, the arrangement being such that when a magnetic or magnetisable element worn by a small animal is brought into proximity with one or more of said switch means the catch means is caused to release the flap.

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FIXED COUPLING DEVICE BETWEEN A WINDOW AND A WINDOW-RAISER MECHANISM IN A VEHICLE

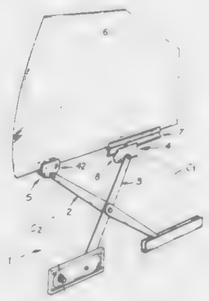
Carlo Bertolini, Paris, France, assignor to Rockwell-CIM, France

Filed Sep. 25, 1989, Ser. No. 411,822

Claims priority, application France, Sep. 29, 1988, 88 12761

Int. Cl.[5] E05F *11/48*

U.S. Cl. 49—351 **6 Claims**



1. In an automobile window system having a glass mounted for movement between open and closed positions by suitable drive means, the combination comprising:

(a) a support section (42) operably connected to the automobile window glass to provide support and connection to the drive means;

(b) a drive arm (2) operably connected to the drive means; and

(c) a glass support section (42) that includes a rigid part (45) and a flexible part (46) articulated elastically on the rigid part, so as normally to be returned and kept bearing against the said rigid part, forming with the latter a gripper capable of retaining a coupling sphere (44) disposed on the said drive arm (2), as a result of the snapping of the elastic part (46) into the rigid part (45).

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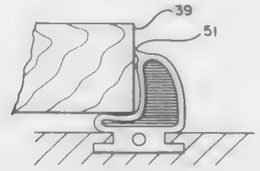
DOOR GASKET WITH TRIANGULAR SHAPE

Michael L. Hyer, Weatherford, Tex., assignor to JMK International, Inc., Fort Worth, Tex.

Continuation of Ser. No. 276,118, Nov. 25, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 512,025

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—495 **5 Claims**



1. A door gasket for sealing between two confronting surfaces, comprising in combination:

an elongate gasket member of elastomeric material having a length, having a base for mounting to the first of the confronting surfaces and a deforming section protruding outwardly from the base for sealing contact with the second of the surfaces;

wherein the deforming section includes a bottom wall which is parallel to the plane of the first confronting surface, a vertical wall which forms a right angle with the bottom wall, and a slanting wall which interconnects the bottom wall and vertical wall, the bottom, vertical and slanting walls all being integrally formed with the base and interconnected to define a right triangular exterior and a hollow interior, the interconnecting of said slanting wall and said vertical wall being defined by an arcuate juncture having a first and second end portion, said first end portion merging into said slanting wall and said second end portion merging into said vertical wall, the slanting wall forming substantially the hypotenuse of the right triangle and comprising a primary exterior sealing surface for the door gasket; and

wherein the door gasket further comprises a fin located on the primary exterior sealing surface of the door gasket for the length thereof and being adjacent said first end portion of said arcuate juncture of the slanting wall and vertical wall, said fin extending in a direction outwardly from said slanting wall and away from the bottom and vertical walls, the fin being deformed through an arc inwardly toward the sealing surface when the second confronting surface is brought into contact with the primary exterior sealing surface to thereby form a secondary sealing surface with the first confronting surface.

4,991,353

GRINDING MACHINE FOR GRINDING PREGEARED BEVEL GEARS

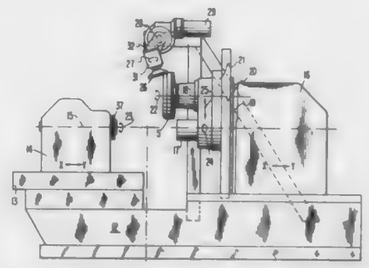
Dieter Wiener, Tulpenstrasse 9, D-7505 Ettlingen, Fed. Rep. of Germany

Division of Ser. No. 617,523, Jun. 4, 1984. This application Jul. 31, 1985, Ser. No. 761,077

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320042

Int. Cl.[5] B24B *7/00*

U.S. Cl. 51—5 D **11 Claims**



1. A grinding machine for grinding pregeared bevel gears, the grinding machine comprising a stationary machine bed, a workpiece carrier for a bevel gear, a motor driven spindle in said carrier and holding a bevel gear to be ground, a motor driven grinding head having a grinding spindle, a grinding wheel on said grinding spindle, a truing device connected to a rigid part of the machine and cooperating with said grinding wheel, said truing device being pivotable relative to said grinding wheel for changing an angle of engagement with said grinding wheel, said grinding wheel and the bevel gear being ground cooperating with one another to execute a hobbing motion to generate a shape of a tooth in a direction of a tooth depth, said grinding wheel defines a shape of the tooth in a longitudinal direction of the tooth and a cutting motion of said grinding wheel results in a metal removal from the pregeared bevel gear being ground, and an eccentricity of the grinding spindle to a center of the grinding machine results in a desired angle of the tooth an individual motor drive means for independent driving said truing device, and, wherein said grinding is adjustable by a motor in a radial direction to said bevel gear and also in a direction perpendicular to said radial direction over a limited distance.

4,991,354

ABRASIVE SAW ADJUSTABLE WORKPIECE SUPPORTING FRAME

Karl B. Schweickhardt, St. Louis County, Mo., assignor to Great Eagle Enterprises Corporation, Manchester, Mo.

Filed Oct. 31, 1988, Ser. No. 264,539

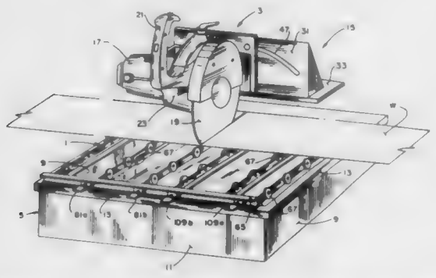
Int. Cl.[5] B24B *7/00*

U.S. Cl. 51—78 **10 Claims**

1. An adjustable workpiece supporting frame for use with an abrasive saw supported relative to a base pan, the workpiece supporting frame being supported by and extending generally horizontally across the base pan for horizontally supporting a workpiece relative to said abrasive saw, said frame including a plurality of generally parallel rails extending longitudinally of said frame, adjustment means for adjusting a workpiece relative to said abrasive saw while resting on said frame, said workpiece adjustment means including lateral and longitudinal adjustment means for lateral and longitudinal adjustment relative to said abrasive saw, and means for providing incremental measured adjustment relative to said abrasive saw, said longitudinal adjustment means comprising a series of spaced freely-turning rollers mounted to said parallel rails for rollingly supporting the work piece thereon and for permitting ease of movement of the workpiece toward and away from the abra-

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sive saw, and said lateral adjustment means including incremental adjustment means for adjusting said workpiece substantially normal to said generally parallel rails, the lateral adjustment means comprising a workpiece fence extending generally



parallel to said parallel rails and positioned above said frame, said workpiece fence being connected to a laterally adjustable side rail of said frame, and said workpiece fence also being laterally adjustable relative to said frame.

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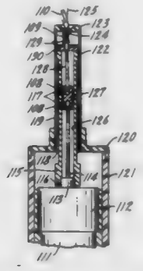
APPARATUS FOR SHARPENING POINTS

John E. Giles, 8614 Tarpon Springs Rd., Odessa, Fla. 33556

Division of Ser. No. 176,213, Mar. 31, 1988, and a continuation-in-part of Ser. No. 176,213, Mar. 31, 1988, Pat. No. 4,869,028, which is a division of Ser. No. 73,572, Jul. 15, 1987, Pat. No. 4,879,844. This application May 1, 1989, Ser. No. 345,836

Int. Cl.[5] B24B *19/16*

U.S. Cl. 51—90 **41 Claims**



1. Apparatus for sharpening a metal point having a central axis comprising:

A. means for positioning said metal point with its central axis in a predetermined location;

B. first shaft means having a curved abrasive surface adjacent one of its ends, said curved abrasive surface having a central axis and said central axis of said curved abrasive surface being coaxial with said first shaft means; and

C. a motor driving said first shaft means so as to rotate said abrasive surface at a first speed, said motor driving second shaft means so as to revolve said abrasive surface around said metal point at a second speed that is slower than said first speed, and said first and second shaft means being coaxial.

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ULTRA-PRECISION GRINDING MACHINE

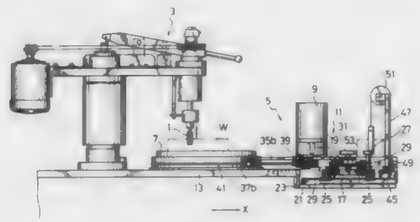
Yoshihiko Ono, Kanagawa, Japan, assignor to Tokiwa Seiki Industrial Company, Ltd., Japan

Filed Jun. 2, 1989, Ser. No. 360,342

Claims priority, application Japan, Jun. 8, 1988, 63-139233

Int. Cl.[5] B24B *49/00, 51/00*

U.S. Cl. 51—165.93 **3 Claims**



1. An ultra-precision grinding machine, comprising:

a processing member carrying a grinding tool;

a work table which is slidable and rotatable in a horizontal plane, and which holds a work piece underneath said grinding tool; and

a slide table having a motor for driving said work table in rotational motion, said slide table being slidable in a horizontal plane together with said work table, said work table and said motor being connected by a belt wound around a driving pulley connected to a driving axis of said motor and a circumference of said work table, and said slide table including arms extending toward said work table having pulleys which make contact with said circumference of said work table in order to secure said belt on said circumference.

4,991,357

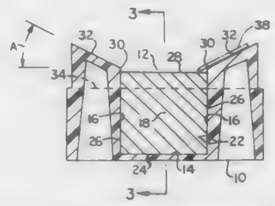
KNIFE SHARPENING KIT

Donald L. Stickles, Sr., 36 Nessrala Dr., Brockton, Mass. 02402

Filed Mar. 26, 1990, Ser. No. 498,429

Int. Cl.[5] B24B *15/08*

U.S. Cl. 51—214 **1 Claim**



1. A mechanism for sharpening knife blades, comprising:

a case defining a hollow rectangular trough having a central horizontal axis; said trough comprising a flat internal bottom surface (14) and two flat internal side surfaces (16) extending upwardly from said bottom surface in facing relation; the cross-sectional width dimension of said internal bottom surface being slightly less than the cross-sectional width dimension of each said internal side surface;

and a square-cross sectioned cutting stone removably seated in said trough; said cutting stone having four similarly dimensioned side surfaces, each side surface of the stone having the same cross-sectional width dimension as that of the trough bottom surface, whereby the stone can be immovably positioned in the trough with any one of its side surfaces presented upwardly to form the stone upper surface; the cross-sectional dimensions of the trough side surfaces being such that the upper edges thereof are located a discernible distance above the plane of the stone upper surface;

said case further comprising two flat blade-support surfaces (32) extending from the upper edges of the trough side surfaces away from the trough central axis; said flat blade-support surfaces being angled upwardly and outwardly away from the respective internal side surfaces of the trough, whereby when a knife blade is held flatwise against either blade-support surface and moved so that its cutting edge is in frictional contact with the upper surface of the stone a sharpening action is achieved on the blade cutting edge;

the cross-sectional dimension of each blade-support surface being at least one half the cross-sectional width dimension of the stone upper surface, whereby a knife blade can be held flatwise against either blade-support surface without wobbling or changing its angle relative to the upper surface of the cutting stone.

4,991,358

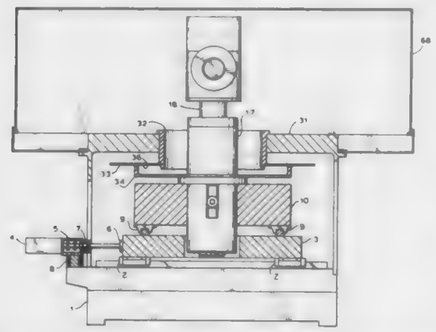
GRINDING MACHINE

Karl H. Giebmanns, Westport, Conn., assignor to International Tool Machines, Inc., Westport, Conn.

Filed Nov. 7, 1989, Ser. No. 432,654

Int. Cl.[5] B24B *55/02, 55/04, 5/00*

U.S. Cl. 51—267 **10 Claims**



1. An improved machine tool having a first base, a first slide linearly slidably movably mounted on said first base, a second slide linearly slidably movably mounted on said first slide, first bushing means are rigidly mounted on said second slide, a support column is reciprocally slidably mounted in said first bushing means for a preselected reciprocal vertical slidable movement therein, machine tool means operatively mounted on said column, driving means operatively connected to said machine tool means, a second base is rigidly mounted on said first base, a bearing is rotatably mounted in said second base, a support shaft is rotatably mounted in said bearing, a workpiece holding table is fixedly mounted on said support shaft for rotation about a vertical axis, workpiece holding means are operatively mounted on said table so as to hold a workpiece for operative contact with said machine tool means, second bushing means are mounted on said second base, said first bushing and support column extending through said second bushing means, the interior diameter of said second bushing means being substantially larger than the exterior diameter of said first bushing means to thereby permit lateral movements of said first bushing within said second bushing; first cover means fixedly mounted on said first bushing so as to surround it, second cover means having an undersurface and being fixedly mounted on said second bushing above said first cover means, vertical wall means extending upwardly from said first cover means toward abutting contact with the underside of said second cover means, coolant medium storage means operatively mounted in said machine tool, coolant medium dispensing for dispensing a coolant medium toward the region of said machine tool where said machine tool means makes contact with said workpiece, a substantial portion of said coolant medium being collected between said first and second over means after cooling the contact region between said machine tool means and workpiece, said first and second cover means preventing contact between the coolant medium and said first and second slides.

4,991,359

METHOD OF ABRADING A HARDENED RESIN

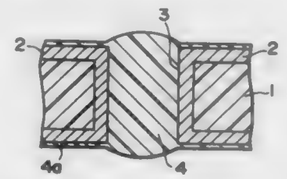
Osamu Ogitani, Koshigaya, Japan, assignor to Somar Corporation, Japan

Filed Oct. 30, 1989, Ser. No. 428,622

Claims priority, application Japan, Oct. 31, 1988, 63-275921

Int. Cl.[5] B24D *3/00*

U.S. Cl. 51—293 **6 Claims**



1. A method comprising the steps of:

(a) contacting a surface of the resin layer with an aqueous alkaline liquid selected from the group consisting of aqueous solution of an alkali carbonate, alkali hydroxide or alkali silicate, having a pH of 9–14 to swell said surface;

abrading the resin layer having the swollen surface, step (b) being preceded by or simultaneous with step (a); and

(c) then washing the abraded surface with an aqueous neutral liquid.

4,991,360

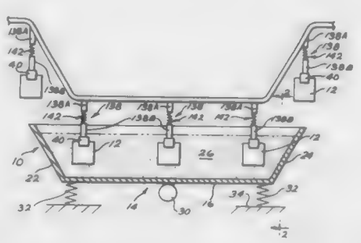
METHOD AND APPARATUS FOR SURFACE TREATING A WORKPIECE

James R. DeSpain, Prospect, Ky., assignor to Carrier Vibrating Equipment, Inc., Louisville, Ky.

Filed Jul. 25, 1988, Ser. No. 223,336

Int. Cl.[5] B24B *31/06*

U.S. Cl. 51—317 **12 Claims**



1. An apparatus for surface treating a workpiece comprising:

an elongated housing for containing a bed of treating media, the housing having a floor, spaced apart side walls, and spaced apart end walls;

vibrating means for imparting a vibrating force to the housing having at least a generally vertical force vector sufficient for fluidizing the bed of treating media in the housing;

overhead conveying means located above and extending along the elongated housing for continuously moving the workpieces to be treated through the housing and the fluidized bed of treating media contained therein from one end of the housing to the other end of the housing;

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a plurality of workpiece suspension means each having a proximal end and a distal end located at spaced apart intervals along the conveying means, each workpiece suspension means being individually affixed at its proximal end to the conveying means for movement therewith, and depending from the conveyor means for suspending the workpieces positioned at the distal end of each workpiece suspension means from the overhead conveying means into the fluidized bed of treating media contained in the housing;

workpiece supporting means at the distal end of the workpiece suspension means for affixing the workpiees to be treated to the suspension means; and,

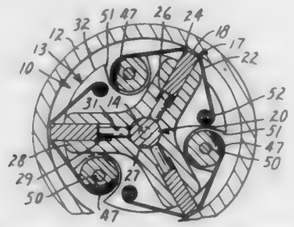
vibratory isolation means structurally associated with each suspension means for individually isolating each workpiece supporting means, and the workpiece affixed thereto, from the conveying means to allow each workpiece supporting means, and the workpiece affixed thereto, to vibrate due to the excitation thereof by the vibrating bed of surface treating media independently of each other and independently of the conveying means.

4,991,361

CYLINDER HONE

James C. Huppert, and Jack A. Zitzer, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 16, 1989, Ser. No. 438,520
Int. Cl.[5] B24B *9/02*; B24D *17/00*
U.S. Cl. 51—346 **4 Claims**



1. A hone adapted for use in truing the inside cylindrical surface of a tube that is longer than the hone, said hone comprising:

a driven member having an axis and an end portion adapted to be engaged to axially move said driven member while rotating said driven member around said axis;

a plurality of pressure members having elongate pressure surfaces;

means mounting said pressure members on said driven member for movememt radially of said driven member with said pressure surface aligned axially of said driven member, facing radially outwardly of said driven member, and spaced circumferentially around said driven member;

cam means adapted to be operated through the driven end portion of the driven member and including a cam mounted for movement on said driven member between release and pressure positions and in engagement with said pressure members for moving said pressure members radially outwardly of said driven member upon movement of said cam from said release position toward said pressure position;

a separate supply of abrasive coated sheet material adjacent each of said pressure members, said abrasive coated sheet material having a portion extending over the pressure surface of the adjacent pressure member; and

means only operable between uses of the hone to true the inside cylindrical surface of a tube for changing the portion of the abrasive coated sheet material extending over each of said pressure surfaces.

4,991,362

HAND SCOURING PAD

Raymond F. Heyer, St. Paul, and Connie L. Hubbard, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 13, 1988, Ser. No. 244,055
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—400 **5 Claims**



1. A method of making a scouring article, comprising the steps of:

(a) arranging a multiplicity of continuous, crimped or undulated, thermoplastic, organic filaments into an open lofty array with one point of each filament in said array corresponding to a first filament bonding site and a second point of each filament, distant from said first point, corresponding to a second filament bonding site;

(b) bonding substantially all of said thermoplastic organic filaments together at said first and said second bonding sites to respectively provide a first bond area comprising bonded filaments and a second bond area comprising bonded filaments, said bond areas being of a size sufficient to permit division thereof into at least two bond area segments per bond area with each bond area segment having said filament array bonded therein in a unitary structure; and

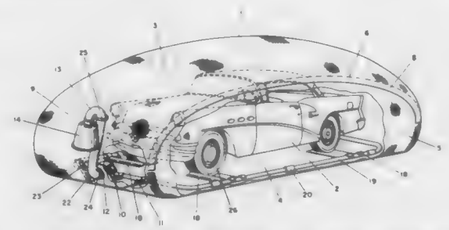
(c) dividing each of said first and said second bond areas into at least two bond area segments, each bond area segment having said filament array bonded therein in a unitary structure, by cutting said filament array within said bond areas to provide an open, lofty, nonwoven pad.

4,991,363

PORTABLE PROTECTIVE ENCLOSURE FOR A VEHICLE

Rein Randmae, 12 Breezy Hill Dr., Northport, N.Y. 11768

Filed Sep. 7, 1989, Ser. No. 404,258
Int. Cl.[5] E04B *1/34*
U.S. Cl. 52—2 R **24 Claims**



1. A portable protective enclosure for a vehicle comprising:

flexible sheeting means for totally surrounding a vehicle;

said sheeting means comprising a lower part and an upper part;

openable closure means

for separating at least a part of the upper part from the lower part to allow the vehicle to be driven over the lower part, and

for joining the lower part to the upper part to totally enclose the vehicle on all sides and on top and bottom;

frame means, locateable on the lower part, for retaining at least a part of the lower part on a ground surface against lifting air pressure;

support means

for bearing the vehicle's weight beneath the vehicle, and

for transmitting the weight outwardly to the frame means to hold said frame means down, and

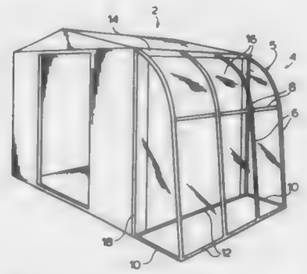
fan means, located within the enclosure, for pressurizing the enclosure and pneumatically supporting the flexible sheeting means spaced from upper surface of the vehicle.

4,991,364

GREENHOUSE ATTACHMENT

Finn Nilsson, Sherkston, Canada, assignor to Spacemaker Limited, Mississauga, Canada

Filed Jun. 28, 1989, Ser. No. 372,627
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—86 **14 Claims**



1. In combination, two corresponding structural members, each structural member comprising a generally 'T' configuration at an upper side edge having a downwardly and inwardly directed retaining flange, the base of said 'T' configuration having to the side of said base opposite said retaining flange an upwardly and inwardly extending retaining flange,

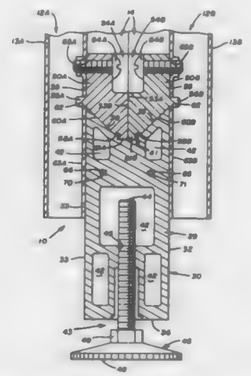
said structural members being held in back to back relation with the top portion of said 'T' configurations abutting to define a configuration generally symmetrical about the plane of said abutting top portions.

4,991,365

FOOT AND LEVELING MECHANISM FOR PANELS IN A RELOCATABLE WALL

Francis G. Jackson, Hudsonville, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Jan. 9, 1989, Ser. No. 364,260
Int. Cl.[5] E04H *1/12*; A47F *5/10, 11/02*
U.S. Cl. 52—126.6 **6 Claims**



1. A foot and levelling mechanism for attachment to at least two vertical members in a relocatable wall, said foot and levelling mechanism comprising:

a first anchor block secured to one of said successive members;

said first anchor block presenting a downwardly directed wedging surface;

a second anchor block secured to the other of said successive members;

said second anchor lock also presenting a downwardly directed wedging surface;

a leveller housing;

said leveller housing presenting upwardly directed guide surfaces to engage said wedging surfaces on said first and second anchor blocks;

a foot assembly extending downwardly from said leveller housing;

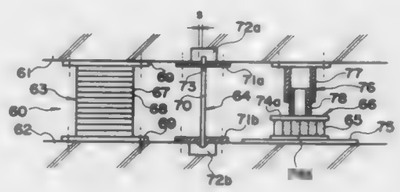
means to adjust said foot assembly vertically with respect to said leveller housing in order to establish a vertical disposition of the successive members in a relocatable wall.

4,991,366

VIBRATION ISOLATING DEVICE

Akira Teramura, 29-10 Nukui 1-chome, Nerima-ku, Tokyo; Mitsuru Kageyama, 11-8, Katsuyama 3-chome, Niiza-shi, Saitama, and Arihide Nohata, 2-3, Higashigoken-cho, Shinjuku-ku, Tokyo, all of Japan

Filed Aug. 18, 1988, Ser. No. 233,230
Claims priority, application Japan, Oct. 5, 1987, 62-249853; Nov. 17, 1987, 62-288287; Jun. 29, 1988, 63-159410; Jun. 29, 1988, 63-159411
Int. Cl.[5] E04H *9/02*
U.S. Cl. 52—167 R **10 Claims**



1. A vibration isolating device comprising:

an isolator disposed between a base and a foundation of a building structure for supporting a vertical load of the building structure, the isolator being formed by an elastic member and adapted to permit a displacement of said building structure relative to said base in a horizontal direction;

a main damper disposed side by side with the isolator and adapted to positively absorb vibration energy for damping relatively large amplitude vibrations; and

a sub-damper disposed side by side with the isolator and adapted to positively absorb vibration energy for damping relatively small amplitude vibrations.

4,991,367

APPARATUS AND METHOD FOR REINFORCING A WOODEN POLE

Henry J. McGinnis, P.O. Box 7256, Fort Worth, Tex. 76111

Filed Sep. 11, 1989, Ser. No. 405,569
Int. Cl.[5] E02D *5/74*
U.S. Cl. 52—170 **12 Claims**

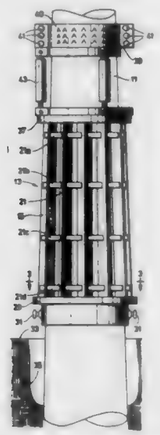
1. An apparatus for reinforcing a wooden pole, the pole having a longitudinal axis and a tapered exterior, comprising:

at least three longitudinal braces adapted to be spaced circumferentially around the pole;

connection means for connecting the longitudinal braces

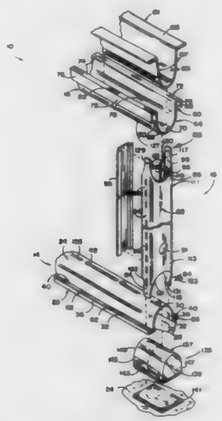
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together into a tapered configuration having substantially the same degree of taper as the pole; and



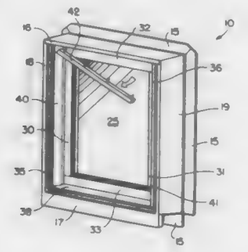
wedge means for moving the braces downward in unison while connected together by the connection means, for wedging the longitudinal braces into the pole.

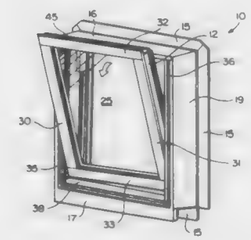
4,991,368
WALL SYSTEM
Douglas D. Amstutz, Muskegon, Mich., assignor to Amstore Corporation, Muskegon, Mich.
Filed Jan. 6, 1989, Ser. No. 294,242
Int. Cl.[5] E04B *2/60*
U.S. Cl. 52—241 **36 Claims**



1. A wall system comprising:
a top rail and a bottom rail, each said rail including a central portion and a pair of side channels, said side channels of each rail having an orientation which opens toward and is aligned with a corresponding channel on the other rail, each said channel further including a row of slots positioned adjacent said central portion, each said slot being aligned laterally with another slot in the other channel of the same rail and aligned vertically with the slot in the corresponding channel of the other rail;
a plurality of vertical, spaced apart struts interconnecting said top and bottom rails, each said strut having a plurality of projections which are received within said slots in said rails; and
fastening means for positively attaching said struts to said rails.

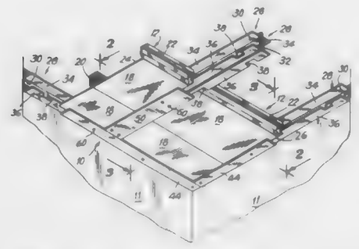
4,991,369
WINDOW WITH REMOVABLE FIXED WINDOW SASH
Thomas L. Lamb, Lexington, N.C., assignor to Binnings Building Products, Inc., Lexington, N.C.
Filed Dec. 18, 1989, Ser. No. 452,607
Int. Cl.[5] E06B *3/00, 3/58*
U.S. Cl. 52—476 **8 Claims**





1. A window with a removable fixed window sash, comprising:
(a) window frame means including opposed, spaced-apart top, bottom and side frame members;
(b) a window sash having a top and bottom and first and second opposing sides, said window sash positioned removably in said window frame means;
(c) window sash retaining means for sequentially holding the bottom, sides and top of the window sash in sealing relation in the window frame means, wherein the top retainer member, when installed, spans the distance in between the first and second side retainer member, and comprising, in sequence of installation:
(i) a bottom retainer member for holding the bottom of the window sash against the bottom frame member of the window frame means;
(ii) a first side retainer member for engaging one end of the bottom retainer member and holding the first side of the window sash against a corresponding side of the window frame means;
(iii) a second side retainer member for engaging the other end of the bottom retainer member and holding the second side of the window sash against a corresponding side of the window frame means;
(iv) a top retainer member for engaging and holding the top of the first and second side retainer members against the first and second sides of the window frame means and for engaging the top of the window sash and holding the top of the window sash against the top member of the window frame means;
and whereby the window sash can be removed for repair or replacement by reversing the sequence set out in (c)(i)—(iv).

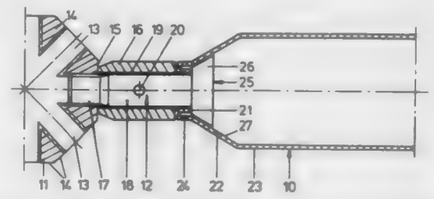
4,991,370
SECURITY PANEL SYSTEM
J. Lynn Galley, Clover, S.C., and Thomas O. Johnstone, Cortland, Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio
Filed Jan. 11, 1989, Ser. No. 295,824
Int. Cl.[5] E04B *5/52*
U.S. Cl. 52—484 **14 Claims**



1. A security panel system comprising:
at least one pan member having a generally flat surface with first and second faces, a pair of ends, and a pair of generally parallel longitudinal sides each with a rib projecting from the flat surface, the rib projecting from the first of the pair of sides, being adapted to interlock with the rib projecting from the second of the pair of sides of an adjacent pan member, so that the generally flat surfaces of the adjacent pans lie in a plane and the second faces of the pan members form a flat surface and first faces of the adjacent pan members form a flat surface bisected by an interlocked pair of ribs projecting from the surface;
at least one channel member having a web, a first flange adapted for attachment to the pan ribs and a second flange adapted for abutting the first face of the pan member along a substantial portion of one end of the pan member, the second flange having at least one notch adapted to permit passage of the pan ribs through the second flange when the end of the pan is positioned adjacent the side of the web closer to the web than the distal edge of the second flange, so that the distal end of the ribs may be abutted against the first flange and attached thereto when the first face along one pan end is aligned in generally parallel abutting contact with the second flange; and
at least one trim member for placement against the second face of the pan member over the channel member second flange, so that the generally flat surface of the pan member is captured between the channel member and the trim member.

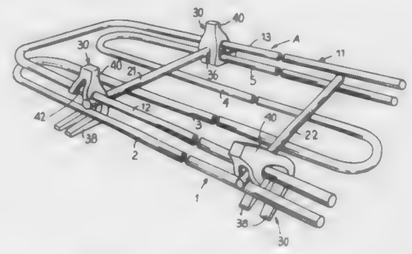
4,991,371
TUBULAR FRAMING BAR, ESPECIALLY A THIN MEMBER FOR FRAMING OF ROOMS OR OPEN SPACES
Peter Preuss, Herzog-Johann-Str. 43, 8000, Munich, Fed. Rep. of Germany, and Reinhard Schmidek, Pappenheimer-Str. 8, 8701, Eibelstadt, Fed. Rep. of Germany
Filed Sep. 8, 1989, Ser. No. 404,497
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830738
Int. Cl.[5] E04H *12/00*
U.S. Cl. 52—648 **11 Claims**

1. Tubular framing bar assembly, comprising a tubular bar, an intersecting member having threaded boreholes, a screw bolt supported for rotatable and axial movement in the end area of the tubular bar, the screw bolt having a threaded segment at its outer end that is threadably received within a borehole of the intersecting member, and the screw bolt having a head at its inner portion that is engagable with an adjacent end portion of the tubular bar to limit its axial outer movement,



characterized in that said end portion of the tubular bar (**10**) is an inwardly bent, substantially annular boss (**21**), said boss (**21**) comprising an end segment (**24**) of the bar (**10**) that is bent inwardly around an angle of approximately 180 degrees.

4,991,372
ASSEMBLY OF REINFORCING BARS AND CLIP
Roger P. Sonneville, Annapolis, Md., assignor to Sonneville International Corporation, Washington, D.C.
Filed Nov. 16, 1989, Ser. No. 437,434
Claims priority, application France, Nov. 17, 1988, 88 14948
Int. Cl.[5] E04C *5/16*
U.S. Cl. 52—685 **12 Claims**



1. In an assembly comprising at least two bars which are parallel to each other and a third bar extending transversely between the first two bars so as to form a cross-shaped or T-shaped assembly node, the improvement comprising a clip made from an elastically deformable material having the general shape of C comprising a back portion and two curved end portIons defining confronting concave inner surfaces, said concave surfaces being adapted to cooperate by an elastic clipping with the two parallel bars, a part of the back portion and a first of the curved end portions constituting a fork adapted to straddle the transverse bar.

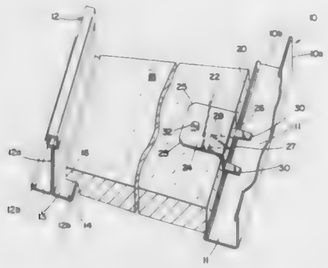
4,991,373
SUPPORT CLIP FOR CEILING PANELS
Melvin H. Shaub, 416 Fairway Dr., Lancaster, Pa. 17603
Filed Mar. 21, 1990, Ser. No. 496,758
Int. Cl.[5] E04B *1/38;* **E04C** *5/00*
U.S. Cl. 52—715 **19 Claims**

1. A support clip for supporting ceiling panels in a suspended ceiling, said support clip comprising:
a front portion of generally rectangular shape having a width dimension and a length dimension;
a top portion connected to and arranged substantially perpendicular to said front portion, said top portion being of generally rectangular shape having a width dimension and a length dimension, the width dimension of said top portion being substantially equal to the width dimension of said front portion but the length dimension of said top

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portion being substantially greater than the length dimension of said front portion whereby said top portion is substantially larger than said front portion;

prong means extending rearwardly from said front portion



below said top portion for insertion into an edge of a ceiling panel; and

tab means extending forwardly from said front portion and being positioned to rest on a wall molding attached to a wall of a building.

4,991,374

PACKAGING MACHINE FOR SLIDE-FASTENER MANUFACTURE

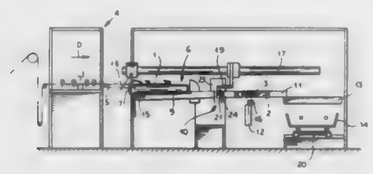
Werner Rademacher, Essen-Kettwig; Franz Hochlehnert, Essen; Jörg Geiger, Oberhausen; Frank Kuhnke, Essen; Kurt Scheid, Dorsten, and Werner Schulz, Essen, all of Fed. Rep. of Germany, assignors to Opti Patent- Forschung-und Fabrikations AG, Riedera-Allmeind, Switzerland

Filed Jul. 28, 1989, Ser. No. 387,297

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825715

Int. Cl.[5] **B65B** *27/10, 61/26*

U.S. Cl. 53—131 **8 Claims**



1. An apparatus for packing slide fasteners as they arrive in a longitudinal transport direction one after the other at a predetermined travel speed from a production facility, the apparatus comprising:

a speedup conveyor receiving the arriving slide fasteners and operating at a speed substantially higher than the travel speed thereof;

a separating conveyor running transversely of the speedup conveyor and having an upstream end receiving the fasteners from the speedup conveyor and a downstream end transversely offset therefrom;

a collection trough having a floor inclined to the horizontal, upper and lower ends, and a plate blocking the lower end, the collection trough being positioned underneath the separating conveyor to receive the fasteners therefrom;

a downstream trough aligned longitudinally with and having an upstream end separated by a space from the collection trough, a floor formed with a throughgoing aperture, and a downstream end;

a collection vessel underneath the downstream end of the downstream trough;

transport means having an upstream arm engageable in the collection trough at the lower end thereof and a downstream arm engageable in the space and downstream trough for displacing both of these arms between upstream and downstream positions for pushing respective bundles of the fasteners downstream;

packing means in the space between the troughs for applying a wrapping to the bundles thereat; and

labeling means underneath the aperture for labeling the wrappings as same pass the aperture.

4,991,375

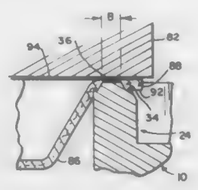
HEAT SEAL CARRIER ASSEMBLY

Glen F. Raque, and Edward A. Robinson, both of Louisville, Ky., assignors to Raque Food Systems, Inc., Louisville, Ky.

Filed Nov. 14, 1988, Ser. No. 271,049

Int. Cl.[5] **B65B** *7/28, 51/10*

U.S. Cl. 53—329 **9 Claims**



1. An apparatus for mating a covering material with a deformable sealing portion of a product-filled container to seal the container without substantial deformation of the covering material, the apparatus comprising,

means for providing a covering material over the container opening and the container sealing portion,

a heat seal head having a substantial flat planar, downwardly facing surface across an entire sealing area for contacting the covering material for sealing the covering material to a portion of the container even during minor misalignment of the heat seal head,

means for applying a downwardly directed force of a specified magnitude to the heat seal head to move the substantially flat planar surface of the head downwardly against the covering material and toward the container sealing portion, and

a support member for supporting an underside area of the container sealing portion and oriented to oppose the force imposed by the applying means for compressing the container sealing portion in response to the force executed by the applying means, the support member having first and second portions for compressing the container sealing portion, the first portion having a first cross-sectional area and the second portion having a second cross-sectional area, the second portion elevated above the first portion a specified distance such that the second portion compresses the container sealing portion a greater amount relative to the compression of the sealing portion by the first portion such that the underside area of the sealing portion of the second portion is substantially deformed by the sealing pressure while an upwardly facing surface of the sealing portion located directly above the deformed underside area maintains its configuration so as to provide for a sealing of the covering material without any substantial deformation of the covering material and to also permit minor misalignment of the seal head with respect to the support member.

4,991,376

METHOD AND APPARATUS FOR WRAPPING A PRODUCT, PARTICULARLY WRAPPING A BUNDLE OF NEWSPAPERS OR MAGAZINES IN PLASTIC FILM

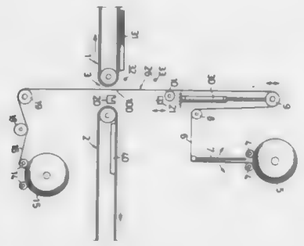
Ralf Backman, Ekajo, Sweden, assignor to Wamac AB, Sweden

Filed Jan. 27, 1989, Ser. No. 303,443

Claims priority, application Sweden, Jan. 28, 1988, 88002670

Int. Cl.[5] **B65B** *13/04, 27/08, 41/16, 57/12*

U.S. Cl. 53—399 **12 Claims**



12. A method of wrapping a product without distorting a leading edge of the product, the method comprising:

(A) supporting a curtain of film between an upper deflection member and a lower deflection member such that the curtain of film extends through a gap in a conveyor system;

(B) conveying the product across the gap in the conveyor system such that the leading edge of the product is pushed into the curtain; and

(C) as the leading edge of the product is conveyed across the gap and as the leading edge of the product is pushed into the curtain, reducing the tension within the film by lowering the upper deflection member.

4,991,377

METHOD FOR THE MUTUAL JOINING OF THE CAP AND THE BODY OF A CAPSULE USED TO ENCLOSE MEDICINES AND APPARATUS WHICH CARRIES OUT THIS METHOD

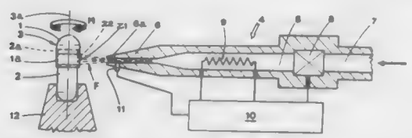
Massimo Marchesini, Pianoro, Bologna, Italy (40065)

Filed Sep. 18, 1989, Ser. No. 408,759

Claims priority, application Italy, Sep. 19, 1988, 3592 A/88; Nov. 21, 1988, 3666 A/88

Int. Cl.[5] **B65B** *51/20*

U.S. Cl. 53—478 **21 Claims**



1. A method using a flow of fluid for joining a cap and body of a capsule used to enclose medicines, said body having and end fitted inside an open end of said cap, a portion of said cap overlapping a correspondingly shaped portion of said body, comprising the steps:

(a) directing a flow of heated fluid from a source to impinge said overlapped portions on said capsule;

(b) moving said capsule and flow relative to each other causing said flow to heat a peripheral overlapped strip on said cap;

(c) adjusting the rate, pressure and temperature of said flow source to transmit heat at a desired rate from said fluid flow into said cap in said strip, and from said cap to said overlapped portion of said body in said strip, whereby said body and cap overlapped portions soften and seal together.

4,991,378

MACHINE FOR MANUFACTURING AND PACKAGING ADHESIVE PLASTERS

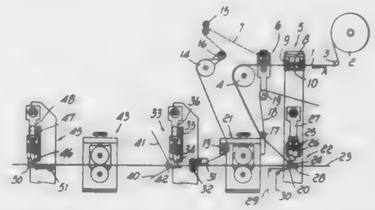
Giorgio Dotta, Via Alamandini 10 - 40136, Bologna, Italy

Filed Dec. 7, 1988, Ser. No. 280,789

Claims priority, application Italy, Dec. 16, 1987, 3733 A/87

Int. Cl.[5] **B65B** *9/02*

U.S. Cl. 53—520 **36 Claims**



24. Machine for manufacturing adhesive plasters, comprising;

means for intermittently advancing a band of supporting material having an adhesive face and a non-adhesive face,

a station for feeding and cutting a band of bandage material into bandage segments,

means for coupling said bandage segments to said adhesive face of said band of supporting material,

means for superimposing band-like protective films on said adhesive face of said band of supporting material coupled with said bandage segments, thereby forming a composite band,

a die-cutting station bearing means for transversely cutting said composite band in an intermediate position between said bandage segments, thereby forming individual adhesive plasters,

wherein an auxiliary band is superimposed on said non-adhesive face of said supporting material, said auxiliary band being closed on itself in a loop, said auxiliary band being constituted by a supporting layer of material having an adhesive face on which another band is applied, said other band having perforations through which said auxiliary band adheres to said non-adhesive face of said supporting material.

4,991,379

SUBSTANTIALLY FRICTIONLESS AND STATIC-FREE FORMER AND FEED TUBE

Hugo Boeckmann, Arlington Heights, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Continuation of Ser. No. 341,471, Apr. 21, 1989, abandoned. This application Jul. 13, 1990, Ser. No. 552,854

Int. Cl.[5] **B65B** *9/08*

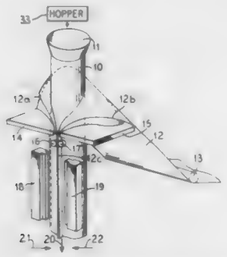
U.S. Cl. 53—552 **5 Claims**

1. In an apparatus for making form fill plastic film bags, said apparatus having a hollow supply tube arranged to receive a continuous length of plastic film, means for supplying film to be wrapped around the tube, guide means for wrapping the film onto the tuber over a portion of the outer surface of said tube, means for downwardly drawing said film over said tube surface, means for joining the edges of the film to form an axial seal to complete a bag tube, means for delivering goods to the tube interior to flow into the bag tube, means for cross-sealing the bag tube before and after said goods are delivered thereto, and means for severing a filled and cross-sealed bag from said bag tube, the improvement comprising:

said supply tube having a plurality of slots therein extending axially along said portion of said outer surface;

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a plurality of ribs consisting of friction-reducing and anti-static material respectively disposed in said slots and extending along the entire axial length of said portion of said outer surface of said tube, said ribs projecting radially from said slots beyond said outer surface of said tube, and



said slots and said ribs therein being substantially uniformly distributed around the circumference of said outer surface of said tube so that as said film is drawn over said surface of said tube said film is in contact substantially only with said ribs.

4,991,380

PACKAGING APPARATUS

Tsutomu Saito, Sannou 2-16-5, Ota-ku, Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 489,479
Claims priority, application Japan, May 2, 1989, 1-112149
Int. Cl.[5] B65B *9/02, 51/30*
U.S. Cl. 53—553 **20 Claims**



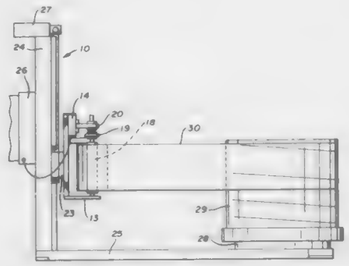
1. Apparatus for use in fusing together the overlapping edges of a packaging film wrapped around an article, including a support member arranged to be located in a fusion-processing position between the said overlapping edges and the article during the fusing operation; means for feeding the said support member to, and withdrawing it from, said fusion-processing position, substantially along the line of the said overlapping edges; and a flexible sheet member arranged to be located between the said support member and either the said overlapping edges or the article during the fusing operation; the said sheet member being connected to the support member in such manner that it is gradually peeled off toward the side of said support member from either the said overlapping edges or the article as the support member is withdrawn from its fusion-processing position.

4,991,381

STRETCH WRAPPED BRAKING APPARATUS

Robert B. Simons, Newton Falls, Ohio, assignor to Liberty Industries, Girard, Ohio

Filed Jun. 7, 1989, Ser. No. 362,849
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—556 **3 Claims**



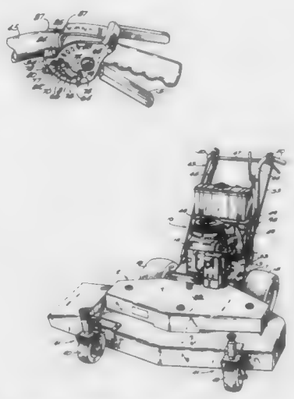
1. An improvement in a stretch wrap braking apparatus comprising in combination a film supply roll and a braking roller, means for mounting same in spaced relation to one another, a turntable assembly and drive means on which said load is positioned, a stretchable film band from said supply roll connecting said load to said film roll and being moved by the driving means rotating said turntable assembly, a non-powdered DC permanent magnet motor in communication with said braking roller and driven by the movement of the film over the braking roller, a gear transfer means engaging said DC motor and said braking roller, an electronic control circuit means powered by said motor for controlling the speed of said motor and braking roller to stretch said film between said braking roller and the load.

4,991,382

LAWN MOWER

Dane T. Scag, Elm Grove, Wis., assignor to Scag Power Equipment, Inc., Mayville, Wis.

Filed Aug. 30, 1989, Ser. No. 400,488
Int. Cl.[5] A01D *34/68*
U.S. Cl. 56—10.9 **33 Claims**



1. A lawn mower having a pair of drive wheels, a reversible hydraulic motor coupled to each drive wheel for rotating the same, a pair of simultaneously driven/ pumps with one of said pumps being connected to each motor, and control means coupled to each pump for controlling the pressure and fluid

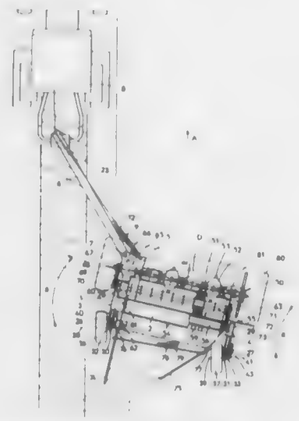
flow direction between said pump and its associated motor whereby each drive wheel can be driven at various speeds in the forward and reverse directions, each control means including a control lever coupled to each pump and operable upon being pivoted in a first direction to increase fluid pressure from said pump in a forward direction and being operative upon pivotal movement in the opposite direction to decrease fluid flow to a neutral point where fluid flow ceases and thereafter increasing fluid flow in the reverse direction upon further pivotal movement of said control lever in said opposite direction, biasing means urging said lever in said first direction, index means mounted adjacent each of said control levers and each having a plurality of indexing means, said indexing means each being mounted adjacent one of said control levers and mounted for displacement to move successive ones of said indexing means into an operative position, coupling means on said levers for selectively engaging one of said indexing means, each of said indexing means being operative to support said control lever in a different pivoted position, and link means for coupling each of said control levers to one of said pumps so that the speed of said wheels will be controlled by the pivotal position of said control levers.

4,991,383

AGRICULTURAL HARVESTING MACHINE MOVABLE INTO TWO POSITIONS

Rino Ermarcora, Saverne, France, assignor to Kuhn S.A., Saverne, France

Filed Mar. 6, 1989, Ser. No. 319,161
Claims priority, application France, Apr. 3, 1988, 88 02999
Int. Cl.[5] A01D *75/14*
U.S. Cl. 56—14.9 **13 Claims**



1. An agricultural machine for harvesting crop, which is pulled by a tractor in a direction of advance and projects laterally beyond said tractor during work, said machine comprising:

a frame provided with tongue means for hitching said machine to said tractor, said tongue means being pivotally mounted on the frame;

ground engaging wheels on which said frame is mounted for carrying said machine;

arms on which said wheels are mounted, said arms having pivots carrying said wheels and which are pivoted to substantially vertical pins;

cutting means, and conditioning and throwing means, mounted on said frame;

adjustable deflector means disposed at a rear side of said frame; and

transposition means, for positively moving said machine from a first work position in which the cutting means and the conditioning and throwing means are disposed substantially perpendicular to the direction of advance to a second work position in which the cutting means and the conditioning and throwing means form a first acute angle with a straight line perpendicular to the direction of advance and second acute angles with the axes of said ground engaging wheels, the second angles having substantially the same value as the first angle;

wherein said transposition means comprises:

a first hydraulic cylinder means disposed between said frame and said tongue means and a pair of second hydraulic cylinder means, each of said second hydraulic cylinder means being disposed between said frame and one of said wheels;

an adjusting cylinder means disposed between said frame and said deflector means; and

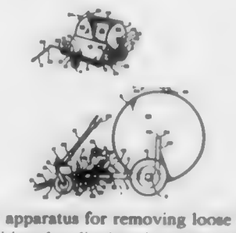
means for causing said transposition means to act simultaneously.

4,991,384

GRASS SWEEPER

Graham Steckly, R.R. #2, Carstairs, Alberta, Canada T0M 0N0

Filed Dec. 11, 1989, Ser. No. 448,342
Int. Cl.[5] A01D *35/22, 61/00*
U.S. Cl. 56—202 **7 Claims**



1. A sweeper apparatus for removing loose cuttings from a lawn and depositing the clippings in a single heap comprising frame means; wheel means carrying said frame means for movement along a lawn; tow bar means connected to said frame means for attaching the apparatus to a towing vehicle; drum means rotatably mounted on said frame means, said drum means having an open side for receiving lawn cuttings; sweeper means for sweeping cuttings from the ground into said drum means; tilting means for causing said drum means to rotate from a cuttings receiving position to a cuttings discharge position, in which substantially all of the cuttings are emptied from the drum means to form a heap on the ground during movement of the apparatus over the ground; and release means for deactivating said tilting means, whereby said drum means automatically returns to the cuttings receiving position.

4,991,385

CROP HARVESTING APPARATUS AND METHODS

Wilfred E. Klinner, Woburn Sands, United Kingdom, assignor to National Research Development Corporation, London, England

Division of Ser. No. 35,909, Apr. 8, 1987, Pat. No. 4,843,806, which is a continuation-in-part of Ser. No. 879,109, May 27, 1986, Pat. No. 4,790,128. This application Apr. 20, 1989, Ser. No. 340,783
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[5] A01D *82/00, 65/02, 89/00*
U.S. Cl. 56—364 **14 Claims**

1. Apparatus for harvesting required crop parts from standing crop comprising

a mobile frame for movement over the ground,

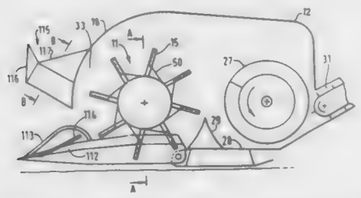
moveable support means mounted for driven movement relative to the frame,

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a plurality of outwardly projecting crop engaging elements mounted on the moveable support means,

guide means cooperating with the crop engaging elements to form a crop flow passage, and

drive means for driving the moveable support means to carry the elements upwardly at a front region of the apparatus so as to detach predetermined required parts of the crop from said standing crop and to move the detached



crop parts along the crop flow passage, the crop engaging elements being arranged to engage standing crop while projecting forwardly relative to the direction of forward travel of the apparatus,

wherein there are provided at the junction of adjacent crop stripping elements at least two relief spaces for detaching crop parts by the effect of edges of the stripping elements and for allowing stripped remaining crop parts to be released from the elements.

4,991,386

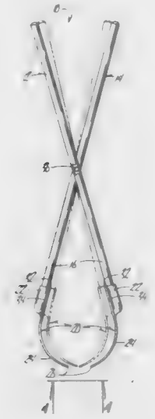
COMBINATION LEAF CADDY AND PICKUP TOOL

Ole A. Dirksen, 1104 Pleasant La., Spencer, Iowa 51301

Filed May 4, 1987, Ser. No. 45,309

Int. Cl.[5] A01D *7/06*

U.S. Cl. 56—400.12 **4 Claims**



1. A combination leaf caddy and pickup tool, comprising,

oppositely disposed pivotably interconnected first and second rakes each having a handle with a jaw of sheet material connected at one end, said jaws being of plastic material and identical in shape but positioned in opposing relationship to each other, each of said jaws having upper and lower sections having a substantially uniform thickness throughout the area of each, said upper section being substantially flat and solid and merging smoothly into said lower section, said lower section including a plurality of curved teeth extending towards the teeth of the other rake, said first and second rakes being pivotal between open and closed positions with the teeth of each rake being in engagement with the teeth of the other rake when in said closed position,

said jaws having a rectangular shape including straight end and top and bottom edges and when in said closed position defining a cylindrical-like transverse passageway between said jaws which allows for emptying leaf material from either end when the transverse axis of said passageway is vertically positioned, said teeth having a width throughout their length greater than their thickness, and

a handle mounting means on entirely the back side of each of said jaws at the upper edge of the top section to provide an uninterrupted smooth front surface on said jaws for gathered material to freely flow from said passageway when in said vertical position.

4,991,387

POLYESTER AND COTTON BLENDED YARN AND POLYESTER STAPLE FIBER STOCK USED THEREIN

Mikio Tashiro; Akira Kimura; Tsukasa Kobayashi, all of Matsuyama; Nobuharu Izawa; Tamio Mitamura, both of Kobe, and Sei Tanizawa, Kashihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP89/00336, § 371 Date Nov. 18, 1989, § 102(e) Date Nov. 18, 1989, PCT Pub. No. WO89/09297, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 30, 1989, Ser. No. 444,122

Claims priority, application Japan, Mar. 30, 1988, 63-74834

Int. Cl.[5] D02G *3/04, 3/02, 3/22, 3/24*

U.S. Cl. 57—256 **6 Claims**



1. A polyester and cotton blended yarn composed of polyester staple fibers and cotton fibers, a blending ratio of the polyester staple fibers and the cotton fibers in the yarn being between 65 to 35 and 35 to 65,

characterized in that a mean number (N) of the polyester staple fibers included in a cross section of said blended yarn is at least 10 or more, and the polyester staple fibers are constituted of two or more different type denier polyester staple fibers and include a coarse denier polyester staple fiber having a denier (D_1) which satisfied the equation $1.8 \geqq D_1 \geqq 1.0$ and a fine denier polyester fiber having a denier (D_2) which satisfies the equation $1.0 > D_2 \geqq 0.4$;

said two or more different type denier polyester staple fibers being blended with each other under a condition satisfying the following equations and being presented in a mutually blended state in the cross section of the blended yarn:

$$D_1/D_2 \geqq 1.25 \quad (1)$$

$$0.30\,N \geqq N_1 \geqq 0.05\,N \quad (2)$$

$$16.1\,D_i + 26 \geqq L_i \geqq 10.2\,D_i + 10 \quad (i = 1, 2) \quad (3)$$

$$44 \geqq L_1 \geqq 1.18\,L_2 \quad (4)$$

wherein N stands for a mean number of the polyester staple fibers included in the cross section of the blended yarn,

N_1 stands for a mean number of the coarse denier polyester staple fibers included in the cross section of the blended yarn,

L_1 stands for a mean fiber length of the coarse denier polyester staple fibers and is expressed in mm,

L_2 stands for a mean fiber length of the fine denier polyester staple fibers and is expressed in mm.

4,991,388

DRAFT DEVICE IN SPINNING MACHINE

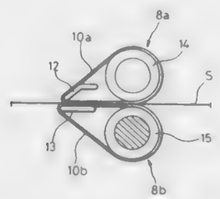
Hisaaki Kato, Shiga, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 2,118, Jan. 12, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 239,016

Claims priority, application Japan, Jan. 16, 1986, 61-4970[U]

Int. Cl.[5] D01H *5/88*

U.S. Cl. 57—328 **11 Claims**



1. A draft device in a pneumatic spinning machine, comprising:

two apron belts, each apron belt composed of a rubber material, the two apron belts defining a sliver running path therebetween;

two rotatably driven rollers, each rotatably driven roller being associated with a respective one of the apron belts and having an outer peripheral surface composed of a rubber material and in contact with the associated apron belt for driving the associated apron belt.

4,991,389

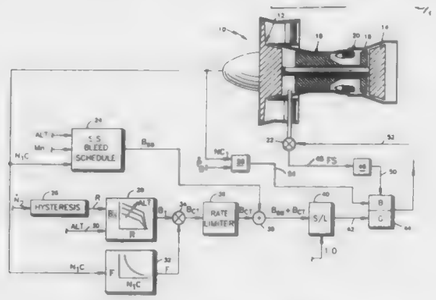
BLEED MODULATION FOR TRANSIENT ENGINE OPERATION

Bradley C. Schafer, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 21, 1989, Ser. No. 342,001

Int. Cl.[5] F02C *9/52*

U.S. Cl. 60—39.29 **5 Claims**



1. In a gas turbine engine having a compressor and a compressor bleed valve, means for controlling said valve during an engine transient comprising:

function generator means for generating, during the engine transient, a transient bleed reset position signal for use in reducing a shift in the compressor operating line toward the compressor stall line during the transient, the signal having a value which is (1) a function of the rate of change of compressor speed, (2) independent of any schedule of maximum allowable rate of change of compressor speed, and (3) biased by a parameter indicative of the flight condition at which the engine is operating;

means for generating a correction factor for the transient bleed reset position signal dependent upon engine power level;

means for applying the correction factor to the transient bleed reset position signal to produce a corrected transient bleed reset position signal;

means for producing a steady-state bleed position signal appropriate for steady-state engine operation;

means for adding said steady-state bleed position signal to said corrected transient bleed position signal to produce a combined signal; and

means responsive to said combined signal for modulating, as a function of the value of said combined signal, the position of said bleed valve during the engine transient.

4,991,390

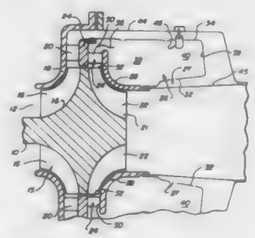
MOUNTING AND COOLING TURBINE NOZZLE VANES

Nipulkumar Shah, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 26, 1988, Ser. No. 248,602

Int. Cl.[5] F02C *7/12*

U.S. Cl. 60—39.36 **12 Claims**



1. A turbine engine comprising:

a rotary compressor;

a radial inflow turbine wheel coupled to said compressor to drive the same;

axially spaced front and rear shrouds for said turbine wheel;

an annular combustor disposed about said turbine wheel for receiving compressed air from the compressor and fuel from a source and combusting the same to produce gases of combustion;

a turbine nozzle disposed about said turbine wheel for receiving gases of combustion from said combustor and directing the same at said turbine wheel to drive said turbine wheel, said nozzle comprising angularly spaced vanes extending generally axially between said shrouds radially outwardly of said turbine wheel;

means mounting said vanes between said shrouds comprising a generally axial bore in each said vane and aligned openings in said shrouds and elongated elements extending through and between said shrouds and impaling corresponding vanes by extending through the associated bore, and fasteners for said elements to hold the same in place; and

cooling means for said vanes comprising a gap between said bores and the associated elongated elements and in fluid communication with said compressor;

said elongated elements being threaded fasteners; and

said gap being defined by the space between threads.

4,991,391

SYSTEM FOR COOLING IN A GAS TURBINE

Andrew J. Kosinski, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1989, Ser. No. 302,489

Int. Cl.[5] F02C *7/16*

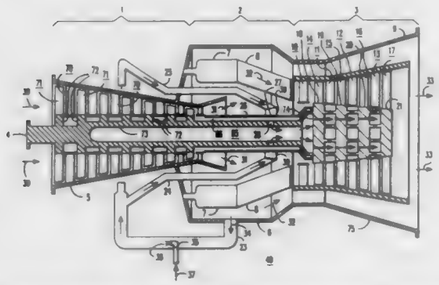
U.S. Cl. 60—39.182 **9 Claims**

1. A gas turbine system comprising:

(a) a compressor section for compressing air,

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(b) a combustion section connected to receive air from said compressor section and to produce hot compressed gas by burning fuel in said received compressed air,
(c) a turbine section connected to receive gas from said combustion section and for expanding said heated compressed gas,
(d) a chamber between said compressor section and said combustor section for collecting said compressed air,
(e) communicating means for diverting some of said air in said chamber to said turbine,



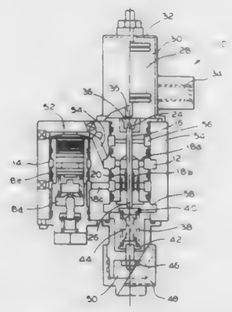
(f) means for evaporating water in said diverted air upstream from said turbine section, thereby cooling said air diverted to said turbine section,
(g) a water supply, means for directing water from said water supply to said evaporating means, and
(h) means for heating said water prior to said evaporating, said heating means in water flow communication with said water supply means.

4,991,392

ALTITUDE-SENSITIVE FUEL FLOW CONTROL DEVICE

Gary L. Goldberg, San Diego; Sam S. Navidi, Poway, and Wendell E. Reed, Chula Vista, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 6, 1990, Ser. No. 489,022
Int. Cl.[5] F02D *35/00*
U.S. Cl. 60—39.281 **17 Claims**



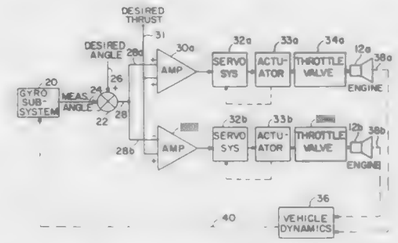
1. An altitude-sensitive fuel flow control device comprising:
a fuel inlet in communication with a fuel source and a fuel outlet in communication with a fuel combustor;
means for metering fuel flow intermediate said fuel inlet and said fuel outlet including an axially extending rod having a metering surface intermediate the ends thereof, said axially extending rod being disposed in a fuel flow path extending from said fuel inlet to said fuel outlet and adapted to supply fuel to said fuel combustor within a preselected range of altitude-dependent fuel flow rates, said axially extending rod being axially movable to variously position said metering surface relative to said fuel flow path to vary fuel flow rates within said preselected range;
means for moving said metering means responsive to altitude to vary fuel flow rates within said preselected range; and
means for maintaining a constant pressure drop across said metering means independently of altitude.

4,991,393

SPACECRAFT GUIDANCE AND CONTROL SYSTEM

David D. Otten, Redondo Beach, and Robert L. Sackheim, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 863,630, May 15, 1986, abandoned. This application Jun. 26, 1989, Ser. No. 372,239
Int. Cl.[5] F02K *9/80*
U.S. Cl. 60—204 **8 Claims**



1. For use in a space vehicle apparatus for controlling the movement of said vehicle to achieve a desired attitude, comprising:
at least two propulsion rocket engines positioned approximately on opposite sides of the center of mass of the space vehicle and in parallel relation with one another; said vehicle being subject to a series of guidance control errors caused by each of said engines having a different thrust valve for a given rate of fuel feed, the mass of said vehicle and the distribution of mass of said vehicle relative to the position of said engines on said vehicle;
means for sensing the attitude of the vehicle,
means for comparing the sensed attitude of the vehicle with a desired attitude;
means for inputting to said means for comparing electronic signals representative of the errors of said different thrust values and means for further correcting the input signals in the comparator to compensate for the vehicle mass and its mass distribution with respect to the position of said engines and produce a cumulative electronic correcting signal;
means responsive to said cumulative electronic correcting signal for differentially throttling the engines continuously over a modulation range whereby the vehicle is rotated and positioned in the desired attitude.

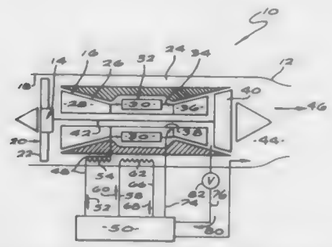
4,991,394

HIGH PERFORMANCE TURBINE ENGINE

E. Scott Wright, Mesa, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 3, 1989, Ser. No. 332,689
Int. Cl.[5] F02C *3/04*
U.S. Cl. 60—226.1 **15 Claims**

1. A turbine engine comprising a compressor inducting ambient air and delivering this air pressurized to a combustor, means for introducing fuel to said combustor to sustain combustion producing a flow of high-temperature pressurized combustion products, a turbine receiving said high-temperature pressurized combustion products for expanding the latter toward ambient and drivingly connecting with said compressor, and refrigeration means for receiving both a fractional flow of said pressurized air and power input from said engine



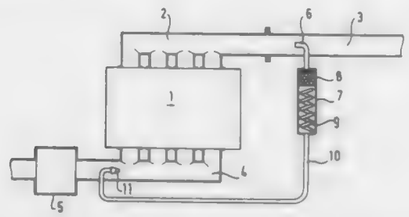
driving a refrigeration cycle cooling said fractional air flow, and means for applying said cooled fractional air flow to a rotating turbine blade of said turbine.

4,991,395

DEVICE FOR CLEANING THE EXHAUST GASES OF A COMBUSTION ENGINE IN USE

Miltiathis Markou, Panorama/Thessaloniki, and Konstantin N. Pattas, Thessaloniki, both of Greece, assignors to Creative Combustion, Ltd., London, England

Filed Feb. 27, 1989, Ser. No. 316,040
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806220; European Pat. Off., Oct. 25, 1988, 88117761.2
Int. Cl.[5] F02B *47/00*
U.S. Cl. 60—295 **12 Claims**



1. A device for cleaning the exhaust gases of a combustion engine in use, wherein a line for hot gas, which is separate from a fuel supply system of the engine, opens into a combustion air intake manifold, and wherein a catalytic element containing rare earths, particularly cerium, is inserted into said line so that hot gas flowing in said line passes through said catalytic element, the improvements being said catalytic element (7) comprising an alloy body (9) being made of misch metal and said hot gas being humidified air.

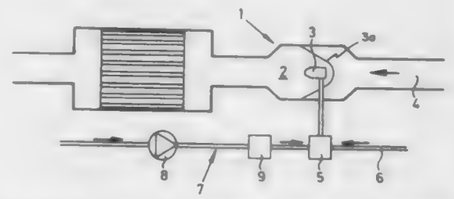
4,991,396

HIGH PERFORMANCE BURNER

Dieter Goerlich, Emmering, and Rainer Kolodzie, Munich, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,117
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710054
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—303 **16 Claims**

1. High performance burner arrangement having a burner nozzle extending into a combustion chamber and an air-fuel mixture preparation device containing a fuel supply unit, wherein said mixture preparation device comprises a premixing chamber means, connected to said fuel supply unit and to a source of air, for producing a mixture of fuel and air, said premixing chamber means being located upstream of said burner nozzle, externally of the combustion chamber and being connected to said burner nozzle for supplying the mixture of air and fuel to said burner nozzle as an air-fuel emulsion, said premixing chamber and burner nozzle together forming means for atomizing the mixture into the combustion chamber in a manner enabling combustion of the mixture within the combustion chamber without requiring any means to vaporize the



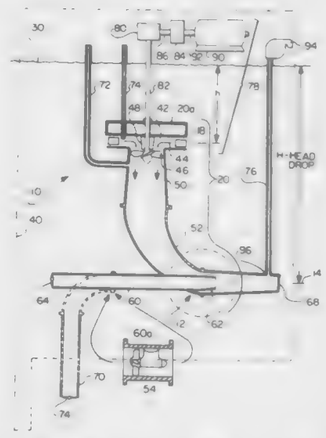
fuel directly within the combustion chamber; wherein said burner nozzle is located in an exhaust gas line, and wherein shielding means is provided for preventing exhaust gases in said exhaust gas line from flowing directly to said burner nozzle and mixing with the mixture of fuel and air being atomized into the combustion chamber.

4,991,397

HYDRAULIC TURBINE WITH VIRTUAL HEAD DROP AND METHOD FOR ITS MANUFACTURE

Istvan S. Varsa, 4000 Massachusetts Ave., NW. #1631, Washington, D.C. 20016

Continuation-in-part of Ser. No. 217,651, Jul. 12, 1988, abandoned. This application Dec. 8, 1989, Ser. No. 447,916
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—398 **17 Claims**



1. A hydraulic turbine system with virtual head drop for converting energy of static pressure into rotary energy comprising
a conically configured inlet,
a water jet member having a generally horizontally disposed driving nozzle with inlet means and outlet means,
the driving nozzle being fluid coupled to a generally horizontally disposed elongated inlet means and including constant operation of a booster pump in the inlet means to provide an energy input into the system, the inlet means being fluid coupled to a suction nozzle having an outlet proximate the driving nozzle outlet and coupled to the conically configured inlet,
the water jet member thereby adapter for producing a fluid jet at a defined hydrostatic head,

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a runner turbine member defining a watertight system within which are gate operating mechanisms being fluid coupled to a runner means effecting an empty vessel of atmospheric pressure, the static pressure therefor inducing movement of fluid into a steady flow of fluid through the runner means, and

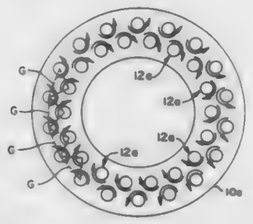
the runner turbine member having a tube thereof exiting fluid to the conically configured inlet for symbiotic cooperation with the water jet member.

4,991,398

COMBUSTOR FUEL NOZZLE ARRANGEMENT

Jim A. Clark, Jupiter; James H. Shadowen, Riviera Beach, and Thomas L. DuBell, Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 12, 1989, Ser. No. 296,155
Int. Cl.[5] F02C *1/00*
U.S. Cl. 60—748 **1 Claim**



1. An annular combustor for a gas turbine engine having an outer annular axially extending wall and an inner annular axially extending wall concentrically disposed relative to said outer wall and defining a combustion chamber, a dome interconnecting said inner wall to said outer wall at the forward end for enclosing the forward end of said combustion chamber, a plurality of fuel nozzles having air swirl means disposed in said dome, said fuel nozzles each arranged in a smaller radii and larger radii tier, three adjacent fuel nozzles of said plurality of fuel nozzles including two of said adjacent fuel nozzles being from one of said larger radii tier or said smaller radii tier and one of said adjacent fuel nozzles being from the other of said larger radii tier or said smaller radii tier and together arranged such that an imaginary line passing through the center of each of said three adjacent fuel nozzles define a triangle, said air swirl means being disposed such that the rotation of the swirl of air in each air swirl means of each tier being in the same direction and the swirl rotation of each air swirl means in the larger radii tier being opposite to the swirl rotation of each air swirl means in the smaller radii tier, the fuel/air emitted from each of said fuel nozzles interacting with the discharge from adjacent fuel nozzles for establishing a fuel/air swirl pattern in the front end of said annular combustor for stabilizing the burning.

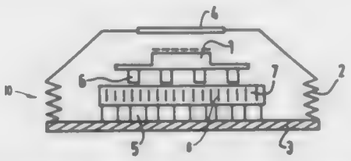
4,991,399

DEVICE FOR TEMPORARILY OVERCOOLING A COOLED DETECTOR AND DETECTOR COMPRISING SUCH A COOLING DEVICE

Henri Bourcier, Marolles en Brie, and Marc Pochard, Limeil Brevannes, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,614
Claims priority, application France, Dec. 18, 1987, 87 17713
Int. Cl.[5] F25B *21/02*
U.S. Cl. 62—3.2 **3 Claims**

1. A device for temporarily overcooling a detector cooled permanently in a space by means of a first cooler, said device comprising a housing having a bottom wall, adjoining lateral surfaces and at least one wall that includes a transparent window; a detector arranged within said housing opposite the window; a first cooler in contact with the bottom wall; a second cooler in contact with the detector, said first and second coolers operating using the Peltier effect; and a space containing a material changing in phase from solid phase to liquid phase in response to a predetermined temperature change, said space being interposed between said first and second coolers, wherein said second cooler is temporarily made operative using the Peltier effect to produce the required overcooling without causing heat exchange with the outside as



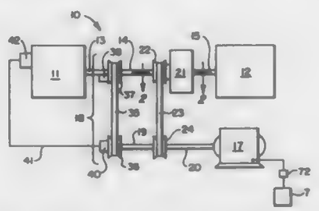
a result of thermal energy dissipated by the said second cooler being absorbed by the passage from the solid state to the liquid state of said material changing in phase, said material being chosen as a function of the permanent operating so that the overall energetic balance is zero whereby the external enviroment is not thermally disturbed as long as the duration of the overcooling does not exceed the duratrion of absorption of said material changing phase.

4,991,400

ENGINE DRIVEN HEAT PUMP WITH AUXILIARY GENERATOR

William H. Wilkinson, Columbus, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Feb. 23, 1990, Ser. No. 483,676
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—228.4 **9 Claims**



1. A motive drive system, for heating and cooling apparatus having vapor compressor means, comprising:

(a) an internal combustion engine means in rotating driving connection to the compressor means, and to an electric generator means, and providing motive power for the system;

(b) with the driving connection to the compressor means including: an input and an output means of a differential planetary power transmission means;

(c) with the driving connection to the electric generator means including: a continuously variable transmission means and a component of the differential planetary power transmission means connected to the driving connection to the compressor means;

(d) a governor means for sensing the rotational speed of the driving connection to the generator means and controlling the throttle and speed of the engine means, to provide substantially constant rotative speed and electrical frequency output of the generator means without respect to the speed, load, or torque of the compressor means, and

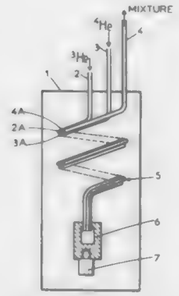
(e) control means for the continuously variable transmission means to control the speed of the compressor means in response to the need for comfort conditioning.

4,991,401

PROCESS AND APPARATUS FOR OBTAINING VERY LOW TEMPERATURES

Alain Benoit, Eybens, France, assignor to Centre National D'Etudes Spatiales, Paris, France

PCT No. PCT/FR89/00034, § 371 Date Sep. 25, 1989, § 102(e) Date Sep. 25, 1989
PCT Filed Feb. 2, 1989, Ser. No. 423,441
Claims priority, application France, Feb. 2, 1988, 88 01232
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.3 **8 Claims**



1. A process for obtaining very low temperatures which comprises the steps of:

(a) providing a mixing box,

(b) continuously supplying liquid 4He and liquid 3He in separate streams into said mixing box in proportions such that a two-phase system comprising a solution phase of 3He dissolved in liquid 4He and a liquid phase consisting of pure 3He are formed in said mixing box, said solution phase containing 3He at a predetermined level,

(c) extracting a stream of said solution phase from said mixing box at a sufficiently high velocity that the 3He in said stream cannot substantially diffuse in countercurrent fashion back into the solution phase in said mixing box to thereby reduce the amount of 3He from said stream of 3He supplied to said mixing box which dissolves in the 4He from said stream of 4He supplied to said mixing box in providing said solution phase.

4,991,402

PORTABLE SELF-CONTAINED COOLER/FREEZER APPARATUS FOR USE ON COMMON CARRIER TYPE UNREFRIGERATED TRUCK LINES AND THE LIKE

Louis P. Sala, III, P.O. Box A, Station 1, Houma, La. 70360

Continuation of Ser. No. 343,025, Apr. 24, 1989, abandoned, which is a continuation of Ser. No. 119,702, Nov. 12, 1987, Pat. No. 4,825,666. This application Mar. 14, 1990, Ser. No. 493,298
Int. Cl.[5] F17C *7/02*
U.S. Cl. 62—52.1 **22 Claims**

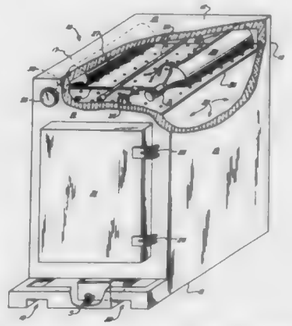
1. A shipping container for shipping frozen and/or refrigerated cargo comprising:

(a) a container having an interior with an access doorway that can be opened/closed;

(b) one or more refrigerant tanks mounted in the container for containing refrigerant under pressure to be dispensed during use for cooling the container interior;

(c) header means for piping refrigerant in the tanks to the container interior; and

(d) temperature responsive controller means for periodically dispensing refrigerant from the tanks to the header in order to maintain a desired preselected preset refrigerated or frozen temperature range within the container interior; and



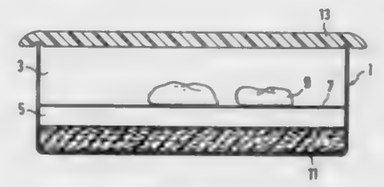
(e) a lower pedestal base supporting the container, the base including horizontal slots receptive of fork lift tines.

4,991,403

PROCESS AND DEVICE FOR THE FREEZING OF BAKED GOODS

Ernst Kirchhoff, Buchfinkenweg 1, D-3050 Wunstorf, Fed. Rep. of Germany

PCT No. PCT/EP87/00576, § 371 Date Apr. 26, 1989, § 102(e) Date Apr. 26, 1989, PCT Pub. No. WO88/02988, PCT Pub. Date May 5, 1988
PCT Filed Oct. 6, 1987, Ser. No. 460,145
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636713; Apr. 2, 1987, 3711117
Int. Cl.[5] F24F *3/16*
U.S. Cl. 62—78 **3 Claims**



1. Process for the freezing of baked goods, comprising increasing atmospheric humidity of an atmosphere surrounding baked goods with regard to normal atmospheric humidity, and exposing unfrozen baked goods, at least during the freezing process, to the atmosphere of increased atmospheric humidity and to a freezing temperature of the baked goods.

4,991,404

VACUUM PRESSURE MONITORING SYSTEM

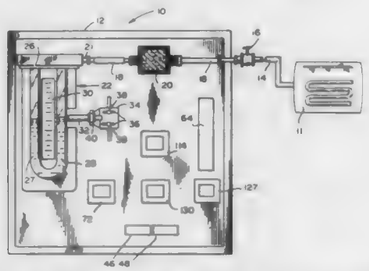
Emile Yassa, 4 Niagara Way, Morganville, N.J. 07751

Filed Feb. 2, 1989, Ser. No. 305,063
Int. Cl.[5] F25B *49/00*; G01L *9/00*
U.S. Cl. 62—126 **15 Claims**

1. A pressure monitoring apparatus comprising manometer means for measuring high vacuum approximating absolute zero pressure within an absorption refrigeration system having a vacuum chamber, said manometer means including a column of mercury within a U-tube, said U-tue having two lets, a first leg being in communication with the vacuum chamber, a second leg being closed to the atmosphere, the mercury column

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being displaceable in response to pressure chambers within the vacuum chamber, proximity sensor means spaced from said mercury column in one of said legs for radiating a sensing field, said sensing field being adapted to detect displacement of the



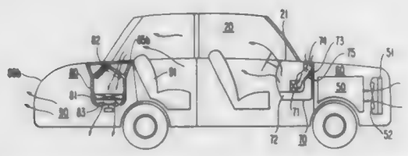
mercury column corresponding to low vacuum by inductive interaction with the mercury and to generate an output signal, and control circuit means actuated by the proximity sensor for energizing peripheral refrigeration system safety components when low vacuum is detected.

4,991,405

AUTOMOTIVE AIR CONDITIONING SYSTEM

Riichi Sakano, Saitama, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 386,725, Jul. 31, 1989, abandoned. This application Aug. 10, 1990, Ser. No. 565,898
Claims priority, application Japan, Jul. 29, 1988, 63-188394
Int. Cl.[5] B60H *1/32*
U.S. Cl. 62—244 **19 Claims**



1. An air conditioning system for controlling the temperature of a vehicle passenger compartment, said air conditioning system comprising:
- a first heat exchanger comprising an evaporator;
- a second heat exchanger comprising a condensor;
- first duct means for conducting air from said first heat exchanger to said vehicle passenger compartment;
- second duct means for conducting air from said vehicle passenger compartment to said second heat exchanger;
- third duct means for conducting air from outside said vehicle passenger compartment to said second heat exchanger; and
- means for selectively opening and closing said first, said second and said third duct means.

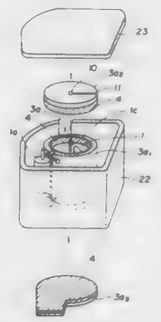
4,991,406

AIR CONDITIONER

Eiichiro Fujii, Fuji, and Kiyoshi Horimizu, Fujinomiya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1989, Ser. No. 384,422
Claims priority, application Japan, Jul. 27, 1988, 63-98433[U]; Oct. 31, 1988, 63-142265[U]
Int. Cl.[5] F25D *19/00*
U.S. Cl. 62—296 **12 Claims**

1. An air conditioner comprising:
- an outer casing in a form of a rectangular box;
- a compressor accommodated in the outer casing;
- an inverter operatively connected to the compressor for controlling an operation of the compressor;
- a heat exchanging means disposed in the outer casing;
- a fan means for circulating outdoor air into the casing of the air conditioner; and
- a sound-proof means surrounding said compressor and comprising a main body provided with inner and outer surfaces and a heat insulating member substantially covering the entire inner surface of the main body;
- said heat insulating member having a heat transfer efficiency smaller than that of said main body, said main body being formed of a sound absorbing member laminated with a noise insulating member.

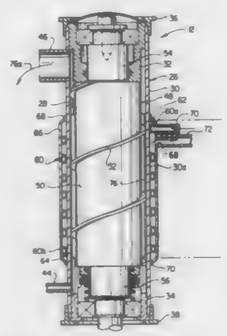


4,991,407

AUGER TYPE ICE FLAKING MACHINE WITH ENHANCED HEAT TRANSFER CAPACITY EVAPORATOR/FREEZING SECTION

Robert J. Alvarez, Denver; Tom N. Martineau, Aurora, and Steven D. VanderBurgh, Boulder, all of Colo., assignors to Mile High Equipment Company, Denver, Colo.

Continuation of Ser. No. 257,770, Oct. 14, 1988, abandoned. This application Nov. 29, 1989, Ser. No. 443,019
Int. Cl.[5] F25C *1/14*
U.S. Cl. 62—354 **11 Claims**



1. An ice making machine comprising:
an evaporator section including:
- a vertically disposed flaker barrel member having an inlet opening in a lower end portion thereof for receiving water from a source thereof, an outlet opening in an upper end portion thereof for discharging ice, an interior side surface, and an exterior side surface, and

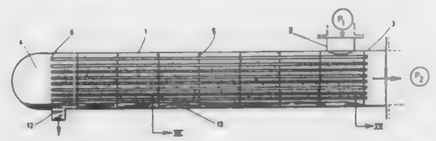
chilling means, including a length of refrigerant tubing tightly wrapped around said exterior side surface in a helical configuration, for receiving a throughflow of refrigerant from a source thereof to thereby chill said flaker barrel member and responsively cause the formation, from water received within said flaker barrel member, of an ice layer around a portion of said interior side surface of said flaker barrel member;
- refrigeration circuit means for operatively flowing refrigerant through said chilling means;
- ice removal means for continuously removing portions of said ice layer and forcing the removed portions outwardly through said flaker barrel member outlet opening; and
- surface contact enhancement means for substantially increasing the heat transfer rate between said flaker barrel member and said refrigerant tubing, and for substantially inhibiting movement of said refrigerant tubing relative to said flaker barrel member, said surface contact enhancement means including:
  - a substantially roughened portion of said flaker barrel member exterior side surface having a spaced apart series of relatively small, laterally outwardly projecting sections which, due to the tight wrapping of the refrigerant tubing around the flaker barrel member, are pressed firmly against side surface portions of said refrigerant tubing in a manner substantially increasing the surface-to-surface contact area, and thus the heat transfer rate, between said flaker barrel member and said refrigerant tubing, and creating a substantial gripping force between said flaker barrel and said refrigerant tubing which materially inhibits movement of said refrigerant tubing relative to said flaker barrel member.

4,991,408

ADIABATIC SEPARATOR

John Liazka, 2265, de Montreuil, Montreal, Quebec, Canada H3M 1X4

Filed Sep. 29, 1989, Ser. No. 414,446
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—401 **20 Claims**



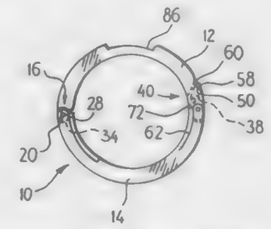
1. An adiabatic separator for the separation by condensation of a portion of a homogeneous gas or of a condensible gas from a carrier gas, said separator comprising:
- an elongated vessel defining an interior space and having a closeable condensate outlet, a gas inlet port and a gas exit port;
- a plurality of heat-conducting tubes extending in said interior space, each of said tubes having an inlet end opening into said space at a point distant from said inlet port to cause incoming gases to pass over said tubes before reaching said inlet ends, each of said tubes also having an outlet end opening into said exit port, said exit port being otherwise hermetic, each of said tubes further having a substantial portion thereof within said vessel, that is of reduced internal cross-sectional area to ensure a higher velocity for said carrier gas within said tubes than over said tubes along said portions of reduced cross-section area,; and
- means for providing a pressure difference between said ports to force said carrier gas within said vessel and through said tubes.

4,991,409

OPENABLE RING WITH SAFETY SNAP LOCK ELEMENT

Allan B. Creates, 4990 Prince of Wales, Montreal, Quebec H4V 2M9, Canada

Filed Nov. 20, 1989, Ser. No. 438,239
Claims priority, application United Kingdom, Dec. 23, 1988, [redacted]
Int. Cl.[5] A44C *9/00*
U.S. Cl. 63—15.7 **7 Claims**



1. A finger ring shaped to provide an annulus for surrounding a finger, said ring comprising:
- a first and a second arcuate segment, each of said segment having an inner circumferential surface, an outer circumferential surface, a hingeable end and a lockable end;
- a segment hinge means for adjacently connecting said hingeable end of said first and second segment allowing said first segment and said second segment to pivot relative to one another between an open position allowing lateral insertion of said finger in the ring and a closed position whereby the segments encircle the finger;
- a releaseable locking means for hooking together the lockable ends of the first and second segments said releasable locking means comprising;
- a clasp being hingedly mounted adjacent the lockable end of the first segment and longitudinally extending from said lockable end of said first segment, said clasp being provided with a radial locking notch defining a curved slot extending through said clasp and opening on the surface of said clasp facing inside said annulus, said clasp having an abutting end portion at the longitudinal extremity closest to the first segment and a prehension tip at the opposite longitudinal extremity, said curved slot extending through said clasp generally in the direction of said prehension tip;
- a bifurcated structure extending from said lockable end of said second segment and adapted to straddle said clasp;
- a locking rod extending across said bifurcated structure, the clasp being adapted to pivot with respect to the first segment between a closed clasp position whereby the locking rod is engaged inside said radial locking notch for locking said first and second segments in a closed position and an open clasp position whereby said locking rod is released from said radial locking notch, said curved slot adapted to maintain the retention of the clasp on the locking rod by biasedly gripping the latter in the direction of the prehension tip by a portion of said clasp in the closed position defining said curved slot extending radially inward of said locking rod so that said locking rod is maintained in said curved slot;
- a circumferential leaf spring positioned in a recess provided in said inner circumferential surface to said first segment, one end of said leaf spring being secured to said first segment and the other end of said leaf spring resiliently abutting said first segment adjacent said bifurcated structure, said other end of said leaf spring also abutting against said abutting end of said clasp for resiliently maintaining the latter in said clasp closed position, the length of said leaf spring at said other end being sufficient to maintain contact with said abutting end of said clasp when the latter is in the open clasp position.

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4,991,410

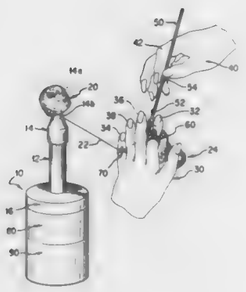
METHOD AND APPARATUS FOR IMPROVING CROCHETING PROCEDURES

Jean Donatelli, 340 Emerson Way, Sparks, Nev. 89431

Continuation of Ser. No. 372,960, Apr. 29, 1982, abandoned. This application Apr. 28, 1988, Ser. No. 187,160

Int. Cl.[5] D04B *3/04, 3/06*

U.S. Cl. 66—1 A 1 Claim



1. An apparatus for improving crocheting procedures which comprises: a support means for supporting a crocheting thread supply means, said support means being an elongated vertically disposed rod member terminating in an enlarged and then reducing to a pointed upper end suitable for supporting a ball of crocheting thread in such manner as to cause said ball to be resting at an angular relationshiP to said elongated rod; a base means upon which said rod is mounted, base means comprising a hollow round compartment, crocheting implements located within said round hollow compartment; a first guide means cooperative with thread being removed from the ball of crocheting thread located on said pointed member at an angular relationship thereto which guide means consists of ring for a finger and means to guide the direction of thread from the ball, and wherein a second guide means is mounted upon another finger for guiding said thread being removed from said ball in a different direction from the original first guide means.

Patent Not Issued For This Number
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4,991,412

OSCILLATORY SUPPORT FOR DRUM WASHING MACHINES

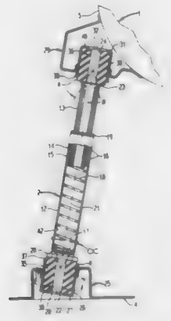
Fritz Bauer; Hans-Peter Bauer, both of Altdorf, and Hans J. Bauer, Altdorf-Röthenbach, all of Fed. Rep. of Germany, assignors to Fritz Bauer & Shone oHG, Altdorf, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,594

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237759

Int. Cl.[5] D06F *37/22*

U.S. Cl. 68—23.1 9 Claims



7. An oscillatory support for drum washing machines having a horizontal axis of rotation, including a washer unit supported on a base plate via at least two telescopic spring struts disposed at either side of a vertical plane passing through the axis of rotation, each spring strut including a longitudinal axis and having one end articulated elastically on the base plate and an opposite end articulated on the washer unit via a tappet, said support comprising:

a plug connection for articulating each end of each said spring strut on the base plate and the washer unit, respectively, the plug connection including

a tang coaxially disposed on each of the upper and lower ends of each spring strut,

a unitary vibration and damping element disposed in a support casing on each of said base plate and said washer unit, each said vibration and damping element having the same cross-section as said support casings and including a coaxial bore, said vibration and damping elements each being supported on its bottom and sides by its respective casing,

each lower end tang being disposed in the bore of a respective vibration and damping element supported on said base plate, and each upper end tang being disposed in the bore of a respective vibration and damping element supported on said washer unit,

each spring strut resting on its respective vibration and damping element with a thrust bearing, and

each vibration and damping element being fixed in its respective support casing in the direction of the longitudinal axis of the spring strut, whereby axial support for each spring strut is provided substantially solely by said thrust bearings while support for said spring strut is directions normal to said strut longitudinal axis is provided solely by the interaction of said upper and lower end tangs with their respective vibration and damping element.

4,991,413

ANTITHEFT DEVICE FOR ARTICLES HAVING AT LEAST AN ARM ELEMENT, IN PARTICULAR SPECTACLES

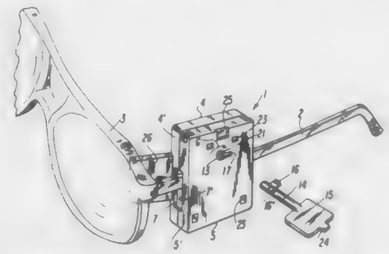
Mazzucchelli Arnaldo, via D. F. Lazzari 15, 24064 Grumello Del Monte, Bergamo, Italy

Filed Mar. 21, 1990, Ser. No. 497,101

Claims priority, application Italy, May 9, 1989, 20421 A/89

Int. Cl.[5] E05B *73/00*

U.S. Cl. 70—19 9 Claims



1. An antitheft device (1) for articles (3) having at least an arm element (2), said device comprising a pair of bodies mutually pivoted (at 6) adapted to clamp therebetween said arm element (2), means (10,11,18) associated with said bodies for locking said bodies in a closed condition, and key means (14) for allowing an authorized person to unlock said bodies characterized in that said associated with said bodies for locking said bodies in a closed condition comprise an element (10) pivoted (at 9) on one of said bodies (5) and provided with a clawed lip (11) and an elongated element (18) fixed to said one body (5), said clawed lip resiliently engages said elongated element in the closed condition of said bodies.

4,991,414

LOCKABLE HANDLE

Joseph Moore, and Roger W. Tasker, both of Brighouse, United Kingdom, assignors to Window Machinery Sales Limited, West Yorkshire, United Kingdom

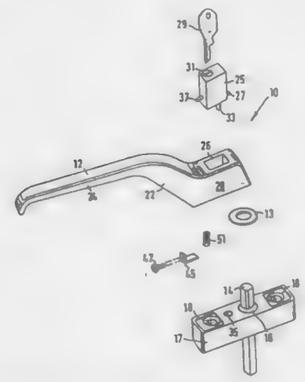
PCT No. PCT/GB88/00489, § 371 Date Dec. 21, 1989, § 102(e) Date Dec. 21, 1989, PCT Pub. No. WO88/10350, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 24, 1988, Ser. No. 438,392

Claims priority, application United Kingdom, Jun. 24, 1987, 8714726

Int. Cl.[5] E05B *13/10*

U.S. Cl. 70—215 2 Claims



1. A lockable handle assembly comprising

a backplate for fixing to a member to which the handle is to be locked,

a handle member having a head region pivotally mounted about an axis normal to said backplate and a grip region offset from said backplate and extending radially from said head region, said head region having a lower face substantially in contact with said backplate,

a lock body of non-circular shape when viewed in plan slidably retained in a slideway formed in said head region between said axis and said grip region for travel towards and away from said backplate,

a depending locking pin fixed to said lock body, said backplate being formed with an aperture for receiving said locking pin when said lock body is moved along said slideway to a locking position thereby holding said handle against pivotal movement, and said slideway being formed with a smooth region leading to a first recess beneath said smooth region,

a biased latch member mounted to reciprocate in said lock body and arranged for one end of said latch member to slide over said smooth region as said lock body is moved towards said locking position to a position in which it snaps into said first recess to hold said lock body in said locking position,

a key operated lock barrel rotatably mounted in said lock body with its key receiving end exposed in the surface of said lock body remote form said backplate and operative to withdraw said latch member from said recess,

a return spring biasing said lock body away from said locking position whereby the required locking effect may be obtained by manually moving said lock body against said biasing spring towards said locking position and may be released by the actuation of said key operated lock barrel,

said slideway being formed laterally with a second recess extending from an end facing towards said backplate by a distance at least equal to the travel of said lock body in said slideway,

a second pin fixed to said lock body in a position to travel therewith along said second recess and said second pin engaged by said return spring, and

a retaining member fixed to said head region and operative to retain said biasing spring between itself and said second pin.

4,991,415

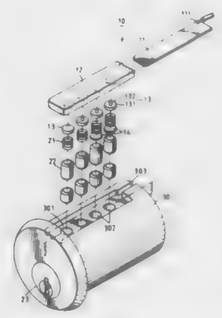
LOCK WITH ELECTRONIC WARNING AND ELECTROMAGNETIC CONTROL SYSTEM

Gary Shieh, Fl. 9-4, No. 106, Sec. 3, Hsin-I Rd., Taipei City, Taiwan

Filed Jul. 18, 1990, Ser. No. 554,803

Int. Cl.[5] E05B *43/00*

U.S. Cl. 70—268 13 Claims



1. A lock with an electronic warning system comprising a hollow lock body with a plurality of aligned first transverse

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holes, a cylindrical key plug rotatably disposed inside said lock body and having a plurality of second transverse holes aligned with said first transverse holes, and a plurality of tumbler pins, each of said tumbler pins extending into one set of said aligned said first and said second transverse holes, said lock further comprising:

a first control switch actuated by inserting a key into said key plug;

a second control switch actuated by rotating said key plug relative to said lock body; and

an electrical control means including a first timer means connected to said second control switch, a second timer means connected to said first control switch, a first electrical relay means interconnecting said first and said second timer means, and a warning device actuated by said second timer means, said first timer means disabling said second timer means for a predetermined time period when said first timer means is actuated;

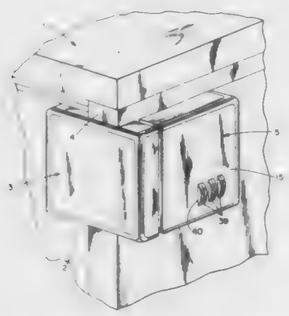
whereby, said warning device sends out alarm signals for a predetermined period of time if said key plug has not been rotated after said second timer means has counted down a preset time period.

4,991,416

LOCK FOR RELEASABLY SECURING TWO CLOSEABLE ELEMENTS

Henry Resendez, Jr., 5358 N. Forkner, Fresno, Calif. 93711, and Helmut Klein, Heidekamp 51, D-5620 Velbert 1, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 426,716
Int. Cl.[5] E05B *37/02*
U.S. Cl. 70—312 26 Claims



1. A lock for a closeable member comprising first and second relatively movable elements, said lock comprising a lock component adapted to be mounted to one of said elements, and a counter-locking component adapted to be connected to the other of said elements, said lock component comprising:

a housing having an opening;

a latching bolt slidably mounted in said opening, said latching bolt including a rear end disposed in said housing and a hook-shaped front end disposable outside of said housing, said latching bolt being slidable rearwardly by said counterlocking component to a latching position in response to the closing of said other element wherein said hook-shaped end is placed in latching engagement with said counter-locking component, said latching bolt also being slidable forwardly to an unlatching position;

means for swiveling said latching bolt in one direction during rearward sliding movement thereof to effect said latching engagement;

means for swiveling said latching bolt in an opposite direction during forward sliding movement thereof to effect said unlatching; and

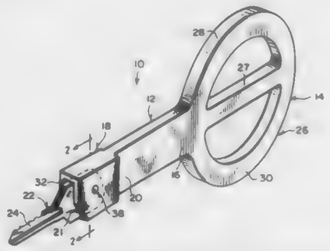
a locking bolt for releasably engaging said latching bolt in said latching position.

4,991,417

KEY EXTENSION FOR THE PHYSICALLY IMPAIRED

Pasquale Grecco, 37 16th St., Hicksville, N.Y. 11801

Filed Mar. 20, 1990, Ser. No. 496,369
Int. Cl.[5] E05B *19/00*
U.S. Cl. 70—408 2 Claims



1. A key extension for the physically impaired comprising:

(a) a shank portion;

(b) an enlarged handle portion affixed to a first end of said shank portion;

(c) a head portion affixed to a second end of said shank portion; and

(d) means in said head portion, for retaining a bow of a standard key therein so that a blade of the standard key can be inserted within a lock allowing the physically impaired to turn said key extension to operate the lock;

wherein said shank portion is flexible and rectangular in its cross sectional configuration;

wherein said enlarged handle portion is an annular ring having a bar extending across its diameter in alignment with said shank portion to divide said annular ring into a first segment and a second segment so that the physically impaired can contact said shank portion, push/pull said first segment of said annular ring of said handle portion and push/pull said second segment of said annular ring of said handle portion with a hand, elbow, wrist, palm and other parts of the body to turn said key extension to operate the lock;

wherein said retaining means includes:

(a) said head portion having a recess extending therein opposite from the affixed second end of said shank portion and having a transverse aperture extending through said recess so that the bow of the standard key can be received in said recess with the hole in the bow in alignment with said transverse aperture; and

(b) a bolt having a threaded shaft to enter through said transverse aperture and he hole in the bow to threadably engage with said head portion so as to retain the standard key thereto.

4,991,418

METHOD FOR DETERMINING TEMPERATURE OF METAL TO BE ROLLED BY HOT STRIP MILL AND APPARATUS FOR PERFORMING THE SAME

Fumio Yamada, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

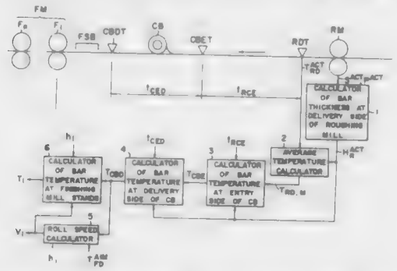
Filed Sep. 20, 1989, Ser. No. 409,723
Claims priority, application Japan, Sep. 20, 1988, 63-236051
Int. Cl.[5] B21B *37/10*
U.S. Cl. 72—11 9 Claims

1. A method of determining a metal temperature of a bar in a hot strip mill having a roughing mill, a finishing mill including a plurality of mill stands and a coil box disposed between said roughing mill and said finishing mill, said method comprising

a first step of setting a roll gap and a rolling force of said roughing mill when a tail end portion of said bar reaches said roughing mill and calculating a bar thickness at a delivery side of said roughing mill on the basis of said roll gap and said rolling force,

a second step of detecting a surface temperature of said bar when said tail portion of said bar exits said roughing mill and calculating an average temperature of said bar in the direction of the thickness thereof on the basis of said surface temperature and said bar thickness,

a third step of measuring a transportation time of said bar from said roughing mill to the entry side of said coil box and calculating a temperature of said bar at an entry side of said coil box on the basis of said transportation time of said bar from said roughing mill to the entry side of said coil box, said bar thickness and said average temperature,



a fourth step of measuring a transportation time of said bar from said entry side to said delivery side of said coil box and calculating the temperature of said bar at a delivery side of said coil box on the basis of said transportation time of said bar from said entry side to said delivery side of said coil box, said bar thickness and said temperature of said bar at said entry side of said coil box,

a fifth step of calculating roll speeds of said respective mill stands of said finishing mill on the basis of said temperature of said bar at said delivery side of said coil box, an objective temperature value at a delivery side of said finishing mill and objective thickness values of said bar at said respective mill stands of said finishing mill, and

a sixth step of calculating the temperature of said strip at said respective mill stands of said finishing mill on the basis of said temperature of said bar at said delivery side of said coil box, said roll speeds at said respective stands of said finishing mill and said objective thickness at said respective stands of said finishing mill.

4,991,419

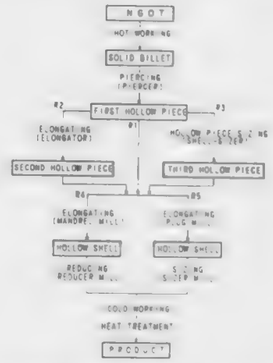
METHOD OF MANUFACTURING SEAMLESS TUBE FORMED OF TITANIUM MATERIAL

Atsuhiko Kuroda; Yoshiaki Shida, both of Osaka; Hiroki Kawabata, Wakayama; Tetsuya Nakanishi, Wakayama; Kazuhiro Nakajima, Wakayama, and Shigemitsu Kimura, Wakayama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Nov. 16, 1989, Ser. No. 437,273
Claims priority, application Japan, Nov. 18, 1988, 63-293027; Dec. 14, 1988, 63-317226; Dec. 14, 1988, 63-317227; Nov. 8, 1989, 1-290693
Int. Cl.[5] B21B *19/06*
U.S. Cl. 72—97 25 Claims

1. A method of manufacturing a seamless tube formed of a titanium material by the use of the Mannesmann's method comprising a first step of heating and working an ingot formed of pure titanium or titanium alloy so as to be turned into a solid billet; a step of piercing the resulting solid billet so as to be turned into a hollow piece; a step of elongating the resulting hollow piece so as to be turned into a hollow shell; and a step of sizing or a step of reducing the resulting hollow shell;

said ingot being heated within a temperature range of 850° to 1,250° C., a final temperature being within a range of 600° to 1,100° C., and a working degree being 50% or more during the first step, and said solid billet being subjected to



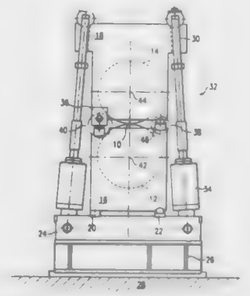
piercing within a temperature range of β transus − 100° to 1,250° C. during the piercing step.

4,991,420

ROLLER NIP ADJUSTMENT DEVICE

Bruno Frischknecht, and Rudolf Roder, both of Gwatt, Switzerland, assignors to Lauener Engineering AG, Thun, Switzerland

Filed Aug. 26, 1988, Ser. No. 237,240
Claims priority, application Switzerland, Aug. 26, 1987, 03276/87
Int. Cl.[5] B21B *31/02*
U.S. Cl. 72—244 27 Claims



1. In a stand useful for rolling or roll casting, said stand having a first bearing housing, in which a first roller having a first rotational axis is rotatably mounted, operatively connected to and spaced from a second bearing housing, in which a second roller having a second rotational axis is rotatably mounted, and a roller nip defined between the first and second rollers, the improvement comprising:

means for adjusting the spacing between the first and second bearing housings, at least a portion of said means for adjusting being positioned within the spacing between the first and second bearing housings in recesses of said first and second bearing housings, displaced from a surface coplanar with the first and second rotational axes, and capable of both increasing and decreasing the roller nip; and

means for pivoting the second bearing housing relative to the substantially stationary first bearing housing to permit the spacing of the roller nip to change in response to said means for adjusting, said means for pivoting having a third

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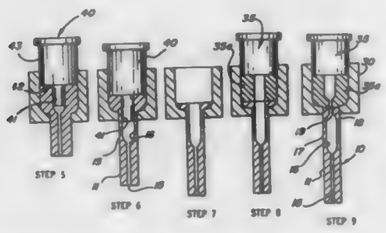
rotational axis parallel with the first and second rotational axes, said means for pivoting being displaced from said surface coplanar with the first and second rotational axes, disposed across said surface from said means for adjusting and said means for pivoting being positioned in recesses of said first and second bearing housings.

4,991,421

METHOD FOR EXTRUDING AN ELONGATED, LIGHTWEIGHT RACK

Joseph A. Simon, 30855 Little Mack Ave., Roseville, Mich. 48066

Filed Mar. 8, 1990, Ser. No. 490,286
Int. Cl.[5] B21C *23/14, 25/08*
U.S. Cl. 72—260 3 Claims



1. A method for making an elongated rack for use in transmitting forces from a pinion means in an automotive-type steering gear assembly, and formed of an elongated rack part integral end to end with an elongated link part, comprising:

positioning a short, tubular, metal blank within an open ended tubular die having an entry end and an extrusion end which is formed by an annular, radially inwardly extending, continuous, die extrusion throat of smaller cross sectional area than the blank, through which the blank is extruded;

inserting a punch having a force applying, relatively blunt leading end surface, into the die entry end for closely fitting within the die, with the punch leading end surface engaging and overlapping the complete trailing end of the blank, that is, the annular end and opening in the blank end which are furthest from the die throat;

moving the punch, relative to the die, longitudinally towards the die throat and extruding the leading end portion of the blank, that is, the portion which is initially closest to the die throat, through the die throat and collapsing the blank leading end portion radially inwardly during the longitudinal extrusion thereof through the throat to leave a small diameter, central space extending along the axis of the extruded leading end portion for forming the longitudinally extending rack part with a fine central opening extending along its axis;

removing the punch and replacing it with a punch having a mandrel extending longitudinally into the blank and with the punch having an annular shoulder engaging the annular trailing end of the blank, and moving the punch relative to the die throat and positioning the mandrel within the die throat for extruding a thin wall, tubular, link part around the mandrel and through the throat;

whereby the blank leading portion forms the integral rack part, with its fine, central opening extending along its horizontal axis and communicating with a large, substantially uniform diameter, hollow space within the integral, thin wall tubular link part formed by the trailing end portion of the blank by the extrusion through the die throat;

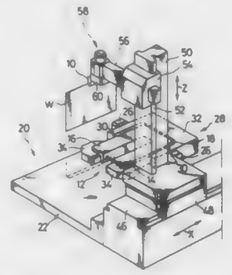
and whereby a number of teeth may be relatively deeply cut in the external surface of the rack portion subsequent to the extrusion thereof.

4,991,422

PLATE BENDING MACHINE

Franco Sartorio, Turin, Italy, assignor to Amada Company, Limited, Japan

Filed May 15, 1989, Ser. No. 351,212
Claims priority, application Italy, May 16, 1988, 67451 A/88
Int. Cl.[5] B21D *5/02*
U.S. Cl. 72—311 9 Claims



1. A plate bending machine comprising:

a punch and a die movable toward and away from each other for bending a workpiece in cooperation with each other, said punch having a bending edge extending along a line;

a first support means for supporting the punch and the die, the first support means being rotatable about a bending axis coincident with the bending edge of the punch;

a second support means for supporting the first support means, the second support means being pivotable about an axis intersecting the bending axis; and

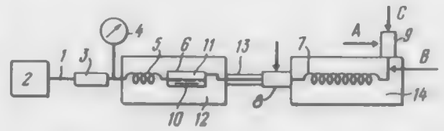
a workpiece support means for supporting the workpiece between the punch and the die with the plane of the workpiece extending vertically and perpendicularly to the pivoting axis of the second support means and said plane of the workpiece extending so as to contain the bending axis.

4,991,423

METHOD OF GAS-CHROMATOGRAPHIC ANALYSIS OF MIXTURES AND DEVICE THEREFOR

Vladimir M. Poshemansky, 2-oi Paviovsky pereulok, 20, kv. 20; Eduard P. Skornyakov, ulitsa admirala Makarova, 21, kv. 14, and Jury K. Fiseisky, ulitsa Alyabieva, 2, kv. 36, all of, Moscow, U.S.S.R.

Filed Aug. 23, 1989, Ser. No. 397,738
Int. Cl.[5] G01N *30/26*
U.S. Cl. 73—23.35 7 Claims



1. A method of gas-chromatographic analysis of mixtures comprising:

using as a chromatograph column a hollow capillary tube which continuously passes a carrier-gas flow saturated with solvent vapors at a temperature below or equal to the temperature of said chromatograph column maintained above the condensation point of vapors of said solvent and below the boiling point of said solvent;

periodically introducing a sample of mixture to be analyzed into said chromatograph column after attaining the equality between the quantity of vapors of said solvent supplied to said chromatograph column and the quantity of vapors

of said solvent removed from said chromatograph column; and subsequently

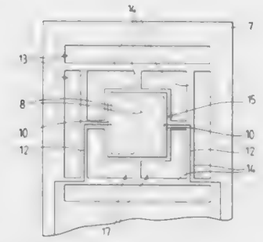
detecting at the output of said column components of said mixture separated in said chromatograph column.

4,991,424

INTEGRATED HEATABLE SENSOR

Ari Lehto, Helsinki, Finland, assignor to Vaisala Oy, Helsinki; Kemira Oy, Espoo; Neste Oy, Espoo; Outokumpu Oy, Espoo, all of, Finland and Engicom N.V., Boechout, Belgium

Filed May 22, 1989, Ser. No. 355,283
Claims priority, application Finland, Jun. 8, 1988, 882697
Int. Cl.[5] G01N *27/12*
U.S. Cl. 73—31.060 16 Claims



1. An integrated sensing apparatus for measuring gas concentration comprising:

a sensor element for providing a sensor signal;

a heating element arranged in conjunction with the sensor element for heating the sensor element to a temperature above the ambient gas atmosphere temperature; and

electronic circuitry, coupled to the sensor element and the heating element, for measuring desired electrical properties of the sensor element in accordance with the sensor signal and controlling the heating element in response thereto,

the sensor element and the electronic circuitry being placed on a common planar substrate, and that

the common planar substrate including adjacent openings situated around the sensor element in the immediate vicinity thereof and extending entirely through the common planar substrate such that only thin isthmuses are formed between the adjacent openings for connecting the sensor element to the surrounding part of the common planar substrate and to the electronic circuitry.

4,991,425

PORTABLE GAUGE FOR MEASURING AIR FLOW IN A PAPERMAKING MACHINE

Thomas G. Gulya, Appleton, and Gary V. Schultz, Kimberley, both of Wis., assignors to Appleton Mills, Appleton, Wis.

Filed Feb. 20, 1990, Ser. No. 481,210
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—38 15 Claims

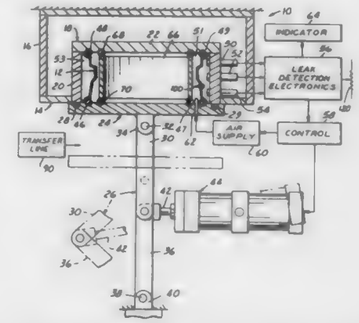
1. An apparatus for measuring air flow in connection with a papermaking fabric, comprising housing means having an open front end and having a straight edge bordering said open front end, air flow measuring means disposed at the rear end of said housing means and having a smaller cross sectional area than said open front end for providing a measurement of air flow through said housing means, said housing means being constructed and arranged to direct air from said front end to said air flow measuring means, and a blade removably connected to said straight edge and extending forwardly of said edge, said blade being constructed and arranged to ride against said fabric and direct air into said housing.

4,991,426

CALIBRATION OF AIR LEAK DETECTION APPARATUS

Arthur C. Evans, Union Lake, Mich., assignor to Oakland Engineering, Inc., Pontiac, Mich.

Filed Aug. 22, 1989, Ser. No. 397,507
Int. Cl.[5] G01M *3/02, 3/24*
U.S. Cl. 73—40.7 12 Claims



1. Apparatus for testing a workpiece of predetermined contour for air leak integrity specified by a maximum allowable air flow rate at a specified pressure, said apparatus comprising: an air-tight housing, means for positioning a workpiece in sealing engagement with portions of said housing so as to form first and second chambers within said housing internally and externally of the workpiece, means for supplying air at a test pressure to one of said chambers, means for detecting leakage of air through the workpiece into the other of said chambers and thereby indicating absence of leak integrity at the workpiece, and means for calibrating said leakage-detecting means to said maximum allowable flow rate at said specified pressure comprising:

a test part having a contour coordinated with said predetermined workpiece contour for sealing engagement with said portions of said housing to form said first and second chambers, and means on said test part forming an orifice for controlled leakage of air between said chambers, said orifice having a size coordinated with said test pressure to permit air flow through said orifice at a flow rate corresponding to said maximum allowable flow rate at said specified pressure.

4,991,427

BORE MAPPING AND SURFACE TIME MEASUREMENT SYSTEM

Lawrence D. Nottingham, Charlotte, N.C.; Thomas E. Michaels, and Jennifer E. Michaels, both of Freeville, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 878,649, Jun. 26, 1986, Pat. No. 4,964,295.
This application Apr. 20, 1990, Ser. No. 511,705
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—623 8 Claims

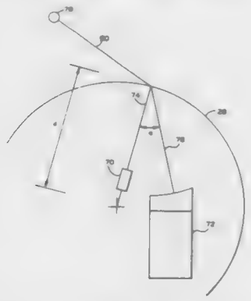
1. A surface time measurement system for a shear mode inspection transducer producing an inspection beam incident on a bore surface, said system comprising:

a ranging transducer, positioned at a known geometric angle with respect to the inspection transducer, producing a ranging beam pulse substantially normally incident on substantially the same circumferential position on the bore surface as the inspection beam and receiving a reflection of the ranging beam pulse from the bore surface; and

surface time calculation means for calculating a surface time for the inspection beam from a ranging surface time mea-

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sured as the time between transmission of the ranging beam pulse and the receipt of the reflection, a calibration



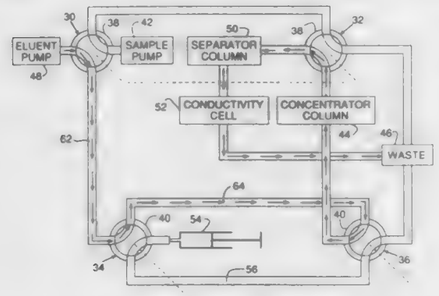
ranging beam surface time, a calibration inspection beam surface time and the known angle.

4,991,428

ION CHROMATOGRAPHY METHOD FOR LOW CONCENTRATIONS

H. Paul Heyde, 206 Loma Bonita Dr., San Luis Obispo, Calif. 93401

Filed Sep. 25, 1989, Ser. No. 412,112
Int. Cl.[5] G01N *30/08*
U.S. Cl. 73—61.1 C **1 Claim**



1. Apparatus for use in an ion chromatographic method for measuring ionic concentrations in the parts per trillion range, comprising in combination:

a sample pump (42);

an eluent pump (48);

a first conduit (62) having an input end and an output end; first valve means for selectively connecting the input end of said first conduit to said sample pump and for selectively connecting the input end of said first conduit to said eluent pump;

input end of said first conduit to said sample pump and for selectively connecting the input end of said first conduit to said eluent pump;

a syringe (54);

a loop conduit (56) having an input end and an output end;

a second conduit (64) having an input end and an output end;

second valve means for selectively connecting the output end of said first conduit to the input end of said second conduit, for selectively connecting the output end of said first conduit to the input end of said loop conduit, and for selectively connecting said syringe to the input end of said loop conduit;

a concentrator (44) having an input port and an output port;

a waste receptacle (46)

third valve means for selectively connecting the output end of said second conduit to the input port of said concentrator, for selectively connecting the output end of said loop conduit to the input port of said concentrator, and for selectively connecting the output end of said loop conduit to said waste receptacle;

a separator (50) having an input port;

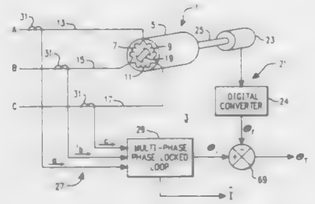
fourth valve means for selectively connecting the output port of said concentrator to said waste receptacle, and for selectively connecting the output port of said concentrator to the input port of said separator.

4,991,429

TORQUE ANGLE AND PEAK CURRENT DETECTOR FOR SYNCHRONOUS MOTORS

Eric J. Stacey, Penn Hills Twp, Allegheny County, Pa., and Geoffrey M. Smith, Reisterstown, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 28, 1989, Ser. No. 458,216
Int. Cl.[5] G01R *31/34*
U.S. Cl. 73—116 **14 Claims**



1. A torque angle detector for a multiphase synchronous motor having a rotor and a stator winding to which multiphase current is applied to operate said motor, said detector comprising:

means monitoring rotation of said rotor and generating a rotor position signal representing an instantaneous angular position of the rotor;

means monitoring the multiphase current applied to said stator winding and generating current signals representative of said multiphase current;

means generating from said current signals a field position signal representing the instantaneous angular position of a composite magnetic field produced by said current in the motor; and

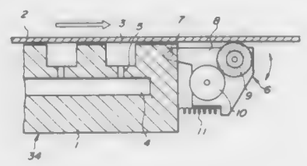
means determining the difference between the field position signal and said rotor position signal to produce a torque angle signal.

4,991,430

SUPPORTING STRUCTURE FOR ROAD SIMULATED ENDLESS BELT ARRANGEMENT FOR BENCH TESTING APPARATUS

Hideo Kaizu, Gunma, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,069
Claims priority, application Japan, Mar. 2, 1989, 1-24075; Mar. 2, 1989, 1-24076
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—117 **12 Claims**



1. An endless belt type bench testing apparatus, comprising:

a pair of rotary drums;

a flexible metallic endless belt wound over the pair of rotary drums;

a supporting base disposed in a clearance defined between the rotary drums and in opposition to a portion of said endless belt with a predetermined clearance between the mating surfaces;

a liquidus lubricating medium supply system associated with said supporting base for supplying a liquidus lubricating medium into said clearance between said supporting base and said belt for forming a lubricating layer; and

a drainage system provided at least at the downstream end of said supporting base for collecting the liquidus lubricating medium discharged from said clearance;

a seal structure including a seal member resiliently contacting with said endless belt, said seal member having capability of absorbing liquidus lubricating medium; and

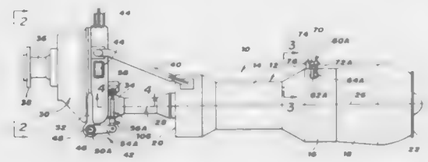
means for squeezing the liquidus lubricating medium absorbed within the porous structure of said seal member.

4,991,431

METHOD OF MONITORING A MOUNT SYSTEM FOR AN AIRCRAFT ENGINE

Charles W. Gaither, Nineveh, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 31, 1990, Ser. No. 472,914
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 **4 Claims**



1. A method, of monitoring the condition of a mount system between an airframe of an aircraft and a propulsion engine having a case and an output shaft rotatably supported on said case,

said mount system including a plurality of mount elements between said case and said airframe of said aircraft each reacting a predetermined fraction of the dynamic torque transferred by said output shaft in a normal operating condition of said mount system,

said method comprising the steps of:

dynamically measuring the fraction of said output shaft torque being reacted by a selected one of said mount elements, and

comparing said dynamically measured fraction with said predetermined fraction for said selected one of said mount elements thereby to identify changes in load distribution between each of said mount elements.

4,991,432

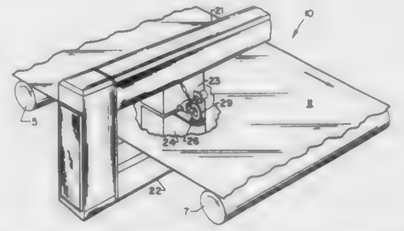
SENSOR AND SYSTEM FOR CONTINUOUS DETERMINATION OF SHEET CHARACTERISTICS

Paul J. Houghton; Lee M. Chase, both of Los Gatos; John D. Goss, San Jose, and Kent M. Norton, Los Gatos, all of Calif., assignors to Measurex, Cupertino, Calif.

Continuation of Ser. No. 56,332, May 26, 1987, Pat. No. 4,864,851, which is a continuation of Ser. No. 784,213, Oct. 4, 1985, abandoned, and a continuation-in-part of Ser. No. 730,406, May 2, 1985, abandoned. This application Aug. 1, 1989, Ser. No. 388,567
Int. Cl.[5] G01L *5/04*
U.S. Cl. 73—159 **21 Claims**

1. A sensor for non-destructively and continuously determining a physical characteristic of a continuous moving sheet under tension, the sensor comprising:

a sheet support having a sheet supporting surface adapted to support the moving sheet at a plurality of locations defining an open area therebetween, wherein one of the locations is adjacent to the open area in a direction perpendicular to the direction of motion of the sheet and a second location is disposed on the side of the open area opposite the one location;



a sheet displacing member adapted to be disposed at least partially within the open area, the member having a sheet displacing surface adapted to non-destructively displace a portion of the moving sheet into the open area; and

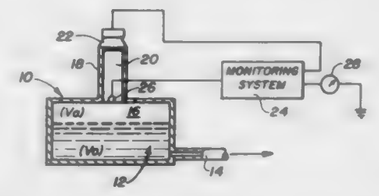
a displacement sensing means operatively coupled to the sheet support and the member to sense the distance the sheet displacing member displaces the sheet into the open area, and to generate signals indicative of the sensed distance.

4,991,433

PHASE TRACK SYSTEM FOR MONITORING FLUID MATERIAL WITHIN A CONTAINER

Glenn E. Warnaka, State College, and Mark E. Warnaka, Howard, both of Pa., assignors to Applied Acoustic Research, State College, Pa.

Filed Sep. 21, 1989, Ser. No. 410,699
Int. Cl.[5] G01F *23/28*
U.S. Cl. 73—290 V **21 Claims**



1. A method of monitoring an unknown volume of a fluent material within a container, having a specific resonance frequency at a given volume, which comprises directing acoustical energy at an excitation frequency at or near the Helmholtz resonance frequency of the container into the container, sensing acoustical vibrations emitted therefrom having phase characteristics, and measuring the phase relationship of the acoustical vibrations relative to a reference electrical input, and determining the unknown volume of the fluent material within the container based on the thus measured phase relationship for the excitation frequency utilized.

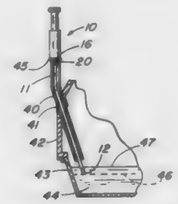
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,434

METHOD AND APPARATUS FOR DETERMINING WHETHER A LIQUID IN A RESERVOIR IS ABOVE A CERTAIN LEVEL

A. Ray Snow, Sandy, Utah, assignor to Chain Tool Company, Inc., North Salt Lake, Utah

Filed Jul. 5, 1989, Ser. No. 375,526
Int. Cl.[5] G01F *23/00*; G01L *7/16*
U.S. Cl. 73—303 **20 Claims**



1. Apparatus for determining whether a liquid in a liquid reservoir is above a certain level in the reservoir, comprising a cylinder; a piston slideably and sealingly mounted in the cylinder and forming a suction chamber in the cylinder between the piston and one end of the cylinder said suction chamber being configured so that presence of liquid therein can be visually detected; bias means between the piston and the one end of the cylinder to bias the piston away from the one end of the cylinder; means for positioning the piston in the cylinder against the bias means toward the one end of the cylinder so that when the piston is released, it moves under the urging of the bias means to create a suction in the suction chamber; conduit means extending from the one end of the cylinder and adapted to be positioned in the reservoir, said conduit means having a passage therethrough communicating with the suction chamber in the cylinder and communicating with the reservoir through an opening at the end of the passage located in the reservoir at the certain level so that if the liquid in the reservoir is above the certain level, it is above the opening of the passage into the reservoir, and if the liquid in the reservoir is below the certain level, it is below the opening of the passage into the reservoir; whereby, when suction is created in the suction chamber, if the liquid in the reservoir is above the certain level, the liquid is drawn through the passage into the suction chamber and its presence therein is visually detectable, but, if the level of the liquid is below the certain level, liquid is not drawn into the passage, presence of an amount of the liquid in the chamber after operation of the piston means indicating the liquid level in the reservoir is above the certain level while absence of an amount of the liquid in the chamber after operation of the piston means indicating the liquid level in the reservoir is below the certain level; and means for allowing communication between the suction chamber and the atmosphere after liquid has been drawn into the suction chamber so the liquid drawn into the suction chamber can flow through the passage back into the reservoir.

4,991,435

ELECTRONIC FUEL GAUGE SYSTEM

Vincent Colarossi, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 5, 1989, Ser. No. 402,377
Int. Cl.[5] G01F *23/00*
U.S. Cl. 73—313 **20 Claims**

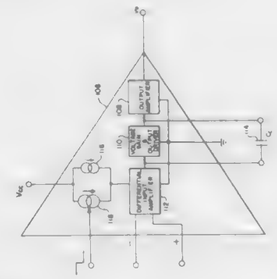
13. A liquid level indicating system for use in an environment such as a motor vehicle wherein the liquid level is subjected to relatively rapid variations compared to the variations which are produced by consumption of the liquid, said system comprising:

a sensor for generating a signal representative of the liquid level;

a liquid level signaling gauge;

amplification means interconnected between said sensor and said gauge for amplifying said signal; and

slew rate control means coupled to said amplification means



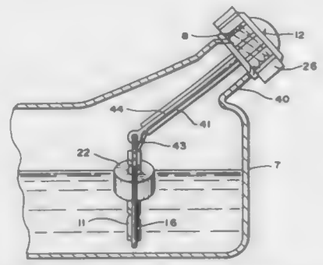
for limiting the slew rate of said amplification means to substantially eliminate the rapid variations from said signal, the slew rate of said amplification means being substantially constant.

4,991,436

FUEL TANK GAUGE

Thomas N. Roling, 2311 N. Fifth St., Clinton, Iowa 52732

Filed Dec. 26, 1989, Ser. No. 456,933
Int. Cl.[5] G01F *23/50*
U.S. Cl. 73—320 **2 Claims**



1. A fuel tank gauge for accurately measuring fuel in a tank having a fill pipe through which said gauge is directed,

said gauge including a gauge cap adapted to be attached to said fill-pipe,

said gauge having a pair of support rods attached to said gauge cap and extending through said fill-pipe to the interior of said tank,

said support rods having lower ends with a float guide freely pivotally connected thereto,

said float guide having a rotatable vertical shaft with a spiral section having a vertically moveable float mounted on said spiral section,

said float engageable with said float guide in a vertically moveable, non-rotational manner whereby vertical movement of said float causes said vertical shaft to rotate, and

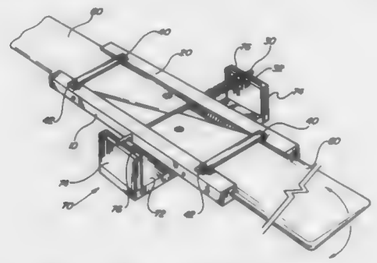
means on said filler-cap connected to said rotatable vertical shaft to indicate the rotational position of said shaft and thus the vertical position of said float.

4,991,437

AIRFOIL BALANCER

Raymond L. Hanchett, 7405 W. M78, Perry, Mich. 48872

Filed Nov. 30, 1988, Ser. No. 277,803
Int. Cl.[5] G01M *1/02*
U.S. Cl. 73—455 **11 Claims**



1. A balancer of airfoils comprising:

two clamps, each having a grooved side adapted for removably holding the edge of an airfoil and having one centrally located orifice essentially perpendicular to said grooved side;

a straight pin slidably passing through each of said centrally located orifices, with said grooved sides facing each other, and extending beyond each of said clamps; and

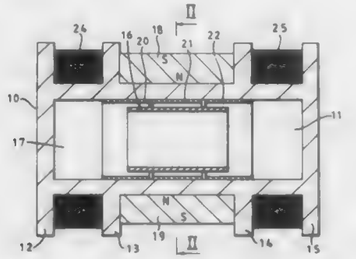
force producing means for urging said clamps together thereby securing an airfoil on each side of said pin.

4,991,438

MAGNETIC FLUID REBALANCE ACCELEROMETERS

Kenneth S. Evans, Cheltenham, England, assignor to Baroid Technology, Inc., Houston, Tex.

Filed Mar. 3, 1989, Ser. No. 318,237
Claims priority, application United Kingdom, Mar. 15, 1988, 8806113
Int. Cl.[5] G01P *15/13*
U.S. Cl. 73—516 R **8 Claims**



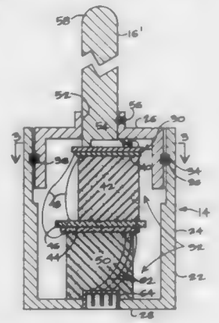
1. A linear accelerometer comprising a housing defining an elongate cylindrical chamber having a longitudinal axis and two ends, a magnetizable fluid within the chamber, an electrically conductive and substantially non-magnetic cylindrical proof mass which is coaxially disposed in the chamber in spaced relationship to the ends and which is displaceable in response to linear acceleration, magnet means outside the chamber for magnetizing the fluid to cause the proof mass to be suspended by the fluid away from the walls of the chamber while permitting displacement of the proof mass along the axis of the chamber, sensing means for detecting displacement of the proof mass from a null position along the axis of the chamber in response to the acceleration and providing an electrical output signal indicative of the applied force, and restoring coil means for applying a magnetic field to induce current flow in the proof mass and to cause the proof mass to be restored to its null position by interaction between the magnetic field and the induced current flow in response to detection of displacement of the proof mass.

4,991,439

APPARATUS FOR DETECTING INSECT-INDUCED VIBRATIONS IN PARTICULATE MATTER

William B. Betts, Alva, Okla., assignor to B & B Industries, Alva, Okla.

Filed Nov. 18, 1988, Ser. No. 272,857
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—587 **21 Claims**



1. An apparatus for detecting the presence of insects in particulate matter comprising:

(a) a vibration receiving structure;

(b) a piezoelectric transducer means physically contacted by the vibration receiving structure at an off-center location on the transducer means for directly detecting the vibrations in the particulate matter via the vibration receiving structure and generating electrical signals in response to the detected vibrations;

(c) means for selectively amplifying the portion of the electrical signals representative of the frequency range of vibrations generated by insects which may be present in the particulate matter; and

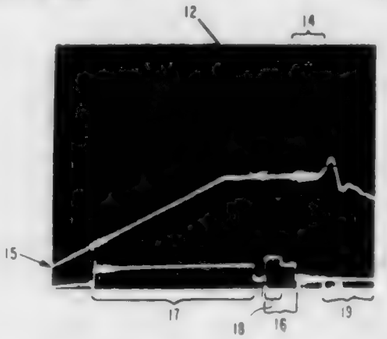
(d) means for analyzing the electrical signals representative of the vibrations to identify the species within the particulate matter.

4,991,440

METHOD OF ULTRASONICALLY MEASURING THICKNESS AND CHARACTERISTICS OF ZIRCONIUM LINER COEXTRUDED WITH ZIRCONIUM TUBE

Michael J. Pleinis, Ogden, and David M. Allen, Brigham City, both of Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1990, Ser. No. 474,898
Int. Cl.[5] G01B *17/02*; G01N *29/00*
U.S. Cl. 73—615 **6 Claims**



1. A method of measuring wall thicknesses and cross-sectional characteristics of a zirconium metal liner of a coex-

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truded zirconium metal tube and tube liner along the length of the coextrusion, comprising continuously applying ultrasonic energy to the outer surface of a rotating coextruded tube and tube liner while traveling along the length of said tube and tube liner, so as to generate echo signals corresponding, respectively, to the interface between said tube and tube liner and the inside surface of said coextruded tube and tube liner; detecting a weak ultrasonic echo from said interface between the tube and liner and a stronger ultrasonic echo from said inside surface of said coextruded tube and tube liner to define a variable timing zone therebetween corresponding to the thickness and cross-sectional characteristics of said tube liner at successive points along the travel of application of ultrasonic energy while blocking out extraneous signals at opposite sides of and within said timing zone by respective blocking gates; locking the side of the blocking gate that is within said timing zone and adjacent to the detected interface echo signal onto said interface echo signal; adjusting the opposite side of said blocking gate from time to time so that said blocking gate will cover a maximum area of said timing zone while still being narrower than said timing zone; repeatedly timing travel of an ultrasonic wave across said timing zone along said length of the coextrusion; and determining liner thicknesses and characteristics from the measured travel times of the ultrasonic wave.

4,991,441

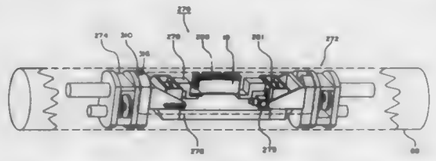
POSITIONING ASSEMBLY FOR A TRANSDUCER IN A BORESONIC INSPECTION SYSTEM

Lawrence D. Nottingham, Charlotte, N.C.; Thomas E. Michaels, and Jennifer E. Michaels, both of Freeville, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 160,211, Feb. 25, 1988, Pat. No. 4,864,862, Division of Ser. No. 117,918, Nov. 6, 1987, Pat. No. 4,757,516. This application May 8, 1989, Ser. No. 349,001

Int. Cl.[5] G01N *9/24*

U.S. Cl. 73—633 **5 Claims**



4. A positioning assembly for a transducer in an ultrasonic inspection system comprising:

a carriage;

a fixture mounted on said carriage for supporting said transducer;

a first positioning means coupled to a first end of said carriage for tilting said first end of said carriage in a radial axial plane whereby said transducer may be positioned at an angle to a longitudinal axis of said inspection system;

said first positioning means comprising a gear rack mounted for movement in a rack slide, a gear coupled to said rack and a first motor coupled to said gear;

a first positioning resolver coupled to said first positioning means;

a second positioning means for circumferentially rotating said transducer to a known and repeatable angular position;

said second positioning means comprising a rotatable shaft coupled to said fixture and a second motor coupled to said shaft; and

a second position resolver coupled to said second positioning means.

4,991,442

METHOD AND APPARATUS FOR DETECTING CRACKS IN BEARINGS

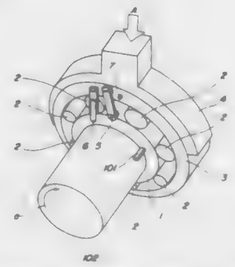
Youichi Matsumoto, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 451,013

Claims priority, application Japan, Dec. 16, 1988, 63-318011; May 25, 1989, 1-132130

Int. Cl.[5] G01M *13/04*

U.S. Cl. 73—660 **18 Claims**



1. An apparatus for detecting a crack in a bearing including a stationary element, a moving element, and a plurality of rolling elements disposed between said stationary element and said moving element at equal intervals in a direction of movement of said moving element and movable in said direction, the apparatus comprising:

crack detecting means for detecting a signal characteristic of a crack in said bearing;

a rolling element position sensor for detecting a position of said rolling elements;

a moving element position sensor for detecting a position of said moving element; and

control means connected to said crack detecting means, said rolling element position sensor, and said moving element position sensor;

said control means determining, when an output signal from said crack detecting means is supplied thereto for the first time, based on at least one of position signals respectively supplied from said rolling element position sensor and said moving element position sensor, a condition of said at least one of position signals to be satisfied when said output signal from said crack detecting means is supplied to said control means the next time, monitoring said at least one of position signals thereafter, accumulating said output signal from said crack detecting means if said output signal is supplied to said control means when said at least one of position signals satisfying said condition is supplied to said control means, and determining whether or not said crack exists in said bearing based on a result of said accumulation.

4,991,443

VIBRATION TESTING SYSTEM

David L. Fowler, and Dennis P. Gregory, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 27, 1989, Ser. No. 428,142

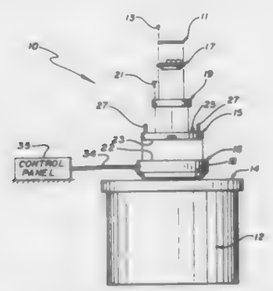
Int. Cl.[5] G01M *7/00*

U.S. Cl. 73—663 **10 Claims**

1. In a vibration testing machine having means for moving a surface of said vibration testing machine to induce vibration in a fixture attached to a unit under test, an improvement wherein said improvement comprises:

an adapter plate attached to said surface of said vibration testing machine at a first surface thereof; and

pumping means for creating a vacuum between a second surface of said adapter plate and a surface on said fixture whereby said fixture and said unit under test attached



thereto is secured to said adapter plate and thereby secured to said vibration testing machine.

4,991,444

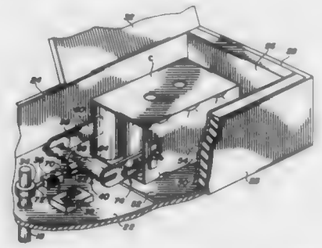
CENTRIFUGAL CARTON TEST METHOD AND APPARATUS

Clayton Dodd, West Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Apr. 16, 1990, Ser. No. 509,923

Int. Cl.[5] G01N *3/00*

U.S. Cl. 73—788 **13 Claims**



1. A test apparatus for determining the centrifugal force at which the contents of an open-ended carton having side panels are forced out an open end thereof, comprising:

a support attached to a drive shaft;

means for rotating the drive shaft and the attached support at varying speeds;

means on the support for receiving an open-ended test carton arranged with one open end thereof facing the drive shaft and the other open end facing outwardly so that centrifugal force from the rotating support tends to cause the contents of the carton to move out said other open end;

means for gripping the carton so as not to interfere with movement of the contents of the carton out said other open end; and

means connected to the support and to the gripping means for measuring the force applied to the carton at the time the contents move out said other open end of the carton.

4,991,445

APPARATUS FOR MEASURING THE DEFORMATION OF AN OBJECT SUBJECTED TO STRESSES

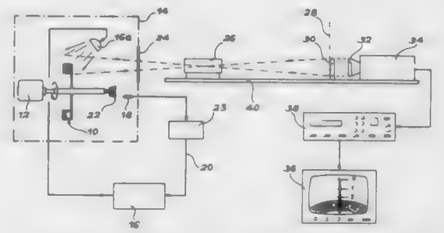
Michel Le Bail, Versailles, and Hubert Vaillant De Guelis, Aubergenville, both of France, assignors to Aerospatiale Societe Nationale Industrielle, France

Filed Dec. 29, 1989, Ser. No. 458,995

Claims priority, application France, Dec. 30, 1988, 88 17516

Int. Cl.[5] G01L *5/00*

U.S. Cl. 73—800 **8 Claims**



1. An apparatus to measure the deformations of an object subjected to stresses and comprising:

(a) a first objective forming a real image of the object on scale 1;

(b) a graduated reticule placed at the location of said real image;

(c) a second objective placed beyond the real image with respect to the first objective and forming enlarged images of the real image and the reticule; and (d) means for observing said enlarged images of the real image and the reticule, thus permitting the measurement of the deformations of the real image, and thus of the object under stress, by comparing the enlarged images on the observing means.

4,991,446

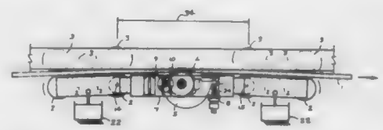
FORCE MEASUREMENT WITH COMPENSATION OF ERRORS CAUSED BY ACCELERATIONS OF MEASURING APPARATUS

Friend K. Bechtel, Moscow, Id., assignor to Metriguard, Inc., Pullman, Wash.

Filed Oct. 5, 1989, Ser. No. 417,898

Int. Cl.[5] G01N *3/20*

U.S. Cl. 73—849 **13 Claims**



7. Apparatus for compensating for errors caused by accelerations of a load beam assembly interposed between a load point and first and second compliant supports located respectively at first and second reference points along the load beam assembly during measurement of a force applied to the load point on the load beam assembly along a reference direction, comprising:

means for obtaining a first signal proportional to the compression of the first compliant support;

means for obtaining a second signal proportional to acceleration along the reference direction of a selected location on the load beam assembly, the selected location being spaced from the first and second compliant supports on the load beam assembly, the acceleration of the selected location in the reference direction being directly proportional to the acceleration induced noise components of the first signal for any combination of acceleration inputs in

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the reference direction at the first and second compliant supports within a preselected frequency range; and

means for adding the first signal to the second signal to obtain a composite signal that is proportional to the force in the reference direction at the load point and which is compensated for accelerations of the load beam assembly.

4,991,447

TORQUE DETECTING DEVICE

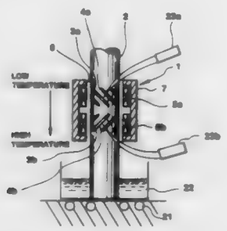
Shinichiro Yahagi, Obbe; Hiroyuki Aoki, Yokohama, and Takanobu Saito, Okazaki, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha and Nissan Motor Company Limited, both of, Japan

Filed Nov. 2, 1989, Ser. No. 430,406

Claims priority, application Japan, Nov. 4, 1988, 63-278981

Int. Cl.[5] G01L *3/10*

U.S. Cl. 73—862.36 14 Claims



1. A torque detecting device having a measuring shaft, excitation means for forming a magnetic circuit wherein said measuring shaft is a part of said magnetic circuit, and detection means for detecting a magnetostriction passing through said measuring shaft, wherein said measuring shaft has following electromagnetic characteristics at least in a part in which said magnetostriction is detected:

Electric resistivity ρ_{RT} of not less than 30 $\mu\Omega$—cm at room temperature;

temperature coefficient $\alpha\rho$ of electric resistivity ρ of not more than 0.25×10^{-2}/°C. at temperature of −50° to 150° C.; and

temperature coefficient α_L of inductance L of not more than 0.07×10^{-2}/°C. at temperature of −50° to 150° C.

4,991,448

FUNCTION CHECKING SYSTEM FOR MAGNETIC TAPE CASSETTE

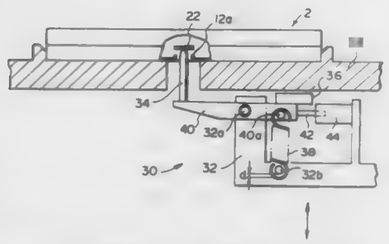
Youichi Hayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1989, Ser. No. 363,578

Claims priority, application Japan, Jun. 8, 1988, 63-140810

Int. Cl.[5] G01L *5/00, 5/28*

U.S. Cl. 73—862.52 10 Claims



1. A cassette brake function checking system which checks the reel braking function of a magnetic tape cassette comprising a reel around which a magnetic tape is wound and which has a flange, the outer periphery of the flange being toothed so that top lands and bottom lands are alternately formed, and a brake mechanism including a brake lever which can be swung between an engaging position in which its engaging portion abuts against one of the bottom lands and a retracted position in which the engaging portion is away from the teeth, and a brake lever urging spring which urges the brake lever toward the engaging position, the checking system comprising:

brake instrument means for moving toward operative brake checking positions,

abutment member means which is supported on said brake instrument means so that said abutment member means can be swung relative to said brake instrument means in a direction opposite to a direction of movement of said brake instrument means toward said brake checking positions, said abutment member means for being operatively brought into abutment contact against the brake lever as said brake instrument means is moved toward said brake checking positions.

first loading means for imparting a light load to said abutment member means in the direction of movement of said brake instrument means toward said brake checking positions so that said abutment member means urges the brake lever toward the retracted position under the light load against the force of the brake lever urging spring when said abutment member means is operatively brought into abutment contact against the brake lever.

a second loading means for imparting a heavy load to said abutment member means in the direction of movement of said brake instrument means toward said brake checking positions when said abutment member means is displaced under a counterforce of the brake lever by a predetermined amount relative to said brake instrument means in the direction opposite to the direction of movement of said brake instrument means toward said brake checking positions, and

position detecting means for detecting a position of the abutment member means.

4,991,449

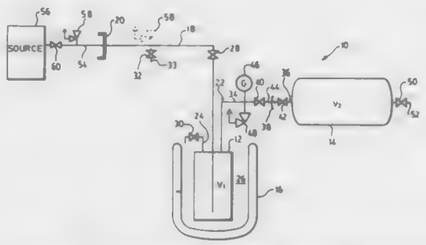
METHOD AND APPARATUS FOR SAMPLING A CRYOGENIC LIQUID FOR ANALYSIS

José M. Dieguez, Saint-Bruno, Canada, assignor to Canadian Liquid Air Ltd-Air Liquide Canada LTEE, Montreal, Canada

Filed Jul. 3, 1989, Ser. No. 374,762

Int. Cl.[5] G01N *1/00*

U.S. Cl. 73—863.11 10 Claims



1. A method of sampling a cryogenic liquid for determination of the molar composition of the cryogenic liquid comprising:

isolating a liquid sample of the cryogenic liquid in an environment at a sampling location which is at a temperature above the freezing temperature of the cryogenic liquid and not greater than the boiling temperature of the cryogenic liquid,

removing said environment,

allowing the isolated liquid sample to vaporize in bulk into a collection vessel,

collecting the vaporized liquid in gas form in said collection vessel for analysis, and

removing only said collection vessel from said sampling location for said analysis.

9. An apparatus for sampling a cryogenic liquid for determination of the molar composition of the cryogenic liquid, comprising:

a sampling vessel for housing a sample of the cryogenic liquid,

first conduit means for flow of the cryogenic liquid into said sampling vessel,

a removable chamber encompassing said sampling vessel,

an outlet in said sampling vessel for flow of cryogenic liquid from said sampling vessel to said chamber,

a gas collection vessel,

second conduit means adapted to provide gas flow communication between said sampling vessel and said gas collection vessel, wherein said gas collection vessel is detachably connected to said sampling vessel by said second conduit means.

4,991,450

FILLING ARRANGEMENT FOR TAKING A SAMPLE OF A RADIOACTIVE PROCESS SOLUTION

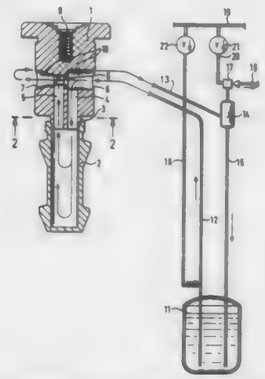
Ulrich Schaarschmidt, Stutensee, and Wolfgang Haut, Waghausel, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jun. 21, 1989, Ser. No. 369,136

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821706

Int. Cl.[5] G01N *1/00*

U.S. Cl. 73—863.61 2 Claims



1. A filling arrangement for taking a sample of a radioactive process solution from a liquid flow, the filling arrangement comprising:

a sample vessel for receiving and holding the sample therein, said vessel having a connecting portion defining a filling opening through which the sample is passed into the interior of the vessel;

a filling head having a through-flow bore formed therein through which the liquid flow is passed when a sample is taken, said through-flow bore being configured so as to have a constricted segment;

first and second passages formed in said filling head so as to be mutually adjacent and having respective first ends opening into said through-flow bore forward of and rearward of said constricted segment, respectively;

said filling head having a docking extension formed thereon and said first and second passages being formed in said filling head so as to pass through said docking extension and having respective second ends formed and defining opening in said docking extension;

annular seat means formed on said docking extension;

said connecting portion of said vessel being configured so as to cause said filling opening to have a diameter to permit said connecting portion to be docked directly on said docking extension so as to be in direct contact engagement with said seat means; and,

said connecting portion and said seat means being formed so as to conjointly define a seal-tight contact interface when said vessel is docked on said filling head for receiving the sample.

4,991,451

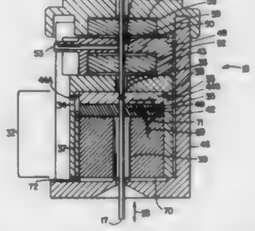
PROBE WIPING

Guy F. Rodomista, Natick, and Michael J. Monahan, Needham, both of Mass., assignors to Nova Biomedical Corporation, Waltham, Mass.

Filed Jun. 22, 1989, Ser. No. 370,405

Int. Cl.[5] B01L *3/02*

U.S. Cl. 73—864.24 18 Claims



1. Apparatus for removing fluid residue from an outer surface of a probe after said probe has been exposed to a fluid sample, comprising

a wiper comprising wicking material having a contact surface for wiping the residue from the outer surface of the probe, a fluid flow path cooperating with the contact surface for withdrawing wiped residue away from the contact surface and the probe, and an evaporation surface, along said flow path, exposed to air at the outer periphery thereof for evaporating fluid residue passing thereto,

a reservoir, separate from the wiper, comprising a tube of wicking material having one peripheral surface in contact with the wiper for receiving fluid residue from the wiper, for temporarily storing fluid residue, and for allowing passage of fluid residue between the reservoir and the wiper, said reservoir having a tubular central aperture, said wiper being positioned at one end of said tubular aperture with the contact surface of the wiper coaxial therewith and the other end of said tubular aperture being open, said tubular aperture having a larger lateral dimension than the diameter of said outer surface of said probe, such that said reservoir is not in direct contact with said outer surface of said probe, and

a mechanism for causing the contact surface to be swept along the outer surface of the probe.

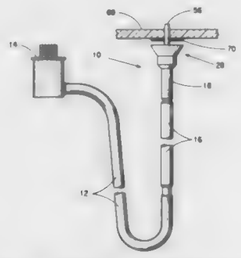
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,452

SAMPLER FOR HAZARDOUS SOLID MATERIALS

Ralph H. Dillard; Arthur H. Reppert, Jr., and Isaac B. Wilson, Jr., all of Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 14, 1990, Ser. No. 479,876
Int. Cl.[5] G01N *1/08*
U.S. Cl. 73—864.44 7 Claims



1. Apparatus for sampling potentially hazardous solid materials comprising:

a handle having an interior bore, said handle having connection means for connecting said interior bore to a source of vacuum; and

sampler means mounted on said handle for sampling said material, said sampler means comprising:

a collector having a funnel-shaped wall which diverges away from said handle from a minor opening to a major opening,

a separator plate having an exterior surface oriented in the direction of divergence of said funnel-shaped wall and with an interior surface in communication with said interior bore of said handle;

a cutter holder mounted in said separator plate and extending into said collector, said cutter holder being generally centered with respect to said minor opening of said collector and said funnel-shaped wall;

an elongate, removable cutter sleeve and means for attaching an attachment end of said cutter sleeve to said cutter holder, said cutter sleeve having a cutting end sharpened to cut and receive a sample into the interior of said cutter sleeve when attached to said cutter holder, said cutter sleeve having a wall thickness not greater than about 0.1 inch;

said minor opening of said collector and said cutter holder each being dimensioned such that an annular area of said exterior surface of said separator plate about said cutter holder is exposed to the interior of said collector and has a minimum dimension between said cutter holder and said funnel-shaped wall sufficient to permit access for easy cleaning; and

at least one aperture in said exposed annular area of said separator plate to communicate vacuum supplied to said bore in said handle to said collector.

4,991,453

CENTRIPEDAL DEVICE FOR CONCENTRATING CENTRIFUGAL FORCE

Lyle M. Mason, USS Portsmouth SSN 707, FPO San Francisco, Calif. 96673

Filed Oct. 5, 1989, Ser. No. 417,634
Int. Cl.[5] F16H *33/20, 21/50*
U.S. Cl. 74—84 R 10 Claims

1. A centrifugal force apparatus comprising:

a frame;

a vertical shaft rotatably mounted on said frame;

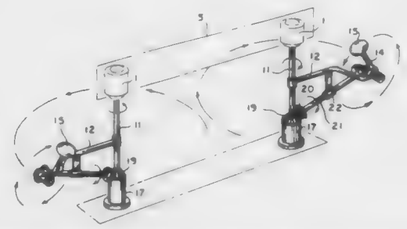
a bearing having an axis of rotation;

an arm having an inner end fixed to said shaft, and an outer end distant from said shaft fixed to said bearing;

said axis of rotation of said bearing horizontal, and said axis of rotation normal to a vertical plane defined by said shaft and said arm;

an armlet having a first end and a second end, said first end rotatably engaging said bearing to allow said armlet to rotate in a vertical plane relative to said arm;

a mass attached to said second end of said armlet, and



powering means to cause rotation of said vertical shaft and of said armlet relative to said arm, whereby

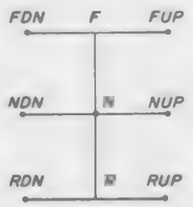
said mass moves in cycles and epicycles and exerts forces on said frame in the vertical direction and in the horizontal direction.

4,991,454

POWER SHIFT TRANSMISSION SHIFT PATTERN

Garth H. Bulgrien, Ephrata, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 444,312, Dec. 1, 1989, abandoned. This application May 21, 1990, Ser. No. 526,157
Int. Cl.[5] B60K *20/10*
U.S. Cl. 74—335 17 Claims



1. A control mechanism operably connected to a power shift transmission to control the operation thereof, said power shift transmission being operably connected to a vehicle to control the direction and speed of operation of said vehicle and including an electronic controller operably associated therewith to effect gear changes in said power shift transmission, said control mechanism being operably coupled with said electronic controller to signal gear changes desired by the operator, comprising:

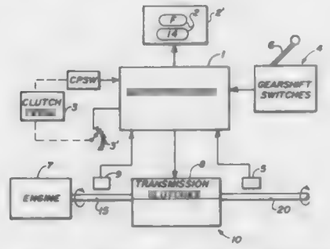
a lever movable between a forward position, a neutral position, and a reverse position, each said position corresponding to a desired direction of movement of said vehicle, said lever being movable between an upshift sub-position, a noshift sub-position, and a downshift sub-position at each of said forward, neutral, and reverse positions, each said sub-position corresponding to a desired gear change direction for said transmission.

4,991,455

HIGH SPEED DECELERATION OF A POWER SHIFT TRANSMISSION

Garth H. Bulgrien, Ephrata, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 444,312, Dec. 1, 1989. This application May 10, 1990, Ser. No. 521,799
Int. Cl.[5] F16H *5/42*
U.S. Cl. 74—336 R 8 Claims



1. A method of controlling vehicle deceleration during shuttle shifting of a power shift transmission having clutches for selectively interconnecting an input drive shaft, an output drive shaft, and a plurality of gears rotatably housed in said transmission in driving relationship with said input and output drive shafts such that a selective engagement of said clutches will effect a varying of the speed of operation of said output shaft for a given speed of operation of said input shaft, said gears being arranged in preselected gear ratios from a low speed to a high speed, said power shift transmission further having an electrical control system responsive to switches actuated by manual movement of a gearshift lever between a plurality of positions for controlling clutches in the transmission, the method comprising:

generating signals representing the present gear ratio corresponding to the current speed of travel of said vehicle and of the desired gear ratio corresponding to the desired speed of travel of said vehicle indicated by manipulation of said gearshift lever, the change of vehicle speed to said desired speed of travel requiring a deceleration of said vehicle from said current speed of travel; and

entering a high speed deceleration routine stored in a microprocessor in said electrical control system, said high speed deceleration routine comprising the steps of:

sensing the rate of rotation of said output shaft;

comparing the sensed rate of rotation of said output shaft to a lookup table having stored therein rate of rotation limits corresponding to selected gear ratios of said transmission;

downshifting said transmission to the next lowest gear ratio when the sensed rate of rotation of said output shaft falls below the stored limit corresponding to the present gear ratio; and

repeating said sensing, comparing and downshifting steps until the sensed rate of rotation of said output shaft reaches a predetermined value.

4,991,456

INDUSTRIAL ROBOT

Kunio Shibata; Shinji Naruoka, and Osamu Toyama, all of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 18, 1990, Ser. No. 524,857
Claims priority, application Japan, May 19, 1989, 1-127708
Int. Cl.[5] B25J *18/00*
U.S. Cl. 74—479 4 Claims

1. An industrial robot comprising a shoulder portion, a first arm and a first link supported on said shoulder portion for swing movements about a common axis, a second arm pivoted at the end of said first arm for swing movement about a swing axis parallel to the common axis and being provided with a wrist portion at the front end thereof, a second link connected between said first link and said second arm so as to form a parallel link mechanism together with said first arm, said second arm and said first link, and first and second motors for swinging said first arm and said first link, respectively, wherein

said second arm is provided with a first connecting portion and a second connecting portion which are formed at the rear side and the front side of said second arm, respectively, with respect to the swing axis of said second arm, said first and second connecting portions being selectively connectable with said second link with a connecting mechanism; and

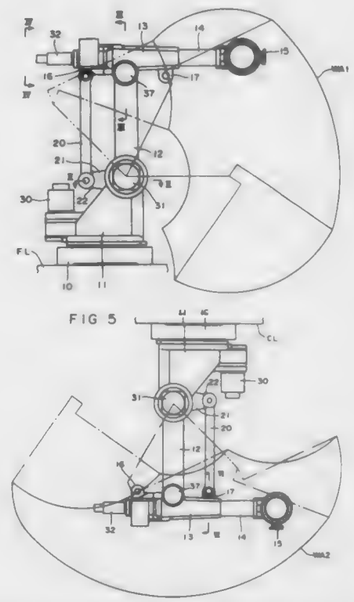


FIG 5

said first arm is provided with a supporting mechanism for supporting said second arm under a first condition that said first connecting portion is located in the back of said first arm in which said second link is located and said second link is connected with said first connecting portion using said connecting mechanism, and a second condition that said second connecting portion is located in the back of said first arm in which said second link is located and said second link is connected with said second connecting portion using said connecting mechanism.

4,991,457

SHIFT BOOT SUPPORT AND BEZEL ARRANGEMENT

Benjamin S. Chen, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 14, 1990, Ser. No. 522,755
Int. Cl.[5] G05G *9/00*; F16J *15/52*
U.S. Cl. 74—473 R 4 Claims

1. In an outer boot cover and bezel frame assembly for a floor mounted manually operated vehicle transmission pivotal gear shift lever extending upwardly from an opening in a generally horizontal floor portion, wherein an improved attaching arrangement for said assembly comprising:

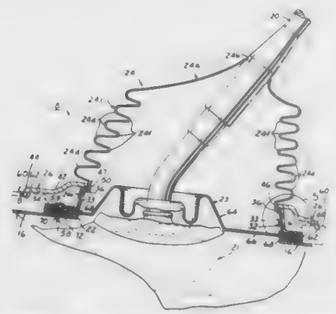
a one-piece outer boot cover molded of elastomeric material having an upper flexible conical-shaped sheath portion tapering upwardly to a circular shift lever circular passage, an intermediate generally frusto-conical shaped flexible bellows portion formed with a plurality of convo-

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lutions having a generally rectangular shape in horizontal plan, each said bellows portion convolution having a generally rectangular outline in horizontal plan, and a lower composite laminated rigid base portion defined by a substrate core of sheet metal;

said composite rigid base portion in the shape of an upstanding collar interconnecting a lower outwardly projecting foot flange adapted to be secured to said floor portion and an upper inwardly projecting rigid stop flange, said stop flange having interior opposed longitudinal and transverse edges defining a rectangular shaped opening having a predetermined length and width;

said bellows portion having a series of flexible convolutions defined by alternating outer crests and inner troughs with the lower most crest terminating in a locking groove having a trough defined by planar upstanding flexible bight wall, said bight wall extending upwardly from said composite stop flange to its adjacent lower most convolute defining a predetermined groove height substantially equal to but slightly greater than the thickness of said bezel frame, with said bight wall having a rectangular exterior periphery determined by said rigid base portion stop flange rectangular shaped opening;



said bezel frame having a rectangular shape in plan and formed with a central rectangular shaped aperture having a predetermined length and width substantially equal to but slightly greater than the length and width, respectively, of said base portion central rectangular opening, whereby with said bezel frame central opening receiving said shift lever and boot cover therethrough such that said lowermost of bellows convolution outer crest portion being resiliently deformed inwardly enabling said bezel frame to be moved downwardly until said bezel frame being seated on said base portion stop flange with its rectangular opening releasably engaging said locking groove.

4,991,458

ANTI-THEFT STEERING SHAFT LOCK

Richard T. Stuedemann, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1990, Ser. No. 473,758

Int. Cl.[5] B62D *1/16*; B60R *25/02*

U.S. Cl. 74—492 **3 Claims**

1. In a steering column having a housing and a steering shaft supported on said housing for rotation about a longitudinal centerline of said housing,

an anti-theft steering shaft lock comprising:

means defining a cylindrical bore in said housing centered on said longitudinal centerline and surrounding said steering shaft,

means on said steering shaft defining a non-cylindrical cam section surrounded by said cylindrical bore,

a longitudinally split elastomeric clutch sleeve on said cam section of said steering shaft having a right cylindrical outside surface smaller than said cylindrical bore and a non-cylindrical inside surface corresponding to the shape of said non-cylindrical cam section of said steering shaft and a longitudinal slot extending the full length of said clutch sleeve,

said cam section radially expanding said clutch sleeve when said steering shaft rotates relative to said clutch sleeve, and

a lock bolt supported on said housing for transverse bodily movement relative to said longitudinal centerline between

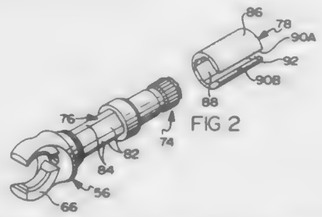


FIG 2

an extended position projecting into said longitudinal slot in said clutch sleeve to prevent rotation thereof with said steering shaft and a retracted position withdrawn from said longitudinal slot,

said cam section wedging said clutch sleeve against said cylindrical bore with said lock bolt in said extended position after predetermined relative rotation between said steering shaft and said clutch sleeve thereby to impede rotation of said steering shaft relative to said housing.

4,991,459

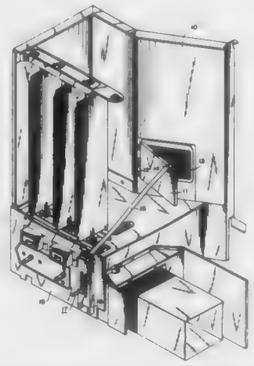
LINEAR MOTION CONTROL ARRANGEMENT

Richard F. Stewart, Middlesex, N.J., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 279,654, Dec. 5, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 529,111

Int. Cl.[5] F16C *1/10*

U.S. Cl. 74—500.5 **6 Claims**



1. A control arrangement for translating movement, comprising a strip of resilient material having a bowed transverse cross section, whereby said strip extends substantially linearly in the absence of external forces thereon;

a driving element mounted for substantially linear movement in a first direction, said driving element being a manually movable actuator affixed to said strip at a first point of said strip for moving said strip longitudinally in said direction at said point;

a driven element mechanically coupled to said strip at a second point thereof to be mechanically moved by said strip, said driven element being a pivotally mounted door; and

means for bending said strip in at least a first region between said driving element and driven element to extend in substantially different directions at the ends of said region, said strip being substantially unsupported in a second region thereof between said driving element and said driven element.

4,991,460

SHIFT LEVER DEVICE FOR AUTOMATIC TRANSMISSION

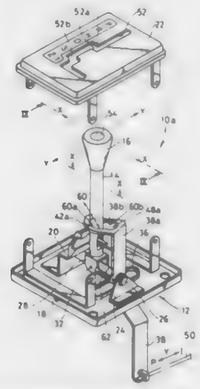
Katsunori Shirahama, Zama; Toshiyuki Hara, Kanagawa; Junichi Maekawa, Kanagawa; Hiroshi Yamazaki, Kanagawa, and Tsutomu Aihara, Kanagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Ohi Seisakusho Co., Ltd., Kanagawa, both of, Japan

Filed Oct. 28, 1988, Ser. No. 263,766

Claims priority, application Japan, Oct. 30, 1987, 62-166344

Int. Cl.[5] G05G *1/04*; B60K *20/00*

U.S. Cl. 74—523 **5 Claims**



1. A shift lever device for controlling an automatic transmission for an automatic vehicle, comprising:

(a) a shift lever pivoted in a first direction and a second direction perpendicular to said first direction, for controlling the automatic transmission;

(b) a guide plate formed with a shift lever guide slot extending in both first and second directions, for guiding said shift lever at a plurality of transmission range positions;

(c) a pivotal motion transmitting mechanism linked with said shift lever, for directly transmitting only a first-direction pivotal motion of said shift lever to a first-direction pivotal motion of an output lever;

(d) a pivotal motion converting mechanism linked with said shift lever, for converting only a second-direction pivotal motion of said shift lever into said first-direction pivotal motion of said output lever, wherein

said output lever is linked between said pivotal motion transmitting and converting mechanisms and the automatic transmission, for transmitting the transmitted and converted first direction pivotal motion to the automatic transmission to control the transmission.

4,991,461

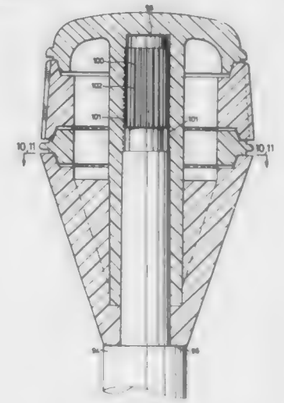
GEAR KNOB

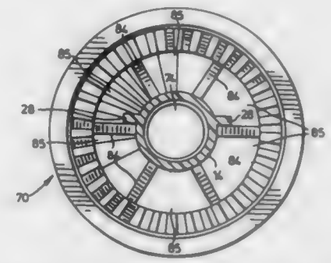
Michael T. Sennett, and Leonard Neal, both of Windsor, Canada, assignors to Tamco Limited, Windsor, Canada

Continuation of Ser. No. 135,835, Dec. 21, 1987, abandoned. This application Sep. 28, 1989, Ser. No. 414,610

Int. Cl.[5] G05G *1/10*

U.S. Cl. 74—553 **27 Claims**





1. A knob for a lever having a lateral shoulder comprising:

a cap assembly having a cap with a stem integral with the cap and depending centrally from one end thereof and ring gear means having a multiplicity of gear teeth about the stem, the stem having an axial bore extending inwardly from its distal end, and two splines extending longitudinally on its outer surface on opposite faces thereof, the splines not being aligned symmetrically about the stem but offset slightly to one side; a base formed separately from the cap and having an axial bore through it and a ring gear having a multiplicity of gear teeth about one end of the bore, a portion of the axial bore in the base receiving a portion of the stem of the cap therein and having a multiplicity of inwardly projecting ribs between which the splines on the stem of the cap fit at substantially all rotational positions of the splines relative to the base, with one spline engageable on only one face of one rib to prevent substantially all rotation of the stem relative to the base in one rotational direction and the other spline engageable only with the opposite face of a second rib to prevent substantially all rotation of the stem relative to the base in the opposite rotational direction and the gear teeth about the stem of the cap meshing with the gear teeth about the bore of the base preventing the cap from rotating with respect to the base; and

the knob mountable on the lever with the lever passing through the bore of the base and engaging a portion of the bore of the stem in an interference fit, and the cap holding the base between it and the lateral shoulder of the lever.

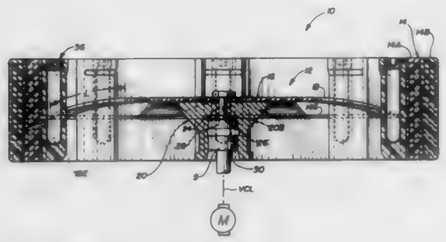
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,462

FLEXIBLE COMPOSITE ULTRACENTRIFUGE ROTOR

Francis N. Breslich, Jr., and John H. Laakso, both of Seattle, Wash., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 6, 1985, Ser. No. 805,709
Int. Cl.[5] G05G *1/00*; F16F *15/22*
U.S. Cl. 74—572 15 Claims



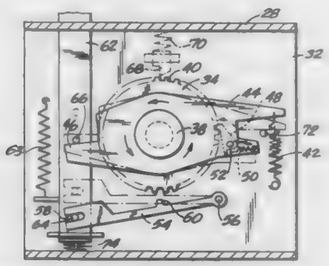
1. A centrifuge rotor comprising:
an annular rim having a circumferential groove disposed on the radially inner surface thereof, the rim having a first predetermined stiffness associated therewith;
a hub formed of a plurality of laminae, the hub having a central body portion and an array of radially outwardly extending curved spokes, the radially outer ends of each of the spokes being received in driving relationship within the groove disposed on the inner peripheral surface of the rim, the hub having a second predetermined stiffness associated therewith;
an array of sample carriers mounted to the rim at circumferential locations thereon defined between adjacent pairs of spokes; and
the rotor being rotatable to a predetermined rotational speed whereby centrifugal force acts on the hub and the rim to cause them to grow radially outwardly due to the disparity in stiffness and to the flattening of the curved portion of the spokes, the growth of the hub being at least equal to that of the rim.

4,991,463

DEVICE FOR INDEXING

Yasuyuki Kawata, Kyoto, Japan, assignor to Kawata Chuck Manufacturing Co., Ltd., Kyoto, Japan

Division of Ser. No. 57,340, Jun. 2, 1987, Pat. No. 4,884,474.
This application Jul. 25, 1989, Ser. No. 385,280
Claims priority, application Japan, Aug. 2, 1986, 61-182338
Int. Cl.[5] B23B *29/24*
U.S. Cl. 74—817 6 Claims



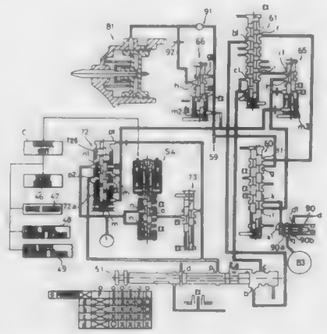
1. An NC machine tool comprising:
a spindle having a tool at its one end;
a drive motor for driving said spindle for rotation;
an index device including a housing and a index table on which a work is held, said table being supported for rotation on said housing, said housing accomodating means for actuating said table when indexing said work;
a push bar movable in its longitudinal direction in said housing of said index device, said push bar extending into said housing and outwardly of said housing so that said push bar can be pushed and moved longitudinally by utilizing an extra relative movement between said spindle and said index device other than a working relative movement between them for machining said work in accordance with the programming in NC device; and
said means for actuating said table comprising means for operatively connecting said push bar to said table so that said table is rotated for a predetermined angle in response to the longitudinal movement of said push bar to index said work.

4,991,464

ENGINE BRAKE CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION

Kazunori Ishikawa; Kazumasa Tsukamoto, both of Toyota; Takuji Taniguchi, Wakamatsu; Yuji Kashihara, Toyota; Kunihiro Iwatsuki, Toyota, and Hiroji Taniguchi, Toyota, all of Japan, assignors to Aisin Aw Co., Ltd. and Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 21, 1989, Ser. No. 313,234
Claims priority, application Japan, Feb. 20, 1988, 63-37882; Mar. 23, 1988, 63-70157
Int. Cl.[5] B60K *41/18*
U.S. Cl. 74—866 10 Claims



1. In an automatic transmission of a vehicle having a transmission mechanism including a plurality of gear elements, a brake operative to engage and restrain one of said elements to effect an engine-brake, a hydraulic servo associated with said brake for controlling said brake to engage and release said one of said elements, and a shift valve operatively hydraulically connected to said servo for allowing hydraulic fluid to be supplied to or drained from said servo, an engine brake control device for controlling the force at which the brake is controlled by the hydraulic servo to engage said one of said elements and effect the engine brake, said device comprising:
a modulator value operatively hydraulically connected between said shift valve and said hydraulic servo for modulating the pressure of hydraulic fluid supplied to said servo from said shift valve;
a pressure control valve operatively hydraulically connected to said modulator valve for providing a selective control of the modulator valve that establishes the modulated pressure of the hydraulic fluid supplied to said servo from said shift valve;
first sensor means for sensing one running condition of the vehicle from the group including the speed of the vehicle, the application of a foot brake in the vehicle, and the state of rotation of wheels in the vehicle and for issuing signals indicative of said one running condition;

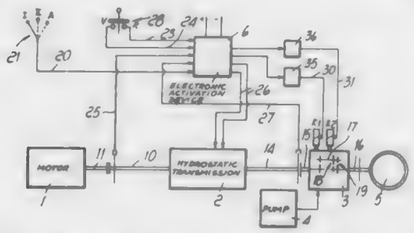
second sensor means for sensing another running condition of said group and for issuing signals indicative of said another running condition; and
an electronic control unit operatively connected to said pressure control valve and to said first and said second sensor means for receiving the signals issued by said first and said second sensor means, and for issuing signals based on the signals received to said pressure control valve which control said pressure control vale to provide the selective control of said modulator valve.

4,991,465

AUTOMATIC CONTROL DEVICE FOR THE GEARSHIFT OF INDUSTRIAL VEHICLES

Fritz C. A. Hurth, Montagnola, Switzerland, assignor to Hurth Axle S.p.A., Trento, Italy

Filed Apr. 25, 1989, Ser. No. 343,487
Claims priority, application Italy, Apr. 27, 1988, 20350 A/88
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 5 Claims



1. An automatic control device for gearshifts of industrial vehicles, comprising an actuation motor, a gearshift including at least a first and a second gears and having an input shaft, a transmission interposed between said actuator motor and said input shaft, first and second electromagnetic elements controlling alternate engagement of said first and said second gears, an electronic control device connected to said electromagnetic elements through respective connection lines and generating first and second engagement signals for selectively and respectively activating said first and second electromagnetic elements, and a delay element arranged externally with respect to said electronic control device, on one of said connection lines, between said electronic control device and said first electromagnetic element for delaying said first engagement signal generated by said electronic control device and fed to said first electromagnetic element.

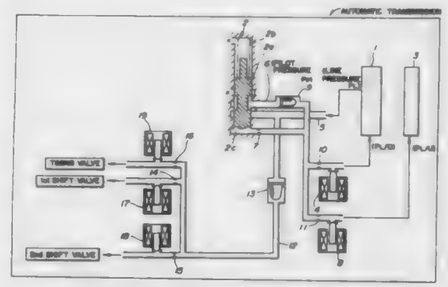
4,991,466

HYDRAULIC CIRCUIT FOR SUPPLYING BASE PRESSURE TO SOLENOID IN AN AUTOMATIC TRANSMISSION

Koichi Hayasaki, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 11, 1989, Ser. No. 378,091
Claims priority, application Japan, Jul. 11, 1988, 63-170791
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—867 7 Claims

1. A hydraulic circuit for an automatic transmission comprising:
means for generating a line pressure;
means communicating with said line pressure for generating a constant pressure;
first solenoid means of the two-state type communicating with said line pressure for generating a first solenoid pressure; and
second solenoid means of the duty controlled type communicating with said constant pressure for generating a second solenoid pressure, said line pressure generating means



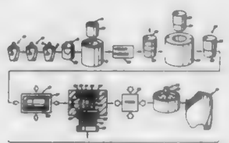
being connected to said second solenoid means and operable in response to said second solenoid pressure.

4,991,467

DIAMOND TWIST DRILL BLANK

Scott M. Packer, Provo, Utah, assignor to Smith International, Inc., Houston, Tex.

Filed Aug. 14, 1989, Ser. No. 393,162
Int. Cl.[5] B23P *15/32*
U.S. Cl. 76—108.6 11 Claims



1. A helically fluted diamond twist drill comprising:
a first drill blank forming a first cutting end and a second base end, said drill blank further forming at least a pair of flutes, said drill blank being formed from a relatively tough material,
a channel is formed within each of said flutes, said channels substantially parallel the helix of said flutes from an outside peripheral edge formed by said drill blank to a central axis of said blank, said channels further intersect one another at the apex of said first cutting end of said blank adjacent on axis of said blank, and
diamond matrix material is secured within said channels formed in said flutes by diamond sintering means, said diamond matrix material thereby forming a cutting edge continuously across the first cutting end of said blank where said flutes terminates at said cutting end.

4,991,468

BARREL TYPE SOCKETS

Clark J. Lee, 429-6 Chung Cheng Rd, Fu Liao Li, Tzao Tun Town, Nantou Hsien, Taiwan

Filed Aug. 10, 1990, Ser. No. 565,471
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—60 2 Claims

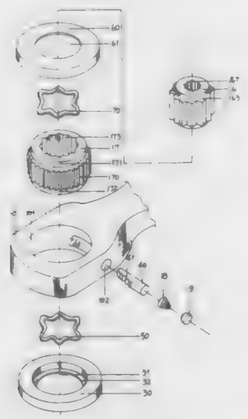
1. In a socket wrench for transmitting axial torque to a threaded fastener which comprises a ratchet wrench comprising a handle, a driver wheel rotatably mounted in one end of the handle along an axis perpendicular to the handle, and ratchet means for connecting the driver wheel to rotate with the handle around said axis in only one direction, and a socket detachably connected to the driver wheel, wherein the improvement comprises:
(a) the socket comprising a barrel of uniform polygonal trannsverse section having an axial polygonal wrenching

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aperture at the center and a slant inward chamfer at the outer surface of each end of said barrel;

(b) the driver wheel having an axial polygonal receiving hole which is adapted to intimately receive the socket; and

(c) a pair of ring detents, each of which have an inner diameter larger than the smallest diameter of the chamfer and



smaller than the outer diameter of the polygonal barrel of the socket, and are connected co-axially to the opposite ends of the receiving hole of the driver wheel respectively, to elastically grip the chamfer on both ends of the socket respectively as the socket is received in the receiving hole of the driver wheel.

4,991,469

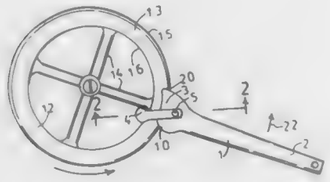
VALVE HANDWHEEL WRENCH

Paul D. Pella, 1206 Emerald Dr., Singer Island, Fla. 33404

Filed Jan. 16, 1990, Ser. No. 465,054

Int. Cl.[5] B25B *13/48*

U.S. Cl. 81—176.2 **14 Claims**



1. A valve wrench for turning the handwheel of a valve of the type having a wheel with a rim and radial spokes, said wrench comprising:

(A) an elongate handle member having a long axis lying in a first plane, said handle member having a free end, an intermediate portion and a wheel grasping end;

(B) a connecting member pivotally affixed to said intermediate portion by a pivot pin arranged substantially at right angles to said long axis;

(C) a fixed, arcuate rim grip extending from said wheel grasping end in said first plane, said rim grip having a radius of curvature which approximates the radius of curvature of said rim, said rim grip having an extended, arcuate rim-engaging face, said face having an arcuate groove therein for enhanced grasping of the outer perimeter of said rim;

(D) a movable jaw means for gripping an interior surface of said rim and for gripping a spoke of said wheel, said jaw means having a central portion interposed between a first side portion and a second side portion;

(E) said central portion arranged to appose said groove in said fixed rim grip for engaging an inside surface of said rim and a surface of said spoke;

(F) said first side portion having at least one lateral protuberance extending outwardly for engaging said rim and said spoke on a surface other than that engaged by said central portion for enhanced, slip-proof grasping; and

(G) said second side portion rigidly connected to said connecting member, whereby said pivot pin restricts said connecting member motion to pivoting in a second plane parallel to said first plane and displaced therefrom a distance great enough to enable said movable jaw means to move in a fixed arc whose center corresponds to the position of said pivot pin and to forcefully engage the inner surface of said rim and spoke of said wheel while said fixed grip forcefully engages the outer surface of said rim when said handle is moved through said first plane in a wheel-turning motion.

4,991,470

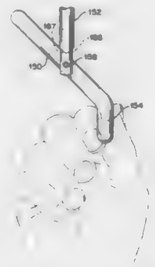
SOCKET WRENCH WITH IMPROVED HANDLE

Robert P. Singleton, Birmingham, Ala., assignor to Sidewinder Products Corporation, Birmingham, Ala.

Continuation of Ser. No. 74,572, Jul. 17, 1987, Pat. No. 4,907,476, Continuation-in-part of Ser. No. 771,625, Sep. 3, 1985, Pat. No. 4,680,944, Continuation-in-part of Ser. No. 746,673, Jun. 20, 1985, Pat. No. 4,620,459. This application Nov. 13, 1989, Ser. No. 434,302

Int. Cl.[5] B25G *1/00*

U.S. Cl. 81—177.7 **4 Claims**



1. A handle for use with a tool having an elongated shaft which rotates about the longitudinal axis of said shaft, comprising:

a transverse bar member having a main portion and being pivotally mounted at its center portion on said shaft along the longitudinal axis of said shaft adjacent one end of said shaft; at least one end portion of said bar member extending at an angle relative to the main portion of said bar member; stop means on said shaft for preventing said bar member from moving pivotally beyond a certain angle relative to the normal to said shaft, the angle of said at least one end portion of said bar member relative to an extension of said bar main portion being complementary to said certain angle, said at least one end portion thus being parallel to said shaft when said bar member engages said stop means, so that said at least one end portion will be parallel to said shaft in the operating mode.

4,991,471

THREE-POINT-CONTACTING PLIERS FOR BREAKING GLASS

Heinz Herrmann, Leipzigerstrasse 105, D-4154 Tönisvorst 1, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,610

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 8716749[U]

Int. Cl.[5] B25B *7/02*

U.S. Cl. 81—426 **2 Claims**



1. In a three-point-contacting pliers for breaking glass along a prescored line with two opposing movable jaws of which one of said jaws has a central projection and the other of said jaws is formed as an abutting member, the improvement wherein said other of said jaws formed as said abutting member has protruding therefrom a flexible circular elastic ring which surrounds said central projection and serves as main contact to said abutting member against said glass, said ring being held clamped in an associated receptacle portion of said other jaw, said other of said jaws being provided with a throughgoing hole substantially coaxial with said ring which acts as a viewing window.

4,991,472

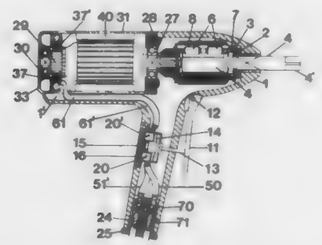
D.C. DIRECT DRIVE IMPACT WRENCH

Lyndol W. Hollingsworth, Wichita Falls, Tex., assignor to James Curtis Hilliard, Dallas, Tex., a part interest

Filed Nov. 4, 1988, Ser. No. 267,081

Int. Cl.[5] B25B *19/00*

U.S. Cl. 81—464 **10 Claims**



1. A direct drive impact wrench, comprising in combination:

a wrench housing;

a direct current motor and motor housing means carried by the wrench housing;

said motor comprising a splined shaft on one end thereof;

an anvil carried by the wrench housing adjacent an end of the wrench housing;

direct drive means carried by the wrench housing and connected between said splined shaft and said anvil;

means for connecting the motor to a source of electrical power for intermittently driving the anvil;

said direct drive means comprise;

an anvil sleeve receiving said splined shaft and carrying said anvil;

a tubular hammer disposed on the anvil sleeve;

said hammer having a pair of spaced apart grooves in the inner periphery thereof;

said anvil sleeve having a plurality of spaced apart slots through its periphery;

a plurality of pins respectively disposed between the slots and the grooves whereby momentum from the hammer is intermittently transferred to the anvil upon rotation being imparted to said sleeve;

said pins are dimensioned to fit approximately one third of their bodies into the slots and to be engaged and disengaged by the hammer grooves upon said motion being imparted to said sleeve;

the grooves in the hammer are diametrically opposed and the slots in the sleeve are axially spaced apart in groups which are diametrically opposed;

the anvil includes curved striking regions disposed to strike all pins;

said housing comprises a hollow handle;

a reversing switch and an On-Off switch disposed in said handle;

electrical connections extending from the motor to said switches for connection to an external power source;

said reversing switch comprises an upper part affixed to the housing and a lower part rotatably carried by the housing for selecting forward and reverse polarity for motor drive; and,

said lower part includes a semi-circular alignment slot and said housing comprises a means extending into the slot establishing alignment of the lower part during rotation.

4,991,473

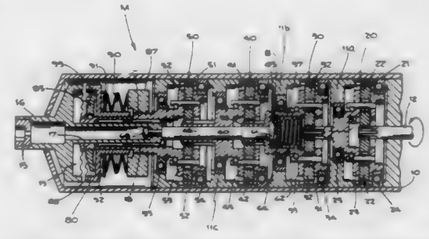
ROTATING DRIVER WITH AUTOMATIC SPEED SWITCHING AND TORQUE LIMITING CONTROLS

Alexander Gotman, Redondo Beach, Calif., assignor to Franklin S. Sax, Marina del Rey, Calif., Trustee for the Gotman Group Division of Ser. No. 64,182, Jun. 19, 1987, Pat. No. 4,869,139.

This application Jun. 21, 1989, Ser. No. 369,329

Int. Cl.[5] B25B *23/157, 21/00*

U.S. Cl. 81—475 **3 Claims**



1. A machine for driving a nut first at a relatively high speed, then at a much lower speed but with higher driving torque, and then finally stopping its rotation altogether when a predetermined level of reaction torque is encountered in the nut, said machine comprising:

a rotatably driven power input shaft;

first gearing coupled to said power input shaft, said first gearing including a first planetary gear reduction stage having a sun gear and satellite gears, and a hollow shaft connected to the centers of said satellite gears, said hollow shaft being externally toothed;

first clutch means coupled to said first gearing;

a drive head adapted to be drivingly coupled to the nut, said first clutch means initially coupling said first gearing to said drive head for rotating said drive head at the relatively high speed;

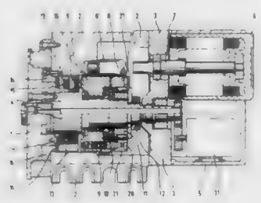
second gearing coupled to said first gearing;

an additional planetary gear reduction stage that forms a part of said second gearing, said hollow shaft providing the sun gear of said additional planetary gear reduction stage;

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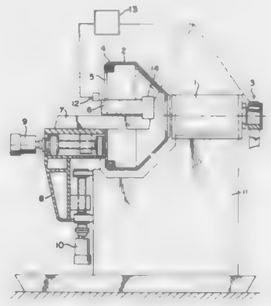
a high-speed shaft extending concentrically through said hollow shaft;
a low-speed rotating drive means coupled to said second gearing for rotating said drive head at a low speed;
selectively operable means for decoupling said first clutch means and for coupling said low-speed rotating drive means to said drive head;
said first clutch means coupling said hollow shaft to said high-speed shaft; and
second clutch means responsive to the predeteremined level of reaction torque for terminating the low-speed driven rotation of said drive head.

4,991,474
TOOL TURRET WITH FLEXIBLE CLUTCH
Helmut Thumm, Metzingen; Walter Reusch, Dettingen/Erms; Gunther Schips, Metzingen, and Willy Sauter, Reutlingen, all of Fed. Rep. of Germany, assignors to Sauter Feinmechanik GmbH, Fed. Rep. of Germany
Filed May 26, 1989, Ser. No. 358,004
Claims priority, application Fed. Rep. of Germany, May 26, 1989, 38178737
Int. Cl.[5] B23B *29/32*
U.S. Cl. 82—159 21 Claims



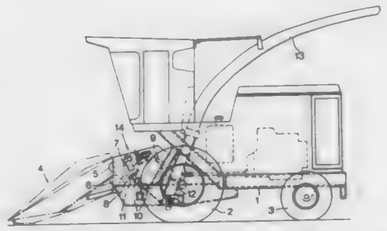
1. A tool turret comprising:
a housing;
a turret head coupled to said housing for rotation relative to said housing about a rotary axis, said turret head being fixedly connected to a drive shaft;
motor means for rotating said turret head relative to said housing;
first and second annular gears mounted coaxially relative to said rotary axis, said first gear being nonrotatably coupled to said turret head, said second gear being nonrotatably coupled to said housing;
a locking mechanism part axially slidable in said housing relative to said turret head between locking and unlocking positions, said locking mechanism part having a third annular gear aligned with said first and second gears and engaging said first and second gears in said locked position;
a power driven control member mounted concentric to said rotary axis;
powered indexing means for locking said turret head against rotation relative to said housing after each rotary adjusting movement of said turret head to a desired angular setting, but prior to locking thereof by said locking mechanism part;
a flexible clutch coupling said control member to said drive shaft and being flexible in directions of rotation;
drive means coupling said locking mechanism part and said turret head for simultaneous rotary movement.

4,991,475
METHOD AND APPARATUS FOR SAWING BAR-SHAPED WORKPIECES INTO SLICES
Hanifi Malcok, Burghausen, and Hermann Zwirglmaier, Teising, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany
Filed Feb. 13, 1990, Ser. No. 479,480
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1989, 3906091
Int. Cl.[5] B23Q *17/09, 15/12;* B24D *5/12;* B28D *1/04*
U.S. Cl. 83—13 13 Claims



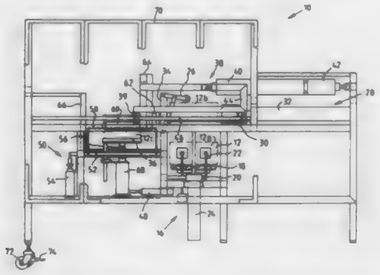
1. A method for sawing a bar-shaped workpiece into slices, which comprises:
guiding an annular saw radially through the workpiece comprising a rotatable saw blade having a peripheral surface and an inner cutting edge set with cutting grains, and a blade clamping means for operatively clamping the saw blade on said peripheral surface said workpiece held in a sawing position by a workpiece holding device, while with a longitudinal axis of said workpiece being substantially parallel to a rotary axis of said blade clamping means, and detecting an actual position of the saw blade during the cutting operation;
determining a deviation of the actual position of the saw blade from a nominal position of the saw blade; and
compensating for the deviation by a translatory axial relative movement between the workpiece and the blade clamping means.

4,991,476
AUTOMATIC KNIFE SHARPENING METHOD FOR FORAGE HARVESTERS
Mark K. Chow, Paoli, and John R. McClure, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Feb. 8, 1990, Ser. No. 486,213
Int. Cl.[5] B24B *19/00;* B26D *1/00*
U.S. Cl. 83—13 10 Claims



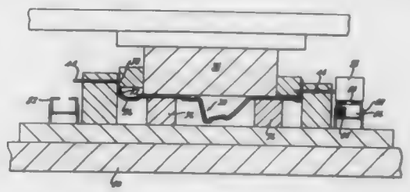
1. A method of controlling knife sharpening in a forage harvester having a rotatable cutterhead carrying knives, a sharpening stone driven by a sharpener drive motor for sharpening the knives, and a control circuit for energizing said drive motor for a fixed interval of time to drive said sharpening stone adjacent said knives to sharpen them, said method comprising:
sensing the rate of rotation of said cutterhead; and,
inhibiting the energization of said drive motor by the control circuit when the rate of rotation of said cutterhead is less than the rate of rotation necessary for proper sharpening of said knives during said fixed interval of time.

4,991,477
CUTTING OF BLOCKS
Michael J. Butt, Poole; Nigel L. Hicks, South Petherton, and Nicholas P. Lambert, Dorchester, all of England, assignors to Wright Pugson Limited, England
Filed Nov. 29, 1989, Ser. No. 442,631
Claims priority, application United Kingdom, Dec. 6, 1988, 8828441-9
Int. Cl.[5] B26D *1/553, 7/06*
U.S. Cl. 83—35 15 Claims



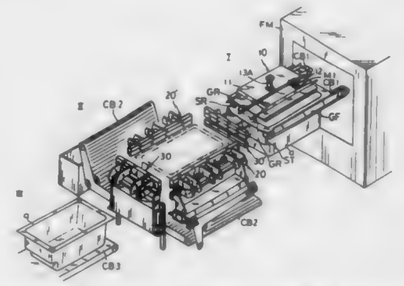
12. A method of cutting a block of material having at least first and second surfaces disposed opposite each other and being of a predetermined size using apparatus comprising, at a first cutting station, a first pusher having a head and a first cutting frame in alignment with said head and including first cutting members for cutting said block and, at a second station, a second pusher having a head and a second cutting frame in alignment with said head of said second pusher and including second cutting members for cutting said block, said method comprising:
locating said block of material between said head of said first pusher and said first cutting frame with said first surface of said block facing said first cutting frame and said second surface of said block facing said head of said first pusher, said first cutting frame defining an opening through which said block is pushed in a first direction of movement for cutting by said first cutting members;
actuating said first pusher to cause said block to be pushed through said opening of said first cutting frame to provide cutting of said block by said first cutting members, with said head being on said second surface of said block;
rotating said block by 90° after the block has been pushed through said opening of said first cutting frame;
locating at least part of said block of material, after said rotation, between said head of said second pusher and said second cutting frame, said head of said second pusher being movable between a withdrawn position and an active position between said first and second cutting frames and said second cutting frame defining a further opening through which said at least part of said block is pushed in a second direction of movement for cutting of said block by said second cutting members;
actuating said second pusher with said head in said active position to cause said at least part of said block to be pushed through said further opening to provide cutting of said at least a part of said block by said second cutting members, said first direction of movement of said block through said first cutting frame and said second direction of movement of said at least a part of said block through said second cutting frame being the same.

4,991,478
TRIMMING APPARATUS AND METHOD
Wayne F. Riley, Warren, Mich., assignor to Reflex Trim, Inc., Sterling Heights, Mich.
Continuation of Ser. No. 166,198, Mar. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 916,213, Oct. 7, 1986, Pat. No. 4,785,695. This application Jul. 26, 1989, Ser. No. 386,143
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.[5] B26D *1/09, 5/16*
U.S. Cl. 83—49 32 Claims



1. A method of trimming excess covering material from a workpiece along a contour comprising:
positioning said workpiece adjacent a blade assembly comprising a plurality of blade segments arranged side by side and along a line defined by said contour;
sequentially pressing a plurality of adjacent blade segments into contact with said workpiece and pressing at least one of said plurality of adjacent blade segments into cutting contact with said workpiece to sever said excess covering material from said workpiece;
sequentially lifting said blade segments out of cutting contact with said workpiece following said sequentially pressing step; and
separating said workpiece from said excess.

4,991,479
APPARATUS FOR TRIMMING ARTICLES MOLDINGLY FORMED ON THERMOPLASTIC SHEET AND PROCESS FOR OPERATING THEREOF
Kazuo Asano; Toshihiro Takai, and Masayasu Kinoshita, all of Nagoya, Japan, assignors to Kabushiki Kaisha Asano Kenkyusho, Nagoya, Japan
Filed Dec. 27, 1988, Ser. No. 290,340
Claims priority, application Japan, Jan. 21, 1988, 63-11576
Int. Cl.[5] B26D *3/00, 11/00*
U.S. Cl. 83—152 7 Claims



1. Apparatus for trimming articles moldingly formed on a plastic sheet, which comprises,

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a carriage having means for suckingly holding the molded article thereunder and means for reciprocally longitudinally moving the carriage through the apparatus,

a first zone having conveyor means for receiving said article from a forming machine to be brought under said carriage for suckingly holding,

a second zone downstream of said first zone having a pair of first cutter assemblies each comprising a longitudinal cutter device mounted on a base member; a pair of second cutter assemblies each comprising a transverse cutter device mounted on another base member; means for actuating said pair of first cutter assemblies to transversely move between an inner position for trimming and a normal outer retreated position; means for actuating said pair of second cutter assemblies to vertically move between an upper position for trimming and a normal lower retreated position, so that when said first and second cutter assemblies are in the respective retreated positions the molded article is brought by said carriage in said second zone, and then said molded article is sequentially trimmed by said longitudinal and transverse cutter devices which are moved into respective trimming positions by a respective actuating means; means for tilting said longitudinal and transverse cutter devices respectively by an angle of about 90° relative to the respective base members so as to release respectively trimmed longitudinal plastic sheet portions to fall down; and conveyor means transversely extended thereunder to remove the trimmed sheet portions thereon out of the apparatus,

and a third zone downstream of said second zone to remove the trimmed molded article which is brought thereto by and released to fall from the carriage out of the apparatus.

4,991,480

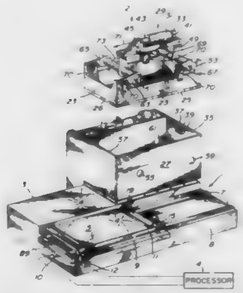
METAL SHEARING MACHINE

Rudy Fritsch, 7395 David Laurent, Riviere des Prairie, Quebec, Canada

Division of Ser. No. 168,143, Mar. 14, 1988, Pat. No. 4,811,640. This application Aug. 15, 1988, Ser. No. 232,300

Int. Cl.[5] B26D *1/09, 5/12*

U.S. Cl. 83—620 **6 Claims**



1. A metal shearing machine for cutting a workpiece simultaneously along two intersecting lines, comprising:

shearing means comprising two shearing blades disposed along two lines which intersect each other;

ram means for carrying said shearing means;

means for supporting and activating said ram means to thereby move said ram means and said shearing means upwardly and downwardly, said means for supporting and activating supporting said ram means at four points thereof;

said ram means comprising a four-walled structure;

adjacent ones of said walls being at an angle to each other and being joined to each other at the ends thereof;

said shearing blades underlying two adjacent walls of said ram means;

said four points being on two opposing walls of said rams means adjacent the ends thereof.

4,991,481

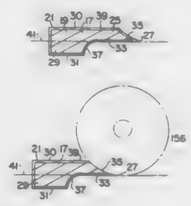
BLADE FOR CUTTING SHEET MATERIAL AND RELATED CUTTING METHOD

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Jun. 23, 1989, Ser. No. 370,649

Int. Cl.[5] D06H *7/00*

U.S. Cl. 83—697 **6 Claims**



1. A blade for a sheet material cutting machine, said blade prior to use comprising:

an elongated piece of base material having a lower cutting part extending along a longitudinal axis, said cutting part including a forward cutting edge providing portion and a rear body portion,

said body portion having first and second generally flat side faces spaced from and parallel to one another, and

said cutting edge defining portion including first, second, third and fourth side surfaces, said first side surface being located in a middle reference plane parallel to and located substantially mid-way between said first and second side faces of said body portion, said fourth side surface being located in the same plane as said first side face of said body portion, said second side surface being inclined relative to said reference plane, extending between said fourth side surface and said first side surface and intersecting said first side surface to define a cutting edge extending parallel to said longitudinal axis, and said third side surface being inclined relative to said reference plane and extending from the rear of said first side surface to said second side face of said body portion, whereby as a result of repeated sharpening grindings of said second side surface said cutting edge gradually moves rearwardly towards said body portion while remaining on said middle reference plane.

4,991,482

APPARATUS AND METHOD FOR CUTTING RUBBER MATERIAL

Olivio D'Angelo, 315 Scarborough Beach Road, Innaloo, and Mario Bosnar, 9 Pitino Court, Osborne Park, both of Australia

PCT No. PCT/AU86/00292, § 371 Date Aug. 20, 1987, § 102(e) Date Aug. 20, 1987, PCT Pub. No. WO87/02293, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 7, 1986, Ser. No. 86,090

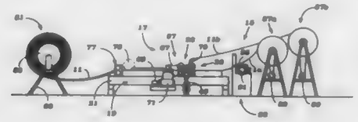
Claims priority, application Australia, Oct. 15, 1985, PH2915

Int. Cl.[5] B26D *3/28*

U.S. Cl. 83—874 **13 Claims**

1. A method for cutting a layer of rubber from a substrate length of rubber material reinforce by a rigid core, employing an apparatus comprising a cutting station having a table with an upper surface to receive said material and knife means to cut said material; conveying said substrate length of material along the surface of said table and through said knife means; pressing said substrate into engagement with said table adjacent and ahead of said knife means in the direction the length of material

is conveyed, said knife means having a knife edge disposed in a plane generally parallel to and in spaced relation with the upper surface of said table to confront said material for cutting; said knife edge being arranged to extend in a transverse direction to the conveyed direction of said material through said



knife means; the knife means being supported for reciprocation in said transverse direction, and reciprocating said knife edge in said transverse direction within said plane upon the conveyance of material through said knife means to successively cut said layer from said material.

4,991,483

MOUTHPIECE FOR WIND INSTRUMENT, AND CORRESPONDING LIGATURE AND MOUTHPIECE COVER

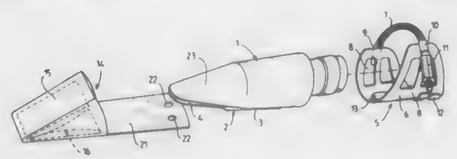
Roger Petit, 27, boulevard de l'Est, 93340 Le Raincy, France

Filed Dec. 22, 1989, Ser. No. 454,942

Claims priority, application France, Dec. 23, 1988, 88 17117

Int. Cl.[5] G10D *9/02*

U.S. Cl. 84—383 R **19 Claims**



1. A wind instrument mouthpiece, including at least one reed having a vibrating portion and a tail, said tail being joined by a ligature to a barrel having an interior and on the interior a bore having at one end thereof a chamber having an opening with said vibrating portion of said reed extending over at least a section thereof, said barrel having a lower face and exterior of selected size, said ligature including a cradle which presses the tail of the reed on the lower face of the barrel, said cradle having edges spaced a distance apart and connected by at least one member including a means of adjustment of the distance between said edges to adapt the ligature to the size of the barrel, characterized in that said one member is a flexible, tension-resistant rod, and the said barrel is clasped partly by said cradle and partly by said flexible rod.

4,991,484

TONE SIGNAL GENERATION DEVICE HAVING A SAMPLING FUNCTION

Susumu Kawashima, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 3, 1989, Ser. No. 292,751

Claims priority, application Japan, Jan. 6, 1988, 63-1083; Jan. 6, 1988, 63-1084

Int. Cl.[5] G10H *7/02, 1/18*

U.S. Cl. 84—603 **18 Claims**

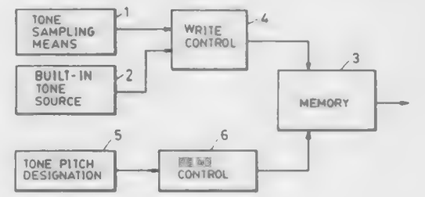
1. A tone signal generation device, comprising:

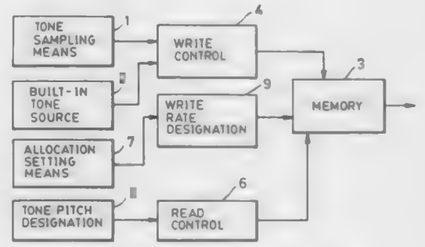
tone sampling means for sampling a tone waveform signal applied from outside;

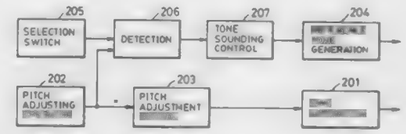
built-in tone source means responsive to tone pitch information for generating a tone waveform signal independent of said tone waveform signal applied from outside and having tone pitch corresponding to the tone pitch of the tone pitch information;

memory means capable of both writing and reading for storing waveform sampled data of said tone waveform signal generated by said tone sampling means and waveform sampled data of said tone waveform signal generated by said built-in tone source means;

write control means for selecting one of waveform sampled data of a tone waveform signal sampled by said tone sampling means and waveform sampled data of a tone waveform signal generated by said built-in tone source means and writing the selected waveform sampled data in said memory means;







tone pitch designation means for designating tone pitch of a tone to be generated; and

read control means for reading out the waveform sampled data from said memory means in accordance with the tone pitch designated by said tone pitch designation means;

wherein said tone signal generation device generates a tone signal corresponding to the waveform sampled data read out from said memory means.

4,991,485

SCALING OF EACH HARMONIC COEFFICIENT FOR ELECTRONIC MUSICAL INSTRUMENT

Kiyomi Takauji, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Continuation of Ser. No. 75,605, Jul. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 847,426, Apr. 2, 1986, Pat. No. 4,700,603. This application Dec. 28, 1988, Ser. No. 290,860

Claims priority, application Japan, Sep. 2, 1986, 61-206492

Int. Cl.[5] G10H *1/057, 1/08, 7/10*

U.S. Cl. 84—608 **4 Claims**

1. An electronic musical instrument which synthesizes a musical wave form by harmonics through use of W harmonic coefficients, wherein means for controlling each of said W harmonic coefficients comprises:

harmonic coefficient storage means for storing said W harmonic coefficients which constitute the basis for the production of said musical wave form;

harmonic order generating means for generating a harmonic

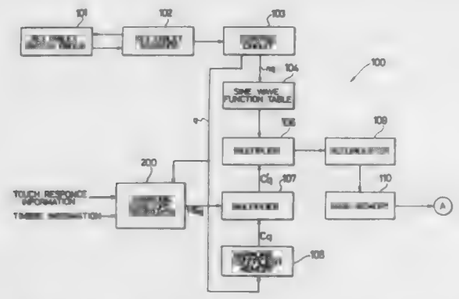
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order signal, said harmonic order signal for specifying each of said W harmonic coefficients;

grouping code storage means for dividing a number of said W harmonic coefficients into P groups (where P is smaller than W) of a number smaller than the number of harmonic coefficients, in accordance with timbre information, and for storing a grouping code for each harmonic order;

harmonic envelope generating means for generating P harmonic envelopes;

harmonic coefficient read out means responsive to said harmonic order signal for reading out the corresponding one of said harmonic coefficients from said harmonic coefficient storage means;



grouping code read out means responsive to said harmonic order signal for reading out said grouping code stored in said grouping code storage means for each harmonic order; and

selecting means responsive to said grouping code, for selecting from said harmonic envelope generating means one of said P harmonic envelopes which corresponds to said each harmonic order;

wherein each harmonic coefficient corresponding to each harmonic order signal, read out of said harmonic coefficient storage means, is controlled by said selected harmonic envelope corresponding to said each harmonic order signal.

4,991,486

ELECTRONIC MUSICAL INSTRUMENT HAVING A RHYTHM PERFORMANCE FUNCTION

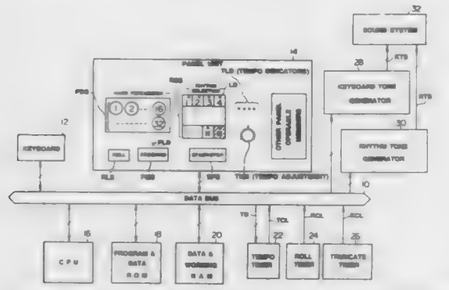
Mikio Ito; Masao Kondo, and Yasunao Abe, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 28, 1988, Ser. No. 291,275

Claims priority, application Japan, Dec. 30, 1987, 62-332648; Dec. 30, 1987, 62-332649; Dec. 30, 1987, 62-332650; Dec. 30, 1987, 62-332651

Int. Cl.[5] G10H *1/057, 1/42, 7/00*

U.S. Cl. 84—611 13 Claims



1. An electronic musical instrument having a rhythm performance function, comprising:

(a) tone source means having plural rhythm tone source channels, said tone source means storing plural rhythm tone color kinds, each of which can be designated by a player, said tone source means thereby generating a rhythm tone color kind from each rhythm tone source channel;

(b) generating means for generating rhythm tone color kind designating information by which at least one rhythm tone color kind to be performed is designated at each one of plural tone-generation timings; and

(c) assigning means for assigning said rhythm tone color kind designating information to one of said plural rhythm tone source channels so that a desired rhythm tone color kind is designated in an assigned rhythm tone source channel each time said generating means generates said rhythm tone color kind designating information.

4,991,487

AUTOMATIC MUSICAL ACCOMPANIMENT SOUND GENERATING APPARATUS

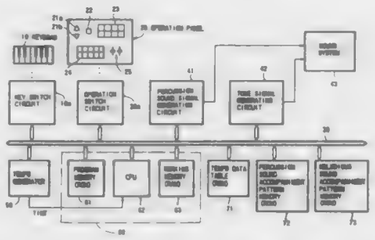
Yorihisa Yamaguchi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 27, 1989, Ser. No. 373,045

Claims priority, application Japan, Jun. 28, 1988, 63-160555

Int. Cl.[5] G10H *1/42*

U.S. Cl. 84—714 9 Claims



1. An automatic musical-accompaniment sound-generating apparatus for generating various accompaniment sounds, the apparatus comprising:

(a) memory means for storing data sets being composed of accompaniment sound data and control data, the accompaniment sound data composing the original accompaniment pattern, control data corresponding to information about whether to generate each of accompaniment sounds corresponding to the accompaniment sound data in relation with the current tempo at which the accompaniment sounds are produced;

(b) a tempo generator for generating tempo signals;

(c) accompaniment sound generating means for reading the data sets according to tempo signals, deciding whether to transmit the accompaniment sound data on the basis of the control data and the tempo;

(d) a sound system for emitting accompaniment sounds according to the accompaniment-sound data, whereby the current accompaniment patterns are varied from the original accompaniment patterns and the variation depends on both the current tempo and the original pattern.

4,991,488

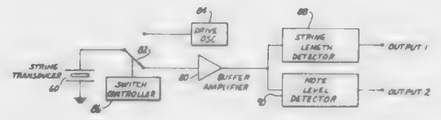
ACOUSTIC DETECTION OF NOTE BENDING IN STRINGED M.I.D.I. COMPATIBLE MUSICAL INSTRUMENTS

Joseph M. Fala, 3885 Canfield Rd., Pasadena, Calif. 91006; Ajay K. Keshap, 14339 Tiara #7, Van Nuys, Calif. 91401; Mark S. Doerning, 947 Balboa Dr., and Jay T. Barbeau, 5200 Gary-Park Ave., both of Arcadia, Calif. 91006

Continuation of Ser. No. 231,271, Aug. 12, 1988, abandoned, which is a division of Ser. No. 1,646, Jan. 9, 1987. This application Feb. 2, 1990, Ser. No. 474,656

Int. Cl.[5] G10H *3/18*

U.S. Cl. 84—731 15 Claims



12. A string bend pick-up system for a fretted string instrument comprising:

transmitter means for propagating a test signal of given frequency along each of a plurality of string;

detector means for detecting an echo signal returned along each said string by reflection of said test signal at a point of the string held against a fret; and

circuit means for measuring a time interval between propagation of said test signal and detection of said echo signal, comparing said time interval against a stored table of reference values to identify the fret at which said reflection occurred and for deriving an output related to the difference between said time interval and a reference value associated with the identified fret indicative of the degree of string bending by a player.

4,991,489

LOADING DEVICE

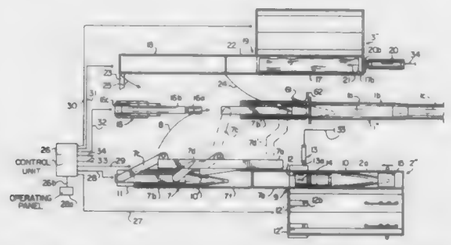
Sven Lindberg, Degerfors, Sweden, assignor to Aktiebolaget Bofors, Karlskoga, Sweden

Filed Sep. 20, 1989, Ser. No. 409,662

Claims priority, application Sweden, Sep. 21, 1988, 8803335

Int. Cl.[5] F41A *9/38*

U.S. Cl. 89—6.5 16 Claims



1. A loading device for use in large caliber weapons for firing with rounds consisting of projectiles of different types and charges/cartridges of different sizes combinable with the projectiles in the weapon on loading, comprising:

a first magazine for storing projectiles;

a first transfer device for transferring each respective projectile from said first magazine to the axis of the bore of the weapon;

a ramming device for interaction with said projectile for ramming home into the weapon said each respective projectile placed in the axis of the bore;

a second magazine for storing charges/cartridges;

a second transfer device for transferring each respective charge/cartridge to a defined position behind the associated projectile rammed home by said ramming device; and

magazine control devices for controlling said transfer and ramming devices to provide a fully automatic loading function for the projectiles and charges/cartridges; and

wherein said first magazine includes a first revolver magazine placed on a first side of the weapon and having its longitudinal axis inclined in relation to a horizontal plane for allowing discharge of said each respective projectile from said first magazine with the aid of the projectile's own weight.

4,991,490

BREECH WEDGE FOR ARTILLERY CANNON

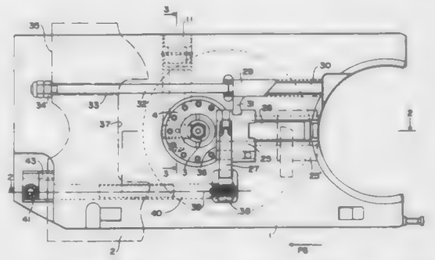
Patrick Balbo, and Robert Vernet, both of Bourges, France, assignors to Etat Francais-Delegue General Pour l'Armement, Paris, France

Filed Dec. 16, 1988, Ser. No. 285,065

Claims priority, application France, Dec. 17, 1987, 87 17620

Int. Cl.[5] F41A *3/10*

U.S. Cl. 89—24 8 Claims



1. A mechanism for controlling a primer-cartridge magazine, said magazine exhibiting both translation and rotation and being mounted in an artillery cannon breech wedge which slides in relation to a breech sleeve, said mechanism comprising: a fork which slides in relation to the breech wedge under control of a lever, said fork having a portion forming a rack and communicating with a first pinion, said first pinion being mounted on a shaft which supports a second pinion communicating with a second rack, and the second rack controlling the translation and rotation of said magazine.

4,991,491

CIRCUIT ARRANGEMENT FOR POSITION AND FEED CONTROL OF A HYDRAULIC CYLINDER

Joachim Neumann, Lohr/Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lahr, Fed. Rep. of Germany

Continuation of Ser. No. 131,906, Dec. 11, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 344,469

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642642

Int. Cl.[5] F15B *13/16*

U.S. Cl. 91—361 10 Claims

1. A control circuit which is part of an arrangement for position and feed control of a hydraulic cylinder, the arrangement having a proportional valve with an overlap in its neutral position in which its passages close before the valve is fully in the neutral position for controlling fluid paths between the cylinder and a fluid source and a tank, the control circuit comprising:

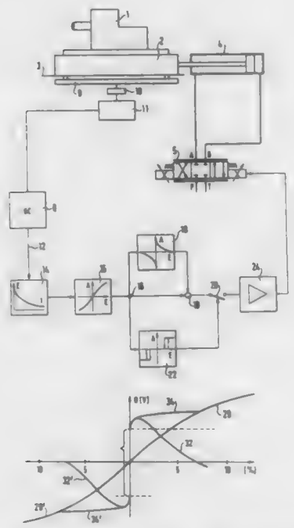
means for generating a control signal from a deviation between a common variable and a controlled variable,

a first compensation circuit for generating a position compensation signal when said proportion valve approaches the overlapping position,

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means for summing said position compensation signal and said control signal, and

amplifier means for communicating an operating signal to said proportional valve in response to a summation of said



position compensation signal and control signal, the operating signal directing the proportional valve to retain a remaining cross-section of said proportional valve opened before reaching its overlapping condition and until the control deviation is zero.

4,991,492

HYDROSTATIC AXIAL PISTON MACHINE

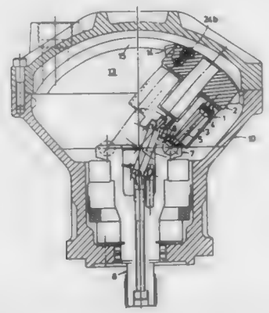
Stig Bratt, Myrgangen 56, S-461 62 Trollhättan, and Torby Malmros, Bergkullevägen 390, S-461 67 Trollhättan, both of Sweden

Filed Nov. 28, 1989, Ser. No. 442,262

Claims priority, application Sweden, Nov. 30, 1988, 8804341

Int. Cl.[5] F01B *3/00, 13/04*

U.S. Cl. 92—12.2 7 Claims



1. A variable displacement hydrostatic axial piston machine comprising a cylinder barrel rotatably mounted in a yoke and housing a plurality of circumferentially spaced cylinder bores in which are mounted reciprocally movable pistons with associated piston rods, the free ends of said piston rods being journalled in a drive disk, a machine shaft with which the drive disk is rigidly connected and which is rotatably mounted in a machine casing, the yoke including a leg which is pivotally journalled for reciprocatory swinging motions on a transverse axis through the drive disk center by means of an adjustment device in order to vary the displacement of the machine, a pair of connecting conduits for hydraulic liquid situated in the yoke and the machine casing, a guiding segment mounted on the yoke and adapted to move along a curved guide path in the machine casing, said guide path extending in a plane perpendicular to the pivot axis of the yoke, one of said pair of connecting conduits extending within the yoke leg, a hollow space within the machine casing forming the other conduit, said adjustment device comprising two cylinder bores formed in the yoke and located substantially equally spaced from a center plane of said yoke, an adjustment piston mounted in each of said cylinder bores and having piston rods which are journalled with their ends in seats in the machine casing, and an adjustment valve adapted to selectively connect one of said adjustment cylinder bores with one of said conduits for carrying out yoke adjustment.

4,991,493

CYLINDER WITH TWO CONCENTRIC PISTONS ACTUATED BY A PRESSURE MEDIUM AND EXTENDING TO THREE TIMES THE LENGTH OF THE CYLINDER

Matti N. Luojus, Äyräpäänkatu 12, 33340 Tampere, Finland

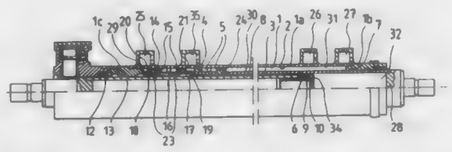
PCT No. PCT/FI88/00075, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09441, PCT Pub. Date Dec. 1, 1988

PCT Filed May 18, 1988, Ser. No. 303,762

Claims priority, application Finland, May 18, 1987, 872189

Int. Cl.[5] F01B *7/20*

U.S. Cl. 92—53 9 Claims



1. Cylinder-piston combination actuated by a pressure medium, comprising an outstretched cylinder space (1) and a two-part piston assembly (3, 8) movable in opposite directions in the axial direction of the cylinder space (1), the piston rod (6) of the first part (3) of the piston assembly having a tubular construction, the first part (3) being provided with a sealing between the piston (4) and the inner surface (2) of the cylinder space (1), the cylinder space (1) being provided with a connection (27) through which the pressure medium can be passed into the space (31) limited by the cylinder space (1) and the outer surface of the first part (3), the second part (8) being constructed to dimensions allowing it to fit inside the first part (3) and arranged to be movable relative to the latter, characterized in that the combination comprises an auxiliary piston (14) fitted around the piston rod (13) of the second part and sealed relative to the inner surface (2) of the cylinder space (1), that the cylinder space is provided with a connection (25) permitting the passage of the pressure medium into the space (29) limited by he cylinder space (1) and the auxiliary piston end face (20) facing away from the first part (3), and that the cylinder space (1) is provided with another connection (26) permitting the passage of the pressure medium to the auxiliary piston end face (21) facing towards the first part (3) when the piston (9) of the second part (8) is in engagement with the auxiliary piston (14).

4,991,494

SEALING DEVICE FOR RODLESS PNEUMATIC CYLINDERS

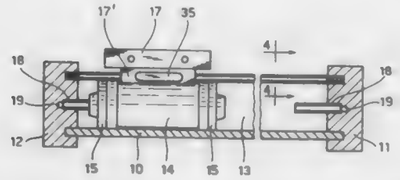
Luciano Migliori, Milan, Italy, assignor to Univer S.p.A., Milan, Italy

Filed Jun. 2, 1989, Ser. No. 360,980

Claims priority, application Italy, Jun. 8, 1988, 20900 A/88

Int. Cl.[5] F01B *29/00*

U.S. Cl. 92—88 12 Claims



1. A rodless cylinder comprising a barrel and end caps defining a cylindrical chamber, said barrel being provided with a longitudinal slot; a reciprocable piston member within said chamber operatively connected to a power transmission means through said slot; a sealing device comprising a flexible sealing member longitudinally disposed and extending inside of the chamber along said slot, said sealing strip freely passing through a deflecting passageway in the reciprocable piston member; engageable and disengageable retaining means for the sealing strip, said retaining means comprising parallel retaining grooves formed in an interior wall of the barrel on opposite sides of the slot respectively, and longitudinal headed bead members on opposite sides of the sealing strip; said grooves having respective recessed inner wall surfaces facing away from the slot and said bead members having respective inner sealing surfaces facing towards the slot for sealingly engaging and disengaging against the respective inner wall surfaces of the grooves; said sealing strip further comprising tapered outwardly protruding lips for contacting bevelled sealing surfaces provided on the interior wall of the barrel outwardly of the respective retaining grooves.

4,991,495

PUMP-ACTUATING MECHANISM

Charles Loegel, Sr., Rue des Cochers, F-67 340 Lichtenberg; Isabelle Durr, la rue des Poiriers, F-67 340 Ingwiller; Sylvie Reichert, 115 rue du Gal Gourean, F-67 340 Ingwiller; Patrick Loegel, rue du Zollstock, F-67 340 Lichtenberg; Francine Schneider, 10 rue des Poiriers, F-67 340 Ingwiller, and Charles Loegel, Jr., 27 rue du Chateau, F-67 340 Lichtenberg, all of France

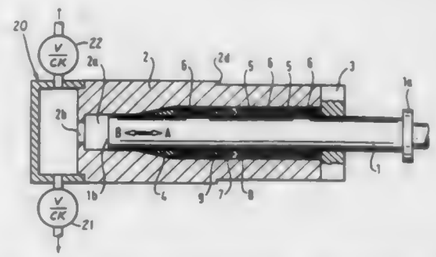
Filed Oct. 4, 1989, Ser. No. 416,965

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834610

Int. Cl.[5] F16J *15/18*

U.S. Cl. 92—165 R 13 Claims

1. Pump-actuating mechanism for a high-capacity feed pump having a delivery pressure of more than 1000 bar, said mechanism comprising a housing having a cylindrical bore, a plunger axially reciprocatable in said bore, a sealing ring mounted to said plunger within said bore, said sealing ring (i) in a normal position thereof having a non-sealing relation with both the plunger and the bore and (ii) in a sealing position thereof having sealing engagement with both the plunger and the bore, and separate stacks of thin spacer discs mounted to said plunger on opposite axial sides of said sealing ring, said discs having running clearance with both the plunger and the bore so that individual discs can move axially with respect to each



other and to said sealing ring when said sealing ring is in said normal position.

4,991,496

AIR-CONDITIONING DUCT APPARATUS WITH TWISTABLE DUCT VANES

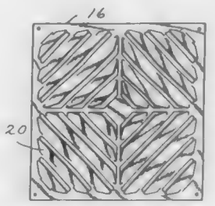
Toshio Kuno; Yoshikazu Shindo; Yukio Kuno; Takeshi Ueno, all of Fukuoka; Akira Torimi, Saga, and Yoji Mori, Fukuoka, all of Japan, assignors to Kabushiki Kaisha Kyoritsu, Kasuya, Japan

Continuation-in-part of Ser. No. 184,013, Apr. 20, 1988, Pat. No. 4,887,522. This application Aug. 14, 1989, Ser. No. 393,487

Claims priority, application Japan, May 22, 1987, 62-77574[U]; Jul. 16, 1987, 62-178648; Sep. 8, 1987, 62-137868[U]; Sep. 26, 1987, 62-147426[U]; Oct. 19, 1987, 62-160641[U]; Feb. 10, 1988, 63-29338

Int. Cl.[5] F24F *13/068*

U.S. Cl. 98—40.13 4 Claims



2. An air-conditioning apparatus for adjusting the direction and quantity of air, comprising:

a duct means for providing an air guiding passage extending through said duct means;

an airflow adjusting means for adjusting a flow of air, the airflow adjusting means being fitted to said duct means across said air guiding passage and being made from a single plate, the airflow adjusting means including a plurality of vanes, the form of each vane being defined by:

a first long slit and a first pair of side slits, one of said first pair of side slits extending from each end of said first long slit;

a second long slit extending substantially parallel to said first long slit and a second pair of side slits, one of said second pair of side slits extending from each end of said second long slit, said first pair of side slits and said second pair of side slits each having short slit at the opposite end of said long slit and extending generally toward each other; and

a first and second uncut portion located between each of said side slits of said pairs;

wherein each vane is rotatable about an axis extending from said first uncut portion to said second uncut portion;

said plurality of vanes comprising a first group, a second

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group, and a third group, the axes of the vanes in the first group all being oriented in a first direction, the axes of the vanes in the second group all being oriented in a second direction, the axes of the vanes in the third group all being oriented in a third direction.

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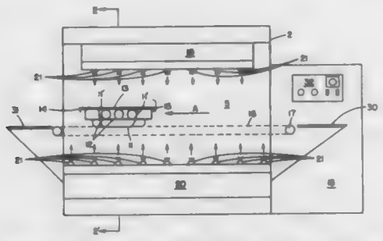
METHOD AND APPARATUS FOR SIMULATING OPEN FLAME BROILED MEAT PRODUCTS

Keith D. Barkhau, LaGrange; John D. Beltz, Louisville; Donald R. Kupski, LaGrange, all of Ky.; Mitchell Henke, Fort Wayne, Ind., and Soldon A. Svensson, Cincinnati, Ohio, assignors to KFC Corporation, Louisville, Ky.

Filed Jul. 10, 1989, Ser. No. 377,177

Int. Cl.[5] **A47J** *37/00, 37/06*

U.S. Cl. 99—349 **11 Claims**



1. Apparatus for rapidly cooking meat products to simulate open flame broiling, said apparatus comprising:

(a) pan means for supporting a meat product to be cooked, said pan means having a series of elevated crowns for receiving and directly conducting heat from the pan to the meat product to be cooked, said crowns alternating with a plurality of reservoirs for collecting fat and juices from said meat products,

(b) grill means overlying said meat product, said grill means releasably mounted on said pan to enable placement of said meat products to be cooked between said grill and said pan, said grill means and said pan arranged to clamp the meat to a predetermined thickness between the crowns of said pan and an underside of said grill means,

(c) a heating means, said means having a plurality of high velocity jets of heated air which impinge on said pan, grill and meat product,

(d) transport means for moving said pan, grill and meat products through said heating means such that the plurality of heated jets sweep both the surface of the meat product to be cooked and the underside of the crowns of the pan during transport.

4,991,498

LEAF BALER

Harold L. McCurdy, 408 E. Market, Panora, Iowa 50216

Filed Jan. 16, 1990, Ser. No. 465,436

Int. Cl.[5] **A01F** *15/14;* **B30B** *9/30;* **B65B** *13/02*

U.S. Cl. 100—8 **8 Claims**

1. A leaf baler, comprising:

a frame;

a compression chamber mounted on said frame;

said compression chamber including:

an end wall having a pair of vertical slot recesses formed therein;

a bottom wall extending from said end wall and having a first pair of horizontal slot openings formed therein and disposed in communication with said end wall slots;

a top wall extending from said end wall and having a second pair of horizontal slot openings formed therein and disposed in communication with said end wall slot;

a rear wall attached to and disposed to interconnect said end wall, bottom wall, and top wall;

a front wall attached to and disposed to interconnect said end wall, bottom wall, and top wall; and

an open end disposed opposite said end wall and adapted to receive compressible materials;

a feed chamber mounted on said frame and being disposed in communication with the open end of said compression chamber, said feed chamber including a selectively closable top door pivotally attached to said feed chamber and being movable between a closed position and an open position;

a hydraulic cylinder mounted on said frame in longitudinal alignment with said compression chamber, said cylinder



being selectively movable between a retracted and an extended position;

a foot member attached to said hydraulic cylinder and disposed to extend through said open end when said cylinder is in the extended position, said foot member having a pair of vertical slot recesses formed therein and disposed in communication with said first and second pairs of slot openings when said cylinder is in the extended position;

means for controlling said hydraulic cylinder wherein said cylinder is prevented from travelling between its retracted position and its extended position when said top door is in the open position;

means for training a flexible line through said end wall slots, first slot openings, and second slot openings and around said compressed bale to form a tied bale; and

means for releasing said tied bale from said compression chamber.

4,991,499

ROLLAPPARATUS HAVING AN IMPROVED QUICK RELEASE DEVICE

Karl-Heinz Küsters, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 349,041

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815464

Int. Cl.[5] **B30B** *3/04, 15/16*

U.S. Cl. 100—47 **10 Claims**

1. A roll apparatus comprising:

(a) a first roller having a rotatable hollow cylinder forming a working roll circumference at its outer diameter and a stationary crosshead extending lengthwise through said hollow cylinder to form a surrounding clearance space between an inner circumference of the hollow cylinder and an outer portion of the crosshead, said cross head having ends projecting from the hollow cylinder;

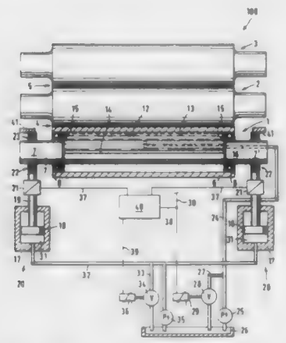
(b) force exerting devices for applying supporting forces to the ends of the crosshead;

(c) a hydraulic supporting device provided in said clearance space for exerting forces against the inner circumference of the hollow cylinder to support same;

(d) a second roller retained in a position above the first roller to form a roll nip therebetween; and

(e) a quick release device for selectively separating the first and second rollers by allowing movement of the first roller in a downward direction away from the second roller, said quick release device including

(i) means for lowering the pressure of the hydraulic supporting device; and



(ii) a safety device having a sensor for generating a signal indicative of the load present at the ends of the crosshead, said safety device reducing the magnitude of the supporting forces of the force exerting devices only after operation of said quick release device and in response to said signal being below a predetermined value.

4,991,500

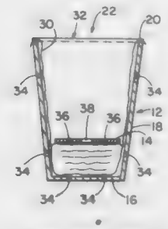
REFUSE COMPACTOR DEVICE

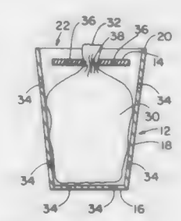
James S. Knapp, 911 Royal Oak Dr., Louisville, Ky. 40272

Filed Jun. 8, 1989, Ser. No. 363,671

Int. Cl.[5] **B30B** *9/00, 5/00*

U.S. Cl. 100—90 **5 Claims**





1. A refuse compactor device comprising:

a container housing having a bottom having a perimeter and a peripheral side wall defining a peripheral configuration extending upwardly from the perimeter of the bottom, the side wall having a peripheral top edge defining an open container top end for holding a flexible bag having an open mouth with the open mouth of the bag in registration with the open container top end and folded over the top edge of the peripheral side wall;

ventilation apertures formed through the peripheral side wall of the container housing;

a compactor plate having a peripheral configuration corresponding to the peripheral configuration defined by the peripheral container side wall to be received through the open container top end into the container and moved from the open container top end toward the container bottom; and,

a central opening through the compactor plate defining a hand grasp and for receiving the material of the bag mouth when the bag material defining the bag mouth is unfolded from over the top peripheral edge of the container side wall and gathered together closing the bag mouth.

4,991,501

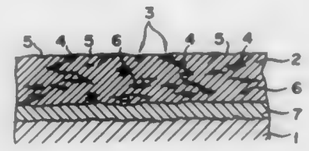
DAMPENING WATER FEED ROLLER FOR PLANOGRAPHIC PRINTING PRESS

Kazuhiro Yokoyama; Masami Akiyama; Teiichi Ando, and Yasutaka Kojima, all of Tokyo, Japan, assignors to Nippon Steel Corporation and Akiyama Printing Machinery Manufacturing Corp., Tokyo, both of, Japan

Filed Aug. 8, 1989, Ser. No. 390,373

Int. Cl.[5] **B41F** *7/26*

U.S. Cl. 101—148 **14 Claims**



1. A dampening water feed roller, characterized by a process of manufacture which comprises forming a flame sprayed layer of a ceramic material composed of Al_2O_3, TiO_2, or a mixture of Al_2O_3 and TiO_2 on the peripheral surface of a metallic roller, subjecting the flame sprayed ceramic layer to a pore-occluding treatment with a hydrophilic pore-occluding agent comprising SiO_2, whereby a pore-occluding layer is formed on the flame sprayed ceramic layer which occludes pores in said flame sprayed ceramic layer and which has a final content of SiO_2 after drying and/or firing in a range of not less than 55% SiO_2, and then grinding the thus treated peripheral surface of the metallic roller to a surface roughness of not more than 1.6 S, such that the only portion of the pore-occluding layer remaining on said flame sprayed ceramic layer after grinding exists in the pores of said flame sprayed ceramic layer.

4,991,502

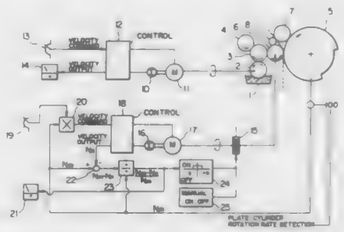
DAMPING SYSTEM FOR AN OFFSET PRESS

Yoshiaki Akao, Tokyo, Japan, assignor to JPE Co., Ltd., Kitamoto, Japan

Continuation of Ser. No. 248,442, Sep. 23, 1988, abandoned. This application Oct. 5, 1989, Ser. No. 418,752

Int. Cl.[5] **B41F** *7/26, 7/32*

U.S. Cl. 101—148 **3 Claims**



1. A damping system for an offset press comprising:

a plate cylinder, a water-applicator roller for applying water, means for supplying water to said water-applicator roller, said water-applicator roller being in contact with said plate cylinder;

a motor driving said water-applicator roller;

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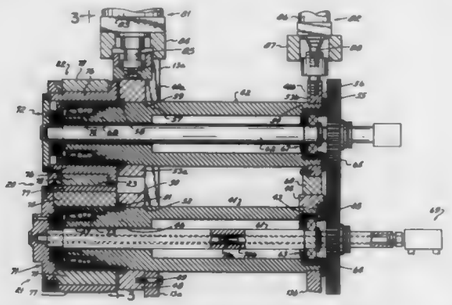
motor speed detecting means for detecting a rotational speed of said motor;
peripheral speed detecting means for detecting a peripheral speed of said plate cylinder;
slip input means for setting a desired difference between the peripheral speed of said plate cylinder and a peripheral speed of said water-applicator roller; and
control means connected to said motor speed detecting means, said peripheral speed detecting means and said slip input means for controlling the rotational speed of said motor with said peripheral speed of said plate cylinder, said rotational speed being modified by said desired difference set by said slip input means.

4,991,503

HIGH PRESSURE INTAGLIO CANTILEVER PRESS

Robert W. Morner, Hamilton, Ohio, assignor to The Hamilton Tool Company

Filed Aug. 24, 1989, Ser. No. 398,134
Int. Cl.[5] B41M *1/10*
U.S. Cl. 101—170 **15 Claims**



14. In a method of intaglio printing, the steps of:
supporting a pair of shafts cantilevered from a stationary frame whereby each of said shafts has a free end in approximately parallel spaced relationship to each other;
supporting a print roller and an impression roller, each to the free end of a different one of said shafts and positioned to make rolling contact across their widths with a substrate web moving therebetween; and
applying a force to one of said shafts remote from the free end to angularly displace said shaft with respect to the other of said shafts and to urge its free end toward the free end of the other of said shafts to force said rollers together against said web to exert high printing pressure therebetween.

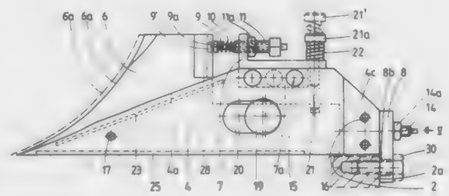
4,991,504

INK DUCT FOR A PRINTING MACHINE

Raffaele Fina, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed Nov. 15, 1989, Ser. No. 436,628
Claims priority, application Switzerland, Dec. 15, 1988, 4639/88
Int. Cl.[5] B41F *31/06, 31/18*
U.S. Cl. 101—208 **12 Claims**

1. An ink duct for a printing machine comprising an ink duct cylinder, a base formed by a metal sheet whose front end touches the ink duct cylinder, and side walls in contact with the base and the ink duct cylinder, wherein at least one separating wall is provided which is fastened to the base and is formed from two metal plates, fastened at a distance from each other, from a plastic intermediate plate mounted between these two metal plates so that it can be displaced and tilted, this intermediate plate having a front edge which has the shape of an arc of a circle corresponding to the periphery of the ink duct cylinder, and from pressure means which act on this intermediate plate and push it towards the periphery of the ink duct cylinder so as to create a leaktight contact between them, while the leaktightness between the base of the ink duct and the separating wall is ensured by a plastic sealing strip provided on the lower edge of the metal plates said pressure means including springs applied to a rear edge of said intermediate plate for



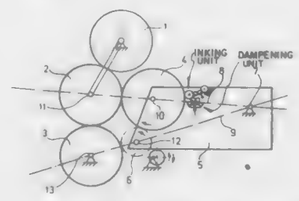
pushing it against said ink duct cylinder, said intermediate plate having a manual actuating means affixed thereto and being accessible for drawing the intermediate plate backwardly against action of the springs for removing the intermediate plate from the ink duct cylinder, and said ink duct further including a blocking means for locking the intermediate plate in its withdrawn position.

4,991,505

DEVICE FOR PERFORMING A CIRCUMFERENTIAL-REGISTER ADJUSTMENT IN A SHEET-FED ROTARY PRINTING PRESS

Walter D'Heureuse, Ladenburg, and Martin Greive, Leimen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 482,529
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905250
Int. Cl.[5] B41F *13/14*
U.S. Cl. 101—248 **5 Claims**



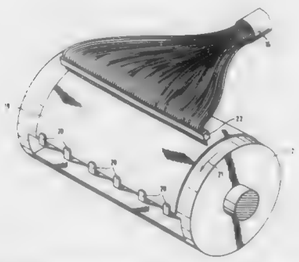
1. Device for performing a circumferential-register adjustment in a sheet-fed rotary printing press having a machine frame with a printing unit including an impression cylinder an intermediate gear wheel, a blanket cylinder and at least two plate cylinders engageable with the blanket cylinder, one of said plate cylinder being drivable by the impression cylinder via said intermediate gearwheel, comprising a mounting movable with respect to the machine frame, one of said plate cylinders being held in said mounting together with the intermediate gearwheel inking and dampening units assigned to said one of said plate cylinders and carried by said mounting, said mounting being held in the machine frame so as to be pivotal about an axis disposed parallel to axes of the cylinders of the printing unit and lying on of a straight connecting line through the axes of the impression cylinder and the intermediate gearwheel.

4,991,506

DEVICE FOR DRYING PRINTED PRODUCTS IN A PRINTING MACHINE

Anton Rodi, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Aug. 25, 1989, Ser. No. 398,631
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828753
Int. Cl.[5] B41F *23/04*
U.S. Cl. 101—416.1 **3 Claims**



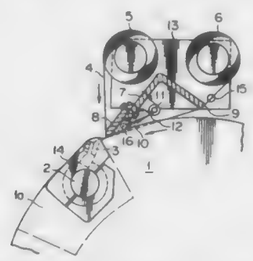
1. Device for drying printed products in a printing machine having a transport device for conveying printed products along a given path, comprising a radiation device located outside the printing machine for generating radiant energy, and means for transmitting the radiant energy generated by the radiation device to a surface of the printed product, said transmitting means being disposed at least partly in the printing machine so as to direct the radiant energy simultaneously over a defined width of said surface of the printed product, and said transmitting means comprising an elongated member having at least one optical fiber having an end thereof a substantially linear-shaped body with at least one optical fiber having an end thereof facing in a direction toward the printed product and being locatable above the surface of the printed product.

4,991,507

CLEANING SYSTEM FOR OFFSET SHEET-FED PRINTING PRESSES

Yoshiki Nozaka, Tokyo; Shinya Fujino, Kawagoe, and Hiroshi Miyama, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,179
Claims priority, application Japan, Oct. 19, 1988, 63-261395; Feb. 7, 1989, 1-26621; May 1, 1989, 1-112434
Int. Cl.[5] B41F *35/00*
U.S. Cl. 101—425 **9 Claims**



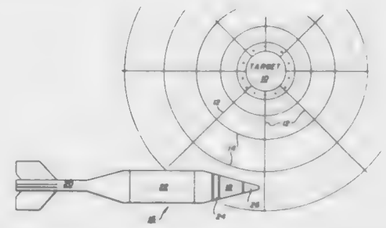
3. A cleaning system for cleaning an impression cylinder in an offset sheet-fed printing press, comprising:
a cleaning cloth;
a magazine roll for reeling-out said cleaning cloth;
a take-up roll for reeling-in said cleaning cloth;
a blade provided within a loop of said cleaning cloth which is disposed around said magazine roll and said take-up roll, said blade contacting a surface of said cleaning cloth which does not contact the impression cylinder;
a cleaning liquid supply tube provided adjacent said surface of said cleaning cloth for air spraying two or more types of liquid from both ends of said supply tube;
a guide member for urging said cleaning cloth into contact with an arcuate circumferential surface of the impression cylinder along the axial length of the impression cylinder; and
a pressing member provided between said blade and said guide member for pressing an arc-shaped portion of said cleaning cloth against the impression cylinder.

4,991,508

ELECTRIC FIELD ENABLED PROXIMITY FUZING SYSTEM

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Dec. 18, 1989, Ser. No. 451,901
Int. Cl.[5] F42C *13/00*
U.S. Cl. 102—211 **6 Claims**



6. A proximity fuzing system for a warhead of a missile engaging an airborne target, said system comprising, in combination:
A. a detonator;
B. a first detection section including a radar antenna, a transceiver connected with said antenna for transmitting and receiving RF signals and means for processing said RF signals to generate a triggering signal to said detonator, said transceiver being normally inactive; and
C. a second detection section including an electrostatic probe and signal processing means responsive to voltages developed on said probe upon missile entry into an electric field associated with an airborne target for generating an arming signal indicating the presence of a valid target within the detection range of said probe, said arming signal being applied to activate said transceiver and thus enable generation of said triggering signal to initiate warhead explosion by said detonator.

4,991,509

OPTICAL PROXIMITY DETECTOR

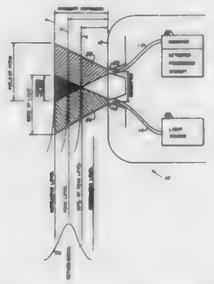
Paul J. Smith, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1983, Ser. No. 507,441
Int. Cl.[5] F42C *13/02*
U.S. Cl. 102—213 **11 Claims**

1. A proximity detector for detecting an object at a predetermined distance in front of a structure surface comprising:
a pair of optical fibers each terminating in laterally spaced-apart first ends facing in the same optical direction and having cones of acceptance which partially overlap in front of the structure surface to define a common volume;
one of the pair of optical fibers coupled with a light source at its other end to emit that light from its one end to illuminate objects coming within its cone of acceptance;

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the other of the pair of optical fibers adapted to receive in its first end light reflected from illuminated objects coming within the common volume of the cones of acceptance and transport that light to its other end;
photodetector means receiving reflected light emitted from the optical fiber other end;
said photodetector means converting that light to a first electrical signal; and



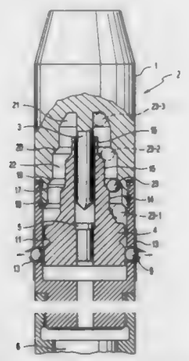
means processing the first electrical signal to generate a second signal only after the first electrical signal has decreased to around 30% of its peak level;
whereby the second signal defines a control signal only after an object has come in closer proximity to the structure surface than where reflected light from the common volume was at its maximum.

4,991,510

IMPACT FUSE HAVING FORE-BORE SAFETY

Willi Lübbers, Rotenbek, Fed. Rep. of Germany, assignor to Nico-Pyrotechnik Haans-Jurgen Diederichs, Fed. Rep. of Germany

PCT No. PCT/DE89/00533, § 371 Date Apr. 13, 1990, § 102(e) Date Apr. 13, 1990, PCT Pub. No. WO90/02309, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 14, 1989, Ser. No. 477,890
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827785
Int. Cl.[5] F42C *1/04, 15/24*
U.S. Cl. 102—247 **5 Claims**



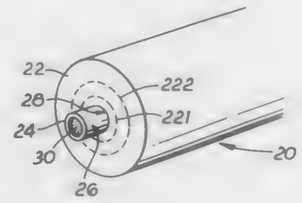
1. An impact fuse having fore-bore safety for a projectile, comprising a percussion needle stationary on the fuse, an impact body containing a percussion cap and supported slidingly in the projectile's direction of flight, and a race for a blocking ball between the impact body and the inner wall of the fuse casing, which is limited by a groove in the impact body that is open toward the front in the projectile's direction of flight, the inner wall of the fuse casing and a shoulder opposite the open end of the groove in the projectile's direction of flight, as well as by a receiving space for the blocking ball adjacent thereto, characterized in that the race (22) for the blocking ball (23) has a plurality of adjacent steps (14, 15, 16) in the direction of flight of the projectile (1).

4,991,511

NON-DISRUPTIVE DETONATING CORD

Geoffrey M. Simpson, Nottingham, England, assignor to Haley & Weller Limited, Derbyshire, England

Filed Oct. 25, 1989, Ser. No. 426,446
Int. Cl.[5] C06C *5/04*
U.S. Cl. 102—275.6 **10 Claims**



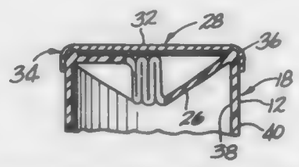
9. A detonating cord for detonation of a remote secondary charge, the cord comprising an outer relatively thick walled solid metal tube of a first metal, an inner relatively thin walled tube of a second metal abutting the inner surface of the outer tube, the inner tube being filled with a secondary explosive, in which the second metal is of greater density than the first metal, in which the ratio of the thickness of the outer and inner tubes is greater than 5 to 1, in which the diameter of the cord is less than 3 mm (0.125 inches), and in which the thickness of the outer and inner tubes in combination with the difference in density between the inner and outer tubes is such that the cord is non-disruptive and retains its integrity on functioning when the secondary explosive is ignited.

4,991,512

MOISTURE SEAL SHOTSHELLS

Rodney Van Wyk, Alton, Ill., assignor to Olin Corporation, Stamford, Conn.

Filed Nov. 3, 1989, Ser. No. 431,509
Int. Cl.[5] F42B *7/12*
U.S. Cl. 102—462 **37 Claims**



1. In a shotshell having a biaxially oriented tubular plastic body, a head end and an opposite end, an end seal member cover in said opposite end, said member having an annular rim portion of thermoplastic material fused to said tubular body sealing said opposite end while maintaining the overall biaxial orientation of said body adjacent said rim portion.

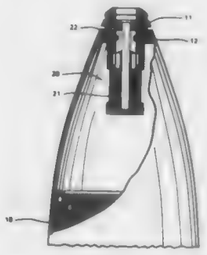
13. A moisture seal for a shotshell having a biaxially oriented plastic tubular body with inner and outer tubular wall surfaces, said body having a head end and an opposite end and an end closure at said opposite end, said moisture seal comprising:
a composite cover member having an outer layer of thermally conductive metal containing material laminated to an inner layer of high density polyethylene adapted to extend across said opposite end, said member having a rim portion of high density polyethylene adapted to be fused to said body to seal said opposite end while maintaining the biaxial orientation of said body adjacent said rim portion.

4,991,513

CARRIER PROJECTILE WITH SAFETY VENTS

James Malamas, Fredericksburg, Va., and Harvey M. Day, Waldorf, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1990, Ser. No. 491,792
Int. Cl.[5] F42B *12/00, 39/00*
U.S. Cl. 102—481 **5 Claims**



1. A carrier projectile system comprising:
a. cylindrically shaped housing having a longitudinal spin axis and a coaxial housing cavity;
b. an expulsion charge and fuze assembly disposed in the forward portion of said housing cavity for expelling cargo members;
c. a nose assembly attached to the forward end of said housing for supporting said expulsion charge and fuze assembly and having a plurality of vent holes disposed radially in the nose assembly;
d. a venting collar having a plurality of vent holes corresponding to the vent holes in said nose assembly rotatably attached to said nose assembly whereby spin of the carrier projectile rotates said venting collar, offsetting the vent holes in said collar from the vent holes in said nose assembly; and
e. a safety pin for locking the vent collar in an open position.

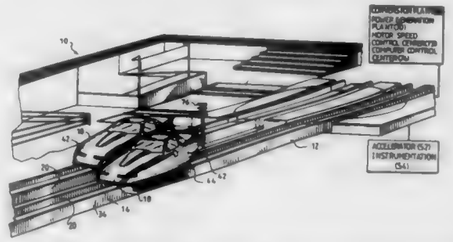
4,991,514

ELECTROMAGNETICALLY POWERED DRAG RIDE ATTRACTION

Tyrone E. Powell, 2000 Otter St., Anchorage, Ak. 99504, and James Trani, 10842 Langmuir, Sunland, Calif. 91040

Filed Dec. 26, 1989, Ser. No. 456,479
Int. Cl.[5] A63G *25/00*
U.S. Cl. 104—60 **15 Claims**

1. An electromagnetically powered drag racing ride attraction, comprising:
(a) a two lane track having a starting line and designed to look and operate like a conventional drag strip, each lane of said two lane track having a track bed, a center line, a data link, a far end, and a near end of said track;
(b) a plurality of vehicles, and a load/unload vehicle rotation assembly disposed at said far end of said two lane track, said load/unload vehicle rotation assembly turning said vehicles around and facilitating loading and unloading of said vehicles off said two lane track simultaneously while two other vehicles are racing down said tow lane track;
(c) a vehicle support pedestal disposed at said center line of said each of said two lane tracks;
(d) a continuous row of loudspeakers mounted within said pedestal;
(e) a linear induction motor support rail;
(f) a linear induction motor affixed to said linear induction motor support rail in said two lane track bed;
(g) induction plate assemblies disposed on said vehicles; and



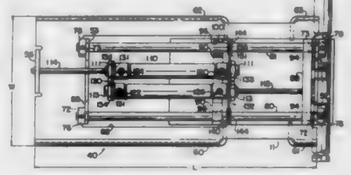
(h) a turntable assembly disposed at said near end of said two lane track, said turntable assembly turning said vehicles around for their return run down said two lane track.

4,991,515

DOUBLE ACTING SWITCH AND METHOD OF USE

Vladimir Evanzon, Vernon, and Richard Kuchta, Tolland, both of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Jan. 30, 1990, Ser. No. 472,365
Int. Cl.[5] E01B *25/26, 7/08;* **B61J** *3/00*
U.S. Cl. 104—88 **23 Claims**



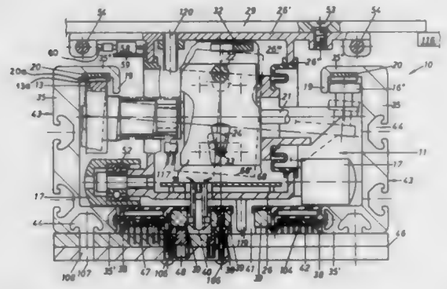
1. A switch for use in a conveyorized transport system for moving a transfer rail section between discrete positions with one of said positions being in line with a main rail and with the remaining positions each being in line with a subsidiary loop entrance end located opposite one another on either side of said main rial, said switch comprising:
a support;
a bracket moveable relative to said support and carrying a transfer rail section for movement between said discrete positions;
first actuator means connected with said support for imparting to said transfer rail a first linear movement;
second actuator means connected with said bracket for imparting to said transfer rail a second linear movement;
guide means mounted to said support for slidably supporting said bracket and said first and second actuator means thereon; and
said first and said second actuators being arranged in a parallel spaced apart side-by-side relationship with one another for unitary movement relative to said support such that said first linear movement and said second linear movement either combined or individually effect selective positioning said transfer rail at one of said discrete positions.

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4,991,516
TRANSPORT SYSTEM FOR WORKPIECES

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Filed Oct. 11, 1989, Ser. No. 420,041
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834581
Int. Cl.[5] E01B *25/06, 25/12*
U.S. Cl. 104—130 18 Claims

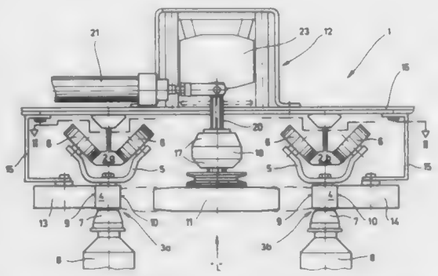


1. A transport system for workpieces, comprising:
a track defined by rails and including first rigid longitudinally extending rail segments continuing along an original path at a branch in said track and second rigid longitudinally extending rail segments diverging from said first segments at said branch; and
a workpiece-carrying carriage mounted on said rails and displaceable along said track and comprising:
drive wheels on said carriage form-fittingly engaging said rails and propelling said carriage along said track,
a remotely controlled motor mounted on said carriage and operatively connected to said drive wheels for rotating same to propel said carriage along said track,
at least one guide element on said carriage shiftable in position selectively to engage and clear said first and second rigid rail segments, and
actuating means on said carriage for shifting said guide element to engage selectively in one of said rail segments and cause said carriage to continue along said path or to divert to said branch, two of said guide elements being provided on opposite sides of said carriage and are positioned for selective engagement in the respective rail segments, said actuating means including means for alternatively shifting said guide elements into engagement with the respective rail segment, a respective one of said drive wheels being disposed opposite one another on said opposite sides of said carriage, each of said drive wheels passing into engagement with a respective one of said rail segments corresponding to the guide element engaging same, said carriage having a generally rectangular plan configuration and is provided with two of said running rollers spaced apart along each of said sides, a pair of said guide elements spaced apart along each side with each guide element being located in a vicinity of a respective running roller, a respective one of said drive wheels being located between the guide elements of each pair on the respective side of the carriage, each of said drive elements being shiftable transversely to said direction relative to the carriage, said carriage further comprising:
a common drive shaft on said carriage operatively connected to both said drive wheels and driven by said motor,
means including a displacement shaft for mounting said motor and said drive shaft for displacement on said carriage to shift said drive wheels relative to said rails, and
a servomotor on said carriage operatively connected to said displacement shaft for displacing same, said guide elements being coupled with the respective drive wheel for displacement with said motor and said common drive shaft, said carriage further comprising means between said servomotor and said displacement shaft for selectively in respective positions of said servomotor:
(a) shifting both pairs of guide elements and the respective drive wheels into engagement simultaneously with rail segments on opposite sides of said carriage;
(b) shifting one of said pairs of guide elements and the respective drive wheel into engagement with one of said first and second rail segments while holding the other of said pairs of guide elements and the respective drive wheel out of engagement with the other of said first and second rail segments;
(c) shifting the other of said pairs of guide elements and the respective drive wheel into engagement with said one of said first and second rail segments while holding said one of said pairs of guide elements and the respective drive wheel out of engagement with said one of said first and second rail segments; and
(d) shifting both of said pairs of guide elements and said drive wheels out of engagement with said rail segments.

4,991,517
SUSPENSION CONVEYOR SYSTEM

Karl Lötzer, Munich, Fed. Rep. of Germany, assignor to Veit Transpo GmbH, Landsberg, Fed. Rep. of Germany

Filed Jan. 9, 1990, Ser. No. 462,456
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902186
Int. Cl.[5] B61B *13/06;* E01B *25/22*
U.S. Cl. 104—165 7 Claims



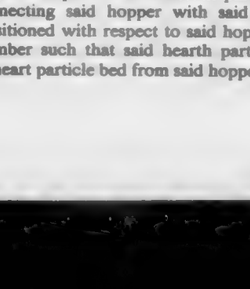
1. A suspension conveyor system comprising at least two carriers for conveying objects in a suspended condition, said carriers traveling on spaced, parallel rails and each having a friction-engaging surface facing each other and extending parallel to the carrier's direction of travel, a friction wheel rotatably mounted between said carriers adjacent their friction-engaging surfaces, drive means for rotating said friction wheel, and shift means for shifting the friction wheel between a neutral position where it is not in frictional engagement with the surface of either carrier, a first operating position wherein it is in frictional engagement with the surface of one of said carriers and a second operating position where it is in frictional engagement with the surface of the other of said carriers.

4,991,518
COMPUTER WORK TABLE

Fernando A. Romero, Jr., 1795 Messina Dr., San Jose, Calif. 95132

Filed Dec. 18, 1989, Ser. No. 451,647
Int. Cl.[5] A47B *41/04*
U.S. Cl. 108—32 4 Claims

1. A computer work table for securement of equipment thereof including a keyboard, the table comprising,
a first pair of support legs spaced from and parallel to a second pair of support legs, wherein the second pair of support legs are spaced from and parallel to a third pair of support legs, and wherein each of the individual legs of the first, second, and third pairs of support legs are each aligned relative to one another defining a matrix of support legs, wherein the first and second pairs of support legs are of a first height, and wherein the third pair of support legs are of a second height less than the first height, and
a top shelf integrally mounted to and orthogonally oriented between the first and second pairs of support legs coextensive therewith, and
an angular reader shelf underlying the top shelf, wherein the angular reader shelf is secured to define an acute angle relative to the top shelf, and
a bottom shelf underlying the angulated reader shelf, the bottom shelf slidably mounted between the first and second pairs of support legs, and
a plurality of shelves integrally secured between the second and third pairs of support legs, wherein the plurality of shelves are each parallel relative to one another, and further including a plurality of braces between each of the individual legs of the first and second pairs of support legs



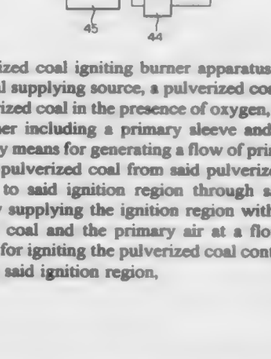
to secure the legs together and maintain geometric integrity thereof, and
wherein the reader shelf includes a forward edge oriented below a top edge of the reader shelf, and the reader shelf further including a support bar integrally and orthogonally mounted between forward legs of each of the first and second pairs of support legs, wherein the support bar is positioned adjacent the forward edge of the reader shelf in contact therewith, and
wherein the reader shelf includes a first spindle and a second spindle, the spindles orthogonally and integrally mounted adjacent the rear edge of the reader shelf, and further including a respective first and second spook wherein the first and second spool each includes an axial bore directed therethrough, wherein each axial bore of the first and second spools is mounted in frictional engagement with the first and second spindle respectively, the first and second spools mounting securement means for securement of reading material onto an upper surface of the reader shelf.

4,991,519
INCINERATING FURNACE

Shigeru Saitoh, 169 Dai, Obamamachi Iwaki-shi Fukushima-Prefecture, Japan

Filed Jan. 22, 1990, Ser. No. 467,952
Claims priority, application Japan, Jan. 31, 1989, 1-19665
Int. Cl.[5] F23G *5/00, 5/12*
U.S. Cl. 110—235 9 Claims

1. An incinerating furnace which utilizes hearth particles as a fixed hearth bed or a movable hearth bed, said furnace comprising: a hopper having hearth particles contained therein; a combustion chamber containing a hearth particle bed, said hearth particle bed having a sloped surface of an angle about equal to the angle of repose of said hearth particles; a first passageway connecting said hopper with said combustion chamber and positioned with respect to said hopper and said combustion chamber such that said hearth particles can be supplied to said heart particle bed from said hopper by gravity flow through said first passageway; a waste materials bin containing waste materials to be incinerated in said combustion chamber; a second passageway connecting said bin with said combustion chamber and positioned with respect to said bin and said combustion chamber such that said waste materials are supplied onto the sloped surface of said hearth particle bed from said bin through said second passageway; an outlet for discharging a mixture of used hearth particles and combustion

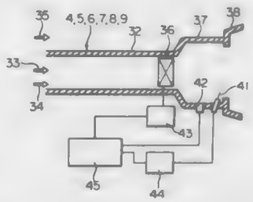


remainder, said outlet being provided at a lower portion of said furnace; and a movable plane member for removing said mixture of used hearth particles and combustion remainder discharged from said outlet, said movable plane member being positioned underneath said outlet at a distance such that at least a part of said mixture forms a continuous bed extending between said outlet and the surface of said movable plane member, said mixture bed having a sloped surface of an angle about equal to the angle of repose of said mixture.

4,991,520
IGNITION BURNER APPARATUS FOR PULVERIZED COAL

Toshikazu Tsumura; Ryuichi Sugita; Yasuhide Sakaguchi; Ikuhisa Hamada, and Akira Baba, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 207,640, May 31, 1988, abandoned.
This application Oct. 5, 1989, Ser. No. 417,464
Claims priority, application Japan, Oct. 1, 1986, 61-231107
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—263 3 Claims



1. A pulverized coal igniting burner apparatus including a pulverized coal supplying source, a pulverized coal burner for igniting pulverized coal in the presence of oxygen, said pulverized coal burner including a primary sleeve and an ignition region, delivery means for generating a flow of primary air and delivering the pulverized coal from said pulverized coal supplying source to said ignition region through said primary sleeve, thereby supplying the ignition region with mixture of the pulverized coal and the primary air at a flow rate, and igniting means for igniting the pulverized coal contained in the mixture within said ignition region,

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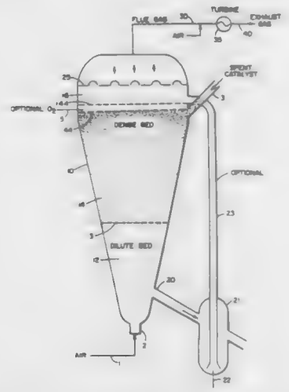
wherein said primary sleeve has an outer periphery along which secondary air flows and a distal end formed with a large diameter portion for reducing the flow rate of the mixture, said igniting means being located adjacent the inner peripheral wall of the large diameter portion such that a vicinity of an inner peripheral portion within said large diameter portion not exposed to said secondary air constitutes said ignition region; and a rotary vane is provided in said primary sleeve adjacent said large diameter portion for imparting swirling energy to the mixture thereby to enhance density of the pulverized coal contained in the mixture introduced into said ignition region, and further comprising flame maintenance means for maintaining a flame at an outer peripheral portion of said large diameter portion, said flame maintenance means protruding inwardly from the inner peripheral portion of the large diameter portion so that eddy recirculation flows of the mixture are formed in the vicinity of the flame maintenance means.

4,991,521

FLUIDIZED BED COMBUSTION PROCESS AND APPARATUS

Gary J. Green, Yardley, and Tsoung Y. Yan, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 12, 1988, Ser. No. 180,755
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—347 **9 Claims**



1. A fluidized bed combustion process wherein a combustible substance is burned with an oxygen containing gas at fluidized bed combustion conditions including a flue gas oxygen concentration of 0 to 10% oxygen, to produce a flue gas characterized by countercurrent combustion in:

(a) a dilute phase base zone comprising a dilute phase, fluidized bed combustion zone wherein oxygen containing gas is added, said base zone having a top portion and a top cross-sectional area, and operating at dilute phase conditions including a superficial vapor velocity;

(b) a dense phase fluidized bed zone wherein said combustible substance is added and wherein combustion occurs comprising a dense phase fluidized bed supported by and in open fluid communication with the dilute phase base zone, and wherein said dense phase fluidized bed zone has an average cross-sectional area and the cross-sectional area of said dilute phase base zone at said top portion is 15 to 90% of the average cross-sectional area of said dense phase fluidized bed zone; and

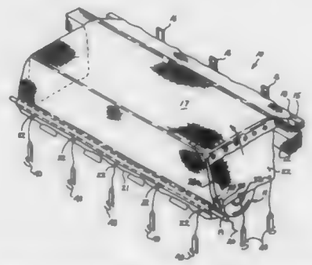
(c) a dilute phase upper zone above said dense phase fluidized bed, characterized by a relatively lower superficial vapor velocity than said dilute phase base zone, from which said flue gas is removed.

4,991,522

AGRICULTURAL PLANTER AND COVER APPARATUS

Matthew O. Alexander, RR #1, Box 104, Delavan, Ill. 61734

Filed Feb. 26, 1990, Ser. No. 484,999
Int. Cl.[5] B60P *7/04;* **E04H** *15/06*
U.S. Cl. 111—200 **10 Claims**



1. An agricultural planter and cover apparatus comprising, in combination,

a planter wagon including a plurality of wheels rotatably mounted to the wagon, and

the wagon including a support platform overlying the wheels, with an upper horizontal frame member and a lower horizontal frame member spaced rearwardly of the support platform, and the support platform including a plurality of seed containers mounted thereon, and

a flexible horizontal covering web formed of water impermeable material mounted coextensively with and adjacent a rear edge of the support platform, the covering web rotatably mounted about a central axle, the central axle including a crank handle extending outwardly therefrom, and the central axle fixedly mounted to &he covering web adjacent a forward web edge of the covering web, and

a horizontal cover support frame mounted rearwardly of the upper frame member and above the lower frame member, and

a rear edge portion of the covering web mounted to the horizontal cover support frame.

4,991,523

TUFTING APPARATUS

Gary L. Ingram, Ooltewah, Tenn., assignor to Textile Corporation of America, Ringgold, Ga.

Filed Jun. 15, 1989, Ser. No. 366,545
Int. Cl.[5] D05C *15/00*
U.S. Cl. 112—80.05 **24 Claims**

1. Apparatus for producing tufted goods from a backing web and a length of continuous yarn, comprising:

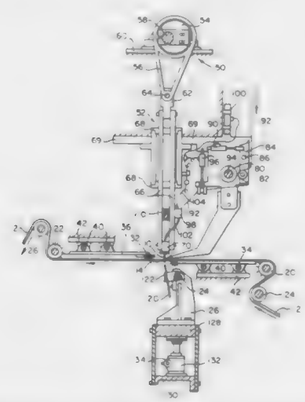
(a) backing web support means for supporting the backing web;

(b) a backing opener tube containing a longitudinally-extending through passageway and including at one end a pointed tip formed by an angled surface that is angled with respect to the longitudinal axis of the tube, said backing opener tube being arranged generally normal to said backing web with said pointed tip having a pointed extremity adjacent said web;

(c) means for axially reciprocating said backing opener tube between positions in which said pointed tip penetrates through and is withdrawn from said web, respectively;

(d) means for transporting the length of yarn successively

through said passageway and outwardly through said pointed tip; and



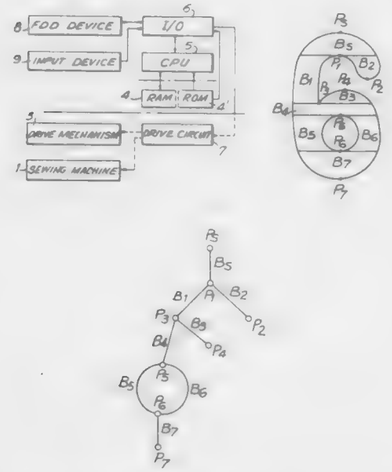
(e) blade means operable in sliding contact with said angled surface for severing a yarn tuft from said length of continuous yarn.

4,991,524

DEVICE FOR AUTOMATICALLY MAKING EMBROIDERING DATA FOR A COMPUTER-OPERATED EMBROIDERING MACHINE

Yoshiaki Ozaki, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 315,461, Feb. 24, 1989, abandoned. This application Mar. 5, 1990, Ser. No. 490,532
Claims priority, application Japan, Feb. 26, 1988, 63-41899
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 **1 Claim**



1. In a computer operated sewing machine provided with a needle attached at a lower part of a needle bar, a drive device for reciprocating the needle bar vertically, a thread loop hook for catching a thread loop carried by the needle, a drive part for moving an embroidering frame in X and Y coordinate directions, and memories or storing data controlling the drive part,

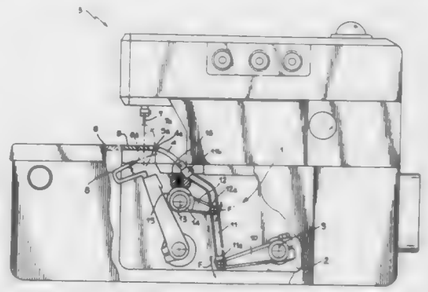
a device for automatically preparing embroidering data for a desired pattern to be embroidered, comprising a digitizing input device which scans in a predetermined direction an outline of an original pattern and detects apex points of all concave and convexe portions on said outline, means for registering said apex points in a data memory; means for preparing an embroidering sequence of data blocks pertaining to areas of said pattern separated by scanning lines passing through the respective apex points; and means for registering said embroidering sequence in said data memory.

4,991,525

DRIVING MECHANISM FOR THE UPPER LOOPER IN OVERLOCK SEWING MACHINES

Gennaro De Santis, Pavia, Italy, assignor to Rimoldi S.R.L., Milan, Italy

Filed Aug. 23, 1989, Ser. No. 397,724
Claims priority, application Italy, May 31, 1989, 20712 A/89
Int. Cl.[5] D05B *57/14*
U.S. Cl. 112—199 **3 Claims**



1. A driving mechanism for use in an overlock sewing machine having an upper looper and a bed, comprising:

a drive shaft rotatably mounted to the bed of the sewing machine and operated with an angular oscillatory movement about is own axis;

a driving arm fastened to the drive shaft and extending therefrom in a substantially radial direction, the driving arm having a lower part;

a support arm pivoted to the driving arm at the lower part thereof and fixedly supporting said upper looper;

a bearing pin having an axis along which the bearing pin extends, the bearing pin being connected to the bed of the sewing machine and disposed sideways of the support arm and opposite to the drive shaft;

an auxiliary arm rotatably connected to the bearing pin, extending from said pin in a substantially radial direction and having its free end pivotally mounted to the support arm,

wherein said mechanism further comprises an auxiliary pivot pin integral with the bearing pin, rotatably engaged with the bed of the sewing machine and extending according to an axis parallelly offset relative to the axis of the bearing pin, said auxiliary pin being selectively oriented according to different angular positions about its own axis in order to modify the position of the axis of the bearing pin.

4,991,526

BED PLATE INSERT AND PRESSER FOOT, EACH HAVING A GUIDE SURFACE FOR LATERALLY SUPPORTING A SEWING MACHINE NEEDLE

Ferdinand H. Jeanblanc, 201 Main St., Harrison, Id. 83833

Filed Jul. 20, 1989, Ser. No. 384,171
Int. Cl.[5] D05B *29/04, 29/06, 27/20*
U.S. Cl. 112—227 **14 Claims**

1. In a sewing machine wherein relatively thick materials are sewed together as they are advanced forwardly by a forward

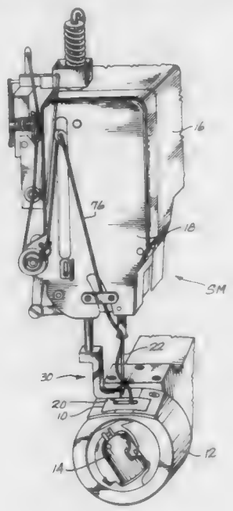
VOL 1123 ISS 2 FE 12 1991 UMI

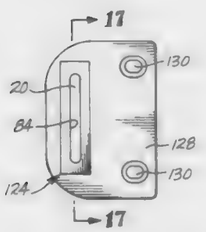
displacement of a sewing machine needle while the needle is within the materials, and a shuttle hook delivers a lower thread into engagement with an upper thread at a particular lowered position of the needle, the improvement comprising:

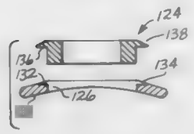
said needle being long and shelter having a pointed lower end and a needle eye adjacent said lower end wherein the upper thread extends through the needle eye from a first side of the needle to a second side;

wherein the lower thread is brought into engagement with the upper thread immediately laterally adjacent the second side of the needle;

a support for the materials, said support including a bed plate having an insert receiving opening and recessed surfaces







endwise outwardly from both ends of the insert receiving opening, and an insert insertable into the insert receiving opening, said insert including opposite end portions receivable said recessed surfaces and a needle receiving slot elongated in the direction of material advancement;

a presser foot forwardly of the needle in the path of material movement, said presser foot including a foot portion engageable on the materials and exerting a downward pressure on the materials when said materials are stopped, and raised up away from the materials when the needle is moving forwardly to in turn move the materials forwardly;

said insert also including a side guide surface at a side of the slot said guide surface adjacent the first side of the needle, said side guide surface being contiguous the first side of the needle; and

wherein the presser foot is pressing on the materials while the needle is moving downwardly through the materials and the presser foot is raised after the pointed end of the needle enters into the slot;

whereby the side guide surface braces the needle against lateral movement away from the shuttle hook as the needle continues to move downwardly and then upwardly and the shuttle hook rotates to bring the lower thread into engagement with the upper thread.

4,991,527

METHOD OF ATTACHING A STRIP OF CLOTH WITH A ZIP-FASTENER COMPONENT TO A TROUSER FOREPART

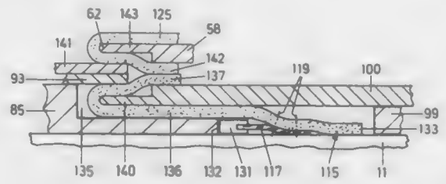
Hans Scholl, Oerlinghausen-Lipperreihe, and Siegfried Vogt, Leopoldshöhe, both of Fed. Rep. of Germany, assignors to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 336,210, Apr. 11, 1989, Pat. No. 4,911,091. This application Nov. 2, 1989, Ser. No. 430,793

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812800

Int. Cl.[5] D05B *3/12, 21/00*

U.S. Cl. 112—265.2 **4 Claims**



1. A method of attaching a strip of cloth provided with a zip fastener component to a trouser forepart, comprising the following steps:

an edge of the trouser forepart is folded over;

an edge of the strip of cloth is folded over;

the folded-over edge of the strip of cloth and the folded-over edge of the trouser forepart are brought into mutual contact;

the trouser forepart with the folded-over edge and the strip of cloth with the folded-over edge are positioned relative to one another in a position which they occupy after being joined together; and

the trouser forepart and the strip of cloth are joined by means of a seam effected in a single sewing operation.

4,991,528

METHOD AND APPARATUS FOR DETECTING IMPROPER STITCHES FOR A CHAINSTITCH SEWING MACHINE

Stephen L. Bellio, West Roxbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 31, 1989, Ser. No. 332,227

Int. Cl.[5] D05B *69/36*

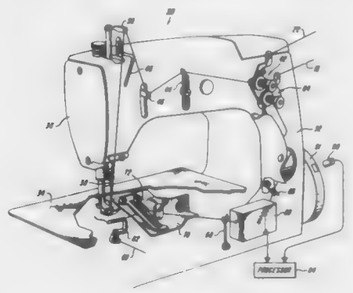
U.S. Cl. 112—278 **17 Claims**

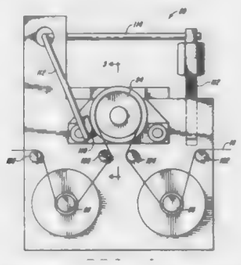
1. Apparatus for detecting an improper stitch for a Class 400 chainstitch sewing machine, said machine including an axially reciprocable needle adapted to incorporate one or more needle threads into a succession of Class 400 chainstitches and including a reciprocable looper adapted for incorporating a looper thread into said chainstitches, comprising:

looper thread means for monitoring the consumption per stitch of said looper thread during the formation of said chainstitches,

processor means for identifying times when said monitored

consumption is indicative of looper thread consumption per stitch below a predetermined threshold value, said





identified times corresponding to times when improper stitches have occurred.

4,991,529

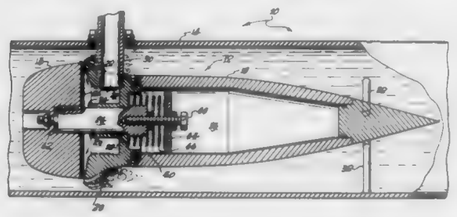
SLURRY DISPENSER

John W. McKune; Arnold O. Musolf, both of Glendora; Timothy W. Hales, Redlands, and Eric D. Swanson, Sunset Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1972, Ser. No. 230,543

Int. Cl.[5] B63B *1/34;* **B05B** *7/00*

U.S. Cl. 114—67 R **12 Claims**



1. A dispenser for ejecting slurry in a liquid stream comprising

an elongated body having nose and main sections;

the forward end of the main body section having an annular slurry receiving cavity which is located adjacent the nose;

means mounting the nose to the main body section for longitudinal movement so as to open and close the annular cavity to the liquid stream; and

the main body section having an annular exterior step decrease immediately aft of the noise so as to cause turbulence in the liquid,

whereby slurry can be ejected and dispersed into the liquid stream when the annular cavity is opened.

4,991,530

FIN APPARATUS FOR CONTROLLING HEAT FLUX DISTRIBUTIONS

Alan D. Rathsam, San Diego, Calif., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 27, 1977, Ser. No. 849,381

Int. Cl.[5] F42B *19/00*

U.S. Cl. 114—20.1 **16 Claims**



1. In a torpedo having inner and outer spaced apart shells, the improvement comprising:

a plurality of conducting fins and a plurality of nonconducting fins affixed to the shells in the space therebetween; and

the number of conducting fins to the number of nonconducting fins being established at a predetermined ration to distribute heat from the outer skin of the outer shell into an ambient water environment about the torpedo,

whereby laminar flow of water past the outer shell can be improved as the torpedo travels through the water.

4,991,531

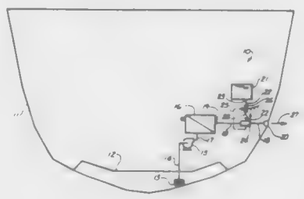
SYSTEM FOR IDENTIFYING UNAUTHORIZED BILGE WATER DISCHARGES FROM MARINE VESSELS

Joseph C. St. Amant, 183 McCandliss Dr., Gulfport, Miss. 39503

Filed Jan. 11, 1990, Ser. No. 463,401

Int. Cl.[5] B63B *13/00, 29/16*

U.S. Cl. 114—183 R **5 Claims**



1. An apparatus for marking unauthorized discharge of bilge waste from a marine vessel via the ship's overboard bilge discharge flow line that discharges at a discharge port comprising:

(a) a supply for containing a dye tracer product within the confines of a vessel;

(b) an interface line for adding the dye product to the overboard bilge discharge line of the marine vessel;

(c) valve controller means for valving the flow of dye product between the supply and the vessel overboard discharge line;

(d) activating means for activating the valve controller responsive to the sensing of a preset level of waste products being discharged via the overboard discharge line so that unauthorized discharge of waste material from the vessel's bilge via the overboard discharge line automatically activates the valve controller to mix said dye product contained within the supply with the unauthorized discharge.

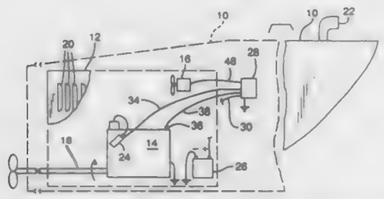
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4,991,532

AUTOMATIC CONTROL OF ENGINE COMPARTMENT VENTILATION

Richard A. Locke, Milwaukie, Oreg., assignor to Boat Safe Products, Inc., Portland, Oreg.

Filed Jun. 2, 1989, Ser. No. 360,390
Int. Cl.[5] B63J *2/00*
U.S. Cl. 114—211 9 Claims



1. An automatic fan controller for an engine compartment of a boat having an electrical power supply, an inboard internal combustion engine, and an electrically powered ventilation fan arranged to ventilate said engine compartment, the fan controller comprising:

(a) engine speed sensor means for determining whether said engine is operating above a predetermined engine speed;

(b) electrically controlled power switch means for selectively connecting said power supply operatively to said ventilation fan;

(c) switch controller means responsive to said engine speed sensor means, for energizing said power switch means so as to connect said power supply operatively to said ventilation fan when said engine speed sensor means has determined that said engine is not operating above said predetermined engine speed; and

(d) temperature sensitive means for energizing said power switch means in response to the temperature of said engine, so as to keep said power switch means closed to connect said electrical power supply to said ventilation fan so long as the temperature of said engine remains below a predetermined minimum temperature.

4,991,533

BOAT BOTTOM CLEANING DEVICE

Charles Sterling, 457 Lake Havasu Dr., Virginia Beach, Va. 23454

Filed Sep. 16, 1988, Ser. No. 230,298
Int. Cl.[5] B63B *59/08*
U.S. Cl. 114—222 3 Claims



1. A device for cleaning the bottom of a boat while the boat is afloat, manually by an operator standing on the boat, the device comprising:

a. a vertical pole member;

b. a horizontal pole member;

c. a brush means mounted at one end of said horizontal pole member as to be mounted in two positions, a horizontal position which has the brush means extending along the longitudinal axis of the horizontal pole member, and a 90 degree position which has the brush means extending laterally from said horizontal pole member;

d. a first sleeve reinforcement mounted on said horizontal pole member and connected to one end of said vertical pole member;

e. an angle support member;

f. a second sleeve reinforcement mounted intermediately on said vertical pole member; and

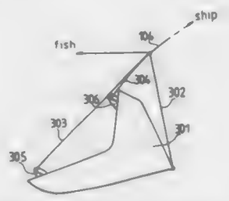
g. said angle support member connected at one end to said second sleeve reinforcement and at the other end to the other end of said horizontal pole member, as to have the angle support member brace the cleaning device without contacting the boat.

4,991,534

DEVICE DESIGNED TO KEEP A TOWED UNDERWATER VEHICLE SUBMERGED AND METHOD FOR THE USE OF SAID DEVICE

Francois Warnan, Trappes, and Bernard Hébert, Cagnes sur Mer, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Oct. 3, 1989, Ser. No. 416,708
Claims priority, application France, Oct. 11, 1988, 88 13337
Int. Cl.[5] B63B *21/66*
U.S. Cl. 114—245 8 Claims



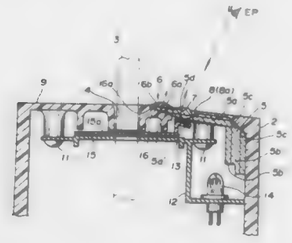
1. A device designed to keep an underwater vehicle (103), towed by a ship (101) by means of a towing cable (104), submerged at a substantially constant depth (H), said device comprising a non-dihedral swept wing (103) made of a sheet having a profile of an inverted aircraft wing with an aspect ratio substantially equal to 6, and three suspenders (302, 303, 304) having a length between a half and two-thirds f the span of the wing, said suspenders being fixed at one of their ends, respectively, to a tip and to two rear ends of the wing, and at their other ends to one and the same point of the towing cable, the lengths of these suspenders enabling the wing to be fixed at a negative angle of incidence (i) enabling a negative lift that draws the towing cable and the underwater vehicle (103) towards the bottom of the water.

4,991,535

SHIFT LEVER UNIT FOR AUTOMOTIVE AUTOMATIC TRANSMISSION

Satoshi Kobayashi, Hiratsuka; Katsunori Shirahama, Atsugi; Tsuyoshi Todoriki, Yokosuka, and Hiroshi Yamazaki, Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd. and Ohi Seisakusho Co., Ltd., both of, Japan

Filed Jun. 14, 1990, Ser. No. 538,067
Claims priority, application Japan, Jul. 5, 1989, 1-175002
Int. Cl.[5] G01D *13/04*; G09F *9/00*
U.S. Cl. 116—28.1 11 Claims



1. A shift lever unit comprising:

a shift lever;

a housing of plastic having an upper cover portion, said upper cover portion being formed with a slot through which said shift lever passes;

a position mark plate of transparent plastic mounted on said upper cover portion, said position mark plate having a plurality of position marks on an upper surface thereof;

a light blocking layer covering the upper surface of said position mark plate except the positions where the position marks are located;

a light source installed in said housing;

a light conductive member of transparent plastic, said light conductive member including a horizontal part whose leading end is formed with a first light reflecting surface and located behind said position mark plate, a vertical part which is formed with a rounded recess from which light rays from said light source enter said vertical part, and a jointed part at which said horizontal and vertical parts are jointed, said jointed part being formed with a second light reflecting surface by which said light rays from said rounded recess is reflected toward said first light reflecting surface;

a plurality of raised window portions formed by said horizontal part of said light conductive member, said window portions being exposed to the outside of the housing at positions beside said position marks; and

a pointer movably located within said housing below said raised window portions, said pointer being movable together with said shift lever,

wherein said first light reflecting surface is granulated.

4,991,536

MARKER FOR BURIED OBJECTS

Jerome F. Moshofsky, Portland, Oreg., assignor to Epic Corporation, Portland, Oreg.

Filed Dec. 22, 1989, Ser. No. 454,935
Int. Cl.[5] G01D *21/00*
U.S. Cl. 116—209 3 Claims

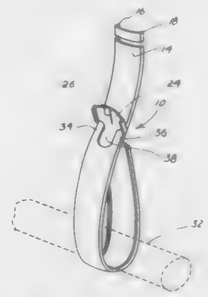
1. A marker for locating an underground object comprising:

a flexible, elongate plastic body having an aperture therein located between opposite ends of said body,

a pair of opposed indents in opposite margins of said body adjacent but spaced inwardly from one end of said body and a terminal portion of said body extending from said one end along the body toward said indents,

a division in said body extending from said one end along said terminal portion to a position between said indents to produce side-by-side segments in said terminal portion which are movable to partially overlap with distortion of the indents thus to produce collapsing of the terminal portion,

said aperture accommodating the passage therethrough of



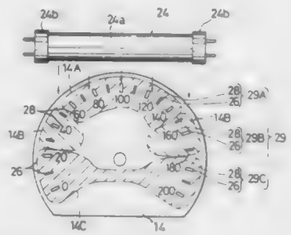
said terminal portion with the body reversely turned on itself and said indents defining a seated position for said body within said aperture, the terminal portion permitting the indents to deform to enable the terminal portion to be retracted through the aperture in response to a displacement force being exerted thereon.

4,991,537

INDICATOR

Masahiro Muramatsu, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Feb. 1, 1989, Ser. No. 304,836
Claims priority, application Japan, Feb. 3, 1988, 63-12513
Int. Cl.[5] G01D *11/28*
U.S. Cl. 116—286 5 Claims



1. An indicator, comprising:

a scale plate having a pointer rotatably mounted thereon;

indicia provided on said scale plate and containing fluorescent brightener therein, said indicia indicating a specific value in cooperation with said pointer;

a single ultraviolet light source for illuminating said indicia; and

means for equalizing the brightness of said indicia when said indicia are illuminated by said single ultraviolet light source, the equalizing means comprising different quantities of the fluorescent brightener contained in the indicia, in which the indicia located on the scale plate far from the ultraviolet light source have a larger quantity of the fluorescent brightener than the indicia located near the ultraviolet source.

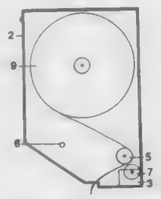
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,538

TOWEL COATER AND DISPENSER

Orville H. Davids, 3229 Beneva Rd.-103, Sarasota, Fla. 34232, and Harold R. Holding, 4306 34th East, Brandenton, Fla. 34206

Continuation-in-part of Ser. No. 204,028, Jun. 8, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,458
Int. Cl.[5] B05C *1/12*
U.S. Cl. 118—231 1 Claim



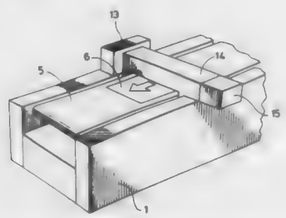
1. A device for dispensing a web of absorbent material and coating said material, comprising: A housing having a bottom and a support means being mounted in said housing, a second roll in said support means rotatively mounted such that said second roll is movable away from and towards a coating roll mounted in a coating chamber at the bottom of said housing, the material being engaged between the coating roll and said second roll when said support means has a position in said housing such that the second roll is at the nearest position to the coating roll that it is capable of occupying.

4,991,539

MICROWAVE UNIT FOR THERMOGRAPHIC PRINTING

Jean L. Sarda, 25, Rue Pradier, 75019 Paris, France

Continuation of Ser. No. 76,137, Jul. 21, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,514
Claims priority, application France, Jul. 28, 1986, 861877
Int. Cl.[5] B05C *1/16*
U.S. Cl. 118—668 2 Claims



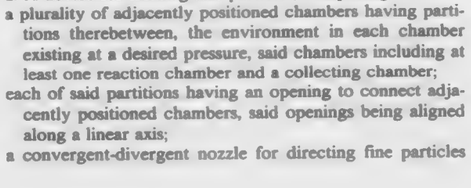
1. An apparatus for producing relief printing, comprising in combination:
- a printing press for printing images on printed matter with a liquid ink;
- conveyor means including a conveyor belt for conveying the printed matter on the belt from the printing press while ink on the printed matter is still wet;
- powdering means including a trough mounted over the conveyor belt for distributing a thermographic powder from the trough onto the wet ink on the printed matter and for sucking away from the printed matter and recycling excess powder;
- microwave means including a microwave generator and a wave guide for applying microwave energy to the powder contained on the printed matter for melting the powder, the wave guide being mounted over the belt;
- cooling means including a tunnel mounted over the belt and a fan for discharging air onto the printed matter to cool the powder after it has melted; and
- means for sensing the presence of printed matter under the wave guide, and for automatically reducing the transmission of powder from the microwave generator in the absence of printed matter.

4,991,540

QUARTZ-GLASS REACTOR FOR MOCVD SYSTEMS

Holger Jürgensen, and Meino Heyen, both of Aachen, Fed. Rep. of Germany, assignors to Aixtron GmbH, Fed. Rep. of Germany

PCT No. PCT/DE88/00397, § 371 Date Feb. 24, 1989, § 102(e) Date Feb. 24, 1989, PCT Pub. No. WO89/00212, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 30, 1988, Ser. No. 334,109
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721636
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—715 11 Claims



1. A reactor for MOCVD systems consisting essentially of:
- a reaction vessel through which reactant gas or gases flow and in which substrates are arranged in such a manner that a main surface is approximately parallel to the flow direction, said reaction vessel being made of quartz-glass and having a rectangular cross-section in the region in which the reactant gas flows and a flange element provided at a gas-entrance-side end of the reaction vessel, said reaction vessel having a round cross-section at the flange element, said round cross-section continuously widening in the flow direction to said rectangular cross-section;
- a protective tube surrounding said reaction vessel, said protective tube having a face-end reactant gas inlet and a flange element connected with the reactant gas inlet, said flange element of the protective tube being flanged with said flange element of the reaction vessel, said protective tube also having on its superficies a protective gas inlet and a reactant gas outlet which permits purging the space between said reaction vessel and said protective tube;
- means for deflecting the reactant gases in the reaction vessel to exit through the superficies of the reaction vessel; and
- a diffusion barrier provided at the end of the reaction vessel opposite the gas-entrance-side end of the reaction vessel.

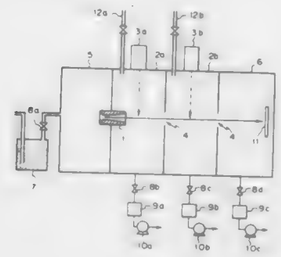
4,991,541

DEVICE AND PROCESS FOR TREATING FINE PARTICLES

Hiroyuki Sugata; Masao Sugata, both of Yokohama; Noriko Kurihara, Kawasaki; Tohru Den, Tokyo; Kenji Ando, Kawasaki, and Osamu Kamiya, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 99,749, Sep. 22, 1987, abandoned. This application Nov. 30, 1989, Ser. No. 443,862
Claims priority, application Japan, Sep. 25, 1986, 61-224929
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—716 12 Claims

1. A device for treating fine particles, comprising:
- a plurality of adjacently positioned chambers having partitions therebetween, the environment in each chamber existing at a desired pressure, said chambers including at least one reaction chamber and a collecting chamber;
- each of said partitions having an opening to connect adjacently positioned chambers, said openings being aligned along a linear axis;
- a convergent-divergent nozzle for directing fine particles under pressure through said openings along said linear axis such that said fine particles may be acted upon in one of said reaction chambers by chemical treatment therein and be directed to said collecting chamber;
- means for adjusting the pressure under which said fine particles are directed through said nozzle relative to the pressures of each of said chambers such that said fine particles are projected from said nozzle in a beam having a substantially consistent cross-section in each of said chambers; and
- means for adjusting the pressures of each of said chambers relative to one another such that the pressures of adjacently positioned chambers are substantially equal.

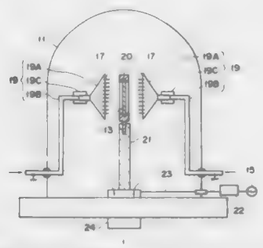


4,991,542

METHOD OF FORMING A THIN FILM BY PLASMA CVD AND APAPRATUS FOR FORMING A THIN FILM

Yukio Kohmura, Chiba; Yoshinori Ishida, Ichihara, and Takuya Nishimoto, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/01043, § 371 Date Jun. 12, 1989, § 102(e) Date Jun. 12, 1989
PCT Filed Oct. 14, 1988, Ser. No. 368,312
Claims priority, application Japan, Oct. 14, 1987, 62-257429; Oct. 14, 1987, 62-257430; Nov. 17, 1987, 62-288325; Dec. 22, 1987, 62-194548[U]; Dec. 23, 1987, 62-325748
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 5 Claims



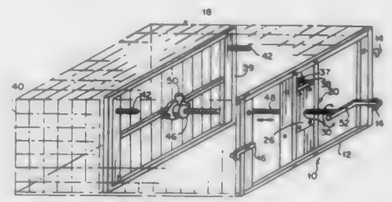
4. An apparatus for forming a thin film by plasma CVD comprising:
- feed-gas supplying electrodes disposed facing each other in a predetermined spacing in a vacuum reaction chamber;
- feed-gas supplying means connected to said feed-gas supplying electrodes;
- supporting means for supporting an object to be processed in a predetermined position between said feed-gas supplying electrodes;
- high frequency electric power supplying means for supplying a high frequency electric power to said object to be processed while said feed-gas supplying electrodes are being grounded; and
- an annular outer work holder provided with a uniformly thin portion having substantially the same thickness as that of said object to be processed and abutting against an outer surface thereof, said outer work holder being adapted to hold said object to be processed such that both faces of said object to be processed are exposed.

4,991,543

ANIMAL SQUEEZER CAGE CONVERTER

Mark Silberman, 4570 Bissonnet, Bellaire, Tex. 77401

Filed Apr. 17, 1989, Ser. No. 339,606
Int. Cl.[5] A61D *3/00*; A01K *15/04*
U.S. Cl. 119—17 3 Claims



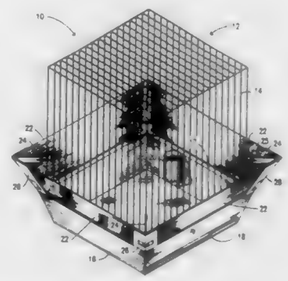
1. An animal squeezer cage converter used with and comprising:
- (a) an inner push rack which fits into and can slide towards and away from rear wall of the cage;
- (b) an outer cage door frame which hinges and locks into place on the cage;
- (c) means for releasably attaching said push rack to the rear of said cage door frame; and
- (d) means for adjustably locking and releasing said push rack between said cage door frame and rear wall of the cage to restrain an animal therein, wherein said releasably attaching means includes a plurality of post fasteners which extend through said push rack and said cage door frame and a plurality of captivating devices that can be unconnected and reconnected as said push rack is used.

4,991,544

SEED GUARD FOR BIRD CAGES

David Galvin, 1176 Friar Tuck La., Dunedin, Fla. 34698; Tom Williamson, 1071 Lexington Ct., Largo, Fla. 34641, and John S. TenBarge, Clearwater, Fla., assignors to David Galvin, Largo and Tom Williamson, Dunedin, both of, Fla.

Filed Jul. 31, 1990, Ser. No. 562,304
Int. Cl.[5] A01K *31/06*
U.S. Cl. 119—17 11 Claims



1. A seed guard assembly for a bird cage, comprising:
- at least a pair of corner members;
- each of said corner members adapted to releasably engage a corner bar of a bird cage at vertically spaced apart locations thereon;
- at least one elongate, flat sheet of cuttable material;
- each of said corner members adapted to releasably engage opposite ends of said at least one flat sheet;

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whereby a pair of corner members are engaged to adjacent corner bars of a bird cage and said flat sheet of material is cut to size and positioned in interconnecting relation therebetween to form a barrier that prevents seeds and hulls from being thrown from said cage.

4,991,545

STEAM GENERATOR FOR COOKING EQUIPMENT HAVING A DECALCIFICATION MEANS

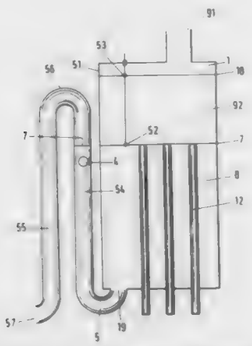
Hermann Rabe, Ahornallee 18, D8910 Landsberg/Lech; Jaroslav Klouda, Livry-Gargan-Str. 13/7, D8080 Fuerstenfeldbruck; Ladislav Lafuntal, Schlossstr. 69, D8031 Esting, and Siegfried Meister, Siemensstr 2, 8910 Landsberg/Lech, all of Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 481,602

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1989, 8901904

Int. Cl.[5] F22B *37/54*; F28G *9/00*

U.S. Cl. 122—382 **12 Claims**



1. In a steam generator for cooking equipment, particularly for table-top or footed equipment for gastronomy, industrial kitchens or the like working in combination with hot air and hot steam, said generator comprising a water-filled boiler having an automatic, level-regulated water admission, a steam discharge for automatic introduction of hot steam into the cooking chamber of the cooking equipment as needed, said generator having heating means operating at intervals, and having decalcification means for removing lime particles from the boiler including water drain means arranged close to the floor and to the side wall of the boiler for, as needed, at least partial emptying of the boiler for the purpose of flushing out lime particles that have flaked off and collect at the floor of the boiler, the improvements comprising the water drain means having first means for generating a flow in the steam generator that automatically kicks in at preferably adjustable intervals dependent on the operating duration and/or operating temperature of the heating means, said first means supplying the water to an elimination device.

4,991,546

COOLING DEVICE FOR BOAT ENGINE

Tsuyoshi Yoshimura, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

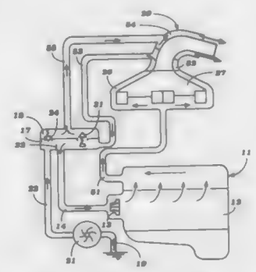
Filed Jun. 30, 1989, Ser. No. 374,282

Claims priority, application Japan, Jul. 5, 1988, 63-165838

Int. Cl.[5] F01P *7/16*

U.S. Cl. 123—41.31 **8 Claims**

1. In a cooling system for a watercraft internal combustion engine, said engine having a cooling jacket having an inlet and an outlet, an exhaust system for said engine comprises of an exhaust manifold having an exhaust inlet end communicating with an exhaust port of said engine and an exhaust discharge end for discharging exhaust gases to an exhaust inlet end of an exhaust elbow, said exhaust elbow having an exhaust outlet and for discharging exhaust gases to the atmosphere, said exhaust manifold further being provided with a cooling jacket having a coolant inlet in proximity to said exhaust inlet end and a coolant outlet spaced from said exhaust inlet end and in proximity to said exhaust discharge end, the improvement comprising means for circulating coolant only from said engine cooling jacket outlet to said exhaust manifold cooling jacket coolant inlet for delivering only heated coolant to said exhaust



manifold cooling jacket, said exhaust elbow having a cooling jacket surrounding the inlet end of said exhaust elbow and having a coolant inlet and a coolant outlet, means for circulating coolant from said exhaust manifold cooling jacket coolant outlet to said first exhaust elbow cooling jacket coolant inlet and from said first exhaust elbow cooling jacket outlet, back to said engine cooling jacket inlet, and a further cooling jacket surrounding the discharge end of said exhaust elbow adapted to receive coolant and adapted to discharge the coolant into the exhaust gases discharged from said exhaust elbow.

4,991,547

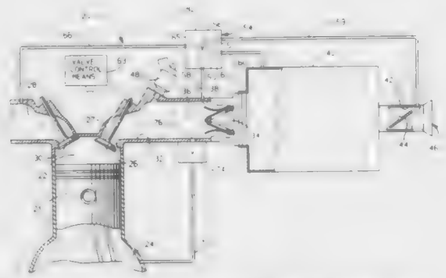
INTAKE PORT PRESSURE CONTROL SYSTEM FOR ENGINE INDUCTION SYSTEM

Richard S. Davis, Romeo; Glen R. Mac Farlane, Clarkston, and Ko-Jen Wu, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1990, Ser. No. 534,986

Int. Cl.[5] F02M *35/10*

U.S. Cl. 123—52 MF **6 Claims**



1. An intake port pressure control system comprising:
an intake passage leading to a cylinder in an engine;
a check valve in said intake passage allowing fluid flow toward the cylinder and obstructing fluid back-flow in the reverse direction;
an intake valve seated in said intake passage between said check valve and the cylinder;
a bypass port located on said intake passage so that said bypass port communicates with a trapped volume defined by the portion of said intake passage between said check valve and said intake valve; and
a control valve means having an outlet passage, a secondary

passage, and an actuating means enabling communication between said outlet passage and said secondary passage, said actuating means further enabling active adjustment of the flow area of the flowpath between said secondary passage and outlet passage throughout a range of engine operating conditions, said outlet passage being connected to said bypass port enabling communication between said outlet passage and trapped volume, said secondary passage being connected to a secondary air source allowing communication therebetween, said control valve means enabling a controlled air flow through it between the secondary air source and said trapped volume when said intake valve is closed.

4,991,548

COMPACT VALVE ACTUATOR

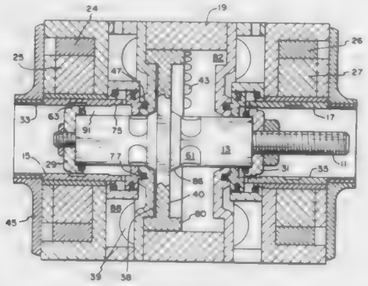
William E. Richeson, and Frederick L. ERickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 6, 1989, Ser. No. 295,178

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] F01L *9/02*

U.S. Cl. 123—90.14 **3 Claims**



1. A pneumatically powered valve actuator comprising a valve actuator housing; a main piston reciprocable within the housing along an axis, the main piston having a pair of oppositely facing primary working surfaces; a pair of air control valves reciprocable along said axis relative to both the housing and the main piston between open and closed positions; a substantially constant high pressure air source located closely adjacent each of the air control valves; means for selectively opening one of said air control valves to supply pressurized air from the constant pressure air source to one of said primary working surfaces causing the main piston to move without significant depletion of the air pressure within the source.

4,991,549

CAMSHAFT LUBRICATING SYSTEM FOR ENGINE

Yoshiaki Sugiura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

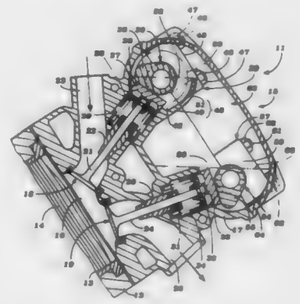
Filed Dec. 8, 1989, Ser. No. 447,632

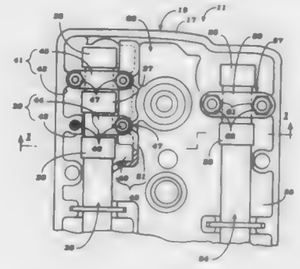
Int. Cl.[5] F01L *9/02*

U.S. Cl. 123—90.27 **11 Claims**

1. A cylinder head arrangement for an internal combustion engine wherein the cylinder head is disposed at an inclined angle and having first and second camshafts journaled for rotation relative to said cylinder head for operating poppet valves reciprocating in said cylinder head, means for delivering lubricant to said cylinder head for lubricating said camshafts, and means for forming a lubricant dam to trap and retain a volume of lubricant in contact with said camshafts and at least partially submerging said camshafts when said means for delivering lubricant ceases to deliver lubricant.

11. A cylinder head arrangement for an internal combustion engine having first and second camshafts journaled for rotation relative to said cylinder head for operating poppet valves reciprocating in said cylinder head, means for journaling said first and said second camshafts comprising respective first and second sets of bearing caps each associated with the respective of said first and said second camshafts, a first series of threaded fastening means for affixing said first series of bearing caps to said cylinder head, and a second series of threaded fastenings





means for affixing said second series of bearing caps to said cylinder head, the number of bearing caps in said first series being greater than the number of bearings caps in said second series, the threaded fastening means of said first series having a smaller effective diameter than the threaded fastening means of said second series.

4,991,550

OIL PRESSURE RUSH ADJUSTER OF A DIRECTLY ACTING TYPE

Akihiko Hosaka, Tokyo, Japan, assignor to Nittan Valve Co., Ltd., Tokyo, Japan

Filed May 31, 1990, Ser. No. 531,038

Claims priority, application Japan, Jun. 2, 1989, 1-139326

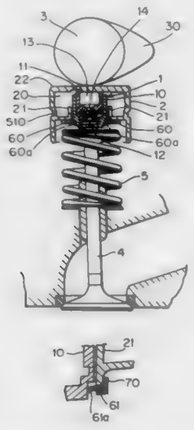
Int. Cl.[5] F01L *1/24*

U.S. Cl. 123—90.55 **5 Claims**

1. In an oil pressure rush adjuster of a directly-acting type for an engine with a cylinder head, comprising a bucket having an interior partitioning wall bounding a sub-reservoir in said bucket, an oil pressure unit mounted slidably in and bounded by said partitioning wall in said bucket, said oil pressure unit being provided with a main reservoir connectable with said sub-reservoir, said sub-reservoir surrounding said oil pressure unit in said bucket supplying oil fed from said cylinder head to said main reservoir, said oil pressure unit having an outer circumference, the improvement comprising a sealing device provided on said outer circumference of said oil pressure unit so as to provide a seal between said partitioning wall and said

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outer circumference of said oil pressure unit when said engine is stopped and so as to allow a portion of said oil to leak between said partitioning wall and said oil pressure unit when said engine is operated.

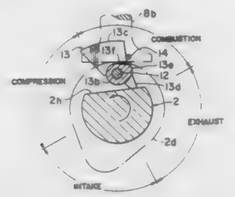


4,991,551

APPARATUS FOR PREVENTING REVERSE ROTATION OF AN ENGINE

Masahiro Terai; Yasuyo Hisano; Katsuhiro Eda, and Kazuto Shimada, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 414,206
Claims priority, application Japan, Oct. 7, 1988, 63-253260
Int. Cl.[5] F01L 13/08
U.S. Cl. 123—198 D 2 Claims



1. An apparatus for preventing reverse rotation of an engine having an intake valve for inducing air/fuel mixture into a cylinder of said engine, an exhaust valve for discharging exhaust gas from said cylinder, a cam shaft driven by a crank shaft through gears, and the apparatus having valve actuating means engaged with a cam formed on said cam shaft, an improvement of the apparatus which comprises:

a release lever mounted on a groove of said cam shaft for releasing said intake valve when said crank shaft rotates in a reverse direction;

a cam lobe formed on said release lever to actuate said valve actuating means;

a stopper provided on said release lever to contact said groove when said crank shaft rotates in a right direction;

a weight connected to said release lever to turn said release lever by centrifugal force thereof without releasing said intake valve and for abutting said stopper to said groove when said crank shaft rotates in said right direction; and

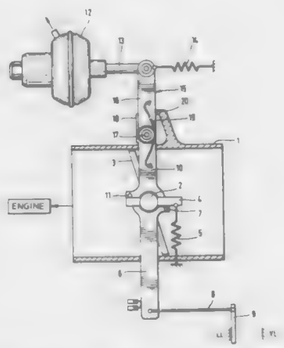
elastic means for urging said weight to resist said centrifugal force and for lifting said valve actuating means to open said intake valve so as to stop said engine when said crank shaft rotates in said reverse direction.

4,991,552

THROTTLE VALVE SETTING DEVICE

Jürgen Luft, Bad Soden, and Erwin Schneider, Liederbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 23, 1990, Ser. No. 485,093
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, 3910661; Apr. 5, 1989, 3910948; May 19, 1989, 3916296
Int. Cl.[5] F02D 7/00
U.S. Cl. 123—401 8 Claims



1. A throttle-valve setting device operative in response to the position of an accelerator pedal, the setting device comprising;

a throttle valve setting lever which is connected to an accelerator pedal;

a throttle valve arranged, fixed for rotation, on a throttle valve shaft, and actuated by said setting lever;

a return spring;

a setting motor operating exclusively in the opening direction of the throttle valve against a force of said return spring in order to permit idling adjustment;

a setting member displaceable by said setting motor; in a first direction and displaceable by said return spring in a second direction opposite said first direction

a movement-reversal device which mechanically interconnects said setting member and said setting lever to provide for actuation of the throttle valve by said setting motor, said movement-reversal device switching as a function of a distance of movement of said setting member; and

wherein upon a displacement of the setting member by said return spring, the throttle valve first swings in the closing direction and then, upon further displacement of the setting member, in the opposite direction.

4,991,553

ENGINE CONTROLLER EQUIPPED WITH KNOCKING DETECTOR

Nobuo Kurihara, Hitachioota; Masayoshi Kaneyasu, and Kouji Kitano, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

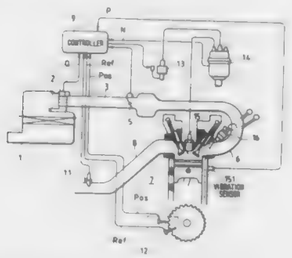
Filed Apr. 13, 1990, Ser. No. 508,657
Claims priority, application Japan, Apr. 14, 1989, 1-92864
Int. Cl.[5] F02P 5/15
U.S. Cl. 123—425 14 Claims

1. An engine controller equipped with a device for judging occurrence of knocking of the engine, comprising:

a sensor for sampling an internal pressure vibration generated in a cylinder of the engine;

a knocking detector for judging the occurrence of knocking by extracting at least two frequencies contained in an output from said sensor, deriving a knocking judgement index based on the two extracted frequencies and comparing the knocking judgement index with a threshold value; and

a controller for controlling ignition timing of the engine based on an output from the knocking detector.

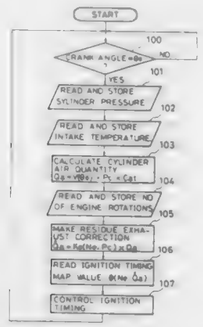


4,991,554

DEVICE FOR CONTROLLING IGNITION TIMING OF ENGINE

Seiji Wataya, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,429
Claims priority, application Japan, Jan. 20, 1989, 1-12936
Int. Cl.[5] F02P 5/15
U.S. Cl. 123—425 5 Claims



1. A device for controlling an engine ignition timing, comprising:

a cylinder pressure sensor mounted on each cylinder of a multiple cylinder engine;

a crank angle sensor for detecting a crank angle;

an intake air temperature sensor for detecting a temperature of intake air in an intake passage;

pressure storage means for reading and storing a cylinder pressure outputted from said cylinder pressure sensor whenever an output signal of said crank angle sensor reaches a predetermined crank angle in a compression cycle;

load calculation means for calculating an engine load based on said cylinder pressure and said intake air temperature as primary parameters; and

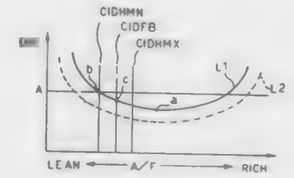
ignition timing means for determining ignition timing based on the number of engine rotations and said engine load for a cylinder to be ignited next or for the next cycle of ignition in its own cylinder.

4,991,555

AIR-FUEL RATIO CONTROL SYSTEM FOR AUTOMOTIVE ENGINE

Masaaki Tamekio, Hatsukaichi, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 14, 1990, Ser. No. 479,431
Claims priority, application Japan, Feb. 14, 1989, 1-32660
Int. Cl.[5] F02D 33/00; F02M 7/00
U.S. Cl. 123—436 7 Claims



1. A air-fuel control system for an automotive engine for controlling an air-fuel ratio at which fuel is delivered to the automotive engine to a desirable lean air-fuel ratio so as to maintain the automotive engine to operate with a predetermined degree of instability less than an allowable limit of instability, said air-fuel ratio control system comprising:

leanest air-fuel ratio detecting means for detecting the leanest air-fuel ratio at which said automotive engine operates with said predetermined degree of instability;

eventual air-fuel ratio setting means for setting said desirable lean air-fuel ratio to an air-fuel ratio shifted by a predetermined value from said leanest air-fuel ratio toward a rich side of air-fuel ratio; and

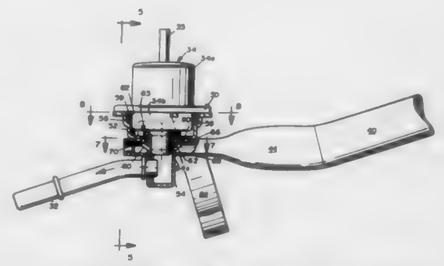
guard value setting means for setting a lower guard value of air-fuel ratio to an air-fuel ratio shifted by a predetermined value from said desirable lean air-fuel ratio toward a lean side of air-fuel ratio.

4,991,556

AUTOMOTIVE FUEL RAIL ASSEMBLIES WITH INTEGRAL MEANS FOR MOUNTING FUEL REGULATOR

Randall M. Mahnke, Newport News, and Michael J. Horaby, Yorktown, both of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Sep. 28, 1988, Ser. No. 250,056
Int. Cl.[5] F02M 39/00
U.S. Cl. 123—463 35 Claims



1. A fuel rail assembly for supplying pressurized fuel to injectors of an internal combustion engine comprising:

an elongate rigid fuel conduit defining a central passageway for providing an available standby source of pressurized fuel, and including means providing fluid communication to a number of fuel injectors so that some of said available

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standby source of pressurized fuel may be supplied thereto;

a fuel pressure regulator having a housing which defines an interior chamber and including a movable diaphragm which separates said interior chamber into high and low pressure subchambers;

said fuel conduit including a mounting section, and means defining a recess in said mounting section for accepting a lower region of said regulator housing therein;

said recess defining means also establishing an annular chamber with said lower regulator housing region which is in fluid communication with said central passageway of said fuel conduit;

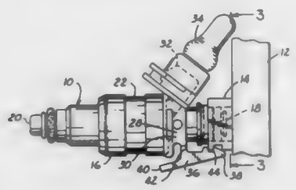
said lower regulator region defining at least one aperture which establishes fluid communication between said established annular chamber and said high pressure subchamber so that pressurized fuel may flow into said high pressure subchamber from said central passageway via said established annular chamber, whereby the pressure of said fuel may be regulated.

4,991,557

SELF-ATTACHING ELECTROMAGNETIC FUEL INJECTOR

Louis G. DeGrace, Newport News, and James A. Wynn, Jr., Virginia Beach, both of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Aug. 21, 1989, Ser. No. 396,592
Int. Cl.[5] F02M *39/00*; B05B *1/14*
U.S. Cl. 123—470 10 Claims



1. In an electromagnetic fuel injector comprising a body, a liquid fuel inlet in said body at which pressurized fuel is introduced to the injector, a flow path from said inlet through said body leading to a fuel outlet at which fuel is emitted from the injector, a solenoid coil that controls the flow of fuel through said flow path, electrical terminal means via which said solenoid coil is energized, and electrical insulating material disposed on said body to form a body-engaging portion and a terminal-means-surrounding portion, the improvement for rendering the injector self-attaching which comprises an attaching clip of said electrical insulating material that is integral with said body-engaging and said terminal-means-surrounding portions and that is resiliently pivotally supported on said body-engaging portion, said clip providing for the self-retention of the fuel injector on a portion of the fuel injection system that supplies fuel to the injector.

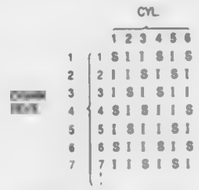
4,991,558

IDLE AND OFF-IDLE OPERATION OF A TWO-STROKE FUEL-INJECTED MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Paul D. Daly, Troy; Douglas R. Verner; Mark A. Brooks, both of Sterling Heights, and Robert E. Fallis, Milford, all of Mich., assignors to Siemens Automotive L.P., Troy, Mich.

Filed Jan. 3, 1989, Ser. No. 461,557
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—481 16 Claims

1. In a multiple-cylinder, two-stroke, fuel-injected internal combustion engine, means for operating the engine at idle which comprises means for interrupting the fuel injection stages in a predetermined pattern such that over a certain number of engine crankshaft revolutions a fewer number of injection stages occur than over the same number of engine crankshaft revolutions during non-idle operation, and means



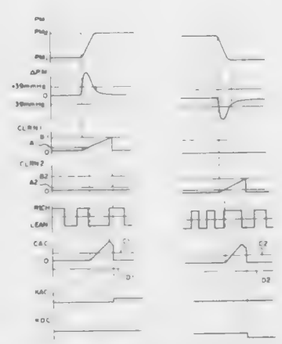
for increasing the quantity of fuel injected per injection stage relative to the quantity of fuel required per injection stage to secure idle operation without any injection interruptions.

4,991,559

FUEL INJECTION CONTROL DEVICE OF AN ENGINE

Kouichi Osawa; Hiroshi Kanai; Kouichi Hoshi; Hiroki Matsuoka, all of Susono; Michihiro Ohashi, Mishima; Yukihiro Sonoda, Susono; Hiroshi Sawada, Gotenba; Shinichi Matsumoto, Susono; Kiyoshi Asada, Okazaki; Hidehiro Oba, Aichi; Sinji Kato, Toyota; Katsushi Anzai, Toyota, and Ryouichi Harada, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 23, 1990, Ser. No. 468,902
Claims priority, application Japan, Jan. 24, 1989, 1-13300; Jan. 27, 1989, 1-16344; Jan. 27, 1989, 1-16348; Apr. 3, 1989, 1-81524
Int. Cl.[5] F02D *41/14, 41/10, 41/12*
U.S. Cl. 123—489 37 Claims



1. A fuel injection control device of an engine having an intake passage and an exhaust passage, said device comprising:

an oxygen concentration detector arranged in the exhaust passage and producing an output signal indicating whether an air-fuel mixture fed into the engine is lean or rich;

feedback control means for controlling an amount of fuel fed into the engine in response to the output signal of said oxygen concentration detector, to bring an air-fuel ratio of the mixture to a desired air-fuel ratio;

acceleration detecting means for detecting an accelerating operation of the engine;

fuel increasing means for increasing the amount of fuel fed into the engine when the accelerating operation of the engine is carried out;

time calculating means for calculating a lean time and a rich time of the air-fuel mixture on the basis of the output signal of said oxygen concentration detector during a predetermined lean-rich discriminating time when the accelerating operation of the engine is carried out, said lean-rich discriminating time being an integral number of times of a time of the occurrence of either one of said lean time and said rich time when the air-fuel ratio of mixture is maintained at the desired air-fuel ratio due to an increase in the amount of fuel by said fuel increasing means;

difference calculating means for calculating a difference between said lean time and said rich time; and

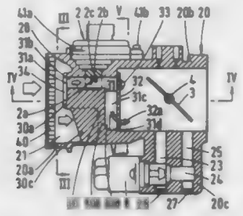
correction means for correcting an increase in the amount of fuel, which increase is caused by said fuel increasing means, to increase said increase in the amount of fuel when said lean time is longer than said rich time and when said difference is larger than a predetermined value, and to reduce said increase in the amount of fuel when said rich time is longer than said lean time and when said difference is larger than a predetermined value.

4,991,560

HOT-WIRE AIR FLOW METER AND INTERNAL COMBUSTION ENGINE PROVIDED WITH SAME

Nobukatsu Arai, Tsuchiura; Toshifumi Usui, Katsuta; Tetsuo Matsukura, Katsuta; Shinya Igarashi, Katsuta, and Youichi Furuhashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1990, Ser. No. 487,611
Claims priority, application Japan, Mar. 7, 1989, 1-054182
Int. Cl.[5] G02M *51/00*; G01F *1/68*; G01M *19/00*; G01P *5/12*
U.S. Cl. 123—494 23 Claims



1. A hot-wire air flow meter for detecting air flow intake includes a main passage, a sub-passage bypassing said main passage, a hot-wire element located in said sub-passage for detecting said air flow intake, and a dished member upstream from an inlet of said sub-passage, said dished member having a base portion adjacent said sub-passage inlet and an upstream projecting edge extending from said base portion, said projecting edge at least partially surrounding said inlet and being located between said inlet said main passage, whereby said dished member tends to stabilise air flow entering said sub-passage by said inlet.

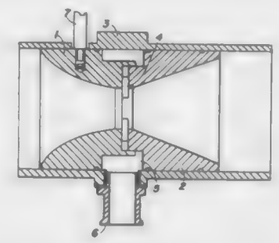
4,991,561

GAS-AIR MIXER

Milen B. Gerassimov; Stojtscho Dimitrov, and Zonjo I. Petkov, all of Ruse, Bulgaria, assignors to N I S pri VTU "Angel Kantschev", Ruse, Bulgaria

Filed Feb. 2, 1990, Ser. No. 473,774
Int. Cl.[5] F02B *43/00*
U.S. Cl. 123—527 2 Claims

1. An improved gas-air mixer for an internal combustion engine, comprising in combination, an inlet and an outlet diffusor coaxially arranged with respect to each other, and a collar member which includes a cylindrical surface formed between the inlet and outlet diffusor, said inlet and outlet diffusors and collar member jointly defining feeding channels means terminating at the outer side of the diffusors in a concentrically shaped annular channel which is connected to supply conduit means for gaseous fuel, said inlet diffusor and said outlet diffusor are constructed as separate bushings, whereby said outlet diffusor is fixedly mounted in said collar member and said inlet diffusor is movably mounted in said collar member around its axis by means of a control lever, said inlet diffusor and said outlet diffusor are seated and packed in said collar member one against the other, along an inner cylindrical surface formed by one of said diffusors and an outer cylindrical surface formed by another one of said diffusors, said inner and outer cylindrical



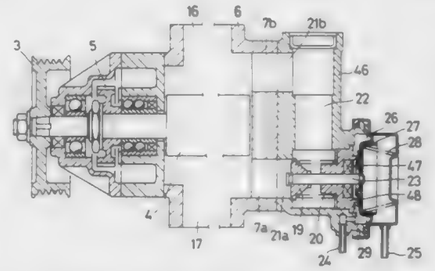
surfaces having cut radial slots which at least partially form said feeding channels means for gaseous fuel having an adjustable cross-section which depends on the angle of rotation of the inlet diffusor around its axis at different operating regimes of said engine.

4,991,562

MECHANICAL SUPERCHARGER SYSTEM

Masaki Chujo, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 25, 1989, Ser. No. 412,177
Claims priority, application Japan, Sep. 28, 1988, 63-126699
Int. Cl.[5] F02D *23/00*
U.S. Cl. 123—564 3 Claims



1. A mechanical supercharger comprising:

a supercharger housing defining a working volume and having an inlet and an outlet;

compressing means in said working volume and comprising means for compressing a gas between said inlet and said outlet; and

by-pass means for selectively by-passing a compressed gas from said outlet back to said inlet, comprising:

(a) a valve body unitarily fixed to said supercharger housing as a single body and having a by-pass passage fluidically connected between said outlet and said inlet for permitting compressed gas to flow from said outlet to said inlet,

(b) a normally closed valve in said valve body for closing the fluid communication between said outlet and said inlet via said by-pass passage,

(c) diaphragm means for selectively opening said valve so as to open said by-pass passage,

(d) spring means for biasing said valve in the normally closed position, whereby said valve opens independently of said diaphragm when an opening force on said valve due to a pressure of said compressed gas at said outlet exceeds a closing force of said spring means, and

(e) a headed shaft fixed to said diaphragm, said valve being

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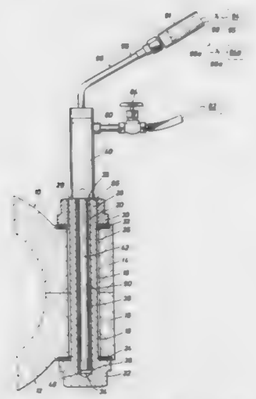
freely slidably mounted on said shaft, whereby said valve slides on said shaft to open when the opening force exceeds the closing force of said spring means, and whereby said valve opens when said diaphragm retracts said shaft such that said valve is engaged by the head of said shaft.

4,991,563

APPARATUS AND METHOD FOR HEATING HOLLOW BOLTS

Royce C. Ashley, P.O. Box 10, Deer Park, Tex. 77536

Filed Jun. 6, 1989, Ser. No. 362,053
Int. Cl.[5] F24C *3/02*; B23P *11/02*
U.S. Cl. 126—401 4 Claims



1. Apparatus for thermally expanding a hollow bolt extending through aligned openings in a pair of mating flanges, the hollow bolt having at least one nut rotatably mounted adjacent one flange, said apparatus comprising:

a generally cylindrical support body having a central bore therethrough defining a small diameter intermediate bore portion and an enlarged diameter inner end bore portion for positioning on the extending end portion of said bolt in axial alignment therewith with the bore of the body being in fluid communication with the bore of said bolt and forming a continuation thereof;

a tubular fluid transmitting and heat transfer conduit secured to said body within said enlarged diameter end bore portion and defining an annular chamber between said conduit and said body having a vent to atmosphere, said tubular conduit extending within the bore of said hollow bolt for a major portion of the length of said bolt bore and defining an annular space between the conduit and the bolt;

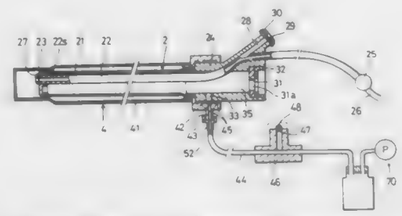
the outer end of said body bore adapted to receive a conventional tip of a heating torch to provide a heated fluid therein for flow in one direction through said conduit and discharge from the end of said conduit, said heated fluid and conduit heating said bolt to a predetermined high temperature whereby said bolt is tensioned a predetermined amount by rotation of a nut on said externally threaded end portion to provide a predetermined stress on said bolt.

4,991,564

SHEATH DEVICE FOR ENDOSCOPE

Nagashige Takahashi, and Teruo Ouchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 547,054
Claims priority, application Japan, Jul. 4, 1989, 1-172698
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 13 Claims



1. A sheath device for an endoscope comprising:

a sheath which is inflatable with a gas that is sent into the inside thereof to cover an insert tube of said endoscope; and

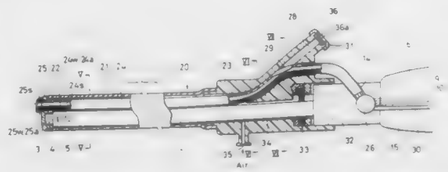
a sheath cover which is formed in the shape of a tube that surrounds said sheath with a space left therebetween to control overinflation of said sheath, a portion of said sheath cover that surrounds the distal end portion of said sheath being tapered toward the distal end of said sheath cover.

4,991,565

SHEATH DEVICE FOR ENDOSCOPE AND FLUID CONDUIT CONNECTING STRUCTURE THEREFOR

Nagashige Takahashi, and Teruo Ouchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 537,984
Claims priority, application Japan, Jun. 26, 1989, 1-163114; Jun. 26, 1989, 1-163115; Jun. 26, 1989, 1-74613[U]
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 25 Claims



1. A sheath device for an endoscope, which is removably fitted over an insert tube of said endoscope to isolate said insert tube from the external environment, comprising:

a sheath which removably covers said insert tube to isolate it from the external environment;

a plurality of channels for passing fluids, each channel having an opening at one end near the distal end portion of said sheath; and

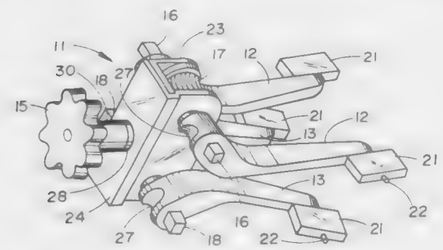
a channel connecting means provided at proximal end portions of said channels near the proximal end portion of said sheath, and capable of simultaneously connecting at least two of said channels to respective conduits in said endoscope.

4,991,566

ARTICULATING MOUTH-PROP DEVICE FOR USE IN THE DIAGNOSIS AND/OR TREATMENT OF PATIENTS SUFFERING FROM TRISMUS OR OTHER MEDICAL OR DENTAL PROBLEMS OR FOR OTHER PURPOSES

David H. Shulman, 2 Hickory Hill Rd., Hunt Valley, Md. 21030; Barry R. Berman, Owings Mills, and Paul Varga, Salisbury, both of Md., assignors to David H. Shulman, Hunt Valley and Barry R. Berman, Owings Mills, both of, Md.

Filed Apr. 25, 1989, Ser. No. 344,068
Int. Cl.[5] A61B *1/32*
U.S. Cl. 128—17 51 Claims



1. A device for dilating and propping open a patient's jaw, said device comprised of:

a housing having a pair of sides;

an upper shaft means mounted on the housing and extending outwardly from both sides of the housing, a lower shaft means mounted on the housing and extending outwardly from both sides of the housing, the upper shaft means being substantially above the lower shaft means;

a pair of upper arms mounted on the upper shaft means and moving conjointly with the upper shaft means, one upper arm being on the one side of the housing and the other upper arm being on the other side of the housing;

a pair of lower arms mounted on the lower shaft means and moving conjointly with the lower shaft means, one lower arm being on the one side of the housing and the other lower arm being on the other side of the housing;

each of said upper arms being positioned substantially above a respective lower arm, each of said arms having a distal end means for contacting the jaw and a proximal end means being pivotably carried by its respective shaft means, said upper and lower shaft means for pivotal movement of the upper and lower arms upwardly and downwardly between open and closed positions, such that in the open position each of the distal end means of the upper arms are spaced apart from the distal end means of the lower arm above which each respective upper arm is positioned, and further such that in the closed position each of the distal end means of the upper arms are substantially adjacent to the distal end means of the lower arm above which each respective upper arm is positioned;

means disposed between the pair of upper arms and the pair of lower arms for pivoting the upper and the lower arms simultaneously towards one another into the closed position for allowing natural closure of the jaw and for pivoting the upper and the lower arms simultaneously away from one another into the open position for dilating and propping open the jaw, such that the distal end means of the arms move substantially arcuately and further such that the spacing between the upper and the lower arms is infinitely variable.

4,991,567

MICRO-IRIS RETRACTOR

Brooks W. McCuen, II, 2807 Montgomery St., Durham, N.C. 27705; Dyson Hickingbotham, 9805 Colt Dr., Bahama, N.C. 27503, and Eugene de Juan, Jr., 2 Roswell Ct., Durham, N.C. 27707

Filed Jan. 16, 1990, Ser. No. 465,334
Int. Cl.[5] A61B *17/02*; A61F *9/002/14*
U.S. Cl. 128—20 9 Claims



1. Apparatus affording pupillary dilation for intraocular surgery, comprising:

a tack for temporarily securing the iris in place during a surgical procedure;

and an applicator, manually adjustable for grasping said tack and for releasing said tack, in the insertion of said tack into position and in its removal, as the case may be;

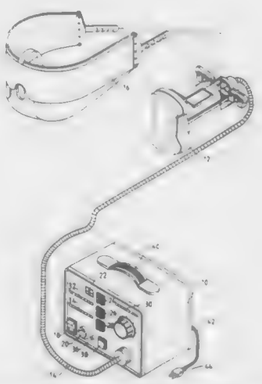
and with said tack having an anterior blade and a bearing projection at a distal end, forming a meridian therebetween in which the iris is held in place when said tack is inserted into position in the eye.

4,991,568

MASSAGE DEVICE

Pin-Hung Lin, Taipei, Taiwan, assignor to Ching-Sung Lin, Taipei Hsien, Taiwan

Filed Apr. 4, 1989, Ser. No. 332,898
Int. Cl.[5] A61H *7/00*, *11/00*
U.S. Cl. 128—64 23 Claims

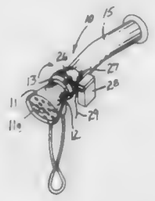


1. A massage device comprising: a massage head unit having a body portion and an enlarged plate carried by the body portion for contacting parts of a user's body being massaged, a massage belt for contacting further parts of a user's body being massaged, whereby the massage belt cooperates with the enlarged plate to substantially surround and embrace a user's body being massaged, reciprocating means carried by the body portion for moving the massage belt in a reciprocating motion, such that the user is massaged, a drive unit including a drive mechanism for producing a reciprocating drive motion and a flexible drive link located between and connected to the drive

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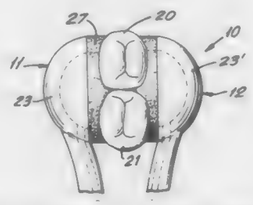
mechanism and the reciprocating means for transmitting the reciprocating drive motion from the drive mechanism to the belt, such that the user's body is massaged thereby.

4,991,569
ORAL HYGIENE SHOWER NOZZLE APPARATUS
Exequiel Martin, 21281 Bristlecone, Mission Viejo, Calif. 92692
Filed Nov. 21, 1988, Ser. No. 274,343
Int. Cl.[5] A61H 9/00
U.S. Cl. 128—66 1 Claim



1. An oral hygiene shower nozzle apparatus for fluid engagement with a water conduit comprising, in combination,
a shower head formed with a forward water discharge plate formed with water openings therethrough and a rear dispersion plate formed with a matrix of first apertures, and
a valve means for selectively directing water flow to said first apertures and rotatably mounted between and adjacent said dispersion plate and a conduit boss, said conduit boss mounted for securement to said water conduit with an oral hygiene tool operatively secured in fluid communication through said conduit boss, and
a conduit valve positioned in said oral hygiene tool, and
wherein said valve means comprises a plate member formed with a matrix of second apertures, ad said second apertures are aligned with said first apertures when said valve means is rotated in a first position, and said second apertures are displaced with and misaligned from said first apertures when said valve means is rotated in a second position to restrict water communication from said second apertures to said first apertures, and
wherein each of said second apertures has formed thereabout an "O" ring means for sealing communication of said first apertures to said second apertures wherein said "O" ring means are of a thickness at least equal to a spacing defined between said valve means and said dispersion plate, and
wherein said oral hygiene tool includes a flexible conduit secured in water communication with said conduit boss at one end and secured to an enlarged grip member at its other end with said conduit valve positioned adjacent said grip member, and
wherein said conduit boss includes an outwardly projecting hook for selective securement of said oral hygiene tool thereto, and
wherein said conduit boss includes a toothpick case integrally secured to said conduit boss and a dental floss case integrally secured to said toothpick case wherein said toothpick case and said dental floss case are integrally secured to the conduit boss diametrically opposed to said oral hygiene tool, and
wherein a plurality of bridge members extend through arcuate slots formed in said valve means to integrally secure said conduit boss and said shower head together and enable rotation of said valve means relative to said conduit boss and shower head.

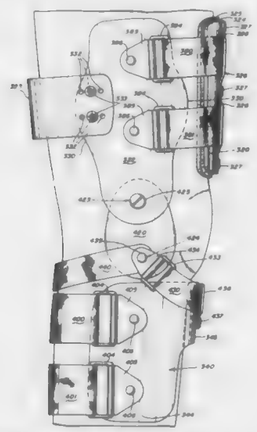
4,991,570
VACUUM TEETH CLEANING SYSTEM AND METHOD
Horace Bullard, 3333 Henry Hudson Pkwy., Riverdale, N.Y. 10463
Filed Jun. 6, 1989, Ser. No. 361,926
Int. Cl.[5] A61H 9/00
U.S. Cl. 128—66 5 Claims



1. A system for cleaning a set of teeth comprising:
(a) vacuum means to create a vacuum;
(b) a source of liquid to be pulled by the vacuum through gaps between the teeth;
(c) a clamp means to removably form an air-tight chamber over at least two teeth; said clamp means comprising a first clamp member to fit on the back of the teeth and a second clamp member fit on the front of the teeth;
(d) a vacuum line leading from the vacuum means to one clamp member;
(e) a liquid line leading from the liquid source to the other clamp member;
(f) control means connected to said vacuum line to intermittently apply vacuum from said vacuum means to said clamp means and to thereby pull liquid from said liquid source around the teeth within said chamber.
wherein each of said clamp members is a cup-like member having a cavity adapted to face said teeth and each includes a plurality of bristles within said cavity, said bristles having free ends adapted to contact said teeth.

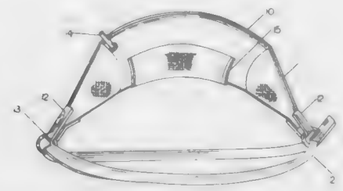
4,991,571
MODULAR KNEE BRACE FOR CONTROL OF LIGAMENT INSTABILITY
James H. Kausek, 31 Stanwood Rd., Swampcott, Mass. 01907
Continuation-in-part of Ser. No. 241,588, Sep. 8, 1988. This application Apr. 26, 1989, Ser. No. 343,861
The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.
Int. Cl.[5] A61F 5/00
U.S. Cl. 128—80 C 8 Claims

1. A modular knee brace comprising:
a thigh restraining means including lateral and medial thigh plates positionable to engage lateral and medial portions of the thigh respectively, and means for securing the lateral and medial thigh plates to the leg, each of the lateral and medial thigh plates being symmetically shaped to permit interchangeable use on left and right knee braces;
a shin restraining means;
a hinge for preventing medial-lateral displacement of the thigh and shin restraining means, the hinge being positionable at the lateral side of the knee and having upper and lower hinge arms and at least one pivot point therebetween;
means for connecting the upper hinge arm to the lateral thigh plate and the lower hinge arm to the shin restraining means;
a medial articulation plate to stabilize the brace positionable to engage the medial side of the knee and symmetically shaped to permit interchangeable use on left and right knee braces;
means for pivotally connecting the medial articulation plate and the medial thigh plate to provide a medial articulation point adjacent the knee from which the plate pivots in a substantially anterior-posterior direction; and
means for connecting the medial articulation plate and the shin restraining means to restrain anterior movement of



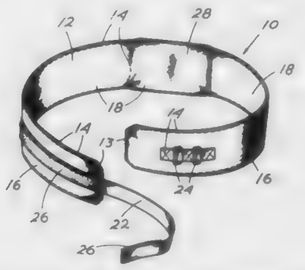
the tibia with respect to the femur, the connecting means including an anterior strap extending from the medial articulation plate to the shin restraining means and a posterior strap extending from the medial articulation plate to the shin restraining means.

4,991,572
LUMBAR TRACTION DEVICE
Ronald L. Chases, 621 Seabright La., Del Mar, Calif. 92075
Filed Oct. 30, 1989, Ser. No. 429,027
Int. Cl.[5] A61F 5/04
U.S. Cl. 128—75 6 Claims



1. An end-to-end inflatable lumbar traction harness for encircling and semi-suspending a patient in a variety of orthopedic positions comfortably while the gravitational pull on the patient's own body releases pressure on the spine for immediate back pain relief wherein the improvement comprises:
(a) a bag shaped as the quarter section of a ring with a circular cross-section;
(b) said bag enclosing an airtight bladder, which completely fills the bag from end-to-end when inflated;
(c) said bag having affixed to it a stop valve to adjust the air pressure around the patient for personalized comfort while in suspension and to let air out of the bladder for lowering the patient into different body positions or into increased or decreased traction;
(d) said bag, when inflated having a smooth, curved inside surface that can be moved along the spine by the patient while in traction to position the harness for maximum pain relief;
(e) said bag having means for pinpointing the traction force and for assisting in opening the spinal segments, said means comprising an isolating seam; and
(f) said bag having hook and loop type fasteners on the inside surface for the attachment of the above means.

4,991,573
ORTHOPEDIC SUPPORT BELT
Donald L. Miller, 16622 NE. 132nd St., Redmond, Wash. 98052
Filed Mar. 26, 1990, Ser. No. 498,695
Int. Cl.[5] A61F 5/02, 5/28, 5/30
U.S. Cl. 128—78 2 Claims



1. An orthopedic support structure for human use, comprising in combination:
an elongated first panel, said first panel being of a flexible generally non-stretchable material, said first panel further being generally porous to provide for a degree of air and moisture movement therethrough;
a pad comprising a generally rigid reinforcing panel generally covered on at least one surface thereof with a resilient padding layer, said pad having narrow side edges and two oppositely disposed wide surfaces, said padding layer having a generally centered groove extending across a surface thereof with the grooved surface being oppositely disposed from said reinforcing panel, the grooved surface of said padding layer being one of said two oppositely disposed wide surfaces of said pad; said pad having a plurality of apertures therethrough, said apertures through said pad extending from one said wide surface through the other said oppositely disposed wide surface of said pad, said apertures adapted to provide for a degree of air movement through said pad;
an elongated second panel, said second panel being of a flexible material sufficiently soft to be generally nonabrasive to human skin, said second panel further being generally porous to provide for a degree of air and moisture movement therethrough, said second panel further being of a said material adapted to absorb moisture from a surface;
said pad placed between said first panel and said second panel with said first panel and said second panel being aligned lengthwise, said pad being placed between two oppositely disposed free ends of said aligned first and second panel, said aligned first panel and said second panel affixed together with said pad therebetween, said pad being affixed between said affixed together first panel and second panel with the grooved surface of said padding layer being adjacent said second panel; said affixment of said first panel to said second panel with said pad therebetween providing a belt having said two oppositely disposed free ends;
attachment means affixed to at least one of said two oppositely free ends of said belt with said attachment means adapted to provide releasable attachment of said two oppositely disposed free ends together;
said belt adapted for affixing about a human torso with said second panel adjacent said human torso and the grooved surface of said padding layer placed adjacent a lumbar area of said human torso, said groove of the grooved surface adapted to provide an area for spine placement when said belt is affixed about said human torso.

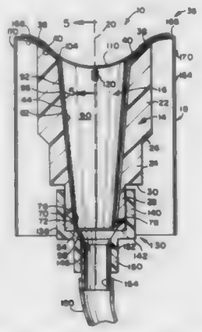
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,574
SURGICAL DRESSING
David Pocknell, Antibes, France, assignor to Dow Corning Corporation, Midland
Continuation of Ser. No. 222,445, Jul. 21, 1988, abandoned. This application Aug. 15, 1990, Ser. No. 568,539
Claims priority, application France, Jul. 22, 1987, 87 10364
Int. Cl.[5] A61L *15/00*
U.S. Cl. 128—156 9 Claims



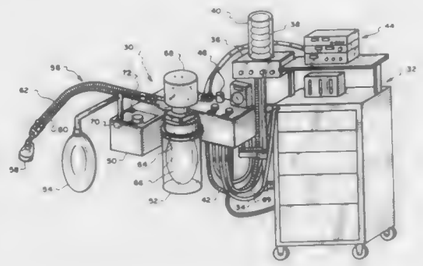
1. A surgical dressing comprising an imperforate sheet of silicone gel having a wound-facing surface and a distal surface and an imperforate film of silicone elastomer substantially coextensively laminated to said distal surface.

4,991,575
DISPOSABLE LINER FOR BREATHING APPARATUS
Edward Fitz, 27 Llanfair Rd., Ardmore, Pa. 19003
Filed Aug. 31, 1989, Ser. No. 401,848
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—202.28 10 Claims



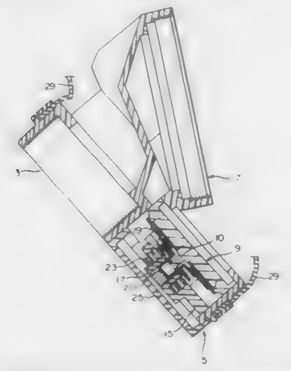
1. A disposable liner for a mouthpiece assembly for a breathing device comprising
a first member, said first member being a hollow frusto-conical member comprised of a generally rigid material, said frusto-conical member having a longitudinal axis,
a second member, said second member being relatively thin and flexible, said second member including a central opening with the portion of said second member surrounding said central opening being for engagement with a patient's lips,
said second member being connected to the larger end of said first member with said central opening lying along the axis of said first member.
the juncture of said first and second members being generally saddle shaped so that said second member is generally curved so as to be yieldably engaged by a patient's lips, and
spacer means connected to said liner, said spacer means being operative to engage a second disposable liner whose first member is telescopically engaged by the first member of said first disposable liner.

4,991,576
ANESTHESIA REBREATHING SYSTEM
Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001
Filed Oct. 11, 1988, Ser. No. 255,372
Int. Cl.[5] A61M *16/00;* A62B *9/02*
U.S. Cl. 128—203.28 102 Claims



1. An anesthesia system for coupling a fresh gas supply means to a patient's airway, said system including:
a single use structural portion including connector body means defining a fresh gas interface port and a patient overflow interface port;
a reusable structural portion including mounting structure means defining a fresh gas interface port and a patient overflow interface port;
means for detachably connecting said connector body means and said mounting structure means for communicating said fresh gas interface ports to one another and said patient overflow interface ports to one another;
said single use portion including:
patient airway communication means;
elongated breathing tube means having a first port coupled to said patient airway communication means and a second port coupled to said single use portion fresh gas interface port;
overflow means having a first end coupled to said breathing tube means and a second end coupled to said single use portion patient overflow interface port; and
patient breathing reservoir means having an entrance opening coupled to said breathing tube means proximate to the second port thereof;
said reusable portion including:
patient valve means having an inlet port coupled to said resuable portion patient overflow interface port; and
control means for establishing the level of pressure at said inlet port for opening said patient valve means;
said control means including:
container means;
means in communication with said container means for varying the pressure therein;
means mounting said patient breathing reservoir means in said container means whereby pressure variations therein will produce corresponding variations in said reservoir means;
said means for detachably connecting said connector body means and said mounting structure means including latching means for automatically latching said connector body means to said mounting structure means when said connector body means is seated on said mounting structure means to functionally mate said fresh gas interface ports to one another and said patient overflow ports to one another;
selectively actuatable unlatching means, said unlatching means being the sole means for unlatching said latching means; and
sensing means for indicating when said connector body means is seated on said mounting structure means.

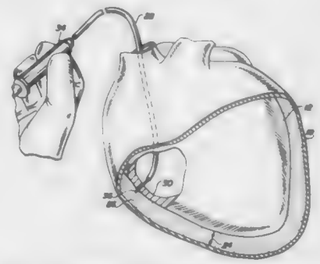
4,991,577
EXHALATION VALVE MEANS OF A RESPIRATION MASK
Nobuo Shigematsu, Urawa, Japan, assignor to Shigematsu Works Co., Ltd., Tokyo, Japan
Filed Sep. 26, 1988, Ser. No. 248,929
Claims priority, application Japan, Jan. 25, 1988, 63-7081
Int. Cl.[5] A62B *18/10, 18/02*
U.S. Cl. 128—207.12 6 Claims



1. An exhalation valve apparatus in combination with a respiration mask, said apparatus including a valve chamber and a valve body unit which is mounted within said valve chamber when the respirator mask is used as a positive pressure type mask and which is taken out of said valve chamber when the mask is used as a non-positive pressure type mask, and a valve housing which defines said valve chamber and which includes an exhalation valve seat body including a valve seat and further including means for mounting a membrane valve body within said valve chamber when said valve body unit is taken out of said valve chamber, said valve body unit comprising a valve body supporting member including mounting means for detachably mounting said valve body supporting member within said valve chamber, a valve body which is supported by said valve body supporting member and movable between a first position wherein said valve body is brought into contact with said valve seat of said exhalation valve seat body and a second position wherein said valve body is separated from said valve seat, and means for urging said valve body towards said valve seat under a desired pressing force.

4,991,578
METHOD AND SYSTEM FOR IMPLANTING SELF-ANCHORING EPICARDIAL DEFIBRILLATION ELECTRODES
Donald M. Cohen, Irvine, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.
Filed Apr. 4, 1989, Ser. No. 333,391
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D 41 Claims

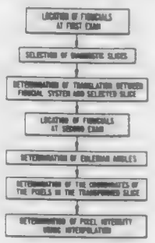
1. A method of percutaneously implanting a defibrillation lead within the intrapericardial space of a patient's heart, the defibrillation lead having a distal electrode, a body, and proximal connection means capable of making electrical contact to an implantable defibrillation device, the method comprising the steps of:
distending the pericardium from the epicardium by injecting a small volume of fluid into the pericardium, so that pericardial effusion results;
percutaneously perforating the pericardium by advancing a perforation device having a lumen therethrough towards the distended pericardium until the fluid flows out of the lumen, thereby indicating that the pericardium wall has been perforated;
inserting a guide wire into the pericardium through the lumen of the perforation device until a distal end thereof is positioned within the pericardium;



enlarging the perforated opening in the pericardium by inserting an introducer over the guide wire and into the tissue; and
inserting the distal electrode of the defibrillation lead within the introducer until the distal electrode is likewise positioned within the pericardium.

4,991,579
METHOD AND APPARATUS FOR PROVIDING RELATED IMAGES OVER TIME OF A PORTION OF THE ANATOMY USING FIDUCIAL IMPLANTS
George S. Allen, 628 Westview Ave., Nashville, Tenn. 37205
Filed Nov. 10, 1987, Ser. No. 119,353
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—653 R 20 Claims

15. A method for providing comparable images of a portion of anatomy having three fiducial implants comprising the steps of:
(a) taking cross-sectional image slices of the portion of the anatomy during a first time period; and



(b) reformatting an image of a specified view of the anatomy with respect to an internal coordinate system defined by said three implants.

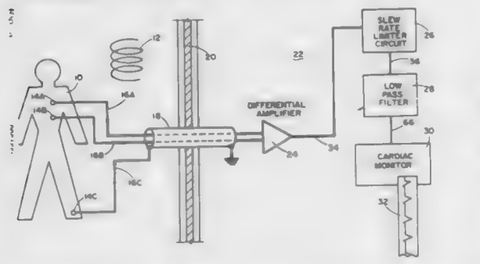
4,991,580
METHOD OF IMPROVING THE QUALITY OF AN ELECTROCARDIOGRAM OBTAINED FROM A PATIENT UNDERGOING MAGNETIC RESONANCE IMAGING
John C. Moore, Tulsa, Okla., assignor to Invivo Research, Inc.
Filed Mar. 30, 1989, Ser. No. 330,773
Int. Cl.[5] A61B *5/0402*
U.S. Cl. 128—696 2 Claims

1. A method of improving the quality of electrocardiogram (ECG) signals for input to a cardiac monitor and obtained from

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a patient undergoing magnetic resonance imaging (MRI) wherein the ECG leads attached to the patient are exposed to changing magnetic fields produced by the MRI which induce relatively high levels of rapid voltage changes in the ECG leads, comprising:

conducting the ECG signals having MRI induced noise signals superimposed therein to the input of a slew rate limiter (SRL) circuit having a preselected maximum slew rate, the circuit providing an output signals having a maximum dv/dt which is slightly greater than the maximum typical ECG dv/dt;



amplifying the ECG signal having the MRI induced noise superimposed thereon;

connecting the amplified output of the SRL circuit to the input of a low pass filter (LPF) circuit having attenuation above the ECG typical fundamental frequency; and

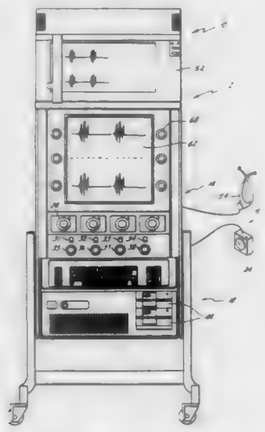
connecting the output of the LPF circuit to a cardiac monitor, wherein said step of amplifying the ECG signal having the MRI induced noise superimposed thereon has a gain of X and wherein said SRL maximum slew rate dv/dt is about 0.3 X v/sec.

4,991,581

ACOUSTIC PROCESSING APPARATUS

Francis M. Andries, Austin, Tex., assignor to Andries Tek R&D Limited Partnership, Austin, Tex.

Filed Mar. 4, 1988, Ser. No. 164,204
Int. Cl.[5] A61B *5/02, 7/00*
U.S. Cl. 128—715 **30 Claims**



1. An apparatus for pick-up and recording of acoustic signals, such as body sounds or the like, comprising:

transducer means for detecting sound and for producing an input analog signal representative of the sound;

convertor means for receiving the input analog signal from the transducer means and converting the input analog signal to a digital signal;

editing means coupled to the convertor means for receiving the digital signal and for editing the signal, including means for adjusting the waveform of the digital signal, and computer means for storing in memory at least a portion of the digital signal;

recorder means coupled to the computer means for selectably recording at least a portion of the digital signal;

the convertor means being operable for receiving the digital signal from the memory of the computer means and for converting the digital signal to an output analog signal; and

interface means coupled to the convertor means for receiving the output analog signal and adapted for communicating the output analog signal to the operator.

4,991,582

HERMETICALLY SEALED CERAMIC AND METAL PACKAGE FOR ELECTRONIC DEVICES IMPLANTABLE IN LIVING BODIES

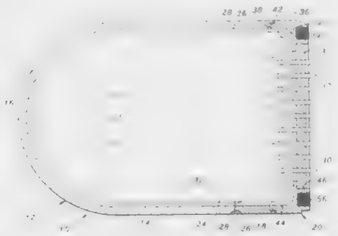
Charles L. Byers, Canyon Country; James W. Beazell, Rancho Palos Verdes; Joseph H. Schulman, Granada Hills, and Ali Rostami, Santa Monica, all of Calif., assignors to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.

Filed Sep. 22, 1989, Ser. No. 411,403
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 P **24 Claims**

1. A hermetically sealed combination ceramic and metal package for electronic devices implantable in living bodies, comprising:

a sleeve having a closed end and an open end for receiving electronic components of a device implantable in a living body, at least some of the components being adversely sensitive to high temperatures, the sleeve being formed of a ceramic material and the open end having a flat annular end face;

a closed band having an annular edge butting against and hermetically bonded to the open-end face of the sleeve, the band being formed of a metal having a coefficient of linear thermal expansion substantially the same as that of the ceramic material forming the sleeve; and



header means closing the package, hermetically bonded to the band and carrying a plurality of electrical connectors for connecting electrical leads to the electrical components within the sleeve.

4,991,583

PACEMAKER HAVING INDEPENDENTLY PROGRAMMABLE ELECTRODE CONFIGURATION FOR PACING AND SENSING AND METHOD FOR OPERATION THEREOF

Sergiu Silvian, Pasadena, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 896,542, Aug. 13, 1986, abandoned. This application May 1, 1989, Ser. No. 345,590
Int. Cl.[5] A61N *1/368*
U.S. Cl. 128—419 PG **45 Claims**

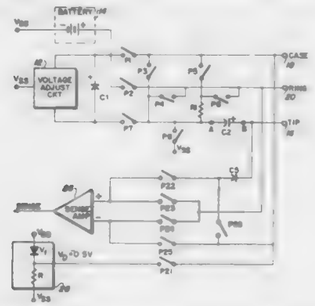
1. An implantable pacemaker, comprising: a first electrode terminal;

a group of return electrode terminals, said group including a second electrode terminal (20) and a third electrode terminal (18);

means for selecting a return electrode terminal selected from said group of return electrode terminals;

a voltage source (14) having a ground reference potential (V_{dd}) and a negative reference potential (V_{SS}) associated therewith;

means (28), coupled to said voltage source, for generating a



first reference potential different from said ground reference potential;

pulse generating means (12, C1) for generating a stimulation pulse;

a coupling capacitor (C2) for coupling said stimulation pulse generated by said pulse generating means to said first electrode terminal;

pacing configuration means for electrically connecting said selected return electrode terminal to said ground reference potential only during said stimulation pulse, and for electrically connecting said first electrode to said pulse generator means so that said stimulation pulse is delivered between said first electrode and said selected return electrode; and

fast discharge means for discharging said coupling capacitor towards said first reference potential for said prescribed time period by connecting together said coupling capacitor, said selected return electrode, and said first reference potential for a prescribed time period immediately subsequent to said stimulation pulse, whereby said selected return electrode provides a ground reference during said stimulation pulse and a non-ground reference during a fast discharge time period.

4,991,584

OPHTHALMIC EXAMINING APPARATUS AND METHOD CAPABLE OF EXAMINING GLAUCOMA

Kazunobu Kobayashi, Yokohama, and Isao Matsumura, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

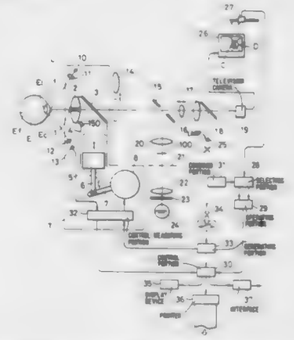
Continuation of Ser. No. 108,814, Oct. 15, 1987, abandoned. This application Aug. 31, 1989, Ser. No. 403,018
Claims priority, application Japan, Oct. 25, 1986, 61-254064; Oct. 25, 1986, 61-254066; Nov. 15, 1986, 61-272072; Dec. 6, 1986, 61-290744
Int. Cl.[5] A61B *3/16*
U.S. Cl. 128—648 **23 Claims**

1. An ophthalmic examining apparatus, comprising:

eye fundus information detecting means for detecting information relating to the eye fundus and including an objective lens begin positionable opposite an eye to be examined;

fluid discharging means for discharging fluid against the eye to be examined, said fluid discharging means including fluid pressure varying means for varying fluid pressure over time, said fluid discharging means further including a blowing nozzle substantially coaxial with an optical axis of;

cornea deformation detecting means for detecting deformation of a cornea of the eye to be examined caused by said fluid discharged by said fluid discharging means, said cornea deformation detecting means including light projection means for projecting a light flux to the cornea and light receiving means for receiving a light flux reflected by the cornea;



detecting means for detecting at least one of internal pressure information on the internal pressure in said fluid discharging means and time information relating to the length of time of discharging of said fluid discharging means; and

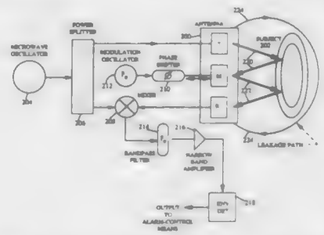
calculating means for calculating data of an eye pressure of the eye to be examined on the basis of information of said cornea deformation detecting means and at least one of said internal pressure information and said time information.

4,991,585

NON-INVASIVE RESPIRATION AND/OR HEARTBEAT MONITOR OR THE LIKE

Daniel D. Mawhinney, Livingston, N.J., assignor to MMTC, Inc., Princeton, N.J.

Filed Mar. 13, 1990, Ser. No. 492,959
Int. Cl.[5] A61B *5/00, 5/08*
U.S. Cl. 128—653 R **11 Claims**



1. In apparatus for monitoring movement within certain tissue of an individual; the combination comprising:

an antenna including three independent elements;

first means including a source of original carrier signal having a given frequency and phase coupled to a first of said three independent antenna elements for transmitting said original carrier signal into said certain tissue of said individual, whereby some of said transmitted carrier signal is back-scattered and a respective back-scattered portion is received by each of a second and a third of said three independent antenna elements;

second means including a source of modulation signal having a second frequency and a phase shifter coupled to said second of said three independent antenna elements for phase modulating said back-scattered portion received by said second of said three independent antenna elements in accordance with said modulation signal and retransmit-

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ting therefrom said phase-modulated portion back into said certain tissue of said individual, whereby some of said retransmitted phase-modulated portion is back-scattered and received by said third of said three independent antenna elements;

mixer means coupled to said third of said three independent antenna elements and to said source of original carrier signal for beating both of the back-scattered portions received by said third of said three independent antenna elements against said original carrier signal, whereby said mixer means has an output which includes a component apparatus having said second frequency; and

third means including bandpass filter means having said mixer-means output applied as an input thereto for passing said mixer-means output component having said second frequency and rejecting all other components of said mixer-means output, whereby said bandpass filter means derives an output signal having an envelope indicative of movement within said certain tissue of said individual.

4,991,586

METHOD FOR MONITORING VASCULAR FLOW USING MAGNETIC RESONANCE SIGNALS

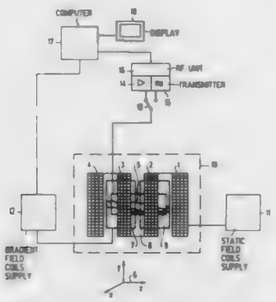
Edgar Mueller, and Gerhard Laub, both of Heroldsbach, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 15, 1989, Ser. No. 393,897

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827800

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 AF **11 Claims**



1. A method for monitoring the chronological course of a flow in a vessel of an examination subject using the phenomena of nuclear magnetic resonance, comprising the steps of:

selectively exciting nuclear spins in a slice, containing a vessel in which flow is to be monitored, of an examination subject by simultaneously applying a frequency-selective, radio frequency pulse and a slice selection gradient, thereby generating a nuclear magnetic resonant signal;

generating an echo signal of said nuclear magnetic resonant signal;

reading out said echo signal while applying a read-out gradient disposed perpendicularly relatively to said slice selection gradient;

repeating the above steps n times in succession thereby obtaining raw data signals for each repetition; conducting a Fourier transformation of the raw data signals; and and

generating a display of said Fourier transformed raw data signals with respect to time as a representation of the chronological course of said flow.

4,991,587

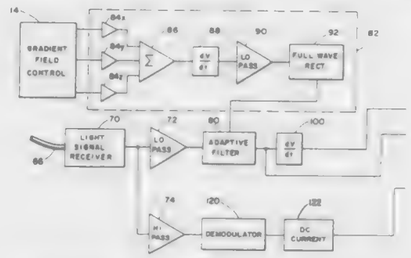
ADAPTIVE FILTERING OF PHYSIOLOGICAL SIGNALS IN PHYSIOLOGICALLY GATED MAGNETIC RESONANCE IMAGING

Douglas M. Blakeley, Euclid, and James J. Rogers, University Heights, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Continuation-in-part of Ser. No. 98,546, Sep. 18, 1987, abandoned, which is a continuation of Ser. No. 764,440, Aug. 9, 1985, Pat. No. 4,694,837. This application Nov. 21, 1989, Ser. No. 439,855

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 A **14 Claims**



1. A non-invasive diagnostic apparatus comprising:

a means for non-invasively examining an internal region of a subject and generating diagnostic signals indicative thereof;

a monitoring means for monitoring a condition of the subject generating output signals indicative thereof, the non-invasive examination means causing a noise signal component that changes with changing examination parameters during the non-invasive examination, the noise component being superimposed on the output signal such that the output signal includes both noise and monitored condition information;

means for detecting the changing examination parameters an adaptive filter means for filtering the output signal with a filter that is adjusted in accordance with the detected changing examination parameters.

4,991,588

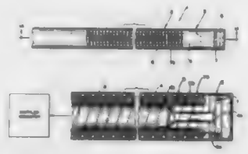
DOPPLER GUIDE WIRE

D. Russell Pflueger, Newport Beach; Cliff N. Cottonaro, Trabuco Canyon, and Scott M. Evans, Tustin, all of Calif., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Continuation of Ser. No. 224,206, Jul. 22, 1988, abandoned, which is a continuation of Ser. No. 887,291, Jul. 21, 1986, abandoned. This application Nov. 13, 1989, Ser. No. 434,590

Int. Cl.[5] A61B *8/12*

U.S. Cl. 128—662 **10 Claims**



1. A guide wire comprising

(a) an elongated wire body having a distal portion, said wire body comprising a relatively straight central wire having a proximal and a distal portion, and a helically coiled wire spring surrounding said central wire, said relatively straight central wire and said helically coiled wire spring forming a guiding wire for steering said guide wire, said central wire and said helically coiled wire spring both comprised of a conductive material, and means for insulating said central wire and said wire spring from each other,

(b) Doppler means for transmitting signal and for receiving a reflected signal, said Doppler means comprising a single piezoelectric transducer attached to said wire body adjacent said distal portion, said central wire and said wire spring being electrically connected to said piezoelectric transducer, whereby said central wire and said helically coiled wire spring serve as electrical leads to said piezoelectric transducer, said guide wire being adapted to steer an intravascular catheter within a blood vessel.

4,991,589

ULTRASONIC IMAGING APPARATUS

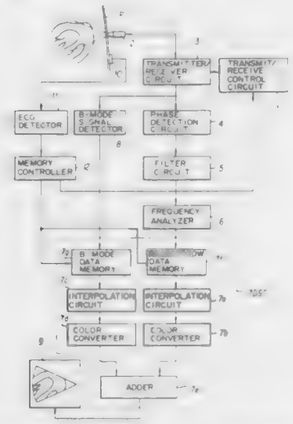
Hironobu Hongo, Ootawara, and Eiichi Shiki, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 246,105, Sep. 19, 1988, abandoned. This application Nov. 9, 1989, Ser. No. 434,483

Claims priority, application Japan, Sep. 22, 1987, 62-237790

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—661.09 **6 Claims**



1. An ultrasonic imaging apparatus comprising:

ultrasonic transducer means for transmitting ultrasonic beams to scan an region of interest of a subject and receiving echo waves of the ultrasonic beams for conversion to echo signals;

specific signal generating means for generating a plurality of specific signals periodically;

transmitter/receiver circuit means coupled to said ultrasonic transducer means and said specific signal generating means for delivering driving signals to said ultrasonic transducer means so that the region of interest is repeatedly scanned in response to the specific signals, the starts of repeated scans in intervals of the specific signals being sequentially staggered in increments or decrements of a regular time interval, receiving echo signals corresponding in number to the scans and processing the echo signals to output a predetermined number of frame signals which are sequentially staggered in increments or decrements of the regular time interval; and

storing/reconstructing means coupled to said transmitter/-receiver circuit means for storing each of the frame signals in the form of divided sub-frame signals, extracting a corresponding sub-frame signal from each of the stored frame signals and synthesizing corresponding sub-frame signals extracted from the frame signals to reconstruct a frame signal.

4,991,590

FIBER OPTIC INTRAVASCULAR BLOOD PRESSURE TRANSDUCER

Weimin Shi, Piscataway, N.J., assignor to Martin Goffman Associates, Edison, N.J.

Filed Jan. 30, 1989, Ser. No. 303,847

Int. Cl.[5] A61B *5/0215*

U.S. Cl. 128—667 **20 Claims**

1. A device for the measurement of the blood pressure of a patient which comprises:

(a) means for producing a light for transmission through an optical fiber;

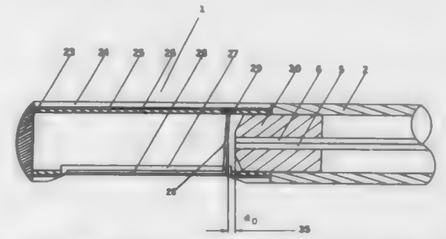
(b) means for receiving and measuring the light reflected through an optical fiber;

(c) a fiber holder;

(d) a first optical fiber for the transmission of the produced light having a distal end arranged longitudinally in said fiber holder and a proximal end connected to the means for producing a light;

(e) a second optical fiber for the transmission of the reflected light having a distal end arranged longitudinally in said fiber holder and a proximal end connected to the means for receiving and measuring a reflected light;

(f) a pressure sensing mechanism connected to said fiber holder comprising a cylindrically shaped outer shell having a side window; and a thin plate having two sections



including a reflector section arranged at an angle of approximately 90° to the other section, said other section being movably situated within said window and one end of the reflector section being attached to the outer shell opposite to said window, said reflector section of said plate being located a predetermined nominal distance from and perpendicular to the distal end of said optical fibers such that the reflector section reflects light emitted from the first optical fiber into the second optical fiber in dependence of a variation in distance between the reflector setion and the distal ends of said optical fibers; and

(g) a membrane surrounding said shell to seal the pressure sensing mechanism blood and to permit the transmission of the blood pressure to the plate.

4,991,591

SPIROMETER WITH MULTI-STAGE FIXED ORIFICE

William C. Jones, and William C. Jones, Jr., both of 200 Windsor Dr., Oak Brook, Ill. 60521

Filed Jun. 22, 1989, Ser. No. 369,744

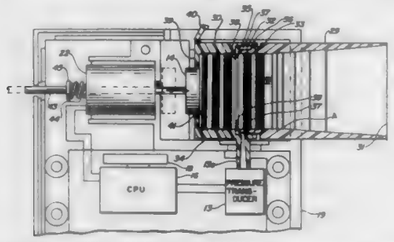
Int. Cl.[5] A61B *5/08*

U.S. Cl. 128—719 **8 Claims**

1. A spirometer for measuring breathing functions of a human subject, said spirometer comprising: a hollow elongate body with a first opening through which the subject inhales or exhales, a second opening through which the breath enters the elongate body when the subject inhales or discharges from the body when the subject exhales, and a third opening disposed between said first and second openings; pressure sensing means in fluid communication with said third opening of said elongate body for sensing the pressure of the breath moving through said hollow elongate body; plug means disposed proximate said second opening of said elongate body for closing a predetermined portion of said second opening for levels of breath flow

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rate below a predetermined level without stopping the flow of breath through said body, said plug means allowing free, unob-



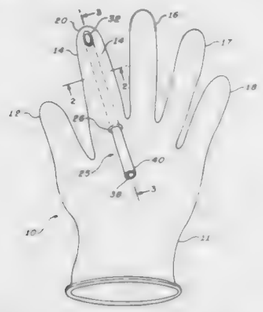
structed fluid flow through the second opening for levels of breath flow rate above the predetermined level.

4,991,592

DEVICE FOR OBTAINING TISSUE SAMPLE IN PERFORMING A BIOPSY

Howard N. Christ, 291 Cedar Ave., Islip, N.Y. 11751

Filed Dec. 4, 1989, Ser. No. 445,363
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **8 Claims**



1. A device for obtaining a sample of tissue from a body organ in a body cavity in performing a biopsy, comprising:

an elastic, thin walled, tubular member for enclosing a person's finger, said member having an open end for insertion of said person's fingertip, and having a closed end snugly engageable around said fingertip to enable palpation by said fingertip of a particular area of said organ; and

a flexible tube longer than said tubular member extending axially inside said member along one side thereof,

said tube having an inner end secured at and inside said closed end of said member, and having a free outer end disposed beyond said open end of said member to receive a biopsy needle, with said inner end of said tube being beveled to face said one side of said member and to face away from said fingertip; and

said tube having an axial passage for guiding said biopsy needle therethrough to pierce said closed end of said tubular member as close as possible to said fingertip and said palpated area of said organ adjacent to said fingertip, to obtain a sample of tissue thereat.

4,991,593

FLEXIBLE BAG FOR STORING BODY ORGANS

Bruce A. LeVahn, New Brighton, Minn., assignor to Minnesota Scientific, Inc., Minneapolis, Minn.

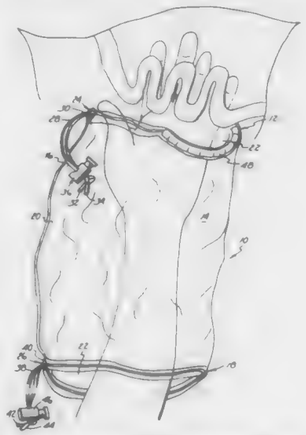
Filed Jun. 13, 1989, Ser. No. 365,754
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—856 **11 Claims**

1. A device for maintaining a body organ during surgery, comprising:

a flexible enclosure having first and second openings, the first opening being large enough to permit the body organ to pass through;

means for closing the first opening of the flexible enclosure; and

semi-rigid means for limiting closure of the first opening such that injury to the body organ is minimized, the semi-rigid means including sleeve means proximate the opening and forming a circumferential passage, drawstring means including at least one drawstring positioned in the circumferential passage and a flexible tube having a passage



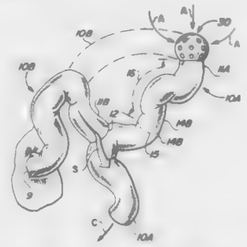
extending therethrough, the flexible tube being positioned in the circumferential passage, and at least one draw string being positioned in the passage of the tube.

4,991,594

METHOD AND APPARATUS FOR REMOVING ASCITIC FLUID FROM ABDOMINAL CAVITY

Jean P. Angelchik, 1728 W. Glendale Ave., Ste. 401, Phoenix, Ariz. 85021

Filed Nov. 20, 1989, Ser. No. 438,875
Int. Cl.[5] A61B *19/00;* **A61M** *31/00*
U.S. Cl. 128—898 **5 Claims**



1. A method for removing ascitic liquid from the peritoneal cavity through the alimentary canal, said method comprising:

(a) forming an opening in the wall of the intestine;

(b) attaching to said opening means for permitting ascitic fluid in the peritoneal cavity to flow into said opening without permitting the contents of said intestine to escape from within said intestine, out said opening, and into said peritoneal cavity.

4,991,595

SELF-EXTINGUISHING CIRGARETTE WITH FAIL-SAFE TILT-RING

Roscoe Jones, Jr., Louisiana State Penitentiary, Angola, La. 70712

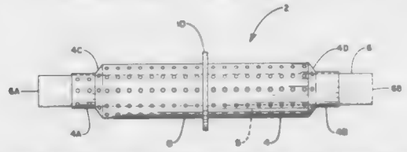
Filed Jun. 12, 1989, Ser. No. 365,210
Int. Cl.[5] A24F *13/02*
U.S. Cl. 131—175 **20 Claims**

1. A self-extinguishing cigarette, comprising:

(a) a perforated first hollow, elongated member of greater cross-sectional area than a cigarette;

(b) a cigarette coaxially disposed within the first elongated member;

(c) means for holding the cigarette in the first elongated member, said means including a perforated second hollow, elongated member disposed at one end of the first



elongated member, and a third hollow, elongated member disposed at the other end of the first elongated member, the second and third elongated members having an internal diameter adapted to having a cigarette fitted therein;

(d) means for limiting the supply of air to the cigarette; and

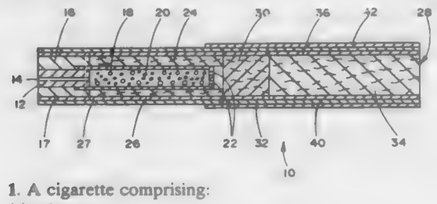
(e) means for separating the outer surface of the first elongated member from a horizontal surface supporting the first elongated member.

4,991,596

SMOKING ARTICLE

Brian M. Lawrence; Milly M. L. Wong; Thomas A. Perfetti; Thomas L. Gentry, all of Winston-Salem; Alvaro Gonzalez-Parra; Jerry W. Lawson, both of Clemmons; Gary R. Shelar, Greensboro, and Gary W. Worrell, Tobaccoville, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jul. 11, 1989, Ser. No. 378,551
Int. Cl.[5] A24D *1/00, 1/02, 1/18*
U.S. Cl. 131—194 **29 Claims**



1. A cigarette comprising:

(a) tobacco;

(b) a combustible fuel element; and

(c) an aerosol generating means (i) physically separate from the fuel element and in a heat exchange relationship with the fuel element, and (ii) including a flavor package including tobacco and a portion of an essential oil gland bearing plant which is capable of releasing essential oil substances by the application of heat but without burning.

4,991,597

PROCESS AND APPARATUS FOR WRAPPING CIGARETTE PACKS IN TRANSPARENT FILM

Helmut Demny, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

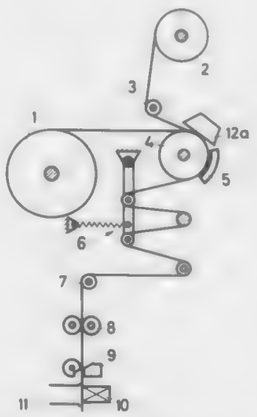
Filed Jun. 2, 1987, Ser. No. 57,430
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618736
Int. Cl.[5] A24C *1/00*
U.S. Cl. 131—280 **15 Claims**

1. A method for wrapping a package in a transparent film which undergoes thermally induced expansion, the film subsequently shrinking upon cooling, said method comprising the steps of:

drawing the film taut;

heating the film to cause the film to uniformly thermally expand;

folding the expanded film around a package and bonding the film to itself to define a wrapping; and



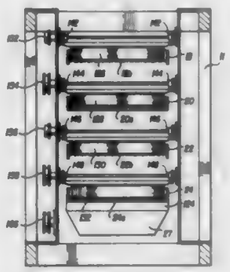
allowing the folded and bonded film to cool whereby the film shrinks and the wrapping tightly conforms to the package.

4,991,598

METHOD OF AND APPARATUS FOR AUTOMATICALLY ANALYZING THE DEGRADATION OF PROCESSED LEAF TOBACCO

Richard M. Henderson; Roger A. Foote, both of Winston-Salem; Henry H. Warren, Jr., Clemmons; D. Randall McHone, Winston-Salem, all of N.C., and David B. Coleman, Richmond, Va., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 18, 1989, Ser. No. 395,876
Int. Cl.[5] A24C *5/00, 5/92, 5/14*
U.S. Cl. 131—290 **49 Claims**



1. Apparatus for analyzing the degradation of leaf tobacco during the processing thereof comprising:

means for selecting a sample of tobacco from a tobacco processing line for degradation analysis, said selecting means comprising a weigh conveyor means receiving a supply of tobacco from said processing line for weighing the supplied tobacco and for producing an output signal proportional to the weight of the sample of tobacco to be analyzed;

means for separating the selected sample of tobacco into a plurality of different-sized fractions of tobacco, said separating means comprising a plurality of screen means over which said sample is passed in succession, said screen means having upper and lower surfaces, said weight conveyor means being arranged to deliver the selected sample of tobacco to a first one of said screen means;

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means associated with said separating means for automatically cleaning residual tobacco of the sample from the surfaces of at least some of said screen means;

means for collecting and weighing each of the different-sized fractions of tobacco and for producing output signals indicative of the weights of each tobacco fraction; and

means for receiving said output signals and for calculating the percentage by weight of each fraction of tobacco to the total weight of the tobacco fractions as an indication of the degradation of the tobacco being processed.

4,991,599

FIBERLESS TOBACCO PRODUCT FOR SMOKING AND CHEWING

Hubert M. Tibbetts, 137 Pecksland Rd., Greenwich, Conn. 06831

Filed Dec. 20, 1989, Ser. No. 453,629
Int. Cl.[5] A24B *15/24*
U.S. Cl. 131—297 3 Claims

1. A process for producing a smokable or chewable tobacco product having a tobacco taste and aroma but essentially free of fibers comprising:

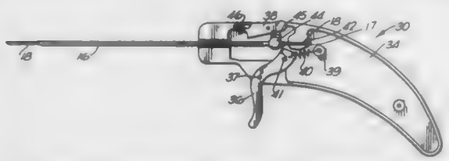
providing cured tobacco leaf, passing boiling water or water vapor through said tobacco leaf, collecting the boiling water or water vapor to produce an aqueous, fiberless extract of said tobacco, concentrating and drying said aqueous extract to produce a solid fiberless tobacco extract, and crushing said solid fiberless extract into smokable or chewable particles of a fiberless tobacco extract.

4,991,600

SAMPLING DEVICE

James Taylor, Droitwich, England, assignor to Anchor Products Company, Addison, Ill.

PCT No. PCT/GB88/00297, § 371 Date Dec. 12, 1989, § 102(e) Date Dec. 12, 1989, PCT Pub. No. WO88/07839, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 15, 1988, Ser. No. 438,455
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 15 Claims



1. A device for obtaining a sample of a material from within a larger body of the material, the device comprising: a sampling needle having a sample collecting end portion; a substantially cylindrical outer needle arranged to receive substantially coaxially the sampling needle, the said needles co-operating in use to obtain the sample in the sample collecting end portion;

a handle means to which one of the said needles is removably secured;

a lever arm provided in the handle means and arranged to enable the other of the said needles to be slidingly moved in relation to the one needle by a user in order to obtain the sample;

resilient biassing means provided in the handle means and arranged to bias the lever arm into a predetermined position thereby to position the said needles in a predetermined relationship to each other; and

a latch means arranged to allow the other of the said needles to be moved to a position in which the sample collecting portion is fully enclosed by the outer needle and to latch the said other needle in the said position.

4,991,601

HOLDER FOR BLOOD SAMPLE TUBE

Masaaki Kasai; Sakae Yamazaki, and Kazuhisa Sensyu, all of Yamanashi, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1989, Ser. No. 350,541
Claims priority, application Japan, May 20, 1988, 63-121835
Int. Cl.[5] B65D *81/00*; A61B *5/00*
U.S. Cl. 128—763 11 Claims





1. A blood sample tube holder for holding a blood sample tube, comprising:

a holder body having a needle joint on one end for connection to a blood sample collecting needle,

said holder body having an open end opposite said one end, and at least one elastic and flexible land on an inner wall surface thereof,

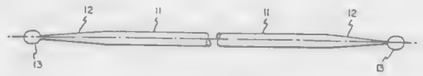
said at least one land having a radially innermost surface arranged such that when a blood sample tube is inserted into said holder body through said open end, said at least one land is engaged and elastically deformed by said blood sample tube so as to increase contact area between said at least one land and said blood sample tube, thereby firmly holding said blood sample tube in said holder body and preventing said blood sample tube from being pushed or kicked back out of said holder body.

4,991,602

FLEXIBLE GUIDE WIRE WITH SAFETY TIP

Curtis A. Amplatz, St. Paul, and Stuart Lind, Minneapolis, both of Minn., assignors to Flexmedics Corporation, Minneapolis, Minn.

Filed Jun. 27, 1989, Ser. No. 372,049
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 5 Claims



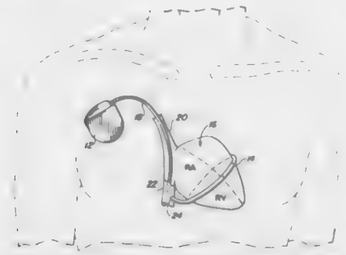
1. A guide useful for guiding a catheter within a blood vessel, comprising an elongated, flexible metal wire of shape memory alloy having a central portion of uniform diameter and identical tapered end portions of continuously decreasing diameter each terminating in an integral, enlarged diameter bead, the guide wire being formed from a single length of shape memory alloy wire having a uniform diameter by the process of centerless grinding, the ends of the wire being characterized by smooth, rounded transition between the ends of the tapered portions and the respective beads.

4,991,603

TRANSVENOUSLY PLACED DEFIBRILLATION LEADS VIA AN INFERIOR VENA CAVA ACCESS SITE AND METHOD OF USE

Donald M. Cohen, Irvine, and Werner Hafelfinger, Valencia, both of Calif., assignors to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Oct. 30, 1989, Ser. No. 429,261
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 34 Claims



1. A method of transvenously implanting a defibrillation lead about a mammalian heart; said heart being located within a chest cavity, said heart having a major vein proximate thereto, said defibrillation lead having at least one distal electrode, a flexible body, and proximal connection means for making electrical contact with the distal electrode from a proximal end of the lead; said method comprising the steps of:

(a) transvenously inserting guide means into the chest cavity from a position within said major vein;

(b) inserting the distal electrode of the defibrillation lead into the chest cavity following said guide means; and

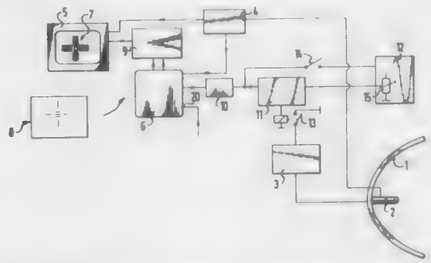
(c) positioning said distal electrode within the chest cavity so as to be about said heart.

4,991,604

ULTRASONIC TREATMENT APPARATUS

Helmut Wurster, Oberderdingen; Werner Krauss, Knittlingen, and Peter Vallon, Bretten Gölshausen, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,221
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811872
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.03 16 Claims



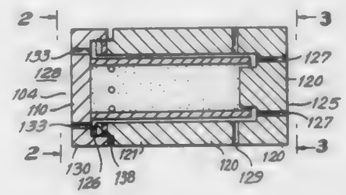
1. Apparatus for the detection and destruction of an object in a body of a patient to be treated, by means of ultrasonic shock waves, the apparatus comprising; an ultrasonic pulse generator actuable to initiate said shock waves, an ultrasonic transducer associated with said pulse generator for focussing said shock waves onto said object by way of a fluid coupling medium; an object location system connected to said transducer and having at least one monitor in the form of a display device provided with an image screen, for depicting on said screen, an image of said object and an aiming mark capable of being brought into coincidence by relative movement of said patient and said transducer to position the focus thereof on said object; and means for authorising the actuation of said pulse generator when said image and said aiming mark have been brought into coincidence; the apparatus further comprising; means for obtaining from a video signal of said location system, a signal having a level corresponding to the brightness of said object depicted on said screen to establish a reference value, means for automatically displacing said transducer to scan said object; a comparator for comparing as actual values, video signals produced in said location system, with said reference value; and means for actuating said pulse generator when said actual values are at least equal to said reference value.

4,991,605

CONTAINER FOR ADDITIVE MATERIALS FOR SMOKING ARTICLES

Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,239
Int. Cl.[5] A24D *3/04*; A24F *5/04*
U.S. Cl. 131—335 12 Claims



1. A container for an additive material for modifying the characteristics of a smoking article comprising:

a first element having a first end, a second end, and a side wall between said first and second ends defining a chamber for containing the additive material, said first element having a first perforation proximate to its first end and a second perforation proximate to its second end for forming an air pathway through the chamber of said first element;

a second element having a first end, a second end, and a side wall between said first and second ends, said second end being open and a portion of the side wall of said second element extending over a length of the side wall of said first element; and

means for movably interconnecting said first and second elements between a first and a second position, said first position having said first and second perforations covered to form an air impermeable chamber when said smoking article is being stored, said second position having said first and second perforations uncovered so that there is an air flow pathway through said chamber whereby the additive material can modify the characteristics of the smoking article when the article is being used.

4,991,606

SMOKING ARTICLE

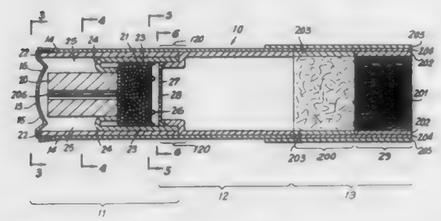
Mark A. Serrano, Greenwich, Conn.; Kenneth S. Houghton, Midlothian, Va.; Harry V. Lanzillotti, Midlothian, Va.; Edward B. Sanders, Richmond, Va.; A. Clifton Lilly, Jr., Chesterfield, Va.; Charles R. Hayward, Midlothian, Va.; John R. Hearn, Richmond, Va., and D. Bruce Losee, Jr., Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 22, 1988, Ser. No. 223,153
Int. Cl.[5] A24D *1/00, 1/02, 1/18*
U.S. Cl. 131—359 37 Claims

1. A smoking article having a mouth end and a distal end remote from said mouth end, said smoking article comprising:

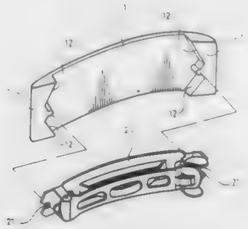
VOL 1123 ISS 2 FE 12 1991 UMI

an active element at said distal end in fluid communication with said mouth end, said active element comprising:
a substantially non-combustible substantially cylindrical hollow sleeve having internal and external walls, and having a first end at said distal end and a second end closer to said mouth end,
an outer surface comprising at least one of (a) said external wall, and (b) a wrapper,
a heat source contained in said sleeve adjacent said first end, said heat source having a fluid passage therethrough, and
a flavor bed in said sleeve adjacent said second end thereof, in radiative and convective heat transfer relationship with said heat source; wherein:



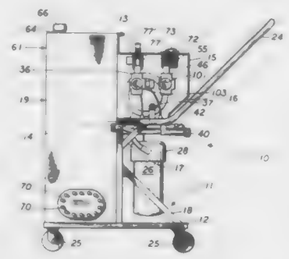
said outer surface has a sufficient porosity to allow air to be admitted through said outer surface adjacent said heat source for continually admitting air to support combustion of said heat source, and is air-impermeable adjacent said flavor bed to prevent combustion of material in said flavor bed; whereby:
when said heat source is ignited and air is drawn through said smoking article, air is heated as it passes through said fluid passage, said heated air flowing through said flavor bed, releasing a flavored aerosol, and carrying it to said mouth end.

4,991,607
HAIRPIN
Chin J. Chen, 48, RueyMing St., ShiauGaang Dist., Kaohsiung, Taiwan
Filed Jan. 8, 1990, Ser. No. 461,847
Int. Cl.[5] A45D *8/28*
U.S. Cl. 132—278 2 Claims



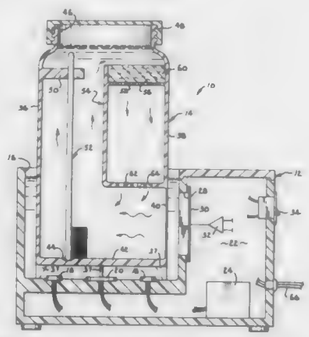
2. A hairpin comprising a curved plastic plate and a curved metal clip having a base conforming substantially in curvature to the curvature of the plate, said plastic plate provided with a projecting wall respectively at the inside of both lengthwise ends thereof, the base of the metal clip being resiliently compressed lengthwise between the inner wall faces of the plastic plate, the base of the clip and the respective walls of the plate having inter engaging male and female formations respectively and the distance between the formations on the base of the clip in an uncompressed state of the clip being a little longer than the distance between the formations on the inner wall faces of the plate whereby the base of the clip is retained on the plate by the resilient lengthwise compression of the base.

4,991,608
APPARATUS AND METHOD FOR CLEANING HEAT EXCHANGERS
Delano Schweiger, 9500 Winterbrook Way, Orangevale, Calif. 95662
Filed Mar. 27, 1989, Ser. No. 329,021
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—56 R 8 Claims



1. Apparatus for cleaning heat exchangers to remove contaminated oil and contaminants therefrom comprising:
a housing having a source of solvent and a source of oil;
a first pump-actuated flow controllable valve assembly mounted on said housing fluidly coupled to said source of solvent and having a tubular conduit fluidly coupled thereto terminating in a first fitting;
a first filter canister mounted on said housing fluidly coupled to said first valve assembly with a second fitting coupled to said first filter canister;
a second pump actuated flow controllable valve assembly 14 mounted on said housing fluidly coupled to said source of oil and having a tubular conduit fluidly coupled thereto terminating in a third fitting;
a second filter canister mounted on a said housing fluidly coupled to said second valve assembly with a fourth fitting coupled to said second filter canister; and
an air inlet coupled to each of said valve assemblies and in selective fluid communication with said first and fourth fittings for selectively injecting air thereout.
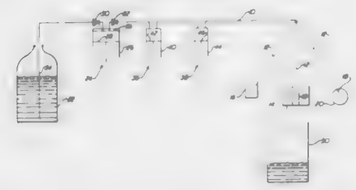
4,991,609
ULTRASONIC CLEANING METHOD AND APPARATUS
Iben Browning, 14 Guadin Loop, Sandia Park, N. Mex. 87047
Filed May 16, 1988, Ser. No. 194,139
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—57 R 14 Claims



7. A device for cleaning objects in an aqueous cleaning media, said device comprising:
a housing;

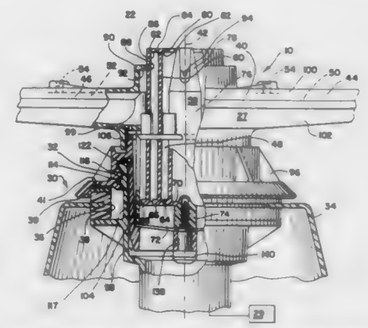
a container adapted to receive said object and an aqueous cleaning media,
said container being further adapted to be received by said housing;
said housing being adapted to receive a quantity of water for partially surrounding said container;
means in said housing for heating said cleaning media to a temperature of at least 65° C.;
means in said housing for sensing the temperature of said media in said container, said temperature sensing means being coupled with said heating means;
means in said housing for generating ultrasonic waves in said media,
said ultrasonic wave generating means being positioned below the level of water surrounding said container; and
timing means coupled with both said ultrasonic wave generating means and said heating means and operable to provide sequential activation of said wave generating means and said heating means, the activation of said heating means following the activation of said wave generating means.

4,991,610
RINSING LIQUID APPARATUS FOR ANALYTICAL INSTRUMENTS
Bernhard Huber, Hildegardring 42, D-7770 Überlingen, and Toma Tomoff, Lavendelweg 9, 7770 Überlingen, both of Fed. Rep. of Germany
Filed Feb. 3, 1987, Ser. No. 10,352
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603632
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—169.00 R 2 Claims



1. Apparatus for use in analytical instruments comprising, in combination:
an elongated dosing tube having a tip at one end, said tip being constructed and arranged to move between a sample vessel, a rinsing vessel and an analytical instrument; the other end of said dosing tube being connected in fluid flow communication to a rinsing liquid supply vessel through a sample pump assembly and a rinsing liquid pump assembly; said liquid pump assembly including a pump cylinder having an inlet and an outlet; a pump piston arranged for reciprocal movement in the pump cylinder; motive means for moving said pump piston in said pump cylinder between a first end position in the discharge direction and an opposite second end position in the intake direction; a first check valve mounted on said inlet of said pump cylinder and a second check valve mounted on said outlet of said pump cylinder; sealing means mounted adjacent said outlet which cooperate with said pump piston to sealingly close said outlet when said pump piston is positioned in its first end position in the discharge direction, said sealing means comprising a sealing disc disposed at the outlet side of the internal end face of the pump cylinder, said pump piston being constructed and arranged to sealingly engage said sealing disc when in its first end position, and said sealing disc having a thru bore communicating with said outlet.

4,991,611
LOWER SPRAY ARM FOR DISHWASHER
Wilbur W. Jarvis, St. Joseph Township, Berrien County; John I. Smith, Coloma Township, Berrien County, both of Mich.; Kirk A. Gutmann, Perry Township, Allen County, Ind.; Lane S. Duncan, Independence, Ohio; Richard D. Taylor, Harrison Township, Bartholomew County, Ind., and Richard W. Germuska, Brunswick, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jun. 8, 1989, Ser. No. 363,614
Int. Cl.[5] A47L *15/23*
U.S. Cl. 134—179 14 Claims



1. A spray arm assembly for delivering fluid under pressure into a dishwasher wash chamber, said spray arm assembly comprising:
a spray arm having a rotational axis and defining a fluid passageway for distributing fluid from a pressurized supply into a wash chamber;
a tower section;
means for mounting the tower section to the spray arm for guided movement relative to the spray arm between a retracted position and an extended position; and
means on the tower section for directing fluid from a pressurized supply into a wash chamber with the tower in its extended position,
said mounting means further including means integrally and permanently formed with the spray arm for preventing the tower section from separating from the spray arm,
whereby the spray arm and tower section are permanently and inseparably assembled,
said mounting means comprising a wall integrally formed as one piece with the spray arm, said wall defining a shoulder which abuts a part of the tower section to thereby hold the tower section in its extended position and prevent separation of the tower section from the spray arm.

4,991,612
STORAGE MECHANISM FOR VEHICLE COVERING
Jozsef Kiss, 8 Woodman Dr. S., Hamilton, Ontario, Canada L8K 4C9, and John P. Stricker, RR #1, Brantford, Ontario, Canada N3T-5L4
Filed Oct. 23, 1989, Ser. No. 426,075
Int. Cl.[5] E04H *15/54*
U.S. Cl. 135—88 1 Claim

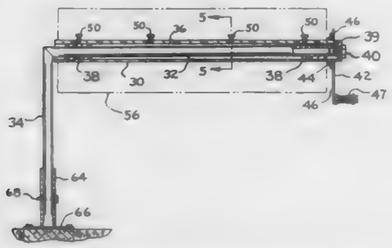
1. In combination, a flexible covering for an automotive vehicle, including a main cover section adapted to extend over upper surface areas of a vehicle, said main cover section having two longitudinal side edges and two transverse end edges; said flexible covering further including two side flaps hingedly connected to the side edges of said main cover section for extension downwardly along side surfaces of a vehicle, and two end flaps extending from opposite end edges of the main cover section for extension downwardly along end surfaces of a vehicle;

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a vertical post (34) defining a swing axis, a horizontal shaft (32) extending from the upper end of the shaft so that the post acts as a cantilever support for the shaft, said post and shaft being constructed so that the shaft can swing in a horizontal arc between a first position in the path of an automotive vehicle and a second position extending away from the vehicle path;

a tubular reel member (36) extending around and along said horizontal shaft, bushings (38) carried within the tubular member for rotatably supporting said member on the shaft; said shaft having a length greater than the length of the tubular reel member so that the end of the shaft remote from the vertical post extends outwardly beyond the reel member; means (at 39, 40) for preventing axial dislocation of the tubular reel member off the shaft; a hand crank connected to said reel member at the end thereof remote from the vertical post;

means for detachably connecting one of said end flaps to said tubular reel member, said detachable connecting means



comprising a plurality of headed pins (50) extending radially outwardly from the tubular reel member at spaced points therealong, and a plurality of annular grommets (52) affixed to said one end flap; said grommets having openings therethrough that have a larger diameter than the heads on the associated pins, whereby the flexible covering can be disengaged from the reel member;

said side flaps and said end flaps having connection mechanisms (58) for holding the flaps in positions extending downwardly along the associated vehicle surfaces when the flexible covering is disengaged from the reel member and the main cover section is laid on the vehicle roof;

said side flaps being foldable onto the upper face of said main cover section when it is desired to roll the flexible covering onto and around the tubular reel member, the transverse width of the flexible covering then being less than the axial length of the tubular reel member, whereby the hand crank can be operated to wind the covering onto the reel member for compact storage.

4,991,613

METHOD FOR STORING A HAZARDOUS LIQUID

Frank Kaminski, Churchville, and Earl J. Schiffhauer, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1989, Ser. No. 432,263
Int. Cl.[5] E04H *7/18*
U.S. Cl. 137—1 13 Claims

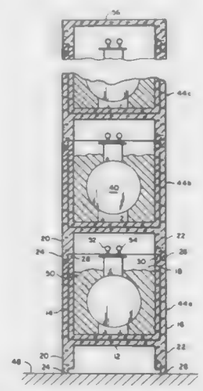
1. A method for the safe and economical storage of liquids, comprising the steps of:

constructing off site a plurality of transportable modules with each module comprising (1) a liquid storage tank mounted within (2) a leak tight prefabricated reinforced concrete vessel that is interchangeable with and stackable with other similar vessels, each vessel having a bottom wall, side walls, end walls, legs projecting below the bottom wall and being open at the top,

transporting the modules to an installation site,

placing one of the modules on a foundation with the legs of the vessel of such module supporting the module above the foundation by a distance to enable visual inspection for leaks between the bottom wall of such module and the foundation, above grade,

stacking a second module on said one module with the legs of the second module resting on the side walls of said one module and with the bottom wall of the second module closing the top of said one module,



filling the space between the storage tanks and the vessels with a fire retardant, and

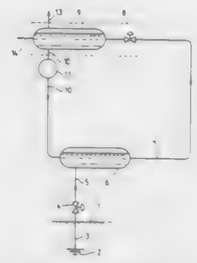
connecting conduits to the storage tanks so that the liquid can be provided to and removed from, the storage tanks.

4,991,614

METHOD AND A PLANT FOR TRANSPORT OF HYDROCARBONS OVER A LONG DISTANCE FROM AN OFFSHORE SOURCE OF HYDROCARBONS

Bent Hammel, Eiksmarka, Norway, assignor to Kvaerner Engineering A/S, Lysaker, Norway

PCT No. PCT/NO88/00056, § 371 Date Dec. 7, 1989, § 102(e) Date Dec. 7, 1989, PCT Pub. No. WO88/10397, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 22, 1988, Ser. No. 438,412
Claims priority, application Norway, Jun. 25, 1987, 872666
Int. Cl.[5] F17D *1/17*
U.S. Cl. 137—13 5 Claims



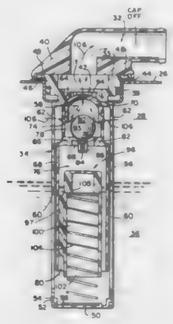
1. A method for transporting hydrocarbons in a pipeline over long distances, from a first location at an offshore hydrocarbon source to a second location, comprising the steps of providing, at the first location, an absorbent including a gas-poor hydrocarbon liquid, supplying a flow of gas saturated hydrocarbon liquid and released associated hydrocarbon gas from the hydrocarbon source to said gas poor hydrocarbon liquid adjacent said first location, the volume of gas-poor hydrocarbon liquid being selected to be large enough to permit all released associated hydrocarbon gas to be absorbed by said gas-poor hydrocarbon liquid, flowing said hydrocarbon liquid with absorbed hydrocarbon gas to said second location, separating the hydrocarbon gas from said hydrocarbon liquid with absorbed hydrocarbon gas at said second location to provide said gas-poor hydrocarbon liquid flow that is supplied at said first location.

4,991,615

TANK PRESSURE CONTROL APPARATUS

Emil Szlaga; Robert S. Harris, and Jeffery Griffin, all of Connersville, Ind., assignors to Stant Inc., Connersville, Ind.

Filed Mar. 2, 1990, Ser. No. 488,289
Int. Cl.[5] F16K *31/28, 17/36*
U.S. Cl. 137—43 62 Claims



62. An apparatus for controlling flow of fluid through an aperture, the apparatus comprising

a housing,

a float valve disposed in and unattached to the housing and formed to include a float chamber, the float valve being moveable in the housing between an aperture blocking position and an aperture-unblocking position, and

means for controlling movement of the float valve by selectively venting fluid from the float chamber to reduce the buoyancy of the float valve.

4,991,616

INSTALLATION FOR THE SUPPLY OF OXYGEN IN HOSPITALS AND THE LIKE

Francisco B. Fabregat, Madrid, Spain, assignor to Desarrollos, Estudios Y Patentes, S.A., Madrid, Spain

Filed Jan. 11, 1989, Ser. No. 295,806
Claims priority, application Spain, Nov. 1, 1988, 8800056
Int. Cl.[5] G05D *11/13*
U.S. Cl. 137—93 8 Claims

7. An installation for the supply of oxygen comprising:

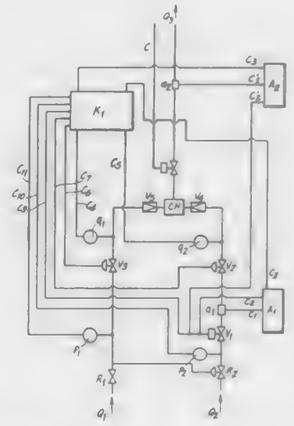
an oxygen source supplying oxygen stored in bottles;

an oxygen generating unit providing oxygen through the filtering of air;

a mixing frame for mixing oxygen simultaneously supplied by said oxygen source and said oxygen generating unit, said mixing frame comprising two oxygen analyzers, one for determining the concentration of oxygen in the mixing frame, and the other for determining the concentration of oxygen from the oxygen generating unit, wherein the minimum acceptable value of oxygen concentration in the mixing frame is stored in one analyzer and the minimum acceptable value of oxygen concentration from the oxygen generating unit is stored in the other oxygen analyzer;

said mixing frame further comprising a controller for controlling the proportion between the oxygen flow from the oxygen source and the oxygen flow from the oxygen generating unit, said controller controlling two valves, one regulating the flow of oxygen from the oxygen source, the other regulating the flow of oxygen from the oxygen generating unit; two pressure sensors, one for measuring the pressure of the flow oxygen from the oxygen source and the other for measuring the flow of oxygen from the oxygen generating unit; and two pressure controllers for ensuring that the outlet pressures from the oxygen source and oxygen generating units are the same;

a middle mixture deposit station for receiving said mixture of oxygen from said mixing frame;



an emergency frame for receiving said mixture of oxygen from said middle mixture deposit station and detecting a drop in pressure below a pre-established limit; and

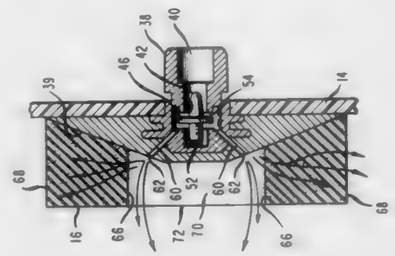
an emergency oxygen supply connected to said emergency frame, said emergency oxygen supply being activated to supply oxygen to said emergency frame if said emergency frame detects a drop in pressure, said emergency frame supplying said mixture of oxygen to a distribution network.

4,991,617

GAS INLET VALVE ASSEMBLY FOR INFLATABLE BOATS

James R. Butler, Palm Beach, Fla., assignor to Seaco, Inc., Riviera Beach, Fla.

Filed Oct. 3, 1989, Ser. No. 416,382
Int. Cl.[5] F16K *15/20, 47/00;* B01D *39/20*
U.S. Cl. 137—223 10 Claims



4. An inlet valve assembly for inflating an inflatable boat, comprising:

a valve body, said valve body comprising at least one inlet opening and at least one outlet opening, and a valve member positionable between the inlet opening and the outlet opening to control flow of gas through the valve body, and comprising means for biasing the valve member to

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close said inlet opening of said valve body, said outlet opening producing a jet of gas during inflation;

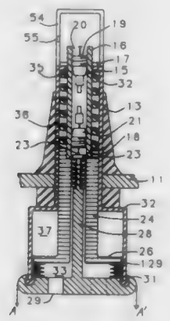
a gas dispersion member adjacent said outlet opening, said gas dispersion member comprising at least one of the group consisting of felt and fiberglass, and having a position whereby said gas jet emanating from said outlet opening will impinge upon said gas dispersion member, said gas dispersion member being adapted to disperse said jets into a plurality of smaller flow currents, whereby direct contact between said gas jet and adjacent portions of said inflatable boat will be substantially prevented.

4,991,618

AIR PRESSURE INDICATION AND CONTROL SYSTEM FOR A TIRE STEM AIR VALVE

Sheldon D. Gould, 3601 NE. 170th St., North Miami Beach, Fla. 33160-3149

Filed Jul. 6, 1989, Ser. No. 376,030
Int. Cl.[5] F16K *15/20*
U.S. Cl. 137—225 **11 Claims**



1. An improved pressure control valve assembly for a pressure valve, said assembly having a nipple sleeve portion and a base portion, the assembly comprising:

(a) a niple barrel portion slideably within said nipple sleeve portion, said nipple barrel portion having a fore section and an aft section;

(b) first and second stem valve means fluidly secured to said nipple barrel portion to permit flow of gas under pressure through said nipple barrel portion, said first stem valve means secured to said fore section, and said second stem valve means secured to said aft section in opposition to said first stem valve means;

(c) compressable tensioning means for biasing said nipple barrel portion with respect to said nipple sleeve portion in response to pressure levels in the vicinity of the base portion; and

(d) pressure sensitive biasing means fluidly attached to said base portion for biasing said second stem valve means in an open position until a predetermined pressure is reached in the vicinity of the base portion, said pressure sensitive biasing means comprising:

(i) a stem base portion, connected to said base portion and extending towards said second stem valve means;

(ii) a stem platform; and

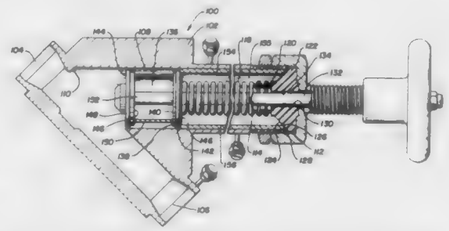
(iii) stem tensioning means for biasing said stem platform with respect to said stem portion and against said second stem valve means.

4,991,619

HIGH PURITY GAS DELIVERY CONTROL ASSEMBLY

Paolo della Porta, Milan, Italy, assignor to SAES Getters SpA, Milan, Italy

Filed Dec. 15, 1989, Ser. No. 451,183
Claims priority, application Italy, Jan. 4, 1989, 19009 A/89; Oct. 27, 1989, 22154 A/89
Int. Cl.[5] F16K *1/10, 41/10, 41/18*
U.S. Cl. 137—240 **6 Claims**



1. A high purity gas delivery control assembly (100) comprising:

A. a stainless steel body (102) having:

a. a high purity gas flow inlet port (104) of circular cross section;

b. a high purity gas flow outlet port (106) of circular cross section coaxial with said inlet port (104) and having the same diameter;

c. a gas flow interruption means translation channel (108) having a circular cross section of diameter greater than that of the inlet port and whose axis is at about 45° to the axes of the inlet and outlet ports, the translation channel (108) terminating within said body;

d. a cone shaped seat seal receiving surface (110) located at the intersection between said translation channel and said inlet port and furthermore said translation channel terminating externally to said body; and

e. a gas flow interruption means support end (112);

B. a gas flow interruption means (114), to control the delivery of high purity gas, located between the high purity gas flow inlet port and the high purity gas flow outlet port, and within said interruption means translation channel, said interruption means comprising:

a. a bellows assembly (116) comprising:

i) a bellows (118) of circular cross section the first end (120) of which is sealed in a gas tight manner to

ii) a conical shaped gas flow interruption means seal (122) whose conical surface (124) forms a gas tight seal with a curved surface (126) on the external termination (128) of the translation channel (108), the conically shaped seal (122) having a coaxial cylindrical hole (130) through which passes,

b. a translation means (132) in the form of a cylindrical rod (134); and

c. a gas flow sealing assembly (136) comprising:

(i) a dead volume defining means (138) comprising a first stainless steel disc (140) having a diameter less than the diameter of the translation channel (108) and a flexible dead volume seal disc (142) having a diameter greater than that of the seal disc (140) and slightly less than the diameter of the translation channel (108); and

(ii) a seat seal (144) comprising a second stainless steel disc (146) having a diameter less than the diameter of the translation channel (108) and a flexible seat seal disc (148), said dead volume defining means (138) and said seat seal (144) being distanced apart by means of a hollow stainless steel cylinder (150) and held rigidly together by coupling means (152); and

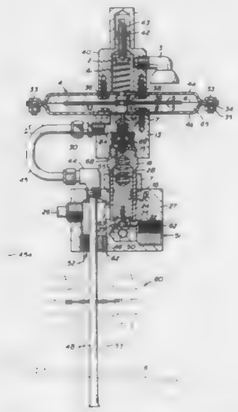
C. a bellows volume isolation means (154) in the form of a stainless steel cylinder (156) attached to inner wall (158) of translation channel (108) at a position between dead volume defining means (138) and conically shaped gas flow interruption means seal (122).

4,991,620

TANK BLANKETING VALVE

Jone Yen Ligh, 12634 Ashford Pine Dr., Houston, Tex. 77082

Continuation of Ser. No. 352,619, May 15, 1989, which is a continuation of Ser. No. 213,928, Jun. 30, 1988, abandoned. This application Jul. 19, 1990, Ser. No. 554,550
Int. Cl.[5] F16K *31/38*
U.S. Cl. 137—489 **15 Claims**



1. A pressure balanced pilot valve comprising:

a body having a chamber therein,

an inlet and an outlet in fluid communication through said chamber,

a neck extending rectilinearly into said chamber, said neck having an annular lip about the terminus thereof in said chamber,

a spindle comprising:

a hollow body, said hollow body being slidably mounted in said chamber on said neck,

a rectilinear member extending from said chamber, said rectilinear member being operably associated with a pressure sensing means,

a first annular seal positioned externally on said hollow body, proximal to said rectilinear member and aligned to operably engage a portion of the chamber to form a first fluid seal between said inlet and said outlet,

a second annular seal positioned internally in said hollow body, distal to said rectilinear member and operably aligned to engage said annular lip and form a second fluid seal between said inlet and said outlet, and

a port communicating the interior of said hollow body with said outlet, and

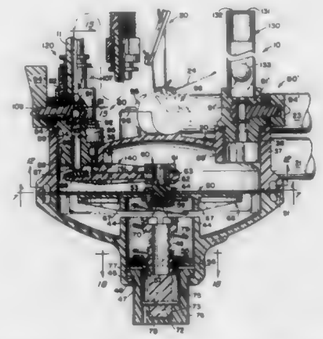
a spring mounted in said hollow body tending to bias said seals to fluidly seal said inlet and outlet apart and to bias said rectilinear member toward said pressure sensing means whereby a reduction in pressure sensed by said pressure sensing means will unseat said seals and provide communication between said inlet and said outlet.

4,991,621

PRESSURE REGULATOR

Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Filed Nov. 2, 1989, Ser. No. 430,384
Int. Cl.[5] F16K *43/00;* **G05D** *16/08*
U.S. Cl. 137—505.46 **11 Claims**



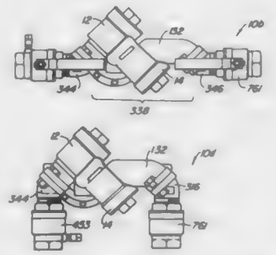
1. A pressure regulator comprising a housing, a flexible diaphragm in part setting-off a liquid chamber in said housing, an inlet and an outlet for respectively introducing liquid into and discharging liquid from said liquid chamber, valve means adjacent said inlet for selectively controlling liquid flow into said liquid chamber through said inlet, actuator means operative by said diaphragm for actuating said valve means, said valve means including a valve seat and a valve, coupling means for releasably coupling a liquid line to said inlet, one of said valve seat and valve being carried by said coupling means, the other of said valve seat and valve being carried by said actuator means whereby upon the uncoupling of said releasable coupling means at least one of said one and other valve seat and valve can be removed from said inlet, and shut-off valve means carried by said coupling means for preventing liquid flow through said coupling means incident to the removal thereof from said inlet.

4,991,622

MULTIPLY CONFIGURABLE BACKFLOW PREVENTER

John L. Brewer, and Gary A. McCauley, both of Clovis, Calif., assignors to CMB Industries, Fresno, Calif.

Filed Dec. 19, 1989, Ser. No. 454,776
Int. Cl.[5] F16K *17/00*
U.S. Cl. 137—512 **3 Claims**



1. A backflow preventer assembly, comprising:

backflow preventer valve means;

a housing for said valve means having a fluid inlet first end and a fluid outlet second end, a first opening formed at one of said first and second ends and a second opening formed at the other of said first and second ends, said first and

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second openings of said housing lying substantially in first and second planes, said first and second planes being disposed with respect to each other at an angle of about 90°;

a first fitting having a first longitudinal axis and having first and second openings, said first opening of said first fitting lying in a plane which is inclined with respect to said longitudinal axis at an angle of about 45°;

means for sealingly, rotatably joining said first opening of said first fitting to said first opening of said housing to permit rotation of said first fitting with respect to said first opening of said housing;

a second fitting having a second longitudinal axis and having first and second openings, said first opening of said second fitting lying in a plane which is inclined with respect to said second longitudinal axis at an angle of about 45°; and

means for sealingly, rotatably joining said first opening of said second fitting to said second opening of said housing to permit rotation of said second fitting with respect to said second opening of said housing.

4,991,623

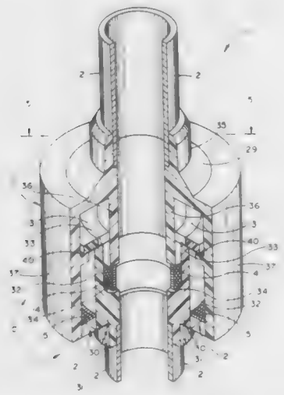
AUTOMATIC AIR VALVES FOR DUCTS

Kurt S. B. Ericson, Prins Boudewijnlaan, 48, Schilde, Belgium

Division of Ser. No. 301,547, Jan. 26, 1989, abandoned. This application Nov. 27, 1989, Ser. No. 441,259

Int. Cl.[5] F16K *17/12*; **E03C** *1/295*

U.S. Cl. 137—526 **2 Claims**



1. An automatic air valve for a duct system having a conduit through which passes fluids and/or solids, the conduit further having a pressure therein, said air valve, in combination, comprised of:

a tubular member interposed in the conduit of the duct system, such that the fluids and/or solids may freely pass through both the tubular member of the valve and the conduit of the duct system;

a passageway formed in the tubular member between the conduit and the ambient environment outside the conduit, whereby gaseous communication is provided therebetween;

the passageway having an interior end and an exterior end, the passageway further having a substantially 180° bend formed therein between the interior and exterior ends thereof and a second substantially 90° bend formed therein between the 180° bend and the interior end of the passageway;

a valve member disposed in the substantially 180° bend of the passageway for automatically controlling the flow of air therethrough, said valve member being operatively movable between a seated closed position, wherein the flow of air through the passageway is prevented when the pressure in the conduit is equal to or exceeds the pressure of the ambient environment, and an unseated open position, wherein the flow of air through the passageway is permitted when the pressure in the conduit is less than the pressure of the ambient environment for admitting atmospheric air into the conduit in response to a negative pressure in the conduit;

an interior filter disposed between the conduit and the valve member, whereby foreign objects in the conduit are restrained from operatively interfering with the valve member; and

the interior filter being disposed substantially at the interior end of the passageway between the conduit and the valve member, whereby foreign objects in the conduit are restrained from operatively interfering with the valve member.

4,991,624

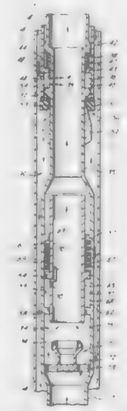
SAFETY VALVES AND CONTROL APPARATUS

Joe R. Fowler, Spring, and Robert J. Pirkle, Jr., Missouri City, both of Tex., assignors to Safety Services, Inc., Houston, Tex.

Division of Ser. No. 315,814, Feb. 27, 1989, Pat. No. 4,949,749. This application Apr. 13, 1990, Ser. No. 508,291

Int. Cl.[5] B65G *65/30*

U.S. Cl. 137—594 **5 Claims**



1. In a transmission system for fluids including an outer casing and an inner conduit insertable into and normally extending along the outer casing, said outer casing and inner conduit being of generally similar tubular configuration and allowing separate fluid flow in the annulus between the outer casing and the inner conduit and in the inner conduit; apparatus for selectively controlling fluid flow in the annulus and in the inner conduit comprising a complex tubular section capable of being interposed in the inner conduit and inserted therewith into and along the outer conduit to a desired control location, said complex tubular section being sealed in communication with the inner conduit thereby to preserve the separate fluid flow in the annulus and in the inner conduit, first closure means mounted on said complex tubular section and capable of being actuated to open or close off fluid flow in the annulus, second closure means mounted on said complex tubular section and being capable of being actuated to open or close off fluid flow in the inner conduit, and actuating means for selectively actuating said first closure means and said second closure means to open or close off fluid flow in the annulus or the inner conduit, or both, as desired.

4,991,625

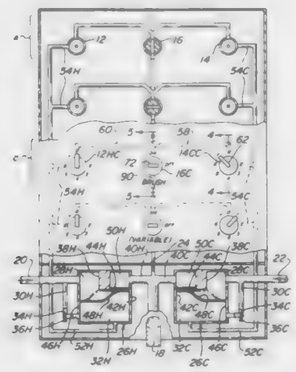
MULTIPLE STREAM FLUID MIXING AND DISPENSING APPARATUS

Paul R. Manganaro, P.O. Box 535, Coopersburg, Pa. 18036-0535

Filed Dec. 11, 1989, Ser. No. 448,639

Int. Cl.[5] F17D *3/01*

U.S. Cl. 137—606 **14 Claims**



1. A plural station, fluid flow rate and temperature control console adapted for cooperating with the standing hydraulic pressure of a dual temperature fluid supply means, comprising, in combination:

two main fluid supply conduits, a single fluid exit conduit interruptably connectable to both of said supply conduits, a variable effluent flow rate regulator interposed in each of the said main supply conduits, a bypass fluid supply conduit operably connected to each of the main fluid supply conduits and to the interposed flow rate regulators, an ancillary fluid outlet conduit connected to each regulator and serving as a signal control fluid supply means, and at least one associated controller means for presetting the flow rate through each regulator and determining both the degree of mixing and the incidence of the fluid flow to be provided from said fluid supply conduits to the exit conduit;

each of the flow rate regulators comprising a rigid impermeable main chamber connecting a first section thereof with one of the main fluid supply conduits, and also with said fluid exit conduit, said bypass fluid supply conduit being operably connected between each of said main supply conduits and a second section of the main chamber of the interposed flow rate regulators;

the main chamber being provided with first fluid valving means comprising an internally disposed, perforated support means upstream of said fluid exit conduit, a flexible fluid-impermeable membrane securely arranged across said main chamber separating said first and second sections thereof and adapted to seat sealingly, either fully or partially, over said perforated support means, said membrane being responsive to the differential pressures created on the opposing sides of said membrane by the dissimilar flow pressures from the main fluid supply conduit and the bypass fluid supply conduit;

the associated controller means is adapted for setting the regulator main flow rate, comprising a first multisetting flow valve means disposed downstream in the signal control fluid supply means, and a second valving means connectably disposed downstream of the first multisetting valve means, being adapted to only "ON" or "OFF" modes of operation; and

said second valving means also being connected to a second companion multisetting flow valve means for the other signal control fluid supply means of the other main fluid supply and also to said main exit conduit, said second valving means serving as a common flow control valve for the mixed control fluid streams.

4,991,626

BREAKAWAY COUPLING, CONDUIT SYSTEM UTILIZING THE COUPLING AND METHODS OF MAKING THE SAME

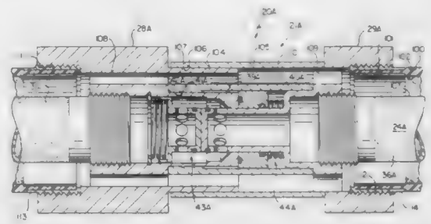
Rodger P. Grantham, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 417,381, Oct. 5, 1989, Pat. No. 4,917,149, which is a continuation of Ser. No. 181,296, Apr. 14, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 472,004

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] F16L *29/00*

U.S. Cl. 137—614.03 **20 Claims**



1. In a method of making a breakaway coupling for incorporation into a conduit system and comprising a pair of tubular coupling members each having opposed end means one of which is adapted to be interconnected to a part of said conduit system and the other of which is held in sealing and coupling engagement with the other end means of the other coupling member until uncoupled therefrom by a certain axial force means being created therebetween, each of said coupling members having a fixed valve seat means and a movable valve member for opening and closing its respective said valve seat means whereby said valve seat means of said coupling members must both be open before a fluid flow can pass through said coupling members, each of said coupling members having spring means operatively associated with its respective valve member to tend to move that valve member to its closed position, each of said coupling members having abutment means for engaging said valve member of the other coupling member and moving the same to its open position in opposition to its respective spring means as said coupling members are being disposed in their said coupling engagement, said fixed valve seat means of one of said coupling members comprising a cup-shaped member having a closed end interconnected by sidewall means to an open end disposed in fluid communication with the one opposed end means of said one coupling member, said sidewall means having opening means therethrough, said valve member of said one coupling member comprising an annular slide member telescopically receiving said cup-shaped member therein so as to slide on said sidewall means and tend to be urged to a position thereon by its said spring means to close said opening means, the improvement comprising the step of forming said annular slide member to comprise a one-piece member having a rectangular transverse cross-sectional configuration that defines flat parallel opposed annular end surfaces of said slide member and concentrically disposed inner and outer cylindrical peripheral surfaces of said slide member that extend completely between said flat opposed annular end surfaces and that respectively have circular transverse cross-sectional configurations of the same diameters throughout the entire lengths thereof.

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4,991,627

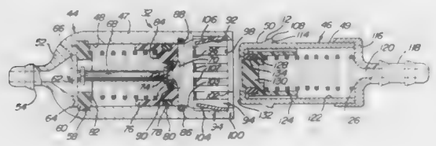
CONNECTOR FOR MODULAR PREFILLED HYDRAULIC CONTROL APPARATUS

Richard A. Nix, Rochester Hills, Mich., assignor to Automotive Products plc, Warwickshire, England

Continuation of Ser. No. 310,839, Feb. 14, 1989, abandoned, which is a division of Ser. No. 133,247, Dec. 10, 1987, abandoned, which is a continuation of Ser. No. 899,717, Aug. 25, 1986, abandoned. This application Feb. 20, 1990, Ser. No. 481,815

Int. Cl.[5] F15L *29/00*

U.S. Cl. 137—614.03 15 Claims



1. A hydraulic apparatus for controlling a utilization device, said apparatus including:

(A) a master cylinder having an outlet and an input member adapted to be connected to a control member of the utilization device;

(B) a slave cylinder having an inlet and an output member adapted to be connected to a controlled member of the utilization device;

(C) a conduit adapted to extend between said master cylinder outlet and said slave cylinder inlet; and

(D) a quick connect leak-proof connector mounted at a predetermined location between said master cylinder outlet and said slave cylinder inlet to define a first modular unit including said master cylinder and a second modular unit including said slave cylinder, each of said modular units being filled with hydraulic fluid, said quick connector including two engageable members each associated with a respective modular unit, said members acting to hydraulically seal the respective modular units when not engaged and allowing the establishment of hydraulic fluid communication between said modular units when engaged, one of said members comprising a male member having an axially extending body portion and the other of said members comprising a female member defining an axially extending bore sized to receive said body portion of said male member, one of said members including resilient means, the other of said member including leading camming means operative in response to insertion of said male member portion into said female member bore to bias said resilient means resiliently radially, said other member further including trailing abutment means operative in response to movement of said leading camming means past said resilient means to coact with said resilient means to inhibit withdrawal of said male member body portion from said female member bore;

(E) said resilient means comprising a tubular spring clip including a plurality of circumferentially spaced cuts extending from the rear annular edge of the clip to a location proximate to but spaced rearwardly from the front annular edge of the clip to define a plurality of circumferentially arrayed, axially extending finger portions, alternate finger portions being bent radially inwardly from the tubular plane of said clip to define a circumstantial array of spring fingers extending axially rearwardly and radially inwardly to provide free rearward ends movable resiliently radially; and

(F) said leading means and said trailing means being defined respectively by the leading and trailing annular surfaces of an annular rib structure on said other member.

4,991,628

VALVE SYSTEM, E.G. FOR ANALYZERS

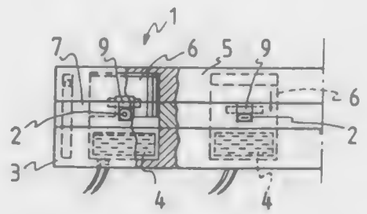
Keijo Mäkelä; Mikko A. Miettinen, both of Espoo, and Arto J. Juslin, Kellokoski, all of Finland, assignors to Kone OY, Finland

Continuation of Ser. No. 334,709, Apr. 6, 1989, abandoned. This application Aug. 7, 1990, Ser. No. 564,704

Claims priority, application Finland, Apr. 15, 1988, 881778

Int. Cl.[5] F16K *7/04*

U.S. Cl. 137—884 7 Claims



1. A valve apparatus including a plurality of electromagnetically operating clamp valves for unclamping and/or clamping elastic tubes passing through said clamp valves and thus respectively permitting or preventing fluid flow in one or more of said tubes, said apparatus comprising: a magnet table provided with a plurality of electromagnets; a cover adjacent to said magnet table having disposed therein a plurality of closing pegs aligned and cooperatively associated with said electromagnets, said closing pegs being movable by means of said electromagnets to clamp or unclamp said tubes; and a tube cassette disposed between said magnet table and said cover, said tube cassette being adapted to maintain said tubes in a given array.

4,991,629

GAS-TIGHT CLOSURE DEVICE FOR THE CONNECTING ENDS OF TUBES FOR BIOMEDICAL FLUID-TRANSPORTING APPARATUS, PARTICULARLY HAEMODIALYSIS LINES, WHICH ARE STERILIZED BY MEANS OF STERILIZING GAS

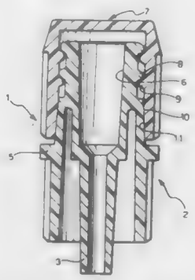
Guala Ernesto, and Beolchi Mario, both of Turin, Italy, assignors to Industrie Borla S.p.A., Turin, Italy

Filed Sep. 23, 1988, Ser. No. 248,016

Claims priority, application Italy, Sep. 25, 1987, 53672/87[U]; Nov. 4, 1987, 53790/87[U]

Int. Cl.[5] F16L *55/10;* B65D *59/06*

U.S. Cl. 138—89 6 Claims



1. A gas-tight closure device for the connecting ends of tubes for biomedical fluid-transporting apparatus, particularly but not exclusively haemodialysis lines, which are sterilised by means of sterilising gas, comprising a tubular connector having an end surface, an internal Luer cone and an outer lateral wall provided with external screw-engagement projections, a cap having an inner wall which is fitted to the tubular connector, and hermetic sealing means between the cap an the tubular connector, wherein the hermetic sealing means are only situated outside the Luer cone of the connector and include complementary conical surfaces defined by the outer lateral wall of the connector and the inner wall of the cap for mutual sealing engagement.

4,991,630

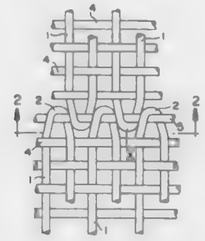
SINGLE LAYER PIN SEAM FABRIC HAVING PERPENDICULAR SEAMING LOOPS AND METHOD

Patrick H. Peaven, Clinton, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Filed Apr. 10, 1989, Ser. No. 334,347

Int. Cl.[5] D03D *3/04*

U.S. Cl. 139—383 A 16 Claims



1. A papermakers fabric comprising:

(a) a woven base fabric having first and second ends;

(b) said base fabric including a single layer of machine direction yarns having a system of cross machine direction yarns interwoven with said machine direction yarns in a repeat pattern;

(c) at each end of said base fabric, said machine direction yarns formed with a common angular orientation into a series of loops across said respective base fabric end such that

(i) said base fabric ends can be joined by intermeshing said first end series of loops with said second end series of loops and inserting a joining pintle through the intermeshed loops; and,

(ii) when intermeshed, the angular orientation of the loops of said first end series being formed in the opposite direction of the angular orientation of the loops of said second end series; and

(d) the angular orientation of the loops of said first and second end series having been converged toward each other and a plane orthogonal to a joining pintle by heat setting the base fabric ends while joined with a pintle.

4,991,631

LEAD STRAIGHTENING AND TRIMMING APPARATUS

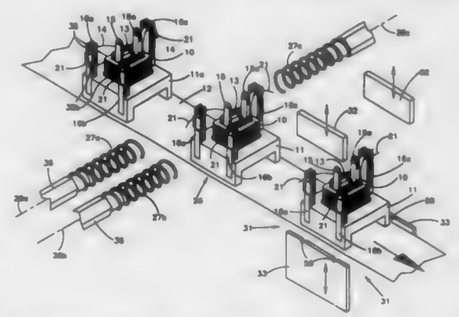
Robert J. Eminger, Ft. Wayne; Bueford Ebert, Kendallville; Paul R. Russell, Roanoke, and Donald L. Van Gilder, Ft. Wayne, all of Ind., assignors to Pease Windamatic Systems, Inc., Fort Wayne, Ind.

Filed Sep. 7, 1989, Ser. No. 403,940

Int. Cl.[5] B21F *1/02*

U.S. Cl. 140—140 18 Claims

1. A method of finishing wire leads of electrical components when said leads are held in retainers and provide free ends randomly extending from said retainers, comprising capturing said free ends in a pick-up tool, retracting said pick-up tool to move said free ends to a gripping position in which said free ends extend generally in a predetermined direction from said retainers, while said free ends are in said gripping position gripping said free ends with grippers, applying tension to said free ends with said grippers thereby straightening portions of said free ends extending from said retainers, and cutting said free ends with said grippers at least adjacent said portion leaving straightened portions extending from said retainer in a predetermined direction through a predetermined distance.



4,991,632

METHOD OF GENTLY PACKING A PRODUCT

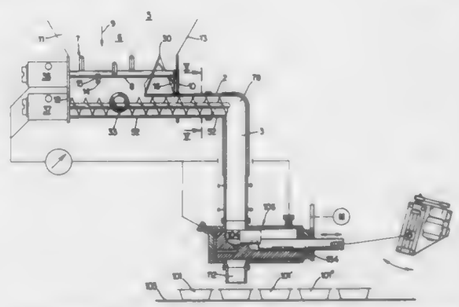
Manfred Nordmeyer; Wolfgang Nienstedt, and Helmut Gruene, all of Schwarmstedt, Fed. Rep. of Germany, assignors to Lieder Maschinenbau GmbH & Co. KG, Schawarmstedt, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 258,144

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1987, 3734361

Int. Cl.[5] B65B *1/04*

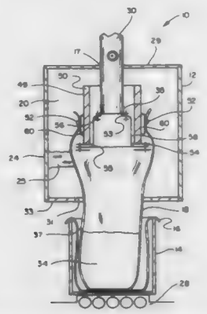
U.S. Cl. 141—1 20 Claims



1. A method of gently packing a product the consistency of which can be affected by external influences and which is composed of a plurality of separable components tending to adhere to one another to at least some extent and being readily deformable under the influence of mechanical forces, comprising the steps of establishing and maintaining a supply of separable components; drawing components from the supply; loosening the withdrawn components; converting the loosened components into a stream and equalizing the stream; conveying the components in successive increments of the equalized stream into a duct wherein the components form a column which tends to descend by gravity; evacuating metered quantities of components from the duct by gravity including admitting metered quantities of components into a measuring vessel having a capacity at least approximating that of the duct; and transferring the metered quantities into discrete packing units.

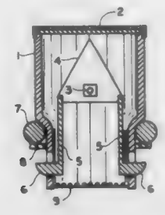
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,633
SANITARY PACKAGING SYSTEM
David M. Wong, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.
Filed Jan. 31, 1990, Ser. No. 473,072
Int. Cl.[5] B65B *1/16*
U.S. Cl. 141—5 18 Claims



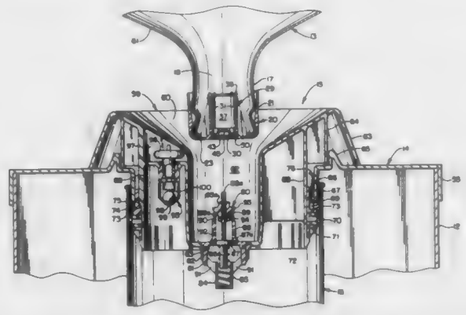
10. A method of sanitary packaging of a product comprising:
a. attaching a product bag to a sliding adjustment tube within a sanitary housing enclosure,
b. adjusting said sliding adjustment tube with respect to an attached product entry tube for positioning of said product bag,
c. employing a blower to blow sanitized air through said sanitary housing enclosure by means of an air inlet and an air outlet opening, and
d. allowing a sanitary product to flow through said product entry tube under pressure into said sanitary housing enclosure, through said sliding adjustment tube and into said product bag to package said product whereby said sanitized air blown into said air inlet, through said sanitary housing enclosure and out said air outlet, creates a positive pressure current therein to ensure upon development of any leakage within said product bag, said sliding adjustment tube, and said product entry tube causes sanitary product to be pulled outwardly therefrom by said positive pressure rather than allowing contaminates to be pulled inwardly and contaminate said sanitized product.

4,991,634
MOTOR OIL FILLER CAP ASSEMBLY
Arthur L. Tudek, 507 Indiana Ave., Glassport, Pa. 15045
Filed Aug. 3, 1989, Ser. No. 389,103
Int. Cl.[5] F01M *11/04*
U.S. Cl. 141—330 4 Claims



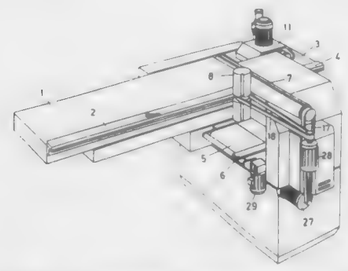
1. An assembly for insertion into an oil receiving tube of a motor vehicle comprising a cylindrical tube having a hinged cap, a top and a bottom and having an inwardly and downwardly tapered lower portion surrounded by washer means adapted for sealingly connecting said cylindrical tube to said oil receiving tube, a pair of holes on diametrically opposite sides of said downwardly tapered lower portion, a cutter blade mounted on the interior of said tube with a pointed end thereof extending upwardly in spaced relationship to the inner wall of said cylindrical tube, said cutter blade having a pair of downwardly extending, diametrically opposite flexible strips, each having an extension adapted to project radially outwardly through said holes, and a disc shaped screen filter extending across the bottom of said tube.

4,991,635
DECAP DISPENSING SYSTEM FOR WATER COOLER BOTTLES
John G. Ulm, Loveland, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio
Continuation-in-part of Ser. No. 251,267, Sep. 30, 1988, Pat. No. 4,874,023. This application Aug. 9, 1989, Ser. No. 391,186
Int. Cl.[5] B65B *3/04*
U.S. Cl. 141—346 53 Claims



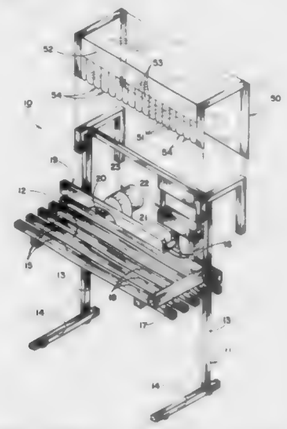
1. In combination a container for liquid having a projecting neck through which the liquid contents is to be dispensed and a dispenser having a reservoir for receiving said liquid when the container is inverted thereon;
a cap and outlet valve assembly in said neck, said assembly comprising a cap carrying a guide structure and an annular slider outlet valve, said slider valve being mounted for sliding movement along said guide structure between a normally-closed position and an opened position; said guide structure having a length, being mounted on said cap and extending into the neck, means forming elongated outlet passages along said length, said guide structure comprising at least two arcuate surfaces engaging said slider outlet valve,
said slider outlet valve having a length of substantially lesser extent than said passages to permit flow through said passages as the valve moves toward said opened position,
a socket and inlet valve assembly mounted in cooperation with said reservoir, said socket and inlet valve assembly comprising an upwardly-opening neck-receiving socket having an axis which receives the neck of said container when inverted, said inlet valve including a valve stem carrying a valve body which is normally biased to closed position, a reservoir inlet leading from the said upwardly-opening socket into said reservoir and closed by said valve body when in closed position, a tubular probe coaxially mounted with an extending upwardly in said upwardly-opening socket, said valve stem being axially slidably mounted in said probe, said valve stem projecting upwardly from the probe so as to engage said slider outlet valve in the container neck when the neck is inverted in the upwardly-opening socket to move said slider outlet valve into said opened position, engagement of the stem with said slider outlet valve also moving the stem downwardly in said probe to move said valve body carried thereby into said opened position form said normally-biased closed position,
resilient gripping fingers on said slider outlet valve for engaging the guide structure to normally hold the outlet valve in said normally-closed position, said fingers being arranged in groups annularly spaced to align with said guide structure, said slider outlet valve having guide structure engaging means projecting into each of said passages for engaging the guide structure to prevent rotation of said outlet valve to keep the groups of fingers in alignment with said guide structure.

4,991,636
TIMBER PLANING MACHINES
Thomas Robson, Houghton-le-Spring, United Kingdom, assignor to Wadkin PLC, Leicester, England
PCT No. PCT/GB86/00435, § 371 Date Feb. 5, 1987, § 102(e) Date Feb. 5, 1987, PCT Pub. No. WO87/01067, PCT Pub. Date Feb. 26, 1987
PCT Filed Jul. 22, 1986, Ser. No. 12,931
Claims priority, application United Kingdom, Aug. 16, 1985, 8520505
The portion of the term of this patent subsequent to Aug. 12, 2005, has been disclaimed.
Int. Cl.[5] B27C *1/00*
U.S. Cl. 144—116 14 Claims



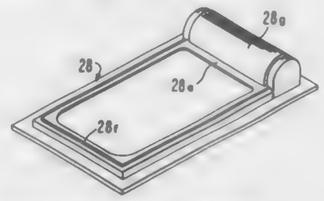
1. A machine for planing and straightening lengths of timber comprising a bed, first and second mutually perpendicular spindles for cutter blocks adjacent the bed, feed mechanism beyond said first spindle with respect to the passage of a workpiece along the bed for conveying the workpiece, an extractor for chips, said first spindle extending below the bed said second spindle extending across the bed beyond the first spindle, and means for feeding the workpiece past the cutter blocks downwardly of said bed.

4,991,637
TRIMMER APPARATUS AND METHOD
Timothy J. Butler, P.O. Box 6454, High Point, N.C. 27262
Filed Aug. 3, 1989, Ser. No. 389,183
Int. Cl.[5] B27M *1/00*
U.S. Cl. 144—372 25 Claims



1. Trimmer apparatus comprising: a stand, means to trim an object, said trim means being vertically, pivotally affixed to said stand, said trim means comprising a pendulum member, a motor, and a blade attached to said motor, said motor attached to said pendulum member, said trim means being accurately movable laterally along said stand.

4,991,638
CARTRIDGE SHADE ASSEMBLY
Ted Magee, Hillsborough, and Sean P. Magee, San Mateo, both of Calif., assignors to Magee Plastics Company, Menlo Park, Calif.
Continuation of Ser. No. 240,373, Aug. 26, 1988, Pat. No. 4,915,152. This application Feb. 12, 1990, Ser. No. 478,597
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] E06B *9/08*
U.S. Cl. 160—31 9 Claims



1. A cartridge shade assembly comprising:
a frame adapted to be removably mounted to a support in fixed position, said frame being formed from a number of molded parts bonded together to form a unitary construction, said parts having respective webs spaced apart to form a pair of side grooves;
means on the frame for defining a shell-like recess therein; a flexible shade member of a material having an inherent bias so as to be normally in the form of a scroll, said shade member being free of any structure connecting the shade member to the frame, whereby the shade member is loosely receivable in the form of a scroll in the recess, said shade member being an opaque laminated composite; and
a pull bar having a pair of opposed ends and being secured to one end of the shade member, said grooves being located for shiftably receiving the ends of the bar for guiding the bar and thereby the shade member longitudinally of the frame as the bar moves along the path, the frame and the

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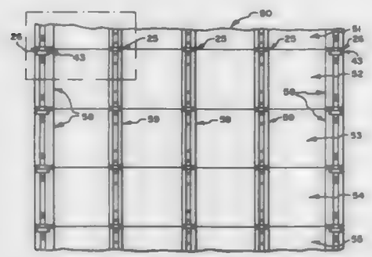
shade member being movable as a unit into and out of said fixed position to provide a cartridge-like replaceability for said assembly.

4,991,639

GUARD MEMBERS FOR PREVENTING SHIFTING CARGO FROM INTEFERING WITH THE OPERATION OF A ROLL-UP DOOR

Roy T. Clay, Jr., Snyder, and Donald J. Whiting, Akron, both of N.Y., assignors to Whiting Roll-Up Door Mfg. Corp., Akron, N.Y.

Filed Dec. 6, 1989, Ser. No. 446,978
Int. Cl.[5] B62D *25/06*
U.S. Cl. 160—201 11 Claims



1. In a roll-up door having a rectangular first panel mounted for guided articulated movement relative to an opening between a lowered position partially closing said opening and a raised overhead out-of-the-way position, said panel having a planar inner surface facing into a protected area, and having a hinge section mounted on said panel and facing into said protected area, said hinge section having a leaf portion mounted on said panel and having a knuckle portion extending from said leaf portion into said protected area, the improvement which comprises:

an elongated guard mounted on said panel and having a planar first surface arranged substantially parallel to said panel inner surface and facing into said protected area, said guard extending substantially the full height of said panel and having a first marginal end portion overlapping said leaf portion and having an end closely spaced to said knuckle portion, the transverse cross-sectional shape of said guard substantially concealing said hinge section;

whereby said guard and knuckle portion will present a substantially smooth non-stepped surface facing into said protected area such that if an object within said protected area bears against said panel, said panel may be moved from said lowered position to said raised position.

4,991,640

FASTENING MEANS FOR FASTENING A FLEXIBLE SHEET TO A BODY

Glenn M. Verkindt, Erin Township; Edward A. Lockhart, Brampton, and Douglas J. Plester, Dundalk, all of Canada, assignors to Ontario Limited D/B/A G.M. Associates, Bramalea, Canada

Continuation-in-part of Ser. No. 187,800, Apr. 29, 1988, abandoned. This application Dec. 20, 1989, Ser. No. 453,735
Int. Cl.[5] B60P *7/02*
U.S. Cl. 160—368.1 24 Claims

1. A fastening system for securing a flexible sheet to a body, the system comprising:

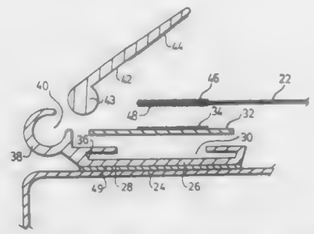
a base member;

a cover member connected to said base member for movement between closed and open positions, the cover member in the closed position overlying and covering the base member;

a sheet member having an edge portion thereof adapted to be sandwiched between said base and cover members when the cover member is in the overlying closed position, with one edge portion surface contacting the base member and the opposite edge portion surface contacting the cover member; and

two separate fastening means for fastening the sheet to the body, which separate fastening means have respective fastening members cooperating with one another in the absence of the sheet member between them to fasten the base member to the cover member;

wherein the sheet member edge portion carries on its opposite surface respective hook and loop fastening member each of which is a part of as respective one of the two separate fastening means, and the base and cover members carry respective hook and loop fastening member each of which is also a part of a respective one of the two separate fastening means cooperating with the hook and loop fastening members on the respective contacted sheet member surfaces;



the cover member in the overlying closed position with the sheet member edge portion sandwiched between the base and cover members covering the hook and loop fastening members on the cover member, the sheet member edge portion, and the base member for protection of the sandwiched cover edge portion and the hook and loop fastening members against physical damage and the deleterious effects of weathering; and

the hook and loop fastening members on the cover member and the base member fastening to one another in the absence of the sheet member between them to hold the cover member in closed overlying covering engagement with the base member, so that the cover member then protects the hook and loop fastening means on the cover and base members against physical damage and the deleterious effects of weathering.

4,991,641

METHOD OF AND APPARATUS FOR METAL CASTING

Thomas F. Kidd, Toledo, Ohio, and Stephen A. Thompson, St. Bruno, Canada, assignors to Electrovert Ltd., Laprairie, Canada

Filed May 7, 1990, Ser. No. 520,213
Int. Cl.[5] B22D *17/04*
U.S. Cl. 164—120 15 Claims

1. An apparatus for producing a casting from a molten metal comprising

a tank adapted to contain the molten metal,

a cylinder located in the tank having at its base a connection to an injection passageway leading through the tank to a die located outside the tank,

a piston within the cylinder,

a first valve in the passageway, located in the tank having a first position wherein the passageway from the cylinder to the die is open, and a second position wherein the passageway to the die is closed, and a connection is open from the cylinder to a valve port opening in the tank,

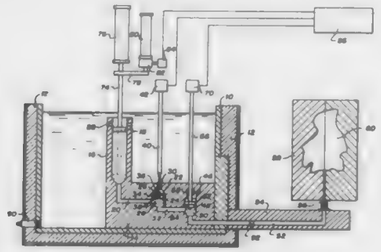
first valve operating means to transfer the first valve from one position to the other position,

a second valve in the passageway, located in the tank after the first valve, to open and close the passageway from the first valve to the die,

second valve operating means to open and close the second valve, and

means to raise the piston in the cylinder with the first valve in the second position and the second valve closed, to fill the cylinder with molten metal, and means to lower the piston in the cylinder with the first valve in the first position and the second valve open to inject molten metal into the die.

10. A method of producing a casting from a molten metal utilizing an injection cylinder having an injection piston therein, the cylinder located in a tank containing molten metal and means to raise and lower the piston in the cylinder, an injection passageway leading to a die external of the tank, the passageway having a first valve therein with a valve port



opening to the tank and a second valve therein to open and close the passageway, the first valve and the second valve contained within the tank, the method comprising the steps of:

operating the first valve to open the passageway from the cylinder and close the valve port opening,

operating the second valve to open the passageway to the die,

injecting molten metal into the die by lowering the piston in the cylinder until the die is full,

after a predetermined time delay, operating the second valve to close the passageway to the die,

operating the first valve to close the passageway from the cylinder and open the valve port opening, and

filling the cylinder with molten metal from the tank through the valve port opening by raising the piston in the cylinder.

4,991,642

FLUORINE-FREE MOLD POWDERS

Elie E. Saad, Silver Springs, Md., assignor to Stollberg, Inc., Niagara Falls, N.Y.

Division of Ser. No. 307,666, Feb. 6, 1989, Pat. No. 4,880,463. This application Aug. 16, 1989, Ser. No. 394,783
Int. Cl.[5] B22D *11/07, 11/10*
U.S. Cl. 164—472 6 Claims

1. A method of protecting molten steel during a process for the continuous casting of steel wherein a pool of molten steel is maintained in the upper end of an open ended continuous casting mold, the method comprising forming on the top of said pool a protective layer of a fluorine-free particulate slagging composition having the theoretical approximate oxide analysis of:

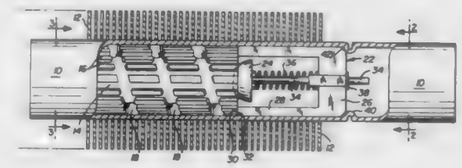
Li_2O	0.5–9
Na_2O	29–38
CaO	0–25
B_2O_3	5–10
SiO_2	38–50.

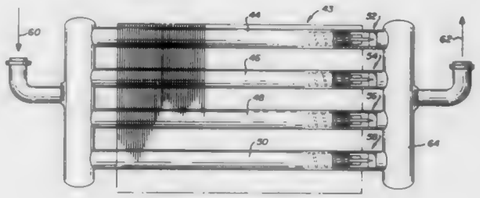
4,991,643

HEAT EXCHANGER WITH INTERNAL BYPASS VALVE

Stephen G. Price, Corona, and James E. Ott, Anaheim, both of Calif., assignors to Hayden, Inc., Corona, Calif.

Filed Aug. 23, 1989, Ser. No. 398,163
Int. Cl.[5] G05D *15/00, 23/12;* F28F *27/02*
U.S. Cl. 165—38 15 Claims





1. A heat exchanger with an internal bypass valve comprising:

a heat exchanger tube;

a bypass insert adapted for fixed mounting within the heat exchanger tube including:

a substantially unobstructed bypass tube having an open end forming a valve seat,

a plurality of turbulating internal radial fins in fixed heat conducting contact with the interior of the heat exchanger tube and the exterior of the bypass tube, and

a substantially bypass valve adapted to fit completely within the heat exchanger adjacent to the bypass insert including:

a valve body having a diameter equal to the diameter of the bypass insert for insertion into the heat exchanger tube and at least one elongated contact arm extending away from the valve body a predetermined distance, the contact arm being substantially parallel to the heat exchanger tube and having a stop contact surface at an end thereof adapted to contact the stop face formed by the internal fins and the end of the bypass insert,

a valve head for sealing against the valve seat and blocking the open end of the bypass tube,

a valve head guide means retained by the valve body for guiding the valve head into and out of sealing contact with the valve seat,

the valve head being mounted on the valve head guide means, and

a valve actuation means for longitudinally moving the valve head and pressing it into sealing contact with the valve seat, the elongated contact arm having a preselected length adapted to function with the valve actuation means to hold the valve body spaced the predetermined distance away from the stop face, said predetermined distance controlling the operation of the bypass valve; and

a securement means for holding the stop contact surface on the contact arm in contact with the stop face.

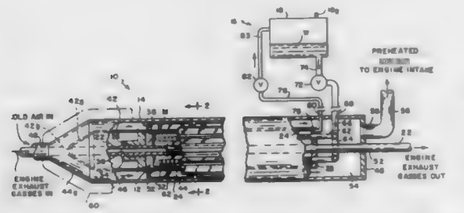
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4,991,644

ENGINE PREHEATING PROCESS AND SYSTEM

Ioannis N. Miaoulis, Stow, and Maureen Selvidge, Belmont, both of Mass., assignors to Tufts University, Medford, Mass.

Filed Jul. 12, 1989, Ser. No. 378,970
Int. Cl.[5] F01N *5/02*; F02G *5/02*; F02M *31/08*
U.S. Cl. 165—52 **12 Claims**



4. A cold start system for an internal combustion engine comprising

a thermally conductive chamber;

an heat exchange material of the type that undergoes a reversible dehydration/rehydration cycle contained in said chamber;

a fluid container having an upper space and a lower space;

means for conducting hot engine exhaust gases into intimate heat exchange relation with said chamber to dehydrate said thermal storage material therein;

a first conduit for conducting dehydration vapor from said chamber to said container for condensing in the container lower space;

means for sealing said chamber and its contents from external moisture;

a second conduit for conducting water in said container lower space to said chamber for hydrating the thermal storage material therein to evolve thermal energy to heat the chamber, and

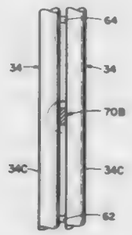
means for circulating fluid for said engine into intimate heat exchange relation with said chamber as to heat said fluid for delivery to said engine.

4,991,645

STEAM GENERATOR TUBE ANTIVIBRATION APPARATUS

Hermann O. Lagally, Hempfield Township, Westmoreland County, and Thomas A. Pitterle, Unity Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 208,714, Jun. 20, 1988, Pat. No. 4,893,671.
This application Nov. 1, 1989, Ser. No. 430,208
Int. Cl.[5] F28F *7/00*
U.S. Cl. 165—69 **4 Claims**



1. In combination with a pair of longitudinal columns of steam generator tubes, a supplementary antivibration member comprising:

(a) an elongated bar of rectangular cross-section with two pairs of diagonally opposite longitudinal edges, said bar being placed between said pair of tube columns;

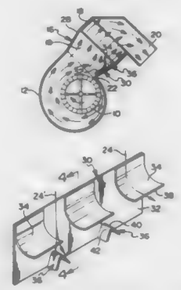
(b) said bar having a greater width than thickness and being rounded off at one of said pairs of said diagonally opposite edges and having a solid cross-section such that said bar is placed between said pair of tube columns by insertion with its thickness extending between said pair of tube columns and then quarter-turned to position its width therebetween, said longitudinal spans of said tubes being laterally outward deformed away from one another as a result of said inserted and quarter-turned solid bar.

4,991,646

AIR FLOW DISTRIBUTION BAFFLE

Thomas D. Spears, West Amherst, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 23, 1990, Ser. No. 527,413
Int. Cl.[5] F28F *13/06*
U.S. Cl. 165—122 **4 Claims**



1. In a heat exchanger system having a heat exchanger core and a blower which produces a nonuniform air flow in a preferential path toward the core, a distribution baffle in the air flow for diffusing the air flow comprising:

a main baffle panel disposed in the preferential path and parallel to the air flow from the blower,

means for directing a portion of the air flow in a direction transverse to the panel including a plurality of spaced bending surfaces protruding from the panel into the air flow, whereby some of the air is directed out of the preferential path to improve the air flow distribution and the remainder of the air remains in the preferential path, and

means for diffusing the remainder of the air in the preferential path comprising laterally deflecting elements on the panel downstream of the bending surfaces and in the path of the said remainder of the air, so that the remainder of the air is distributed evenly.

2. In a heat exchanger system having a housing including opposed walls, a heat exchanger in the housing, a radial flow blower in the housing upstream of the heat exchanger for inducing air flow into the housing and toward the heat exchanger wherein the blower produces a preferential air flow along one wall of the housing and a low flow region at the opposite wall, and a distribution baffle between the blower and the heat exchanger, the baffle comprising:

a main panel mounted along the said one wall of the housing adjacent the preferential air flow,

a plurality of laterally spaced deflecting surfaces extending from the panel into the air flow, the surfaces being shaped to redirect a portion of the air flow away from the wall into the low flow region to thereby balance the flow distribution in the housing, and

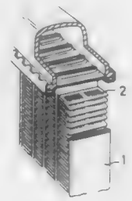
diffusers aligned with the spaces between the deflecting surfaces and downstream of said surfaces for laterally distributing the portion of the air flow along the panel which passes between the deflecting surfaces, whereby substantially uniform air flow occurs at the heat exchanger.

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HEAT EXCHANGER

Tsuyoshi Kawabe, Utsunomiyashi; Tadayoshi Hayashi, Fujimishi; Ryotatsu Otsuka, Osakashi; Ichiro Iwai, Oyamashi; Ichizo Tsukuda, Kishiwadashi, and Makoto Tanio, Sakaishi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

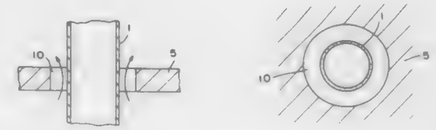
Filed Jun. 18, 1990, Ser. No. 539,983
Claims priority, application Japan, Jun. 19, 1989, 1-156362
Int. Cl.[5] F28F *19/00*
U.S. Cl. 165—134.1 **8 Claims**

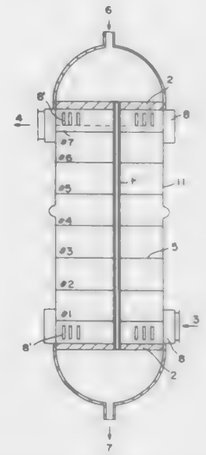


1. A heat exchanger which comprises tubular elements and fin members:

the tubular elements being made of a first aluminum alloy containing 0.05 to 1.0 wt % of Mg, 0.2 to 1.2 wt % of Si, 0.2 to 1.5 wt % of Mn, 0.01 to 0.5 wt % of Fe, as necessary components, and 0.05 wt % or less of Cu as a controlled impurity, the balance being aluminum and unavoidable impurities; and

the fin members being made of a second aluminum alloy containing 0.05 to 1.0 wt % of Mg, 0.2 to 1.2 wt % of Si, 0.2 to 1.5 wt % of Mn, 0.01 to 0.5 wt % of Fe, and further containing at least one of 0.01 to 0.1 wt % of In and 0.1 to 2.0 wt % of Zn as necessary components, and 0.05 wt % or less of Cu as a controlled impurity, the balance being aluminum and unavoidable impurities.





wherein said inner diameter of said holes in said baffle plates are of varying sizes distributed on said baffle plates to define said annular flow passageways with cross-sectional areas of varying sizes distributed across said baffle plates.

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MULTI-TUBE TYPE HEAT TRANSFER APPARATUS

Akira Magari; Hideaki Nagai; Hiroichi Kurita, all of Tokyo, and Kazuto Kobayashi, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1990, Ser. No. 476,548
Claims priority, application Japan, Feb. 10, 1989, 1-29950; Feb. 10, 1989, 1-29951; Nov. 15, 1989, 1-294971
Int. Cl.[5] F28F *9/22*
U.S. Cl. 165—159 **12 Claims**

1. A multi-tube heat transfer apparatus, comprising:

a shell having a first inlet and a first outlet for a heat transfer fluid and a second inlet and a second outlet;

a plurality of heat transfer tubes in said shell fluidly connecting said second inlet and said second outlet; and

a plurality of baffle plates disposed at intervals within said shell between said first inlet and said first outlet, each of said baffle plates having a plurality of holes therein, said holes having a larger inner diameter than the outside diameter of said heat transfer tubes to define annular spaces therebetween, and said heat transfer tubes extending through respective said holes of said baffle plates, wherein annular flow passageways for the heat transfer fluid are defined by said annular spaces;

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OIL WELL PACKER RETRIEVER

Manfred Steinkamp, 148 Market Street, Aberdeen, Great Britain (AB1 2PP)

Continuation of Ser. No. 773,839, Sep. 6, 1985, abandoned, which is a continuation of Ser. No. 707,539, Mar. 4, 1985, which is a continuation of Ser. No. 545,399, Sep. 15, 1983, abandoned.
This application Oct. 15, 1986, Ser. No. 919,244
Claims priority, application United Kingdom, Jan. 27, 1982, 8201306
Int. Cl.[5] E21B *10/64*
U.S. Cl. 166—55.7 **7 Claims**

1. In an oil well packer retriever comprising a packer miller for milling the packer to release it from the well casing, and a packer catcher mounted on a tubular member extending from the miller for engaging the packer once the packer is released; the packer catcher comprising a sleeve slidable along said tubular member and slotted to define resilient fingers, and including an emergency release means;

the improvement comprising the packer miller including a plurality of radial blades having end faces and side faces provided with abrasive material, the end faces being dimensioned to mill substantially the entire annular surface of the packer, and the side faces having said abrasive material extending along a major portion thereof; and

the catcher sleeve being urged by resilient means into en-

gagement with a collar and said emergency release means comprises the collar being secured to the tubular member



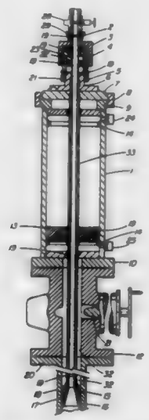
by shear pins or bolts adapted to shear at a predetermined stress.

4,991,650

WELLHEAD ISOLATION TOOL

Roderick D. McLeod, 5104-125 Street, Edmonton, Alberta, Canada T6H 3V5

Filed Nov. 30, 1989, Ser. No. 443,389
Claims priority, application Canada, Dec. 1, 1988, 584720
Int. Cl.[5] E21B *23/06, 33/02*
U.S. Cl. 166—72 3 Claims



1. A concentric mandrel apparatus for use as a wellhead isolation tool, said apparatus comprising:

(a) means for mounting said apparatus on a wellhead;

(b) an inner mandrel extending down through and acted on by an actuating cylinder and extending through an outer mandrel and having a seal expander on the lower end of said inner mandrel;

(c) an outer mandrel extending down through and acted on by an operating cylinder and having a nipple means including a resilient sealing member attached to the lower end thereof; the improvement in said apparatus comprises:

means in the actuating cylinder for moving the inner mandrel relative to the outer mandrel so that its seal expander will deform the resilient sealing member of the outer mandrel against the casing;

means for mechanically locking the inner mandrel in position in relation to the outer mandrel;

means in the actuating cylinder for hydraulically locking the inner mandrel in position in relation to the outer mandrel; and

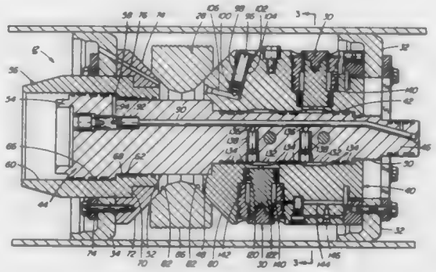
piston means in the operating cylinder to move the assembly of inner mandrel, actuating cylinder and outer mandrel relative to the wellhead in order to position the resilient sealing member in a well casing.

4,991,651

PIPELINE PACKER FOR PLUGGING A PIPELINE AT A DESIRED LOCATION

Douglas C. Campbell, Edmonton, Canada, assignor to Dowasue Industries Ltd., Canada

Continuation-in-part of Ser. No. 115,866, Nov. 2, 1987, Pat. No. 4,854,384. This application Jun. 14, 1989, Ser. No. 366,510
Claims priority, application Canada, Apr. 7, 1987, 534015
Int. Cl.[5] F16L *55/132*
U.S. Cl. 166—122 27 Claims



1. A pipeline packer for plugging a pipeline at a selected location therein, comprising:

(a) a body assembly having an upstream high pressure end and a downstream low pressure end and adapted for insertion into and propulsion through the pipeline in the axial direction under the influence of fluid pressures acting thereon;

(b) a plurality of brake shoes capable of gripping the interior wall of the pipeline mounted to said body assembly and extending thereabout in circumferentially spaced relation;

(c) said brake shoes being mounted to said body assembly for generally radial motion of each brake shoe relative to said body assembly from a non-gripping to a pipeline wall gripping position;

(d) a pair of annular wedging means mounted to said body assembly for relative axial movement therebetween;

(e) fluid pressure activated means associated with said annular wedging means for effecting said relative axial movement and with said brake shoes for moving same to the pipeline wall gripping position;

(f) an annular sealing member of elastomeric material mounted to said body assembly between said pair of annular wedging means and co-operating therewith to expand radially outwardly as relative motion of the annular wedging means toward one another occurs thereby to bring the sealing member into engagement with the interior wall of the pipeline to substantially prevent leakage of fluid around said body assembly;

(g) fluid pressure supply and control means connected to said fluid pressure activated means and adapted, to command, to cause said brake shoes to be urged generally radially outwardly into gripping relation with the pipeline wall and to effect said relative axial movement between said annular wedging means to expand said sealing member into sealing engagement with the pipeline wall;

(h) said fluid pressure supply and control means including a source of fluid pressure, and valve means for controlling admission to and release of the fluid from the fluid pressure activated means, and wherein

(i) said fluid pressure supply and control means includes a pressure intensifier means between said source and the fluid pressure activated means, means for by-passing said intensifier during a first stage of the admission of the pressurized fluid to the fluid pressure activated means and means to render the intensifier operative during a second stage of the admission to bring the brake shoes and the annular sealing member into the pipeline wall gripping and sealing positions respectively.

4,991,652

OIL RESERVOIR PERMEABILITY PROFILE CONTROL WITH CROSSLINKED WELAN GUM BIOPOLYMERS

Dennis H. Hoskin, Lawrenceville; Thomas O. Mitchell, Hopewell Township, Mercer County, and Paul Shu, West Windsor, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 283,399, Dec. 12, 1988. This application Jul. 17, 1989, Ser. No. 380,348
Int. Cl.[5] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—270 18 Claims

1. A process for improving sweep efficiency during a fluid flood oil recovery operation in which regions of higher permeability within an oil-bearing subterranean formation are plugged with a gel-forming composition, comprising the step of injecting into the region of higher permeability within the formation an aqueous gel-forming composition which comprises:

(a) water;

(b) a viscosifying amount of welan gum heteropolysaccharide biopolymer produced by fermentation of carbohydrate sources of assimilable carbon in the presence of a microorganism of the genus Alcaligenes;

(c) about 0.01 to about 2.0 weight percent of at least one phenolic compound selected from the group consisting of phenol, resorcinol, catechol, phloroglucinol, pyrogallol, 4,-4'diphenol and 1,3-dihydroxynaphthalene; and

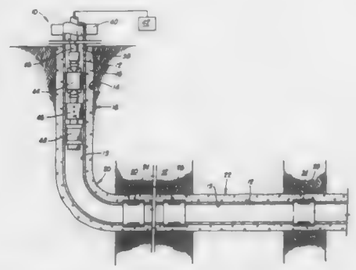
(d) about 0.01 to about 3.0 weight percent at least one aldehyde component selected from the group consisting of aliphatic monoaldehydes, aromatic monoaldehydes, aliphatic dialdehydes and aromatic dialdehydes, which amounts of said phenolic compound and said aldehyde component are sufficient to cause gelation of the aqueous solution of said biopolymer.

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WASH TOOL

Steven L. Schwegman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 8, 1989, Ser. No. 433,944
Int. Cl.[5] E21B *37/00*
U.S. Cl. 166—312 18 Claims



1. Apparatus to be run on a tubing string to clean out a casing bore, said tubing string and casing bore defining a well annulus therebetween, comprising:

a housing including connector means for connecting said housing to said tubing string;

an upper packer means, connected to said housing, for sealing between said housing and said casing bore and for defining an upper portion of said well annulus above said upper packer means;

a lower packer means, connected to said housing below said upper packer means, for sealing between said housing and said casing bore, and for defining an intermediate portion of said well annulus between said upper and lower packer means and defining a lower portion of said well annulus below said lower packer means;

said housing having:

an upper fluid bypass passage means defined in said housing, for communicating said upper portion and said intermediate portion of said well annulus so that fluid pumped down said well annulus is bypassed around said upper packer means and directed into said intermediate portion of said well annulus to wash said casing bore in said intermediate portion of said well annulus;

a lower fluid bypass passage means, defined in said housing, for communicating said intermediate portion and said lower portion of said well annulus so that fluid is bypassed from said intermediate portion of said annulus around said lower packer means and directed into said lower portion of said well annulus to wash said casing bore below said lower packer means; and

a longitudinal housing bore, defined through said housing, having an open lower end so that fluid in said lower portion of said well annulus may return up through said housing bore and said tubing string to carry debris out of said casing bore.

15. A method of cleaning a casing bore of a well, comprising:

(a) breaking debris loose in a portion of said casing bore by rotating a workstring having a clean-out tool with teeth on a lower end thereof;

(b) reverse circulating well fluid up through said tool and said workstring to carry said debris out of said well;

(c) after step (a), wiping said portion of casing bore as said tool is advanced; and

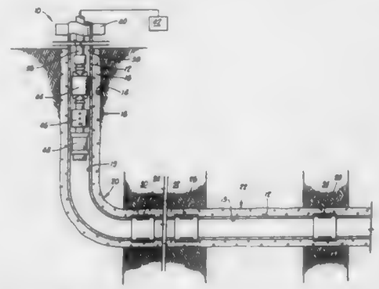
(d) after step (c), jet washing said portion of said casing bore with well fluid.

4,991,654

CASING VALVE

John T. Brandell; David D. Szarka, and Bob L. Sullaway, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 8, 1989, Ser. No. 435,114
Int. Cl.[5] E21B *34/06, 34/14*
U.S. Cl. 166—332 25 Claims



1. A sliding sleeve casing tool apparatus for use in a casing string of a well, comprising:

an outer housing having a longitudinal passageway defined

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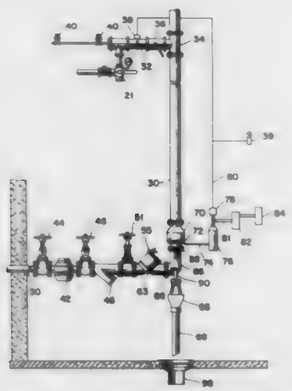
therethrough and having a side wall with a communication port defined through said side wall;
a sliding sleeve slidably disposed in said longitudinal passageway and being selectively movable relative to said housing between a first position blocking said communication port and a second position wherein said communication port is communicated with said longitudinal passageway;
first and second longitudinally spaced seals disposed between said sliding sleeve and said housing and defining a sealed annulus between said sliding sleeve and said housing; and
position latching means for releasably latching said sliding sleeve in its said first and second positions, said latching means being disposed in said sealed annulus.

4,991,655

COMBINED ALARM AND BACK-FLOW PREVENTION ARRANGEMENT FOR FIRE SUPPRESSION SPRINKLER SYSTEM

George J. McHugh, Broomall, Pa., assignor to Back-Flo Alarm Valve Co., Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 269,314, Nov. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 250,834, Sep. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 247,073, Sep. 21, 1988, abandoned. This application Apr. 10, 1989, Ser. No. 335,381
Int. Cl.[5] A62C *35/68, 35/60;* G08B *17/00;* E03C *1/10*
U.S. Cl. 169—16 **73 Claims**



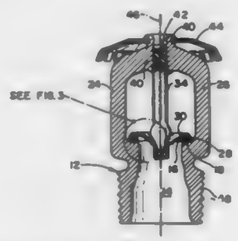
24. A combined alarm valve and backflow prevention arrangement for a fire suppression, water sprinkler system, having a main conduit and an arrangement of individual water sprinklers downstream of the main conduit, said combined alarm valve and backflow prevention arrangement comprising:
a first check valve provided in said main conduit upstream of said arrangement of individual sprinklers;
an alarm valve including a second check valve provided in said main conduit downstream of said first check valve and upstream of said arrangement of individual sprinklers;
alarm means for indicating when the alarm valve is open; and
means for providing fluid communication between said first check valve and said alarm valve in a passageway, said means for providing fluid communication including means for draining the passageway in response to the pressure in said main conduit of the fire suppression system and means for venting said passageway when the pressure in the passageway is below a predetermined amount, said means for providing communication between said first check valve and said alarm valve comprising a plumbing fitting, said plumbing fitting having means for coupling said plumbing fitting to the first check valve upstream of the plumbing fitting and means for coupling said plumbing fitting to the alarm valve downstream of the plumbing fitting, said first check valve and said second check valve together providing a double check valve, reduced pressure zone, backflow preventer.

4,991,656

QUICK RELEASE VALVE FOR SPRINKLER HEAD

George S. Polan, Harleysville, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Continuation-in-part of Ser. No. 357,389, May 25, 1989, abandoned. This application Mar. 30, 1990, Ser. No. 502,462
Int. Cl.[5] A62C *37/14*
U.S. Cl. 169—38 **13 Claims**



1. A quick release sprinkler comprising:
a sprinkler body defining a flow passage for conducting a fire retarding fluid to an outlet;
a valve seat formed on an end face of the sprinkler body around the outlet, the valve seat including stop means extending from the end face and spaced radially outwardly from the outlet;
a sealing member seated on the valve seat, at least a portion of the sealing member being spaced radially outwardly from the outlet;
a resiliently flexible valve disk for obstructing the flow of fluid through the outlet, the valve disk having a peripheral flange portion turned over the sealing member towards the sprinkler body and resting against the stop means such that the stop means prevents outward radial movement of the peripheral flange portion of the valve disk;
a substantially rigid, frangible, thermal responsive element received centrally on the valve disk opposite the flow passage; and
loading means for adjustably loading the frangible element under compression against the valve disk such that the valve disk resiliently deflects, without outward radial movement of the peripheral flange portion, to compress the sealing member against the valve seat to seal the outlet.

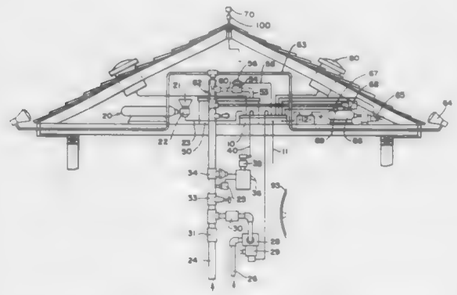
4,991,657

FIRE SUPPRESSION SYSTEM

Walter C. LeLande, Jr., 301 N. Hart Pl., Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 908,808, Sep. 17, 1986, Pat. No. 4,836,290. This application May 16, 1989, Ser. No. 352,566
Int. Cl.[5] A62C *1/20*
U.S. Cl. 169—46 **36 Claims**

1. A fire extinguishing system for roof fires or the like, comprising:
a fire sensor for monitoring a condition indicative of a fire and for signaling the sensing of the condition;
a wind sensor for monitoring wind speed;
a first fire extinguishing means for spraying a fire retardant fluid onto an exterior surface of an associated roof; and,
a control circuit connected to said fire sensor, said wind sensor and said first fire extinguishing means for actuating said first fire extinguishing means as driven by said fire sensor, wherein a composition of the fire retardant fluid is



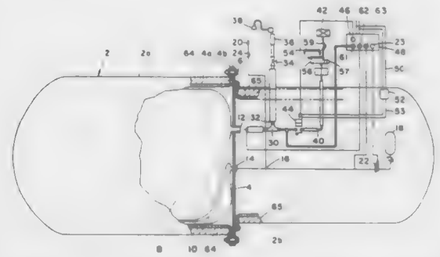
regulated by said control circuit based on readings from said wind sensor.

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DEVICE PARTICULARLY USEFUL AS A FIRE EXTINGUISHER

Shlomo B. Shlomo, of Moshav Tzur Moshe, D.N. Lev Hasharon, Israel

Continuation-in-part of Ser. No. 223,986, Jul. 25, 1988, abandoned. This application Dec. 27, 1988, Ser. No. 290,278
Claims priority, application Israel, Dec. 22, 1987, 84924
Int. Cl.[5] A62C *3/07*
U.S. Cl. 169—62 **16 Claims**



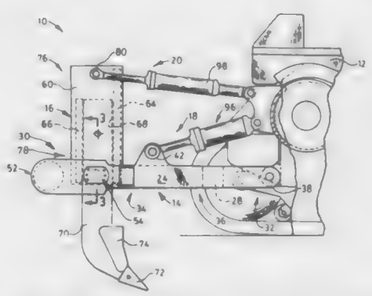
1. A device comprising: a rigid tank containing an expansible water chamber for receiving a quantity of water to be used for extinguishing a fire, and an expansible air chamber for receiving pressurized air in order to pressurize the water in said water chamber; a water inlet into said water chamber for introducing water thereinto; an air inlet into said air chamber for introducing pressurized air thereinto from an external pump for pressurizing the water in said water chamber; a pressurized air tank or boosting the pressure of the air in said air chamber, and maintaining said boosted air pressure at the desired level, said pressurized air tank connected to said air chamber by a coupling to said air inlet separate to the connection of said air inlet to said external pump; a discharge nozzle from said water chamber for discharging water therefrom in the form of a fog jet; and a control valve for controlling the discharge of water from said water chamber through discharge nozzle.

4,991,659

RIPPER ASSEMBLY WITH PITCH CONTROL AND INTEGRAL FRAME AND PUSH BLOCK

Visvaldis A. Stepe, East Peoria, and Chris E. Akins, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 23, 1990, Ser. No. 513,129
Int. Cl.[5] A01B *63/10;* E02F *5/32*
U.S. Cl. 172—464 **9 Claims**



1. A ripper assembly adaptable for mounting on a vehicle, comprising:
a one piece frame assembly having first and second mounting brackets, first and second lift brackets, and an integrally constructed push block, each of the first and second mounting brackets, being spaced from one another and adapted for pivotal connection with the vehicle;
a ripper carriage assembly adapted to receive a ripper shank, the ripper carriage assembly being pivotably secured to the ripper frame assembly at a point of connection between the push block and the first and second lift brackets;
a lift mechanism connected to the first and second lift brackets of the frame assembly, the first and second lift brackets being at a location on the frame assembly between the ripper carriage assembly connection point and the first and second mounting brackets, the lift mechanism being adapted for connection to the vehicle, and operative to raise and lower the ripper assembly;
a pitch control mechanism connected to the ripper carriage assembly above the connection point of the ripper carriage assembly with the frame assembly and adapted for connection to the vehicle, said pitch control mechanism being operative to pivot the ripper carriage assembly about the connection point located on the frame assembly; and
a sight opening is defined in the frame assembly adjacent the ripper carriage assembly, said sight opening is located in the frame assembly between the ripper carriage assembly and the first and second mounting brackets and is of a size sufficient to provide clear visibility therethrough to the area around the ripper shank and/or the ripper tip.

4,991,660

ROLLING HOE

Benedek Horváth; Cecilia R. Horváthné, both of Kecskemét, and Ferenc Zöld, Jakabszállás, all of Hungary, assignors to Agrikon Mezogazdasagi Gepgyarto Uzletag, Hungary

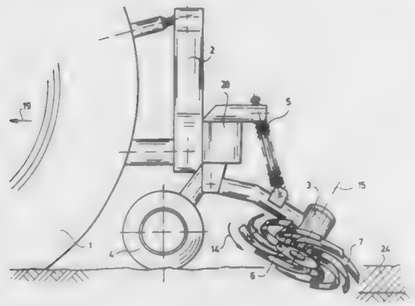
Filed Aug. 25, 1989, Ser. No. 398,627
Claims priority, application Hungary, Sep. 8, 1988, 4621/88
Int. Cl.[5] A01B *21/02*
U.S. Cl. 172—551 **6 Claims**

1. A rolling hoe apparatus for cultivating soil comprising:
a frame supporting at least one rotary hoe wheel, each said hoe wheel comprising a hub, a shaft, bearings and cultivating teeth,
each said hoe wheel being individually suspended from said frame through a bearing structure for allowing said hoe wheel to be flexible in a vertical direction,
said cultivating teeth comprising a plurality of arcuate teeth

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each having an elongated cutting edge and each extending radially outwardly from said hub and curving rearwardly with respect to the normal direction of rotation during cultivation, said teeth being arranged substantially equally spaced about the circumference of said hub,

characterized by said hoe wheel having a plane of rotation during cultivation extending generally forwardly and upwardly forming an angle (α) with the soil surface, wherein the magnitude of said angle (α) is between 5 and 75 degrees,



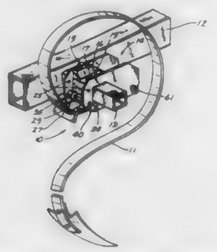
and by said teeth each having an axis of symmetry when viewed in cross-section which forms an angle (γ) with the axis of rotation of the hoe wheel, wherein during cultivation the magnitude of the angle (α) between the plane of rotation of the hoe wheel and the soil surface is approximately equal to the magnitude of the angle (γ) between the axis of symmetry of each tooth and the axis of rotation of the hoe wheel.

4,991,661

LOCK-UP MOUNT APPARATUS FOR AN EARTH WORKING TILLAGE TOOL

Roger S. Barenthsen, West Fargo, N. Dak., assignor to Alloway Manufacturing, Fargo, N. Dak.

Filed Apr. 23, 1990, Ser. No. 513,069
Int. Cl.[5] A01B *19/10, 73/00, 39/28*
U.S. Cl. 172—662 **3 Claims**



1. A lock up mount apparatus for an earth working tillage tool comprising:

a bracket having a toolbar opening disposed therein along a first generally horizontal axis, said toolbar opening being adapted to receive a toolbar in said toolbar opening, a first pin opening in said bracket, a second pin opening in said bracket and a third pin opening in said bracket;

a tillage tool means having one end for engagement with ground to be worked;

attachment means disposed on the other end of said tillage tool means, said attachment means having a first hole disposed therein and a second hole disposed therein;

first pin means for selectively extending through said first pin opening in said bracket and said first hole in said attachment means whereby said attachment means and thereby said tillage tool means if pivotally attached to said bracket;

second pin means for selectively extending through one of said second and third pin openings, said second pin means also extending through said second hole in said attachment means when said pin means is disposed in said second pin opening in said bracket whereby said tillage tool means is held in an operative earth working position and said tillage tool means is held up in a non-earth working position when said second pin means is disposed in said third pin opening in said bracket; and

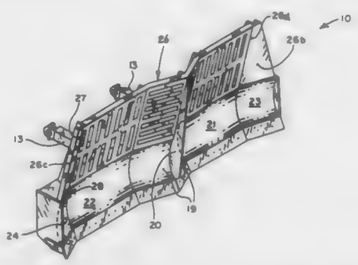
a fourth pin opening in said bracket for selectively receiving said first pin means therethrough and through the first hole in said attachment means and having said second pin means extending through said first opening.

4,991,662

LAND FILL SPREADER BLADE ASSEMBLY

James O. Caron, and Kenneth H. Pratt, both of Modesto, Calif., assignors to Caron Compactor Company, Modesto, Calif.

Filed Oct. 25, 1989, Ser. No. 427,005
Int. Cl.[5] E02F *3/815*
U.S. Cl. 172—701.1 **4 Claims**



1. A land fill spreader blade assembly of a type serving to deflect trash to opposite sides of the center line of the path of a tractor and into the paths of demolition wheels carried on opposite sides of the tractor, said blade assembly comprising means protruding forwardly of the blade for deflecting trash to opposite sides of the center line of the tractor's path, broad blade portions extending transversely of the paths of the demolition wheels, forwardly directed portions formed on the ends of said blade for retaining trash in the region of the paths of said wheels, said forwardly protruding means flaring rearwardly and laterally to merge with said broad blade portions and said forwardly directed end portions tapering rearwardly and laterally to merge with said broad blade portions whereby the blade is so configured that the demolition wheels will pass directly over the trash, and a rigid screen extending upwardly from the upper edge of said blade serving to deflect trash forwardly thereof, and means supporting said blade assembly with respect to the leading portion of the tractor.

4,991,663

SHUT-OFF VALVE HAVING VARIABLE INPUT

James F. Steverding, Stanley Air Tools, Div. of The Stanley Works, 700 Beta Dr., Cleveland, Ohio 44143

Filed Dec. 19, 1988, Ser. No. 286,759
Int. Cl.[5] B25B *23/14*
U.S. Cl. 173—12 **18 Claims**

10. A shut-off type fluid operated power tool comprising:

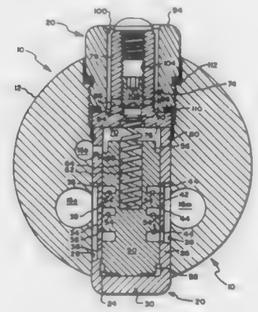
(a) a housing having a fluid supply inlet passage and a motor fluid passage;

(b) a motor in said housing and operated by fluid from said motor passage, said motor having a free running no load speed at a predetermined supply fluid pressure which decreases in speed as torque loading on the motor increases;

(c) means in said housing for defining a valve chamber including passage means for enabling fluid to flow from said inlet passage through an input orifice to the valve chamber and through an output orifice to said motor passage;

(d) a valve movable in said chamber and operatively associated with said valve chamber passage means for controlling fluid flow between said inlet passage and said motor passage, said valve being movable between a run position allowing fluid flow from said inlet passage to said motor passage and a shut-off position blocking fluid flow from said inlet passage to said motor passage;

(e) means for directing fluid under motor operating pressure against one portion of said valve for moving said valve away from said run position and toward said shut-off position;



(f) means for applying bias force against another portion of said valve for urging said valve toward said run position for balancing the force of motor operating pressure acting on said valve until a specified torque load on said motor is reached whereupon said valve moves to said shut-off position; and

(g) said valve and said passage means of said valve chamber being configured and located relative to each other to define said input orifice of variable flow area for supplying fluid from said supply passage to said motor passage, said variable input orifice having less than maximum flow area when said valve is in said run position and said variable input orifice expanding to maximum flow area during a portion of the travel of said valve from said run position to said shut-off position.

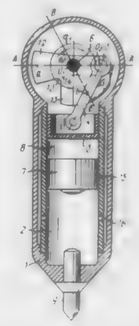
4,991,664

COMPRESSION-VACUUM PERCUSSIVE ACTION MACHINE

Jury N. Kolgan, Planernaya, 14, korpus 2, kv.13; Nikolai M. Kirjushin, Kolomensky proezd, 3, korpus 1, kv. 63, both of, Moscow; Ivan A. Prokhorov, ulitsa Smuryakova, 9, kv. 48, oblast, Ivanteevka, Moskovskaya; Vitold A. Kezik, ulitsa Stradnieku, 99, kv. 54, and Evgeny I. Ryabokon, ulitsa Sarkanarmiyas, 186, kv. 40, both of Latviiskaya SSR, Daugavpils, all of U.S.S.R.

PCT No. PCT/SU89/00205, § 371 Date Apr. 9, 1990, § 102(e) Date Apr. 9, 1990, PCT Pub. No. WO90/01612, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 9, 1989, Ser. No. 474,739
Claims priority, application U.S.S.R., Aug. 9, 1988, 4471996
Int. Cl.[5] B25D *9/26, 11/12;* **F21C** *37/24*
U.S. Cl. 173—116 **1 Claim**

1. A compression-vacuum percussive action machine comprising a housing (1) which accommodates a cylinder containing a hammer (7) intended to engage with a work tool (9), and a piston (3) separated from the hammer (7) by an air cushion (8) and positioned inside the cylinder (2) for reciprocations, a crank pin (5) connected to the piston (3) and linked with a drive shaft (6) by a counterweight (10) whose centre of mass is offset relative to a straight line (A—A) passing through the points of intersection of the axes(O_1 and O_2) of the drive shaft (6) and crank pin (5) in a plane perpendicular to the axis of the drive shaft (6), characterized in that a projection of the counterweight (10) plotted on this plane perpendicular to the axis (O_1) of the drive shaft (6) has a shape made up of two portions (12, 13) of which one (12) is positioned in symmetry with the



straight line (A—A) passing through the points of intersection of the axes (O_1 and O_2) of the drive shaft (6) and crank pin (5) in a plane perpendicular to the axis (O_1) of the drive shaft (6), whereas the centre of mass ("b") of the other portion (13) rests at the line (B—B) turned at an angle (β) of 45°–90° relative to said straight line (A—A) in a direction (ω) of rotation of the crank pin (5), masses m_1 and m_2 of the parts of the counterweight (10) corresponding to the portions (12, 13) of the shape being determined by the relationship:

$$m_1 r_1 = \frac{m_2 r_2}{K}$$

where r_1 and r_2 are the distances from the point of intersection of the axis (O_1) of the drive shaft (6) in a plane perpendicular to this axis (O_1) to the centres of mass (a, b) of the portions of the counterweight (10) having respective mass m_1 and m_2, whereas $K = 1–2$.

4,991,665

FLEXIBLE CIRCUIT CONDUCTOR RUN

Joseph A. Kueneman, Torrance, Calif., assignor to Buss Systems Incorporated, El Segundo, Calif.

Filed Dec. 5, 1988, Ser. No. 279,790
Int. Cl.[5] H01B *11/00*
U.S. Cl. 174—34 **14 Claims**

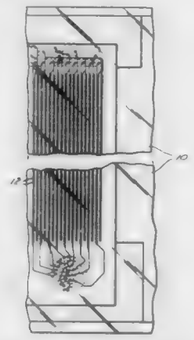
1. A conductor run, comprised of a thin flexible sheet which includes circuits, for interconnecting circuit elements, operable at a frequency at which characteristic impedances of the circuit elements and interconnecting flexible circuit conductor run are generated, which flexible circuit conductor run is adapted to generate a characteristic impedance at the operating frequency which is substantially matched with the characteristic impedances of the circuit elements at the operating frequency, comprising:

(a) a plurality of pairs of generally parallel spaced-apart thin conductors, including means for controlling the characteristic impedance generated therein at the operating frequency, comprising alternating lengths of conductor crossing portions and conductor extending portions in each pair of conductors, in which each extending portion in each conductor in each pair of conductors includes a generally sidewardly-projecting tine portion, adapted to generate a characteristic impedance of the flexible circuit

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conductor run at the operating frequency substantially matched with the characteristic impedances of the circuit elements at the operating frequency;

(b) means for insulating each pair of conductors and each conductor in each pair of conductors from each other; and



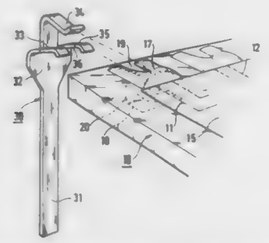
(c) means for securing each of the pairs of conductors and each conductor in each of the pair of conductors in the insulating means in generally parallel spaced-apart relation to each other.

4,991,666

TERMINAL PAD FOR FIXING A CLAWED PIN TO THE EDGE OF A HYBRID CIRCUIT SUBSTRATE AND A CONNECTION FORMED THEREBY

René Septfons, Paris, and Michel Rabartin, Orsay, both of France, assignors to Societe Anonyme dite: Alcatel Cit, Paris, France

Filed Dec. 22, 1988, Ser. No. 288,189
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—261 10 Claims



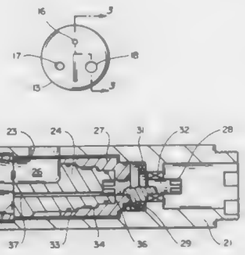
1. In combination, hybrid circuit substrate having an edge for fixing a clawed pin including claws constituting jaws of a resilient clamp to opposite first and second faces of the edge of said hybrid circuit substrate, a terminal pad on said hybrid circuit substrate at said edge, said pad having opposite faces one on each side of the substrate including at least one tinnable area on each face for bearing a solder blob on said edge of said substrate in a position suitable for being grasped by the claws of the pin, the improvement wherein said tinnable areas are each notched with at least one groove for receiving a respective claw of the pin engagable with said face of said substrate on which the blob of solder is to be disposed with each groove defining a slide path for a corresponding claw of the pin when the pin is placed on the edge of the substrate, and each groove being slightly narrower than a respective claw to ensure that the claw overlaps the tinnable area to some extent.

4,991,667

HYDRAULIC DRILLING APPARATUS AND METHOD

Robert D. Wilkes, Jr.; Paul S. Turin; Michael J. Pesavento, all of Berkeley, Calif., and Ben W. O. Dickinson, III, 2125 Broderick St., San Francisco, Calif. 94115, assignors to Ben Wade Oakes Dickinson, III, San Francisco and Robert Wayne Dickinson, San Rafael, both of, Calif.

Filed Nov. 17, 1989, Ser. No. 439,659
Int. Cl.[5] E21B *7/08, 7/18*
U.S. Cl. 175—61 13 Claims



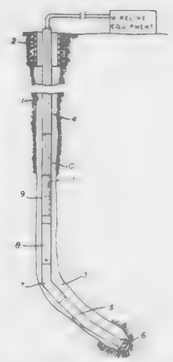
1. In apparatus for drilling a borehole in the earth: a drill head having a plurality of forwardly facing nozzles inclined at different angles about an axis, a valve member rotatable about the axis and having a bore which can be brought into communication with different ones of the nozzles as the valve member is rotated, means for delivering a pressurized drilling fluid to the bore for discharge as a high velocity cutting jet through the nozzle in communication with the bore, and means for rotating the valve member to selectively position the bore in communication with different ones of the nozzles to control the direction in which the drilling fluid is discharged and the hole is cut.

4,991,668

CONTROLLED DIRECTIONAL DRILLING SYSTEM AND METHOD

William A. Rehm; William J. McDonald; William C. Maurer, and Curtis E. Leitko, Jr., all of Houston, Tex., assignors to Maurer Engineering, Inc., Houston, Tex. and Bechtel Investments, Inc., Nev., part interest to each

Filed Feb. 6, 1989, Ser. No. 306,050
Int. Cl.[5] E21B *7/04*
U.S. Cl. 175—61 38 Claims



1. A system of apparatus for the controlled directional drilling of a deviated well bore into the earth comprising;

a drill string extending into a substantially vertical well bore in the earth,

a fluid operated motor and drill bit operated thereby secured on the bottom end of said drill string,

means supporting at least a part of said motor and drill bit at a substantial angle to said substantially vertical well bore for continuing the drilling of said well bore at an angle to the substantially vertical portion thereof,

a surveying tool connected in said drill string above said motor for determining and controlling the direction of drilling,

a mule shoe keying sub connected to said surveying tool for orienting the position of said motor in relation to said surveying tool, and

an orienting sub connected to said surveying tool by said mule shoe keying sub at one end and connected at the other end to said means supporting said motor at an angle, and including

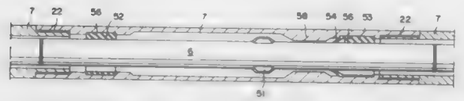
means to adjust the angular orientation of the point of connection to said mule shoe keying sub in relation to said means supporting said motor at an angle.

4,991,669

DEVICE FOR CONTROLLING THE PASSAGE OF A FLUSHING MEDIUM IN IMPACT MACHINES

Kurt H. Andersson, Tyresö, Sweden, assignor to Atlas Copco MCT AB, Nacka, Sweden

Filed Feb. 14, 1990, Ser. No. 479,714
Claims priority, application Sweden, Mar. 7, 1989, 8900782
Int. Cl.[5] E21B *21/10*
U.S. Cl. 175—135 1 Claim



1. Device in impact machines comprising a machine housing (3, 11), a hammer piston (4) movable to and fro in the machine housing and arranged for delivering impacts against a tool, and a rotary device (12, 13) for rotation of the tool, said tool comprising a central set of rods including a plurality of rods (6), a set of tubes comprising a plurality of interconnected tubes (7) surrounding the set of rods, and means for supplying flushing medium under pressure to a space between said set of rods and said set of tubes, characterized in that said rods (6) are guided by elastic bushings (52, 53) arranged in said tubes (7), one of said elastic bushings (53) comprising a lip (54) which is arranged to sealingly rest against the rod (6) when flushing medium is not supplied and to allow passage of flushing medium when flushing medium is supplied, and said lip (54) being provided with a plurality of longitudinal cuts such that said lip can be readjusted between said sealing position resting against the rod and an open position allowing passage of said flushing medium.

4,991,670

ROTARY DRILL BIT FOR USE IN DRILLING HOLES IN SUBSURFACE EARTH FORMATIONS

John Fuller, Penzance, and Joseph A. Gasan, Stroud, both of England, assignors to Reed Tool Company, Ltd., Newtownabbey, Northern Ireland

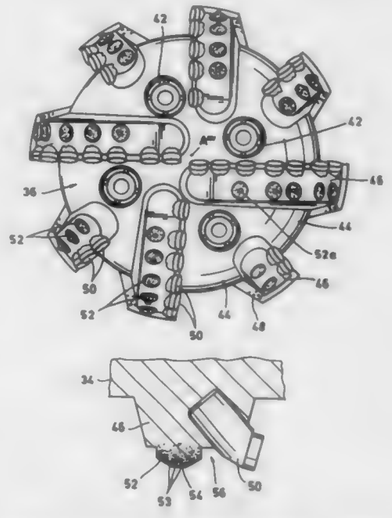
Continuation of Ser. No. 187,811, Apr. 29, 1988, Pat. No. 4,889,017, which is a continuation-in-part of Ser. No. 118,604, Nov. 9, 1987, Pat. No. 4,823,892, which is a division of Ser. No. 754,506, Jul. 12, 1985, Pat. No. 4,718,505. This application Nov. 8, 1989, Ser. No. 433,689
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—329 34 Claims

1. A rotary drill bit for use in drilling holes in subsurface earth formations comprising:

a bit body having a shank at one end for connection to a drill string and an operating end face at the other end;

a plurality of first cutting structures each comprising a preform cutting element mounted in said bit body at said end face, and each having a superhard front cutting face; and

a plurality of protuberances projecting outwardly from adjacent portions of said end face, said protuberances forming a plurality of second cutting structures disposed in generally trailing relation, respectively, to at least some of said first cutting structures, each of said protuberances



carrying a plurality of superhard particles, various of the particles in each protuberance being disposed at different distances from a surface of revolution defined by the outer extremities of the first cutting structures and each of said protuberances so projecting by a sufficient distance so that it is at least partially aligned with the respective leading first cutting structure;

and wherein at least a major operative portion of each of said second cutting structures is circumferentially separated from the respective leading first cutting structure by an open space.

4,991,671

MEANS FOR MOUNTING A ROLLER CUTTER ON A DRILL BIT

David E. Pearce, and James C. Walter, both of Houston, Tex., assignors to Camco International Inc., Houston, Tex.

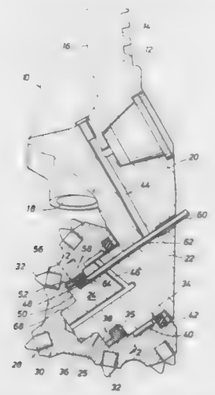
Filed Mar. 13, 1990, Ser. No. 492,789
Int. Cl.[5] E21B *10/20*
U.S. Cl. 175—369 10 Claims

1. In a triple cone drill bit having a bit body, a generally cylindrical journal extending from the bit body having an extending reduced diameter end portion forming a bearing surface and an annular groove defining an annular flange adjacent said reduced diameter end portion, a conically shaped roller cutter having a body with a central bore therein receiving said journal and including internal screw threads defining a portion of said central bore, and a retainer ring mounted within said annular groove and having external screw threads along its outer periphery in threaded engagement with said internal screw threads on said roller cutter for rotation with said roller cutter relative to said journal, said annular groove having a bottom surface and inner and outer side surfaces defining inner

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and outer corners at the junctures of said bottom surface with said inner and outer side surfaces;

an improved journal design for forming said annular groove



including a predetermined minimum radius R1 for said inner corner being in accordance with the following formula for determining said predetermined minimum radius R1:

$$\frac{R1}{E} \geq a \ln \left[\frac{\left(\frac{J}{E} - 1 \right)}{b} \right]$$

where

J is the diameter of the journal bearing in inches,

E is the diameter of the groove in inches,

a is 0.0096 (a constant derived empirically from testing),

b is 0.0035 (a constant derived empirically from testing), and

ln is the natural logarithm for base e.

4,991,672

AUTOMATIC CONTROL SYSTEM FOR THE TRANSFER OF THE DRIVE POWER BETWEEN A TRACTOR AND A TRAILER

Reijo Leino, Lappeenranta, Finland, assignor to Orion-Yhtyma Oy Normet, Finland

PCT No. PCT/FI89/00044, § 371 Date Oct. 25, 1989, § 102(e) Date Oct. 25, 1989, PCT Pub. No. WO89/09352, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 10, 1989, Ser. No. 424,290

Claims priority, application Finland, Mar. 25, 1988, 881439

Int. Cl.[5] B62D *59/02, 55/00*

U.S. Cl. 180—14.3 **7 Claims**

1. An automatic control system for the transfer of drive power between a tractor and a trailer, said system comprising a closed hydraulic circuit which operates a set of drive wheels integral to said tractor and an open hydraulic circuit which operates another set of drive wheels integral with said trailer, said closed hydraulic circuit comprising:

an adjustable displacement pump; and

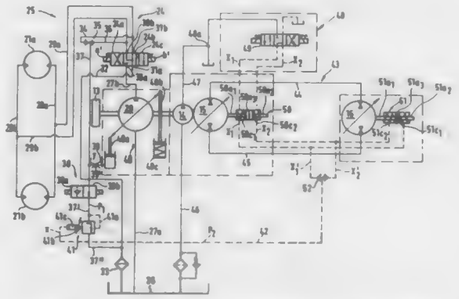
a motor driven by said adjustable displacement pump; and said open hydraulic circuit comprises:

another adjustable displacement pump;

at least one other motor driven by said another adjustable displacement pump; and

a pressure-limiter valve; and said system further comprises:

a fluid containing line connected to said closed hydraulic circuit and, through said pressure-limiter valve, to said open hydraulic circuit, said line functioning to transmit fluid pressure from said closed hydraulic circuit to said open hydraulic circuit in such a manner that, when fluid pressure changes in magnitude within said closed hydraulic circuit a corresponding change in fluid pressure magnitude occurs within said open hydraulic circuit such that said another hydraulic pump delivers a corresponding change in pressure to said at least one other motor in a manner such that, with increasing traction resistance to said set of drive wheels integral to said tractor, said fluid pressure in said fluid containing line increases and said



increased fluid pressure is transmitted through said pressure-limiter valve to said adjustable displacement pump which in turn produces a higher drive pressure for said at least one other motor and, in a corresponding way, with decreasing traction resistance to said set of drive wheels integral to said tractor, said fluid pressure in said fluid containing line decreases and said decreased fluid pressure is transmitted through said pressure-limiter valve to said adjustable displacement pump which in turn produced a lower drive pressure for said at least one other motor.

4,991,673

CROSS-COUNTRY VEHICLE OR MACHINE

Jan E. Ericsson, Umeå, Sweden, assignor to Umea Mekaniska AB, Umea, Sweden

Continuation of Ser. No. 45,241, May 4, 1987, abandoned, which is a continuation of Ser. No. 637,826, Aug. 6, 1984, abandoned. This application Feb. 24, 1989, Ser. No. 315,227

Claims priority, application Sweden, Aug. 5, 1983, 8304292

Int. Cl.[5] B60G *17/04*

U.S. Cl. 180—41 **3 Claims**

1. A mobile cross-country vehicle, including:

a chassis having longitudinal and transverse dimensions, including an imaginary longitudinal vertical center plane;

ground-engaging support members mounted to said chassis for supporting the chassis on the ground;

a superstructure including a driver's cab;

means mounting the superstructure on the chassis, said mounting means including:

means providing a first pivot axis extending longitudinally of said vehicle,

means providing a second pivot axis extending transversally of said vehicle; and

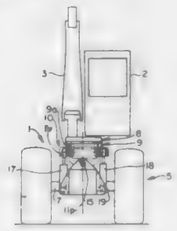
means for pivoting said superstructure about said first, longitudinally-extending pivot axis, for tilting said superstructure leftwardly and rightwardly relative to said chassis, and for pivoting said superstructure about said second, transversally-extending pivot axis, for tilting said superstructure up in front and down in front relative to said chassis;

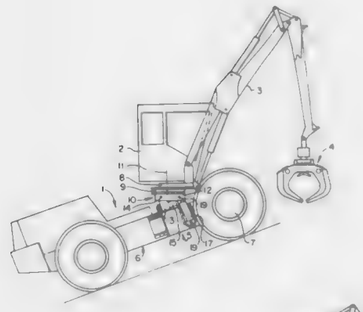
said pivoting means including at least two pressure cylinders, including at least one disposed to the left of said longitudinal vertical center plane and at least another disposed to the right of said longitudinal vertical center plane, each said pressure cylinder being mounted to act

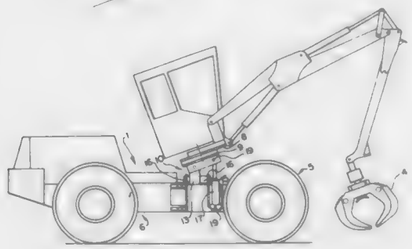
effectively between said chassis and said superstructure, at corresponding locations displaced longitudinally along said vehicle from said second, transversally-extending axis,

whereby,

(a) said one and another pressure cylinders, when extended and retracted by equal amounts, cause said superstructure to pivot about said second axis but not about said first axis, whereas







(b) when said one or another pressure cylinders is extended and retracted with said another or one being correspondingly retracted and extended, cause said superstructure to pivot about said first axis but not about said second axis, and

(c) when said one and another pressure cylinders are extended and retracted by other amounts than specified in (a) and (b), said superstructure pivots about both said first, longitudinally-extending axis and said second, transversally-extending axis.

4,991,674

FORKLIFT TRUCK BATTERY RETAINER WITH SPRING

Todd M. Fullenkamp, Ft. Recovery, Ohio, assignor to Crown Equipment Corporation, New Bremen, Ohio

Filed Aug. 9, 1989, Ser. No. 391,349

Int. Cl.[5] B60R *16/04*

U.S. Cl. 180—68.5 **18 Claims**

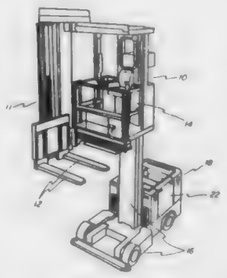
1. A releasable battery retainer mechanism for closing one end of a battery compartment housing heavy batteries of the type used to power vehicles, said retainer comprising

a battery retainer plate for closing one end of the battery compartment,

at least one wedge element associated with said retainer plate, said wedge element having a first inclined surface,

a second wedge element having a second inclined surface in mating engagement with said first inclined surface,

a battery engaging surface associated with said second



wedge element for holding the battery in its compartment without lateral movement,

the angle of said first and second inclined surfaces being selected to provide a friction lock for preventing relative movement of the inclined surfaces toward said retainer plate,

and means for releasing said second wedge element from its friction lock relation with said first wedge element thereby to permit removal of said battery from its compartment.

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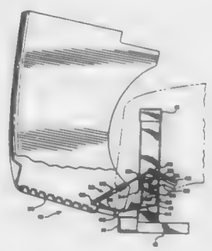
HOOD TILT MECHANISM

James J. Tosconi, Fort Wayne, and Steven A. Burke, New Haven, both of Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Oct. 11, 1988, Ser. No. 256,004

Int. Cl.[5] B62D *25/10*

U.S. Cl. 180—69.21 **17 Claims**



1. A motor vehicle hood tilt apparatus comprising:

a motor vehicle supporting framework;

a hood supporting bracket mounted to said framework, said bracket providing a hinge pivot axis extending transversely of the path of travel of said vehicle;

a manually operated, engine-covering hood pivotally mounted to said hood supporting bracket for swinging movement about said hinge pivot axis between an open position wherein the hood center of gravity is forward of said pivot avis, an intermediate over-center position, and a

VOL 1123 ISS 2 FE 12 1991 UMI

closed position wherein said hood center of gravity is rearward of said pivot axis; and

a hood tilt assist mechanism having a first end pivotally attached to said hood and a second end engaged with said hood supporting bracket, said hood tilt assist mechanism incorporating means for counterbalancing the weight of said hood in both said open position and said closed position and for limiting travel of said hood in said open position, said hood tilt assist mechanism being the exclusive connection means between said hood and said framework, other than said pivotal mounting therebetween, in said open position;

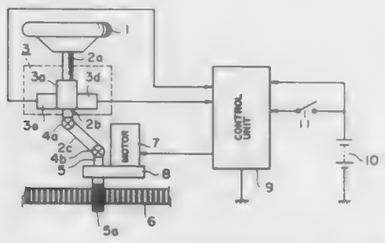
said assist mechanism comprising first and second elongated members disposed in telescoping engagement and connected respectively to said hood and said hood supporting bracket, a first compression spring means operatively coupled between said first and second elongated members to be compressed when said hood is in its open position, and a second compression spring means operatively coupled between said first and second members to be compressed when said hood is in its closed position, said first elongated member comprising a tube having an axially extending slot in its periphery and said second elongated member comprising a rod slidably disposed within said tube, said rod having a radially extending pin extending through said slot in said tube, said first and second spring means being disposed on the outside of said tube respectively on each side of said radially extending pin for engagement therewith, and stop means respectively attached to the exterior of said tube engageable with the ends of said first and second spring means remote from said pin.

4,991,676

MOTORIZED POWER STEERING APPARATUS

Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1989, Ser. No. 408,334
Claims priority, application Japan, Sep. 22, 1988, 63-239418
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 **5 Claims**



1. A motorized power steering apparatus for a vehicle comprising:

torque sensing means for generating an output voltage proportional to both a supply voltage and to a steering torque exerted by a driver of the vehicle;

a motor for generating an auxiliary steering force;

a self-excited pulse width modulation circuit for supplying the motor with drive pulses having a pulse width which is modulated by the output voltage of the torque sensing means; and

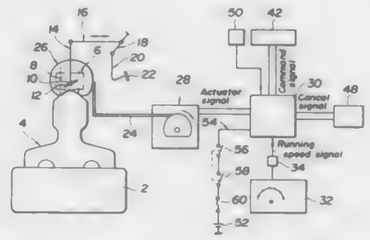
feedback means embodying RC time constant means (941–946) connected between the motor and the pulse width modulation circuit for preventing variations in the net energy applied to the motor due to variations in the supply voltage.

4,991,677

EXAMINATION DEVICE IN A VEHICLE CONSTANT SPEED CONTROL APPARATUS

Fujiyuki Suzuki, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 279,556, Dec. 2, 1988, abandoned. This application May 10, 1990, Ser. No. 520,858
Claims priority, application Japan, Dec. 10, 1987, 62-310941
Int. Cl.[5] B60K *31/04*
U.S. Cl. 180—179 **2 Claims**



2. A constant speed control device for causing a moving vehicle to maintain a predetermined cruising speed, comprising:

a vehicle engine, a carburetor in which an air-fuel mixture is prepared, a suction manifold connected between said vehicle engine and said carburetor for supplying the air-fuel mixture to said vehicle engine, and a throttle valve pivotally supported on said carburetor for adjusting the composition of the air-fuel mixture supplied to said vehicle engine;

a cruise cable connected at one end to said throttle valve, actuator means connected at the other end of said cruise cable for reciprocating said cruise cable relative to said throttle valve to effect reciprocally pivotal movement of said throttle valve and adjust the air-fuel mixture in said carburetor, command switch means having an operating state for activating constant speed control and selecting the predetermined cruising speed, a vehicle speed sensor for sensing an actual vehicle speed, and control means connected to said command switch means, said vehicle speed sensor, and said actuator means for determining the difference between the predetermined cruising speed and the actual speed and providing a signal to said actuator means based on said difference; and

means for making a connection between said control means and an electric power source, cancel switch means having an operating state for selectively overriding activation of constant speed control by said command switch means and disabling constant speed control, said command switch means including coast switch means for causing the vehicle speed to be changed to and maintained at a decremental speed less than the predetermined cruising speed, set switch means for causing the vehicle speed to be changed to and maintained at an incremental speed greater than the predetermined cruising speed, and return switch means for causing the vehicle to return from one of the decremental and incremental speeds to the predetermined cruising speed, fault protection means automatically operative immediately after said power source connection is made for selectively prohibiting constant speed control only if said command switch means is in said operating state substantially at the same time that said power source connection is made, said control means including means for disabling said constant speed control until the actual vehicle speed has reached a predetermined minimum speed, means for repeatedly determining whether said cancel switch means is in its operating state until it is determined that said cancel switch means is not in its operating state, means for repeatedly determining whether said cancel switch means is in its operating state

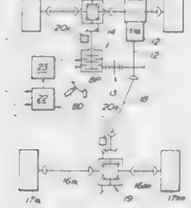
and whether the vehicle has reached said predetermined minimum speed until it is determined that said cancel switch means is not in its operating state and that the vehicle has reached said predetermined minimum speed, and means for repeatedly determining whether said cancel switch means is in its operating state, whether the vehicle has reached said predetermined minimum speed, and whether said command switch means is in its operating state, until it is determined that said cancel switch means is not in its operating state, that the vehicle has reached said predetermined minimum speed, and that said command switch means is in its operating state.

4,991,678

SYSTEM METHOD FOR DRIVE FORCE DISTRIBUTING CONTROL FOR FRONT-AND-REAR-WHEEL DRIVE MOTOR VEHICLE

Kunitaka Furuya, and Yasuji Shibahata, both of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 272,962
Claims priority, application Japan, Nov. 20, 1987, 62-294803
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] B60K *23/04*
U.S. Cl. 180—197 **10 Claims**



1. A system for controlling distribution of drive forces from a drive source unit of front and rear wheels of a four-wheel drive motor vehicle, said system comprising:

drive force distributing means for transmitting drive forces to said front and rear wheels proportionally, at a continuously variable distribution ratio;

first speed detecting means for detecting a rotational speed (Nf) of said front wheels;

second speed detecting means for detecting a rotational speed (Nr) of said rear wheels;

control means including means for calculating a slip ratio (S), wherein $S=2(Nr-Nf)/(Nr+Nf)$, of said rear wheels to said front wheels for a condition of a road on which the motor vehicle is running and for calculating an optimum distribution ratio between the drive forces to be distributed to said front and rear wheels based on said slip ratio (S), and

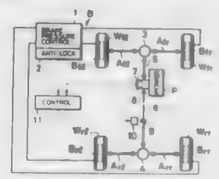
means for controlling said drive force distributing means to transmit the drive forces from the drive force unit proportionally to said front and rear wheels according to said calculated optimum distribution ratio.

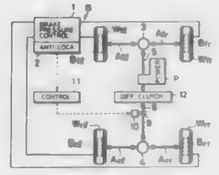
4,991,679

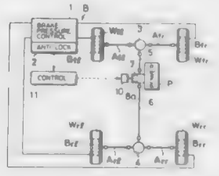
FOUR WHEEL-DRIVE ANTI-LOCKING BRAKING

Etsuo Fujii; Makoto Sato, and Seiichi Hirai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,144
Claims priority, application Japan, Jun. 21, 1985, 60-135501; Jun. 25, 1985, 60-138308; Nov. 15, 1985, 60-256326
Int. Cl.[5] B60K *17/34;* **B60T** *8/00*
U.S. Cl. 180—233 **12 Claims**







1. A four-wheel-drive vehicle, comprising:

a set of front wheels;

a set of rear wheels;

brakes on all said wheels;

anti-locking means for preventing locking of at least one of said rear wheels; and

a motive power transmission system linking said front wheels and said rear wheels, whereby braking torque applied to said front wheels is transmitted to said rear wheels;

wherein said power transmission system includes means for reducing braking torque transmitted from said front wheels to said rear wheels when said anti-locking means are operating.

4,991,680

CONTROL DEVICE OF A REMOTE FREE WHEEL HUB MECHANISM

Masayoshi Shiba, Anjo, and Tooru Kagata, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 30, 1988, Ser. No. 251,528
Claims priority, application Japan, Sep. 30, 1987, 62-24674
Int. Cl.[5] B60K *23/00;* **F16D** *27/16, 41/00*
U.S. Cl. 180—233 **3 Claims**

1. A control device of a remote free wheel hub mechanism, comprising:

a free wheel hub mechanism disposed between an axle shaft and a wheel;

an actuator operatively connected to said free wheel hub mechanism;

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a control circuit for controlling said actuator to a two-wheel-drive condition or a four-wheel-drive condition with a signal and further comprising a two-wheel-drive circuit, a four-wheel-drive circuit, a transfer shift position detecting sensor and an engine driving detecting sensor for detecting engine rotation;

said engine rotation drive detecting sensor detecting a rotational condition of an engine and generating a signal which is transmitted to one of said two-wheel-drive circuit and said four-wheel-drive circuit so as to close and establish the four-wheel-drive condition when said engine stops operation;

said transfer shaft position detecting sensor moving one of said two-wheel-drive circuit and said four-wheel drive circuit to a closed condition independently of a shift position when said engine stops operation and correspondingly producing a signal indicative of either said two-wheel-drive or said four-wheel-drive condition.

4,991,681

MOTOR VEHICLE BRAKING SYSTEM

William C. Paulson, Georgetown, Canada, assignor to S.B.R. Limited, Guernsey, Channel Islands

Continuation-in-part of Ser. No. 70,796, Jul. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,256, Jun. 23, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 309,881

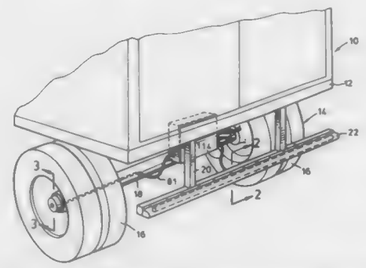
Int. Cl.[5] B60T *7/12;* B60K *28/00*

U.S. Cl. 180—275 33 Claims

1. A method of operating the brakes of a vehicle, comprising the steps of:

sensing movement of the vehicle and arming, in response to said movement, an auxiliary pneumatic circuit means connected to the vehicle brakes whereby the brakes are actuable by a pneumatic detector signal;

detecting the vehicle contacting an obstruction when the vehicle is moving, whereby a pneumatic detector signal is generated causing the auxiliary pneumatic circuit means to actuate the brakes;



the brakes being releasable, and the pneumatic circuit means being rearmed after the release of the brakes.

4,991,682

ACCELERATION SENSOR

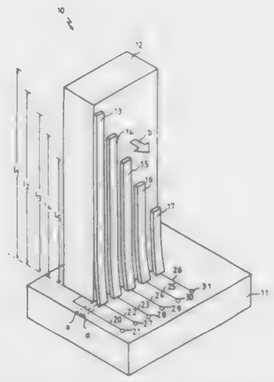
Walter Kuntz, Furtwangen, and Manfred Sondergeld, St. Georgen/Schwarzwald, both of Fed. Rep. of Germany, assignors to Gebr. Schmidt Fabrik für Feinmechanik, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,611

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801512; Feb. 19, 1988, 3805161

Int. Cl.[5] B60R *21/32;* G01D *1/12*

U.S. Cl. 180—282 21 Claims



1. An apparatus for measuring acceleration, comprising:

a plurality of acceleration sensors, being jointly subjected to an acceleration to be measured, said sensors being designed to switch and generate at an output thereof a logical signal when a predetermined individual acceleration threshold value is exceeded, with individual threshold values of said acceleration sensors being different one from the other;

sampling means for sampling a bit-pattern consisting of said logical signals at said outputs when an acceleration is exerted on said sensors;

memory means having stored therein a plurality of bit patterns corresponding to physically possible or impossible switching conditions of said plurality of sensors;

comparing and determining means for comparing said sampled bit-pattern with said stored bit-patterns and for determining whether said sampled bit-pattern corresponds to a physically possible or a physically impossible switching condition of said plurality of sensors;

measuring means connected to said output of a predetermined one of said acceleration sensors for measuring whether said individual acceleration threshold value of said one predetermined acceleration sensor is exceeded;

suppressing means connected to said comparing and determining means and to said measuring means for deactivating said measuring means when said sampled bit-pattern corresponds to a physically impossible switching condition of said plurality of sensors.

4,991,683

ANTI-THEFT VEHICLE SYSTEM

Michael A. Garretto, North Melbourne; Warren A. M. Howitt, Ivanhoe, and Edward Vanda, Ringwood, all of Australia, assignors to Fail Proof Anti Theft System Pty. Ltd., North Melbourne, Australia

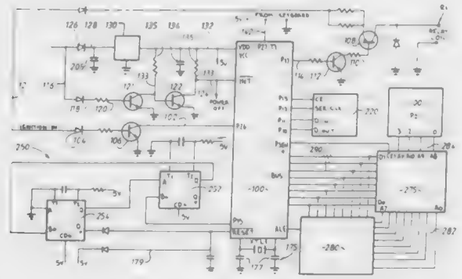
PCT No. PCT/AU88/00030, § 371 Date Aug. 17, 1989, § 102(e) Date Aug. 17, 1989, PCT Pub. No. WO88/06110, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 3, 1988, Ser. No. 397,481

Claims priority, application Australia, Feb. 20, 1987, PI0467; Nov. 11, 1987, PI5365

Int. Cl.[5] B60R *25/04*

U.S. Cl. 180—287 8 Claims



1. An anti-theft system for a vehicle having an engine and an ignition switch comprising:

an actuating means in an ignition line in the vehicle;

a normally open switch means in a power supply line for supplying power to said actuating means;

at least two branch lines in said ignition line on the side of said actuating means opposite said ignition switch;

an engine component connected in each branch line; and

isolating means connected in each branch line for preventing power flow in a direction from the respective component to said actuating means but allowing power flow from said actuating means to said respective component and for preventing power from being supplied to one of said engine components in the event of hot-wiring another of said engine components to prevent said vehicle engine from starting, said actuating means being normally non-conducting to disrupt power supply to said components;

so that turning on the ignition switch and actuation of said switch means to close the switch means supplies power to said actuating means to cause said actuating means to conduct power to said engine components, notwithstanding de-activation and opening of said switch means, and turning off the ignition switch disconnects ingition power supply to said actuating means in the ignition line to cause said actuating means to open said ignition line and stop conducting to said engine components, and said vehicle can only be restarted when said ignition switch and switch means are both closed.

4,991,684

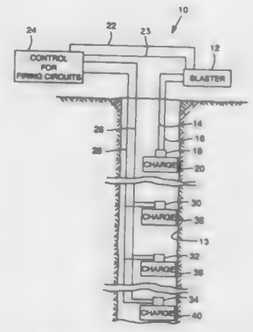
METHOD AND APPARATUS FOR DETONATION OF DISTRIBUTED CHARGES

Donald K. Mitchell, 4903 E. 26th Pl., Tulsa, Okla. 74114

Filed Apr. 13, 1989, Ser. No. 337,958

Int. Cl.[5] G01V *1/40*

U.S. Cl. 181—106 41 Claims



1. A method of geophysical exploration wherein a seismic wave is passed through a bore hole so as to sequentially detonate a plurality of explosive charges disposed within said bore hole at spaced intervals, each of said charges being provided with an electrically-responsive detonator, and wherein each of said detonators if fired by the discharge of a charged capacitor associated therewith, said method comprising the steps of:

operatively connecting a plurality of electronic switches to said capacitors so as to control the completion of the respective discharge circuits of said capacitors;

preselecting a seismic wave magnitude;

causing a seismic wave to successively strike a plurality of electro-acoustic sensors connected respectively to said switches;

comparing the seismic wave magnitude indicated by said sensors with the predetermined magnitude; and

generating successive voltage pulses adapted to actuate said switches sequentially and discharge said capacitors when the seismic wave magnitude indicated by said sensors substantially equals the preselected magnitude.

4,991,685

DOWNHOLE SEISMIC SOURCE

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 2, 1989, Ser. No. 415,618

Int. Cl.[5] G01V *1/40*

U.S. Cl. 181—106 40 Claims

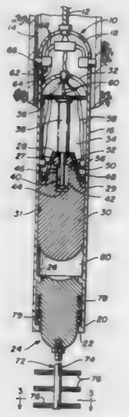
1. Improved apparatus for generating downhole seismic signals comprising:

an elongate hollow body arranged to be lowered into a well bore;

signal generating means in said body operably having a lower portion located at the distal end of said body so that, when lowered into the well bore, said lower portion is in

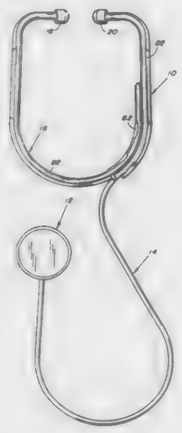
VOL 1123 ISS 2 FE 12 1991 UMI

contact with a medium into which said seismic signals are to be transmitted; and



control means in said body for activating said signal generating means to create said seismic signals in said medium with said lower portion.

4,991,686
DISPOSABLE STETHOSCOPE
Derek R. Allen, 30994 Steeplechase Dr., San Juan Capistrano, Calif. 92675
Filed Dec. 12, 1988, Ser. No. 282,741
Int. Cl.[5] A61B *7/02*
U.S. Cl. 181—131 **14 Claims**



1. A stethoscope comprising:
a stethoscope head
a pair of ear tips;
binaural tube means providing two individually separate air passages extending between said stethoscope head and each ear tip and including a longer passage and a shorter passage;
a substantially U-shaped binaural yoke having channel means adapted for holding said binaural tube means;
said substantially U-shaped yoke having a first end and a second opposite end;
said channel means comprising:
a first open channel extending from said first end of said substantially U-shaped yoke toward said second opposite end of said yoke and adapted for receiving and holding said longer binaural tube means;
means within said first open channel for accommodating a doubled over portion of said longer binaural tube means without producing any sharp bends which would cause a loss of sound transmission;
a second open channel extending from said second end of said yoke toward said first end and adapted for receiving and holding said shorter binaural tube means;
said second open channel terminates in an open end for receiving both said longer binaural tube means and said shorter binaural tube means; and,
a lengthwise section of said first and second channels have a common wall, said common wall having an opening therein for communication between said first and second open channels which is adapted for receiving said longer binaural tube means from said second open channel for receipt within said first open channel.

4,991,687
SPEAKER SYSTEM HAVING DIRECTIVITY
Takashi Oyabe; Hideaki Morikawa; Yasuo Gan, all of Saitama, and Naobumi Kanemaki, Tokyo, all of Japan, assignors to Pioneer Electronic Corporation and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan
Filed Dec. 21, 1989, Ser. No. 454,239
Claims priority, application Japan, Mar. 14, 1989, 1-59681
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—145 **2 Claims**

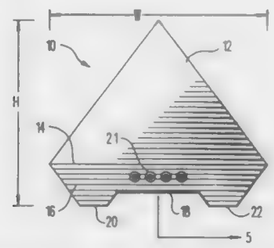


1. A speaker system for effecting sound directivity, said speaker system comprising two pairs of speakers for reproducing signals in a frequency range, said frequency range being divided at a frequency f_c having a wavelength of λ_c into a higher frequency range and a lower frequency range, a first pair of said two pairs of speakers reproducing signals in said higher frequency range and a second pair of said two pairs of speakers reproducing signals in said lower frequency range, wherein
said second pair of speakers for the lower frequency range is disposed with a first space d_1 therebetween and said first pair of speakers for the higher frequency range is disposed with a second space d_2 therebetween in such a way that

$d_1=\lambda_c\pm 50\%$ and $d_2=d_1/4$ to $d_1/2$.

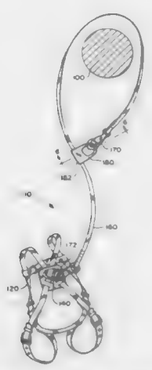
4,991,688
AUDIO SPEAKER SYSTEM
Ervin Kery, 1027 East Sahuaro Dr., Phoenix, Ariz. 85020, and Steve A. Alverson, Springfield, Oreg.
Filed May 2, 1989, Ser. No. 346,596
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—153 **16 Claims**

1. An audio speaker, comprising:
a plurality of inclined triangular side walls intersecting at a common apex, forming a pyramidal enclosure;
at least one speaker in said enclosure; and
a thin sheeting of copper lining on an interior surface of said triangular sidewalls, within said enclosure for reflecting



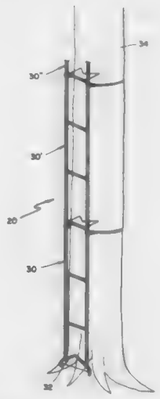
sound produced by said at least one speaker in said enclosure.

4,991,689
SAFETY RESTRAINT DEVICE
Barry A. Cole, Colchester, Conn., assignor to SINCO, Inc., East Hampton, Conn.
Continuation-in-part of Ser. No. 389,752, Aug. 4, 1989, Pat. No. 4,923,048. This application May 11, 1990, Ser. No. 522,253
Int. Cl.[5] A62B *35/00*
U.S. Cl. 182—3 **12 Claims**



1. A safety restraint device comprising:
harness means for attachment to an individual;
safety lanyard means connected to said harness means for attachment to a fixed object, said lanyard means comprising:
a lanyard having a free end;
snap hook means connected to said lanyard at said free end comprising a hook having a releasable safety keeper for securing said lanyard means;
slidable ring means mounted to said lanyard for slidable positioning therealong, said ring means comprising a connector sleeve defining a longitudinal channel for receiving said lanyard and a ring integrally extending from said connector sleeve and dimensioned wherein said hook may be securely attached to said slidable ring,
so that said lanyard is wrappable around a fixed object and said snap hook means is engagable with said slidable ring to secure said lanyard means to said fixed object.

4,991,690
PORTABLE HUNTING LADDER
John A. Woller, 2311 College St., SE., Decatur, Ala. 35601
Filed Mar. 19, 1990, Ser. No. 495,596
Int. Cl.[5] E06C *1/10, 7/08*
U.S. Cl. 182—93 **24 Claims**



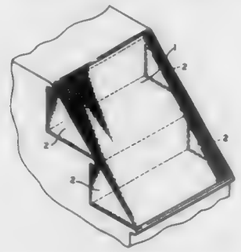
1. A portable hunting ladder for use in climbing trees comprising:
at least one ladder section having:
a pair of generally parallel rails spaced from one another by a distance selected to be larger than the width of a typical boot and less than twice the width of a typical boot, each rail being a predetermined length with a tubular cross section, and an end adapted to slidably join with an end of a similar rail,
a plurality of rungs extending between and connected to each of the parallel rails, one rung being attached closely adjacent to the first ends of the generally parallel rails,
stand-off means for positioning the ladder section at a predetermined distance from a support and for resisting sideways movement of the ladder section relative to such support, being attached to the ladder section closely adjacent the one rung, and
securing means attached to the ladder section for securing the ladder section at the location of the stand-off means to such support; and
a base section having a pair of legs spaced farther from one another than the distance between the parallel rails of the ladder section, including a pair of parallel connector elements shaped to slidably join with corresponding second ends of the parallel rails of the ladder section.

4,991,691
STAIR BARRIER
David B. Brawer, 226 Forrest Ave., Narbeth, Pa. 19072, and Michael I. Hauptman, 216 Fitzwater St., Philadelphia, Pa. 19147
Filed Jun. 22, 1990, Ser. No. 542,738
Int. Cl.[5] E04F *11/00;* **E06C** *7/00*
U.S. Cl. 182—106 **20 Claims**

1. A stair barrier comprising:
a planar member to be inclined over treads of stairs on a stairway, said planar member having a width dimension sufficient to block passage of a child up the stairway, and a length dimension sufficient for superposition over at least two stairs, said stair barrier further comprising at

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least one support member on the underside of said planar member, said support member having a height dimension



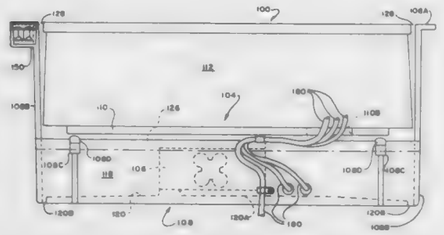
sufficient to support the planar member at rest on the stairway.

4,991,692

SPILL CONTROL MOUNTING FOR DATA GATHERING SYSTEM

Howard H. Nojiri, Eugene, Oreg.; Nigel G. Mills, Worthington; James F. Million, Powell, both of Ohio, and David L. Latimer, Eugene, Oreg., assignors to Spectra-Physics, San Jose, Calif.

Filed Mar. 24, 1989, Ser. No. 328,230
Int. Cl.[5] A47F *9/04*; G06K *7/10*
U.S. Cl. 186—61 **10 Claims**



6. In a two part data gathering system inserted into a checkout counter to determine information relating to products to be purchased, said counter defining an upper surface upon which products are placed for access to said data gathering system, a spill control mounting comprising:

support means for suspending said data gathering system within said checkout counter;

a first part of said data gathering system being secured to said support means and suspended a defined distance below an upper surface of said checkout counter; and

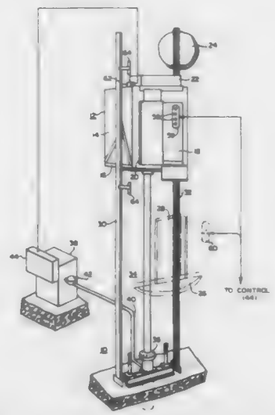
a second part of said data gathering system being supported upon said first part and extending thereabove by said defined distance to extend said data gathering system into substantial alignment with the upper surface of said checkout counter, said second part also extending beyond said first part on at least two sides thereof, being constructed to be substantially impervious to liquids which may be inadvertently spilled upon said data gathering system to shield said support means and said second part, and being spaced from said counter to receive spilled liquids between said second part and said counter whereby liquids spilled on said data gathering system flow over said second part and between said second part and said counter to be substantially diverted away from said support means and said first part.

4,991,693

METHOD OF IMPROVING THE LANDING OF A HYDRAULIC ELEVATOR CAR

Lawrence Stern, Morristown, and Jeffrey W. Blain, Scenic Lakes Township, Sussex County, both of N.J., assignors to Inventio AG, Hergiswil, Switzerland

Filed Feb. 16, 1989, Ser. No. 311,507
Int. Cl.[5] B66B *1/26*
U.S. Cl. 187—111 **9 Claims**



1. A method of improving the landing of a hydraulic elevator car, during each run of the elevator car, at a floor of a building having slowdown and leveling indicia associated with each floor, comprising the steps of:

providing an optimum deceleration time (TOPT) for the elevator car,

initiating a run of the elevator car,

delaying the initiation of deceleration of the elevator car, after the elevator car reaches a slowdown indicia associated with the target floor, by a predetermined time delay Td,

timing the actual time of the elevator car to travel between slowdown and leveling indicia associated with a target floor, to provide a time TACT,

comparing TACT - Td with TOPT,

changing Td in a direction which brings TACT- Td closer to TOPT when TACT - Td is not equal to TOPT,

and using the changed Td during a subsequent run of the elevator car.

4,991,694

GROUP CONTROL FOR ELEVATORS WITH IMMEDIATE ALLOCATION OF DESTINATION CALLS

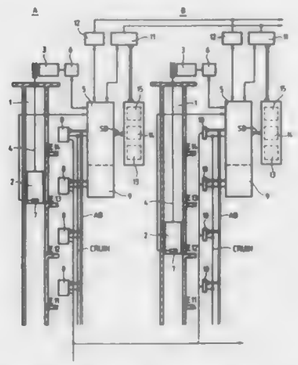
Paul Friedli, Remetschwil, Switzerland, assignor to Inventio AG, Switzerland

Filed Aug. 31, 1989, Ser. No. 401,035
Claims priority, application Switzerland, Sep. 1, 1988, [illegible]
Int. Cl.[5] B66B *1/18*
U.S. Cl. 187—127 **5 Claims**

1. An improvement in a group control for elevators having at least two elevator cars for serving a plurality of floors and for the immediate assignment of floor calls of destination, the group control including call registering devices arranged at the floors for entering floor calls for desired floors of destination, a call memory connected to said call registering devices and including a first memory and a second memory where on input of floor calls at a floor, an input floor call representing the entry floor is stored in the first memory and a destination floor call representing the floor of destination is stored in the second memory, load measuring devices provided in the cars, a load

table connected to said load measuring devices for storing a number of passengers in the cars, selectors associated with each elevator of the group for indicating in each case the floor of a possible stop, and means for assigning the entered floor calls to the elevators of the elevator group including a computer and comparison device for each elevator wherein the computer calculates at each floor designated by the selector operating costs corresponding to the waiting times of passengers from data specific to the elevator, and wherein at least one assignment memory is provided and the operating costs of all elevators are compared with each other by means of the comparison device and a new floor call is assigned by the entry of an assignment instruction into the assignment memory of the elevator which displays the lowest operating costs, the improvement comprising:

a cost register for each car connected to the associated computer and the associated comparison device for storing the operating costs for a floor call input floor and the destination floor immediately after the entry of said floor call;



a door time table for each car connected to the associated computer for storing door opening and closing times which are utilized by the computer in the calculation of the stopping time of the car for the operating costs, wherein said stopping time of each elevator car is calculated by said associated computer by adding the door opening time to the time for which the door is kept open based on the number of the boarding and alighting passengers times a constant time factor per person plus the door closing time;

a travelling time table for each car connected to the associated computer for storing travelling times between each floor and each other floor in accordance with upward and downward directions of travel, the computer also utilizing said travelling times in the calculation of the operating costs; and

a car position register for each car connected to the associated computer for storing the instantaneous position of the car which the computer utilizes as the basis for access to said travelling time table.

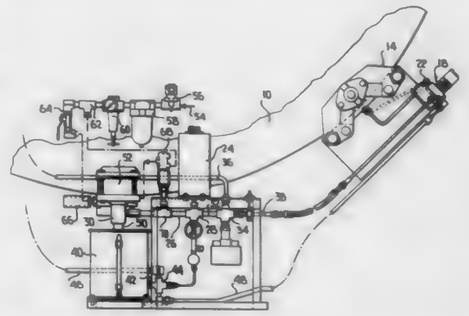
4,991,695

HYDRAULIC BRAKE SYSTEM FOR A LARGE ROTATING MASS

Ernest W. Hellmer, Chicago, and Frank W. Pfohl, Westmont, both of Ill., assignors to Continental Plastic Containers, Norwalk, Conn.

Filed Jun. 27, 1985, Ser. No. 749,215
Int. Cl.[5] F16D *55/18*
U.S. Cl. 188—72.4 **3 Claims**

1. A hydraulic brake system for a large rotating mass, said system comprising at least one rotor and at least two remotely positioned calipers, a central source of hydraulic fluid under pressure, hydraulic lines having hydraulic fluid therein under pressure leading from said source to valves located adjacent to each of said calipers, hydraulic lines normally not under pressure leading from said valves to respective ones of said calipers, and control means remote from said valves coupled to said valves for actuating said valves in unison whereby substantially instantly actuation of said calipers may be effected upon actuation of said control means, said system including a



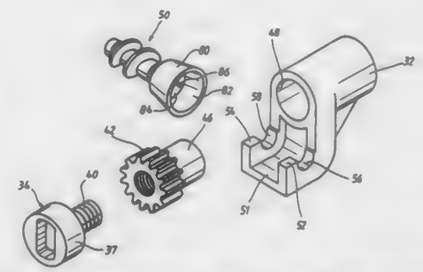
supply tank, and return lines from said calipers to said valves and from said valves to said supply tank, said system including a hydraulic pump coupled to said supply tank for receiving hydraulic fluid from said supply tank and to said hydraulic lines, said source of hydraulic fluid under pressure being an accumulator receiving hydraulic fluid under pressure from said pump and storing said hydraulic fluid under pressure, said pump having an actuator responsive to the pressure of hydraulic fluid in said accumulator.

4,991,696

BRAKE SHOE ADJUSTMENT DEVICE

Manfred Minning, Ebersbach, and Thomas Müller, Wernau, both of Fed. Rep. of Germany, assignors to Daimler-Benz

Filed Oct. 6, 1989, Ser. No. 419,081
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834714
Int. Cl.[5] F16D *65/46*
U.S. Cl. 188—79.61 **3 Claims**



1. A brake shoe adjustment device for shoe brakes internally mounted in a brake drum and arranged between mutually neighboring ends of two brake shoes,

which neighboring ends are connected to each other by a tension spring,

comprising mutually opposite spreading elements holding the neighboring ends in a desired position;

a receptacle provided with a worm operatively mounted thereon, a baring bore and worm wheel operatively mounted in the bearing bore, said receptacle constituting one of the spreading elements;

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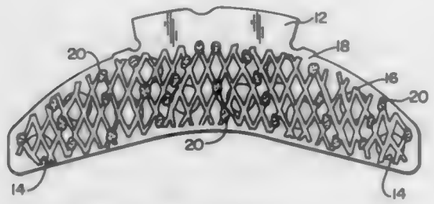
another of the spreading elements having a threaded shank screwed into an internal threaded bore of the worm wheel;
the worm wheel being operatively engaged with the worm for turning via an adjusting tool; and
an axis of the worm wheel being disposed normal to an axis of the brake drum;
wherein the operative mounting of the worm wheel in the receptacle is provided by a laterally protruding bearing neck of the worm wheel extending into the bearing bore of the receptacle;
the receptacle has two bearing webs arranged adjacent to the periphery of the worm wheel and spaced from one another in the axial direction of the worm; and
each bearing web has means which opens facing a side of the worm wheel for bearing support of the worm.

4,991,697

DISC BRAKE PAD

Alan R. Hummel, and Ernest R. Welch, both of Winchester, Va., assignors to Abex Corporation, Newton, Mass.

Division of Ser. No. 320,945, Mar. 9, 1989, Pat. No. 4,924,583.
This application Jan. 16, 1990, Ser. No. 468,007
Int. Cl.[5] F16D *69/00*
U.S. Cl. 188—250 B **1 Claim**



1. A disc brake pad which comprises:
a metal backing plate having a top surface adapted to receive a friction member;
an expanded metal mesh element which is affixed to said top surface by welding at discrete locations and which contacts said top surface at said same discrete locations;
wherein said metal mesh is expanded away from said top surface such that it projects upwardly above said top surface to enable adhesive and friction material to occupy the spaces created between said metal mesh and said top surface; and
a friction member comprising a first layer of compacted friction material powder adjacent said top surface and a second layer of a solid friction material preform on top of said compacted powder layer wherein said metal mesh projects into said first layer of compacted friction material.

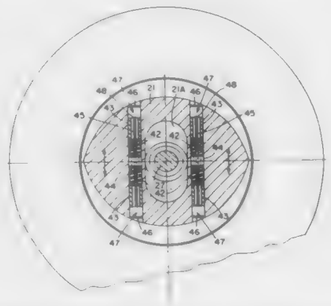
4,991,698

DAMPING WITH DAMPING MASS INSIDE WHEEL

David E. Hanson, Westborough, Mass., assignor to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 194,515, May 16, 1988, abandoned.
This application Oct. 13, 1989, Ser. No. 421,309
Int. Cl.[5] F16F *7/10, 9/00;* **A63C** *17/12;* **B60B** *37/00*
U.S. Cl. 188—380 **15 Claims**

1. A vehicle suspension system comprising,
an unsuspended mass comprising a wheel having a wheel axis with an annular region about the wheel axis free of brake elements, having a wheel spindle and rotatable about the wheel axis and embracing a central plane perpendicular to the wheel axis,
a suspended mass comprising the vehicle body,
damping mass means for damping vibrations of said wheel, said damping mass means being located within said wheel in said annular region substantially symmetrical about said central plane and relatively translatable with respect to said wheel along a nonrotating damping mass axis passing through said wheel axis and in said central plane,



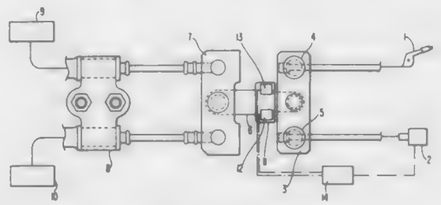
and damping mass support means for supporting said damping mass means to always be in noncontacting relationship with said wheel.

4,991,699

PARKING BRAKE APPARATUS

Kazuyoshi Hiraiwa, and Tadao Takimoto, both of Hamamatsu, Japan, assignors to Rhythm Motor Parts Mfg. Co., Ltd., Shizuoka, Japan

Filed Jul. 6, 1989, Ser. No. 376,031
Claims priority, application Japan, Jul. 13, 1988, 63-92743[U]; Jul. 13, 1988, 63-92744[U]
Int. Cl.[5] B60K *41/20*
U.S. Cl. 192—1.34 **7 Claims**



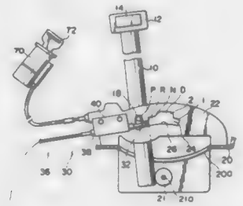
1. A parking brake apparatus comprising:
a manipulation lever;
an actuator;
a balance lever connected at its one end through a first coupling member with said manipulation lever so that a manipulated force of said manipulation lever acts on said one end and at its other end through a second coupling member with said actuator so that an operating force of said actuator acts on said other end, said balance lever having a portion on which a parking brake force acts;
relative displacement detecting means for detecting a relative displacement between said manipulation lever and said actuator; and
control means for controlling said actuator so that the relative displacement detected by said relative displacement detecting means is reduced.

4,991,700

SELECTOR LEVER APPARATUS FOR VEHICLE

Masazumi Koga, Oobu, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,683
Claims priority, application Japan, Mar. 15, 1988, 63-33801; Jun. 30, 1988, 63-87056
Int. Cl.[5] B60K *41/28*
U.S. Cl. 192—4 A **20 Claims**





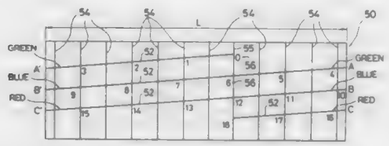
1. A selector lever apparatus for use in a vehicle having an automatic transmission, comprising;
a selector mechanism having a selector lever shiftable to a plurality of mode setting positions including a parking position wherein an output shaft of the automatic transmission is fixed; and
a lock mechanism for locking the selector lever when it is in the parking position and the brake pedal has not been depressed, said lock mechanism including a lock pin movable between a lock position where the lock pin locks the selector lever in the parking position and a lock release position where the lock pin allows shifting of the selector lever, biasing means for biasing the lock pin to the lock position, and coupling means including a connecting member having one end connected to the brake pedal and the other end connected to the lock pin, for moving the lock pin to the lock release position upon a depressing of the brake pedal, said coupling means including means for releasing the coupling between the lock pin and the brake pedal when a tension exceeding a predetermined value acts on the connecting member.

4,991,701

TRIPPING TORQUE SETTING MECHANISM OF OVERLOAD CLUTCH

Isamu Nakano, and Shunji Fujii, both of Osaka, Japan, assignors to Tsubakimoto Emerson Co., Osaka, Japan

Filed Feb. 9, 1990, Ser. No. 477,614
Claims priority, application Japan, Mar. 20, 1989, 1-30922; Mar. 20, 1989, 1-30923
Int. Cl.[5] F16D *7/08;* **G01D** *13/14, 13/22*
U.S. Cl. 192—56 R **3 Claims**



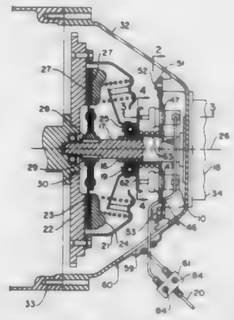
3. A tripping torque scale tape of an overload clutch printed with helical line elements such that they form a complete helical line when wound in a circle having a predetermined diameter and angular positional figures represented at positions equally dividing the circle, wherein the axially adjacent portions of said helical line are indicated by different colors and said figures for indicating the angular positions are indicated by the same color as the portion of the helical line to which said figures correspond.

4,991,702

MOTOR VEHICLE CLUTCH CONTROL WITH CO-ACTING MULTIPLE ACTUATORS MOUNTED APART FROM THE AXIS OF A CLUTCH

Eli M. Ladin, 1608 Morton Ave., Ann Arbor, Mich. 48104

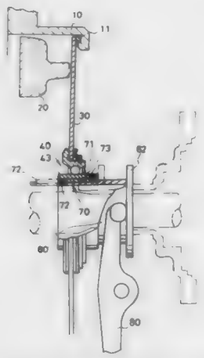
Filed Feb. 15, 1989, Ser. No. 311,114
Int. Cl.[5] F16D *25/08*
U.S. Cl. 192—85 C **16 Claims**



1. In a motor vehicle of the type having an engine with a rotatable output member for applying the torque of the engine to a load, a transmission having a rotatable input member for receiving and transmitting the engine torque to said load, a clutch which is fixed to said engine output member and rotatable about the same axis as said engine output member for coupling and de-coupling said engine output member to said transmission input member, and a control for actuating said clutch to selectively couple and de-couple said engine output member to said transmission input member said control having a member which is moveable in the direction of the rotational axis of said clutch for actuating said clutch, the improvement comprising: a stationary bell housing mounted on said engine for enclosing said clutch and said moveable control member, said bell housing having an outer wall and at least one aperture in said wall for installing and removing a pair of actuators mounted inside of said housing which is located apart from the axis of said clutch; at least two actuators spaced apart from the axis of said clutch and mounted on said bell housing for displacing said moveable member to actuate said clutch and de-couple said transmission input member from said engine output member, each of said actuators comprising a housing and a piston, said actuator housings being detachably mounted to said bell housing such that said actuator housings are restrained from moving axially in said bell housing; and a means for detachably mounting said actuators to said bell housing apart from the axis of said clutch; said mounting means having an intermediate portion between said actuators which is eccentric to said clutch axis for installing and removing said actuators through said aperture of said bell housing when said housing is mounted on the vehicle's engine.

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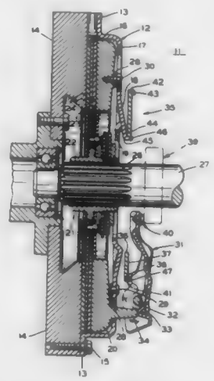
4,991,703
CLUTCH COVER AND RELEASABLE BEARING ASSEMBLY
Shozo Kuno, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Division of Ser. No. 32,387, Mar. 31, 1987, Pat. No. 4,830,162.
This application Mar. 6, 1989, Ser. No. 319,188
Claims priority, application Japan, Mar. 31, 1986, 61-73433; Mar. 31, 1986, 61-73434
Int. Cl.[5] F16D *23/14*
U.S. Cl. 192—98 2 Claims



2. A clutch cover and releasable bearing assembly comprising:
a clutch cover;
a pressure plate disposed inwardly of said clutch cover;
a diaphragm spring having an outer edge engaged by said clutch cover for resiliently pressing said pressure plate;
a bearing fixed to an inner edge of said diaphragm spring and having rotatable elements and an inner race supporting said rotatable elements;
a bearing tub axially movably disposed in said bearing for being axially movably disposed on an input shaft of a transmission;
locking means disposed between said inner race and said bearing hub for selectively limiting movement of said bearing hub with respect to said bearing, said locking means including at least one key positioned between said bearing hub and said inner race and a pair of snap rings at opposite ends of said key, one of said snap rings being retained on said bearing hub and the other snap rings being retained on a part of said bearing, whereby said bearing hub is axially movable with respect to said bearing in a first direction; and
a release fork engageable with said bearing hub for axially moving said bearing hub and said bearing in a second direction to release said diaphragm spring from said pressure plate.

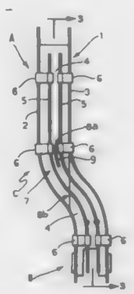
4,991,704
APPARATUS FOR ADJUSTING HYSTERESIS IN A CLUTCH
Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed Nov. 28, 1989, Ser. No. 442,192
Int. Cl.[5] F16D *03/14*
U.S. Cl. 192—106.1 20 Claims

1. A clutch driven disc assembly comprising:
a hub;
a support plate mounted on and rotatable relative to said hub;
at least one reinforcing plate mounted on and rotatable relative said hub;
a plurality of circumferentially spaced fasteners connecting together said support plate and said reinforcing plate; and



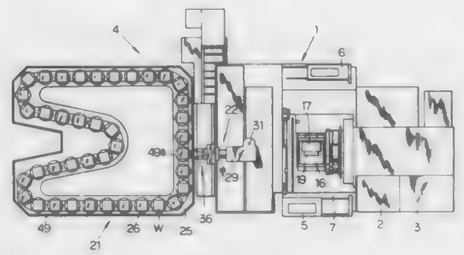
a backing plate mounted on said hub and abutting said fasteners for applying an axial load through said fasteners to said support plate and said reinforcing plate.

4,991,705
DEVICE FOR TRANSPORTING A FLOW OF PRODUCTS TO BE PACKAGED, WITH THE DISCHARGE OF WRONGLY-POSITIONED PRODUCTS
Renzo Francioni, Prato Sesia, Italy, assignor to Cavanna S.p.A., Italy
Filed Jun. 19, 1989, Ser. No. 367,881
Claims priority, application Italy, Oct. 19, 1988, 67939 A/88
Int. Cl.[5] B65G *47/256*
U.S. Cl. 193—44 11 Claims



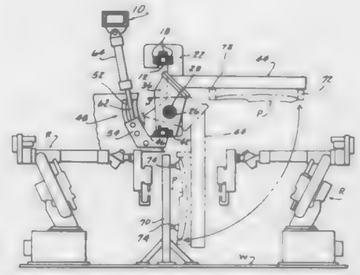
1. A device for transporting a flow of stacked products which advance with their greater dimension substantially perpendicular to the direction of advance, comprising:
first and second opposing wall means which guide the products in the direction of advance, and
third wall means extending between the first and second wall means for maintaining the products in guiding relationship with the first and second wall means; the third wall means defining a break for enabling products which are arranged with their greater dimension parallel to the direction of advance to be expelled from the device,
wherein:
said first and second wall means define a lateral curved section positioned in correspondence with said break in said third wall means so that the products are made to travel along a curved path with relative pivoting of adjacent products in the flow,
said break is defined by end edges which are upstream and downstream respectively in the direction of advance of said products and said third wall means define a complete break at least adjacent said upstream edge which extends entirely across the third wall means to each of the first and second wall means, and
at least in correspondence with said break, said first, second and third wall means extend along a path which descends generally in the direction of advance of said products.

4,991,706
MACHINE TOOL
Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan
Division of Ser. No. 918,888, Oct. 15, 1986, Pat. No. 4,890,716.
This application Aug. 28, 1989, Ser. No. 398,911
Claims priority, application Japan, Oct. 15, 1985, 60-227839; Oct. 15, 1985, 60-227840; Oct. 15, 1985, 60-227841; Oct. 15, 1985, 60-227842
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—346.1 9 Claims



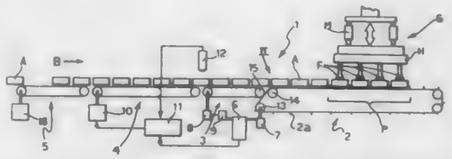
1. A machine tool, comprising:
a machine tool body;
a spindle provided at the machine tool body for holding a tool, the spindle being movable in a vertical direction;
a bed provided in the machine tool body;
a plurality of workpiece holders each holding one workpiece, each of the workpiece holders having first and second recesses;
movable table means provided on the bed for holding detachably a workpiece holder and moving the workpiece holder to a predetermined position near the tool so that the workpiece can be machined by the tool;
a workpiece station for storing many workpiece holders;
a workpiece changer for changing selectively the workpiece holders between the table means and the workpiece station;
the workpiece station including an endless type transfer means having a series of setting openings;
a pair of first and second fingers provided in said workpiece changer for holding at least one of said workpieces;
first stop means disposed on said transfer means for preventing the workpiece holder from rotating in the setting opening when the first stop means engages the first recess of the workpiece holder; and
second stop means disposed on said workpiece changer for preventing the workpiece holder from rotating with respect to the first and second fingers when the second stop means engages the second recess of the workpiece holder.

4,991,707
BODYSIDE PANEL HANDLING CONVEYOR
Robert O. Alexander, West Bloomfield; Michael R. Dugas, Brighton; Mark W. Hazelton, West Bloomfield, and Patrick J. Kenny, Detroit, all of Mich., assignors to Progressive Tool & Industries Co., Southfield, Mich.
Filed Jan. 12, 1990, Ser. No. 464,147
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—346.1 12 Claims



1. Article handling apparatus comprising a pair of first and second spaced parallel elongate conveying rails defining a fixed conveying path, one of said rails including a movable rail section, manipulator means operable to move said movable rail section between a first position wherein said section is aligned with and functions as a portion of said one of said rails and a second position wherein said section is located in displaced parallel offset relationship from said first position, an article carrier mounted on said rails for movement along said fixed conveying path, an article support frame mounted on said carrier for movement relative to said carrier between a conveying position and a transfer position, rail gripping means fixedly secured to said support frame and slidable along said one of said rails for locating said support frame in its conveying position when said gripping means is located on the fixed portions of said one of said rails and being operable when located on said rail section to move said support frame relative to said carrier between said conveying position and said transfer position in response to movement of said rail section between its first and second positions.

4,991,708
APPARATUS FOR FORMING GROUPS OF ARTICLES, PARTICULARLY FOR AUTOMATIC PACKAGING LINES
Renzo Francioni, Prato Sesia, Italy, assignor to Cavanna S.p.A., Prato Sesia, Italy
Filed Dec. 7, 1988, Ser. No. 281,098
Claims priority, application Italy, May 18, 1988, 67460 A/88
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—419.2 18 Claims



1. Apparatus for supplying a station, from a substantially but not necessarily continuous flow of articles, with groups of a predetermined number of said articles which, for a predetermined period of time, are substantially stationary in correspondence with said station, said apparatus comprising:
a conveyor line for said articles, which extends in correspondence with said station and has respective positions for receiving said articles;

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drive means associated with said conveyor line which can cause its intermittent movement with a condition in which said conveyor line is substantially stationary for said predetermined period and a condition of movement in which said conveyor line is advanced by a number of said receiving positions equal to said number of articles in said groups,

a conveyor for batched supply of said predetermined number of articles to said conveyor line, the conveyor being adapted for intermittent motion which copies the intermittent motion of said conveyor line,

means for linking the movement of said conveyor to that of said conveyor line so as to regulate the supply to articles to the receiving positions of the conveyor line itself, and

a unit for accumulating said articles located upstream of said conveyor for generating, from said flow of articles, an accumulation of articles which are supplied continuously to said conveyor,

wherein said conveyor line includes a first plurality of separate conveying elements arranged parallel to each other so as to define separating spaced between them and a spacer conveyor which is provided immediately upstream of said first plurality of separate conveying elements and is constituted by a second plurality of separate conveying elements arranged parallel to each other and extending, at least marginally, into said separating spaces.

4,991,709

DEVICE FOR TRANSFERRING OBJECTS FROM A SUPPLY DEVICE TO A TAKE UP DEVICE

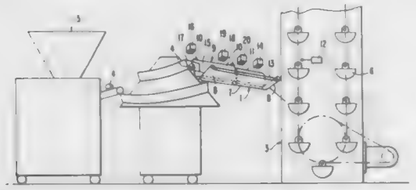
Mathijs Steeghs, Panningen, Netherlands, assignor to Werner & Pfleiderer-Haton B.V., Panningen, Netherlands

Filed Jan. 19, 1989, Ser. No. 299,093

Claims priority, application Netherlands, Jan. 22, 1988, 8800147

Int. Cl.[5] B65G *43/00*

U.S. Cl. 198—460 2 Claims



1. A device (1) for transferring objects (4) from a supply device (2) from which the objects (4) are irregularly delivered to a take up device (3) having pockets (6) to which the objects (4) are to be supplied one by one, the transferring device (1) comprising at least one endless conveyor (7,9), a first sensor (12) for producing a ready-to-take-up signal when the take up device (3) can take up an object (4), and a second sensor (14) for producing a present signal when an object (4) is present at an end (13) of the conveyor (7) positioned near the take up device (3), the signal from the second sensor bringing the conveyor to a stop (7) as long as the first sensor (12) is not producing a ready-for-take-up signal, the transferring device (1) comprises two conveyors (7,9) which are spearately driven, both conveyors (7,9) starting near the supply device (2), the first conveyor (7) extending to a point near the take up device (3), the second conveyor (9) extending from a point near the supply device (2) to an end point at a distance between the supply device (2) and the take up device (3), a fixedly positioned bridging plate (11) lying in the plane of the second conveyor (9) extending from the end point to a point near the take up device (3), both conveyors (7,9) being set at an angle to the horizontal plane such that a V-shaped conveyor is obtained and the objects (4) can be conveyed by the first conveyor (7) as well as by the second conveyor (9), a third sensor (16) located near the point (15) where the objects (4) are supplied to the transferring device (1) by the supply device (2), the third sensor (16) detecting the presence of an object (4) near the point (15) where objects are supplied and which, when detecting the object (4) causes operation of one of the conveyors (9) at least during a given period during which the detected object (4) is brought to a point at a distance form the beginning (15) of the device (1).

4,991,710

STRUCTURE OF OVERLAPPING PORTIONS IN APRON CONVEYOR

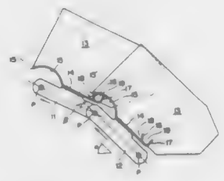
Toshio Imatomi, Toyonaka, Japan, assignor to Tsubakimoto Bulk Systems Corporation, Osaka, Japan

Filed Jan. 22, 1990, Ser. No. 467,886

Claims priority, application Japan, Aug. 10, 1989, 1-93375[U]

Int. Cl.[5] B65G *17/10*

U.S. Cl. 198—822 4 Claims



1. An apron conveyor comprising:

a plurality of aprons individually connected to links of a conveyor chain, and front and rear end portions of said aprons being overlapped with the respective rear and front end portions of adjacent aprons;

a cover portion formed in the front end portion of a bottom plate of each said apron and having a partial circular inner surface generated about a center which substantially coincides with the position of a connecting pin located at the front end of the respective link;

a front weir plate and a rear weir plate formed in the rear end portion of the bottom plate, a free end of the front weir plate being adapted to slidingly contact said circular inner surface;

said circular inner surface having a length such that a free front end thereof is adapted to contact an upper surface of the bottom plate of the forwardly adjacent apron when the angle of bending between adjacent links is zero and a front chamber is formed between the circular inner surface and a front side of the front weir plate and a rear chamber is formed between the front and rear weir plate;

said front chamber being opened when the front end of said circular inner surface is separated from said upper surface of said bottom plate, as the angle of the relative bending between adjacent links increase;

said rear chamber being opened as the angle of relative bending between adjacent links further increases; and

said circular inner surface in the vicinity of the free end thereof being adapted to contact the free end of said rear weir plate when the forward link becomes substantially horizontal with the angle of relative bending between adjacent links being a maximum.

4,991,711

ARTIST STORAGE CONTAINER HAVING SCALLOPED HANDLES

Nancy C. Cheng, 3360 Byrd Ave., Allentown, Pa. 18103

Filed Mar. 15, 1990, Ser. No. 493,630

Int. Cl.[5] B65D *85/20*; B44D *3/04*

U.S. Cl. 206—1.7 6 Claims

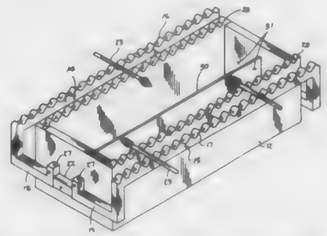
1. Artist supply storage container apparatus comprising in combination,

an elongate housing including spaced side walls orthogonally joined to spaced end walls,

a first handle including spaced support brackets orthogonally and integrally mounted to opposed ends of the first handle and pivotally mounted to opposed end walls,

a second handle including spaced further support brackets integrally and orthogonally mounted to opposed terminal ends of the second handle pivotally mounting the spaced further support brackets to the opposed end walls, wherein a support bracket and a further support bracket are pivotally mounted to each end wall associated with each of the first and second handles,

a lid member including a central web with a skirt continuously formed about the central web, the lid member removably and selectively mounted overlying the side walls and the end walls with the skirt surroundingly positionable about the side walls and end walls when the lid member is mounted overlying the side walls and end walls,



a partition wall spaced below upper terminal ends of the side walls and end walls orthogonally and medially mounted to interior opposed surfaces of the end walls,

a tray member overlying a partition member removably mounted within the housing,

insert containers mounted within the housing on either side of the partition wall, the insert containers are defined by a predetermined length substantially equal to that defined by the partition wall,

each of the first and second handles include respective first and second scalloped forward end edge surfaces, the first end edge surface defined by first end edge recesses and projections, and the second end edge surface defined by second end edge recesses and projections, wherein the second end edge recesses and projections are offset relative to the first end edge recesses and projections for interdigited securement of the first end edge projections within the second end edge recesses.

4,991,712

DESK ORGANIZER

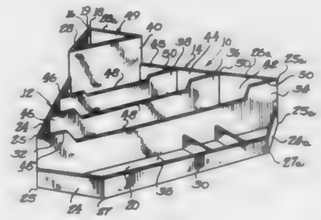
Michael J. Wagner, Carol Stream, Ill., assignor to Sanford Corporation, Bellwood, Ill.

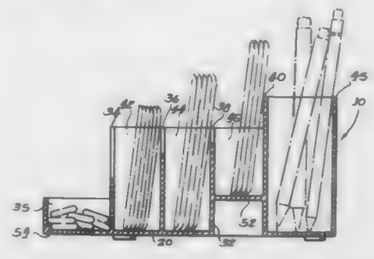
Filed Oct. 10, 1989, Ser. No. 418,652

Int. Cl.[5] A45C *11/34*

U.S. Cl. 206—214 4 Claims

1. A desk organizer for containing a variety of stationary items made of one-piece molded plastic comprising vertically upstanding first and second angularly disposed and intersecting sidewalls, said first and second sidewalls being joined together at their common ends, a vertically upstanding end wall connecting opposite ends of said first and second sidewalls, a bottom wall covering the area between said first and second sidewalls and said end wall, and means for dividing said organizer into at least a first, middle and third successive bins for retaining said stationary items, said bottom wall having a raised portion for elevating the bottom of said middle bin, said first and second sidewalls including a first section having a predetermined height, a middle section having a predetermined height which is greater than the height of said first section and an end section having a predetermined height which is greater than the height of the middle section and height of the first section, said end wall having a predetermined vertical height which is substantially the same as the height of the first section of said first and second sidewalls defining a shallow front tray member, said bin means including at least a first, second and third vertically upstanding divider having predetermined vertical heights, said first divider extending from the inside of said first sidewall at approximately the point where said first section and second section of said first sidewall meet to the inside of said second sidewall at approximately the same point, said second divider being spaced from said first divider, said second divider extending from the inside of said first sidewall at a predetermined point to the inside of said second sidewall at approximately the same predetermined point, said third divider





being spaced from said second divider and from the joined ends of said first and second sidewalls, said third divider extending from the inside of said first sidewall at approximately the point where said second section and said end section of said first sidewall meet to the inside of said second sidewall at approximately the same point, said third divider having substantially the same vertical height as said end sections of said first and second sidewalls, said first and second dividers defining said first bin, said second and third dividers defining said middle bin and said third divider and said joined ends of said first and second sidewalls defining said third bin for retaining writing instruments, said bottom wall curing into said first section of said first and second sidewalls and said end wall.

4,991,713

SERVING TRAY APPARATUS

Frederick T. Phillips, 705 S. Adams, Mt. Pleasant, Mich. 48858

Filed Mar. 26, 1990, Ser. No. 500,534

Int. Cl.[5] B65D *77/06*

U.S. Cl. 206—218 6 Claims



1. A serving tray apparatus comprising,

a tray member including an annular floor, the annular floor including a top planar surface overlying a bottom planar surface, and

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a surrounding wall extending upwardly relative to the top surface in a surrounding relationship to the tray floor, and

a plurality of annular wells arranged in an annular sector defined by a predetermined angle of arc directed downwardly and orthogonally relative to the floor, wherein the wells are arranged coaxially relative to the tray floor adjacent the surrounding wall, and

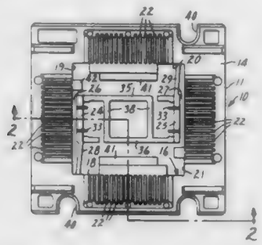
wherein the annular wells are defined by a cylindrical annular well wall directed downwardly from the bottom surface of the floor, and each well includes a concave floor member, arranged at the lower terminal end of each well, and wherein each concave floor member includes a coaxially arranged drainage aperture positioned therewithin.

4,991,714

SPRING LOADED INTEGRATED CIRCUIT CARRIER

William J. Clatanoff, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 17, 1989, Ser. No. 438,694
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—331 **16 Claims**



1. A carrier device for supporting an electronic component having a plurality of fragile leads extending therefrom, said carrier comprising a unitary body having a first and a second surface and having a generally centrally positioned opening, defined by edge walls, formed in said body and communicating between said surfaces, means on said first surface for supporting the leads of a said component and means extending into said opening from the edge walls defining said opening for supporting a said component within said edge walls, said support means comprising a pair of beams extending outwardly into said opening, one from each of a pair of opposing edge walls, said beams being spaced apart and each beam being formed with component engaging means for engaging the component to secure the same within said opening with the leads supported by said means for supporting said leads, and flexible means extending between said beams and joined thereto for affording the resilient separation of said beams between a first spaced position and a second spaced position for permitting the insertion of a said component between said component engaging means on said beams and for urging said beams toward each other and said first position to afford component retaining means for said body.

4,991,715

BICYCLE TRANSPORT CASE

Robert F. Williams, 3027 Swandale, San Antonio, Tex. 78230

Filed Aug. 25, 1989, Ser. No. 398,628
Int. Cl.[5] B65D *85/68*
U.S. Cl. 206—335 **19 Claims**

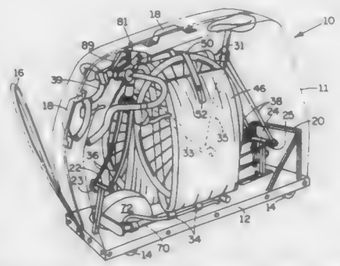
1. A case for transporting a bicycle, comprising:

a base;

a pair of mounts connected to said base for attaching front and rear portions of said bicycle respectively, wherein at least one of said mounts is moveable on said base to permit the distance between said mounts to be varied;

a flexible cover attached to said base for containing the bicycle;

a frame connected to said base for protecting the gears of said bicycle; and



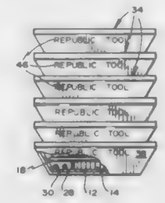
a wheel pad for wrapping the wheels of said bicycle, said wheel pad being of a size and shape such that said wheel pad containing said wheels may be placed against the frame of said bicycle when said bicycle is within said case.

4,991,716

NESTED PACKAGING ARRANGEMENT FOR HAND-PROPELLED WHEELED VEHICLES

Paul M. Havlovitz, Escondido, Calif., assignor to Republic Tool & Mfg. Corp., Carlsbad, Calif.

Filed Mar. 8, 1990, Ser. No. 490,395
Int. Cl.[5] B65D *21/02*
U.S. Cl. 206—335 **10 Claims**



1. A packaging arrangement for a hand-propelled load carrying vehicle, comprising

a tub means defining a tub having slanted sidewalls, one with respect to another,

an auxiliary means defining auxiliary portions of said vehicle including wheel means defining a wheel and handle means defining a handle separate from said tub means,

said auxiliary means being disposed in a generally planar configuration at a bottom-most portion of the interior of said tub means, and

a packaging means substantially enveloping said tub means and said auxiliary means, thereby defining a package having the same general shape and configuration as said tub means, whereby one said package can be nested within another said package.

9. A packaging arrangement for a hand-propelled load carrying vehicle, comprising

a tub means defining a tub,

an auxiliary means defining auxiliary portions of said vehicle including wheel means defining a wheel and handle means defining a handle,

said auxiliary means being disposed in a generally planar configuration adjacent a bottom wall of said tub means,

packaging means substantially enveloping said tub means and said auxiliary means, thereby defining a package whereby one said package can be nested within another said package, and

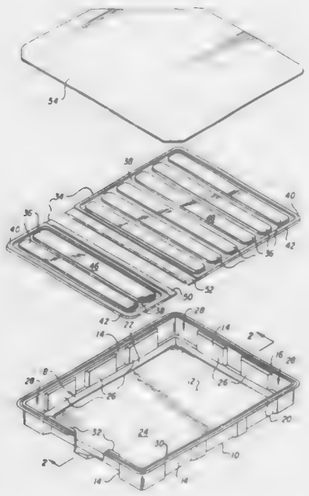
graphic material disposed on a portion of an outside sidewall of said package and visible in a repetitive form when one said package is nested within another said package.

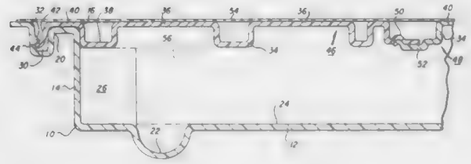
4,991,717

LIGHT AND MOISTURE RESISTANT PACKAGE

Robert D. May, Brockport, and John M. Williamson, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1990, Ser. No. 471,446
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—455 **21 Claims**





1. A packaging system, comprising:

a container body having a bottom wall and upwardly extending side walls surrounding an interior compartment of said body, said side walls having upper edges surrounding an access opening into said compartment;

a laterally and peripherally extending flange attached to said upper edges of said side walls;

a lid panel extending across said access opening and partially across said flange, whereby a peripheral portion of said flange remains exposed;

means, extending in said lid panel across said opening, for permitting a portion of said lid panel to be raised to an open position to permit access to said compartment; and

seal membrane means, extended across said means for permitting and fixedly adhered at least to the upper peripheral edge of said lid panel but peelably adhered to said exposed peripheral portion of said flange, for sealing (a) said means for permitting and (b) said lid panel to said flange,

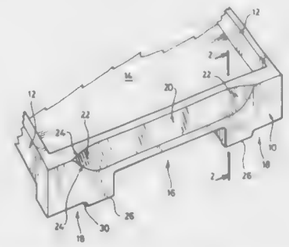
whereby when said seal membrane means is grasped at said flange and pulled, said seal membrane means peels away from said exposed peripheral portion of said flange while remaining fixedly adhered to said lid panel and permitting said portion of said panel to move to said raised position.

4,991,718

STARCH TRAY

John Withers, Stalham, England, assignor to Moores of Stalham (U.K.) Limited, Catfield, England

Filed Mar. 27, 1989, Ser. No. 328,954
Claims priority, application United Kingdom, Apr. 15, 1988, 8808979
Int. Cl.[5] B65D *21/02*
U.S. Cl. 206—511 **6 Claims**



1. A rectangularly-shaped starch tray adapted for aligned stacking on a similar tray with restricted freedom for sliding movement between the stacked trays, both parallel to and at right angles to a length of said starch trays, each of said starch trays comprising:

a flat base; and,

upstanding peripheral wall portions for said flat base, said upstanding peripheral wall portions including two side walls which project only in an upward direction at two oppositely-positioned side edges of said flat base, said peripheral wall portions further including two end walls which project in both an upward direction and a downward direction relative to said flat base with portions of the downward projecting end walls being cut away over a central region of each of the ends walls in order to define four corner feet for said starch tray, each of the end walls of said starch tray having a top surface, which is at a height above said flat base, and an outer end face with the outer end face of each the end wall facing in a direction outward from said flat base and being positioned perpendicular to the flat base, the end walls of said starch tray being shaped over at least one part of a length thereof with at least one recess being provided in each end wall with a planar bottom face which slopes from the top surface of said end wall to the outer end face of said end wall, the slope of the bottom face of said recess being approximately sixty degrees to the top of said end wall and approximately thirty degrees to the outer end face of said end wall, said recess further including sloping end regions, the two corner feet at each end of said starch tray having respective elongate downward projections which are spaced apart from one another in order to enable the elongate downward projections to be located into the recesses of a similar starch tray located directly below said starch tray when such starch trays are stacked.

4,991,719

METHOD AND APPARATUS FOR SORTING RANDOMLY POSITIONED ITEMS MINIMIZING SORTING CONVEYOR MOVEMENT

R. E. Butcher, and A. A. Henderson, Jr., both of Houston, Tex., assignors to Speed Sort, Inc., Houston, Tex.

Continuation of Ser. No. 318,914, Mar. 3, 1989, Pat. No. 4,907,699. This application Dec. 12, 1989, Ser. No. 449,536
The portion of the term of this patent subsequent to Mar. 13, 2006, has been disclaimed.
Int. Cl.[5] B07C *3/10*
U.S. Cl. 209—3.3 **20 Claims**

1. A method of sorting items in a preselected order each

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having an identifying marking and arranged in an unordered sequence prior to sorting, the method comprising:

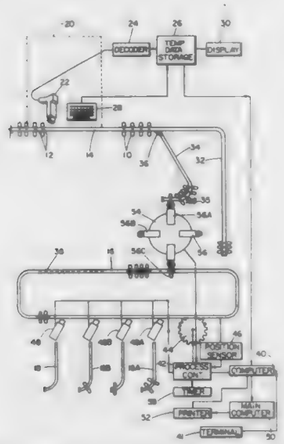
(a) identifying each item in the unordered sequence from the identifying marking and outputting identification signals in response thereto;

(b) arranging each item on a sorting conveyor having a multiplicity of movable carriers each for receiving a respective item thereon;

(c) arranging the identification signals such that each of the identification signals is positioned between other identification signals in the preselected order;

(d) assigning a plurality of arranged identification signals to each one of the corresponding plurality of unloading mechanisms positioned along the sorting conveyor;

(e) positioning the sorting conveyor such that a selected carrier on the sorting conveyor is at a selected position;



(f) calculating bidirectional movement of the sorting conveyor to each of a plurality of potential first positions such that in each of the potential first positions an item respresentative of a first identification signal in each of the plurality of arranged identification signals will be positioned for unloading by the respective unloading mechanism thereof;

(g) selecting one of the calculated movements which is preferred over the other calculated movements to unload the items from the sorting conveyor;

(h) driving the sorting conveyor a fixed distance in a selected direction in response to the selected calculated movement; and

(i) activating the respective unloading mechanism to remove the item positioned for unloading from the sorting conveyor.

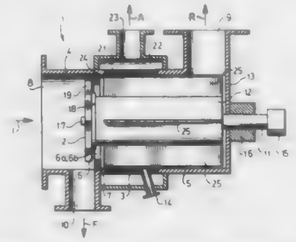
4,991,720

APPARATUS FOR DIVIDING A SUSPENSION OF FIBROUS CELLULOSE PULP

Roany Höglund, Skoghall, and Lars Jacobson, Karlstad, both of Sweden, assignors to Kamyr AB, Karlstad, Sweden

Continuation of Ser. No. 207,214, Jun. 16, 1988, abandoned.
This application Nov. 14, 1989, Ser. No. 434,474
Claims priority, application Sweden, Jul. 3, 1987, 8702744
Int. Cl.[5] B03B 7/00; B07B 9/00
U.S. Cl. 209—12 5 Claims

1. An apparatus for dividing a suspension of fibrous cellulose pulp into a plurality of portions comprising a closed housing divided into two chambers, a first forward chamber including an inlet and an outlet, and a second rearward chamber including at least a pair of outlets; said chambers being separated by an open, annular slot defined by inner and outer diameters; a rotor located substantially in said second chamber, with an impeller mounted thereon projecting into said first chamber in close proximity to said slot, and wherein said rotor defines the inner diameter of said slot; said impeller serving to separate undersized parts from the suspension in said first chamber, and to fluidize remaining suspension as it enters the second chamber; said second chamber defined by a cylindrical wall having a forward screened portion and a rearward solid portion and



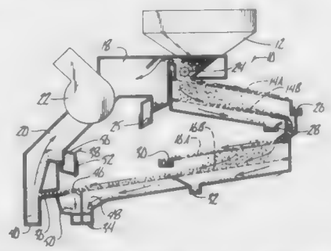
said rotor having a plurality of blades mounted thereon and extending axially substantially coextensively with said screened and solid portions of said second chamber; one of said pair of outlets of said second chamber located radially outwardly of said cylindrical wall and adjacent said screened portion of said second chamber, the other of said pair of outlets of said second chamber extending from said solid portion of said second chamber.

4,991,721

AUTOMATION OF AN AIR-SCREEN SEED CLEANER

Manjit K. Misra, and Yuh-Yuan Shyy, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 15, 1988, Ser. No. 231,946
Int. Cl.[5] B07B 9/00, 4/02; G05B 13/02
U.S. Cl. 209—31 16 Claims



1. An improved cleaning system for separating lighter material from heavier material in a mixture of particulate materials, the system including an inlet for receiving the mixture, an outlet for discharging heavier material, and a vacuum air-lift means between the inlet and the outlet for separating the lighter material from the heavier material, the air-lift means having a spout for collecting the lighter material and having a first gate movable between a normal closed position for maintaining the vacuum of the air-lift means and a second open position for discharging the lighter material, the improvement comprising:

a second gate in said air-lift spout mounted upstream from the first gate and being movable between a normal open position when the first gate is closed and a closed position when the first gate is open; and

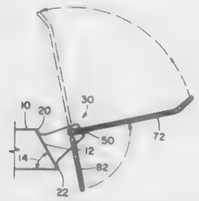
a sensor for sensing the quantity of lighter material separated by the air-lift means, the sensor being mounted in the spout downstream from the second gate so that when the second gate is in the open position, the lighter material separated by the air-lift means enters the spout and passes the second gate for sensing by the sensor.

4,991,722

PRODUCT DISPLAY HOOK

Gerry M. Hight, 13809 E. 29th St., Tulsa, Okla. 74134

Filed Jun. 1, 1990, Ser. No. 531,932
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—59.1 15 Claims



1. A hook for displaying products in front of a shelf comprising:

bracket means adapted to be mounted on said shelf;

bearing means disposed on said bracket means;

journal means rotatable in said bearing means between a display position and a clearing position;

display means connected to said journal means for supporting the products in a vertical hanging position in front of the shelf when said journal means is in said display position; and

clearing means connected to said journal means and cooperable with said display means for supporting the products in a horizontal position in front of the shelf when said journal means is in said clearing position.

4,991,723

ADJUSTABLE UNIVERSAL GUN RACK

Johnny C. Elkins, P.O. Box 2599, San Angelo, Tex. 76902

Filed Sep. 15, 1989, Ser. No. 407,976
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—64 12 Claims



1. A gun rack for mounting guns in supported relationship thereon; said rack includes an inner support assembly, an outer support assembly spaced from said inner support assembly, and an upper and a lower attachment blade; said inner support assembly has opposed marginal terminal ends;

fastener means by which the upper and lower attachment blades, respectively, are attached to the opposed marginal terminal ends, respectively, of said inner support assembly;

said outer support assembly has opposed marginal terminal ends; fastener means by which said opposed marginal terminal ends, respectively, of said outer support assembly are connected to said upper and lower attachment blades, respectively;

said inner support assembly further includes adjacent, overlapping, marginal ends adjustably received respective to one another;

said outer support assembly further includes adjacent, overlapping, marginal ends adjustably received respective to one another;

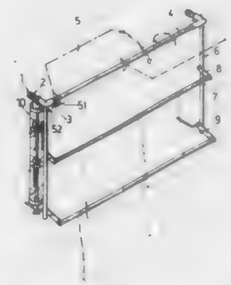
and further including upwardly opening cradle means attached to said outer support assembly by which at least part of an elongated object, such as a gun, can be supportedly received thereon.

4,991,724

STRUCTURE OF RACK ASSEMBLY

Chih-Yen Wei, No. 225, She Chung Street, Shihlin District, Taipei, Taiwan

Filed Feb. 1, 1990, Ser. No. 473,454
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—87 7 Claims



1. A rack assembly for holding towels and toothbrushes, including:

two fastening elements each comprising a circular base having an extension sleeve upstanding therefrom and a fastening hole therethrough, said extension sleeve having a circular groove thereon;

two connectors, each comprising a stepped socket having small pivot holes for the setting therein of a steel ball each, and a front sleeve which comprises a circular groove haVing a C-retainer clamped thereon to secure a second spring and a cap, a pressure element and a first spring inserted in said stepped socket opposite to said front sleeve and firmly secured therein by a holder which comprises an outer thread on its one end;

two L-shaped couplers, each having a bolt hole at its one end for the connection with the outer thread of said connector, a sleeve portion at its other end for inserting in a cross rod, a quarter turn in the middle having a T-shaped positioning hole thereon;

an elongated circular cross rod having boring bore through its central axis for the insertion therein of the sleeve portion of said two L-shaped couplers from its both ends to connect said two L-shaped couplers together;

two supporting rods comprising each a pull rod having a ball head, an upper key hole notch, and a lower key bole notch;

two circular suspension rods having each a ball head at its both ends;

two upper struts comprising each a ball head portion, a projecting block and a key hole notch.,

two lower struts comprising each a ball head portion, a projecting block, a key hole notch, and a lever bracket; and

a toothbrush holder comprising an axle received in a transparent cylindrical shell and having thereon two holder plates for holding toothbrushes, a block on its top top end for the connection thereto of a hook bolt to secure an upper cap to the top end of said transparent cylindrical shell and an outer thread on its lower end for the connection thereto of a knob to secure a bottom cap to the bottom end of said transparent cylindrical shell;

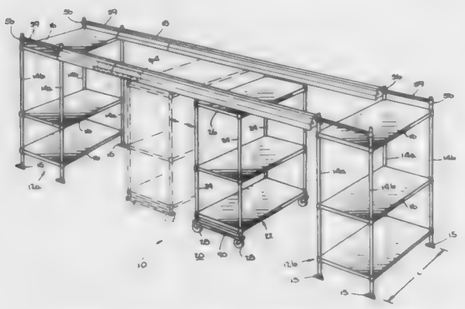
wherein said two fastening are respectively secured to a wall by screw nails for the connection thereto of said two connectors, said two couplers being respectively connected to said two connectors with said cross rod connected therebetween for the mounting thereon of two frame plates by means of sleeve-joint, said two supporting rods being bilaterally secured to said two L-shaped couplers with the ball heads of the pull rods thereof respectively retained in the T-shaped positioning hole of said two L-shaped couplers, said two upper struts being bilaterally secured in the upper key hole notch of said two supporting rods by means of the ball head portions thereof with the projecting blocks thereof respectively stopped against said two supporting rods, said two lower struts being bilaterally secured in the lower key hole notch of said two supporting rods by means of the ball head portions thereof with the projecting blocks thereof respectively stropped against said two supporting rods and with the lever brackets thereof stopped against said wall, said two circular suspension rods being respectively connected between said two upper struts and said two lower struts with the ball heads thereof respectively retained in the key hole notches to said upper and lower struts, and said toothbrush holder being hung on either one of said L-shaped couplers by means of its hook bolt.

4,991,725

COMPACT STORAGE SYSTEM

John H. Welsch, Moscow; John J. Chapko, Wilkes-Barre; Robert J. Cohn, Dallas, all of Pa.; Daniel C. Dubin, Brecksville, Ohio, and Robert J. Carver, Nanticoke, Pa., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Aug. 29, 1985, Ser. No. 770,798
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—162 **2 Claims**



1. A compact storage system mountable for operation on a planar base platform, said storage system comprising:

at least one guide rail means having a roof and two legs projecting from said roof thereby defining a generally U-shaped continuous channel;

means for mounting said guide rail means in spaced, generally mutually parallel relation to said base platform with said legs projecting toward said base platform so that said channel opens theretoward;

at least one movable storage unit;

means for supporting said storage unit for translational movement on said base platform, said supporting means comprising two casters each including a wheel, and a horn having a base and depending legs between which said wheel is mounted for rotation, and further comprising retainer means fixed to said movable storage unit and embracing said legs of said horn, said retainer means including a channel member simultaneously embracing the horns of said two casters;

guide roller means mounted on said storage unit and received in said channel of said guide rail means, said guide roller means being formed to engage either one of said legs of said guide rail means for movement relative thereto,

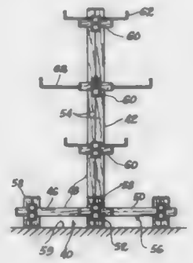
whereby translational movement of said movable storage unit is confined to a path defined by said guide rail means.

4,991,726

SUPPORT STAND

David W. Johnson, 2601 Hoover St., Ste. H,, National City, Calif. 92050

Filed Aug. 12, 1988, Ser. No. 231,379
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[5] A47B *47/00*
U.S. Cl. 211—189 **13 Claims**



1. A support stand comprising:

(a) A three-dimensional joint defining orthogonal X, Y, and Z directions comprising:

(i) a plurality of elongated structural member pairs formed into an X-directional parallel contiguous pair, a Y-directional parallel contiguous pair, and a Z-directional parallel contiguous pair;

(ii) said parallel contiguous pairs intersecting one another to define said joint between six elongated structural members such that said joint has:

(1) three elongated structural members that are only fully notched, said full notch being of length substantially equal to twice the thickness of said structural members and of depth substantially equal to half the thickness of said structural members such that when paired with an oppositely-directed full notch defines a paired pass-through opening for a pair of members which pair will snugly fit into the paired pass-through opening when inserted orthogonally therethrough;

(2) two of said members having similar full notches and also having an additional half notch, said half notch being formed at 90 degrees to the full notch and substantially at mid-span of the full notch; and,

(3) the sixth elongated structural member having no notches at said joint and being the key post that holds the remaining five members together as a joint;

(iii) said joint comprising an interlocking joint held together by the interlocking configurations of the elongated structural members themselves such that said lattice is rigid and completely integral without the use of blocks or sockets at the joints; and,

(b) two of said parallel contiguous pairs each extending mutually orthogonally outward horizontally beyond said joint to define a cross support base having four extended legs; and,

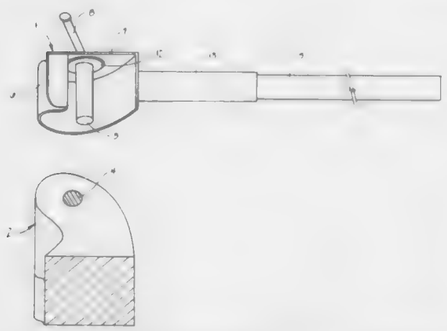
(c) the third of said contiguous pairs extending upright from said support base well beyond said joint to define a vertical support post.

4,991,727

DRAWHEAD ALIGNMENT DEVICE

Leonard T. White, Rte. 4, Box 792, Calahan, Fla. 32011

Filed Aug. 10, 1989, Ser. No. 391,970
Int. Cl.[5] B61G *7/12*
U.S. Cl. 213—20 **8 Claims**



1. A Railroad Drawhead Alignment Device, comprising:

a first rigid linear element capable of being used as a lever arm; and

A connecting means whereby said first rigid linear element may be rigidly connected to, and serve as a substantially linear extension of, the drawhead of a railroad car, said connecting means including a plurality of vertical linear elements perpendicular to the first rigid linear element, said vertical linear elements being positioned in such manner as to proximately contact, along the length of each, the sides of a railroad car's knuckle tip when the Railroad Drawhead Alignment Device is connected thereto via its connecting means.

4,991,728

BLOW-MOLDED BOTTLE-SHAPED CONTAINER OF BIAXIALLY ORIENTED POLYETHYLENE TEREPHTHALATE AND PIECE TO BE BLOW-MOLDED INTO THE SAME BOTTLE-SHAPED CONTAINER

Yoshiaki Hayashi, and Takuzo Takada, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 222,334, Jul. 20, 1988, which is a continuation of Ser. No. 62,407, Jun. 15, 1987, abandoned, which is a continuation of Ser. No. 780,723, Sep. 27, 1985, abandoned, which is a continuation of Ser. No. 592,748, Mar. 23, 1984, abandoned, which is a continuation of Ser. No. 413,560, Aug. 31, 1982, abandoned. This application Jul. 12, 1989, Ser. No. 378,909
Claims priority, application Japan, Sep. 2, 1981, 56-130590
Int. Cl.[5] B65D *1/02, 23/00;* **B29B** *11/14*
U.S. Cl. 215—1 C **4 Claims**

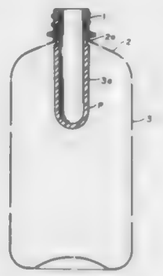
1. A hollow blowmolded container of a biaxially oriented polyethylene terephthalate resin, comprising:

a cylindrical walled body having a wall thickness;

a tapered cylindrical walled shoulder portion integrally formed from and upper end of said body and having a wall thickness substantially equal to said wall thickness of said body;

a cylindrical walled neck portion integrally formed on an upper end of said shoulder portion and having a wall thickness substantially greater than said wall thickness of said shoulder portion with an abrupt transition between said wall thickness of said shoulder portion and said wall thickness of said neck portion; and

a stepped portion formed on an inner peripheral surface of a boundary between said neck portion and said shoulder portion, said stepped portion having been formed by biaxially blow-molding a parison having a crystallized neck portion, a body forming portion and a shoulder forming portion extending between said neck portion and said



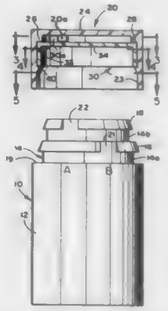
body forming portion and being sharply thinner than both said body forming portion and said neck portion, said neck portion of the parison being crystallized to a point immediately adjacent an upper end of said shoulder forming portion by a predetermined heat treatment.

4,991,729

ELDER-ACCESSIBLE CHILD-RESISTANT PACKAGING

Robert M. Hunter, 320 S. Willson Ave., Bozeman, Mont. 59715

Filed Apr. 18, 1989, Ser. No. 339,819
Int. Cl.[5] B65D *50/10, 50/06*
U.S. Cl. 215—206 **36 Claims**



1. A child-resistant container and closure cap combination comprising two parts:

a container part and

a closure cap part;

one of the two parts movably supporting a single movable member that is frictionally engaged by a selected part, the movable member being engaged and moved relative to the frictionally engaged part by means on the other part to at least one indexed position relative to the selected part so that movement of the parts in the opposite direction frictionally carries the movable member relative to the other part to a position relative to the other part that allows access to the container contents solely by relative movement of the two parts.

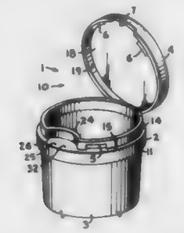
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,730

CAPTIVE KEY RELEASE CLOSURE STRUCTURE

Harold T. Pehr, P.O. Box 6698, Leawood, Kans. 66206

Filed Sep. 12, 1989, Ser. No. 406,169
Int. Cl.[5] B65D *50/14*
U.S. Cl. 215—215 14 Claims



1. A captive key release closure structure for a container, said structure comprising:

(a) closure base means for connection to said container;

(b) a closure member having at least one open position and a closed position;

(c) hinge means connecting said closure member to said base means to enable pivoting said closure member between said closed position and said open position;

(d) cooperating latch means on said base means and said closure member to releasably retain said closure member in said closed position; said latch means including indentation means and pawl means aligned such that when said closure member is in the closed position thereof, said pawl means is interferingly received in said indentation means at a substantial angle relative to a direction of opening of said closure member from the closed position to an open position thereof, so that said pawl means must be forceably biased by a user from the indentation means in order to move the closure member to an open position thereof; and

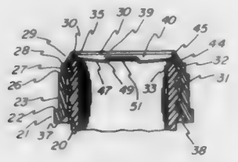
(e) key slot means formed on at least one of said closure member and said base means and positioned at an interface therebetween when said closure member is in said closed position, said key slot means being adapted to receive key means operable to pry said closure member away from said base means to thereby release said latch means and allow said pivoting of said closure member.

4,991,731

RETORTABLE COMPOSITE CLOSURE FOR PLASTIC CONTAINERS

Thomas W. Osip, and Paul A. Pezzoli, both of Worthington, Ohio, assignors to Abbott Laboratories/Ross Laboratories, Columbus, Ohio

Filed Aug. 3, 1989, Ser. No. 388,882
Int. Cl.[5] B65D *41/00;* B65B *7/00, 51/10*
U.S. Cl. 215—232 14 Claims



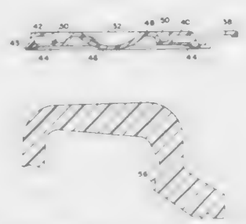
1. A closure for plastic containers, said closure comprising, an upper portion, said upper portion comprising a metallic disk, said disk having an edge portion and a center portion, said disk having an upper surface and a lower surface, said lower surface having applied thereto a fusible coating, and a generally cylindrical side wall, said side wall having an outer surface and an inner surface, said closure having container retaining means located along said inner surface for cooperative engagement with said plastic container, said closure having upper portion retaining means for retaining said upper portion in cooperative relationship to said inner surface of said side wall, said outer surface having a lower portion, a middle portion, and an upper portion, each of said lower portion, middle portion and upper portion having a respective lip, with said upper portion also having an inclined portion and an annular upper edge.

4,991,732

EXCESS PRESSURE VENT FOR RESEALABLE BEVERAGE CAP

Robert L. La Barge, Ben Avon Borough, and Thomas P. Grzybek, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 14, 1989, Ser. No. 338,096
Int. Cl.[5] B65D *51/16*
U.S. Cl. 215—260 14 Claims



1. In a container closure for an open mouth container having a liquid content from which a gas dissociates, the combination comprising:

a spout assembly having a score line defined opening panel therein and an outwardly projecting continuous lip defining a substantially smooth sealing surface surrounding said opening,

a sealing cap adapted to removably overlie said spout assembly, said sealing cap including,

a top wall,

a skirt depending from said top wall adapted to fit in sealing interference with said sealing surface on said spout, said skirt having an inwardly directed ledge at its distal end that includes an upper ledge surface adapted to be disposed in interfacial sealing engagement with at least a portion of said sealing surface in aid spout assembly and a lifting tab extending outwardly from the skirt, and

at least one channel means in said inwardly directed ledge in close proximity to said lifting table to provide at least one exposable unobstructed pressure venting channel traversing said continuous lip for interrupting the interfacial sealing engagement between said upper ledge surface and said projecting lip in said spout assembly in response to outward displacement of said upper ledge surface relative to said sealing surface in said spout assembly.

4,991,733

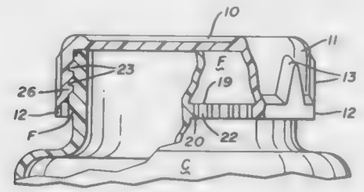
CLOSURE AND CONTAINER HAVING PASS OVER INTER-ENGAGING RATCHET TEETH

Michael Marino, New Castle, Pa., assignor to West Penn Plastic, Inc., New Castle, Pa.

Filed Sep. 25, 1989, Ser. No. 411,838
Int. Cl.[5] B65D *41/04, 50/00*
U.S. Cl. 215—330 5 Claims

1. A closure and container assembly having pass over inter-engaging means comprising a container having a neck finish with a centerline; a closure threadably received on said neck

finish; and closure including a top portion, a depending annular flange on said top portion; a section of said depending annular flange forming a lower edge thereof being of a slightly greater dimension than the depending annular flange, two spaced apart groups of modified ratchet teeth in said section of said depending annular flange, each group of modified ratchet teeth including a plurality of individual modified ratchet teeth, each tooth of said modifed teeth of said two groups of modified ratchet teeth in said section of said depending annular flange being spaced apart from adjacent teeth and defining a cavity with each of such adjacent teeth to define a plurality of cavities, each of the modified ratchet teeth of said two groups of modifed ratchet teeth in said section of said depending annular flange having a substantially flat innermost surface which is spaced from said depending annular flange and two inclined side surfaces which intersect said innermost surface and said annular flange to form roots, said innermost surface all lying on a common arc which is centered at the center of the cap, each of said side surfaces being inclined with respect to a radially positioned center line extending through each of said modified rachet teeth of said two groups in said section of said depending annular flange, each of said side surfaces also being inclined oppositely to the other side surface of said each tooth to diverge away from each other and from said innermost surface and defining opposite sides of said cavities, said oppositely inclined side surfaces of each tooth of said modified ratchet teeth of each of said groups in said section of said depending annular flange having different annular inclines with one of the oppoositely inclined side surfaces being longer than the other, another group of modified ratchet teeth being formed on said neck finish of said container, the modified ratchet teeth on said



neck finish of said container being shaped and positioned for engagement and registry in said cavities defined by said modified ratchet teeth in said section of said depending annular flange, each of said modified ratchet teeth of said another group of said modified ratchet teeth on said neck finish of said container having oppositely inclined side surfaces matching said oppositely inclined side surfaces of said modified ratchet teeth of said two groups of modified ratchet teeth in said section of said depending annular flange, said oppositely inclined side surface of each of the modified ratchet teeth of said another group of modified ratchet teeth on said neck finish of said container having different angular inclines with respect to said radially positioned centerline, one of the oppositely inclined side surfaces of each tooth of said another group being longer than the other side surface of said each tooth of said another group so that the longer inclined side surfaces of each of the modified ratchet teeth of each of said groups of modified ratchet teeth in said section of said depending annular flange engage the longer inclined side surfaces of each of said modified ratchet teeth of said another group of modified ratchet teeth on said neck finish of said container when said closure is resolved clockwise on said neck finish of said container, each tooth of said another group having a substantially flat outermost surface, with all of said outermost surfaces lying on a common arc centered at the neck finish centerline, said side surfaces of each tooth in said another group of teeth intersecting said neck finish to form roots with each of said teeth in said another group being spaced from adjacent teeth in said another group of teeth to define a plurality of neck finish cavities, the side surfaces of each tooth in said another group of teeth diverging away from each other and from the outermost surface of that each tooth.

4,991,734

THERMOPLASTIC CONTAINER HAVING A RING-SHAPED REINFORCING ZONE AT ITS BOTTOM

Torsten Nilsson, Loddekopinge, and Kjell M. Jakobsen, Skanor, both of Sweden, assignors to PLM, AB, Malmo, Sweden

Continuation of Ser. No. 126,560, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 708,685, Mar. 6, 1985, abandoned, which is a continuation of Ser. No. 443,939, Nov. 23, 1982, Pat. No. 4,512,735. This application Aug. 3, 1989, Ser. No. 389,273
Claims priority, application Sweden, Nov. 26, 1981, 8107044
Int. Cl.[5] B65D *1/00*
U.S. Cl. 220—604 23 Claims



1. A container of polyethylene terphthalate or similar thermoplastic material comprising a body, a closed bottom portion of curved shape which bulges inwardly into the body, and an annular region joining said bottom portion and said body, said annular region providing a standing surface for the container, the material of said body which is joined to said annular region being substantially monoaxially oriented with an orientation corresponding to that arising in a sheet of material which is stretched mono-axially to cause material flow, said annular region including a ring-shaped region which is constituted of material which is oriented and under internal pre-stress tending to contract said ring-shaped region, said internal pre-stress in said ring-shaped region being produced by reshaping said oriented material of said body, the combination of the orientation and internal pre-stress of said ring-shaped region serving as a means for preventing said inwardly curved bottom portion from straightening out or turning inside-out, said bottom portion of curved shape being uniform in thickness and relatively thick compared to said ring-shape region and having a periphery directly connected to said ring-shaped region substantially at said standing surface, said ring-shaped region directly connecting said relatively thick bottom portion to said body substantially at said standing surface, said material of said body having a thickness substantially less than the thick bottom portion to which it is connected by said ring-shaped region, said ring-shaped region providing stable connection of the body with the bottom portion while preventing the inwardly curved bottom portion from straightening out or turning inside-out.

4,991,735

PRESSURE RESISTANT END SHELL FOR A CONTAINER AND METHOD AND APPARATUS FOR FORMING THE SAME

Scott C. Biondich, Delmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 8, 1989, Ser. No. 348,828
Int. Cl.[5] B65D *51/14;* B21D *51/44*
U.S. Cl. 220—600 34 Claims

1. An end shell for a container having improved internal pressure resistance comprising:

a central panel portion,

an open annular groove around and below the general plane of the central panel portion, said open annular groove

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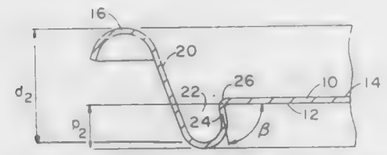
bounded outwardly by a chuckwall portion extending upwardly and outwardly from the annular groove beyond the general plane of the central panel portion, said annular groove bounded inwardly with respect to the central panel, by a panel wall portion integrally connected to the central panel portion, said panel wall disposed at an angle of less than 90° and greater than or equal to 70° from the general plane of the central panel portion, and at an angle greater than or equal to the angle formed by the chuckwall relative to the general plane of the central panel portion, and

an outwardly projecting flange, extending radially outwardly of the upwardly extending chuckwall portion.

16. A method of forming a pressure resistant end shell for a container comprising the steps of:

providing an end shell having an interior surface and an exterior surface with respect to the intended disposition of the end shell onto the container, a central panel portion in the end shell, a frustoconical chuckwall portion projecting outwardly and upwardly beyond a general plane of the central panel portion at an angle of from 70° to 90° with respect to the central panel portion, and an outwardly projecting flange extending radially outwardly of the chuckwall portion, and

while substantially retaining the angular disposition of the chuckwall with respect to the central panel portion, moving a part of the central panel portion to form an annular groove about the central panel portion bounded outward, with respect to the central panel, by the chuckwall portion extending from the annular groove upwardly beyond the general plane of the central panel portion, and



bounded inwardly, with respect to the central panel, by a panel wall portion disposed at an angle of less than 90° and greater than or equal to 70° from the general plane of the central panel portion, and said panel wall portion being disposed at an angle greater than or equal to the angle of the chuckwall portion with respect to the central panel portion.

34. An apparatus for forming a pressure resistant end shell for a container comprising:

a first die set including a generally planar top surface, an annular ring surrounding said top surface and recessed below said top surface at a depth less than the distance between an inside surface of a central wall and an outside surface of an annular groove of the end shell, and an upstanding portion extending outwardly and upwardly from the annular ring, said upstanding portion having a configuration mating substantially with a configuration of the annular groove, chuckwall and at least a portion of a peripheral flange of the end shell,

a second die set, generally opposing the first die set, including a central punch having a circular outside surface with a diameter greater than the diameter of the top surface of the first die set, and a clamping ring having an outside clamping surface having a configuration mating substantially with a configuration of at least a portion of the exterior surface of the peripheral flange and at least an upper portion of the exterior surface of the chuckwall,

means for inserting an end shell between the first die set and the second die set,

means for moving the clamping ring of the second die set toward the upstanding portion of the first die set to clamp at least a portion of the peripheral flange and at least an upper portion of the chuckwall of the end shell therebetween,

means for moving the central punch against the exterior surface of the central wall of the end shell, after the peripheral flange and chuckwall portions have been clamped, to move a panel wall of the end shell outwardly into a recess in the apparatus to dispose the panel wall at an angle of less than 90° from the general plane of the central wall,

means for opening the dies, and

means for removing the end shell.

4,991,736

COLLECTION CONTAINER FOR REUSABLE MATERIAL

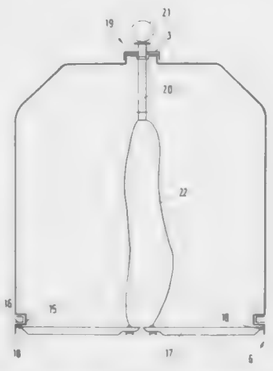
Lothar Ruehland, Grasgarten 34, 3340 Wendeburg, Fed. Rep. of Germany

Filed May 31, 1988, Ser. No. 200,201

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625995; Apr. 22, 1987, 8705993[U]

Int. Cl.[5] B65D *90/62;* **F16K** *3/04*

U.S. Cl. 220—4.24 **23 Claims**



1. A collection container for reusable material comprising a closed upper structure which has a bottom portion opening to a base, and to which is pivoted a bottom which can be swung outwardly relative to the base for emptying the collection container the upper structure having at its top at least two insertion openings facing one another and connected to one another by means of a connecting profile which holds respective housing halves together and which extends around the upper structure in a vertical plane, wherein at least two of said insertion openings are provided adjacent one another in a row, and each of the insertion openings is associated with a container section which is defined by a vertical stiffening corrugation, which is located on a container front side between two insertion openings, and which extends into a further, horizontal stiffening corrugation extending in the container top perpendicular to a separating plane between the housing halves for the stabilization of the respective housing halves.

4,991,737

RECYCLING TRASH BOX

Frederick Edelman, Yardley, Pa., assignor to Art Kraft Container Corporation, Tullytown, Pa.

Filed Jan. 16, 1990, Ser. No. 465,449

Int. Cl.[5] B65D *5/00, 51/18*

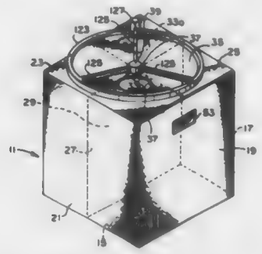
U.S. Cl. 220—525 **9 Claims**

1. A recycling trash box for holding different types of trash in separate compartments comprising

a box having a bottom wall, four side walls extending upwardly from the bottom wall, and a top wall positioned on top of the side walls,

the box having a center dividing wall attached to and extending between two opposite side walls to form two compartments in the box,

the top wall having an opening formed therein above each compartment to permit trash to be inserted into each compartment,



a disc mounted on the top wall and having an opening near its rim, and

means for rotatably mounting the disc on the top wall to open and close the box

whereby the box is opened by rotating the disc opening into alignment with an opening in the top wall, and

whereby the box is closed by rotating the disc to a position where the disc opening is not aligned with an opening in the top wall.

4,991,738

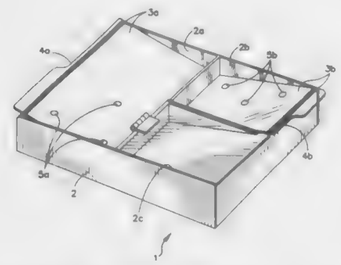
BEAUTICIAN'S DISPENSER OF FOIL SHEETS, AND METHOD OF DISPENSING

Natalie Peterson, P.O. Box 1296, Escondido, Calif. 92025

Filed Sep. 9, 1988, Ser. No. 242,710

Int. Cl.[5] B65H *3/20*

U.S. Cl. 221—1 **26 Claims**



13. A method of dispensing sheets one at a time from a dispenser comprising:

stacking a plurality of sheets substantially flat within a open-topped reservoir of complementary configuration defined by and within a container of sheets;

pressing a paddle that bears contact adhesive upon an underside surface that is, in a paddle end region, substantially coextensive with a sheet, downwards against an uppermost one of the stacked plurality of sheets until the uppermost one sheet is releasably adhesively affixed to the paddle;

lifting the paddle, and the uppermost one sheet adhesively affixed thereto, from off the stacked plurality of sheets;

transporting the paddle and the sheet adhesively affixed thereto to a position remote from the reservoir, and no longer contacting the reservoir or any remaining ones of the stacked plurality of sheets;

turning the paddle over so that the one sheet adhesively affixed to the paddle is uppermost and is substantially supported on the paddle; and

pulling the one sheet off the paddle and from the contact adhesive upon the surface of the paddle.

4,991,739

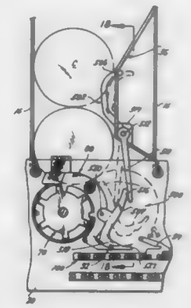
VENDING MACHINE

Joseph L. Levasseur, Chesterfield, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Aug. 10, 1988, Ser. No. 230,983

Int. Cl.[5] G07F *11/10, 11/24*

U.S. Cl. 221—14 **28 Claims**



22. A vending machine, comprising:

(a) article storage means including a plurality of substantially vertical columns disposed in side-by-side relation, each column being adapted to receive a plurality of vertically adjacent generally cylindrical articles,

(b) an elongate, rotatable support means disposed below each column and having a plurality of support elements, each support means having opposed ends and operatively supporting an article in a first position and tending to rotate to a second position under the weight of the article,

(c) release means connected to each support means and selectively controlling rotation of the support means between the first and second position incident to releasing an article,

(d) actuating means including an elongate member extending between said release means and having indexing means positionable adjacent a selected release means reciprocatively engageable with said selected release means to release said release means and permit rotation of the associated support means, and

(e) control means for the actuating means.

4,991,740

VENDING MACHINE

Joseph L. Levasseur, Chesterfield, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Aug. 10, 1988, Ser. No. 230,843

Int. Cl.[5] G07F *11/10*

U.S. Cl. 221—114 **7 Claims**

1. A vending machine, comprising:

(a) article storage means including a plurality of substantially vertical columns disposed in side-by-side relation, each column being adapted to receive a plurality of vertically adjacent generally cylindrical articles,

(b) an elongate, rotatable support means disposed below each column and having a plurality of support elements, each support means having opposed ends and operatively supporting an article in a first position and tending to rotate to a second position under the weight of the article,

(c) release means including a ratchet means fixedly attached to one end of each support means and rotatable with said support means, and pawl means pivotally mounted adja-

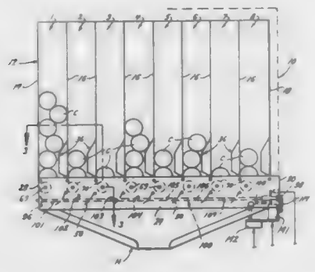
VOL 1123 ISS 2 FE 12 1991 UMI

cent said ratchet means to control rotation of the support means between the first and second position incident to releasing an article,

(d) actuating means for the release means including:

1. a drive shaft having a plurality of angularly related indexing members attached thereto, each indexing member being engageable with an associated pawl means,

2. means for rotating said drive shaft so that a selected indexing member is disposed adjacent a selected pawl means,



3. means for inducing alternating motion into said drive shaft and indexing members so that said indexing member engages said pawl means to move said pawl means into and out of engagement with said ratchet means to permit rotation of said support means, and

(e) control means for the actuating means,

(f) the pawl means including an end portion and means pivotally attaching said end portion to the other portion for one-way movement of said end portion relative to said other portion, and

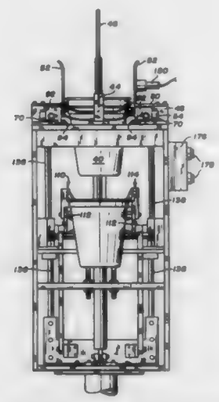
(g) said actuating means including means for oscillating said drive shaft and selected indexing member to induce said alternating motion into said indexing member.

4,991,741

PAIL SEPARATING MECHANISM FOR AN AUTOMATIC FILLING MACHINE

Douglas R. Anderson, Eden Prairie, Minn., assignor to Liberty Diversified Industries, New Hope, Minn.

Filed Apr. 26, 1989, Ser. No. 344,301
Int. Cl.[5] B65G *59/06*
U.S. Cl. 221—223 **18 Claims**



1. A mechanism for separating a lowermost container from a nested column of like containers, each said container having a generally upright side wall defining a receptacle region and a rim extending outwardly from said side wall, said mechanism comprising:

a housing having a generally open top and a container delivery station;

stacking means for retaining the column of like containers in a generally vertical nested stack at an elevation above the container delivery station with the lowermost container disposed proximate to the open top of the housing;

column support means engaging the column of like containers and including means for controllably lowering the elevation of the column of like containers an incremental amount generally equal to a normal vertical spacing between the rims of adjacent like containers;

a container pull-down carriage assembly mounted for generally vertical linear movement between a raised position proximate to the elevation of the lowermost container and a lowered position;

container separating means for separating the lowermost container from the column of like containers, the container separating means being mounted on the container pull-down carriage assembly for movement therewith and including at least one toggle mounted for movement such that the toggle will engage the rim of the lowermost container when the container pull-down carriage assembly is moved to the raised position and such that the toggle will exert a force on the lowermost container to separate the lowermost container from the column as the container pull-down carriage assembly is moved to the lowered position, the container pull-down carriage assembly delivering the separated container to the container delivery station as the container pull-down carriage assembly moves to the lowered position; and

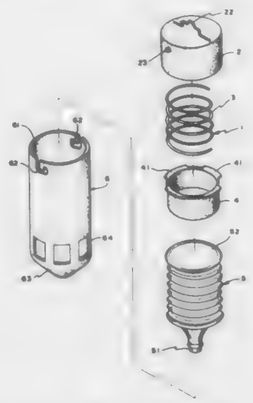
a container ejector assembly to eject the separated container from the container delivery station.

4,991,742

AUTOMATIC DRIP BOTTLE SET

Chin-Fu Chang, No. 166-1, Chang Nan Road, Changhua, Taiwan

Filed Aug. 1, 1989, Ser. No. 387,808
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—95 **2 Claims**



1. An automatic drip bottle set comprising:

(a) a hollow cylinder including a conical-shaped bottom portion terminating in an axially disposed through-hole and a top portion provided with a pair of opposed J-shaped notches;

(b) a compressible drip bottle for containing infusion solution and being receivable within the hollow cylinder, the drip bottle including a head portion for insertion through the through-hole of the hollow cylinder when the drip bottle is received therein; and

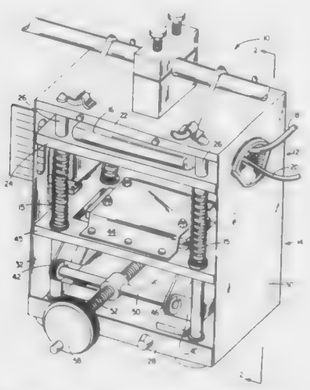
(c) a spring pressure assembly including a basin, a cover and a spring, the basin including a plurality of retainer plates extending outwardly from a top portion thereof, the cover including a stepped hanger at a top portion thereof, a pair of opposed dowels extending outwardly from an outer surface of the cover for corresponding engagement within the pair of opposed of J-shaped notches for connecting the spring pressure assembly to the hollow cylinder, and a plurality of stop plates extending inwardly from a bottom portion of the cover for matching engagement with the retainer plates to slidably secure the basin within the cover, and the spring being disposed within the basin and cover for urging the basin downwardly against the drip bottle and providing a uniform pressing force against the drip bottle to compress same and cause the infusion solution contained therein to be smoothly infused into the body of a patient.

4,991,743

CONTROLLED FLOW ACCUMULATOR

John C. Walker, Louisville, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Nov. 6, 1989, Ser. No. 432,364
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—103 **6 Claims**



1. A fluid flow control apparatus comprising

a flexible fluid container having an opening for the flow of fluid therethrough,

a fluid flow portion configured to receive and apply a flexible wall deflecting force to said flexible fluid container,

a spring member positioned to apply a spring force to said fluid flow portion, and

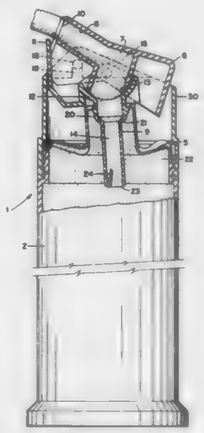
an adjustable actuating portion, said adjustable actuating portion acting upon said spring member to provide an adjustable spring force to said fluid flow portion, said fluid flow portion providing said flexible wall deflecting force to said flexible fluid container and thereby controlling fluid pressure therein, said fluid pressure controlling flow from said flexible fluid container.

4,991,744

DISPENSER FOR THE METERED DELIVERY OF PASTY PRODUCTS

Alfred Von Schuckmann, Kevelaer, Fed. Rep. of Germany, assignor to Colgate Palmolive Company, New York, N.Y.

Filed Feb. 1, 1989, Ser. No. 304,553
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803229
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—136 **19 Claims**



1. Dispenser for the metered delivery of a pasty substance comprising a housing defining a chamber for containing said substance and having a discharge end, piston means mounted within said housing and being incrementally displaceable in the direction of said discharge end, pump means mounted within said housing between said discharge end and said piston means, said pump means being resiliently biased to a non-dispensing position and actuatable toward said piston means to pump said substance from said chamber toward said discharge end, a discharge tube assembly including a first segment associated with said pump means and having a first passageway communicating with said chamber, a second rocker segment pivotally connected to said housing, said rocker segment having a discharge opening and a second passageway communicating between said discharge opening and said first passageway, said rocker segment being pivotable between a first normally closed position and a second open dispensing position, closure means mounted adjacent said rocker segment for closing said discharge opening when said rocker segment is in said first position, said rocker segment being pivotally actuatable to its second position to move said discharge opening away from said closure means and to actuate said pump means to pump said substance from said chamber through said first and second passageways out through said discharge opening, whereby upon its release said rocker segment automatically returns to said first position and said closure means automatically closes said discharge opening.

4,991,745

DISPENSING VALVE WITH TRAMPOLINE-LIKE CONSTRUCTION

Paul E. Brown, Midland, Mich., assignor to Liquid Molding Systems, Inc., Midland, Mich.

Continuation-in-part of Ser. No. 343,464, Apr. 25, 1989. This application Jan. 9, 1990, Ser. No. 462,613
Int. Cl.[5] B05B *11/04*
U.S. Cl. 222—212 **37 Claims**

1. A dispensing package for fluid materials and the like, comprising:

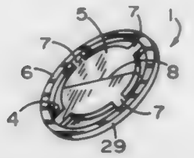
VOL 1123 ISS 2 FE 12 1991 UMI

a container shaped to retain a preselected fluid product therein, and including a wall having a discharge opening, and a resiliently flexible portion for manually shifting said container between a compressed condition and a decompressed condition to selectively move the fluid product through the discharge opening of said container;

a self-sealing dispensing valve connected with said container, communicating with the discharge opening thereof, and including:

a valve wall having a marginal groove extending along one face thereof in a closed pattern to define a center valve area inside said groove, and an outer valve area outside said groove;

at least one rib extending between said center valve area and said outer valve area to bridge said groove and selectively stiffen said valve;



a slit extending through said valve wall to define an orifice that shifts between outwardly open, closed, and inwardly open positions in response to shifting the flexible wall portion of said container; said slit extending substantially continuously along said center valve area, and into at least a portion of said groove, whereby shifting the flexible wall portion of said container from the decompressed condition to the compressed condition shifts said orifice into the outwardly open position, and forces the fluid product therethrough to dispense the same from said container, and shifting the flexible wall portion of said container from the compressed condition to the decompressed condition shifts said orifice from the outwardly open position, through the closed position, into the inwardly open position, and draws air therethrough to substantially equalize the pressure within said container, and thereby return said orifice to the closed position.

4,991,746

MODULAR PUMP HAVING A LOCKING ROTATABLE SLEEVE

Robert S. Schultz, Old Greenwich, Conn., assignor to Emson Research Inc., Bridgeport, Conn.

Filed Jul. 7, 1989, Ser. No. 375,050

Int. Cl.[5] G01F *11/36*

U.S. Cl. 222—321 19 Claims

1. A modular pump for dispensing material from a container comprising:

a pump housing having a pump chamber therein;

a piston slidably supported for reciprocal motion in the pump chamber, said piston having a central opening therein;

an outer stem having a first portion of predetermined diameter and a second portion disposed inwardly of said first portion, said second portion having a smaller diameter than said predetermined diameter, said first portion extending through said central opening in the piston and including a radially outwardly extending flange for moving said piston inwardly in the pump chamber;

an inner stem having a hollow portion press fit onto said second portion, said inner stem having a radially outwardly extending flange for abutting a surface of said piston to form therewith an outlet valve for the pump chamber;

an axial passage formed in said outer stem;

at least one inlet disposed downstream of said outlet valve leading into the axial passageway;

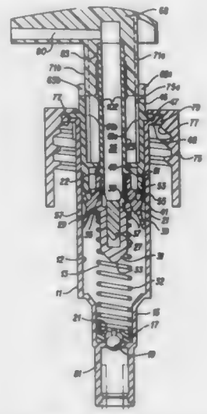
a check valve disposed at one end of the pump chamber forming an inlet valve therefor;

a rotatable locking sleeve supported for rotation within the other end of the pump chamber;

a spring biasing said inner stem outwardly to an unactuated position in which the inner stem flange abuts the piston surface to close the outlet valve, said outer stem flange is spaced from the piston, and said piston abuts an inner end of the locking sleeve to seal said pump chamber;

an actuator mounted on said outer stem for moving said out stem inwardly against the bias of said spring to actuate the pump to an operative position in which the outer stem moves relative to said piston to open said outlet valve and abut the piston whereafter the outer stem moves the piston inwardly for pressurizing said pump chamber;

at least one slot formed on an inner surface of said locking sleeve;



at least one cooperating rib formed on an outer surface of said actuator, said at least one rib being received in said at least one slot for guiding the actuator as it is depressed to actuate the modular pump;

at least one partially circumferentially extending slot disposed adjacent said at least one slot and having a ledge formed at a depth adjacent a bottom edge of said at least one rib when said actuator is in a fully outwardly biased position; and

at least one stop projecting radially inward at a remote end of said at least one circumferentially extending slot whereby the actuator may be rotated relative to the locking sleeve until said at least one rib passes said at least one stop and is retained in a detent position in which said ledge prevents inward movement of the actuator and the locking sleeve may be rotated relative to said pump housing to reposition the orientation of the actuator.

4,991,747

SEALING PUMP

Owen F. Van Brocklin, Bristol, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Oct. 11, 1988, Ser. No. 256,327

Int. Cl.[5] B65D *88/54*

U.S. Cl. 222—321 27 Claims

1. A pump for dispensing liquids from a container, comprising:

a hollow body having upper and lower ends having openings therein;

a hollow piston slidable reciprocally with sealing fit in said body, said piston having upper and lower ends having openings therein;

a piston seat sized to be received inside said piston, said piston seat having

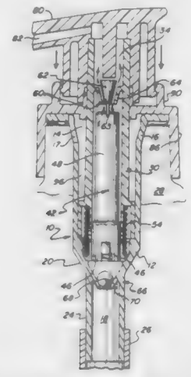
a larger diameter segment at its lower end sized for sealing fit inside said piston when said piston is at the terminal portion of a downward stroke and the initial portion of an upward stroke of said piston, and

a smaller diameter segment at its upper end sized to provide a space between said smaller diameter segment and the inner walls of said piston;

a chamber defined by said piston, body and piston seat;

means for biasing said piston against a downward stroke and for biasing said piston with an upward stroke;

an upper valve positioned in the upper end of said piston, said upper valve being moveable to open said opening in



said upper end of said piston during a downward stroke of said piston to dispense liquids from said chamber; and

a lower valve positioned in the lower end of said body, said lower valve being moveable to open said opening in said lower end of said body during an upward stroke of said piston to permit liquid to enter said chamber;

a dispensing nozzle located at the upper end of said piston, said upper valve being located between said dispensing nozzle and said chamber;

cooperating means on said upper valve member and the upper end of said piston seat to hold said upper valve open during an initial portion of an upward stroke of said piston, whereby a pressure gradient between said nozzle and said chamber is created to cause liquid being dispensed from said pump to be drawn towards said chamber from said nozzle.

4,991,748

DEVICE FOR DISPENSING PORTIONS OF GRAINY MEDIA, IN PARTICULAR PELLETS

Ludger Hackmann; Josef Wilken, and Werner Sieverding, all of Lohne, Fed. Rep. of Germany, assignors to ByK Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Fed. Rep. of Germany

PCT No. PCT/EP88/00197, § 371 Date Nov. 17, 1989, § 102(e) Date Nov. 17, 1989, PCT Pub. No. WO88/07483, PCT Pub. Date Oct. 6, 1988

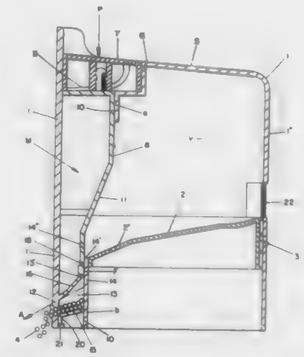
PCT Filed Mar. 12, 1988, Ser. No. 411,480

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 8704248

Int. Cl.[5] G01F *11/10*

U.S. Cl. 222—361 7 Claims

1. In a device for the dosed dispensing of grainy media, in particular pellets, from a housing, the housing defining a storage space for storing the grain media, the housing further having a bottom and a dispensing opening adjacent the housing bottom, the device including a hand-operated actuator, the actuator being movable in a dispensing direction relative to the dispensing opening between a first position for closing the dispensing opening and a second dispensing position, the actuator defining a dosing chamber having a first end portion which is closed in the dispensing position of the actuator relative to the storage space by a partition wall, the dosing chamber having a second end portion which is in the dispensing position of the actuator in communication with the dispensing opening, the dosing chamber further being defined by a cover which is



inclined in the dispensing direction, the dosing chamber having a size which substantially greater than the diameter of a pellet, the improvement comprising a portion of the cover adjacent the storage space defining an auxiliary dosing chamber, the auxiliary dosing chamber having a depth which corresponds approximately to the diameter of a pellet, the portion of the cover defining the auxiliary dosing chamber having upper flanks which converge toward one another and end in an upwardly directed notch, wherein the notch is narrower than the diameter of a pellet.

4,991,749

MANUALLY-OPERATED FLUID DISPENSER AND ASSOCIATED CLOSURE CAP

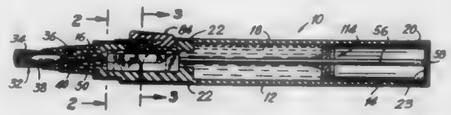
Nathan Kay, Encino; Donald W. McNab, Long Beach, and Edward J. Moya, San Gabriel, all of Calif., assignors to Photofinish Cosmetics, Inc., Encino, Calif.

Continuation of Ser. No. 194,840, May 17, 1988, Pat. No. 4,874,117. This application Oct. 5, 1989, Ser. No. 417,292

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—384 56 Claims



1. In a fluid dispenser for manually-effected operator-controlled discharge of a stored fluid:

an elongated dispenser housing defining an interior space for storing a fluid dischargeable from the housing, said housing including a fluid discharge opening and a vent opening proximate opposite ends of the housing;

variable length means normally urged to a maximum longitudinal extension between and for concurrently closing said fluid discharge and vent openings; and

fluid discharge actuating means operatively movable between a first and a second position for causing foreshort-

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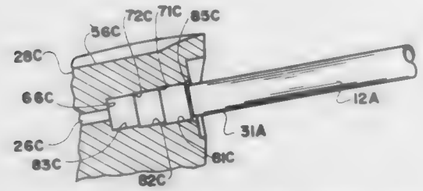
ening of said variable length means relative to said maximum longitudinal extension to space said variable length means from and concurrently open said fluid discharge and vent openings whereby stored fluid is discharged from said dispenser through said fluid discharge opening and air enters the housing through said vent opening, said actuating means comprising first movable means on said housing and second movable means within said housing for operatively causing said foreshortening of said variable length means.

4,991,750

MOUNTING FOR EXTENSION TUBE

Leonardo D. Moral, Streamwood, Ill., assignor to Pittway Corp., Cary, Ill.

Filed Dec. 8, 1988, Ser. No. 281,462
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—402.24 **18 Claims**



1. An improved mounting for a flexible extension tube in a fluid sprinkling apparatus for spraying a liquid from a container through the extension tube, the fluid sprinkling apparatus having an input orifice communicating with the liquid internal the container and an actuator means for controlling the flow of the liquid from the input orifice to a terminal orifice, the extension tube having an outer diameter, the improvement comprising:

a bore formed within the fluid sprinkling apparatus with said bore extending between an outer wall of the fluid sprinkling apparatus and an inner wall in the fluid sprinkling apparatus;

the terminal orifice being disposed within said inner wall of said bore;

said bore having a plurality of shoulders spaced along said bore from said outer wall to said inner wall for respectively defining a plurality of bore portions;

said plurality of bore portions having progressively decreasing diameters from said outer wall to said inner wall; and

at least one of said bore portions radially inwardly compressing the flexible extension tube for frictionally retaining and forming a fluid tight seal with the extension tube irrespective of manufacturing tolerances of said bore and the outer diameter of the extension tube for enabling the liquid from the container to flow from the terminal orifice through the extension tube and to be expelled therefrom.

4,991,751

FOAM ACTUATOR FOR METERING AN AEROSOL PRODUCT

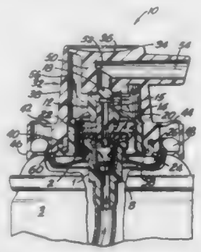
Virgil Naku, Hawthorne, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Dec. 19, 1989, Ser. No. 453,396
Int. Cl.[5] B65D *83/20*
U.S. Cl. 222—402.13 **4 Claims**

1. A metering actuator for dispensing the pressurized contents of an aerosol container through a tubular valve stem associated therewith comprising:

(a) a valve-opening member having a hub defining a recess suitable for receiving a valved, tubular valve stem, said hub having a conduit therethrough communicating at one end with the valve stem and at the other end with a metering chamber, said hub further having a dome portion, an annular lateral flange, an annular sidewall extending downwardly from the lateral flange, and sealing means associated with the annular side-wall;

(b) A finger-bearing member constructed so as to surround and seal with the valve-opening member, having a hub defining a recess suitable for receiving the dome portion of the valve-opening member in sealing relation, and said hub defining, at least in part, a conduit for the flow of material to a discharge nozzle, said finger-bearing member further having (i) an annular side-wall having sealing



means associated therewith, (ii) a flexible flange extending laterally from the side wall, and (iii) a further annular sidewall extending downwardly from the flexible flange suitable for attaching the finger-bearing member to the valve closure bead of an aerosol container;

(c) the sealing means of the valve opening member and the finger bearing member forming an interference fit between an upstanding annular wall and a mating recess; and

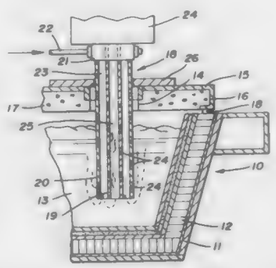
(d) a metering chamber defined by the undersurface of the finger-bearing member and the outersurface of the valve-opening member.

4,991,752

METHOD AND APPARATUS FOR STIRRING AND POURING MOLTEN METAL IN A NEUTRAL ATMOSPHERE

Micheal D. LaBate, 115 Hazel Ave., Ellwood City, Pa. 16117

Filed Jan. 22, 1990, Ser. No. 468,109
Int. Cl.[5] B22D *37/00*
U.S. Cl. 222—590 **4 Claims**



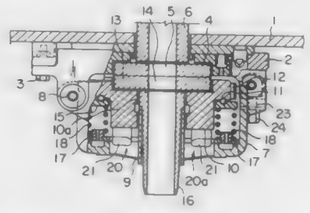
1. A gas pressurizing shroud assembly extending from a source of molten metal to a receiving vessel, comprises first and second coaxial tubular elements of a known length within one another, said first tubular element being of a diameter less than said second tubular element, said first tubular element being in communication with said source of molten metal, a distribution and spacing ring is secured to one end of said tubular elements defining an enclosure communicating with said second tubular element, means for supplying inert gas under pressure to said distribution and spacing ring, said first and second tubular elements having a plurality of longitudinally spaced apertures therein, said spaced apertures in said first tubular element supplying said inert gas to said source of molten metal within the length of said first tubular element, means for sealing said receiving vessel from atmosphere and means for sealing said gas pressurized shroud assembly to said means for sealing said receiving vessel.

4,991,753

DOOR-TYPE ROTARY NOZZLE

Hisao Inubushi; Tetsuya Yoshihara, and Mioshi Sakamoto, all of Kanagawa, Japan, assignors to NKK Corporation, Tokyo; Nippon Rotary Nozzle Co., Ltd.; Kokan Kikai Kogyo Kabushiki Kaisha, both of Kawasaki and Tokyo Yogyo Kabushiki Kaisha, Tokyo, all of, Japan

Filed May 24, 1989, Ser. No. 356,779
Int. Cl.[5] B22D *41/26*
U.S. Cl. 222—598 **6 Claims**



1. A door-type rotary nozzle comprising:

a base member in which a bottom plate brick is arranged, said bottom plate brick having a first nozzle hole defined therein;

a fixed door frame hinged to said base member for swinging said door frame between an open and closed position, said door frame having an opening defined therein;

a rotatable rotor arranged in said door frame and connectable to a drive means, said rotor having a hole defined therein;

a slide plate brick arranged in said door frame, and adjacent an upper portion of said rotor, having a second nozzle hole defined therein, said second nozzle hole and said first nozzle hole being alignable to communicate with one another;

a collector nozzle insertable within said hole in said rotor to communicate with said first and second nozzle holes;

a plurality of spring means positioned between said rotor and an inner portion of said door frame;

at least one clamp fitting part connected to a lower portion of said rotor;

locking means to lock said door frame to said base member in said closed position;

at least one cam surface positioned on an outer surface of said door frame; and

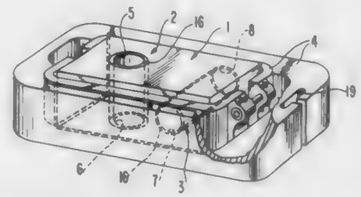
at least one clamper, having upper and lower engaging parts, insertable through said opening so that said lower part engages said clamp fitting part and said upper part overlaps said outer surface of said door frame so that rotation of said rotor causes said upper engaging part to contact said cam surface and pull said rotor away from said bottom plate brick and prevents said collector nozzle from being inserted within said hole in said rotor.

4,991,754

CLOSING MEMBER FOR A SLIDE GATE NOZZLE ON A VESSEL CONTAINING METAL MELT AND A SLIDE GATE NOZZLE WITH SUCH A CLOSING MEMBER

José Gimpera, Wiesbaden, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

PCT No. PCT/EP88/00644, § 371 Date Dec. 6, 1988, § 102(e) Date Dec. 6, 1988, PCT Pub. No. WO89/01373, PCT Pub. Date Feb. 23, 1989
PCT Filed Jul. 16, 1988, Ser. No. 294,626
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726312
Int. Cl.[5] B22D *41/08*
U.S. Cl. 222—600 **22 Claims**



1. A slide gate for a molten metal container, comprising

a housing;

a carrier frame mounted in said housing;

a closing member mounted in said carrier frame and having a plurality of external surfaces,

a first flow channel formed through said closing member and having opposite ends forming openings through different ones of said plurality of external surfaces, and

a second flow channel formed through said closing member and having opposite ends forming openings through different ones of said plurality of external surfaces, said external surfaces through which said ends of said second flow channel form openings being different external surfaces than said external surfaces through which said ends of said first flow channel form openings, said first and second flow channels being adapted to allow fluid through said closing member; and

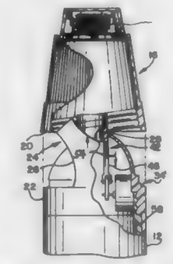
moving means for moving said carrier frame and said closing member relative to said housing.

4,991,755

TOOTHPASTE DISPENSER WITH TIMER ASSEMBLY

Stephen Grusmark, 2901 S. Bayshore Dr., #15C, Coconut Grove, Fla. 33133

Continuation-in-part of Ser. No. 115,803, Nov. 2, 1987, Pat. No. 4,836,415. This application Jun. 5, 1989, Ser. No. 361,061
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—638 **9 Claims**



1. A timer assembly used in combination with a toothpaste

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dispenser of the type including an elongated housing means having a base portion for supporting a toothpaste container therein and comprising:

a. a plunger means movably mounted on said housing and disposed and structured to cause the dispensing of toothpaste from said container.

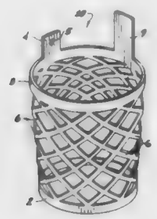
b. said base comprising an open ended construction and a hollow interior portion communicating exteriorly of said housing through said open end,

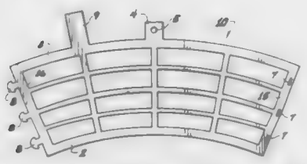
c. said timer assembly including an activating means disposed on an accessible portion of the timer and structured to selectively activate said timer,

d. said timer assembly dimensioned and configured to be receivably secured within said hollow interior of said base and be supported by said housing, and

e. said activating means disposed in an accessible position through said open end when said timer assembly is secured within said base.

4,991,756
GLOVE AND MITTEN DRYER
John R. Benjamin, 1010 - 92nd St., Niagara Falls, N.Y. 14304
Filed Mar. 6, 1989, Ser. No. 319,115
Int. Cl.[5] D06C *5/00;* **D06F** *59/04*
U.S. Cl. 223—72 **8 Claims**

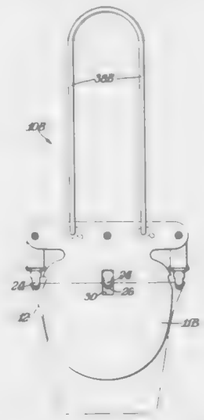




1. A device for drying wet articles of clothing, the clothing having a shape of substantially tubular form having an inside surface and having a length of at least three inches; the device consisting of a single sheet of flexible plastic material capable of being bent into a tubular shape when inserted into the tubular article and further having outer and inner surfaces, said sheet of material further having means for allowing ventilation of air therethrough when inserted into said tubular article and whereby the outer surface of the device contacts the inner surface of the tubular clothing.

4,991,757
SOCK APPLYING DEVICE
Ralph V. Deakyne, Millcroft Apt. 120, 255 Possum Park Rd., Newark, Del. 19711
Filed Feb. 22, 1990, Ser. No. 483,388
Int. Cl.[5] A47G *25/90*
U.S. Cl. 223—112 **30 Claims**

4. A sock applicating device comprising a stiff, bendable sheet having a shovel-like shape with a rounded tip at its lead end and a remote end whereby a sock may be inserted over said lead nd and pulled toward said remote end when said sheet is bent about its longitudinal centerline extending from said tip to said remote end, a cutout in each edge of said sheet at opposite sides thereof at said remote end to form an ear on each side of said sheet, fastening means on said remote end for detachable securement to said sock when the sock is mounted on said bent sheet, a registry notch on each edge of said sheet between said tip and a respective cutout for limiting the extent the sock is pulled on said bent sheet, each of said registry notches opening toward said rounded tip, said registry notches being aligned with each other, said edge of said sheet being smooth and uninterrupted from said rounded tip to said registry



notches, the depth of each of said notches into said sheet being less than the depth of each of said cutouts into said sheet, and pull cord means secured to said remote end whereby said bent sheet and sock may be placed on the floor and the user's foot may be inserted therein and the bent sheet and sock may be pulled up the foot until the sock is applied in place so that the sheet can be detached from the sock and be removed with the sock remaining on the foot.

4,991,758
SUPPORT SYSTEM FOR PORTABLE VIDEO CAMERA
Charles S. Eaneff, 1100 Edgewood Rd., Redwood City, Calif. 94062
Filed Sep. 22, 1989, Ser. No. 410,869
Int. Cl.[5] G03B *29/00*
U.S. Cl. 224—208 **12 Claims**

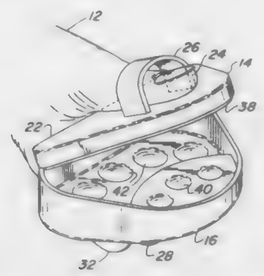


1. A support structure for a portable video camera operative to balance the weight of the camera on both shoulders of a cameraman carrying the camera, comprising:

(a) a harness adapted to be donned by the cameraman and including a main support strap having opposite ends and anterior and posterior portions adapted to extend diagonally anteriorly and posteriorly of the torso of the cameraman and over a shoulder to form a weight-transferring loop; and

(b) a shock absorber assembly mounted on the harness and adapted to be supportingly interposed between the harness and a video camera the weight of which is partially supported directly on a shoulder of the cameraman with the remaining weight of the camera being transferred to the other shoulder of the cameraman via the harness.

4,991,759
DENTAL DISPENSER FOR LIGHT CURABLE SUBSTANCES
Jonathan Scharf, 364-A7 St. Andrews Rd., Glenmoore, Pa. 19343
Filed Mar. 26, 1990, Ser. No. 499,239
Int. Cl.[5] A61C *19/02*
U.S. Cl. 224—217 **18 Claims**



1. Apparatus for use in the practice of dentistry, comprising:

a container and a cover both formed of a light opaque material, said cover sealably mating with said container to prevent the entry of light when said cover is in sealable engagement with said container;

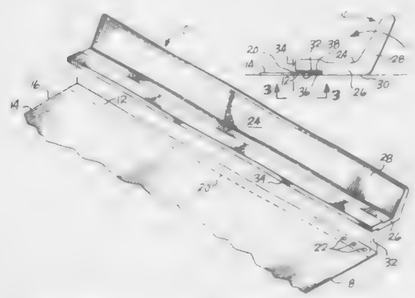
said container including therein a plurality of open recesses for receiving one or more light sensitive substances useful in the practice of dentistry;

said cover being provided with means for retaining said cover on one or more digits of a users hand;

said container being provided with means for retaining other digit or digits of the same hand in operative engagement with said container;

whereby said apparatus may be retained on and opened and closed by the digits of one hand.

4,991,760
CLAMPING TOOL
Judith K. Coryell, 1857 23rd Ave. East, Seattle, Wash. 98112
Filed Dec. 12, 1989, Ser. No. 449,537
Int. Cl.[5] B26F *3/02*
U.S. Cl. 225—106 **12 Claims**



1. A tool usable in connection with a support surface that is separate from the tool, for facilitating removal of feed strips from a sheet of computer paper to which the feed strips are connected by lines of perforations which extend lengthwise of the sheet, comprising:

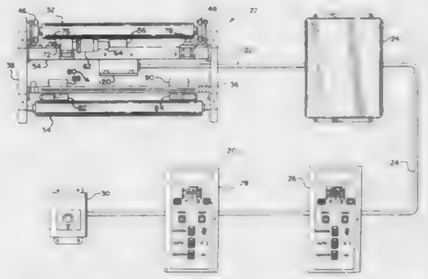
an elongated body having a side edge and a base portion, said base portion having lower surface means which can be set onto the support surface;

a downwardly directed feed strip receiving region extending the full length of the body, said region being disposed laterally between the side edge and the lower surface means, said region having a width substantially equal to the width of the feed strip, said region having a downwardly directed roof surface which is situated above and confronts a feed strip within the region and a vertical side boundary bordering the lower surface means, said vertical side boundary extending downwardly from the roof surface to the lower surface means;

said downwardly directed roof surface being normally spaced above the lower surface means a distance allowing the tool and a sheet of computer paper to be moved relatively together to insert a feed strip into the region; and

said tool being movable while on the support surface to lower the roof surface onto the feed strip, so that the roof surface can apply a clamping pressure on the feed strip, clamping the feed strip between the roof surface and the supporting surface, allowing the sheet to be pulled upon and torn along the line of perforations to in that manner separate it from the clamped feed strip.

4,991,761
WEB GUIDE APPARATUS
Herman C. Gnuechtel, Arlington Heights, and Stephen P. Koemen, Hoffman Estates, both of Ill., assignors to Web Printing Controls Co., Inc., Barrington, Ill.
Filed Oct. 31, 1988, Ser. No. 265,423
Int. Cl.[5] B65H *25/26;* **G01N** *21/86;* **G01V** *9/04*
U.S. Cl. 226—15 **17 Claims**



1. A web guidance system for automatically controlling alignment of a moving web, comprising:

a stationary support frame;

a pivotable frame attached to the stationary support frame for receiving the moving web, and being pivotable over a predetermined range and including parallel steering rollers rotatable about an axis extending transversely of the web direction of travel;

sensing means including at least one edge sensor for sensing a transverse deviation in the position of a longitudinal edge of the web and for generating an error signal in response thereto;

control means for generating control signals responsive to the error signals for automatically correcting the deviation of the web position by pivoting the pivotable frame;

drive means for pivoting the pivotable frame to control the angular position of said pivotable frame responsive to the control signals;

manual means for enabling an operator to assume manual control of the drive means; memory means having a plurality of memory locations for storage of operational data and

maintenance means for disabling operation of the control means providing selectable and programmable mainte-

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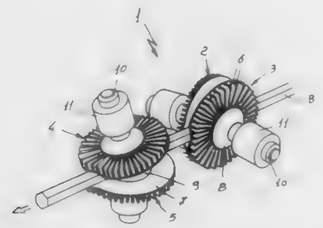
nance modes of operation to permit operator entry of programmable parameters from a control panel, wherein the maintenance means comprises means for enabling the operator to select desired functions and maintenance modes including a mode which enables an operator to address any memory location of the memory means and store selected data of the addressed memory location.

4,991,762

BAR GUIDING DEVICE FOR BAR FEEDERS OF MACHINE TOOLS

Vladimiro Fabbri, Faenza, Italy, assignor to I.E.M.C.A. S.p.A. Industria Elettromeccanica, Faenza, Italy

Filed Mar. 13, 1989, Ser. No. 322,133
Claims priority, application Italy, Mar. 18, 1988, 3384 A/88
Int. Cl.[5] B65H *51/00*; B23B *13/00*
U.S. Cl. 226—182 **11 Claims**



1. Guiding device for bars comprising at least one group of wheels, each wheel comprised in said at least one group of wheels having a flexible contact portion, said each wheel being rotatably supportable and angularly arrangeable about one bar, said flexible contact portion of said each wheel thereby being arrangeable in flexible supporting contact with the bar, said flexible contact portion comprising a flexible planar surface arrangeable in contact with the bar and a plurality of protruding fingers on an opposite side from the flexible planar surface, each protruding finger being laterally spaced apart from one another thereby defining a plurality of radial notches therebetween.

4,991,763

SURGICAL STAPLER

Anthony Storace, Norwalk, Conn., assignor to Technalytics Inc., Montvale, N.J.

Filed May 23, 1988, Ser. No. 197,618
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[5] A61B *17/068*
U.S. Cl. 227—177 **17 Claims**

1. A stapling device for use in ejecting a single staple to close an incision or wound comprising:

a case including a staple discharge area;

a cartridge assembly adapted to receive a plurality of staples in a generally stacked planar arrangement disposed within said case at a first plane;

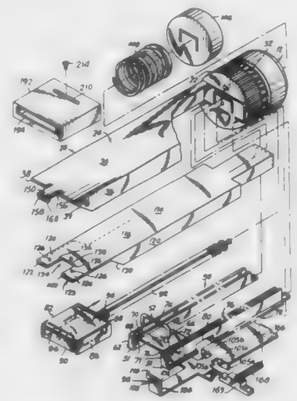
a pusher assembly engageable with said stack of staples and movable between a first rearward position and a second forward position to advance said stack of staples;

control means for turning a single staple around an axis generally normal to said stack of staples to form a turned staple, wherein said turned staple is at a second plane other than the first plane of the stack of staples;

means for moving said turned staple at a predetermined distance within the device;

forming means for forming the staple into a closed gripping configuration;

stripping means for disengaging the staple to be ejected from the device; and



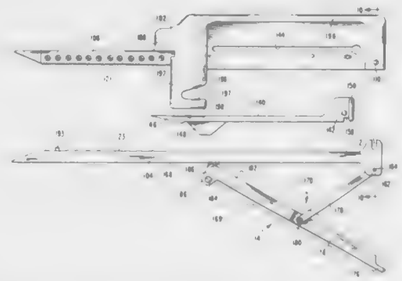
loading means for loading a single staple within said stack of staples into a position to be turned.

4,991,764

SURGICAL STAPLING INSTRUMENT

Robert Mericle, Raleigh, N.C., assignor to Edward Weck Incorporated, Princeton, N.J.

Filed Jan. 23, 1989, Ser. No. 300,523
Int. Cl.[5] A61B *17/00*
U.S. Cl. 227—178 **15 Claims**



1. A surgical stapling instrument comprising:

first and second body members pivotally and detachably connected to each other, each having an elongated jaw, one of said jaws being adapted to receive at least two spaced apart longitudinal rows of staples;

an elongated bar slidable longitudinally relative to said jaws for ejecting staples from an inner face of said jaws and shaping the staples against anvil means provided on an opposing inner face of the other of said jaws to form a pair of spaced staple rows in tissue gripped between said jaws;

means for releasably locking said jaws in a tissue gripping staple inserting position, said locking means comprising:

a toggle joint having a first end pivotally mounted to said second body member;

a second end adapted to engage said second body member distally of said first end of said toggle joint, said toggle joint including a knee portion disposed between said first and second ends, said second end also adapted to engage a portion of said first body member to lock said first and second jaws in the tissue gripping position when said knee is straightened.

4,991,765

PUSH ROD MANUFACTURING METHOD

Kenji Sugiyama, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha/Ltd., Japan

Filed Jun. 8, 1990, Ser. No. 536,180
Claims priority, application Japan, Jun. 13, 1989, 1-150031
Int. Cl.[5] B23K *11/14, 11/30*
U.S. Cl. 228—164 **4 Claims**



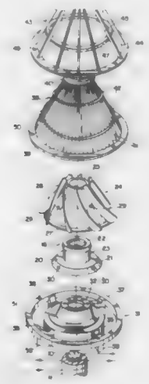
1. A method of manufacturing a push rod by projection-welding a bottom surface of an end element having a concave or convex end surface to a tapered annular end surface of a pipe, comprising the steps of integrally forming a plurality of rose seats of wedge shape in cross section on the bottom surface of the end element that extend radially with respect to the axial center of the end element, and performing projection-welding by bringing the rose seats into confronting contact with the tapered annular end surface of substantially triangular shape in cross section.

4,991,766

PROCESS OF MANUFACTURING A CONICAL FLIGHT ASSEMBLY

Joseph W. Hunnicutt, III., 1530 Lauden Hts. Rd., Charleston, W. Va. 25314; Jimmy Taylor, Box 227, Mt. Gay, W. Va. 25637, and David L. Singleton, 3608 Hummingbird Dr., Poland, Ohio 44514

Continuation of Ser. No. 417,517, Oct. 5, 1989, abandoned. This application Jun. 19, 1990, Ser. No. 540,469
Int. Cl.[5] B23K *9/04, 31/02*; B04B *1/08, 7/08*
U.S. Cl. 228—175 **22 Claims**



1. A process of manufacturing a frustoconical flight assembly for use in a vertical centrifugal separator comprised of a vertical drive shaft assembly, a frustoconical flight assembly coaxially carried by said drive shaft assembly, and a frustoconical screen also carried by said drive shaft assembly, which screen concentrically surrounds said flight assembly, wherein said flight assembly consists essentially of a hollow, ferrous frustrum of a right circular cone having a plurality of parallel, spiral, hindrance flights attached to the frustrum's lateral wall, said process comprising the steps of:

(a) obtaining a hollow, ferrous frustrum of a right circular cone;

(b) obtaining a plurality of equal size lengths of steel plate, each said length of plate having a lengthwise inside edge; an outside edge that is opposite, and substantially parallel to, the inside edge; a shorter top edge at one end of the plate; a bottom edge at the opposite end of the plate; a face; and an underside;

(c) forming flights out of said lengths of plate by identically bending each of the plates to conform it to the outer curvature of said frustrum, so that the inside edge of the plate can be placed against the lateral wall of the frustrum in such an orientation that the plate spirals part way around the frustrum from approximately the top of the frustrum to approximately the base thereof, without any substantial gaps between the plate and the frustrum;

(d) welding said flights to the lateral wall of said frustrum in a parallel relationship to one another, at substantially equal distances from one another, each said welded flight being positioned so that its top edge is located at approximately the top of the frustrum; its bottom edge is located at approximately the base of the frustrum; its lengthwise inside edge is welded to the frustrum; its face faces toward the top of the frustrum and protrudes substantially perpendicularly from the frustrum's lateral wall; and the flight spirals downward part way around the frustrum;

(e) machining the outside edge of each said welded flight to conform all of the flights within a predetermined tolerance to the frustoconical figure defined by the inner surface of the frustoconical screen with which the flight assembly is to be used; and

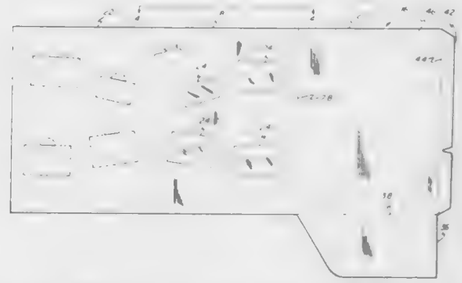
(f) applying a hard coating to at least a portion of each said machined flight by welding to said face of the flight a metal weldment that borders the flight's outside edge, said weldment being of a composition that is harder than the steel of which said flight is made.

4,991,767

PORTFOLIO WITH PHOTOGRAPH DISPLAYING COVER

Jon R. Wyant, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 13, 1989, Ser. No. 379,306
Int. Cl.[5] B65D *27/04, 27/08*
U.S. Cl. 229—1.5 R **6 Claims**



1. A portfolio comprising a front cover and a rear cover hingedly attached to said front cover, characterized in that said front cover comprises:

an outer front panel provided with a plurality of spaced generally rectangular openings;

a transparent film overlaying said openings to define a plurality of windows; and,

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an inner front panel secured against said outer front panel in areas surrounding each of said windows to define a plurality of insert receiving pockets; said inner front panel being provided with slits substantially matching one side of each of said openings for enabling insertion of photographs or the like into said pockets.

4,991,768

SEALED CONTAINER

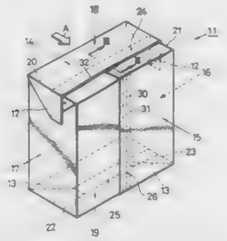
Yoshihito Kondo, Tokushima, Japan, assignor to Shikoku Kakooki Co., Ltd., Tokushima, Japan

Filed Dec. 5, 1986, Ser. No. 938,493

Claims priority, application Japan, Dec. 6, 1985, 60-188931[U]

Int. Cl.[5] B65D *5/40*

U.S. Cl. 229—137 3 Claims



1. A sealed container made of a paper base blank having a pair of opposite longitudinal edges, a pair of transverse edges respectively forming a top edge and bottom edge of said blank and a thermoplastic synthetic resin layer on each side thereof and shaped into a rectangular parallelepiped by forming a longitudinal seal by bending the blank into a tubular form with a surface portion of the top and bottom edges opposing another surface portion thereof, lapping the opposite longitudinal edges of the blank over each other to provide two interfacing edge portions with one longitudinal edge and an end face of said longitudinal edge inside the tubular form and joining the edge portions together to form a longitudinal seal, a seal tape affixed to an inner surface of the tubular form and extending across said end face of said longitudinal edge, subsequently fitting and joining the opposed surface portions of said top edge and said bottom edge to form upper and lower transverse seals respectively, said container comprising a main body having a front side, a rear side, opposite lateral sides, a top side and a bottom side, a side ridge between each lateral side and the top and bottom sides, and two upper and two lower triangular ears extending respectively from the two side ridges between the top side and the lateral sides and from the two side ridges between the bottom side and the lateral sides, the upper transverse seal extending sidewise in an upstanding state across the top side between the two upper triangular ears, the lower transverse seal extending sidewise in a depending state across the bottom side between the two lower triangular ears, the longitudinal seal extending vertically across the rear side, the top side and the bottom side to intersect the upper and lower transverse seals, the container being characterized in that the upper and lower transverse seals are folded rearward to direct the top and bottom edges of the blank rearward and fold said tape sealed longitudinal seal intersecting said upper and lower transverse seals back upon itself.

4,991,769

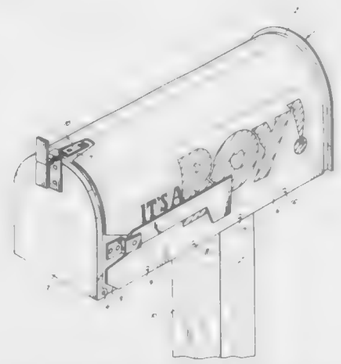
REMOVABLE MAIL BOX COVER DISPLAY

Curtis L. Todd, St. Louis County, Mo., assignor to Mailwraps, Inc., St. Louis, Mo.

Filed Nov. 6, 1989, Ser. No. 432,154

Int. Cl.[5] B65D *91/00*

U.S. Cl. 232—17 5 Claims



1. A removable mailbox cover adapted to overlay an exterior surface of a rural type mailbox having at least a top and two opposed longitudinal sides, the cover having a general rectangular shape and being formed from a flexible material that enables the cover to be bent in an arcuate configuration to overlay the top and two opposed longitudinal sides of the mailbox, and the cover having a pair of strips of magnetic material fixed thereto, each strip being fixed along an opposite side of the cover and enabling the cover to be removably held by magnetism to the two opposed longitudinal sides of the mailbox by engaging the strips against the two opposed longitudinal sides.

4,991,770

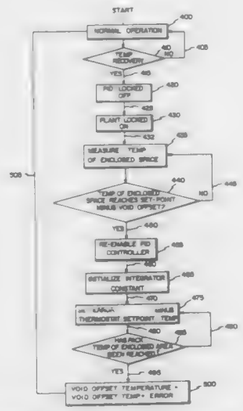
THERMOSTAT WITH MEANS FOR DISABLING PID CONTROL

Douglas D. Bird, Dayton, and Daniel T. Uhrich, Mayer, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 27, 1990, Ser. No. 499,877

Int. Cl.[5] G05B *13/02*

U.S. Cl. 236—44.6 13 Claims



1. A thermostat for minimizing deviation from a first preselected temperature during a temperature recovery period wherein a plant is used to change the temperature of a space, comprising:

a memory adapted to receive, store and output first and second preselected temperatures and a new second preselected temperature;

a PID controller connected with said memory;

a means for disabling a PID controller connected with said PID controller and said memory, said means for disabling being adapted to disable said PID controller and lock on the plant during the temperature recovery period until a second preselected temperature is reached;

a comparator in communication with said memory, said comparator being adapted to generate an error signal which is equal to the difference between a current room temperature and said first preselected temperature when said current room temperature first reaches said second preselected temperature and then reaches a maximum difference from said second preselected temperature;

a means for modifying said second preselected temperature connected to said comparator, said means for modifying being adapted to subtract said error signal from said second preselected temperature to create a new second preselected temperature for use in a next temperature recovery period.

4,991,772

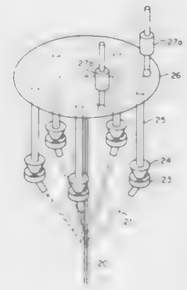
MULTIPLE AIR-STREAM SEALANT CONTROL

Pasquale V. Costa, Nissequogue, and Edwin M. Northup, Stony Brook, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 303,752, Jan. 30, 1989, abandoned. This application Jun. 15, 1990, Ser. No. 538,689

Int. Cl.[5] B05B *7/08*

U.S. Cl. 239—1 9 Claims



6. An arrangement for controlling the location of sprayed viscous material comprising; spray head means for forming a stream of viscous material, said spray head means containing at least three orifices for forming air streams, said orifices being disposed at substantially equal angles around said material stream; means for applying air pressure to said orifices; valve means for controlling air pressure to each of said orifices; plate means; coupling means for adjusting said valve means proportional to the position of said plate means; and control means for positioning said plate means to alter said air pressure proportionally to each orifice to induce said air streams to deflect said material stream in a smooth unbroken bead to a predetermined location.

8. A method for controlling the location and shaping of sprayed viscous material comprising the steps of: providing a pivotable spray head with a spray axis and a symmetrical spray about said axis; directed said symmetrical spray without shifting the origin of said spray axis; conducting viscous material to said spray head through a flexible coupling; pivoting said spray head in at least one direction by applying a controlled force; and controlling said force to direct a spray of said viscous material in a predetermined direction to form a smooth unbroken bead on a surface by maintaining precise calibration of said spray of viscous material through said compensating step.

4,991,771

FUEL INJECTION VALVE

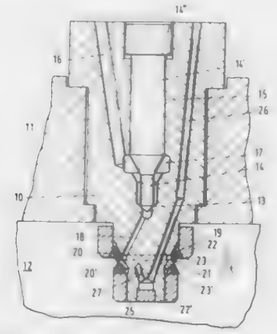
Frederic Porchet, Birchwil, and Robert Hofer, Elgg, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 27, 1989, Ser. No. 385,653

Claims priority, application Switzerland, Aug. 10, 1988, 03019/88

Int. Cl.[5] F02M *53/04*

U.S. Cl. 239—533.3 15 Claims



1. A fuel injection valve comprising

a valve body having an end for projecting into a combustion chamber, a valve seat and a duct extending from said valve seat to said end to convey a flow of fuel thereto;

a valve needle movably mounted in said valve body for selectively seating on said valve seat to block a flow of fuel into said duct;

a first pair of rings removably mounted about said valve body end to define at least one nozzle opening therebetween communicating with said duct to exhaust a flow of fuel in to the combustion chamber, said rings being in contact with each other and having facing surfaces at least about said nozzle opening made of erosion-resistant material; and

a second pair of rings threaded onto said valve body end with said first pair of rings clamped therebetween.

4,991,773

METHOD AND APPARATUS FOR DISSIPATING FOG

Darrell R. Jones, 7515 N. Fessenden, Portland, Oreg. 97203

Filed Mar. 17, 1989, Ser. No. 325,136

Int. Cl.[5] E01H *13/00*

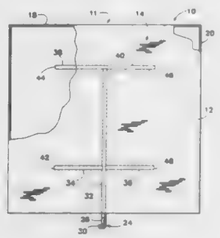
U.S. Cl. 239—2.1 29 Claims

1. A method for dissipating fog comprising the steps of:

positioning a substantially planar member comprising an enclosure having a top and a side, said side having less

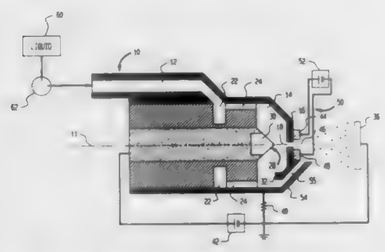
VOL 1123 ISS 2 FE 12 1991 UMI

than 10% of the area of said top, generally parallel and above a horizontal surface;
creating a plurality of openings in said planar member;



generating a flow of heated air; and
directing the heated air beneath said planar member.

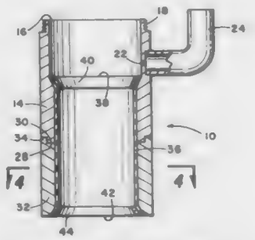
4,991,774
ELECTROSTATIC INJECTOR USING VAPOR AND MIST INSULATION
Arnold J. Kelly, Princeton Junction, N.J., assignor to Charged Injection Corporation, Princeton Junction, N.J.
Filed Aug. 24, 1989, Ser. No. 398,151
Int. Cl.[5] B05B 5/025
U.S. Cl. 239—3 25 Claims



1. A method of atomizing a liquid comprising the steps of
(a) supplying a liquid;
(b) providing a net charge on said liquid so that said liquid is atomized at least partially under the influence of said net charge; and
(c) supplying an insulating mist in juxtaposition with said charged liquid so as to insulate said charged liquid from the surroundings prior to said atomization.

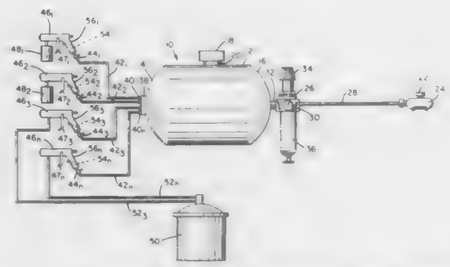
4,991,775
QUICK CONNECT FOUNTAIN
John J. Huber, 1614 S. Magnolia, Broken Arrow, Okla. 74012, and Alvin J. Huber, 5738 E. 61st Pl., Tulsa, Okla. 74136
Filed Aug. 7, 1989, Ser. No. 389,951
Int. Cl.[5] B05B 1/16
U.S. Cl. 239—25 5 Claims

1. A drinking fountain attachment, for a faucet having a downwardly extending open end portion, comprising:
a tubular body portion having a tubular sidewall and an upper and a lower end and having means for the attachment of the upper end to the downwardly extending portion of the faucet, the body portion having an orifice in the tubular sidewall;
a tubular spigot element affixed at one end to said tubular body portion in communication with said orifice, the spigot element having means for discharge of water therefrom in an upward direction to provide a fountain drinking stream;
a tubular control member rotatably and concentrically affixed to said tubular body portion lower end; and
the tubular control member having a tubular elastomeric member therein, the tubular elastomeric member having



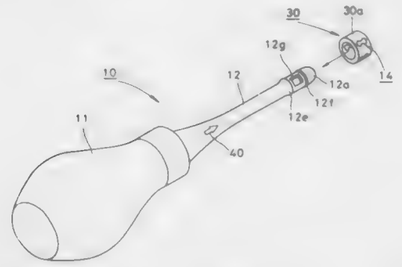
an upper end affixed circumferentially to the interior of said tubular body portion and a lower end affixed circumferentially to the interior of said tubular control member whereby the rotation of said control member causes said tubular elastomeric member to twist, reducing the internal cross-sectional area thereof to thereby restrict the flow of water therethrough.

4,991,776
HIGH VOLUME, LOW PRESSURE SPRAYING SYSTEM
William C. Smith, 7701 Whiterim Ter., Potomac, Md. 20854
Filed Dec. 14, 1989, Ser. No. 450,474
Int. Cl.[5] B05B 7/24, 7/06; F04B 23/00
U.S. Cl. 239—302 25 Claims



1. A high volume, low pressure atomization system, coupled to a compressed air source, for atomizing a fluid, comprising:
at least one atomizer including means for being coupled to a source of fluid to be atomized;
a jet venturi induction pump including a nozzle and a venturi section, said venturi section having an input end, an output end, and induction port means located at said input end adjacent said nozzle;
means for coupling the nozzle to said compressed air source;
a sealed enclosure having an air chamber including a manifold for storing and delivering low pressure air, said manifold further including a plurality of outlets for the selective coupling of low pressure air to said at least one atomizer for powering said atomizer, and an ambient air inlet assembly secured to said enclosure and including an air induction chamber projecting into said air chamber for supporting said induction pump therein and having ambient air intake means for receiving ambient air in the vicinity of said enclosure, said induction port means being located inside of said air induction chamber for receiving ambient air from said intake means, and said output end being located outside of said air induction chamber for feeding low pressure air generated thereby into said air chamber,
said enclosure being located apart from and at a predetermined distance away from said at least one atomizer so that overspray produced thereby and present in the ambient air in the vicinity thereof is prevented from being fed into said air intake means and said venturi induction pump along with compressed air from said compressed air source.

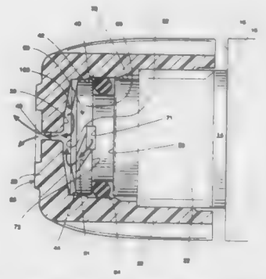
4,991,777
NOZZLE MEMBER IN USE WITH A JET SHOOTING DEVICE
Hiromichi Sato, 3-21-403, Kita-machi 2-chome, Nerima-ku, Tokyo, Japan
Filed Nov. 28, 1988, Ser. No. 276,743
Claims priority, application Japan, Nov. 30, 1987, 62-302922
Int. Cl.[5] A61M 31/00
U.S. Cl. 239—327 9 Claims



1. A jet shooting device comprising:
nozzle means for shooting a jet of washing liquid having a spiral rotation toward an object, said nozzle means including a pair of circular holes of same diameter and a slit with a width at least equal to or smaller than said same diameters through which said pair of circular holes intercommunicate with each other,
a container containing said washing liquid, and
a tubular nozzle member coupled with said container and having said nozzle means formed in a circumferential surface of a closed end thereof.

4,991,778
ADJUSTABLE NOZZLE ASSEMBLY
Wilhelmus J. J. Maas, Someren, and Petrus L. W. Hurkmans, Someren-Eind, both of Netherlands, assignors to AFA Products, Inc., Forest City, N.C.
Filed Nov. 16, 1989, Ser. No. 437,549
Int. Cl.[5] B05B 9/043, 1/12
U.S. Cl. 239—333 14 Claims

1. An adjustable nozzle assembly for a liquid dispenser comprising:
a nozzle cap having a discharge orifice located in a front face of a front wall thereof and a nozzle cap flange skirt extending rearwardly from said front wall, said nozzle cap flange skirt having threads for cooperating with a threaded portion of a nose bushing for selectively positioning the nozzle cap relative to the nose bushing, said flange skirt also having an inner stepped surface defined by two annular surfaces forward of said threads, the smaller diameter of the two annular surfaces being positioned to extend rearwardly from an inner wall surface of said nozzle cap and the larger diameter of the two annular surfaces being located just forward of said threads;
a nose bushing comprising a body having an axially extending hollow passage extending into said body from a rear end thereof to a first inner wall and having two radial passageways extending radially outwardly to an annular slot formed in said body, said body including a threaded portion and a front face disc separated by said annular slot, and said face disc having a front face and an annular outer periphery with two angular, diametrically opposed, grooves therein;
said nozzle cap being threadedly received on said nose bushing and selectively movable relative to said nose bushing to three positions including (a) an off mode position wherein said front face of said nose bushing face disc is in flush contact with said inner wall surface of said nozzle cap and with said first and smaller diameter annular surface in said nozzle cap flange skirt in flush sealing contact with said outer periphery of said face disc to prevent communication of liquid from the angular grooves to the discharge orifice, (b) a spray mode position wherein said front face of said nose bushing face disc is unseated from said inner wall surface of said nozzle cap, said unseated position defining a swirl chamber within said nozzle cap between said front face of said nose bushing face disc and



said inner wall surface of said nozzle cap but with said outer annular periphery of said nose bushing face disc still in flush, sealing contact with said smaller diameter annular surface in said nozzle cap flange skirt so that liquid flowing radially outwardly from said radial passageways into said annular slot is channeled to move only through said angular grooves into said swirl chamber in a circular or spinning motion for discharge out of the nozzle cap discharge orifice in a conical spray pattern, and (c) a stream mode position wherein said outer annular periphery of said nose bushing face disc is unseated from said smaller diameter annular surface in said nozzle cap, such that said outer annular periphery of said nose bushing face disc is spaced from said larger diameter annular surface to permit liquid from said radial passageways to flow over said outer annular periphery in a non-directed manner to said discharge orifice and out of said discharge orifice in a stream pattern.

4,991,779
FOAM GENERATING DEVICE
Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840
Division of Ser. No. 57,037, Jun. 2, 1987, Pat. No. 4,901,925.
This application Feb. 16, 1990, Ser. No. 481,435
Int. Cl.[5] B05B 7/32
U.S. Cl. 239—343 9 Claims

1. A foam producing device for the alternative dispensing of foams or liquids comprising:
(a) a porous element comprising:
(1) a hollow partially gas permeable wall;
(2) a gas distributing plenum; and
(3) a gas entry port in fluid connection with said plenum;
(b) a second wall opposite an inner radial surface of said gas permeable wall;
(c) a mixing chamber comprising:
(1) at one end, the proximal end, a small annular opening between said gas permeable and second wall, compris-

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ing an orifice for the uniform distribution of foamable liquids therethrough and into said chamber; and

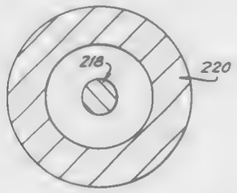
(2) at the opposite, distal end an exit port for the discharge of foams or liquids from said chamber;

(d) a liquid supply element comprising:

(1) a liquid distribution plenum for the uniform distribution of said foamable liquids to said orifice; and

(2) a liquid entry port in fluid connection with said plenum and a pressurized foamable liquids supply;

(e) pressurized gas supply means comprising:



(1) a reservoir for said gas, and

(2) conduit means between, and in fluid connection with, said reservoir and said gas entry port; and

(f) foamable liquid supply means comprising

(1) a reservoir for said foamable liquid; and

(2) conduit means between, and in fluid connection with, said liquid entry port;

with the proviso that only the portion of said gas permeable wall between said orifice and said exit port is gas permeable.

4,991,780

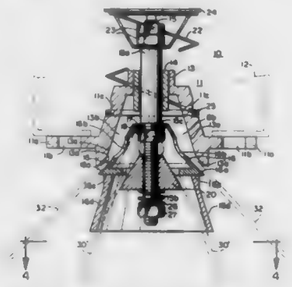
DUOCONE SPRAY NOZZLE

Raghavachari Kannan, Newtown Square, and Bernard A. Lewandowski, King of Prussia, both of Pa., assignors to Crane Co., New York, N.Y.

Filed Jan. 29, 1990, Ser. No. 471,944

Int. Cl.[5] B05B *1/32, 1/26*

U.S. Cl. 239—440 **10 Claims**



1. A double cone spray nozzle comprising:

a nozzle housing having a bore extending therethrough, said bore having a frustoconical section at the discharge end thereof, said nozzle housing having openings in the walls thereof for entry of liquid into said frustoconical section of said bore;

a valve stem extending through said bore of said nozzle housing, said valve stem having a first portion supported for reciprocation at one end of said bore and said valve stem having a second portion extending through said frustoconical section of said bore;

an outer spreader having a frustoconical outer surface carried by said second portion of said valve stem and positioned within said frustoconical section of said bore, said outer spreader having openings in the walls thereof for receiving liquid from said frustoconical section of said bore,

means for securing said outer spreader to said second portion of said valve stem, the outer frustoconical surface of said outer spreader cooperating with the frustconical section of said bore to provide an outer orifice at the discharge end for the production of an outer cone spray;

an inner spreader slidably carried by said second portion of said valve stem, said inner spreader having a frustoconical outer surface extending into said outer spreader and cooperating with structure on said outer spreader for forming an inner orifice therebetween for the production of an inner cone spray;

outer spring means connected between said valve stem and said nozzle housing for biasing said outer orifice in a closed position; and

inner spring means connected between said valve stem and said inner spreader for biasing said inner orifice in a closed position, whereby when liquid enters into the spray nozzle the liquid tries to pass through both the outer and inner orifices to produce a double cone spray and the openings of said orifices are variable as determined by the respective pressures of said inner and outer spring means.

4,991,781

MACHINE FOR SPREADING FERTILIZERS, SEEDS, SALT, AND THE LIKE

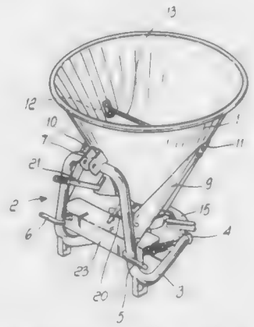
Silvano Barbieri, Curtarolo, Italy, assignor to B. S. Barbieri di Barbieri Silvano, Curtarolo, Italy

Filed Jun. 7, 1989, Ser. No. 362,784

Claims priority, application Italy, Jun. 23, 1988, 30676/88[U]

Int. Cl.[5] A01C *17/00, 15/00*

U.S. Cl. 239—661 **13 Claims**



1. Machine for spreading fertilizers, seeds, salt, sand and the like, comprising a hopper means which feeds a rotating centrifugal bladed spreader means and a substantially chair-shaped supporting frame means supporting said hopper means and being connectable to a three-point coupling means of a tractor means, said supporting frame means comprising a first supporting arm means and a second supporting arm means, said first supporting arm means being connected at one end thereof with said supporting frame means and being connected at another end thereof externally with said hopper means at a first connection point thereof, said second supporting arm means being connected at one end thereof with said supporting frame means and being connected at another end thereof externally with said hopper means at a second connection point thereof, said first connection point and said second connection point being a pair of diametrically opposite connection points arranged on said hopper means, said machine further comprising a stiffening element means, said stiffening element means internally spanning said hopper means and having a first end being connected to said hopper means internally thereof at said first connection point and having a second end being connected to said hopper means internally thereof at said second connection point.

4,991,782

MACHINE AND METHOD FOR FORMING WINDINGS ON ELECTRIC MOTOR STATORS

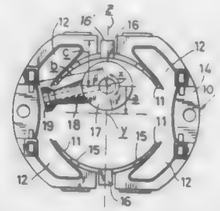
Sabatino Luciani, Florence, Italy, assignor to Axis S.p.A., Firenze, Italy

Filed Mar. 18, 1986, Ser. No. 840,735

Claims priority, application Italy, Apr. 2, 1985, 20184 A/85

Int. Cl.[5] H02K *15/06, 3/12*

U.S. Cl. 242—1.10 R **28 Claims**



1. A machine for winding a stator having a hollow, substantially cylindrical outer member and at least one pole piece projecting radially inward from the inner surface of said outer member, the inner surface of said pole piece defining an arcuate segment of a cylindrical surface contained entirely within said outer member and having a central longitudinal axis substantially parallel to the longitudinal axis of said outer member, said arcuate segment being bounded by first and second longitudinally spaced arcuate end segments and by first and second arcuately spaced longitudinal side edges, each of said longitudinal side edges being substantially parallel to said central longitudinal axis, the inner surface of said outer member adjacent each of said first and second longitudinal side edges being spaced radially outward from said cylindrical surface to define first and second channels extending radially outward from said cylindrical surface alongside each of said first and second longitudinal side edges respectively, said machine comprising: a needle having a longitudinal axis and a point projecting transverse to said longitudinal axis, means for driving said needle, and means for delivering a wire through said point of said needle, said means for driving said needle including means for moving said needle in reciprocating linear motion along said longitudinal axis of said needle and in reciprocating rotary motion about said longitudinal axis of said needle, said machine further comprising means for positioning said stator relative to said needle so that said longitudinal axis of said needle is parallel to said central longitudinal axis and between said central longitudinal axis and said pole piece, said longitudinal axis of said needle being maintained at a predetermined distance from said central longitudinal axis and said point projecting outwardly into one of said first and second channels during said reciprocating linear motion of said needle and projecting radially outward beyond one of said first and second arcuate end segments during said reciprocating rotary motion.

4,991,783

YARN TRAVERSING METHOD AND AN APPARATUS THEREFOR

Takami Sugioka, Matsuyama, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Dec. 21, 1988, Ser. No. 288,411

Claims priority, application Japan, Dec. 30, 1987, 62-336113; Feb. 23, 1988, 63-39807

Int. Cl.[5] B65H *54/28, 54/32*

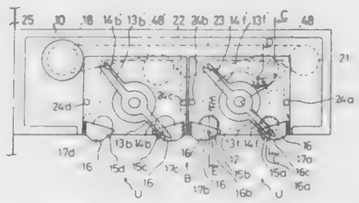
U.S. Cl. 242—043 A **7 Claims**

1. A method for traversing a yarn along a bobbin, with which a contact roller contacts, by a traversing apparatus disposed after the fulcrum for traverse motion and separated by a predetermined distance therefrom, which method comprises the steps of:

conveying said yarn to a traverse end by traversing said yarn through a substantially full traverse stroke by means of a first traverse means, which comprises a least one first plate guide and at least a pair of rotary blades rotatable in opposite directions and cooperating with said first plate guide;

receiving said yarn conveyed by one of said rotary blades of said first traverse means by means of a rotary blade of a second traverse means which is disposed after said first traverse means and separated by a predetermined distance therefrom at positions near traverse ends and which comprises at lease one second plate guide and rotary blades cooperating with said second plate guide;

then releasing said yarn from said one of said rotary blades of



said first traverse means by means of cooperation of said first plate guide and said one of said rotary blades;

engaging said released yarn with another rotary blade of said first traverse means which blade rotates opposite to said one of said rotary blades of said first traverse means;

comprising moving said yarn by means of said rotary blade of said second traverse means to a position wherein said fulcrum, said rotary blades of said first traverse means, and a contacting point between said yarn conveyed by said rotary blade of said second traverse means and said contact roller at least align with an imaginary line that at least approximates a straight line; and

then releasing said yarn from said rotary blade of said second traverse means by means of cooperation of said second plate guide and said rotary blade of said second traverse means.

4,991,784

APPARATUS FOR GUIDING A CURVED STRIP

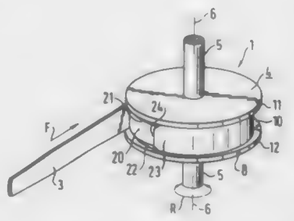
Hans A. Schmid, Ismaninger Strasse 66, 8000 München 80, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,905

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 3741403; Nov. 15, 1988, 3838724

Int. Cl.[5] B65H *75/18*

U.S. Cl. 242—55 **24 Claims**



1. Apparatus for guiding an elongate strip of a stiff material which is prestressed to be cambered in a transverse direction, so that it has a wide transversely concave and a wide transversely convex surface and two narrow side surfaces, said apparatus comprising:

at least one contact surface which to each portion of the strip

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bearing against it by one of said wide surfaces imposes a longitudinal curvature about a transverse axis, thereby reducing resiliently the transverse camber of said portion of the strip,

and first and second lateral support surfaces disposed in mutually opposite relationship in the direction of the transverse axis and being inclined to converge towards each other in a direction away from said transverse axis,

said contact surface being arranged between said first and second lateral support surfaces the spacing of which allows each still transversely cambered portion of the strip to enter between said support surfaces and to be conformed to said contact surface, whereby said portion of the strip is subjected to an increase in width when its transverse camber is reduced,

wherein said two narrow side surfaces of said strip are inclined at an angle such that the inclination of said narrow side surfaces of any portion of said strip at least substantially corresponds to the inclination of said lateral support surfaces when such a portion of the strip bears against said contact surface,

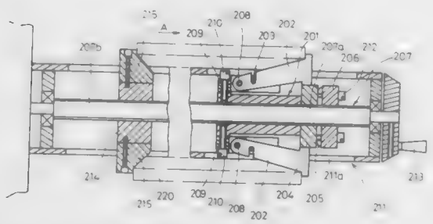
whereby said portion of the strip is gripped immovably in a resiliently reversible manner between said contact surface and said lateral support surfaces in such a manner that said guiding apparatus can take any pressure load which is applied to said strip in its longitudinal direction towards said guiding apparatus.

4,991,785

REEL CLAMPING DEVICE

John Kuo, and Ming-Shung Cho, both of Hsin-Chu, Taiwan, assignors to Mirle Automation Corporation, Hsin-Chu, Tai-[illegible]

Filed Jan. 26, 1990, Ser. No. 470,762
Int. Cl.[5] B65H *75/18*
U.S. Cl. 242—68.3 4 Claims



1. A reel clamping device comprising:

a cylindrical shell having a plurality of through slots extending parallelly with the axis thereof;

a screw bolt rotatably disposed within said shell, whose first and second threaded end portions have different thread directions;

a jaw base mated to the first threaded end portion of said screw bolt;

a plurality of first jaws fixed on said jaw base and protruding from said through slots formed in said shell;

a plurality of second jaws;

a jaw seat mated to the second threaded end portion of said screw bolt, for accommodating said second jaws in such a way that said second jaws can protrude from or retract into said through slots freely;

means mated to the second threaded end portion of said screw bolt, for driving said second jaws to protrude from or to retract into said through slots; and

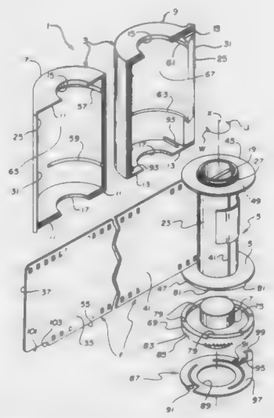
means for driving said screw bolt to rotate around its longitudinal axis so as to conduct said base and said seat to move synchronously toward or apart from each other and to conduct said second jaws to protrude from or to retract into said through slots simultaneously, characterized in that said second jaw drive means can conduct said second jaws to protrude from or to retract into said through slots within one turn of rotation about the axis of said shell, and means for adjusting the frictional torque between the second jaw drive means and the second threaded end portion of said screw bolt in such a way that the second jaw drive means can be frictionally torqued to rotate integrally with the screw bolt.

4,991,786

FILM CASSETTE

Robert P. Cloutier, Spencerport; David C. Smart, and Roger G. Covington, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1990, Ser. No. 464,267
Int. Cl.[5] G03B *17/26*
U.S. Cl. 242—71.100 6 Claims



1. A film cassette comprising a film spool rotatable inside a cassette shell in an unwinding direction to thrust a leader section of a filmstrip coiled about said spool from within a light-tight passageway to the exterior of said shell and in a winding direction to return said leader to the interior of the shell, is characterized in that:

unidirectional arresting means is movable into engagement with said spool for preventing rotation of the spool in only the winding direction; and

said filmstrip includes actuating means for moving said arresting means out of engagement with said spool responsive to thrusting said leader substantially to the exterior of said shell, to allow the spool to be rotated in the winding direction in order to return the leader to the interior of the shell, and for permitting the arresting means to move into engagement with the spool responsive to return of the leader to within said passageway, to prevent the spool from being rotated further in the winding direction to thereby retain the leader in the passageway.

4,991,787

PIVOTING GUIDE FOR WEB CONVEYING APPARATUS

Jack V. Berg, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

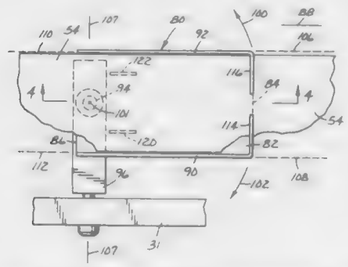
Filed Mar. 15, 1989, Ser. No. 324,238
Int. Cl.[5] B65H *23/10*
U.S. Cl. 242—76 12 Claims

1. Apparatus for conveying a web, comprising:

(a) means for conveying a web along a path;

(b) a web guide having a web conveying surface extending between a first end and a second end along a longitudinal axis, said web conveying surface extending between a pair of longitudinally extending laterally side plates;

(c) means for supporting said web guide in said web path so that said web passes over said web conveying surface from said first end of said web conveying surface to said second end of said web conveying surface between said pair of side plates, said supporting means enabling said



web guide to pivot about an axis adjacent said second end of said web guide and transverse to said longitudinal axis of said web conveying surface and to the web so that transverse movement of the web is attenuated between said first end and said second end of said web conveying surface.

4,991,788

FOLDABLE SPOOL

Dewayne Pattison, 820 Yellowstone, Grapevine, Tex. 76051

Filed Sep. 29, 1989, Ser. No. 414,689
Int. Cl.[5] B65H *75/18*
U.S. Cl. 242—85.1 13 Claims

1. A foldable spool comprising:

a first elongate arm having a first tine located at one end and a second tine located at the opposite end;

a second elongate arm having a first tine located at one end and a second tine located at the opposite end;

means for pivotally connecting a central portion of said first arm to a central portion of said second arm so that the arms are pivoted between a first position wherein the respective first tines thereof form a first fork and the respective second tines thereof form a second fork to allow winding of an elongate flexible member therearound to form a coil, and a second position wherein said arms are pivoted to allow removal of the coil; and

means for releasably holding said arms in said first position.

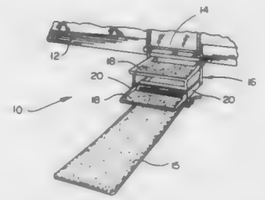
4,991,789

RETRACTABLE CARPET SYSTEM FOR VEHICULAR QUARTERS

Michael H. Buerger, c/o Del-Met, 115 Hazel Path, Hendersonville, Tenn. 37075

Filed Oct. 16, 1989, Ser. No. 422,075
Int. Cl.[5] B65H *75/40;* B60J *11/00*
U.S. Cl. 242—86.52 13 Claims

1. A retractable carpet system for movable quarters, the carpet system comprising a carpet runner, a mounting bracket, means for attaching the bracket to the quarters beneath an entranceway of the quarters, the bracket including an elongated, generally planar stringer plate, the stringer plate having a length greater than the width of the carpet runner, the mounting bracket further including a pair of parallel end plates extending from opposite ends of the stringer plate, the carpet system further including a spindle rotatably mounted between the end plates about an axis parallel to the plane of the stringer plate, means for securing an end of the carpet runner to the spindle, means for rotating the spindle to wind the carpet



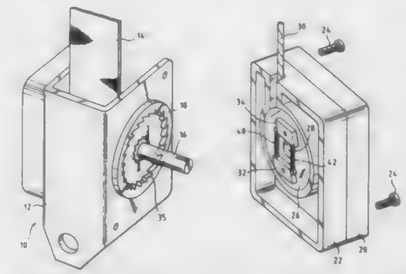
runner about the spindle and means for assuring that the carpet runner is tightly wound about the spindle when not in use and for preventing inadvertent unwinding of the carpet runner, the means for assuring and preventing including a one piece spring and means mounting the spring to the bracket, the spring having a normal profile transverse to the axis of the spindle which includes at least a portion of the spring spaced from the axis a distance less than the radial distance of the outer periphery of the carpet runner when wound about the spindle, the portion of the spring being biased against and engaging the outer periphery of the carpet runner when being rewound.

4,991,790

TIGHTENING DEVICE

Artur Föhl, Schornodorf, and Jochen Dobelmann, Mutlangen, both of Fed. Rep. of Germany, assignors to TRW Repa GmbH, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 324,224
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810701
Int. Cl.[5] B65H *75/48*
U.S. Cl. 242—107 5 Claims



1. A tightening device on a belt tractor of a motor vehicle safety belt restraining system, comprising an emergency tightening rotary drive including a drive pulley whereon a first coupling pawl is eccentrically and pivotably mounted on a side face of said drive pulley facing the belt retractor by means of a pivot bearing, and a coupling ring which is connected to the belt coiling shaft of the belt retractor for joint rotation with said shaft and comprises an internal toothing which lies opposite said first coupling pawl and into which said first coupling pawl can be driven by pivoting about said pivot bearing by a sudden initiation of rotary movement of said drive pulley for establishing a coupling connection between said drive pulley and said coupling ring, said first coupling pawl being mounted

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in its center of gravity, and a second coupling pawl being pivotably and eccentrically mounted on said drive pulley, said first and second coupling pawls having engagement faces which are offset with respect to each other in the peripheral direction of said drive pulley by an angle which corresponds at least approximately to an odd multiple of half the pitch of the internal toothing of said coupling ring, and said first and second coupling pawls being biased by spring means into a rest position out of engagement with said internal toothing of said coupling ring.

4,991,791

EXPANSIBLE REEL FOR TESTS ON FILAMENTARY MATERIAL IN PARTICULAR OPTICAL FIBRES

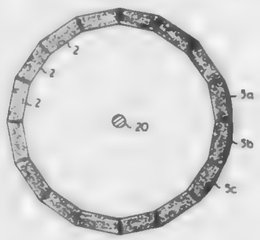
Giuseppe Cocito, S. Giusto Can.Se, Italy, assignor to Sip-Societa Italiana Per L'Esercizio Delle Telecomunicazioni P.A., Turin, Italy

Filed Nov. 2, 1989, Ser. No. 431,377

Claims priority, application Italy, Nov. 16, 1988, 68018 A/88

Int. Cl.[5] B65H *75/24*

U.S. Cl. 242—110 **12 Claims**



1. An expansible reel for winding filamentary material and for conducting tests and measurements on same, comprising:

a plurality of rigid elongated members each having first and second ends opposite another and a pair of side surfaces each extending between said first and second ends, said rigid elongated members oriented parallel to a central axis of said reel;

a pair of supports encompassing therebetween said rigid elongated members;

a plurality of fastening means for fastening said first and second ends of said rigid elongated members to a respective one of said supports, said fastening means allowing radial displacement of said rigid elongated members with respect to said supports;

a plurality of inflatable members positioned between confronting side surfaces of adjacent rigid elongated members, said inflatable members extending substantially over whole length of said side surfaces;

a plurality of means for connecting said inflatable members to a system supplying gas under pressure and capable of varying in a controlled manner an internal pressure of said inflatable members; and

said rigid elongated members being substantially in contact with one another when gas under pressure is absent from said inflatable members but being progressively spaced from one another as gas is introduced into said inflatable members.

4,991,792

REEL FOR TWINE FOR A MACHINE FOR TYING KNOTS

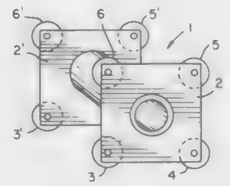
Luigi Pedroia, Via Cadogno 1, 6648 Minusio, Switzerland

Filed Oct. 20, 1989, Ser. No. 425,847

Claims priority, application Switzerland, Oct. 24, 1988, [illegible]

Int. Cl.[5] B65H *75/14*

U.S. Cl. 242—118.4 **2 Claims**



1. A reel for twine for a machine for tying knots, the reel having two heads and a hub that interconnects and is rotatable relative to the heads, and a plurality of rolling elements spaced about the periphery of each head and protruding outwardly from each head and adapted to roll on the interior of a guide housing of a said machine for tying knots.

4,991,793

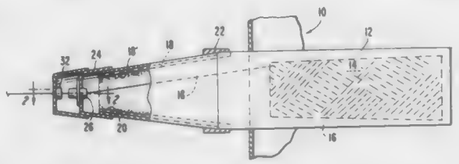
OPTICAL CABLE PAYOFF SYSTEM

Kendall L. Belsley, and William C. Imes, both of Gaithersburg, Md., assignors to Optelecom, Inc., Gaithersburg, Md.

Continuation of Ser. No. 371,095, Jun. 26, 1989, abandoned. This application Jul. 11, 1990, Ser. No. 551,038

Int. Cl.[5] B65H *49/02, 59/10, 59/22*

U.S. Cl. 242—128 **10 Claims**



1. A payoff system for an optical fiber to be carried by a moving vehicle, comprising a spool having an axis, an optical fiber wound about the axis of the spool, a cone, the inner surface of the cone having secured thereto an energy-absorbing member selected from the group consisting of resilient foam and a textured energy-absorbing fabric, positioned rearwardly of the spool through which the optical fiber passes, a pair of flats between which the fiber passes, means mounting said flats such that the fiber passing therebetween is essentially aligned parallel to the axis of the spool, means resiliently biasing the pair of flats toward each other to place tension on the fiber as it passes therebetween.

4,991,794

RADAR SEEKER TRANSIENT SUPPRESSOR

Anthony J. Benson, Grays; Frederick L. Pew, St. Albans; Oliver H. D. Walter, Harrow; Geoffrey Warman, Watford, and Michael A. Jones, Radlett, all of England, assignors to The Marconi Company Limited, England

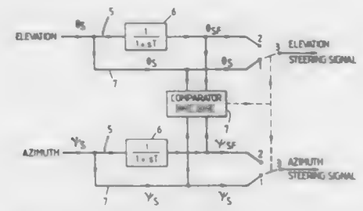
PCT No. PCT/GB89/00088, § 371 Date Sep. 11, 1989, § 102(e) Date Sep. 11, 1989, PCT Pub. No. WO89/07231, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 30, 1989, Ser. No. 399,490

Claims priority, application United Kingdom, Jan. 29, 1988, 8802075

Int. Cl.[5] F41G *7/22*

U.S. Cl. 244—3.15 **8 Claims**



1. A transient suppressor system for a radar seeker in a missile, said system comprising:

a control signal output from said seeker, said control signal being substantially independent of pitch and yaw motion of the missile;

parallel paths for said control signal to generate output signals, said parallel paths including a filtered path and a relatively unfiltered path;

means for comparing the output signals from said filtered path and from said unfiltered path to produce a difference signal; and

means for selecting said filtered path when said difference signal exceeds a threshold value, and for selecting said relatively unfiltered path when said difference signal does not exceed said threshold value.

4,991,795

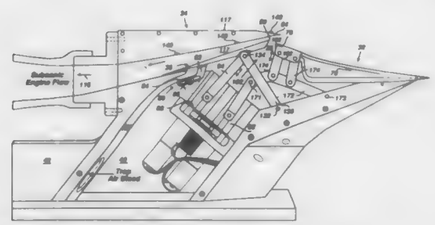
TWO-STAGE SUPERSONIC INLET

Joseph L. Koncsek, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 17, 1989, Ser. No. 298,117

Int. Cl.[5] B64D *33/02*

U.S. Cl. 244—53 B **22 Claims**



1. An inlet having an inlet duct for an aircraft engine, comprising:

a cowl having a cowl lip, said cowl forming a wall of said inlet duct;

a forward ramp having a leading edge positioned forward of said cowl lip and a trailing edge extending aft of said cowl lip;

a aft ramp positioned within said inlet duct aft of said cowl lip;

a throat region within said duct at a leading edge of said aft ramp;

means for simultaneously rotating and moving said aft ramp fore and aft for varying the cross-sectional area of said throat simultaneously with changing the location of said throat within said duct;

a slot opening into a plenum chamber, said slot being positioned forward of said leading edge of said aft ramp;

a vent coupled to said plenum chamber to vent air from said plenum chamber to ambient air;

a vent door means for varying the cross-sectional area of said vent opening to control the quantity of air exiting from said plenum chamber through said vent;

a pressure sensor for sensing the air pressure within said plenum chamber; and

a vent door control means for selectively controlling the pressure within said plenum chamber by varying the position of said vent door, said vent door control means receiving an input from said pressure sensor.

4,991,796

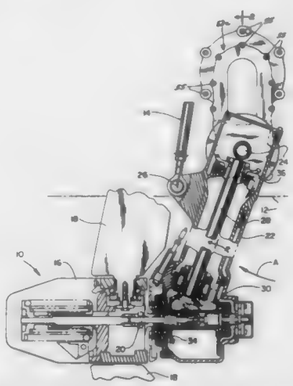
RAM AIR TURBINE DRIVE SYSTEM

Walter C. Peters, and William E. Seidel, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 14, 1988, Ser. No. 271,439

Int. Cl.[5] B64D *41/00*

U.S. Cl. 244—58 **22 Claims**



1. A drive system between a ram air turbine and at least a pair of accessory power units of an aircraft, the ram air turbine being movable between stowed and deployed positions relative to the fuselage of the aircraft, the drive system comprising:

a first drive shaft extending between the ram air turbine and a second drive shaft of a first accessory power unit within the aircraft fuselage;

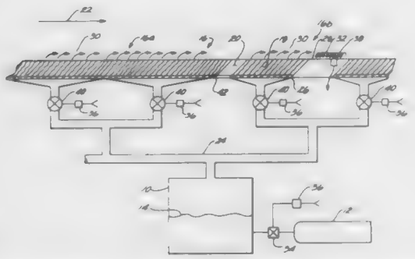
first bevel gear means drivingly connecting an outer end of the first drive shaft to a rotating member of the ram air turbine;

second bevel gear means drivingly connecting an inner end of the first drive shaft to the second drive shaft of the first accessory power unit; and

gear train means drivingly connecting the second drive shaft of the first accessory power unit to a rotatable drive member of a second accessory power unit within the aircraft fuselage.

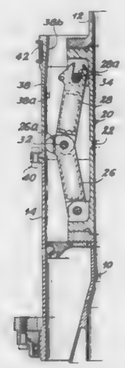
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4,991,797
INFRARED SIGNATURE REDUCTION OF AERODYNAMIC SURFACES
Robert C. Miller, Encino, and Rudolf J. Seemann, Santa Ana, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.
Filed Jan. 17, 1989, Ser. No. 298,071
Int. Cl.[5] B64C 1/32
U.S. Cl. 244—117 A 18 Claims



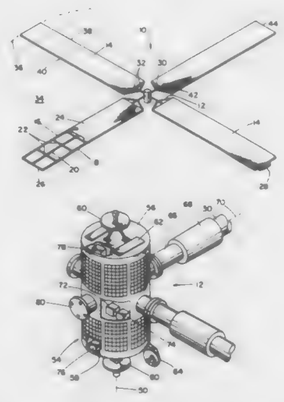
1. An apparatus for reducing the temperature of a surface subjected to heating comprising:
a skin having porous wall sections and solid wall sections;
said porous wall sections further comprise an inner high-pressure loss portion and an outer low-pressure loss portion;
a means for storing a liquid coolant;
a means for pressurizing the liquid coolant; and
a manifold means for delivering the liquid coolant from the storage means to the porous wall sections whereby vaporization is induced in a pressure-temperature environment below the coolant vapor pressure line with liquid coolant passing through said inner portion being vaporized to make the latent heat of vaporization available for cooling said outer portion.

4,991,798
APPARATUS FOR FILLING CRYOGENIC ENGINES OF A LAUNCHER WITH AUTOMATIC SEPARATION ON LIFT-OFF
Jacques Landat, Oinville, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris Cedex, France
Filed Nov. 13, 1989, Ser. No. 435,354
Claims priority, application France, Nov. 29, 1988, 88 15580
Int. Cl.[5] B64D 37/00; B64G 1/22; F41F 3/04, 3/55
U.S. Cl. 244—135 R 11 Claims



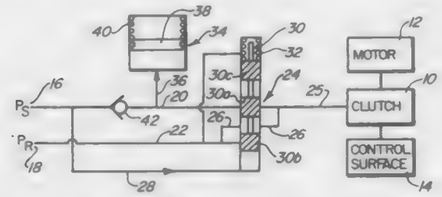
1. Apparatus for filling cryogenic propellents into a launcher, with automatic separation at the time of launch of the latter, characterized in that it comprises a filling tube having a weakened zone and a mechanism bearing on the filling tube on either side of the weakened zone, said mechanism being sensitive to a displacement of the launcher on moving away from the ground in order to automatically apply to the tube a tensile stress leading to its fracture in the weakened zone during the lift-off of the launcher.

4,991,799
ORBITAL DEBRIS SWEEPER AND METHOD
Andrew J. Petro, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Feb. 16, 1990, Ser. No. 480,985
Int. Cl.[5] B24G 1/00
U.S. Cl. 244—158 R 20 Claims



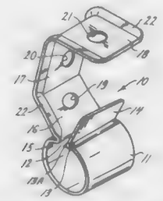
1. An orbital debris sweeper for removing particles from orbit which otherwise may impact and damage an orbiting spacecraft, the orbital debris sweeper comprising:
a sweeper core having a central sweeper axis;
a debris monitoring unit carried by the sweeper core for monitoring the trajectory and size of individual orbiting particles in the vicinity of the debris sweeper;
a plurality of impact panels rotatable about the central sweeper axis, each impact panel having a cantilevered end extending radially outward from the sweeper core, a leading edge circumferentially spaced from a rotationally preceding panel, and a trailing edge circumferentially spaced from the leading edge of a rotationally succeeding panel;
a plurality of radially extendable and retractable booms each interconnecting the sweeper core and a corresponding impact panel;
a computer responsive to the debris monitoring unit for determining whether, as a function of the monitored size of an individual particle, the individual particle preferably impacts one of the rotating impact panels or passes between the rotating impact panels; and
a power control unit responsive to the computer for extending or retracting one or more of the booms to change the moment of inertia of the sweeper and thereby the rotational velocity of the plurality of rotating panels to increase panel impact frequency of particles which preferably impact one of the panels while reducing panel impact frequency of particles which preferably pass between the rotating panels.

4,991,800
BACKDRIVE CONTROL SYSTEM FOR AIRCRAFT FLIGHT CONTROL SURFACES
Robert A. Schwarz, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Nov. 14, 1988, Ser. No. 271,438
Int. Cl.[5] B64C 13/40
U.S. Cl. 244—226 22 Claims



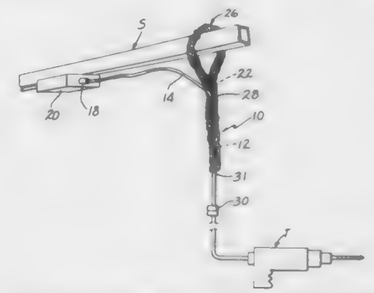
13. A backdrive system for aircraft flight control surfaces and the like, comprising:
motive means for driving a control surface;
fluid pressure responsive clutch means operatively associated between the motive means and the control surface, the clutch means being disengaged in the presence of fluid pressure;
fluid pressure supply means connected to the clutch means;
accumulator means connected in-line between the supply means and the clutch means for storing hydraulic energy during normal operation of the system and for releasing the stored hydraulic energy for at least a given period of time in the event of loss of supply pressure to allow the control surface to backdrive to a neutral position; and
check-valve means between the fluid pressure supply means and the accumulator means to prevent return of hydraulic energy from the accumulator means to the fluid pressure supply means in the event of loss of the supply pressure.

4,991,801
UNIVERSAL SUPPORT STRAP
Terry N. Trumbull, 14933 Royalbrook Dr., Chesterfield, Mo. 63017
Filed Mar. 1, 1990, Ser. No. 486,945
Int. Cl.[5] F16L 3/08
U.S. Cl. 248—74.2 9 Claims



1. A body supporting strap for attaching a body received in the supportive strap in any one of a plurality of positions from a supporting structure, said body supporting strap comprising:
(a) a cylindrically shaped portion to receive a body for support, said portion having an entrance opening through which a body can pass; and
(b) strap attachment means connected to said cylindrically shaped portion in position for selective use in attaching said body receiving portion to a supporting structure, said body receiving portion attachment means including,
(1) a plurality of interconnected and aligned webs projecting from said body receiving portion with said individual webs being angularly related to establish a position of attachment of said cylindrically shaped body receiving portion that corresponds to the angular relation of the web that is selected for attachment to the supporting structure, and
(2) each said web having marginal flange means angularly divergent therefrom to render the web stable when attached to the supporting structure by any selected one of said webs.

4,991,802
SUSPENSION DEVICE FOR CABLE OR A LIKE LINEAR BODY
Lawrence A. Deacon, 3855 Remsen Rd., Medina, Ohio 44256
Filed Feb. 21, 1990, Ser. No. 482,703
Int. Cl.[5] B60D 1/00
U.S. Cl. 248—60 23 Claims



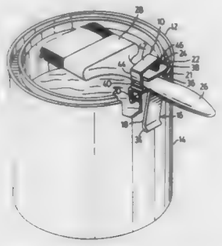
1. A device for suspending an elongated generally flexible cable and the like, from an overhead support said device comprising:
an elongated braided or woven member formed of flexible nonmetallic strands and defining a wall encompassing an elongated generally lengthwise extending passageway in said member, the diameter of said passageway being enlarged by imposing a lengthwise compressive force upon said member and decreased by imposing a lengthwise tensile force;
a first end of said member being doubled back upon itself for insertion from exteriorly of said member through a first opening formed through the strands of said wall of said member and into said passageway, to provide a formed securement loop at said first end for attaching said member to said overhead support; and
said member having a second opening through the strands of said wall thereof below the first mentioned opening and from said passageway for receiving therethrough said cable or the like, the suspended weight of said cable upon said member providing sufficient lengthwise tensile force upon said member to put said member into gripped relation with said cable or the like.

4,991,803
PAINT BRUSH HOLDER
James E. Buder, Kitchener, Canada, assignor to J. Buder & Co. Inc., Kitchener, Canada
Filed Jan. 25, 1990, Ser. No. 470,115
Int. Cl.[5] A46B 17/02
U.S. Cl. 248—113 10 Claims

1. A paint brush holder adapted to hold a paint brush generally horizontally over the rim of an open paint can, comprising:
resilient leg members spaced from each other and joined at the upper ends in a U-shaped connection such that the lower ends are biased inwardly toward each other to grip the upper rim of the open paint can, the U-shaped connection forming a lower plate member which extends parallel to and above the upper rim of the paint can when the holder is fastened to the rim; and
clip means connected above the U-shaped connection to hold the paint brush, the clip means comprising an upper

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plate member positioned above the lower plate member and extending generally parallel thereto, and resilient connection means connecting the upper and lower plate members, the resilient connection means comprising a spring plate member positioned above and generally parallel to the upper plate member, a first arm member extending generally vertically between and connecting one



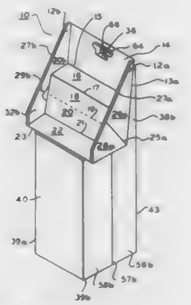
end of the lower plate member to one end of the spring plate member, and a second arm member connecting the other end of the spring plate member to the upper plate member, the resilient connection means being operative to downwardly bias the upper plate member, whereby a paint brush handle may be received and retained between the upper and lower plate members.

4,991,804

DISPLAY STAND

Steve Iannucci, 79 Holiday Dr., W. Caldwell, N.J. 07006

Filed Nov. 27, 1989, Ser. No. 441,760
Int. Cl.[5] A47F *5/11*
U.S. Cl. 248—174 12 Claims



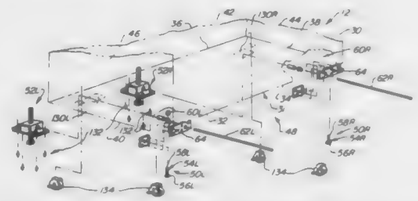
1. A display article comprising:
a support portion including at least one ledge portion; and
a display portion connected to said support portion, said display portion comprising:
first and second side panels;
a third side panel connecting the first and second side panels, and a fourth side panel disposed between and at an angle to said first side panel and said second side panel, said third side panel and said fourth side panel lying in perpendicular planes; and
first, second, and third contiguous folding panels connected between said third side panel and said fourth side panel;
said first folding panel being foldable along a first score line adjacent said third side panel and a second score line adjacent said second folding panel;
said second folding panel being foldable along said second score line and a third score line adjacent said third folding panel;
said third folding panel being foldable along said third score line and a fourth score line adjacent said fourth side panel;
said first, second, and third contiguous folding panels comprising a first position wherein said first and second folding panels are coplanar with said third side panel, and said third folding panel is coplanar with said fourth side panel, and said third folding panel is disposed at a right angle to the second folding panel, and a second position wherein said first folding panel is disposed at a right angle to said third side panel and is parallel to said fourth side panel, and said second and third folding panels are coplanar and disposed at a right angle to said fourth side panel and are parallel to said third side panel;
said first, second, and third contiguous folding panels being movable from said first position to said second position upon contact of said first, second, and third panels, with said at least one ledge portion of said support portion.

4,991,805

REFRIGERATOR GEAR DRIVEN LEVELING SYSTEM

Gregory P. Solak, Ohio Twp., Warrick County, and Shelby A. Lynn, Johnson Twp., Gibson County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 17, 1989, Ser. No. 353,049
Int. Cl.[5] F16M *00/00*
U.S. Cl. 248—188.4 10 Claims



1. In a refrigeration apparatus including a cabinet having front leveling legs adjacent a front portion of said cabinet and rear leveling legs adjacent a rear portion of said cabinet, the improvement comprising:
a generally cylindrical threaded rod connected to each rear leveling leg and having a flattened edge;
a pair of blocks each including a bore therethrough being of a size and shape for receiving said threaded rod, to thereby permit axial movement but to prevent rotational movement of the threaded rod;
drive means drivingly engaging said rear leveling legs for adjusting said rear leveling legs comprising a first bevel gear including a central threaded opening threadably received on each said threaded rod adjacent a top portion of said block and a second bevel gear mated with each said first bevel gear so that rotation of said second bevel gear causes rotation of said first bevel gear to provide axial movement of said threaded rod to level the cabinet; and
remote means operatively connected to said second bevel gear to provide rotation thereof and extending toward the front portion of said cabinet for permitting leveling of the cabinet to be adjusted from in front of the refrigeration apparatus.

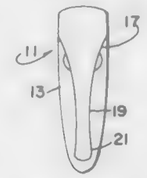
4,991,806

SUCTION MOUNTED CLIP

Jeffrey M. Nakamura, 321 N. Kuakini St., Suite 412, and Denny Kwock, 321 N. Kuakini St., Suite 412, both of Honolulu, Hi. 96817

Filed Oct. 12, 1988, Ser. No. 256,755
Int. Cl.[5] F16B *47/00*
U.S. Cl. 248—206.2 17 Claims

1. A suction cup mounted clip apparatus comprising a suction cup having a resilient body with a depressed portion surrounded by a rim for contacting a mounting plane and for forcing air out of the depression past the rim as the body is moved toward the plane and for resiliently reforming and reducing pressure in the depression and holding the body on the mounting plane, a knob extending from the body at a portion thereof opposite the rim, a clip having a generally planar back portion and a curved front portion, the curved front portion having a bow section extending outward from one end of the back portion, extending opposite the back portion and spaced therefrom and extending inward toward the back portion to a nip section of the front portion which is adjacent the back portion, the front portion further having a receiver section which extends outward from the nip section to an outer distal edge remote from an opposite section of the back portion, whereby a portion of a planar article may be



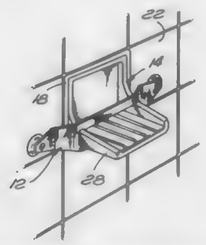
slipped between the receiver section and the back portion and between the nip section and back portion and may be held in the clip by the nip section, the back portion having an opening in a section thereof opposite the bow section for receiving the knob of the suction cup and the knob of the suction cup being resiliently compressed and inserted through the opening and expanded on a side of the back portion toward the bow section, further comprising a reverse reading sticker adjacent the rim of the suction cup, for interposing between the rim of suction cup and the mounting plane, the sticker having a first sticky side and information on the sticker legible through the first sticky side and legible through a transparent planar mounting media.

4,991,807

SOAP DISH TEMPORARY SUPPORT MECHANISM

James J. Radnich, HC-1 Box 1092, Joshua Tree, Calif. 92252

Filed Nov. 16, 1989, Ser. No. 437,119
Int. Cl.[5] F16B *47/00*
U.S. Cl. 248—206.3 1 Claim



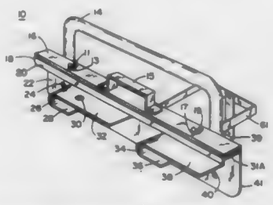
1. A soap dish temporary securing mechanism for holding a soap dish having a horizontal soap support section, said soap dish being secured to said wall by adhesive and being aided in being held in place by said securing mechanism until said adhesive dries, comprising:
a sling formed of stretchable material having a horizontal slot formed therein enclosing said soap dish horizontal support section for supporting and holding said soap dish horizontal soap support section positioned in said slot; and
securing means attached to said sling for attaching said sling to the wall surface on opposite sides of said soap dish comprising suction cups removable from said sling, said suction cups containing shafts which pass through apertures in said sling which are spaced from said slot.

4,991,808

MOVABLE UTILITY BRACKET FOR LADDERS

Paul LaChance, 135 North Main St., West Bridgewater, Mass. 02379

Filed Sep. 12, 1989, Ser. No. 405,936
Int. Cl.[5] E06C *7/00*
U.S. Cl. 248—211 5 Claims



1. A movable utility bracket for ladders comprising:
a sleeve contacting and conforming to a side rail of a ladder, wherein the sleeve extends over a length of the side rail equal to a distance between at least two ladder rungs, wherein a narrow elongated section of the sleeve covers a top edge of the side rail of the ladder and, extending orthogonally from the narrow elongated section, an elongated wide section covering the external side of the side rail, and permanetly secured to a top central portion of the sleeve a handle means for moving the utility bracket;
at least two hooks protruding interiorly from the sleeve, each of which hooks partially encircles one of the rungs over a top of the rung thereby providing a bracket which slides onto a ladder hooked over the rungs of the ladder securely but instantly removable to other rungs on the ladder, wherein the two hooks are attached together by a narrow elongated rigid strip which underlies the narrow elongated section of the sleeve and the hooks are adjustably and removably attached to the sleeve, and wherein the hooks are arched away from the narrow elongated rigid strip to conform to the rungs of an extension ladder, and the hooks are spaced a short distance from the narrow elongated rigid strip corresponding to the distance between an edge of a side railing and a rung on an extension ladder; wherein the narrow elongated section of the sleeve further comprises two transverse slots therethough and the narrow elongated strip further comprises two holes therethrough mating with the slots so that the hooks and the sleeve are adjustable secured together by a bolt means through the slots and holes; and
a means of securing a utility device to the utility bracket for use by a person on the ladder, wherein the utility device comprises any of the following: a bracket for holding a paint bucket pivotally to the utility bracket, a bracket for holding a paint tray pivotally to the utility bracket, a bracket for holding a utility tray pivotally to the utility bracket, a bracket for holding a painting tool, a bracket for holding a tool, a hand rail rigidly secured to the utility bracket.

4,991,809

MUSICAL INSTRUMENT SUPPORT

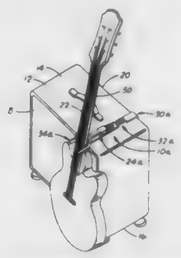
James R. Harkey, P.O. Box 714, Tishomingo, Okla. 73460

Filed Nov. 13, 1989, Ser. No. 435,065
Int. Cl.[5] A47B *96/00*
U.S. Cl. 248—231.4 20 Claims

1. A musical instrument support removably connectable to a support having an upper surface, a front face and a rear face for cooperating with the support to support a musical instrument, comprising:
a first clip having a first portion engageable with a portion of the front face of the support and a second portion extending a distance generally over a portion of the upper surface of the support comprising:

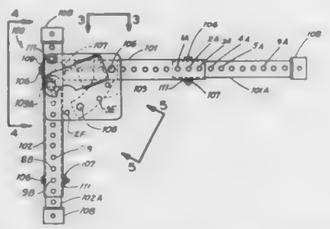
VOL 1123 ISS 2 FE 12 1991 UMI

a clip lip extendible over a portion of the front face of the support and engageable with a portion of the front face of this support and having opposite ends;
a clip plate having opposite ends with one end connected to one end of the clip lip and the clip plate extending from the clip lip a distance over the upper surface of the support; and
a clip base connected to the clip plate; and
clip means connectable to a portion of the support and spaced a distance from the first clip;
stretch means consisting of at least one of an elastomeric member and a spring connected to the clip base and to the



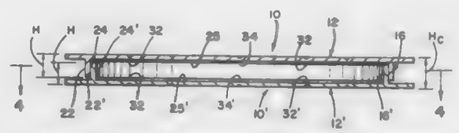
clip means for stretchably connecting the first clip to the clip mans whereby the first clip and the clip means are stretchable in opposite directions thereby extending the distance therebetween so the first clip is disposable on the support and the clip means is connectable to the support, the stretch means biasing the first clip generally toward the clip means for maintaining the first clip engaged with the support and the clip means connected to the support; and
support means on the first clip for cooperating to support the musical instrument when the first clip is engaged with the support and the clip means is connected to the support.

4,991,810
ADJUSTABLE SUPPORT BASE FOR MOBILE VEHICLE HOIST
Terry A. Andrus, Oconomowoc; Robert D. Bartelt, Merton; William W. Belson, III, Nashota, all of Wis.; Michael R. Bruno, 3950 Southwood Dr., Oconomowoc, Wis. 53066; Scott M. Moen, and Joseph A. Popelka, both of Oconomowoc, Wis., assignors to Michael Roman Bruno, Oconomowoc, Wis.
Filed Nov. 16, 1989, Ser. No. 437,148
Int. Cl.[5] B60R *11/00*
U.S. Cl. 248—286 **4 Claims**



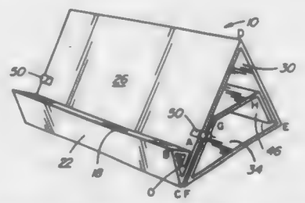
1. An adjustable support base for rigidly mounting a portable vehicle hoist to a surface, said support base comprising:
first and second anchoring legs slidably and perpendicularly mounted to one another, each said leg being adjustable in length;
wherein each end of said first leg has means for rigidly mounting said first leg to the surface, and wherein the first end of said second leg is slidably mounted to said first leg and the second end of said second leg has means for rigidly anchoring said second leg to the surface;
further wherein said legs define a plane;
a first rigid mounting plate rigidly secureable to each of said legs and parallel to said plane;
wherein said first mounting plate is angularly adjustable and secureable while maintaining said parallel orientation to said plane; and
an elongated support column rigidly attached to said first plate and extending generally perpendicular therefrom.

4,991,811
COMPACTLY STACKABLE CAKE PLATTERS
Tanchum G. Portnoy, Jamaica Estates, N.Y., assignor to MIA Industrial Group Ltd., Bronx, N.Y.
Filed Aug. 22, 1989, Ser. No. 396,909
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—346 **26 Claims**



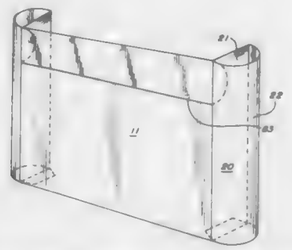
1. A platter adapted when used to support an article above a support and when stored to be nested back to back with a mating platter to minimize the storage space required to store the platters, comprising a member having a planar upper surface adapted to support the article thereon and a back, and a supporting flange depending from said member and having a continuous lower surface lying substantially in a common plane spaced below the plane of said back; the dimensions of said member and the dimensions of the corresponding member of the mating platter being substantially the same and the dimensions of said flange and the dimensions of the corresponding flange of the mating platter being different such that said platter and the mating platter can be nested back to back for storage.

4,991,812
PORTABLE VIEWING STAND
Neil MacEwan, Windsor, Canada, assignor to Patricia MacEwan, Windsor, Canada
Filed Jan. 11, 1990, Ser. No. 463,402
Int. Cl.[5] A47B *97/04*
U.S. Cl. 248—459 **14 Claims**



1. A collapsible, portable, viewing stand comprising: an elongated blank of semi-rigid material having therein a plurality of spaced parallel fold lines extending transversely of the blank to define multiple successive rectangular panels; one group of said panels being folded and arranged to provide an upwardly and rearwardly sloping frontal panel, a downwardly extending rearward panel connected thereto and a bottom panel; another group of panels being folded and arranged to provide a bracing panel extending between said frontal and rearward panels in a mid-height region of the stand to stabilize said frontal panel, said bracing panel being of essentially the same width measured transversely of the blank as is said frontal panel; and a still further group of said panels being folded and arranged in a predetermined folded condition to provide a stop means adjacent a lower portion of said frontal panel to provide a rest for a book or other material when located in juxtaposition to said frontal panel for viewing purposes.

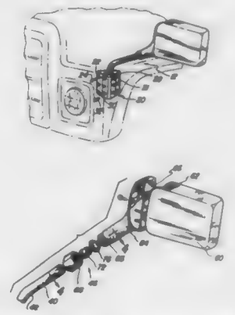
4,991,813
FRAMELESS PORTABLE DISPLAY
Bryan J. Beaulieu, Burnsville, Minn., assignor to Skyline Displays, Inc., Burnsville, Minn.
Filed Mar. 13, 1990, Ser. No. 492,974
Int. Cl.[5] A47F *1/14*
U.S. Cl. 248—469 **24 Claims**



1. A lightweight portable support for supporting at least a flexible display, comprising
(a) a first and second vertical column, each column having a first flat sheet of flexible material of first predetermined width and elongate length, a second sheet of flexible material of second predetermined width greater than said first predetermined width, and elongate length, and means for attaching said first sheet to said second sheet along respective edges of said elongate length whereby said second sheet is affixed to and bowed outwardly from said first sheet;
(b) a third column having a first flat sheet of flexible material of first predetermined width and second elongate length, a second sheet of flexible material of second predetermined width greater than said first predetermined width, and second elongate length; and
(c) means for attaching respective elongate ends of said third column to respective elongate edges of said first and second vertical columns, whereby said third column is attached horizontally between said first and second vertical columns.

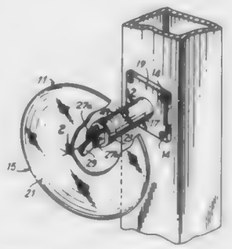
4,991,814
REVERSIBLE VEHICULAR MIRROR ASSEMBLY
William P. Schmidt, 21000 Woodruff, Rockwood, Mich. 48173, and Frank D. Hutchinson, 28000 Beel Rd., New Boston, Mich. 48164
Filed Sep. 15, 1989, Ser. No. 407,639
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—479 **13 Claims**

1. A mirror assembly for mounting onto a vehicle, the assembly enabling a driver of the vehicle to view around and about the vehicle, the assembly comprising:
(a) a mounting bracket which is secureable to the vehicle;
(b) a cantilever which is rotatable and slidable relative to the vehicle, the cantilever being engageable in multiple mounting positions relative to the vehicle, the cantilever being secured to the mounting bracket;
(c) a linkage having a mating arm, the linkage being secureable to the cantilever; and
(d) a detachable mirror housing, the housing being secured to the cantilever by the mating arm, the engagement between the mating arm and the detachable mirror housing having two alternative mounting orientations, the engagement between the mating arm and the mirror housing enabling the mirror housing to be disengaged from the first orientation and subsequently reengaged thereto in the



second orientation, the second orientation being essentially opposite to the first orientation.

4,991,815
MIRROR ASSEMBLY
Donald G. Softness, West Islip, N.Y., assignor to Susan E. Lauter, Inc., New York, N.Y.
Filed Sep. 16, 1988, Ser. No. 245,470
Int. Cl.[5] B60R *1/00*
U.S. Cl. 248—487 **21 Claims**



1. a mirror assembly comprising:
a mirror
means for supporting the mirror;
means for connecting the supporting means to the mirror comprising a female element and a male element matingly engaging the female element;
first means for enabling rotation of said mirror about a first axis comprising said female element and said male element;
a shaft extending through said male and female elements for enabling rotatable pivoting of said male element with respect to said female element;
means for preventing the male element from rotatably pivoting with respect to the female element comprising at least one set screw located in said female element and adapted to be tightened against said male element; and
second means for enabling rotation of said mirror about a second axis substantially perpendicular to the first axis comprising a cap member rotatably mounted on said supporting means.

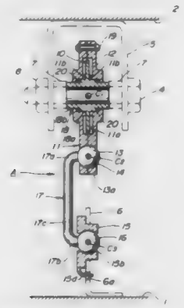
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,816

DAMPER UNIT FOR AUTOMOTIVE POWER UNIT OR THE LIKE

Takanobu Ide, Isehara; Masamitsu Kojima, and Masami Mochimaru, both of Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd. and Oiles Corporation, both of, Japan

Filed Jun. 5, 1989, Ser. No. 361,350
Claims priority, application Japan, Jun. 6, 1988, 63-138667
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—562 **14 Claims**



1. A vibration damper comprising:
a housing, said housing including a chamber, said chamber being filled with a viscous fluid, said housing being so constructed and arranged as to be connectable to a first structure;
a disc, said disc being disposed in said housing in manner to be immersed in said viscous liquid;
a rigid link, said link extending between said housing and a second structure
means defining a first universal joint, said first universal joint operatively interconnecting a first end of said link with said housing;
means defining a second universal joint, said second universal joint being arranged to connect a second end of said link to a second structure.

4,991,817

CADDY FOR REMOTE CONTROLS

Robert D. VonKleist, 63 Maplewood Ave., West Hartford, Conn. 06119, and Bruce Fisher, 7 Washington Cir., Unionville, Conn. 06085

Filed May 22, 1989, Ser. No. 354,849
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—676 **12 Claims**



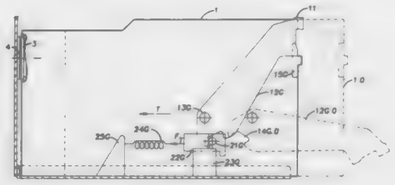
1. A remote control caddy for holding one or more electronic remote control devices, comprising:
a first planar member, said first planar member having a front edge, a rear edge and a pair of opposed side edges;
a second planar member, said second planar member having a top surface, a front edge, a rear edge and a pair of opposed side edges, disposed above said first planar member and oriented at a nonzero angle relative to said first planar member so that the rear edges of the planar members converge toward each other; and
a pair of opposed vertical support members, each of said support members being secured to a respective one of each pair of the opposed side edges of the planar members;
said top surface providing a support for the one or more remote control devices;
said caddy providing a storage compartment between said planar members and said compartment having a rectilinear opening between the front edges of the planar members.

4,991,818

SYSTEM FOR RAPID MOUNTING AND REMOVAL OF A CARRIER ON AND FROM A SUPPORT FRAME

Benoit Darbo, Cauderan, and Patrice Lacroix, St. Aubin De Medoc, both of France, assignors to Thomson CSF, Paris, France

Filed Jan. 5, 1989, Ser. No. 293,836
Claims priority, application France, Jan. 8, 1988, 88 00137
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—681 **7 Claims**



1. A system for rapid mounting and removal of a carrier on and from a support frame by horizontal translational displacement of the carrier, comprising:
a handle which is accessible at the front of the carrier, the ends of the handle being joined to two arms disposed respectively on the left side and right side of the carrier and pivoted between a top and a down position respectively on two shafts rigidly fixed to the carrier, each arm being provided with a notched portion;
a locking device for locking the handle when the arms are in the top position;
two studs positioned respectively within the notched portions of the arms when the carrier is pushed in the support frame, each stud being mounted on a member which is capable of displacement in the directions of translational motion for mounting and removal of the carrier and which is coupled mechanically to a spring secured to the frame, said spring being stretched so as to exert a tractive force in the direction of mounting of the carrier, the arms being mounted to displace the studs when the arms are moved to the top position, thereby increasing the stretching of the springs;
a mechanical stop device for limiting to a stop position the travel of each stud-supporting member in the direction of mounting of the carrier, the resultant of the tractive forces of the two springs in the stop position being of higher value than is necessary for displacing the carrier in said translational motion.

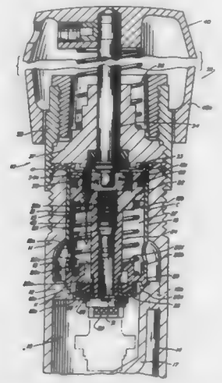
4,991,819

METERING VALVE

Daniel J. Laube, Oak Park, Ill., assignor to Chicago Faucet Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 336,887, Apr. 12, 1989, Pat. No. 4,899,778. This application Feb. 9, 1990, Ser. No. 477,727
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] F16K *31/143*
U.S. Cl. 251—35 **5 Claims**

2. A metering valve for controlling fluid flow, comprising a piston assembly mounted within a tubular unit for movement between open and close modes and being biased to assume a close mode, said piston assembly assuming an open mode only when a predetermined external force is applied to a valve actuating means forming a component of said metering valve; upon the external force being removed, said piston assembly automatically returning to the close mode upon successively moving through first and second segments of travel; said piston assembly being in sliding sealing engagement with an interior



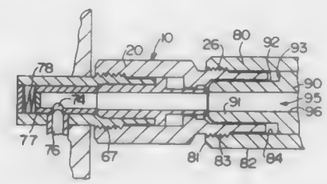
surface of said tubular unit when moving through said first segment of travel whereby movement of said piston assembly is retarded allowing a predetermined volume of fluid to flow through the metering valve, said piston assembly being in a non-sealing relation with the tubular unit interior surface when said piston assembly moves through the second segment of travel whereby said piston assembly moves substantially instantaneously to the close mode halting further fluid flow.

4,991,820

FLUID CONDUIT COUPLER

Gabriel S. Kohn, Ballwin; Robert L. Bollinger, and Gregory A. Svolopoulos, both of St. Louis, all of Mo., assignors to Allied Healthcare Products, Inc., St. Louis, Mo.

Filed Feb. 9, 1990, Ser. No. 477,073
Int. Cl.[5] F16L *29/00*
U.S. Cl. 251—149.5 **15 Claims**



1. A coupler for connecting a first conduit to a second conduit, the first conduit having a valve to control the flow of fluid through the first conduit, the valve being operated by moving a collet positioned within the first conduit, comprising:
body means for providing a fluid flow passage between the first conduit and the second conduit;
connection means for connecting said body to the first conduit and the second conduit to establish a fluid flow path from said first conduit through said passage to said second conduit;
operating means for moving the collet to open the valve in response to the connection of said body means to the first and second conduits, wherein upon connection said first conduit is positioned between an inside diameter of the body means and an outside diameter of the operating

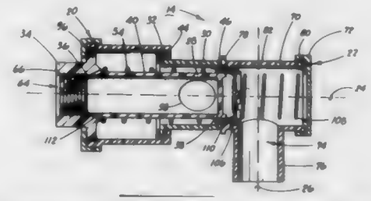
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4,991,821

COUPLING DEVICE

Brook J. Beaston, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.

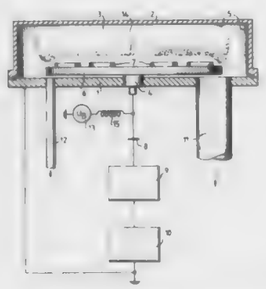
Continuation of Ser. No. 180,355, Apr. 11, 1988, Pat. No. 4,844,408. This application Jun. 16, 1989, Ser. No. 367,477
Int. Cl.[5] F16L *37/28*
U.S. Cl. 251—149.8 **11 Claims**



1. A coupling device for interconnecting flow conducting members comprising:
a male barrel member having a male input port, a male output port and a male barrel flange disposed near an upstream end of the male barrel member;
a slide member coaxially and slidably mounted on the male barrel member and having a slide flange at an upstream end thereof, the slide member having a retracted position and an extended position;
means for biasing the slide member toward the extended position;
a collar member coaxial with the male barrel member and the slide member and mounted on the male barrel member to guide the slide member so that the slide member is movable between the retracted position and the extended position, the slide member covering the male output port when in the extended position;
a female barrel member having a female input port at an upstream end thereof and a female output port, the upstream end of the female barrel member receiving a downstream end of the slide member, the female barrel member comprising a threaded output column disposed at the female output port;
plunger means for sealing and opening the female input port, comprising:
a seal member supported by the female barrel member at the female input port;
a plunger member; and
means for biasing the plunger member toward the seal member, the plunger member being movable by the male barrel member as it penetrates the female input port; and
connecting means for connecting the female barrel member to the collar member so that the slide member is pushed by the female barrel member to move the slide member to the retracted position to open the male output port, the male barrel member disposed to penetrate the female input port to move the plunger means to index the male output port with the female output port, the connecting means comprising a plurality of collar dogs located on the collar member and a plurality of female barrel dogs located on the female barrel member so that the collar dogs mesh with the female barrel dogs when the male unit is connected with the female unit, the male unit then being rotatable with respect to the female unit so that the coupling device is maintained in operational engagement.

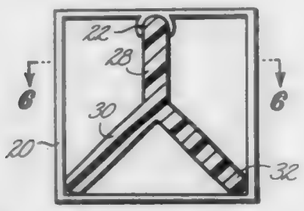
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,822
VALVE HAVING CERAMIC VALVE BODIES WITH LOW FRICTION COATINGS
Knut Eake, Johannesberg, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau I, Fed. Rep. of Germany
Filed Nov. 14, 1988, Ser. No. 271,176
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 3832692
Int. Cl.[5] F16L *5/00*
U.S. Cl. 251—368 6 Claims



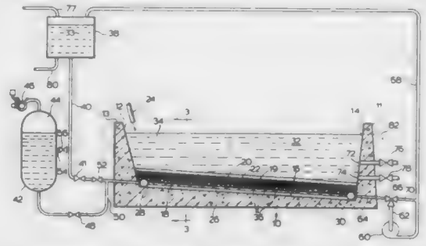
1. A valve, especially for shut-off and regulating means, comprising a pair of ceramic valve bodies having respective sealing surfaces which slide against each other, each valve body being coated with a hard carbonaceous coating comprising a first layer containing carbon with a silicon admixture.

4,991,823
PICKET FENCE CAP
William A. Stanish, Jr., 6004 38th Ave. East, Bradenton, Fla. 34208
Filed Apr. 26, 1989, Ser. No. 515,089
Int. Cl.[5] E04H *17/00*
U.S. Cl. 256—1 5 Claims



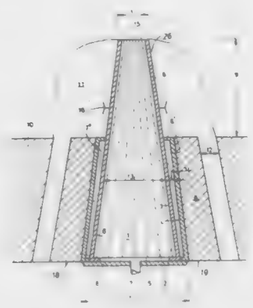
1. A picket fence cap for a hollow picket or post fence member having a square cross-section having four internal corners, an open end and at least one internal longitudinally extending fastener receiving channel centrally positioned on one wall therein opposite two internal corners comprising:
a top coextensive with the fence member end;
a bottom portion depending from said top;
said bottom portion having a laterally extending leg having an end positioned to be pressed into the fence member channel when said top is aligned with the fence member and;
a pair of angularly extending legs are joined to said laterally extending leg;
said pair of angularly extending legs having ends positioned to be in the corners opposite the one fence member channel.

4,991,824
APPARATUS FOR BENEFICIATING ORES
Daniel A. Mackie, 474 Copeland Court, Oakville, Ontario, L6J 4B9, Canada
Filed Nov. 21, 1988, Ser. No. 273,536
Claims priority, application United Kingdom, Nov. 19, 1987, 8727124
Int. Cl.[5] C22B *3/04*
U.S. Cl. 266—168 16 Claims



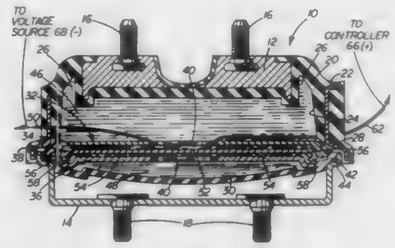
1. An apparatus for treating a particulate ore for the recovery of contained values therefrom comprising, in combination: a tank for receiving a liquid, said tank having a feed end, a discharge end and a bottom, said tank adapted to receive a bed of coarse particulate material on the tank bottom having a base adjacent the tank bottom, means for feeding said particulate ore to the tank at the feed end thereof onto the bed of coarse particulate material, means for intermittently fluidizing the particulate ore in the tank for moving the ore particles from the feed end to the discharge end of the tank, means for withdrawing the ore particles at the tank discharge end, and means at the bottom of the tank at the base of the bed of coarse particulate material for withdrawing the liquid therefrom.

4,991,825
INJECTION DEVICE
Erich Struzik, Solingen; Herbert Wagner, Dillingen, and Dirk Stein, Höhr-Grenzhausen, all of Fed. Rep. of Germany, assignors to Plibrico Co. GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Dec. 20, 1989, Ser. No. 453,661
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843149; Mar. 8, 1989, 3907383
Int. Cl.[5] C21C *5/48*
U.S. Cl. 266—218 11 Claims



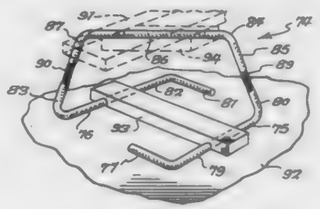
1. A device for injecting gases into metallurgical vessels, comprising:
(a) a gas sink (1) formed as a circular frustum of refractory material and having a base area (5), a cover area (15) and a plurality of through-going gas-carrying ducts (2) extending through the gas sink between the base area (5) and the cover area (15), the circular frustrum having an outer generated surface,
(b) a metal layer (6) enclosing the outer generated surface of the gas sink and the base area (5),
(c) a gas supply pipe (7) disposed at the centre of the metal-coated base area (5) of the gas sink (1) for supplying gas to the gas-carrying ducts (2),
(d) a perforate block (8) enclosing the metal-coated generated surface of the gas sink (1),
(e) an upper end part (9) of the frustum of the gas sink (1) being not enclosed by the perforate block (8) and extending beyond a lining (10) of a ladle bottom into the inside of a ladle, and
(f) the perforate block (8) and the gas sink (1) with the upper end part (9) being provided with an outer envelope (11) of refractory material, so that due to the extension of the upper end part of the frustrum of the gas sink beyond the lining of the ladle bottom into the inside of the ladle durability of the gas sink is enhanced by preventing settling of slag residues, which are deposited and collected at the ladle bottom on the emptying of the ladle, on the gas sink.

4,991,826
HYDRAULIC MOUNT WITH VOLTAGE CONTROLLED FLUID
John F. Hoying, Bellbrook, and Daniel G. Abels, Fort Recovery, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 2, 1989, Ser. No. 415,698
Int. Cl.[5] F16F *9/50*
U.S. Cl. 267—140.1 3 Claims



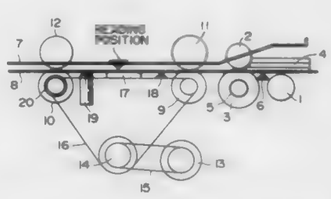
1. A hydraulic mount assembly, comprising:
a pair of mounting members;
a hollow body connected to said mounting members;
a resilient diaphragm closing said hollow body and forming therewith a closed cavity that is filled with an electro-rheological fluid;
means for partitioning said cavity into a primary chamber and a secondary chamber enclosed by said diaphragm, said partitioning means including upper and lower conductive plates defining a cell therebetween, each plate further including a fluid flow orifice connecting said chambers through said cell so as to effect damping;
a substantially continuous, conductive intermediate plate mounted in said cell between said upper and lower plates;
insulated mounting means upon which said intermediate plate is mounted to said partitioning means; and
means for applying a voltage to said electro-rheological fluid across said intermediate plate and said partitioning means including said upper and lower plates so as to selectively vary viscosity of said fluid and thus the damping of said hydraulic mount assembly.

4,991,827
SPRINGS FORMED OF ROPE PRESSURE-SATURATED OR IMPREGNATED WITH BINDER
Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.
Division of Ser. No. 928,710, Nov. 10, 1986, abandoned, which is a continuation of Ser. No. 650,668, Sep. 13, 1984, abandoned. This application Nov. 1, 1988, Ser. No. 268,564
Int. Cl.[5] F16P *1/52*
U.S. Cl. 267—149 21 Claims



1. A spring comprising a conventional preformed rope consisting of a plurality of synthetic resinous plastic monofilaments with spaces therebetween, and a cured binder which has saturated said spaces between said filaments of said conventional preformed rope to cause it to be self-sustaining in spring form.

4,991,828
DOCUMENT FEEDING APPARATUS
Motoshi Mizoguchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jan. 25, 1989, Ser. No. 301,060
Claims priority, application Japan, Jan. 25, 1988, 63-7049
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—3 2 Claims



1. A document feeding apparatus, comprising:
a document feeding roller for feeding an original document into a reading section where an image of said original document is optically read;
a document discharging roller for discharging said original document from said reading section;
driving means for driving said document feeding and document discharging rollers;
clutch means mounted on said document discharging roller for operatively coupling and decoupling said document discharging roller to and from said driving means;
wherein when said clutch means is temporarily energized, said document discharging roller is operatively coupled to said driving means, and, on the other hand, when said clutch means is deenergized, said document discharging roller is operatively decoupled from said driving means;
when the discharging roller is halted temporarily, a next original document is transported to an original-document-reading-standby position by means of said document feeding roller;
said clutch means temporarily deenergized when a stamping operation is to be carried out for the original document which has just been read;
wherein simultaneously with sending out a transmission

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termination protocol, the clutch means provided on the discharge roller is deenergized to thereby stop only the discharge roller, and after the stamping operation, the clutch means is energized to have the discharge roller rotate in synchronism with the feed roller.

4,991,829

METHOD FOR CONTROLLING TWO INTERRELATED TRANSPORT MEANS AND MACHINE THUS CONTROLLED, ESPECIALLY A PERSONAL BANKING MACHINE

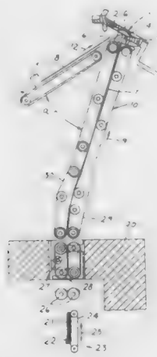
Ludwig Fischer, Herrenberg; Manfred Haas, Waldenbuch, and Hermann Pape, Gäufelden, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 5, 1989, Ser. No. 402,315

Claims priority, application European Pat. Off., Sep. 7, 1988, 88114602.1

Int. Cl.[5] B65H *5/26*

U.S. Cl. 271—9 **10 Claims**



10. A time-adaptive mechanism suitable for use with a banking machine to issue first and second documents simultaneously through a common exit gate, said transport mechanism comprising:

first means for transporting the first document at a first speed;

second means for transporting the second document at a second speed and for merging the first and second documents together;

means for controlling the movement of said first and second transporting means, said controlling means delaying the movement of one of the transporting means, after the movement of the other transporting means, by a stored time delay value;

means for independently sensing the arrival times of the first and second documents at the exit gate;

means for determining any time difference between the sensed arrival times; and

means for specifying a new stored time delay value which compensates for the determined time difference and which is calculated to make the documents arrive simultaneously at the exit gate during the next transporting operation.

4,991,830

PAPER SUPPLY APPARATUS

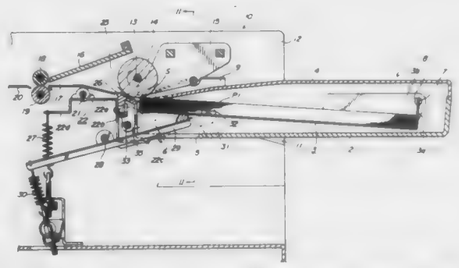
Toshio Yamanaka, Hyogo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 401,787

Claims priority, application Japan, Sep. 7, 1988, 63-117815[U]

Int. Cl.[5] B65H *3/44*

U.S. Cl. 271—9 **4 Claims**



1. A paper supply apparatus for supplying recording paper from either a main paper supply or an auxiliary paper supply comprising:

a paper supply roller including a paper pressing portion;

a main recording paper stacking table oscillatably supported in the apparatus and including a front end, the front end being disposed below the paper pressing portion of the paper supply roller and being capable of moving toward and away from the supply pressing portion;

an auxiliary recording paper stacking table including a front end, the auxiliary recording paper stacking table being disposed above the main recording paper stacking table, and the front end of the auxiliary recording paper stacking table extending close to the paper pressing portion of the paper supply roller;

main recording paper stacking table urging means for forcing the front end of the main recording paper stacking table towards the paper pressing portion of the paper supply roller; and

oscillation means in communication with main recording paper stacking table urging means for oscillating the main recording paper stacking table against the force of the main recording paper stacking table urging means.

4,991,831

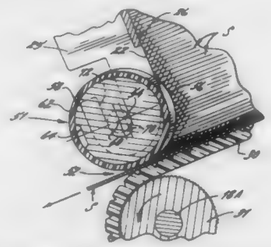
PAPER SHEET FEEDING APPARATUS

Ronald J. Green, E11412B N. Reedsburg Rd., Baraboo, Wis. 53913

Filed Aug. 14, 1989, Ser. No. 393,135

Int. Cl.[5] B65H *3/52, 7/04, 7/14*

U.S. Cl. 271—121 **30 Claims**



27. A gate forming member for use with an apparatus for serially feeding sheets in a forward direction from the bottom of a generally vertical stack of such sheets and comprising:

a generally cylindrical roll defining a central axis and an outer peripheral surface which is concentric to said central axis, said roll having a plurality of annular grooves extending about the circumference thereof, with said grooves being disposed about a second axis which is parallel to and offset from said central axis and so that each groove is relatively deep along a first half of the peripheral surface of said roll and relatively shallow along a second half of the peripheral surface, and

a ring disposed in each of said grooves, with said rings being composed of a material having a higher coefficient of friction than the material of said roll and being sized so as to lie radially inside of said peripheral surface of said roll about said first half thereof and to extend radially beyond said peripheral surface about said second half thereof.

4,991,832

DELIVERY SHEET BRAKE FOR A SHEET-FED PRINTING PRESS

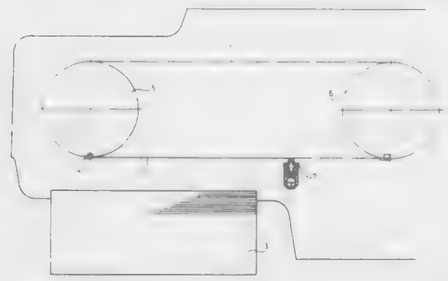
Nikolaus Spiegel, Walldorf; Karl-Heinz Filsinger, Wiesloch, and Roland Hirth, Römerberg, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 25, 1989, Ser. No. 426,962

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1988, 3836253

Int. Cl.[5] B65H *29/68*

U.S. Cl. 271—183 **6 Claims**



1. Delivery sheet brake for sheet-fed printing presses having a sucker formed with a suction opening movable on a closed loop path at varying speed corresponding in a sheet-transfer position to travel speed of a sheet and then being deceleratable until a sheet-release position is reached above a pile of sheets at a delivery, elements of a drive connected to the sucker for imparting a horizontal motion component to the sucker which is simultaneously movable vertically, and control valves for controlling vacuum in a suction line connected to the sucker, the sucker comprising a piston disposed in a cylinder of a housing so as to be movable in direction of a longitudinal axis of the piston, said housing being connected to the drive and being disposed swivelingly on a shaft having an axis extending transversely to a direction of travel of the sheet and parallel to the sheet, said piston being reciprocatingly movable in the cylinder of the housing by the vacuum in the suction line to the sucker and being controllable by contact of the sheet with the suction opening.

4,991,833

AUTOMATIC DOCUMENT FEEDER

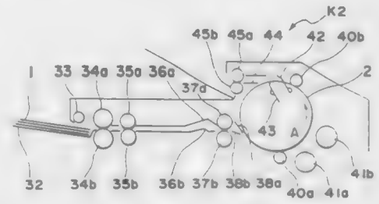
Hisashi Minami, Yamatokoriyama; Hideo Matsuda; Yoichi Shimazawa, both of Nara, and Shinitiro Hiraoka, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 161,339, Feb. 19, 1988, Pat. No. 4,843,433, which is a continuation of Ser. No. 849,021, Apr. 7, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 337,755

Claims priority, application Japan, Apr. 10, 1985, 60-53842[U]; Apr. 11, 1985, 60-78009; Apr. 13, 1985, 60-79021; May 27, 1985, 60-1114782

Int. Cl.[5] B65H *5/12*

U.S. Cl. 271—277 **1 Claim**



1. An automatic sheet winding device for an automatic document feeder, said automatic sheet winding device comprising:

a rotary drum provided with a sheet grip member for gripping said original sheet;

means for advancing said original sheet to said sheet grip member and automatically winding said original sheet around a circumferential face of said rotary drum through rotation of said drum by said automatic sheet winding device;

wherein said means for advancing is at a speed identical to a peripheral speed of said rotary drum and said original sheet is gripped by said sheet grip member upon lapse of a predetermined time after said means for advancing has been actuated;

wherein a character L represents a distance between said means for advancing and said sheet grip member and a character V represents a peripheral speed of said rotary drum, whereby rotation of said rotary drum is started upon lapse of the predetermined time as calculated by L/V after start of transport of said original sheet through said means for advancing.

4,991,834

SHOCK-ATTENUATING SEAMLESS SURFACE SYSTEM FOR USE UNDER AND AROUND PLAYGROUND EQUIPMENT

Thomas M. Vaux, 437 Tenth Ave. West, Kirkland, Wash. 98033

Continuation-in-part of Ser. No. 152,817, Feb. 5, 1988, Pat. No. 4,846,457, which is a continuation-in-part of Ser. No. 767,718, Apr. 23, 1986, Pat. No. 4,727,697, which is a continuation of Ser. No. 364,811, Apr. 2, 1982, abandoned. This application Jul. 10, 1989, Ser. No. 377,430

Int. Cl.[5] A63B *71/02*

U.S. Cl. 272—3 **38 Claims**

1. A surface system, for use under and around playground equipment, for placement on a base, comprising:

a surface layer having a bottom and outer edges;

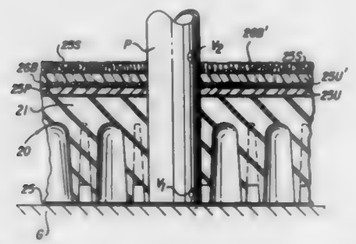
rib means, extending from the bottom of the surface layer, for defining an array of air-filled cells affixed to the bottom of the surface layer;

a sealer and aggregate spread over the surface layer, the outer edges, and the base immediate to the surface system;

median rib means, extending a shorter distance from the bottom of the surface layer than the defining rib means, for defining a structure that produces consistent attenuating characteristics upon impact to the surface layer, for

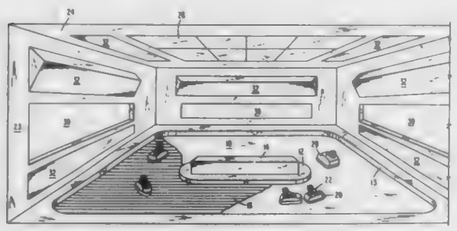
VOL 1123 ISS 2 FE 12 1991 UMI

facilitating internal venting of the surface system, and for facilitating conformity of the surface system to the base; and



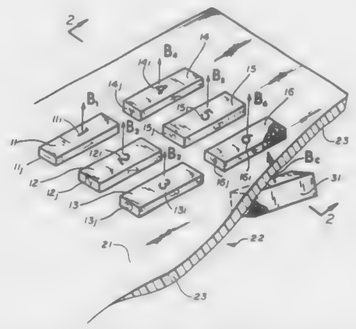
a sloping outer edge means, surrounding all sides of the surface system, for helping to prevent tripping and for facilitating access by handicapped persons.

4,991,835
AMUSEMENT VEHICLE GAME
Egidio Lamanna, Downsview, Canada, assignor to Bompo Corp., Hockessin, Del.
Continuation of Ser. No. 367,074, Jun. 16, 1989, Pat. No. 4,898,382. This application Dec. 19, 1989, Ser. No. 452,481
The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.
Int. Cl.[5] A63B 67/00
U.S. Cl. 273—1 GC 18 Claims



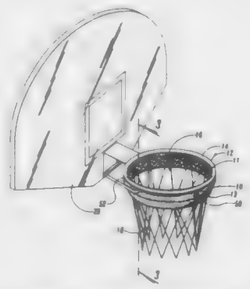
1. Game apparatus comprising:
a self-propelled vehicle capable of being steered;
said vehicle having a forward portion and a rearward portion;
forward bumper means mounted on said forward portion and rearward bumper means mounted on said rearward portion;
said bumper means being resiliently mounted on said vehicle and adapted for bumping contact with other objects;
switch means on said vehicle adapted to be actuated by said bumper means;
counter means adapted to be actuated by said switch means to increment in one direction upon actuation by said forward bumper means and to decrement in another direction upon actuation by said rearward bumper means; and
display means associated with said counter means for displaying the count thereof.

4,991,836
DYNAMIC GAME APPARATUS AND METHOD USING MULTIPLE MAGNETS AND A MAGNETIC MANIPULATOR BELOW THEM
Benjamin Joffe, 22314 James Alan Cir., Chatsworth, Calif. 91311
Filed Jan. 19, 1989, Ser. No. 298,738
Int. Cl.[5] A63F 9/00
U.S. Cl. 273—1 GD 56 Claims



1. Game apparatus for use by a player and comprising:
a base defining a substantially continuous playing surface;
macroscopic permanent magnets supported directly and generally free to slide about on the substantially continuous playing surface, each magnet having a magnetic field vector that is substantially perpendicular to the surface where that magnet is supported;
the magnets having their respective field vectors oriented in common relative to the surface where, respectively, the magnets are supported; and
a magnetic manipulator disposed below the surface, and generally below a first particular individual one of the magnets, and controlled by such player to cause said first particular one magnet individually to form a predetermined regular array, generally wherever on the substantially continuous playing surface the player chooses, with at least one other particular individual one of the magnets;
the field-vector orientation of each permanent magnet being the same after formation of the array as before.

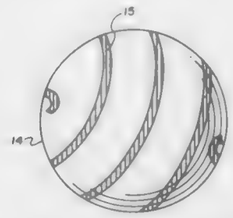
4,991,837
BASKETBALL HOOP VISUAL GUIDE
Richard E. Deal, 614 S. Moore, Algona, Iowa 50511
Filed Sep. 19, 1989, Ser. No. 409,246
Int. Cl.[5] A63B 63/08
U.S. Cl. 273—1.5 R 18 Claims



1. A device for use in shooting a basketball into a basketball hoop, the hoop having a rim with depending net hangers, and a net descending from the net hangers, comprising:

an annular member having top and bottom edges; and
means for detachably mounting the annular member to the rim the mounting means detachably mounted to the rim, with the top edge of the annular member positioned immediately below the rim and adjacent to and at least partially covering the net hangers so that the annular member provides a visual guide of the rim position when shooting the basketball into the basketball hoop.

4,991,838
MARKED BASEBALL COVER AS TRAINING AID AND METHOD FOR USE
Keith N. Groves, 1779 E. 4500 South, Salt Lake City, Utah 84124
Filed Apr. 9, 1990, Ser. No. 506,098
Int. Cl.[5] A63B 69/00
U.S. Cl. 273—26 R 2 Claims



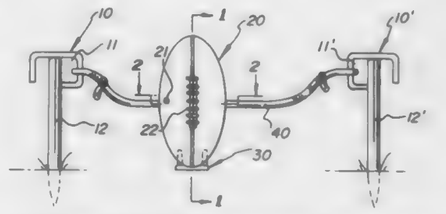
1. A baseball training apparatus comprising;
a regulation baseball having a continuous spiraling line on its surface, said line extending from a first point on the ball surface and spirals to a second point on the ball surface, said first and second points being positioned at spaced locations on a diametrical axis of the ball; said line having a width selected from the range of one-fourth to one-half inch and a single color selected from the group, red, green, yellow or blue; said ball when thrown will display a dot as seen by a pitcher, batter or catcher.

4,991,839
GOLF CLUB SUPPORT DEVICE
John R. Lumbattis, Jr., 6051 Lee Dr., Cypress, Calif. 90630
Filed Jan. 8, 1990, Ser. No. 461,822
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—32 R 5 Claims



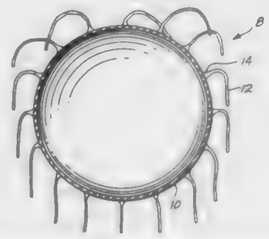
1. A support mechanism for slightly elevating the handgrip portion of a prone golf club from a wet grass surface, comprising a flat disk having two flat side faces and a hole extending through the disk in interconnecting relationship to the disk faces; an annular elastomeric grommet having a peripheral groove therearound that defines an annular groove bottom surface and two facing parallel side faces; said elastomeric grommet being mounted in said hole, with the groove bottom surface confronting the edge surface of the hole and the groove side surfaces in gripping engagement with the disk side faces; said grommet having a radially inwardly facing annular surface adapted to grip the handgrip portion of a golf club; said disk having at least one outer supporting edge thereof spaced from the inwardly facing surface of the grommet by a distance not less than one inch and not more than three inches, whereby when the golf club is laid on wet grass said outer support edge of the disk will engage the ground surface to space the handgrip portion of the club above the tips of the grass blades.

4,991,840
UNINFLATED TETHERED FOOTBALL PRACTICE KICKING AID
John C. Patton, P.O. Box 67, La Pryor, Tex. 78872, assignor to John C. Patton, La Pryor and R. E. Peppy Blount, Longview, both of, Tex.
Filed Nov. 29, 1989, Ser. No. 442,661
Int. Cl.[5] A63B 67/00
U.S. Cl. 273—55 B 1 Claim



1. In a football device for kicking practice comprising (1) a football of regulation size and weight and (2) tether means for said football comprising two spaced apart stakes and two segments of rope of relatively equal length connecting said stakes with said football, said segments of the rope extending outwardly from opposed sides of the football and being oppositely spaced apart, the improvement comprising using as said football, a football fabricated from injection molded thermoplastic polyester elastomer having a flexural modulus of about 117 MPa, a nominal durometer hardness of about 470, a melt flow rate of about 5.5 g/min., melting point at peak of endotherm of about 208° C. and at the extrapolated end point of about 225° C., a compression set after 22 hours at 70° C., 2.8 MPa load of about 2 and a specific gravity of about 2; said football having two opposing openings through which a rope is passed; said rope, after passing through said holes, forming said two segments of rope of relatively equal length extending outwardly from said football and connecting said stakes with said football.

4,991,841
NOVELTY BALL
Arlen C. Paranto, 39009 114th St. E., Eatonville, Wash. 98328
Continuation-in-part of Ser. No. 383,607, Jul. 24, 1989, Pat. No. 4,927,141. This application Apr. 23, 1990, Ser. No. 512,487
Int. Cl.[5] A63B 37/14, 43/02
U.S. Cl. 273—58 K 7 Claims

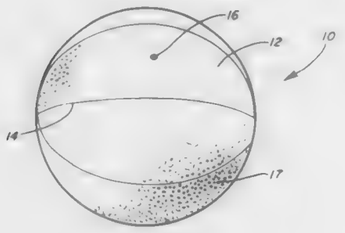


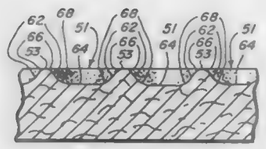
1. A novelty ball useful for the development of motor skills and for other purposes which comprises:
a hollow, generally spherical resilient ball; and

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a multiplicity of flexible whisker means having one end anchored to and protruding from the ball generally along radii thereof, said whiskers having at least some drape when the ball is at rest but not so much drape so that they hang limply from the ball.

4,991,842
GRIP ENHANCED BASKETBALL
Charles O. Finley, 155 N. Michigan Ave., Chicago, Ill. 60601
Continuation-in-part of Ser. No. 404,663, Sep. 8, 1989, Pat. No. 4,928,962. This application Feb. 1, 1990, Ser. No. 473,589
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] A63B *41/08*
U.S. Cl. 273—65 EG 5 Claims

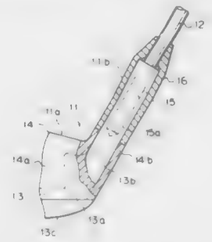




1. A grip enhanced substantially spherical sports ball comprising a plurality of laterally spaced recesses formed on an exterior thereof, each recess having a substantially polygonal open outer side and a wall converging from the open outer side towards a closed bottom wall, and a network of interconnected ridges separating adjacent recesses, each ridge in cross section having a narrow outer surface, sides diverging from the outer surface, and rounded segments interconnecting the outer surface to the sides.

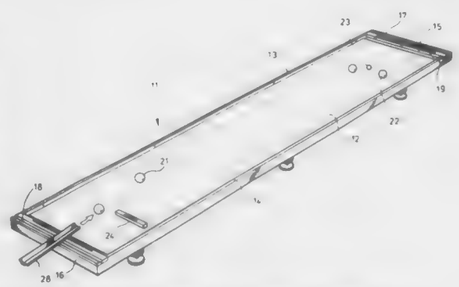
4,991,843
GOLF CLUB WITH A PLASTIC HEAD
Masahiro Mori, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Mar. 23, 1989, Ser. No. 327,670
Claims priority, application Japan, Apr. 8, 1988, 63-46769
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—80.3 9 Claims

1. A golf club comprising a head and a shaft connected to said head, said head comprising a metal core member including a metal core body portion and a first metal neck portion integrally extending from said metal core body portion, and an outer member of a plastic or a fiber reinforced plastic material covering a substantial part of said metal core body and a bottom part of said fist metal neck portion for constituting at least a hitting portion for hitting a golf ball and a second neck portion integrally extending from said hitting portion to cover said bottom part of said first metal neck portion of said metal core member such that a substantial part of said first metal neck portion extends outside from said second neck portion to form a free end without being covered by said second neck portion, said free end of said first metal neck portion of said metal core member having a bore formed therein for insertion of said shaft, said bore, extending from a tip end of said free end to a



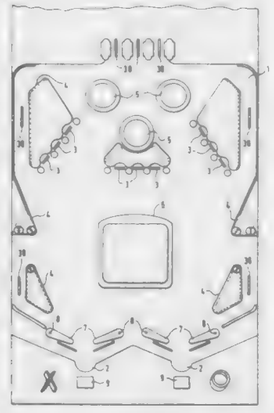
position where a tip end of said second neck portion is positioned such that said free end can be bent in order to adjust an angle of said shaft with respect to said head without causing damage to said second neck portion.

4,991,844
APPARATUS FOR PLAYING A BALL GAME
David G. Derry, Muddlewood, Gonvena, Wadebridge, Cornwall, England
Filed May 9, 1989, Ser. No. 349,257
Claims priority, application United Kingdom, May 12, 1988, 8811246.1
Int. Cl.[5] A63D *3/02;* A63B *71/00*
U.S. Cl. 273—120 R 9 Claims



1. Apparatus for playing a ball, game, comprising:
a playing surface,
a plurality of balls having an eccentric distribution of mass, and
means for initiating rolling movement of a selected one of said balls in a way which preserves the orientation of the eccentricity of mass distribution of said ball with respect to the rolling axis thereof, wherein said balls have a spherical outer surface and said eccentric mass distribution of said balls is produced by forming a generally radially extending cavity therein such that spherical outer surface of said ball to define a first axis joining the barycenter and the geometric center of said spherical outer surface, and further wherein one end of said axis defined by the straight line joining said geometric center of the spherical surface of a ball and said barycenter of the mass thereof is marked with an index detectable in one of a visual and tactile manner.

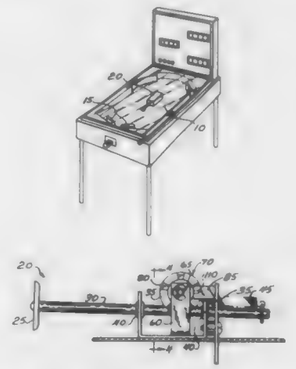
4,991,845
FLIPPER GAME
Wolfgang Wies, Goettinger Strasse 5, 6090 Ruesselsheim, Fed. Rep. of Germany
Filed Jun. 15, 1989, Ser. No. 366,488
Int. Cl.[5] A63F *7/00;* H03K *17/00*
U.S. Cl. 273—121 A 13 Claims



1. A flipper game apparatus for playing by a multitude of players comprising balls of first and second different types, a playing surface having first and second ends, means for introducing balls on to the playing surface for the balls to roll thereover, a multiplicity of outlets located adjacent at one of said ends for said balls which have rolled over said playing surface, a plurality of switch means each adapted to be actuated by a ball encountering same as it rolls over said playing surface, a plurality of flippers flanking said outlets, means adapted to be operated by a player for actuating said flippers, a respective sensor means operatively associated with at least some of said switch means and responsive only to one type of ball, and a circuit adapted upon actuation of said switch means to distinguish the types of ball from each other by means of said sensor means.

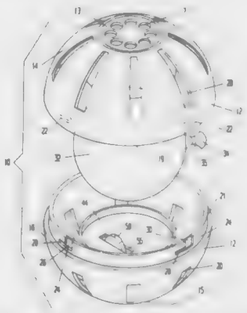
4,991,846
VARIABLE POSITION TARGET ASSEMBLY
Donald M. Sondej, Cicero, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.
Filed Oct. 23, 1989, Ser. No. 424,992
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—127 R 10 Claims

1. A variable position target assembly for pinball games, comprising:
a target connected to one end of a linearly displaceable shaft, said shaft being supported on a playfield for linear displacement in response to being struck by a pinball; and,
transducing means for converting the linear position of said shaft to an electrical signal, said electrical signal indicating



discretely the position of said shaft at a plurality of points along the longitudinal axis of said shaft.

4,991,847
TIMED WATER RELEASE TOY
Elliot Rudell, 6556 Sattes Dr., Rancho Palos Verdes, Calif. 90274; George Foster, 2700 Panorama Dr. #404, Signal Hill, Calif. 90806, and Joseph Cernansky, 2369 W. 246th Pl., Lomita, Calif. 90717
Continuation-in-part of Ser. No. 299,225, Jan. 23, 1989, Pat. No. 4,890,838. This application Nov. 13, 1989, Ser. No. 433,593
Int. Cl.[5] A63F *9/100;* A63B *71/00*
U.S. Cl. 273—138 R 14 Claims



5. A toy comprising a container with a rigid, foraminous wall totally free of any external appendages, and totally enclosing an interior chamber, an enclosure totally received within said interior chamber and filled with water and having opening means at a well surface location, a wall opening means with a timer mechanism also contained within said interior chamber and positioned in operative engagement therein to activate said wall opening means, and including randomly selectable time setting means whereby the duration of time interval between setting of said time setting means and activation of said wall opening can be preset.

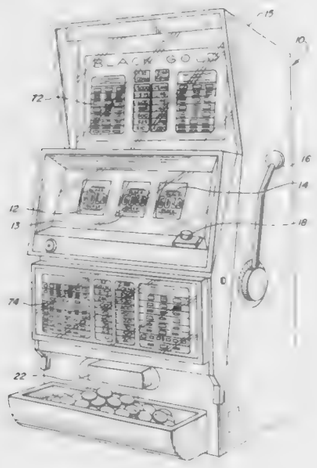
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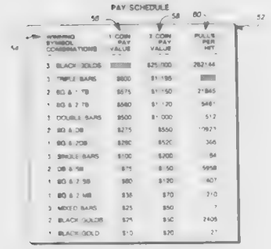
4,991,848

GAMING MACHINE WITH A PLATEAUED PAY SCHEDULE

Nick E. Greenwood, Reno, Nev., and Dominic Tiberio, Addison, Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Aug. 7, 1989, Ser. No. 390,026
Int. Cl.[5] A63F *5/04*
U.S. Cl. 273—143 R 22 Claims





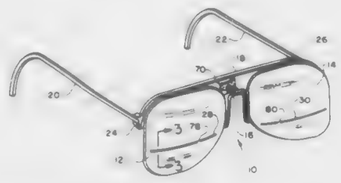
1. A gaming apparatus having a coin input, a memory, a processor for randomly selecting and displaying a plurality of indicia wherein certain predetermined combinations of the indicia result in corresponding payouts comprising:
detection means operatively associated with the processor for detecting the selected indicia;
pay means operatively associated with said detection means and the processor for generating a pay signal representing one of the payouts according to a first pay schedule contained in said memory wherein said pay schedule is composed of a maximum win corresponding to one of the predetermined combinations of indicia wherein said maximum win is at least 1000 times greater than the value of a coin input, at least four of the predetermined combinations result in payouts that are less than but within 80% of an administrative value, wherein said administrative value is based upon an external administrative requirement, and wherein the remaining predetermined combinations result in payouts less than said administrative value.

4,991,849

GOLFING SPECTACLES

John P. Fabanich, 4301 Colorado Ave., Lorain, Ohio 44054

Filed Dec. 18, 1989, Ser. No. 451,634
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 B 3 Claims



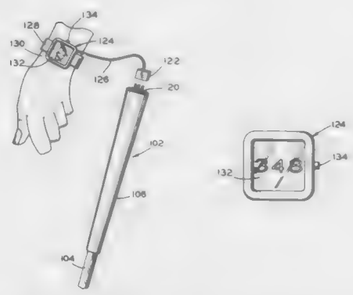
1. A golfing spectacle to be worn by a golfer in aligning a golf ball with a target object comprising:
a lens frame member,
a pair of tinted translucent lenses, each lens provided with a horizontal clear line on the lenses surface thereon, said translucent lenses affixed to said lens frame member,
wherein each horizontal clear line is terminated by said lens surface, each of said clear lines being located on each of said lens surfaces proximately adjacent to said nose piece, and
an adjusting assembly for adjusting the distance from the lenses to the golfer's eyes, such that said golfer, when looking through said golfing spectacles, sees the golf ball through the horizontal clear lines inside of a frame defined by said tinted lens surface located on each lens, said frame extending from the golf ball to the target object, and
said defined frame providing the golfer with greater means for concentration in lining the golf ball along said clear path, said clear path being the means by which the golfer lines the golf ball to the target object.

4,991,850

GOLF SWING EVALUATION SYSTEM

Donald F. Wilhlem, Maumee, Ohio, assignor to Helm Instrument Co., Inc., Maumee, Ohio

Continuation-in-part of Ser. No. 151,068, Feb. 1, 1988, abandoned. This application Dec. 22, 1988, Ser. No. 289,231
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 A 16 Claims



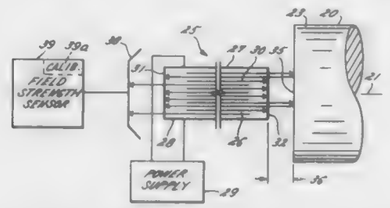
1. A golf swing evaluation system comprising:
a golf club including a shaft having a club head with a golf ball striking face attached at one end and a grip portion attached to an opposite end;
a plurality of sensing means embedded within said club head and oriented for sensing an impact of said striking face on a golf ball and for generating associated sensor signals representing characteristics of said impact including at least a force of said impact and a location of said impact on said striking face;
a force circuit electrically connected to said sensing means and being responsive to said sensor signals for generating an indication signal representing said characteristics of said impact; and
means responsive to said indication signal for generating a visual indication of said characteristics of said impact, said visual indication including a peak magnitude force indication and a graphic indication of the location of said impact on said striking face.

4,991,851

REFLECTIVE GOLF BALL AND METHOD

Ruben Melesio, 324 Sunset Dr., Palatine, Ill. 60067

Filed May 9, 1990, Ser. No. 521,299
Int. Cl.[5] A63B *43/06, 69/36*
U.S. Cl. 273—213 3 Claims



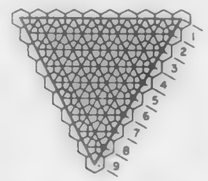
1. A golf ball for nighttime use, said golf ball comprising a golf ball having an outer surface, and a solid layer of light reflecting material consistency essentially of reflective glass beads disposed on said surface.

4,991,852

MULTI-PURPOSE GOLF BALL

John W. Pattison, 7007 Pine Vista, Houston, Tex. 77092

Filed Apr. 28, 1989, Ser. No. 345,166
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 1 Claim



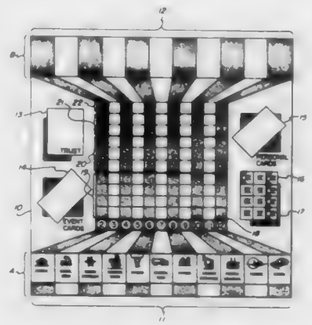
1. A multi-purpose golf ball having 812 concave hexagonal surface depressions uniformly arranged over the surface thereof,
each of said hexagonal depressions having a surface diameter in the range of from 0.090 inches to 0.140 inches and having a depth in the range of from 0.002 inches to 0.014 inches,
said 812 hexagonal depressions being uniformly arranged over the surface of the ball in a nine frequency geodesic or curved icosahedral pattern defined by twenty main triangles with each side of each main triangle divided into nine parts to form a total of 812 intersecting vertices uniformly distributed over the entire surface of the ball, and
each of said depressions being centered on the point of intersection of each of the vertices.

4,991,853

FINANCIAL BOARD GAME APPARATUS

Nathaniel E. Lott, 20 Hairs Ct., Westport, Conn. 06880

Filed Aug. 28, 1989, Ser. No. 399,023
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—242 8 Claims



1. A board game for two or more players comprising;
(A) a game board having delineated theron a plurality of tracks each track bearing a different number each number representing a different company, said companies names and company symbols being denoted in adjacent rectangular spaces along one edge of saidgame board;
(B) said rectangular spaces being an integral part of said tracks said tracks proceeding across said game board to the opposite edge ending in adjacent rectangular spaces along said opposite edge of said game board said rectangular spaces along said opposite edge being an itegral part of said tracks;
(C) said game further comprising a plurality of stock certificates for each company denoted on said game board the face of each of said stock certificate denoting thereon the name and company symbol of the company so represented, the reverse side of each of said stock certificate bearing indicia representing the value and quarterly dividend of said stock certificate at various levels of play;
(D) a plurality of chairman of the board business cards, one each of said business cards representing one of said companies denoted on said game board, the face of said business card denoting thereon the name and company symbol of the company so represented, the reverse side of said business card bearing indicia representing the quarterly salary of the chairman of the board at various levels of play,
(E) a deck of personal cards each card having denoted thereon a situation that will impact the player holding said chairman of the board business cards
(F) a deck of event cards each card having denoted thereon an event and a percentage value that will impact the current company in play;
(G) a plurality of simulated currency to be used to conduct various financial transactions;
(H) two or more dice; and
(I) a plurality of pawns.

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EDUCATIONAL BOARD GAME

Adrienne J. Weiss, 707 Pine Valley Dr., Pittsburgh, Pa. 15239

Division of Ser. No. 181,501, Apr. 14, 1988, Pat. No. 4,890,844. This application Nov. 8, 1989, Ser. No. 433,566
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—249 6 Claims

1. A game for stimulating a plurality of participants to improve language skills in learning to interpret the meaning of idiomatic expressions comprising,

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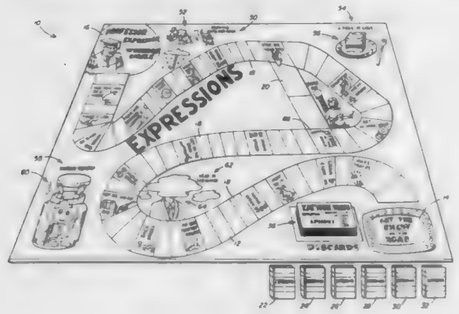
a game board having a playing field defined by a course extending in a continuous path from a start point to a finish point,

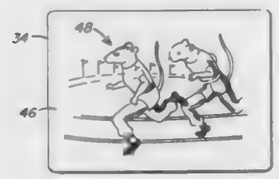
said continuous path being divided into increments from said start point to said finish point,

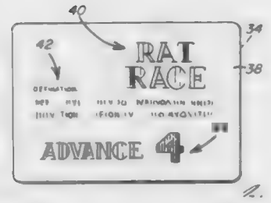
a plurality of game pieces representing the respective positions of the participants on said course between said start and finish points,

a deck of cards, each card in said deck having on one face thereof an idiomatic expression, a definition of the idiomatic expression as understood in the language of the expression, and a number for determining incremental advancement of said respective game pieces along said continuous path, each of said cards having a different idiomatic expression thereon,

each card having on an opposite face an illustration being symbolic of said idiomatic expression,







said card face bearing said illustration being revealed to an answering participant for abstractly interpreting said illustration with said card face bearing the idiomatic expression being concealed from said answering participant,

said game piece of said answering participant being advanced a selected increment along said path upon said answering participant first translating the illustration into a known idiomatic expression and identifying said idiomatic expression followed by correctly defining the meaning of said idiomatic expression as understood in the language symbolically represented by said illustration on said card face, and

said game pieces of said participants being progressively advanced along said path in response to identifying said idiomatic expression and then correctly defining the meaning of said idiomatic expression until one of said participants is the first to reach said finish point.

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APPARATUS FOR PLAYING A GAME

Richard Hazlewood, 7 Firs Close, Hitchin, Hertfordshire, England

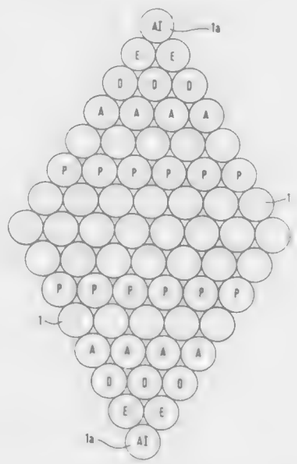
PCT No. PCT/GB87/00065, § 371 Date Jul. 29, 1988, § 102(e) Date Jul. 29, 1988, PCT Pub. No. WO87/04636, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 30, 1987, Ser. No. 227,910

Claims priority, application United Kingdom, Jan. 31, 1986, 8602488; Mar. 27, 1986, 8607649

Int. Cl.[5] A63F *3/02*

U.S. Cl. 273—258 **7 Claims**



1. Apparatus for playing a game, the apparatus comprising a generally rhomboidal playing area and first and second sets of playing pieces, the sets being associated, in use, with a pair of opposing players, the playing pieces of the first set having a first identifiable characteristic, and the playing pieces of the second set having a second identifiable characteristic distinguishable from the first identifiable characteristic, the playing area having an n×n array of playing positions, where n is an integer greater than 5, the playing positions at a pair of opposed apices of the playing area being designated target playing positions, each target playing position having an identifiable characteristic corresponding to that of a respective set of playing pieces, and each set of playing pieces having a master playing piece and at least first, second and third groups of playing pieces, each first group having at least two identical playing pieces each of which is movable over the playing area from a given playing position in either the vertical direction or the horizontal direction to any playing position in the chosen direction of movement, provided it does not jump over any other playing piece, each second group having at least three identical playing pieces each of which is movable over the playing area from a given playing position in any diagonal direction to any playing position in the chosen direction of movement, provided it does not jump over any other playing piece, and each third group having at least four identical playing pieces each of which is movable over the playing area from a given playing position either vertically to an adjacent playing position or horizontally to an adjacent playing position and then in any diagonal direction to an adjacent playing position, each master playing piece being movable over the playing area from a given playing position to an adjacent playing position in any of the horizontal, vertical and diagonal directions.

4,991,856

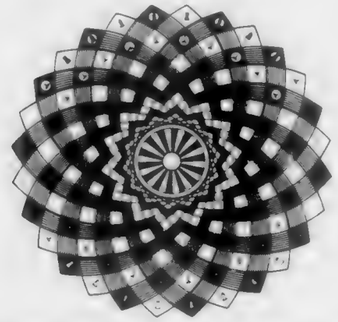
CIRCULAR CHESS GAME BOARD

Curtis Hoerbelt, 90 Townline Rd., Lancaster, N.Y. 14086

Filed Jul. 11, 1989, Ser. No. 378,592

Int. Cl.[5] A63F *3/02*

U.S. Cl. 273—261 **5 Claims**



1. A circular game board for play of a game of a variety of chess by two or more players, the board comprising:

a plurality of playing spaces arranged in circular ranks and radial files, said circular game board being bounded by an outermost periphery comprising an outer circular rank and an innermost periphery comprising an inner circular rank, the playing spaces each being distinguishable into two sets, a first set of playing spaces being distinguished by a first color and a second set of playing spaces being distinguished by a second color;

a plurality of diagonal paths, each diagonal path extending in an arcuate fashion from the outermost periphery to the innermost periphery, each diagonal path having a common set of playing spaces;

a plurality of non-playing spaces distinguishable from said playing spaces by a third color, a non-playing space being alternatingly disposed between each of the playing spaces in each of the diagonal paths; and

a neutral central area bounded by the innermost periphery.

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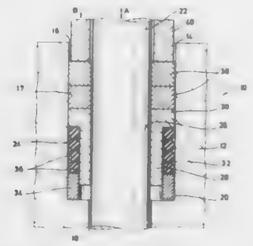
STUFFING BOX ASSEMBLY

Frederick B. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Filed Nov. 22, 1989, Ser. No. 440,497

Int. Cl.[5] F16J *15/18*

U.S. Cl. 277—102 **4 Claims**



1. A stuffing box assembly comprising:

a body having an axial bore defined by a generally cylindrical wall;

a shaft extending concentrically through said bore;

a sleeve disposed in said bore in relatively movable, surrounding relationship to said shaft, said sleeve including a cylindrical portion and an annular, radially outwardly extending flange portion, an annulus being formed between said cylindrical portion and said wall;

at least one annular member formed of an elastomeric material disposed in said annulus;

stop means to limit movement of said annular member away from said flange portion, said stop means including a portion extending into said annulus, said annular member being disposed between said flange portion and said stop means, said sleeve being axially movable relative to said stop means;

a seal for sealing between said shaft and said wall, said seal being disposed between said shaft and said wall on the opposite side of said flange portion from said annular member; and

means to urge said seal against said flange portion whereby said annular member is compressed and exerts a reactive force against said flange portion, said annular member serving to form a seal between said wall and said cylindrical portion of said sleeve when compressed.

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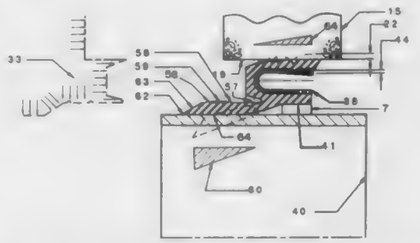
CONNECTOR SEAL

Ernesto M. Abila, and Vito J. Ciminello, both of Sugarland, Tex., assignors to Hamilton Kent Manufacturing, Inc., Houston, Tex.

Filed Mar. 7, 1989, Ser. No. 320,151

Int. Cl.[5] F16J *9/08, 9/00;* **F16L** *33/16*

U.S. Cl. 277—205 **13 Claims**



1. A connector seal for sealing a hole in a wall of a fluid-containing well wherein a section of open-ended pipe or conduit passes through the hole to position its open end within the well, said connector seal comprising:

an elastomeric annularly shaped body comprising an inner surface which defines a first opening which is larger in diameter than the pipe to be inserted through it;

an elastomeric lip portion projecting from said body circumferentially away from said first opening toward the fluid-containing well and tapering toward the center of a cylinder defined by said inner surface to define a second opening which is smaller in diameter than the pipe which is to be inserted through it so that said lip portion must flex radially outwardly upon insertion of the pipe while pressing against the outer surface of the pipe to thereby form a tight seal;

and an outer portion curvedly projecting outwardly from said body to, in combination with said body, form a U-shaped cross section and thereby define a channel which is positioned concentrically between said body and said outer portion, said outer portion having an outer contact surface which defines a circle slightly greater in diameter than the hole in the wall into which the connector seal is inserted in order to form a tight seal with that wall; and

an annular spring ring shaped to conform to said channel defined by said U-shaped cross section and positioned within said channel to ensure that when said connector seal is inserted into the hole in the wall said curvedly projecting outer portion will only deflect minimally, thereby ensuring that said outer contact surface provides a tight seal against the hole.

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SELF-TIGHTENING DRILL CHUCK

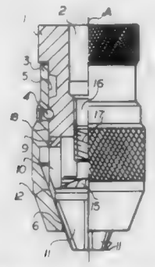
Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 16, 1990, Ser. No. 510,037

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1989, 3920075

Int. Cl.[5] B23B *31/12*

U.S. Cl. 279—60 **8 Claims**



1. A self-tightening drill chuck comprising:
a chuck body adapted to be mounted on a drill spindle for rotation about an axis;
a tightening sleeve surrounding the body, formed with a substantially frustoconical seat centered on the axis, and having a front end turned away from the chuck body and formed with a plurality of radially inwardly open, angularly offset, and axially extending grooves;
means securing the sleeve on the chuck body for rotation about the axis thereon but against axial movement thereon;
a jaw guide in the sleeve formed with a plurality of axially forwardly open and angularly spaced slots and having a front end formed with respective radially outwardly projecting ridges engaged in the grooves; and
respective jaws axially and radially displaceable in the slots and on the seat.

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DRILL CHUCK

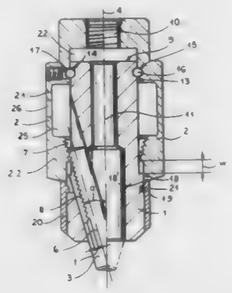
Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,734

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808155

Int. Cl.[5] B23B *5/22*

U.S. Cl. 279—62 **3 Claims**



1. A drill chuck comprising:
a chuck body centered on a chuck axis and formed with a rear end,
substantially cylindrical rear outer surface centered on the axis adjacent the rear end, and
itself formed with an outwardly open annular groove,
a front end, and
a plurality of circumferentially spaced angled guides opening at the front end of
the body and laterally intermediate
the chuck-body ends;
respective jaws in the guides each formed with a row of teeth exposed at the respective lateral openings between the chuck-body ends;
a tightening sleeve centered on the chuck axis and formed with a base defining
a substantially cylindrical rear inner surface
riding on the cylindrical rear outer surface of the body and
formed with an inwardly open annular groove confronting the groove of the body, a forward end,
a rear end axially confronting the rear end of the chuck body and formed with a central hole adapted to receive a drill spindle,
a one-piece front end ring, axially forward said rear inner surface and formed internally with a screw thread meshing with the exposed teeth of the jaws such that rotation of the sleeve about the axis relative to the chuck body in one direction urges the jaws axially forward;
means including at least one coupling element in the grooves axially coupling the sleeve to the body while permitting relative rotation between the sleeve and the body about the axis;
the portion of said sleeve bore extending between the rear end of the body and the forward end of the sleeve being a first portion, the portion of said body extending between the rear end of the body and the forward end of the sleeve being a second portion, said first portion of said sleeve bore being of a diameter greater than the greatest diameter of the second portion of the body.

4,991,861

BICYCLE VEHICLE HAVING FRONT AND REAR STEERABLE WHEELS

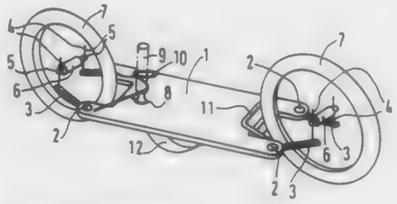
Rozenn M. F. Carn, and Gwendoline M. K. Carn, both of 17, Cite de Kerguelen, FR 29000, Quimper, France

PCT No. PCT/FR88/00165, § 371 Date Nov. 29, 1988, § 102(e) Date Nov. 29, 1988, PCT Pub. No. WO88/07467, PCT Pub. Date Oct. 6, 1988

PCT Filed Apr. 5, 1988, Ser. No. 286,956

Int. Cl.[5] A63C *17/06*

U.S. Cl. 280—87.042 **7 Claims**



1. A coaster comprising
a front wheel, the front wheel being rotative about a front axle;
a rear wheel spaced from the front wheel, the rear wheel being rotative about a real axle;
a footplate supported between the front and rear wheels, the footplate having a top and a bottom; and front and rear steering means respectively interconnecting the front and rear wheels to the footplate,
the steering means respectively interconnecting the front axle and the rear axle to the footplate;

each steering means comprising the pair of spaced arms having first and second ends, the respective first arm ends being pivotally interconnected to the footplate by pivot pins;
pairs of vertical rods respectively connected to the second ends of the front wheel arms and to the second ends of the rear wheel arms;
a cursor respectively positioned on each of the vertical rods, the front wheel axle being secured between a first pair of cursors and the rear wheel axle being secured between a second pair of cursors;
the said respective pairs of arms, an axle and the portion of the footplate defined between pivot pins defining front and rear trapeziums, each trapezium having a large base and a small base, the said axles being the respective small base of each trapezium.

4,991,862

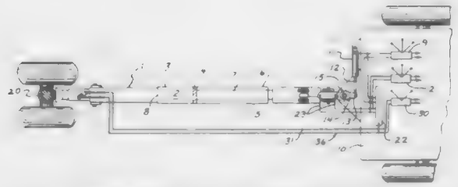
AIRCRAFT TOWING APPARATUS

Keh C. Tsao, Mequon, and Mark R. Heckenkamp, Brookfield, both of Wis., assignors to University of Wisconsin-Milwaukee, Milwaukee, Wis.

Filed Apr. 26, 1989, Ser. No. 343,340

Int. Cl.[5] B64C *25/50;* **B60D** *1/62*

U.S. Cl. 280—421 **1 Claim**



1. A universal single operator controlled tow bar for ground transport of aircraft comprising:
a towbar having an aircraft coupling end and an opposite end containing semi-permanent coupling means for rotatably attaching to a tow vehicle;
a hydraulic cylinder attached at its cylinder end to said towbar and a piston rod end of said cylinder rotatably attached to said tow vehicle for controlling vertical movement of aircraft coupling end of said towbar, movement of said piston rod in said hydraulic cylinder controlled by admitting and releasing hydraulic pressure to said cylinder from a control valve located in tow vehicle;
a second hydraulic cylinder attached at its cylinder end to said tow vehicle a piston rod end of said cylinder attached to linkage means connected to said towbar for controlling horizontal movement of aircraft coupling end of said towbar, movement of said piston rod in said hydraulic cylinder controlled by admitting and releasing hydraulic pressure to said cylinder from a control valve located in tow vehicle;
an internal hydraulic cylinder means for extending and reducing the length of said towbar by admitting and releasing hydraulic pressure to said hydraulic cylinder means from a control valve in tow vehicle;
electrical contacting means for establishing telephone communication between tow vehicle and aircraft during tow operation including electric spring loaded contacts located on tow vehicle and connected to telephone communication system in tow vehicle said contacts arranged to cooperate during coupling with aircraft fixed electric contacts leading to aircraft communication system;
hydraulic positioning means controlled by admitting hydraulic pressure controlled from a valve in tow vehicle to either side of a two position piston where in locked towing position a valve located in aircraft probe is positioned by movement of said piston to disassociate aircraft controlling steering pressure lines to render aircraft freewheeling and permitting steering control solely from the tow vehicle and in unlocked position said piston positions said valve to connect aircraft controlling steering pressure lines allowing steering control of aircraft solely from aircraft;
aircraft locking means for locking and unlocking said towbar to the aircraft nose wheel probe for aircraft towing, said aircraft locking means consisting of said two position piston located in said towbar controlled by means of a control valve located in tow vehicle where said locking means consists of a plurality of locking balls contained in said towbar when in said locked towing position are forced into engagement by movement of said piston with a locking groove on said aircraft probe and when in said unlocked position said locking balls are disengaged from said groove.

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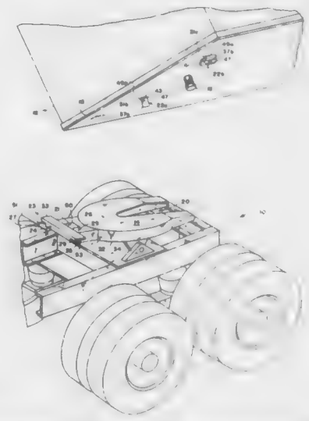
ANTI-JACKKNIFE APPARATUS FOR TRAILER TRUCKS

Jimmy D. Hosmer, Scottsboro, Ala., assignor to Jim-Jak, Inc., Scottsboro, Ala.

Continuation-in-part of Ser. No. 418,280, Oct. 6, 1989. This application Apr. 2, 1990, Ser. No. 502,820

Int. Cl.[5] B62D *53/06*

U.S. Cl. 280—432 **19 Claims**



1. An apparatus for limiting turning movement between a truck tractor and a trailer coupled thereto by means of a kingpin secured to and extending downward from a wear plate under the trailer and a kingpin-receiving aperture in a fifth wheel horizontally disposed on the tractor, the fifth wheel having a front edge that traverses an arcuate path against said wear plate upon relative movement of the tractor and trailer around the axis of the kingpin, comprising:
a pair of stop blocks securable to the underside of said wear plate on opposite sides thereof outside said arcuate path;
a latch block supportable by said fifth wheel and movable back and forth from a deployed position substantially coplanar with the fifth wheel and extended forward from said front edge, whereby the latch block will come into contact with one of said stop blocks upon turning of the vehicle to a predetermined extent, to a retracted position where the latch block will not come into such contact;
said latch block including a longitudinally extending body and a pair of laterally extending arms each having an end region adapted to engage a stop block in intermeshing relation, preventing further lateral or downward movement upon making contact therewith;
wherein said end regions have a vertically extending end surface and a corner notch on the lower side of the region

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defining a section of reduced thickness adjacent to said end surface and the stop blocks at their inward facing ends each having a vertically extending surface adapted to come into flush contact with a said end surface of a latch block arm and a projecting ledge defining a cavity for receiving said area of reduced thickness above the ledge and securing the latch block and from being sprung downward past a stop block upon being engaged;

means for deploying said latch block; and

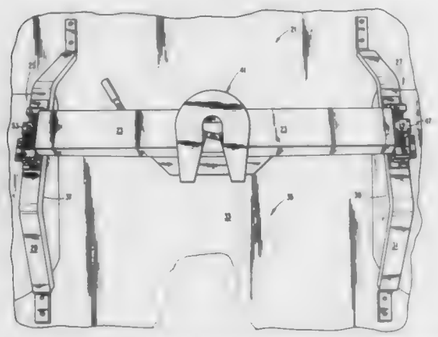
framework means for supporting said latch block and said means for deploying the same.

4,991,864

FORCE ABSORBER FOR A TOW VEHICLE-TRAILER CONNECTION

George Potsch, R.R. #1, Box 24, Goodland, Ind. 47948

Filed Mar. 3, 1989, Ser. No. 318,820
Int. Cl.[5] B62D *53/06*
U.S. Cl. 280—441 35 Claims



1. A device for absorbing forces between a tow vehicle and a trailer, comprising:

first means for absorbing force mountable to the tow vehicle;

second means for allowing force mountable to the tow vehicle;

a transverse cross member coupled to said first and second means for absorbing forces and having means for coupling said cross member to the trailer disposed between said first and second means for absorbing forces, wherein said first means for absorbing force includes:

(a) a guide member oriented in a slide direction generally along the direction of travel of the tow vehicle;

(b) means for mounting said guide member to the tow vehicle;

(c) a slide body having means for coupling to said cross member and longitudinally slidable along said guide member, said slide body has means for pivoting said means for coupling to said cross member with respect to said guide member on a pivot axis oriented generally vertically with respect to said slide direction of said guide member to allow pivoting of said cross member between said first and second means for absorbing force; and

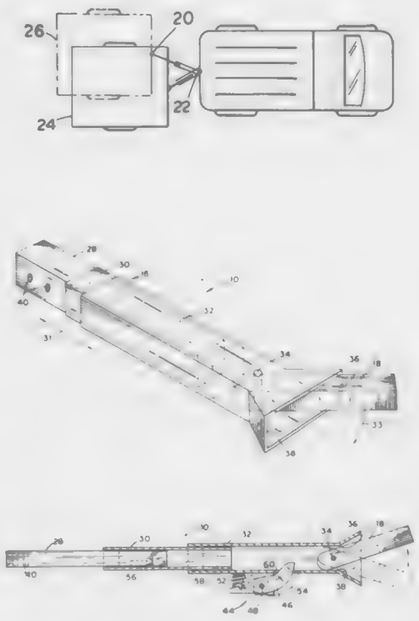
(d) biasing means for resiliently biasing against movement of said slide body along said guide member.

4,991,865

AUTOMATIC SELF-ALIGNING TRAILER HITCH

Thomas E. Francisco, 27 Sherry Dr., Cheektowaga, N.Y. 14303

Filed Aug. 21, 1989, Ser. No. 396,981
Int. Cl.[5] B60D *1/14*
U.S. Cl. 280—477 11 Claims



1. An automatic, self-aligning trailer hitch assembly for use with a towing vehicle and towed vehicle comprised of:

(a) a first attachment means for attaching a first end of said hitch assembly to said towing vehicle;

(b) an integral second attachment means for pivotally attaching a second end of said hitch assembly to said towed vehicle;

(c) telescoping means for longitudinally extending and contracting said hitch assembly to a predetermined maximum length and a predetermined minimum length, respectively, said telescoping means is comprised of at least a first tubular integral telescoping member and a second tubular integral telescoping member said first telescoping member is pivotally attached to said second attachment means, said second telescoping member is removably attached to said first attachment means, and:

1. said first attachment means is comprised of a first attachment member and a second attachment member, said first attachment member has a first end with a cross-sectional shape which is substantially congruent with the cross-sectional shape of said second telescoping member and said second attachment member is removably connected to said first attachment member;

2. at least one of said integral first and second telescoping means is comprised of at least one projection disposed within and integrally connected to the inner surface of said telescoping member;

(d) means for allowing said first telescoping member to pivot in a horizontal axis;

(e) means for limiting the extent to which said first telescoping member may pivot in said horizontal axis;

(f) means for preventing said first telescoping member from pivoting in a vertical axis; and

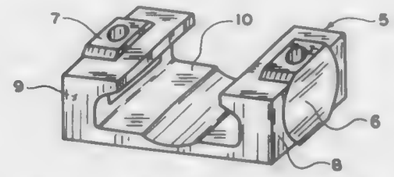
(g) stop means for preventing the extension of said telescoping members beyond a first specified point.

4,991,866

CLAMP ASSEMBLY FOR SKI BINDING

Manfred Bader, Peissenberg, and Edwin Lehner, Garmisch-Partenkirchen, both of Fed. Rep. of Germany, assignors to Marker Deutschland GmbH, Eschenlohe, Fed. Rep. of Germany

Filed Aug. 2, 1989, Ser. No. 388,986
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1988, 3826270
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—631 4 Claims



1. A clamp for mounting a base plate of a ski binding to a ski, said base plate operative to move longitudinally along the axis of said ski and including outwardly extending side sections, said clamp comprising:

a pair of opposed side portions having inwardly facing guide means operative to engage said side sections of said base plate and to guide said base plate along said longitudinal axis of said ski, each side portion including a cylindrical recess, said recesses extending along a common axis which is transverse to the axis of said ski;

a pair of cylindrical members dimensioned to be received within said recesses said side portions including an upper surface and a lower surface and said cylindrical recesses communicating with said upper and lower surfaces through openings formed therein; and

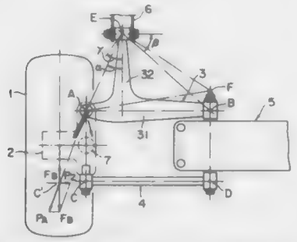
means for securing the lower portion of said cylindrical members into fixed engagement with said ski, wherein said side portions are capable of limited pivotal movement on said cylindrical members about said transverse axis.

4,991,867

REAR SUSPENSION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Shoichi Washizu; Yoshimitsu Kobayashi, and Hideo Shimada, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 505,998
Claims priority, application Japan, Apr. 12, 1989, 64-92632
Int. Cl.[5] B60G *3/20*
U.S. Cl. 280—690 2 Claims



1. A rear suspension system for an automotive vehicle including a rear wheel, a support member for rotatably supporting said rear wheel and a rear lower arm having one end pivotally supported on a vehicle body and the other end pivotally supported on said vehicle body at a rearward portion with a center of said rear wheel, comprising;

a T-shaped front lower arm provided with a lateral arm portion disposed parallel to said rear lower arm and a forward arm portion extending forwardly from an intermediate part of said lateral arm portion,

said lateral arm portion having a first pivotal point pivotally supported on said vehicle body and a second pivotal point pivotally supported on said support member at a forward portion with the center of said rear wheel,

said forward arm portion having a third pivotal point pivotally supported on said vehicle body via a bush, which is located inwardly from a line extending through the second pivotal point and an intersection defined by an extension line extending from a center line of the rear lower arm and a central plane of the rear wheel,

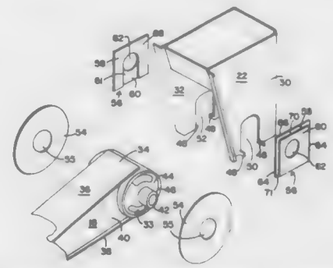
said bush having a ratio of a longitudinal spring constant thereof to a lateral spring constant thereof, which is smaller than a ratio of a tangent of an angle defined by a line extending through the third pivotal point and the first pivotal point as well as a lateral axis of the vehicle to a tangent of an angle defined by a line extending through the third pivotal point and the second pivotal point as well as a longitudinal axis of the vehicle.

4,991,868

VEHICLE SUSPENSION BEAM PIVOT CONNECTION

Ervin K. VanDenberg, North Canton, Ohio, assignor to The Boler Company, Itasca, Ill.

Filed Dec. 19, 1989, Ser. No. 452,631
Int. Cl.[5] B60G *11/28*
U.S. Cl. 280—711 3 Claims



1. In a beam-type axle suspension system for a frame membered wheeled vehicle, said suspension system comprising an elongated, longitudinally extending beam connected at one end to a hanger bracket by way of a resilient bushing means, said hanger bracket being connected to said frame member of said wheeled vehicle, and wherein said hanger bracket is comprised of two laterally spaced and opposing side walls, spring means located at the opposite end of said elongated beam from said resilient bushing means and further connecting said elongated beam to the frame member of the wheeled vehicle, means for connecting an axle to the beam located intermediate the ends of the beam, the improvement comprising:

means for aligning the axle of said system with respect to said wheeled vehicle, said aligning means comprising an elongated open-ended aperture located within each of said laterally spaced side walls of said hanger bracket, said resilient bushing means comprising a tubular member extending through a resilient bushing, said resilient bushing being located between the spaced side walls of said hanger bracket, and said tubular member extending between, through and past the peripheral edges of the side walls of said hanger bracket and being located in said open-ended apertures, said tubular member having a diameter less than the width of said open-ended aperture so as to be longitudinally and laterally movable within said aperture, thereby to allow said tubular member to be slidably placed in or removed from said apertures and movable within said apertures a sufficient distance to allow said axle to be aligned with respect to said vehicle,

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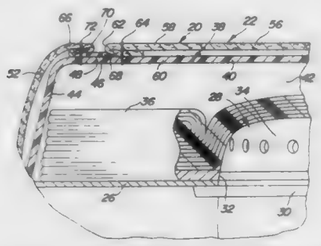
a first plate having an open-ended aperture therewithin and being of a width only slightly greater than the diameter of said tubular member and less than the width of said open-ended apertures in said side walls of said hanger bracket, and a second plate having a closed-ended orifice therewithin having a diameter only slightly greater than the diameter of said tubular member, said first plate being connected to the outer surface of a spaced side wall of said hanger bracket and said second plate being connected to said first plate such tht said first plate is located between said side wall and said second plate, said tubular member extending through and beyond said first and second plate and being connected to said second plate.

4,991,869

COVER ASSEMBLY FOR OCCUPANT RESTRAINT SYSTEM

Philip W. Hopf; Robert L. Jones, both of Centerville, and Eric D. Carlson, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1989, Ser. No. 416,181
Int. Cl.[5] B60R *21/20*
U.S. Cl. 280—731 6 Claims



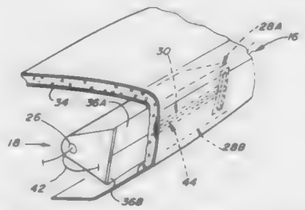
1. In an occupant restraint system having a generally box like container housing an inflatable cushion and including an upper wall provided with a tear pattern having a longitudinal leg and lateral legs which define first and second severable wall sections, the common edges of the wall sections being provided by the longitudinal leg of the tear pattern and the side edges of the wall sections being provided by the lateral legs of the tear pattern, the wall sections opening outwardly and oppositely of each other about hinge lines spaced from the common edges thereof upon inflation of the cushion and rupture of the upper wall along the tear pattern, a decorative cover assembly covering the container wall and including first and second cover portions, each generally coextensive with a respective container wall section, and side portions located to the sides of the first and second cover portions, the longitudinal edges of the first and second cover portions being spaced from each other across the longitudinal leg of the tear pattern and the lateral edges of the first and second cover portions being spaced from the side portions of the cover across the lateral legs of the tear pattern, first flap means extending from a longitudinal edge of one of the cover portions across the longitudinal leg of the tear pattern and into engagement with the common edge of the other cover portion, and second flap means extending from the side portions of the cover across the lateral legs of the tear pattern and into engagement with the lateral edges of the first and second cover portions, the first and second flap means providing decorative concealment of the tear pattern when the cushion is not inflated.

4,991,870

METHOD AND ARRANGEMENT FOR FORMING AN AIR BAG DEPLOYMENT OPENING IN AN AUTO INTERIOR TRIM PIECE

Julie A. Beusterien, Farmington Hills, and Richard E. Powell, Pleasant Ridge, both of Mich., assignors to Tip Engineering Group, Inc., Farmington Hills, Mich.

Filed Aug. 28, 1989, Ser. No. 399,026
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 4 Claims



4. A method of forming one or more air bag deployment doors in an automotive vehicle interior trim piece comprising the steps of:

coating an inner surface of said trim piece in a pattern forming said one or more doors with a material comprising a carrier containing particles of an explosive dispersed therein;

curing said carrier to form a durable deposit on said inner surface; and

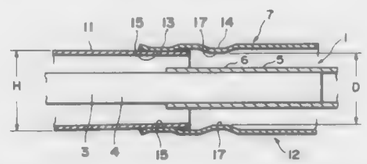
detonating said explosive upon activation of said air bag system.

4,991,871

COLLAPSIBLE STEERING COLUMN APPARATUS

Kiyoshi Sadakata, Gunma, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1990, Ser. No. 475,833
Claims priority, application Japan, Dec. 11, 1989, 1-142034[U]
Int. Cl.[5] B62D *1/18*
U.S. Cl. 280—777 7 Claims



1. A collapsible steering column apparatus comprising:

a steering shaft in which a steering wheel is fixed to one end and a whole length in an axial direction can be contracted; and

a steering column in which a whole length in an axial direction can be contracted by inserting an edge portion of an inner column to the inside of an edge portion of an outer column,

wherein a first engaging portion is formed near the edge portion of the outer column, the first engaging portion comprises a pair of first arc portions which face each other and are respectively come into contact with an outer peripheral surface of the edge portion of the inner column and a pair of second arc portions which are arranged between the pair of first arc portions and are away from the outer peripheral surface of the edge portion of the inner column by having a radius of curvature which is smaller than a radius of curvature of the outer peripheral surface of the edge portion of the inner column, a second engaging portion is formed in a portion which is slightly

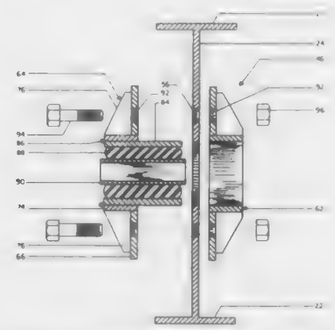
near the center of the outer column than the first engaging portion, the second engaging portion comprises a pair of third arc portions which face each other and are respectively come into contact with the outer peripheral surface of the edge portion of the inner column and a pair of fourth arc portions which are arranged between the pair of third arc portions and are away from the outer peripheral surface of the edge portion of the inner column by having a radius of curvature which is smaller than the radius of curvature of the outer peripheral surface of the edge portion of the inner column, and a length of the pair of third arc portions is set to be longer than a length of the pair of first arc portions.

4,991,872

LOW-BED TRAILER SUSPENSION SYSTEM

Gregory A. Richardson, Holton, Mich., assignor to Neway Corp., Muskegon, Mich.

Filed May 4, 1990, Ser. No. 519,164
Int. Cl.[5] B60G *7/02*
U.S. Cl. 280—788 24 Claims



1. A trailing arm suspension for a frame beam including a web having an opening, the suspension comprising inner and outer pivot brackets adapted to be secured to opposite sides of said web in alignment with each other and with said opening, a bushing in said pivot brackets, a bushing core carried by said bushing and extending in opposite directions out of said pivot brackets, fastening means extending through said bushing core, and pivotally mounting a trailing arm, said trailing arm including a front portion in the form of a yoke including two 10 spaced arms, said arms opposing opposite ends of said bushing core and being carried by said fastening means.

4,991,873

SLIDER STOPPING MECHANISM FOR AUTOMATIC SEATBELT SYSTEM

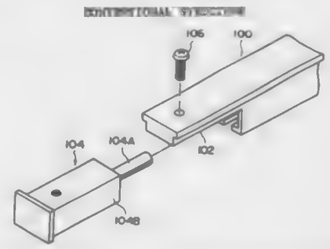
Kenji Matsui; Tatsuo Yamashita; Kazuyoshi Ishiguro, and Toshikatsu Kondo, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan

Filed Oct. 23, 1989, Ser. No. 425,114
Claims priority, application Japan, Oct. 27, 1988, 63-140125
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 20 Claims

1. In an automatic seatbelt system including (a) an elongated guide rail extending in a longitudinal direction of a vehicle and having a groove formed along the longitudinal axis thereof, (b) a slider, a part of which is supported by being accommodated in said groove in such a manner as to be movable in the longitudinal direction of said vehicle and by which one end of a webbing worn by a seat occupant of said vehicle is supported, and (c) driving means for driving in such a manner as to move said slider to one end of said guide rail from an opposite end of said guide rail along the longitudinal axis of said guide rail so as to apply said webbing to said occupant or release the application thereof, a slider stopping mechanism for an automatic seatbelt system for stopping the movement of said slider at one end of said guide rail while simultaneously cushioning the impact of said slider against said slider stopping mechanism, comprising:

a switch which is inserted in one end of said groove from said one end of said guide rail and stops the driving of said driving means by switching when said slider is moved from said opposite end of said guide rail to a predetermined switch-triggering position in the vicinity of said one end of said guide rail;

a resilient shock-absorbing means which is fitted to and wholly disposed in said groove at said one end of said guide rail in proximity to said switch and with which said slider is brought into contact; and



a movement hindering means which penetrates said shock-absorbing means so that at least a portion of said shock-absorbing means is interposed between said movement hindering member and said slider, and which is firmly anchored to at least said guide rail, said movement hindering means being able to hinder the movement of said shock-absorbing member in a direction toward said one end of said guide rail when said slider is brought into contact with said shock-absorbing member by the action of said driving means; wherein, said movement hindering means acts in combination with said shock-absorbing means and said switch upon impact of said slider to reliably and quietly stop said slider, while significantly minimizing shock of stopping impact of said slider by cushioning due to the interposition of said shock-absorbing means between said slider and said movement hindering means.

4,991,874

WEBBING RETRACTOR

Hiroshi Tsuge, and Shinji Mori, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Mar. 28, 1990, Ser. No. 500,561
Claims priority, application Japan, Mar. 31, 1989, 1-38895[U]
Int. Cl.[5] B60R *22/32, 22/36*
U.S. Cl. 280—806 18 Claims

11. A webbing retractor for winding a webbing which is fastened around a seat occupant of a vehicle, comprising:

a take-up shaft around which said webbing is wound by an urging force;

a ratchet wheel which is coaxial with respect to said take-up shaft and which is rotated together with said take-up shaft;

a claw member which is pivotal between a first position at which said claw member engages said ratchet wheel and prevents rotation of said take-up shaft in a direction in which said webbing is drawn out and a second position at which said claw member is separated from said ratchet wheel and enables rotation of said take-up shaft;

a first urging means for urging said claw member to said second position;

a sensing means operated when it detects sudden reduction in a speed of the vehicle;

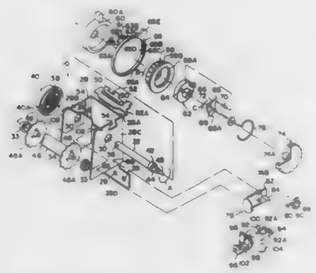
a rotary wheel which is coaxial with respect to said take-up shaft and which is rotatable relative to said take-up shaft,

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said rotary wheel being coupled to said take-up shaft an rotated in the direction in which said webbing is drawn out when said sensing means is operated;

a driving plate which is rotatable relative to said rotary wheel, said driving plate causing said claw member to pivot from said second position to said first position when rotated in the direction in which said webbing is drawn out;

an engaging lever supported on said driving plate, said engaging lever being pivotal between a third position at which said engaging lever couples said rotary wheel to said driving plate so as to rotate said driving plate in the direction in which said webbing is drawn out when said



rotary wheel is rotated in the direction in which said webbing is drawn out and a fourth position at which it disconnects said rotary wheel from said driving plate;

a cam ring which si coaxial with respect to said take-up shaft and which is pivotal between a first state in which said cam ring presses said engaging lever toward said third position and a second state in which said cam ring presses said engaging lever toward said fourth position;

a second urging means for urging said cam ring in a direction in which said cam ring is maintained in said first state; and

an unlocking means for causing said claw member to pivot from said first position to said second position and for displacing said cam ring from said first state to said second state.

4,991,875

SKI POLE MOUNTED WINDSCREEN

James W. McDermott, Rte. 6, Box 1224, Ellensburg, Wash. 98929

Filed Nov. 1, 1989, Ser. No. 430,575
Int. Cl.[5] A63C *11/22*
U.S. Cl. 280—816 **15 Claims**

1. A ski pole mounted windscreen to be mounted between a pair of elongated ski pole shafts and dimensioned to shield the head and torso of a user riding on a ski chair lift, comprising:

a sheet of flexible material having opposed first and second longitudinal edges jointed by transverse end edges;

the end edges being spaced apart by a distance approximately equal to the seated height of the user's head and torso;

the first and second longitudinal edges being spaced apart by a distance approximately equal to the width between a user's shoulders;

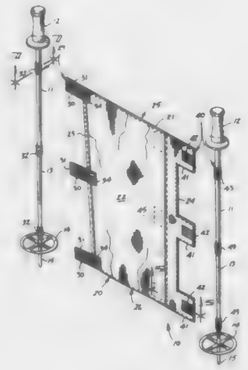
first fastener means along the first longitudinal edge for fastening the first longitudinal edge to a first securing means fixed on a first ski pole shaft and for securing the first longitudinal edge to the first ski pole shaft against longitudinal movement thereon;

said sheet being sufficiently flexible to be rolled onto itself from an unrolled operative condition, to a rolled storage condition around the first ski pole;

a second fastener means along the second longitudinal edge for selectively securing the second longitudinal edge to a second securing means fixed on a second ski pole against longitudinal movement thereon with the sheet in said operative condition, and for selectively securing the second longitudinal edge to the first ski pole shaft with the sheet in said rolled storage condition; and

wherein the sheet dimensions and the first and second fastener means are positioned in relation to one another and to the ski poles to enable a user, while seated on a chair lift to: (a) unroll the sheet from the rolled storage condition around the first ski pole, (b) connect the second fastener





means to the second ski pole, (c) grasp the first and second ski poles and hold them in front of the torso with the sheet spanning the torso laterally across the shoulders and longitudinally along the torso and head for protection against climatic elements, (d) to subsequently disconnect the second fastener means from the second ski pole, (e) roll the sheet back onto the first ski pole shaft to the rolled storage condition, and (f) fasten the second fastener means to a third fastener means to maintain the sheet in the rolled storage condition.

4,991,876

CONNECTOR ASSEMBLY FOR HOT WATER HEATERS AND OTHER APPLIANCES

Philip Mulvey, St. Charles, Ill., assignor to Euroflex, S.A., Seine, France

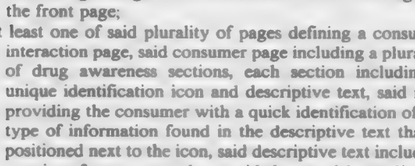
Filed Jul. 28, 1989, Ser. No. 387,178
Int. Cl.[5] F16L *13/02*
U.S. Cl. 285—21 **15 Claims**

1. A connector assembly for connecting a water line of an appliance, comprising:

a composite fitting assembly for connection to a hose and to an internally threaded water line associated with an appliance, said appliance comprising a hot water heater;

said composite fitting assembly having a male electrically conductive tubular outer fitting and an electrically insulative tubular insert;

said male outer fitting having a tubular neck with a plurality of outwardly extending barbs including an intermediate barb and a terminal barb for engaging said hose, an externally threaded water line-engaging male portion extending from and in substantial coaxial alignment with said neck for threadedly engaging said internally threaded water line of said hot water heater, said male outer fitting having a flange-receiving face adjacent said externally



threaded portion and defining an internal cavity for receiving said insert;

said insert having a flange for positioning against and seating upon said face of said male fitting and for engaging said water line of said hot water heater, said insert having an elongated tubular body extending from said flange for positioning in said internal cavity of said male outer fitting; and

said composite fitting assembly including an O-ring positioned about said tubular body adjacent said flange for sealing said insert to said fitting.

4,991,877

DRUG INFORMATION COMMUNICATION SYSTEM EMPLOYING CARDS, ICONS AND A DISPLAY RACK WITH INTEGRAL INDEXING SYSTEM

Michael L. Lieberman, 301 E. 62nd St., New York City, N.Y. 10021

Filed Jan. 31, 1990, Ser. No. 475,978
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—36 **7 Claims**

1. A system for conveying information to consumers of prescription drugs, said system comprising:

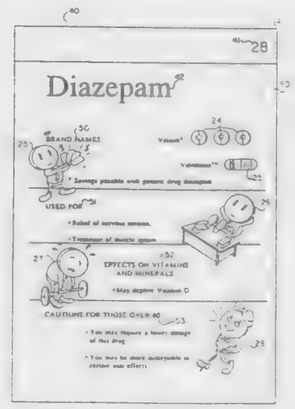
an information card having a plurality of pages including a front page;

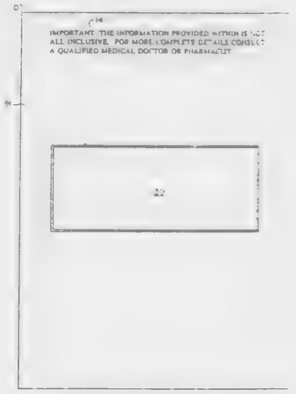
said front page having information printed thereon, said information including an information band across the top of the front page, said information band including a unique index identification symbol for identifying a drug the name of which also appears on said front page;

a plurality of drug information sections each section including a unique identification icon and descriptive text, said icon providing the consumer with a quick identification of the type of information found in the description text that is positioned next to the icon, said drug information sections being arranged next to each other down the length of the front page;

at least one of said plurality of pages defining a consumer interaction page, said consumer page including a plurality of drug awareness sections, each section including a unique identification icon and descriptive text, said icon providing the consumer with a quick identification of the type of information found in the descriptive text that is positioned next to the icon, said descriptive text including a series of statements about said drug and box adjacent each statement, said box providing an identification block for the consumer to mark and create a permanent record on said consumer page of the relevance of said statements; and

at least one of said plurality of pages defining a drug instruction page, said instruction page including a plurality of drug instruction sections, each section including a unique identification icon and descriptive text, said icon providing the consumer with a quick identification of the type of information found in the descriptive text that is positioned





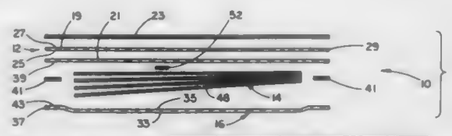
next to the icon, said descriptive text providing instructions concerning the drug listed on the information band.

4,991,878

LABEL ASSEMBLY WITH REMOVABLE BOOKLET

Randy G. Cowan; Richard J. Donovan, and Barron G. McKillip, all of Sioux Falls, S. Dak., assignors to CCL Product Identification, Inc., Grand Rapids, Mich.

Filed May 10, 1990, Ser. No. 521,574
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 **20 Claims**



1. A label assembly for use in marking a product and supplying informational material, said label assembly comprising:

a base label defining front and rear surfaces, said front surface having a first indicia thereon and said rear surface having a first adhesive applied thereto to affix said base label to a product;

an over-laminate sheet adapted to overlie said base label;

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a second adhesive applied between said base label and said over-laminate sheet to releasably affix said over-laminate sheet to said base label and define a pocket therebetween, said second adhesive being cleanly removable from said base label when said over-laminate is removed therefrom; and

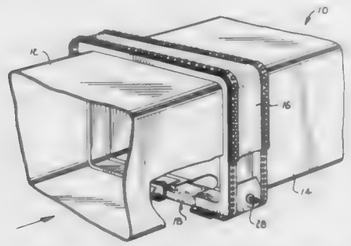
informational material defining a front cover portion, said informational material being located within said pocket, said front cover portion being visible through said over-laminate sheet and having a second indicia printed thereon, such that said second indicia functions to mark the product while said over-laminate sheet is affixed to said base label, and said first indicia functions to mark the product after the removal of said over-laminate sheet and informational material.

4,991,879

METHOD AND APPARATUS FOR JOINING TWO RELATIVELY MOVABLE MEMBERS

Dale L. Miller, 525 Nashua Rd., Liberty, Mo. 64068

Filed Nov. 6, 1989, Ser. No. 434,859
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—236 15 Claims



1. A flexible coupling positioned between spaced apart first and second sections of a duct for conveying a gas stream carrying particulate material wherein said sections are coupled together to form a closed passage for said gas stream and said coupling acts to retard the accumulation of solid particulate material in the space between said structures, said coupling comprising:

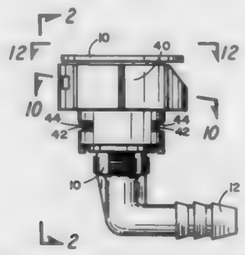
an inflatable member characterized by a gas permeability factor sufficient to accomodate the flow of gas through the member while the member remains inflated.

4,991,880

QUICK CONNECT COUPLING WITH TWIST RELEASE

René F. Bernart, Homeworth, Ohio, assignor to Handy and Harman Automotive Group, Inc., New York, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,255
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—321 11 Claims



8. An improved readily attachable and detachable coupling for fluid conduits, comprising:

a receptacle member having a passageway therethrough coincident with a longitudinal axis and having a first end, the passageway having an enlarged internal diameter portion adjacent said first end, the receptacle member having first and second spaced apart notches formed therein, each notch extending from the receptacle member exterior surface into said enlarged diameter passageway, each notch having a forward wall in the direction towards said first end and a rearward wall in the direction away from said first end, the rearward wall of each notch being in a common plane intersecting said receptacle member longitudinal axis at an acute angle and the forward wall of each notch being in a plane intersecting the receptacle member longitudinal axis substantially radially thereof;

a tubular plug member having a forward end portion having an external diameter less than said receptacle member passageway and being slidably receivable within said receptacle member, the plug member having a short length, radially extending circumferentially enlarged external diameter portion spaced from said forward end, the enlarged diameter portion being slideably receivable within said receptacle member enlarged internal diameter passageway;

first and second retention wires each having opposed ends and being received about said receptacle member and fixed axially thereto and each wire having a generally straight portion which is received within a said notch and the balance of each wire in both directions away from said straight portion being curved around at least a substantial portion of, but less than all of the external circumferential surface of said receptacle member, the opposed ends of each said retention wire being thereby displaced away from said substantially straight portion, said plug member being insertable within said receptacle member passageway, the enlarged diameter portion displacing said straight portion of each said retention wire outwardly and on said rearward wall of each said notch, and after the enlarged diameter portion passes each of said wire straight portions the wire straight portions each returns to their seated positions rearwardly of said enlarged plug member diameter portion to thereby retain said plug member within said receptacle member; and

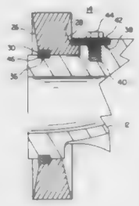
means carried by said receptacle member of simultaneously engaging one of each said ends of each of said retention wires and displacing said engaged ends in the direction towards said straight portions to thereby displace said retention wires straight portions within said first and second notches outwardly relative to said receptacle member passageway and away from said seated positions whereby said enlarged diameter portion of said plug member may pass said retention wires to enable said plug member to be withdrawn from said receptacle member.

4,991,881

VALVE FLANGE RETAINMENT SYSTEM

James R. Davis, and Melvin L. Osgood, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Jul. 10, 1989, Ser. No. 378,405
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—330 5 Claims



1. In combination:

a pipeline device having a body defining a circumferential groove;

a split ring positioned in said groove;

a loosely mounted flange secured to said body by said split ring; and

removable means engaging both said flange and said body for securing said flange in position on said body, said removable means precluding both lateral and rotational movements between said body and said flange, said removable means capable of being loosely applied and still precluding said movements.

4,991,882

FLUID-TIGHT CONNECTOR

Heinz U. Gähwiler, Domat, Switzerland, assignor to EMS-Inventa AG, Switzerland

Filed Mar. 24, 1989, Ser. No. 328,479
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841246
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—331 89 Claims



20. A connector including a male member and a female member adapted to mate therewith,

said female member being hollow and having a female axis therethrough, an annulus defining a plane substantially perpendicular to said axis, a substantially cylindrical hollow nozzle within said annulus, said nozzle having an outer diameter smaller than an inner diameter of said annulus, thereby defining a space therebetween, a hollow portion extending in a first direction away from said male member and being substantially coaxial with said nozzle,

said annulus being supported by at least one strut which extends from said annulus in said first direction and is affixed to said female part at a point adjacent an intersection of said nozzle and said portion,

said male member being generally cylindrical and hollow with a male axis therethrough and comprising a collar of outer diameter smaller than said inner diameter of said annulus and an inner diameter larger than said outer diameter of said nozzle, whereby said collar is adapted to occupy said space, said male member and said female member, when connected, forming a passage for flow of fluids therethrough,

said female member carrying at least one detent and said male member comprising a flange, said flange and said detent being complementary to each other whereby, when said male member is inserted into said female member, a stop on said detent abuts a face on said flange to secure said male and female members together,

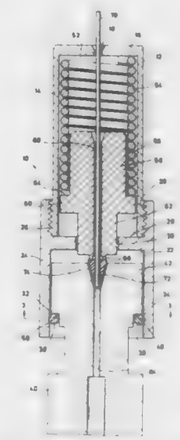
said detents comprising ramps extending in said first direction and radially inward to said stop and said flange comprising a slope extending in a second direction opposite to said first direction and radially outward to said face.

4,991,883

CONNECTION APPARATUS

Raymond D. Worden, Houston, Tex., assignor to Ruska Laboratories, Inc., Houston, Tex.

Filed Sep. 25, 1989, Ser. No. 411,929
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—334.4 9 Claims



1. An apparatus for connecting a first conduit having a first bore to a second conduit having a second bore to provide communication between said first and second bores comprising:

a base;

means to attach said base to said first conduit;

a cap, said second conduit extending through said cap;

means to attach said cap to said base;

a follower slidably disposed in said cap, said follower having a passageway therethrough, said second conduit extending through said passageway;

a ferrule received on said second conduit, said ferrule having a first end and a second end;

biasing means operative to urge said follower against said first end of said ferrule;

said first bore in said first conduit having a frustoconical surface defining receiving formation for said ferrule, said ferrule second end of said having a portion which is circular when viewed in transverse cross section such that when said second end of said ferrule is urged into said receiving formation by said biasing means, said ferrule engages said frustoconical surface defining said receiving formation in substantially line contact.

4,991,884

SELF-PRESENTING SECONDARY HOOD LATCH RELEASE AND HOOD POP-UP

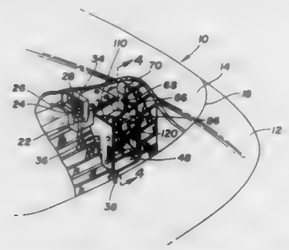
Donnell A. Cairns, Columbia, Tenn., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1990, Ser. No. 561,390
Int. Cl.[5] E05B *3/00*
U.S. Cl. 292—28 3 Claims

1. In a vehicle body having a closure panel hinged for movement between opened and closed positions, a primary latch means for retaining the closure panel in the closed position and being releasable to allow movement of the closure panel from the closed position toward the opened position, a secondary latch means for limiting further movement towards the opened position of the vehicle closure panel upon partial opening movement of the vehicle closure panel subsequent to release of the primary latch means, and a pop-up and release handle mechanism comprising;

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a pop-up means for urging the vehicle closure panel towards the opened position;
a flexible push-pull cable;
a secondary latch means handle connected to the secondary latch means by the flexible push-pull cable; and
presenter means connecting the pop-up means to the secondary latch means handle for moving the secondary latch



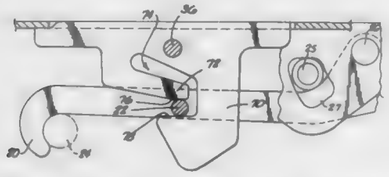
means handle from a retracted position beneath the closure panel to an extended position extended from the closure panel as the closure panel moves from the closed position, whereby the secondary latch means handle is in the extended position, accessible by the operator to release the secondary latch means allowing movement of the vehicle closure panel to the opened position.

4,991,885

TRIGGER LOCK CAM

L. Richard Poe, Long Beach, Calif., assignor to The Hartwell Corporation, Placentia, Calif.

Continuation of Ser. No. 92,001, Sep. 2, 1987, Pat. No. 4,877,274. This application Aug. 16, 1989, Ser. No. 394,634
Int. Cl.[5] E05C *5/00*
U.S. Cl. 292—113 **3 Claims**



1. A latch handle assembly for securing a latch having a trigger pin comprising:
a handle pivotally joined to the latch;
a trigger latch pivotally joined to said handle and including a trigger opening engageable onto the trigger pin;
at least one cam plate pivotally mounted onto said trigger latch; and
biasing means for biasing said cam plate against the trigger pin.

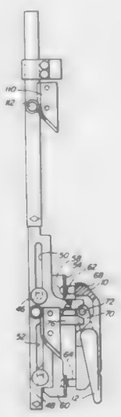
4,991,886

WINDOW LOCK

Douglas A. Nolte, Owatonna, and Peter E. Braun, Faribault, both of Minn., assignors to Truth Incorporated, Owatonna, Minn.

Continuation of Ser. No. 297,490, Jan. 17, 1989, abandoned. This application Jun. 7, 1990, Ser. No. 535,282
Int. Cl.[5] E05C *9/02*
U.S. Cl. 292—161 **16 Claims**

1. A window lock for a window having a window frame and a movable window sash comprising, a slider having a cam member, a ramped keeper, and means for moving the slider in a path extending lengthwise thereof to cause the cam member to coact with the ramped keeper in establishing either a locked or unlocked condition of the window; the improvement comprising: multi-point locking of the window sash to the window frame by utilization of at least two of said ramped keepers and two of said cam members, each of said ramped keepers having an inclined ramp section and a generally planar section, and said slider having a length of movement along said path greater than that required to move a cam member along said ramp



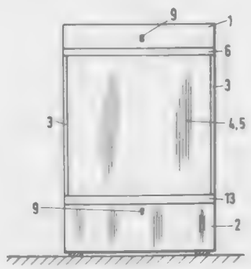
section and onto a planar section of a ramped keeper whereby delayed lock-up of one cam member and associated ramped keeper may be achieved relative to the other cam member and ramped keeper by having said ramped keepers at a distance apart greater than the distance between said cam members, and a planar section of a ramped keeper having a length greater than said difference in distances.

4,991,887

DEVICE FOR LOCKING A SLIDING DOOR OF A SHOWCASE HAVING A FRAME CONSTRUCTION

Till H. Hahn, Frankfurt am Main, Fed. Rep. of Germany, assignor to Glasbau Hahn GmbH & Co. KG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 17, 1989, Ser. No. 382,473
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824638
Int. Cl.[5] E05C *17/56*
U.S. Cl. 292—251.5 **8 Claims**



1. A device for locking a sliding door of a showcase having a frame construction in the showcase body, the sliding door comprising a glass pane and at lease one support member (6, 13) and the glass pane aligning in the closed position of the sliding door with other parts of the showchase body, which comprises parallel transport means (14) fixed to the frame construction whereby the sliding door (4) is opened by moving horizontally thereon and by shifting laterally by means of said at least one support member, at least one permanent magnet (7)

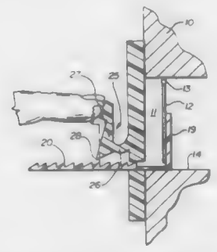
in the showcase body holding said at least one support member directly or by means of a member (8) in the rest position of the sliding door, said support member or said member (8) consisting of magnetic flux conductive material, said permanent magnet (7) having an electric coil which releases the horizontal and lateral movement of the sliding door (4) when a direct electric current flows by neutralizing the magnetic holding force.

4,991,888

CHILD-PROOFING DEVICE FOR TAPE CASSETTE PLAYERS

Edwin T. Cinnamond, 231 N. Fourth St., Danville, Ky. 40422

Filed Feb. 7, 1990, Ser. No. 476,258
Int. Cl.[5] E05C *19/18*
U.S. Cl. 292—296 **5 Claims**



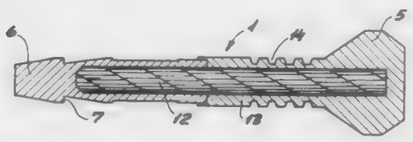
1. A child-proofing device for a tape cassette player having a cassette opening with an inwardly pivotable door comprising
(a) a tongue element comprising
i. an elongated body,
ii. a flange on one side of one end portion of the body sized to fit through the opening past the door, and
iii. ratchet teeth across the same side of the body at the opposite end portion thereof and inclined toward the flange;
(b) a block sized to span the outside of the opening and formed with a hole through which said opposite end portion of the body is insertable; and
(c) detent means on the block engageable with the ratchet teeth on said opposite end portion of the body to prevent and disengageable therefrom to allow displacement of the flange relative to the body;
(d) whereby after the flange is inserted through the opening past the door the opposite end portion of the body is pulled back to bring the flange against the backside of the closed door and be held there by the detent means engaging the ratchet teeth and upon disengagement of the detent said opposite end portion is pushed to displace the flange inwardly clear of the door and then pulled out of the cassette opening while the door is manually held open.

4,991,889

SEAL WITH ANNULAR GROOVES

Preben M. Remark, Tjornevej 10, DK-2800 Lyngby, Denmark

Continuation of Ser. No. 269,014, May 20, 1981, abandoned. This application Aug. 26, 1985, Ser. No. 769,756
Claims priority, application Denmark, Sep. 28, 1979, 4077/79
Int. Cl.[5] E05B *39/02*
U.S. Cl. 292—327 **8 Claims**



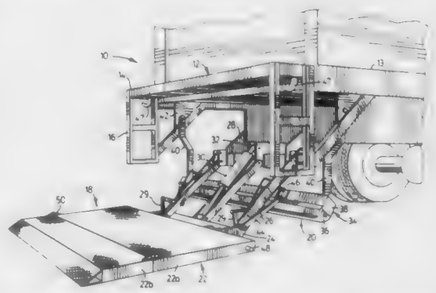
1. A seal device applicable, especially to closure means for containers comprising a male part and a female part, said male part comprising an elongated shank having first and second ends, protuberant stop means at said first end for preventing withdrawal of said shank from said closure means by said first end, a male ferrule on said second end having a smaller lateral dimension than said stop means thereby allowing insertion of said shank in said closure means by said second end, said female part having a socket for reception of said male ferrule, and said device including locking means for cooperating with said male ferrule and said socket to couple said male and female parts within said socket when said male ferrule is inserted in said socket, whereby said female part prevents withdrawal of said shank from said closure means, characterized in that said shank comprises a wire means and a rigid layer to stiffen and brace the wire means, said rigid layer including a plurality of annular grooves to create lines of weakness, said rigid layer permitting the male and female parts to be interlocked with a stroke of a hammer without unraveling said wire means.

4,991,890

RETRACTABLE BUMPER BAR

William C. Paulson, Georgetown, Canada, assignor to S.B.R. Limited, Guernsey, Channel Islands

Continuation of Ser. No. 260,304, Oct. 20, 1988, abandoned. This application Apr. 25, 1990, Ser. No. 513,022
Int. Cl.[5] B60R *19/38*
U.S. Cl. 293—118 **6 Claims**



1. For use with a tailgate assembly on a motor vehicle frame, a bumper assembly comprising:
a bumper bar carrying a pair of laterally projecting, spaced arms, one end of each of the arms being fixed to the bumper bar and the other end adapted to be pivotally mounted on the frame of the vehicle; and,
rigid bar linkage means connected at one end with the bumper bar and adapted to be connected at the other end with the tailgate assembly, whereby upon lowering the tailgate said links urge the bumper bar to swing out of the path of the tailgate into a position suspended beneath the frame and spaced above ground.

4,991,891

REMOVABLE LOCKING SIDE GUARD FOR VEHICLE PROTECTION

Philipp G. Karsbens, 1572 Mendocino St., Livermore, Calif. 94550

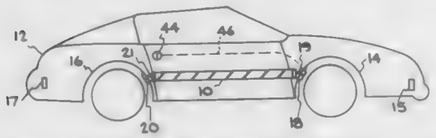
Filed Mar. 21, 1989, Ser. No. 326,513
Int. Cl.[5] B60R *19/42*
U.S. Cl. 293—128 **19 Claims**

1. Apparatus for protecting the side of a vehicle, comprising:
a protective guard of elongated shape with two ends;
guard attachment means secured at the ends of the protective guard, the guard attachment means comprising

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clamp means attached to an end of the protective guard, a pivoting arm pivotably attached at one end to the clamp means, and a connection member extending substantially at right angles from the other end of the pivoting arm;

recessed securing means mounted in the vehicle and recessed from the side surface which releasably engage the connection member of the guard attachment means for



mounting the protective guard along the side of the vehicle at a height determined by the length of the protective guard, position of the securing means, length of the pivoting arm and angle of the pivoting arm to the protective guard;

electrical circuit means formed in the protective guard which connect to a security alarm system.

4,991,892

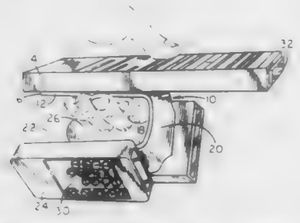
REMOTE CONTROL HOLDER

Dale E. Burrell, 4912 Reynolds Ct., Pontiac, Mich. 48054

Filed Apr. 18, 1989, Ser. No. 339,975

Int. Cl.[5] A47F *7/00*; B65D *69/00*

U.S. Cl. 294—1.1 **18 Claims**



1. A holder for multiple remote control devices comprising:

a central body:

a plurality of elongate support members integrally formed with and extending outwardly and downwardly from the central body, each support member including:

(a) a shoulder portion attached to and contiguous with the central body;

(b) a base opposed to the shoulder portion;

(c) opposed side edges extending from the shoulder portion to the base, the side edges of each support member being spaced from the side edges of adjacent support members to form gaps between the support members; and

(d) an outwardly oriented face; and

means for releasably attaching a selected remote control device to the outwardly oriented face.

4,991,893

MANHOLE COVER LIFTING DEVICE

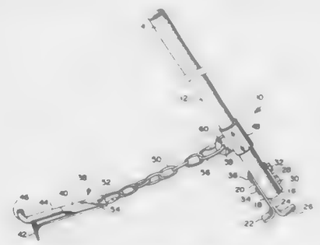
Russell B. Gordon; Jimmy A. Gordon, both of Atlantic Beach, and Bill Beach, Jacksonville, all of Fla., assignors to Saddle Vent, Inc., Atlantic Beach, Fla.

Filed Aug. 25, 1988, Ser. No. 236,415

Int. Cl.[5] B65G *7/12*; B66F *11/00*

U.S. Cl. 294—17 **17 Claims**

1. A manhole cover lifting device for lifting a manhole cover having at least two lifting holes or slots therein comprising an elongated lever provided at one end with a first manhole cover lifting means fixed to the lever for engagement with a first of said slots or holes, and at the other end with a manually engageable handle; a sleeve freely slidably mounted on the elongated lever between said ends, and a second manhole cover lifting means for engagement with a second of said slots or holes operatively connected to said sleeve by a flexible member, wherein said sleeve is freely slidable along said elongated



lever to accommodate manhole covers of various diameters and to maximize available leverage.

4,991,894

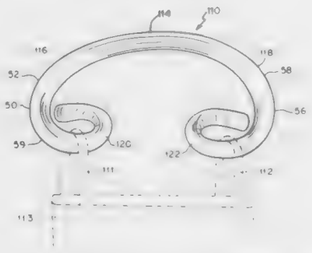
CARRYING HANDLE

John Rutens, 31-50 104th St., Linden Hill, N.Y. 11354

Continuation-in-part of Ser. No. 411,843, Sep. 25, 1989, abandoned. This application Feb. 9, 1990, Ser. No. 478,257

Int. Cl.[5] B65D *33/06*

U.S. Cl. 294—170 **1 Claim**



1. A carrying handle for supporting a shopping bag and its contents comprising:

a central portion having a first end and a second end;

a first intermediate section having a first end and a second end with said first end of said first section integrally attached to said first end of said central portion;

a first end member integrally attached to said second end of said first section;

a second intermediate section having a first end and a second end with said first end of said second section integrally attached to said second end of said central portion;

a second end member integrally attached at said second end of said second section;

said central portion being an arc with a large radius of curvature;

each of said first and second intermediate sections being an arc with an intermediate radius of curvature smaller than said large radius of curvature;

each of said first and second end members being U-shaped comprising an arc with a radius of curvature smaller than said intermediate radius of curvature;

wherein said first end member and said second end member are directed inwardly toward each other;

wherein said central portion, said intermediate sections, said first end member, and said second end member being continuously curved all in the same plane;

wherein each of said end members comprises a folded back U-shaped arc forming substantially parallel first and second horizontal portions;

said second horizontal portion has a free end which is closely adjacent to the second end of the respective intermediate section to prevent inadvertent disengagement from a shopping bag; and

wherein each of said U-shaped members has a convex bottom arc; and said convex bottom arc of each end member points toward the convex bottom arc of the other end member.

4,991,895

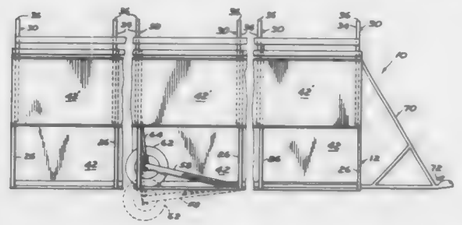
LIVESTOCK SHELTER AND BALED HAY RACK

Jerry D. Artho, Box 7, Bushland, Tex. 79012

Filed May 17, 1990, Ser. No. 524,532

Int. Cl.[5] B60P *3/00*

U.S. Cl. 296—6 **6 Claims**



1. A combination livestock shelter and baled hay rack, comprising:

a horizontal base frame having elongated side members interconnected at their respective ends by end members;

a plurality of opposing pairs of longitudinally spaced generally upright studs on said base frame side members;

a like plurality of joist means extending transversely of said base frame and connected with the upper end portion of the respective pairs of studs for forming a baled hay support rack;

first rail means coextensive with said base frame side members overlying and connected with the upper end limit of said studs for forming a lateral limit for baled hay placed on said rack;

rafter means including pairs of rafters respectively connected at their depending end portions with an intermediate portion of each stud of said pairs of studs and a lateral end portion of each respective said joist and projecting a predetermined distance above said joists for longitudinally dividing said bale rack; and,

panel means extending between said studs above one said base side member for forming a windbreak.

4,991,896

GOLF BALL RETRIEVER

E. Ralph Martin, 735 Kentucky Dr., Rochester, Mich. 48063

Filed Apr. 17, 1989, Ser. No. 338,574

Int. Cl.[5] A63B *47/02*

U.S. Cl. 294—19.2 **15 Claims**



1. A golf ball retriever comprising: an elongated handle;

a frame formed by first and second diverging L-shaped prongs, each of said prongs having an opening adjacent a distal end thereof;

a pivot joint securing one end of said handle to said frame;

a rod retained in said openings of said prongs;

a plurality of disks located between said prongs, each of said disks having a central hole for receiving said rod, said disks being rotatable relative to said frame;

a plurality of spacer tubes, each of said spacer tubes being disposed between two disks;

nut bearings secured to said rod adjacent said openings for retaining said rod in said openings; and

said frame being pivotable between a first position in which said rod is aligned substantially parallel to the handle for storage in a golf bag laterally adjacent said handle in a space equal to the diameter of said disks and the lateral distance between the disks and the pivot joint, and a second position in which said rod is substantially perpendicular to the length of said handle for picking up golf balls in a path as substantially as broad as the length of said rod.

4,991,897

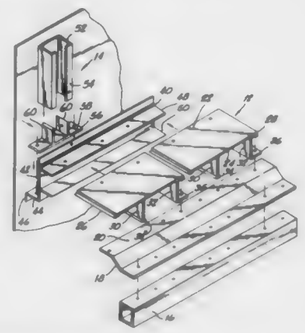
VEHICLE BODY

Vahe Karapetian, 4801 Los Feliz Blvd., Los Angeles, Calif. 90027

Filed Jun. 6, 1989, Ser. No. 362,236

Int. Cl.[5] B62D *27/00*

U.S. Cl. 296—29 **11 Claims**



1. A vehicle body comprising

a floor;

columnar rib members of quadrangular cross section affixed at one end to said floor and extending upwardly therefrom;

crown members including in cross section two spaced roof flanges, two spaced wall flanges extending perpendicularly to said roof flanges and an elongate crown body from which said roof and wall flanges extend;

horizontal roof members of quadrangular cross section extending between two crown members positioned along the sides of the vehicle, said spaced wall flanges abutting against the upper end of said columnar rib members and said spaced roof flanges abutting against the ends of said horizontal roof members;

frame clips affixed to said crown members between said spaced roof flanges and between said spaced wall flanges, said frame clips having attachment legs extending outwardly from between said roof and wall flanges to fit closely within said horizontal roof members and said columnar rib members, respectively, said frame clips being affixed to said horizontal roof members and said columnar rib members, respectively.

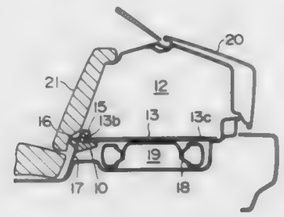
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,898

FIXING DEVICE FOR TRUNK COMPARTMENT FLOOR PLATE

Kazutoshi Nomura, Hamamatsu, Japan, assignor to Suzuki Motor Co., Hamana, Japan

Filed Dec. 11, 1989, Ser. No. 449,552
Claims priority, application Japan, Mar. 1, 1989, 1-23593[U]
Int. Cl.[5] B62D *43/00*
U.S. Cl. 296—37.2 5 Claims



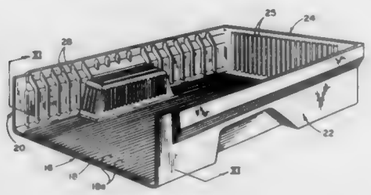
1. A fixing device arrangement for a vehicle trunk compartment comprising: a fixing device including a support portion defining a mounting surface, a restriction wall portion extending upwardly from said support portion, a convex portion provided on said support portion extending outwardly from said support portion, and a ledge portion extending outwardly from said restriction wall portion, wherein said ledge portion includes an undersurface inclined downwardly from an outer end to said restriction wall portion; and a floor plate defining a bore having a bore opening dimension, said convex portion being hooked into said bore for positioning said floor plate with respect to said mounting surface, said bore dimension being larger than that of said convex portion to define a gap between an interior side of said bore and said convex portion once said floor plate is positioned on said mounting surface and said convex portion is hooked into said bore, said floor plate having a dimension from said bore to a top end of said floor plate which is smaller than a distance from said convex portion to said restriction wall portion to define a gap between said top end and said restriction wall portion, thereby maintaining said floor plate with said convex portion hooked into said bore unless a forward portion of said floor plate is raised upwardly.

4,991,899

FOLDABLE TRUCK BED LINER

Dennis P. Scott, Hanover, Pa., assignor to York Products, Inc., Hanover, Pa.

Filed Nov. 22, 1989, Ser. No. 440,317
Int. Cl.[5] B60R *13/01*
U.S. Cl. 296—39.2 3 Claims



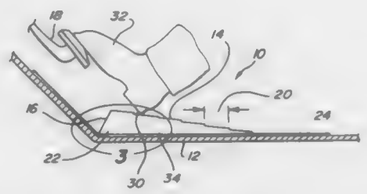
1. A foldable protective liner for a vehicle cargo bed, said liner comprising:
- a liner floor portion positionable upon a floor portion of the vehicle cargo bed, said liner floor portion having elevated portions formed thereupon to conform to wheel wells protruding from the vehicle cargo bed floor;
- liner sidewall portions extending upwardly from opposite sides of the liner floor portion, each of said liner sidewall portions being positionable against sidewall portions of the vehicle cargo bed;
- a liner frontwall portion extending upwardly from a front end of the liner floor portion and integrally joined to the liner floor portion and each of the liner sidewall portions, said liner frontwall portion being positionable against a frontwall portion of the truck cargo bed and formed of a material which is of sufficient flexibility to permit bending thereof; and
- means provided on said liner for permitting repeated folding of said liner from an unfolded operative position to a folded inoperative position and repeated unfolding of said liner from said folded inoperative position to said unfolded operative position, said means for permitting repeated folding and repeated unfolding comprising vertically extending rib means provided on said liner frontwall portion, said rib means being of such depth, spacing and rigidity so as to prevent creasing of said rib means and said frontwall portion during folding of said liner and to provide effective cargo impact energy absorption and distribution when said liner is in said operative position in a vehicle cargo bed,
- whereby said unfolded operative position constitutes a normal use arrangement of said liner and said folded inoperative position constitutes a compact storage arrangement of said liner.

4,991,900

FLOOR COVERING

A. Leon White, 23300 Providence Dr., Apt. 510, Southfield, Mich. 48075-3629

Filed Oct. 10, 1989, Ser. No. 419,780
Int. Cl.[5] B60N *3/06*
U.S. Cl. 296—75 3 Claims



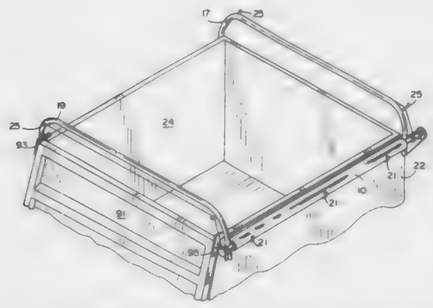
1. A floor covering for use with an automotive vehicle having a floor and a control pedal positioned at the front of said floor, said floor covering comprising:
- a substantially flat bottom adapted to flatly abut against the floor of the vehicle adjacent to the control pedal,
- a front end, said front end positioned adjacent to and underneath the control pedal;
- a forwardmost edge at said front end, said edge sloping downward toward said vehicle floor;
- at least three steps of s preset longitudinal width, said steps laterally elongated with respect to the longitudinal axis of said automotive vehicle, said steps further extending from a forwardmost step at said front end to a rearwardmost step, said steps decreasing by a preset amount in height rearwardly from said control pedal;
- wherein a heel of a vehicle operator's shoe is adapted to be positioned on one of said steps, and
- wherein said preset amount is dimensioned so that, with the operator's heel positioned on one step and in engagement with the control pedal, a back of the vehicle operator's shoe is spaced upwardly from an adjacent rearward step so as to prevent scuffing of said shoe while operating said control pedals.

4,991,901

TRUCK BODY COVER

David H. Meekhof, Sr., 4186 Burton, SW., Walker, Mich. 59504, and David H. Meekhof, Jr., 4360 Fairview, Grandville, Mich. 49418

Filed Aug. 28, 1989, Ser. No. 399,606
Int. Cl.[5] B60J *11/00*
U.S. Cl. 296—98 15 Claims



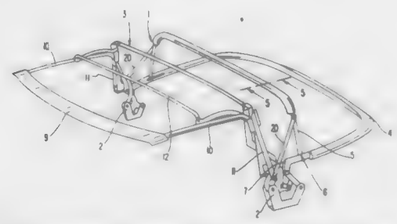
1. A power driven cover for an open load carrying body comprising:
- a cover for confining a load in an open body;
- a roller for gathering said cover as it uncovers said open body;
- a pair of supports, one at each end of said open body for supporting said roller as said roller moves from one side of said truck to the other side;
- a driving means for moving said roller;
- a flexible actuating and guide member extending from one side of said body to the other side for controlling the movement of said roller;
- a motor for driving said driven means; and
- a control for said motor.

4,991,902

FOLDING TOP COVERING FOR A FOLDING TOP OF A VEHICLE

Jürgen Schrader, Stuttgart; Klaus Claar, Gechingen; Harald Koppenstein, Filderstadt, and Kurt Gramer, deceased, late of Nagold, all of Fed. Rep. of Germany (by Margot Gramer, executor), assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 478,438
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3903680
Int. Cl.[5] B60J *7/12*
U.S. Cl. 296—107 9 Claims



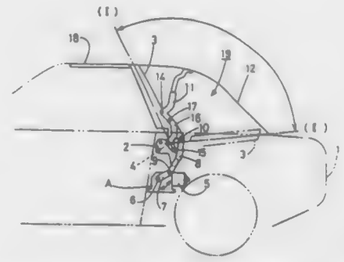
1. A folding-top covering, for a folding top of a vehicle, on which the covering is stretched onto a supporting folding-top frame structure, comprising two releasably interconnected folding-top front and back covering portions arranged one behind the other along a longitudinal direction of the vehicle;
- the two covering portions being joined in a plane along a width of the vehicle by being connected to a connecting element by strip-shaped fastening portions;
- the folding-top covering being divided into its two portions along a bow of the folding top frame;
- the strip-shaped fastening portions of the folding-top covering portions being clamped to the bow by the connecting element; and
- the fastening portions of the folding-top covering portions being held between a circumferential face of the bow and a clamping rail of the connecting element, which is braced relative to the bow, wherein the bow has a cylindrical circumferential face; and
- the clamping rail is a clamping shell having a clamping face curved concentrically relative to a circumference of the bow.

4,991,903

DRIVE EQUIPMENT FOR OPENING AND CLOSING OF A VEHICLE TOP

Sigeki Okabe, Toyohashi; Masaya Horikawa, Shizuoka; Tatsuo Maeda, Hiroshima; Seiichi Omoto, Hiroshima, and Kozo Odoi, Hiroshima, all of Japan, assignors to Asmo Co., Ltd., Kosai and Mazda Co., Ltd., Hiroshima, both of, Japan

Filed Aug. 2, 1988, Ser. No. 227,138
Claims priority, application Japan, Aug. 4, 1987, 62-195105; Aug. 4, 1987, 62-195107; Oct. 31, 1987, 62-276292
Int. Cl.[5] B60J *7/12*
U.S. Cl. 296—112 4 Claims



1. A drive device for opening and closing a vehicle top comprising: a top member forming an upper part of a vehicle body; a falling pillar swingably supporting the top member on the vehicle body; a pair of forming bars pivotally positioned on the falling pillar; a pair of control devices, each of which is fixed in a side of the vehicle body; and inclinable link rods, each of which couples the falling pillar with one of the control devices, each of said control devices including:
- a swinging arm connected to the link rod;
- an output shaft for rotating the swinging arm;
- a housing in which is rotatably positioned at least a portion of the output shaft;
- driving means attached to the housing and generating a rotary driving force;
- a first reduction gear stage formed as a worm drive which is coupled with the driving means and housed in the housing;
- a second reduction gear stage formed as a spur gear drive coupled with the worm drive for driving the output shaft and housed in the housing;
- a transmission gear included in the second reduction gear stage and having a connecting pawl projecting from a side thereof;
- a gear shaft rotatably positioned in the housing and rotatably supporting the transmission gear;
- a clutch disk positioned on the gear shaft in an axially displaceable manner, said clutch disk being substantially rotationally fixedly positioned on the gear shaft, said clutch disk having a connecting concave part on one side thereof for generating a claw clutch engagement with the

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connecting pawl of the transmission gear, said clutch disk having a connecting annular groove formed therein;

a clutch-disengaging member having a semi-circular connecting convex part which is inserted into the connecting annular groove of the clutch disk;

an operating shaft positioned within the housing, said clutch-disengaging member being positioned on said operating shaft; and

screw means for thrusting the operating shaft in order to enable manual opening and closing of the top member.

4,991,904

COLLAPSIBLE TOP FOR MOTOR VEHICLES

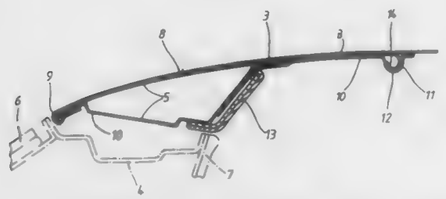
Gerhard Zweigart, Aidlingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,025

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814379

Int. Cl.[5] B60J *7/12*

U.S. Cl. 296—121 **10 Claims**



1. A collapsible top for a motor vehicle, with a top cover which, in a region of a windscreen frame of the motor vehicle, is supported by and fastened to a rigid roof panel located under the top cover and extending in the transverse direction of the vehicle, wherein the top cover is secured to an underside of the roof panel by a cloth lug fastened to the top cover near a rear end of the roof panel and being fixed at the underside of the roof panel and being spaced from a front end termination of the top cover in the region of the windscreen frame.

4,991,905

VEHICLE CONSTRUCTION OF AUTOMOBILE PROVIDED WITH SLIDE DOOR

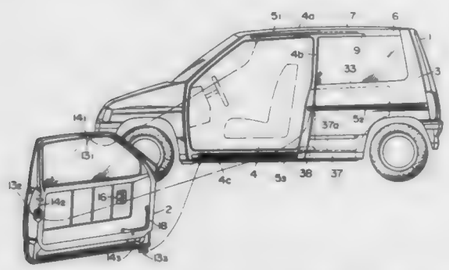
Tomoyoshi Watanabe, and Keiichi Asai, both of Hamamatsu, Japan, assignors to Suzuki Motor Company Limited, Hamana, Japan

Filed Aug. 21, 1989, Ser. No. 396,515

Claims priority, application Japan, Aug. 29, 1988, 63-214682; Aug. 29, 1988, 63-214686; Aug. 29, 1988, 63-214687

Int. Cl.[5] B60J *5/05*

U.S. Cl. 296—155 **2 Claims**



1. An automobile construction, comprising a vehicle body defining a front door opening and including a rear body panel extending rearwardly of said front door opening; an upper, a central and a lower guide rail connected to said vehicle body; a slide door positionable in said front door opening for closing said front door opening, said slide door including an upper, a central and a lower guide roller engaging said upper, central and lower guide rails respectively, and upper side of said slide door has a length which is shorter than a length of a lower side of said slide door, a forward end of said upper side of said slide door is provided in a position which is rearwardly of a front end of said lower side of said slide door; a stopper provided at said front end of said upper side of said slide door positioned to engage an engaging portion positioned on a front side of said front door opening of said vehicle body substantially simultaneously with the front end of the lower side of said slide door engaging the front side of the front door opening of the vehicle body.

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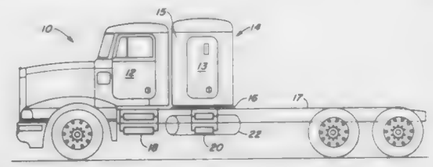
CAB SKIRT FAIRING MOUNTING FOR BELOW A TRUCK SLEEPER BOX

Robert F. Fingerle, Fremont, Calif., assignor to Paccar Inc., Bellevue, Wash.

Filed Aug. 25, 1989, Ser. No. 398,659

Int. Cl.[5] B62D *35/00*

U.S. Cl. 296—180.2 **7 Claims**



1. An assembly for mounting a sleeper box fairing panel beneath the entry door of a sleeper box assembly supported on the bed frame of a truck, said assembly comprising:

means for fixedly mounting said sleeper box fairing panel to one of said bed frame of said truck and said sleeper box assembly, such that when stepped upon by a person entering said sleeper box assembly through said entry door, said sleeper box fairing panel can withstand any excess force created by said person's weight; and

means for flexibly securing the proximate end of said sleeper box fairing panel to a separate member, such that said separate member is substantially isolated from vibrations transferred to said panel while said truck is in motion, as a result of said sleeper box fairing panel being fixedly mounted to one of said bed frame and said sleeper box assembly.

4,991,907

AUTOMOBILE SEAT HEAD REST DEVICE

Yuji Tanaka, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jul. 26, 1989, Ser. No. 385,158

Claims priority, application Japan, Jul. 28, 1988, 63-100554[U]; Jul. 28, 1988, 63-100555[U]

Int. Cl.[5] A47C *7/36*

U.S. Cl. 297—408 **5 Claims**

1. A head rest device for use with a seatback, comprising:

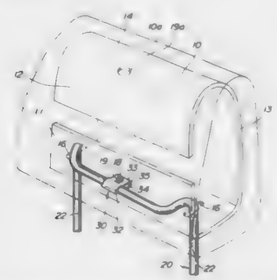
a support stay extending from said seatback, said support stay having a straight section which lies substantially horizontally when said support stay is properly connected to said seatback;

an inner support member which is pivotally supported by said support stay in the vicinity of said straight section;

an outer cushioning member disposed about said inner support member;

a resilient clip of generally U-shaped cross section, said clip including a channel portion in which said straight section of said support stay is received, and an open portion defined by a pair of parallel flange portions which extend from said channel portion;

a lip member which extends from a leading end of one of said parallel flange portions toward a leading end of the other flange portion;



connection means for connecting said clip to said inner support member, said connecting means being capable of adjusting the clearance between major portions of said flange portions and thus adjusting the gripping force of the clip on said straight section.

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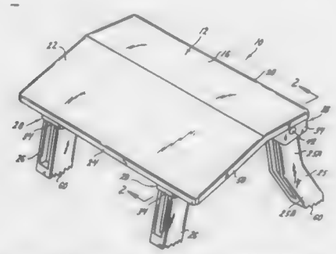
PORTABLE FOOTREST

P. Kurt Krechel, St. Louis, Mo., assignor to Smooth Sailing, Inc., High Ridge, Mo.

Filed Mar. 30, 1990, Ser. No. 503,219

Int. Cl.[5] A47C *16/00*

U.S. Cl. 297—439 **8 Claims**



1. A portable footrest comprising a top having a first end, a second end opposite said first end, and an inclined portion located between said first and second ends, a plurality of legs supporting the top, the legs being pivotally mounted on the top for swinging motion about an axis between a folded position in which the footrest is configured for storage and transportation in a small container such as a briefcase or the like and an upright position in which the footrest is configured for use, and means for locking the legs in the upright position, a first pair of legs each having an upper portion and a lower portion, said lower portion being angled outwardly with respect to said upper portion and the top, said first pair of legs being mounted on the top at said first end thereof, and a second pair of legs mounted on the top at said second end thereof, each leg of said first pair of legs being generally opposite a corresponding leg of said second pair of legs, the opposite legs being sufficiently laterally offset to provide clearance for the opposite legs in the folded position, said first pair of legs being longer than said second pair of legs such that said first end of the top is higher than said second end.

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WHEEL COVER

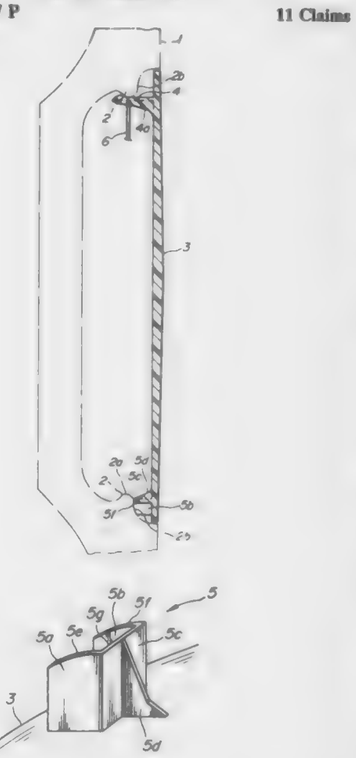
Kazutaka Hamada, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Apr. 18, 1989, Ser. No. 339,849

Claims priority, application Japan, Apr. 27, 1988, 63-56890

Int. Cl.[5] B60B *7/02*

U.S. Cl. 301—37 P **11 Claims**



1. A wheel cover for use with a wheel disc, said wheel disc having an annular ridge integral therewith, said wheel cover comprising:

a cover proper;

a series of lugs integrally formed on a back face of said cover proper and equally spaced around the circumference of said cover proper, each lug having a latching pawl which latchingly engages with said annular ridge upon fitting of said wheel cover to said wheel disc;

a resilient wire ring held by said lugs in a manner to bias the latching pawls radially outwardly;

a series of stoppers integrally formed on said back face of said cover proper and arranged to alternate with said lugs, each stopper including at least one radially extending wall whose upper free edge is sloped so that said sloped free edge faces toward the perimeter of said wheel cover proper,

wherein, upon proper fitting of said wheel cover to said wheel disc, said sloped free edge abuts against a given portion of said annular ridge of said wheel disc to stop further axial movement of said wheel cover toward said wheel disc, and

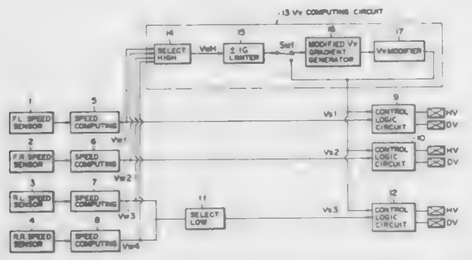
wherein, upon improper fitting of said wheel cover to said wheel disc, said sloped free edge enables said stopper to slide into and abut said given portion, causing said wheel cover to properly fit against said wheel disc.

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4,991,910
ANTI-LOCK CONTROL SYSTEM FOR MOTOR VEHICLES

Haruki Shimanuki, Kasukabe; Yuji Matsubara, Kazo, and Takao Maki, Kitakatsushika, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Japan

Filed Dec. 1, 1988, Ser. No. 278,618
Claims priority, application Japan, Dec. 4, 1987, 62-305586
Int. Cl.[5] B60T *8/68*
U.S. Cl. 303—109 5 Claims



1. An anti-lock control system for motor vehicles, comprising:

means for computing a computed vehicle speed based on respective wheel speeds of a motor vehicle when said motor vehicle is braked, said computed vehicle speed having a predetermined acceleration or deceleration follow-up limit;

means for setting up a threshold speed which is lower than and follows said computed vehicle speed in a predetermined relationship therewith;

means for causing brake fluid pressure to be increased when the wheel speed to be controlled, which has been decreased through a braking operation, is changed from decrease to increase as a result of reduction and subsequent holding of the brake fluid pressure and goes above said threshold speed and reaches a high peak or a level close thereto; and

means for modifying said computed vehicle speed to follow a deceleration gradient line with a gentler gradient than a reference deceleration gradient line representing a predetermined acceleration or deceleration follow-up limit of said computed vehicle speed with respect to the wheel speed when the condition that said computed vehicle speed follows said reference deceleration gradient line has persisted for a predetermined period of time during a control cyclic period from a point of time when the braking operation is started to a point of time when the brake fluid pressure is increased for the first time after the brake fluid pressure is reduced through said braking operation, thereby increasing said threshold speed.

4,991,911
TRACK CLEAT

Christian Blais, Sherbrooke, Canada, assignor to Bombardier Inc., Canada

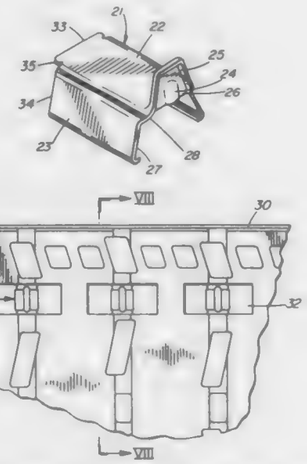
Continuation of Ser. No. 205,747, Jun. 13, 1988, abandoned.
This application Feb. 22, 1990, Ser. No. 485,855
Int. Cl.[5] B62D *55/24*
U.S. Cl. 305—24 5 Claims

1. A guide clip for a snowmobile track belt comprising:

a body fabricated from sheet metal and having a central generally rectangular bearing portion which extends on its two longer sides into two opposed downwardly extending integral mounting limbs to define therewith a profile generally of inverted U shape, there being an integral guide lug projecting upwardly from one end of the bearing portion;

wherein said guide lug extends across the full width of said end and is strengthened in the region thereof by a shallow L-shaped stamped depression the limbs of which extend into the adjacent regions of said bearing portion and said lug so as to be below the level of the upper surface of the bearing portion and the adjacent surface of the guide lug;

said lug tapering in width upwardly from said end and being generally in a plane, said lug being strengthened by a marginal region thereof extending outwardly away from the plane of the lug to define a continuous edge on the



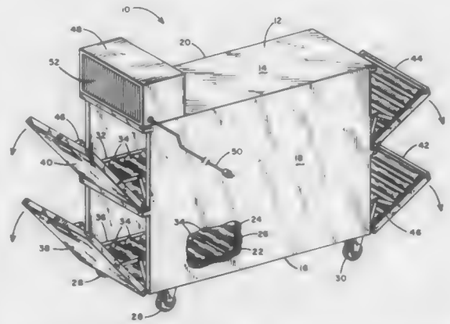
lateral and upper regions of the lug that is spaced outwardly from said plane;

said continuous edge outwardly offset from adjacent ends of each mounting limb and merging smoothly therewith through a continuously curved transition section, said end of each mounting limb, said transition section, and said continuous edge on the lateral region of the lug being smooth and uninterrupted by any notch.

4,991,912
REFUSE STORAGE BIN

Anthony Fox, Bloomington, Minn., assignor to Marcella M. Fox, Bloomington, Minn.

Filed Mar. 19, 1990, Ser. No. 495,627
Int. Cl.[5] A47B *77/08*
U.S. Cl. 312—236 7 Claims



1. Apparatus for temporary storage of containers filled with compacted organic and inorganic waste prior to the pick-up thereof by a trash hauler comprising:

(a) a cart comprising a wheel-mounted, elongated, horizontally disposed cabinet of rectangular cross-section including a top wall, a bottom wall, two mutually perpendicular side walls and first and second opened ends defining a refuse storage chamber, said cabinet including door means at each of said open ends thereof and hinged about a horizontal axis and including conveyor means on the interior surface of said door means which, when closed, seals said open ends and said storage chamber from the ambient;

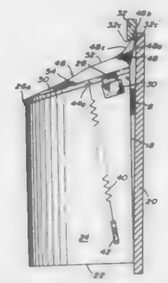
(b) conveyor means mounted in said cabinet and extending along the length dimension thereof for facilitating the filling of said chamber with a plurality of containers of compacted refuse; and

(c) temperature control means mounted on said cabinet for maintaining said chamber at a predetermined temperature when said door means are closed to inhibit the decomposition of said organic waste while stored in said cabinet.

4,991,913
TRASH BIN ASSEMBLY

Van W. C. Roger, 1278 Av. La Lorraine, Sainte Foy, Quebec, Canada G1W3Y4, and Van W. P. Charles, 3805 Saint Kevin #14, Montreal, Quebec, Canada H3T 1H8

Filed Jan. 2, 1990, Ser. No. 460,036
Int. Cl.[5] A47B *81/00*
U.S. Cl. 312—275 9 Claims



1. A trash bin assembly comprising a receptacle, a top lid therefor pivoted thereto about a lid pivotal axis for movement between an open and a closed position, said receptacle having a flat back wall mounted against the inside face of the door of a kitchen counter, hinged to a door frame which is part of said counter, and spring means carried by said receptacle and acting on said door frame and on said lid to bias both said door and said lid to open position after being opened a small amount or unlatched; wherein said spring means includes a spring member acting directly on said receptacle and on said lid to open the latter, and an elongated cam member carried by and over said lid and extending at an angle to said back wall, said cam member having a cam edge downwardly inclined in a direction away from aid back wall, said cam edge slidably engageable with the lintel of said door frame to cause door-opening movement through the opening of said lid under the action of said spring member.

4,991,914
MAIL SORTER BASKET FOR HANDLING MAIL TRAYS

Melvin Kerstein, Lincolnwood, Ill., assignor to Bell & Howell Co., Skokie, Ill.

Continuation of Ser. No. 199,372, May 26, 1988, abandoned.
This application Dec. 12, 1989, Ser. No. 453,134
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—319 1 Claim

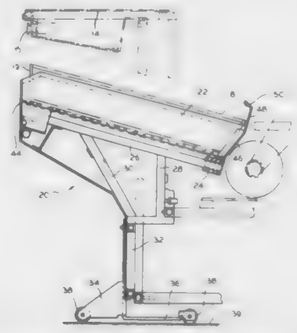
1. A sliding basket means for storage of mail trays including primary support structure for maintaining said basket means in a plurality of positions relative to a generally planar work surface and adapted to be accepted in a semi-concealed manner relative to another surrounding structure, said basket means further including linear moveable support means, said linear moveable support means adapted for moving said basket means between a first stored condition within said primary support structure and a second open condition extending beyond said primary support structure whereby access to said basket means is readily available, means for altering the elevation of the basket means relative to said surrounding structure to thereby facilitate transfer of mail between an upper surface of said surrounding structure and said mail trays located in said basket means;

said elevation altering means including an inclined slide means;

said slide means including a plurality of nested sections that carry said basket means and permit its movement a distance substantially equal to its own length;

said slide means further including detent means to restrain said basket means in at least two positions;

said basket means including a counterbalancing means to assist said detent means in maintaining said basket means at



predetermined selected positions, as well as assist the operator in moving said basket means along the incline of said slide means between said first stored condition and said second open condition;

said counterbalancing means including a vertically moveable weight carrying a centrally disposed double pulley in a cutout portion of said weight, a pair of fixed pulleys positioned adjacent the upper path of said weight, a fixed hook adjacent one of said fixed pulleys, a third fixed pulley spaced from said first two pulleys and the path of said weight and said third pulley being fastened to a bracket mounted on the support carrying said slide means, cable means connected at one end to the forward end of said basket means, passing around said third pulley and then winding around said two other pulleys and said double pulley with said other end of said cable means being affixed to said fixed hook means, whereby movement of said basket means along said slide means results in an elevation of said weight means be action of said cable means moving around said pulley means.

4,991,915
MICROWAVE MOISTURE SENSING ARRANGEMENT

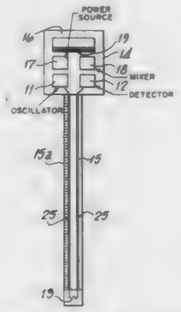
Frank Thompson, Dale Road, Marple Stockport SK 6 6EZ, United Kingdom, and John R. P. Clarke, Stockport, United Kingdom, assignors to Imperial Chemical Industries PLC Manchester Polytechnic, London and Frank Thompson, Stockport, both of, England

Filed Jul. 25, 1989, Ser. No. 384,961
Claims priority, application United Kingdom, Aug. 4, 1988, [redacted]
Int. Cl.[5] G01N *22/04*
U.S. Cl. 324—640 7 Claims

1. A microwave sensing arrangement comprising an oscilla-

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tor and a detector and a microwave strip line sensor connected between said oscillator and said detector, said strip line sensor being insertable to a substantial depth into a static, bulk, penetrable material whereby the detector detects a change in received signal due to absorption by the material of radiation



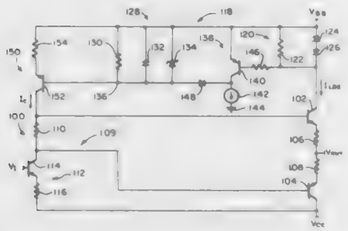
from the sensor, said oscillator and said detector being contained in a housing and said sensor being carried on a probe projecting from said housing a sufficient distance to permit said strip line sensor to be completely immersed in the material while leaving said housing outside the material.

4,991,916

METHOD AND APPARATUS FOR AUTOMATICALLY BIASING A PUSH-PULL AMPLIFIER

David K. Deaver, Snohomish, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Apr. 12, 1988, Ser. No. 180,540
Int. Cl.[5] H03F 2/26
U.S. Cl. 330—263 24 Claims



20. A method for automatically biasing a push-pull amplifier to maintain a predetermined parameter of the supply current above a predetermined minimum value, said method comprising the step of:

a. sensing the supply current and thereafter performing step b;

b. processing the sensed supply current to compute the value of the predetermined parameter and performing step c;

c. determining whether the value of the predetermined parameter of the supply current is below the predetermined minimum value and, if so, increasing the value of a control signal and, if not, performing step d; and

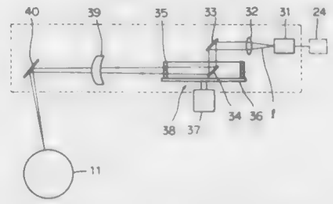
d. providing an offset current which is proportional to the value of the control signal such that the value of the predetermined parameter of the supply current will be above the predetermined minimum value and returning to step a.

4,991,917

HOLOGRAPHIC SCANNING SYSTEM FOR LASER PRINTER

Keung Y. Yang, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 27, 1989, Ser. No. 413,201
Claims priority, application Rep. of Korea, Sep. 30, 1988, 12857/1988
Int. Cl.[5] G02B 5/32, 26/10
U.S. Cl. 350—3.71 6 Claims



1. A laser beam scanning system for a laser printer comprising:

a laser generating a laser beam;

a collimator converting said laser beam generated from said laser into a parallel beam;

a hologram scanner focusing and diffracting said parallel beam, said hologram scanner including at least one hologram cylindrically supported on a rotary disc and a driving means for driving the rotary disc;

means for deflecting said parallel beam passed through said collimator so as to be incident upon said hologram scanner, said means for deflecting disposed between said collimator and said hologram scanner, said means for deflecting including a first reflective mirror and a second reflective mirror slightly, vertically suspended over said hologram scanner in substantially parallel relationship with each other, wherein said second reflective mirror is disposed below said first reflective mirror and disposed within said hologram so that the parallel beam reflected by the first and second reflective mirrors is incident upon an axial line X based on the center of the hologram;

means for compensating said laser beam passed through said hologram scanner so as to be scanned straight on a drum; and

a main reflective mirror deflecting said laser beam passed through the means for compensating so as to be incident upon said drum.

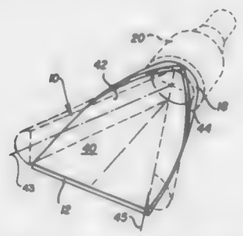
4,991,918

LIGHT COLLECTOR FOR STIMULABLE PHOSPHOR IMAGING APPARATUS

James F. Owen; Robert W. Kulpinski; William F. Garbe; John C. Boutet, all of Rochester; Anthony R. Lubinsky, Webster; David Kessler, and Nea Y. Woo, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1988, Ser. No. 460,837
Int. Cl.[5] B29D 11/00; G02B 6/00
U.S. Cl. 350—96.10 4 Claims

1. A light collector for stimulable phosphor imaging apparatus of the type comprising a sheet of transparent material having a linear input edge for receiving light emitted from a storage phosphor material along a scan line, and an opposite output edge formed into an annular shape for delivering collected light to a photodetector by total internal reflection, characterized by: the sheet of transparent material being of increasing thickness from the linear edge to the annular output edge, such that the number total internal reflections is reduced,



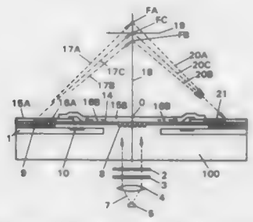
thereby increasing the light collection efficiency of the light collector.

4,991,919

OPTICAL HEAD APPARATUS INCLUDING CONCENTRIC, PERIODIC GRATING IN A WAVEGUIDE

Seiji Nishiwaki, Katano; Yoshinao Taketomi, Moriguchi; Shinji Uchida, Osaka; Takaaki Tomita, Moriguchi; Taketoshi Yonezawa, and Sadao Mizuno, both of Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/01344, § 371 Date Oct. 18, 1989, § 102(e) Date Oct. 18, 1989, PCT Pub. No. WO89/06424, PCT Pub. Date Jul. 13, 1989
PCT Filed Dec. 28, 1988, Ser. No. 415,224
Claims priority, application Japan, Dec. 29, 1987, 62-336213; Aug. 5, 1988, 63-196583; Oct. 3, 1988, 63-249198
Int. Cl.[5] G02B 6/34, 27/42; G11B 7/00
U.S. Cl. 350—96.19 16 Claims



1. An optical head apparatus comprising a laser light source, a coupling means which introduces laser light from said laser light source into a waveguiding layer to turn it into waveguided light, a waveguiding path to direct the waveguided light from a point 0 in the waveguiding layer in the radiation direction, and a periodical structure A of concentric circles or a spiral configuration provided in the waveguiding path around the point 0, wherein said waveguided light is radiated by means of said periodical structure and is focused at a point F located outside of said waveguiding path.

4,991,920

OPTICAL CONVERTER

Andrzej Peczalski, 9000 Cherokee Dr., Brooklyn Park, Minn. [56]

Filed Dec. 27, 1988, Ser. No. 290,072
Int. Cl.[5] H03M 1/12, 7/16
U.S. Cl. 350—96.14 20 Claims

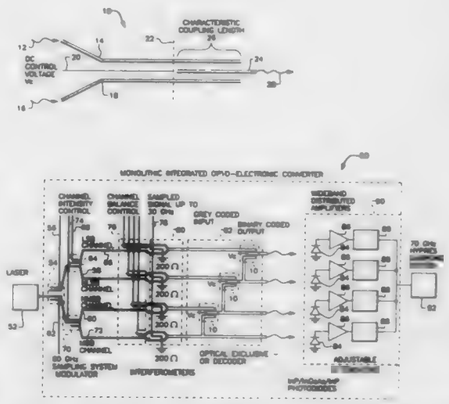
1. An optical converter comprising:

first input means for receiving a first light signal;

first light guide means, connected to said first input means, for guiding said first light signal;

second input means for receiving a second light signal;

second light guide means, connected to said second input means, for guiding said second light signal;



phase-shifting means, proximate to said first and second light guide means, for shifting phases of said first and second light signals; and

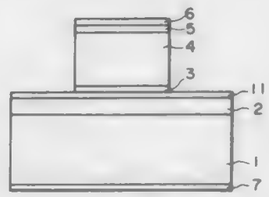
summing means, coupled to said first and second light guide means, for summing the first and second light signals.

4,991,921

PN JUNCTION OPTICAL MODULATING DEVICE HAVING A BUFFER LAYER WITH SMALL ENERGY GAP

Masatoshi Suzuki; Hideaki Tanaka; Shigeyuki Akiba, and Yuichi Matsushima, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 442,521
Claims priority, application Japan, Dec. 1, 1988, 63-302222
Int. Cl.[5] G02B 6/10; H01S 3/00, 3/19; H01L 29/61
U.S. Cl. 350—96.14 5 Claims



1. An optical modulating device which has, on a substrate directly or via a lower cladding layer, an optical waveguide layer, an upper cladding layer of a refractive index smaller than that of the optical waveguide layer and a pair of electrodes for applying an electric field across the substrate and the upper cladding layer and in which the absorption coefficient for incident light of a fixed intensity incident to the optical waveguide layer is varied by the electric field applied across the pair of electrodes to perform the modulation of the light and the modulated light is emitted from a light emitting end face of the optical waveguide layer,

characterized in that a pn junction is formed in the upper cladding layer and at least one buffer layer of an energy gap smaller than that of the upper cladding layer but

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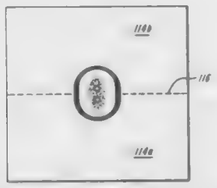
larger than that of the optical waveguide layer is interposed between the upper cladding layer and the optical waveguide layer.

4,991,922

OPTICAL FIBER COUPLER AND METHOD

Robert P. Dahlgren, Somerville, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 29, 1988, Ser. No. 237,778
Int. Cl.[5] G02B 6/26, 6/42
U.S. Cl. 350—96.15 17 Claims



1. A coupler for optically joining first and second optical fibers such that a portion of light in the first fiber is coherently coupled to the second fiber, such coupler comprising

a first support block fixedly carrying the first fiber such that said first fiber surfaces along a first path at a first surface of said first support block,

a second support block fixedly carrying the second fiber such that said second fiber surfaces along a second path at a second surface of said second support block,

each said support block being formed of material having a thermal coefficient of expansion substantially matched to material of the first and second fiber, and each said first and second surface being optically worked to expose a central region of fiber cladding while forming a corresponding first or second optically flat surface comprised of a fiber and a surrounding support block surface region,

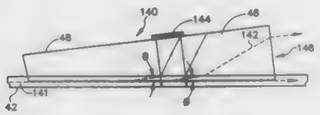
said first and second optically flat surfaces being secured together in alignment by optical contact bonding of corresponding fiber and support block surface regions at said first and second optically flat surfaces.

4,991,923

ACOUSTO-OPTIC MODULATOR FOR OPTICAL FIBERS USING HERTZIAN CONTACT WITH A GROOVED TRANSDUCER SUBSTRATE

Gordon S. Kino; Guo Q. Xiao, both of Stanford; Butrus T. Khuri-Yakub, Palo Alto; David B. Patterson, Stanford, and Asif A. Godil, Palo Alto, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jan. 17, 1989, Ser. No. 298,177
Int. Cl.[5] G02B 6/26
U.S. Cl. 350—96.15 25 Claims



1. An acousto-optic device comprising:

an optical waveguide for propagating light along a first optical path wherein a portion of a surface of said optical waveguide defines a substantially curved configuration along at least a portion of the length of said waveguide;

a portion of a capillary configured so as to define a groove along a portion of its length, wherein a portion of the curved surface of the optical waveguide is secured about a portion of the curve and along a portion of the waveguide's length in Hertzian contact with a portion of the groove; and

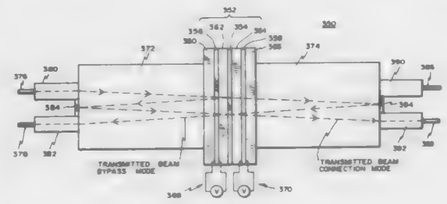
an acoustic transducer secured upon the capillary so as to generate acoustic waves for propagation through an acoustic path extending from said transducer through said capillary and then through the optical waveguide into said first optical path, with the acoustic path between said capillary and said optical waveguide being formed entirely of solid material, thereby producing interaction between the acoustic waves and light traveling along the first optical path.

4,991,924

OPTICAL SWITCHES USING CHOLESTERIC OR CHIRAL NEMATIC LIQUID CRYSTALS AND METHOD OF USING SAME

Narendra K. Shankar; Jeffrey A. Morris; Clifford R. Pollock, all of Ithaca; Christopher P. Yakymyshyn, Saratoga Springs, all of N.Y., and T. Wilson Whitehead, Raleigh, N.C., assignors to Cornell Research Foundation, Inc., Wilmington, Del. and E. I. du Pont de Nemours & Company, Ithaca, N.Y.

Filed May 19, 1989, Ser. No. 354,304
Int. Cl.[5] G02B 6/26, 5/30; G02F 1/13
U.S. Cl. 350—96.15 18 Claims



1. An optical switch comprising:

at least a first layer of a cholesteric or chiral nematic liquid crystal for decomposing an incident light beam into first and second circularly polarized components, one of which is transmitted by said layer, and the second of which is reflected by said layer;

first and second reflector means disposed, one on each side of said layer, for reflecting both of said circularly polarized components back toward said layer to recombine them into a transmitted light beam; and,

means to selectively switch the direction of said transmitted beam comprising means to selectively switch the circular polarization sense of said polarized components before they are recombined in said liquid crystal layer.

12. A method of switching the direction of beams of light comprising the steps of:

directing a beam of light to be switched at a layer of cholesteric or chiral nematic liquid crystal at an angle nearly parallel to a helix axis of the crystal, and in so doing, separating said beam of light into first and second circularly polarized components, one of which is transmitted by said layer, and the other of which is reflected by said layer;

reflecting both said polarized components back toward said liquid crystal layer, and thereby recombining said polarized components into a transmitted light beam; and,

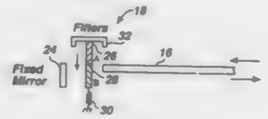
selectively causing said transmitted light beam to be transmitted in one of two directions by selectively changing the circular polarization sense of said polarized components before they are recombined by said liquid crystal layer.

4,991,925

SPECTRUM SHIFTING OPTICAL SWITCH

Gordon L. Mitchell, Woodinville, and Elric W. Saaski, Bothell, both of Wash., assignors to MetriCor, Woodinville, Wash.

Filed Oct. 4, 1988, Ser. No. 253,239
Int. Cl.[5] G02B 6/26, 6/42
U.S. Cl. 350—96.15 28 Claims



1. A spectrum shifting optical switch adapted to receive input light at a light port, said input light having a predetermined spectrum of wavelengths, said switch comprising:

a spectral modulation element movable between at least two positions to spectrally modulate said predetermined spectrum in at least one of said positions, thereby creating output light having respective wavelength spectrums indicative of the position of said spectral modulation element;

a manually actuatable member adapted to be actuated to alter the state of said switch;

a reflector directing said output light to said light port; and

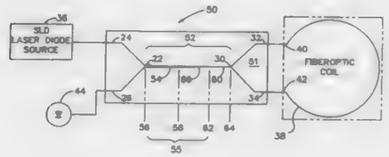
coupling means coupling said spectral modulation element to said manually actuatable member, thereby allowing said spectral modulation element to be moved between said positions to generate output light having corresponding wavelength spectrums whereby the state of said switch is indicated by the wavelength spectrum of said output light.

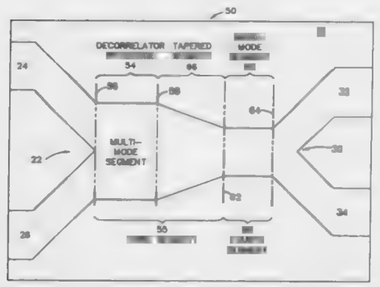
4,991,926

INTEGRATED OPTICS DECORRELATOR

George A. Pavlath, Ventura County, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 6, 1990, Ser. No. 505,968
Int. Cl.[5] G02B 6/26
U.S. Cl. 350—96.15 10 Claims





1. An integrated optics decorrelator device comprising:

a first integrated optics junction having two input paths and at least one output path formed as a Y-shaped assembly of two mono-modal optical waveguides joined at a node with a central multi-modal optical waveguide, the central multi-modal optical waveguide segment having an output end;

a second integrated optics junction having two output paths formed as a Y-shaped assembly of two output mono-modal optical wave-guides joined at the output end of the central multi-modal optical waveguide segment;

the first integrated optics junction and the second integrated optics junction being formed inside a refractive medium having a lower refractive index than the refractive index of the waveguides;

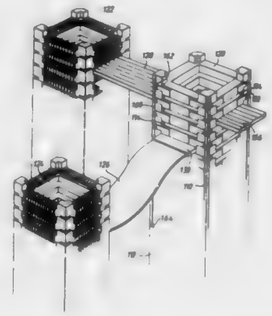
the central multi-modal optical waveguide segment being a means for decorrelating symmetric mode light passing through the central multi-modal optical waveguide segment With respect to anti-symmetric mode light passing through the central multi-modal optical waveguide segment.

4,991,927

INTERCONNECTION SYSTEMS FOR ELECTRICAL CIRCUITS

Michael J. Anstey, Wokingham, England, assignor to Dowty Electronic Components Limited, Buckinghamshire, England

Continuation-in-part of Ser. No. 123,160, Nov. 23, 1987, Pat. No. 4,872,841. This application Aug. 7, 1989, Ser. No. 390,180
Int. Cl.[5] G02B 6/42
U.S. Cl. 350—96.20 5 Claims



1. An interconnection system for interconnecting two-sided chip carriers comprising one or more interconnection units, at least one of the interconnection units comprising,

a plurality of mechanically interlocking spacer elements arranged in a stack, each of at least some of said spacer elements including at least one elongate support member having an upper surface, for supporting a chip carrier, a lower surface and side surfaces,

one or more chip carriers, each chip carrier being mounted on at least one of said support members of a spacer element, a plurality of electrically conductive contact clips distributed along the support member in spaced relationship with one another, each contact clip comprising a first part, a second part, and third part uniting the first and second parts,

location means on the support member for locating each said contact clip at a respective position on the support member, the contact clip embracing the support member so that the first and second parts thereof are disposed adjacent the said upper and lower surfaces respectively of the support member, wherein the said upper and lower surfaces of immediately adjacent support members in the stack define a respective aperture in the stack enabling an external electrical connection to be made to one or more

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of the contact clips disposed adjacent to said upper and lower surfaces, and

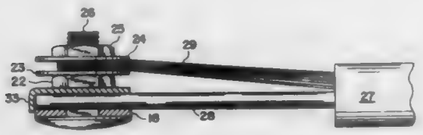
said first part of each contact clip is capable of establishing an electrical connection with a respective contact pad on the lower surface of a chip carrier supported by said support member, and said second part of each contact clip is capable of establishing an electrical connection with a respective contact pad on the upper surface of a chip carrier supported by a support member of an immediately underlying spacer element in the stack so that said contact pads are connected together electrically via said first, second and third parts of the contact chip, wherein at least one of the chip carriers carries optical emitters and/or detectors for cooperation with optical fibres.

4,991,928

MOVABLE CLAMP FOR FIBER OPTIC ENCLOSURES

Rainer M. Zimmer, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Feb. 20, 1990, Ser. No. 481,612
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.20 **7 Claims**



1. Apparatus for securing a fiber optic cable having a rod-like rigid reinforcing member in an enclosure, comprising:

(a) an enclosure for holding optical splices or connectors, the enclosure having an outer wall through which optical cables enter the enclosure;

(b) a support member mounted in the enclosure, the support member extending parallel to the outer wall through which optical fibers enter; and,

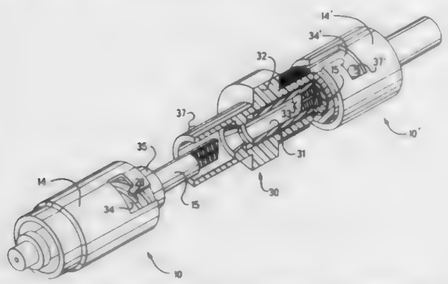
(c) securing means for securing a rod-like rigid reinforcing member at any of a plurality of points on the support member.

4,991,929

INDEX MATCHING FILM

Terry P. Bowen, Etters, and Paul R. Reitz, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 351,684, May 12, 1989, abandoned. This application Feb. 7, 1990, Ser. No. 476,219
Int. Cl.[5] G02B *6/38*
U.S. Cl. 350—96.21 **20 Claims**



1. An optical fiber connector comprising, a receptacle having a sleeve into which corresponding alignment ferrules are inserted, each of the ferrules aligning a corresponding optical fiber along the sleeve, the improvement comprising;

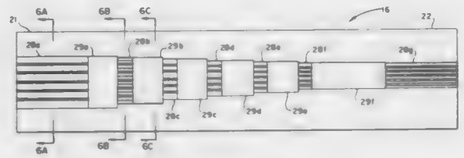
a film of optically transparent material of a thickness on the order of less than one-half the diameter of each corresponding optical fiber spanning across the interior of the sleeve, a periphery of the film being in frictional engagement with an inner diameter of the sleeve to hold the film stationary and self supporting.

4,991,930

FIBER OPTIC ARRAY

Seung H. Baek, Pittsford; Eileen M. Tyo, Livonia, and Joseph Y. Kaukeinen, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1989, Ser. No. 440,153
Int. Cl.[5] G02B *6/04*
U.S. Cl. 350—96.24 **12 Claims**



1. A fiber optic array comprising:

a first substrate which is adapted to support optical fibers on a surface thereof, said substrate including a plurality of sets of generally parallel grooves therein, said grooves being generally V-shaped and each set of grooves being separated from the other sets of grooves by an area on said surface; and

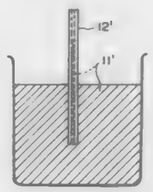
at least two rows of optical fibers supported on said substrate, a first row of optical fibers being supported in said grooves and a second row of optical fibers being disposed on said first row, each of the optical fibers in said second row being disposed on two adjacent fibers in said first row, all of said fibers being of a predetermined diameter, and the spacing of the optical fibers in said second row being determined by the spacing of said grooves and the diameter of said fibers.

4,991,931

METHOD OF DRIVING OPTICAL WAVELENGTH CONVERTER MODULE

Akinori Harada; Yoji Okazaki, and Hiroshi Sunagawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1990, Ser. No. 470,500
Claims priority, application Japan, Jan. 31, 1989, 1-22337
Int. Cl.[5] G02B *6/02*; H03F *7/00*
U.S. Cl. 350—96.29 **8 Claims**



1. A method of driving an optical wavelength converter module including an optical wavelength converter device having a cladding and a waveguide which is disposed in the cladding and has a higher refractive index than the cladding, at least one of the cladding and the waveguide being made of a nonlinear optical material, whereby the wavelength of a fundamental wave of a laser beam which is propagating in the waveguide is converted, the optical wavelength converter module also including a semiconductor laser for emitting said laser beam which is introduced as said fundamental wave of said laser beam into the waveguide, said method comprising the steps of:

(i) driving the semiconductor laser with a pulsed drive current; and

(ii) controlling a duration of said drive current pulses to enable a peak output power of the semiconductor laser to increase over that when the semiconductor laser is continuously driven, and controlling said duration of said drive current pulses to be longer than a duration within a range of pulse durations between which the input coupling efficiency decreases as the pulse duration decreases and the wavelength conversion efficiency is equal to that achieved when the semiconductor laser is continuously driven.

4,991,932

OPTICAL WAVEGUIDE

Peter Herbrechtsmeier, Königstein/Taunus; Gerhard Wieners, Frankfurt; Jürgen Kubis, Burghausen; Herbert Fitz, Burgkirchen, and Manfred Tschacher, Emmerting, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,006
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814295
Int. Cl.[5] G02B *6/00*; D02G *3/00*
U.S. Cl. 350—96.34 **6 Claims**

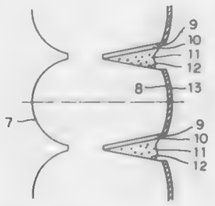
1. An optical waveguide having a core/sheath structure whose core comprises a polymer with a refractive index n(C) and whose sheath comprises a polymer with a refractive index n(S), where $n(C)/n(S) > 1.01$, wherein the core comprises a polymer which contains units which, based in each case on the polymer, are derived from 30 to 50 % by weight of vinylidene fluoride, 25 to 55% by weight of tetrafluoroethylene and 15 to 25% by weight of hexafluoropropylene and the sheath comprises a polymer which contains units which are derived from vinylidene fluoride to the extent of less than 30% by weight of the polymer, tetrafluoroethylene and hexafluoropropylene or from esters of methacrylic acid or α-fluoroacrylic acid with fluorinated alcohols.

4,991,933

FRONT PROJECTION SCREEN

Hong C. Park, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 24, 1990, Ser. No. 469,262
Claims priority, application Rep. of Korea, Jan. 28, 1989, 89-950
Int. Cl.[5] G03B *21/60*
U.S. Cl. 350—129 **1 Claim**



1. A front projection screen for use in a liquid crystal display, comprising:

front refractive facets means for allowing an image light and an illumination light to penetrate therethrough within a range of an angle of incidence $-\alpha$ to $+\alpha$ and β to γ, respectively, wherein α is a maximum angle of incidence of the image light, β is a minimum angle of incidence of the illumination light, and γ is a maximum angle of incidence of the illumination light;

rear refractive facets disposed at a rear side of the screen and opposed to said front refractive facets;

reflective coating means, formed on said rear refractive facets, for reflecting the image light penetrating through said front refractive facets toward said front refractive facets;

upper and lower flanks disposed at both the upper and the lower side surfaces of said rear refractive facets;

penetrating coating means, formed on said lower flanks, for allowing the illumination light to penetrate through said front refractive facets; and

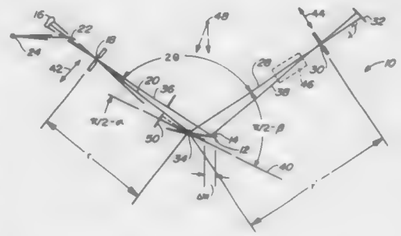
light-absorbing means, disposed between said penetrating coating means and said upper flanks, for absorbing the illumination light penetrating through said penetrating coating means.

4,991,934

VARIED SPACE DIFFRACTION GRATING AND IN-FOCUS MONOCHROMATOR

Michael C. Hettrick, P.O. Box 8046, Berkeley, Calif. 94707

Filed Aug. 10, 1989, Ser. No. 392,428
Int. Cl.[5] G02B *5/18*
U.S. Cl. 350—162.21 **33 Claims**



1. A grating which comprises:

a. a concave surface;

b. a plurality of substantially parallel diffracting elements spaced from each other by unequal distances as projected upon a chord of said concave surface, according to a density function;

c. an object point substantially fixed in space;

d. an image point substantially fixed in space;

e. a first path length equal to the distance which extends between said fixed object point and a first one of said diffracting element plus the distance which extends between said first diffracting element and said fixed image point;

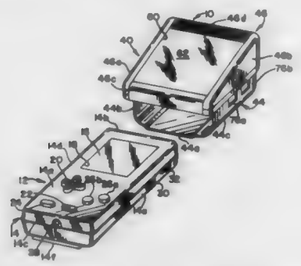
f. a second path length equal to the distance which extends between said fixed object point and a second one of said differacted element plus the distance which extends between said second diffracting element and said fixed image point;

wherein the difference between said first and second path lengths plus a distance equal to a non-zero integer times a chosen wavelength times an integer equal to one plus the number of diffracting elements intervening said first and said second diffracting elements, defines a path-length error function, said grating characterized in that said concave surface, density function and said object and image points are chosen such that said path-length error function when written as a sum of powers of said chord distance between said first and said second diffracting elements lacks both second and third power terms at more than one distinct said chosen wavelength diffracted from said fixed object to said fixed image, said distinct wavelengths being determined by rotation of said grating about a fixed axis.

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4,991,935
MAGNIFYING DEVICE FOR HAND-HELD VIDEO DISPLAY APPARATUS AND THE LIKE
Jun Sakurai, Ashiya, Japan, assignor to Konami Industry Co., Ltd., Japan
Filed Nov. 13, 1989, Ser. No. 435,700
Int. Cl.[5] G02B *27/02*; A47G *1/16*
U.S. Cl. 350—239 **13 Claims**



1. A magnifying device for use with a hand-held video display apparatus which includes a housing and a video display supported by the housing so as to be visually observable from externally of the housing, said magnifying device comprising frame means adapted for releasable mounting on the housing, said device having a magnifying lens supported by said frame means to overlie the video display when said magnifying device is mounted on the housing, said magnifying lens being operative to effect magnification of said video display when viewed through said lens during operation of the video display apparatus.

4,991,936
THERMALLY-TRANSFERRED COLOR FILTER ARRAY ELEMENT
Michael J. Simons, Ruislip, Great Britain, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 18, 1989, Ser. No. 408,340
Claims priority, application United Kingdom, Oct. 18, 1988, 8824362; May 31, 1989, 8912487
Int. Cl.[5] G02B *5/22*; B41M *5/20*
U.S. Cl. 350—317 **9 Claims**

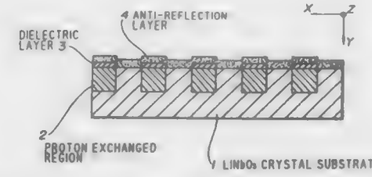
1. A thermally-transferred color filter array element comprising a transparent support having thereon a thermally-transferred image comprising a repeating mosaic pattern of colorants in a cross-linked polymeric binder having a glass transition temperature T_g greater than 150° C., said binder being cross-linked after transfer of said image.

4,991,937
BIREFRINGENCE DIFFRACTION GRATING TYPE POLARIZER
Yutaka Urino, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jun. 27, 1989, Ser. No. 371,899
Claims priority, application Japan, Jun. 29, 1988, 63-164049
Int. Cl.[5] G02B *5/18*, *5/30*
U.S. Cl. 350—401 **5 Claims**

1. A birefringence diffraction grating type polarizer: comprising,

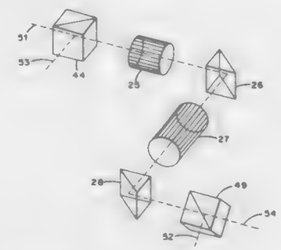
an optically anisotropic sheet crystal substrate having periodical ion-exchanged regions to provide a birefringence diffraction grating which functions as a polarizer;

dielectric layers each provided over each of said ion-exchange regions, and having a refractive index proximate or equal to that of said crystal substrate; and



an anti-reflection layer of a uniform thickness provided over the whole surface of said crystal substrate and said dielectric layers.

4,991,938
QUASI-ACHROMATIC OPTICAL ISOLATORS AND CIRCULATORS USING PRISMS WITH TOTAL INTERNAL FRESNEL REFLECTION
Carl F. Buhrer, Framingham, and W. John Carlsen, Boston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Apr. 7, 1989, Ser. No. 335,146
Int. Cl.[5] G02B *5/30*, *27/28*; G02F *1/09*
U.S. Cl. 350—403 **22 Claims**



1. A nonreciprocal optical wavelength filter comprising:

input polarization filtering means accepting an input beam;

an alternating sequence of wavelength dependent Faraday rotators and wavelength independent linear retardation elements through which said beam propagates;

output polarization filtering means through which said beam exits.

4,991,939
LIQUID CRYSTAL DISPLAY DEVICE
Hidehiko Momose, Sakurai; Kohei Kishi, and Takayuki Urabe, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 240,672, Sep. 6, 1988. This application Feb. 28, 1990, Ser. No. 486,359
Claims priority, application Japan, Oct. 15, 1987, 62-260694
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—333 **7 Claims**

1. A liquid crystal display device comprising:

an insulating substrate;

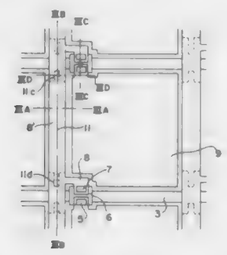
an insulating film formed on the insulating substrate;

row and column electrodes formed on the insulating film, said column electrodes having a width;

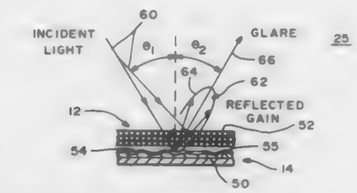
thin film transistors formed on the insulating film at intersections of the row and column electrodes, each of said thin film transistors having a gate electrode connected to each of the row electrodes and having source and drain electrodes, one of the source and drain electrodes being connected to the column electrode;

picture element electrodes formed on the insulating film, each of the picture element electrodes being connected to the other of the source and drain electrodes not connected to the column electrode; and

thin film layers formed along and under the column electrodes between the row electrodes, each of said thin film layers having a width greater than or equal to said width of the column electrodes to prevent the insulating substrate from being etched, both ends of said thin film layer being terminated by projections having width smaller than said width of the column electrodes.



4,991,940
GAIN REFLECTOR-LIQUID CRYSTAL DISPLAY
Andrew L. Dalisa, Cupertino; James McCoy, San Jose, and Richard Wiley, Los Altos, all of Calif., assignors to Taliq Corporation, Sunnyvale, Calif.
Filed Jan. 25, 1988, Ser. No. 147,756
Int. Cl.[5] G02F *1/133*
U.S. Cl. 350—338 **19 Claims**



19. A display comprising:

a display medium switchable between a first state in which incident light is at least one of scattered and absorbed and a second state in which the amount of such scattering or absorption is reduced; and

an offset gain reflector means disposed behind said display medium for reflecting light passing through said display medium such that said reflected light is angularly offset from the specular reflection from said display medium, said offset gain reflector means including an array of optical elements disposed in a continuous relation forming a sheet of optical elements and each optical element having in a first plane orthogonal to the sheet a curved reflecting surface with a positive slope portion and a negative slope portion wherein the length of one of said portions is greater than the other and said portion having the greater length having a curvature less than said other portion, and having in a second plane orthogonal to the sheet a curved reflecting surface with positive and negative slope portions wherein the lengths and curvatures of said slope portions are substantially the same.

4,991,941
METHOD AND APPARATUS FOR MULTI-COLOR DISPLAY
Michael H. Kalmanash, Los Altos, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Ofster City, Calif.
Filed Jun. 13, 1988, Ser. No. 205,814
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—347 E **38 Claims**



1. A field sequential color shutter display system, comprising:

a source of light that melts light rays of a plurality of colors and having substantially first and second different primary colors, one of said first and second different primary colors being itself one of the primary colors of the display system;

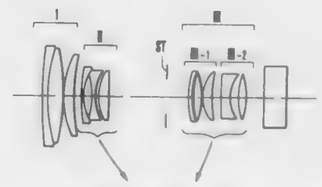
first light polarizing means in optical communication with said source, including a color selective polarizing filter having first and second substantially orthogonally oriented absorption axes, said first absorption axis passing linearly polarized light of said first color, said second absorption axis passing linearly polarized light of both said first and second colors;

second light polarizing means in optical communication with said first light polarizing means, including a polarizing filter having a first absorption axis substantially aligned with one of said first or second absorption axes of said first light polarizing means and passing linearly polarized light of both said first and second colors, and a second absorption axis of essentially zero transmission;

liquid crystal variable optical retarding means disposed between said first and second light polarizing means; and

switching means in communication with said variable optical retarding means to selectively provide first and second switching states to produce respective first and second amounts of optical retardation to develop, over a relatively broad range of viewing angles, a light output of either said first color, or a composite color containing both said first an d second colors, through said second light polarizing means.

4,991,942
ZOOM LENS
Kazuo Fujibayashi, Kanagawa, and Makoto Sekita, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 26, 1990, Ser. No. 514,726
Claims priority, application Japan, May 2, 1989, 1-112975; Sep. 1, 1989, 1-226634
Int. Cl.[5] G02B *15/15*, *9/64*
U.S. Cl. 350—423 **7 Claims**



1. A zoom lens comprising, from front to rear, a first lens

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group of positive refractive power, a second lens group of negative refractive power, and a third lens group of positive refractive power, wherein zooming is performed by moving said second lens group and said third lens group, and the following conditions are satisfied:

$$0.9<|\beta 2T|<1.1,\ \beta 2T<0$$

$$0.5<|\beta 3T<1,\ \beta 3T<0$$

$$0.4<XIII/fW<0.6$$

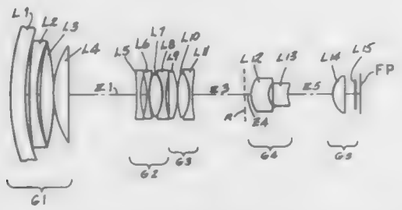
where $\beta 2T$ and $\beta 3T$ are the image magnifications of said second lens group and said third lens group respectively, XIII is the amount of movement of said third lens group as zooming is performed, and fW is the shortest focal length of the entire lens system.

4,991,943

COMPACT ZOOM LENS WITH HIGH ZOOM RATIO

Ellis I. Betensky, Redding, Conn., assignor to Lenzar Optics Corp., Riviera Beach, Fla.

Filed Mar. 27, 1989, Ser. No. 329,283
Int. Cl.[5] G02B 15/14
U.S. Cl. 350—427 26 Claims



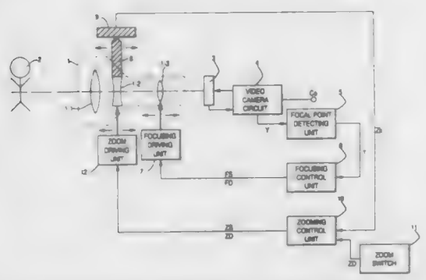
1. A zoom lens comprising from the object end a first positive stationary lens unit, a second negative variating lens unit, a third positive variating lens unit, and a fourth compensating lens unit, said variating lens units and said compensator lens unit being axially moveable to vary the equivalent focal length of said lens, said compensating lens unit, having an object magnification change of less than twenty-five percent over the zoom range of said lens.

4,991,944

ZOOM LENS DRIVING APPARATUS

Yoshiaki Hirao, Habikino; Ryuichiro Kuga, Katano; Masayuki Yoneyama, Takatsuki, and Shusuke Ono, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1988, Ser. No. 290,195
Int. Cl.[5] G02B 15/00
U.S. Cl. 350—429 6 Claims



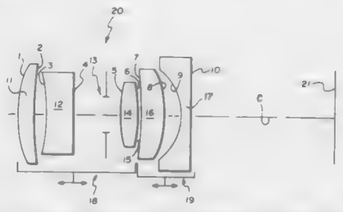
1. A zoom lens driving apparatus comprising:
a zoom encoding means for detecting a position of an image magnification varying lens section having an image magnification varying function of a zoom lens and for outputting a position signal indicative of a detected position of said image magnification varying lens section;
a zoom driving means for driving said image magnification varying lens section; and
a zooming control means for controlling said zoom driving means;
wherein said zooming control means is responsive to said position signal outputted from said zoom encoding means for determining a zoom driving speed in accordance with a predetermined relationship between said position of said image magnification varying lens section and said zoom driving speed and for controlling said zoom driving means so as to move said image magnification varying lens section at a speed corresponding to said zoom driving speed.

4,991,945

ZOOM LENS

Lee R. Estelle, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1989, Ser. No. 376,275
Int. Cl.[5] G02B 9/60
U.S. Cl. 350—455 6 Claims



1. A lens system capable of operation in wide angle and telephoto modes, including five lens elements arranged in two groups, an airspace between said groups, the length of said airspace being variable for zooming, three of said optical elements being positive and two of the said optical elements being negative, said optical elements having weak spherical surfaces or weak bendings so as to fulfill the following condition:

$$.22 < W < .27$$

$$\frac{\sum_{i=1}^{N} \left| \frac{Clap_i}{R_i} \right|}{2N} = W$$

where
R_i=radii of curvature
N=number of surfaces
$Clap_i$=clear aperture of surface i .

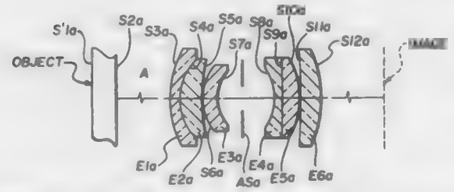
4,991,946

FINITE CONJUGATE PROJECTION LENS SYSTEM

William T. Goosey, Jr., Fairport, and Lee R. Estelle, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1989, Ser. No. 396,397
Int. Cl.[5] G02B 9/40, 9/50, 9/54
U.S. Cl. 350—471 10 Claims

1. A Gaussian-type lens with an overall sequential asymmetry with respect to a sequence of the doublets and singlets about an aperture stop and also in terms of the signs of the powers of the lens elements, said lens comprising, from an object side, a cemented doublet lens component including a negative lens element and a positive meniscus lens element, a negative meniscus lens component, a cemented doublet lens component including a negative lens element and a positive lens element, and a positive meniscus lens component.

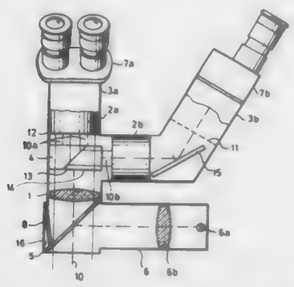


4,991,947

TWO OPTOMECHANICALLY COUPLED SURGICAL MICROSCOPES WITH COAXIAL ILLUMINATION

Ulrich Sander, Oberkochen; Ulrich Lemke, Oggenhausen, and Albrecht Vogel, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Oct. 2, 1989, Ser. No. 416,047
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833876
Int. Cl.[5] G02B 21/00, 5/04
U.S. Cl. 350—507 3 Claims



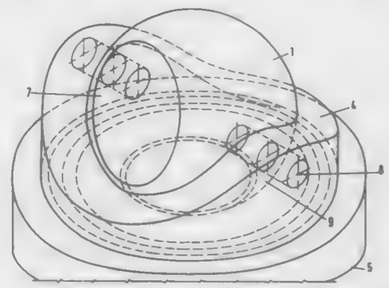
1. In a microscope with first and second optomechanically coupled binocular observation barrels, each having its own respective set of binocular optical axes and magnification means, a both barrels receiving radiation from an object field through a splitter means and both sharing a common optical axis between said splitter means and the object field, said splitter means being in the form of a composite prism with a base perpendicular to said common optical axis and an interface with a reflective mirror layer extending obliquely to the base, the improvement wherein said reflective mirror layer is contoured to follow a spectacle-shaped outline of the binocular passageways of one of said observation barrels when said outline is projected onto said obliquely-extending interface, said contoured mirror layer deflecting a portion of the radiation from the object field along the binocular axes of said one observation barrel while permitting other radiation from said object field to pass directly through said interface along the binocular axes of the other observation barrel.

4,991,948

REFLECTOR TELESCOPE

Hermann Hugenell, Maxdorfstr. 47, D-6715 Lambsheim, Fed. Rep. of Germany

PCT No. PCT/DE87/00159, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/06743, PCT Pub. Date Sep. 7, 1988
PCT Filed Apr. 9, 1987, Ser. No. 275,088
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707642
Int. Cl.[5] G02B 23/16; E04B 1/346; F16M 11/16
U.S. Cl. 350—568 17 Claims



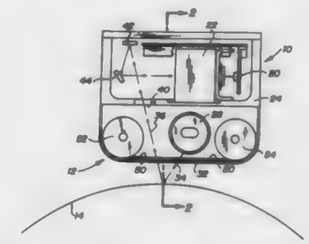
1. A reflector telescope, comprising: a tube including a supporting bar structure and a primary reflector housed in said tube and supported by said supporting bar structure; an outer framework mounted rotatably on a base structure for rotation about a vertical axis; outer framework hydrostatic slide bearing means positioned between said base structure and said outer framework for supporting said rotatable outer framework with respect to said base structure; a spherical casing rotatable with respect to said outer framework about a horizontal axis; spherical casing hydrostatic slide bearing means for supporting said rotatable spherical casing with respect to said outer framework; and, mounting means for mounting said tube within said spherical casing thereby improving the reflector telescope picture quality by increasing the stability of the optical axis for high dimension reflectors.

4,991,949

DUST PROTECTION DEVICE FOR AN IMAGE SENSOR

Robert M. Moorehead, Richardson, Tex., assignor to Comar, Inc., Richardson, Tex.

Filed Jan. 23, 1990, Ser. No. 469,030
Int. Cl.[5] G02B 27/00
U.S. Cl. 350—582 1 Claim



1. A dust protection device for an image sensor for capturing an image of an object comprising:
a housing;
an image sensor mounted within said housing;
an illumination source mounted within said housing;
said housing including an aperture disposed adjacent said illumination source for allowing light from said illumina-

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tion source to impinge on the object and for allowing reflected light from the object to reenter said housing to impinge upon said image sensor;

a continuous sheet of plastic material mounted within said housing between a supply and a takeup reel, said reels being mounted adjacent said illumination source and adjacent said aperture and within said housing for preventing dust from entering said housing through said aperture; and

said continuous sheet of plastic forming a wall for said housing and being selectively movable from said supply reel across said aperture and adjacent said illumination source to said takeup reel thereby providing a clean surface across said aperture.

4,991,950

MECHANICALLY ADJUSTABLE REAR-VIEW MIRROR

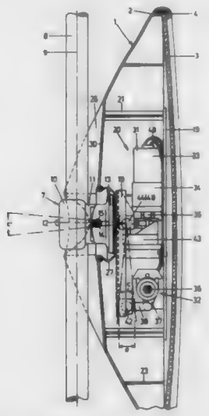
Heinrich Lang, Ergersheim, and Wolfgang Seiboth, Bad Windsheim, both of Fed. Rep. of Germany, assignors to MEKRA Rangau Plastics GmbH & Co. KG, Furth, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 243,102

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730219; Apr. 6, 1988, 3811448

Int. Cl.[5] G02B 7/18; B60R 1/06

U.S. Cl. 350—634 18 Claims



1. A mechanically adjustable rear-view mirror for motor vehicles, comprising a housing (1) holding a mirror glass (3), a mounting unit (7) for securely fixing to the vehicle, a base plate (18, 18') which is fixed relative to the mounting unit (7) and with a servomotor unit (20, 20') mounted between the base plate (18, 18') and the housing (1), said servomotor unit comprising two servomotors (31, 32; 31', 32') with actuators by which the housing (1) is pivoted around two pivot axes (45, 46) which lie practically perpendicular to one another, wherein a support plate (19, 19') immediately next to the mirror glass (3) in the housing (1) is securely mounted relative to the housing (1), the servomotors (31, 32; 31', 32') are mounted to said support plate (19, 19') between said support plate and the base plate (18, 18'), the actuators of the servomotors (31, 32; 31', 32') are each connected to the base plate (18, 18') by a universal joint (41, 42), a bearing support (43, 55) is mounted on the support plate (19, 19') and is connected to the base plate (18; 18') by means of a universal joint (44; 58), and the universal joint (44; 58) of the bearing support (43; 55) and one universal joint (41, 42) of each servomotor (31, 32; 31', 32') form the pivot axes (46, 45) of the other servomotor (31, 32: 31', 32').

4,991,951

EYEGLASS FRAME FOR ELECTROOPTICAL LENSES

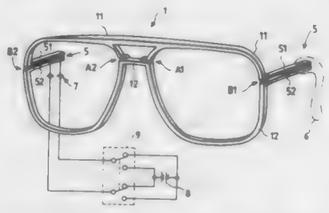
Mitsuyoshi Mizuno, Matsudo, and Tatsuo Niwa, Sakura, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,026

Claims priority, application Japan, Apr. 7, 1989, 1-86990

Int. Cl.[5] G02C 7/10

U.S. Cl. 351—41 8 Claims



1. An eyeglass frame for supporting an optical member having an electrooptical device and a pair of electrodes exposed in different peripheral positions, comprising:

a front part providing a rim for supporting said optical member, said front part including first and second front members which constitute different parts of said rim, are composed of conductive metal and are mutually insulated electrically, wherein said first front member is in contact with a first peripheral part including one of the paired electrodes of said optical member while the second front member is in contact with a second peripheral part including the other of said paired electrodes; and

means for applying a voltage between said first and second front members, for electric supply to said electrooptical device.

4,991,952

PAIR OF GLASSES WITH INCLINABLE TEMPLES

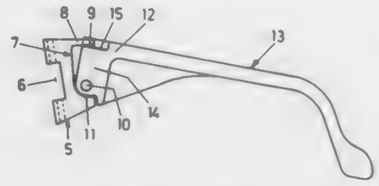
Werner Grau, Aichach-Untermauerbach, Fed. Rep. of Germany, assignor to Uvex Winter Optik GmbH, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 348,778

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 8806308[U]

Int. Cl.[5] G02C 5/14

U.S. Cl. 351—120 2 Claims



1. A pair of glasses with inclinable temples, each temple being articulated pivotally around a swivel bearing on a holder connected to the frame, and a locking device with a plurality of locking ribs positioned concentrically to the swivel bearing, said locking device being provided adjacent to the swivel bearing for keeping the temple in a certain position of inclination, wherein said holder (5) has a first approximately plate-like basic body (18), a recess (7) open only to the inside and facing in a backward direction, and said recess being provided in the holder (5), wherein a plate-like appendage (14) is integrally provided at the front end of the temple (12), first locking ribs (15) adjacent to a radial outer edge of said appendage (14), corresponding locking ribs (9) being integral with said holder (5) at an inner edge (8) of the recess (7) of the holder (5), said first locking and corresponding locking ribs being positioned

to engage each other, a swivel bearing bolt (10) passing through the appendage (14) of the temple (13) and the holder (5) adjacent to its recess (7), the swivel bearing bolt (10) being arranged adjacent to the lower edge (11) and the locking ribs (9) being arranged adjacent to the upper edge (8) of the recess (7), the outside of the holder (5) being equally provided with a recess (16) open only to the outside and facing in a backward direction, a second plate-like appendage (17) extending parallel to the first plate-like appendage at the front end of the temple (12), and said second plate-like appendage (17) engaging the outer recess (16) of the holder (5), thus that the section of said holder (5) tapered in thickness by said recesses (7, 16) is placed between said appendages (14, 17), the total thickness of the area of said appendages (14, 17) corresponding to the thickness of said basic body (18) of said holder (5).

4,991,953

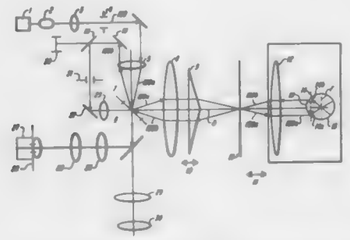
SCANNING LASER VITREOUS CAMERA

Kent P. Pflibsen, Tucson, Ariz., and Yakov Reznichenko, Brookline, Mass., assignors to Eye Research Institute of Retina Foundation, Boston, Mass.

Filed Feb. 9, 1989, Ser. No. 308,898

Int. Cl.[5] A61B 3/14, 3/10

U.S. Cl. 351—206 30 Claims



1. An instrument for imaging the vitreous humor of the eye, comprising

a light source,

means for forming a slit illumination beam,

a first scanning mirror for scanning the slit illumination beam onto an objective optical system,

an objective optical system located to project said scanning slit illumination beam through a first region of the pupil plane of the eye to a focal region in the vitreous and to form an observation beam of reflected light reflected at an angle to said slit beam through a different region of the pupil plane of the eye, said objective optical system including an aspheric opthalmic lens for relaying a wide angle scan intermediate illumination image into the vitreous humor,

an observation slit conjugate to said focal region,

a second scanning mirror for receiving said observation beam from said objective optical system and directing it at the second slit, said second scanning mirror being synchronized with said first scanning mirror so as to descan light reflected from said focal region in the vitreous and maintain the descanned light stationary at said second slit, and

means for forming an image from the stationary descanned light at said observation slit.

4,991,954

OPHTHALMIC DISEASE DETECTION APPARATUS

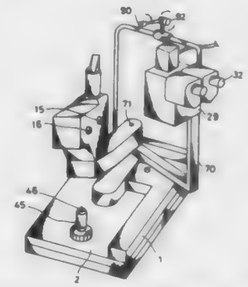
Kouichi Akiyama, Tokyo, Japan, assignor to Kowa Company Ltd., Japan

Continuation of Ser. No. 196,006, May 19, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 430,062

Claims priority, application Japan, May 20, 1987, 62-121414; May 20, 1987, 62-121415; May 20, 1987, 62-121416

Int. Cl.[5] A61B 3/10

U.S. Cl. 351—221 3 Claims



1. An apparatus for detecting ophthalmic diseases in a patient's eye comprising:

a laser source for producing a linearly polarized laser beam;

a laser beam projector for projecting said laser beam;

means for focusing said laser beam at a selected spot in said patient's eye;

means for receiving light scattered from said spot in the patient's eye and photoelectrically converting it into an electric signal;

means for processing said electrical signal to evaluate the ophthalmic diseases in the patient's eye;

means for producing a signal representative of the quantity of laser light produced from said laser source; and

means responsive to said signal for adjusting the quantity of light produced from said laser source whereby said laser beam is substantially constant independently of a fluctuation in power of said laser source.

4,991,955

CIRCULAR PROJECTION AND DISPLAY SYSTEM USING SEGMENTED TRAPEZOIDAL SCREENS

Richard Vetter, Pacific Palisades, Calif., assignor to Todd-AO Corporation, Los Angeles, Calif.

Filed Apr. 6, 1990, Ser. No. 506,289

Int. Cl.[5] G03B 37/00

U.S. Cl. 352—69 22 Claims

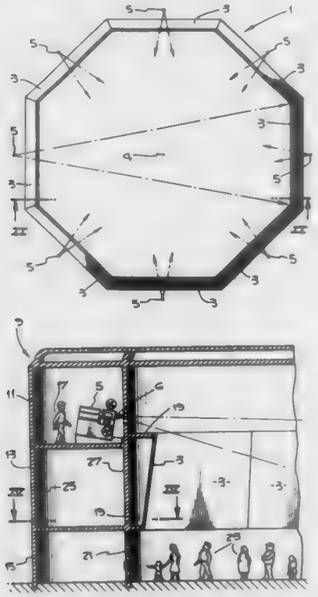
1. A multiple screen picture system comprising:

a plurality of trapezoidal screens, each having a flat reflective surface of trapezoidal shape wherein the screen bottom width is greater than the screen top width;

screen mounting means for mounting said plurality of screens in a continuous arcuate array positioned about a central vertical axis of such array and with each of said

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screens tilted to face in a downward inclined direction relative to said axis; and



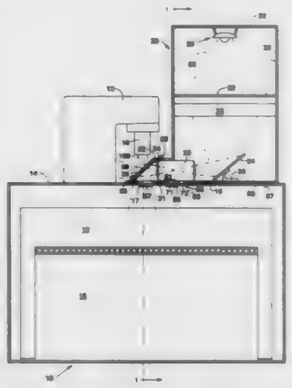
a plurality of motion picture projectors provided to project an image on each of said screens.

4,991,956

APPARATUS FOR FACILITATING CORRELATION WITH A TRANSPARENCY IMAGE

Stephen L. Griffin, 3043 Nantucket, San Antonio, Tex. 78230

Filed Mar. 2, 1989, Ser. No. 317,852
Int. Cl.[5] G03B *21/00*
U.S. Cl. 353—30 4 Claims



1. An apparatus for facilitating the creation and storage of information relative to a given job plan, comprising:

a housing;

means for releasably connecting said housing to a microfilm viewing table which is adapted for projecting a first beam of light onto a viewing surface on which the image of a microfilm may be viewed when said housing is not connected to said table;

a light source for projecting a second beam of light, said light source being mounted to said housing;

an LCD, connected to said housing, for controlling the image of said second beam of light;

a transparent mirror mounted to said housing;

means for directing said second beam of light through said LCD and to said transparent mirror;

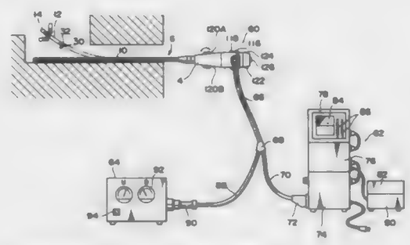
said transparent mirror being oriented relative to said housing such that, when said housing is releasably connected to said microfilm viewing table, said first beam passes through said transparent mirror onto said surface, and said second beam is reflected by said transparent mirror onto said surface in a manner such that the image of said second beam is superimposed over the image of said first beam on said surface.

4,991,957

BORESCOPE APPARATUS

Nobuyuki Sakamoto, Tokyo; Yoshio Shishido, Sagamihara; Masahiro Kumakura, Zama; Morihide Mizumoto, Tokyo; Morihide Tojo, Tokyo; Ryouji Masubuchi, Tokyo; Atsushi Miyazaki, Tokyo; Satoshi Tagami, Tokyo; Hiroshi Hasegawa, Tokyo; Shinichi Nishigaki, Tokyo; Yasuhiro Ueda, Tokyo; toshiaki Nishikiori, Sagamihara; Kunio Kinoshita, Tokyo; Takeaki Nakamura, Tokyo; Eiichi Fuse, Tokyo; Yoshisada Aoki, Tokyo, and Kazuhiro Misono, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 241,078
Claims priority, application Japan, Sep. 8, 1987, 62-223170; Sep. 17, 1987, 62-233458; Sep. 21, 1987, 62-236851; Sep. 21, 1987, 62-236852; Sep. 21, 1987, 62-236854; Sep. 21, 1987, 62-144098[U]; Nov. 16, 1987, 62-288740; Jan. 11, 1988, 63-2512; Mar. 8, 1988, 63-54083; Mar. 8, 1988, 63-30806[U]; Mar. 9, 1988, 63-55362; Mar. 9, 1988, 63-537612; Mar. 9, 1988, 63-53760; Mar. 16, 1988, 63-62276; Apr. 6, 1988, 63-83005; Apr. 7, 1988, 63-85784; Apr. 14, 1988, 63-50115[U]
Int. Cl.[5] G02B *23/26*
U.S. Cl. 356—241 28 Claims



1. A borescope apparatus comprising:

(A) a borescope including:

a. an operation unit;

b. an insertion unit having a bending tube portion being bent by operating the operation unit, a jet port member connected to a proximal end of the bending tube portion and having a jet port for ejecting a fluid, and a flexible tube portion connected to the jet port member and being bent by fluid jet from the jet port, independently of the bending tube portion; and

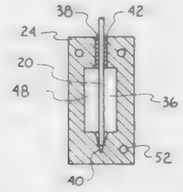
(B) pressurized fluid supply means for supplying a pressurized fluid to the jet port of said jet port member.

4,991,958

MICROPIPETTE ADAPTOR FOR SPECTROPHOTOMETERS

Harold R. Garner, Encinitas, Calif., assignor to General Atomics, San Diego, Calif.

Filed Jul. 10, 1989, Ser. No. 377,476
Int. Cl.[5] G01N *21/01*
U.S. Cl. 356—244 19 Claims



1. An adaptor for holding a micropipette in a spectrophotometer having a source of collimated light and a detector which comprises:

a base member formed with a first hole and a conical well distanced from said first hole, said conical well being aligned with said first hole and cooperating therewith to hold said micropipette;

a directing lens for linearly focusing the collimated light from said light source along the axis of said micropipette; and

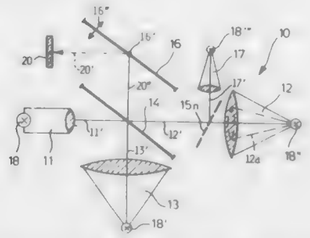
a receiving lens to recollimate the light passed through said micropipette for measurement by said detector.

4,991,959

OPTO-ELECTRONIC SIGHT

Roderich Rueger, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 276,215
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739698
Int. Cl.[5] G02B *23/10*
U.S. Cl. 356—251 20 Claims



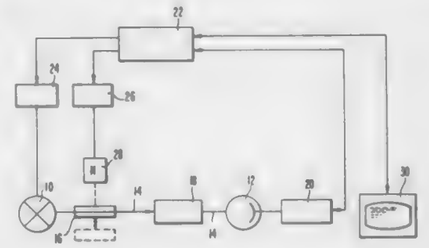
1. An opto-electronic sight, comprising a first optical device (**13**, **13***a*) having a first optical axis (**13'**, **13***b*), a second optical device (**12**, **12***a*) having a second optical axis (**12'**, **12''**), a third optical device forming a sighting image projector means (**11**, **11***a*) controlled to operate intermittently for short periods of times, said sighting image projector means being arranged separate from said first and second optical devices, said separate sighting image projector means having a third optical axis (**11'**, **11***b'*) for projecting a sighting image (**18**) into said first and second optical devices, and beam splitter means (**14**, **14***a*) arranged for passing a scene beam directly through said beam splitter means to one of said first and second optical devices and for simultaneously deflecting a portion of said scene beam to the other of said first and second optical devices, said first and second optical devices being so arranged relative to said beam splitter means that the respective first and second optical axes (**13'**, **13***b*; **12'**, **12''**) extend approximately at a right angle to each other upstream of said beam splitter means (**14**, **14***a*) and exactly in parallel to each other downstream of said beam splitter means, whereby harmonization of said first and second optical axes is automatically enforced through said beam splitter means (**14**, **14***a*), said third optical axis (**11'**, **11***b'*) of said separate sighting image projector means (**11**, **11***a*) being oriented to coincide with one of said first and second optical axes and to intersect the other of said first and second optical axes in said beam splitter means (**14**, **14***a*) so that said sighting image is projected simultaneously into said first and second optical devices.

4,991,960

ATOMIC ABSORPTION SPECTROMETER

Bernhard Huber, Hildegardring 42, 7770 Uberlingen; Rolf Tamm, Am Fohrenbuhl 8, 7777 Salem 2; Tomo Tomoff, Lawendelweg 9, 7770 Uberlingen, and Gunther Dencks, Prielstrasse 3, 776 Owingen, all of Fed. Rep. of Germany

Filed Aug. 6, 1986, Ser. No. 893,766
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528300
Int. Cl.[5] G01N *21/72*, *21/31*
U.S. Cl. 356—307 18 Claims



1. An atomic absorption spectrometer comprising

a housing

a line emitting light source;

detector means for measuring the absorption of light from said light source,

an optical means for generating a measuring light beam along a fixed optical path from said light source to said detection means, said optical path extending though said housing,

atomizer means for atomizing a sample to generate a cloud of atoms for atomic absorption analysis with said light beam,

means for movably mounting said atomizer means within said housing for movement between a first sample measurement position wherein a cloud of atoms from said atomizer means is within said optical path and a second drift compensation reference measurement position wherein a cloud of atoms from said atomizer means is without said optical path,

signal processing means for processing signals from said detector means to provide an atomic absorption measurement and drift compensation, and

means controlling said signal processing means and said atomizer mounting means

(i) to position said atomizer means in said first position for a first measuring time period to perform a sample measurement without interruption of the measuring light beam during said measuring time period, said measuring time period being sufficient for an entire atomic absorption measurement of an atomized sample and

(ii) to position said atomizer means in said second position after said sample measurement for a second time period to provide drift compensation for said sample measurement.

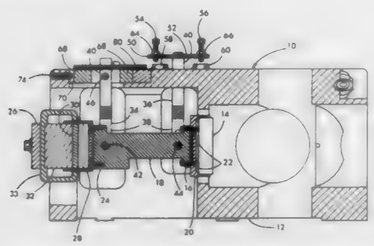
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4,991,961

MOVING MIRROR TILT ADJUST MECHANISM IN AN INTERFEROMETER

David R. Strait, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed May 26, 1989, Ser. No. 357,526
Int. Cl.[5] G01J *3/45*
U.S. Cl. 356—346 30 Claims



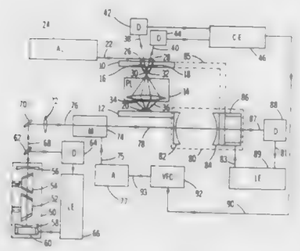
1. A mechanism for adjusting the tilt in the moving mirror of a spectrometer to maintain perpendicularity of the moving mirror to the line of motion, the mechanism comprising:
(a) a rigid mirror arm that is attached to a mirror and which is capable of movement along the line of motion;
(b) a housing within which the mirror arm is positioned for movement;
(c) two links each having a first end and a second end, each of the first ends of the links being attached to the arm at two swinging pivots at position along the length of the mirror arm that are spaced a fixed distance apart and each of the second ends of the links being attached to the housing at two independent fixed pivots; and
(d) a block forming a portion of the housing and to which the second end of one of the links is attached, and means for adjusting the position of the block to adjust the distance between the swinging pivots along the length of a mirror arm and the fixed pivots of the housing.

4,991,962

HIGH PRECISION ALIGNMENT SYSTEM FOR MICROLITHOGRAPHY

Kantilal Jain, 18 Algonquian Trail, Briarcliff Manor, N.Y. 10510

Filed Jan. 4, 1989, Ser. No. 293,778
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—349 16 Claims



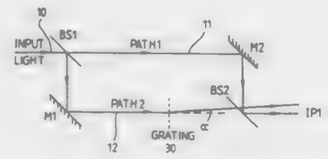
4. A high precision alignment system comprising:
(a) a first object having one or more diffraction gratings as alignment targets;
(b) a second object having at least one diffraction grating as an alignment target, the alignment targets on said first object and on said second object having a defined locational relationship;
(c) optical means for providing by double diffraction, using the alignment targets, interference signals which are a function of displacement between alignment targets on said first object and said second object;
(d) control electronics operatively connected to said optical means so as to provide a signal output related by the interference signals to the displacement of said first object to said second object;
(e) conversion means operatively connected to said control electronics to provide a displacement-related modulating signal;
(f) frequency stabilized light production means;
(g) modulation means operatively connected to said conversion means and to said frequency stabilized light production means so as to provide a displacement-modulated light signal; and
(h) resonator means, physically connected to said first object and to said second object to provide relative motion between them related to the displacement-modulated light signal.

4,991,963

WAVELENGTH-INDEPENDENT INTERFEROMETER FOR OPTICAL SIGNAL PROCESSING

Philip Sutton, Hampshire, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 250, Mar. 31, 1988. This application Sep. 21, 1989, Ser. No. 424,094
Claims priority, application United Kingdom, Apr. 9, 1987, 8708488; May 8, 1987, 8710883
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—353 7 Claims



1. A wavelength-independent interferometer for optical signal processing comprising:
(a) means to receive electro-magnetic radiation, hereinafter called light, from a field of view;
(b) means to separate the light into two beams;
(c) means to combine the two beams; and
(d) diffraction means interposed in the path of only one of the two beams to produce a wavelength-dependent shear

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4,991,964

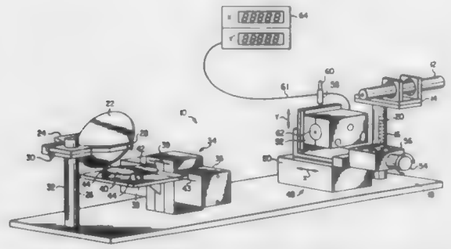
LASER STRESS MEASUREMENT APPARATUS AND METHOD

Moody K. Forgey, and Santos Garza, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1988, Ser. No. 237,603
Int. Cl.[5] G01B *11/30*
U.S. Cl. 356—371 31 Claims

1. Apparatus for determining a compressive stress on a semiconductor wafer surface, comprising:
(a) a known wavelength light source to provide a beam of light along a path;
(b) a light detector for receiving said light beam, said detector being separately adjustable horizontally and vertically relative to said path; and

(c) a reflector for reflecting said beam of light directly from said light source onto the wafer surface and from the



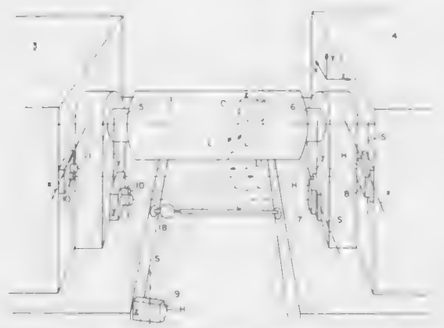
wafer surface directly to said light detector such that the compressive stress on the surface may be determined.

4,991,965

ELECTRO-OPTIC DEVICE FOR CONTINUOUSLY MONITORING THE RELATIVE POSITIONS OF TWO MACHINES OR PARTS THEREOF

Dieter Busch, Ismaning, Fed. Rep. of Germany, assignor to Prüftechnik Dieter Busch & Partner GmbH & Co., Ismaning, Fed. Rep. of Germany

PCT No. PCT/EP87/00395, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988, PCT Pub. No. WO88/01045, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 20, 1987, Ser. No. 187,531
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625641
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—373 5 Claims



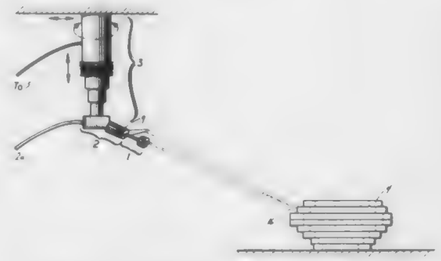
1. An electro-optic device for the continuous monitoring of the relative position in space of two machine or parts of machines, said device comprising:
(a) a beam transmitter rigidly mounted on the one machine or the one machine part, which transmits a closely collimated primary light beam,
(b) a reflecting system rigidly mounted on the other machine or the other machine part, respectively, which receives the primary light beam and reflects it as a secondary light beam in a manner dependent on the relative position,
(c) a beam receiver mounted on the one machine or the one machine part, respectively, which receives the secondary light beam and produces electrical signals which characteristics dependent on the conditions of incidence thereof,
(d) an electronic data processing device processing the electrical signals from the beam receiver, with an alphanumeric display for the recallable representation of information concerning the relative position and/or changes in the relative position and/or correctional measures for correcting changes in the relative position and possible other information derived from further input signal and-/or data, and
(e) signal deriving means electrically coupled to said beam receiver for deriving an electrical signal indicative of the intensity and position of said beam received by the beam receiver, and signal inputting means coupled to said data processing device for transmitting thereto electrical signals from said signal deriving means.

4,991,966

OPTICAL POSITIONING METHOD AND SYSTEM

Gary J. Raymond, Meriden, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 23, 1989, Ser. No. 370,674
Int. Cl.[5] G01B *11/14*
U.S. Cl. 356—375 10 Claims



1. A system for indicating a desired relative position between a sprayhead and a workpiece, wherein said system is coaxially affixed to a sprayhead, said sprayhead supported by a locating arm, comprising:
an enclosure containing a primary light source,
a primary light aperture disposed in the enclosure in spaced relationship between the primary light source and the workpiece, the primary light source, primary light aperture, and workpiece in coaxial alignment, the light source projecting a primary light pattern along the alignment upon the workpiece;
a secondary light aperture disposed through the periphery of the enclosure, the secondary aperture being skewed from the axial alignment of the primary light source, the primary light aperture, and the workpiece;
a reflector disposed outside the enclosure in coaxial spaced relationship with the primary light source and the secondary light aperture, whereby the illumination from the primary light source reaching the reflector through the secondary light aperture is reflected onto the workpiece, resulting in an initial secondary light pattern cast thereon,;
a selectively adjustable light-bar in spaced relationship between the reflector and the workpiece whereby the light-bar interferes with the initial secondary light pattern as reflected upon the workpiece such that a shadow edge of the initial secondary light pattern created by the interference of the light bar is locatable proximate to the primary light pattern cast thereon, the proximity of the shadow edge of the secondary light pattern with the primary light pattern indicative of a desired sprayhead-to-workpiece distance.

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4,991,967

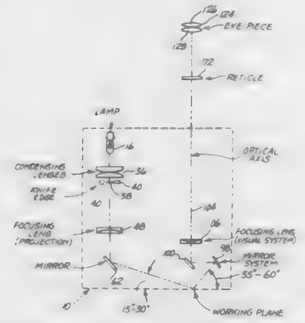
SCRATCH DEPTH MEASURING INSTRUMENT AND METHOD

Albert K. Creighton, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 14,136, Jan. 30, 1987, abandoned, which is a continuation of Ser. No. 613,455, May 24, 1984, abandoned. This application Dec. 19, 1989, Ser. No. 455,920

Int. Cl.[5] G01B *11/22*

U.S. Cl. 356—376 **15 Claims**



1. Hand-holdable portable apparatus for measuring the depth of a scratch in a surface, said apparatus being for use on matte, opaque, transparent, and specular surfaces, comprising:

a light projector positioned to project a light beam along a path towards said surface;

a masking member in said path to mask a portion of said light beam to produce a sharp boundary line between projected light and a shadow;

a microscope spaced laterally from said light projector, said microscope including an image receiving first end directed towards said surface and an opposite end including an eyepiece;

a system of mirrors positioned to receive the projected boundary line and redirect it so that it strikes said surface at an angle of incidence in the range of 15° to 30° and to direct the boundary line across the scratch so that the boundary line will have a deflection caused by the scratch, and to receive said boundary line after it has been reflected from said surface at an angle of reflection in the range of 40° to 60° and redirect it into said microscope; to enable reading of scratch depth on matte, opaque, transparent, and specular surfaces without changing either the angle of incidence or the angle of reflection;

a mounting frame for said light projector, said microscope, and said system of mirrors which is movable along said surface lengthwise along the length of the scratch for depth measurement thereof without significant change in adjustment in the apparatus; and

means within said microscope for measuring a length of said deflection of the boundary line into the scratch.

4,991,968

THREE DIMENSIONAL OBJECT SURFACE DETERMINATION WITH AUTOMATIC SENSOR CONTROL

William E. Yonescu, Dix Hills, and Howard K. Stern, Greenlawn, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,641

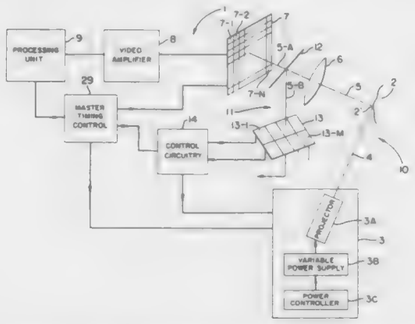
Int. Cl.[5] G01B *11/24*

U.S. Cl. 356—376 **44 Claims**

1. Apparatus for developing data for use in determining the three dimensional position of the points on the surface of an object comprising:

sensor means including: means for projecting electromagnetic radiation at the surface of the object; means for collecting electromagnetic radiation reflected from the object surface; and first detector means for receiving a first portion of the collected electromagnetic radiation; and

control means comprising: second detector means for receiving a second portion of the collected electromagnetic



radiation, said second detector means developing a plurality of second signals each indicative of the energy in a different one of a plurality of different parts of said second portion of electromagnetic energy; and means for inhibiting electromagnetic radiation from being received by said first detector means when any one of said second signals exceeds a predetermined level.

4,991,969

METHOD FOR MEASURING FILM THICKNESS

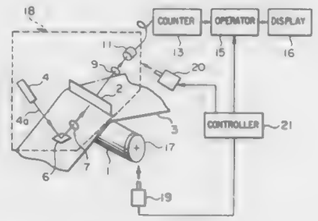
Makoto Tokumaru; Toshishige Nagao; Masayuki Ariki, and Hideki Nakano, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 25, 1989, Ser. No. 342,852

Claims priority, application Japan, Apr. 26, 1988, 63-104719; Jan. 7, 1989, 1-1631

Int. Cl.[5] G01B *11/06*

U.S. Cl. 356—381 **2 Claims**



1. A method for measuring the thickness of a sheet comprising:

feeding a sheet having a thickness to be measured over the surface of a rotatable shaft having a first diameter and, on one end, a different, second diameter portion the rotary shaft, over which the sheet is not fed;

disposing a light shield substantially parallel to the axis of rotation of the shaft at a predetermined distance from the surface of the shaft to define a first gap between the first diameter and the light shield and a second gap between the second diameter and the light shield;

scanning a laser beam along and transverse to the first and second gaps with no sheet present and along and transverse to the first and second gaps with the sheet present on at least part of the first diameter portion of the shaft;

measuring the time during which the laser beam passes through the first and second gaps without and with the sheet present on at least part of the first diameter portion of the shaft, respectively;

calculating the difference between (i) the time during which the laser beam passes through the second gap and (ii) the time during which the laser beam passes through the first gap without and with the sheet present; and

correcting the time that the laser beam passes through the first gap between the surface of the sheet and the light shield from the calculated difference to determine the thickness of the sheet.

4,991,970

METHOD FOR OPTIMIZING CONTRAST IN AN IMAGE OF A SAMPLE

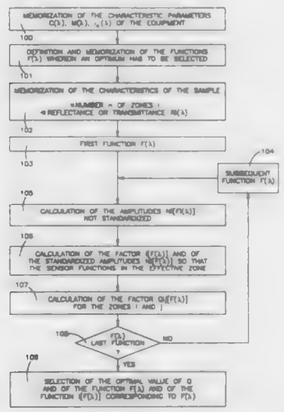
Michel Darboux; Gilles Grand, both of Grenoble, and Frédéric Moisan, Brest, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 13, 1989, Ser. No. 297,295

Claims priority, application France, Jan. 18, 1988, 8800496

Int. Cl.[5] G01J *3/51*

U.S. Cl. 356—402 **6 Claims**



1. A method for optimizing contrast in an image of a sample to be quality controlled having a whole number n of zones i, with $n>2$, having various reflectance and transmittance coefficients, these zones being illuminated by a light source and the image obtained at the output of an optical system to be analyzed by a sensor supplying recording signals of this image on the outputs, comprising the following steps before obtaining the image of the sample:

defining a set of functions F(λ) each representing transmittance according to the wavelength of an optical filter to be inserted between the source and the sample;

calculating for these functions F(λ) the amplitudes values Ni(F(λ)) with $1<i<n$ which would be equal to those of the corresponding output signals of the sensor respectively for each sample zone i with a transmittance filter F(λ), these amplitudes Ni(F(λ)) being calculated from the equation:

$$Ni(F(\lambda)) = I(F(\lambda)) \int_{\lambda A}^{\lambda B} C(\lambda) \cdot M(\lambda) \cdot F(\lambda) \cdot Ri(\lambda) i_o(\lambda) d\lambda$$

in which the following parameters are known:

C(λ) denotes the sensor spectral response,

M(λ) denotes the spectral response of the optical system,

Ri(λ) denotes the reflectance or spectral transmittance of the zone i,

$i_o(\lambda)$ denotes the power spectral density of the source, λA and λB are the two preliminarily selected limiting wavelengths,

I(F(λ)) is the attenuation factor calculated for each of the functions F(λ) so that the illumination power of the sample is compatible with the effective functioning zone of the sensor (I(F(λ)) and is between 0 and 1;

calculating for each function F(λ) from the corresponding amplitudes Ni the values of one factor Q_{ij} defined by the equation:

$$Q_{IJ} = \frac{Ni - Nj}{N_{sat}}$$

with $1 \leqq i \leqq n$ and $1 \leqq j \leqq n$ and $i<j$, each value of the factor Q_{ij} being representative of the contrast between zones i and j and N_{sat} denoting the signal amplitude with the highest value which the sensor can supply when it is saturated;

selecting for each function F(λ) a value Q of the factor Q_{ij} corresponding to the desired contrast and called the quality factor;

selecting from amongst the quality factors the quality factor Q allowing for the contrast to be optimized, this optimization supplying the transmittance F(λ) of the filter to be selected; and

inserting the selected filter between the source and the sample to be controlled so as to obtain the image of the sample.

4,991,971

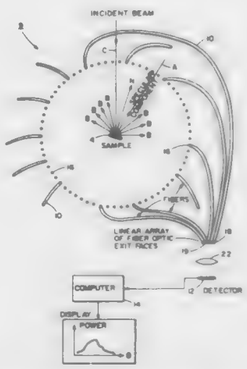
FIBER OPTIC SCATTEROMETER FOR MEASURING OPTICAL SURFACE ROUGHNESS

Joseph M. Geary, Las Cruces, N. Mex., and Charles G. Hull-Allen, Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 13, 1989, Ser. No. 311,130

Int. Cl.[5] G01N *21/47*

U.S. Cl. 356—446 **21 Claims**



1. A device for measuring scattered light reflectance for use in determining surface roughness of an optical surface of an object being tested, the device comprising:

means for directing light at the object being tested;

means for collecting a representative sampling of global reflected scattered light from the object, said collecting means including multiple light transmitting fibers having first ends formed along a light receptor arced path substantially equispaced from the object being tested, said fibers having equal lengths and second ends aligned in a substantially linear array such that said first ends of said fibers can each simultaneously receive a different angular component of reflected scattered light from the object

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being tested and independently transmit the received scattered light components to said second ends such that the transmitted scattered light components can exit said second ends simultaneously in a linear array; and

linear array detector means in communication with said second ends for reading the exited scattered light components and producing individual electrical output signals corresponding thereto for measuring scattered light reflectance and determining surface roughness of the optical surface of the object.

4,991,972

CONTROL APPARATUS FOR A PRINTER

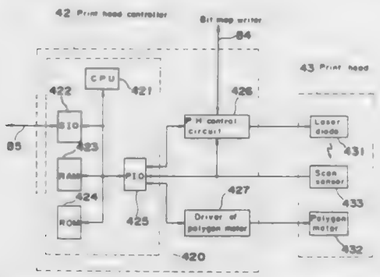
Yoshikazu Ikenoue, Fort Lee, N.J.; Kiyoshi Emori, and Makoto Sekiya, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1987, Ser. No. 72,722

Claims priority, application Japan, Jul. 14, 1986, 61-165754; Jul. 14, 1986, 61-165755; Jul. 14, 1986, 61-165756; Jul. 21, 1987, 62-125824

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—519 **12 Claims**



1. A printer which temporally stores printing data received from an external data processor and is capable of printing out images according to said stored printing data in a manner independent of the external data processor, comprising:

receive means for receiving said printing data and control data different from said printing data;

memory means for storing said printing data and control data;

print control means for printing out images according to said printing data read out from said memory means;

entry means for permitting the entry of a plurality of different signals, and

deletion means, responsive to an entered control signal, for deleting said printing data stored in said memory means by an amount determined according to the kind of the entered control signal.

4,991,973

ELECTRONIC BALANCE WITH SCALE ON TOP

Günther Maaz, Uslar; Klaus Dardat, Dransfeld, and Alfred Klauer, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius AG, Göttingen, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,138

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1988, 3819073

Int. Cl.[5] B01F *7/16, 13/08*; G01G *7/04, 21/22*

U.S. Cl. 366—141 **2 Claims**

1. An electronic balance having a magnetically driven agitator comprising:

weighing scale on top of said electronic balance,

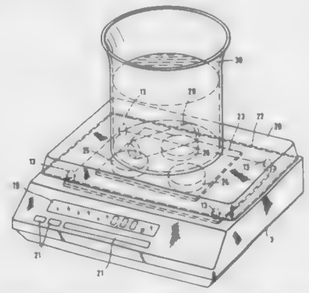
magnetic shield means positioned on said weighing scale,

drive means for the magnetically driven agitator positioned on said magnetic shield means and having a plurality of coils fastened to the weighing scale adapted and constructed to generate a magnetic rotary field.

said magnetic shield means being of a dimensional size whereby to magnetically isolate said electronic balance from said drive means for said magnetically driven agitator,

said weighing scale having a plurality of first support points terminating in first electrically conducting means,

said first electrically conducting means being electrically connected to said coils,



said electronic balance having a plurality of second support points terminating in second electrically conducting means adapted and constructed to be in abutting electrical communication with said first support point and to support said weighing scale, and a source of alternating electric current connected to said second electrically conducting means.

4,991,974

METHOD OF AND IMPLEMENT FOR MIXING FARINACEOUS MATERIAL

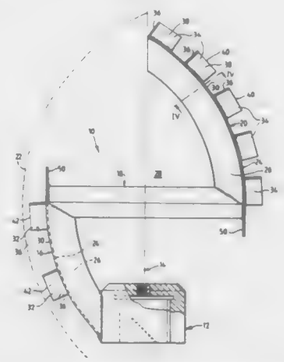
Neil Clyde, Burnley, and Mark D. Yell, Sheffield, both of England, assignors to Tweedy of Burnley Limited, Lancashire, England

Filed Feb. 6, 1989, Ser. No. 307,011

Claims priority, application United Kingdom, Feb. 6, 1988, 8802709

Int. Cl.[5] B01F *7/04*

U.S. Cl. 366—279 **11 Claims**



1. A method of mixing farinaceous material using a mixing implement in a container having a wall comprising

rotating said mixing implement about an axis to cause farinaceous material located between said mixing implement and a portion of said wall of said container located on a radius passing through said implement to move in a first direction and a second direction,

said first direction being transverse to the direction of movement of said implement at that location and transverse to the extent between said implement and said portion of said wall, said material moving in said first direction from one axial end of said implement towards and axial region located intermediate the ends of said implement, and

said second direction being transverse to the direction of movement of said implement at that location and transverse to the extent between said implement and said portion of said wall, said material moving in said second direction from the other axial end of said implement towards said axial region located intermediate the ends of said implement.

4,991,975

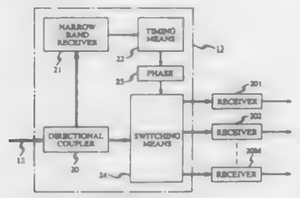
DIVISION MULTIPLEXING AND DEMULTIPLEXING MEANS LIGHTWAVE COMMUNICATION SYSTEM COMPRISING OPTICAL TIME

Rodney C. Alferness, Holmdel; Gadi Eisenstein, Middletown; Steven K. Korotky, Toms River, and Rodney S. Tucker, Howell, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 22, 1988, Ser. No. 275,454

Int. Cl.[5] H04J *14/08*

U.S. Cl. 370—4 **7 Claims**



1. A time-division multiplexed communication system comprising transmitter means, receiver means, and optical fiber means signal-transmissively connecting the transmitter and receiver means;

wherein the transmitter means comprise

(a) means for generating n optical pulse streams, with $n \geq 2$, a given pulse stream to carry information in accordance with an external signal; and

(b) multiplexer means for combining the n optical pulse streams into a multiplexed optical pulse stream nominally having a pulse repetition rate f_p;

wherein the receiver means comprise

(c) demultiplexer means adapted for separating the multiplexed optical pulse stream into m ($m \geq 2$, with m not necessarily equal to n) optical pulse streams; and

(d) a multiplicity of detector means, each detector means adapted for producing an electrical signal in response to an optical pulse stream incident thereon, the detector means arranged such that an electrical signal can be produced from each of the multiplicity of demultiplexed optical pulse streams;

CHARACTERIZED IN THAT the demultiplexer means comprise

(e) means for deriving an electrical timing signal of frequency f'_p from the multiplexed optical pulse stream, with f'_p being less than f_p, said deriving means comprising coupler means adapted for dividing the multiplexed optical pulse stream into a first and a second optical pulse stream, further comprising means for producing a substantially sinusoidal electrical signal of frequency f_p from the second optical pulse stream; means for producing the timing signal from the electrical signal of frequency f_p, and still further comprising means for adjusting the phase of the timing signal relative to the multiplexed optical pulse stream; and

(f) at least a first optical switch means that is responsive to the electrical timing signal of frequency f'_p and comprises at least one input port and at least two output ports, the first optical pulse stream entering the input port and an optical pulse stream of repetition rate f'_p appearing at an output port.

4,991,976

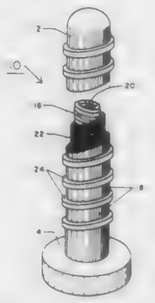
TEMPERATURE SENSOR PROBE APPARATUS AND METHOD FOR IMPROVING TIME RESPONSE

Joe D. Byles, Leander, Tex., assignor to Weed Instruments Company, Inc., Round Rock, Tex.

Filed May 31, 1989, Ser. No. 359,212

Int. Cl.[5] G01K *1/16, 13/02, 1/18*

U.S. Cl. 374—135 **20 Claims**



1. A temperature sensor probe for sensing the temperature of a flowing fluid, the temperature sensor probe comprising:

A. a temperature sensing element;

B. temperature probe housing means for housing the temperature sensing element so as to isolate the sensing element from direct contact with the fluid being sensed; and

C. flow channeling means formed on the outer surface of the housing means at an acute angle to the direction of fluid flow for deflecting the fluid over the outer surface of the housing means as the fluid flows over said outer surface so as to reduce the separation of fluid flow from the outer surface of the housing and thereby increase the convective heat transfer coefficient of the housing means.

16. A method of reducing the time response of a temperature sensor probe to temperature changes of a fluid flowing past the probe, the method comprising the step of:

A. deflecting the fluid over the outer surface of the probe at an acute angle to the direction of fluid flow as the fluid flows along said surface so as to reduce the separation of fluid from the outer surface of the probe, thereby increasing the convective heat transfer coefficient of the probe.

4,991,977

SMOOTHING FILTER FOR STAGE POSITION PULSES

William G. Manns; Anthony B. Wood, both of Dallas; Ronald S. Drafz, Richardson, and Don J. Weeks, Southlake, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1988, Ser. No. 173,777

Int. Cl.[5] G06K *7/10, 9/20*; G01B *11/02, 11/04*

U.S. Cl. 382—65 **5 Claims**

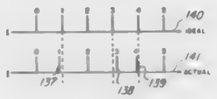
1. A computerized method of filtering position pulses for a stage for a pattern inspection or writing system, comprising the steps of:

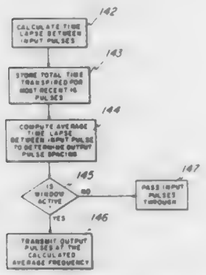
inputting the stage position pulses;

computing a running average time lapse between input pulses for a predetermined number of the most recent input pulses;

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outputting a pulse train having a period equal to the current computed average time lapse between input pulses; and





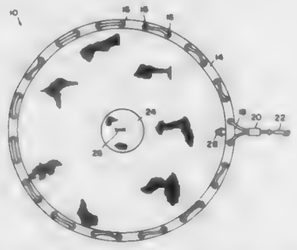
outputting the input stage position pulses without modification when the stage is accelerating or decelerating.

4,991,978

TOWEL BAG COMBINATION APPARATUS

Michael J. Ostrowski, 91 Old Toll Rd., West Barnstable, Mass.

Continuation-in-part of Ser. No. 437,216, Nov. 16, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 465,809
Int. Cl.[5] B65D *30/10, 33/02, 33/12*
U.S. Cl. 383—4 7 Claims



1. A towel-bag apparatus which is adapted to move between an open and closed position and which in the open position provides a towel suitable for drying and beach purposes, and in the closed position provides an enclosed bag with a carrying strap, and which towel-bag apparatus comprises in combination:

a) a generally circular, fabric towel element having a reinforced peripheral web and a plurality of holes in the web and having a top surface and a bottom surface, the bottom surface having a generally centrally reinforced section;

b) a loop means generally centrally secured to the the reinforced section;

c) a ring means secured to the reinforced peripheral web; and

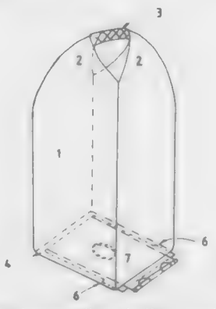
d) a draw cord means having a one and an other end, the draw cord passing through the holes in the reinforced web of the towel element, so as to permit the circular towel element to move between an open position for towel or beach with the draw cord in a relaxed, extended position use and a closed position for bag use with the draw cord in a drawn position, the draw cord means including a clip-type closure means at the one end and the other end so as to permit the said clip-type enclosure means to engage the loop means or the ring in the closed position to form a carrying strap for the towel-bag apparatus.

4,991,979

FLEXIBLE INTERMEDIATE BULK CONTAINER WITH MEANS FOR PARTLY OF COMPLETE DISCHARGE

Olaf Strand, and Bjarne Omdal, both of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Dec. 21, 1989, Ser. No. 454,503
Claims priority, application Norway, Dec. 21, 1988, 885697
Int. Cl.[5] B65D *33/06, 33/16*
U.S. Cl. 383—25 13 Claims



1. In a flexible intermediate bulk container including a double base structure formed by two layers one above the other, the improvement comprising:

each said layer having an opening therein, said openings being aligned one above the other and thus forming a discharge opening through said base structure;

closure means for selectively closing and partially or fully opening said discharge opening, said closure means comprising a member formed of flexible material folded to form two layers and positioned between said two layers of said base structure, said member having a first end fixedly fastened to said structure and a free second end; and

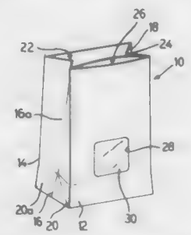
means at said second end of said member for pulling said member from a fully inserted position, whereat said two layers of said member block said discharge opening, in a direction outwardly of said base structure such that a folded edge between said two layers of said member progressively moves across and unblocks said discharge opening, during which said first end of said member remains fixedly fastened to said base structure.

4,991,980

BAG WITH AUXILIARY POCKET AND VIEWING WINDOW

Alden M. Cohen, Evanston; Mark Faltynek, Chicago; Ronald Marsik, Willow Springs, all of Ill., and David A. Riseman, Waban, Mass., assignors to Bagcraft Corporation of America, Chicago, Ill.

Filed Aug. 8, 1989, Ser. No. 390,823
Int. Cl.[5] B65D *30/22, 33/04*
U.S. Cl. 383—40 5 Claims



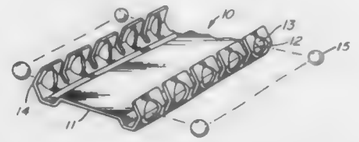
1. A flexible bag construction wherein the bag includes a front panel; a back panel constructed to be spaced from said front panel; a pair of side panels, each joined to a front and back panel; a bottom panel joined to each of the front, back and side panels; and an open top for access to the interior of the bag, wherein the improvement comprises said bag having an interior partition panel secured to the bag adjacent the front panel and separable therefrom so as to define a main article-carrying compartment with an open top between said partition panel and back panel and an auxiliary article-carrying compartment with an open top between said partition panel and front panel, said front panel also defining a viewing aperture and there being provided a transparent film adhered to said front panel and covering said aperture so as to define a viewing window through which contents of the auxiliary compartment can be viewed, wherein the partition panel is adhered to the front panel by a glue pattern that defines an adhered area between the aperture and the bottom panel, whereby the auxiliary compartment is shorter than the main compartment and the bottom of the auxiliary compartment is spaced above the bottom of the main compartment.

4,991,981

BALL BEARING RETAINER FOR DRAWER SLIDES

Alan R. Baxter, Waterloo, Canada, assignor to Waterloo Metal Stampings Ltd., Waterloo, Canada

Filed May 14, 1990, Ser. No. 522,737
Int. Cl.[5] F16C *29/04*
U.S. Cl. 384—18 4 Claims



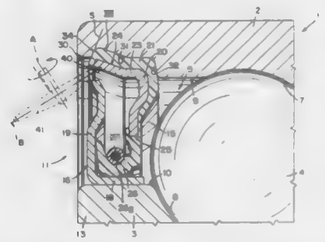
1. A ball-bearing retainer for use with drawer slides comprising a channel member consisting of a base and at least one upturned side flange, said side flange having at least one aperture; said aperture being elongated in the length of the channel and further dimensioned to engage and retain a common steel ball, from longitudinal movement; and when in operation said aperture provides a seat for rotation of said steel ball about an axis which is transverse to the length of the channel member and at right angles to the base thereof, such that the regions of the ball most distanced from the axis of rotation do not contact said aperture.

4,991,982

SEAL BEARING

Franco Colanzi, and Angelo Vignotto, both of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa, S.P.A., Turin, Italy

Division of Ser. No. 278,846, Dec. 2, 1988, Pat. No. 4,928,371. This application Jan. 29, 1990, Ser. No. 471,946
Claims priority, application Italy, Dec. 23, 1987, 68114 A/87
Int. Cl.[5] F16C *33/78, 33/74;* F16J *15/32, 15/40*
U.S. Cl. 384—486 3 Claims



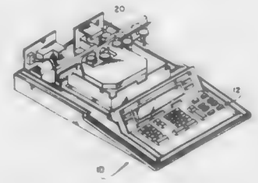
1. Bearing assembly comprising spaced inner and outer rings defining an annular space therebetween and a plurality of rolling elements in the annular space between the rings, means defining a seat on the inner peripheral surface of one of said rings facing said annular space including a throat section having a sawtooth-shaped axial profile defined by a first and second oblique lateral side surfaces facing one another and having opposite slopes, said first side surface being located toward the outside of the said annular space and having, with respect to a common axis of symmetry of said rings, a lesser axial length and greater slope than said second side surface, a seal system at least at one axial end of said annular space, comprising at least one generally rigid shield member, a cover member of resilient material covering at least a portion of said shield member, said shield member including a separate sleeve-shaped portion and with interposition of at least part of the said elastomeric covering in the said annular seat, said sleeve portion being placed coaxially within said ring and presenting a separate rim facing towards the outside of the said annular space, folded over so as to engage in the said sawtooth-shaped throat to immobilize the said shield axially in the said annular seat.

4,991,983

MICR ENCODER

James M. Graverholt, Woodinville, Wash., assignor to Global Technology International, Inc., Mukiteo, Wash.

Filed Sep. 9, 1988, Ser. No. 242,709
Int. Cl.[5] B41J *5/00*
U.S. Cl. 400—105 8 Claims



1. A portable apparatus for automatically encoding MICR characters on a check or other document, comprising:

guide means capable of receiving a check or other document to be encoded;

means including first and second spaced apart sensors for detecting when the check is correctly positioned in the check guide means;

means for selectively clamping the check when both the first and second sensors detect the presence of a check and for thereafter moving the check along the check guide means;

means for encoding the check with selected data;

means located in the vicinity just prior to the encoding means for detecting the leading edge of the check and thereby locating the check in a base position, prior to encoding, in which base position the leading edge of the check is positioned before encoding means along the check guide means;

means for ejecting the check form the check guide means, said eject means located downstream of said encoder means and including means for gripping and moving the check, wherein the eject means is operative on the check while the check is clamped by the check clamping and moving means, the action of the eject means being insufficient, however, the to overcome the control of the movement of the check by the check clamping and moving means as long as said clamping and moving means is operative on the check; and

means for releasing the clamping means from the check when encoding has been completed and the eject means is operative on the check, thereby permitting the eject means to move the check rapidly out of said guide means and said apparatus.

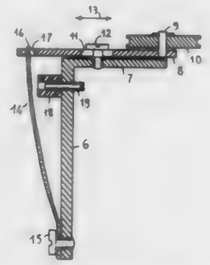
VOL 1123 ISS 2 FE 12 1991 UMI

4,991,984

BELT TENSIONING MEANS FOR A SERIAL PRINTER

Carlo Fare', Limito, Italy, assignor to Bull HN Information Systems Inc., Billerica, Mass.

Filed Jun. 8, 1989, Ser. No. 364,050
Claims priority, application Italy, Jul. 7, 1988, 21262 A/88
Int. Cl.[5] B41J *19/56*
U.S. Cl. 400—335 6 Claims



1. A belt tensioning means for a serial printer in which a spring imposes a continuous predetermined tension to a drive belt by applying a first continuous predetermined elastic return force to an idle pulley in a first direction to maintain said tension imposed to said drive belt, said pulley and said first return force being set at a working point when said belt is unaffected by elongations and belt tension increases caused by dynamic effects, said pulley being displaceable from said working point due to elongations and belt tensions increases caused by said dynamic effects, said tensioning means comprising:

a first means comprising said spring for providing said first continuous predetermined elastic return force in said first direction to maintain said tension imposed to said drive belt when said pulley is displaced in said first direction by said dynamic effects and when said pulley is displaced in a second direction opposite to said first direction by said dynamic effects, and

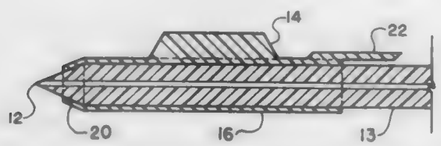
a second means for providing an additional second elastic return force to said pulley, said second return force being continuously applied to said pulley in said first direction when said pulley is displaced from working point in said second direction by said dynamic effects, said second return force being substantially zero when said pulley is at said working point and increasing with small displacements of said pulley from said working point in said second direction opposite to said first direction of said first predetermined return force.

4,991,985

MULTIFUNCTIONAL HANDLE FOR WRITING IMPLEMENT

Thomas C. Laipply, 28 Lyman Cir., Shaker Heights, Ohio 44122

Filed Dec. 27, 1988, Ser. No. 290,143
Int. Cl.[5] A46B *5/02*
U.S. Cl. 401—6 6 Claims



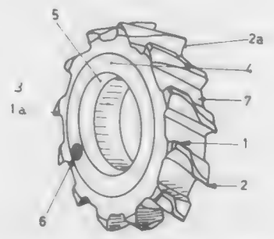
1. A tubular grip steadying device for a hand held writing instrument comprising a circular cylindrical collar having a smooth inner cylindrical surface for encircling at least a portion of the transverse periphery of said instrument and slidably movable there along and said instrument being thereby positionable at an infinite number of locations along the entire instrument, said collar having a cylindrical exterior surface including an elevated, elongate protrusion extending outward from the exterior surface to a height sufficient to be graspable between opposing surfaces of a writer's thumb and forefinger and positioned parallel to the instrument's logitudinal axis wherein said collar is long enough to be slid toward the instrument's tip sufficiently far so that one of its end is substantially co-extensive with said tip, while the other end still encircles said instrument, and wherein said collar has a cantilevered clip projection attached thereto and extending parallel to the longitudinal axis of said instrument and being spaced therefrom so as to admit a layer of fabric to which said instrument can be clipped.

4,991,986

MILLING CUTTER HAVING FACE AND PERIPHERAL CUTTING EDGES

Kurt Wiederkehr, Stetten, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jan. 3, 1990, Ser. No. 460,623
Int. Cl.[5] B26D *1/12*
U.S. Cl. 407—53 3 Claims



1. A milling cutter of unitary toroidal construction having a plurality of face cutting edges on opposite sides of said milling cutter, and a pair of peripheral cutting edges associated with each of said plurality of face cutting edges, each of said pair of peripheral cutting edges disposed on an outer circumference of said milling cutter, wherein the milling cutter, on each face side and on the peripheral side, is designed as a reversible milling cutter, a first cutting edge region of each of said pair of peripheral cutting edges being oriented in an opposite circumferential direction from a second cutting edge region of each of said pair of peripheral cutting edges, each of said first and second cutting edge regions of each of said pair of peripheral cutting edges being about half the width of the reversible milling cutter.

4,991,987

COSMETIC CONTAINER

Thomas F. Holloway, Southbury, and Dominic Wilks, Jr., Ridgefield, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.

Filed Jan. 23, 1990, Ser. No. 471,098
Int. Cl.[5] A45D *40/06, 40/12*
U.S. Cl. 401—78 9 Claims

1. A cosmetic dispenser, comprising:

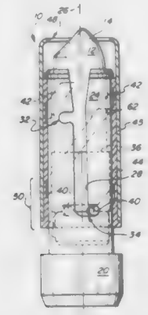
a tubular inner body having upper and lower ends and a wall, said inner body being provided with a longitudinal track extending through the wall of said inner body along a substantial length of said inner body, said longitudinal track having a lower end;

means for grasping and applying torque to said lower end of said inner body;

a tubular cam sleeve slidably and closely fitted over said inner body, said cam sleeve having upper and lower ends, and an internal helical track extending along a substantial length of said cam sleeve, said helical track having an upper terminus and a lower terminus, said cam sleeve helical track lower terminus extending below said inner body longitudinal track lower end when said cam sleeve is in a retracted position;

stop means for stopping said lower end of said cam sleeve in its retracted position;

an elevator cup for receiving a cosmetic stick material, said elevator cup being fitted inside said inner body, said elevator cup being provided with a radially outwardly extending lug, said lug being sized to fit into and engaging said longitudinal track of said inner body and said helical track of said cam sleeve for axial movement of said elevator cup by relative rotation of said cam sleeve and inner body;



whereby relative rotation of said cam sleeve and said inner body in one direction causes said cam sleeve to move to abut said stop means to be held in its retracted position and causes said elevator cup to be propelled upwardly in said inner body to a maximum extension, and relative rotation of said cam sleeve and said inner body in an opposite direction causes said elevator cup to be retracted into said inner body to a maximum retraction when said lug travels to said lower end of said inner body longitudinal track and causes said cam sleeve to be propelled upwardly relative to said inner body to an extended position as said lug travels to said lower terminus of said helical track.

4,991,988

COMPONENT WRITING INSTRUMENT HAVING RETRACTABLE CARTRIDGE

Thomas G. Snell, Madison, and M. David Gandelman, Branford, both of Conn., assignors to BIC Corporation, Milford, Conn.

Filed Apr. 18, 1989, Ser. No. 339,776
Int. Cl.[5] A43K *7/12, 24/08*
U.S. Cl. 401—111 34 Claims

1. A writing instrument comprising:

an elongated housing having a generally cylindrical shape, said housing being cut from an extruded tube having a generally uniform cross-section as an outer surface and defining a central opening along its length;

tip means attachable to said housing at a first end portion and defining an opening communicable with said central opening of said housing;

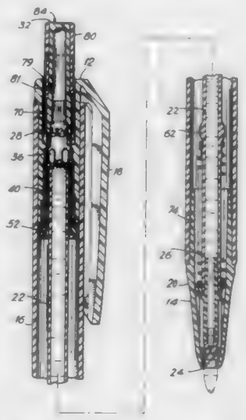
writing means positionable within at least a portion of said central opening of said housing and said tip means for writing on a substrate;

cam means attachable to the end of said housing opposite said first end portion at least for retaining said writing means therein;

means for positioning said writing means in one of a first position whereby said writing means extends through said tip means and is capable of contacting a substrate for writing thereupon, or a second position whereby said writing means is maintained within said tip means and housing;

said tip means and cam means each including an extension member dimensioned and configured for insertion into said central opening of said housing in interference relation therewith for retention of said tip means and cam means in engagement therewith; and

means located upon said housing outer surface for providing a predetermined finish thereto which facilitates non-slip contact and comfort during use of the writing instrument.

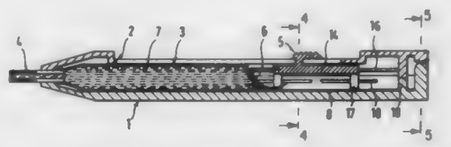


4,991,989

APPLICATOR DEVICE WITH SLIDE MEMBER

Holger Fitjer, Ansbach, Fed. Rep. of Germany, assignor to Georg Karl geka-brush GmbH, Bechhofen-Waizendorf, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 344,331
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814304
Int. Cl.[5] A46B *11/02*
U.S. Cl. 401—155 12 Claims



1. An applicator device for a liquid cosmetic material comprising an elongated housing means having an elongate axis, a foil cartridge containing said material disposed in said housing means, said foil cartridge comprising a foil container and an applicator means fixed to said foil container, a sealing cap disposed on said applicator means, and ejector means mounted on said housing means for slidably movement in an axial direction for squeezing out said material from said foil cartridge to said applicator means upon removal of said sealing cap.

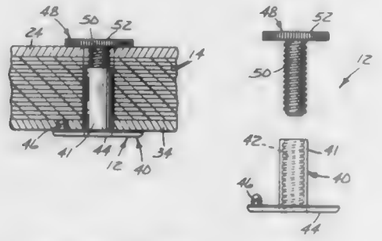
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4,991,990

PHOTOGRAPH ALBUM ATTACHMENT ASSEMBLY

John W. Frank, Cottage Grove; Bruce E. Samuelson, West Lakeland Township, Washington County, and Troy R. Weich, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 5, 1990, Ser. No. 461,263
Int. Cl.[5] B42F 3/00, 13/14
U.S. Cl. 402—53 6 Claims



1. In a photo album comprising

a stack of pages adapted to receive photographs said pages having spine edges and spaced openings through said pages along said spine edges;

front and rear covers each including:

a main portion having a spine edge and an inner major surface of a size adapted to overlay said pages when the spine edge of the main portion extends parallel to the spine edges of said pages;

an elongate attachment portion adapted to overlay narrow portions of the pages around the openings and adjacent the spine edges of the pages, said attachment portion having an outer edge adapted to lay adjacent and parallel with the spine edges of the sheets, having an inner edge opposite and parallel to said first edge, having a predetermined width between said inner and outer edges, and having through openings with the same spacing as the openings in said pages, and

a flexible hinge portion attaching said outer edge of said attachment portion to the spine edge of said main portion to afford movement of said main portion relative to said attachment portion between a closed position with the attachment portion along the inner surface of the main portion, and an open position with the inner surface of the main portion spaced from the attachment portion; and

a plurality of attachment assemblies, each including

a barrel part comprising

a tubular portion having opposite ends, a through opening defined by internal threads and an outer diameter adapted to pass through the opening in said pages and said attachment portions; and

a plate at one end of the tubular portion having a periphery larger than the diameter of the tubular portion so that the plate will not pass through the openings in the pages and the attachment portions; and

a screw part comprising

an externally threaded portion having opposite ends and adapted to threadably engage the internal threads in said tubular portion; and

a head at one of said ends having a periphery larger than the diameter of the tubular portion so that the head will not pass through the openings in the pages and the attachment portions, said head including means adapted to afford engagement of the head by a user to afford engagement of the screw part with and disengagement of the screw part from the barrel part;

said attachment assemblies being inserted through the openings in the stack of pages and the attachment portions with the plate and head on the sides of the attachment portions opposite the stack of pages, and said main portions of said front and rear covers overlying said plates and heads when said main portions are in said closed positions; the improvement wherein:

said plates have projections generally parallel to, along and spaced from said tubular portions;

at least one of said attachment portions has sockets receiving said projections to restrict rotation of said plates and thereby said barrel parts relative to said one attachment portion; and

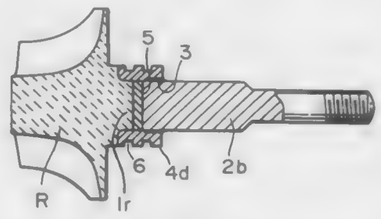
said heads on said screw parts have ridges along their peripheries adapted for manual engagement and diameters about equal to the width of at least the other one of said attachment portions to afford easy manual engagement with said peripheries along the inner edge of said other one of said attachment portions.

4,991,991

JOINT STRUCTURE BETWEEN A CERAMIC SHAFT AND A METALLIC SHAFT

Masaya Ito; Shunichi Takagi, and Noboru Ishida, all of Aichi, Japan, assignors to NGK Spark Co., Ltd., Aichi, Japan

Continuation of Ser. No. 783,966, Oct. 4, 1985, abandoned. This application May 4, 1987, Ser. No. 45,208
Claims priority, application Japan, Oct. 6, 1984, 59-210279; Oct. 9, 1984, 59-212070
Int. Cl.[5] F16B 9/00; F01D 5/28
U.S. Cl. 403—30 10 Claims



1. A joint structure for use in a turbocharger used in connection with an internal combustion engine, said turbocharger having a turbine section and a compressor section, said joint structure comprising:

a ceramic turbine rotor having at least one projection, said projection having an outer surface and a substantially cylindrical ceramic end face;

a metallic shaft member attached to said compressor section, said metallic shaft member having an outer surface and a substantially cylindrical metallic end face, said metallic end face of said metallic shaft member being adjacent to said ceramic end face of said projection;

means for joining the adjacent end faces of said projection and said metallic shaft member, said joining means having an outer surface and rigidly connecting said projection to said metallic shaft member; and

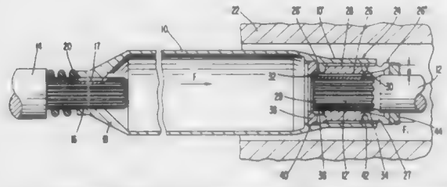
a separate sleeve member having an inner surface covering the outer surfaces of said projection, said metallic shaft member, and said joining means, said inner surface of said sleeve member being affixed to the outer surface of said metallic shaft member in a region proximate to the end face of said metallic shaft member.

4,991,992

COUPLING OF TWO SHAFT PARTS OF TOOTHED PROFILES

Siegfried Gutfleisch, Bisingen, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Sep. 27, 1989, Ser. No. 413,191
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1988, 3835544
Int. Cl.[5] F16D 3/06
U.S. Cl. 403—359 6 Claims



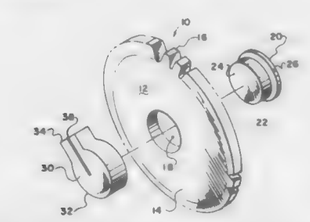
1. A coupling device for permitting a certain axial displacement of a rotationally rigid connection between two shaft parts having toothed profiles in which one shaft part, with a hub-like end piece, overlaps an end piece of the other shaft part, said end pieces of the two shaft parts being coupled to one another by a coupling part which is slit at one end to form a collet and which, with an internally toothed profile, meshed with an externally toothed profile of a meshing part overlapped by the hub-like end piece and fixed in terms of rotation to the other shaft part, whereby, when said meshing part and slit coupling part are mutually thrown into mesh, said coupling part, when pressing against a stop, being radially compressed by a clamping member, wherein the coupling part forms an intermediate bush arranged between both shaft parts, the coupling part forming the intermediate bush having an externally and an internally toothed profile which respectively mesh with a corresponding mating toothed profile of the shaft parts, wherein the clamping member interacts with a slit end piece of the intermediate bush and is provided inside the hub-like end piece and another end piece of the intermediate bush being slit like a collet and accommodated by the hub-like end piece at least over a sectional piece and also having, at least along this sectional piece, an externally toothed profile on a bush side extending to the slit so as to be radially expandable by pressing against said stop.

4,991,993

LOCK COUPLING

Larry D. Watlington, Rte. 1, Box 286, Colorado City, Tex. 79512, and Nathan T. Haynes, Rte. 3, Box 309, Sweetwater, Tex. 79556, assignors to Larry D. Watlington, Colorado City, Tex. and Nathan T. Haynes

Filed Jul. 3, 1990, Ser. No. 547,858
Int. Cl.[5] B25G 3/02; F16D 1/00
U.S. Cl. 403—365 8 Claims



1. A gear with a radial face and gear teeth at its periphery, comprising:

a. a hexagonal gear hole concentric with the gear teeth,

b. a lock plate on the face of the gear,

c. the lock plate having a cylindrical peripheral shape concentric with said gear teeth,

d. a hexagonal lock hole in the lock plate aligned with the hexagonal gear hole,

e. ears on the lock plate,

f. a slot between the ears, said slot extending to the hexagonal hole,

g. said lock plate welded to the gear along an arc away from the ears, and

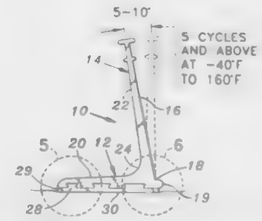
h. a bolt through the ears for clamping the gear upon a hexagonal shaft.

4,991,994

HIGHWAY TRAFFIC LANE AND EDGE DELINEATOR

Robert F. Edouart, 18207 Verano Dr., San Diego, Calif. 92128

Filed Oct. 11, 1989, Ser. No. 419,691
Int. Cl.[5] E01F 9/06
U.S. Cl. 404—10 6 Claims



1. A highway traffic lane and edge delineator, comprising:

a generally L-shaped, single piece, resilient polymer-based pavement marker including

a horizontally extending base for supporting the marker on a pavement surface,

a leg extending in a vertical direction and tapering inwardly as it rises vertically from the base with a rear face of the leg extending from a lower edge of the base below a top surface thereof and a forward face of the leg facing oncoming highway traffic when the marker is secured on the pavement surface, and

fillet means joining the forward face of the leg and the top surface of the base, said fillet means having a radius of curvature which allows for (1) stretching as a tire of an oncoming vehicle rolls over the marker and (2) the leg to fold back from the base in the direction of oncoming traffic and compress in a region of the rear face and the lower edge of the base, whereby as the tire passes over the marker the leg automatically returns to a vertical condition.

4,991,995

LAYING PLANK FOR A ROAD FINISHING MACHINE

Dirk Heims, Bad Münder, Fed. Rep. of Germany, assignor to ABG-Werke GmbH, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,400
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838157
Int. Cl.[5] E01C 19/22
U.S. Cl. 404—118 10 Claims

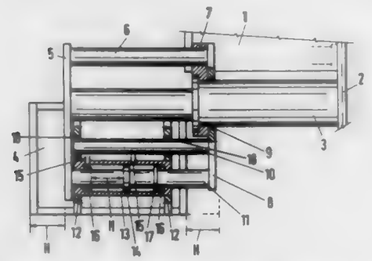
1. Laying plank for a road finishing machine comprising:

a centrally divided basic plank having a respective left-hand and right-hand half, an inward direction oriented from each half toward the other half and an outward direction oriented away from the other half, each half including a central upright cheek and an extension cylinder attached to said central upright cheek;

an extensible plank for elongation of said basic plank when said extensible plank is in an extended state, said extensible plank including an inner movable cheek guided by said extension cylinder and engaging an outer movable cheek;

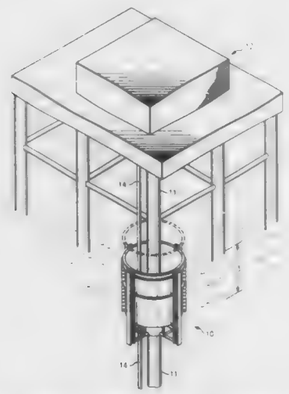
VOL 1123 ISS 2 FE 12 1991 UMI

a first guide rod disposed parallel to the axis of the extension cylinder between said inner and outer movable cheeks;
an outer stantionary cheek fixed to said basic plank for guiding said first guide rod;
two second guide rods disposed parallel to the axis of the extension cylinder between the inner and outer movable cheeks and outward of the outer stationary cheek;
two guide cheeks guided by said second guide rods, said



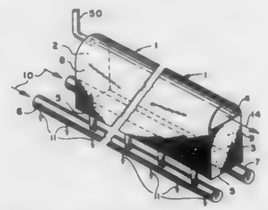
guide cheeks spaced form each other and connected to said extensible plank; and
a cylinder embracing one of said second guide rods, connected to said guide cheeks and including an annular piston stressable on both sides to move said extensible plank in a stroke, said stroke corresponding substantially to the interval between the inward surface of the inner movable cheek and the outward surface of said basic plank when said extensible plank is in the extended state.

4,991,996
WORK ENCLOSURE FOR SERVICING MARINE STRUCTURES
Steven H. Tate, Morgan City, La., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 30, 1989, Ser. No. 444,029
Int. Cl.[5] B63C *11/00*
U.S. Cl. 405—14 **13 Claims**



1. A work enclosure adapted to be positioned about marine support member, said enclosure comprising:
at least two sections, each section being open at the top and having a bottom which has an opening therethrough;
means for securing said sections together in a watertight, closed position around said support member whereby said openings in said bottoms of said sections cooperate to form a central opening through said bottom which surrounds said support member; and
clamp means for securing said enclosure to said support member when said sections are in a closed position and
wherein said bottom of at least one of said sections includes a riser opening therethrough adapted to receive at least one riser when said enclosure is in said closed position.

4,991,997
METHOD AND APPARATUS FOR THE TRANSPORT OF PARTICULATE SOLIDS USING A SUBMERGED FLUID INDUCTION DEVICE
Norman T. Cowper, 1A Noonbinna Crescent, Northbridge, New South Wales, Australia
Filed May 15, 1989, Ser. No. 352,122
Claims priority, application Australia, May 13, 1988, PI8216
Int. Cl.[5] E02F *3/88*
U.S. Cl. 405—73 **17 Claims**

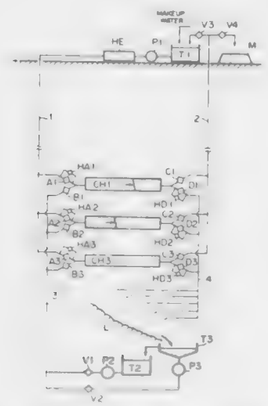


1. An apparatus for transporting sand or silt which underlies or adjoins a body of water, comprising:
an elongated enclosure completely buried below the top level of the sand or silt, said enclosure having a top, a pair of side walls, a pair of end walls, and an open bottom, said open bottom comprising a first opening, one of said end walls being at least partially open and including a second opening; and
a means to fluidize sand or silt underlying said enclosure, said fluidizing means comprising at least one pipe having apertures or nozzles for discharging fluidizing media delivered to said pipe into the sand or silt surrounding said pipe to fluidize said sand or silt and to cause said fluidized sand or silt to move up into said enclosure through said first opening and out of said enclosure through said second opening.

4,991,998
MINE COOLING POWER RECOVERY SYSTEM
Yukishige Kamino, Tsuchiura; Makoto Saito, Ibaraki; Kenji Uchida, Kashiwa; Naoshi Furutani, Ibaraki, all of Japan, and Ian Monroe, Johannesburg, South Africa, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 7, 1989, Ser. No. 432,902
Claims priority, application Japan, Aug. 23, 1989, 1-215095
Int. Cl.[5] E02D *19/14*
U.S. Cl. 405—130 **8 Claims**

6. In a system comprising a refrigerator provided on the ground surface, a pressure changeover feed chamber and a heat load both provided in an underground mine, a cold water feed pipeline extending from the surface to an underground, and a warm water feed pipeline extending from the underground mine to the ground surface, a mine cooling power recovery system characterized in that a warm water charging low-pressure pump for delivering a warm water to the refrigerator is provided on the ground surface, both a slurry pump for

delivering a mud slurry to the pressure changeover feed chamber and a slurry tank are provided in the underground mine,



and a mud slurry sedimentation tank is provided on the ground surface.

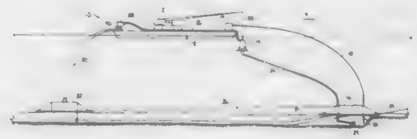
4,991,999
CORRUGATED STRUCTURAL PANELS
Robert C. Helms, 2470 S. Dairy Ashford #200, Houston, Tex. 77077
Filed May 7, 1990, Ser. No. 519,944
Int. Cl.[5] E21D *11/00*
U.S. Cl. 405—151 **4 Claims**



1. A corrugated structural panel wherein:
said corrugation is of the folded plate type;
each of said corrugations comprises an outer flange, two inner flanges, and two webs;
the said outer flange is in a plane parallel to the plane containing said two inner flanges;
the longitudinal axis of said outer flange is parallel to the longitudinal axis of each of said two inner flanges;
each long edge of said outer flange is connected by a web to one long edge of one of said inner flanges;
said corrugation is terminated on each end by a triangular prism element located transversely to the longitudinal axis of the corrugation; and
said triangular prism element is externally shaped as a solid, triangular in cross-section; and
one face of said triangular prism element serves as an edge of said corrugated structural panel and as a bearing plate to transmit forces from the structural panel to the structural panel's connecting support.

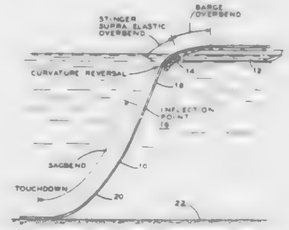
4,992,000
UNDERWATER TRENCHING SYSTEM
Donald L. Doleshal, Overland Park, Kans., assignor to Central States Underwater Contracting, Inc., Kansas City, Kans.
Filed Jun. 19, 1989, Ser. No. 369,042
Int. Cl.[5] F16L *1/12*
U.S. Cl. 405—163 **16 Claims**

16. An underwater trenching system comprising:
(a) a floating vessel;
(b) an underwater trenching sled comprising a shell attached to a frame, which is attached to a pair of parallel, generally horizontally disposed runners, means for trenching the bottom of a waterway, and means for sucking up the sediment disturbed by said trenching means;
(c) an underwater bury sled comprising a shell attached to a frame, which is attached to a pair of parallel, generally



horizontally disposed runners, and means for discharging the sediment sucked up by said trenching sled;
(d) means for conveying the sediment from said trenching sled to said bury sled; and
(e) a surge bin disposed on said vessel interposed in said conveying means.

4,992,001
METHOD OF DEEPWATER PIPELAY
Gary E. Harrison, Katy, Tex., assignor to McDermott International, Inc., New Orleans, La.
Filed Aug. 17, 1990, Ser. No. 570,172
Int. Cl.[5] F16L *1/16*
U.S. Cl. 405—166 **8 Claims**



1. A method of deepwater pipelaying comprising the steps of:
(a) assembling a straight pipeline on a lay barge in a marine environment;
(b) deploying said pipeline from said lay barge along a stinger;
(c) overbending said straight pipeline along said stinger to bending strains exceeding normal Conventional Lay bending strain limitations of approximately 0.15 to 0.35 percent;
(d) reverse bending said pipeline before leaving said stinger to a pre-determined negative or reverse curvature resulting in a bending strain of opposite sign at that point along said pipeline; and,
(e) applying a generally horizontal axial force to said pipeline to control said bending strain as said pipeline is deployed to and engages the ocean floor thereby resulting in a final, at rest, in-situ residual bending strain value within acceptable limits.

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4,992,002

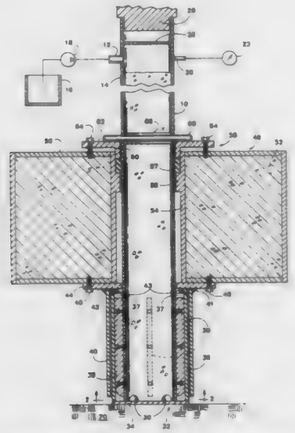
APPARATUS FOR FORMING IN-GROUND CONCRETE PILINGS

Wayne DeWitt, 10816 SE. Evergreen, Vancouver, Wash. 98664

Continuation-in-part of Ser. No. 378,008, Jul. 11, 1989, abandoned. This application May 29, 1990, Ser. No. 529,486

Int. Cl.[5] E02D *5/34*

U.S. Cl. 405—237 10 Claims



1. Apparatus for forming an in-ground concrete piling comprising:

(a) an elongate, drivable, hollow mandrel having a hollow interior, an upper end and a lower end, said mandrel having grout transmitting openings located proximate said lower end for conducting grout outwardly from said hollow interior into an exterior area surrounding said mandrel;

(b) foot means at the lower end of said mandrel for forming a hole which is larger in cross section than the cross section of said mandrel when said mandrel is driven into the ground;

(c) a collar having a central opening longitudinally slidably receiving said mandrel;

(d) means for introducing fluid grout into said hollow interior of said mandrel; and

(e) sealing means on said collar for preventing the flow of grout from said hollow interior of said mandrel outwardly through said grout transmitting openings when said collar and foot means are proximate to each other, and permitting said flow when said collar and foot means are remote from each other, said hollow interior of said mandrel and said sealing means cooperating as means for receiving and retaining an elongate vertical column of fluid grout within said mandrel extending upwardly above said grout transmitting openings and above the level of any fluid grout in said exterior area surrounding said mandrel.

4,992,003

UNIT COMPRISING MESH COMBINED WITH GEOTEXTILE

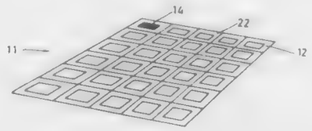
Chaim Perach, Ra'anana, Israel, assignor to Yehuda Welded Mesh Ltd., Ashdod, Israel

Filed Jan. 12, 1989, Ser. No. 296,503

Int. Cl.[5] E02D *17/20*

U.S. Cl. 405—258 10 Claims

1. A porous geotextile unit comprising a porous geotextile material and means for minimizing the stretching of the porous geotextile material including a rigid mesh of construction steel rods and means for integrally coupling the porous geotextile material to the mesh wherein the porous geotextile material comprises first and second sheets of porous geotextile material disposed on opposite sides of said mesh and the means for integrally coupling the porous geotextile material to the mesh



comprises heat welds joining said first and second sheets of porous geotexile material only at the areas between the rods.

4,992,004

INJECTION ADAPTOR FOR AND A METHOD OF APPLYING A CORROSION PROTECTIVE AGENT TO A FIXING ELEMENT ANCHORED IN A HOLE

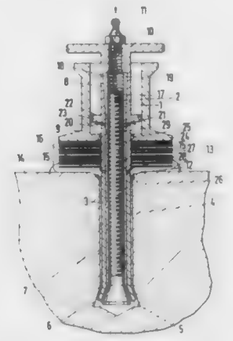
Willi Haug, Freudenstadt, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co KG, Waldachtal/-Tumlingen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,983

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841577

Int. Cl.[5] E21D *20/02*

U.S. Cl. 405—269 2 Claims



1. An injection adaptor for injecting a free-flowing compound into a hole drilled in masonry and into clearance space between a sleeve and a threaded bolt of fixing means anchored in the drilled hole, said injector adaptor comprising a cylindrical member defining an inner pressure chamber in which a portion of the threaded bolt projecting from the drilled hole is received, said cylindrical member having an inner thread for engaging the threaded bolt and an end face facing the sleeve and located at a mouth of the drilled hole; means for injecting the free-flowing compound into said inner pressure chamber; means for sealing said inner pressure chamber with respect to a sleeve end located at the mouth of the drilled hole, said sealing means comprising a first sealing element located between said end face of said cylindrical member and the sleeve end; overflow channel means formed in an area of said inner thread to enable flow of the free compound along the threaded bolt; an actuation cylinder supported on said cylindrical member for axial diplacement over said cylindrical member; an outer pressure chamber formed between said actuation cylinder and said cylindrical member; and hole means for connecting said outer pressure chamber with said inner pressure chamber; said cylindrical member having an outer surface on which a pile of sealing platelets is placed, said platelets being pressed toward the sleeve upon pressurization of said outer pressure chamber in response to actuation of said actuation cylinder.

4,992,005

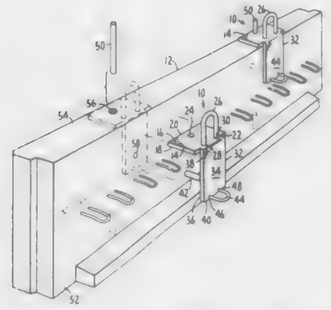
LIFTING DEVICE AND METHOD FOR RETAINING WALL PANELS

William K. Hilfiker, P.O. Box 2012, Eureka, Calif. 95501

Filed Jan. 9, 1990, Ser. No. 462,222

Int. Cl.[5] E02D *29/02;* B66C *1/66*

U.S. Cl. 405—284 9 Claims



1. A lifting device for a retaining wall panel of the type having top and side surfaces, said device comprising:

(a) first and second plates connected for complemental engagement with the top and side surfaces, respectively, of the panel;

(b) a pin extending from each of said plates for engagement in a cavity formed in the surface of a panel complementally engaged by the plate to secure the plates to the panel; and,

(c) hoist engageable means carried by one of said plates for applying lifting force to the plate and a panel secured thereto.

4,992,006

DEVICE FOR HYDRAULIC CONVEYANCE OF LOOSE MATERIALS

Valery P. Drobadenko, Pogonny proezd, 2, kv.3I, and Sergei J. Chepov, Sirenevy bulvar, 43a, kv.128, both of Moscow, U.S.S.R.

Filed Feb. 14, 1990, Ser. No. 480,633

Int. Cl.[5] B65G *53/40*

U.S. Cl. 406—109 10 Claims



1. A device for hydraulic conveyance of loose materials, comprising:

a toroidal chamber having a meridianal plane and an equatorial plane thereof and arranged in such a way that an angle α defined between said equatorial plane and a horizontal plane, be within a range of

$$\phi < \alpha < 90°,$$

where ϕ is the angle of internal friction of the loose material, when saturated with the liquid used for hydraulic conveyance;

a first pipe for charging the loose material and a second pipe for discharging the liquid used for hydraulic conveyance, both of said pipes being arranged on one side with respect to said meridianal plane in the upper portion of said chamber;

a slurry discharge unit arranged on the other side of said meridianal plane in the lower portion of said chamber.

4,992,007

CUTTING INSERT AND A TOOL HOLDER THEREFOR

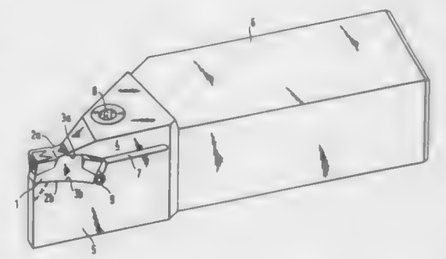
Amir Satran, Kirat Bialik, Israel, assignor to Iscar Ltd., Nahariya, Israel

Continuation of Ser. No. 237,990, Aug. 29, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 414,582

Claims priority, application Israel, Oct. 14, 1987, 84171

Int. Cl.[5] B23B *27/08, 29/14*

U.S. Cl. 407—110 9 Claims



1. A metal cutting tool for use in parting, grooving or turning operations and comprising: a tool holder; upper and lower clamping jaws of the tool holder defining therebetween an insert receiving slot; respective clamping surfaces of said jaws; the clamping surface of a lower jaw defining an angle of at least 90° with an adjacent outer edge of the tool holder when viewed from the side of the tool holder; a cutting insert of elongated substantially prismatic shape received within said receiving slot and having top and bottom faces of respectively substantially convex and concave disposition with respect to an axis transverse to a longitudinal axis of the insert and front, rear and a pair of side peripheral faces; a first cutting end of said insert and having a front cutting edge formed at the intersection of the top face and the front peripheral face; first and second side cutting edges formed respectively at the intersections of the top face and the two side peripheral faces; chip forming means for shaping chips produced in said operations and located on said top face within an area defined by said cutting edges; front and side rake surfaces respectively separating said cutting edges from said chip forming means; and clamping means for clamping said clamping surfaces against said front and bottom faces.

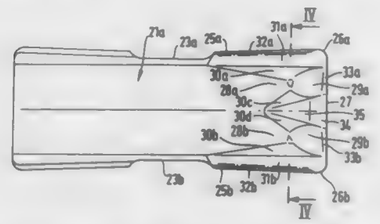
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4,992,008

CUTTING INSERT

Joseph Pano, Nahariya, Israel, assignor to Iscar Ltd., Nahariya, Israel

Continuation of Ser. No. 235,924, Aug. 23, 1988, abandoned. This application Jul. 3, 1990, Ser. No. 547,391
Claims priority, application Israel, Oct. 2, 1987, 84078
Int. Cl.[5] B23P *15/20*
U.S. Cl. 407—114 12 Claims



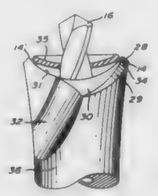
1. A polygonally shaped metal cutting insert for use in parting or grooving operations and turning in a separate operation comprising top and bottom faces and front, rear and a pair of side peripheral faces; a front cutting edge formed at the intersection of the top face and the front peripheral face for use in the parting and grooving operations and first and second side cutting edges formed respectively at the intersections of said top face and the two side peripheral faces for use in the separate turning operation; chip forming means located on said top face within an area defined by said cutting edges and comprising a pair of spaced apart chip deflector ridges extending longitudinally along a front end of said top face and projecting therefrom above the level of the cutting edges, each ridge being formed with a front deflector surface with a side deflector surface, the front deflector surfaces being spaced apart symmetrically with respect to a longitudinally directed median axis of the insert, being located in the vicinity of the front cutting edge and being respectively spaced from said front cutting edge by a pair of front rake surfaces, said side deflector surfaces extending respectively along the lengths of said cutting edges and being respectively spaced therefrom by side rake surfaces.

4,992,009

SHEET METAL DRILL BIT

Mark Wallach, Markham, Canada, assignor to Canadian Flexi Drills, Markham, Canada

Filed Aug. 25, 1988, Ser. No. 236,175
Int. Cl.[5] B23B *51/05*
U.S. Cl. 408—67 5 Claims



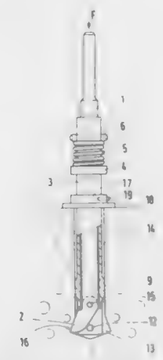
1. A drill bit for drilling burrless round holes in sheet metal, said drill bit comprising a solid drill body of circular cross-section having a drill head and a connecting shaft, said drill head having two diagonally opposed outer cutting edges in a front face thereof, said cutting edges extending along a respective opposed circumferential segment of said drill head, a stabilizing central drill but located in a central axial bore in said front face and having spring biasing means to bias a drill end portion of said bit outwards of said front face to protrude beyond said outer cutting edges a distance sufficient to penetrate through sheet metal to be drilled, each said cutting edge having a leading edge portion which is elevated from said front face and a downwardly sloping trailing portion, said front face defining a concave wall between outer cutting edges and said central drill bit, said trailing portion extending from said leading edge to an angulated web portion of said drill head, said concave wall retaining an undrilled sheet metal piece about said central drill bit whereas said web portion permits evacuation of loose drilled material during a drilling process.

4,992,010

DEVICE FOR FORMING AN UNDERCUT IN A DRILLED HOLE

Artur Fischer, Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co KG, Waldachtal/-Tumlingen, Fed. Rep. of Germany

Filed Nov. 20, 1989, Ser. No. 439,463
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839617
Int. Cl.[5] B23B *29/034;* B28D *1/14*
U.S. Cl. 408—159 7 Claims



1. A device for forming an undercut in a drilled hole in masonry, comprising a stem having an upper portion to be clamped in a drilling machine and a lower portion and having upper and lower end positions; a reaming element arranged at said lower end portion of said stem and having a cutting edge; a guide tube in which said stem is displaceable between the upper and lower positions thereof, said reaming element pivoting radially outwards out of said guide tube with said cutting edge projecting laterally from said guide tube upon displacement of said stem to the lower end position thereof; and a compression spring surrounding said guide tube and biasing said stem into the upper end position thereof, said guide tube having slot means at an upper end thereof and a ring spaced from said slot means, said stem being provided with a transverse pin extending through said slot means, said compression spring extending between said transverse pin and said ring.

4,992,011

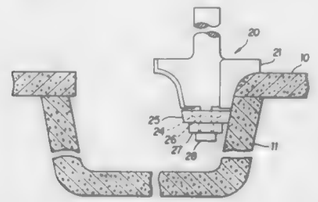
CUTTING AND SHAPING TOOL

Robert J. Cesark, Putnam Valley, N.Y., assignor to Fred M. Velepec Co., Inc., Glendale, N.Y.

Filed Apr. 6, 1989, Ser. No. 334,217
Int. Cl.[5] B27C *5/00*
U.S. Cl. 409—126 4 Claims

1. A cutting tool suitable for shaping the top of a counter section having a fixture disposed therebeneath the cutting tool comprising a shaft member having a shaped cutting means disposed at the lower end thereof for shaping the counter section, first bearing means mounted to said shaft member adjacent said cutting means, a follower means having at least one inside diameter and at least one outside diameter mounted

on said first bearing means, substantially shaped to bear against the side wall of the fixture, capping means for capping the bearing, the capping means being disposed adjacent said follower means and having a portion thereof mounted to same follower means, a second bearing means having an inner diameter disposed adjacent same capping means and having an



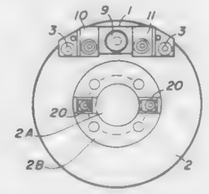
outer diameter larger than the inside diameter of said follower means such that the outer portion of the second bearing means abuts the follower so as to prevent the latter from becoming dislodged from said shaft member, and fastening means for securing said first bearing means, said capping means, said follower means and said second bearing means to said shaft member.

4,992,012

APPARATUS FOR THE UNIVOCAL AND AUTOMATIC POSITIONING AND BLOCKING ON THE NOSE OF THE SPINDLE OF A TOOL MACHINE AND THE LIKE OF MECHANISMS FOR VARIOUS CHIP REMOVAL MECHANICAL WORKINGS

Mauro Cioci, Florence, Italy, assignor to Bakuer Italiana S.p.A., Florence, Italy

Continuation of Ser. No. 363,494, Jun. 8, 1989, abandoned. This application Mar. 5, 1990, Ser. No. 490,541
Claims priority, application Italy, Jun. 21, 1988, 9430 A/88
Int. Cl.[5] B23B *47/00*
U.S. Cl. 409—136 9 Claims



1. A holder block for a rotatable spindle having a main bore for receiving a generic operating mechanism, comprising a block body formed as an integral unit including:

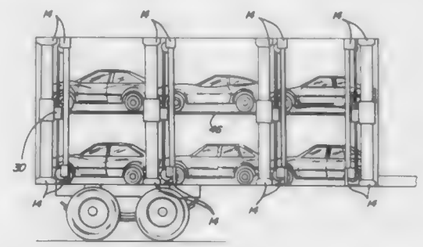
a first opening defining a seat for holding the shank of a first tool; a second opening defining a seat for holding the shank of an arm carrying a mechanism and a third opening defining a seat for holding the shank of an arm carrying another mechanism, said mechanism and said another mechanism operating on different fluids, said second opening being connected to a first inwardly extending operating medium bore passage, said third opening being connected to a second inwardly extending operating medium bore passage, each of said first, second, and third openings having a center lying on a circumferential line concentric with a central axis of the spindle.

4,992,013

COMBINATION FREIGHT AND VEHICLE CARRYING TRAILER

Norman Westerdale, Novi, Mich., assignor to Autohaul Industries, Inc., Flint, Mich.

Filed Oct. 21, 1988, Ser. No. 260,768
Int. Cl.[5] B60P *3/08*
U.S. Cl. 410—29.1 16 Claims



11. An enclosed vehicle for alternately carrying vehicular and non-vehicular cargo comprising:

(A) a wheeled chassis;
(B) means for removably coupling the front part of said chassis to a towing vehicle;
(C) a framework defining an enclosure having a length, a width and a height and mounted on said chassis;
(D) a floor mounted on said chassis;
(E) a top mounted on said framework;
(F) a plurality of walls mounted on said framework, said walls forming an enclosure mounted to said framework and said chassis and wherein one said wall is equipped with an opening;
(G) at least one door within said opening;
(H) means for opening said door;
(I) a plurality of full-range hydraulic actuators each having a fixed length substantially equal to the height of said enclosure and disposed vertically at intervals within said enclosure;
(J) a plurality of mounting trolleys, one said trolley mounted on each said actuator;
(K) at least one elongated planar support located within said enclosure attached to said trolleys;
(L) means for actuating said actuators to raise and lower said at least one elongated planar support, said means including a deactivation device comprising at least one infrared light beam emitter and corresponding beam receiver, whereby an infrared light beam is located in close proximity to the upper limits of the enclosure, above said at least one planar support and causes a deactivation of said hydraulic actuators when the infrared light beam is interrupted; and
(M) said elongated planar support being adapted to be moved substantially along the entire height of said enclosure by said hydraulic actuators.

4,992,014

TRANSPORT SAFETY FOR CONTAINERS, NOTABLY INTERCHANGEABLE CONTAINERS

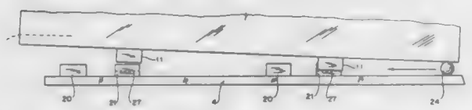
Normann Bock, Syke-Barrien, Fed. Rep. of Germany, assignor to Idelhoff M.S.T.S. GmbH, Iserlohn, Fed. Rep. of Germany

PCT No. PCT/DE88/00407, § 371 Date Mar. 9, 1989, § 102(e) Date Mar. 9, 1989
PCT Filed Jul. 1, 1988, Ser. No. 348,585
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 8709539[U]
Int. Cl.[5] B60P *7/10;* B65D *88/12*
U.S. Cl. 410—52 10 Claims

1. A locking device for a lift-on lift-off container which has an underside and which is loadable onto the back of a transport vehicle having a loading surface providing an in transit position of the container, with a front end comprising:

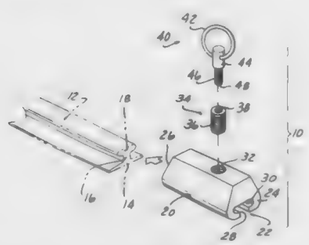
VOL 1123 ISS 2 FE 12 1991 UMI

an adjusting element having a length and arranged on the underside of the container at the level of said vehicle loading surface;
an arresting element arranged on said vehicle loading surface and associated with said adjusting element;
and said arresting element positioned adjacent to its associated adjusting element so that the container is maintained in the in transit position of the container;
each arresting element comprising two adjoining cams; the distance between the two adjoining cams being substantially equal to the length of said adjusting element;



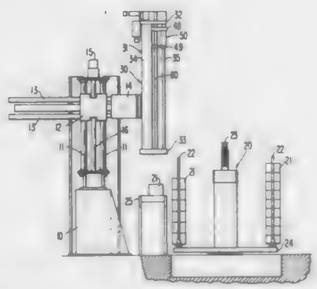
each adjusting element has a projecting part which can be disposed between the cams; and
a first cam of the arresting element, respectively, facing said front end of said vehicle loading surface, is flatter than a respective adjoining second cam of the same arresting element;
whereby said container is protected against longitudinal and transverse forces during the transit thereof, but the on-loading and off-loading vertical movement is not obstructed during the transit thereof.

4,992,015
CARGO TIE-DOWN ANCHOR
Glen A. Florence, 39745 Silvia, Mt. Clemens, Mich. 48045
Filed Jan. 11, 1989, Ser. No. 295,584
Int. Cl.[5] F16B *37/08*
U.S. Cl. 410—104 **2 Claims**



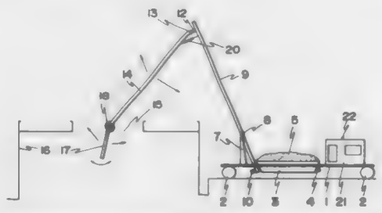
1. A cargo tie-down anchor adjustably mountable on an elongated rail having an upstanding anchor engaging section, the cargo tie-down anchor being formed by the process comprising the steps of:
extruding a metallic material to form a body having a longitudinal bore extending therethrough configured to slidably engage the anchor engaging section of the rail;
forming a threaded bore in the body transverse to and communicating with the longitudinal bore in the body;
threadingly mounting a threaded sleeve having an internal threaded bore extending therethrough in the transverse bore in the body, the sleeve being formed of a metallic material having a higher strength than the body; and
threadingly inserting a cargo retaining ring having a threaded shaft mounted thereon through the bore in the sleeve, such that when the cargo tie-down anchor is mounted on the anchor engaging section of the rail, the cargo retaining ring extends through the bore in the sleeve into engagement with the anchor engaging section of the rail to secure the body in a fixed position to the rail.

4,992,016
DEVICE FOR CHARGING AND DISCHARGING YARN CHEESES FROM CHEESE FRAMES
Alessandro Ferloni, Gerenzano, Italy, assignor to Camel Robot S.p.A., Milan, Italy
Filed Oct. 12, 1988, Ser. No. 262,737
Claims priority, application Italy, Oct. 12, 1987, 22226 A/87
Int. Cl.[5] B65G *60/00*
U.S. Cl. 414—27 **10 Claims**



1. An apparatus for loading and unloading articles, comprising:
a frame;
a locking rod freely extending from said frame, said locking rod having a longitudinal axis and a free end;
means for expanding the diameter of said free end of said locking rod to engage an article;
a carriage mounted to said frame for movement substantially parallel to said axis;
means for moving said carriage with respect to said frame in directions substantially parallel to said axis;
a plurality of gripping arms connected to said carriage, said gripping arms extending from said carriage substantially parallel to said axis, said gripping arms being mounted on said carriage radially of, and for rotation about, said axis;
gripping means mounted at the free end of each of said arms for gripping the article; and
means for rotating each of said arms independently about said axis.

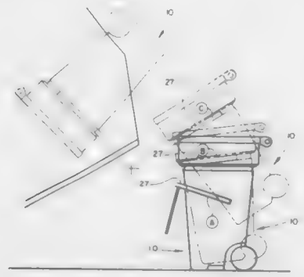
4,992,017
BULK SHIPPER FOR HARBOURS AND THE LIKE
Francisco J. Jauregui Carro, Castilla, 14, 39002 Santander, Spain
Filed May 22, 1989, Ser. No. 355,000
Claims priority, application Spain, May 27, 1988, 8801692; Nov. 17, 1988, 8803508; Nov. 17, 1988, 8803509
Int. Cl.[5] B65G *63/00*
U.S. Cl. 414—140.5 **1 Claim**



1. A conveyor mechanism for use in loading grain or other particulate material into the hold of a ship, comprising:
a frame having a longitudinal direction and a transverse direction;
wheels supporting said frame for movement in at least one of said longitudinal and transverse directions;

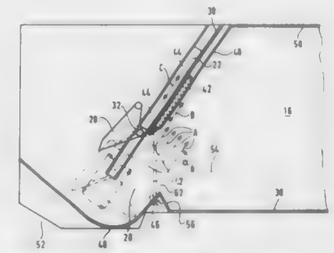
a hopper supported on said frame, said hopper having a low profile permitting top loading thereof from a dump truck, and having a conveyor belt extending in the longitudinal direction of said frame and providing a bottom surface of said hopper, said hopper extending downwardly beneath said frame into proximity with a ground surface on which said mechanism is supported, and having a discharge opening extending rearwardly of said hopper and located at a position beneath said frame;
a screw-type conveyor pivotally supported on said frame for arcuate movement in the longitudinal direction of said frame about an axis extending transversely of said frame, said screw-type conveyor having an inlet at a lower end thereof positioned for cooperation with said hopper discharge opening in one extreme position of arcuate movement of said screw-type conveyor, said inlet being removed from cooperation with said hopper discharge opening and said screw-type conveyor extending longitudinally along said frame when said screw-type conveyor is in an opposite extreme non-use position of arcuate movement;
a discharge tube pivotally connected at one end to an upper end of said screw-type conveyor and adapted to extend over the side of a ship;
a discharge nozzle pivotally connected to an opposite end of said discharge tube and adapted to discharge conveyed material into a hold of said ship;
means for moving said screw type-conveyor from said opposite position to said one position;
means for adjusting the angular orientation of said discharge tube relative to said screw-type conveyor;
means for adjusting the angular orientation of said discharge nozzle relative to said discharge tube; and,
means for driving said respective conveyors;
said screw-type conveyor extending rearwardly of said frame when in said one position for a discharge opening of said screw-type conveyor to be located above and rearwardly of said frame when in said one position.

4,992,018
REFUSE CONTAINER FOR USE WITH EMPTYING MECHANISM
John T. Prout, Winston-Salem, and Billy R. Cagle, Statesville, both of N.C., assignors to Toter, Inc., Statesville, N.C.
Filed Apr. 11, 1989, Ser. No. 336,253
Int. Cl.[5] B65F *3/02*
U.S. Cl. 414—408 **14 Claims**



1. A refuse container of the type adapted to be lifted during an emptying cycle from an upright position by opposed retaining arms of a mechanical dumping unit, tiltably emptied into a refuse vehicle and lowered back to the upright position, said refuse container being molded of plastic and comprising a bottom, side walls connected to said bottom on one end and defining a substantially open top on the other end thereof, said side walls including a first wall segment and a second wall segment spaced-apart from said first wall segment and defining in the space between said first and second wall segments a narrowed waist formed in the walls around the periphery of the refuse container, said waist having a height dimension adapted to receive retaining arms having substantially the same height dimension as the waist and to receive the retaining arms and lock the refuse container against substantial vertical and horizontal movement relative to the retaining arms during both the lifting and lowering movements of the emptying cycle without clamping pressure against the side walls of the container.

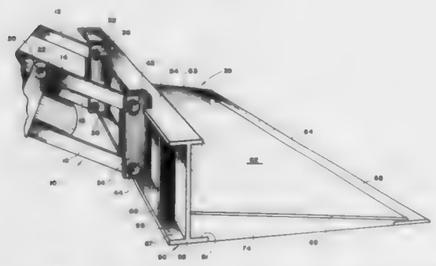
4,992,019
RUBBISH COLLECTION VEHICLE
Hans-Jurgen Behling, Hannover, and Friedrichwilhelm Schmadeke, Neustadt, both of Fed. Rep. of Germany, assignors to Schorling GmbH & Co. Waggonbau, Hannover, Fed. Rep. of Germany
Filed Apr. 7, 1989, Ser. No. 335,137
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811716
Int. Cl.[5] B65F *3/20*
U.S. Cl. 414—525.2 **4 Claims**



1. A rubbish collection vehicle comprising:
a chassis;
a driver's cabin mounted on a forward portion of said chassis;
a rubbish collection container having a floor and mounted on said chassis, rearward of said driver's cabin, on a rear portion of said chassis and having an intake opening on a front side thereof;
a rubbish intake unit mounted adjacent said driver's cabin on a forward portion of said chassis;
a rubbish compaction unit having a bottom, a front, a top and a rear end and operating to compact rubbish from said rubbish intake unit and to feed the rubbish into said rubbish collection container, said rubbish compaction unit feeding the rubbish in an operating direction extending upwardly from the bottom and front of the rubbish collecting container to a top and rear thereof at an oblique angle;
a projection extending upwardly from the floor of said rubbish collection container adjacent said intake opening so as to reduce the size of said intake opening;
wherein said front side of the rubbish collection container extends at an oblique angle above said intake opening in a direction parallel to said operating direction;
wherein said front side of said rubbish collection container is equipped with a telescopically extendable plate to seal said rubbish collection container intake opening; and
wherein the telescopically extendable plate pivots in its fully extended position about a pivot point and, for the purpose of closing said intake opening, abuts said projection on the floor of said rubbish collection container.

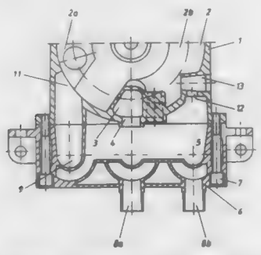
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4,992,020
FRONT LOADER LIFTING ATTACHMENT
Charles Bartlett, 2713 Phil La., Marrero, La. 70072
Filed Mar. 13, 1990, Ser. No. 481,516
Int. Cl.[5] B66C *1/00*
U.S. Cl. 414—723 12 Claims



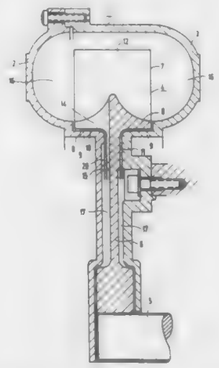
1. A lifting attachment for a front loader having power operation lifting arms, the attachment comprising:
an attachment bracket means pivotally connected to the lifting arms;
an elongated I-shaped rear wall rigidly attached at its rear side to the bracket means in substantially perpendicular relationship thereto;
a downwardly inclined solid top plate means fixedly attached at an angle to a front side of the rear wall at a vertical distance from a bottom end of the rear wall and extending forwardly from the rear wall, a front edge of the top plate being proximate a leading edge of the attachment;
a supporting plate means rigidly attached to a bottom end of the rear wall and extending towards the leading edge of the attachment in co-planar relationship to a plane defined by the bottom end of the rear wall for supporting the top plate; and
a pair of parallel end walls fixedly secured between opposite lateral ends of the top plate and the supporting plate means for retaining the top plate in an angular relationship to the rear wall.

4,992,021
SIDE CHANNEL BLOWER
Herbert Langen, Altbach; Peter Steiner, Aichwald, and Helmut Keinert, Nürtingen, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany
Filed Nov. 20, 1989, Ser. No. 439,456
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1988, 3839430
Int. Cl.[5] F04D *23/00*; F01N *3/02, 3/30*
U.S. Cl. 415—52.1 6 Claims



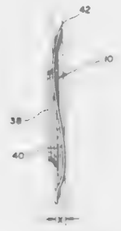
1. A side channel combustion air blower for an engine-independent, liquid fuel-fired burner device for cleaning soot filters by burning off soot, with at least two soot filters being connected in parallel such that one soot filter may be regenerated by burning off soot while another or other soot filters are being used as a soot particle filter, comprising:
a side channel blower housing defining a side channel annular space, and air intake port and a side channel blower air discharge opening, said side channel blower housing including a bypass regulator for return of air not withdrawn into the side channel annular space;
a chamber housing defining a chamber, said chamber housing being positioned adjacent said side channel blower housing, said side channel blower air discharge opening communicating with said chamber, said chamber having a first air discharge opening and a second air discharge opening and an air passage opening leading to said side channel annular space;
and, valve means for selectively individually opening and closing said first opening, said second opening and said air passage opening for changing the blower delivery without changing the blower speed.

4,992,022
SIDE CHANNEL COMPRESSOR
Norbert Aust, and Rudolf Schoening, both of Bad Neustadt, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Nov. 22, 1989, Ser. No. 440,986
Claims priority, application European Pat. Off., Dec. 5, 1988, 88120298
Int. Cl.[5] F04D *29/70*
U.S. Cl. 415—121.2 4 Claims



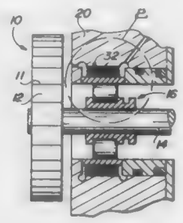
1. A double-pass side-channel compressor comprising:
a housing;
a rotor rotatably supported in said housing for rotating about an axis, said rotor comprising a central disk-shaped hub and a blade ring arranged at the outer circumference of said hub;
a clearance space formed between said housing and said rotor in the vicinity where said hub merges into said blade ring;
a plurality of recesses formed in said rotor in said vicinity where said hub merges into said blade ring, each recess extending over the entire effective length of said clearance space in said vicinity where said hub merges into said blade ring and including a groove formed in said disk-shaped hub, each recess effectively forming an extension of said clearance space; and
at least one counterbore that is formed in said houisng and extends in the circumferential direction a distance several times the width of said groove, said counterbore having an opening facing said clearance space and said disk-shaped hub.

4,992,023
VEHICLE WATER PUMP WITH IMPROVED SLINGER
Steven F. Baker, Bellevue; Joseph L. Tengowski, and Brent R. Behrman, both of Norwalk, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 5, 1990, Ser. No. 548,651
Int. Cl.[5] F01D *11/00*; F16J *15/00*
U.S. Cl. 415—171.1 2 Claims



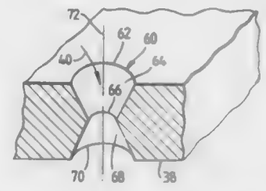
1. For use in a vehicle water pump of the type that has a rotating pump shaft extending axial)y through a cylindrical housing and through a water pump seal, and in which said housing has at least one vent hole located axially outboard of said seal at a fixed radius relative to said pump shaft, a slinger comprising,
a cylindrical mounting portion adapted to be secured to said pump shaft in axial alignment with said vent hole, and,
a circular outer lip having a radius slightly less than said fixed radius, said lip further being scalloped in the axial direction,
whereby, as said pump shaft rotates, said slinger lip rotates in radial proximity to said vent hole while simultaneously moving axially back and forth past said vent hole.

4,992,024
MULTI-FILM FLUID BEARING DAMPER
Hans Heydrich, Phoenix, Ariz., assignor to Allied-Signal Inc., Morris Township, N.J.
Filed Dec. 13, 1989, Ser. No. 450,932
Int. Cl.[5] F01D *25/16*
U.S. Cl. 415—229 12 Claims



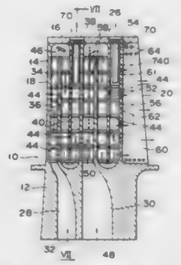
1. A fluid damper for a bearing, comprising:
a first housing adapted to receive a bearing therewithin:
a second housing extending radially outwardly from said first housing and cooperating therewith to define a closed annular fluid damping chamber, a fluid inlet and a fluid outlet for delivery and exhaust of damping fluid to and from said chamber; and
a plurality of thin shims stacked radially between said first and second housings, define said shims configured and arranged to define radially stacked fluid damping cavities therebetween and to define circumferentially spaced, radially extending lands for circumferentially separating said cavities and for providing radial contact and support between said shims, each of said cavities being in fluid communication with said inlet and said outlet.

4,992,025
FILM COOLED COMPONENTS
David Stroud; Arthur G. Corfe, both of Bristol; Jonathan P. W. Towill, Cardiff, and Brian G. Cooper, Derby, all of England, assignors to Rolls-Royce plc, London, England
Filed Oct. 10, 1989, Ser. No. 417,971
Claims priority, application United Kingdom, Oct. 12, 1988, 8823874
Int. Cl.[5] F01D *5/08, 5/18*
U.S. Cl. 416—97 R 20 Claims



1. A film-opposed component subject to heating by hot fluid flowing therepast, the component having wall means with one side thereof being a first surface subject to said heating and the other side thereof being a second surface subject to cooling by flow of pressurized coolant therepast, the wall means having a plurality of film cooling holes therethrough connecting the first and second surfaces to allow coolant to flow through said holes onto the first surface for film-cooling of the same, wherein the holes comprise in coolant flow series an inlet aperture on the second surface, a convergent portion, a coolant flow metering restriction, a divergent portion and an outlet aperture on the first surface, the metering restriction connecting the narrowest parts of the convergent and divergent portions, wherein no line of said convergent portion is co-linear with a line of said divergent portion.

4,992,026
GAS TURBINE BLADE
Fumio Ohtomo; Yasuo Okamoto, both of Yokohama; Shoko Ito, Tokyo; Yoshitaka Fukuyama, Yokohama; Hideo Iwasaki, Kawasaki, and Takeshi Watanabe, Ooiso, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation-in-part of Ser. No. 31,268, Mar. 30, 1987, abandoned. This application Jun. 22, 1989, Ser. No. 370,080
Claims priority, application Japan, Mar. 31, 1986, 61-72971
Int. Cl.[5] B63H *1/14*
U.S. Cl. 416—97 R 16 Claims



1. A blade of a gas turbine, said blade comprising:
a main body including a dovetail portion and a blade portion extending from said dovetail portion, said blade portion having an extended tip, leading and trailing edges which extend substantially along the extending direction of said blade portion, and a suction side surface and a pressure side surface which are located between said leading and trailing edges and face each other; and

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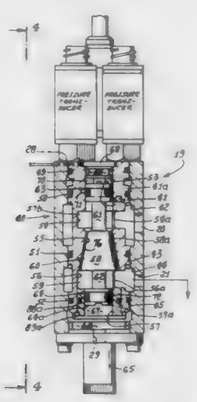
(b) cooling means for introducing cooling air inside said main body to cool said main body, said cooling means including a first cooling air passage formed in said main body, said first cooling air passage including:
(i) a cooling air inlet port open to said dovetail portion;
(ii) an outlet port in said extended tip of said blade portion;
(iii) a first passage portion extending from said cooling air inlet port close to said extended tip along said leading edge;
(iv) a final passage portion extending from said dovetail portion to said outlet port; and
(v) a plurality of film cooling holes which extend from said suction side surface of said blade portion to said final passage portion of said first cooling air passage,
(vi) said cooling means having decreasing means fitted to said outlet port, for gradually decreasing a flow sectional area of said final passage portion from said dovetail portion toward said outlet port so that the speed of the cooling air flowing through said final passage portion does not fall despite the fact that air flows out through said plurality of film cooling holes.

4,992,027

HYDRAULIC CONTROL VALVE FOR FUEL PUMPING SYSTEM

Allan J. Acosta, Seal Beach, Calif., assignor to Able Corporation, Yorba Linda, Calif.

Filed Jun. 8, 1989, Ser. No. 363,482
Int. Cl.[5] F04B 49/00
U.S. Cl. 417—47 16 Claims



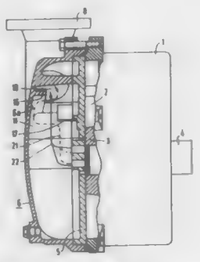
1. In a low pressure drop valve connectible to a source of pressurized hydraulic fluid for modulating hydraulic fluid flow, the improvement combination comprising:
(a) valve body means defining an axially extending tapered bore and having hydraulic flow inlet and outlet ports,
(b) a plug valve movable axially in that bore and having an externally tapered surface facing the tapered bore and movable axially relative thereto to increase or decrease a gap formed between the tapered surface and the tapered bore, for controlling the flow of hydraulic fluid via the gap and at least one of said ports,
(c) means responsive to a side stream of pressurized hydraulic fluid to control axial movement of the plug valve in the tapered bore, said means including first and second pistons connected with the plug valve to move axially therewith, the valve body means forming first and second cylinders respectively receiving the pistons for application of hydraulic fluid pressure to the pistons for displacing the pistons and plug valve axially, and protective O-rings in the cylinders acting to space the pistons from bores formed by the cylinders,
(d) and stop means in the valve body means to limit axial movement of the plug valve so as to prevent closing of said gap, said stop means spaced from said gap and from said pistons and O-rings.

4,992,028

LIQUID RING PUMP

Siegfried Schoenwald, Bad Neustadt/S, and Robert Seufert, Bastheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 429,765
Claims priority, application European Pat. Off., Nov. 7, 1988, [redacted]
Int. Cl.[5] F04C 19/00
U.S. Cl. 417—68 6 Claims



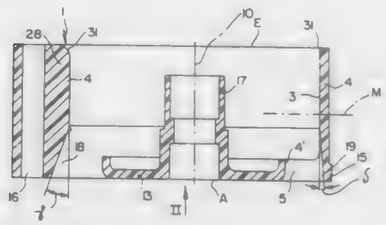
1. A liquid ring pump comprising:
(a) a cup-shaped housing having an open end;
(b) an impeller rotatably supported in said cup-shaped housing, said impeller including blades, said blades spaced so that blade pockets are formed between adjacent blades to contain a certain amount of liquid;
(c) a cup-shaped member covering the open end of said housing, said cup-shaped member including an intake conduit having an inlet opening and a pressure conduit having an outlet opening, said openings providing fluid communication between said intake and pressure conduits and the interior of said cup-shaped member facing said housing, said cup-shaped member further including at least one wall extending toward said cup-shaped housing and being disposed between said inlet opening and outlet opening;
(d) a control disk arranged between said cup-shaped housing and said cup-shaped cover member, said control disk and said cup-shaped cover member together with said at least one wall forming a suction chamber in fluid communication with said intake conduit via said inlet opening and a surge chamber in fluid communication with said pressure conduit via said outlet opening, said control disk including at least one inlet port and at least one outlet port formed therethrough, said inlet port providing fluid communication between said suction chamber and at least one of said blade pockets and said outlet port providing fluid communication between at least one of said blade pockets and said surge chamber; and
(e) means being disposed within said surge chamber between the outlet port of said control disk and the outlet opening of said pressure conduit for diverting fluid flowing in said surge chamber from said outlet port toward the outlet opening of said pressure conduit to follow a path in the axial direction, thereby diverting the portion of the sealing liquid, which is expelled with compressed gas into the surge chamber, to follow a path which intersects the path of the compressed gas, said diverting means comprising first and second radially spaced baffles that extend in the axial direction with respect to said cup-shaped member, said first and second baffles being arranged without overlap therebetween in said axial direction so that an axial gap is formed therebetween that provides a relatively straight unobstructed path extending between said baffles and toward said outlet opening.

4,992,029

MINIATURE AXIAL FAN

Siegfried Harmsen, St. Georgen, and Gunter Wrobel, Villingen, both of Fed. Rep. of Germany, assignors to Papst Motoren GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 221,947, Jul. 6, 1988, Pat. No. 4,806,081, which is a continuation of Ser. No. 928,476, Nov. 10, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 312,971
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3539623
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.
Int. Cl.[5] F04D 25/08, 29/44
U.S. Cl. 417—354 1 Claim



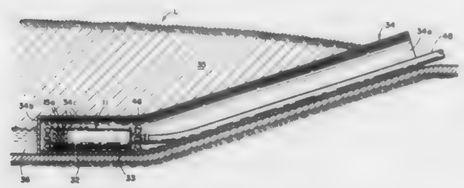
1. A miniature axial fan, particularly of an axially compact construction, comprising:
a central motor driving a rotor disk;
a one-piece molded unitary housing surrounding said rotor disk and including an inlet flow side being cylindrical with an approximately constant diameter extending rearwardly to and over the axial center of said housing;
said housing also including more than one web means on the outlet side for holding said central motor and rotor disk and a square flange plate means at the housing outlet side for defining the configuration thereof;
said housing further including a fastening pillar means having a continuous fastening bore which extends from said inlet side to said outlet side of the housing, said fastening pillar extending from the square flange plate at the outlet side to the inlet side of the housing; and
wherein said rotor disk has a number of fan blades thereon, which number of blades differs from the number of web means.

4,992,030

SUMP DRAINING APPARATUS

John S. Hasslen, III, 1033 Manor Pl., Elk River, Minn. 55330

Continuation-in-part of Ser. No. 346,396, May 2, 1989. This application May 9, 1990, Ser. No. 521,257
Int. Cl.[5] F04B 35/04
U.S. Cl. 417—360 11 Claims



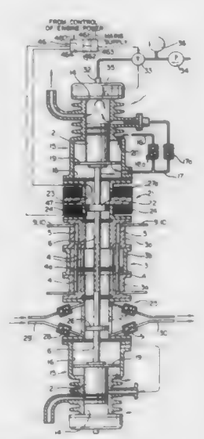
1. Sump draining apparatus intended for use in a landfill or the like having a side slope riser conduit of predetermined cross-sectional size extending from a first point outside the landfill to a second point proximate the landfill bottom, the sump draining apparatus comprising:
a body member having first and second ends and a cross-sectional size less than that of the side slope riser conduit and defining an external surface, the body member having a fluid inlet proximate the first end for receiving fluid and a fluid outlet proximate to the second end through which fluid maybe discharged, the outlet being adapted for connection to a fluid conduit that extends at least to the first point of said side slope riser conduit;
pumping means within the body member for pumping fluid received from the inlet to said outlet; and
wheel means carried by the body member and defining a plurality of rolling surfaces each of which projects laterally beyond said external surface, whereby the sump draining apparatus may longitudinally roll over the length of the side slope riser conduit to the lower end thereof.

4,992,031

INTERNAL COMBUSTION ENGINE DRIVEN MULTIPLE PUMP

Matti Sampo, Turenki, Finland, assignor to Toiminimi Kone-Sampo, Turenki, Finland

Continuation-in-part of Ser. No. 160,006, Feb. 24, 1988, abandoned. This application Dec. 11, 1989, Ser. No. 456,151
Claims priority, application Finland, Feb. 25, 1987, 870801
Int. Cl.[5] F01B 17/00
U.S. Cl. 417—364 7 Claims



1. A power aggregate comprising:
a body;
an internal combustion engine having at least one engine cylinder mounted on said body;
a fuel injection nozzle fluid connected to said engine cylinder;
magnetic valve means for regulating the flow of fuel through said fuel injection nozzle into said engine cylinder;
sensor means for sending a control signal to said magnetic valve means for preventing said magnetic valve means from opening in case of inadequate or excessive pressure;
control means for delaying the timing of the switching ON and OFF of said magnetic valve means relative to the sending of the control signal from said sensor means;
a reciprocating engine piston in said engine cylinder;
a piston rod fastened to said engine piston, whereby said

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piston rod reciprocates in association with said engine piston; and

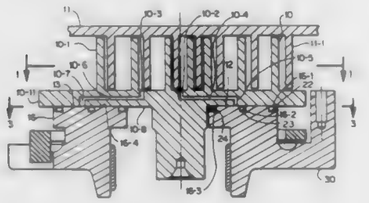
a power output unit comprising at least three pump cylinders and at least three pump pistons fixed to said piston rod at a radial distance from said piston rod, each of said pump cylinders having a corresponding pump piston reciprocating therein and each of said pump cylinders and its corresponding pump piston forming a unit, and at least three fluid intake ducts and at least three pressure ducts, each of said pump cylinders having a hydraulic fluid intake duct and a pressure duct, said intake ducts and said pressure ducts connecting said pump cylinders to a drive motor or an actuator cylinder, at least two of said pump cylinders having different diameters, and said pressure ducts of said at least two pump cylinders each having control valve means for separately controlling the outputs of said at least two pump cylinders.

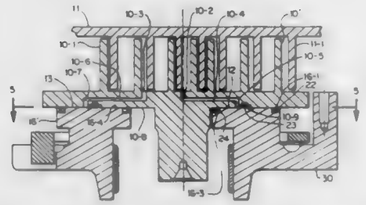
4,992,032

SCROLL COMPRESSOR WITH DUAL POCKET AXIAL COMPLIANCE

Thomas R. Barito, East Syracuse, and Howard H. Fraser, Jr., Lafayette, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 6, 1989, Ser. No. 418,079
Int. Cl.[5] F04C *18/04, 27/00*
U.S. Cl. 418—55.4 **6 Claims**





1. In a scroll compressor including a crankcase and a fixed scroll means, axial compliance means comprising:

an orbiting scroll means having a plate with a wrap on a first side and an annular surface on a second side;

annular ring means fixed with respect to said crankcase and coacting with said annular surface to define a plurality of radially spaced annular pocket means;

said pocket means are sealed by inner, intermediate and outer radially spaced seals which are carried by said annular ring means;

fluid pressure supply means for supplying pressurized fluid to said pocket means from at least one trapped volume whereby fluid pressure supplied to said pocket means acts on said orbiting scroll means to keep said orbiting scroll means in axial engagement with said fixed scroll means and spaced from said annular ring means to thereby support said orbiting scroll means in engagement with said fixed scroll means.

2. In a scroll compressor including a crankcase and a fixed scroll means, axial compliance means comprising:

an orbiting scroll means having a plate with a wrap on a first side and an annular surface on a second side;

annular ring means fixed with respect to said crankcase and coacting with said annular surface to define a plurality of radially spaced annular pocket means;

said pocket means are sealed by inner, intermediate and outer radially spaced seals and said inner and outer radially spaced seals are carried by said annular ring means and said intermediate radially spaced seal is carried by said orbiting scroll means; and

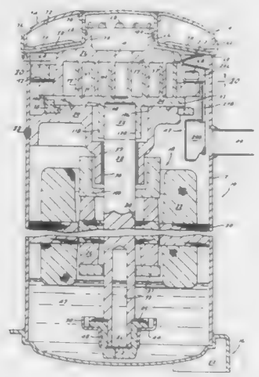
fluid pressure supply means for supplying pressurized fluid to said pocket means from at least one trapped volume whereby fluid pressure supplied to said pocket means acts on said orbiting scroll means to keep said orbiting scroll means in axial engagement with said fixed scroll means and spaced from said annular ring means to thereby support said orbiting scroll means in engagement with said fixed scroll means.

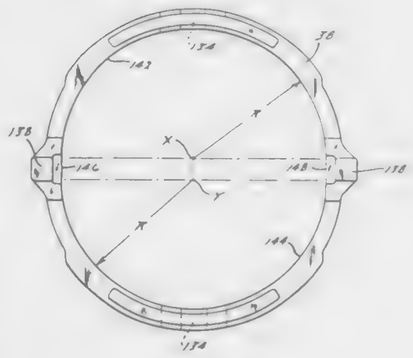
4,992,033

SCROLL-TYPE MACHINE HAVING COMPACT OLDHAM COUPLING

Jean-Luc M. Caillat; Roger C. Weatherston, both of Dayton, and James W. Bush, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382, which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Jul. 31, 1989, Ser. No. 387,699
Int. Cl.[5] F01C *1/04, 21/02*
U.S. Cl. 418—55.3 **7 Claims**





1. A scroll-type machine, comprising:

a non-orbiting scroll member;

a fixed body having a portion which is generally circular about the machine axis;

an orbital scroll member mounted for orbital movement about said axis with respect to said body, said circular portion of said fixed body defining a surface supporting said orbital scroll member;

mounting means for mounting said non-orbiting scroll to said fixed body;

means for causing said orbital scroll member to orbit with respect to said body; and

compact Oldham coupling means for preventing rotational movement of said orbital scroll member with respect to said body, said compact Oldham coupling being positioned between said circular body portion and said mounting means and comprising

(1) means defining generally diametrically aligned first abutment surfaces on said body,

(2) means defining generally diametrically aligned second abutment surfaces on said orbital scroll member, arranged at right angles to said first abutment surfaces,

(3) a transversely disposed annular ring member generally surrounding said circular body portion, the inner peripheral surface of said ring member being non-circular in configuration, comprising at opposite ends circular arcs of equal radius, the centers of curvature of said arcs being spaced apart a predetermined distance, and relatively straight portions connecting said arcs whereby the area of said supporting surface defined by said circular portion may be maximized,

(4) a first pair of keys on one face of said ring member in linear sliding engagement with said first abutment surfaces, and

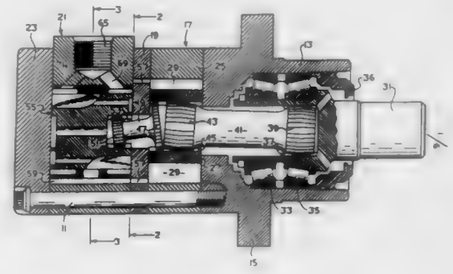
(5) a second pair of keys on the opposite face of said ring member in linear sliding engagement with said second abutment surfaces.

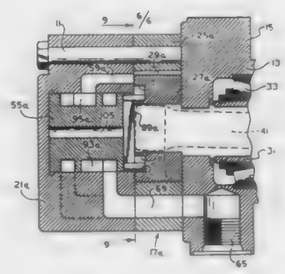
4,992,034

LOW-SPEED, HIGH-TORQUE GEROTOR MOTOR AND IMPROVED VALVING THEREFOR

Sohan L. Uppal, Bloomington, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 24, 1989, Ser. No. 342,424
Int. Cl.[5] F01C *1/10;* **F03C** *2/08;* **F16K** *31/44, 39/00*
U.S. Cl. 418—61.3 **15 Claims**





1. A rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means; fluid energy translating displacement means associated with said housing means and including one member having rotational movement relative to said housing means, and one member having orbital movement relative to said housing means, to define expanding and contracting fluid volume chambers in response to said rotational and orbital movements; valve means cooperating with said housing means to provide fluid communication between said fluid inlet means and said expanding volume chambers, and between said contracting volume chambers and said fluid outlet means; input-output shaft means and means for transmitting torque between said member of said displacement means having rotational movement and said input-output shaft means; said valve means comprising a generally cylindrical spool valve member, defining a pair of end surfaces, and defining valving passages on its outer cylindrical surface, and being rotated at the speed of rotation of said member of said displacement means having rotational movement; said housing means comprising a valve housing section, defining a spool bore, and surrounding said spool valve member and defining a plurality of meter passages each being in fluid communication with one of said fluid volume chambers; characterized by:

(a) said valve housing section including a relatively thicker outer housing portion and a relatively thinner inner housing portion defining said spool bore; and

(b) said inner housing portion being press-fit within said outer housing portion with an interference fit sufficient to preload said inner housing portion with a preload force at least equal to the equivalent force of a predetermined fluid pressure, whereby said inner housing portion will be able to withstand said predetermined fluid pressure, without substantial expansion of said spool bore.

6. A rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means; fluid energy translating displacement means associated with said housing means and including one member having rotational movement relative to said housing means, and one member having orbital movement relative to said housing means, to define expanding and contracting fluid volume chambers in response to said rotational and orbital movements; valve means cooperating with said housing means to provide fluid communication between said fluid inlet means and said expanding volume chambers, and between said contracting volume chambers and said fluid outlet means; input-output shaft means and means for transmitting torque between said member of said displacement means having rotational movement and said input-output shaft means; said valve means comprising a generally cylindrical spool valve member, defining a pair of end surfaces, and defining valving passages on its outer cylindrical surface, and being rotated at the speed or rotation of said member of said displacement means having rotational movement; said housing means comprising a valve housing section, defining a spool bore, and surrounding said spool valve member and defining a plurality of meter passages, each being in fluid communication with one of said fluid volume chambers; characterized by;

(a) said spool valve member and said valve housing section being disposed on the side of said displacement means opposite said input-output shaft means;

(b) said spool valve member being relatively solid, whereby said spool valve member is able to withstand the force of

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a predetermined fluid pressure, without substantial collapse of said spool valve member; and,

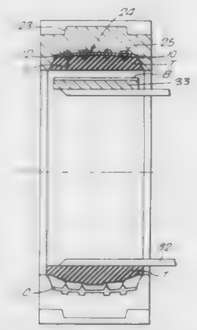
(c) said fluid energy translating displacement means being disposed immediately adjacent said valve housing section, and comprising a gerotor gear set including an internally-toothed ring member and an externally-toothed star member disposed for orbital and rotational movement relative to said ring member.

4,992,035

VEHICLE TIRE MOLD

Eric Holroyd, Knutsford, and Colin Holroyd, Crossens, both of England, assignors to Apsley Metals Limited, United Kingdom

Division of Ser. No. 198,520, May 25, 1988, Pat. No. 4,921,673.
This application Jan. 2, 1989, Ser. No. 459,559
Claims priority, application United Kingdom, Jul. 14, 1987, 8716494
Int. Cl.[5] B29C *33/00, 33/40, 35/00*
U.S. Cl. 425—32 6 Claims



1. A tire manufacturing apparatus comprising:

a tread mold having an inner surface for forming the ground contacting outer surface of the tread of a cured tire to be molded therein,

a cylindrical grid which is a close fit within the tread mold and which is removable therefrom with a tire cured in the mold, said grid comprising an open network of ribs or lugs for forming grooves in the tread and location means for locating the grid internally of said inner surface without attachment thereto, the cylindrical grid having at least one coaxial split to allow the grid to be removed from the cured tire.

4,992,036

MOLD CLAMPING SYSTEM

William D. Herdtner, Amelia, and Frederick F. Van Keuren, III, Batavia, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 31, 1990, Ser. No. 473,043
Int. Cl.[5] B29C *45/67, 45/68*
U.S. Cl. 425—135 8 Claims

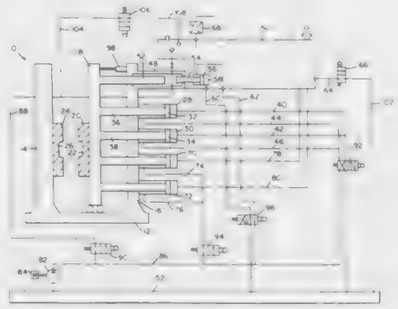
1. A molding machine clamp system for molding machines that mold articles from a flowable molding material that is introduced under pressure into a closed mold cavity, said clamp system comprising:

(a) mold traversing means for moving a first mold section relative to a second mold section, the mold sections together defining a mold cavity;

(b) hydraulically operated mold clamping means for providing a clamping force for holding the first and second mold sections together in contacting relationship during injection into the mold cavity of pressurized molding material, the clamping means includiung a clamp cylinder and a ram member movable within the cylinder for providing clamping force;

(c) a first hydraulic fluid reservoir for containing a quantity of hydraulic fluid for operating hydraulically operated components of the mold traversing means; and

(d) a second hydraulic fluid reservoir positioned at a higher



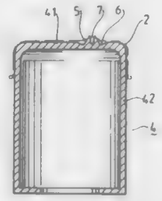
elevation than the first reservoir and connected with the first reservoir through a connecting conduit to permit excess hydraulic fluid above a predetermined fluid level in the second reservoir to flow from the second reservoir to the first reservoir, the second reservoir having a hydraulic fluid capacity to provide a sufficient volume of hydraulic fluid only for operating the mold clamping means.

4,992,037

MOLD FOR FORMING NATURAL LATEX LID

Wei-Chao Hwang, Panchiao City, Taiwan, assignor to BJL Industry (M) Sdn. Bhd., Selangor, Malaysia

Filed Oct. 11, 1989, Ser. No. 419,693
Int. Cl.[5] B29C *41/14, 41/40*
U.S. Cl. 425—275 6 Claims



1. A dipping mold for forming a latex lid comprising

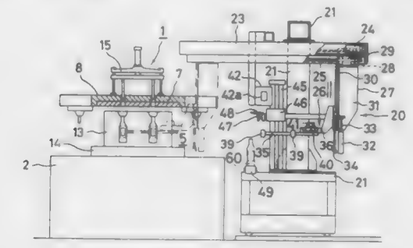
a body having a top forming face and a side forming face extending around and turning downward from said top forming face, a stubby projection which has a rounded surface, provided on said top forming face, and a shallow recessed sink provided in said top forming face around said stubby projection, said stubby projection being provided with a blind hole which opens upward.

4,992,038

MOLDING MACHINE FOR AN ORIENTED AND BLOWN HOLLOW CONTAINER WITH A LABEL

Tatsuo Furuse; Keiji Kazato; Katsuyuki Ohno; Katsuhiko Kimura, all of Tokyo; Yoshinori Nakamura, Sakakimachi, and Katsumi Noda, Kyoto, all of Japan, assignors to Toppan Printing Co., Ltd.; Nissei ASB Machine Co., Ltd. and Yusin Precision Equipment Co., all of, Japan

PCT No. PCT/JP88/00531, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09259, PCT Pub. Date Dec. 1, 1988
PCT Filed May 30, 1988, Ser. No. 304,848
Claims priority, application Japan, May 29, 1987, 62-136017
Int. Cl.[5] B29C *49/24*
U.S. Cl. 425—503 7 Claims



3. In a rotary molding machine having a preform molding station, preform temperature controlling station, blow molding station, a product removing station, and a label supply and product removing apparatus, said apparatus comprising:

(a) a molded product removing device for removing molded products from said machine, said product removing device located adjacent said product removing station and comprising a horizontally disposed member for moving said product removing device forwardly and backwardly;

(b) a label magazine positioned above said member;

(c) a label supply device located adjacent said product removing station and to the side of said product removing device; and

(d) means for moving said label supply device upwardly and downwardly for engaging labels in said label magazine and forwardly and backwardly for providing labels to said blow molding station.

4,992,039

PULSE COMBUSTION ENERGY SYSTEM

Hanford N. Lockwood, Jr., San Mateo, Calif., assignor to NEA Technologies, Inc., San Francisco, Calif.

Continuation of Ser. No. 113,686, Oct. 26, 1987, abandoned, which is a division of Ser. No. 41,805, Apr. 23, 1987, Pat. No. 4,767,313, which is a division of Ser. No. 852,854, Apr. 16, 1986, Pat. No. 4,708,159. This application Feb. 13, 1989, Ser. No. 311,417
Int. Cl.[5] F23C *11/04*
U.S. Cl. 431—1 10 Claims

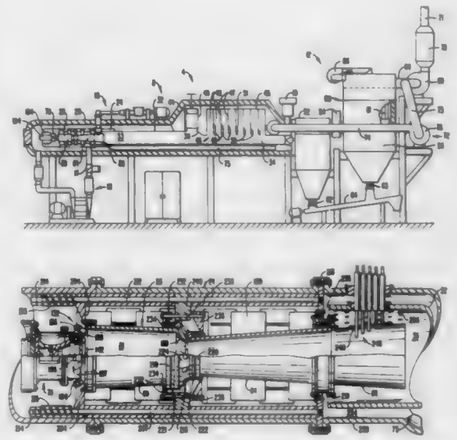
1. A pulse combustor comprising:

an elongated combustion tube having an upstream end and a downstream end;

an oxidizer intake valve at the upstream end in fluid communication with the tube for supplying an oxidizer to the tube in the form of discrete pulses;

means for modulating the operating frequency of the oxidizer pulses over a substantial range of frequencies other than the natural operating frequency of the pulse combustor; and

means for adding fuel to the oxidizer pulses proximate the upstream end of the tube so that the fuel can be combusted to generate hot gas pulses which propagate through and exit from the tube at the downstream end, whereby the frequency of hot gas pulses can be varied with the modulating means over a substantial range of frequencies other



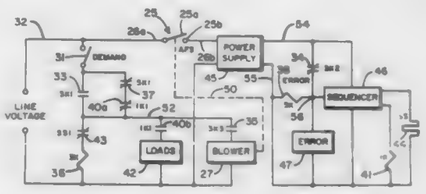
than the natural operating frequency of the pulse combustor.

4,992,040

AIRFLOW SWITCH CHECKING CIRCUIT

James S. Warren, Brooklyn Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 19, 1990, Ser. No. 495,672
Int. Cl.[5] F23H *5/00*
U.S. Cl. 431—31 11 Claims



1. In a burner system control of whose operation is powered by electric power supplied from a power terminal, said system having a blower for providing combustion air through a duct to combustion chamber, an ignition/fuel assembly for controlling fuel flow to the combustion chamber and ignition of the fuel, a demand control switch supplying power from the power terminal, and a load relay having a first pair of normally open load contacts for providing power to the ignition/fuel assembly responsive to a control signal; and having a control system receiving power from the demand control switch including

(i) an airflow switch in the duct conducting responsive to airflow in the duct, said airflow switch having one contact connected to the power terminal;

(ii) a load sequencer receiving power from the power terminal when the airflow switch conducts and supplying the control signal to the load relay responsive to receiving power; and

a blower relay having a first normally open pair of contacts controlling the supply of power to the blower,

an improvement to the control system for conditioning

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burner operation on designed-for operation of the airflow switch, comprising

(a) in the blower relay, a second normally open pair of contacts in series connection with the blower relay's winding to form a series blower relay circuit receiving power from the power terminal when the demand control switch is conducting; and

(b) a safety relay having (i) a normally closed pair of contacts forming a first series safety circuit connected to shunt the blower relay's second normally open pair of contacts, and (ii) a winding connected to receive power which flows through the airflow switch.

4,992,041

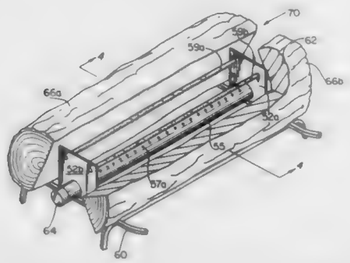
METHOD AND APPARATUS FOR PRODUCING A WOOD-LIKE FLAME APPEARANCE FROM A FIREPLACE-TYPE GAS BURNER

Steven A. Kewish, Gates Mills; Alice M. Waters, South Euclid; Stephen R. Walzer, Brunswick; Roger D. Sheridan; Robert B. DeRemer, both of Maple Heights, and James R. Hatfield, Breckiville, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Nov. 13, 1989, Ser. No. 437,699

Int. Cl.[5] F23Q *2/08*

U.S. Cl. 431—126 21 Claims



1. A flame-coloring device for use in the secondary reaction zone of flames, especially flames produced by gas burning fireplaces, comprising:

flame providing means for providing a flame having a mixing zone, a primary reaction zone and a secondary reaction zone;

support means situated in said secondary reaction zone;

a coating on said support means which resists degradation by said secondary reaction zone;

reactant means in said coating responsive to engagement with said secondary reaction zone of said flame to cause the color of said flame to be more yellow and orange than a gas flame; and

wherein said coating is formed from:

soda lime glass;

aluminum oxide;

at least one of the group comprising $Na_2O.xSiO_2$ where $x=3-5$, $Na_2Si_2O_5$, $NaSiO_3.9H_2O$, and Na_2SiO_3; and

at least one of the group comprising Na_2CO_3, and $NaHCO_3$.

4,992,042

MULTIPURPOSE LIGHTER

Reiner Knuepfer, Poecking, Fed. Rep. of Germany, assignor to ERKA GmbH, Poecking, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,753

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811161

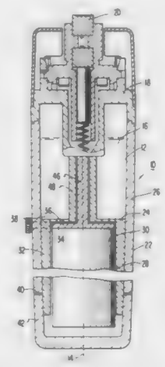
Int. Cl.[5] F23D *21/00*

U.S. Cl. 431—253 10 Claims

1. A multipurpose lighter comprising;

(a) a container having first and second opposed ends and a peripheral wall defining a reservoir for liquified gas or other suitable fuel, and an igniting mechanism arranged at the first end of the container for igniting the gas,

(b) a partition mounted in said container relatively adjacent the second end, said partition sealing off the liquified gas contained in said reservoir, said partition and said peripheral wall defining a hollow space in said second end of said container,



(c) a lipstick mounted in said hollow space, and

(d) a central guide extending from said partition into said reservoir, support means located within said hollow space for supporting said lipstick, and a guide pin connected to said support means and extending into said central guide, whereby said lipstick is precluded from tilting.

4,992,043

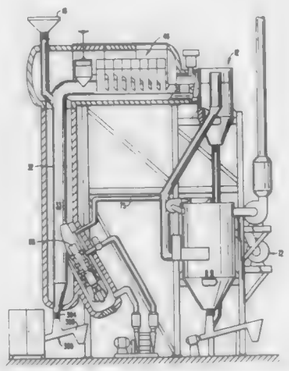
PULSE COMBUSTION ENERGY SYSTEM

Hanford N. Lockwood, Jr., San Mateo, Calif., assignor to NEA Technologies, Inc., Larkspur, Calif.

Division of Ser. No. 41,794, Apr. 23, 1987, Pat. No. 4,838,784, which is a division of Ser. No. 852,854, Apr. 16, 1986, Pat. No. 4,708,159. This application Jul. 13, 1988, Ser. No. 218,720

Int. Cl.[5] F27B *15/00*

U.S. Cl. 432—58 20 Claims



1. A pulse combustion energy system comprising:

a pulse combustor having a combustion chamber and a generally tubular outlet in fluid communication with the combustion chamber for emitting high temperature pulses;

a processing tube for flowing a material to be processed therethrough, including:

a generally vertical section having an upper portion and a lower portion, the lower portion being in fluid communication with the outlet of the pulse combustor for receiving the high temperature pulses emitted therefrom; and

a generally horizontal section having an upstream segment and a downstream segment, the upstream segment being in fluid communication with the upper portion of the vertical section;

means for introducing a foreign material to be processed by the high temperature pulses into the high temperature pulses so that the foreign material flows through the vertical section of the processing tube;

first receiving means, in fluid communication with the downstream segment of the horizontal section of the processing tube, for receiving the introduced material to be processed that flows through the horizontal section;

second receiving means, in fluid communication with the lower portion of the vertical section of the processing tube, for receiving the introduced material to be processed that flows through the vertical section;

wherein the material introducing means includes means for introducing the material to be processed into the high temperature pulses flowing through the upper portion of the vertical section of the processing tube;

wherein the introduced material that flows through the vertical section of the processing tube flows from the upper portion to the lower portion of the vertical section and through the high temperature pulses emitted from the pulse combustor; and

means for flowing a separate fluid into the lower portion of the vertical section of the processing tube.

4,992,044

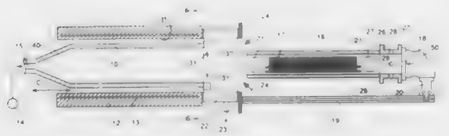
REACTANT EXHAUST SYSTEM FOR A THERMAL PROCESSING FURNACE

Ara Philipossian, Stoneham, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1989, Ser. No. 372,663

Int. Cl.[5] F27D *5/00, 7/02*

U.S. Cl. 432—253 17 Claims



1. A thermal processing furnace comprising:

(a) a tube furnace having an elongated cylindrical chamber open at one end for receiving a cantilever tube containing articles to be processed, the cantilever tube having circumferentially-spaced exhaust holes positioned near said one end when said cantilever tube is within said cylindrical chamber;

(b) means for introducing reactant and/or inert gases into the other end of said chamber;

(c) a gas scavenger chamber fixed to said cylindrical chamber surrounding said one end of said cylindrical chamber when said cantilever tube is within said cylindrical chamber radially outward of the position of said cantilever tube and having a plurality of openings spaced circumferentially around an inner cylindrical face of said scavenger chamber for providing radially symmetric outflow of exhaust gases from said furnace, the cantilever tube moving axially within the scavenger chamber whereby the scavenger chamber also provides removal of gases when said cantilever tube is in a position withdrawn from said cylindrical chamber.

4,992,045

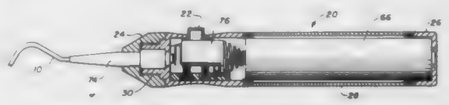
BATTERY POWERED CONDENSER FOR ROOT CANALS

Robert F. Beisel, Robesonia, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Continuation of Ser. No. 33,323, Apr. 1, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 266,253

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—32 20 Claims



1. A self-contained heated dental instrument comprising:

(a) a dental tool means for filling root canal cavities comprising a single piece of electrically conductive tubing, said dental tool means having a first end comprising a tip for working in the root canal, and a second end adapted to be attached to a handle means, said dental tool means being shaped to be adapted for use in the mouth,

(b) an element within said dental tool means comprising a conductive portion and a resistive portion, said resistive portion being conductively connected to the tip of said dental tool, wherein said element is provided with insulating substantially throughout its length,

(c) a resistor in said conductive portion of said element substantially proximal to said second end of said dental tool, said resistor being provided to control the heating of said first end of said heated tool,

(d) handle means having an aperture at one end for receiving said dental tool and

(e) a power source means associated with said handle means.

4,992,046

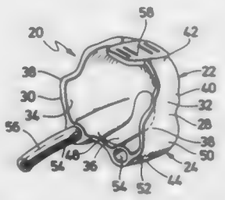
DENTAL MOUTH PROP FOR ISOLATING A TOOTH

Harry K. Sharp, Memphis, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Feb. 3, 1989, Ser. No. 305,809

Int. Cl.[5] A61C *17/06*

U.S. Cl. 433—93 16 Claims



1. A mouth prop for use while working upon a preselected tooth of a dental patient, said prop comprising:

a body for isolating a preselected tooth of a patient including a pair of sidewalls of relatively rigid construction and positionable on opposite sides of the preselected tooth so as to maintain a separation between the tooth and the mouth tissue positioned adjacent and on opposite sides of the tooth and means for joining the sidewalls together so that a tooth-accepting slot and a workspace-defining cavity is provided between the sidewalls, said cavity having an opening providing access to the cavity interior for working upon the preselected tooth and said tooth-accepting slot communicating with said cavity so that when the prop is operatively positioned within the mouth, the preselected tooth projects through the tooth-accepting slot and into the cavity interior and the interior of the workspace-defining cavity is isolated from the mouth tissue

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positioned adjacent and on opposite sides of the tooth by the body sidewalls so that fluids are prevented from entering the cavity interior through the body sidewalls;

said body further including means defining a hollow portion associated with each of the two sidewalls and positioned generally beneath the workspace-defining cavity for extending generally along the gum tissue of the mandibular arch so that when the prop is operatively positioned within the mouth, the two hollow portions are positioned on opposite sides of the posterior teeth of the mandibular arch, each hollow portion defining at least one opening permitting fluids to enter the inside of the hollow portion from the mouth region adjacent the gum tissue and each hollow portion further defining an exit passageway accommodating the removal of fluids from the inside of the hollow portion, the inside of the hollow portion being separated from the cavity interior so that no communication is provided therebetween so that fluids which enter the hollow portion cannot enter the cavity interior; and

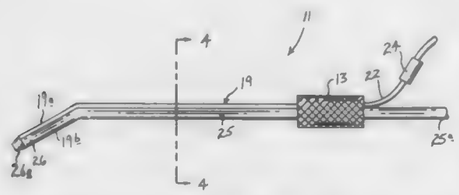
each sidewall including an upper portion for bounding the workspace-defining cavity and a lower portion incorporating said means defining said hollow portion, each of said upper and lower portions being shaped so that its outer surface is rounded and substantially convex in form and the upper and lower portions are joined to one another in a region which is smooth, continuous and devoid of sharp corners as a path is traced between the upper and lower sidewall portions so that the sidewalls collectively provide the body with a substantially ovoid form and so that when operatively positioned within the patient's mouth, the mouth prop fits comfortably therein.

4,992,047

SURGICAL SUCTION TOOL

Charlene Warner, Rte. 7 Box 7890, Nacogdoches, Tex. 75961

Filed Dec. 29, 1989, Ser. No. 459,251
Int. Cl.[5] A61C *17/06, 1/00;* A61N *1/30*
U.S. Cl. 433—91 4 Claims



1. A surgical suction tool comprising, a main body defined by a first cylindrical tube member including a first bore, wherein the first bore is defined by a first axis, and a second cylindrical tube means including a second bore, wherein the second bore is defined by a second axis, the first bore and the second bore in angular aligned communication with one another, wherein the first axis is oriented at an obtuse angle relative to the second axis, and the first cylindrical tube terminating in a tapered forward end,

the first tube and the second tube defined by as predetermined diameter,

and

a cylindrical knurled handle member integrally surroundingly mounted and coaxially aligned about a rear end portion of the second cylindrical tube, wherein the knurled handle member is defined by a handle diameter greater than said predetermined diameter,

and

a further tube in communication with said first bore directed through said handle, wherein the further tube extends rearwardly of said handle in communication with a vacuum source,

and

including an upper bore defined by an upper bore axis, the upper bore and upper bore axis are aligned parallel to the first tube and the second tube and spaced therefrom, the upper bore further including a fiber optic cable directed through the upper bore and defined by an external configuration complementary to that defined by an internal configuration of the upper bore,

and

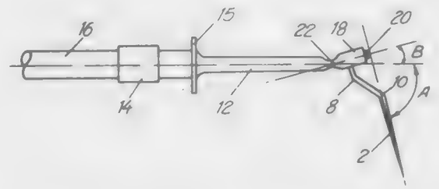
wherein the fiber optic cable is coextensive with the first tube and the second tube and extends through the handle and rearwardly thereof, and including a fiber optic connection means for securement of the fiber optic cable to an illumination source.

4,992,048

TOOL FOR CLEANSING TOOTH ROOT CANALS

Sven K. L. Goof, 236A, Gl. Strandvej, DK-3050 Humlebaek, Denmark

Continuation-in-part of Ser. No. 4,437, Dec. 9, 1986, abandoned.
This application Apr. 24, 1989, Ser. No. 342,652
Claims priority, application Denmark, Apr. 15, 1985, 1686/85
Int. Cl.[5] A61C *5/02*
U.S. Cl. 433—102 6 Claims



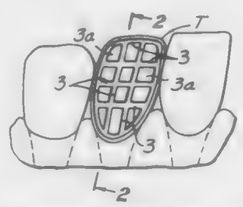
1. An endodontic tool for directing ultrasonic vibrations in connection with cleansing and preparation of tooth root canals; said tool comprising a generally straight and needle-shaped working portion and a shank portion for mounting and firmly securing in a drive instrument of the type adapted to be operatively coupled to an ultrasonic vibratory handpiece, characterized by said shank portion including two oppositely directed bends with parallel axes of bending, said bends being selected to provide a configuration for transforming and directing ultrasonic vibrations from said handpiece and drive instrument into the direction of a longitudinal axis of said generally straight working portion.

4,992,049

METHOD FOR APPLYING A VENEER FACING TO TEETH

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed May 12, 1988, Ser. No. 193,328
Int. Cl.[5] A61C *5/00*
U.S. Cl. 433—215 10 Claims



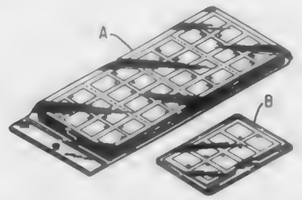
1. A method for securing a veneer onto a single surface of a tooth substrate, the method comprising removing from one of the lingual or buccal surfaces of a tooth the outer enamel layer, to a predetermined minimum depth to provide a first excavated enamel surface; excavating a plurality of compact areas on the first excavated surface to an additional predetermined depth to below the first excavated surface, but without exposing the dentin, to form grooves on an indexed single enamel surface; taking a mold of such indexed enamel surface for the purpose of obtaining from such mold a dental veneer, obtaining a dental veneer having a first indexed veneer surface with convex compact impressions inverse to and mateable with, the indexed enamel surface, and a second outer surface providing an attractive dentitious appearance, and adhering the indexed veneer surface to the indexed enamel surface such that the plurality of compact areas mate with the plurality of compact impressions on the veneer, and the attractive dentitious surface provides an outer labial or buccal surface for the excavated tooth.

4,992,050

CONSUMER COLOR REFERENCE KIT

Diane M. Edwards, 3000 Dorf Dr., Moraine, Ohio 45418

Filed Jun. 7, 1989, Ser. No. 362,590
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—98 11 Claims



1. A consumer color reference kit based on the four basic known processing printing colors, magenta, yellow, cyan and black, and containing a primary color sheet having a first plurality of different, distinct and readily visually discernible shades of major colors: red, orange, yellow, green, blue, purple, brown and gray, and

eight secondary major color sheets, each having a second and greater plurality of different, distinct and readily visually discernible shades of one of said major colors, wherein each primary and secondary color sheet is readily separable into a plurality of minor color cards.

4,992,051

INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS MUTANTS, METHODS FOR THE PRODUCTION OF SAME AND METHODS FOR THE USE OF SAME

Malon Kit; Saul Kit, and Haruki Otsuka, all of Houston, Tex., assignors to Novagene, Inc. and Baylor College of Medicine, both of Houston, Tex.

Filed Nov. 8, 1987, Ser. No. 116,197
Int. Cl.[5] C12N *15/00, 7/00*
U.S. Cl. 435—235.1 42 Claims

1. An infectious bovine rhinotracheitis virus which fails to produce any antigenic IBRV gIII polypeptides as a result of a deletion, an insertion or both a deletion and an insertion in the IBRV gIII gene.

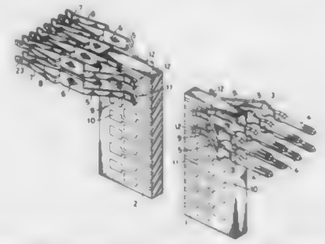
4,992,052

MODULAR CONNECTOR SYSTEM WITH HIGH CONTACT ELEMENT DENSITY

Laurentius M. Verhoeven, Veghel, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1989, Ser. No. 301,381
Claims priority, application Netherlands, Feb. 1, 1988, 8800237
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—62 34 Claims

1. A connector for mounting to a printed circuit board comprising a housing of electrically insulative material, a plurality of contact elements arranged in said housing in rows and columns, said rows disposed substantially parallel to the circuit board and said column disposed substantially transverse to the circuit board, each of said contact elements having a base section with a contact portion and a connecting portion extending from opposite sides of said base section, the connecting portion projecting from one side of the housing facing the



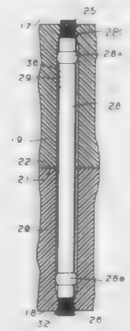
circuit board and adapted for mounting to contact surfaces on said circuit board, one row of openings formed in said one side of the housing and extending in the longitudinal direction of the housing and adjacent a side wall thereof, the connecting portions of adjacent contact elements in the same column being displaced in the direction of the row so as to contact surfaces on said printed circuit board offset relative to one another.

4,992,053

ELECTRICAL CONNECTORS

Richard J. Lindeman, Wood Dale, and Saeed U. Zafar, Park Ridge, both of Ill., assignors to Labinal Components and Systems, Inc., Elk Grove Village, Ill.

Filed Jul. 5, 1989, Ser. No. 375,588
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—66 16 Claims



1. An electrical connector comprising: a block of insulating material having opposite surfaces in spaced generally parallel planes and having a plurality of spaced parallel openings therethrough extending between and in transverse relation to said opposite surfaces thereof, a plurality of elongated slugs of conductive material positioned in said openings with there being inward spacings between opposite terminal ends of each slug and said opposite surfaces of said block to provide a pair of cavities within each opening at the opposite ends of each of said slugs, a pair of resilient wadded conductor contact elements disposed in each of said pairs of said cavities for engagement with conductive elements placed in alignment with said cavities and pressed against said opposite surfaces of said block, and retaining means operative to allow said resilient wadded conductor contact elements to be securely held in said cavities while allowing free resilient axial compression of said resilient wadded conductor contact elements to develop elec-

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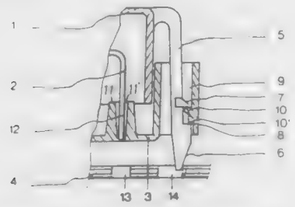
trically efficient contact pressures with surfaces of conductors placed in alignment with said cavities and pressed toward said opposite surfaces of said block.

4,992,054

CONNECTOR WITH A RETRACTABLE BASE PLATE TO PROTECT ITS CONTACT OUTLETS

Daniel Cassan, Sucy-en Brie, France, assignor to Societe Francaise Metallo S.A., France

Filed Mar. 28, 1989, Ser. No. 329,705
Claims priority, application France, Jul. 28, 1987, 87 10685
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—76 **4 Claims**



1. A connector for electrically connecting a component, such as a cathode ray tube of the television type, to a printed circuit, comprising:

a base plate having at least one contact protecting and guide housing through which a contact protecting and guide opening is formed;

a contact holder casing holding at least one contact having a terminal part, said contact holder casing being slidably supported on said base plate for movement between a first storage and transport position in which said terminal part of a respective contact is situated within a respective one of said contact protecting and guide openings for protection during storage and transport, and a second operating position in which said terminal part of a respective contact extends outwardly of a respective contact protecting and guide opening for connection to a printed circuit; and

holding and locking means provided on said base plate and contact holder casing for releasably holding said contact holder casing in said first storage and transport position with said contact terminal part situated within a respective contact protecting and guide opening and for locking said connector to a printed circuit in said second operating position with said contact terminal part extending outwardly of said contact protecting and guide opening for connection into the circuit.

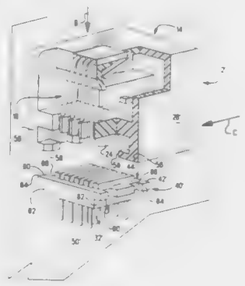
4,992,055

ELECTRICAL JACKS AND HEADERS

Wilhelmus J. Brummans, Michielsgestel, and Cornelus A. H. M. Sterken, Eindhoven, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 10, 1990, Ser. No. 507,333
Claims priority, application United Kingdom, Apr. 11, 1989, 8908098
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—78 **6 Claims**

1. An electrical jack and header assembly, wherein the jack comprises an insulating housing defining a cavity for receiving an electrical plug, and a row of electrical terminals secured to a wall of the cavity and each having a contact spring extending obliquely thereinto for engaging a respective electrical contact on the plug, and a contact tail depending from said wall, the header comprising an insulating block having securing thereto to a row of contact elements each having on one side of the block, a contact portion, and on the opposite side of the block a leg for insertion in a hole in a printed circuit board, the jack being matable with the header to cause each contact tail of the jack to engage a respective contact portion of the header; wherein each contact tail terminates in a contact surface which is bowed in a direction perpendicular to, and away from, said wall, and in that each contact portion extends across said one



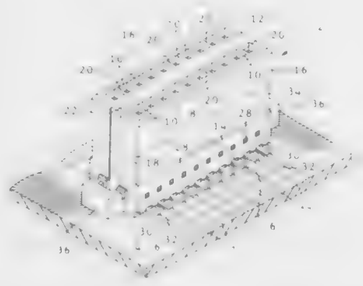
side of the insulating block, the leg of each contact element depends from the opposite end of the contact portion thereof to a next adjacent leg of the header, whereby the insertion legs depend from the header in two spaced rows.

4,992,056

SURFACE MOUNT ELECTRICAL CONNECTOR AND AN ELECTRICAL TERMINAL THEREFOR

George H. Douty, Mifflintown; Timothy L. Kocher, Camp Hill; Martha L. Rupert, Hummelstown, and Robert W. Walker, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 27, 1989, Ser. No. 315,889
Int. Cl.[5] H01R *9/09, 9/24*
U.S. Cl. 439—83 **21 Claims**



1. An electrical connector for mounting on a surface of a circuit board having pads thereon, the connector comprising:

an insulating housing having terminal receiving passages extending therethrough and being provided with terminal retaining means; and

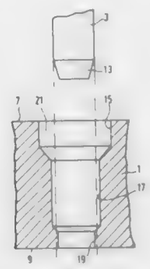
electrical terminals each received within a respective one of the terminal receiving passages and each having a mating portion and a pad engaging solder tail, said solder tail resiliently connected to said terminal and extending laterally beyond said housing, for engaging a pad, said solder tail having a pad engaging sheared edge, each of said terminals having a retaining member for cooperation with said terminal retaining means for affording limited movement of said terminal along its passage and for urging and maintaining said edge of the pad engaging solder tail into engagement with a respective pad on said circuit board when said electrical connector is mounted thereon.

4,992,057

DEVICE COMPRISING A CARRIER WITH HOLES FOR RECEIVING PINS

Hermanus Smit, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1990, Ser. No. 499,924
Claims priority, application Netherlands, Apr. 13, 1989, 8900920
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—83 **2 Claims**



1. A device comprising an electrically insulating carrier, said carrier comprising a first face, a second face opposite said first face, and a circumferential wall extending from said first face to said second face and defining a through-hole for receiving an electrically conductive pin having a mainly rectangular cross-section, a first end of said pin projecting from said first face and a second pin end projecting from said second face after insertion of said pin into the carrier, the hole comprising at least two sections which are consecutively disposed in its longitudinal direction, the first section opening into said first carrier face and having a cross-section large enough such that, after insertion, the pin does not contact the wall of the first section in any location, the second section having an at least partly circular cross-section whose diameter is so much smaller than the diagonal of the cross-section of the pin that the pin can be pressed onto the second section with some force, thus producing friction for retaining the pin between corner portions of the pin and parts of the wall of the second section which contact said corner portions, characterized in that: said circumferential wall defines a third hole section which extends between the second section and said second carrier face and has a cross-section whose largest dimension at the most equals the smallest dimension of the cross-section of the pin.

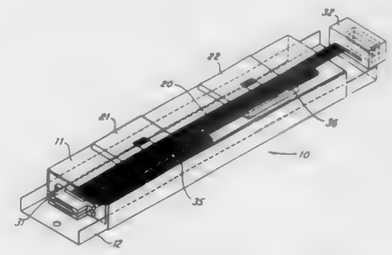
4,992,058

FLAT CABLE TRANSMISSION SYSTEM

Peter R. Tanner, Barking, England, assignor to Comfloor Limited, Barking, United Kingdom

PCT No. PCT/GB87/00432, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO87/07985, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 19, 1987, Ser. No. 294,158
Claims priority, application United Kingdom, Jun. 19, 1986, 8615004
Int. Cl.[5] H01R *25/16*
U.S. Cl. 439—211 **14 Claims**

1. A multiconductor flat cable trunking module comprising means defining an elongate duct, a flat cable having a plurality of conductors and extending within and along the length of said duct, linking means at each end of said duct, a plurality of socket outlets at intervals along a surface of the duct, and intermediate connections within the duct from said cable to said socket outlets which are formed by a number out of said plurality of conductors which form part of the flat cable along a first part of the length thereof, but which are separated from



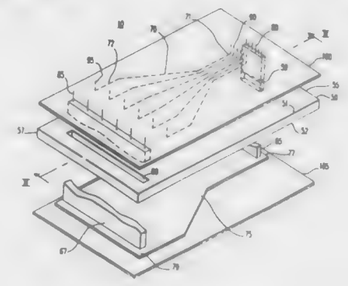
the remaining conductors along a second part of the length thereof.

4,992,059

ULTRA FINE LINE CABLE AND A METHOD FOR FABRICATING THE SAME

David R. King, Catonsville, and David B. Harris, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 1, 1989, Ser. No. 445,292
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—492 **20 Claims**



1. A method of fabricating an elongated cable having closely spaced lines for interconnecting spaced apart integrated circuits comprising a plurality of closely spaced elongated planar first conductor lines in a first plane insulatingly spaced from at least one elongated planar second circuit line with contact posts extruding from opposed ends of each of the first conductor lines and from opposed ends of the at least one planar second conductor line, which method comprises the steps of:

(a) fabricating a first cable panel by depositing upon a first layer of conductive material having two opposed ends a plurality of raised electrically conductive closely spaced elongated planar first conductor lines of a known length having first and second ends and also depositing upon the first base layer at least a pair of electrically conductive vertical connecting pillars extending above the planar first conductor lines, each of the pillars of a pair positioned near each opposed end of the first base layer and positioned beyond the ends of the first conductor lines;

(b) fabricating a second cable panel by depositing at least one raised electrically conductive elongated planar second conductor line upon a second base layer of conductive material, the second conductor line being of a length at least equal to the distance between opposing pairs of vertical pillars of the first cable panel;

(c) laminating the first cable panel to the second cable panel with a thin flexible laminate insulating material being disposed therebetween with the vertical pillars extending

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through the laminate to electrically contact opposite ends of the second conductor line;

(d) removing selected areas of the first base layer of conductive material to expose the ends of the first conductor lines and the ends of the vertical pillars and to simultaneously provide the necessary electrical conduction for electrolytical deposition upon the first conductor line ends and the vertical pillar ends;

(e) electrolytically depositing vertical contact posts of conductive material upon the exposed ends of the first conductor lines and the exposed ends of the pillars;

(f) removing the remaining portion of the first conductive base layer to electrically insulate the contact posts and the first conductor lines;

(g) removing the second conductive base layer;

(h) disposing a layer of electrical insulation upon the exposed surfaces of the laminated first and second cable panels and permitting the contact posts to protrude through the layer to provide electrical access to the flexible cable.

4,992,060

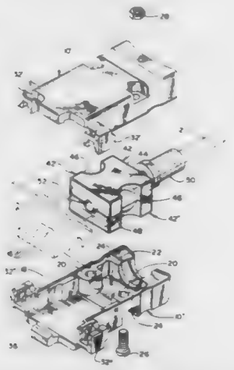
APPARATAUS AND METHOD FOR REDUCING RADIO FREQUENCY NOISE

Dennis R. Meyer, Plymouth, Minn., assignor to GreenTree Technologies, Inc., Plymouth, Minn.

Continuation-in-part of Ser. No. 372,661, Jun. 28, 1989, abandoned. This application Oct. 10, 1989, Ser. No. 419,100

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—620 **21 Claims**



1. Apparatus for reducing radio frequency noise emanating from a transmission line interconnecting electronic devices, wherein the transmission line includes a conductive connector housing at at least one end thereof, comprising:

a ferrite core received and held within the connector housing, said ferrite core surrounding and engaging, within the connector housing, a shield surrounding all conductors passing through said ferrite core;

wherein said ferrite core functions to provide substantially increased series impedance in said conductors and a common dielectric for multiple, distributed, bypass capacitors along said conductors.

4,992,061

ELECTRICAL FILTER CONNECTOR

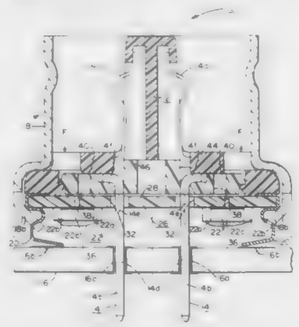
Robert W. Brush, Jr., Flemington; Robert M. Scharf, Bedminster; Campbell Davie, Rahway; Arthur A. Lutsky, Springfield, and Frank S. Siano, Monroe Twp., Middlesex County, all of N.J., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Jul. 28, 1989, Ser. No. 387,282

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—620 **18 Claims**

1. In an electrical filter connector of the type including an insulative housing supporting a plurality of electrical contacts, a metal shell supported by said housing substantially surrounding said contacts, a resilient ground spring in electrical engagement with said metal shell, said spring having a resilient portion projecting from said connector for resilient engagement with a ground trace on a system circuit board, a plurality of capacitive elements, each having a pair of spaced terminations, a first termination of each capacitive element being in electrical engagement with respective electrical contacts and a second termination of each capacitive element being in electrical engagement with said ground spring, wherein the improvement comprises:



a capacitor sub-assembly comprising an insulative substrate, and a plurality of capacitors, said capacitors being supported by said substrate, said first capacitor terminations being electrically individually connected to respective contacts, said second capacitor terminations being electrically connected to said ground spring, said capacitors being of the type wherein a dielectric surface extends between said first and second terminations, said subassembly further including a curable dielectric material disposed on said dielectric surface between each of said first and second terminations.

4,992,062

ELECTRICAL CONNECTION DEVICE

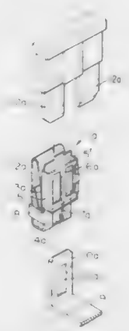
Makoto Nakayama, and Shoichi Mochizuki, both of Gotenba, Japan, assignors to Yazaki Corporation, Japan

Filed Jan. 19, 1990, Ser. No. 467,250

Claims priority, application Japan, Jan. 24, 1989, 1-5989[U]

Int. Cl.[5] H01R *13/68*

U.S. Cl. 439—621 **2 Claims**



1. An electrical connection device comprising:

a terminal connector including a terminal guide, a resilient strip formed continuous to said terminal guide to be located opposite to one of the surfaces of said terminal guide, and a terminal support located opposite to the other surface of said terminal guide a tab-shaped terminal of a bus bar to be electrically connected with said resilient strip; and a tab terminal of a fuse to be electrically connected with said terminal support; characterized, in that said tab-shaped terminal of the bus bar being formed with at least one electrical-contact surface projection projecting toward said terminal guide of said terminal connector, and said terminal guide of said terminal connector being formed with a cutout for receiving said surface projection and permitting outward protrusion of said surface projection toward said terminal guide, whereby said surface projection of said tab-shaped terminal of the bus bar makes direct electrical contact with said tab terminal of the fuse.

4,992,063

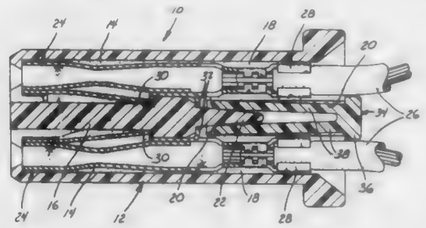
ELECTRICAL CONNECTOR

William L. Stein, Sr., Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1990, Ser. No. 546,994

Int. Cl.[5] H01R *13/436*

U.S. Cl. 439—752 **5 Claims**



1. An electrical connector comprising:

a connector body having two rows of terminal cavities that are on opposite sides of a divider wall and that are separated from each other by vertical partitions,

the vertical partitions having cutouts that form a common lateral slot at a cable end of the connector body,

the divider wall ending short of the cable end of the connector body and terminating in a projection that extends part way into the common lateral slot,

electric terminals that are attached to electrical cables being disposed in the terminal cavities, and

a one-piece bifurcated lock member that is attached to but separable from the connector body to prevent withdrawal of the electrical terminals from the terminal cavities,

the bifurcated lock member having portions disposed on opposite sides of and adjacent the projection and located by the projection solidly behind portions of the electric terminals in the respective rows.

4,992,064

FLAT CONTACT SPRING FOR PLUGS FOR ELECTRIC PLUG-TYPE CONNECTORS AND PROCESS FOR PRODUCING IT

Helmut Steinhardt, Nürnberg, and Anton Bieringer, Schwabach, both of Fed. Rep. of Germany, assignors to TRW Daut & Rietz GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

PCT No. PCT/EP89/00127, § 371 Date Oct. 16, 1989, § 102(e) Date Oct. 16, 1989, PCT Pub. No. WO89/07846, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 11, 1989, Ser. No. 424,240

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3804977

Int. Cl.[5] H01R *13/00*

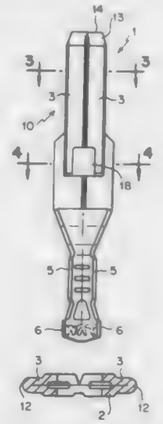
U.S. Cl. 439—845 **7 Claims**

1. A flat contact spring for plugs of electric plug connectors with socket bodies having socket contacts comprising

a center strip having crimp attachments arranged axially with a spacing from the center strip;

lateral strips arranged on both sides of the center strip and foldable onto the center strip, said lateral strips having substantially half of the width of the center strip;

said center strip having two indentations extending parallel to each other in the lengthwise direction with a spacing between said indentations;



each of said two lateral strips having one indentation;

and the indentations of the center strip and the two lateral strips when folded are disposed one on top of the other, jointly forming two chambers closed all around.

4,992,065

REVERSING DEVICE OF A JET PROPULSION ASSEMBLY FOR A SHIP

Gerard Törneman, Gimo, and Nils E. Lundberg, Österbybruk, both of Sweden, assignors to MJP Marine Jet Power AB, Osthammar, Sweden

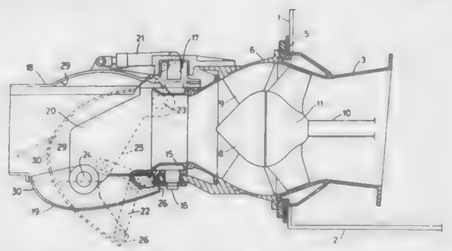
PCT No. PCT/SE88/00270, § 371 Date Nov. 16, 1989, § 102(e) Date Nov. 16, 1989, PCT Pub. No. WO88/09288, PCT Pub. Date Dec. 1, 1988

PCT Filed May 20, 1988, Ser. No. 435,415

Claims priority, application Sweden, May 21, 1987, 8702122

Int. Cl.[5] B63H *11/11*

U.S. Cl. 440—41 **1 Claim**



1. Reversing device of a jet propulsion assembly for a ship, comprising a steering means connected to an outlet side of a pump, for steering a driving water jet, said steering means including two flaps for reversing the driving water jet, said flaps being provided so that an actuator pivots a fist of said two flaps down and around a first flap bearing across the water jet at the same time as link arms, which are mounted on link bearings, and extend between front edges of said two flaps, swing a second flap of said two flaps around a second flap bearing whereby a rear portion of the second flap is raised towards the water jet and encounters an inner side of the first flap in such a way that said two flaps jointly shut off rearwards water passage, diverting the water jet obliquely downwards/-forwards, characterized in that said two flaps bearing points on

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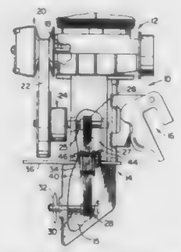
said steering means together with the link arm bearing points on said two flaps provide an equilibrium of forces between actuator pressure on the first slap and water jet pressure on said two flaps under the condition that a reduction of pressure on the actuator results in the first lap being swung upwards by water pressure.

4,992,066

MARINE MOTOR TRANSMISSION

Robert K. Watson, Post Office Box 127, Ridgetown, Ontario, Canada N0P 2C0

Filed Jul. 28, 1989, Ser. No. 386,702
Int. Cl.[5] B63H *23/00*
U.S. Cl. 440—75 10 Claims



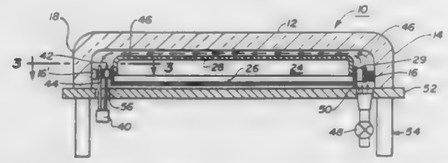
1. A transmission for a propeller driven outboard marine motor comprising the following:
(a) a speed dependant variable pulley coupled to the output of the power plant of said marine motor;
(b) a torque dependant variable pulley radially spaced from said speed dependant variable pulley and coupled to a chain or belt driver means;
(c) an endless belt means interengaging said speed dependant variable pulley and said torque dependant variable pulley;
(d) a propeller shaft spaced radially from said chain or belt driver means supporting chain or belt driven means;
(e) endless chain or belt means interengaging said chain or belt driver means and said chain or belt driven means;
(f) a propeller supported by said propeller shaft;
(g) a chain or belt tensioning means for maintaining tension on said endless chain or belt means comprising means to urge a cam against generally opposed sides of said endless chain or belt means; and
(h) a housing enclosing said chain or belt driven means.

4,992,067

METHOD OF MANUFACTURING A COLOR CATHODE-RAY TUBE

Ted J. Flock, Warren, Ind., assignor to RCA Licensing Corp., Princeton, N.J.

Filed Oct. 25, 1989, Ser. No. 426,248
Int. Cl.[5] H01J *9/00*
U.S. Cl. 445—30 2 Claims



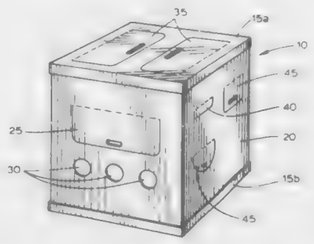
1. In a method of manufacturing a cathode-ray tube having a color selection electrode attached to a plurality of support studs distributed about and affixed to an interior surface portion of a faceplate panel by a plurality of support means each of which includes stud-engaging means, at least one of said stud-engaging means includes a washer having a stud-receiving aperture therethrough, said washer being welded to said support means, wherein the method comprises the steps of: attaching said plurality of support means to said color selection electrode; positioning the color selection electrode within the faceplate panel with the stud-engaging means positioned on said support studs; and welding said washer to said support means, wherein the improvement comprises
directing a stream of air, during said welding step, between said faceplate panel and said color selection electrode toward said stud having said washer thereon, said stream of air being sufficient to direct weld-generated debris away from the faceplate panel.

4,992,068

EDUCATIONAL PLAY HOUSE

Peter M. Conrad, 211 Lucinda, Fairview Heights, Ill. 62208

Filed Dec. 28, 1989, Ser. No. 458,325
Int. Cl.[5] A63H *33/04, 3/52;* A63J *19/00;* B65D *5/00*
U.S. Cl. 446—85 4 Claims



1. A play apparatus comprising a top piece, a bottom piece, and a side wall, wherein said top piece and said bottom piece are identically sized and have a lip around each piece, and wherein said side wall has a top edge, a bottom edge and two lateral edges and is adapted at spaced intervals to permit said side wall to be folded to create an enclosure having a plurality of sides and open ends when said lateral edges of said side wall are mated, and wherein said top piece and said bottom piece are sized to mate with said open ends of said enclosure formed by said folded side wall, and wherein said top piece, said bottom piece, and said side wall may be provided with openings to allow access between the interior and exterior of said enclosure, and wherein either said top piece or said bottom piece or both said top piece and said bottom piece includes hatchways which are cut out and can be removed and inserted, as desired; and whereby during play, said side wall is folded to create said enclosure and said top piece and said bottom piece and mated with said enclosure, and whereby when play has ceased, said apparatus can be disassembled.

4,992,069

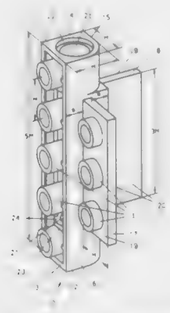
BUILDING SET HAVING PLUG-IN BUILDING BLOCKS FOR BUILDING IN LAYERS

Peter Bolli, Steinhausen, and Heinz Looser, Baar, both of Switzerland, assignors to Interlego A.G., Switzerland

Filed Oct. 20, 1989, Ser. No. 424,532
Claims priority, application Switzerland, Oct. 25, 1988, 3961/88
Int. Cl.[5] A63H *33/08, 3/52;* E04G *7/00;* E04B *1/00*
U.S. Cl. 446—128 31 Claims

1. In combination with a building set of plug-in building blocks (44) for building in layers, having connecting elements (1) which are arranged in a square array of a modulus (M), and having corresponding mating connecting means (2); a plurality of prismatic girder elements (10, 50, 60, 70), which have centering means (21) on two opposite end faces (11, 12) for centering with further girder elements which join at the end faces,

and at least one row each of connecting elements (1) with modular spacing on each of two first side faces (13, 14), said



girder element further comprising at least one bar support face, said support face parallel and adjacent a said first side face.

4,992,070

FINGER ACTUATED TOY FIGURE

Charles F. Mullen, 204 Yacht Club La., Seabrook, Tex. 77586, and Daniel C. Mullen, 243 W. Mount Royal La., Milwaukee, Wis. 52317

Filed May 2, 1986, Ser. No. 858,810
Int. Cl.[5] A63H *3/20*
U.S. Cl. 446—359 8 Claims



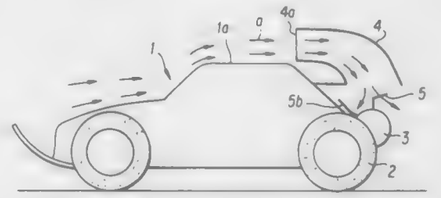
1. An improved manipulative articulated toy figure selectively convertible between use as an articulated toy figure and a figure manipulated by the fingers of a human operator for reproducing lifelike human or animal movement comprising;
a central body portion,
a plurality of generally cylindrical limbs movably mounted to said central body portion and having longitudinally spaced portions of varying transverse dimension defining a circumferential ring receiving groove,
a ring releasably attached to certain ones of said limbs in said ring receiving groove and positioned immediately adjacent the limb to which it is attached with the ring axis substantially parallel to the limb to which it is attached,
each said ring formed of a single unit of plastic material having a circular finger receiving portion and an integral expandable semi-circular limb attachment portion contiguous and immediately adjacent the finger receiving portion to be releasably engaged in said ring receiving groove whereby said ring is releasably maintained on the limb,
the circular finger receiving portion of each said ring adapted to receive the portion of a human finger between the first and second joints immediately adjacent and parallel to the limb to which said ring is attached for independent manipulation of said limbs to control the movements of the articulated figure,
said central body portion of the figure being of sufficient size and proportion to be self supported on said limbs with no auxiliary support means and to reside closely adjacent to the fingers of the operator when properly positioned,
said rings capable of being selectively removed from the limbs to allow manipulation of the limbs in a conventional manner when removed therefrom or selectively converted to a finger manipulated figure controlled by the fingers of a human operator when attached to said limbs, and
said rings of sufficient size to allow manipulation of the limbs in a conventional manner with said rings attached and the fingers removed therefrom.

4,992,071

COOLING DEVICE FOR A DRIVING MOTOR IN A TRAVELING TOY

Shohei Suto, Tokyo, Japan, assignor to Taiyo Kogyo Company, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00163, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO88/06053, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 18, 1988, Ser. No. 273,512
Claims priority, application Japan, Feb. 18, 1987, 62-21346
Int. Cl.[5] A63H *29/00, 30/04, 33/00;* H02K *1/32*
U.S. Cl. 446—457 6 Claims



1. A cooling device for a driving motor mounted in a model car, comprising:
a ventilating conduit having an air intake port;
a radiating plate having a plurality of air holes;
said conduit being mounted on said car with said intake port open windward of a current of air formed by the motion of said card, and said conduit directing said current of air onto said plate and said motor to cool said plate and said motor, said current of air being directed in a direction substantially perpendicular to a plane defined by said plate;
said plate having a basal portion attached to said motor and a radiating portion positioned in said current of air, said holes allowing passage of said current of air through said plate and onto said motor.

4,992,072

FLUTTERING TOY

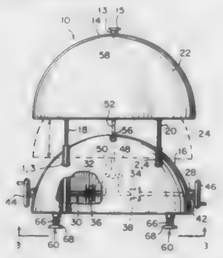
William B. Leigh, 986 S. Main St., Cedar City, Utah 84720

Filed Jul. 17, 1989, Ser. No. 380,609
Int. Cl.[5] A63H *33/00*
U.S. Cl. 446—486 7 Claims

1. A self contained toy that can jump up and down on a support surface, comprising:
(a) a lower hollow hemisphere;

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(b) an upper hollow hemisphere movably connected to said lower hollow hemisphere; and



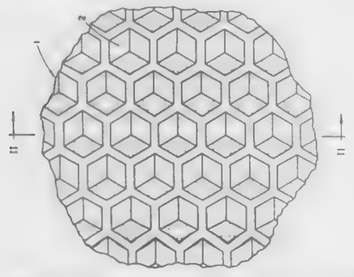
(c) means for causing said upper hollow hemisphere to jump up and down relative to said lower hollow hemisphere on said support surface.

4,992,073

ACCESSORIES FOR USE IN APICULTURE

Uri Levy, Holon, and Giora Sha'ar, Haifa, both of Israel, assignors to B-Horizon Limited, Holon, Israel

Filed Nov. 30, 1988, Ser. No. 277,781
Claims priority, application Israel, Dec. 3, 1987, 84698
Int. Cl.[5] A01K *47/04*; B32B *3/12*
U.S. Cl. 449—44 **8 Claims**



1. A molded apiculture accessory comprising a solid homogeneous mass of polypropylene copolymer and from 7.5 to 15% by weight of beeswax, said accessory being selected from the group consisting of honeycomb foundation units, beehive covers, behive bottom boards, behive queen excluders, beehive queen cages, beehive cell cups and combinations thereof.

4,992,074

REUSABLE SELF-SUPPORTING BRASSIERE

Amanda Diaz, Burbank, Calif., assignor to Damin Industries, Inc., Los Angeles, Calif.

Filed Jun. 1, 1989, Ser. No. 359,983
Int. Cl.[5] A41C *3/00, 3/14*
U.S. Cl. 450—81 **10 Claims**



1. A backless, strapless bra comprised of:

a resuable, self-supporting shaped form constructed of a flexible homogeneous material having a front surface and a back surface, the front surface having a generally rounded, smooth contour and the back surface forming an open breast receiving pocket having a shelf-life supporting ledge that comes into contact with the bottom of the breast; and

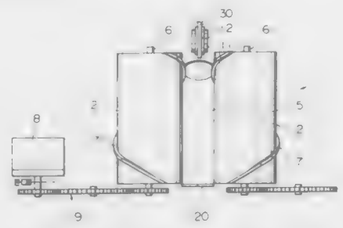
an adhesive strip cut into a winged shape having an adhesive layer on one surface, such that when the adhesive layer is exposed and the shaped form is placed on the wearer, the strip may overlay a portion of the form and attach to the skin of the wearer, holding the form in place.

4,992,075

COIN STACKING APPARATUS

Katsuyuki Miyamoto, Urawa, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 449,792
Claims priority, application Japan, Dec. 22, 1988, 63-324545; Dec. 6, 1989, 1-317077
Int. Cl.[5] G07D *9/06*
U.S. Cl. 453—61 **10 Claims**



1. A coin stacking apparatus for a coin handling machine comprising a pair of stacking drums, outer peripheries thereof being formed with spiral guide means which extend in opposite directions to each other and in phase and a pulse motor for intermittently rotating said pair of stacking drums so that said spiral guide means are intermittently lowered, the coin stacking apparatus being adapted to enable said spiral guide means to support and stack coins on an upper face thereof, said coin stacking apparatus further comprising control means for outputting pulse signals to said pulse motor, thereby to drive it, reference data storing means for storing reference pulse signals to be output from said control means to said pulse motor to lower said spiral guide means in accordance with coin denominations and coin detecting means provided above said pair of stacking drums for detecting whether or not the coin is accommodated between said pair of stacking drums by detecting whether or not the coin contacts said coin detecting means, said control means outputting a correction pulse signal to said pulse motor thereby to drive it, when the control means judges based upon a detection signal detected by said coin detecting means after it outputs the reference pulse signal to the pulse motor that the coin has not been accommodated between the pair of stacking drums.

4,992,076

YOKE FOR HOOKES UNIVERSAL JOINT WHEREIN THE YOKE IS DIVIDED IN THE REGION OF THE BEARING BORE

Wilfried Gille, Dorsten; Dieter Heier, Gelsenkirchen, and Gerd Sehlbach, Essen, all of Fed. Rep. of Germany, assignors to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

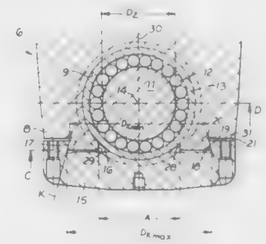
Filed Feb. 24, 1989, Ser. No. 315,942
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806259
Int. Cl.[5] F16D *3/41*
U.S. Cl. 464—130 **11 Claims**

1. A Hookes universal joint comprising two joint yokes having respective rotational axes, and a cross-member connecting the joint yokes together;

each yoke comprising two spaced arms extending generally parallel to the rotational axis of the yoke, said arms being connected together at their respective one ends and being provided adjacent their other, free, ends with bores having axes aligned with one another and extending perpendicular to the rotational axis of the yoke; said bores receiving bearing bushes supporting an opposed pair of journals of the cross-member;

each yoke arm comprising a main part and a removable portion connected to the main part of the arm in the region of the bore but offset from the bore axis towards the free end of the arm;

wherein the main part and removable portion of each yoke arm have interengaging dovetail formations which connect the main part to the removable portion, and the bearing bush being arranged so as to hold the removable



portion relative to the main part so that said dovetail formations cannot disengage.

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4,992,077

AGENT FOR THE OXIDATIVE DYEING OF HAIR, METHOD FOR THE PREPARATION OF THE AGENT AND USE OF THE AGENT

Jürgen Tennigkeit, Seeheim, and Herbert Lorenz, Gross-Bieberau, both of Fed. Rep. of Germany, assignors to Goldwell GmbH, Darmstadt-Eberstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00466, § 371 Date Apr. 14, 1988, § 102(e) Date Apr. 14, 1988, PCT Pub. No. WO88/01162, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 19, 1987, Ser. No. 187,539

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628398

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—406 10 Claims

1. An agent for dyeing human or animal hair, comprising: a mixture of approximately one-third by weight of an oxidation dye in creme or gel form containing an effective amount of an oxidation dye, and approximately two-thirds by weight of a developer solution containing approximately two percent of hydrogen peroxide, and as a catalyst 0.0001 to 1.00 percent by weight of at least one metal salt selected from the group consisting of copper (II) chloride, copper (II) sulfate, cobalt chloride, cerium sulfate and vandium sulfate, said agent having a pH between 5.9 and 6.9.

4,992,078

SULFUR DYES AND METHOD OF PREPARING SAME: MEMBRANE PROCESS

Laszlo A. Meszaros, Charlotte, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 23, 1989, Ser. No. 314,730

Int. Cl.[5] D06P *5/20;* C09B *49/00, 67/28*

U.S. Cl. 8—444 44 Claims

1. A process for the production of an aqueous dispersion of an oxidized sulfur dye having a lowered content of inorganic salt which comprises subjecting an aqueous suspension of oxidized sulfur dye particles which also contains inorganic salt to separation by a semipermeable membrane having a pore size giving a cut-off so lower than molecular weight 500 which prevents passage therethrough of the desired size dye particles but permits passage therethrough of water and inorganic salts.

4,992,079

PROCESS FOR PREPARING A NONPHOSPHATE LAUNDRY DETERGENT

Charles W. Lutz, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 929,128, Nov. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,318, Dec. 12, 1985, abandoned. This application Dec. 27, 1988, Ser. No. 290,491

Int. Cl.[5] C11D *3/10*

U.S. Cl. 23—313 R 16 Claims

1. A process for preparing a low bulk density, soda ashbased, nonphosphate agglomerated laundry detergent having increased resistance to liquid nonionic surfactant bleeding, which comprises (a) loading nonaqueous liquid surfactant onto substantially anhydrous, hydratable soda ash particles in the absence of added water, (b) turbulently dispersing the surfactant-loaded particles into an inert gaseous medium while wetting the dispersed particles with an atomized stream of dilute aqueous sodium silicate or with separate atomized streams of water and concentrated aqueous sodium silicate, to form the agglomerated detergent, the amount of sodium silicate added during the agglomeration constituting from about 15% to about 20% by weight of 38% concentrated aqueous sodium silicate (N-silicate) based on the total weight of the said detergent and (c) recovering the resultant agglomerated detergent.

4,992,080

OIL COMPOSITIONS CONTAINING ALKYL AMINE DERIVATIVES OF COPOLYMERS OF AN ALPHA OLEFIN OR AN ALKYL VINYL ETHER AND AN UNSATURATED ALPHA, BETA-DICARBOXYLIC COMPOUND

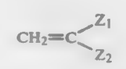
Hanh T. Le, Wilmington, Del., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 265,614, Oct. 31, 1988, Pat. No. 4,900,331. This application Nov. 16, 1989, Ser. No. 438,820

Int. Cl.[5] C10L *1/18, 1/22*

U.S. Cl. 44—62 17 Claims

1. An oil composition which comprises a major amount of an oil selected from a crude oil and a minor amount of an alkyl amine derivative of an alpha olefin or alkyl vinyl ether and an unsaturated alpha, beta-dicarboxylic compound copolymer having pour point depressant properties said copolymer comprising the reaction product of (a) an alpha olefin having from about 2 to about 30 carbon atoms or mixtures of alpha olefins having from about 2 to about 30 carbons atoms or an alkyl vinyl ether or mixture of alkyl vinyl ethers having the formula:



wherein Z_1 and Z_2 are the same or different, H, R_1 or OR_1 and R_1 is an alkyl group having 1 to 30 carbon atoms, (b) maleic anhydride; and (c) an alkyl amine having the formula:

$X(R_2)_y$

wherein X is N and R_2 is an alkyl group having from about 3 to about 30 carbon atoms and y is either 1 or 2.

4,992,081

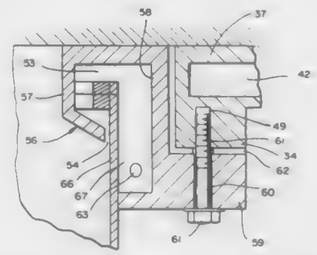
REACTOR DIP TUBE COOLING SYSTEM

Alfred L. Den Bleyker, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 15, 1989, Ser. No. 407,977

Int. Cl.[5] C10J *3/82*

U.S. Cl. 48—69 1 Claim



1. In a gasification reactor for combusting a carbonaceous fuel mixture to produce a hot effluent stream comprised primarily of a usable gas, said reactor including:

an elongated shell (11),

means forming a combustion chamber (12) in said shell,

a burner (14) in said shell interconnected with a means for supplying a pressurized carbonaceous fuel and combustion supporting gas to discharge a mixture of the fuel and combustion support gas into combustion chamber (12), and produce a hot effluent stream therein

means forming a quench chamber (19) in said shell (11) holding a liquid bath (21),

effluent guide means communicated with said combustion chamber (12) for conducting said hot effluent stream

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therefrom, and into said bath held in the quench chamber, said effluent guide means comprising:

a quench ring (36) supportably positioned in said quench chamber (19) having a first toroidal body (37) including:

means forming an annular coolant compartment (42) interconnected with means for supplying pressurized liquid coolant (45), the improvement therein of:

an annular rim (34) depending from said first toroidal body (37) defining a downwardly facing cylindrical receptacle (41),

flow channel means (48) in said annular rim (34) communicated with said annular coolant compartment (42),

a dip tube assembly (56) removably engaging said quench ring (36) and including:

a second toroidal body (57) having a lateral wall (58) registered in said sealed engagement with said cylindrical receptacle (41), and having a flange (59) extending outwardly from said lateral wall,

a dip tube (66) depending from said second toroidal body (57), having an exterior wall spaced from said lateral wall to define a liquid coolant circulating jacket (67) therebetween,

liquid discharge port means (54) in said second toroidal body (57) in communication with said liquid coolant circulating jacket and aligned to direct liquid coolant against an interior wall of the dip tube which is exposed to the hot effluent stream, and

flow passage means (63) in said flange (59), communicating said coolant circulating jacket (67) with said flow channel means (48).

4,992,082

METHOD OF TOUGHENING DIAMOND COATED TOOLS

William R. Drawl, State College, Pa., and Robert C. McCune, Birmingham, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 296,469, Jan. 12, 1989. This application Dec. 14, 1989, Ser. No. 450,700

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—295 2 Claims



1. A diamond composite coated tool structure, comprising:

(a) a tool substrate effective to retain strength related physical properties while experiencing temperatures of up to 1050° C. for up to 22 hours;

(b) a plurality of layers of noncontiguous diamond or diamond-like crystals on said tool substrate; and

(c) a plurality of planarized layers of binding material, each layer being interposed between or on the layers of diamond or diamond-like crystals and deposited at temperatures below 500° C.

4,992,083

APPARATUS FOR INTERMEDIATE ENRICHMENT OF TRACE SUBSTANCES FROM A GAS STREAM IN A COLD TRAP, AND CHROMATOGRAPHY ARRANGEMENT PROVIDED THEREWITH

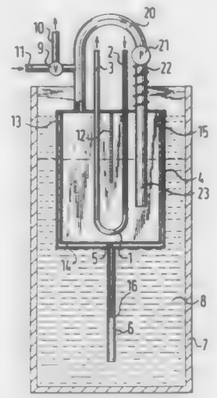
Klaus-Peter Mueller, Juelich, and Jochen Rudolph, Huertgenwald, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Juelich Gesellschaft mit beschraenkter Haftung, Juelich, Fed. Rep. of Germany

Filed Nov. 20, 1989, Ser. No. 438,078

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1988, 3839116; Nov. 24, 1988, 8814619[U]

Int. Cl.[5] B01D *15/08*

U.S. Cl. 55—197 11 Claims



1. An apparatus for intermediate enrichment of trace substances from a gas stream in a cold trap which carries a flow and optionally contains an adsorbent material and which, during the enrichment phase, is immersed into cooling fluid in a cooling bath and, for desorption, is subjected to heated or unheated air or gas, comprising:

(a) a gas-tight jacket surrounding said cold trap ;

(b) an opening on the lower end of said jacket; and

(c) means for connecting the interior of said jacket via at least one valve to the atmosphere above said cooling fluid in said cooling bath or to a compressed gas.

10. A chromatography arrangement for use in conjunction with the apparatus recited in claim 1, comprising:

(a) a separation column with a detector and an upstream fractionating column;

(b) at least one valve-controlled outlet upstream of said separation column and upstream and downstream of said fractionating column;

(c) feed lines for two carrier gas streams I and II;

(d) means for alternating operation of said arrangement between the independent steps of,

(i) simultaneously introducing a sample to said cold trap, passing said carrier gas I through said separation column and passing said carrier gas II through said fractionating column,

(ii) compressing said sample collected in said cold trap and then passing said carrier gas I through said cold trap so that said compressed sample enters said fractionating column, and

(iii) passing said sample through said fractionating column and then through said separation column, and;

(e) means for temporarily connecting said fractionating column to said valve-controlled outlet for the removal of the most volatile gas fractions from said arrangement.

4,992,084

ACTIVATED CHARCOAL FILTER LAYER FOR GAS MASKS

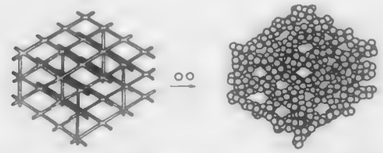
Hasso Von Blücher, Columbusstrasse 58, D-4000 Düsseldorf 1, and Ernest De Ruiter, Höhenstrasse 57a, D-5090 Leverkusen 3, both of Fed. Rep. of Germany

Filed Apr. 20, 1989, Ser. No. 341,091

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813564

Int. Cl.[5] B01D *53/02*

U.S. Cl. 55—316 27 Claims



1. An activated charcoal filter layer for gas masks, comprising a highly air-permeable, three dimensional carrier framework essentially stable in shape, formed of wires, monofilaments or stays, to which there is a affixed a layer of granular activated charcoal particles with a diameter of about 0.1 to 1 mm and in an amount of 50 to 300 g per liter, the distance between the wires, monofilaments or stays being at least twice as great as the diameter of the activated charcoal particles.

4,992,085

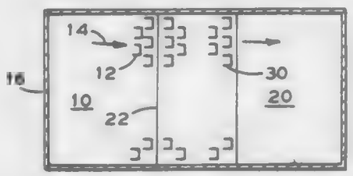
INTERNAL IMPACT TYPE PARTICLE SEPARATOR

Felix Belin, Brecksville; David E. James, Barberton, and David J. Walker, Wadsworth, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 8, 1990, Ser. No. 461,707

Int. Cl.[5] B01D *45/00*

U.S. Cl. 55—444 15 Claims



1. An internal impact type particle separator for a circulating fluidized bed combustor comprising a plurality of concave impingement members supported within a furnace enclosure, said members extending uniformly in at least two staggered rows fully across and just upstream of a furnace exit opening, said members also extending along the length of said opening and terminating at a location below the lower elevation of said exit opening with collected particles falling unobstructed and unchanneled directly underneath said members and along one wall of said furnace enclosure for reentrainment and recycling thereof, said staggered rows being spaced from each other a distance of at least 50% of the distance between adjacent said members with one said row being spaced from said furnace wall a distance less than the depth of a said concave impingement member.

4,992,086

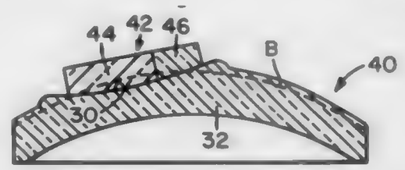
MULTIFOCAL LENS METHOD

Milford L. Buckley, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Feb. 20, 1990, Ser. No. 481,209

Int. Cl.[5] C03B *11/08*

U.S. Cl. 65—38 10 Claims



1. A method of producing a miltifocal, ophthalmic, lens blank assembly which comprises forming a glass major element, the glass major element having a raised countersink zone on one surface, the remainder of the glass major element being thinner than the countersink zone, but of such thickness that it can be ground and polished to form a lens, largely removing the raised portion of the major to form a countersink that extends below the line of finished lens curvature defined by the upper surface of the remainder of the major element, forming a segment element, placing the segment element in the countersink on the glass major element and subjecting the assembly to a fusing temperature to provide a fused, multifocal, ophthalmic lens blank.

4,992,087

PROCESS FOR THE PRODUCTION OF A TEMPERED OR BENT GLASS PLATE WITH A REAR COATING, GLASS PLATE PRODUCED ACCORDING TO THE SAME AND THE USE THEREOF

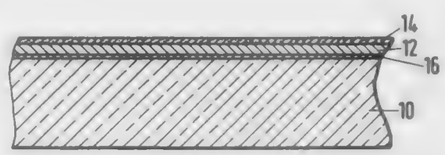
Heinz W. Hölscher, Datteln, Fed. Rep. of Germany, assignor to Flachglas Aktiengesellschaft, Bayern, Fed. Rep. of Germany

Filed Jan. 26, 1990, Ser. No. 470,497

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1989, 3902596

Int. Cl.[5] C03C *17/36*

U.S. Cl. 65—60.2 14 Claims



1. A process for the production of a tempered or bent glass plate provided with a reflective coating, comprising the steps of:

applying to the rear side of the glass plate at least one opaque metal layer with a preponderant content of at least one metal or a metal alloy from elements of numbers 22 to 28 of the Periodic System of elements;

applying to said at least one metal layer a protective layer;

thermal tempering or bending said coated glass plate in air at a temperature between approximately 580° C. and 680° C., wherein the thickness and material content of said protective layer are selected such that during the tempering or bending step there is no significant oxygen diffusion to said at least one metal layer, and wherein said protective layer is formed by an alloy of Al with Ti and/or Zr with the content thereof at least 10 atomic %.

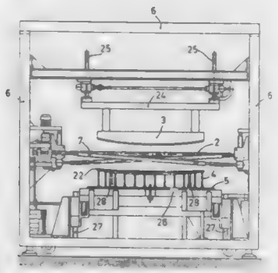
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4,992,088

PROCESS AND APPARATUS FOR THE BENDING OF FLAT SHEETS OF GLASS

Vito Sassanelli, and Francesco Pracilio, both of Vasto, Italy, assignors to Societa Italiana Vetro - SIV - S.p.A., San Salvo, Italy

Filed Oct. 11, 1989, Ser. No. 420,004
Claims priority, application Italy, Oct. 11, 1988, 48442 A/88
Int. Cl.[5] C03B *23/023*
U.S. Cl. 65—106 **6 Claims**



1. A method of bending a sheet of glass, comprising the steps of:

heating a sheet of glass to be bent in an oven to its deformation temperature;

transporting said sheet of glass on a means for horizontally conveying a sheet of glass from said oven to a position between contraposed male and female moulds, said means for horizontally conveying having a plurality of horizontal conveyor rollers located between said male and female moulds;

inclining individual ones of said horizontal conveyor rollers in opposite directions by lowering one end of each of said horizontal conveyor rollers so as to form a cross-sectionally crossed configuration of said horizontal conveyor rollers and lower said sheet of glass onto said female mould;

bending and shaping said sheet of glass between said male and female moulds; and

lowering said female mould so as to release said sheet of glass onto said crossed configuration of said horizontal conveyor rollers.

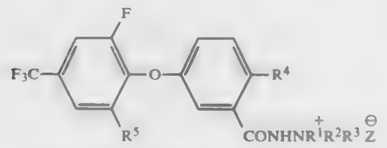
4,992,089

HERBICIDAL COMPOUNDS, COMPOSITIONS AND USE

David Cartwright, Reading, and David J. Collins, Crowthorne, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Nov. 18, 1986, Ser. No. 932,101
Claims priority, application United Kingdom, Nov. 22, 1985, 8528856
Int. Cl.[5] A01N *43/84, 37/18;* **C07C** *243/38;* **C07D** *265/30*
U.S. Cl. 71—88 **8 Claims**

1. A compound of formula (I)



(I)

or a zwitterion derivative thereof; wherein

R^1, R^2 and R^3 are each independently optionally substituted alkyl or R^1 and R^2 together with the nitrogen atom to which they are attached form a 5- or 6-membered heterocyclic ring;

R^4 is hydrogen, nitro, halo, alkyl or CF_3;

R^5 is halo; and

Z is an anion.

7. A herbicidal composition comprising a compound of formula (I) as defined in claim 1 in combination with a solid or liquid diluent.

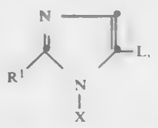
4,992,090

HERBICIDALLY ACTIVE 5,6-DIHYDROCYCLOPENTATHIOPHENYL-IMIDAZOLE DERIVATIVES

Hans-Dieter Schneider, Efringerstrasse, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

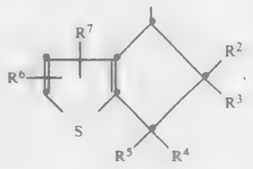
Filed Jun. 5, 1989, Ser. No. 361,088
Claims priority, application Switzerland, Jun. 13, 1988, 2251/88
Int. Cl.[5] C07D *409/02;* **A01N** *43/50*
U.S. Cl. 71—90 **8 Claims**

1. A 5,6-dihydrocyclopentathiophenyl-imidazole derivative of formula I

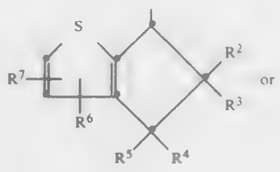


(I)

stereochemically isomeric forms thereof, or a salt, wherein X is a radical of formula

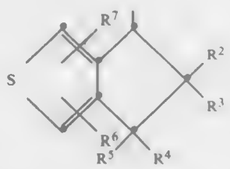


X1



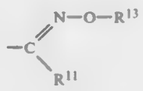
X2

or



X3

R^1 is hydrogen or —SH, and L is cyano, —COOH, —$COOR^8$, —$COSR^8$, —$CONR^9R^{10}$, —CO—R^{11}, —CH_2—O—R^{12} or a group



wherein each of R^2 and R^3, independently of the other, is hydrogen, C_1–C_4alkyl, C_2–C_4alkenyl or C_2–C_4alkynyl or together they form a spirocyclically linked C_2–C_6alkylene chain, each of R^4 and R^5, independently of the other, is hydrogen or C_1–C_4alkyl, R^6 is hydrogen, cyano, halogen, C_1–C_4alkyl, C_1–C_4haloalkyl or nitro, R^7 is hydrogen, halogen or C_1–C_4alkyl, R^8 is C_1–C_6alkyl, C_3–C_7cycloalkyl, C_2–C_6alkoxyalkyl, benzyl, —$CR^{14}R^{15}$—C_2–C_4alkenyl or —$CR^{14}R^{15}$—C_2–C_4alkynyl, R^9 is hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, benzyl, —$CR^{14}R^{15}$—C_2–C_4alkenyl or —$CR^{14}R^{15}$—C_2–C_4alkynyl, R^{10} is hydrogen or C_1–$_4$alkyl, R^{11} is hydrogen, C_1–C_6alkyl, $_3$–C_7cycloalkyl, C_1–C_4haloalkyl, or phenyl that is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, nitro or by halogen, R^{12} is hydrogen, C_1–C_6alkyl, phenyl that is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or by nitro, C_1–C_6alkylcarbonyl, C_1–C_4haloalkylcarbonyl, or benzyl that is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or by nitro, R^{13} is C_1–C_4alkyl, —$CR^{14}R^{15}$—C_2–C_4alkenyl, benzyl or —$CR^{14}R^{15}$—C_2–C_4. chloroalkenyl, and each of R^{14} and R^{15}, independently of the other, is hydrogen or C_1–C_4alklyl.

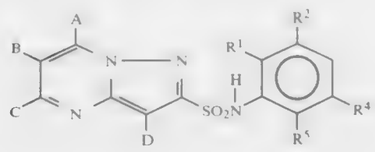
4,992,091

SUBSTITUTED PYRAZOLO[1,5-A]PYRIMIDINE-2-SULFONAMIDES AND COMPOSITIONS AND METHODS OF CONTROLLING UNDESIRED VEGETATION

Anna P. Vinogradoff, Concord, and William A. Kleschick, Martinez, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 11, 1986, Ser. No. 884,696
Int. Cl.[5] C07D *487/04;* **A01N** *43/54*
U.S. Cl. 71—92 **12 Claims**

1. A compound having the formula:



(I)

wherein B represents hydrogen, halogen or C_1–C_4 alkyl; A, C and D independently represent hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, cyano, hydroxy, CO_2 alkyl of 1–3 carbon atoms or A and B or B and C may be bonded together in a cyclic structure —$(CH_2)_n$— where n is 3, 4 or 5; R^1 represents F, Cl, Br, I, —NO_2, phenyl, —OAr, —CF_3, —OCF_3, —OCF_2CF_2H, —OCF_2CCl_2H, —OCH_2CF_3, —SCF_3, —SCF_2CF_2H, —SCF_2CCl_2H, —$SOCF_3$, —$SOCF_2CF_2H$, —$SOCF_2CCl_2H$, —SO_2CF_3, —$SO_2CF_2CF_2H$, —$SO_2CF_2CCl_2H$, —SR^6, —SOR^6, —SO_2R^6, —CN, —$COOR^7$, —$CONH_2$, —$CONHR^8$, —$CONR^8(R^9)$, —SO_3R^8 and —$SO_3CH_2CF_3$; R^2 and R^4 represent H, F, Cl, Br, C_1–C_4 alkyl, $COOR^7$ and —OR^8; and R^5 represents H, C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, Br, NO_2, CF_3, —OCF_3, —OCF_2CF_2H, —OCF_2CCl_2H, —OCH_2CF_3, —SCF_3, —SCF_2CF_2H, —SCF_2CCl_2H, —$SOCF_3$, —$SOCF_2CF_2H$, —$SOCF_2CCl_2H$, —SO_2CF_3, —$SO_2CF_2CF_2H$, —$SO_2CF_2CCl_2H$, —SR^6, —SOR^6, —SO_2R^6, —CN, —$COOR^7$, $CONH_2$, $CONHR^8$, —$CONR^8(R^9)$, —SO_3R^8, —$SO_3CH_2CF_3$, —$CR^6R^6OR^6$ and —$CR^6R^6SR^6$, wherein R^6 represents H, phenyl or C_1–C_4 alkyl, R^7 represents C_1–C_6 alkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, phenyl, halo substituted C_1–C_6 alkyl or halo substituted phenyl and R^8 band R^9 individually represent C_1–C_4 alkyl, with the proviso that all sulfur containing substituents are in the same oxidation state.

4,992,092

METHOD FOR SAFENING GRAMINEOUS CROPS AGAINST PYRIDINE IMIDAZOLINONE HERBICIDES

Jeffrey H. Birk, and Timothy Malefyt, both of Morrisville, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,209
Int. Cl.[5] A01N *43/40, 43/00*
U.S. Cl. 71—92 **8 Claims**

1. A method for protecting a gramineous crop from injury caused by a herbicidally effective amount of a pyridine imidazonlinone herbicide selected from the group consisting of

2(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid;

5-methyl-2-(4-isopropyl-4methyl-5oxo-2-imidazolin-2yl) nicotinic acid;

5-ethyl-2-(4-isopropyl-4-methyl-5oxo-2-imidazolin-2yl) nicotinic acid; and

allyl 5-methyl-2-(4-isopropyl-4-methyl-5oxo-2-imidazolin-2-yl) nicotinate;

which comprises applying an effective non-phytotoxic antidotal amount of a chemical safener selected from the group consisting of 1.8-naphthalic anhydride and the dicationic salt of 1,8-naphthalic acid to the seed of the crop, the foliage of the crop, or the soil surrounding the crop or crop seed.

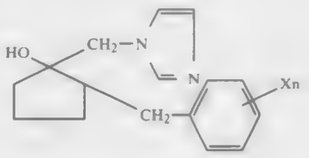
4,992,093

AZOLYLCYCLOPENTANOL DERIVATIVES AND AGRICULTURAL AND HORTICULTURAL COMPOSITION CONTAINING THE SAME AS ACTIVE INGREDIENTS

Satoru Kumazawa; Atsushi Ito; Nobuo Sato; Toshihide Saishoji; Masahiro Hamada; Shiro Yamazaki, and Hiroyuki Enari, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Division of Ser. No. 903,992, Sep. 4, 1986, Pat. No. 4,863,505.
This application May 25, 1989, Ser. No. 357,422
Claims priority, application Japan, Sep. 12, 1985, 60-202431; Jun. 25, 1986, 61-147175
Int. Cl.[5] A01N *43/50;* **C07D** *233/60*
U.S. Cl. 71—92 **15 Claims**

1. An imidazole derivative represented by the formula (I):



(I)

wherein X represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 5 carbon atoms, a trihalomethyl group, a phenyl group, or a cyano group and X can be the same or different group or atom, and n represents an integer of 1 or 2.

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4,992,094

PHENYLSULFONYL 2-IMIDAZOLIN-5-ONE COMPOUNDS

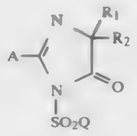
Sergio I. Alvarado, Princeton; Alvin D. Crews, Jr., Plainsboro; Peter J. Wepplo, Princeton; Robert F. Doehner, Jr., East Windsor; Thomas E. Brady, Whitehouse Station; David M. Gange, Princeton, and Desiree L. Little, Burlington, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 214,507, Jul. 7, 1988, Pat. No. 4,883,914, which is a continuation-in-part of Ser. No. 86,416, Aug. 17, 1987, abandoned. This application Oct. 5, 1989, Ser. No. 417,400

Int. Cl.[5] C07D *233/32*

U.S. Cl. 71—92 7 Claims

1. A herbicidal phenylsulfonyl 2-imidazolin-5-one compound of formula (I)



I

wherein

A is hydrogen; straight or branched C_1–C_4 alkyl, optionally substituted with one to three halogens, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1C_4 alkylsulfonyl, carboalkoxy, phenyl, or oxo;

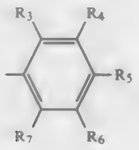
straight or branched C_2–C_4 alkenyl, optionally substituted with one to three halogens or phenyl; or

C_2–C_4 alkynyl, optionally substituted with one to three halogens; R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached, they may be C_3–C_6 cycloalkyl optionally substituted with methyl;

and when R_1 and R_2 are not the same, thus creating an asymmetric center, an optical isomer thereof; and

Q is represented by formula (III)



III

wherein

R_3–R_7 are each hydrogen, halogen; nitro; cyano; straight or branched C_1–C_4 alkyl, optionally substituted with one or more halogens or phenyl;

straight or branched C_2–C_4 alkenyl, optionally substituted with one to three halogens;

OR_8 where R_8 is hydrogen; C_1–C_4 alkyl, optionally substituted with halogen(s), C_1–C_4 alkoxy, or phenyl; or C_2–C_4 alkenyl optionally substituted with one to three halogens or phenyl;

phenyl, optionally substituted with one to three halogens, one to three C_1–C_4 alkyl, one to three C_1–C_4 alkoxy, or one to two nitro;

C_1–C_4 alkylcarbonyl, optionally substituted with

C_1–C_4 alkylthio, optionally substituted with halogen(s);

C_1–C_4 alkylsulfinyl, optionally substituted with halogen(s);

C_1–C_4 alkylsulfonyl, optionally substituted with halogen(s);

amino, optionally substituted with C_1–C_4 alkyl;

CO_2R_9 where R_9 is hydrogen or C_1–C_4 alkyl, optionally substituted with one to three halogens; or

R_3–R_4, R_4–R_5, R_5–R_6, R_6–R_7 may also be —(CH=CH—CH=CH)—, optionally substituted with up to three of the substituents described for R_3–R_7 above;

with the proviso that no more than three of R_3–R_7 can be: cyano, nitro, (substituted-phenyl, alkylcarbonyl, alkylthio, alkylsulfinyl, alkylsulfonyl, amine or CO_2R_9.

4,992,095

ALLOY TARGET USED FOR MANUFACTURING MAGNETO-OPTICAL RECORDING MEDIUM

Tasuo Nate; Toshio Morimoto, both of Ichikawa, and Shinobu Endo, Komae, all of Japan, assignors to Sumitomo Metal Mining Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1989, Ser. No. 426,710

Claims priority, application Japan, Oct. 26, 1988, 63-268216; Oct. 26, 1988, 63-268217

Int. Cl.[5] B22F *9/00*

U.S. Cl. 75—246 8 Claims

1. An alloy target for use in manufacturing a magneto-optical recording medium, wherein the component and composition comprises from 10–50 atom % of at least one rare earth element selected from the group consisting of Nd, Sm, Gd, Tb, Dy, Ho, Er and Tm, from 0.1 to 10 atom % of at least one additive element selected from the group consisting of B, AL, Si, P. Ti, V, Cr, Mn, Zr, Nb, Mo, Hf, Ta, W, Pt, Pb and Bi, and the balance substantially composed of at least one transition metal selected from the group consisting of Co, Fe and Ni; and a structure comprises any one of mixed structure from the group consisting of (1) a mixed structure comprising a phase of intermetallic compound of rare earth element—additive element—transition metal, and a fine mixed phase of rare earth element and intermetallic compound of rare earth element—transition metal, (2) a mixed structure comprising a phase of intermetallic compound of rare earth element—transition metal and a fine mixed phase of rare earth element and intermetallic compound of rare earth element—transition metal, at least one of the rare earth element and the intermetallic compound in the fine mixed phase containing the additive element; (3) a mixed phase comprising a phase of intermetallic compound of rare earth element—transition metal and a phase of intermetallic compound of rare earth element—additive element; (4) a mixed structure comprising any one of said mixed structures (1), (2), and (3) above and a phase of rare earth element along, and (5) a mixed structure of any one of the mixed structures comprising a phase of intermetallic compound of rare earth element—additive element—transition metal, and a phase of the rare earth element along; in which a phase of transition metal alone is not substantially present.

4,992,096

METALLOTHERMIC REDUCTION OR RARE EARTH METALS

Edward J. Skach, Jr., Freeport; Kenneth G. Claus, and Matthew R. Earlam, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 9, 1989, Ser. No. 364,770

Int. Cl.[5] C22B *26/22, 59/00*

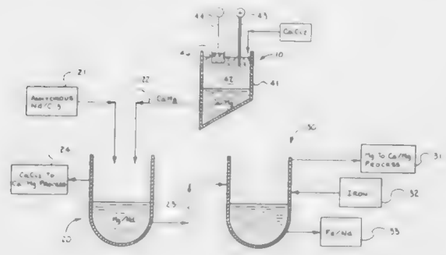
U.S. Cl. 75—588 8 Claims

1. A process for producing an alloy of Fe and at least one rare earth metal by starting with at least one calciothermically reducible compound of said rare earth metal(s), said process comprising

(1) forming a melt of (a) the rare earth metal compound(s) and (b) a Ca/Mg metal alloy, whereby the Ca reduces the rare earth metal compound(s), thereby forming a molten Ca compound and a molten alloy of Mg and rare earth metal(s),

(2) separating the molten Ca compound from the molten alloy of Mg and rare earth metal(s),

(3) introducing iron into the molten alloy of Mg and rare earth metal(s), thereby forming an alloy of iron and rare earth metal(s), and



(4) removing the Mg from the molten alloy of iron and rare earth metal(s).

4,992,097

METAL RECOVERY PROCESS

Alan G. Fricker, Korokoro, New Zealand, assignor to Her Majesty the Queen in right of New Zealand (Department of Scientific and Industrial Research, New Zealand

Filed Oct. 11, 1989, Ser. No. 419,829

Claims priority, application New Zealand, Oct. 12, 1988, 226529

Int. Cl.[5] C22B *3/00*

U.S. Cl. 75—733 17 Claims

1. A process for recovering a valuable metal or metals from an ore or ores thereof, comprising

forming a pulp of particles of the ore(s), said pulp having at least a solid element, a liquor component, and at least one leaching chemical, said leaching chemical being selected to react with the valuable metal(s) to remove same,

contacting at least the liquor component of the pulp containing the valuable metals with a flow of gas for removal into the gas of any volatile residual elements of the leaching chemical and volatile products of the leaching process, said removal being effected prior to recovery of any major portion of the valuable metal(s) from the pulp,

isolating for recirculation said gas containing the removed material, and

recovering the valuable metal(s).

4,992,098

GLOSSY, PRECIOUS-METAL PREPARATIONS FOR MICROWAVE-RESISTANT TABLEWARE-DECORATIONS

Marion Lotze, Hammersbach; Hans Mehner, Frankfurt, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 4, 1988, Ser. No. 252,932

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736583

Int. Cl.[5] C09D *5/30*

U.S. Cl. 106—123 7 Claims

1. A glossy precious-metal preparation comprising at least one organo-gold compound, an organic carrier and a fluxing agent composed of at least one organic base-metal compound and containing an organic silicon compound with three hydrolyzable groups at the silicon atom, and a proportion between 0.1 and 2 moles of silicon per mole of precious metal in the preparation, which preparation is suitable for use as microwave-resistant decoration on tableware made of silicates, wherein the organic silicon compound has a formula selected from the group consisting of Y_3SiX, where

Y=alkoxy, aryloxy, aralkoxy, acyloxy, ketoximyl, mercaptan, halogen or pseudohalogen, and

X=alkyl, aryl, aralkyl, alkenyl, cycloalkenyl, vinyl or heteroatom-substituted analogues,

$(ZO)_3SiX$, where Z=R^1—OR and where

R=linear or branched hydrocarbons with 1 to 24 C atoms, cycloaliphatic hydrocarbons with 3 to 8 C atoms, aromatic hydrocarbons with 6 to 10 C atoms and aliphatic-aromatic hydrocarbons with 7 to 15 C atoms,

R^1=linear or branched hydrocarbons with 2 to 10 C atoms,

X=alkyl, aryl, aralkyl, alkenyl, cycloalkenyl, vinyl or heteroatom-substituted analogues,

and $(ZO)_3SiX$, where z=R, R^1—OR or R_2CO and where

R=linear or branched hydrocarbons with 1 to 24 C atoms, cycloaliphatic hydrocarbons with 3 to 8 C atoms, aromatic hydrocarbons with 6 to 10 C atoms and aliphatic-aromatic hydrocarbons with 7 to 15 C atoms,

R^1=linear or branched hydrocarbons with 2 to 10 atoms, and

R^2=linear or branched hydrocarbons with 1 to 10 C atoms,

X=R^2—Q, with Q=halogen, mercaptan, amine, urethane, amide, urea, azide, thiocyanate, isocyanate, epoxy, glycidyl or ester, and

R^2=linear or branched hydrocarbons with 1 to 10 C atoms.

4,992,099

PRINTING PASTE, METHOD FOR PRINTING TEXTILE PRODUCTS USING THE PASTE, AND TEXTILE PRODUCTS OBTAINED THEREBY

Masato Yamate, 612-2, Oaza-managura, Ekiya-cho, Fukuyama-shi, Hiroshima-ken, Japan

Filed Oct. 5, 1989, Ser. No. 417,252

Claims priority, application Japan, Oct. 6, 1988, 63-253324

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—24 6 Claims

1. A printing paste of a uniformly kneaded mixture comprising 100 wt. parts of egg yolk, 1–10 wt. parts of a preservative, 1–10 wt. parts of a lower alcohol, 20–40 wt. parts of an alkyd paint and 5–30 wt. parts of a water soluble resin clear paint.

4,992,100

GELATINE GRANULES AS WELL AS METHODS AND APPARATUS FOR THEIR MANUFACTURE

Peter Koepff, Heidelberg; Klaus Bräumer, Eberbach, and Helmuth Stahl, Michelstadt, all of Fed. Rep. of Germany, assignors to Deutsche Gelatine-Fabriken Stoess & Co. GmbH, Eberbach, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 390,653

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1988, 3827061

Int. Cl.[5] C08L *89/00*

U.S. Cl. 106—125 17 Claims

1. Gelatine granules for use in forming gelatine articles by means of a plastics extruder without presoaking, comprising solid gelatine particles with a water content of from 1 to 12% by weight, with a particle size of from 0.1 to 10 mm, with an entrapped air content of less than 1% by volume and with a melt flow index (MFI) greater than 1 g/10 min at 110 degrees C. testing temperature, 30 kg total loading weight and using a standard die in accordance with DIN (German standard) A 53 735, page 2 with a length-to-diameter ratio of 8 mm of 2 mm.

4,992,101

PROCESS FOR THE PREPARATION OF OPAQUE DIKETOPYRROLO-PYRROLE PIGMENTS

Edward E. Jaffe, Wilmington, Del., and Fridolin Babler, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

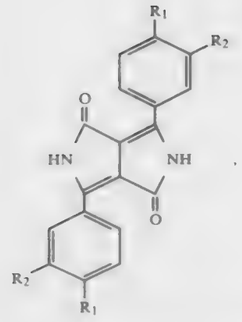
Continuation of Ser. No. 181,864, Apr. 15, 1988, abandoned. This application Sep. 19, 1989, Ser. No. 409,987

Int. Cl.[5] C08K *5/3415*

U.S. Cl. 106—498 11 Claims

1. A process for increasing the opacity of 1,4-diketopyrrolo[3,4-c]-pyrrole pigments of the formula

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(I)

wherein one of R_1 and R_2 is hydrogen, halogen or C_1–C_4-alkyl and the other is hydrogen, which process consists essentially of milling the pigment in an alcohol which is present in an amount ranging from 5 to 25 times the weight of the diketopyrrolopyrrole and in the presence of a base which is present in an amount ranging from 2 to 50% by weight of the diketopyrrolopyrrole at a temperature below 50° C.

4,992,102

SYNTHETIC CLASS C FLY ASH AND USE THEREOF AS PARTIAL CEMENT REPLACEMENT IN GENERAL PURPOSE CONCRETE

Ronald L. Barbour, 3339-2K, Circle Brook Dr., SW., Roanoke, Va. 24014

Filed Aug. 8, 1988, Ser. No. 229,454
Int. Cl.[5] C04B *7/02*
U.S. Cl. 106—645 **9 Claims**

1. In a settable composition for producing general purpose concrete which comprises per cubic yard of the concrete to be produced an admixture of about 400–750 lbs. Portland cement, about 1600–2000 lbs. coarse aggregate of a size of at least about ¾ inch, and sufficient fine aggregate of a size less than ¾ and minor amounts of optional additives to yield one cubic yard when the admixture is combined with water equal to about 40–70% by weight of said cement, the improvement wherein more than about 25% up to about 50% by weight but not more than about 200 lbs. of said Portland cement is replaced with a homogeneous blend of (a) a fly ash having a combined content of silica, alumina and ferric oxide exceeding 70% and a calcium oxide content of less than 10% and (b) cement kiln dust, said blend having a combined content of silica, alumina and ferric oxide higher than about 50% but less than about 70% and a calcium oxide content higher than 10%.

4,992,103

CEMENTITIOUS COMPOSITIONS

Roderick M. Smart, Birmingham, United Kingdom, assignor to Fosroc International Limited, Birmingham, England

Continuation of Ser. No. 178,158, Apr. 6, 1988, abandoned. This application Oct. 18, 1989, Ser. No. 423,632
Claims priority, application United Kingdom, Apr. 8, 1987, 8708479
Int. Cl.[5] C04B *7/32*
U.S. Cl. 106—695 **16 Claims**

1. A method of stowing or partially filling a cavity in a mine, the method comprising mixing with water a dry cementitious composition comprising an aluminous cement, a calcium sulphate, a water soluble fluoride, and an accelerator comprising a lithium salt, the calcium sulphate being present in a weight ratio of about 3:7 to 4:1 relative to the aluminous cement, the water soluble fluoride being present in a weight ratio of about 4 to about 10% by weight relative to the aluminous cement, the accelerator being present in a weight ratio of about 0.1 to about 1% relative to the aluminous cement, the dry cementitious composition being mixed with the water in a weight ratio of water : solids of about 1 to about 4:1 to form a slurry, supplying the slurry to the cavity and allowing the composition to set rapidly to form ettringite and develop early compressive strength.

4,992,104

METHOD FOR PREPARING MORTARS AND CONCRETES USING POLYFLUORINATED SURFACE-ACTIVE COMPOUNDS AS WATER-REDUCING PLASTICIZERS

Bernard Boutevin, Montpellier, France, assignor to Societe Atochem, Puteaux, France

Filed Mar. 29, 1988, Ser. No. 174,861
Claims priority, application France, Apr. 2, 1987, 87 04621
Int. Cl.[5] C04B *24/26, 24/24*
U.S. Cl. 106—724 **6 Claims**

1. A method for preparing mortar or concrete, comprising the use, as a water-reducing plasticizer, of a polyfluorinated acrylamide-based surface-active compound selected from the group consisting of:

(a) the random copolymers obtained by radical polymerization of acrylamide with a polyfluorinated acrylate of formula:

$$R_F(CH_2)_n—OCOC(R_7)=CH_2 \qquad (VIII)$$

where R_F is a linear or branched perfluoroalkyl radical containing from 4 to 14 carbon atoms, n is an integer ranging from 1 to 12, and R_7 is hydrogen or methyl, the molar ratio acrylamide/acrylate being between 10 and 200;

(b) the random cotelomers resulting from the redox telomerization of acrylamide and of a polyfluorinated acrylate of formula (VIII) with carbon tetrachloride, the molar ratio acrylamide/acrylate being between 10 and 500; and

(c) the block telomers of the formula:

$$R_F—CH_2CH_2—S—(CH_2CH\rangle_u H \quad (CONH_2)$$

$$R_F(CH_2)_m—(CH_2CH\rangle_u I \quad (CONH_2)$$

$$R_F—CH_2CH_2—OCO—CCl_2—(CH_2CH\rangle_u Cl \quad (CONH_2)$$

$$R_F—CH_2CH_2—OCO—CHCl—CH_2—CCl_2—(CH_2CH\rangle_u Cl \quad (CONH_2)$$

where R_F is as defined above, m is an integer ranging from 0 to 12, and u is an integer ranging from 5 to 1000.

4,992,105

METHOD AND APPARATUS FOR THE HYDROLYTIC SEPARATION OF CELLULOSE

Johannes Werner, and Klaus-Jürgen Hinger, both of Stuttgart, Fed. Rep. of Germany, assignors to Werner & Pfleiderer, GmbH, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,453
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729428
Int. Cl.[5] B01J *3/00;* **C13K** *1/02*
U.S. Cl. 127—1 **11 Claims**

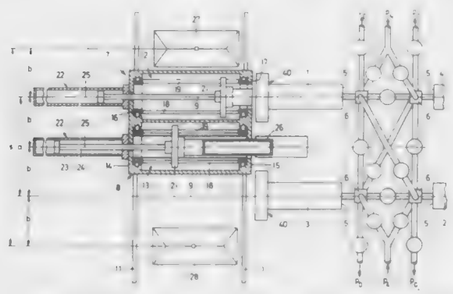
1. Apparatus for carrying out a method for the hydrolytic separation of a cellulose-containing substrate comprising an acid treatment and a subsequent water vapor treatment of the substrate, water vapor impinging in a plurality of discrete pressure build-up stages at successive time intervals and each

having increasing pressure and temperature values and then a pressure drop in immediately successive pressure drop stages corresponding to the pressure build-up stages during water vapor treatment in a hydrolysis cycle, and the steam of a pressure drop stage being used for the pressure build-up of the next lowest pressure build-up stage of another temporally successive hydrolysis cycle comprising:

four reactors (**1** to **4**), forming two pairs of two reactors, each pair of which is arranged in juxtaposition to one another and the two pairs are arranged in mirror symmetry with one another and the number of which corresponds to the number of pressure stages;

a live steam pipe (**62**) connected to each reactor for feeding live steam to a reactor for producing a pressure stage of the highest pressure;

a connection pipe (L) connecting each reactor to each other for feeding steam during a pressure drop in one of said



reactors from this reactor in pressure drop stages having decreasing pressure values directly to a plurality of time-staggered hydrolysis cycles each taking place in a separate one of said reactors;

an exhaust steam pipe (**63**) connected to each reactor for education of steam out of a reactor, where a pressure drop stage has the lowest pressure;

each of said connection pipes, live steam pipes and exhaust steam pipes is provided with a valve (**64**) for controlling said pressure build-up stages and said pressure drop stages;

hydrolysis tanks (**26**) connected to each reactor for feeding the substrate into each reactor (**1** to **4**); and

at least one loading and unloading device (**12**, **13**) is positioned in front of at least one reactor and said device comprises means for inserting a hydrolysis tank through an opening of the reactor into said reactor and to take said hydrolysis tank out of said reactor.

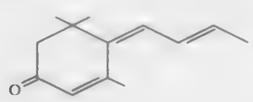
4,992,106

NOVEL OXO-IONOL CARBONATES USEFUL AS TOBACCO FLAVORANTS

Philip A. Christenson, Midland Park, N.J.; Robert G. Eilerman, Merrick, and Brian J. Drake, Clifton, both of N.Y., assignors to BASF Corporation, Clifton, N.J.

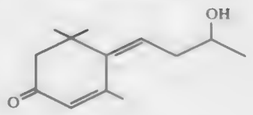
Division of Ser. No. 159,252, Feb. 23, 1988, Pat. No. 4,827,210. This application Mar. 23, 1989, Ser. No. 328,054
Int. Cl.[5] A24B *3/12, 15/30*
U.S. Cl. 131—276 **2 Claims**

1. A tobacco composition comprising tobacco and from about the 1 to 1,000 ppm of an oxo-ionol derivative of the formula I or II



or

-continued



wherein R is lower alkyl of 1 to 6 carbons.

4,992,107

METHOD OF MAKING HIGH VISCOSITY DETERGENT GEL

Ralph S. Itoku, Glendale Heights, Ill., and Terry M. Crowell, Twin Lakes, Wis., assignors to Park Corporation, Barrington, Ill.

Continuation-in-part of Ser. No. 266,588, Nov. 3, 1988, abandoned. This application Nov. 24, 1989, Ser. No. 440,704
Int. Cl.[5] B08B *3/00;* **C11D** *9/30, 1/75, 7/32*
U.S. Cl. 134—27 **13 Claims**

1. A process of making a high viscosity detergent gel composition which comprises the steps of:

(a) preparing an anionic surfactant slurry by neutralizing an acid containing at least one long chain alkyl group having an average of from 8 to 22 carbon atoms selected from the group consisting of sulfonic acids, sulfuric acids, phosphoric acids, and carboxylic acids with a base in water, said anionic surfactant slurry comprising from about 10% to about 50% by weight of said composition;

(b) preparing a monoethanolamide and diethanolamide mixture in a steam kettle by melting the monoethanolamide comprising from about 8% to about 40% by weight of said composition with the diethanolamide comprising from about 3% to about 40% by weight of said composition at 16020 F.;

(c) adding the monoethanolamide and diethanolamide mixture to the anionic surfactant slurry;

(d) mixing at a speed sufficient to disperse said mixture until a substantially constant viscosity is obtained;

(e) adjusting the viscosity as necessary with anionic surfactants as prepared in step (a) or with monoalkanolamides and dialkanolamides as prepared in Step (b) from about 15,000 centipoise to about 60,000 centipoise; and

(f) heating the mixture from about 130° F. to about 200° F. to remove entrapped air from said mixture, whereby a stable high viscosity detergent gel is produced consisting essentially of, by weight, from about 10% to about 50% of anionic surfactant, from about 8% to about 40% of monoalkanolamide, from about 3% to about 40% of dialkanolamide and from about 10% to about 50% water.

4,992,108

PHOTORESIST STRIPPING COMPOSITIONS

Irl E. Ward, 1526 Leon Dr., Hatfield, Pa. 19440, and Francis W. Michelotti, 3560 Southwood Dr., Easton, Pa. 18042

Filed Jan. 18, 1990, Ser. No. 466,758
Int. Cl.[5] C11D *1//12;* **C23G** *1/02*
U.S. Cl. 134—38 **10 Claims**

1. A non-aqueous halogen and phenol free negative resist stripping composition having low toxicity and operable at temperatures of about 85° C. or less, consisting essential of about 60 to 96% by weight of diisopropylbenzene and about 4 to 40% by weight of an organic sulfonic acid of the formula:

$$R_3—SO_3H$$

wherein R_3 is a member selected from the group consisting of phenyl, tolyl, dodecylbenzene and naphthyl.

VOL 1123 ISS 2 FEB 12 1991 UMI

4,992,109

PHOTOELECTRIC CONVERSION ELEMENT

Masao Yoshikawa; Tetsuro Suzuki, both of Yokohama; Akio Kojima, Mitaka; Masayuki Shoshi, Yokohama, and Masafumi Ohta, Susono, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 450,288

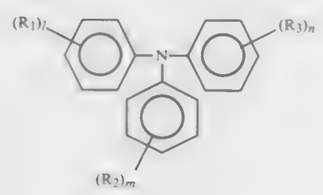
Claims priority, application Japan, Dec. 11, 1987, 62-312021; Dec. 11, 1987, 62-312022; Dec. 11, 1987, 62-312023; Feb. 24, 1988, 63-39635

Int. Cl.[5] H01L *31/06, 31/0344*

U.S. Cl. 136—263 22 Claims

22. A photoelectric conversion element comprising a light-permeable front electrode, a photo-activatable layer disposed on one surface of said front electrode, and a rear electrode disposed on one surface of said photo-activatable layer opposite said front electrode.

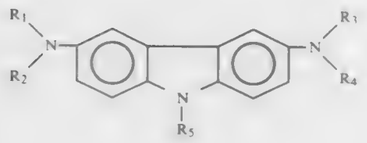
wherein said photo-activatable layer contains a compound selected from a group consisting of a triphenylamine compound represented by the following general formula (I):



(I)

in which R_1, R_2, and R_3 represent a halogen atom, a nitro group, a cyano group, a substituted or non-substituted alkyl group, a substituted or non-substituted alkoxy group, a substituted or non-substituted aryl group, a substituted or non-substituted phenoxy group or a substituted or non-substituted amino group, respectively, and l, m and n represent 0, 1, 2 or 3, respectively,

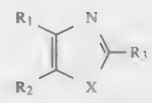
a diaminocarbazole compound represented by the following general formula (II):



(II)

in which R_1, R_2, R_3, R_4 and R_5 represent a hydrogen atom, a substituted or non-substituted alkyl group or a substituted or non-substituted aryl group, respectively, wherein R_1, R_2, R_3, R_4 and R_5 may be the same as or different from one another,

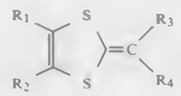
a compound represented by the following general formula (III):



(III)

in which R_1, R_2 and R_3 represent a hydrogen atom, a substituted or non-substituted alkyl group which is saturated or unsaturated, a substituted or non-substituted alkoxy group, a substituted or non-substituted aryl group or a substituted or non-substituted heterocyclic ring group, respectively, wherein R_1 and R_2 may form a ring, and X represents a sulfur atom or on oxygen atom, and

a 1,3-dithiol compound represented by the following general formula (IV):



(IV)

in which R_1, R_2, R_3 and R_4 represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, a substituted or non-substituted alkyl group which is saturated or unsaturated, a substituted or non-substituted alkoxy group, substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic ring group, respectively, wherein R_1 and R_2, and R_3 and R_4 may respectively form rings.

4,992,110

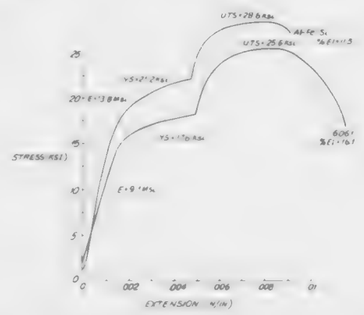
WROUGHT ALUMINUM EUTECTIC COMPOSITES

John M. Tartaglia, 9071 Garrison St., Westminster, Colo. 80020; Thomas B. Cox, 2517 Vivian St., Lakewood, Colo. 80215, and Daniel J. Adenis, 406 Surrey Dr., Lancaster, Pa. 17601

Filed Jun. 9, 1989, Ser. No. 363,840

Int. Cl.[5] C22F *1/04*

U.S. Cl. 148—2 7 Claims



1. A method for producing a wrought aluminum eutectic composite characterized by improved physical properties which comprises:

forming a casting of an aluminum alloy characterized metallographically by the presence of a eutectic structure,

heat treating said casting at a temperature related to the eutectic-forming temperature of said alloy casting,

said heat treating temperature being just below the eutectic-forming temperature,

continuing said heat treatment for a time at least sufficient to convert the morphology of said eutectic to dispersed fine particles of reinforcing phase(s),

and then physically working said heat treated casting to reduce the cross section thereof and provide a wrought aluminum eutectic composite characterized by improved physical properties.

4,992,111

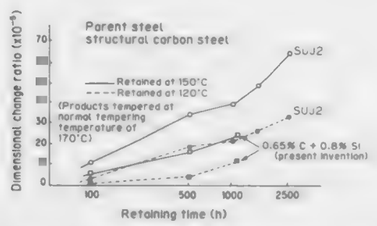
BEARING RACE MEMBER AND METHOD OF FABRICATION

Hiroshi Yamada, Mie; Hirokazu Nakajima, Gifu; Noriyuki Tsushima, Mie, and Hirotsugu Hamaoka, Hyogo, all of Japan, assignors to N.T.N. Corporation, Osaka, Japan

Filed Aug. 8, 1989, Ser. No. 391,147

Int. Cl.[5] C22C *38/02, 38/06;* C21D *9/36*

U.S. Cl. 148—12.4 7 Claims



1. A bearing race member being made with an alloy steel consisting essentially of 0.60 to 0.85% carbon by weight, 0.5 to 1.0% by total weight of one or a combination of Si and Al, 13 ppm or less oxygen and the balance of Fe, said steel being a structural carbon steel, said structural carbon steel having been subjected to quenching and tempering to obtain 15% or less retained austenite by volume therein and a hardness of said bearing race of HRC 60 or more.

4,992,112

ANNEALING AND QUENCHING METHOD

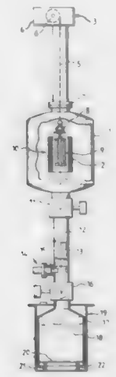
Wolfgang Reuter, Niddatal, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 10, 1989, Ser. No. 377,133

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844272

Int. Cl.[5] C21D *1/78*

U.S. Cl. 148—13 34 Claims



1. An annealing and quenching method for materials and parts composed of materials, referred to as a charge, the charge being annealed in a vacuum or protective atmosphere annealing system and being subsequently quenched in a quenching system, the charge being moved by a conveyor system from the annealing system to the quenching system, the method comprising the steps of lowering the charge by the conveyor system into a heating zone in a first chamber of the annealing system and heating the charge therein; moving the charge with the conveyor system through a first sluice valve and into a sluice chamber, and positioning the charge therein; releasing the charge by means of a gripper element on t he conveyor system and retracting the gripper element from the sluice chamber through the first sluice valve; closing the first sluice valve to close the first chamber of the annealing system relative to the sluice chamber; opening a second sluice valve located between the sluice chamber and a quenching container containing a quenching medium in the quenching system thereby suctioning the quenching medium out of the quenching container and into the sluice chamber as a consequence of a pressure differential between the sluice chamber and the quenching container and quenching the charge positioned in the sluice chamber.

4,992,113

PROCESS FOR HEAT TREATMENT UNDER A GASEOUS ATMOSPHERE CONTAINING NITROGEN AND HYDROCARBON

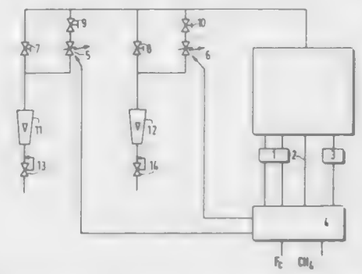
Pascal Baldo, Sceaux, and Eric Duchateau, Versailles, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 266,092, Nov. 2, 1988, abandoned. This application Aug. 22, 1990, Ser. No. 571,022

Claims priority, application France, Nov. 17, 1987, 87 15860

Int. Cl.[5] C21D *1/76, 11/00, 9/08*

U.S. Cl. 148—160 21 Claims



1. A process for heat treating a low alloy steel work piece, comprising heat treating said piece in a furnace to a temperature greater than 600° C. within a protective atmosphere containing N_2, CH_4 and CO not in thermodynamic equilibrium and having a relative proportion of CO/CH_4 between 0.05 and 15 with a residual content of CH_4 lower than 2.5% and a residual content of CO lower than 2%, and injecting N_2 and a hydrocarbon C_xH_y into the furnace to control said atmosphere, said injection of N_2 and hydrocarbon C_xH_y being increased when a measured dew point DP_m in the furnace is greater than a set dew point DP_s calculated from a set flow F_s of transfer of the carbon between the work piece and the atmosphere through the surface of the work piece, said injection of N_2 and hydrocarbon C_xH_y being maintained when DP_m is equal to DP_s, and said injection of N_2 and hydrocarbon C_xH_y being reduced when DP_m is less than DP_s.

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4,992,114

PROCESS FOR PRODUCING GRAIN-ORIENTED THIN ELECTRICAL STEEL SHEET HAVING HIGH MAGNETIC FLUX DENSITY BY ONE-STAGE COLD-ROLLING METHOD

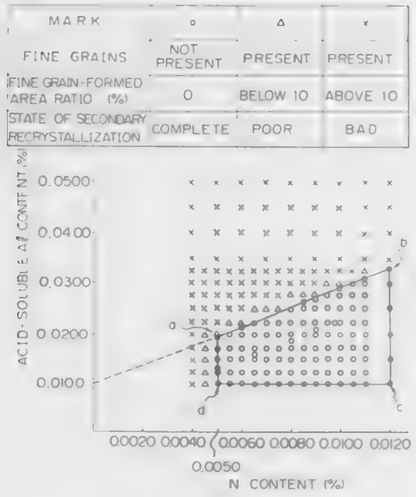
Shozaburo Nakashima; Katsuro Kuroki, and Koji Yamasaki, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 324,602

Claims priority, application Japan, Mar. 18, 1988, 63-63651; Feb. 3, 1989, 1-23955

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—111 **2 Claims**



1. A process for producing a grain-oriented thin electrical steel sheet having a high magnetic flux density and excellent product magnetic characteristics by a one-stage cold-rolling method, which comprises heating at a high temperature a slab comprising 0.060 to 0.120% by weight of C, 2.9 to 4.5% by weight of Si, 0.050 to 0.090% by weight of Mn, 0.020 to 0.060% by weight of at least one of S and Se and 0.05 to 0.25% by weight of Sn, with the balance comprising acid-soluble Al, N, Fe and unavoidable impurities, hot-rolling the slab to provide a hot-rolled steel sheet, annealing the hot-rolled steel sheet at a temperature of 1030° to 1200° C. for less than 10 minutes, cooling the annealed steel sheet to 200° C. at a cooling rate of 10° to 60° C./sec, cold-rolling the steel sheet to a thickness of 0.12 to 0.17 mm, subjecting the cold-rolled steel sheet to decarburization annealing in a hydrogen-containing wet atmosphere, coating an annealing separating agent composed mainly of magnesia powder on the steel sheet, subjecting the steel sheet to high-temperature finish annealing, said finish annealing comprising elevating temperature until the temperature is elevated to at least 1000° C. and providing an atmosphere containing nitrogen during said elevating of the temperature and then holding the temperature of said at least 1000° C. and providing a hydrogen atmosphere during said holding of the temperature, applying a tension coating to said steel sheet after said finish annealing, wherein the N and acid-soluble Al contents in the slab are 0.0050 to 0.010% and $[(27/14)\times N(\%)+0.0035]$ to $[(27/14)\times N(\%)+0.0100]$%, respectively, the thickness of the hot-rolled steel sheet is controlled so that the cold-rolling thickness reduction ratio is 85 to 92%, and the N as AlN content in the hot-rolled steel sheet is controlled to 0.0005 to 0.0020%.

4,992,115

SURFACE TREATMENT CHEMICAL AND BATH FOR ALUMINUM AND ITS ALLOY

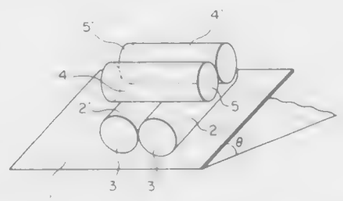
Satoshi Ikeda, Yamato, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed Feb. 15, 1989, Ser. No. 310,569

Claims priority, application Japan, Feb. 15, 1988, 63-33755; Jul. 15, 1988, 63-177672

Int. Cl.[5] C23C *22/36*

U.S. Cl. 148—247 **10 Claims**



1. A surface treatment chemical for aluminum or an alloy of aluminum which consists essentially of 10–1000 parts by weight of vanadium or cerium ion, 10–500 parts by weight of zirconium ion, 10–500 parts by weight of phosphate ion and 1–50 parts by weight of effective fluorine ion; which surface treatment chemical is capable of being diluted to a pH of 2.0–4.0.

4,992,116

METHOD AND COMPOSITION FOR COATING ALUMINUM

Lydia Hallman, Phoenixville, Pa., assignor to Henkel Corporation, Ambler, Pa.

Filed Apr. 21, 1989, Ser. No. 341,610

Int. Cl.[5] C23C *22/36*

U.S. Cl. 148—247 **9 Claims**

1. A non-chromium aqueous coating composition for an aluminum substrate which comprises (a) from about 1.1×10^{-5} to about 5.3×10^{-3} mols per liter of PO_4^{-3}; (b) from about 1.1×10^{-5} to about 1.3×10^{-3} mols per liter of a fluoroacid of an element selected from the group consisting of Zr, Ti, Hf, and Si; (c) from about 0.26 to about 20.0 grams per liter of a polyphenol composition, the polyphenol composition comprising a Mannich Adduct of an amine with a member selected from the group consisting of polyalkenyl-phenols and tannins; and (d) water wherein the pH of the composition is from about 2.5 to about 5.0 and the mole ratio of the fluoroacid to the PO_4^{-3} is from about 2:5:1 to about 1:10.

4,992,117

HEAT RESISTANT ALUMINUM ALLOY EXCELLENT IN TENSILE STRENGTH, DUCTILITY AND FATIGUE STRENGTH

Yoshimasa Okubo; Kazuhisa Shibue, and Hideo Yoshida, all of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 340,124

Claims priority, application Japan, Mar. 20, 1989, 1-66239

Int. Cl.[5] C22C *21/00*

U.S. Cl. 148—439 **2 Claims**

1. A heat resistant aluminum alloy excellent in tensile strength, ductility and fatigue strength, said alloy having a composition consisting essentially of, in weight percentages:

Fe: from 4 to 12%,

Si: from 1 to less than 4.0%

Cu: from 1 to 6%

Mg: from 0.3 to 3%

and the balance aluminum and incidental impurities, wherein said alloy has been prepared by rapidly solidifying a melt of said alloy at a cooling rate of at least 100° C./sec.

4,992,118

CHEMICALLY FOAMED EMULSION EXPLOSIVE COMPOSITION AND PROCESS FOR ITS PREPARATION

Zhonji Peng; Guibao Li; Shiyi Shao; Wenyuan Xu, and Xiangqun Wu, all of Lan Zhou, China, assignors to Gansu Research Institution of Chemical Industry, Gansu, China

Filed Mar. 2, 1990, Ser. No. 488,609

Claims priority, application China, Mar. 4, 1989, 89100981.7

Int. Cl.[5] C06B *45/00*

U.S. Cl. 149—2 **17 Claims**

1. An emulsion explosive composition comprising a disperse phase formed of an aqueous inorganic oxidizer salt solution, a continuous phase formed of a hydrocarbon fuel and emulsifier with emulsion foamer, wherein said aqueous oxidizer salt solution comprises an aqueous salt solution of ammonium nitrate, sodium nitrate, and water and urea, said hydrocarbon fuel is compounded from residual oil (as basic material and thickener, said residual oil is an oil-waxy material left over by extracting light distillate and pitch from crude petroleum, and said emulsion foamer is an oil in water emulsion containing sodium nitrite.

4,992,119

EXPLOSIVE COMPRISING A MIXTURE OF A NITRATE-OIL EXPLOSIVE AND A WATER-IN-OIL EMULSION EXPLOSIVE, AND A METHOD FOR ITS MANUFACTURE

Arne Carlsen, Skien, and Erik C. Nygaard, Porsgrunn, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Mar. 27, 1990, Ser. No. 500,252

Claims priority, application Norway, Mar. 31, 1989, 891365

Int. Cl.[5] C06B *45/00*

U.S. Cl. 149—2 **4 Claims**

1. A heavy ammonium nitrate fuel oil explosive comprising a mixture of at least one nitrate-oil explosive and at least one water-in-oil explosive, wherein the oil of the nitrate-oil explosive contains 0.3–7.0 weight %, based on the weight of said oil, of an oil-soluble elastomer having a viscosity average molecular weight of 30,000–5,000,000.

4,992,120

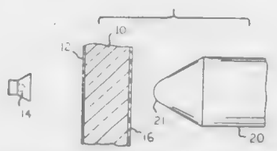
IMAGE FORMATION ON GLASS SURFACES

Robert R. Badura, 7072 S. Sunshine St., Las Vegas, Nev. 89118

Filed Mar. 9, 1990, Ser. No. 491,032

Int. Cl.[5] B32B *31/00, 35/00;* B44C *1/22;* B29C *37/00*

U.S. Cl. 156—62 **6 Claims**



1. A process for forming an image on a transparent glass pane, comprising the steps of adhesively attaching a transparent colored film on one face of a glass pane;

drawing an image on a sheet of tracing paper;

attaching the sheet of paper onto the other face of the glass pane, with the drawn image presented to the glass pane other face;

illuminating the exposed surface of the sheet so that the image is visible to a person looking at the exposed surface of the colored film;

moving a heated stylus along the exposed surface of the colored film, using the image on the tracing paper as a pattern;

and removing the tracing paper from the glass pane.

4,992,121

ELECTROSTATIC CHARGING

Robert M. Rubino, 22 Saturn St., San Francisco, Calif. 94114

PCT No. PCT/US90/00729, § 371 Date Feb. 8, 1990, § 102(e) Date Feb. 8, 1990

Continuation-in-part of Ser. No. 309,598, Feb. 10, 1989. This PCT application Feb. 8, 1990, Ser. No. 459,731

Int. Cl.[5] B32B *7/06, 31/12*

U.S. Cl. 156—71 **4 Claims**

1. In a method of adhering an object to a support surface, the improvement comprising adhering an electrostatically chargeable flexible intermediate polymeric sheet 1/16 of an inch or less in thickness to the back of said object, inducing an electrostatic charge on said sheet by rubbing said sheet with a buffing material selected from the group consisting of substantially oil and fat free hair, fur or hide to impart a charge sufficient to support at least three ounces per square foot of said chargeable sheet for at least three month without siding or falling, and pressing the display and intermediate sheet against the surface.

4,992,122

METHOD OF COUPLING SINGLE-MODE OPTICAL FIBERS TO FORM A COUPLER

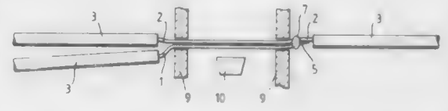
Narinderjeet S. Rayit, Hayes, England, assignor to Telephone Cables Limited, England

Filed Oct. 17, 1988, Ser. No. 258,577

Claims priority, application United Kingdom, Oct. 23, 1987, 8724893

Int. Cl.[5] B32B *17/04*

U.S. Cl. 156—158 **4 Claims**



1. A method of coupling at least two single-mode optical fibres to form a coupler, comprising the steps of: initially terminating an end of at least one of the fibres with a tapered termination; thereupon, bonding the terminated end of said at least one fibre to the other fibre which is not terminated; and applying a controlled tension to the fibres and fusing the tensioned fibres together at a coupling region spaced away from the tapered termination to form a biconical coupling between the fused fibres, said at least one terminated fibre forming a redundant unused port inside the coupler.

4,992,123

METHOD AND APPARATUS FOR INCORPORATING A FILAMENT INTO A PLASTIC CONTAINING SHEET

Brian J. Cave, Formby, and William B. Holmes, Wallasey, both of England, assignors to Stork X-Cel, Boxmeer, Netherlands

Filed May 3, 1989, Ser. No. 346,740

Claims priority, application United Kingdom, May 5, 1988, 8810564

Int. Cl.[5] B29C *65/00, 65/78;* B65H *81/00*

U.S. Cl. 156—161 **11 Claims**

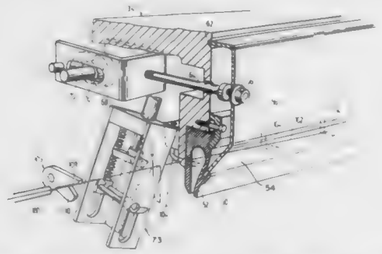
1. An apparatus for incorporating a filament into a plastics containing sheet, which apparatus comprises:

(a) a compressed gas projecting means for projecting a filament across said plastics containing sheet,

(b) an elongate hollow chamber, which chamber is spaced apart from said plastics containing sheet and into which chamber said filament is projected, said chamber having a closeable elongate aperture along its length,

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(c) clamping means situated adjacent each end of said elongate chamber, whereby said filament can be clamped



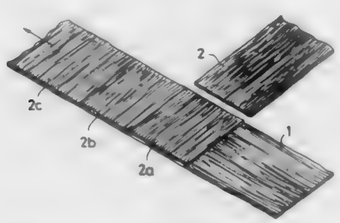
when inside said chamber, and can then be displaced through the opened elongate aperture of the chamber into said plastics containing sheet.

4,992,124

METHOD OF MAKING CROSS-LAMINATED STRETCHED NON-WOVEN FABRIC

Kazuhiko Kurihara; Shigezou Kojima; Hiroshi Yazawa, all of Tokyo; Haruhisa Tani, Tokorozawa; Setsuya Tsuyama, Tokyo, and Yasuo Sasaki, Houya, all of Japan, assignors to Nippon Petrochemicals Co., Ltd. and Polymer Processing Research Institute Ltd., both of Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 302,627
Int. Cl.[5] B29C *47/06*
U.S. Cl. 156—161 18 Claims



1. A method of making a cross-laminated stretched non-woven fabric comprising the steps of:

(a) forming a first web of random-laid non-woven fabric of substantially un-oriented filaments of a thermoplastic resin held together;

(b) stretching the first web in the lengthwise direction to cause the individual un-oriented filaments to be substantially stretched, at least twice the original length thereof, thereby causing a molecular orientation therein;

(c) forming a second web of random-laid non-woven fabric of substantially un-oriented filaments of a thermoplastic resin held together;

(d) stretching the second web in the lengthwise direction to cause the individual un-oriented filaments to be substantially stretched, at least twice the original length thereof, thereby causing a molecular orientation therein;

(e) transversely severing the second web successively into second web pieces of individual lengths substantially equal to the width of said first web;

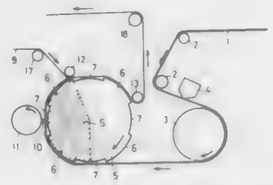
(f) laminating said second web pieces with said first web, with adjacent edges of said second web pieces slightly side by side arrangement with each other in such a manner that the direction of stretch of the first web and the direction of stretch of the second web pieces are crossed perpendicularly to one another.

4,992,125

METHOD FOR ATTACHING ELASTIC MEMBER IN DISPOSABLE DIAPER

Migaku Suzuki; Mitsuzo Ochi; Hironori Nomura; Takamitsu Igaue, and Takeshi Kudo, all of Ehime, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 82,129, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 482,413, Apr. 6, 1983, abandoned. This application May 9, 1988, Ser. No. 191,371
Claims priority, application Japan, Apr. 7, 1982, 57-57633
Int. Cl.[5] B32B *31/08*
U.S. Cl. 156—164 4 Claims



1. A method for attaching portions of an elongated elastic member to a travelling continuous diaper web that has substantially no elasticity, said method comprising

(a) moving an elongated elastic member along a predetermined path and supporting it in at least a portion of that path by the application of suction against the underside of said elastic member,

(b) applying adhesive to spaced apart portions of the upper side of said elastic member to thereby establish a series of spaced apart adhesively coated sections separated by intermediate adhesive-free sections,

(c) bringing a diaper web into contact with the upper surface of said elastic member so that the adhesively coated portions of the elastic member will be joined to said diaper web, and

(d) subsequentially cutting each said adhesive-free section prior to step (c) so that upon the completion of step (c) the continuous diaper web will have attached to it a series of separated lengths of elastic member, each such length of elastic member being composed of a central adhesively coated section and opposite end sections that are not adhesively coated.

4,992,126

METHOD FOR MAKING A CURRENT COLLECTOR BONDED TO A SOLID POLYMER MEMBRANE

Robert D. Door, West Columbia, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 894,594, Aug. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 762,222, Aug. 5, 1985, abandoned. This application Oct. 25, 1989, Ser. No. 428,012
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—182 16 Claims

1. A method for making an ion permeable membrane, electrode and current collector assembly comprising making two assemblies by following the steps of:

(a) forming a foundation layer comprising a porous electrically conductive material;

(b) at least partially coating a fluoropolymer binder on at least one surface of the conductive foundation layer;

(c) applying a particulate and finely divided catalyst material over the floropolymer binder on the foundation layer;

(d) dispersing a suitable polymeric material over the catalyst material in a manner to obtain penetration of the polymeric material into the porous foundation layer to form a substantially continuous coating on the catalyst material and the at least partially coated foundation layer; and

(e) applying sufficient heat and/or pressure to enhance the flow of polymeric material into the foundation layer and around the catalyst material to obtain adherence thereto and to sinter the polymer material into a substantially nonporous layer around the catalyst material;

(f) then, placing the two assemblies together such that the nonporous polymeric surfaces are in intimate contact with each other and applying heat and/or pressure to form a single planar membrane featuring two current collectors having a nonporous, ionically conductive polymer layer therebetween.

4,992,127

PROCESS FOR PREPARING FIBER-REINFORCED THERMOPLASTIC MOLDED ARTICLES USING NOTCHED PREPREG CONTAINING CONTINUOUS FIBER

Satoru Kishi, Tokyo, and Hideo Sakai, Kanagawa, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 15, 1989, Ser. No. 351,534
Claims priority, application Japan, May 17, 1988, 63-118364
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—182 14 Claims

1. A process for preparing a fiber-reinforced thermoplastic article comprising

stacking at least one prepreg A comprising a woven reinforcing fiber impregnated with a thermoplastic resin and containing at least one notch, and at least one sheet prepreg B comprising a unidirectionally arranged reinforcing fiber impregnated with a thermoplastic resin and containing at least one notch in a direction traversing said fiber; and

molding said prepregs to form a fiber-reinforced thermoplastic article.

4,992,128

METHOD OF MAKING HOLDER FOR FLAT OBJECTS SUCH AS COMPUTER DISKS

James R. Sellar, Pittsford; James E. Reisdorf, Rochester; Mark F. Lappies, Marion, and Mark S. Valle, Spencerport, all of N.Y., assignors to Information Packaging Corporation, Macedon, N.Y.

Division of Ser. No. 167,065, Mar. 11, 1988, Pat. No. 4,852,740. This application May 1, 1989, Ser. No. 345,318
Int. Cl.[5] B65D *85/30*
U.S. Cl. 156—217 4 Claims



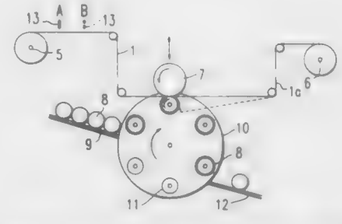
1. The method of making a holder having a plurality of pockets for flat objects from a single sheet of foldable material, which comprises the steps of cutting said material into blanks having a rectangular center panel with a top edge, a bottom edge, and first and second side edges and with a bottom flap extending from said bottom edge of said center panel and a second flap extending from the first side edge of said center panel, said second flap having a free side edge and a free top edge and a bottom edge, said bottom edge of said second flap being above the bottom edge of said center panel; applying lines of adhesive along the side edges of said center panel above said bottom edge of said center panel or on the side edges of said bottom flap below the bottom edge of said center panel, and to said second flap at locations along the free side edge and the bottom edge thereof or on said center panel at locations corresponding to said locations along said free side edge and bottom edge of said second flap when said second flap and center panel are in overlapping relationship when folded about said first side edge of said center panel; first folding said second flap over said center panel about said first side edge of said center panel and securing said second flap to said center panel with said adhesive to define an upper pocket; and then folding said bottom flap about said bottom edge of said center panel and securing said bottom flap to said center panel and to said second flap to define a second pocket below and in tiered relationship with said upper pocket.

4,992,129

TRANSFER PRINTING METHOD

Hitoshi Sasaki, and Shoji Igota, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 798,317, Nov. 15, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,647
Claims priority, application Japan, Nov. 15, 1984, 59-239449; Nov. 15, 1984, 59-239450
Int. Cl.[5] B32B *1/00*
U.S. Cl. 156—240 5 Claims



1. A method for thermal transfer printing, which consists essentially of:

(a) heating, with a hot roll, a transfer sheet, comprising a printing ink layer having an inner and outer side formed on a base sheet with a peel layer therebetween, and with an adhesive layer on said outer side of the printing ink layer, wherein said base sheet is a biaxially stretched plastic film, and

(b) concurrently pressing, with the hot roll, said transfer sheet against a substrate for printing, with a pressure sufficient to thereby transfer said printing ink layer to said substrate, wherein said substrate for printing is preheated prior to said pressing, and wherein a surface of said substrate is preheated at a temperature of from about 90° C. to 130° C., and wherein said hot roll is maintained at a temperature of not more than 240° C., and further wherein said peel layer is made of chloride rubber.

4,992,130

PROCESS FOR THE PRODUCTION OF A LAMINATE

Leon L. Vermeulen, Herenthout, and Robert S. Pauwels, Edegem, both of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Jun. 29, 1989, Ser. No. 372,846
Claims priority, application Belgium, Jul. 7, 1988, [illegible]
Int. Cl.[5] C09J *5/02*
U.S. Cl. 156—307.5 11 Claims

1. A process for producing a laminate by bonding together two hydrophobic thermoplastic resin sheets at least one of which carries on its inner side at least one hydrophilic colloid layer bearing a photograph and/or other information, said process comprising the steps of:

(1) treating such information-bearing hydrophilic colloid layer with an aqueous composition containing a self-cross-linkable reaction product of:

(i) an epihalohydrin or an Alpha-dihalohydrin,

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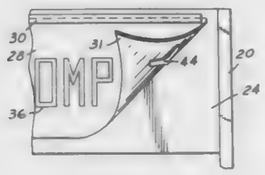
(ii) a water-soluble polyamide, and
(iii) a water-soluble polyamine containing at least two nitrogen atoms separated by at least three carbon atoms and optionally also by at least one oxygen or sulphur atom and having at least two different nitrogen atoms each having at least one hydrogen atom attached thereto
(2) drying thus treated layer, and
(3) applying heat and pressure to bond the hydrophobic resin sheets together with the treated hydrophilic colloid layer sandwiched there, between and concurrently carry out crosslinking of said reaction product.

4,992,131

METHOD OF REMOVING INDICIA FROM A SUPPORT

Michial A. Connell, 622 Bowers, Clawson, Mich. 48017

Filed Feb. 2, 1990, Ser. No. 474,494
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—344 14 Claims



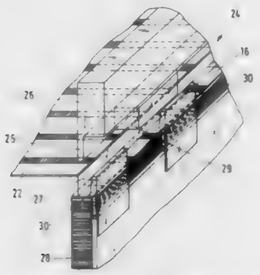
1. A method of removing indicia from a backing member to which the indicia is adhesively attached comprising the steps of:
(A) placing a plastic sheet over the indicia to be removed, the plastic sheet having borders extending beyond the indicia;
(B) performing an actuation step to actuate the plastic sheet to remove the indicia, the activation step being the application of heat to the plastic sheet; and
(C) removing the plastic sheet, leaving the backing member free of the indicia to be removed.

4,992,132

APPARATUS FOR THE PRODUCTION OF AN ENDLESS HONEYCOMB BAND

Hans Schmidlin, Aesch, and Christoph Rohrer, Binningen, both of Switzerland, assignors to Hans Schmidlin, Aesch, Switzerland

Filed Jun. 19, 1989, Ser. No. 367,631
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820718
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—498 10 Claims



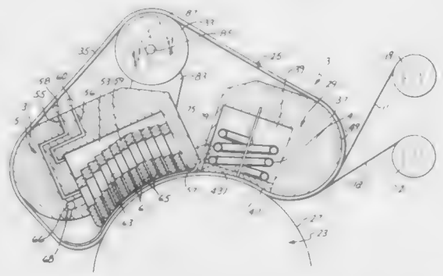
1. An apparatus for producing an endless honeycomb band comprising:
(a) means for the continuous feeding of a plurality of film sheets;
(b) a plurality of hot melt adhesive applicators each of which has at least one slot die with an interchangeable slot mask for the creation of a plurality of glue strips on each of said sheets which extend in the longitudinal direction of said sheets and are equally spaced apart;
(c) laminating means for intersetting said sheets to form a multi-ply film band;
(d) first transverse cutting means for cutting a plurality of film sheet sections of equal length from the forward end of said multi-ply film band, relative to the direction of conveyance;
(e) means for arranging said film sheet sections to form intermediate stacks;
(f) means for storing said stacks;
(g) means for pressing said stacks to form a pack;
(h) second transverse cutting means for cutting said pack to produce a plurality of band sections of equal width such that a multiple of the width of said band sections is equal to the length of said film sheet sections;
(i) a pressing channel, which is arranged underneath said second transverse cutting means, forming an accumulation device, and having at its inlet a partial ram which presses each band section sequentially into said pressing channel and controllable retainers which guide the band sections already located in said pressing channel;
(j) heating means acting on the pressing channel for the interbonding of said band sections to form said endless honeycomb band; and
(k) downstream cooling means for said endless honeycomb band.

4,992,133

APPARATUS FOR PROCESSING COMPOSITE MATERIALS

John N. Border, Sandia Park, N. Mex., assignor to PDA Engineering, Costa Mesa, Calif.

Filed Sep. 30, 1988, Ser. No. 252,652
Int. Cl.[5] B29C *65/32;* B30B *5/04*
U.S. Cl. 156—498 17 Claims



1. An apparatus for use in processing composite material which includes plastic material, said apparatus comprising:
an endless flexible belt circumscribing a zone;
means defining a support surface confronting a region of the belt and adapted to have the composite material pass between the support surface and said region of the belt;
a heating section including an induction heater in said zone;
a pressure section including pressure applying means in said zone for urging a section of the belt toward the support surface; and
means for pivotally coupling the heating section to the pressure section for pivotal movement about a pivot axis whereby the angular orientation of the induction heater and the pressure applying means in said zone can be varied relative to each other.

15. An apparatus for processing composite material which includes plastic material, said apparatus comprising:
a tape head;
means defining a support surface adjacent the tape head;
means for supplying the composite material between the tape head and the support surface;
said tape head including a heating section, a pressure section and means for pivotally coupling the heating section to the pressure section for pivotal movement about a pivot axis whereby the heating section and the pressure section can be moved toward and away from the support surface;
said heating section including a heater for heating the composite material and said pressure section including pressure applying means for applying a force for urging the composite material against the support surface; and
the pressure applying means including a plurality of pressure plates and the apparatus including a source of cooling gas and a cooling gas passage in the pressure section and in said pressure plates for supplying the cooling gas to the pressure section to cool the composite material and means for supplying gas under pressure for urging the pressure plates toward the support surface to thereby apply a compressive load to the composite material.

4,992,134

DOPANT-INDEPENDENT POLYSILICON PLASMA ETCH

Subhash Gupta, San Jose, and Kashmir Sahota, Union City, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 14, 1989, Ser. No. 436,282
Int. Cl.[5] H01L *21/306*
U.S. Cl. 156—628 12 Claims

1. A process for etching n-type, p-type, and intrinsic silicon on the same wafer at substantially the same rate, comprising:
(a) removing any native oxide on exposed surfaces of said silicon by exposure to a first plasma etchant capable of etching native oxide; and
(b) exposing said silicon to plasma etching, using a second etchant comprising at least 75% and less than about 95% hydrogen and the balance a halogen-containing fluid so as to etch said n-type, p-type, and intrinsic silicon at substantially the same rate.

4,992,135

METHOD OF ETCHING BACK OF TUNGSTEN LAYERS ON SEMICONDUCTOR WAFERS, AND SOLUTION THEREFORE

Trung T. Doan, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 24, 1990, Ser. No. 557,672
Int. Cl.[5] B44C *1/22;* C23F *1/00;* C03C *15/00, 25/06*
U.S. Cl. 156—636 21 Claims

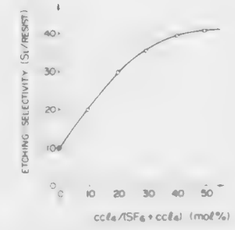
1. A method of etching back a tungsten layer on a semiconductor wafer by a polishing process, the method comprising:
exposing the wafer to be polished to solution comprising an oxidizing component which oxidizes tungsten on the wafer to tungsten oxide;
mechanically polishing the tungsten oxide from the wafer and into the polishing solution; and
the polishing solution also comprising a dissolution component selected from the group consisting of KOH and NH_4OH or a mixture thereof, the tungsten oxide being substantially dissoluted by the dissolution component in the solution.

4,992,136

DRY ETCHING METHOD

Shinichi Tachi, Sayama; Kazunori Tsujimoto, Higashiyamato, and Sadayuki Okudaira, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,570
Claims priority, application Japan, Jul. 29, 1987, 62-187549
Int. Cl.[5] C03C *15/00;* C23F *1/00*
U.S. Cl. 156—643 9 Claims



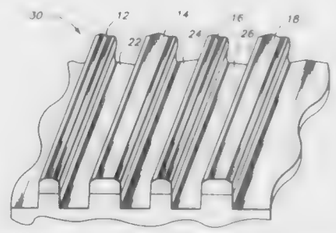
1. A dry etching method for selectively etching an article, wherein the article to be selectively etched, having a resist film as a mask, is placed in a reaction chamber of a dry etching apparatus; is contacted with a plasma of a gas to etch an exposed surface of the article, the gas being a mixed gas comprising (1) an etching gas and (2) a film forming gas or a surface modification gas and the temperature of the article to be etched being maintained at 0° C. or below during etching, whereby the article can be etched with a high selectivity with respect to the resist film and with a tapered sectional shape; and is selectively etched; wherein the article to be etched is silicon; wherein the mixed gas includes the film forming gas, and the film forming gas is at least one member selected from the group consisting of CCl_4, CF_4, CHF_3, $CHCl_3$, SiF_4 and $SiCl_4$; and wherein the etching gas is SF_6.

4,992,137

DRY ETCHING METHOD AND METHOD FOR PREVENTION OF LOW TEMPERATURE POST ETCH DEPOSIT

David A. Cathey, Jr., and Harlan Frankamp, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 18, 1990, Ser. No. 555,100
Int. Cl.[5] B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 23 Claims



1. A method of dry etching a layer on a semiconductor substrate wafer within a reactor, the reactor having cooling means for cooling a wafer positioned within the reactor, the method comprising:
positioning a wafer within the reactor;
injecting at least one gas to within the reactor, the one gas being reactive when in a plasma state with material on the wafer;
applying a preselected amount of electrical power to the

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reactor with the wafer therein for a preselected amount of time to selectively obtain a desired dry etch of the layer;

stopping injection of the at least one gas to within the reactor at the completion of the desired etch while some minimum amount of electrical power is being applied to the reactor to maintain gases present therein in the plasma state;

injecting another gas into the reactor while injection of the one gas has been stopped and while the minimum amount of electrical power is being applied to the reactor, the other gas being substantially inert to reaction with material on the wafer; and

continuing injecting the substantially inert gas for a time sufficient to substantially purge the reactor of the at least one reactive gas while the minimum amount of electrical power is being applied.

4,992,138

METHOD AND APPARATUS FOR CONSTRUCTING A FOIL MATRIX FOR A SOLAR CELL

Millard J. Jensen, Balch Springs, and Gregory B. Hotchkiss, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1989, Ser. No. 387,250
Int. Cl.[5] B44C *1/22*; C23F *1/02*; C03C *15/00, 25/06*
U.S. Cl. 156—644 **20 Claims**



1. A method for constructing an apertured foil matrix suitable for receiving silicon spheres comprising the steps of:

locating a foil between an upper plate and an embossing tool;

feeding said upper plate, foil and embossing tool through a roller mill;

pressing regions of lesser thickness into said foil; and

etching said pressed foil to remove said regions of lesser thickness to provide apertures for receiving said silicon spheres.

4,992,139

CONDUCTIVE MASK AND METHOD OF MAKING SAME

Anthony B. Suppelsa, Coral Springs; Robert W. Pennisi, Boca Raton; James L. Davis, Tamarac, and Robert J. Mulligan, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

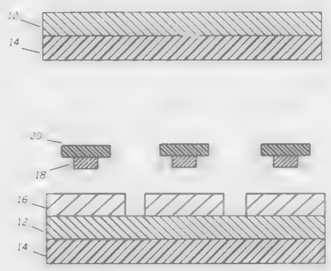
Filed Nov. 16, 1989, Ser. No. 437,136
Int. Cl.[5] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—656 **9 Claims**

2. A method of producing a conductive path on a substrate comprising the steps of:

(a) depositing a first conductive layer on said substrate;

(b) depositing a second conductive layer with a predetermined pattern on the first conductive layer;

(c) etching the first conductive layer not residing under the second conductive layer, wherein the second layer remains above the first layer; and



(d) providing a conductive path through the first and the second conductive layers for interconnecting with an electronic component.

4,992,140

METHOD FOR CREPING A PAPER WEB AND PRODUCT PRODUCED THEREBY

Ralph L. Anderson, Boothwyn; William H. Burgess, Jr., Wallingford; Wesley McConnell, Glen Mills; David L. Shaw, Springfield, and John Thelman, West Chester, all of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 6, 1989, Ser. No. 334,267
Int. Cl.[5] B31F *1/12*
U.S. Cl. 162—111 **6 Claims**

1. A method for creping a web of papermaking fibers comprising:

adhering the web to a creping dryer;

reducing the cohesive forces between the fibers to a greater extent than reducing the adhesive forces between the web and the creping dryer by applying a fluid at least primarily comprising water in sufficient quantity to lower the average dryness from about 2% to about 10% overall to the side of the web away from the creping dryer in close proximity to the creping blade; and

creping the web from the creping dryer at an average dryness of from about 45% to about 60% before the fluid applied penetrates through the web to the creping dryer.

4,992,141

THIN, RESIN-SATURABLE AROMATIC POLYAMIDE PAPER AND PROCESS FOR MAKING SAME

William J. Sullivan, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 357,142, May 26, 1989, abandoned. This application Mar. 2, 1990, Ser. No. 487,467
Int. Cl.[5] D21H *13/26*
U.S. Cl. 162—146 **5 Claims**

1. A process for making a thin, resin-saturable poly(metaphenylene isophthalamide) paper comprising:

making an aqueous slurry comprising solids consisting essentially of about 55 to about 75% by weight short fibers of poly(metaphenylene isophthalamide) and about 25 to about 45% by weight fibrids of poly(metaphenylene isophthalamide), said slurry having a solids concentration of between about 0.005 and about 0 02% by weight;

forming a wet sheet from said slurry using a paper machine having an inclined wire, said wet sheet when dried having a basis weight of between about 10 and about 25 g/m^2;

drying said wet sheet; and

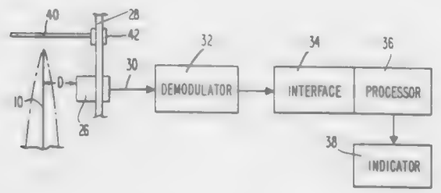
calendering said dried sheet between at least one hard surface roll and at least one resilient, deformable roll to produce a paper having a thickness of between about 25 and about 45 microns, said hard surface roll being heated to above about 150° C.

4,992,142

METHOD FOR DETERMINING AMPLITUDE AND FREQUENCY OF WEB FLUTTER

Dong D. Nguyen, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 192,255, May 10, 1988. This application Apr. 2, 1990, Ser. No. 503,186
Int. Cl.[5] D21F *7/06*
U.S. Cl. 162—198 **5 Claims**



1. A method for determining the frequency and amplitude of flutter of a moving web in a web manufacturing. operation, comprising the steps of:

sensing the passively fluctuating air pressure in a region proximate said web, without contacting the web, and generating a pressure signal representative of said fluctuating air pressure; and

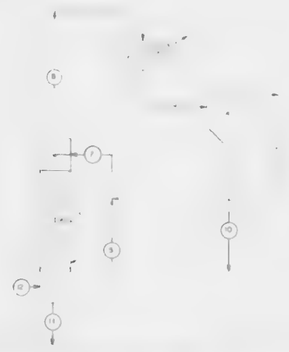
determining the amplitude and frequency of said flutter from said pressure signal and generating an indication signal representative of said amplitude and said frequency.

4,992,143

CONTINUOUS PROCESS FOR THE SEPARATION OF A PARTIALLY WATER SOLUBLE COMPONENT FROM A SLURRY

Heinrich E. Steude, Leverkusen, Fed. Rep. of Germany; Joerg Krell, McMurray; Charles F. Ho, Pittsburgh, both of Pa.; Charles E. Huffman, New Martinsville, W. Va., and Michael E. Bowsher, Crystal Lake, Ill., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 9, 1989, Ser. No. 364,772
Int. Cl.[5] B01D *3/22*
U.S. Cl. 203—26 **7 Claims**



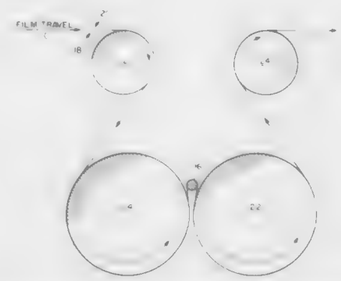
1. A continuous multistage distillation process for separating a partially water soluble organic component from a slurry containing 5% by weight to 65% by weight of an insoluble solid, up to 95% by weight of the partially water soluble organic component and optionally water comprising (a) feeding the slurry to a tower or column equipped with a contact device capable of handling suspensions with substantial solids contents at a point above or below the contact device, (b) applying heat supplied by steam at a point below the contact device, (c) condensing the vapors containing the partially water soluble component which exit the tower or column overhead, (d) recovering the slurry containing the insoluble solid at the bottom of the tower or column and (e) repeating steps (a), (b), (c) and (d) so that the need to interrupt the distillation to allow sedimentation of the insoluble solid is avoided.

4,992,144

THERMALLY STABLE DUAL METAL COATED LAMINATE PRODUCTS MADE FROM POLYIMIDE FILM

Daniel P. Walsh, Peabody, Mass., and Philip D. Knudsen, South Berwick, Me., assignors to Polyonics Corporation, Newbury Port, Mass.

Division of Ser. No. 300,044, Jan. 23, 1989 which is a continuation-in-part of Ser. No. 155,897, Feb. 16, 1988, Pat. 4,868,071 which is a continuation-in-part of Ser. No. 18,346, Feb. 24, 1987, Pat. 4,725,504 and Ser. No. 18,342, Feb. 24, 1987, Pat. 4,806,395.
Filed Sep. 27, 1989, Ser. No. 413,309
Int. Cl.[5] C25D *5/56*
U.S. Cl. 204—20 **11 Claims**



1. A process for coating two surfaces of a polyamide sheet with copper in the absence of an adhesive, said process comprising hydrophilizing the surfaces of the polyamide, contacting said surfaces of said sheet with a catalyst to create surfaces receptive to electroless deposition of nickel or cobalt, depositing nickel or cobalt on said receptive surfaces by electroless deposition to form nickel or cobalt coated surfaces on said sheet, said deposited nickel or cobalt coatings being electrically conductive, forming microcracks in each of said nickel or cobalt coatings, baking said polyimide sheet coated with nickel or cobalt containing microcracks to volatilize components in said polyimide sheet while avoiding delamination of said coatings and depositing copper on said nickel surface or cobalt surface by electrolytic deposition to form exposed copper coatings on said polyimide sheet capable of passing the Modified Thermal Cycling IPC Test 2.4.9 Method E or F.

4,992,145

ELECTROPLATING OF PRECISION PARTS

John C. Hickey, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

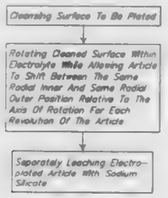
Division of Ser. No. 457,676, Dec. 27, 1989, Pat. No. 4,946,572. This application Jun. 7, 1990, Ser. No. 534,219
Int. Cl.[5] C25D *5/34, 5/48*
U.S. Cl. 204—23 **6 Claims**

1. A method of electroplating a precision hollow metal article with an anticorrosive film, comprising:

(a) cleaning a surface of said article to be plated;

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(b) subjecting the cleansed surface to one or more electrolytic cells having sacrificial anodes and a galvanic field along a predetermined plane, by rotating said article in said cell across said field while allowing at least most of said articles to shift between a radially inner and a radially outer position relative to said axis during each revolution thereof; and



(c) separately leaching said electroplated article with sodium silicate to further enhance the corrosion resistance of said coatings.

4,992,146

METHOD FOR SETTING ELECTRODES IN ALUMINUM ELECTROLYSIS CELLS

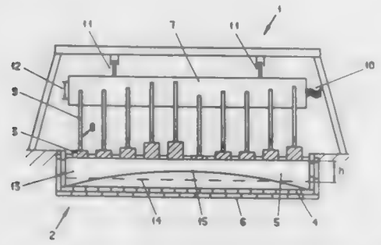
Odd Skaar, and Kurt Nilsson, both of Ovre Årdal, Norway, assignors to Norsk Hydro, a.s., Oslo, Norway

Filed Dec. 20, 1988, Ser. No. 286,790

Claims priority, application Norway, Dec. 30, 1987, 875429

Int. Cl.[5] C25C *3/10, 3/12*

U.S. Cl. 204—67 **7 Claims**



1. A method of setting and positioning electrodes in electrolysis cells, wherein said cells are Hall-Herould process aluminum production cells comprising a cathode forming a bath for having aluminum oxide dissolved in melted cryolite therein, and said electrodes are carbonaceous anodes, said method comprising the steps of;

providing an anode rod for each said anode;

providing a reference mark on each said anode rod defining a predetermined distance from the bottom of each said anode;

providing a rule for each said anode, each said rule having a plurality of reference points thereon, each said reference point corresponding to an expected amount of consumption per unit of time of a said anode;

providing an anode bar for supporting said anode rods;

determining the expected surface level of aluminum in said bath;

placing said rules for said respective anodes on said anode bar equidistantly from said expected aluminum level; and

positioning said anode rods with said anodes on said anode bar with said reference mark of said anode rods corresponding to a said reference point on each respective said rule such that said anodes are positioned equidistantly, from their respective bottoms, relative to said expected level of aluminum.

4,992,147

ELECTROCHEMICAL PROCESS FOR PRODUCING HYDROSULFITE SOLUTIONS

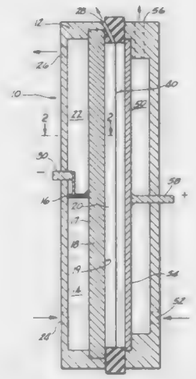
Roger E. Bolick, II, Chattanooga; David W. Cawlfield, and Jimmy M. French, both of Cleveland, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 892,518, Aug. 4, 1986, Pat. No. 4,793,906. This application May 5, 1988, Ser. No. 190,630

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[5] C25B *1/00*

U.S. Cl. 204—92 **14 Claims**



1. A process for electrolyzing an aqueous catholyte solution comprising an alkali metal bisulfite to produce an alkali metal hydrosulfite in an electrolytic membrane cell having a cation exchange membrane separating a cathode compartment from an anode compartment, a porous cathode having a face adjacent the membrane, a back, a porous structure conjoining the face and the back, a first catholyte zone adjacent to the back of the cathode, a second catholyte zone separated from the first catholyte zone by a barrier means, and a cathode-membrane gap between the porous cathode and the cation exchange membrane, which process comprises feeding at least 50 percent of the volume of the aqueous alkali metal bisulfite catholyte to the first catholyte zone and through the porous cathode, the porous cathode having a ratio of total surface area to the projected surface area of at least about 30:1.

4,992,148

PROCESS FOR THE ELECTROLYTIC MANUFACTURE OF ALKALI METAL SULPHIDE

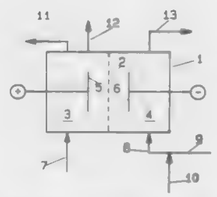
Edgard Nicolas, Rosignano, Italy, assignor to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Feb. 8, 1990, Ser. No. 476,711

Claims priority, application Italy, Feb. 10, 1989, 19412 A/89

Int. Cl.[5] C25B *1/14*

U.S. Cl. 204—92 **11 Claims**



1. A process for the manufacture of alkali metal sulphide comprising:

(a) preparing an electrolysis cell in which a membrane which is selectively permeable to cations separates an anode chamber containing an anode from a cathode chamber containing a cathode by placing an electrolyte containing alkali metal ions in said anode chamber and an aqueous solution of alkali metal polysulfide in said cathode chamber;

(b) electrolysing said electrolyte containing alkali metal in said anode chamber; and

(c) simultaneously electrolysing said aqueous solution of alkali metal polysulphide in said cathode chamber to produce an alkali metal sulfide.

4,992,149

PROCESS FOR THE SIMULTANEOUS RECOVERY OF MANGANESE DIOXIDE AND ZINC

Trong T. Nguyen, Onex, Switzerland, assignor to Recytec S.A., Switzerland

Filed Jul. 16, 1990, Ser. No. 553,719

Claims priority, application Switzerland, Jul. 20, 1989, 2713/89

Int. Cl.[5] C25B *1/00;* **C25C** *1/16*

U.S. Cl. 204—96 **25 Claims**

1. A process for the simultaneous electrolytic production of manganese dioxide and zinc, characterized in that manganese oxides, zinc oxides, zinc halides, and metallic zinc are leached in an acidic solvent comprising tetrafluoroboric acid, and in that a solution comprising essentially manganese tetrafluoroborate and zinc tetrafluoroborate is subjected to an electrolysis in an electrolytic cell having a cathode upon which zinc can be plated and an anode upon which manganese dioxide can be plated.

4,992,150

PROCESS FOR PREPARING OIL-SOLUBLE NITROGEN-CONTAINING COMPOUNDS

Jinichi Igarashi, Tokyo, and Harumichi Watanabe, Yokohama, both of Japan, assignors to Nippon Oil Co, Ltd., Tokyo, Japan

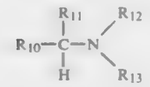
Continuation of Ser. No. 914,467, Oct. 2, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 337,622

Claims priority, application Japan, Oct. 9, 1985, 60-223827; Jun. 10, 1986, 61-132789

Int. Cl.[5] C07C *283/00*

U.S. Cl. 204—157.81 **15 Claims**

1. A process of preparing a nitrogen-containing telomer containing a high molecular weight hydrocarbon group, of average molecular weight between 400 and 3,000, nitrogen content of from 0.1 to 10 wt %, soluble in fuel oils and lubricating oils, which consists of subjecting to a radical telomerization reaction in the presence of a radical initiator at a temperature of 150° C.–200° C. a mixture of 1 mole of: (1) at least one nitrogen-containing compound as a telogen which is an alkanolamine or a cycloalkanolamine of formula



in which R_{10} represents an alkanol group having at least one hydroxyl group and having from 1 to 45 carbon atoms, R_{11}, R_{12} and R_{13} independently represent a hydrogen atom, an alkyl group having from 1 to 45 carbon atoms or an alkanol group having at least one hydroxyl group and having from 1 to 45 carbon atoms, or R_{10} and R_{11} join to form a five- to seven-members saturated ring having at least one hydroxyl group, the ring being unsubstituted or substituted by 1–3 alkyl substituents each having from 1 to 6 carbon atoms, and (2) 0.1 to 20 moles of an alpha-olefin as a taxogen of the general formula $R_5—CH=CH_2$, in which R_5 is alkyl having from 1 to 28 carbon atoms whereby said taxogen becomes attached to the carbon atom in the α-position to the nitrogen atom of said telogen.

4,992,151

METHOD FOR THE SELECTIVE ALPHA HALOGENATION OF ALKYLAROMATIC COMPOUNDS

Marlin E. Walters, West Columbia; George M. St. George, and W. Frank Richey, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 29, 1990, Ser. No. 472,507

Int. Cl.[5] C08G *63/00;* **C07C** *22/00*

U.S. Cl. 204—157.99 **30 Claims**

1. A process for producing an aliphatic substituted aromatic compound having a least two alpha-halogen substituents which comprises contacting a reactive hypohalite compound with an aromatic compound, having at least one aliphatic substituent, and which contains at least two alpha-hydrogens, and in which each aliphatic substituent contains at least one beta-hydrogen in the presence of a free radical generating medium.

4,992,152

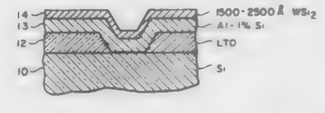
REDUCING HILLOCKING IN ALUMINUM LAYERS FORMED ON SUBSTRATES

Madhav Mehra, Rochester, and Tonya D. Binga, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 341,266, Apr. 20, 1989, abandoned. This application Apr. 4, 1990, Ser. No. 504,362

Int. Cl.[5] C23C *14/34;* **H01L** *21/44*

U.S. Cl. 204—192.15 **1 Claim**



1. A method of reducing hillocks occurring in the layer of aluminum sputtered onto a substrate consisting essentially of the steps of:

(a) sputtering aluminum from a target onto the surface of a substrate to deposit a single layer of aluminum on such substrate having a thickness of between 6000–9000Å;

(b) depositing a single layer of WSi_2 on top of the aluminum layer having a thickness of between 1500–2500Å; and

(c) sintering the deposited aluminum and WSi_2 layers.

4,992,153

SPUTTER-CVD PROCESS FOR AT LEAST PARTIALLY COATING A WORKPIECE

Erich Bergmann, Mels, Switzerland, and Franz Gassner, Triesenberg, Liechtenstein, assignors to Balzers Aktiengesellschaft, Balzers Furstentum, Liechtenstein

Filed Jul. 13, 1989, Ser. No. 379,214

Claims priority, application Switzerland, Apr. 26, 1989, 1586/89

Int. Cl.[5] C23C *14/34, 14/30*

U.S. Cl. 204—192.160 **16 Claims**

1. A process for at least partially coating a workpiece by sputter chemical vapor deposition in a vacuum chamber, comprising:

sputtering one cathode material which forms a cathode that is operated in conjunction with an anode, by applying a DC voltage between the cathode material and the anode;

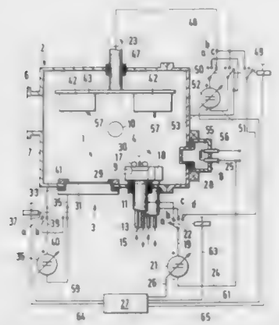
supplying a reactive gas to the vaccum chamber, said reactive gas having a component selected from at least one of a group including a hydrocarbon compound and a volatile silicon compound, the component being capable of reacting in a plasma-chemical reaction with the cathode material and of precipitating onto the workpiece a precipitate

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selected from the group including at least one of carbon and silicon, with at least one of a reaction product of carbon with the cathode material, and a reaction product of silicon with the cathode material;

establishing a plasma in the vacuum chamber for decomposing said component and precipitating the precipitate;

maintaining the surface of the workpiece to be coated at a DC voltage which is more positive than that of the plasma; and



supplying current to the workpiece and to the cathode material, the current supplied to the workpiece being maintained at a level of at least 50% of the current being supplied to the cathode material so that an electrical conductive layer of the precipitate containing free carbon or silicon and the reaction product of carbon or silicon with the cathode material is deposited onto the surface of the workpiece to be coated by a sputter chemical vapor deposition process without the use of high frequency power.

4,992,154

BRUSH FOR ELECTROLYTIC TREATMENT

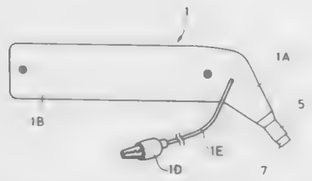
Yoshiaki Ida, and Keigo Obata, both of Hyogo, Japan, assignors to Marui Mekki Kogyo Yugen Kaisha, Hyogo, Japan

Filed Aug. 18, 1989, Ser. No. 395,842

Claims priority, application Japan, Aug. 19, 1988, 63-109387[U]; Nov. 21, 1988, 63-151565[U]

Int. Cl.[5] C25D *17/14, 17/12*

U.S. Cl. 204—224 R **6 Claims**



1. A brush for use in electrolytic treatment having a brush body including an electrode connected to one terminal of a D.C. source and contacting a workpiece connected to the other terminal of the D.C. source, said brush comprising a forward portion formed on the brush body and defining an electrode compartment, an electrode contact disposed inside said compartment, and an electrode holder removably mounted in said compartment, wherein said electrode holder includes a forward portion defining a vessel, and a rear portion defining an engaging portion for fitting into a holder receiving opening defined in said forward portion of said brush body, said vessel having a bottom thereof defining a bore for receiving said electrode extending into said vessel, and felt receiving spaces being defined in said vessel at opposite sides across said electrode for receiving opposite ends of a felt, respectively, and said brush body houses a cartridge containing a plating solution, for automatically supplying the plating solution by way of a conduit extending through said electrode to a liquid retaining material attached to a forward end of said brush body.

4,992,155

CIRCUITRY FOR THE ELECTROLYTIC COLORING OF ANODIZED ALUMINUM SURFACES

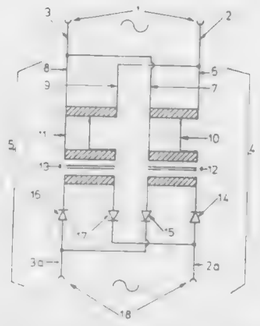
Dieter Brodalla, Duesseldorf; Werner Huppertz, Krefeld; Georg Wagner, Chieming, all of Fed. Rep. of Germany; James W. Costello, Sellersville, Pa., and Karl-Heinz Munk, Hamm, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 363,316, Jun. 5, 1989, Pat. No. 4,915,801, which is a continuation of Ser. No. 76,647, Jul. 23, 1987, abandoned. This application Jan. 10, 1990, Ser. No. 463,180

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624868; Jun. 4, 1987, 3718741

Int. Cl.[5] C25D *11/22, 17/00*

U.S. Cl. 204—228 **5 Claims**



1. A circuit arrangement adapted to provide an a.c. voltage having a negative half wave and a positive half wave for the electrolytic coloring of an anodized article of aluminum or aluminum alloy in a coloring bath which contains at least one metal salt for coloring said article, comprising a voltage source supplying a symmetrical, sinusoidal a.c. voltage having two current paths, said current paths being divided into two parallel main lines each consisting of a pair of individual current paths, each pair of said individual current paths being successively fed to a variable ratio transformer, then to a second transformer, and then to a diode or thyristor, said main lines being recombined to form the a.c. voltage applied to said coloring bath by combining the pairs of individual current paths, whereby the amplitude level of the positive half wave and the amplitude level of the negative half wave and the ratio of the amplitude level of the positive half wave to the amplitude level of the negative half wave of the a.c. voltage are made variable and adjustable independently of one another to provide a controllable, asymmetrical and substantially sinusoidal a.c. voltage of substantially constant frequency.

4,992,156

ELECTROLYTIC POOL PURIFIER

Michael A. Silveri, 7955 Haskell Ave., #23, Van Nuys, Calif. 91406

PCT No. PCT/US89/00853, § 371 Date Aug. 18, 1989, § 102(e) Date Aug. 18, 1989

PCT Filed Mar. 6, 1989, Ser. No. 424,305

Int. Cl.[5] C25B *1/06, 9/00, 11/04*

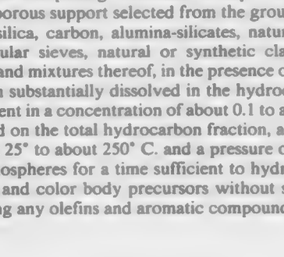
U.S. Cl. 204—228 **23 Claims**

16. A submerged electrolytic cell pool purifier for sanitizing a swimming pool including a piped water circulation system comprising:

(a) an immersed dielectric enclosure having a top, bottom, front,back and sides with an inlet disposed within a lower portion and, an outlet provided in a upper portion with said back affixed to the pool under the water level providing a continual flow path for water within the enclosure,

(b) a plurality of electrodes spaced equally apart between the sides of said enclosure in a vertical juxtaposition manner with the pool water freely surrounding the parallel surfaces,

(c) a pair of electrical conducting wires, having a first and second end, disposed within a return line pipe of the pool water circulation system with the first end of each wire connected to an opposite electrode,



(d) a direct current power supply having polarity reversing means connected to the second end of said wires such that one of the outermost electrodes receives a flow of electricity through the wire in a positive polarity and the other outermost electrode requies a negative flow of direct current electricity forming respectively an anode and an cathode with the pool water acting as electrolyte the combination producing copper and silver ions for aligodynamic sterilization of the pool water,

(e) wire egress means allowing said wires to exit a connecting pipe of the swimming pool in a water-tight manner permitting the purifier to be installed in existing pools independent of the pool system without undue modification thereunto.

4,992,157

PROCESS FOR IMPROVING THE COLOR AND COLOR STABILITY OF HYDROCARBON FRACTION

Jeffery C. Bricker, Buffalo Grove, Ill.; Bryan L. Benedict, Redondo Beach, Calif., and Sheila L. Pollastrini, Bloomingdale, Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 237,471, Aug. 29, 1988, Pat. No. 4,897,175. This application Nov. 27, 1989, Ser. No. 441,869

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] C10G *17/00, 45/00*

U.S. Cl. 208—12 **10 Claims**

1. A process for improving the color and color stability of a hydrocarbon fraction containing color bodies and color body precursors comprising contacting the hydrocarbon fraction with a selective hydrogenation catalyst, the selective hydrogenation catalyst comprising a sulfided Group VIII metal dispersed on a porous support selected from the group consisting of alumina, silica, carbon, alumina-silicates, natural and synthetic molecular sieves, natural or synthetic clays, alkaline earth oxides and mixtures thereof, in the presence of hydrogen, the hydrogen substantially dissolved in the hydrocarbon fraction and present in a concentration of about 0.1 to about 3 mole percent based on the total hydrocarbon fraction, at a temperature of about 25° to about 250° C. and a pressure of about 1 to about 15 atmospheres for a time sufficient to hydrogenate the color bodies and color body precursors without substantially hydrogenating any olefins and aromatic compounds contained in the hydrocarbon fraction, thereby providing a color stable hydrocarbon fraction.

4,992,158

CATALYTIC REFORMING PROCESS USING NOBLE METAL ALKALINE ZEOLITES

Albert E. Schweizer, Baton Rouge, La., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jan. 3, 1989, Ser. No. 292,782

Int. Cl.[5] C10G *35/085, 63/06*

U.S. Cl. 208—65 **7 Claims**

1. In a process wherein a gasoline boiling range hydrocarbonaceous feedstock is catalytically reformed in the presence of hydrogen in a reforming process unit comprised of a plurality of serially connected reactors wherein each of the reactors contains a supported noble metal-containing catalyst, the improvement which comprises the noble-metal catalyst of at least one reactor being selected from the group consisting of alkaline faujasite zeolite, L zeolite and zeolites isostructural thereto, which catalysts are prepared by a: (a) contacting an alkaline faujasite zeolite, L zeolite, or zeolite isostructural thereto, with a noble metal composition selected from $Pt(acetylacetonate)_2$ or $Pd(acetylacetonate)_2$ for an effective amount of time to form a substantially homogeneous mixture and to incorporate the platinum and/or palladium into the near surface regions of the zeolite, but not to disperse the platinum and/or palladium throughout the entire zeolite; and (b) calcining the so treated zeolite at a temperature from about 250° C. to about 600° C. for an effective amount of time.

4,992,159

UPGRADING WAXY DISTILLATES AND RAFFINATES BY THE PROCESS OF HYDROTREATING AND HYDROISOMERIZATION

Ian A. Cody, Clearwater, and David L. Brown, Ontario, both of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 16, 1988, Ser. No. 285,436

Int. Cl.[5] C10G *45/00;* **C07C** *5/13*

U.S. Cl. 208—89 **14 Claims**

1. A method for upgrading waxy distillates and raffinates so as to achieve increased yields of oil of increased viscosity index by the process comprising the steps of:

(a) hydrotreating the waxy distillate or raffinate under conditions so as to reduce the sulfur and nitrogen content thereof;

(b) isomerizing the hydrotreated feed from step (a), over a low total fluorine content small particle size isomerization catalyst having a fluorine content of less than 2 wt % and a particle size of less than 1/16 inch diameter, in the presence of hydrogen;

(c) dewaxing the isomerate to a pour point of 0° C. and less.

4,992,160

CONVERSION OF CRUDE OIL FEEDS BY CATALYTIC CRACKING

Gary N. Long, Putnam Valley; Regis J. Pellet, Croton-On-Hudson, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 772,616, Sep. 4, 1985, abandoned, which is a division of Ser. No. 675,285, Nov. 27, 1984, Pat. No. 4,803,184, which is a continuation-in-part of Ser. No. 490,952, May 2, 1983, Pat. No. 4,512,875. This application Apr. 10, 1987, Ser. No. 37,125

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[5] C10G *11/02*

U.S. Cl. 208—111 **11 Claims**

1. The catalytic cracking process for converting a crude oil feed to hydrocarbon products including gasolines comprising contacting a crude oil feed at effective catalytic cracking conditions at an effective catalytic cracking temperature between

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about 400° F. and about 1400° F. with a catalyst comprising at least one crystalline zeolitic aluminosilicate cracking catalyst selected from the group consisting of Zeolite Y, zeolite LZ-210 and Zeolite LZ-10 and at least one molecular sieve selected from the group consisting of the silicoaluminophosphates SAPO-5 and SAPO-11.

4,992,161

CHROMIUM/TIN MIXTURE AS SULFUR DIOXIDE OXIDATION PROMOTER FOR FCC UNITS

William A. Blanton, Jr., Woodacre, and Alan W. Klaassen, Kensington, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 811,867, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 447,334, Dec. 6, 1982, abandoned. This application May 23, 1988, Ser. No. 197,378

Int. Cl.[5] C10G *11/05*

U.S. Cl. 208—121 2 Claims

1. A fluid catalytic cracking process wherein a circulating inventory of particles is cycled between a hydrocarbon cracking zone and a catalytic regeneration zone, said inventory comprising the admixture of three separate and discrete components,

(1) a particulate cracking catalyst comprising zeolite for cracking hydrocarbon in the absence of hydrogen,

(2) a particulate sulfur oxide sorbent comprising reactive alumina capable of sorbing sulfur trioxide, and

(3) a particulate sulfur dioxide oxidation promoter containing an intimate association of chromium and tin or compounds thereof on a titanium dioxide support.

4,992,162

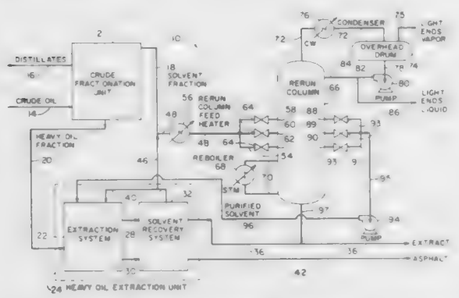
METHOD AND APPARATUS FOR HEAVY OIL EXTRACTION

Richard D. Kuerston, and Ronald E. Brown, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1990, Ser. No. 502,504

Int. Cl.[5] C10G *17/00*

U.S. Cl. 208—177 7 Claims



1. A heavy oil extraction method, comprising the steps of:

(a) fractioning a crude oil to produce a heavy oil fraction and a fresh solvent fraction;

(b) conducting said heavy oil fraction to an extraction unit containing a solvent recycle system;

(c) combining said fresh solvent fraction with a slip stream of rerun solvent from the solvent recycle system of said extraction unit;

(d) distilling said fresh solvent fraction and said slip stream of rerun solvent to obtain a purified extraction solvent;

(e) conducting said purified extraction solvent to said extraction unit; and

(f) utilizing said purified extraction solvent to obtain a deasphalted heavy oil extract from said heavy oil fraction.

4,992,163

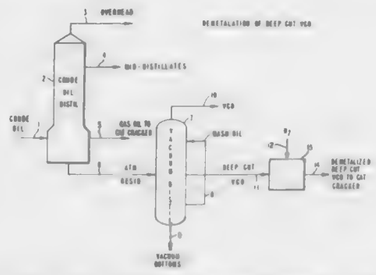
CAT CRACKING FEED PREPARATION

Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 13, 1989, Ser. No. 449,178

Int. Cl.[5] C10G *31/00*

U.S. Cl. 208—251 H 14 Claims



1. A process for producing distillate suitable as feed to a catalytic cracker, the process comprising subjecting a heavy fossil fuel feedstock to distillation in a distillation zone operating under vacuum to obtain a selected distillate fraction characterized by an initial cut point in the range of 800° to 1050° F. and a final cut point in the range of 1075° to 1300° F., and demetallizing the selected distillate fraction only in a demetallation zone, whereby greater than 40 wt. % of the total nickel and vanadium is removed, to obtain a product characterized by a vanadium content of less than about 15 ppm and a nickel content of less than about 10 ppm by weight.

4,992,164

METHOD OF CHARGE NEUTRALIZATION USING CHELANTS

T. Miles McCullough, Houston; James G. Edmondson, Conroe, both of Tex., and Joseph J. Perugini, Ohain, Belgium, assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 1, 1990, Ser. No. 487,362

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—282 2 Claims

1. A method of reducing the evolution of chloride ions generated in crude oil during processing in a petroleum refinery at elevated temperatures comprising adding to said crude oil a chelant comprising nitrilotriacetic acid or salt form thereof.

4,992,165

SEWAGE TREATMENT PLANT

Geoffrey H. Jensen, Salisbury, United Kingdom, assignor to Klargester Environmental Engineering Limited, Aylesbury and G. H. Jensen Limited, Salisbury, both of, England

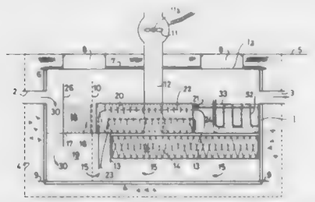
Filed Feb. 8, 1988, Ser. No. 153,131

Claims priority, application United Kingdom, Aug. 14, 1986, [illegible]

Int. Cl.[5] C02F *3/06*

U.S. Cl. 210—124 15 Claims

1. In a sewage treatment plant comprising a tank containing liquid sewage to a normal free surface level and gas above said normal free surface level, a sewage input to the tank, an outlet from the tank for treated sewage, and biomass support means within the tank, the improvement of providing means independent of flow of liquid through said input or outlet for periodically raising and lowering the free surface level of liquid sewage within the tank and of locating the biomass support means above said normal free surface level to ensure that biomass on the support means is alternately contacted by the liquid sewage when said free surface is above the normal free surface level,



and by gas as the said free surface returns to the normal free surface level.

4,992,166

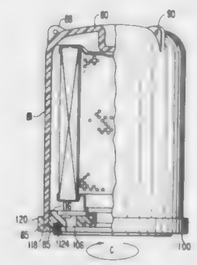
PLASTIC FLUID FILTER AND METHOD FOR MANUFACTURING SAME

John Lowsky; Scott Trierwiler, both of Fayetteville, and Steven Cline, Hope Mills, all of N.C., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed Jun. 13, 1988, Ser. No. 205,632

Int. Cl.[5] B01D *27/10*

U.S. Cl. 210—130 24 Claims



1. A fluid filter for attachment to a filter mount on an engine comprising:

(a) a filter element;

(b) a plastic housing for the filter element having a substantially cylindrical sidewall, a closed first end and an open second end;

(c) a plastic closure member to be directly engaged with the open second end,

(d) plastic complimentary interengageable locking means formed radially on the open second end of the filter housing and the closure member for engaging the housing and the closure member,

wherein the locking means includes a plurality of first members formed on the inside of the filter housing and a plurality of second members formed on the closure member,

wherein the plurality of first members includes a first set of circumferentially spaced flanges fixedly attached to the inside of the cylindrical side wall of the filter housing.

wherein the plurality of second members includes a second set of circumferentially spaced flanged formed on the closure member, and

wherein each of the plurality of first members combines with a corresponding one of the plurality of second members to removably engage the housing relative to the closure member;

(e) sealing means positioned circumferentially between the inside of the cylindrical side wall of the filter housing at the second, open end and the closure member for creating a fluid seal therebetween; and

(f) means formed on the closure member for attaching the closure member to the filter mount.

4,992,167

FILTERING APPARATUS

Tadao Uchiyama, Funabashi, Japan, assignor to Syst Corporation, Tokyo, Japan

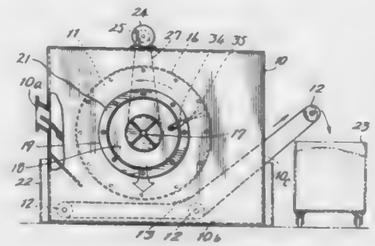
Filed Aug. 1, 1988, Ser. No. 226,847

Claims priority, application Japan, Nov. 25, 1987, 62-296897

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[5] B01D *33/06*

U.S. Cl. 210—171 6 Claims



1. A filtering apparatus for filtering cutting oil containing metal chips, said apparatus comprising:

an oil reservoir having a rectangular cross section, opposed end walls, one of which end walls has an oil inlet extending therethrough and through which oil inlet cutting oil is introduced into the reservoir and the other of which end walls has a chip discharge opening extending therethrough and through which chip discharge opening metal chips are discharged out of the reservoir, opposed side walls extending between said end walls and one of which side walls has an oil discharge opening extending therethrough, and a bottom wall extending between said end walls;

a filtering drum rotatably mounted within said reservoir,

said drum comprising a filtering screen extending about the periphery thereof for filtering cutting oil containing metal chips;

an annular rotary member secured to said drum so as to rotate therewith, said annular rotary member journalled in said discharge opening;

a rotary shaft journalled in the other of said side walls and rotatably supporting said drum with said annular rotary member;

drive means operatively connected to said shaft for rotating said shaft to rotate said drum; and

chip discharge means disposed in said reservoir and extending through said chip discharge opening for discharging metal chips disposed adjacent said bottom wall of said reservoir from said reservoir through said chip discharge opening.

4,992,168

APPARATUS FOR FRACTIONALLY MEASURING POLYMERS

Shigeru Takayama, and Yukitaka Goto, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,243

Claims priority, application Japan, Mar. 7, 1988, 63-53236

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 6 Claims

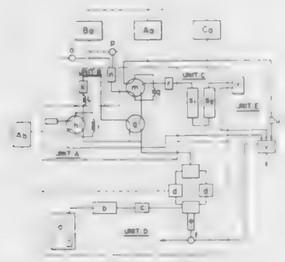
1. An apparatus for fractionally measuring a polymer comprising:

a flow path change valve unit A having an inlet for pouring a sample polymer solution, a loop for metering the sample polymer solution, an internal standard solution pouring mechanism including a loop for metering the standard solution and a valve for pouring the standard solution, and a valve for changing the system flow path;

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a composition fractionation unit B which is provided with a column filled with a filler, and which permits the polymer dissolved in the sample polymer solution transferred from said loop for metering the sample polymer solution to precipitate on said filler, and then fractionally dissolves the polymer by stepwisely raising the temperature in said column;

a molecular size fractionation unit C which is provided with a column filled with a filler, and which fractionates, depending upon the molecular size, the sample polymer fraction solution which has undergone composition fractionation in the unit B and which is batchwisely transferred therefrom;



a solvent feeding unit D which feeds at a predetermined flow rate a solvent for use in the fractional dissolution of the sample polymer in the unit B and for transferring the obtained sample polymer fraction solutions;

a detection unit E which detects the results of fractionation obtained in the unit C and measures the molecular weight distribution;

a system controller; and

automatic temperature controllers which are connected to the units A, B and C and which independently perform temperature control to ensure free flow of the polymer solution;

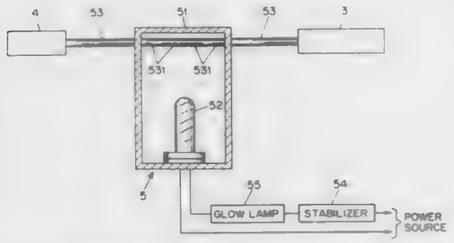
wherein said system controller controls said temperature controllers and the valve in said unit A.

4,992,169

OZONE GENERATING MEANS AND WATER QUALITY IMPROVING APPARATUS USING THE SAME

Tooru Izumiya, Tokyo, Japan, assignor to Nippon Nature Roman Corporation Limited, Japan

Filed Jan. 3, 1990, Ser. No. 460,286
Claims priority, application Japan, Mar. 25, 1989, 1-34093[U]
Int. Cl.[5] C02F *1/78*
U.S. Cl. 210—221.2 **8 Claims**



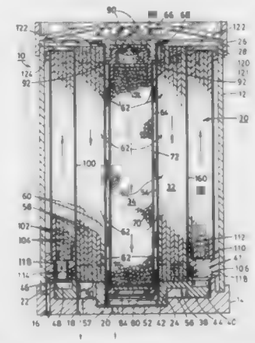
1. An ozone generating means comprising a container body that can be closed, a ultraviolet generating means formed in said container body, and a pipe member extending through said container body, a part of said pipe member that is located in said container body being formed with a plurality of holes.

4,992,170

REVERSE OSMOSIS FILTER CARTRIDGE ASSEMBLY

Krishna S. Menon, Liverpool, and Stephen J. Laird, Baldwinsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1990, Ser. No. 504,446
Int. Cl.[5] B01D *6/08*
U.S. Cl. 210—321.78 **10 Claims**



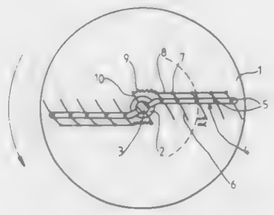
1. In a reverse osmosis filter cartridge assembly adapted to be contained in a tubular housing, said cartridge assembly having an annualar reverse osmosis membrane section, a cylindrical post-filter section, and an annular pre-filter section which sections are disposed in coaxial relationship in said housing, a mechanism for permitting said sections to be separable from said housing as a unitary structure and for permitting said pre-filter and post-filter and membrane sections to be separated independently from each other, said mechanism comprising a support ring having a central opening, said reverse osmosis membrane section having a membrane body, said body having an annular outer peripheral surface, means for providing a unitary membrane structure including said support ring attached to said membrane body, said post-filter section being received in said opening and within said membrane body, and said pre-filter section defining a sheath movably disposed around said outer peripheral surface of said membrane body in juxtaposition and in contact therewith.

4,992,171

FILTERING DEVICE WITH AGITATOR

Hartmut Hetzel, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1990, Ser. No. 486,472
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3907040
Int. Cl.[5] B01D *29/64*
U.S. Cl. 210—413 **3 Claims**



1. A filtering device with an agitator, comprising a horizontal filter plate having a central discharge opening, an agitator shaft disposed vertically and centrally to the filter plate, said agitator shaft having two agitator arms with agitator blades being disposed on said agitator arms and set at a normal non-tangential angle to a circular path of rotation of said blades by tensioning means which allow for movement of said blades from said normal nontangential angle to a second position angle tangential to said circular path in response to the resistance of filter cake disposed on the filter plate, and for movement back to said normal angle in response to increasing disintegration of said filter cake.

4,992,172

BLOTTING METHODS USING POLYALDEHYDE ACTIVATED MEMBRANES

Kariyawasam P. W. Pemawansa, Ann Arbor; Mark D. Heisler, Saline, both of Mich., and Menahem Kraus, Rehovot, Israel, assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 321,282, Mar. 9, 1989, which is a division of Ser. No. 96,730, Sep. 14, 1987, Pat. No. 4,824,870. This application Aug. 15, 1989, Ser. No. 394,362
Int. Cl.[5] B01D *29/00, 29/46, 39/00*
U.S. Cl. 210—490 **6 Claims**

1. A blotting composition, comprising a substrate applied to an activated microporous membrane comprising a membrane polymer and having (1) an internal surface comprising interstices or pore surfaces and (2) an external surface;

wherein substantially all said surfaces of the microporous membrane are coated without significant chemical reaction to substantially all said available surface areas of said microporous membrane and thereby activated by a polyaldehyde-containing mixture in an amount sufficient to effectively activate the microporous membrane; and

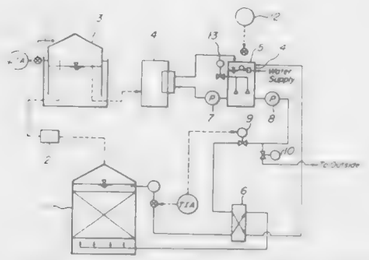
wherein the mixture is soluble enough to penetrate substantially all said interstices of the microporous membrane without substantial damage to the pore structure.

4,992,173

BOILER OPERATING METHOD WITH GASES PRODUCED FROM BIOREACTOR

Keiji Matsuoka, Kani; Yuzo Okamoto, Nagoya, and Isao Niwa, Gifu, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 18, 1990, Ser. No. 524,796
Claims priority, application Japan, May 19, 1989, 1-127475
Int. Cl.[5] C02F *3/28*
U.S. Cl. 210—603 **2 Claims**



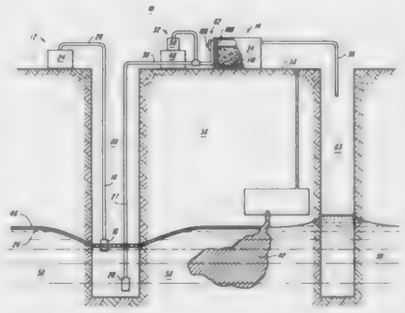
1. A method of operating a boiler for heating a bioreactor with gases produced from the bioreactor, while supplying excessive hot water to outside of a system wherein the boiler is operated to turn on and off depending upon temperature of a hot water tank when a level of a gas holder is higher than an intermediate level H_1, and hot water is unconditionally supplied to the outside when the level of the gas holder is higher than a high level H_2, and hot water is supplied to the outside when temperature of the hot water tank is higher than an intermediate temperature L_1 and the level of the gas holder is between the high level H_2 and the intermediate level H_1 and the supply of the hot water is stopped when the level of the gas holder is less than the intermediate level H_1.

4,992,174

FIXED BED BIOREACTOR REMEDIATION SYSTEM

Jason A. Caplan; Eric K. Schmitt, and Donald R. Malone, all of Raleigh, N.C., assignors to Environmental Science & Engineering, Inc., Raleigh, N.C.

Filed Jun. 8, 1989, Ser. No. 363,077
Int. Cl.[5] C02F *3/06*
U.S. Cl. 210—610 **7 Claims**



4. A process for the microbiological remediation of a site contaminated with a hazardous substance comprising the steps of:

removing groundwater contaminated with a hazardous substance from below a groundwater/hazardous substance interface;

supplementing said removed groundwater with gases and a blend of nutrients in a vessel to enhance the growth of hazardous substance biodegrading microorganisms;

treating said groundwater by concurrently culturing said microorganisms in said supplemented groundwater and biodegrading the hazardous substance therein, said treatment producing a culture of microorganisms comprising a film of microorganisms which remain fixed to a support media in the vessel, and microorganisms, arising from said fixed film, which slough off said support media and disperse into the groundwater;

recirculating said treated groundwater containing nutrients, dissolved gases, and said sloughed off microorganisms to a location proximate to the hazardous substance contaminated site; and

permitting the sloughed off microorganisms to perform in situ biodegradation within the site after recirculation proximate to said hazardous substance contaminated site;

whereby said process continuously remediates a hazardous substance dissolved in said groundwater and provides a substantially continuous seed culture, for in situ remediation of said site, which biodegrades hazardous substances adhered to soil particles and dissolved in the groundwater located at said contaminated site.

4,992,175

METHOD FOR IMPROVING THE SEPARATION PROPERTIES OF SEMI-PERMEABLE MEMBRANES AND MEMBRANES ACCORDINGLY IMPROVED

Jurgen F. Gauger, 34, Ch. des Mesanges, Geneva, Switzerland (CH-1226)

PCT No. PCT/SE87/00297, § 371 Date Feb. 27, 1989, § 102(e) Date Feb. 27, 1989, PCT Pub. No. WO88/10140, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 25, 1987, Ser. No. 326,665
Int. Cl.[5] B01D *65/10*
U.S. Cl. 210—638 **18 Claims**

1. A method for improving the separation properties of semi-permeable membranes having penetrating defects due to the manufacturing process or subsequent handling characterised in that

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during a certain time
one side of the membrane is exposed to a first chemical reaction partner
the other side of the membrane is exposed to a second chemical reaction partner
so that only in the penetrating membrane defects a chemical reaction will take place in a boundary region between the two reaction partners forming occlusions selectively blocking said defects.

4,992,176

DEHYDRATION OF ORGANIC OXYGENATES

Craig R. Bartels, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 23, 1989, Ser. No. 425,156
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 **21 Claims**

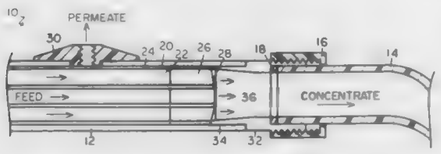
21. The method of concentrating a charge aqueous solution of isopropyl alcohol which comprises
maintaining a non-porous separating layer of cast poly(4-vinyl pyridine) which has been crosslinked with dibromobutane, said separating layer being supported on a porous support layer of polyacrylonitrile;
maintaining a pressure drop across said separating layer and said porous support layer;
passing charge aqueous solution of isopropanol into contact with the high pressure side of said non-porous separating layer whereby at least a portion of the water in said charge aqueous solution and a lesser portion of isopropanol in said charge aqueous solution passes by pervaporation through non-porous separating layer as a lean mixture containing more water and less isopropanol than are present in said charge aqueous solution and said charge aqueous solution is converted to a rich liquid containing less water and more isopropanol than are present in said charge aqueous solution;
recovering as permeate from the low pressure side of said non-porous separating layer said lean mixture containing more water and less isopropanol than are present in said charge aqueous solution, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and
recovering as retentate from the high pressure side of said non-porous separating layer said rich liquid containing a lower water content and a higher isopropanol content than are present in said charge aqueous solution.

4,992,177

TUBULAR FILTRATION MODULE AND SYSTEM WITH FLOW DISTRIBUTOR AND IMPROVED METHOD OF SEPARATION

Clyde W. Fulk, Jr., Haverhill, Mass., assignor to Koch Membrane Systems, Inc., Wilmington, Mass.

Filed Oct. 11, 1989, Ser. No. 419,660
Int. Cl.[5] B01D *61/18, 61/20*
U.S. Cl. 210—644 **12 Claims**



1. In a membrane module system for the separation of a feed stream into a concentrate stream and a permeate stream and which module system comprises:
(a) a plurality of membrane modules connected in series and each module comprising:
(i) a tubular module housing;
(ii) a plurality of membrane tubes within the housing, the membrane tubes having a membrane for the separation of a fluid and having a one and other end; and
(b) a flow connecting means having a central flow passage and having a one and other end to connect the one end of each module's housing to the end of the next succeeding housing in the module system whereby the concentrate stream collected from the individual membrane tubes of one module is collected and forms the feed stream of the individual membrane tubes in the next succeeding module;
(c) means to withdraw a total permeate stream from each module;
(d) means to withdraw a concentrate stream from the last module in the module system; and
(e) a means to introduce a feed stream into the first module of the module system, the improvement which comprises:
flow transmission means to minimize the changes in flow velocity of the streams from or into the individual membrane tubes of each module in the system by maintaining a substantially constant cross flow area between the ends of the individual membrane tubes of the module and the central passageway of the flow connecting means, the transition means comprising and including a plurality of elongated, truncated, conical projection elements extending from the ends of the membrane tubes to define a plurality of generally slightly tapered, truncated, conical flow passageways which extend from the end of the membrane tubes toward the central flow passages of the flow connecting means for reducing the expansion-contraction loss between the membrane modules in the system.

6. A membrane module end fitting for connecting one or the other end of a multiple tube membrane module and which comprises a plurality of membrane tubes in a tubular housing to one end of a tubular U-bend element having a central flow passageway and which tubular U-bend element connects the other end through another end fitting to another end membrane module and which end fitting comprises:
(a) a plastic molded end fitting having a one and an other end, the one end having a solid face end and a plurality of individual flow passages therein, the face end adapted to be connected in a fluid tight relationship with the one or other end of the membrane tubes in the membrane module and with the individual flow passages designed to be axially aligned with the face of the individual membrane tubes of the membrane module;
(b) the end fitting having a plurality of elongated, generally truncated, conical individual flow passages extending from the flow passages at the one end toward the other end of the end fitting; and
(c) the end fitting having a central flow passage extending from the other end and toward the one end whereby the truncated flow passages gradually taper into central flow passage of the end fitting as the stream between the one and other end of the end fitting for providing for maintenance of a substantially constant cross sectional flow area between the central flow passage of the end fitting and the total cross sectional flow area of the sum of the individual membrane tubes of the membrane module.

8. In a method for the separation of a feed stream into a concentrate stream and a permeate stream, which method comprises:
introducing a feed stream into a multiple tube membrane module, withdrawing a concentrate stream from the membrane module at the other end of the module and introducing the withdrawn concentrate stream into a central flow passage and thereafter introducing the withdrawn concentrate stream as the feed stream into the next succeeding membrane module in series and continuing such flow sequence until a concentrate stream of desired concentration is obtained, the improvement which comprises:
(i) providing a flow transmission means between the ends of the individual membrane tubes of each module and the central flow passageway so as to maintain a substantially constant cross sectional flow area between the

cross sectional flow area in sum of the ends of the membrane tube and the central flow passageway during the transition of the flow of the concentrate stream from the end of the individual membrane tubes and into the central flow passageway so as to minimize flow velocity changes and to reduce the expansion and contraction losses associated with such flow velocity changes for permitting reduction in pressure drop of each membrane module in the membrane system and permitting more membrane modules to be used in series to obtain the desired concentrate stream.

12. A molded end fitting which comprises: means for use with an ultrafiltration membrane module system to connect the ends of a multiple tube membrane module with one end of a U-bend connector and through another molded end fitting at the other end of the U-bend connector to a subsequent multiple tube membrane module which end fitting further comprises:
(a) a plastic molded fitting having a one end adapted to fit in a fluid tight manner within the end of the membrane module and another end adapted to be threadably secured in a fluid tight manner to the one end of the U-bend connector and having a central flow passageway extending from the other end a major distance toward the one end;
(b) the one end having a face surface formed to fit in a snug manner against the face surface of the end of the membrane tubes in the membrane modules and having a plurality of circular flow passageways in the face surface for axial alignment with the ends of the membrane tubes in the membrane module; and
(c) a plurality of axially inwardly, tapered, extended, molded projections extending from each of the circular passageways into the central flow passageway of the end fitting, the projections tapered so as to maintain a substantially constant cross sectional flow area between the flow area of the ends of the membrane tubes and the flow area of the central flow passageway for reducing expansion and contraction losses.

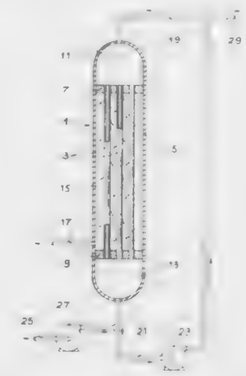
4,992,178

INORGANIC ULTRAFILTRATION OF MICROFILTRATION MEMBRANE MODIFIED BY A HYDROPHILIC POLYMER, ITS PREPARATION PROCESS AND ITS USE FOR THE SEPARATION OF PROTEINS

Bernard Chaufer, Champigny; Jacqueline Dulieu, Malakoff, and Sebille, Pierre Louvier, all of France, assignors to Tech-Sep, Courbevoie and Electricite de France (Service National), Paris, both of, France

PCT No. PCT/FR88/00107, § 371 Date Dec. 19, 1988, § 102(e) Date Dec. 19, 1988, PCT Pub. No. WO88/06477, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 25, 1988, Ser. No. 278,926
Claims priority, application France, Feb. 26, 1987, 8702574
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—651 **16 Claims**

1. Inorganic ultrafiltration or microfiltration membrane having an inorganic material separating layer, characterized in that it comprises, prior to use for an ultrafiltration or microfiltration operation, at least one hydrophilic polymer or copolymer with a molecular mass equal to 20,000 to 70,000 daltons, adsorbed on or in the separating layer of the inorganic membrane, thereby modifying the separating properties thereof, the average pore radius of the membrane being from 50 to 100 Angstroms, and the hydrophilic polymer or copolymer ad-



sorbed on or in the separating layer being 7 to 400 $\mu g/cm^2$ of membrane.

4,992,179

METAL RECOVERY

James A. Brierley; Corale L. Brierley, both of Wheat Ridge, Colo.; Raymond F. Decker, Houghton, Mich., and George M. Goyak, Harmony, Pa., assignors to Vistatech Partnership, Ltd., Salt Lake City, Utah

Division of Ser. No. 882,763, Jul. 3, 1986, Pat. No. 4,898,827, which is a continuation-in-part of Ser. No. 777,061, Sep. 20, 1985, Pat. No. 4,690,894, which is a continuation-in-part of Ser. No. 661,917, Oct. 17, 1984, abandoned. This application Nov. 20, 1989, Ser. No. 439,545
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—661 **36 Claims**

33. A process for treating an aqueous solution containing a least one heavy metal cation to remove said cation by sorption and recover said metal which comprises:
providing a biomass characterized by cell walls of a microorganism which is selective to the sorption of said at least one heavy metal cation, which microorganism has been treated with an amount of a caustic solution maintained at an elevated temperature above ambient and ranging up to boiling at a pH in excess of 9 sufficient to form a causticized biomass reaction product consisting essentially of material derived from the cell walls thereof having enhanced metal uptake properties following which said biomass reaction product is washed, dried and immobilized in an insoluble binder,
contacting said solution with an amount of said biomass reaction product in granular form sufficient to sorb said cation into said biomass product,
and thereafter separating the resulting metal-containing biomass from said solution.

4,992,180

METHOD OF SEPARATING A HEAVY METAL ION

Kazukiyo Onodera, Tokyo; Seiko Funabashi, Asaka, both of Japan, and Shinichi Ito, London, United Kingdom, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1989, Ser. No. 452,335
Claims priority, application Japan, Dec. 19, 1988, 63-319678
Int. Cl.[5] B01D *15/00;* **C02F** *1/42*
U.S. Cl. 210—688 **4 Claims**

1. A method of separating a heavy metal ion from an aqueous solution containing the heavy metal ion, comprising the step of bringing a chitosan derived from a chitosan-producing microorganism into contact with said aqueous solution.

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4,992,181

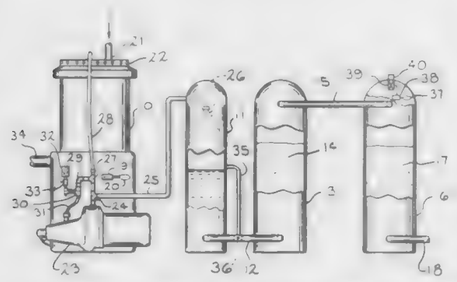
WATER TREATMENT METHOD

Gerald H. Siebert, 4802 Black Rd., Monclova, Ohio 43542

Continuation-in-part of Ser. No. 305,544, Feb. 3, 1989, abandoned. This application Jan. 17, 1990, Ser. No. 466,229

Int. Cl.[5] **C02F** *1/74*

U.S. Cl. 210—744 **20 Claims**



14. A method for treating water removed from the ground to reduce the content of noxious sulfur-containing impurities therein before the water is supplied to an associated water system, said method comprising the steps of spraying the water to be treated in the upper portion of a closed standpipe which has an inlet for the water to be treated and an outlet through which water can flow to the associated water system, the inlet and the outlet of the standpipe being so positioned that air which becomes disassociated from water can collect in the upper portion of the standpipe, controlling the spraying of water in the upper portion of the closed standpipe to maintain a superatmospheric therein to pressurize the associated water system, entraining air with the water before it is sprayed in the standpipe, said last named step being carried out in a vessel in which the ground water is sprayed upwardly, maintaining the water level in the standpipe that is required to enable the flow of water therefrom to the associated water system, containing the ground water, before it is delivered to the associated water system, with a catalyst for the oxidation of sulfur and sulfur-containing moieties to sulfate anions, and controlling the time of contact between the ground water and the catalyst, the amount of air entrained with the water sprayed in the vessel and the amount of air entrained with the water sprayed in the standpipe so that entrained air separates from the water and forms an air pocket inside the standpipe and there is a substantially complete oxidation of sulfur and sulfur-containing moieties to sulfate anions.

4,992,182

SCALE REMOVAL TREATMENT

Leonard J. Kalfayan, Claremont; David R. Watkins, Irvine, and Gregory S. Hewgill, Chino, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 77,305, Jul. 24, 1987, abandoned, which is a division of Ser. No. 800,532, Nov. 21, 1985, Pat. No. 4,708,207. This application Feb. 15, 1989, Ser. No. 311,378

Int. Cl.[5] **C09K** *3/00;* **E21B** *37/06*

U.S. Cl. 252—8.552 **30 Claims**

1. An aqueous solution for scale removal, the solution comprising:

(a) an aminopolycarboxylic compound selected from the group consisting of aminopolycarboxylic acids, aminopolycarboxylic salts, and mixtures thereof, the aminopolycarboxylic compound having a chelating ability and sufficient solubility in water to produce an effective scale removal solution;

(b) a water-soluble organosilicon compound selected from the group consisting of organosilanes, esters of organosilanes, vinyl silane, and mixtures thereof, the organosilicon compound comprising about 1.8 to about 15 weight percent of the solution; and

(c) a glycol ether compound.

4,992,183

MULTIGRADE HYDROGENATED DECENE-1 OLIGOMER ENGINE OILS

Bruce J. Beimesch, Crescent Springs, Ky., and James E. Davis, Loveland, Ohio, assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. 181,132, Apr. 13, 1988, abandoned, which is a continuation of Ser. 33,436, Apr. 1, 1987 abandoned.

Filed Aug. 15, 1989, Ser. No. 394,338

Int. Cl.[5] **C10M** *105/04, 111/02*

U.S. Cl. 252—32.7 E **29 Claims**

1. In an SAE 10W-30 universal engine oil formulated to meet API "C" Service Requirements or API "S" and "C" Service Requirements containing 80% to 90% by weight of a hydrogenated decene-1 oligomer basestock having a 100°C. kinematic viscosity of 7.2 to 9.1 centistokes and 10% to 20% by weight performance additives, to produce an engine oil free of polymeric viscosity index improvers, the improvement wherein the oligomer basestock is a mixture comprising 0.2% to 13.5% C_{30} oligomer, 20% to 64% C_{40} oligomer, 17% to 39% C_{50} oligomer, 6% to 27.5% C_{60} oligomer and 1% to 13.5% C_{70+} oligomers, said ogligomers having a weight average molecular weight from 559 to 750 with 19.8% to 24.2% of the hydrogen atoms of said oligomers being methyl hydrogens.

19. In an SAE 15W-40 universal engine oil formulated to meet API "C" Service Requirements or API "S" and "C" Service Requirements containing 80% to 90% by weight of a hydrogenated decene-1 oligomer basestock having a 100°C. kinematic viscosity of 9.9 to 11 centistokes and 10% to 20% by weight performance additives, to produce an engine oil free of polymeric viscosity index improvers, the improvement wherein the oligomer basestock is a mixture comprising up to 2% C_{30} oligomer, 5% to 51.5% C_{40} oligomer, 27% to 44.5% C_{50} oligomer, 10.5% to 34.5% C_{60} oligomer and 9.5% to 20% C_{70+} oligomers, said oligomers having a weight average molecular weight from 673 to 798 with a 20.2% to 24.7% of the hydrogen atoms of said oligomers being methyl hydrogens.

29. In an SAE 5W-30 universal engine oil formulated to meet API "C" Service Requirements or API "S" and "C" Service Requirements containing 80% to 90% by weight of a hydrogenated decene-1 oligomer basestock having a 100°C. kinematic viscosity of 7.1 to 7.3 and 10% to 20% by weight performance additives, to produce an engine oil free of polymeric viscosity index improvers, the improvement wherein the oligomer basestock is a mixture comprising 12.5% to 13.5% C_{30} oligomer, 43% to 47% C_{40} oligomer, 28.5% to 30.5% C_{50} oligomer, 9% to 10% C_{60} oligomer and 2.4% to 3.5% C_{70+} oligomers, said oligomers having a weight average molecular weight from 550 to 570 with 19.8% to 20.2% of the hydrogen atoms of the oligomers being methyl hydrogens.

4,992,184

PHOSPHITE SULFONATE REACTION PRODUCTS AS MULTIFUNCTIONAL ADDITIVES

Andrew G. Horodysky, Cherry Hill, N.J.; Derek A. Law, Yardley, and Shi-Ming Wu, Newtown, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 19, 1989, Ser. No. 381,891

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] **C10M** *135/10, 137/04*

U.S. Cl. 252—32.7 E **42 Claims**

1. A product of reaction obtained by reacting a partially acidified hydrocarbyl sulfonate having from about 12 to about 32 carbon atoms with a phosphite derived from a diol or an amine, and having from about 10 to about 30 carbon atoms, the reaction being carried out at from about 50° C. to about 225° C. using a mole ratio of sulfonate to phosphite of from about 10:1 to about 1:10.

4,992,185

STABILITY IMPROVER FOR WATER-IN-OIL EMULSION

Joosup Shim, Wenonah, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed May 11, 1988, Ser. No. 195,427

Int. Cl.[5] **C10M** *173/00, 135/04*

U.S. Cl. 252—33 **17 Claims**

1. A process for providing thermal stability to a water-in-oil emulsion base fluid, said emulsion characterized by the presence of between about 40 to 80 percent by weight of an oil of lubricating viscosity; at least about 10 to less than about 60 percent by weight water; about 0.5 to 15 percent by weight of a water-in-oil emulsifier selected from sulfonate and amine emulsifiers and mixtures thereof, all said percentages based on the total weight of said emulsion, comprising adding to said emulsion an emulsion stabilizing amount of between about 0.01 and 2 percent by weight, based on the total weight of said emulsion of a stabilizer selected from the group consisting of sulfurized diisobutylene, sulfurized triisobutylene and mixtures thereof.

4,992,186

ENHANCING ANTIWEAR AND FRICTION REDUCING CAPABILITY OF CERTAIN MOLYBDENUM (V) SULFIDE COMPOUNDS

Jacob J. Habeeb, and Morton Beltzer, both of Westfield, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.Y.

Filed Sep. 7, 1989, Ser. No. 404,144

Int. Cl.[5] **C10M** *133/38, 135/18*

U.S. Cl. 252—47.5 **15 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and a minor amount of an additive comprising a compound of the formula $MoS_2(S_2CNR_2)_3$ and a ligand selected from polydentate ligands and mixtures thereof, wherein each R in the compound may be the same or different and is selected from hydrogen, alkyl, aryl and cycloalkyl groups and at least some of which have a sufficient number of carbon atoms to render the additive soluble in the oil, and wherein the mole ratio of compound to ligand is in the range of from about 1:1 to about 1:4.

4,992,187

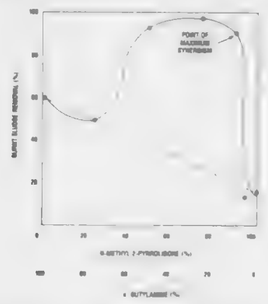
COMPOSITION FOR CLEANING AN INTERNAL COMBUSTION ENGINE

Lawrence J. Adams, Ponte Vedra Beach; Thomas R. Fruda, St. Augustine, and Paul P. Hughett, Jacksonville, all of Fla., assignors to Petro Chemical Products, Inc., Jacksonville, Fla.

Filed Nov. 15, 1989, Ser. No. 436,662

Int. Cl.[5] **C10M** *133/44, 133/26*

U.S. Cl. 252—50 **14 Claims**



1. A composition of matter for dissolving varnish and burned-on sludge in an internal combustion engine which comprises (i) a five-membered heterocyclic ring compound having four carbon atoms and one nitrogen atom consecutively linked and (ii) hydrazine in a ratio in the range of 96:4 to 4:96.

4,992,188

TERTIARY AMIDE-CONTAINING COMPOSITIONS FOR REFRIGERATION SYSTEMS

Scott T. Jolley, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 30, 1990, Ser. No. 502,610

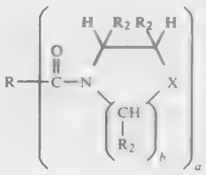
Int. Cl.[5] **C10M** *105/68*

U.S. Cl. 252—51.5 A **12 Claims**

1. A composition, comprising:

(A) a major amount of a fluorine-containing hydrocarbon containing one or two carbon atoms; and

(B) a minor amount of a soluble tertiary amide represented by the formula



wherein a is one or two, provided that when a is one, R is a hydrocarbyl group or a hydrocarbyl polyolyalkylene group, and

when a is two, R is a hyudrocarbylene group;

each R_2 is independently hydrogen or an alkyl group having from 1 to about 8 carbon atoms;

b is one or two;

X is oxygen or N—R_3;

R_3 is independently a hydrocarbyl group having 1 to about 18 carbon atoms or —C(O)R_4.

R_4 is a hydrocarbyl group or a hydrocarbylpolyoxyalkylene alkyl group.

4,992,189

LUBRICANTS AND LUBE ADDITIVES FROM HYDROXYLATION AND ESTERIFICATION OF LOWER ALKENE OLIGOMERS

Catherine S. H. Chen, Berkley Heights, and Paul G. Rodewald, Rocky Hill, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 7, 1990, Ser. No. 476,081

Int. Cl.[5] **C10M** *129/08, 129/74*

U.S. Cl. 252—55 **12 Claims**

1. A process for the production of liquid lubricant or lubricant additive comprising;

contacting an oligomeric alkene and an alkene oxidizing agent under hydroxylating conditions, said alkene comprising the oligomerization product of lower alkene oligomerized in contact with medium pore, shape selective metallosilicate catalyst under oligomerization conditions;

separating the hydroxylation reaction product and recovering said liquid lubricant or additive containing 1,2-glycol groups.

4,992,190

FLUID RESPONSIVE TO A MAGNETIC FIELD

Emil M. Shtarkman, Southfield, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Sep. 22, 1989, Ser. No. 411,029

Int. Cl.[5] **H01F** *1/28*

U.S. Cl. 252—62.52 **11 Claims**

1. A rheological fluid composition which is responsive to a magnetic field, which fluid composition comprises a mixture of carbonyl iron and silica gel comprising about 0.5–10% by weight of said silica gel and about 90% to 99.5% by weight of said carbonyl iron; and a vehicle in the amount of about 15%–50% of the weight of said mixture.

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4,992,191

SPHERE-LIKE MAGNETITE PARTICLES AND A PROCESS FOR PRODUCING THE SAME

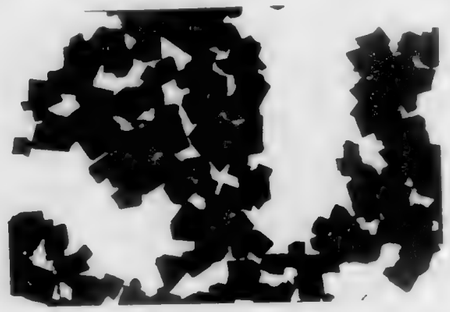
Keiso Mori, Hiroshima; Masaru Kawabata, Saeki; Masao Kunishige, Hiroshima; Nanao Horiishi, Hiroshima, and Koji Toda, Hiroshima, all of Japan, assignors to Toda Kogyo Corporation, Hiroshima, Japan

Continuation of Ser. No. 45,809, Apr. 29, 1987, abandoned, which is a continuation of Ser. No. 714,676, Mar. 21, 1985, abandoned. This application Jan. 11, 1989, Ser. No. 296,280

Claims priority, application Japan, Dec. 27, 1984, 59-279558

Int. Cl.[5] H01F *1/11*

U.S. Cl. 252—62.59 2 Claims



(×30,000)

1. Substantially spherical magnetite particles suitable for use as magnetic toners, having an apparent density of from 0.40 to 1.00 g/cm^3, an oil absorption value of 15 to 21 ml/100 g, a tinting strength (L value) of 33.0 to 37.1, and being thermally stable with respect to the magnetic properties and discoloration of the particles when exposed to temperatures at which the particles lose their magnetic properties and discolor during the production and development of the magnetic toners, and containing from 0.1 to 5.0 atomic % of Si to Fc, said Si being contained in the particles.

4,992,192

ELECTRORHEOLOGICAL FLUIDS

Syed M. Ahmed, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 21, 1989, Ser. No. 341,451

Int. Cl.[5] C10N *169/04*, C09K *3/00*

U.S. Cl. 252—73 29 Claims

1. An electrorheological fluid comprising a dispersion in a non-polar electrically insulating liquid of polymer particles consisting essentially of a hydrophobic polymer core and a neutralized hydrophilic polymer shell around said core, said polymer particles containing a polar liquid.

4,992,193

GRANULAR DETERGENT COMPOSITION INCLUDING SOAP NOODLES THAT CONTAIN FREE FATTY ACID TO IMPROVE DISSOLUTION

Elbed H. Evans, Clwyd, Great Britain, assignor to Lever Brothers Company, New York, NY

Continuation of Ser. No. 109,899, Oct. 19, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 318,499

Claims priority, application United Kingdom, Oct. 24, 1986, [illegible]

Int. Cl.[5] C11D *9/04, 9/48, 10/04, 17/06*

U.S. Cl. 252—92 8 Claims

1. A particular detergent composition comprising one or more anionic and/or nonionic non-soap detergent-active compounds and one or more detergency builders, characterized in that the composition additionally comprises from 0.5 to 10% by weight of the composition of noodles consisting essentially of:

(i) from 63 to 88% by weight of one or more soaps of C_8–C_{20} fatty acids;

(ii) from 2 to 15% by weight or more C_8–C_{20} fatty acids to improve the dissolution properties of the noodles;

(iii) from above 2.0 to 5% by weight of one or more inorganic salts to reduce the tendency of the noodles to bunch together;

(iv) optionally from 0 to 0.1% by weight of one or more dyestuffs; and

(v) from 6 to 16% by weight of water.

4,992,194

STABLY SUSPENDED ORGANIC PEROXY BLEACH IN A STRUCTURED AQUEOUS LIQUID

Patricia Liberati, Valley Cottage, NY; Jack T. McCown, Creskill, NJ; and Michael Aronson, W. Nyack, NY., assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,946

Int. Cl.[5] C11D *3/37, 3/39*

U.S. Cl. 252—99 11 Claims

1. A structured aqueous heavy duty cleaning composition comprising:

(1) about 1 to 40% by weight of a solid, particulate, substantially water-insoluble organic peroxy acid;

(2) about 10 to 50% by weight of a surfactant;

(3) about 1 to 40% by weight of a pH adjusting system comprising:

(a) a borate and;

(b) a polyol wherein said polyol is a Cis 1,2 polyol capable of forming a complex with said borate when said composition is in a concentrated form to cause a reduction in pH of said composition to a value of about 3–6 and said complex being capable upon dilution of said composition, of dissociating in dilute solution to liberate said borate to cause an increase in pH in said dilute solution to a value of about 7–9 said polyol to borate being present in a ratio of 1:1 to 10:1; and

(4) 0.1 to 5% of a stability enhancing polymer which is a copolymer of a hydrophilic and a hydrophobic monomer, said hydrophilic monomer being selected from the group consisting of the acid or salt derivatives of maleic anhydride, acrylic acid, methacrylic acid and analogues of acrylic acid where the carboxylate group is replaced by anionic moieties selected from the group consisting of sulfonate, sulfate, phosphonate and mixtures thereof; said hydrophobic monomer being a hydrophilic monomer functionalized with a hydrophobic moiety selected from the group consisting of fatty amides, fatty esters, fatty alkoxylates, $C_{8\text{-}22}$ alkyls, alkylaryls and mixtures thereof or a $C_{8\text{-}22}$ alklyl or alkylaryl chain formed by reaction with an 60-olefin.

4,992,195

DISHWASHING COMPOSITION

Michael J. Dolan, Manchester, and Frank P. Jakse, Florissant, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 10, 1988, Ser. No. 231,325

Int. Cl.[5] C11D *17/04;* D06M *13/46*

U.S. Cl. 252—99 21 Claims

1. An aqueous slurry automatic dishwashing composition comprising a hypohalite bleach forming agent selected from the group consisting of alkali metal and alkaline earth metal hypohalites in aqueous solution, sulfamic acid or a water soluble salt thereof, a stabilizing agent and a detergent builder wherein the molar ratio sulfamic acid or equivalent to said bleach forming agent is 1:1 to 3:1.

4,992,196

SILICONATE TREATED SODIUM TRIPOLYPHOSPHATE FOR LIQUID DETERGENT FORMULATIONS

Daniel Joubert, Trevoux, and Philippe Jost, Taluyers, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 18, 1989, Ser. No. 381,271

Claims priority, application France, Jul. 20, 1988, 88 09794

Int. Cl.[5] B01F *3/20;* C09K *3/18;* C11D *7/16, 9/36*

U.S. Cl. 252—135 11 Claims

1. A process for the preparation of a sodium tripolyphosphate having 0.2 to 2% by weight of siliconate a phase 1 content of at least 50%, a mean particle diameter ranging from 80 to 200 microns and a water content in the form of crystals of sodium tripolyphosphate hexahydrate ranging from 0.8 to 6%, by weight, said process comprising spraying an aqueous solution containing between 5 and 50% by weight of siliconate onto a sodium tripolyphosphate containing at least 50% of phase and having a particle diameter distribution ranging from 600 to 2,500 microns; and grinding the hydrated tripolyphosphate containing the siliconate to a mean particle diameter ranging from 80 to 200 microns.

5. A sodium tripolyphosphate comprising 0.2 to 2% by weight of siliconate and having a phase 1 content of at least 50%, a mean particle diameter ranging from 80 to 200 microns, and a water content in the form of crystals of sodium tripolyphosphate hexahydrate ranging from 0.8 to 6%, by weight, wherein said tripolyphosphate is obtained by spraying an aqueous solution containing between 5 and 50% by weight of siliconate onto a sodium tripolyphosphate containing at least 50% of phase 1 and having a particle diameter distribution ranging from 600 to 2,500 microns; and grinding the hydrated tripolyphosphate containing the siliconate to a mean particle diameter ranging from 80 to 200 microns.

4,992,197

AQUEOUS GLASS CLEANING COMPOSITION COMPRISING PHOSPHORIC ACID AND ETHANOLAMINE

Hermann J. Huber, 3, Melbourne Road, Teddington, Middlesex, England

Filed May 25, 1989, Ser. No. 356,969

Claims priority, application United Kingdom, May 27, 1988, 8812679

Int. Cl.[5] C11D *7/50, 7/00, 7/08;* C09D *9/00*

U.S. Cl. 252—148 8 Claims

1. A glass cleaning composition comprising an aqueous solution having a pH value greater than about 2 but not greater than 4, the composition including an anionic surface active agent, phosphoric acid and an ethanolamine to combine as a buffer with one valency of the phosphoric acid, the phosphoric acid being present in an amount by weight relative to the ethanolamine of about 1.13–3.4:1 and the anionic surface active agent being present in an amount by weight relative to the phosphoric acid of about 0.5–2:1.

4,992,198

DETERGENT COMPOSITION CONTAINING CLATHRATE GRANULES OF A PERFUME-CLATHRATE COMPOUND

Tutomu Nebashi; Shinichi Yabe; Fumio Sai, all of Tochigi; Yu Izumi, and Takashi Fujieda, both of Chiba, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 297,842

Claims priority, application Japan, Jan. 19, 1988, 63-9163; Jan. 29, 1988, 63-19254

Int. Cl.[5] C11D *3/50;* A61K *7/46*

U.S. Cl. 252—174.11 12 Claims

1. A high-density, granular, concentrated detergent composition comprising a detergent component(s) and clathrate granules of a perfume clathrated with cyclodextrin or a derivation thereof, said detergent component(s) comprising 25 to 50% by weight of an anionic surfactant and said clathrate granules comprising 20 to 80 parts by weight of a perfume-clathrate powder, 5 to 35 parts by weight of polyethylene glycol binder having a molecular weight of 1,500 to 20,000 and 15 to 50 parts by weight of Glauber's salt.

4,992,199

PROCESS FOR PAINT DETACKIFYING AND SEDIMENTATION

Arnold Meyer, St. Michaelisdonn; Klaus F. Noweck, Brunsbuttel; Jan L. Schiefler, Hamburg, all of Fed. Rep. of Germany, and Anders Svensson, Vaxjo, Sweden, assignors to Condea Chemie GmbH, Brunsbuttel, Fed. Rep. of Germany

Filed May 16, 1989, Ser. No. 352,294

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817251

Int. Cl.[5] C23D *17/00;* B08B *7/00;* C11D *7/00*

U.S. Cl. 252—180 5 Claims



1. A process for paint detackification and sedimentation, comprising the step of:

adding a composition comprising from 60% to 80% by weight of alumina in a form selected from the group consisting of boehmite and a pseudo-boehmite, in an x-ray amorphous form or crystallite size of 20 to 150 Å and respectively 20–40% water which is at least partially crystallographically or physically bound as a 5–30% of aqueous dispersion or a dry form, to the circulating water of a paint spraying booth, in a quantity of 1–10% by weight based on 1 kg of paint to be detackified, said percentage by weight based on the total weight of the composition.

4,992,200

RECOVERY OF PRECIOUS METALS

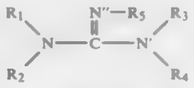
Wilson L. Lin, Plymouth; Phillip L. Mattison, New Brighton, and Michael J. Virnig, Fridley, all of Minn., assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 945,127, Dec. 22, 1986, abandoned, which is a division of Ser. No. 819,778, Jan. 16, 1986, Pat. No. 4,814,007. This application Oct. 21, 1988, Ser. No. 262,228

Int. Cl.[5] C01B *31/16;* C09K *3/00*

U.S. Cl. 252—184 6 Claims

1. A precious metal complex of a guanidine compound, said precious metal being selected from the group consisting of silver and gold and said guanidine compound having a pKa greater than 12 and having the formula



wherein R_1 through R_5 is selected from the group consisting of

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H and aromatic and aliphatic hydrocarbon groups containing up to 25 carbon atoms, and provided further that

(a) R_1 through R_5 may be the same or different groups;
(b) no more than one group is aromatic;
(c) at least one of the R groups R_1 through R_5 is an aliphatic hydrocarbon group containing at least 8 carbon atoms;
(d) no more than 3 of the R groups R_1 through R_5 is greater than 10.

4,992,201

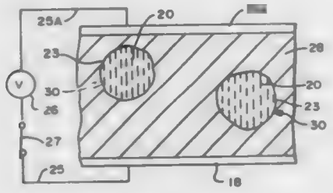
LATEX ENTRAPPED NCAP LIQUID CRYSTAL COMPOSITION, METHOD AND APPARATUS

Kenneth N. Pearlman, San Jose, Calif., assignor to Taliq Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 705,209, Feb. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 591,433, Mar. 20, 1984, abandoned. This application Mar. 16, 1988, Ser. No. 171,135

Int. Cl.[5] C09K *19/00*

U.S. Cl. 252—299.1 **31 Claims**



1. A composition comprising a suspension of latex particles in an aqueous medium wherein said latex particles are insoluble in said medium and an operationally nematic liquid crystal material dispersed in said medium wherein said medium after it has dried induces a generally distorted alignment of said liquid crystal material which in response to said alignment at least one of scatters and absorbs light and which in response to a prescribed input reduces the amount of such scattering or absorption.

4,992,202

NON-LINEAR OPTICS

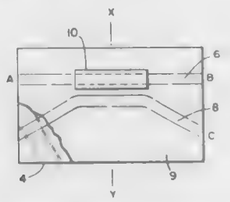
Simon Allen, Cheadle Hulme; Paul F. Gordon, and John O. Morley, both of Rochdale, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 10,611, Feb. 4, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 420,719

Claims priority, application United Kingdom, Feb. 4, 1986, 8602706

Int. Cl.[5] C09K *19/54*

U.S. Cl. 252—299.5 **7 Claims**



1. An optical element having non-linear optical properties comprising a compound selected from the group consisting of:
1-amino-4-(4-nitrophenyl)-pyrazoline;
1-(4-aminophenyl)-3-(4-nitrophenyl)-pyrazoline;
1-phenyl)-3-(4-nitrophenyl)-pyrazoline;
1-phenyl-3-(4-cyanophenyl)-pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-dimethylamino-1-naphthyl)-3-(4-nitrophenyl)pyrazoline;
1-(6-dimethylamino-1-hexa-1,3,5-trienyl)-3-(4-nitrophenyl)-pyrazoline;
1-(4-morpholinophenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-fluorophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-formylphenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-carboxyphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-methylthiophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-phenylthiophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-4'-dimethylaminophenylthiophenyl)-3-(4-cyanophenyl)-pyrazoline;
1-(4-methoxyphenyl)-3-(4-isocyanophenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-acetylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-methoxycarbonylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-phenyliminomethylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-nitrophenylvinyl)-5-(4-nitrophenyl)pyrazoline;
1-methoxy-3-(2-nitrovinyl)pyrazoline;
1-(4-2'-methylbutoxyphenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(2-4'-nitrophenylvinyl)pyrazoline; and
1-(4-dimethylaminophenyl)-3-(2-4'-nitrophenylvinyl)pyrazoline

1. An optical element having non-linear optical properties comprising a compound selected from the group consisting of:
1-amino-4-(4-nitrophenyl)-pyrazoline;
1-(4-aminophenyl)-3-(4-nitrophenyl)-pyrazoline;
1-phenyl)-3-(4-nitrophenyl)-pyrazoline;
1-phenyl-3-(4-cyanophenyl)-pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-dimethylamino-1-naphthyl)-3-(4-nitrophenyl)pyrazoline;
1-(6-dimethylamino-1-hexa-1,3,5-trienyl)-3-(4-nitrophenyl)-pyrazoline;
1-(4-morpholinophenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-fluorophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-formylphenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-carboxyphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-methylthiophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-phenylthiophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-4'-dimethylaminophenylthiophenyl)-3-(4-cyanophenyl)-pyrazoline;
1-(4-methoxyphenyl)-3-(4-isocyanophenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-acetylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-methoxycarbonylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-phenyliminomethylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-nitrophenylvinyl)-5-(4-nitrophenyl)pyrazoline;
1-methoxy-3-(2-nitrovinyl)pyrazoline;
1-(4-2'-methylbutoxyphenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(2-4'-nitrophenylvinyl)pyrazoline; and
1-(4-dimethylaminophenyl)-3-(2-4'-nitrophenylvinyl)pyrazoline;
the molecules of said compound being aligned so that the element has a net non-centrosymmetry.

4,992,203

NON-LINEAR OPTICS

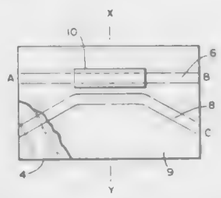
Simon Allen, Cheadle Hulme; Paul F. Gordon, and John O. Morley, both of Rochdale, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 10,634, Feb. 4, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 420,720

Claims priority, application United Kingdom, Feb. 4, 1986, 8602706

Int. Cl.[5] C09K *19/54*

U.S. Cl. 252—299.5 **6 Claims**



1. An optical element having non-linear optical properties comprising a compound selected from the group consisting of:
1-amino-4-(4-nitrophenyl)-pyrazoline;
1-(4-aminophenyl)-3-(4-nitrophenyl)-pyrazoline;
1-phenyl)-3-(4-nitrophenyl)-pyrazoline;
1-phenyl-3-(4-cyanophenyl)-pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-dimethylamino-1-naphthyl)-3-(4-nitrophenyl)pyrazoline;
1-(6-dimethylamino-1-hexa-1,3,5-trienyl)-3-(4-nitrophenyl)-pyrazoline;
1-(4-morpholinophenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-fluorophenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-formylphenyl)pyrazoline;
1-(4-dimethylaminophenyl)-3-(4-carboxyphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-methylthiophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-phenylthiophenyl)-3-(4-cyanophenyl)pyrazoline;
1-(4-4'-dimethylaminophenylthiophenyl)-3-(4-cyanophenyl)-pyrazoline;
1-(4-methoxyphenyl)-3-(4-isocyanophenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-acetylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-methoxycarbonylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-phenyliminomethylphenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(4-nitrophenylvinyl)-5-(4-nitrophenyl)pyrazoline;
1-methoxy-3-(2-nitrovinyl)pyrazoline;
1-(4-2'-methylbutoxyphenyl)-3-(4-nitrophenyl)pyrazoline;
1-(4-methoxyphenyl)-3-(2-4'-nitrophenylvinyl)pyrazoline; and
1-(4-dimethylaminophenyl)-3-(2-4'-nitrophenylvinyl)pyrazoline
the molecules of said compound being aligned so that the element has a net non-centrosymmetry.

4,992,204

IRRADIATION DETECTION AND IDENTIFICATION METHOD AND COMPOSITIONS USEFUL THEREIN

Edward W. Kluger, Pauline; Patrick D. Moore, Pacolet; John B. Hines, and John G. Lever, both of Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 22, 1989, Ser. No. 397,079

Int. Cl.[5] C09K *11/02*

U.S. Cl. 252—301.16 **35 Claims**

1. A method for tagging one or a mixture of natural or synthetic materials comprising contacting the same with one or a mixture of substantially colorless tagging compounds, each of which is comprised of one or more non-ionic luminophore moieties (L) attached to at least one poly(oxyalkylene) moiety (—Y) by means of linking moiety (—X) selected from a convalent bond, —O—, —S—, —CON(R_1)—, —SO_2N(R_1)—, —COO—, —N(R_2)—, —N—, or 1, 2, 5-triazin-2, 4-diylamino, wherein R_1, is selected from hydrogen, Y, unsubstituted or substituted alkyl, cycloalkyl, or phenyl, wherein R_2 is selected from R_1, or —SO_2R_3, wherein R_3 is selected from unsubstituted or substituted alkyl, cycloalkyl or phenyl; wherein said tagging compound has substantial UV radiation absorbance within the range of from about 300 to about 400 nm and reemits substantial visible light, said contacting effecting at least a temporary association between said material and said compound, and wherein said compound is present in an amount between about 0.0001 and about 10 percent by weight of said material.

4,992,205

TITANIUM ACTIVATED HAFNIA AND/OR ZIRCONIA HOST PHOSPHOR CONTAINING INDIUM

Philip S. Bryan, Webster; Patrick M. Lambert; Christine M. Towers, both of Rochester, and Gregory S. Jarrold, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 437,866, Nov. 16, 1989. This application Jun. 27, 1990, Ser. No. 544,568

Int. Cl.[5] C09K *11/67*

U.S. Cl. 252—301.40 F **12 Claims**

1. A phosphor capable of absorbing X-radiation and emitting longer wavelength radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide and/or zirconium dioxide host consisting essentially of oxygen and combined elements satisfying the relationship

$$DTi_xM_yIn_w$$

wherein
D represents at least one of zirconium and hafnium ions;
M represents at least one alkali metal;
w is in the range of from 1×10^{-6} to 5×10^{-3};
x is in the range of from 3×10^{-4} to 1.0; and
y is up to 1;
the phosphor exhibiting reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent indium.

2. A phosphor capable of absorbing X-radiation and emitting longer wavelength radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide and/or zirconium dioxide host consisting essentially of oxygen and combined elements satisfying the relationship

$$DTi_xM_yIn_wNd_v$$

wherein
D represents at least one of zirconium and hafnium ions;
M represents at least one alkali metal;
v is in the range of from 5×10^{-8} up to 5×10^{-4};
w is in the range of from 1×10^{-6} to 5×10^{-3};
x is in the range of from 1×10^{-4} to 1.0; and
y is up to 1;
the phosphor exhibiting reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent neodymium.

4,992,206

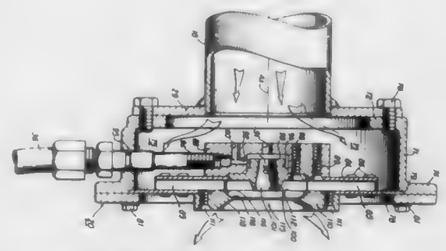
AEROSOL GENERATOR APPARATUS AND METHOD OF USE

J. David Waldrop, Valdosta, Ga., assignor to Lowndes Engineering Co., Inc., Valdosta, Ga.

Filed Nov. 1, 1988, Ser. No. 265,527

Int. Cl.[5] B05B *7/10;* **C09K** *3/30*

U.S. Cl. 252—305 **15 Claims**



1. An aerosol generator for dispensing fluid in a primary air stream to form a fog having finely divided droplets of said fluid entrained therein comprising an air blower means for producing a primary air stream, duct means connected to said blower means and including an outlet end, a nozzle assembly having a housing and a discharge means for discharging said fog, said housing defining an air receiving chamber communicating with said outlet end and said discharge means, a block enclosed in said housing, said block defining a first passage for introducing a secondary air stream into said fluid, said first passage communicating with said air receiving chamber and said discharge means, said block defining a fluid receiving chamber communicating with said first passage, said block defining a second passage communicating between said air receiving chamber and said fluid receiving chamber fluid introduction means connected to said fluid receiving chamber for introducing fluid therein, said second passage directing a tertiary air stream into said fluid receiving chamber, thereby preventing entrance of said fluid into said nozzle assembly when the introduction of said fluid into said fluid introduction means is interrupted.

12. A method of selectively dispersing fluid through a fluid delivery system in a primary air stream to form a fog having finely divided droplets of said fluid entrained therein comprising the steps of

(a) moving said primary air stream in at least one inwardly and then outwardly flaring spiral path about a straight axis and into the atmosphere;
(b) moving a secondary air stream through a first passage and simultaneously moving a tertiary air stream through a second passage;
(c) injecting an ultra thin film of said fluid into said primary air stream along said axis to cause said primary air stream to shear said film into finely divided droplets of fluid entrained in said primary air stream for dispensing same; and

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(d) stopping the flow of said fluid while maintaining the flow of said primary, secondary and tertiary air streams for holding said fluid in said fluid delivery system with said tertiary air stream.

4,992,207

COMPOSITION FOR EXTRACTION OF METAL IONS AND OXANIONS

Dennis W. Darnall; M. Dale Alexander; Michael Henzl; Benjamin Greene; Michael Hosea, and Robert A. McPherson, all of Las Cruces, N. Mex., assignors to Bio-Recovery Systems, Inc., Las Cruces, N. Mex.

Continuation-in-part of Ser. No. 677,148, Dec. 3, 1984, abandoned. This application Aug. 5, 1985, Ser. No. 762,658

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—315.6 4 Claims

1. A composition useful in extraction of metal ions and oxoanions from aqueous solutions consisting essentially of a silica gel polymerized in combination with a metal- or oxoanion-binding effective amount of cells of a unicellular green or blue green alga.

4,992,208

STABILIZATION OF SOLID SODIUM CHLORIDE AGAINST MUSHING IN AN AQUEOUS MEDIUM

Donald T. Ireland, Delano, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 62,724, Jun. 15, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,965

Int. Cl.[5] C02F *5/14*

U.S. Cl. 252—363.5 13 Claims

1. A method of softening water and to prevent mushing and bridging of a plurality of solid pelletized sodium chloride pellets into a mass in an aqueous medium of a water softener, the method comprising:

mixing the sodium chloride pellets with the aqueous medium in the water softener, the sodium chloride pellets prepared by mixing from about 0.01 to about 3.0 percent by weight, based upon the weight of solid sodium chloride, of an anti-mushing agent with non-pelletized solid sodium chloride to provide a non-pelletized solid sodium chloride anti-mushing agent mixture, the anti-mushing agent selected from the group consisting of sodium hexametaphosphate, sodium metaphosphate, trisodium phosphate, sodium tripolyphosphate, disodium ethylenediaminetetraacetic acid or mixtures thereof; and

pelletizing the non-pelletized solid sodium chloride anti-mushing mixture to provide pellets of the sodium chloride mixture which pellets will substantially maintain their shape in the aqueous medium of a water softener.

4,992,209

METHOD FOR INHIBITING CORROSION IN COOLING SYSTEMS AND COMPOSITIONS THEREFOR, CONTAINING A NITRITE CORROSION INHIBITOR AND BROMOSULFAMATE

Eugene B. Smyk, Coal City; Chris R. Smyrniotis, St. Charles, and Christopher L. Wiatr, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 26, 1989, Ser. No. 427,535

Int. Cl.[5] C23F *11/08*

U.S. Cl. 252—387 5 Claims

1. A method of inhibiting corrosion comprising adding to a cooling system containing a nitrite corrosion inhibitor of an effective amount of bromosulfamate as a bactericide and fungicide.

4,992,210

CRUDE OIL DESALTING PROCESS

Dennis P. Naeger, and Joseph J. Perugini, both of The Woodlands, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 9, 1989, Ser. No. 321,424

Int. Cl.[5] C10G *19/02*

U.S. Cl. 252—389.62 5 Claims

1. A composition to remove corrosive contaminants, comprising HCl, from crude oil in a desalter comprising an organic amine and potassium hydroxide in a water soluble solvent, said organic amine having a pKb of from 2 to 6 and having organic groups containing from 1 to 18 carbon atoms per nitrogen.

4,992,211

ALKYLENE OXIDE-CONTAINING AMPHOTERIC SURFACTANTS

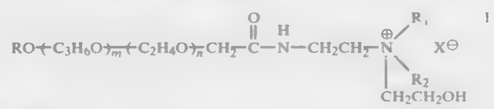
Robert V. Casciani, Charlotte, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 278,070, Nov. 30, 1988. This application Nov. 21, 1989, Ser. No. 439,723

Int. Cl.[5] C11D *7/32;* A01K *7/06;* C07C *67/02, 225/00*

U.S. Cl. 252—541 13 Claims

1. A compound of the formula I:



where

R is C_6-C_{22} straight or branched chain alkyl or a group R^1—C_6H_4—, where R' is C_6-C_{16} straight or branched chain alkyl;

R_1 is —CH_2COOM, where M is hydrogen or a cation selected from alkali metal, alkaline earth metal, ammonium, mono-, di- and tri-C_2-C_4alkanolammonium and mono-, di-, tri- and tetra- C_1-C_4alkylammonium;

R_2 is hydrogen or —CH_2COOM, where M is as defined above;

m is 0 or an integer 1 to 10;

n is an integer 2 or 15; and

$X\ominus$ is an anion,

or a mixture of said compounds.

4,992,212

ALKALINE LIGHT DUTY LIQUID DETERGENTS THAT ARE NON-STAINING TO ALUMINUM

Robert J. Corring, Rockaway Township; Vincent Lamberti, Upper Saddle River, both of N.J., and Michael P. Aronson, West Nyack, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 18, 1988, Ser. No. 259,072

Int. Cl.[5] C11D *3/04, 1/18;* C23F *11/00;* C23G *1/18*

U.S. Cl. 252—542 4 Claims

1. A cleaning composition comprising:

(a) 1–10% of an amine having a pKa greater than 9;

(b) 0.1–4% of a zinc salt selected from the group consisting of zinc halides, zinc sulfate, zinc nitrate, and organic salts of zinc;

(c) 0.1–10% of a complexing agent which is glycine;

(d) 0.2–30% of an anionic surfactant;

(e) 0.005–0.2% of benzotriazole, oxazoles and triazoles; and

(f) water, the composition having a pH of 9–11.

3. A method of cleaning a soiled aluminum surface without causing significant corrosion thereof which comprises applying to said surface a cleaning composition or aqueous solution thereof, said composition comprising:

(a) 1–10% of an amine having a pKa greater than 9,

(b) 0.1–4% of a zinc salt, selected from the group consisting of zinc halides, zinc sulphate, zinc nitrate and organic salts of zinc,

(c) 0.1–10% of a complexing agent which is glycine,

(d) 0.2–30% of an anionic surfactant,

(e) 0.005–0.2% of benzotriazole; and

(f) water,

the composition having a pH of 9–11, and thereafter rinsing said surface.

4,992,213

CLEANING COMPOSITION, OIL DISPERSANT AND USE THEREOF

G. Troy Mallett, 208 Edie Ann Dr., Lafayette, La. 70508; Edward E. Friloux, 204 Notre Dame Dr., Lafayette, La. 70506, and David I. Foster, 6914 Windmill Ln., Lake Charles, La. 70605

Filed Jun. 23, 1989, Ser. No. 370,823

Int. Cl.[5] B01F *3/08, 17/28;* C11D *1/94, 3/43*

U.S. Cl. 252—546 8 Claims

1. An aqueous composition suitable for use as a cleaning agent or as an oil dispersant, comprising:

sodium lauryl sulfate, from 0.02% to 2.25% by total weight;

cocamidopropyl betaine, from 0.02% to 1.95% by total weight;

ethoxylated nonylphenol, from 0.002% to 0.25% by total weight;

lauric acid diethanolamide, from 0.04% to 4.25% by total weight;

diethanolamine, from 0.02% to 1.85% by total weight; and

propylene glycol, from 0.02% to 1.85% by total weight.

6. A method of dispersing oil without destroying microbial genera, which comprises the step of dispersing on oil surface an aqueous solution, comprising:

from 0.02% to 2.25% by total weight of sodium lauryl sulfate;

from 0.02% to 1.95% by total weight of cocamidopropyl betaine;

from 0.002% to 0.25% by total weight of ethoxylated nonylphenol;

from 0.04% to 4.25% by total weight of lauric acid diethanolamide;

from 0.02% to 1.85% by total weight of diethanolamine; and

from 0.02% to 1.85% by total weight of propylene glycol.

4,992,214

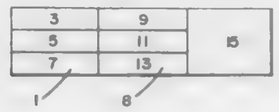
OPTICALLY NONLINEAR AROMATIC CARBOXYLIC ACID COMPLEXES

Margaret C. Etter, St. Paul, and Gayle M. Frankenbach, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

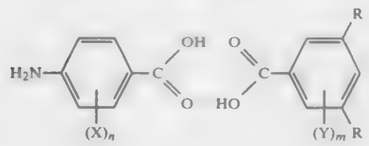
Filed Oct. 13, 1988, Ser. No. 256,973

Int. Cl.[5] F21V *9/04, 9/06*

U.S. Cl. 252—587 10 Claims



1. A crystalline complex of the formula:



wherein each R is CN or NO_2, n is 1–4, m is 1–3, each X is individually (C_1–C_3)alkyl, (C_1–C_3)alkanoyl, (C_1–C_3)alkoxycarbonyl, aryl, ar(C–C_5)alkyl, (C_1–C_3)alkoxy, hydroxy, halo or H, each Y is individually (C_1–C_3)alkyl, (C_1–C_3)alkanoyl, (C_1–C_3)alkoxycarbonyl aryl, ar(C_1–C_5)alkyl, (C_1–C_3)alkoxy, 4-hydroxy or halo, and —C—OH O=C— represents an intermediate hydrogen bond; wherein said complex generates a nonlinear optical response.

4,992,215

POLYMER FIRE RETARDANT

Raymond W. Green, Vancouver, Canada, assignor to Tag Investments, Inc., Vancouver, Canada

Filed Oct. 31, 1988, Ser. No. 265,220

Int. Cl.[5] C09K *21/00*

U.S. Cl. 252—609 6 Claims

6. A method of preparing a fire retardant additive for synthetic polymeric materials comprising preparing a solid composition precipitated from a mixture of three reagents each selected respectively from the group consisting of:

(a) about 30% to 70% of the total weight of the mixture of one of the following oxyacids: phosphoric acid, ammonium dihydrogen phosphate, diammonium hydrogen sulfate, or a mixture of these oxyacids;

(b) about 30% to 70% of the total weight of the mixture of one of the following amines: ethylenediamine, p-phenylenediamine, m-xylene-α, α', -diamine, 2,4,6-triamino-1,3,5-triazine, 2-aminopyridine, diethylenetriamine, and urea, or a mixture of these amines; and

(c) about 0.245% to 10% of the total weight of the mixture of one of the following surfactants: sodium lauryl sulfate, polyvidone, alkylbenzenesulfonate, sodium palmitate or a mixture of these surfactants;

which method comprises dissolving the oxyacid in a minimum volume of boiling water, adding the amine and surfactant to the boiling water and oxyacid, heating and stirring the boiling mixture until the solid composition has completely precipitated, filtering the composition from the mixture, and grinding the composition into the fire retardant additive.

4,992,216

METHOD FOR PRODUCING OZONE-CONTAINING WATER

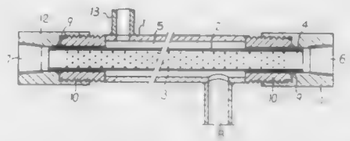
Kozo Saita, Oamishirasato; Hisayuki Kawano, Mobara, and Takeshi Utsuki, Yokosuka, all of Japan, assignors to Ise Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 302,908, Jan. 30, 1989, abandoned. This application Dec. 20, 1989, Ser. No. 455,842

Claims priority, application Japan, Jan. 29, 1988, 63-17170

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—122 12 Claims



1. A method for producing ozone-containing water, which comprises the steps:

(i) flowing an ozone-containing gas through a first passage which is the space between an outer tube and an inner tube disposed in said outer tube; and

(ii) flowing an aqueous liquid through a second passage which is the space in said inner tube, wherein said inner tube possesses a plurality of pores with an average diameter of 2 to 4 microns.

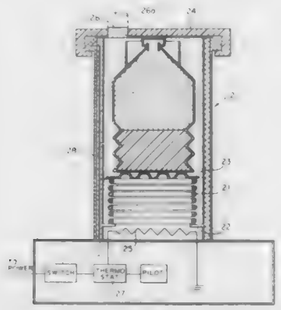
VOL 1123 ISS 2 FE 12 1991 UMI

4,992,217

APPARATUS AND METHOD FOR STERILIZING, DESTROYING AND ENCAPSULATING MEDICAL IMPLEMENT WASTES

Ronald P. Spinello, 523 Post Ave., Westbury, N.Y. 11590

Filed Jun. 9, 1989, Ser. No. 364,978
Int. Cl.[5] A61L *11/00*
U.S. Cl. 264—0.5 **20 Claims**



1. Apparatus for receiving, sterilizing and encapsulating medical implement wastes comprising

a container having a waste receiving space and a volume of a normally solid thermoplastic compound having a temperature-calibrated melting point, and

means to cause the compound in its heated liquid phase to flow into and around the mass of waste in said space to effect biological sterilization and, upon hardening, encapsulation of the waste items in a unitary solid mass.

4,992,218

PROCESS FOR PRODUCING A POLARIZING FILM

Akitoshi Sugio, Ohmiya; Ryozo Kawai, Nagareyama; Masaki Nagata, and Tamaki Kamimura, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 7, 1988, Ser. No. 203,875
Claims priority, application Japan, Jun. 12, 1987, 62-145380
Int. Cl.[5] B29C *55/02, 71/02;* **G02B** *5/30*
U.S. Cl. 264—1.3 **10 Claims**

1. A process for producing a polarizing film, which comprises adsorbing a dichroic dye on a polyvinyl alcohol-type film, subsequently stretching the film substantially in one direction, immersing the stretched film in an aqueous solution containing a metallic ion and boric acid, and subsequently heat treating the stretched film under tension.

6. A process for producing a polarizing film, which comprises adsorbing a dichroic dye on a polyvinyl alcohol film, subsequently immersing the film in an aqueous solution containing a metallic ion and boric acid to impregnate the metallic ion and boric acid in the film, subsequently monoaxially stretching the film in the aqueous solution or in another liquid medium, and then subsequently heat-treating the stretched film under tension.

4,992,219

CHARCOAL BED ASSEMBLY

Pierre P. Meunier, Nepean, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Apr. 27, 1989, Ser. No. 343,510
Claims priority, application Canada, Sep. 20, 1988, 577968
Int. Cl.[5] B29C *65/08, 65/56*
U.S. Cl. 264—23 **4 Claims**

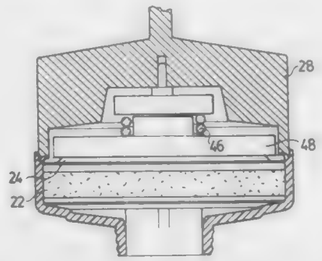
1. A method of securing a bed of charcoal under pressure in a plastic material housing, comprising:

providing a rigid plastic material housing having a cylindrical side wall with a cylindrical outer surface;

placing a bed of particulate charcoal in the housing;

placing a rigid retainer over the bed of charcoal;

locating a compactor on the retainer;



engaging the cylindrical side wall of the housing around the retainer with an ultrasonic welding means at a location spaced inwardly of the cylindrical outer surface;

pressing on the compactor; and

activating the welding means to deform an inner portion of the cylindrical side wall so as to extend over the periphery of the retainer to secure the retainer in the housing.

4,992,220

METHOD FOR PRODUCING BIODEGRADABLE PACKAGING MATERIAL

Michael A. Neri, 48 Flatt Rd., Rochester, N.Y. 14624; Joseph R. DeGeorge, 53 Cascade Rd., W. Henrietta, N.Y. 14586, and William J. Every, 1619 Brighton-Henrietta T.L. Rd., Rochester, N.Y. 14623

Filed Jun. 23, 1989, Ser. No. 370,282
Int. Cl.[5] B29C *39/38*
U.S. Cl. 264—28 **5 Claims**

1. A method for producing a freeze-dried, lightweight, biodegradable packaging product which at room temperature has the consistency of, for example, urethane foam, comprising

boiling a quantity of water,

mixing a quantity of gellable plant extract with the boiling water to form a moldable solution,

pouring said solution into at least one mold and allowing the solution to cool,

freezing the molded solution, and

subjecting the frozen solution to a sublimation process to completely sublimate all moisture therefrom, and to produce a biodegradable product which will retain its molded configuration upon reaching room temperature.

4,992,221

ASYMMETRIC GAS SEPARATION MEMBRANES HAVING IMPROVED STRENGTH

Raymond F. Malon, St. Charles, and Clint A. Cruse, St. John, both of Mo., assignors to Permea, Inc., St. Louis, Mo.

Division of Ser. No. 413,137, Sep. 27, 1989. This application Aug. 24, 1990, Ser. No. 571,817
Int. Cl.[5] D01D *5/247*
U.S. Cl. 264—41 **11 Claims**

1. A process for forming a hollow-fiber, asymmetric, substantially macrovoid-free membrane with potential for gas separation which exhibits increased failure pressure strength, the membrane being comprised of a glassy hydrophobic polymer, the process, comprising:

(a) dissolving the polymer in a solvent system comprised of a strong non-solvent, a weak non-solvent Lewis acid, a solvent Lewis base and a complex formed of Lewis acid and Lewis base, wherein the solvent system has a Hildebrand solubility parameter within about 1.5 $cal^{0.5}/cm^{1.5}$ of the Hildebrand solubility parameter of the polymer, to form a spinning dope containing at least 30% by weight total solids of polymer;

(b) spinning the dope through the orifice of a tube-in-orifice type spinnerette;

(c) injecting coagulation fluid through the tube of the spinnerette;

(d) coagulating the spun dope in a coagulation medium and forming the membrane;

(e) desolvating the formed membrane by washing the membrane in a polar medium; and

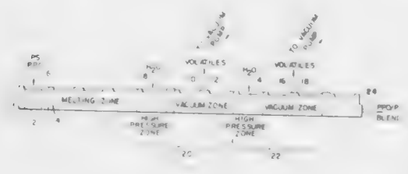
(f) drying the membrane at a temperature from about ambient to about 50° C. below the glass transition temperature of the polymer.

4,992,222

METHOD FOR REMOVING VOLATILE SUBSTANCES FROM POLYPHENYLENE ETHER OR POLYPHENYLENE ETHER/STYRENE RESIN COMPOSITIONS

John P. Banevicius, Slingerlands; Alexandros Hasson, Delmar, and William E. Pecak, Cohoes, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 29, 1988, Ser. No. 291,534
Int. Cl.[5] B29C *47/76*
U.S. Cl. 264—45.9 **36 Claims**



1. A process for the reduction of volatile substances in a composition comprising

(a) a polyphenylene ether resin, alone, or in combination with

(b) a styrene resin, said composition comprising impurities selected from styrene monomer, toluene, volatile odoriferous oxygenated species, sources of volatile odoriferous amines, mixtures of any of them and the like, said process comprising extruding said composition at a temperature above its melting point in one pass in at least two stages, each said stage comprising water injection followed by vacuum venting, the total amount of water being divided between said stages and comprising up to about 15 percent by weight of said composition whereby the devolatilization efficiency of both toluene and trimethylanisole is greater than about 70 percent in comparison with the reduction obtained with the same composition in one pass in a single stage employing the same amount of water.

4,992,223

WATER HEATER CONSTRUCTION AND METHOD OF MAKING SAME

Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Filed Aug. 11, 1989, Ser. No. 392,342
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.5 **2 Claims**

1. A method of constructing a water heater comprising the following steps:

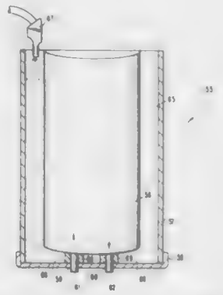
providing an inner water tank which includes a plurality of operational connections extending therefrom;

fabricating enclosing means with a generally cylindrical outer shell and a generally cylindrical cover having connection openings therein, said enclosing means having a size and shape to fit over and around said inner water tank so as to define a clearance space therebetween;

inverting said cover first;

inverting said tank and inserting said operational connections through said connection openings in said generally cylindrical cover;

inverting said cylindrical outer shell and inserting said cylindrical outer shell into said cylindrical cover, whereby said outer shell and said inner water tank define therebetween said clearance space; and



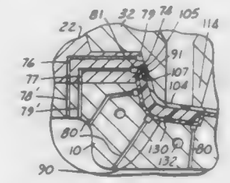
injecting foam-in-place insulation into said clearance space while said cylindrical cover, said outer shell and said inner water tank are inverted so as to foam the portion of said clearance space adjacent the top of the inner water tank first.

4,992,224

METHOD OF MAKING COMPOSITE FOAMED ARTICLES USING FLUID PRESSURE TO POSITION A SKIN LAYER

Harold W. Swenson, Dover, N.H., and Patricia A. Betzig, Gainsville, Fla., assignors to Davidson Textron Inc., Dover, N.H.

Continuation of Ser. No. 245,590, Sep. 19, 1988, abandoned, which is a division of Ser. No. 174,212, Mar. 28, 1988, Pat. No. 4,793,793. This application Dec. 18, 1989, Ser. No. 455,932
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.6 **3 Claims**



1. A method for making a molded foam article comprising:

(a) positioning a layer in a mold cavity of a first mold member with a portion of the layer extending from the mold cavity on a second mold member,

(b) positioning an insert in the mold cavity to form a molding space between the insert and the layer in the mold cavity with a surface on the insert adjacent said portion of the layer,

(c) applying fluid pressure against said portion of the layer on the second mold member to blow said portion off said second mold member for free movement in a direction away therefrom toward the adjacent insert surface to fold said portion over the adjacent insert surface,

(d) moving a mold lid in a direction to press the folded-over portion of the layer against the insert, and

(e) forming foam in the molding space between the layer and

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insert while said portion is folded over and pressed against the insert surface.

4,992,225

WATER CORROSION-RESISTANT CERAMIC OXIDE BODY

Paul Van Diemen, San Jose, Calif., and Kenneth W. Lay, Schenectady, N.Y., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 151,767, Feb. 3, 1988, abandoned. This application Oct. 19, 1988, Ser. No. 260,211
Int. Cl.[5] F27B *9/04*
U.S. Cl. 264—65 32 Claims

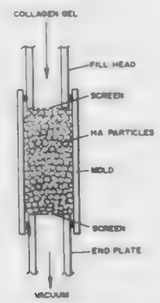
1. A process for producing a sintered body useful as a control rod material in a water cooled nuclear reactor which consists essentially of forming particles of a lanthanide rare earth oxide selected from the group consisting of dysprosium oxide, erbium oxide, europium oxide, gadolinium oxide, samarium oxide and a combination thereof, forming said particles into a compact and sintering the compact at a temperature ranging from about 1500° C. to about 2000° C. to produce a sintered polycrystalline body wherein the outside surface of said body has no significant open porosity and wherein said body has a porosity of less than about 10% by volume of said body.

4,992,226

METHOD OF MAKING MOLDS WITH XENOGENEIC COLLAGEN/MINERAL PREPARATIONS FOR BONE REPAIR

Karl A. Piez, Menlo Park; Bruce B. Pharriss, Palo Alto; George H. Chu, Sunnyvale; Thomas L. Smestad, and Diana Hendricks, both of Palo Alto, all of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Division of Ser. No. 848,443, Apr. 4, 1986, Pat. No. 4,795,467, which is a continuation-in-part of Ser. No. 717,072, Mar. 28, 1985, abandoned. This application Sep. 16, 1988, Ser. No. 245,449
Int. Cl.[5] B27N *3/00*; D04H *3/00*
U.S. Cl. 264—109 4 Claims



1. A process for coating the pores in a porous calcium phosphate mineral material with collagen, which process comprises pumping a collagen dispersion through the mineral material, which material has been placed in a mold, said mold having an inlet port and an outlet port, said ports being capable of permitting the flow of collagen dispersion but preventing the flow of said mineral material,

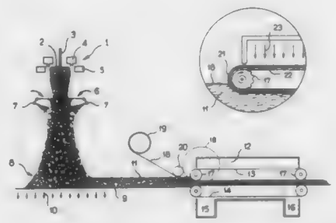
wherein said pumping is conducted by pumping said dispersion into the inlet port through said porous material and out the outlet port.

4,992,227

PROCESS FOR OBTAINING A MINERAL FIBER BASED SURFACED PANEL

Pierre Brossy, Chalon Sur Saone, France, assignor to Isover Saint-Gobain, Courbevoie, France

Filed Dec. 20, 1989, Ser. No. 453,854
Claims priority, application France, Dec. 21, 1988, 88 16895
Int. Cl.[5] C03B *23/20*; B32B *17/12*
U.S. Cl. 264—112 8 Claims



1. Process for manufacturing mineral glass products, comprising the steps of:

spraying mineral wool with a thermosettable organic binder;

placing said sprayed mineral wool on an endless conveyor belt;

forming said sprayed mineral wool into a mattress;

transporting said mineral wool mattress on said conveyor belt to a binder conforming and polymerization chamber, wherein said conforming and polymerization chamber comprises two complimentary calibrating and transport conveyors and a hot gas current circulation means for circulating hot gas through said mineral wool mattress;

compressing said mattress between said conveyors while said mattress is within said conforming and polymerization chamber, said calibrating and transport conveyors comprising a plurality of pallet type articulated perforated elements; and

driving the two calibrating and transport conveyors at different speeds, the difference in speed between said two conveyors corresponding along the length of said conforming and polymerization chamber, to a staggering of a length equivalent to at least the width of one of said pallets, so that one of the faces of the mattress is smoothed during conformation of the mineral wool product.

4,992,228

METHOD FOR PREPARING PREFORMS FOR MOLDING PROCESSES

Henry G. Heck, Bühl, Fed. Rep. of Germany, and Warren D. White, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1989, Ser. No. 414,052
Int. Cl.[5] B29C *43/20*, *41/20*
U.S. Cl. 264—135 7 Claims

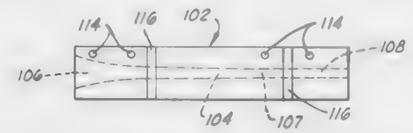
1. A method for preparing preforms which comprises (1) applying substantially evenly onto the surface of each of one or more plys of an unimpregnated substrate material one or more non-sintering thermoplastic-like resinous compounds which are substantially free of any compound which would serve as a crosslinker for said thermoplastic-like, solid resinous compound, said resinous compound being in the form of a powder having a particle size of less than about 500 microns and having a melting point of from about 50° C. to about 70° C. in an amount of from about 2 to about 12 percent by weight based upon the weight of said substrate material; (2) fusing said powdered thermoplastic-like resinous compound into a film on the surface of said substrate material: (3) cooling said resinous material: (4) assembling one or more plies of the thus treated substrate material and conforming said plies of said treated substrate material into a desired shape: (5) subjecting the thus shaped plies of treated substrate material at a temperature sufficient to melt said resinous compound; and (6) cooling said shaped treated plies of substrate material to a temperature below the melting point of said resinous compound; thereby forming a preshaped preform for use in molding processes as reinforcing material.

4,992,229

THERMOPLASTIC RE-PULTRUSION

William H. Beever, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 14, 1989, Ser. No. 311,132
Int. Cl.[5] B29C *55/30*, *67/14*
U.S. Cl. 264—280 15 Claims



1. A process for re-shaping a previously pultruded elongated thermoplastic article having a particular longitudinal cross-sectional area and a particular longitudinal cross-sectional configuration into a new elongated thermoplastic article having approximately the same longitudinal cross-sectional area but a substantially different longitudinal cross-sectional configuration comprising:

pulling said previously pultruded article into an elongated die, said die comprising a final forming zone having a longitudinal cross-sectional area approximately equal to the longitudinal cross-sectional area of said article and a longitudinal cross-sectional configuration substantially different from the longitudinal cross-sectional configuration of said article;

applying sufficient heat to said previously pultruded article to soften said article sufficiently to permit it to be reshaped; and

pulling said previously pultruded article through said final forming zone of said die whereby said article is re-shaped to have a longitudinal cross-sectional area and a longitudinal cross-sectional configuration approximately equal to the longitudinal cross-sectional area and longitudinal cross-sectional configuration of said final forming zone of said die.

4,992,230

METHOD FOR MAKING A HOLLOW POLYETHYLENE TEREPHTHALATE BLOW MOLDED ARTICLE WITH AN INTEGRAL EXTERNAL PROJECTION SUCH AS A HANDLE

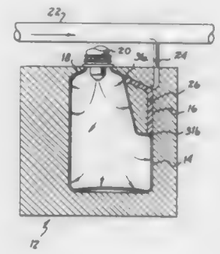
Samuel L. Belcher, Cincinnati, Ohio, assignor to Sabel Plastechs, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 222,186, Jul. 21, 1988. This application Apr. 20, 1990, Ser. No. 511,561
Int. Cl.[5] B29C *45/14*, *49/20*
U.S. Cl. 264—513 4 Claims

3. A method of completely forming from a preform of thermoplastic material and molten thermoplastic material, in a combination mold and in a single stage without intermediate removal of the molded article from a mold, a hollow blow molded article of thermoplastic having an integral injection molded thermoplastic projection bonded to and extending from an exterior wall section thereof which is free of injection molded rings encircling the article and passing through the point where the projection bonds to the exterior wall section thereof, comprising the steps of:

(a) inserting an unblown preform of thermoplastic material into the blow mold cavity of a combination blow mold and injection mold having a hollow article-defining blow mold cavity and a projection-defining injection mold cavity which are physically separate and independent of each other except for communicating at an interface therebetween, wherein the hollow article-defining blow mold cavity has an interior wall surface which defines and corresponds to the entire desired shape of the exterior surface of the hollow article other than at said interface whereat the projection is to be bonded to the exterior wall section of the article, the blow mold being free of relatively movable injection cavity-defining parts which move within the blow mode relative to said injection mold cavity to seal the blow mold and injection mold cavities at the interface, the projection-defining injection mold cavity defines the projection extending from said exterior wall section of the article, and the interface whereat the blow mold and injection mold cavities are in communication with each other corresponding to the location on the article wall from which the projection extends;

(b) closing the combination mold;



(c) injecting blow gas into the interior of said preform when the combination mold is closed and while said preform is at a temperature in the stretch orientation temperature range thereof to conform said preform to the blow mold cavity and produce said article;

(d) injecting molten thermoplastic material into the injection mold cavity after conforming the preform to the blow mold cavity with blow gas and prior to opening the combination mold and exhausting the blow gas and removal of said article from said combination mold, to form an integral injection molded projection bonded to said wall of the hollow blow molded article at the interface whereat the injection mold cavity communicates with the blow mold cavity;

(e) opening the combination mold; and

(f) removing the hollow blow molded article with integral injection molded projection from the combination mold.

4,992,231

EMERGENCY CORE COOLING SYSTEM

Yoshiyuki Kataoka, Toukai; Masanori Naitoh, Hitachi; Takashi Ikeda, Katsuta; Hisamichi Inoue, Takahagi, and Hiroaki Suzuki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,525
Claims priority, application Japan, Mar. 9, 1983, 58-37470
Int. Cl.[5] G21C *15/18*
U.S. Cl. 376—282 20 Claims

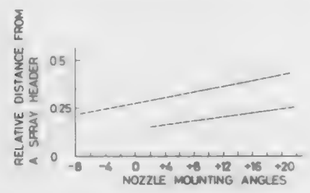
1. An emergency core cooling system for spraying cooling water onto a nuclear reactor core of a nuclear reactor comprising:

at least one header disposed in the nuclear reactor and arranged at an upper and outer circumferential position with respect to the reactor core;

a plurality of spray nozzles mounted on the at least one header so as to define a circumferential row of spray nozzles about the reactor core for spraying cooling water onto the reactor core, the spray nozzles having a center axis, at least one of the plurality of spray nozzles of the row being mounted on the at least one header so that the

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center axis thereof extends upwardly with respect to a horizontal axis and at least one of the remaining plurality of spray nozzles of the row has the center axis thereof



extending downwardly with respect to the horizontal axis; and

means for conducting cooling water to the at least one header.

4,992,232

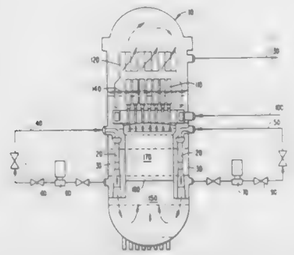
METHOD TO CONTROL N-16 RADIATION LEVELS IN STEAM PHASE BWRS

Robert L. Cowan, II, Livermore; Dragomir Duitna, Fremont; Robert J. Law, Livermore; Chien-Chang Lin; Carl P. Ruiz, both of Fremont, and James L. Simpson, San Jose, all of Calif., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 91,556, Aug. 31, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 380,790

Int. Cl.[5] G21C *1/01*

U.S. Cl. 376—306 **19 Claims**



1. An improved method of utilizing hydrogen water chemistry in a boiling water reactor nuclear power plant, the plant including a reactor which boils water to produce a liquid phase and a steam phase, a turbine for extracting power from the steam phase, a condenser for condensing steam from which power has been extracted, and a feed water system returning the condensed steam as boiler feed water to the reactor, wherein the process of injecting hydrogen into the boiler feed water is utilized to reduce stress corrosion, the improvement comprising the step of reducing the transfer of radioactive gaseous nitrogen compounds from the liquid phase to the steam by inhibiting the formation of said nitrogen compounds in the liquid phase.

4,992,233

SINTERING METAL POWDERS INTO STRUCTURES WITHOUT SINTERING AIDS

Srinivas H. Swaroop, Corning, and Raja R. Wusirika, Painted Post, both of N.Y., assignors to Corning Incorporated, New York, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,986

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—2 **7 Claims**

1. A method of producing an oxidation resistant, hard, porous, sintered body of sinterable metal powder consisting essentially, as analyzed in weight percent, of 5–50% Al, 30–90% Fe, the sum of Al and Fe constituting at least 80% of the total powers, 0–10% Ns, 0–10% Cu, 0–10% Cr, the sum of Sn and Cu and Cr being no more than 20%, in the absence of sintering aids, which method comprises the sequential steps of:

(a) wet mixing the metal powder with organic binder and forming a green body of the resultant mixture,

(b) firing said green body in an oxidizing atmosphere to burn out said binder with some of said metal being consequentially oxidized,

(c) firing said green body in a reducing atmosphere to reduce said oxidized metal, and

(d) firing said green body in a nonoxidizing environment to sinter said metal powder and density said green body into said porous, sintered body.

4,992,234

METHOD FOR THE PREPARATION OF RARE EARTH-BASE PERMANENT MAGNET

Ken Ohashi, and Masanobu Shimao, both of Fukui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 556,254

Claims priority, application Japan, Jul. 24, 1989, 1-191169

Int. Cl.[5] B22F *3/00*

U.S. Cl. 419—23 **8 Claims**

1. A method for the preparation of a permanent magnet of a magnetic alloy comprising a rare earth element, iron and boron which comprises the steps of:

(a) pulverizing an alloy having a chemical composition expressed by the formula

$$R_xFe_{1-x-y-z}B_yM_z$$

in which R is a rare earth element, M is an element selected from the group consisting of aluminum, cobalt, gallium, niobium and zirconium, the subscript x is a positive number in the range from 0.10 to 0.25, the subscript y is a positive number in the range from 0.01 to 0.20 and the subscript z is zero or a positive number not exceeding 0.20, into an alloy powder;

(b) removing particles having a diameter smaller than 2 μm from the alloy powder;

(c) shaping the alloy powder by molding into a green powder compact;

(d) heating the green powder compact to effect sintering at a temperature in the range from 1000° to 1200° C. into a sintered body; and

(e) subjecting the sintered body to a heat treatment at a temperature not lower than 350° C. but lower by at least 50° C. than the temperature at which the green powder compact is sintered in step (c) for a length of time in the range from 30 minutes to 4 hours.

4,992,235

METHOD FOR PRODUCING THERMOELECTRIC ELEMENTS

Takeo Tokiai, and Takashi Uesugi, both of Sodegaura, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

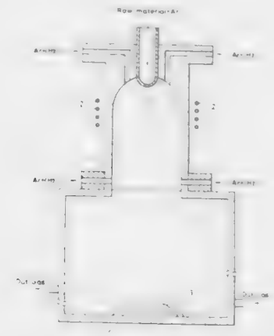
Filed Mar. 23, 1989, Ser. No. 327,592

Claims priority, application Japan, Mar. 30, 1988, 63-78454; Jul. 15, 1988, 63-177795; Jul. 15, 1988, 63-177796

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—23 **9 Claims**

1. In a method for producing thermoelectric elements by molding powders of metal or metal alloy as the raw material and then sintering, the improvement which comprises using ultra fine powders containing Fe and Si as main components and having a mean particle diameter of 50 to 5,000 Å as the raw material, wherein the ultra fine powders are subjected to heat treatment in a reducing gas atmosphere said ultra fine powders being obtained by subjecting said metal or metal alloy to plasma treatment.



4,992,236

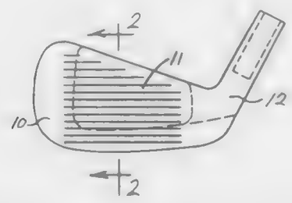
METHOD OF MAKING A GOLF CLUB HEAD AND THE ARTICLE PRODUCED THEREBY

Chester S. Shira, 3634 7th Ave., Apt. 4C, San Diego, Calif. 92103

Filed Jan. 16, 1990, Ser. No 465,831

Int. Cl.[5] B22F *3/26*

U.S. Cl. 419—28 **24 Claims**



1. A method of making a golf club head which comprises filling a mold having the shape of a gold club head with metal powders, said mold optionally containing inserts made from a material selected from the group consisting of castings, wrought metal and green compacts of metal powders and combinations thereof, compressing said material in said mold at a pressure sufficient to form a green compact of said material, removing said thus formed green compact of said material from said mold and then heating said material in said green compact to an elevated temperature sufficient to form a sintered product of said material in said green compact.

4,992,237

IGNITION OF SUSTAINED HIGH TEMPERATURE SYNTHESIS REACTIONS

William A. May, Boulder, Colo., assignor to Amax Inc., Greenwich, Conn.

Filed Jan. 24, 1990, Ser. No. 469,112

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—37 **6 Claims**

1. The process for igniting a mixed powder material compact containing sufficient fuel to support an exothermic reaction between ingredients contained in said compact which comprises contacting said compact in an inert atmosphere with an electric arc produced by an electrode without contacting said compact and thereby initiate said reaction, said arc being applied for a period of about 0.1 to 10 seconds over an arc gap of about $\frac{1}{8}$ to about $\frac{1}{4}$ inch.

4,992,238

PROCESS FOR SHAPING AND IMPROVING THE MECHANICAL PROPERTIES OF BLANKS PRODUCED BY POWDER METALLURGY FROM AN ALLOY WITH INCREASED HIGH-TEMPERATURE STRENGTH BY EXTRUSION

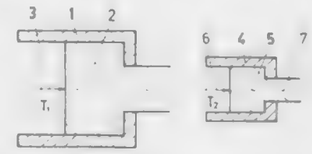
Malcolm Couper, Station-Siggenthal, and Reinhard Fried, Nussbaumen, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jul. 28, 1989, Ser. No. 386,239

Claims priority, application Switzerland, Aug. 2, 1988, 2895/88

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—41 **15 Claims**



1. Process for shaping and improving the mechanical properties of blanks (2) produced by powder metallurgy from an alloy with increased high-temperature strength by hot extrusion, characterized in that the deformation is successively performed in at least two temperature ranges different from one another, and the workpiece is first reduced in its cross section by hot extrusion in a higher temperature range (T_1) and then is further deformed in a lower temperature range (T_2) by hot extrusion, and its cross section is further reduced.

4,992,239

KHARE STEEL

Ashok K. khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Division of Ser. No. 291,509, Dec. 29, 1988, Pat. No. 4,919,735. This application Jan. 24, 1990, Ser. No. 469,139

Int. Cl.[5] C22C *38/14;* **C21D** *9/08*

U.S. Cl. 420—104 **5 Claims**

1. A ferritic alloy steel in weight percentage consisting essentially of from about 0.12% to about 0.22% carbon, about 0.40% to about 0.80% manganese, about 0.025% maximum phosphorus, about 0.025% maximum sulphur, about 0.15% to about 0.40% silicon, about 0.00% to about 0.55% nickel, about 0.80% to about 1.20% chromium, about 0.15% to about 0.60% molybdenum, about 0.03% to about 0.08% vanadium, and balance essentially iron.

4,992,240

ALLOYS BASED ON ZIRCONIUM HAVING PROPORTIONAL AMOUNT OF TIN, IRON, CHROMIUM AND OXYGEN

Kazushi Komatsu; Toshiya Kido; Toshimichi Takahashi; Mitsuru Sugano, and Shigemitsu Suzuki, all of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1989, Ser. No. 359,339

Claims priority, application Japan, Jun. 6, 1988, 63-137433

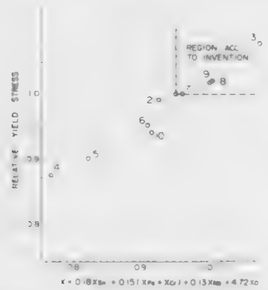
Int. Cl.[5] C21D *1/26*

U.S. Cl. 420—422 **4 Claims**

1. A zirconium alloy containing the elements tin, iron, chromium and niobium, comprising, on weight basis, 0.4–1.2% tin, 0.2–0.4% iron, 0.1–0.6% chromium, a maximum of 0.5% niobium and the balance oxygen and zirconium, wherein the sum of weight proportions of tin, iron and chromium is in the range

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from 0.9 to 1.5%, and the relative yield stress increases with an increase in the sum of the weight percentages of tin, iron,



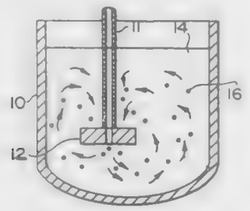
chromium, niobium and oxygen in the alloy while maintaining high corrosion resistance characteristics.

4,992,241

RECYCLING OF METAL MATRIX COMPOSITES

Robert Provencher, Jonquiere, and Gaston Riverin, Chicoutimi, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Mar. 15, 1990, Ser. No. 493,987
Int. Cl.[5] C22C *21/00, 29/00*
U.S. Cl. 420—528 19 Claims



1. A process for recycling an aluminum matrix composite containing solid reinforcing particles, comprising the steps of:
(a) providing a melt of the aluminum matrix composite in a treatment vessel,
(b) heating the melt in said vessel to maintain a temperature in the range of 720–750° C., said heating being conducted such as to avoid unwanted stirring and contamination of the melt,
(c) mixing the melt with a vaned rotary impeller such that no vortex is formed and oxide film is not drawn into the melt,
(d) treating the melt while mixing by injecting a gas through a gas outlet beneath the surface of the melt and near the rotating impeller, said gas comprising a mixture of a major proportion of an inert gas and a minor proportion of a reactive gas, terminating the gas injection after small gas bubbles have been well distributed throughout the melt and thereafter allowing the melt to rest at the temperature of 720–750° C. with at least periodic gentle mixing to keep the reinforcing particles distributed throughout the melt, whereby hydrogen is removed from the melt by diffusion into the gas bubbles and other non-metallic contaminants are lifted into a dross layer by flotation, while the reinforcing particles remain dispersed in the melt, and
(e) skimming the dross layer containing oxide films and other contaminants from the surface of the melt, leaving a purified aluminum matrix composite.

4,992,242

ALUMINUM ALLOY WITH GOOD FATIGUE STRENGTH

Jean-Francois Faure, Voiron, France, assignor to Pechiney Recherche Groupement d'Interet Economique, Paris, France

Division of Ser. No. 409,694, Sep. 20, 1989. This application Jul. 23, 1990, Ser. No. 556,185
Claims priority, application France, Sep. 26, 1988, 88 12982
Int. Cl.[5] C22C *21/08, 21/00, 21/06*
U.S. Cl. 420—535 10 Claims

6. A material retaining good fatigue strength after being kept hot for a long time, produced by consolidating rapidly solidified particles of an aluminium alloy, said aluminium alloy consisting of, in weight percentages: 11 to 26% silicon; 2 to 5% iron; 0.5 to 5% copper; 0.1 to 2% magnesium; 0.1 to 0.4% zirconium; 0.5 to 1.5% manganese; and up to minor additions of nickel and cobalt.

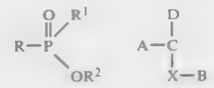
4,992,243

METHOD OF STERILIZING ANTHERS

Marat A. Fedin, ulitsa Dm. Ulyanova, 24, kv. 158; Tatyana A. Kuznetsova, Khoroshevskoe shosse, 36b, kv. 62, both of Moscow; Leonid K. Voskoboinik, ulitsa Pushkina, 35, kv. 6, Krasnodar; Tatyana S. Fedorenko, ulitsa Shkolnaya, II, kv. 23, Krasnodar; Alexandra T. Prokopenko, Peredo vaya ulitsa, 74, kv. 24, Krasnodar; Ivan V. Martynov, prospekt Mira, 112, kv. 221, Moscow; Jury P. Belov, ulitsa Tsentralnaya, 4, kv. 85, Moskovskaya oblast, Noginsky raion; Vyacheslav V. Kormachev, ulitsa Elgera, 16, kv. 161; Oleg A. Kolyamshin, ulitsa Dekabristov, 14, korpus 1, kv. 105, both of Cheboxary; Valentin A. Savchuk, opytnaya stantsia VIR, Poltavskaya oblast, Globinsky raion, selo Ustimovka; Leonid S. Shevnitsyn, ulitsa Vinokurova, 7, kv. 31, Novocheboxarsk; Valery V. Smirnov, bulvar Gidrostroitelei, 6, kv. 10, Novocheboxarsk; Viktor A. Gradov, ulitsa Vinokurova, 7, kv. 16, Novocheboxarsk; Sergei I. Paklin, ulitsa Malaya Filevskaya, 66, kv. 30, Moscow; Svetlana A. Novikova, ulitsa Shirokaya, 19, korpus 2, kv. 176, Moscow; Alexandr A. Vishnyakov, ulitsa 2 Parkovaya, 2/16, Moskovskaya oblast, Mytischi; Alexei J. Axinenko, Shkolny bulvar, 1b, kv. 59a, Moskovskaya oblast, Noginsky raion, poselok Chernogolovka, and Marina G. Rudakova, ulitsa Flotskaya, 26, kv. 102, Moscow, all of U.S.S.R.

PCT No. PCT/SU88/00058, § 371 Date Jan. 8, 1990, § 102(e) Date Jan. 8, 1990, PCT Pub. No. WO89/08401, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 17, 1988, Ser. No. 442,367
Int. Cl.[5] A01H *1/04*
U.S. Cl. 422—28 4 Claims

1. A method of sterilizing anthers of plants by way of treatment thereof with a sterilizing agent in combination with a diluent during the period of the fifth and/or sixth stage of organogenesis, comprising to said anthers a sterilizing agent made of derivatives of phosphoric acids or mixtures thereof of the general formula:



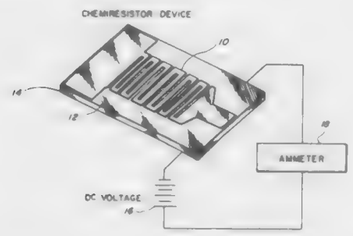
wherein R is H, a C_1–C_4-alkoxy, dimethylamine,
wherein X is O, NH; B is H, a C_1–C_4-alkyl, phenyl; D is H, CH_3; A is a C_1–C_4-alkyl, phenyl, furyl; R^1 is OH, ONH_4, $OAlk(C_1–C_4)$, phenyl; R^2 is a C_1–C_4-alkyl; $NaNH_4$, $NH_3Alk(C_1–C_4)$, $NH_2Alk_2(C_1–C_4)$.

4,992,244

FILMS OF DITHIOLENE COMPLEXES IN GAS-DETECTING MICROSENSORS

Jay W. Grate, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 27, 1988, Ser. No. 250,004
Int. Cl.[5] G01N *27/04*
U.S. Cl. 422—98 15 Claims



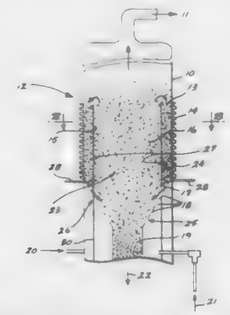
1. A chemical microsensor for detection of gases and vapors, comprising:
a. an insulating substrate;
b. a film comprising a dithiolene complex of a transition metal covering the substrate wherein a measurable physical property of the film changes upon exposure to gases and vapors;
c. a sensing element to detect any change in physical properties of the film.

4,992,245

ANNULAR HEATED FLUIDIZED BED REACTOR

Richard A. Van Slooten, East Aurora, and Ravi Prasad, East Amherst, both of N.Y., assignors to Advanced Silicon Materials Inc., Mosio Lake, Wash.

Continuation of Ser. No. 175,901, Mar. 31, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 484,478
Int. Cl.[5] F27G *15/14;* B01J *8/18*
U.S. Cl. 422—146 14 Claims



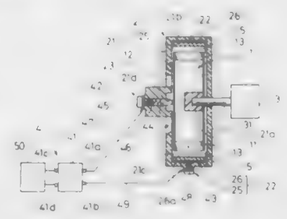
1. A heated fluidized bed reactor consisting essentially of:
(a) a reaction vessel;
(b) means located within the reaction vessel defining a peripheral heating zone annulus surrounding an inner fluidized bed reaction zone which annulus is defined by an inner wall and an outer heating zone wall, said annulus includes an annular space between said walls, an upper annulus end and a lower annulus end, the heating zone annulus laterally confining particles from the fluidized bed in an incipient fluidized state, the annular space of the heating zone annulus respectively defining an upper inlet at the upper annulus end for the entry of the particles from the fluidized bed and a lower outlet at the lower annulus end for introducing heated particles into the inner reaction zone, the heated particles of the heating zone annulus entering the inner reaction zone through the lower outlet of the heating zone annulus supplying heat to the inner reaction zone;
(c) means defining the inner fluidized bed reaction zone;
(d) heating means for supplying heat to the outer heating zone wall that partially defines the peripheral heating zone annulus; and
(e) a fluidizing gas means for fluidizing the particles.

4,992,246

OZONIZER

Yoshikiyo Serizawa, Neyagawa, and Takuo Yamoto, Ibaragi, both of Japan, assignors to O.C. Engineering Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/00450, § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO89/06217, PCT Pub. Date Jul. 13, 1989
PCT Filed May 2, 1988, Ser. No. 397,432
Claims priority, application Japan, Jan. 10, 1988, 63-2751
Int. Cl.[5] B01J *19/08*
U.S. Cl. 422—186.13 7 Claims



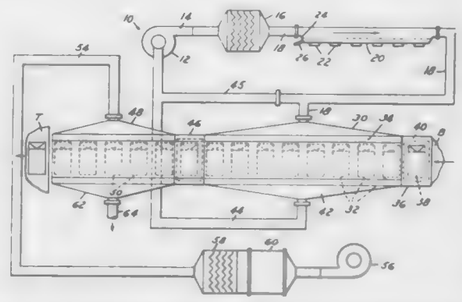
1. An ozonizer for producing ozone from a corona discharge generated between spaced electrodes, said ozonizer comprising a blower wherein said blower comprises an impeller with blades, each of said blades having an outer end surface, and a casing having an inner wall portion circumferentially surrounding a major portion of a circumference of said impeller, said blades forming a first electrode and said inner wall portion forming a second electrode, whereby said corona discharge is generated in a substantially uniform gap between the outer end surfaces of said blades and an inner surface of said inner wall portion.

4,992,247

CONTAINER STERILIZATION SYSTEM

Robert C. Foti, Livonia, Mich., assignor to Elopak Systems, A.G., Glattbugg, Switzerland

Filed May 11, 1989, Ser. No. 350,160
Int. Cl.[5] A61L *2/20;* B65B *55/10*
U.S. Cl. 422—304 22 Claims



1. A sterilization system for containers being conveyed via a

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conveyor, said system comprising a closed loop of ductwork interconnecting in series a blower for blowing sterile air into said ductwork and for directing through said closed loop a flow of a mixture of air, vaporized hydrogen peroxide, and vaporized water; a duct heater mounted in the ductwork to raise the temperature of the sterile air to a predetermined minimum temperature; one of a vapor generation pool or a vapor generation stack with heater means operatively connected thereto, said vapor generation pool or stack providing a vaporized hydrogen peroxide solution into said ductwork; a vapor delivery inlet manifold and vapor delivery return manifold, a chamber intermediate said vapor delivery inlet manifold and said vapor delivery return manifold adapted to having said conveyor move laterally therethrough and having said mixture flow across the chamber from said vapor deliver inlet manifold to said vapor delivery return manifold, and said ductwork continuing from said vapor delivery return manifold back to said blower.

4,992,248

METHOD FOR NEUTRALIZING SULFURIC ACID CONTAINING ZINC ION

Morio Watanabe, Tokyo, and Renpei Sei, Kanagawa, both of Japan, assignors to Solex Corporation of Japan, Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 392,129
Claims priority, application Japan, Aug. 19, 1988, 63-206030
Int. Cl.[5] B01D *11/00*
U.S. Cl. 423—99 **10 Claims**

1. A method for neutralizing an acid solution containing sulfuric acid (H_2SO_4) and predominantly Zn ions, comprising adding, to the acid solution, at least one compound selected from the group consisting of chlorine-containing compounds of Na ion, K ion, Mg ion, Ca ion, and NH_4 ion in an amount at least chemically equivalent to the amount of SO_4 ion contained in the acid solution; and then bringing the acid solution into contact with an organic solvent selected from the group consisting of oxygen-containing organic solvents, alkylamine organic solvents or combinations thereof, to extract the Zn ions from the acid solution as a chloride complex of the organic solvent.

4,992,249

REDUCTION OF NITROGEN- AND CARBON-BASED POLLUTANTS THROUGH THE USE OF UREA SOLUTIONS

Wayne E. Bowers, Clearwater, Fla., assignor to Fuel Tech, Inc., Stamford, Conn.

Continuation of Ser. No. 784,826, Oct. 4, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 90,417
Int. Cl.[5] C01B *21/00*
U.S. Cl. 423—235 **16 Claims**

1. A process for reducing the concentration of nitrogen oxide in an oxygen-rich effluent from the combustion of a carbonaceous fuel, the process comprising:

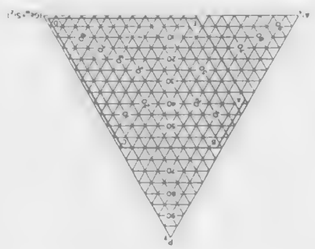
injecting a dispersion of droplets having a Sauter mean diameter of about 150 to about 10,000 microns of an aqueous solution containing urea into said effluent at an effluent temperature above 2050° F., the concentration of the urea in solution, less than 20 percent, and the size of the droplets in the dispersion being effective to achieve reduction of nitrogen oxide levels in the effluent.

4,992,250

GERMANIUM-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVE COMPOSITIONS

Edith M. Flanigen, White Plains; Brent M. T. Lok, New York; Robert L. Patton, Katonah, and Stephen T. Wilson, Shrub Oak, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 599,971, Apr. 13, 1984, abandoned. This application Apr. 15, 1986, Ser. No. 852,175
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—328 **76 Claims**



1. Crystalline molecular sieves comprising three-dimensional microporous framework structures of GeO_2, AlO_2, PO_2 and SiO_2 tetrahedral units having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(Ge_wAl_xP_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(Ge_wAl_xP_ySi_z)O_2$ and has a value of zero to about 0.3; and "w", "x", "y" and "z" represent the mole fractions of germanium, aluminum, phosphorus and silicon, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D, and E of FIG. 1, said crystalline molecular sieves having a characteristic X-ray powder diffraction pattern which contains at least the d-spacings set forth in one of the following Tables A to H and J to W

TABLE A

	(GeAPSO-5)	
2θ	d(Å)	Relative Intensity
7.2–7.7	12.28–11.48	m–vs
19.4–19.9	4.58–4.46	w–m
20.85–21.3	4.26–4.17	w–vs
22.1–22.6	4.02–3.93	m–vs
25.6–26.2	3.480–3.402	vw–m

TABLE B

	(GeAPSO-11)	
2θ	d(Å)	Relative Intensity
7.8–8.2	11.19–10.85	m–s
9.0–9.8	9.83–9.03	vw–vs
19.9–20.5	4.46–4.33	m–s
20.8–21.8	4.27–4.08	m–vs
22.0–22.6	4.04–3.93	m–vs
22.6–23.1	3.93–3.85	vw–vs
23.1–23.5	3.85–3.79	w–vs

TABLE C

	(GeAPSO-14)	
2θ	d(Å)	Relative Intensity
8.6–8.9	10.3–9.93	vs
13.0	6.81	w
21.9–22.2	4.06–4.00	w
25.4	3.51	w
27.5	3.24	w

TABLE C-continued

	(GeAPSO-14)	
2θ	d(Å)	Relative Intensity
29.7	3.01	m

TABLE D

	(GeAPSO-16)	
2θ	d(Å)	Relative Intensity
11.3–11.6	7.83–7.63	w–vs
18.55–18.9	4.78–4.70	vw–m
21.85–22.2	4.07–4.00	m–vs
22.8–23.3	3.900–3.818	w–m
26.4–27.3	3.370–3.267	w–m
29.6–29.9	3.018–2.988	w–m

TABLE E

	(GeAPSO-17)	
2θ	d(A)	Relative Intensity
7.70–7.75	11.5–11.4	vs
13.4	6.61	s–vs
15.5–15.55	5.72–5.70	s
19.65–19.7	4.52–4.51	w–s
20.5–20.6	4.33–4.31	vs
31.8–32.0	2.812–2.797	w–s

TABLE F

	(GeAPSO-18)	
2θ	d(Å)	Relative Intensity
9.6–9.65	9.21–9.16	vs
15.5–15.55	5.72–5.70	m
16.9–17.1	5.25–5.19	m
20.15–20.25	4.41–4.39	m
20.95–21.05	4.24–4.22	m
31.8–32.5	2.814–2.755	m

TABLE G

	(GeAPSO-20)	
2θ	d(Å)	Relative Intensity
13.8–14.2	6.42–6.23	m–vs
19.6–20.15	4.53–4.41	m
24.1–24.8	3.695–3.603	m–vs
27.9–28.6	3.198–3.121	w
31.3–32.05	2.861–2.791	w
34.35–35.0	2.610–2.601	w–m

TABLE H

	(GeAPSO-31)	
2θ	d(Å)	Relative Intensity
8.4–9.5	10.53–9.31	w–s
20.2–20.4	4.40–4.35	m
22.0–22.1	4.040–4.022	m
22.5–22.7	3.952–3.92	vs
31.6–31.8	2.831–2.814	w–m

TABLE J*

	(GeAPSO-33)	
2θ	d(Å)	Relative Intensity
9.25–9.55	9.56–9.26	w–m
12.5–12.9	7.08–6.86	vs
16.9–17.3	5.25–5.13	w–m
20.45–20.9	4.34–4.25	w–m
23.85–24.25	3.73–3.67	w–m
26.05–26.35	3.42–3.38	w–m

TABLE J*-continued

	(GeAPSO-33)	
2θ	d(Å)	Relative Intensity
27.3–27.6	3.27–3.23	vs

*as-synthesized form

TABLE K*

	(GeAPSO-33)	
2θ	d(Å)	Relative Intensity
13.15–13.4	6.73–6.61	vs
18.05–18.35	4.91–4.83	m
18.4–18.6	4.82–4.77	m
26.55–26.7	3.36–3.34	m
32.0–32.1	2.80–2.79	m

*calcined form

TABLE L

	(GeAPSO-34)	
2θ	d(Å)	Relative Intensity
9.3–9.8	9.51–9.03	m–vs
12.6–13.2	7.03–6.71	w–m
15.8–16.3	5.61–5.44	vw–m
20.25–21.2	4.39–4.19	w–vs
24.8–25.4	3.59–3.507	vw–m
30.0–30.9	2.979–2.894	vw–m

TABLE M

	(GeAPSO-35)	
2θ	d(Å)	Relative Intensity
10.6–11.1	8.35–7.97	vw–vs
13.1–13.7	6.76–6.46	vw–vs
17.0–17.6	5.22–5.04	w–s
20.6–21.25	4.31–4.18	vw–m
21.6–22.3	4.11–3.99	m–vs
28.1–28.8	3.175–3.100	vw–m

TABLE N

	(GeAPSO-36)	
2θ	d(Å)	Relative Intensity
7.45–8.0	11.14–11.05	vs
8.1–8.3	10.91–10.65	w–m
16.3–16.6	5.44–5.34	w–m
18.9–19.4	4.70–4.57	w–m
20.7–21.0	4.29–4.23	w–m

TABLE O

	(GeAPSO-37)	
2θ	d(Å)	Relative Intensity
6.1–6.3	14.49–14.03	vs
15.5–15.7	5.72–5.64	w–m
18.5–18.8	4.80–4.72	w–m
23.5–23.7	3.79–3.75	w–m
26.9–27.1	3.31–3.29	w–m

TABLE P

	(GeAPSO-39)	
2θ	d(Å)	Relative Intensity
9.2–9.6	9.61–9.21	m
13.1–13.5	6.76–6.56	m
17.8–18.4	4.98–4.82	w–m
20.8–21.3	4.27–4.17	m–vs
22.2–22.85	4.00–3.892	m–vs
26.4–27.05	3.376–3.296	w–m

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TABLE Q

2θ	(GeAPSO-40) d(Å)	Relative Intensity
7.5–7.7	11.79–11.48	vw–m
8.0–8.1	11.05–10.94	s–vs
12.4–12.5	7.14–7.08	w–vs
13.6–13.8	6.51–6.42	m–s
14.0–14.1	6.33–6.28	w–m
27.8–28.0	3.209–3.187	w–m

TABLE R

2θ	(GeAPSO-41) d(Å)	Relative Intensity
13.6–13.8	6.51–6.42	w–m
20.5–20.6	4.33–4.31	w–m
21.1–21.3	4.21–4.17	vs
22.1–22.3	4.02–3.99	m–s
22.8–23.0	3.90–3.86	m
23.1–23.4	3.82–3.80	w–m
25.5–25.9	3.493–3.44	w–m

TABLE S

2θ	(GeAPSO-42) d(Å)	Relative Intensity
7.15–7.4	12.36–11.95	m–vs
12.5–12.7	7.08–6.97	m–s
21.75–21.9	4.09–4.06	m–s
24.1–24.25	3.69–3.67	vs
27.25–27.4	3.273–3.255	s
30.05–30.25	2.974–2.955	m–s

TABLE T

2θ	(GeAPSO-43) d(Å)	Relative Intensity
12.3–12.95	7.20–6.83	m–vs
16.8–17.45	5.28–5.09	vw–w
21.45–21.85	4.145–4.071	m–vs
27.0–27.85	3.297–3.232	w–vs
32.4–33.2	2.763–2.699	vw–m

TABLE U

2θ	(GeAPSO-44) d(Å)	Relative Intensity
9.2–9.6	9.61–9.21	m–vs
15.9–16.3	5.57–5.44	vw–m
20.5–21.0	4.33–4.23	m–vs
24.3–25.1	3.66–3.548	w–m
30.5–31.1	2.931–2.876	vw–m

TABLE V

2θ	(GeAPSO-46) d(Å)	Relative Intensity
7.2–8.1	12.28–10.92	vs
12.9–13.6	6.86–6.51	vw
21.2–22.2	4.19–4.501	vw–m
22.5–23.45	3.95–3.793	vw–m
26.6–27.9	3.351–3.198	vw–m

TABLE W

2θ	(GeAPSO-47) d(Å)	Relative Intensity
9.4–9.6	9.41–9.21	vs
12.8–13.1	6.92–6.76	vw–m
16.0–16.3	5.54–5.44	vw–m
20.5–21.0	4.31–4.23	m–vs

TABLE W-continued

2θ	(GeAPSO-47) d(Å)	Relative Intensity
24.6–25.3	3.613–3.526	vw–m
30.6–31.1	2.921–2.876	vw–m

4,992,251

SILICAS

Derek Aldcroft, South Wirral; John R. Newton, and Peter W. Stanier, both of Cheshire, all of England, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Sep. 15, 1988, Ser. No. 244,898

Claims priority, application United Kingdom, Sep. 15, 1987, 8721644

Int. Cl.[5] **C01B** *33/12;* **A01K** *7/16*

U.S. Cl. 423—335 **9 Claims**

1. An amorphous silica having

(i) a BET surface area in the range from about 420 to about 550 m^2/g,

(ii) a weight mean particle size in the range from about 5 to about 20 microns,

(iii) a perspex abrasion value in the range from about 15 to about 28,

(iv) a mean pore diameter in the range from about 3.0 to about 8.0 nm,

(v) a transmission of at least about 70% in the refractive index range of 1.444 to 1.460 and

(vi) an oil absorption in the range from about 70 to about 140 cc/100 g.

4,992,252

METHOD FOR PRODUCTION OF HYDROXYLAMMONIUM SALT

Hiroshi Ichihashi, Toyonaka; Kikuo Takeda, and Hiroshi Yoshioka, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 243,504, Sep. 12, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 446,665

Claims priority, application Japan, Sep. 22, 1987, 62-238185; Mar. 31, 1988, 63-82031

Int. Cl.[5] **C01B** *21/20, 21/093*

U.S. Cl. 423—387 **11 Claims**

1. A process for producing a hydroxylammonium salt which comprises catalytically reducing nitrogen monoxide with hydrogen in an acidic medium in the presence of a catalyst which is prepared by subjecting a platinum compound to (a) a first reductive treatment with a thiosulfate or a thiosulfate combined with an alakali metal sulfide in the presence of a catalyst carrier, wherein the amount of platinum supported on the catalyst carrier is 0.01 to 10% by weight; the amount of thiosulfate used in the reductive treatment is 0.3 to 5 as expressed in terms of ratio S/Pt, wherein S is the amount of sulfur atom in the thiosulfate and Pt is the amount of platinum atom in the platinum compound; and the amount of the alkali metal sulfide used in the reductive treatment is 0.05 to 1 as expressed in terms of ratio S/Pt, wherein S is the amount of sulfur atom in the alkali metal sulfide and Pt is the amount of platinum atom in the platinum compound, and (b) a second reductive treatment with a reductant selected from the group consisting of formic acid, hydrogen, hydrazine and sodium borohydride at a temperature of 50° C. to 150° C.

4,992,253

PROCESS FOR PRODUCING AN ULTRAFINE POWDER OF ALUMINUM NITRIDE

Nan-Chung Wu, and Huei-Jung Wang, both of Tainan, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Dec. 29, 1989, Ser. No. 459,426

Int. Cl.[5] **C01B** *21/072*

U.S. Cl. 423—412 **10 Claims**



1. A process for producing an ultrafine powder of aluminum nitride, which comprises:

(a). intimately mixing α phase fine powder of alumina having an average particle diameter of about 0.48 micron, a fine powder of carbon having an average particle diameter of about 0.18 micron and a powder of aluminum nitride in a liquid dispersing medium, wherein the weight ratio of the fine alumina powder to the fine carbon powder is from 1.6:1 to 2.5:1 and the amount of the aluminum nitride added is 1–5 wt % based on the total weight of the alumina powder and the carbon powder;

(b). compressing the resulting mixture into a molded article;

(c). heating the molded article at a temperature of 1550° to 1650° C. in an atmosphere of nitrogen; and

(d). heating the resulting powder at a temperature of 600° to 700° C. for 5–7 hours to remove the unreacted carbon.

4,992,254

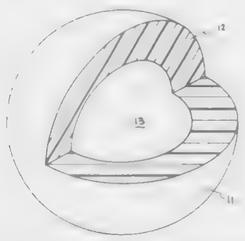
LOW DENSITY CARBONIZED COMPOSITE FOAMS

Fung-Ming Kong, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1989, Ser. No. 447,478

Int. Cl.[5] **C01B** *31/02*

U.S. Cl. 423—449 **17 Claims**



1. A process for preparing a carbonized polystyrene based low density foam which comprises:

(A) preparing an inverse emulsion of a styrene monomer in water;

(B) polymerizing said styrene monomer to produce a foam;

(C) filling said foam with an aqueous resorcinol-formaldehyde solution whereby said resorcinol-formaldehyde solution occupies the cells of said foam;

(D) curing said resorcinol-formaldehyde solution to form a gel; and

(E) heating said resorcinol-formaldehyde gel filled polystyrene foam to a temperature sufficient to carbonize said foam.

4,992,255

CAPILLARY DEPLETION METHOD FOR QUANTIFYING TRANSCYTOSIS THROUGH THE BLOOD-BRAIN BARRIER

William M. Pardridge, 1180 Tellem Dr., Pacific Palisades, Calif. 90272

Filed Dec. 19, 1988, Ser. No. 286,244

Int. Cl.[5] **G01N** *37/00;* **A61B** *6/00*

U.S. Cl. 424—1.1 **9 Claims**

1. A method for measuring the transcytosis of a compound through the blood-brain barrier, said method comprising the steps of:

(a) perfusing a perfusate solution through the brain of a living mammal while said brain is in said mammal, said perfusate solution including:

test compound for which transcytosis across said blood-brain barrier is to be measured, said test compound being labelled with a first radio-active label; and

a marker compound which is labelled with a second radio-active label, wherein said marker compound is not capable of passing through the blood-brain barrier of said mammal and wherein said marker compound is approximately the same size as said test compound;

(b) removing at least a portion of the brain said mammal and weighing this brain;

(c) homogenizing a portion of the brain removed from said mammal to form a brain homogenate;

(d) separating said brain homogenate into a brain vascular tissue fraction and a supernatant fraction;

(e) determining the radio-activity of said first and second radio-active labels in said perfusate solution;

(f) measuring the radio-activity level of said first and second radio-active labels in said supernatant fraction;

(g) computing the volume distribution of said first and second radio-active labels in said supernatant;

(h) determining the transcytosis of said test compound across said blood-brain barrier by subtracting the volume of distribution of said second radio-active label from the volume of distribution of said first radio-active label.

4,992,256

PLAQUE DISCLOSING COMPOSITIONS

J. Michael Skaggs, New Brunswick; Robert E. Dickson, Bellmead; James H. Bowers, Somerville, and Edward A. Tavss, Kendall Park, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 27, 1989, Ser. No. 413,424

Int. Cl.[5] **A61K** *7/16, 9/68, 9/12*

U.S. Cl. 424—7.1 **11 Claims**

1. A method of making dental plaque observable to the naked eye comprising contacting teeth having plaque adhered thereto with FD&C Red No. 40 dye in solution in a quantity effective, at a concentration of at least 0.05% by weight to stain said plaque and render said plaque visible at wave lengths of light visible to said naked eye, exposing the teeth to visible wavelengths of light, and then observing, with the naked eye, for any stained dental plaque, if present, on said teeth.

4,992,257

DIHYDROPORPHYRINS AND METHOD OF TREATING TUMORS

Raymond Bonnett, and Morris C. Berenbaum, both of London, England, assignors to Efamol Holdings PLC, Surrey, England

Filed Mar. 2, 1989, Ser. No. 317,984

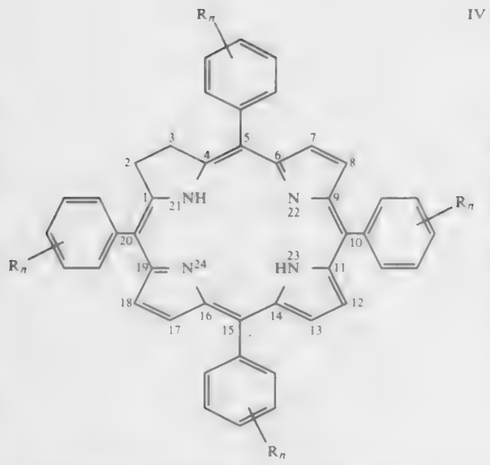
Claims priority, application United Kingdom, Mar. 11, 1988, 8805449

Int. Cl.[5] **A61K** *31/40, 49/00;* **C07D** *487/22*

U.S. Cl. 424—9 **6 Claims**

1. A compound of the formula:

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or the corresponding tetra-hydroporphyrins, where n—1 to 3 and each substituent R, which may be the same or different and at the same or different position in its respective substituent phenyl ring, is a hydroxy group or a hydroxy group substituted with a C_{1-4} alkyl or C_{1-4} acyl group.

4,992,258

DENTRIFICE COMPOSITION

Stephen C. Mason, Colgate-Palmolive, Belgium, assignor to ColgatePalmolive Company, New York, N.Y.

Filed Oct. 23, 1989, Ser. No. 425,538
Int. Cl.[5] A61K 7/16
U.S. Cl. 424—49 10 Claims

1. A dentifrice comprising at least about 0.1% by weight of montmorillonite, clay in a dentifrice vehicle and about 0.1–3% by weight of a polymeric polycarboxylate.

4,992,259

STABLE ORAL COMPOSITION OF ZINC

Michael T. Schiraldi, East Brunswick, and Robert K. Denton, Jr., Trenton, both of N.J., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Filed Jan. 3, 1990, Ser. No. 460,442
Int. Cl.[5] A61K 7/16, 33/30
U.S. Cl. 424—49 15 Claims

1. A stable and clear aqueous composition of a zinc salt comprising a pharmaceutically acceptable zinc salt codissolved with a complexing agent selected from the group consisting of sodium gluconate, maleic acid, aspartic acid, gluconic acid, succinic acid, glucuronic acid, sodium glutamate, fumaric acid and mixtures thereof, in a naturally derived anionic polymer of sodium carboxymethylcellulose or sodium alginate, said composition having a pH of from about 5.7 to about 6.5.

4,992,260

METHOD OF INHIBITING THE FORMATION OF PLAQUE

Vera B. Caslavsky, Lexington, Mass., and Poul Gron, Salem, N.H., assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Jul. 26, 1989, Ser. No. 385,572
Int. Cl.[5] A61K 7/16, 7/18, 7/22
U.S. Cl. 424—52 11 Claims

1. A method of inhibiting the formation of plaque on the tooth enamel of a subject which method comprises:

contacting the teeth of the subject with a composition which consists essentially of an effective, antiplaque amount of a fluoroalkyl thioether alkyl quaternary ammonium surfactant.

4,992,261

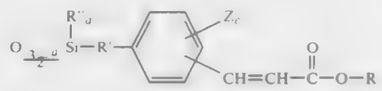
ORGANOSILICON COMPOUNDS THEIR PREPARATION AND USE

André R. L. Colas, Glashutten, Fed. Rep. of Germany; Stephen E. Cray, South Glamorgan, Wales, and Georg Frater, Uster, Switzerland, assignors to Dow Corning Limited, Barry, Wales
Division of Ser. No. 226,326, Jul. 29, 1988, Pat. No. 4,912,261.

This application Nov. 6, 1989, Ser. No. 432,267
Claims priority, application United Kingdom, Jul. 31, 1987, 8718140
Int. Cl.[5] A61K 7/44, 7/42
U.S. Cl. 424—60 11 Claims

1. A sunscreen composition comprising

(I) an organosilicon compound having at least one unit of the formula



(i)

any other units present in the said organosilicon compound being represented by the formula



(ii)

wherein R represents an alkyl group having up to 18 carbon atoms; R′ is selected from the group consisting of divalent alkylene, oxyalkylene, alkenylene and oxyalkenylene groups having from 2 to 20 carbon atoms, wherein the R′ group is attached to a silicon atom; R″ is selected from the group consisting of halogen atoms and alkyl, aryl, alkoxy and alkoxyalkoxy groups having less than 9 carbon atoms; Q is selected from the group consisting of hydrogen, monovalent hydrocarbon and halogenated hydrocarbon groups having less than 19 carbon atom; Z is selected from the group consisting of alkyl and alkoxy groups having from 1 to 8 carbon atoms and hydroxyl groups; a and b are integers with a value from 0 to 3; and c is an integer selected from 0 to 1; and at least one of Z and R′ is linked to the multivalent aryl group via an ether linkage;

and (II) an inert carrier selected from solvents and cream base materials.

4,992,262

PROCESS FOR PRODUCING POWDER-BASED SOLID COSMETIC

Tomonari Nakagaki, Mitaka; Mamoru Ishii, Sagamihara, and Haruo Ishibashi, Hatano, all of Japan, assignors to Asanuma Sogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 122,634, Nov. 12, 1987, abandoned.
This application Mar. 29, 1990, Ser. No. 501,978
Claims priority, application Japan, May 17, 1984, 59-99493
Int. Cl.[5] A61K 7/035
U.S. Cl. 424—63 22 Claims

1. A process for producing a powder-based solid cosmetic comprising the steps of:

mixing (a) a powdered cosmetic composition consisting essentially of powdered cosmetic ingredients with (b) organic bentonite and (c) a volatile solvent consisting essentially of a volatile chlorofluorohydrocarbon which is liquid at room temperature and under atmospheric pressure, wherein the amount of volatile solvent (c) is in the range of 0.3 to 6 times by weight the combined amounts of

powdered cosmetic composition (a) and organic bentonite (b);

(2) shaping the resulting mixture into the shape of a cosmetic; and

(3) drying the shaped cosmetic so as to remove said volatile solvent, thereby obtaining said powder-based solid cosmetic.

4,992,263

THICKENDED AQUEOUS SURFACTANT SOLUTIONS AND THEIR USE IN COSMETIC PREPARATIONS

Holger Tesmann, Duesseldorf; Hermann Hensen, Haan; Wolfgang Hochschon, Hilden, and Uwe Ploog, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,385
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730179
Int. Cl.[5] A61K 7/021, 7/025, 7/07, 7/09
U.S. Cl. 424—63 27 Claims

1. A thickened aqueous surfactant composition consisting essentially of a mixture of:

(a) water,

(b) from about 5 to 20% by weight of at least one water-soluble ionic surfactant.

(c) from about 1 to about 5% by weight of a nitrogen-free thickener consisting essentially of polyethoxylates of unsaturated fatty alcohols having from about 12 to about 22 carbon atoms and having an average degree of ethoxylation of about 2 to about 5, and

(d) from about 0.5 to about 10% by weight of a water-soluble inorganic electrolyte salt.

4,992,264

NOVEL COSMETIC COMPOSITIONS CONTAINING AN EXTRACT OF THE AERIAL PARTS OF *CICHORIUM INTYBUS* L

Michel Diot, 2 allée des Dimanches, Louveciennes, France 78430, and Claude Bonne, 316 avenue d'Occitanie, Montpellier, France 34000

PCT No. PCT/EP89/00073, § 371 Date Sep. 27, 1989, § 102(e) Date Sep. 27, 1989, PCT Pub. No. WO89/06954, PCT Pub. Date Aug. 10, 1989
PCT Filed Jan. 27, 1989, Ser. No. 411,471
Claims priority, application France, Jan. 29, 1988, 88 01464
Int. Cl.[5] A61K 7/48, 35/78
U.S. Cl. 424—63 6 Claims

1. Cosmetic composition preventing aging of the skin, containing an extract of the aerial parts of Cichorium intybus L. at a concentration expressed in polyphenols of from 0.001 to 0.01% by weight, in an appropriate cosmetic base.

4,992,265

METHODS AND COMPOSITIONS FOR INCREASING THE DIAMETER OF THE HAIR COMPRISING RETINOL ESTERS

Walter B. Davis; Margaret D. Batt, and Benjamin D. Ridge, all of Weybridge, England, assignors to Beecham Group p.l.c., England

Filed Feb. 23, 1989, Ser. No. 314,754
Claims priority, application United Kingdom, Feb. 25, 1988, 8804419; Aug. 19, 1988, 8819738
Int. Cl.[5] A61K 7/06
U.S. Cl. 424—70 31 Claims

1. A method of increasing the diameter of growing hair, which comprises the topical administration of an effective amount of an ester of retinol, or of a mixture of esters of retinol.

4,992,266

REDUCING THE OCULAR IRRITANCY OF ANIONIC SHAMPOOS

Donald W Knoll, Waukesha, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 14, 1989, Ser. No. 393,438
Int. Cl.[5] A61K 7/75, 7/5; C11D 1/02, 1/12
U.S. Cl. 424—70 7 Claims

1. A method of reducing the ocular irritancy of an aqueous shampoo composition consisting essentially of from about 1 to about 20% by weight of at least one eye irritating anionic surfactant selected from the group consisting of C_8–C_{18} alkyl sulfates containing from 0 to an average of about 4 ethyleneoxy units per molecule, C_8–C_{18} alkyl benzene sulfonates, C_8–C_{25} olefin sulfonates, C_{10}–C_{20} paraffin sulfonates, C_8–C_9 alkyl phenol ethoxamer sulfates and mixtures thereof and the balance consisting essentially of water, said method comprising including within said shampoo composition from about 0.005% to about 5% by weight of an ethylene oxide homopolymer of the formula $H(OCH_2CH_2)_xOH$ as the sole additive to reduce the ocular irritation of the shampoo, the value of x being such that the weight average molecular weight of the homopolymer is from about 100,000 to about 5,000,000.

4,992,267

HAIR STRAIGHTENING COMPOSITION AND SYSTEM

Marion DenBeste, Arlington Heights, and Muhammad Akhtar, Bolingbrook, both of Ill., assignors to Johnson Products Co., Inc., Chicago, Ill.

Filed Apr. 28, 1988, Ser. No. 187,605
Int. Cl.[5] A61K 7/09; A45D 7/04
U.S. Cl. 424—71 27 Claims

1. An improved aqueous hair-straightening composition having a pH of between about 12 and about 14 comprising in dissolved admixture at least two active hair-straightening agents, said composition comprising about 1 to about 2.5 weight percent on a total composition weight basis of an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide and lithium hydroxide as a main hair-straightening agent and a less amount of an auxiliary hair-straightening agent that is a hair keratin-disulfide reducing agent having a sulfhydryl functional group available and is selected from the group consisting of cysteine, water-soluble homologs of cysteine, and water-soluble derivatives of cysteine having none, one or both of the polar amino and carboxy acid groups thereof substituted, said auxiliary agent being in a free base form or in a mineral acid salt form thereof.

4,992,268

NOVEL SYSTEM FOR MONITORING AND CONTROLLING THE PAPAYA FRUIT FLY

Peter J. Landolt; Robert R. Heath, and Herndon R. Agee, all of Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 6, 1988, Ser. No. 240,312
Int. Cl.[5] A01N 25/24
U.S. Cl. 424—77 3 Claims

1. An apparatus for monitoring or controlling the papaya fruit fly which comprises a green or black sphere having an adhesive material on the surface of said sphere, wherein said sphere is in combination with an effective attractant amount of substantially pure 2-methyl-6-vinylpyrazine as a papaya fruit fly sex pheromone.

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4,992,269

ANIMAL REPELLANT

Roger Snow, Sandringham, and Philip B. Alldritt, Bundoora, both of Australia, assignors to Hot Foot International Pty. Ltd., Melbourne, Australia

Continuation of Ser. No. 620,944, Jun. 15, 1984, abandoned. This application Jul. 15, 1986, Ser. No. 885,812
Claims priority, application Australia, Sep. 15, 1983, 1431/83
Int. Cl.[5] A01N *25/00*
U.S. Cl. 424—83 9 Claims

1. A bird repellant gel composition comprising:
(a) about 75 to 98% by weight based on the total weight of the composition of a high molecular weight polybutene having a molecular weight of about 1300 to 1500 and a low molecular weight polybutene having a molecular weight of about 900 to 1000;
(b) about 1 to 7% by weight based on the total weight of the composition of a clay-based thickening agent; and
(c) about 1 to 3% by weight based on the total weight of the composition of a polar organic solvent swelling agent;
said bird repellant composition having sufficient tackiness to repel birds and with sufficient viscosity to minimize the flattening of an applied bead of said composition.

4,992,270

USE OF BENZYL FORMATE, AND D-PULEGONE AND MIXTURES OF SAME AS BEETLE ATTRACTANTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Beach, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Filed Jan. 9, 1987, Ser. No. 2,018
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] A01N *25/00*
U.S. Cl. 424—84 4 Claims

1. A method of attracting Coleoptera (beetles) to an insect trap comprising the step of exposing the environment surrounding said trap to an insect attractant containing polymer which consists of a mixture of a polymer and from about 1% up to about 45% by weight of said polymer of a composition of matter selected from the group consisting of:
(i) benzyl formate;
(ii) d-pulegone; and
(iii) a mixture of benzyl formate and d-pulegone
said polymer being compatible with said composition of matter.

4,992,271

FORMULATION FOR LIPOPHILIC IL-2 PROTEINS

Wolfgang H. Hanisch, Oakland; Peter M. Fernandes, Walnut Creek, and Terrance Taforo, Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 752,403, Jul. 5, 1985, which is a continuation-in-part of Ser. No. 592,077, Mar. 23, 1984, abandoned, which is a division of Ser. No. 495,896, May 18, 1983, Pat. No. 4,462,940, which is a continuation-in-part of Ser. No. 422,421, Sep. 23, 1982, abandoned. This application Sep. 13, 1985, Ser. No. 775,751
Int. Cl.[5] A61K *37/02, 45/02*
U.S. Cl. 424—85.2 8 Claims

1. A stable pharmaceutical composition suitable for human clinical use comprising a therapeutically effective amount of a biologically active unglycosylated recombinant interleukin-2 (IL-2) protein wherein said IL-2 is at least about 95 % pure as determined by SDS/PAGE and contains endotoxin in the amount of less than 0.5 ng per 100,000 units of IL-2 activity and wherein said IL-2 is solubilized in a non-toxic, inert therapeutically compatible aqueous-based carrier medium at a pH of 6.8 to 7.8 comprising human serum albumin.

4,992,272

CANINE DISTEMPER VIRUS VACCINE

Edmund P. Bass, Menlo Park; William H. Kelsey, Alameda, both of Calif., and Michael D. McFarland, Boone, Iowa, assignors to Diamond Scientific, Des Moines, Iowa

Continuation of Ser. No. 23,314, Mar. 9, 1987, abandoned. This application Dec. 19, 1989, Ser. No. 453,423
Int. Cl.[5] A61K *39/12, 39/175*
U.S. Cl. 424—89 13 Claims

1. A vaccine composition for animals susceptible to infection by canine distemper virus (CDV), comprising:
a small but immunologically effective amount of an inactivated canine distemper virus which although inactivated substantially retains its immunogenicity; and
a non-toxic pharmaceutically acceptable immunologic adjuvant.

4,992,273

ANTIGENS OF LEISHMANIA PARASITES

Louis Monjour, Paris; Alberto Roseto, Chatou; Armand Berneman, Paris; Marie-Claude Guillemin-Debons, Chatou; Martine Domurado, Grandfresnoy, and George Peries, Paris, all of France, assignors to Institut Pasteur, Paris; Universite De Technologie De Compiegne, Compiegne and Universite Pierre Et Marie Curie, Paris, all of, France

PCT No. PCT/FR85/00264, § 371 Date Jul. 31, 1986, § 102(e) Date Jul. 31, 1986, PCT Pub. No. WO86/02098, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 26, 1985, Ser. No. 878,876
Claims priority, application France, Oct. 1, 1984, 84 15079; Feb. 11, 1985, 85 01892
Int. Cl.[5] A61K *39/8*
U.S. Cl. 424—89 10 Claims

1. Antigens of leishmania parasites, having molecular weights on the order of 20,000, 40,000, 70,000, 113,000 or 140,000 daltons and being recognized by the monoclonal antibodies secreted by the hybridomes deposited with the C.N.C.M. under numbers I-344 and I-345; said antigens inducing the in vivo production in mice of protective antibodies against a plurality of leishmaniae; said antibodies inhibiting the infection of mouse sarcomatous cells of a TG180 line, deposited with the C.N.C.M. under number I-343, when 2×10^3 cells of said TG180 line are injected into the peritoneum of mice, mixed with 10^5 promastigotes of a plurality of strains of leishmania; said promastigotes having previously been incubated with said antibodies.

4,992,274

TISSUE PLASMINOGEN ACTIVATOR A-CHAIN/UROKINASE B-CHAIN HYBRID PROTEIN

Jeffery H. Robinson, Epsom, and Ian Dodd, Dorking, both of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 684,593, Dec. 21, 1984, Pat. No. 4,752,581. This application Feb. 22, 1988, Ser. No. 158,542
Claims priority, application United Kingdom, Dec. 24, 1983, [illegible]
Int. Cl.[5] A61K *37/547*; C12N *9/72, 9/48*
U.S. Cl. 424—94.63 6 Claims

1. A fibrinolytically active hybrid protein, which comprises tissue plasminogen activator A-chain covalently linked to urokinase B-chain and which has a catalytic site essential for catalytic activity.

4,992,275

SWEET CORN BASED PESTICIDE

Raymon W. Lush, 113 Crown Point, Bloomfield, Nebr. 68718

Filed Jun. 30, 1989, Ser. No. 373,564
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] A01N *25/34, 25/00, 25/08, 55/02*
U.S. Cl. 424—408 13 Claims

1. An insecticidal composition, comprising,

an effective amount of an insecticide and,
an inert ingredient comprising dried sweet corn as a substantial portion thereof.

4,992,276

ANTISEPTIC COMPOSITIONS CONTAINING HEXAHYDRO-5-PYRIMIDINAMINE COMPOUNDS AND THYMOL AND METHODS FOR PREPARING SAME

Steven S. Dills, Hackettstown, and Deborah A. Noonan, Florham Park, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 14, 1988, Ser. No. 284,213
Int. Cl.[5] A61K *47/00*
U.S. Cl. 424—439 15 Claims

1. An oral antiseptic composition which comprises a therapeutically effective amount of a synergistic antiseptic composition comprising in combination from about 0.01% to about 0.2% by weight of an antiseptic hexahydro-5-pyrimidinamine compound and from about 0.05% to about 0.1% by weight thymol in an oral vehicle.

4,992,277

IMMEDIATE RELEASE DILTIAZEM FORMULATION

Surendra Sangekar, Union; Winston A. Vadino, Whitehouse Station, both of N.J., and Eugenio A. Cefali, Plantation, Fla., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 25, 1989, Ser. No. 399,050
Int. Cl.[5] A61K *9/20*
U.S. Cl. 424—465 3 Claims

1. An immediate release diltiazem tablet comprising:
(a) 3 to 80 percent diltiazem hydrochloride;
(b) 10 to 30 percent hydroxypropylmethyl cellulose;
(c) 2 to 6 percent polyvinylpyrrolidone;
(d) 0.5 to 3 percent magnesium stearate; and
(e) 10 to 50 percent lactose.

4,992,278

THERAPEUTIC SYSTEM FOR SPARINGLY SOLUBLE ACTIVE INGREDIENTS

Satish C. Khanna, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 140,467, Jan. 4, 1988, abandoned. This application Aug. 3, 1989, Ser. No. 390,435
Claims priority, application Switzerland, Jan. 14, 1987, 116/87
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—473 7 Claims

1. Peroral therapeutic system in tablet form for continuous and controlled administration of active ingredients that are sparingly soluble in water, consisting of
(a) a casing made of a material that is permeable to water and impermeable to the components of the core containing the active ingredient,
(b) a compressed core from a granular powder of an active ingredient that is sparingly soluble in water or a mixture of such active ingredients, a hydrophilic, polymeric swelling agent consisting of a mixture of a vinylpyrrolidone/vinyl acetate copolymer with an ethylene oxide homopolymer, optionally a water-soluble substance for inducing osmosis and optionally other pharmaceutically acceptable adjuncts and
(c) a passage through the casing (a) for the transport of the constituents contained in the core into the surrounding aqueous body fluid.

4,992,279

SWEETNESS INHIBITOR

Marcia D. Palmer, Nanuet; Gary L. Hickernell, Ossining, and Paul R. Zanno, Nanuet, all of N.Y., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Jul. 3, 1985, Ser. No. 752,212
Int. Cl.[5] A23L *1/226*
U.S. Cl. 426—3 18 Claims

1. A process for inhibiting sweetness in ingestible products comprising adding, to an ingestible composition containing a sweetener, an effective sweetness inhibiting amount of a compound selected from the group consisting of an alkali metal heptyl sulfonate, an alkaline earth metal heptyl sulfonate, an alkali metal octyl sulfonate, an alkaline earth octyl sulfonate and mixtures thereof, said sweetness inhibiting compound is present in a concentration in the range of between about 0.005 and 1.0 percent by weight, based on the total weight of the ingestible product, and said sweetener is present in the range between 1 percent to about 50 percent sucrose equivalency.

4,992,280

SUSTAINED FLAVORANT RELEASE COMPOSITION, METHOD FOR MAKING SAME AND CHEWABLE STRUCTURE INCORPORATING SAME

Anita W. Yung Chu, and Joseph R. Robinson, both of Madison, Wis., assignors to Columbia Laboratories, Inc., Hollywood, Fla.

Filed Dec. 18, 1989, Ser. No. 452,214
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—5 23 Claims

1. A sustained flavorant release composition suitable for providing sustained release of a flavorant for a chewable structure consisting essentially of a homogenous dispersion of a liquid flavorant agent and polyvinyl acetate having a number average molecular weight of about 150,000 to about 200,000 daltons, the weight ratio of said liquid flavorant agent to said polyvinyl acetate being about 1:5 to about 5:1, respectively, said composition being substantially free of a separate plasticizing agent that is distinct from said liquid flavorant agent.

4,992,281

ANIMAL FEED SUPPLEMENT

John H. Linton, and Nick Hussar, both of London, Canada, assignors to Ogilvie Mills Ltd., Canada

Division of Ser. No. 47,496, May 6, 1987, Pat. No. 4,859,485, which is a continuation of Ser. No. 883,422, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 673,399, Nov. 20, 1984, abandoned, which is a continuation of Ser. No. 387,476, Jun. 11, 1982, Pat. No. 4,486,451, which is a continuation of Ser. No. 222,029, Jan. 2, 1981, abandoned. This application Apr. 18, 1989, Ser. No. 339,658
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[5] A23B *1/00*
U.S. Cl. 426—31 5 Claims

1. A moist, fermentable, cohesive, friable, readily transportable animal feed supplement comprising an admixture of mechanically de-watered corn bran having a solids content of 30% to 50% by weight and a concentrated cornsteep liquor having a solids content of from 45% to 55% by weight, in a ratio of de-watered corn bran to corn steep liquor of 3:1 to 1:1, whereby the resulting admixture readily compacts under its own weight to a bulk density of from 50 to 65 lbs./cubic foot and has a pH of less than about 4.5, a solids content of from 35% to 50% by weight and a protein content of at least 20% on a dry matter basis.

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4,992,282

STABLE NUTRITIONAL VITAMIN AND MINERAL SUPPLEMENTED BEVERAGE

Haile Mehansho, Fairfield; Donald L. Hughes, Cincinnati, both of Ohio; Gunther M. Nakel, Aurora, Ind., and David C. Heckert, Oxford, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 8, 1989, Ser. No. 348,745

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[5] A23L *2/02*

U.S. Cl. 426—72 **20 Claims**

1. A stable nutritional vitamin and mineral supplemented beverage or beverage concentrate, comprising a mixture of:
(i) a nutritionally supplemental amount of encapsulated β-carotene, vitamin C and riboflavin;
(ii) a nutritionally supplemental amount of an iron-sugar complex or iron gluconate/ascorbate;
(iii) a nutritionally supplemental amount of a calcium source;
(iv) at least about 0.1% of weight of flavor, or at least 3% by weight of fruit juice; and
(v) water.

4,992,283

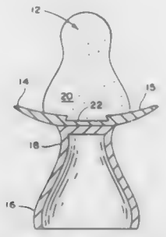
FROZEN CONFECTION HOLDER FOR TODDLERS

Marian Shorey, 93 Cleveland Ave. #33, Adams, Mass. 01257

Filed Dec. 20, 1989, Ser. No. 453,677

Int. Cl.[5] A23G *9/26*

U.S. Cl. 426—132 **4 Claims**



1. The combination of a solid confection and a holder therefore, said holder comprising a handle means and a drip catch means, said handle means comprising a handle of diminutive size sufficient to fit and rest essentially in the open, cupped palm of a small child's hand, said handle having a generally skirt-like shape that diminishes from a wider, flattened base upwards to a narrower neck having a circumferential dimension that may be encircled by said child's opposing thumbs and index finger, said base being flat and flared and having a diameter greater than that of said neck, said drip catch means comprising either a continuous platform for said solid confection positioned on top of said neck of said handle or an annular collar containing a central hole with said annular collar being secured to and around the upper portion of the neck of said handle with said upper portion of the neck of said handle being fitted in said hole of said annular collar, said drip catch means comprising either said continuous platform or said annular collar both having upturned perimetral borders to retain any drippings from said confection, said holder further comprising means to secure said confection to said holder, said means to secure comprising a groove located either in and below the upper surface of said continuous platform when said platform is positioned on top of said neck or in and below the upper surface of said neck itself when said annular collar is secured around the top portion of said neck, said groove being centrally positioned relative to said drip catch means and having an undercut cross-sectional configuration, said solid confection being supported on either said continuous platform or the combination of said annular collar and said neck secured thereto, with a portion of said solid confection filling said grooves, said grooves being dimensioned and configured to anchor said confection on said holder without the use of stick-like supports projecting therefrom.

4,992,284

MICROWAVE FOOD AROMA COMPOSITION

Gordon F. Kunz, Mahwah, N.J., assignor to Kraft General Foods, Inc., Glenview, Ill.

Filed Oct. 25, 1989, Ser. No. 427,263

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—241 **11 Claims**

1. A composition for producing an aroma upon exposure to microwave radiation during the cooking and/or reheating of food in a domestic microwave oven comprising:
(a) food acceptable salts in an amount of from 0.5 to 5% by weight of the composition;
(b) milk solids in an amount of from 5 to 25% by weight of the composition;
(c) lipids in an amount of from 5 to 35% by weight of the composition;
(d) water in an amount of from 30 to 70% by weight of the composition; and
(e) an effective amount of an aroma source which upon exposure of the composition to microwave radiation will produce an aroma.

10. A process for producing an aroma during cooking and/or reheating of food in a domestic microwave oven which comprises:
(a) forming an emulsion composition by admixing a composition comprising food acceptable salts from 0.5–5% by weight of the composition, milk solids from 5–25% by weight of the composition, lipid from 5–35% by weight of the composition, water from 30–70% by weight of the composition and a sufficient quantity of an aroma source which when exposed in the composition to microwave energy will produce an aroma;
(b) coating said emulsion composition onto a comestible; and
(c) subjecting the coated comestible to microwave radiation to produce an aroma within a period of time of less than one minute.

4,992,285

PROCESS FOR LAYERING SHEETS OF FOOD MATERIAL

Hans K. Larsen, Aestorp, Sweden, assignor to Nestec S.A., Vevey, Switzerland

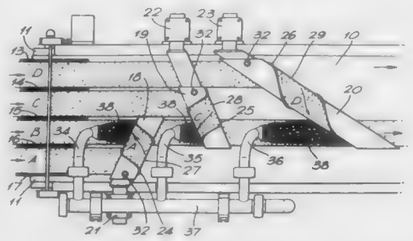
Division of Ser. No. 282,123, Dec. 9, 1988, Pat. No. 4,899,650.

This application Nov. 21, 1989, Ser. No. 439,474

Claims priority, application Peru, Jan. 8, 1988, 88100143

Int. Cl.[5] A21C *3/08, 9/08;* **A23L** *1/16*

U.S. Cl. 426—297 **9 Claims**



1. A process for preparing layered sheets of food material comprising advancing a plurality of sheets of flexible food material lying flat and parallel to one another on a moving conveyor belt beneath at least one substantially spiral guide, each of which is positioned above the advancing conveyor belt and sheets and each of which has a longitudinal axis substantially horizontal and at an oblique angle to a direction of movement of the conveyor belt and sheets, and passing at least one of the advancing sheets at least one complete turn around one the spiral guides for guiding each sheet passed around each spiral guide to lie above another sheet of the plurality of sheets advancing on the belt to form layered sheets of food material.

4,992,286

PROCESS FOR SHAPING FISH-PASTE PRODUCTS FROM FISH PASTE MATERIALS

Shobun Goto, Shiogama; Jiro Sugihara, Miyagi, and Masayoshi Yabusaki, Shiogama, all of Japan, assignors to Kabushiki Kaisha Kibun, Tokyo, Japan

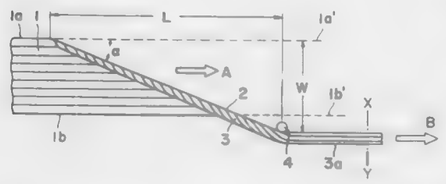
Continuation of Ser. No. 187,370, Apr. 28, 1988, which is a division of Ser. No. 63,761, Jun. 22, 1987, Pat. No. 4,746,525, which is a continuation of Ser. No. 630,760, Jul. 13, 1984, abandoned. This application Mar. 15, 1990, Ser. No. 494,162

Claims priority, application Japan, Jul. 26, 1983, 58-136541

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[5] A23L *1/325;* **A23P** *1/00*

U.S. Cl. 426—383 **2 Claims**



1. A process for shaping fish-paste products from fish-paste materials, which process comprises the steps of:
(1) preparing a fish-paste sheet, composed of all of the fish-paste materials in the product, with specific width and indefinite length, the sheet having incised lines or grooves formed in the length-wise direction of the sheet on at least one of the two surfaces of the sheet;
(2) causing the sheet to travel in its length-wise direction by applying tension to at least its front end in a length-wise direction;
(3) spirally and obliquely curling the thus traveling sheet at the front end portion thereof into a curled body having a lateral edge of the sheet as a core and extending obliquely to the sheet traveling direction and outward beyond the opposite lateral edge of the sheet;
(4) pulling the resulting curled body in a direction substantially parallel to the sheet-moving direction, the curled body being inflected at a point on or outside a line determined by extending the line of said opposite lateral edge of the sheet, at which point the curled body is supported by a guide post means against the force biasing the curled body so that the curled body tends to be parallel to the sheet-moving direction due to the pulling, said guide post means being a roller with its axis perpendicular to the plane of the surface of the sheet, the roller having a substantially constant diameter along the axis at the area of contact with the curled body, and said curled body traveling in contact with the surface of the roller at substantially a predetermined location along the length of the roller, thereby causing said tension to be applied to the sheet and the sheet to be rolled up into a rolled-up article; and then
(5) subjecting the rolled-up article to further processing.

4,992,287

PROCESS FOR TREATMENT OF MEAT

Claude Dreano, rue de Perhan, 56490 Guilliers, France

Continuation of Ser. No. 125,461, Nov. 25, 1987, abandoned. This application Jul. 21, 1989, Ser. No. 384,856

Claims priority, application France, Dec. 2, 1986, 86 16960

Int. Cl.[5] A23L *3/3418*

U.S. Cl. 426—418 **13 Claims**

1. A non-pickling process for tenderizing meat and/or improving its appearance to reduce the release of liquids from the meat during cold room storage thereof substantially without risk of loss of weight or color change in said meat, said process comprising the steps of introducing the meat into a rotatable enclosure which is and remains free of liquid or other preservatives, placing the enclosure under vacuum, establishing a pressure within the enclosure which is greater than atmospheric pressure by introducing into said enclosure compressed air which is substantially sterile, rotating said enclosure and then returning said enclosure to atmospheric pressure.

4,992,288

METHOD OF REMOVING SULFITE FROM SUGARBEETS

Roland F. Olson, Fargo, N. Dak., and Richard R. Fergle, Moorhead, Minn., assignors to American Crystal Sugar Company, Moorhead, Minn.

Continuation of Ser. No. 57,987, Jun. 4, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 373,034

Int. Cl.[5] A23L *1/214*

U.S. Cl. 426—429 **25 Claims**

1. A method of reducing sulfites from sulfite-containing sugarbeet pulp so as to render the pulp fit for human consumption; said method comprising the steps of obtaining sulfite-containing sugarbeet pulp and treating the sulfite-containing sugarbeet pulp with an effective sulfite eliminating amount of an oxidizing compound, which is selected from the group consisting of an organic peroxide, an inorganic peroxide, ozone, and chlorine dioxide, for a time sufficiently long so as to reduce the sulfite content of the pulp by at least about 50%.

4,992,289

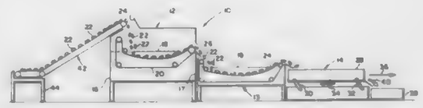
METHOD FOR OPENING A MOLLUSK

Edward F. Kiczek, Long Valley, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 17, 1989, Ser. No. 422,845

Int. Cl.[5] A23L *1/00;* **F25D** *17/00*

U.S. Cl. 426—479 **17 Claims**



1. A method for opening a mollusk's shell to expose the meat contained therein comprising the steps of:
rapidly cooling said mollusk to a surface temperature at or below −100° F.; and
agitating said mollusk immediately thereafter; whereby said mollusk shell is opened without damage to said meat and at least one eye remains attached to one-half of said mollusk shell and said meat is fully frozen.

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4,992,290

EGG-BASED CREAM FOR INDUSTRIAL SCALE CONFECTIONERY PRODUCTION

Giuseppe Bastetti, Milan; Claudio Russo, Modena, and Maria L. Solzi, Parma, all of Italy, assignors to Barilla G. E. R. F.LLI - Societa' Per Azioni, Parma, Italy

Filed Nov. 23, 1988, Ser. No. 275,474
Claims priority, application Italy, Mar. 24, 1988, 19923 A/88
Int. Cl.[5] A23L *1/0522, 1/09, 1/32*
U.S. Cl. 426—572 8 Claims

1. An egg-based cream for industrial scale confectionery production comprising, in parts by weight:

4 to 15 parts of one or more monosaccharides as a humectant;

4 to 6 parts of amylopectin modified with acetic and adipic functional groups; and

3 to 6 parts of protein obtained from egg yolk and milk; said cream having a pH within the 4 to 5 range, an Aw value within the 0.7 to 0.8 range, and a moisture content of between 16% and 23%.

4,992,291

COAGULANT FOR SOYBEAN MILK AND SOYBEAN FOOD USING SUCH COAGULANT

Tokuzo Yamamoto, 10965-3, Yoshino-cho, Kagoshima-shi, Kagoshima 892, Japan

Filed Jul. 31, 1989, Ser. No. 386,732
Int. Cl.[5] A23J *3/16, 1/14*
U.S. Cl. 426—573 4 Claims

1. A soybean curd comprising an aqueous slurry of ground soybean and a juice obtained from leaves of vegetables used as the only coagulant for gelling the soybean slurry, said juice containing at least 100 mg of water-soluble calcium based on 100 g of said juice.

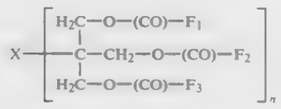
4,992,292

TRIS-HYDROXYMETHYL ALKANE DICARBOXYLATE EXTENDED ESTERS AS LOW CALORIE FAT MIMETICS

Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Anthony Scimone, Cedar Grove, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Division of Ser. No. 311,703, Feb. 6, 1989. This application Apr. 17, 1990, Ser. No. 510,042
Int. Cl.[5] A23D *5/00;* C11C *3/00*
U.S. Cl. 426—611 32 Claims

1. A food composition comprising an edible fat compound of the formula



where X is an alkyl bridge having 1 to 8 carbons, and F_1, F_2, and F_3 are dicarboxylate-extended fatty acid residues.

4,992,293

THIOESTER DERIVATIVES AS LOW CALORIE FAT MIMETICS

Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Anthony Scimone, Cedar Grove, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Sep. 19, 1989, Ser. No. 409,386
Int. Cl.[5] A23L *1/307;* C07C *327/00*
U.S. Cl. 426—611 52 Claims

1. A food composition comprising food ingredients and an edible fat mimetic compound of the following formula:



wherein:

B is a linear or branched alkyl backbone having from 2 to 6 carbons,

m=1 to 6,

n=0 to 3, and

each R is, independently, a C_1 to C_{29} aliphatic group, a C_2 to C_{29} either group of the formula R′—O—R″—, a C_2 to C_{29} ester group of the formula

R′—O—(CO)—R″— or R′—(CO)—O—R″—,

or a C_2 to C_{29} thioester group of the formula

R″—(CO)—S—R′— or R″—S—(CO)—R′—,

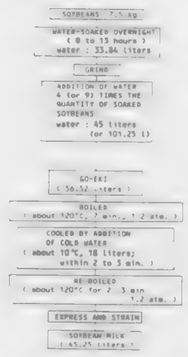
where R′— and R″— are, independently, aliphatic groups, with the proviso that $m+n \geqq 2$ and that each compound has at least one thioester bond.

4,992,294

METHODS OF PRODUCING SOYBEAN MILK AND BEAN CURD

Kenmei Noguchi, 808, Nishinoban, Toyama-shi, Toyama-ken, Japan

Filed Feb. 7, 1989, Ser. No. 307,827
Claims priority, application Japan, Feb. 8, 1988, 63-25743; Feb. 9, 1988, 63-26535
Int. Cl.[5] A23J *1/14;* A23L *3/14*
U.S. Cl. 426—634 9 Claims



1. In a method of producing soybean milk including the steps of soaking soybeans in water, grinding the soaked soybeans to make a mixed solution, boiling the solution and straining the boiled solution to produce soybean milk, the improvement wherein the boiling of the solution further comprises:

a first boiling step for boiling said solution at a temperature between 110° to 120° C. under pressure of about 1.2 atmospheres;

a step for cooling said boiled solution by adding cool water thereto; and

a subsequent second boiling step for boiling said cooled solution at a temperature between 100° and 120° C. under pressure of 1.2 atmospheres.

4,992,295

METHOD OF PRODUCING FROZEN SURIMI AND PRODUCT THEREOF

Ryuzo Ueno, Nishinomiya; Toshitaka Nakashima; Kunihiko Tomiyasu, both of Ushiku, and Yatsuka Fujita, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Mar. 16, 1989, Ser. No. 324,113
Claims priority, application Japan, Mar. 16, 1988, 63-62894
Int. Cl.[5] A23L *1/325*
U.S. Cl. 426—643 5 Claims

1. A method of producing frozen surimi which comprises mixing 0.5 to 15 parts by weight of reduced hydrolyzed starch with 100 parts by weight of dehydrated minced fish meat, and then freezing the obtained mixture.

4,992,296

ABUSE-TYPE DRUG TEST PAPERS AND METHODS OF MAKING AND USING SAME

Jacob J. Gibson, 36 Bonner Dr., Glens Falls, N.Y. 12804

Continuation-in-part of Ser. No. 54,199, May 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 808,378, Dec. 16, 1985, abandoned, which is a continuation of Ser. No. 520,463, Aug. 4, 1983, abandoned. This application Feb. 24, 1989, Ser. No. 316,334
Int. Cl.[5] A61K *9/70;* G01N *21/78, 33/52*
U.S. Cl. 427—2 5 Claims

5. A method for producing a test paper useful in detecting the presence of abuse-type drugs except cocaine in urine which comprises the steps of immersing bibulous paper sheet in dilute hydrochloric acid solution of iodochloroplatinate at about 20°–40° C., providing a second solution composed of about equal proportions of bismuth subnitrate and iodochloroplatinate and containing dilute hydrochloric acid and acetic acid, thereafter immersing the resulting coated sheet in the second solution, then drying the sheet at about 50° in high humidity.

4,992,297

CASTABLE PALLADIUM ALLOYS AND THEIR USE FOR MAKING DENTAL RESTORATIONS, ORNAMENTS, AND THE LIKE

Joseph M. van der Zel, Zwaag, Netherlands, assignor to Elephant Edelmetaal B.V., Hoorn, Netherlands

Continuation of Ser. No. 186,350, Apr. 26, 1988, abandoned. This application May 1, 1989, Ser. No. 346,333
Claims priority, application Netherlands, Apr. 28, 1987, 8701001
Int. Cl.[5] C23D *1/00;* C22C *5/00, 30/00*
U.S. Cl. 427—2 1 Claim

1. A process for making crack-free dental restorations comprising coating with porcelain a castable palladium alloy in the form of a dental restoration containing 35–50 wt % Pd, 20–45 wt % In, 20–45 wt % Ag, up to 6 wt % tantalum, titanium and/or rhenium, up to 5 wt % zinc, tin, gallium, germanium, aluminum, silicon and/or boron and an amount up to 3 wt % scandium, lanthanum, yttrium and/or rare earths to effect reduction of the thickness of an oxide layer on said alloy and thereby improve bonding with porcelain and firing said coated alloy to form a crack-free dental restoration.

4,992,298

DUAL ION BEAM BALLISTIC ALLOYING PROCESS

Arnold H. Deutchman, and Robert J. Partyka, both of Columbus, Ohio, assignors to BeamAlloy Corporation, Dublin, Ohio

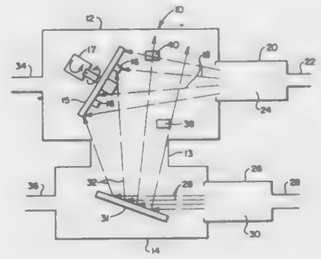
Filed Oct. 11, 1988, Ser. No. 255,573
Int. Cl.[5] B05D *3/06;* C23C *14/00*
U.S. Cl. 427—38 13 Claims

1. A process for forming a film adhered to a substrate in an evacuated atmosphere comprising:

(a) cleaning the surface of the substrate with a first energy beam of inert atoms having an energy level in the range from about 500 eV to 1000 eV,

(b) after said cleaning, sputtering a desired non-hydrocarbon substance within said atmosphere by a second beam of inert atoms having an energy rate of about 1-50 eV/atom at a rate and in a direction to cause such substance to deposit on said substrate,

(c) simultaneously with said sputtering, exposing the substrate to said first energy beam of inert atoms at an energy level in the range from about 0.5 KeV to 100 KeV to grow a ballistically alloyed layer having a thickness of about 10-2000Å in said substrate,



(d) subsequently of exposing the substrate to the first beam and the sputtering, continuing the sputtering and exposing the substrate to a lower energy beam of inert atoms from the source of said first beam at an energy level in the range from about 100 eV to 500 eV that will cause the growth of a film of said substance on said substrate to a final desired thickness.

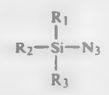
4,992,299

DEPOSITION OF SILICON NITRIDE FILMS FROM AZIDOSILANE SOURCES

Arthur K. Hochberg, Solana Beach; David L. O'Meara, Oceanside, and David A. Roberts, Carlsbad, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 1, 1990, Ser. No. 473,300
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 24 Claims

1. A method of producing a silicon nitride film on the surface of a substrate comprising the steps of heating the substrate surface to a temperature of from about 400° C. to about 600° C. in an oxygen-free environment in which the pressure is from about 0.1 torr to about atmospheric and introducing into said reactor a compound of the class



wherein R_1, R_2, and R_3 are hydrogen, azido, 1 to 6 carbon alkyl, phenyl, or 7 to 10 carbon aralkyl, at least one of R_1, R_2, and R_3 being 1–6 carbon alkyl, phenyl, or 7 to 10 carbon aralkyl.

4,992,300

MANUFACTURING METHOD FOR A RECORDING MEDIUM OR A RECORDING HEAD

Kazufumi Ogawa, Hirakata, and Hideharu Tamura, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1989, Ser. No. 354,240
Claims priority, application Japan, May 24, 1988, 63-126404; Jun. 2, 1988, 63-136401
Int. Cl.[5] B05D *3/06;* G11B *5/72*
U.S. Cl. 427—44 4 Claims

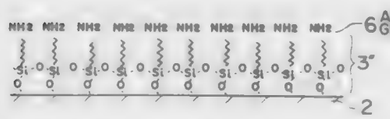
1. A manufacturing method for a recording medium having

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such character that after the process step a. is effected, the process steps b. and c. are repeated several times wherein the process steps a., b. and c. are described below:

a. forming a recording layer on the surface of a substrate of a recording medium,

b. forming one layer of a monomolecular film by chemical adsorption of a silane surfactant on the recording layer, wherein the silane is a linear chain containing an unsaturated hydrocarbon group at one end and a chloro silyl group at the other end, said monomolecular film being formed directly on the recording layer through bonding of silicons of the surfactant and oxygens on the recording layer,



or through another previously layered film on the recording layer through bonding of silicons of the surfactant and oxygens of said another layer on the recording layer;

c. after forming one layer of the monomolecular film, irradiating said film with a high energy beam or treating said film with plasma in an atmosphere that consists essentially of N_2 to form at least —NH groups at outer vinyl groups of the film or consists essentially of O_2 to form at least —OH groups at outer vinyl groups of the film to chemisorb the silane surfactant on said layer of the monomolecular film.

4,992,301

CHEMICAL VAPOR DEPOSITION APPARATUS FOR OBTAINING HIGH QUALITY EPITAXIAL LAYER WITH UNIFORM FILM THICKNESS

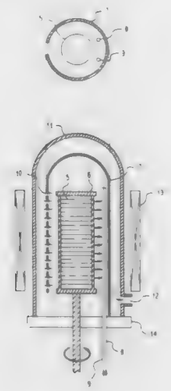
Seiichi Shishiguchi; Fumitoshi Toyokawa, and Masao Mikami, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,850

Claims priority, application Japan, Sep. 22, 1987, 62-239603; Sep. 22, 1987, 62-239605; Sep. 22, 1987, 62-239607; Sep. 29, 1987, 62-247176; Mar. 15, 1988, 63-62553

Int. Cl.[5] C23C *16/00*

U.S. Cl. 427—51 **10 Claims**



1. A chemical vapor deposition apparatus comprising:

a reaction tube;

a substrate-holder installed in said reaction tube, said substrate-holder having a means for stacking a plurality of substrates in a vertical direction with a space of a predetermined interval, surfaces of said substrates being held horizontally;

a rotating-means for rotating said substrates stacked in said substrate-holder;

a heating-means for heating said substrates;

a first gas-supply nozzle tube installed vertically in said reaction tube, said first gas-supply nozzle tube having a first vertical gas-emission line, said first vertical gas-emission line having a plurality of first gas-emission holes aligned in a vertical direction; and

a second gas-supply nozzle tube installed vertically in said reaction tube, said second gas-supply nozzle tube having a second vertical gas-emission line, said second vertical gas-emission line having a plurality of second gas-emission holes aligned in a vertical direction, a first gas-emitting-axis of said first gas-emission holes intersecting with a second gas-emitting-axis of said second gas-emission holes at a first intersection over said substrate, said first intersection of said first and second gas-emitting axes being deviated from a rotation center of said rotating substrates.

4,992,302

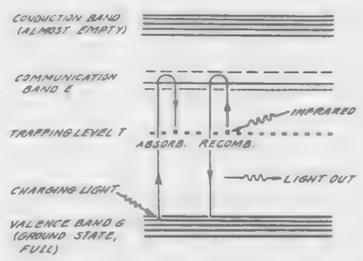
PROCESS FOR MAKING PHOTOLUMINESCENT MATERIALS

Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 34,333, Apr. 3, 1987, Pat. No. 4,822,520, and a continuation-in-part of Ser. No. 78,829, Jul. 28, 1987, Pat. No. 4,842,960, and a continuation-in-part of Ser. No. 147,215, Jan. 22, 1988, Pat. No. 4,879,186, which is a continuation-in-part of Ser. No. 870,809, Jun. 5, 1986, Pat. No. 4,830,875, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Apr. 14, 1989, Ser. No. 338,190

Int. Cl.[5] B05D *5/06;* **C09K** *11/08*

U.S. Cl. 427—70 **22 Claims**



1. A process for preparing a photoluminescent material, comprising the steps of:

(a) mixing,

a base material selected from the group of alkaline earth metal sulfides and mixtures thereof,

a first dopant of samarium or a samarium compound, and

a second dopant selected from the group consisting of a europium compound and a cerium compound;

(b) thoroughly drying the mixture at a temperature of about 150° C. for about one hour by placing it in a graphite crucible within a furnace flushed with a dry inert atmosphere;

(c) heating the mixture in the graphite crucible within the furnace flushed with a dry inert atmosphere to a temperature which is sufficiently high to form a fused mass; and

(d) cooling said fused mass so that the mixture is in crystalline form.

4,992,303

CHEMICAL VAPOR DEPOSITION OF CADMIUM MERCURY TELLURIDE

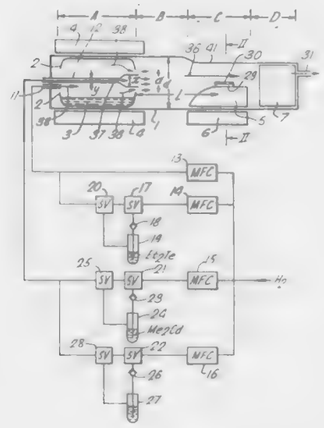
Peter A. C. Whiffin, Horsham; Christopher D. Maxey, Crawley, both of England, and Brian C. Easton, Reigate, United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 276,706, Nov. 28, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 497,746

Claims priority, application United Kingdom, Dec. 22, 1987, 8729875

Int. Cl.[5] C23C *16/00;* **C30B** *25/02*

U.S. Cl. 427—126.1 **12 Claims**



1. A method of manufacturing a solid state electronic device comprising the steps of

(a) providing a heated substrate in a reaction zone of a reactor vessel,

(b) passing a gas stream of at least one first reactant through a first heated zone of said reactor vessel to said reactor zone, said first zone being laterally separated from said reaction zone,

(c) separately passing at least one second reactant to said gas stream in a mixing zone of said reactor vessel between said first heated zone and said reactor zone, said at least one second reactant being introduced to said mixing zone at a flow velocity more closely matching a flow velocity of said gas stream in said mixing zone,

said at least one second reactant being separately passed through said first heated zone through an injection tube having a narrow bore and a widened outlet, said at least one second reactant having a higher flow velocity through said first heated zone in said injection tube, and said at least one second reactant having said matching flow velocity at an outlet end of said injection tube into said mixing zone,

(d) flowing said gas stream through a capsule containing at least one further reactant at said first heated zone, said at least one further reactant being carried by said gas stream to said mixing zone together with said at least one first reactant, said capsule concentrically surrounding said injection tube and being configured to provide all reactants at a matching flow velocity in said mixing zone, and

(e) reacting said at least one first reactant, and at least one second reactant, and said further reactant over said heated substrate to deposit a layer of a material formed from said reactants on said substrate.

4,992,304

METHODS FOR COATING A LIGHT-TRANSMISSIVE SUBSTRATE TO PROMOTE ADHESION OF A PHASE-CHANGE INK

Donald R. Titterington, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 27, 1989, Ser. No. 457,645

Int. Cl.[5] B05D *5/06*

U.S. Cl. 427—164 **13 Claims**

1. A method for producing a phase change ink printed substrate, which comprises:

providing a substrate, said adhesion promoter being applied as an optically clear uniform layer;

applying an adhesion promoter to at least one surface of said substrate;

applying to at least one surface of said substrate to which said adhesion promoter has been applied a predetermined pattern of a light-transmissive phase change ink which transmits light in a non-rectilinear path and which is compatible with said adhesion promoter; and

reorienting said pattern of solidified phase change ink to produce a layer of light-transmissive phase change ink printed on said substrate which is substantially adhesively bonded to said substrate by said adhesion promoter layer, said ink layer having a substantially uniform thickness and said ink layer and said layer of adhesion promoter transmitting light in a substantially rectilinear path.

4,992,305

CHEMICAL VAPOR DEPOSITION OF TRANSISTION METALS

Ahmet Erbil, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jun. 22, 1988, Ser. No. 210,079

Int. Cl.[5] C23C *16/00;* **C07F** *11/00, 17/00*

U.S. Cl. 427—252 **17 Claims**

1. A chemical vapor deposition process for depositing a thin coating comprising a transition metal of Group VB, VIB, VIIB or VIII of the Periodic Table, or a compound thereof, on a heated substrate, which comprises: contacting a heat decomposable organometallic compound of the following formula (I)



wherein:

M is a metal of Group VB, VIB, VIIB or VIII of the Periodic Table,

R_1 is a lower alkyl or lower alkenyl radical of 2 to 6 carbon atoms,

R_2 is hydrogen, a lower alkyl radical of 1 to about 6 carbon atoms, or a lower alkenyl radical of 2 to about 6 carbon atoms;

n is the valence of M and is an integer from 2 to 4, and

p is an integer from 0 to (n−1), with said heated substrate, the temperature of said substrate being above the decomposition temperatures of said organometallic compound.

13. An organometallic compound of the formula (I)



wherein:

M. is a metal of Group VB, VIB, VIIB or VIII of the Periodic Table;

R_1 is a lower alkyl or lower alkenyl radical of 2 to about 6 carbon atoms;

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R_2 is hydrogen, a lower alkyl radical of 1 to about 6 carbon atoms, or a lower alkenyl radical of 2 to about 6 carbon atoms;

n is the valence of M and is an integer from 2 to 4, and

p is from 1 to (n−1);

with the provisos that:

(1) M is a metal of Group VIB or VIIB when R_2 is hydrogen; and

(2) M is a metal of Group VIIB or VIII when R_2 is a lower alkyl, or lower alkenyl radical and p is from 1 to (n−1).

4,992,306

DEPOSITION OF SILICON DIOXIDE AND SILICON OXYNITRIDE FILMS USING AZIDOSILANE SOURCES

Arthur K. Hochberg, Solana Beach; David L. O'Meara, Oceanside, and David A. Roberts, Carlsbad, all of Calif., assignors to Air Products abd Chemicals, Inc., Allentown, Pa.

Filed Feb. 1, 1990, Ser. No. 473,503

Int. Cl.[5] B05D *5/12*; C23C *16/40*

U.S. Cl. 427—255.3 **25 Claims**

1. A low temperature chemical vapor deposition process comprising the steps of:

heating in a chemical vapor deposition reactor a substrate upon which deposition is desired to a temperature of from about 350° C. to about 700° C. at a pressure of from about 0.1 torr to about atmospheric pressure, and maintaining such pressure during the process;

introducing into the reactor a silicon-containing feed and a source of gaseous oxygen, said silicon containing feed consisting essentially of one or more compounds having the general formula



wherein: R_1, R_2, and R_3 are hydrogen, azido or 1–6 carbon alkyl, phenyl or 7 to 10 carbon alkaryl groups, at least one of R_1 and R_2 being 1–6 carbon alkyl, phenyl or 7 to 10 carbon alkaryl

maintaining the flow of said source of gaseous oxygen and the temperature and pressure in said ranges to cause a film of silicon dioxide or silicon oxynitride to deposit on said substrate.

4,992,307

METHOD AND APPARATUS FOR IMPREGNATING A LIQUID INTO WOOD AND FAR-INFRARED-RAY PANEL HEATING STRUCTURE

Nobuo Ikeda, 22-12,, Aza Matsuzaki, Sotoasahikawa Akita-shi, Akita, Japan

Filed Sep. 15, 1988, Ser. No. 244,901

Claims priority, application Japan, May 25, 1988, 63-128101; Jun. 3, 1988, 63-74149[U]

Int. Cl.[5] B05D *5/00*

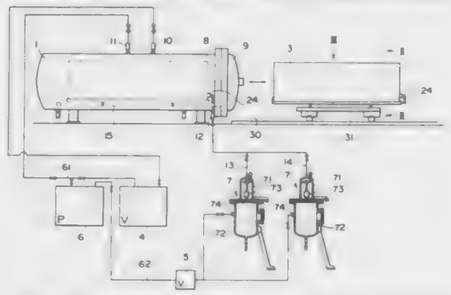
U.S. Cl. 427—297 **7 Claims**

1. A method for impregnating a liquid such as a resinous liquid into wood in a pressure tank which is capable of increasing or reducing an interior pressure, which method comprises:

(a) a step for evacuating the inside of the pressure tank, which contains timbers to be impregnated with the liquid through an evacuation line outside of the pressure tank and through a monitoring timber located outside of said pressure tank and substantially identical with said timbers which is connected to said evacuation line; and

(b) a step for injecting the liquid into the pressure tank under pressurized conditions, while continuing the evacuation of the inside of the tank through such evacuation line and said monitoring timber;

the impregnation of the timbers in the pressure tank with the liquid being continued until the liquid begins to be drawn out of the pressure tank through the evacuation line monitoring timber as evidenced by dripping of liquid from said monitoring timber.



4,992,308

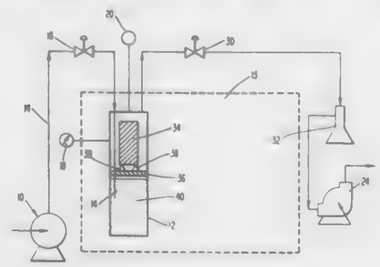
SUPERCRITICAL FLUID-AIDED TREATMENT OF POROUS MATERIALS

Aydin K. Sunol, Port Richey, Fla., assignor to University of South Florida, Tampa, Fla.

Filed Sep. 16, 1988, Ser. No. 245,858

Int. Cl.[5] B05D *3/00*

U.S. Cl. 427—297 **7 Claims**



1. A process of making a porous material having enhanced properties, which comprises:

contacting porous material with a first supercritical solvent under conditions sufficient to extract extractives from said material;

separating supercritical solvent containing extractives from the porous material having less extractives;

contacting the porous material having less extractives with a second supercritical solvent containing a polymerizable monomer under conditions sufficient to impregnate the monomer into the porous material having less extractives;

precipitating the polymerizable monomer within the porous material having less extractives; and

polymerizing said precipitated polymerizable monomer in situ within the porous material having less extractives, thereby making a porous material having enhanced properties.

4,992,309

METHOD FOR SALT BATH-NITRIDING METAL MEMBER

Takesi Omori, Kobe; Osamu Matsumoto, and Tatsuo Horimoto, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Shonan Chikka Kogyo Co, Ltd., Fujisawa, both of, Japan

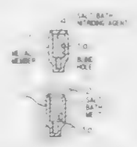
Filed Sep. 11, 1989, Ser. No. 405,289

Claims priority, application Japan, Sep. 12, 1988, 63-228075

Int. Cl.[5] C23C *2/00*

U.S. Cl. 427—431 **3 Claims**

1. A method for salt bath-nitriding a metal member having a blind hole, which comprises supporting said metal member so that the open side of said blind hole is directed upward, filling a solid salt bath-nitriding agent into said blind hole and immersing the resultant metal member in a salt bath melt.



4,992,310

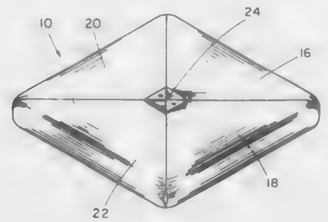
FIRE POUCH

Gabriel M. Gelb, 11709 Durrette, Houston, Tex. 77024; William A. Mallow, San Antonio, Tex., and Scott Stropkay, Boston, Mass., assignors to G. M. Gelb, Houston, Tex.

Filed Jun. 26, 1989, Ser. No. 371,609

Int. Cl.[5] A62C *3/00*; B65D *85/00*

U.S. Cl. 428—345 **20 Claims**



1. A fire pouch for protecting flammable documents from fire and/or water damage, comprising:

a thin pliable fluid-tight exterior container having an interior defined by an outer skin layer and an inner skin layer spaced from the outer skin layer;

a gelled water material substantially filling the interior of the exterior container for absorbing thermal energy during a fire;

a pliable hydrated intumescent material layer in contact with the inner skin layer opposite the gelled water layer to absorb thermal energy and intumesce during a fire to produce a foam layer substantially thicker than the pliable hydrated intumescent material layer;

the exterior container and the hydrated intumescent material layer forming a relatively thin pliable blanket which unfolds to receive the flammable documents and folds to substantially enclose and protect the flammable documents during a fire; and

a water-tight document container positioned interior of the folded blanket for housing the flammable documents to protect the documents from water damage.

4,992,311

RESIN COMPOSITION AND MOLDED PRODUCTS THEREOF

Nobuyuki Hisazumi; Tsutomu Uehara, both of Tsuchiura; Hiroyuki Ohba, Niihari, and Kazuhiko Hirose, Abiko, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 332,823

Claims priority, application Japan, Apr. 8, 1988, 63-86673; European Pat. Off., Apr. 3, 1989, 89303272.2

Int. Cl.[5] B32B *27/30, 27/34*

U.S. Cl. 428—35.4 **5 Claims**

1. A stretched molded product having at least one layer comprising a resin composition consisting essentially of more than 40% by weight and not more than 95% by weight of polyamide resin having a low crystalline melting point of not higher than 210° C. and less than 60% by weight and not less than 5% by weight of vinylidene chloride resin particles dispersed in said layer, the dispersed particles of vinylidene chloride resin in said stretched layer having a long, flat shape along at least one of the stretched directions, and the flatness, calculated as the long axis of the cross section of the dispersed particle divided by the short axis of the cross section of the dispersed particles, being not less than 2.

4,992,312

METHODS OF FORMING PERMEATION-RESISTANT, SILICONE ELASTOMER-CONTAINING COMPOSITE LAMINATES AND DEVICES PRODUCED THEREBY

Eldon E. Frisch, Midland, Mich., assignor to Dow Corning Wright Corporation, Arlington, Tenn.

Filed Mar. 13, 1989, Ser. No. 322,970

Int. Cl.[5] B29D *22/00*

U.S. Cl. 428—35.7 **37 Claims**

1. A method of making a permeation-resistant silicone elastomer-containing laminate for medical devices comprising the steps of:

(a) applying a layer of an unvulcanized heat-curable silicone elastomer composition to a cured silicone elastomer substrate, wherein said unvulcanized silicone elastomer composition is bondable to said cured silicone elastomer substrate,

(b) applying a layer of a solvent dispersion of a permeation-resistant elastomer and a first solvent on said layer of unvulcanized silicone elastomer composition to form a three-layered elastomeric laminate, wherein said permeation-resistant elastomer is selected from the group consisting of polyurethane, silicone-polyurethane copolymer, and silicone-polycarbonate copolymer, and wherein said first solvent is at least a partial solvent for said unvulcanized silicone elastomer composition, and

(c) exposing said three-layered elastomeric laminate to heat until said unvulcanized silicone elastomer composition is substantially vulcanized.

4,992,313

FIBER-REINFORCED PLASTIC STRUT CONNECTING LINK

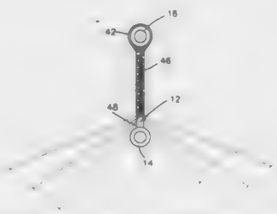
James P. Shobert, 52189 Leland Ave., South Bend, Ind. 46637, and Elson B. Fish, 21366 New Rd., Lakeville, Ind. 46536

Division of Ser. No. 132,774, Dec. 14, 1987, Pat. No. 4,857,124.

This application Jun. 21, 1989, Ser. No. 369,128

Int. Cl.[5] D04C *1/00*

U.S. Cl. 428—36.1 **3 Claims**



1. A fiber-reinforced plastic article having an elongated first cylindrical portion and integral second and third cylindrical portions at its ends which are perpendicular to said first cylindrical portion, said article being defined by a resin-inpregnated braided sleeve forming a cylinder to define said first cylindrical portion and forming flat loops which define said second and third cylindrical portions.

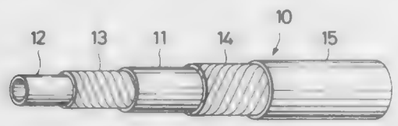
VOL 1123 ISS 2 FE 12 1991 UMI

4,992,314

RUBBER COMPOSITIONS AND HOSES USING THE SAME

Tomoji Saitoh, Hiratsuka, Japan, assignor to 501 Yokohama Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 205,005, Jun. 3, 1988, abandoned, which is a continuation of Ser. No. 926,545, Nov. 4, 1986, abandoned.
This application May 15, 1989, Ser. No. 351,707
Claims priority, application Japan, Nov. 5, 1985, 60-247737
Int. Cl.[5] F16L *11/08*
U.S. Cl. 428—36.3 4 Claims



1. A hose comprising an inner tube, first and second reinforcing layers, at least one adhesive layer and an outer cover superimposed peripherally one on another, said first and second reinforcing layers being wound or braided with brass plated wires or with organic fiber cords resulting from treatment with a mixture consisting essentially of a resorcin-formalin condensate and a latex, said one adhesive layer being disposed between said first and second reinforcing layers, said one adhesive layer being derived from a rubber composition comprising:

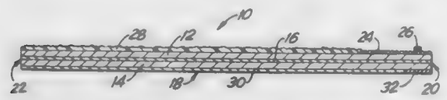
(a) a starting diene rubber vulcanizable with sulfur;
(b) silica, in an amount of 1–100 parts;
(c) a resorcin donor, in an amount of 0.5–20 parts;
(d) a methylene donor, in an amount of 0.1–10 parts; and
(e) 2,4,6-trimercapto-1,3,5-triazine, in an amount of 0.1–15 parts, respectively, by weight of 100 parts of said starting rubber.

4,992,315

ROOFING MEMBRANE AND METHOD

Thomas J. Zickell, Stratham, N.H., and Steven C. Bettoli, Bound Brook, N.J., assignors to GAF Buildinhg Materials Corp., Wayne, N.J., a part interest

Filed Nov. 13, 1989, Ser. No. 434,384
Int. Cl.[5] B32B *7/12, 5/16, 25/02*
U.S. Cl. 428—41 8 Claims



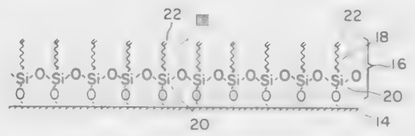
1. A bituminous roofing membrane comprising:
first and second layers of a tacky polymer modified bitumen;
a reinforcing mat layer sandwiched between and in contact with said first and second bitumen layers to form first and second oppositely exposed surfaces of said membrane;
one of said first and second exposed surfaces constituting a non-weather surface adapted to be secured to the roof;
the other one of said first and second exposed surfaces having a leading edge portion and a trailing edge portion;
said leading edge portion having a protective layer of roofing granules constituting a weather exposed surface, and further having a track of pressure sensitive adhesive on said roofing granules extending in the same direction as said leading edge and spaced inwardly of said edge;
the exposed surface of said trailing edge portion having a layer of non-slip plastic film;
whereby when said membrane is secured to the roof, said leading edge portion constitutes a starter strip for receiving thereon the first row of roofing shingles, and said trailing edge portion constitutes an underlayment for receiving thereon successive rows of roofing shingles.

4,992,316

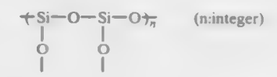
RECORDING MEDIUM AND METHOD OF PRODUCING THE SAME

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 131,011, Dec. 10, 1987, abandoned, which is a continuation of Ser. No. 799,451, Nov. 18, 1985, Pat. No. 4,761,316. This application Oct. 20, 1989, Ser. No. 423,636
Claims priority, application Japan, Nov. 19, 1984, 59-243677
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—64 27 Claims



1. A recording medium comprising:
a base body;
at least one recording layer formed on said base body; and
at least one protection layer formed on said recording layer for protecting said recording layer, said protection layer being at least one monomolecular layer of polymerized silane surface active agent which is made by a chemical adsorption technique, is polymerized through siloxane bonds of the formula



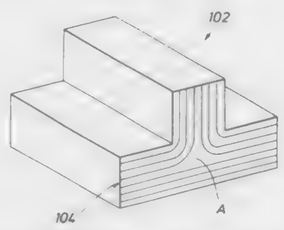
which are oriented along a plane in a plane of the protection layer extending parallel to said base body, and is chemically bonded to said recording layer.

4,992,317

REINFORCED THREE DIMENSIONAL COMPOSITE PARTS OF COMPLEX SHAPE AND METHOD OF MAKING

Henry Chess, Bloomington, and Todd Drummond, Maple Grove, both of Minn., assignors to Xerkon, Inc., Minneapolis, Minn.

Filed Dec. 22, 1988, Ser. No. 288,352
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—102 1 Claim



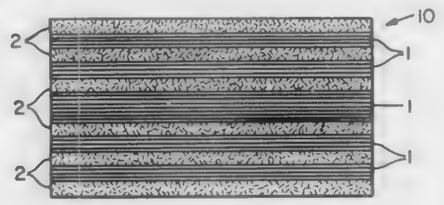
1. A dry resin free dimensionally unstable fiber form, comprised of at least two non-resin impregnated integral parts which lie, at least partially, in intersecting non-parallel planes, the intersection defining a non-adhesively bonded juncture which is reinforced by at least one thread simultaneously defining a hole through said juncture and sewn through said juncture, along a line intersecting the angle formed by said juncture, said dry resin-free fiber form prepared for subsequent resin saturation and cure.

4,992,318

LAMINATED HYBRID CERAMIC MATRIX COMPOSITES

Kishor P. Gadkaree, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Oct. 26, 1989, Ser. No. 426,991
Int. Cl.[5] B32B *5/12;* C04B *35/56*
U.S. Cl. 428—114 8 Claims



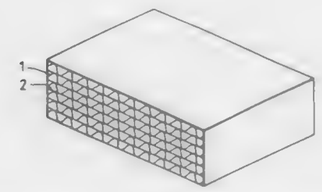
1. A laminated ceramic matrix composite article comprising:
one or more fiber-reinforced layers comprising long inorganic fibers disposed in a ceramic matrix material, wherein the fibers are oriented along axes parallel with the planes of the layers and wherein the ceramic matrix material is substantially free of inorganic whiskers and chopped fibers; and
one or more toughened ceramic matrix layers interlaminated with and integrally bonded to the fiber-reinforced layers, said toughened ceramic matrix layers comprising inorganic whiskers or chopped fibers randomly oriented in a ceramic matrix material, wherein said ceramic matrix material is substantially free of long oriented inorganic fibers, and wherein said whiskers and said chopped fibers comprise less than 25% by weight of said toughened ceramic matrix layers; and wherein the ratio of the elastic modulus of said toughened ceramic matrix layers to the elastic modulus of said fiber-reinforced layers does not exceed about 1.1.

4,992,319

ACTIVATED CARBON SUPPORTING HONEYCOMB STRUCTURE AND PROCESS FOR FABRICATING THE SAME

Masaji Kurosawa, Chiba; Isao Terada, and Hideto Nakada, both of Kanagawa, all of Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed May 16, 1989, Ser. No. 352,200
Claims priority, application Japan, May 18, 1988, 63-119173
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—116 11 Claims



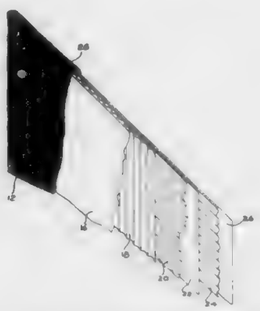
1. A honeycomb structure used for ozone decomposition comprising:
an inorganic fiber made paper having a void factor of at least 60%; and
activated carbon and binder therefor that is loaded in an amount of 70 g per liter of paper volume and fixed in the voids between fibers in said paper.

4,992,320

LAMIANTES FOR HEADLINING

Michael W. Gower, Durban, South Africa, assignor to Courtaulds Automotive Products (SA) (PTY) Limited, Durban, South Africa

Filed Nov. 23, 1988, Ser. No. 276,192
Int. Cl.[5] B32B *3/28;* B60J *10/00*
U.S. Cl. 428—184 2 Claims



1. A panel for lining the inside of automobile roofs comprising a laminate which includes a pair of resin-impregnated corrugated cardboard boards with their corrugations at an angle to one another, said boards being heat bonded together by a sheet of thermoplastic material interposed there between, and a fabric lamina covering said laminate.

4,992,321

HEAT RESISTANT FOAMED GLASS

Takayoshi Kandachi, and Nobuo Nakamura, both of Osaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jun. 21, 1988, Ser. No. 209,626
Claims priority, application Japan, Jun. 22, 1987, 62-153501; Sep. 30, 1987, 62-244085
Int. Cl.[5] C03C *11/00;* B32B *7/02, 5/14*
U.S. Cl. 428—213 25 Claims

1. A reinforced and heat resistant foamed glass, comprising 0.2 to 5 wt % of pieces of a corrosion resistant ferritic steel wire containing 13–20 wt % of Cr dispersed in a matrix of foamed glass, the thermal expansion coefficient of said steel wire being 1.1 to 1.3 times as large as the thermal expansion coefficient of the glass, the wire pieces being each 3 to 50 mm in length and 0.01 to 2 mm^2 in cross-sectional area.

4,992,322

COEXTRUDED PRODUCTS WITH IMPROVED WEATHERABILITY

Herbert L. Curry, Mt. Vernon, Ind., and Kirk L. Kimbel, Highland Park, Ill., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 23, 1988, Ser. No. 210,270
Int. Cl.[5] B32B *27/36*
U.S. Cl. 428—215 8 Claims

1. A coextruded article consisting essentially of:
(a) an aromatic polycarbonate core layer consisting of a polycarbonate resin derived from 2,2-bis(4-hydroxyphenyl)propane and a carbonate precursor; and
(b) a moisture resistant, polyphthalate-carbonate layer adhered to said core layer.

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4,992,323

LAMINATE OF METAL SHEETS AND CONTINUOUS FILAMENTS-REINFORCED THERMOPLASTIC SYNTHETIC MATERIAL, AS WELL AS A PROCESS FOR THE MANUFACTURE OF SUCH A LAMINATE

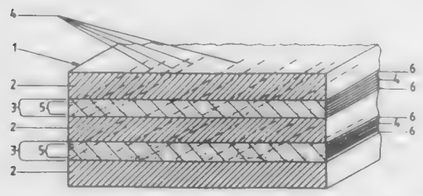
Laurens B. Vogelesang, Nieuwkoop; Leendert G. Meyers, Den Bommel, and Tom M. van Velze, Delft, all of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Filed Oct. 11, 1988, Ser. No. 255,432

Claims priority, application Netherlands, Oct. 14, 1987, #8702452

Int. Cl.[5] B32B *7/02, 15/08*

U.S. Cl. 428—215 18 Claims



1. A laminate composed of at least two metal sheets, between which is provided a synthetic thermoplastic layer containing fibers having a high modulus of elasticity of 60–450 Gpa, which layer is bonded to the metal sheets, wherein:

A. the fibers consist essentially of continuous filaments extending parallel to each other in at least one direction;

B. the metal sheets each have a thickness of less than 1.5 mm and are made of a metal having a tensile strength higher than 0.20 Gpa, said metal being selected from the group consisting of aluminum, aluminum alloys, aluminum-copper alloys, aluminum-zinc alloys, steel, titanium alloys, copper, copper alloys and magnesium alloys;

C. the elongation at rupture of the filaments is higher than 0.5% and not more than 6%;

D. the laminate is prestressed such that in the prestress direction in each metal sheet of the substantially flat laminate in its externally entirely unloaded state there prevails a compressive stress, and in the continuous filaments, a tensile stress;

E. said compressive stress in the metal sheets is in the range of from 0 to 200 MPa and said tensile stress in the filaments is in the range of from 0 to 500 MPa; and

F. the thermoplastic synthetic material is selected from the group consisting of substantially amorphous thermoplastic synthetic materials having a glass transition temperature T_g above 140° and semi-crystalline or para-crystalline synthetic thermoplastic materials having a crystalline melting point T_m above 270° C.

2. A laminate according to claim 1, characterized in that the synthetic layer is composed of one or more layers of plastics-impregnated filaments, said filament layers being provided on either side with a synthetic boundary layer contacted by the metal sheets and bonded thereto, which boundary layers contain virtually no filaments and have a thickness of 10–60 mm.

4,992,324

ABSORBENT FLEXIBLE BOARD

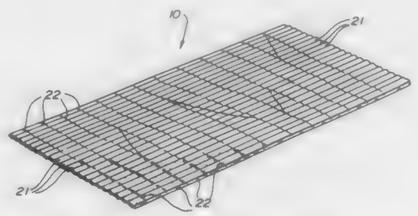
Emile C. Dubé, Montreal East, Canada, assignor to Johnson & Johnson, Inc., Montreal, Canada

Filed Sep. 12, 1988, Ser. No. 242,271

Int. Cl.[5] D03D *3/00*

U.S. Cl. 428—226 19 Claims

1. A flexible absorbent element useful in products for absorbing body fluids comprising a plurality of strips of an absorbent material disposed adjacent to each other and interconnected to one another by a fibrous reinforcing component integral with



said absorbent material and extending between said strips to maintain the structural integrity of said absorbent element.

4,992,325

INORGANIC WHISKER CONTAINING IMPACT ENHANCED PREPREGS AND FORMULATIONS FORMULATIONS

Yang S. Kim, Seoul, Rep. of Korea, and Paul A. Steiner, Concord, Calif., assignors to The Dexter Corporation, Pittsburg, Calif.

Filed Dec. 15, 1987, Ser. No. 132,286

Int. Cl.[5] B32B *5/16, 5/26, 5/28, 5/30*

U.S. Cl. 428—241 16 Claims

1. A prepreg formulation comprising prepreg fabric and filament fibers unidirectionally aligned, a thermosetting matrix resin of a mixed resin of a thermosetting epoxy resin and an amorphous thermoplastic polymer having a T_g greater than about 195° C., a small amount of inorganic whiskers, from the group of carbon whiskers, silicon carbide whiskers, silicon nitride whiskers, and ceramic whiskers, incorporated throughout the resin matrix and a thin surface layer of extremely fine fibers, fibrids or particles of a thermoformable polymer having at least one of a T_m or T_g greater than about 300° C. or no T_m or T_g and a decomposition temperature greater than about 300° C.

4,992,326

HYDROPHILIC POLYMERS FOR INCORPORATING DEODORANTS IN ABSORBENT STRUCTURES

Shmuel Dabi, Highland Park, N.J., assignor to NcNeil-PPC, Inc., Milltown, N.J.

Filed Aug. 28, 1987, Ser. No. 90,491

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—283 1 Claim

1. A thin, flexible substrate in the form of a paper tissue or a water insensitive film, coated with a hydrophilic, water-insoluble, water-swellable cross-linked film forming polymeric material containing a powdered deodorant immobilized in a dust-free manner by being completely or partially encapsulated in said polymeric material.

4,992,327

SYNTHETIC DOWN

James G. Donovan, Norwell, and Zivile M. Groh, Sharon, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Continuation-in-part of Ser. No. 17,472, Feb. 20, 1987, abandoned. This application Feb. 19, 1988, Ser. No. 157,945

Int. Cl.[5] B32B *5/06;* D02G *3/00*

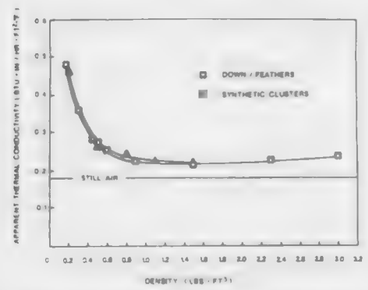
U.S. Cl. 428—296 10 Claims

1. A synthetic fiber thermal insulator material in the form of a cohesive fiber structure, which structure comprises an assemblage of:

(a) from 70 to 95 weight percent of spun and drawn, synthetic polymeric microfibers having a diameter of from 3 to 12 microns; and

(b) from 5 to 30 weight percent of synthetic polymeric macrofibers having a diameter of 12 to 50 microns,

characterized in that at microfiber/macrofiber contact points said microfibers are bonded to said macrofibers and at macrofiber/macrofiber contact points said macrofibers are bonded to said macrofibers, the bonding being such that the macrofiber component does not lose its structural integrity and the density of the resultant structure is within the range of 0.2 to 1.0 lb/ft^3, the thermal insulating



properties of the bonded assemblage being equal to or not substantially less than the thermal insulating properties of a comparable unbonded assemblage, and in that said material has a radiation parameter defined as the intercept on the ordinate axis at zero density of a plot of K_cP_f against P_f less than 0.075 (Btu-in/hr-ft^2-°F.) (lb/ft^3) and an apparent thermal conductivity K_c measured by the plate-to-plate method according to ASTM C518 with heat flow down of less than 0.5 Btu-in/hr-ft^2-°F.

4,992,328

MAGNETIC RECORDING MEDIUM

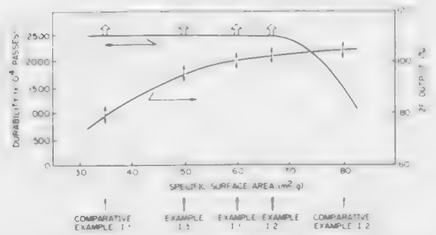
Mikihiko Kato; Yasushi Endo, and Toshio Kawamata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1988, Ser. No. 253,636

Claims priority, application Japan, Oct. 7, 1987, 62-251452; Oct. 7, 1987, 62-251453

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—323 14 Claims



1. A floppy disk type magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer containing ferromagnetic particles which are dispersed in a binder and have a tabular hexagonal crystal shape having a tabular ratio of from 2 to 6 with an axis of easy magnetization perpendicular to the plate, wherein said ferromagnetic particles have a specific surface area of from 50 to less than 70 m^2/g, and further said magnetic layer contains abrasive agents having a Mohs' hardness of 6 or more and having an average particle diameter of from 0.3 to 1.0 μm in an amount of from 7 to 15 parts by weight per 100 parts by weight of the ferromagnetic particles.

4,992,329

MAGNETIC-SHIELDING SHEET

Hiroyoshi Ishii; Kenzo Suzuki; Misao Kaneko, all of Kumagaya, and Noboru Ishikawa, Tokyo, all of Japan, assignors to Kabushikikaisha Riken & Simizu Construction Co., Tokyo, Japan

Continuation of Ser. No. 29,039, Mar. 23, 1987,. This application Mar. 24, 1989, Ser. No. 328,746

Claims priority, application Japan, Mar. 24, 1986, 61-65345

Int. Cl.[5] B32B *5/16, 15/08;* H05K *9/00*

U.S. Cl. 428—328 6 Claims



1. A magnetic-shielding sheet against static and low frequency magnetic fields having flexibility and comprising a laminated-structural layer of soft magnetic amorphous alloy flakes being interposed between non-metal films, each of said soft magnetic amorphous alloy flakes being 20 to 60 μm thick and having an aspect ratio of 50 to 10,000; said soft magnetic amorphous alloy flakes being distributed along said non-metal film's plane direction in such a manner that said flakes substantially contact each other and are laminated in said non-metal film's thickness direction in such a manner as to substantially contact each other.

4,992,330

MAGNETIC RECORDING MEDIUM

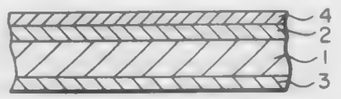
Setsuko Kawahara; Noboru Koyama; Yasushi Nakano, and Noboru Nakajima, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,667

Claims priority, application Japan, Dec. 12, 1988, 63-314490; Feb. 14, 1989, 1-35545

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—329 14 Claims



1. A magnetic recording medium comprising a non-magnetic support having thereon a plurality of magnetic layers, wherein

the magnetic layer farthest from said support has a thickness of between 0.5 μm and 1.5 μm and comprises a magnetic powder having a specific surface area of between 30 m^2/g to 80 m^2/g in terms of BET value and a coercive force of 700 to 1000 Oe, a carbon black in an amount of not more than one part per 100 parts, by weight, of said magnetic powder, and a binder, and

another magnetic layer having a thickness of not more than 2.5 μm and comprises a magnetic powder having a specific surface area of from 20 m^2/g to 70 m^2/g in terms of BET value and a coercive force of 400 to 1000 Oe, and a binder,

900 nm light transmittance of said magnetic medium being not more than 0.1 percent.

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4,992,331

NOVEL CONFORMABLE ADHESIVE TAPE

Leonard D. DeCoste, Jr., Stoneham, Mass., assignor to The Kendall Company, Lexington, Mass.

Filed Sep. 30, 1988, Ser. No. 252,092
Int. Cl.[5] B32B *7/12, 15/04*
U.S. Cl. 428—354 12 Claims

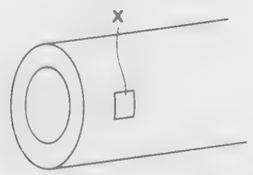
1. An adhesive tape characterized by having conformability rendering it adaptable for use as a harness wrap or for wrapping other small, irregularly shaped articles, said tape comprising a water-impermeable chlorinated polyethylene backing layer from about 1 to about 3 mils thick carrying, on one side thereof, a fiber woven cloth substantially evenly tearable in the cross direction; an outer pressure sensitive adhesive layer; and a thin tie coat layer positioned between said backing layer and said cloth, said tie coat at least partially filling interstices between fibers of said cloth whereby to be in contact with said adhesive layer, said tie coat providing a strong bond at the tie coat/backing layer interface, the tie coat/cloth interface and the tie/coat/adhesive interface, thereby providing a laminar product further characterized as possessing structural stability and integrity.

4,992,332

POROUS HOLLOW FIBER

Eiichi Kamei; Yasushi Shimomura, and Mitsuo Yamanaka, all of Hirakata, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Continuation of Ser. No. 10,863, Feb. 4, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 346,278
Claims priority, application Japan, Feb. 4, 1986, 61-21312; Apr. 8, 1986, 61-79321; Jun. 11, 1986, 61-135573; Sep. 9, 1986, 61-210540; Sep. 9, 1986, 61-210541
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—398 7 Claims



1. In a porous hollow polypropylene fiber having a large number of micropores in its surrounding wall, the improvment in which walls of said pores are coated with an essentially water-insoluble polymer selected from the group consisting of, carboxymethylethylcellulose, hydroxypropylmethylcellulose acetate succinate and hydropropylmethylcellulose phthalate and.

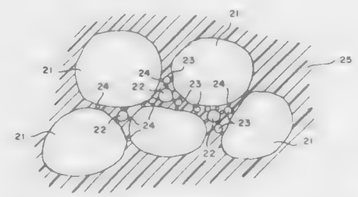
4,992,333

ELECTRICAL OVERSTRESS PULSE PROTECTION

Hugh M. Hyatt, Camarillo, Calif., assignor to G&H Technology, Inc., Santa Monica, Calif.

Filed Nov. 18, 1988, Ser. No. 273,020
Int. Cl.[5] H01B *1/14, 1/16;* H01C *7/12, 7/10*
U.S. Cl. 428—402 14 Claims

1. An electrical overstress composition comprising from about 55 to about 80% by volume of the composition of substantially uniformly distributed different sized conductive/-semiconductive particles, wherein the conductive particles are substantially free of surface oxide insulation films or coatings, from about 20 to about 45% by volume of the composition being insulative material, wherein said insulative material comprises from about 1 to about 5 percent of the composition of substantially uniformly distributed insulative particles in the 100 angstrom range and further comprises sufficient insulative matrix material to bind the composition into a fixed coherent body, and said composition having a density within a few percent of the theoretical density for the materials and proportions employed, the composition being responsive to a high



voltage electrical overstress pulse to switch from a high resistance to a low resistance substantially instantaneously and to clamp said pulse at a low voltage value.

4,992,334

LOW TEMPERATURE WATERPROOFING LAMINATES

Lawrence J. Kindt, Woodbine; James M. Gaidis, Ellicott City, both of Md., and Jay S. Kellett, Reading, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jan. 10, 1989, Ser. No. 295,331
Int. Cl.[5] B32B *11/00*
U.S. Cl. 428—489 5 Claims

1. A low temperature applicable waterproofing laminate which when applied at temperatures between 0° F. and 25° F. meets construction industry standards and which includes a bituminous layer and a support material wherein the bituminous layer comprises

29 to 54 weight percent asphalt having the following alumina separation (ASTM D4124) range:

Saturates	5–25%
Naphthenic Aromatics	20–40%
Polar Aromatics	30–50%
Asphaltenes	5–20%;

25 to 30 weight percent oil having the following clay gel separation (ASTM D2007) range:

Saturates	10–30%
Polar Compounds	10–20%
Aromatics	50–85%
Asphaltenes	0–0.05; and

16 to 35 weight percent thermoplastic polymer of styrene and butadiene monomers comprising a mixture of a polymer having a polystyrene:butadiene ratio of about 70:30 and block polystyrene content of about 30% (high molecular weight polymer) and a polymer having a polystyrene:butadiene ratio of about 75:25 and a block polystyrene content of about 18% (low molecular weight polymer) wherein the ratio of low molecular weight polymer to high molecular weight polymer is in the range of 5:1 to 1:1.

4,992,335

COMPOSITE MATERIAL AND METHOD OF MAKING SAME

Richard J. Guerra, Hudson, and David C. Marshall, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 775,207, Sep. 12, 1985. This application Jun. 18, 1986, Ser. No. 875,838
Int. Cl.[5] B32B *27/08*
U.S. Cl. 428—518 41 Claims



1. A laminate, comprising:
a first material selected from the group consisting of vinylidene chloride homopolymers and copolymers, and any combination thereof; and
a polyolefin laminated to a first surface of said first material, wherein said first material has been surface treated on at least said first surface with a solution comprising a permanganate and water.

4,992,336

MAGNETO-OPTICAL RECORDING MEDIUM

Ryoichi Yamamoto, and Takashi Yamada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 21, 1989, Ser. No. 369,622
Claims priority, application Japan, Jun. 27, 1988, 63-158366
Int. Cl.[5] G11B *7/24, 11/14*
U.S. Cl. 428—635 6 Claims

1. A magneto-optical recording medium comprising a substrate having thereon a recording layer comprising laminated thin films of rare earth metals and transition metals, wherein said recording layer has a structure such that a unit of laminated thin films is periodically laminated in the thickness direction of the recording layer, and each unit of said laminated thin films is composed of at least four thin films and includes a thin film of a first rare earth metal having disposed adjacent to both surfaces of the thin film of the first rare earth metal, a thin film of a first transition metal as the upper and lower layers, wherein the unit of laminated thin films includes the thin film of Dy having disposed adjacent to both surfaces thereof the thin film of Co as the upper and lower layers and, alternatively, a thin film of a second different rare earth metal or a thin film of a second different transition metal adjacent to at least one of said upper and lower first transition metal layers.

4,992,337

ELECTRIC ARC SPRAYING OF REACTIVE METALS

John J. Kaiser, Whitehall; Edward A. Hayduk, Jr., Blandon; Zbigniew Zurecki, Macungie, and Robert B. Swan, Bath, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 30, 1990, Ser. No. 472,676
Int. Cl.[5] B32B *15/00;* B23K *9/04*
U.S. Cl. 428—642 29 Claims

1. A method for applying a metallic coating to a substrate by electric arc spraying comprising:
(a) forming an electric arc between two metallic wires in an electric arc spray gun, at least one of said wires comprising one or more reactive metals, thereby causing said wires to melt; and
(b) directing pressurized inert gas across said arc to form molten metal droplets and propel said droplets onto said substrate to solidify and form said metallic coating, wherein the mass ratio of the feed rate of said wires into said arc to the feed rate of said inert gas is greater than 0.10;
whereby the use of said inert gas shields said molten metal



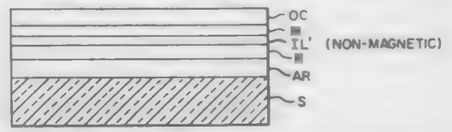
droplets from air and minimizes oxidation and vaporization of said reactive metal, and whereby the use of said inert gas in place of air allows a higher mass feed rate of said metallic wires through said gun at a constant gun power.

4,992,338

MULTILAYER MAGNETOOPTIC RECORDING MEDIUM WITH A POLARIZABLE PALLADIUM INTERMEDIATE LAYER

Tukaram K. Hatwar, Rochester, and Douglas G. Stinson, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1990, Ser. No. 488,166
Int. Cl.[5] G11B *11/00*
U.S. Cl. 428—694 6 Claims



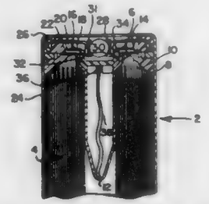
1. A direct-overwrite magneto-optic recording element comprising first and second layers of magnetic material having different coercivities and Curie temperatures, said layers being spaced apart by a contiguous intermediate layer consisting essentially of palladium.

4,992,339

ELECTROCHEMICAL CELL WITH CIRCUIT DISCONNECT DEVICE

Philip Georgopoulos, Westlake, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Mar. 14, 1990, Ser. No. 493,169
Int. Cl.[5] H07M *2/26*
U.S. Cl. 429—7 20 Claims



1. An electrochemical cell comprising an electrode assembly containing at least one positive electrode and at least one negative electrode; a housing containing the electrode assembly and containing first means for providing a terminal on the housing for one of the said positive and negative electrodes; a cover for the housing and an insulating member for insulating the cover from the housing; second means within the housing for providing a terminal on the cover for the opposite electrode; one of said first and second means comprising a current

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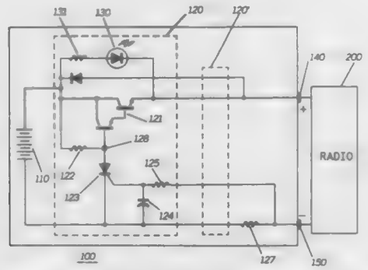
collector assembly containing a movable member adapted for movement from a first position in which the current collector assembly is in electronic contact with one of the terminals to a second position in which the moveable member breaks the electronic contact between the current collector assembly and the terminal; and a shape memory alloy member disposed adjacent the moveable member and adapted to move the moveable member to the second position when the temperature within the cell exceeds a predetermined temperature thereby breaking the electronic contact between the current collector assembly and the terminal.

4,992,340

INTRINSIC SAFE BATTERY HAVING SELF TEST CAPABILITY

James L. Tidwell, Davie, and Henry A. Bogut, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 20, 1989, Ser. No. 340,828
Int. Cl.[5] H07M *2/00*
U.S. Cl. 429—7 **7 Claims**



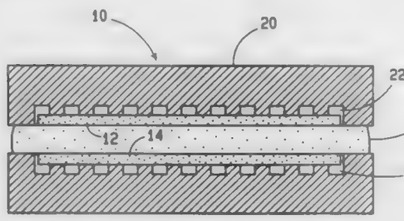
1. A battery having a first and second contact, comprising:
at least one battery cell having first and second terminals,
means for switching coupled between said first terminal and said first contact,
means for controlling said switch coupled to said battery cell and switching means, responsive to detection of a momentary short between first and second contacts, to open said switching means, and provide a constant current through said battery cell;
means for indicating when a short is present between said first and second contacts.

4,992,341

FABRICATION OF DUAL POROSITY ELECTRODE STRUCTURE

James L. Smith, Lemont, and Eugenia H. Kucera, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 21, 1988, Ser. No. 260,837
Int. Cl.[5] H01M *4/90*; C04B *35/02*
U.S. Cl. 429—40 **29 Claims**



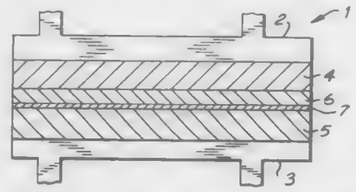
2. An electrode for a molten carbonate fuel cell, comprising a dual porosity structure of randomly positioned electrode-active ceramic fibers, further comprising ceramic fine particles sintered to said ceramic fibers.

4,992,342

STABILIZED CARBONATE FUEL CELL CATHODE

Prabhakar Singh, Bethel; Randolph M. Bernard, New Preston; Lawrence M. Paetsch, Sherman, and Ronald D. Chamberlin, Brookfield, all of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Apr. 19, 1985, Ser. No. 725,257
Int. Cl.[5] H01M *4/86*
U.S. Cl. 429—44 **9 Claims**



1. A composite structure for use in a molten carbonate fuel cell comprising:
an anode layer;
a cathode layer comprising a nickel oxide material;
an electrolyte layer situated between said anode and cathode layers;
and a constituent for retarding migration and/or dissolution of said nickel-oxide constituent from said cathode, said retarding constituent comprising one or more oxides of alkaline earth metals.

4,992,343

LEAD-CONTAINING ANODE CURRENT COLLECTOR FOR ALKALINE CELLS

John C. Nardi, Brunswick, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Aug. 17, 1989, Ser. No. 395,235
Int. Cl.[5] H01M *2/32, 4/66*
U.S. Cl. 429—57 **13 Claims**

1. An electrochemical cell comprising an anode, a cathode, an alkaline electrolyte, and a conductive anode current collector comprising an alloy containing from 60 to 75 weight percent copper, 40 to 25 weight percent zinc and a discontinuous dispersion of lead in which the amount of lead contained in the alloy of the anode current collector is at least 900 parts per million based on the weight of said anode current collector.

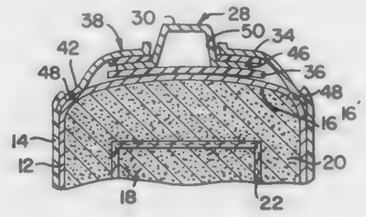
4,992,344

CELL CIRCUIT INTERRUPTER

John C. Coppers, Westlake, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed May 11, 1989, Ser. No. 350,198
Int. Cl.[5] H01M *2/34*
U.S. Cl. 429—61 **18 Claims**

1. A sealed galvanic cell comprising a conductive container having an upstanding wall open at one end and closed at the opposite end and including in said container a positive electrode, a negative electrode and an electrolyte, said conductive container being in electrical contact with one of said electrodes; a first cover mounted over, secured to and electrically insulated from said open end of said conductive container and in electrical contact with the other electrode; a conductive member comprising a central protrusion portion with an extending flange disposed over and electrically insulated from the container; a conductive ring member disposed over the conductive member with the protrusion portion extending through and electrically contacting the wall defining an opening int he ring member, said protrusion portion making a friction fit with the wall, said conductive ring member having an inner segment disposed over and electrically insulated from the flange of the conductive member by a discreet nonconductive material that is disposed between the conductive member and the bottom surface of the inner segment, said conductive ring member further (and) having a peripheral segment secured to and in electrical contact with the conductive container thereby



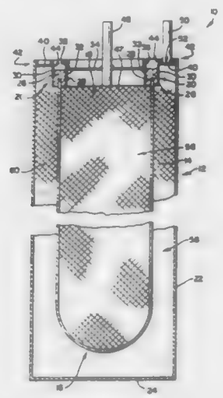
securing and electrically contacting the conductive member to the conductive container thereby adapting the conductive member as a terminal for the cell; and wherein he closed end of the container will bulge upon a predetermined pressure building up within the container to force the central protrusion portion of he conductive member outward thereby breaking the electrical contact between the wall defining the opening in the conductive ring and the protrusion of the conductive member.

4,992,345

ELECTROCHEMICAL CELLS

Anthony A. Meintjes; Johan Coetzer, both of Pretoria, and Keith T. Adendorff, Springs, all of South Africa, assignors to Lilliwyte Societe Anonyme, South Africa

Filed Dec. 21, 1989, Ser. No. 454,299
Claims priority, application United Kingdom, Dec. 22, 1988, 8829948
Int. Cl.[5] H01M *10/44*
U.S. Cl. 429—103 **24 Claims**



1. A method of making an electrochemical cell of the type comprising an anode compartment containing, at the operating temperature of the cell and when the cell is in its charged state, a molten alkali metal anode, a cathode compartment containing, at said operating temperature and when the cell is in its discharged state, an alkali metal aluminium halide molten salt electrolyte which is also molten at the operating temperature of the cell, and having the formula $MAlHal_4$, wherein M is the alkali metal of the anode and Hal is a halide, the cathode compartment containing also a cathode which comprises an electronically conductive electrolyte-permeable matrix which has dispersed therein an active cathode substance which comprises a transition metal T selected from the group comprising Fe, Ni, Co, Cr, Mn and mixtures thereof, the matrix being impregnated with said electrolyte, and, separating the anode compartment from the cathode compartment, a separator which comprises a solid conductor of the ions of the alkali metal of the anode or a micromolecular sieve which contains said alkali metal sorbed therein, the method comprising
loading into a cathode compartment of a cell housing comprising an anode compartment separated from a cathode compartment by a separator which is a solid conductor of ions of alkali metal M or is a micromolecular sieve which contains alkali metal M sorbed therein,
an alkali metal aluminium halide molten salt electrolyte having the formula $MAlHal_4$ wherein M is the alkali metal of the separator and Hal is a halide;
an alkali metal halide MHal wherein M and Hal are respectively an alkali metal and a halide;
a transition metal T selected from the group comprising Fe, Ni, Co, Cr, Mn and mixtures thereof, as an active cathode substance; and
a current collector comprising at least one of copper, a copper-based substance, and a copper-coated substance, thereby to make an electrochemical cell precursor; and
charging the precursor at a temperature at which the molten salt electrolyte and alkali metal M are molten, thereby halogenating the active cathode substance, with alkali metal M being produced and passing through the separator into the anode compartment, the proportions of alkali metal halide MHal and molten salt electrolyte being selected so that when the cell is fully charged and all the available active cathode substance has been halogenated, the proportions of alkali metal ions and aluminium ions in the electrolyte are such that the solubility of the active cathode substance in the molten electrolyte is at or near its minimum, with the production of alkali metal M and halogenation of the active cathode substance taking place in accordance with the following reaction:

$$2MHal + T\Delta 2M + THal_2 \quad (1)$$

4,992,346

PRODUCTION OF HOLOGRAMS

Neil F. Ashford, Crewe; Peter M. Blum, Altrincham; Stephen R. Postle, Oxford, and Alan Hodgson, Stockport, all of United Kingdom, assignors to Ilford Limited, Cheshire, United Kingdom

Filed Dec. 19, 1989, Ser. No. 452,843
Claims priority, application United Kingdom, Dec. 20, 1988, 8829698
Int. Cl.[5] G03C *1/04*
U.S. Cl. 430—2 **11 Claims**

1. A method of preparing a hologram which is of the silver halide in gelatin binder type which method comprises holographically exposing the holographic material by use of coherent light, developing the holographic image by a chemical process the method being characterised in that then the material is treated sequentially either firstly with a solution of an anionic surfactant which comprises at least one alkyl group having at least four carbon atoms and then with a solution of a quaternary ammonium compound which comprises at least one alkyl group having from 10 to 18 carbon atoms or a polymeric compound which comprises at least one quaternary ammonium group in a repeating unit or firstly with a solution of said quaternary ammonium compound or polymeric compound and then with a solution of an anionic surfactant, the material being subjected to a silver bleaching step at one stage after development.

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4,992,347

MARKING

Michael Hawkins, Coventry, and Arthur G. Bowyer, Derby, both of United Kingdom, assignors to Courtaulds PLC, United Kingdom

PCT No. PCT/GB88/00088, § 371 Date Sep. 26, 1988, § 102(e) Date Sep. 26, 1988, PCT Pub. No. WO88/06306, PCT Pub. Date Aug. 25, 1988

Continuation of Ser. No. 252,361, Sep. 26, 1988. This PCT application Feb. 12, 1988, Ser. No. 500,108

Claims priority, application United Kingdom, Feb. 13, 1987, #703400

Int. Cl.[5] G03C *3/00*

U.S. Cl. 430—10 13 Claims

1. An image-bearing film comprising a film-forming material having incorporated therein a reversibly photochromic compound which is capable of converting from pale or colourless to coloured under uv light and of reverting to pale or colourless, said film having an image formed therein by complete or partial conversion of the photochromic compound to a permanently non-photochromic compound in one or more selected areas, which non-photochromic compound cannot readily be distinguished by the eye against a background of the pale or colourless form of the photochromic compound but is readily distinguished against a background of the coloured form of the photochromic compound.

4,992,348

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISING AMORPHOUS SILICON

Takashi Hayakawa, Nara; Shiro Narikawa, Kashihara, and Kunio Ohashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 27, 1989, Ser. No. 372,019

Claims priority, application Japan, Jun. 28, 1988, 63-161977; Nov. 29, 1988, 63-303324

Int. Cl.[5] G03G *5/14, 5/082*

U.S. Cl. 430—57 14 Claims

1. A photosensitive member for electrophotography comprising a conductive substrate and a photoconductive layer; said photoconductive layer comprising two amorphous layers, one of said two amorphous layers being composed of an amorphous silicon containing a member selected from the group consisting of hydrogen, halogen and mixtures thereof at a range of from greater than 40 to about 65 atomic %, and the other of said two amorphous layers being composed of an amorphous silicon germanium containing a member selected from the group consisting of hydrogen, halogen and mixtures thereof at a range of from greater than 40 to about 65 atomic %.

4,992,349

CYCLIC BIS-DICARBOXIMIDE CHARGE TRANSPORT COMPOUNDS FOR ELECTROPHOTOGRAPHY

Chin H. Chen, Fairport, and Yaan Hung, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1989, Ser. No. 432,018

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—58 10 Claims

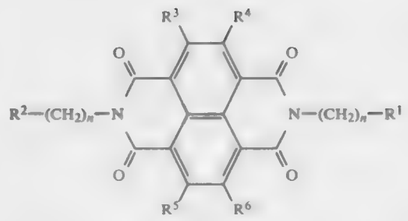
1. A photoconductor element comprising in combination successive adhering layers of:

(a) a substrate;

(b) an electrically conductive layer;

(c) a charge generation layer and

(d) a charge transport layer comprising a polymeric binder which is dissolved at least one cyclic bis-dicarboximide of the formula:



wherein:

R^1 and R^2, which may be the same or different, represent aryl, or aryl substituted with alkyl, alkoxy, perfluoroalkyl or perfluoroalkoxy groups having 2 to 20 carbon atoms; sulfonyl; sulfone; sulfonamide; nitrile; or nitro groups;

R^3, and R^4, R^5, and R^6, which may be the same or different, represent hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, or halogen; and

n is 0 to 3.

4,992,350

BIPHENYL COMPOUNDS AND ELECTHOPHOTOGRAPHIC PHOTOCONDUCTOR COMPRISING THE SAME

Masaomi Sasaki, Susono; Tamotsu Aruga, Mishima, and Tomoyuki Shimada, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

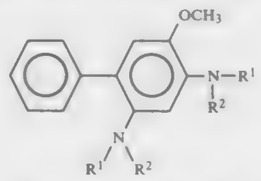
Filed Sep. 19, 1989, Ser. No. 409,421

Claims priority, application Japan, Sep. 30, 1988, 63-247037; Sep. 30, 1988, 63-247038

Int. Cl.[5] G03G *5/06;* C07C *211/00*

U.S. Cl. 430—74 14 Claims

1. An electrophotographic photoconductor comprising an electroconductive support and a photoconductive layer formed thereon comprising as an effective component at least one biphenyl compound represented by formula (I):



(I)

wherein R^1 and R^2 each is an alkyl group which may have a substituent, an alkoxyl group which may have a substituent, or an aryl group which may have a substituent, provided that at least one of R^1 and R^2 is an unsubstituted or substituted aryl group and a sensitizing dye.

4,992,351

RECORDING MEDIUM HAVING A SPECIFIED PHOTOPOLYMERIZATION INITIATOR

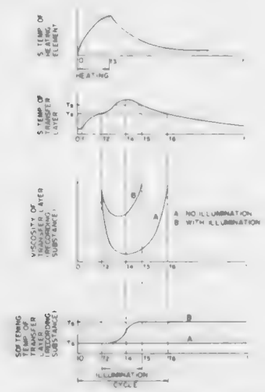
Norio Ohkuma, Machida; Masanori Takenouchi, Atsugi; Masashi Miyagawa, and Tadashi Yamamoto, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 131,068, Dec. 8, 1987, abandoned. This application Dec. 26, 1989, Ser. No. 453,171

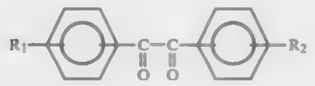
Claims priority, application Japan, Dec. 9, 1986, 61-293157; Nov. 6, 1987, 61-280568

Int. Cl.[5] G03C *1/68;* B41M *5/26, 5/12;* G037 *1/727*

U.S. Cl. 430—138 10 Claims



1. A recording medium having a recording layer comprising microcapsule image-forming elements (A), (B) and (C) containing at least a compound having unsaturated double bond and a photopolymerization initiator, said photopolymerization initiator in said microcapsule element (A) having an absorption maximum from 263 nm to 331 nm and being a compound represented by the following formula (I)



(I)

wherein R_1 and R_2 are each hydrogen atom, halogen atom, alkyl, alkoxy or alkylthio with the provision that at least one of R_1 and R_2 is not hydrogen, said photopolymerization initiator in said microcapsule element (B) having an absorption maximum in a wavelength region of 360 to 430 nm, and said photopolymerization initiator in said microcapsule element (C) having an absorption maximum in a wavelength region above 430 nm and not longer than 700 nm.

4,992,352

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND, AND IMAGE-FORMING METHOD EMPLOYING THE SAME

Koichi Nakamura, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 335,267, Apr. 10, 1989, abandoned, which is a continuation of Ser. No. 947,450, Dec. 29, 1986, abandoned. This application Nov. 20, 1989, Ser. No. 438,273

Claims priority, application Japan, Dec. 26, 1985, 60-294341

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] G03C *5/54, 1/68, 1/34*

U.S. Cl. 430—138 20 Claims

1. A light-sensitive material comprising a support and a light-sensitive layer containing silver halide grains, a reducing agent, a polymerizable compound containing carbon to carbon unsaturation, and a thiol derivative having the formula (I):

R—SM (I)

in which R is a monovalent group selected from the group consisting of an alkyl group, a cycloalkyl group, an aralkyl group, an alkenyl group and an aryl group, each of which may have one or more substituent groups; and M is a monovalent group selected from the group consisting of hydrogen, silver, an alkali metal and ammonium,

wherein the silver halide grains, polymerizable compound and thiol derivative are contained in microcapsules which are dispersed in the light-sensitive layer, said silver halide grains being arranged in a shell of the microcapsule, and said polymerizable compound and thiol derivative being arranged in a core of the microcapsule.

4,992,353

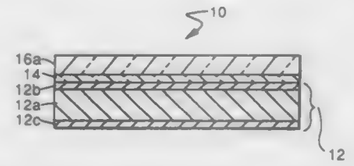
IMAGE-RECEIVING ELEMENT FOR ADHESIVELY BONDABLE DIFFUSION TRANSFER PHOTOGRAPH

John M. Rodakis, Lexington, and Walter Bleszinski, Jr., Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 27, 1989, Ser. No. 328,631

Int. Cl.[5] G03C *5/54, 1/90, 11/12*

U.S. Cl. 430—213 27 Claims



1. An image-receiving element adapted to the production of a diffusion transfer photograph bondable adhesively and securely to an information-bearing document, said image-receiving element comprising first and second sheet-like support members adhesively bonded to one another by a layer of heat-activatable adhesive therebetween, the adhesivity of said first sheet-like support to said adhesive layer being less than the adhesivity of said second sheet-like support to said adhesive layer and being less than the cohesivity of said adhesive layer, said second sheet-like support member carrying on the side thereof opposed from said adhesive layer at least a water-permeable and dyeable image-receiving layer adapted to receive a photographic dye image by diffusion transfer processing, said heat-activatable adhesive being adapted by heat lamination to the secure adhesion of said photograph to the surface of an information-bearing document.

VOL 1123 ISS 2 FE 12 1991 UMI

4,992,354

DRY FILM PHOTORESIST FOR FORMING A CONFORMABLE MASK AND METHOD OF APPLICATION TO A PRINTED CIRCUIT BOARD OR THE LIKE

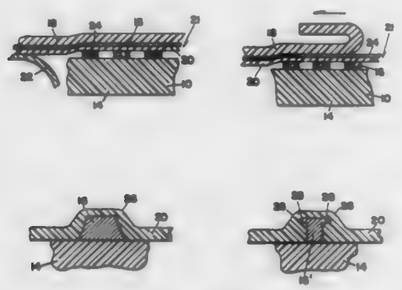
Frederick J. Axon, Manchester, England; James J. Briguglio, Newport Beach, Calif.; Amedeo Candore, Bodio Lomnago, Italy; Lawson Lightfoot, Chesire, England; Clancy P. Crooks, Cypress, and Leo Roos, Laguna Beach, both of Calif., assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 160,895, Feb. 26, 1988, Pat. No. 4,889,790. This application Oct. 28, 1988, Ser. No. 264,472

The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.

Int. Cl.[5] G03C *11/12*

U.S. Cl. 430—258 **13 Claims**



1. A method of forming a photoimaged layer on an uneven substrate surface, the method comprising:

(A) providing a dry film comprising a cover sheet and a layer of photoimageable composition on said cover sheet;

(B) tacking said photoimageable composition layer to said substrate surface;

(C) removing said cover sheet from said photoimageable composition layer, leaving said photoimageable composition layer tacked to said substrate surface;

(D) causing a heated roller to pass across said photoimageable composition layer applying pressure thereto, thereby causing said photoimageable layer to conform to said substrate surface;

(E) exposing said photoimageable composition layer to patterned actinic radiation; and

(F) developing said photoimageable composition to remove either exposed or unexposed portions from said substrate surface, leaving either unexposed or exposed portions remaining on said substrate surface.

4,992,355

SYSTEM FOR THE PRODUCTION OF DOT-ETCHED LITHOGRAPHIC FILMS

Rüger Reinhold, Rodermark, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 233,536, Aug. 18, 1988. This application Jun. 15, 1990, Ser. No. 538,460

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736645

Int. Cl.[5] G03F *7/00*

U.S. Cl. 430—309 **10 Claims**

1. A process for the preparation of dot-etched lithographic films, consisting essentially of (1) a light sensitive material for tanning development, and (2) an etching solution, in which light sensitive material, comprising

(a) a support,

(b) at least one unhardened or substantially unhardened gelatin layer containing at least one colorant, containing at least one acid group, the at least one colorant being stable in developers and forming with bases salts soluble in organic solvents,

(c) a tannable, gelatin cover layer applied directly over layer (b), in which light sensitive material (1) at least one layer (b) and (c) contains silver halide, is exposed imagewise to an image containing halftone dots and developer, the unexposed areas are removed and the film is treated with an aqueous etching solution to reduce the size of the halftone dots, the aqueous etching solution (2) contains at least one base that ionizes the colorant and at least one organic solvent for the resultant ion pair.

4,992,356

PROCESS OF DEVELOPING A RADIATION IMAGED PRODUCT WITH TRINUCLEAR NOVOLAK OLIGOMER HAVING O-NAPHTHOQUINONE DIAZIDE SULFONYL GROUP

Alfred T. Jeffries, III, Providence, R.I.; Andrew J. Blakeney, Seekonk, Mass., and Medhat A. Toukhy, Barrington, R.I., assignors to Olin Hunt Specialty Products Inc., Cheshire, Conn.

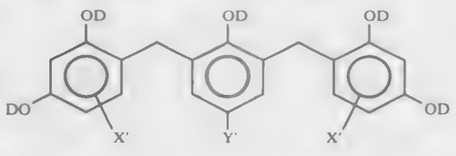
Division of Ser. No. 290,009, Dec. 27, 1988, Pat. No. 4,957,846. This application Jun. 8, 1990, Ser. No. 534,909

Int. Cl.[5] G03F *7/32, 7/023*

U.S. Cl. 430—326 **4 Claims**

1. The process of developing an image-wise exposed photoresist-coated substrate comprising:

(1) coating said substrate with a radiation sensitive mixture useful as a positive working photoresist, said mixture comprising an admixture of an alkali soluble binder resin and a photoactive compound of formula II:



(II)

wherein each X′ is selected from the group consisting of hydrogen, OD and halide; Y′ is selected from the group consisting of a lower alkyl group having 1–4 carbon atoms and halogen atom; and D is selected from the group consisting of o-naphthoquinone diazide sulfonyl group and hydrogen; with the proviso that at least two Ds are o-naphthoquinone diazide sulfonyl groups; and wherein the amount of said binder resin being about 60% to 95% by weight and the amount of photoactive compound being from about 5% to about 40% by weight, based on the total solids content of said radiation sensitive mixture;

(2) subjecting said coating on said substrate to an image-wise exposure of radiation; and

(3) subjecting said image-wise exposed coated substrate to a developing solution the exposed areas of said radiation-exposed coating are dissolved and removed from the substrate, thereby resulting in positive image-wise pattern in the coating.

4,992,357

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yoshihiro Haga; Hiroshi Shimazaki; Atsuo Ezaki, and Yoshiro Shigetomi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 375,388

Claims priority, application Japan, Jul. 7, 1988, 63-170127

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—504 **14 Claims**

1. A silver halide color photographic light-sensitive material having a support and photographic component layers thereon, said layers including at least one red-sensitive layer comprising at least a masking cyan coupler, a green-sensitive layer comprising at least a masking magenta coupler, and a blue-sensitive layer, wherein said light-sensitive material is characterized in that:

A. an uppermost layer of said photographic component layers comprises an alkali-soluble matting agent,

B. a total amount of coated silver is 15 to 45 mg/dm^2,

wherein said alkali-soluble matting agent is:

a. a copolymer of an alkyl methacrylate and a methacrylic acid, acrylic acid, or itaconic acid,

b. a copolymer of an alkyl methacrylate and a maleic monoester and a maleic monoamide,

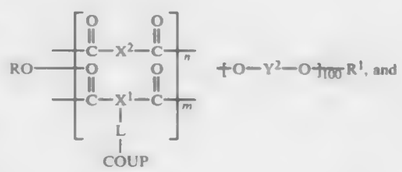
c. a copolymer of styrene with an α, β unsaturated mono- or dicarboxylic acid, a dicarboxylic monoester, or dicarboxylic monoamide,

d. a graft polymer of maleic anhydride/ -olefin copolymer and methacrylic acid or methyl methacrylate, or

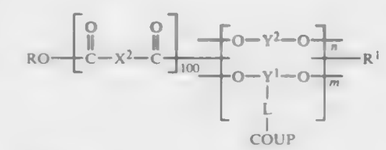
e. a dicarboxylic acid monoester of a cellulose derivative.

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its coupling position, and is represented by one of the following structures:



(I)

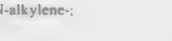


(II)

wherein

R and R^1 represent hydrogen, alkyl or aryl;

X^1 and Y^1 each represents alkylene, arylene, cycloalkylene or



X^2 and Y^2 each represents alkylene, arylene, or cycloalkylene;

m is 15 through 100 mole %; and

M+n=100 mole %.

COUP represents a dye forming coupler moiety; and

L represents a linking group joined to the coupling position of the coupler moiety.

4,992,358

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING UV FILTER COMPOUNDS

Masao Sasaki, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

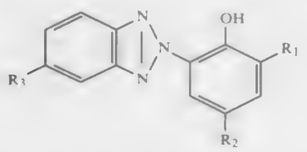
Continuation of Ser. No. 55,726, May 21, 1987. This application Mar. 30, 1989, Ser. No. 332,400

Claims priority, application Japan, Jun. 5, 1982, 57-96814

Int. Cl.[5] G03C *1/815*

U.S. Cl. 430—512 **35 Claims**

1. A color photographic light-sensitive material comprising a reflective support having thereon a plurality of silver halide emulsion layers of which the emulsion layer located farthest from said support has, on each of both the support side thereof and the uppermost side at least one nonlight-sensitive layer containing an effective amount of an ultraviolet absorbing agent, said ultraviolet absorbing agent being used in said nonlight-sensitive layer on the uppermost side of said emulsion layer being a 2-(2′-hydroxyphenyl)benzotriazole-type compound which is in the liquid form at normal room temperature, and wherein said 2-(2′-hydroxyphenyl)benzotriazole-type compound has the following formula:



Formula (I)

wherein R_1 and R_2 independently represent an alkyl, an aryl, an alkoxy and an aryloxy radical, and R_3 represents a hydrogen atom a halogen atom, an alkyl, an aryl, an alkoxy, an aryloxy, an alkenyl, a nitro or hydroxy radical.

4,992,359

POLYMERIC COUPLERS

Ping-Wah Tang; Philip T. S. Lau, and Stanley W. Cowan, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 239,909, Sep. 1, 1988, abandoned. This application Jun. 4, 1990, Ser. No. 532,490

Int. Cl.[5] G03C *7/327*

U.S. Cl. 430—548 **6 Claims**

1. A photographic element comprising

a support,

a silver halide emulsion layer, and

a polymeric dye-forming coupler

wherein the polymeric dye-forming coupler is a polyester condensation polymer having a pendant coupler moiety in which the coupler is joined to the polymer backbone via

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4,992,360

SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL CONTAINING A NOVEL YELLOW COUPLER

Mayumi Tsuruta; Noboru Mizukura, and Satoshi Nakagawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

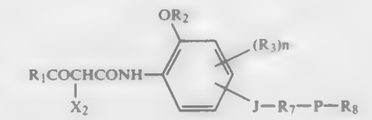
Continuation of Ser. No. 112,779, Oct. 22, 1987, abandoned. This application May 11, 1989, Ser. No. 351,267

Claims priority, application Japan, Nov. 12, 1986, 61-269216

Int. Cl.[5] G03C *7/36*

U.S. Cl. 430—556 **8 Claims**

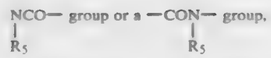
1. A silver halide light-sensitive photographic material comprising a support and, provided thereon, at least one silver halide emulsion layer containing a dye-forming coupler wherein said dye-forming coupler is one represented by Formula [IV]:



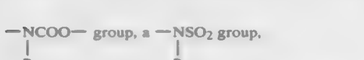
[IV]

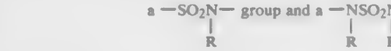
wherein, R_1 is an alkyl group or a cycloalkyl group; R_2 is an alkyl group, a cycloalkyl group, an acyl group or an aryl group; R_3 is a group which is substitutable to a benzene ring, n is 0 or 1; J is a

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wherein R_5 is a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group; R_7 is an unsubstituted alkylene group that can be branched or unbranched; R_8 is an alkyl group, a cycloalkyl group, an aryl group or a heterocyclic group X_2 is a group capable of being split off upon reaction with the oxidation product of a color developing agent; and P is a linkage group selected from the group consisting of a —COO— group, a —SO_2— group, a —NCO— group, a —CON— group,





in which R and R′ each is independently a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group.

4,992,361

PHOTOGRAPHIC SILVER HALIDE MATERIALS AND PROCESS COMPRISING A PYRAZOLOTRIAZOLE COUPLER

Arlyce T. Bowne, Rochester, and Sharon E. Normandin, Macedon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

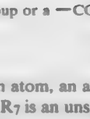
Continuation of Ser. No. 23,520, Mar. 9, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 365,289

Int. Cl.[5] G03C *7/38*

U.S. Cl. 430—558 **4 Claims**

1. In a photographic element comprising a support, a photographic silver halide emulsion, and a magenta dye-forming 1H-pyrazolo[3,2-c]-s-triazole coupler, the improvement wherein

the 1H-pyrazolo[3,2-c]-s-triazole coupler contains in the 3-position a tertiary carbon group



wherein R_1, R_2 and R_3 are individually alkyl.

4,992,362

PRODUCTION OF A SILVER HALIDE EMULSION

Franz Moll, Leverkusen; Bruno Mücke, Bergisch Gladbach; Klaus Wagner, Leverkusen; Herbert Gareis; Wolfgang Graesser, both of Eberbach, and Peter Koepff, Heidelberg, all of Fed. Rep. of Germany, assignors to AGFA Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

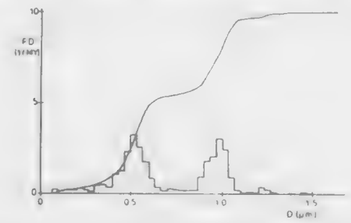
Filed Aug. 4, 1989, Ser. No. 389,544

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, 3828312

Int. Cl.[5] G03C *1/02*

U.S. Cl. 430—640 **6 Claims**

1. A process for the production of a photosensitive silver halide emulsion by precipitation of the silver halide in the presence of gelatine, flocculation and washing of the silver halide precipitated in the presence of the gelatine and redispersion with addition of more gelatine, characterized in that precipitation is carried out in the presence of a gelatine having a gold number of at most 10 μmol/g gelatine and a cysteine



content of at most 6 ppm while redispersion is carried out with a gelatine having a gold number of at least 23 μmol/g gelatine.

4,992,363

METHOD FOR PREPARING GLUCOSE FREE MEDIA FOR STORING BLOOD PLATELETS

Scott Murphy, Ardmore, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 905,277, Sep. 9, 1986, Pat. No. 4,828,976, which is a continuation-in-part of Ser. No. 730,805, May 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 611,895, May 18, 1984, abandoned, and a continuation-in-part of Ser. No. 667,270, Nov. 1, 1985, abandoned, which is a division of Ser. No. 566,709, Dec. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 550,251, Nov. 9, 1983, abandoned. This application Dec. 15, 1988, Ser. No. 284,987

Int. Cl.[5] A01N *1/02*; A61K *35/14*

U.S. Cl. 435—2 **10 Claims**

1. A metbod of processing and storing human blood platelets consisting essentially of the steps of:

(a) providing a platelet concentrate of platelets in blood plasma;

(b) extracting supernatant plasma from said concentrate to leave about 1 to 15 ml of plasma per unit of blood platelets to produce a platelet button and residual associated plasma;

(c) adding 40–70 ml/unit of an aqueous synthetic platelet storage solution containing sodium citrate, sodium chloride, potassium chloride and either sodium phosphate or calcium chloride, which solution is essentially free of glucose, to said platelet button and associated residual plasma;

(d) agitating said solution to resuspend said platelets to provide a synthetic suspension of platelets; and

(e) storing said synthetic systems in an oxygen permeable container maintained at from about 20° to about 24° until needed for use;

said solution being selected to maintain platelet viability during at least 5 days of storage which is comparable to the viability exhibited by platelets stored in plasma for a comparable storage period.

4,992,364

PROBE FOR DNA AND A PROCESS FOR THE DETECTION OF "SHIGELLAE" AND ENTERO-INVASIVE STRAINS OF ESCHERICHIA COLI

Philippe Sansonetti; Catherine Boileau; Helene D'Hauteville, all of Paris, France, assignors to Institut Pasteur and Institut National de la Sante et de la Recherche Medicale both of Paris, France

Division of Ser. No. 755,051, Jul. 12, 1985, Pat. No. 4,816,389

Claims priority, application France, Jul. 13, 1984, 84-11187.

This application Jan. 11, 1989, Ser. No. 295,511

Int. Cl.[5] C12Q *1/68*; C12P *19/34*; C07H *21/04*

U.S. Cl. 435—6 **11 Claims**

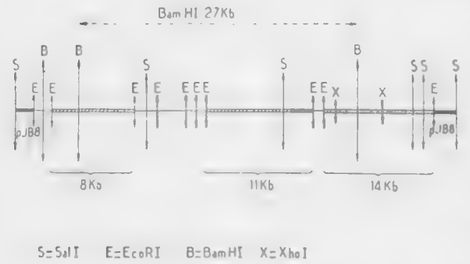
1. A process for detecting in vitro the presence of cells of a virulent *Shigellae flexneri*, wherein the process comprises the steps of:

(A) depositing and fixing nucleic acids of the cells on a filter, so as to make the nucleic acids accessible to a probe;

(B) contacting said fixed nucleic acids from step (A) with the probe under conditions permitting hybridization;

(C) washing said filter resulting from step (B), so as to eliminate any non-hybridized probe; and then

(D) detecting any hybridized probe on said washed filter resulting from step (C);



wherein said probe comprises a nucleic acid sequence which is present in a 140 Mdal virulence plasmid of a M 90 T strain of *Shigellae flexneri*, wherein said nucleic acid sequence has a maximum size of about 27 kb and the nucleic acid sequence includes all or part of a 27 kb BamHI fragment of said 140 Mdal plasmid and in addition, an 11.5 kb EcoRI fragment of said 140 Mdal plasmid, wherein said 11.5 kb fragment has a part in common with said 27 kb BamHI fragment.

4,992,365

METHOD OF DETECTING BACTERIA IN URINE

Edward S. Hyman, 3420 Jefferson Ave., New Orleans, La. 70125

Continuation-in-part of Ser. No. 31,771, Mar. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 603,088, Apr. 23, 1984, Pat. No. 4,673,637.

This application Jun. 13, 1988, Ser. No. 205,959

Int. Cl.[5] C12Q *1/04*, G01N *1/00*

U.S. Cl. 435—34 **26 Claims**



1. In a method for direct microscopic detection of bacteria or bacterial fragments in a urine sample including the steps of staining the bacteria or bacterial fragments with an aqueous soluble dye and microscopically observing the bacteria, wherein the improvement comprises centrifuging the sample at about 3,500–11,000 times gravity to obtain a sediment comprising bacterial or bacterial fragments in the sample prior to staining.

4,992,366

PROCESS FOR PRODUCING A RECEPTOR PREPARATION FOR A RADIORECEPTOR ASSAY AND KIT-CORRECT RADIORECEPTOR ASSAY ACCORDING TO THE PROCESS

Ernst Buergisser, Wangen, Switzerland, assignor to Ahawa Laboratorien AG, Wangen, Switzerland

Filed Jun. 10, 1988, Ser. No. 221,511

Int. Cl.[5] C12Q *1/16*

U.S. Cl. 435—35 **16 Claims**

1. A process for producing a unit suitable for conducting a micro-scale radioreceptor assay, comprising the steps of

(a) preparing separate solutions of:

(i) a plasma membrane preparation containing receptors,

(ii) a labeled ligand substance capable of interacting with said receptors, and

(iii) a protective substance selected from the group consisting of sugars, amino acids, proteins, and combinations thereof;

2m

(b) adding one of solution a)i), a)ii) or a)iii) to a receptacle and shock freezing said solution; adding one of the remaining solutions and shock freezing said solution; and adding the remaining solution and shock freezing said solution;

(c) lyophilizing said solutions; and

(d) sealing the resultant lyophilizations against the penetration of moisture in a receptacle suitable for conducting said assay.

4,992,367

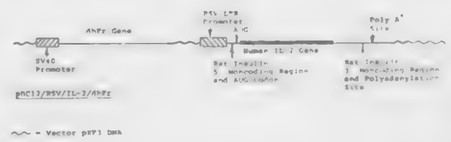
ENHANCED EXPRESSION OF HUMAN INTERLEUKIN-2 IN MAMMALIAN CELLS

Bryan R. Cullen, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 12, 1986, Ser. No. 862,082

Int. Cl.[5] C07K *13/00*; C07H *15/12*; C12P *21/06, 19/34, 15/00, 5/00*

U.S. Cl. 435—69.52 **11 Claims**



1. A DNA sequence coding for human interleukin-2 and a human interleukin-2 signal peptide sequence, which DNA sequence comprises a gene coding for human interleukin-2 and a human interlukin-2 signal peptide sequence in which the 5′ noncoding sequence of the gene has been replaced by the entire 5′ noncoding sequence of the rat preproinsulin II gene.

4,992,368

PROCESS FOR PRODUCING OXETANOCIN G

Seiichi Saito, Kashiwa; Shigeru Hasegawa, Urawa; Masayuki Kitagawa, Urawa; Nobuyoshi Shimada, Tokyo, and Noriyuki Yamashita, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki, Kaisha, Tokyo, Japan

Claims priority, application Japan, Apr. 20, 1989, 64-98907; Aug. 25, 1989, 64-217216.

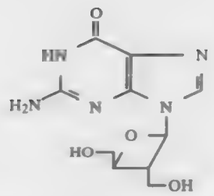
This application Apr. 12, 1990, Ser. No. 508,910

Int. Cl.[5] C07D *473/00* C12P *19/40*

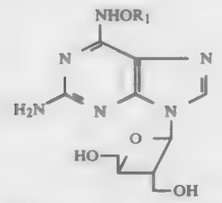
U.S. Cl. 435—88 **7 Claims**

1. A process for producing oxetanocin G represented by the following formula:

VOL 1123 ISS 2 FE 12 1991 UMI

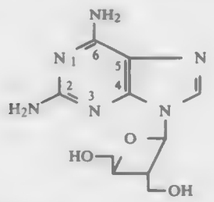


which comprises (1) hydrogenolizing an alkoxylated 2-amino-oxetanocin A represented by general formula (I) below:



(I)

(wherein R_1 represents a lower alkyl group) to convert into 2-amino-oxetanocin A represented by formula:



and (2) then converting



at the 6-position thereof into 22 C=O.

4,992,369

FERMENTATION PROCESS FOR GLYCOPEPTIDE ANTIBIOTIC

Hiroshi Maeda; Junsuke Tone, both of Chita, Japan; John C. Ruddock, Ash, and Kelvin S. Holdom, Minster, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 101,626, Sep. 28, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 366,576

Claims priority, application United Kingdom, Oct. 16, 1986, 8624806

Int. Cl.[5] **C12P** *17/18;* **C12N** *1/20;* **A61K** *37/02*

U.S. Cl. 435—119 **5 Claims**

1. A process for producing an antibiotic UK-68,597 which comprises cultivating a microorganism *Actinoplanes* sp. ATTC 53533 or a mutant or recombinant form thereof having the ability to produce said antibiotic in an aqueous culture medium containing an assimilable source of carbon, nitrogen and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of said antibiotic is produced by said microorganism in said culture medium and then recovering said antibiotic UK-68,597.

4,992,370

PROCESS FOR THE PRODUCTION OF ALCOHOL

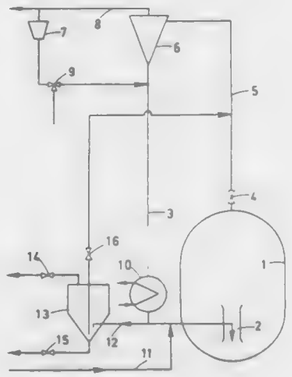
Vladimir Kalina, Lausanne, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 774,184, Sep. 9, 1985, abandoned, which is a continuation of Ser. No. 483,130, Apr. 8, 1983, abandoned. This application Jul. 21, 1989, Ser. No. 384,860

Claims priority, application Switzerland, Apr. 26, 1982, 2514/82

Int. Cl.[5] **C12P** *7/06*

U.S. Cl. 435—161 **13 Claims**



1. A continuous fermentation process for the production of alcohol comprising:

introducing must into a bottom of a fermentation vat;

fermenting the must in the vat with a yeast, which is suitable for the production of alcohol and which aggregates and sediments during the fermentation;

maintaining a back pressure in the vat during the fermentation, by means of a back pressure valve positioned in a top of the vat, for compressing and inhibiting expansion of carbon dioxide evolved from fermenting must in the vat for hindering formation of carbon dioxide gas bubbles in the fermenting must;

transferring fermented must and evolved carbon dioxide from the vat through the back pressure valve to a pumping column extending above the top of the vat for allowing the carbon dioxide released into the pumping column to expand in the column for exerting a mammoth pumping action on the fermented must for pumping the fermented must in the column;

separating carbon dioxide from the pumped must in a degassing device connected with the pumping column above the vat for depleting carbon dioxide from the pumped must;

conveying the carbon dioxide depleted must from the degassing device in a pipe, which is connected to the bottom of the vat, in a turbulent flow;

introducing a mixture of oxygen and carbon dioxide into the turbulent flow of carbon dioxide depleted must in an upper portion of the pipe, the oxygen being introduced in an amount sufficient for obtaining only an amount of oxygen in the fermenting must in the vat which is necessary for maintaining the fermentation action of the yeast in the vat for producing alcohol;

conveying gasified must in the pipe into the bottom of the vat in a turbulent flow for recycling must;

controlling the flow rate of the fermented must, the carbon dioxide depleted must and the gasified must by means of the back pressure valve; and

collecting alcohol from the fermented must.

4,992,371

HYBRID PLASMIDS HAVING A STREPTOMYCETES REPLICON AND AN ESCHERICHIA COLI REPLICON

Wolfgang Wohlleben; Günter Muth, and Alfred Pühler, all of Bielefeld, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 111,105, Oct. 14, 1987, abandoned, which is a continuation of Ser. No. 717,846, Mar. 29, 1985, abandoned. This application Jun. 26, 1989, Ser. No. 372,229

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412093

Int. Cl.[5] **C12N** *15/00, 1/20*

U.S. Cl. 435—172.3 **6 Claims**

1. A hybrid plasmid containing an *E. coli* replicon and a Streptomycetes replicon selected from the group consisting of the replicons of the plasmids pSG2, pSG5 and pSVH1.

4,992,372

METHOD FOR REMOVING IMPURITIES FROM PEROXIDASE SOLUTIONS

Alexander R. Pokora; Mary M. Stanley, and William L. Cyrus, Jr., all of The Mead Corporation, Mead World Headquarters, Courthouse Plaza Northeast, Dayton, Ohio 45463

Filed Feb. 2, 1989, Ser. No. 305,311

Int. Cl.[5] **C12N** *9/08*

U.S. Cl. 435—192 **8 Claims**

1. A process for removing impurities from an aqueous peroxidase enzyme containing solution comprising the steps of:

providing an aqueous solution containing a peroxidase enzyme;

adding a water-immiscible or partially watermiscible organic solvent to said aqueous solution to form a mixture having an organic phase and an aqueous phase;

agitating said mixture to extract impurities from said aqueous phase into said organic phase;

separating said aqueous phase from said organic phase;

discarding said organic phase and recovering said enzyme from said aqueous phase.

4,992,373

VECTORS AND COMPOUNDS FOR DIRECT EXPRESSION OF ACTIVATED HUMAN PROTEIN C

Nils U. Bang; Hartmut Ehrlich; Brian W. Grinnell, and S. Richard Jaskunas, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 4, 1987, Ser. No. 129,027

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[5] **C12N** *9/64, 15/57, 15/85, 15/79*

U.S. Cl. 435—226 **17 Claims**

11. A method for producing recombinant activated protein C directly upon secretion from a eukaryotic host cell, which comprises

(A) transforming a host cell with a recombinant DNA vector, said vector comprising:

(i) a DNA sequence that encodes an amino acid residue sequence, said amino acid residue sequence comprising, from the amino-terminus to the carboxy-terminus:

(a) a signal peptide and a propeptide of a γ- carboxylated, secreted protein;

(b) the light chain of human protein C;

(c) a dipeptide selected from lysine-argine, lysine-lysine, and arginine-arginine;

(d) a cleavage sequence for a cell associated protease, said cleavage sequence containing a dibasic dipeptide at the C-terminus; and

(e) the activated heavy chain of human protein C; and

(ii) a promoter positioned to drive-expression of said DNA sequence; and

(B) culturing said host cell transformed in step (A) under conditions such that said amino acid residue sequence is produced.

4,992,374

MUTANT VACCINIA VIRUS AND PROCESS FOR PRODUCTION THEREOF

Masanobu Sugimoto, Shiki; Fukumi Nishimaki, Irums; Tadashi Maruyama; Keizaburo Miki, both of Tokyo; Michio Morita, Chiba, and Kazuyoshi Suzuki, Ichikawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo and Chiba Prefecture, Chiba, both of, Japan

Filed Jul. 30, 1987, Ser. No. 79,680

Claims priority, application Japan, Jul. 31, 1986, 61-178924

Int. Cl.[5] **C12N** *7/00, 15/00;* **A61K** *39/12*

U.S. Cl. 435—235.1 **1 Claim**

1. An improved mutant vaccinia virus which is LOTC-5.

4,992,375

METHOD OF REGENERATING SOYBEANS FROM CULTURED SOYBEAN COTYLEDONARY NODES

Martha S. Wright, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 555,219, Nov. 25, 1983. This application Jul. 26, 1984, Ser. No. 634,854

Int. Cl.[5] **C12N** *5/00*

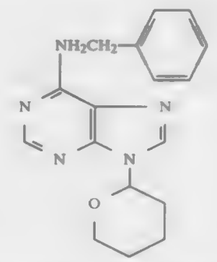
U.S. Cl. 435—240.5 **10 Claims**

1. A method of regenerating soybean plants from callus culture which comprises:

(a) germinating soybean seeds on nutrient medium comprising a cytokinin to produce a donor plant;

(b) excising the cotyledonary node from said donor plant by removing the epicotyl region within about 2 mm to about 3 mm of the cotyledonary node, removing the hypocotyl region within about 2 mm of said cotyledonary node, removing the cotyledons within about 5 mm of the node region and then dividing the excised node into pieces;

(c) culturing a divided node piece on a nutrient medium comprising a cytokinin selected from the group consisting of kinetin, benzyladenine, benzyladenine riboside and a derivative of benzyladenine having the structure



until callus tissue develops which contains shoots; and

(d) removing said shoots from said callus and rooting said shoots on a nutrient medium free of exogenous hormone to form a plantlet.

4,992,376

BIOLOGICAL PURE CULTURE OF *STREPTOMYCES VIOLACEUS* ATCC 53807

Masataka Konishi, Kawasaki; Keiko Shimizu, Tokyo; Masaru Ohbayashi, Tokyo; Koji Tomita, Tokyo; Takeo Miyaki, and Toshikazu Oki, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 437,728, Nov. 17, 1989, which is a division of Ser. No. 246,393, Sep. 19, 1988, Pat. No. 4,927,848. This application Jul. 23, 1990, Ser. No. 555,888

Int. Cl.[5] **C12R** *1/465*

U.S. Cl. 435—253.5 **1 Claim**

1. A biologically pure culture of the microorganism *Streptomyces violaceus* ATCC 53807, which is capable of producing

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the antibiotic BU-3839T in a recoverable quantity upon cultivation in a culture medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions.

4,992,377

ARTICLE FOR CARRYING OUT BIOLOGICAL OR CHEMICAL PROCEDURES CONTAINING MAGNETICALLY RESPONSIVE MATERIAL

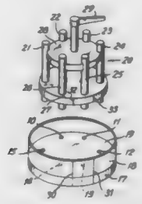
Rolf Saxholm, Box 3, 1362 Billingstad, Norway

Continuation of Ser. No. 891,117, Jul. 28, 1986, abandoned, which is a continuation of Ser. No. 428,172, Sep. 29, 1982, Pat. No. 4,657,868, which is a division of Ser. No. 112,407, Jan. 15, 1980, Pat. No. 4,371,624, which is a division of Ser. No. 716,684, Aug. 23, 1976, Pat. No. 4,213,825, which is a continuation-in-part of Ser. No. 502,107, Aug. 30, 1974, Pat. No. 3,981,776, which is a continuation-in-part of Ser. No. 156,738, Jun. 25, 1971, Pat. No. 3,843,450, which is a continuation-in-part of Ser. No. 705,539, Feb. 14, 1968, abandoned. This application Apr. 19, 1988, Ser. No. 183,671

Claims priority, application Norway, Feb. 16, 1987, 67166874

Int. Cl.[5] C12M *1/16*

U.S. Cl. 435—299 **4 Claims**



1. The combination comprising: an article for carrying out a specific biological or chemical procedure, said article comprising a dose of an active substance which may react with an agent of a medium by diffusion therewith when the article is brought into contact with the medium, said dose being constituted of a specific material in a particular quantity to carry out the specific biological or chemical procedure, and metallic magnetically responsive means incorporated with said dose as a unitary body; and means for applying a magnetic force to said metallic magnetically responsive means to achieve said specific biological or chemical procedure, said metallic magnetically responsive means being in a form distributed in said article so that application of said magnetic force will be applied substantially uniformly on said article, the distributed form of said metallic magnetically responsive means in said article corresponding substantially to the shape of said article.

4,992,378

C-DNA ENCODING HUMAN PROLACTIN RECEPTOR

Paul A. Kelly, Quebec, Canada, and Jean Djiane, Fontenay-aux-Roses, France, assignors to The Royal Institution for the Advancement of Learning (McGill University), Montreal, Canada

Filed Dec. 16, 1988, Ser. No. 286,445

Int. Cl.[5] C12N *15/12, 15/70*

U.S. Cl. 435—320.1 **3 Claims**

1. An isolated DNA sequence comprising the cDNA sequence encoding human prolacting receptor.

4,992,379

FIELD TEST FOR AROMATICS IN GROUNDWATER

John D. Hanby, 2718 Meyer Rd., Seabrook, Tex. 77586

Filed Feb. 5, 1987, Ser. No. 933,020

Int. Cl.[5] G01N *33/22*

U.S. Cl. 436—29 **5 Claims**

1. A method for on-site field testing for an aromatic contamination in a water sample, comprising the steps of:

extracting said aromatic contamination from said water sample with an alkyl halide extractant to produce an extractant phase and a water phase;

withdrawing said extractant phase from said water phase; and

adding a Friedel-Crafts Lewis acid catalyst to said extractant phase to produce a reaction product having a characteristic color indicative of said aromatic contamination.

4,992,380

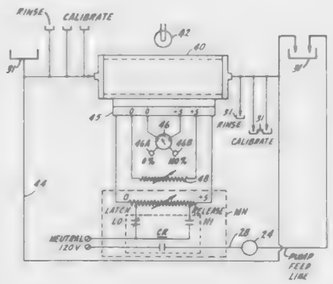
CONTINUOUS ON-STREAM MONITORING OF COOLING TOWER WATER

Barbara E. Moriarty, Naperville; James J. Hickey, Palos Heights; Wayne H. Hoy, Burbank; John E. Hoots, St. Charles, and Donald A. Johnson, Batavia, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 14, 1988, Ser. No. 258,131

Int. Cl.[5] G01N *35/08*

U.S. Cl. 436—55 **20 Claims**



1. In a cooling water system where an on-stream body of water is employed in a heat exchange role, there being a source of makeup water addition to the system as well as a source of blowdown water removal from the system, wherein impurities in the body of water, likely to cause corrosion or scaling of equipment confining the body of water, are inhibited by introducing a treating agent which undergoes depletion in its inhibiting role within the system, the treating agent being introduced proportionally with a tracer which is inert to the system including equipment and chemistry:

instrumentation including an analyzer having a flow cell for receiving a sample of the circulating on-stream body of water and for sensing a characteristic of the tracer indicative of its concentration, said analyzer having a transducer for converting said characteristic to a voltage analog thereof;

a monitor for receiving said voltage analog and for continuously comparing it to a voltage standard representing a standard tracer concentration constituting par performance in consumption of the treating agent, said monitor generating an output signal when said comparison establishes nonstandard performance;

and a pump unit for introducing the proportioned treating agent and tracer at a predetermined dosage; said output signal controlling said pump unit to alter the dosage.

4,992,381

METHOD OF DETECTING ELECTROLYTES IN AN AQUEOUS TEST SAMPLE USING CHROMOGENIC HEMISPHERANDS AND TEST DEVICE THEREFOR

Donald J. Cram, Los Angeles, Calif.; Eddy Chapoteau, Brooklyn, N.Y.; Bronislaw P. Czech, Peekskill, N.Y.; Carl R. Gebauer, Crompond, N.Y.; Roger C. Helgeson, Canuga Park, Calif.; Anand Kumar, Southfields, and Koon-Wah Leong, Ossining, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y. and The Regents of the University of California, Berkeley, Calif.

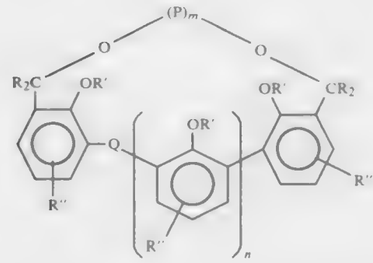
Filed Apr. 15, 1987, Ser. No. 38,679

Int. Cl.[5] G01N *21/78*

U.S. Cl. 436—74 **15 Claims**

1. A method for determining cations in a sample comprising:

(a) preparing a reagent mixture consisting essentially of a first organic solvent having a low vapor pressure and a high boiling point, a second organic solvent that is more volatile than said first solvent, a chromogenic hemispherand having the structure:



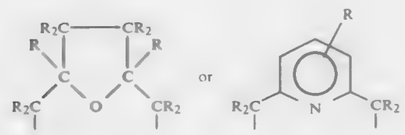
wherein:

R, same or different, is hydrogen, lower alkyl, lower alkylidene, lower alkenyl, allyl or aryl;

R′, same or different, is lower alkyl, lower alkylidene, lower alkenyl, allyl or aryl;

R″, same or different, is hydrogen, lower alkyl, lower alkylidene lower alkenyl, allyl or aryl;

P is an aliphatic or aromatic subunit selected from the group consisting of; $—CR_2R_2OCR_2CR_2—$,



n is 0 to 3;

m is 1 to 3; and

Q is a chromogenic moiety capable of providing an apperance of or change in color, or other detectable response in the presence of a particular cation, and buffer;

(b) adding the reagent mixture to a device consisting of a dimensionally stable, uniformly porous, diffusely reflective single or multi-layer formed of a polymeric matrix;

(c) evaporating the second solvent of the reagent mixture;

(d) adding the sample to the device; and

(e) measuring the reflectance of the device.

4,992,382

POROUS POLYMER FILM CALCIUM ION CHEMICAL SENSOR AND METHOD OF USING THE SAME

Marc D. Porter, and Lai-Kwan Chau, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 21, 1989, Ser. No. 396,446

Int. Cl.[5] G01N *33/20, 21/00*

U.S. Cl. 436—79 **18 Claims**

1. A method of measuring calcium in a solution comprising:

immobilizing a calcium sensitive reagent having an acid selected from the group consisting of sulfonic acid and carboxylic acid and having calcium chelating groups on porous polymer film the acid capable of binding to the film and the calcium chelating groups retaining chelating properties after immobilization;

contacting said film with said calcium containing solution;

measuring reaction of said calcium sensitive reagent to said calcium containing solution; and

determining calcium concentration in said solution as a function of said reaction of the calcium sensitive reagent.

4,992,383

METHOD FOR PROTEIN AND PEPTIDE SEQUENCING USING DERIVATIZED GLASS SUPPORTS

Vincent Farnsworth, Agoura, Calif., assignor to Porton Instruments, Inc., Tarzana, Calif.

Filed Aug. 5, 1988, Ser. No. 228,524

Int. Cl.[5] G01N *1/18*; C12Q *1/68*

U.S. Cl. 436—89 **13 Claims**

1. In a method of sequencing a peptide or protein which comprises immobilizing the peptide or protein on a support and sequencing the peptide or protein by stepwise degradation, the improvement which comprises providing a glass support derivatized with a silica-binding substance having a free acid group, said acid having a pKa<1, said derivatized support being capable of retaining said peptide or protein.

4,992,384

MEASURING APPARATUS AND METHOD OF USE FOR ANALYZING A GAS MIXTURE

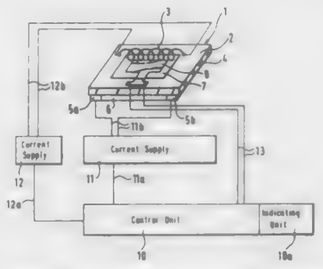
Heinz Laurs, Viersen, and Hans-Peter Oepen, Niederzier, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,442

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729286

Int. Cl.[5] G01N *27/12, 27/16*

U.S. Cl. 436—151 **16 Claims**



15. A method of analyzing a gas mixture for at least one gas contained in the mixture at a very low concentration over a predetermined measurement duration including a plurality of measurement cycles with each other having at least one measuring phase and at least one regeneration phase, the method being conducted with the aid of a heatable catalyzer and a heatable gas sensor with the gas sensor having a measuring quantity which has an initial value at the beginning of the first

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measuring cycle and which can reach an end value at which the sensor is saturated, the method comprising the steps of:

heating the catalyzer exposed to said gas mixture to a first temperature during each measuring phase of each measurement cycle for splitting up said gas mixture into conversion products and controlling the catalyzer to a second temperature less than said first temperature during the regeneration phase;

heating the sensor to a first temperature during said measuring phase during which at least one of said conversion products is taken up by the sensor causing a change in said measuring quantity and then heating the sensor to a second temperature higher than said first temperature during said regeneration phase thereby causing said one conversion product to be released, said sensor being heated so as to cause said measuring phase to be very much shorter than said measurement duration and the time required for said measuring quantity to reach said end value; and,

controlling the heating of the catalyzer and the sensor to cause the apparatus to go through a plurality of said measuring cycles and controlling the heating of said sensor during said regeneration phase so as to cause said measuring value to again reach said initial value at the end of said measurement duration.

4,992,385

POLYMER-COATED OPTICAL STRUCTURES AND METHODS OF MAKING AND USING THE SAME

Robin E. Godfrey, Welwyn, United Kingdom, assignor to Ares-Serono Research and Development Limited Partnership, Boston, Mass.

Filed Jul. 22, 1987, Ser. No. 76,519

Claims priority, application United Kingdom, Jul. 24, 1986, 8618183

Int. Cl.[5] G01N *33/553*

U.S. Cl. 436—525 20 Claims

1. A method of applying a uniform, thin polymer film to the surface of a metallised diffraction grating which comprises the steps of:

(i) inserting the metallised diffraction grating into a bath containing a casting liquid,

(ii) forming a thin film of a desired polymer over the surface of the casting liquid, and

(iii) either raising the diffraction grating through the casting liquid to engage the film of polymer on the surface of the liquid or allowing the casting liquid to drain out of the bath so that the polymer film on the surface of the liquid drops as the liquid level drops until it engages and spreads over the surface of the diffraction grating, in either case the diffraction grating being located at a small angle to the horizontal to facilitate draining of the casting liquid from the surface of the diffraction grating.

4,992,386

METHOD OF MANUFACTURING A SEMICONDUCTOR LIGHT DETECTOR

Hideto Furuyama, Tokyo, and Tetsuo Sadamasa, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1989, Ser. No. 413,489

Claims priority, application Japan, Dec. 14, 1988, 63-315619

Int. Cl.[5] H01L *31/18*

U.S. Cl. 437—3 27 Claims

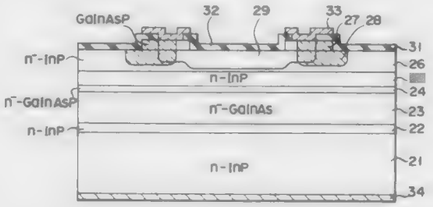
1. A method of manufacturing a semiconductor light detector, comprising the steps of:

forming a guard ring by doping an impurity of a second conductivity type in a surface region of a first semiconductor layer of a first conductivity type having a multilayer structure including a light absorbing layer and an avalanche multiplicating layer, said guard ring defining a first p-n junction;

forming an annular second semiconductor layer on a surface of said first semiconductor layer corresponding to said guard ring;

forming a masking layer on a peripheral portion of said second semiconductor layer and a surface of said first semiconductor layer outside said peripheral portion; and

forming a light detecting region by doping an impurity of a second conductivity type in said first semiconductor



layer, using said masking layer as a mask, in such a manner that the diffusion depth of a central portion of said first semiconductor layer is greater than that of said guard ring, and the diffusion depth of a peripheral portion of said first semiconductor layer is less than that of said guard ring, said light detecting region defining a second p-n junction having a concentration gradient higher than that of the first p-n junction.

4,992,387

METHOD FOR FABRICATION OF SELF-ALIGNED ASYMMETRIC FIELD EFFECT TRANSISTORS

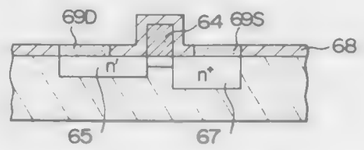
Akiyoshi Tamura, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 20, 1990, Ser. No. 496,300

Claims priority, application Japan, Mar. 27, 1989, 1-75324

Int. Cl.[5] H01L *21/306, 21/22*

U.S. Cl. 437—41 4 Claims



1. A method for fabrication of a field effect transistor comprising:

a step of forming an active layer in a principal surface portion of a compound semiconductor substrate;

a step of forming an insulator film to cover an upper surface portion of said active layer;

a step of forming a conductor film on said substrate and said insulator film and removing selectively said conductor film through etching in a vertical direction so that a gate electrode comprising a portion of said conductor film is formed on an end portion of said insulator film in a self-alignment manner; and

a step of conducting ion implantation for formation of a source region with said insulator film and said gate electrode used as masks to form a region of a high impurity concentration in a portion of said substrate on an unmasking side of said gate electrode so that source and drain regions comprising said region of said high impurity concentration and said active layer and having different impurity concentrations are formed in said substrate on opposite sides of said gate electrode.

4,992,388

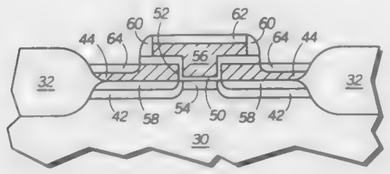
SHORT CHANNEL IGFET PROCESS

James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 10, 1989, Ser. No. 444,651

Int. Cl.[5] H01L *21/336*

U.S. Cl. 437—41 15 Claims



10. A process for fabricating an insulated gate field effect transistor comprising the steps of:

providing a silicon substrate of first conductivity type having a surface;

depositing and patterning a first masking material overlying said surface to form a shaped structure having a sidewall;

forming a sidewall spacer on said sidewall;

removing said shaped structure to leave said sidewall spacer masking a first portion of said surface and exposing other portions of said surface;

depositing by selective deposition a layer of silicon overlaying said other portions of said surface;

doping said layer of silicon with conductivity determining impurities of second conductivity type;

oxidizing said layer of silicon to form a layer of oxide on the upper surface thereof;

removing said sidewall spacer and exposing said first portion of said surface;

forming a gate insulator on said first portion;

providing a layer of electrically conductive material overlaying said gate insulator; and

patterning said layer of electrically conductive material to form a gate electrode.

4,992,389

MAKING A SELF ALIGNED SEMICONDUCTOR DEVICE

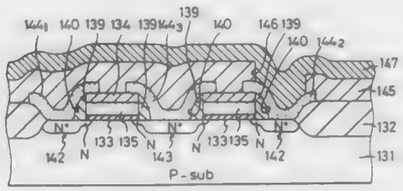
Mitsugi Ogura, Yokohama; Shioji Ariizumi; Fumio Horiguchi, both of Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 824,575, Jan. 23, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 142,272

Claims priority, application Japan, Feb. 8, 1985, 60-22941; Feb. 8, 1985, 60-22942; Feb. 8, 1985, 60-22943

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 1 Claim



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a gate electrode having upper and lower insulating films arranged above and below said gate electrode, on the surface of a semiconductor substrate of a first conductivity type;

forming a pair of diffusion regions of second conductivity type using said gate electrode and its upper and lower insulating films as a mask;

depositing a first insulating layer over the entire surface including said upper insulating film;

forming walls on the both side faces of said gate electrode and its upper and lower insulating films by anisotropic etching of said first insulating layer so as to expose the surface of the semiconductor substrate and simultaneously forming direct contact holes exposing the surface of said substrate;

depositing a conductive layer over the entire surface of said semiconductor substrate so as to directly contact said walls and then forming electrode layers connected to said diffusion regions through said direct contact holes by patterning said conductive layer;

forming a second insulation layer over the entire surface of said semiconductor substrate;

opening at least one contact hole in said insulation layer; and

selectively forming a wiring layer connected to one of said electrode layers through said contact hole;

wherein said upper insulating film arranged over said gate electrode is formed thicker than said first insulating layer and is formed to satisfy the relationship below:

$$t2/A2 > 1.5 \, .t1/A1$$

wherein

t1: the thickness of said first insulating layer

t2: the thickness of said upper insulating film,

A1: etching rate of said first insulating layer at the anisotropic etching,

A2: etching rate of said upper insulating film at the anisotropic etching.

4,992,390

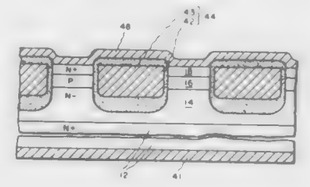
TRENCH GATE STRUCTURE WITH THICK BOTTOM OXIDE

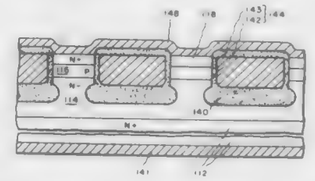
Hsueh-Rong Chang, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1989, Ser. No. 376,072

Int. Cl.[5] H01L *21/26, 21/283, 29/784*

U.S. Cl. 437—42 5 Claims





1. A method of fabricating a trench gate semiconductor device comprising the steps of:

(a) providing a silicon semiconductor wafer of a first type conductivity;

(b) growing a thermal oxide layer on a first major surface of said wafer;

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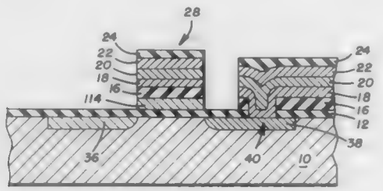
(c) depositing a thin silicon nitride layer on said thermal oxide layer;
(d) ion implanting a second conductivity type dopant through said oxide and nitride layers into the underlying silicon;
(e) forming and patterning a reactive ion etching masking layer over said nitride layer to define a trench location;
(f) reactive ion etching a trench into said silicon material;
(g) implanting oxygen ions into the bottom wall of said trench;
(h) thermal annealing said second conductivity type implanted region and said oxygen implanted region, respectively, to form the desired second conductivity type region and silicon oxide;
(i) removing damaged material from the sidewalls of said trench and any silicon on the bottom of said trench over said silicon oxide;
(j) growing a thin gate oxide layer on the sidewalls of said trench;
(k) filling said trench with conductive gate material;
(l) planarizing said wafer by removing said conductive gate material from over said reactive ion etching mask;
(m) removing said reactive ion etching mask;
(n) forming a first conductivity type region in said second conductivity type region adjacent said first major surface of said wafer; and
(o) forming metallic electrodes on said device.

4,992,391

PROCESS FOR FABRICATING A CONTROL GATE FOR A FLOATING GATE FET

Hsingya A. Wang, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 29, 1989, Ser. No. 442,903
Int. Cl.[5] H01L *21/336*
U.S. Cl. 437—43 **15 Claims**



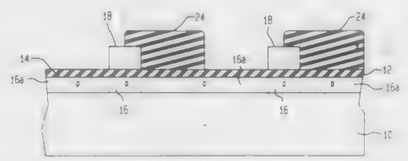
12. A process for fabricating a floating gate field-effect transistor (FET) on a substrate, comprising the sequential steps of:
(a) providing a gate oxide overlying the substrate;
(b) providing a first polysilicon layer overlying the gate oxide layer;
(c) annealing the first polysilicon layer in an environment including $POCl_3$;
(d) etching the first polysilicon layer to form floating gate lines;
(e) providing an inter-gate oxide layer overlying the floating gate lines and the gate oxide;
(f) placing the substrate in a vacuum chamber and reducing the pressure in the vacuum chamber;
(g) providing control gate material layers overlying the intergate oxide layer, the control gate material layers including a second undoped polysilicon layer, a silicide layer overlying the second polysilicon layer and a third undoped polysilicon layer overlying the silicide layer, without breaking the vacuum formed in said step (f);
(h) annealing the substrate in an environment including $POCl_3$ to provide the second and third polysilicon layers with a doping concentration greater than approximately 1×10^{20} cm^{-3};
(i) thermally oxidizing the third polysilicon layer to form a capping oxide layer;
(j) etching the capping oxide layer, the control gate material layers, and the inter-gate oxide layer to form control gate lines;
(k) etching the floating gate lines using the capping oxide and the control gate lines as masks to form floating gates; and
(l) implanting source and drain regions using the control gate lines as masks.

4,992,392

METHOD OF MAKING A VIRTUAL PHASE CCD

David N. Nichols, Fairport; Constantine Anagnostopoulos, Mendon, and Charles V. Stancampiano, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,871
Int. Cl.[5] H01L *21/339*
U.S. Cl. 437—53 **23 Claims**



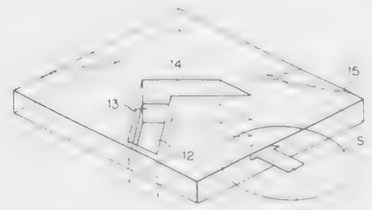
1. A method of making a virtual phase CCD in a semiconductor body having a major surface and being of a first conductivity type comprising the steps of:
forming a channel region of a second conductivity type which is of the opposite conductivity type of the first conductivity type in the body which extends to the major surface;
forming spaced apart masking regions above the major surface and over the channel region;
implanting ions of a second conductivity type which is of the opposite conductivity of the body between the masking regions to increase the impurity concentration of the portions of the channel region not covered by the masking regions;
increasing the size of the masking regions so as to decrease the spaces between the masking regions along the channel region;
implanting ions of the first conductivity type into the semiconductor body between the increased sized masking regions to form virtual gate regions of the first conductivity type in portions of the channel region which extend to the top surface;
implanting ions of the second conductivity type into portions of the channel region below and between the increased sized masking regions to further increase the impurity concentration of portions of the channel region below the virtual gate regions;
further increasing the size of the masking regions to further decrease the spacing between the masking regions along the channel region;
implanting ions of the second conductivity type into portions of the channel region below and between the twice increased sized masking regions to further increase the impurity concentration of portions of the channel region below the virtual gate regions;
removing the masking regions; and
forming conductive gates over and insulated from the major surface between the virtual gates.

4,992,393

METHOD FOR PRODUCING SEMICONDUCTOR THIN FILM BY MELT AND RECRYSTALLIZATION PROCESS

Daisuke Kosaka, Takarazuka, and Junichi Konishi, Ikeda, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 25, 1990, Ser. No. 529,248
Claims priority, application Japan, Jun. 1, 1989, 1-140562; Feb. 21, 1990, 2-41469
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—83 **13 Claims**



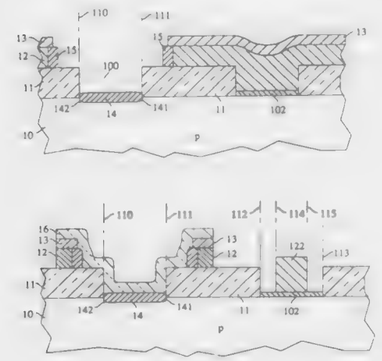
1. A method for producing a semiconductor thin film by melt and recrystallization process in such a way that at least one recess is formed in a stacked layered structure including a semiconductor thin film layer, said recess having an arrow head shape seen from a surface side of said layered structure, an apex of said arrow head shape being oriented to a forward direction on a scanning line, that said surface of said layered structure is covered with a cooling medium so that said recess is filled with said cooling medium, and that an energy beam is irradiated to said layered structure through said cooling medium to scan said structure along said scanning line so as to melt said semiconductor thin film and thereafter said semiconductor is cooled and recrystallized to form a single crystal structure therein.

4,992,394

SELF ALIGNED REGISTRATION MARKS FOR INTEGRATED CIRCUIT FABRICATION

Robert L. Kostelak, Jr., Morris Plains; William T. Lynch, Summit, and Sheila Vaidya, Watchung, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1989, Ser. No. 387,721
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—229 **14 Claims**



1. A method of fabricating an integrated circuit at a surface of a semiconductor body comprising the steps of
(a) forming at the surface a first lithographically patterned layer of first material having a registration feature and a first device feature;
(b) enhancing the registration feature but not the device feature, to form an enhanced registration feature, said enhancing step comprising forming a self-aligned layer of second material having at least one edge which is substantially coincident with an edge of the registration feature of the first patterned layer of first material, the second material being different from the semiconductor and the first material; and
(c) forming at the surface a second lithographically patterned layer of third material having a second device feature, using the edge of the enhanced registration feature as a fiducial mark for aligning the second device feature with respect to first device feature.

4,992,395

MOLTEN ALUMINUM RESISTANT REFRACTORY COMPOSITION CONTAINING CERAMIC FIBERS

Jed L. Dulberg; John K. Steelman, and Timothy K. Myers, all of Burlington, N.C., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 28, 1989, Ser. No. 344,689
Int. Cl.[5] C04B *35/80, 35/10, 28/24*
U.S. Cl. 501—95 **22 Claims**

1. A ceramic fiber containing refractory moldable composition suitable for use with molten aluminum alloys, the composition comprised of:
(a) 10–18 wt.% ceramic fiber;
(b) 33–45 wt.% colloidal silica;
(c) 30–42 wt.% total content of liquid carrier;
(d) 0.2–3.5 wt.% organic polymer; and
(e) 1–15 wt.% barium sulfate.

4,992,396

FUSED AZS REFRACTORY COMPOSITION

Charles N. McGarry, Clarksville; Thomas M. Wehrenberg, Jeffersonville, both of Ind.; Douglas A. Drake, and Gary L. Lawson, both of Louisville, Ky., assignors to Corhart Refractories Corporation, Louisville, Ky.

Continuation of Ser. No. 133,537, Dec. 16, 1987, abandoned.
This application Aug. 15, 1989, Ser. No. 395,285
Int. Cl.[5] C04B *35/48, 35/62*
U.S. Cl. 501—107 **28 Claims**

1. Refractory composition for making refractory articles consisting essentially of:
(a) 40–85 wt. % fused AZS grain;
(b) 10–20 wt. % reactive alumina having an average particle size of about four to one-half micron;
(c) 0–45 wt. % chromic oxide; and
(d) a binding composition selected from the group consisting essentially of alumina phosphate, organic binders and lubricants, the binding composition being combined with one hundred weight percent of components (a), (b) and (c).

24. In a glass melting furnace constructed of shaped, refractory elements, the improvement wherein at least one of the shaped elements is formed from a refractory composition consisting essentially of:
(a) 40–85 wt. % fused AZS grain;
(b) 10–20 wt. % reactive alumina having an average particle size of about four to one-half micron;
(c) 0–45 wt. % chromic oxide; and
(d) a binding composition selected from the group consisting essentially of aluminum phosphate, organic binders and lubricants, the binding composition being combined with one hundred weight percent of components (a), (b) and (c).

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4,992,397

LOW THERMAL CONDUCTIVITY, HIGH STRENGTH REFRACTORY CASTABLE COMPOSITION WITH HIGH ABRASION RESISTANCE

Gustav O. Hughes, Jr., 7932 Westmoreland Ave., Pittsburgh, Pa. 15218

Filed Feb. 6, 1989, Ser. No. 306,923
Int. Cl.[5] C04B *35/14, 35/44*
U.S. Cl. 501—124 7 Claims

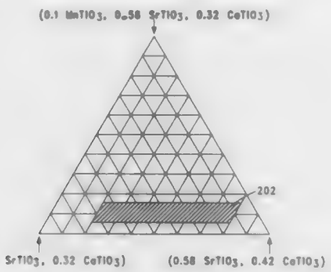
1. A low thermal conductivity, high strength refractory castable dry mix composition with high abrasion resistance consisting essentially of about 32 about 80% by weight amorphous silica, about 5 to about 25% by weight of a calcined alumino-silicate aggregate having a density of about 30 to about 70 pcf and a particle size of about −10 to about +65 mesh, about 5 to about 40% by weight of dense calcined fireclay fines, about 1 to about 10% by weight of a flow aid for particle packing, and about 5 to about 25% by weight of a calcium aluminate cement.

4,992,398

HIGH FREQUENCY DIELECTRIC COMPOSITION

Rong-Fong Huang, and Dean Anderson, both of Alburquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1989, Ser. No. 458,911
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—135 4 Claims



1. A dielectric ceramic consisting substantially of a solid solution titanate having a perovskite-type crystal structure, said titanate having the composition represented by the following general formula:

$$(Sr_xCa_yMn_z)TiO_3$$

wherein x, y, and z are numbers represented respectively by the expressions $0.98<x+y+z<1.02$, $0.34<y<0.4$, and $0.0075<z<0.015$.

4,992,399

CERAMIC, CIRCUIT SUBSTRATE AND ELECTRONIC CIRCUIT SUBSTRATE BY USE THEREOF AND PROCESS FOR PRODUCING CERAMIC

Motoo Kumagai, Yokohama; Keiichi Kato, Tokyo; Masato Nagano, and Michiaki Sakaguchi, both of Iwamisawa, all of Japan, assignors to Canon Kabushiki Kaisha and Nippon Oil & Fats Co., Ltd., both of Tokyo, Japan

Filed Jun. 21, 1988, Ser. No. 209,571
Claims priority, application Japan, Jun. 23, 1987, 62-156141
Int. Cl.[5] H05K *1/03;* C04B *35/46;* B32B *3/00*
U.S. Cl. 174—258 6 Claims

1. A ceramic comprising therein at least two dielectric regions including (a) a first region having (i) a principal composition consisting of from 49.50–54.00 mole percent of TiO_2 and from 50.50–46.00 mole percent of SrO; (ii) from 0.50–5.30 moles MnO_2 per 100 moles of the principal composition and (iii) from 0.02–0.40 moles Y_2O_3 per 100 moles of said principal composition; and (b) a second region having (i) a principal composition consisting of from 49.50–54.00 mole percent of TiO_2 and from 50.50–46.00 mole percent of SrO; (ii) from 0.50–5.30 moles MnO_2 per 100 moles of the principal composition; (iii) from 0.02–0.40 moles Y_2O_3 per 100 moles of said principal composition; and (iv) from 0.40–5.00 moles Al_2O_3 and from 0.05–2.00 moles SiO_2 per 100 moles of said principal composition.

4,992,400

CRACKING CATALYST FOR HYDROCARBON CHARGES COMPRISING AN OFFRETITE, A ZEOLITE AND A MATRIX

Christian Marcilly, Houilles; Jean-Marie Deves, and Francis Raatz, both of Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 10, 1988, Ser. No. 154,258
Claims priority, application France, Feb. 11, 1987, 87 01802; Nov. 30, 1987, 87 16691
Int. Cl.[5] B01J *29/06*
U.S. Cl. 502—67 14 Claims

1. A catalyst containing:
(a) 25–90% by weight of at least one matrix, selected from the group consisting of alumina, silica, magnesia, clay, titanium oxide, zirconia, combinations of at least two of these compounds and alumina-boron oxide combinations,
(b) 1–60% by weight of at least one zeolite of open structure whose main dodecagonal channels have openings of at least 7 Angströms, said zeolite being selected from the group formed of X, Y, L, omega and beta zeolite;
(c) 0.5–60% by weight of at least one dealuminated offretite whose main dodecagonal channels have openings smaller than 7 Angströms and which have a SiO_2/Al_2O_3 molar ratio from about 15 to about 500, the crystalline parameters a and c of elementary mesh ranging respectively from 1.285 to 1.315 nm for a and from 0.748 to 0.757 nm for c and have a potassium content lower than 1.5% by weight, said catalyst being prepared by a process comprising:
(1) preparing a mixture of offretite with a matrix,
(2) preparing a mixture of a zeolite of open structure with a matrix and,
(3) admixing the product of (1) with the product of (2).

4,992,401

NOBLE METAL ALKALINE ZEOLITES FOR CATALYTIC REFORMING

Albert E. Schweizer, Baton Rouge, La., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jan. 3, 1989, Ser. No. 292,781
Int. Cl.[5] B01J *29/32*
U.S. Cl. 502—74 7 Claims

1. A method for producing a noble-metal containing zeolite suitable for catalytic reforming, which method comprises: (a) contacting a zeolite selected from alkaline faujasites and L zeolites and zeolites isostructural thereto, with a noble-metal compound selected from Pt(acetylacetonate)$_2$ and Pd(acetylacetonate)$_2$ for an effective amount of time to incorporate Pt and/or Pd into the pore surface regions of the zeolite, but not to disperse the Pt and/or Pd throughout the entire zeolite; and (b) calcining the so treated zeolite at a temperature from about 250° C. to about 600° C. for an effective amount of time.

4,992,402

NOBLE METAL ACIDIC ZEOLITES FOR ISOMERIZATION

Albert E. Schweizer, Baton Rouge, La., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jan. 3, 1989, Ser. No. 292,783
Int. Cl.[5] B01J *29/10, 29/20*
U.S. Cl. 502—74 7 Claims

1. A method for producing a noble metal containing zeolite catalyst for isomerization of paraffinic hydrocarbons which

method comprises: (a) contacting a zeolite material selected from the group consisting of acidic faujasites, LZ-210 faujasites, and mordenite with a noble-metal compound selected from Pt(acetylacetonate)$_2$ and Pd(acetylacetonate)$_2$ for an effective amount of time to incorporate Pt and/or Pd into the pore surface regions of the zeolite, but not to disperse the Pt and/or Pd throughout the entire zeolite; and (b) calcining the so treated zeolite at a temperature from about 250° C. to about 600° C. for an effective amount of time.

4,992,403

CATALYSTS FOR HYDROTREATING HYDROCARBONS AND METHODS OF PREPARING THE SAME

Yasuhito Takahashi, Narashino; Tomio Kawaguchi. Funabashi, and Shigeru Sakai, Ichikawa, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,560
Claims priority, application Japan, Aug. 19, 1988, 63-206194; Sep. 8, 1988, 63-225099; Sep. 13, 1988, 63-229246; Sep. 13, 1988, 63-229247; Sep. 19, 1988, 63-234000
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] B01J *27/49, 21/51*
U.S. Cl. 502—164 4[5] Claims

1. A catalyst for hydrotreating hydrocarbons, which comprises a shaped body of a mixture composed of a carrier substance consisting essentially of an oxide of aluminium and/or an oxide hydrate of aluminium, at least one compound selected from water-soluble compounds of metals of Group VI and Group VIII of the Periodic Table and at least one organic compound selected from the group consisting of mercapto-carboxylic acids of a general formula:

$$HS—(CH_2)_n—COOR$$

where n represents an integer of from 1 to 3; and R represents a hydrogen atom, or an alkali metal, an alkaline earth metal, an ammonium group, or an alkyl group having from 1 to 10 carbon atoms,
thio-acids of a general formula:

$$R'—COSH$$

where R′ represents a monovalent hydrocarbon group having form 1 to 15 carbon atoms,
amino-substituted mercaptans of a general formula:

$$H_2N—R''—SH$$

where R″ represents a divalent hydrocarbon group having from 1 to 15 carbon atoms,
dimercaptans of a general formula:

$$HS—R''—HS$$

where R″ represents a divalent hydrocarbon group having from 1 to 15 carbon atoms, and mercapto-alcohols of a general formula:

$$R^aS—R'''—(OH)_n$$

where R‴ represents an alkyl group having form 1 to 15 carbon atoms, or a phenyl group; R^a represents a hydrogen atom or an alkyl group having from 1 to 2 carbon atoms; and n represents an integer of from 1 to 2.

4,992,404

CARBON-BASED CATALYST USEFUL IN GAS-SOLID REACTIONS

Siegfried Gruhl, Engelskirchen; Werner Pusch, Leverkusen; Siegbert Humberger, and Goetz-Gerald Börger, both of Odenthal-Osenau, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 227,953, Aug. 3, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 470,021
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727642
Int. Cl.[5] B01J *21/18, 23/22, 23/74, 23/72*
U.S. Cl. 502—185 7 Claims

1. A carbon-based catalyst produced by a process comprising a first step of pyrolyzing a monomeric or polymeric residue from the production of isocyanates, amines, nitriles or polyurethanes, cooling the pyrolysis product formed and size-reducing the cooled pyrolysis product, mixing the size-reduced pyrolysis product with substantially insoluble metal oxide and/or compounds forming substantially insoluble metal oxides and a binder for said pyrolysis product/metal oxide mixture said binder being selected from the group consisting of phenol, cresols, xylenols, naphthols or mixtures of phenol, cresols, xylenols, and naphthols admixed with or condensed with formaldehyde, methaldehyde, benzaldehyde or mixtures of formaldehyde, methaldehyde and benzaldehyde and subjecting the resulting mixture to forming and heat treatment at a temperature of at least 600° C. to obtain a substantially homogeneous catalyst of said metal oxides bound to a carbon matrix, wherein said catalyst of pyrolysis product, insoluble metal oxide and binders has a carbon content of >65% by weight of catalyst, a content of one or more of substantially insoluble oxides of the metals Co, Fe, Ni, Cr, V, Mo, W, Cu, Mn and Ti of 0.1 to 10% by weight of said catalyst and a nitrogen content of 0.5 to 15% by weight of catalyst.

4,992,405

THREE-WAY CATALYST FOR AUTOMOTIVE EMISSION CONTROL AND METHOD OF MAKING THE CATALYST

Mohinder S. Chattha, Northville, Mich.; William L. H. Watkins, Toledo, Ohio, and Haren S. Gandhi, Farmington Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 22, 1989, Ser. No. 440,526
Int. Cl.[5] B01J *21/06, 23/10, 23/44, 23/46*
U.S. Cl. 502—303 14 Claims

1. A three-way catalyst for automotive emissions, the catalyst being applied to a mechanical carrier having a support comprised substantially of alumina, comprising:
(a) discontinuous lanthanum oxide on said support;
(b) catalytic precious metal of palladium and rhodium with rhodium being present in an amount no greater than 10% by weight of the precious metal and palladium constituting at least 60% by weight of the precious metal, the catalytic precious metal being discontinuously supported on or about said support; and
(c) titania discontinuously residing on or about said catalytic precious metal and lanthana, said titania being present in an amount of 0.1–8.0% by weight of said catalyst.

4,992,406

TITANIA-SUPPORTED CATALYSTS AND THEIR PREPARATION FOR USE IN FISCHER-TROPSCH SYNTHESIS

Charles H. Mauldin, and Kenneth L. Riley, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 23, 1988, Ser. No. 275,252
Int. Cl.[5] B01J *21/04, 21/06, 23/74, 32/00*
U.S. Cl. 502—304 43 Claims

1. A support composition for forming a catalyst useful for the conversion of synthesis gas to hydrocarbons which com-

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prises titania in which there is incorporated from 0.1 to about 20 wt% of an inorganic oxide binder selected from the group consisting of alumina and zirconia based on the weight of the titania-binder support, to provide a titania-binder support having a pore volume ranging from about 0.2 cc/g to about 0.5 cc/g, and surface area ranging from about 8 m^2/g to about 70 m^2/g.

4,992,407

CATALYST CONSISTING OF A METAL LAYER SYSTEM FOR THE REMOVAL OF HYDROGEN FROM A GAS MIXTURE

Amiya K. Chakraborty, Erftstadt; Edmund Kersting, Overath; Jurgen Rohde, Bergisch-Gladbach; Karl-Heinz Klatt; Helmut Wenzl, both of Julich, and Ralf Konrad, Sinn, all of Fed. Rep. of Germany, assignors to Forschungszentrum Julich GmbH, Julich and Gesellschaft fur Reaktorsicherheit (GRS)mbH, Cologne, both of, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,652

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 3826503

Int. Cl.[5] B01J *21/04, 23/72, 23/89*

U.S. Cl. 502—327 **12 Claims**

1. A catalyst comprising a system of metal layers for the removal of hydrogen from a gas mixture containing hydrogen and oxygen, at least one surface layer of said system facing the gas mixture, said surface layer being constituted of an alloy of PdNiCu; a carrier of a heat-conductive material bonded to the surface layer; and an intermediate layer selected from the group of materials consisting of V, Nb, Ta, Ti, and Zr being arranged intermediate the surface layer and the carrier.

4,992,408

CATALYST FOR USE IN EFFLUENT TREATMENT

Samuel D. Jackson, Darlington, England, assignor to Imperial Chemical Industries plc, London, England

Division of Ser. No. 141,942, Jan. 11, 1988, Pat. No. 4,879,047. This application Aug. 30, 1989, Ser. No. 400,767

Claims priority, application United Kingdom, Jan. 22, 1987, 8701397

Int. Cl.[5] B01J *21/10, 23/74*

U.S. Cl. 502—328 **5 Claims**

1. An intimate mixture of at least one finely divided oxide of a Group IIA element and at least one finely divided Group VIII element material selected from nickel oxide, mixtures of nickel oxide and cobalt oxide, and hydrates of said oxides, supported on pieces of non-porous substantially inert material, said intimate mixture containing 0.5 to 50% by weight of said Group IIA oxide and the oxidation state of said Group VIII element material is such that the average valency of said Group VIII element is greater than 2.4.

4,992,409

CATALYST AND METHOD OF PREPARING THE CATALYST FOR LOWER ALKANE CONVERSION

Glenn O. Michaels, South Holland, and Michael J. Spangler, Sandwich, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jan. 11, 1989, Ser. No. 295,502

Int. Cl.[5] B01J *21/04, 23/02, 23/04*

U.S. Cl. 502—341 **25 Claims**

1. A method of preparing a catalytic composition effective in the conversion of a feedstock alkane containing from 1 to 3 carbon atoms to a higher molecular weight hydrocarbon, said method comprising the steps of:

thoroughly dispersing in an aqueous medium a mixture comprising a first material comprising a Group IA metal compound and a second material comprising a Group IIA metal compound, a sol comprising an aqueous suspension of a compound of a metal selected from the group consisting of aluminum, silicon, titanium, zinc, zirconium, cadmium and tin to form a slurry with the combination of said Group IA and said Group IIA metals being selected to be stable at oxidative coupling reaction conditions, and

drying said slurry to evaporate substantially all of said aqueous medium and leaving behind a substantially dry solid material wherein said Group IA metal and said Group IIA metal are in an atomic ratio of about 0.5:1 to about 2:1 and said metal of said sol comprises about 1 wt. % to about 30 wt. % of said dry material.

4,992,410

OXYGEN-ABSORBING PACKAGE, COMPOSITION AND METHOD OF FORMULATION THEREOF

John S. Cullen, Buffalo, and Nicholas E. Vaylen, Grand Island, both of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Feb. 17, 1989, Ser. No. 312,534

Int. Cl.[5] B01J *20/10, 20/18, 20/20*

U.S. Cl. 502—407 **23 Claims**

1. An oxygen-absorbing composition which will not absorb appreciable amounts of oxygen from the atmosphere during formulation and handling comprising at the time of formulation in relatively sufficient proportions an oxygen-attracting component, an aqueous electrolyte-impregnated component, and a dry water-attracting component which has a greater affinity for water from said aqueous electrolyte-impregnated component than said oxygen-attracting component and a greater affinity for water vapor from the atmosphere than said oxygen-attracting component so that said aqueous electrolyte from said aqueous electrolyte-impregnated component cannot appreciably react with said oxygen-attracting component to thereby prevent said oxygen-attracting component from prematurely combining with atmospheric oxygen until such time as more of an equilibrium is reached between said electrolyte-impregnated component and said dry water-attracting component at which time said oxygen-attracting component can react with oxygen in the presence of said electrolyte from said electrolyte-impregnated component.

15. An oxygen-absorbing composition as set forth in claim **1** wherein said oxygen-attracting component is iron particles which are present by weight in an amount of about 29% and are of a size of about 100 mesh, and wherein said aqueous electrolyte-impregnated component is impregnated silica gel of a particle size of between about 30 and 200 mesh and is present by weight in an amount of about 61%, and wherein said dry water-attracting component is silica gel having a particle size of between about 30 mesh and 200 mesh and is present by weight in an amount of about 10%.

4,992,411

THERMAL RECORDING PAPER

Hirokazu Ohkura, Tokyo, Japan, assignor to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,390

Claims priority, application Japan, Jan. 12, 1989, 01-007430

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—200 **4 Claims**

1. Thermal recording paper comprising a paper support having a roughness index, measured by the method of liquid absorption test on paper and board (Bristow's method) in Japan TAPPI paper pulp test method No. 51-87, of not more than 8 ml/m^2, a thermal recording layer, and an intermediate layer formed therebetween.

4,992,412

AQUEOUS BASED DEVELOPER COMPOSITION

Robert A. Fetters, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 28, 1988, Ser. No. 212,648

Int. Cl.[5] B41M *5/16, 5/22*

U.S. Cl. 503—225 **20 Claims**

12. A process for the continuous production of a manifold carbonless form having two or more surfaces coated with chromogenic material comprising:

(a) providing a plurality of continuous webs, each of said webs having a front and a back surface;

(b) advancing each web of said plurality of continuous webs in a cooperating relationship with one another;

(c) applying a first coating of an aqueous dispersion of a phenolic resin neat at a coat weight of about 0.1 to about 1 pounds dry weight per 1300 square feet, said dispersion consisting essentially of about 30 to 60% by weight of said developer resin as solids, a dispersant, and water to at least a portion of said front surface of at least one web of said plurality of continuous webs;

(d) setting said first coating;

(e) printing at least one front surface of at least one web of said plurality of continuous webs with a pattern;

(f) applying a second coating of a microencapsulated color precursor to at least a portion of said back surface of at least one web of said plurality of continuous webs;

(g) setting said second coating; and

(h) collating said plurality of continuous webs.

4,992,413

IMAGE-RECEIVING SHEET

Noritaka Egashira; Koichi Asahi; Masanori Akada; Yoshinori Nakamura; Kazunobu Imoto, and Nobuhisa Nishitani, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 320,623

Claims priority, application Japan, Mar. 11, 1988, 63-57990; Mar. 11, 1988, 63-57991; Mar. 11, 1988, 63-57992; Mar. 11, 1988, 63-57993; Mar. 11, 1988, 63-57994; Apr. 18, 1988, 63-95288; May 20, 1988, 63-123694

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **6 Claims**

1. An image-receiving sheet for use with a heat transfer sheet having a dye layer containing a heat-transferable dye, said image-receiving sheet comprising:

a sheet substrate;

an image-receiving layer formed on one surface of said sheet substrate, said image-receiving layer comprising a resin; and

a release layer formed on said image-receiving layer, said release layer comprising a releasable, reaction curable resin having a molecular weight of 3,500 to 20,000 and a reactive group equivalent of 300 or less.

4,992,414

THERMAL TRANSFER RECEIVING SHEET

Seiichiro Kishida; Toshiaki Aono, and Tetsu Kamosaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1989, Ser. No. 413,817

Claims priority, application Japan, Sep. 30, 1988, 63-247218

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **3 Claims**

1. A thermal transfer receiving sheet adapted to receiving a dye from a thermal transfer sheet containing a dye capable of being sublimed or rendered mobile by heat, wherein said thermal receiving sheet comprises at least one receiving layer for receiving dye provided on a base sheet, and said base sheet comprises a support having at least one hydrophilic binder provided on the support between the support and the receiving layer, wherein said hydrophilic binder is gelatin.

4,992,415

METHOD FOR FABRICATING CERAMIC SUPERCONDUCTORS

Sankaranarayanan Ashok, Bethany, and Bruce M. Guenin, Guilford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 31, 1987, Ser. No. 80,718

Int. Cl.[5] H01L *39/12, 5/08, 39/24*

U.S. Cl. 505—1 **15 Claims**

1. A method of fabricating a ceramic superconductor comprising the following steps:

mixing copper or copper alloy metal particulate, a first metal oxide or carbonate selected from the group consisting of $SrCO_3$, $BaCO_3$, SrO and BaO, and a second metal oxide or carbonate selected from the group consisting of $Y_2(CO_3)_3$, $La_2(CO_3)_3$, Y_2O_3 and La_2O_3 to form a copper/ceramic mixture;

heating said copper/ceramic mixture at a temperature in the range between about 900–1100° C.; and

cooling the heated copper/ceramic mixture slowly, thereby forming a superconductive mixture.

4,992,416

ISOMERIC FORMYL TRIMETHYLBICYCLO[2.2.2]OCT-7-ENES

Klaus Bruns, Krefeld-Traar; Thomas Gerke, Neuss, both of Fed. Rep. of Germany, and Michael Virnig, Santa Rosa, Calif., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

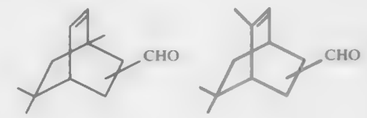
Filed May 5, 1989, Ser. No. 348,353

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815259

Int. Cl.[5] A61K *7/46;* **C07C** *47/44*

U.S. Cl. 512—16 **17 Claims**

1. Isomeric formyl trimethylbicyclo[2.2.2]oct-7-enes of the formulae



4,992,417

SUPERACTIVE HUMAN INSULIN ANALOGUES

Panayotis G. Katsoyannis, Manhasset, and Gerald P. Schwartz, Washingtonville, both of N.Y., assignors to Mount Sinai School of Medicine, New York, N.Y.

Continuation-in-part of Ser. No. 71,558, Jul. 17, 1987. This application Nov. 18, 1988, Ser. No. 273,967

Int. Cl.[5] C07K *7/40;* **A61K** *37/02*

U.S. Cl. 514—3 **9 Claims**

1. A method of treating diabetes in a patient in need of such treatment comprising administering to the patient a therapeutically effective amount of a superactive insulin analogue selected from the group consisting of des-pentapeptide (B26-B30)-[Asp^{B10}, Tyr^{B25}-α-carboxamide] human insulin and des-pentapeptide (B26-B30)-[Glu^{B10}, Tyr^{B25}-α-carboxamide] human insulin together with a pharmaceutically acceptable carrier.

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4,992,418

SUPERACTIVE HUMAN INSULIN ANALOGUE-[10-ASPARTIC ACID-B]HUMAN INSULIN

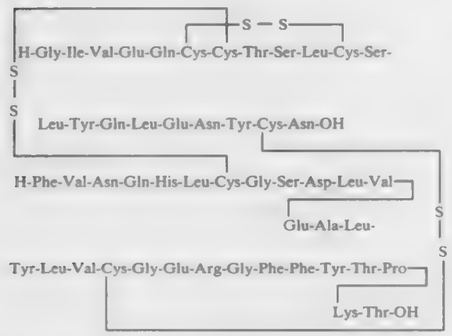
Panayotis G. Katsoyannis, Manhasset, and Gerald P. Schwartz, Washingtonville, both of N.Y., assignors to Mount Sinai School of Medicine, New York, N.Y.

Filed Jul. 17, 1987, Ser. No. 74,558

Int. Cl.[5] C07K *7/40*; A61K *37/02*

U.S. Cl. 514—3 **7 Claims**

3. A method of treating diabetes in a patient in need of such treatment comprising administering to the patient a therapeutically effective amount of a superactive insulin analogue of the formula



together with a pharmaceutically acceptable carrier.

4,992,419

STABILIZED ERYTHROPOIETIN PREPARATIONS

Heinrich Woog, Laudenbach; Werner Gruber, Birkenau; Hans-Jörg Markl, Ellerstadt, and Frtiz Demmer, Hirschberg-Leutershausen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 240,005

Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3729863

Int. Cl.[5] A61K *37/02*

U.S. Cl. 514—8 **16 Claims**

1. Compatible, storage-stable erythropoietin preparation comprising erythropoietin, a physiologically compatible buffer, 5 to 50 g/liter urea and 1 to 50 g/liter amino acids.

4,992,420

DENTAL ANTI-PLAQUE AND ANTI-CARIES AGENT

Jean-Richard Neeser, Lausanne, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 154,077, Feb. 8, 1988. This application Jul. 17, 1990, Ser. No. 554,007

Claims priority, application Switzerland, Feb. 26, 1987, 732/87

Int. Cl.[5] A61K *37/02, 7/16, 9/20, 9/68*

U.S. Cl. 514—8 **10 Claims**

1. A method for inhibiting plaque and caries in a buccal cavity comprising treating bacteria in a buccal cavity which are responsible for formation of dental plaque and caries with a compound selected from a group of compounds consisting of kappa-caseino-glycopeptides and desialylated derivatives thereof.

4,992,421

LUTEINIZING HORMONE RELEASING HORMONE ANTAGONIST

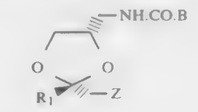
Biswanath De, Vernon Hills; Hwan-Soo Jae, Glencoe, and Jacob J. Plattner, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 19, 1988, Ser. No. 183,201

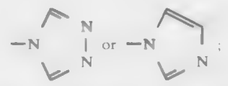
Int. Cl.[5] A61K *37/02*; C07K *5/06, 5/08*

U.S. Cl. 514—19 **8 Claims**

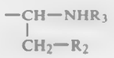
1. A compound of the formula:



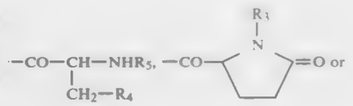
wherein Z is

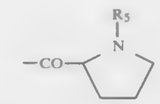


wherein R_1 is phenyl or substituted phenyl wherein the phenyl ring is substituted with one or two substituents independently selected from halogen, loweralkoxy, amino, loweralkylamino and CH_3CONH—; B is



wherein R_2 is selected from indolyl, imidazolyl, furyl, thienyl, pyrazolyl, oxazolyl, isoxazolyl, thiazolyl and isothiazolyl; R_3 is





wherein R_4 is hydroxy, imidazolyl, furyl, thienyl, pyrazolyl, oxazolyl, isoxazolyl, thiazolyl or isothiazolyl and wherein R_5 is hydrogen, t-butyloxycarbonyl [(BOC)], benzyloxycarbonyl [(Cbz)], $—COCH(CH_2R_6)_2$ or $—C(O)OCH_2CH(R_6)_2$ wherein R_6 is phenyl; or a pharmeceutically acceptable salt thereof.

7. A method for suppressing levels of sex hormones in male or female mammals, comprising administering to a host in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,992,422

COMPOSITIONS COMPRISING 1-SUBSTITUTED AZACYCLOALKANES

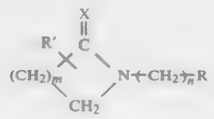
Gevork Minaskanian, Irvine; James Peck, Costa Mesa, and Eric L. Nelson, Santa Ana, all of Calif., assignors to Whitby Research, Inc., Calif.

Continuation of Ser. No. 824,436, Jan. 31, 1986, abandoned. This application Apr. 19, 1989, Ser. No. 341,320

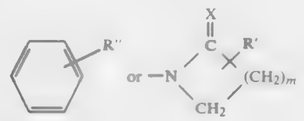
Int. Cl.[5] A61K *7/42, 7/48, 31/65, 31/705*

U.S. Cl. 514—24 **10 Claims**

1. A composition comprising an effective amount of an antibiotic selected from the group consisting of lincomycin, clindamycin, erythromyxcin and pharmaceutically useful salts thereof, and a non-toxic, effective penetrating amount of a compound having the structural formula



wherein X may represent sulfur or two hydrogen atoms; R′ is H or a lower alkyl group having 1–4 carbon atoms; m is 2–6; n is 0–18 and R is $—CH_3$,



wherein R″ is H or halogen.

4,992,423

POLYCYCLIC ETHER ANTIBIOTICS

Walter P. Cullen, East Lyme, Conn.; Hiroshi Maeda, Aichi, Japan; John C. Ruddock, Canterbury, England, and Junsuke Tone, Chita, Japan, assignors to Pfizer Inc., New York, N.Y.

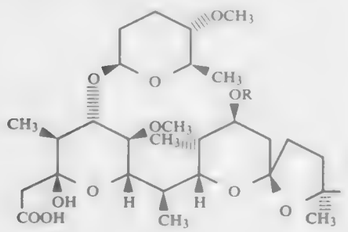
Division of Ser. No. 747,613, Jun. 21, 1985, Pat. No. 4,746,650. This application Feb. 8, 1988, Ser. No. 153,187

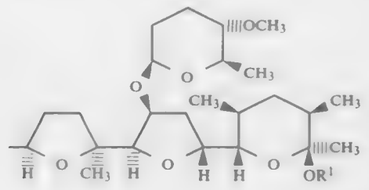
Claims priority, application United Kingdom, Jul. 12, 1984, 8417785

Int. Cl.[5] A61K *31/71*; C07H *17/04*; C12P *17/18*; A23G *3/00*

U.S. Cl. 514—27 **5 Claims**

3. A method for promoting growth or increasing the efficiency of feed utilization in swine or cattle which comprises administering to said swine or cattle a growth-promoting or feed-utilization efficiency increasing amount of the antibiotic of the formula





or a pharmaceutically acceptable cationic salt thereof;

wherein either (1) R and R^1 are each hydrogen; (2) R is hydrogen and R^1 is methyl; (3) R and R^1 are each methyl.

4,992,424

ANTIPARASITIC AVERMECTIN DERIVATIVES

Bernard J. Banks, and Michael J. Witty, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

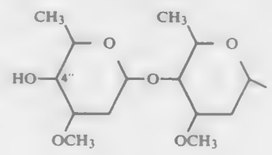
Filed Mar. 7, 1989, Ser. No. 320,209

Claims priority, application United Kingdom, Mar. 26, 1988, 8807280

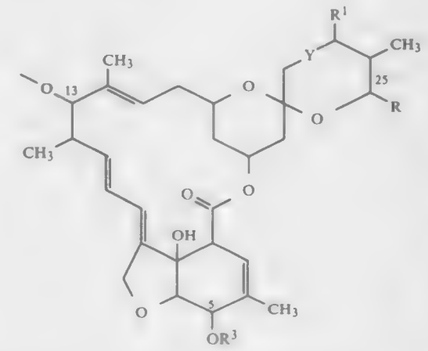
Int. Cl.[5] A61K *31/70*; C07H *17/04*

U.S. Cl. 514—30 **20 Claims**

20. A method of treating parasite infections, or pest or insect infestations, which comprises contacting the organism responsible for said infection or infestation or the location of said organism with a parasite infection treating or pest or insect infestation treating amount of a compound of the formula



(I)



wherein

Y is a single bond or a double bond; R^1 is OH; provided that when Y is a single bond R^1 is present; and when Y is a double bond R^1 is absent;

R^3 is H or CH_3;

R is $=CH_2$, $—CH=CH_2$, $—(X)—C(R^5)=CHR^6$ or $—(X-)—CH(R^8)—S(O)_nR^7$; wherein X is a direct bond or an alkylene group having from 2 to 6 carbon atoms which may be straight or branched-chain; one of R^5 and R^6 is H and the other is C_2–C_6 alkoxycarbonyl, pyridyl, phenyl or substituted phenyl, wherein the substituent is fluorine, chlorine, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, hydroxy(C_1–C_4)alkyl, formyl, aminosulphonyl, C_2–C_6 alkanoyl, C_2–C_6 alkoxycarbonyl, nitro, trifluoromethyl or trifluoromethoxy;

R^7 is C_1–C_4 alkyl;

R^8 is H or C_1–C_4 alkyl and n is 1 or 2.

4,992,425

ANTIBIOTICS BU-3608D AND BU-3608E

Maki Nishio; Yosuke Sawada, both of Tokyo; Takeo Miyaki, and Toshikazu Oki, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

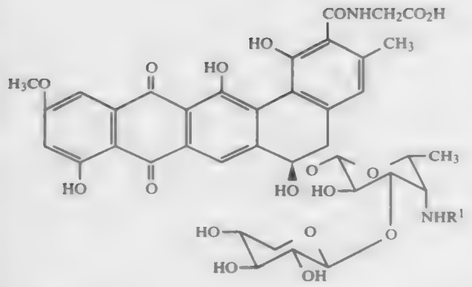
Filed Jun. 7, 1988, Ser. No. 203,776

Int. Cl.[5] A61K *31/71*; C07M *15/24*; C12P *17/56*

U.S. Cl. 514—33 **5 Claims**

1. A compound having the formula

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wherein R^1 is H or methyl; or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition which comprises an antifungal effective dose of a compound of claim 1 and a pharmaceutically acceptable carrier.

4,992,426

ANTIPARASITIC 5'-SULFAMOYL NUCLEOSIDES

Roland K. Robins, Irvine, and Ganesh D. Kini, Costa Mesa, both of Calif. 92627, assignors to Nucleic Acid Research Institute, Costa Mesa, Calif.

Filed Feb. 27, 1989, Ser. No. 316,421
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—43 **7 Claims**

4. A pharmaceutical composition comprising:
an antiparasitic effective amount of a compound selected from the group consisting of 1-(5'-O-sulfamoyl-β-D-ribofuranosyl)[1,2,4]triazole-3-carboxamide, 1-(5'-O-sulfamoyl-β-D-robpfirampsu;)[1,2,4]triazole-3-carbonitrile; and a pharmaceutical carrier thereof.

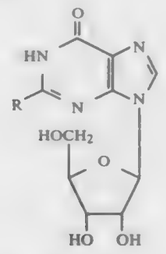
4,992,427

2-SUBSTITUTED INOSINES AND THEIR USE AS ANTIVIRAL AGENTS

Vasu Nair, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Continuation-in-part of Ser. No. 67,498, Jun. 29, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 366,425
Int. Cl.[5] A61K *31/70;* **C07H** *19/167*
U.S. Cl. 514—45 **6 Claims**

6. A method of treating RNA virus infections, said method comprising administering to an RNA virus infected mammal an effective non-toxic antiviral treating amount of a 2-substituted inosine or a pharmaceutically acceptable salt form thereof of the formula:



wherein R is selected from the group consisting of acetonyl and vinyl and the 6-methoxy derivative of the compound wherein R is 2-vinyl.

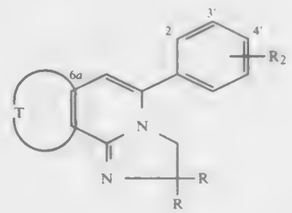
4,992,428

5-ARYL-SUBSTITUTED-2,3-DIHYDRO-IMIDAZO[1,2-A]FURO- AND THIENO PYRIDINES

William J. Houlihan, Mountain Lakes, and Seung H. Cheon, Glen Ridge, both of N.J., assignors to Sandoz Pharm. Corp., E. Hanover, N.J.

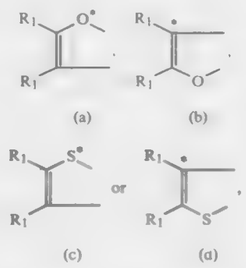
Continuation-in-part of Ser. No. 331,939, Mar. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 263,667, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 190,566, May 5, 1988. This application Jun. 9, 1989, Ser. No. 363,794
Int. Cl.[5] A61K *31/34, 31/38, 31/435;* **C07D** *491/14*
U.S. Cl. 514—63 **20 Claims**

1. A compound of formula I:



I

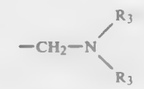
wherein
each R is, independently, hydrogen or methyl;
T is



(a) (b)

(c) (d)

where
each R_1 is hydrogen or methyl, and * indicates the atom attached to the 6a-position of the tricyclic ring; and
R_2 is straight or branched chain C_{1-6}alkyl; tri-C_{1-3} alkylsilyl; a group of the formula

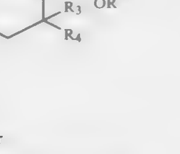


where each R_3, independently, is straight or branched chain C_{1-4}alkyl, or the two R_3's together with the nitrogen atom to which they are attached form a group of the formula



where n is an integer 4, 5 or 6, or a group of the formula

where X is —O—, —S— or —NCH_3; or a group of the formula



where Y is —CH_2—$_{1-3}$, —OCH_2— or —OCH_2CH_2—, and each R_4, independently, is hydrogen or C_{1-3}alkoxy; with the provisos that:
(1) only one of the R_1's in (a), (b), (c) or (d) is methyl; and
(2) the R_2 substituent can only be in the 3'- or 4'- positions; or a pharmaceutically acceptable acid addition salt thereof.

20. A pharamaceutical composition useful in inhibiting PAF-mediated bronchoconstriction and extravasation, for controlling hyperreactive airways, for protecting against endotoxin-induced hypotension and death comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound according to claim 1, or a pharmaceutically acceptable acid addition salt thereof.

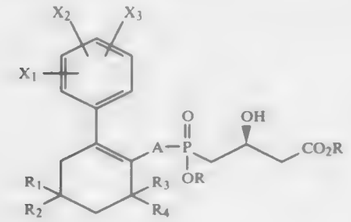
4,992,429

NOVEL HMG-COA REDUCTASE INHIBITORS

John W. Ullrich, Audubon; Kent W. Neuenschwander, Ambler, both of Pa., and John R. Regan, Princeton, N.J., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Fort Washington, Pa.

Filed Aug. 24, 1989, Ser. No. 398,015
Int. Cl.[5] A61K *31/66;* **C07D** *9/30, 9/32*
U.S. Cl. 514—129 **19 Claims**

1. A compound of the formula



wherein
A is:
—C≡C—,
—CH=CH or
—$(CH_2)_m$;
X_1, X_2 and X_3 are independently:
H,
C_1–C_6 alkyl,
halogen,
NRR,
aryl,
CF_3
SO_nR,
OR or
$RO(CH_2)_m$;
R, R_1, R_2, R_3 and R_4 are independently:
H or
C_1–C_6 alkyl; and
n is 0, 1 or 2;
m is 1, 2, 3; and
pharmaceutically acceptable salts thereof.

4,992,430

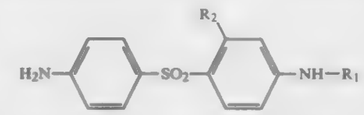
ANTI-BACTERIAL COMPOSITIONS COMPRISING A SUBSTITUTED BIS-(4-AMINOPHENYL)-SULFONE AND A DIHYDRO-FOLIC ACID REDUCTASE

Joachim K. Seydel, Borstel; Helmut Pieper; Gerd Kruger, both of Biberach; Klaus Noll, Warthausen; Johannes Keck, Biberach, and Uwe Lechner, Ummendorf, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an Der Riss, Fed. Rep. of Germany

Division of Ser. No. 62,291, Jun. 15, 1987, Pat. No. 4,829,058, which is a continuation of Ser. No. 732,024, May 8, 1985, Pat. No.

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3419009
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—155 **2 Claims**

1. A pharmaceutical composition of matter for treating a bacterial infection in a warm-blooded animal which comprises a therapeutically effective amount of a compound of formula



wherein R_1 is hydrogen or C_1–C_3 alkyl and R_2 is hydroxy, C_1–C_3 alkyl, C_1–C_3 alkylcarbonyl or cyano, or a non-toxic, pharmaceutically acceptable salt thereof, a therapeutically effective amount of pyrimethamine or trimethoprin, and a non-toxic pharmaceutically acceptable carrier.

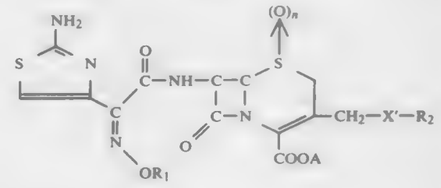
4,992,431

CEPHALOSPORINS

René Heymes, Romainville, and Didier Pronine, Rosay S/S Bois, both of France, assignors to RousselUclaf, Paris, France

Division of Ser. No. 234,327, Feb. 13, 1981, abandoned. This application Jun. 30, 1982, Ser. No. 393,761
Int. Cl.[5] C07D *501/22;* **A61K** *31/545*
U.S. Cl. 514—202 **36 Claims**

1. A syn isomer of a compound of the formula



wherein R_1 is
(a) hydrogen or
(b) alkoxycarbonyl of 2 to 6 carbon atoms,
R_2 is
(a) alkyl of 1 to 6 carbon atoms optionally interrupted with an oxygen atom;
(b) alkenyl of 2 to 6 carbon atoms;
(c) alkynyl of 2 to 6 carbon atoms; or
(d) aralkyl of 7 to 12 carbon atoms optionally substituted with at least one member of the group consisting of carboxy, amino, aminoalkyl of 1 to 6 carbon atoms, alkyl of 1 to 6 carbon atoms, dialkylamino of 1 to 6

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carbon atoms and dialkylaminoalkyl of 1 to 6 carbon atoms;
n is 0, 1 or 2
X' is selected from the group consisting of oxygen and sulfur optionally oxidized to sulfoxide or sulfone and A is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, —NH_4, magnesium, non-toxic, pharmaceutically acceptable organic amines and an easily cleavable ester.

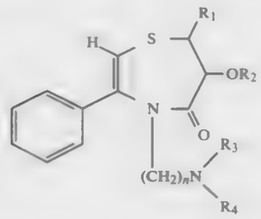
4,992,432

3-PHENYL-THIAZEPINONES AS CALCIUM REGULATING AGENTS

Erno Mohacsi, Summit, and Jay P. O'Brien, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

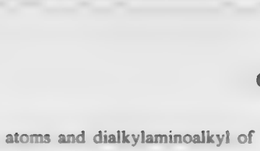
Filed Feb. 12, 1990, Ser. No. 478,378
Int. Cl.[5] A61K *31/55;* **C07D** *281/06*
U.S. Cl. 514—211 **27 Claims**

1. A compound of the formula



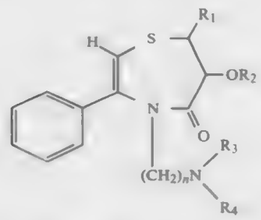
I

wherein R_1 is phenyl substituted with 1 to 3 substituents selected from the group consisting of halogen and lower alkoxy; R2 is hydrogen, lower alkyl, lower alkanoyl, lower cycloalkanoyl,



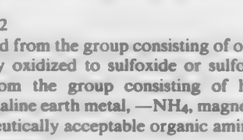
R_3 and R_4 are independently lower alkyl, phenyl lower alkyl or together form a piperidine or pyrrolidine ring; n is 2 to 4; m is 1 to 2; or a pharmaceuticallY acceptable acid addition salt thereof, with the priviso that when R_1, is 4-methoxyphenyl, R_2 is hydrogen, and R_3 and R_4 are methyl; and n is 2, the compound of formula I cannot be in the (−)-cis form.

21. A method of inducing calcium channel blockage, which comprises administering to a warm-blooded animal in need of such treatment an effective amount of a compound of the formula



I

wherein R_1 is phenyl substituted with 1 to 3 substituents selected from the group consisting of halogen and lower alkoxy; R_2 is hydrogen, lower alkyl, lower alkanoyl, lower cycloalkanoyl,



R_3 and R_4 are independently lower alkyl, phenyl lower alkyl or together form a piperidine or pyrrolidine ring; n is 2 to 4; m is 1 to 2; or a pharmaceutically acceptable acid addition salt thereof, with the proviso that when R_1 is 4-methoxyphenyl, R_2 is hydrogen and R_3 and R_4 are methyl; and n is 2, the compound of formula I cannot be in the (−)-cis form.

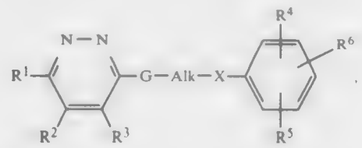
4,992,433

NOVEL PYRIDAZINAMINE DERIVATIVES

Raymond A. Stokbroekx, Beerse; Marcel J. M. Van der Aa, Kasterlee; Marcel G. M. Luyckx, Geel, and Gilbert A. J. Grauwels, Kessel-Lo, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

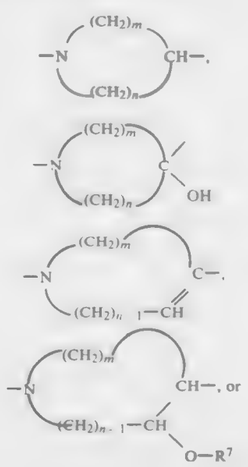
Continuation-in-part of Ser. No. 124,530, Nov. 23, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 269,805
Int. Cl.[5] C07D *237/34, 401/04, 403/04;* **A61K** *31/50*
U.S. Cl. 514—212 **20 Claims**

1. A chemical compound having the formula



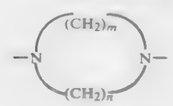
(I)

a pharmaceutically acceptable acid addition salt thereof or a stereochemically isomeric forms thereof, wherein
R^1 is hydrogen, C_{1-6}alkyl, halo, hydroxy, mercapto, trifluoromethyl, amino, mono or di(C_{1-6}alkyl)amino, cyano, C_{1-6}alkyloxy, aryloxy, arylC_{1-6}alkyloxy, C_{1-6}alkylthio, arylthio, C_{1-6}alkylsulfinyl, C_{1-6}alkylsulfonyl, arylsulfinyl, arylsulfonyl, C_{1-6}alkyloxycarbonyl, C_{1-6}alkylcarbonyl or aryl;
R^2 and R^3 each independently are hydrogen or C_{1-6}alkyl, or R^2 and R^3 combined may form a bivalent radical of formula —CH═CH—CH═CH—
G is a bivalent radical of formula

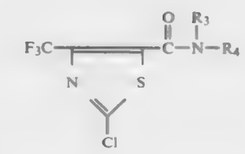


(a-1) (a-2) (a-3) (a-4)

-continued

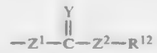


(a-5)



(Id)

wherein one or more carbon atoms within the radicals (a-1) through (a-7) may optionally be substituted with C_{1-6}alkyl or two carbon atoms in the radicals (a-1) through (a-5) may be bridged with a C_{2-4}alkanediyl radical, m and n each independently are integers of from 1 to 4 inclusive with the proviso that the sum of m and n in the bivalent radicals (a-1) through (a-5) is 3, 4 or 5;
R^7 is hydrogen, C_{1-6}alkyl or arylC_{1-6}alkyl;
Alk is C_{1-6}alkanediyl;
X is O, S, or NR^8 said R^8 being hydrogen or C_{1-6}alkyl;
R^4, R^5 and R^6 each independently are hydrogen, C_{1-6}alkyl, hydroxyC_{1-6}alkyl, halo, amino, cyano, nitro, C_{1-6}alkyloxy, hydroxy, C_{1-6}alkylthio, mercapto or trifluoromethyl, in addition and independently from the meaning of R^4 and R^5, R^6 may also be 4,5-dihydro-2-oxazolyl or 2-oxazolyl both being optionally substituted with one or more C_{1-6}alkyl or hydroxyC_{1-6}alkyl substituents; 5,6-dihydro-4H-1,3-oxazin-2-yl or 4H-1,3-oxazin-2-yl both being optionally substituted with one or more C_{1-6}alkyl or hydroxyC_{1-6}alkyl substituents; aryl; or a radical of formula



(b)

wherein
Z^1 is O, S, NR^9, CH_2 or a direct bond;
Z^2 is O, S, NR^{10} or a direct bond; and
Y is O, S or NR^{11};
said R^9, R^{10} and R^{11} each independently are hydrogen or C_{1-6}alkyl; and
said R^{12} is hydrogen, C_{1-6}alkyl, aryl, C_{3-6}cycloalkyl, arylC_{1-6}alkyl, C_{3-6}cycloalkylC_{1-6}alkyl, C_{3-6}alkenyl, C_{3-6}alkynyl, hydroxyC_{1-6}alkyl, C_{1-6}alkyloxyC_{1-6}alkyl, aminoC_{1-6}alkyl or mono or di(C_{1-6}alkyl)aminoC_{1-6}alkyl, or in the instance where Z^1 is a direct bond or CH_2, Y is O, and Z^2 is a direct bond, R^{12} may also be halo or hydrazino; and
aryl is phenyl, being optionally substituted with 1, 2 or 3 substituents each independently selected from halo, C_{1-6}alkyl, trifluoromethyl, nitro, amino, C_{1-6}alkyloxy, hydroxy and C_{1-6}alkyloxycarbonyl.

7. A method of destroying picornaviruses or preventing the growth thereof in warm-blooded animals by the systemic or topical administration of an anti-picornavirally effective amount of at least one compound of formula (I) as claimed in claim 1.

4,992,434

MICROBICIDAL COMPOSITION

Werner Töpfl, Dornach; Robert Nyfeler, Basel, and Werner Föry, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 147,388, Jan. 25, 1988, abandoned. This application Apr. 11, 1989, Ser. No. 336,166
Claims priority, application Switzerland, Jan. 30, 1987, 351/87
Int. Cl.[5] C07D *277/56;* **A01N** *43/78*
U.S. Cl. 514—212 **11 Claims**

1. A 2-chloro-4-trifluoromethyl-thiazol-5-carbonic acid derivative of the formula Id

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4,992,435

SUBSTITUTED THIENOPYRANS AS ANTIHYPERTENSIVE AGENTS

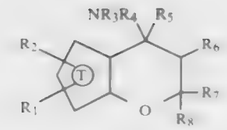
Jeffery B. Press, Rocky Hill; Pauline Sanfilippo, Flemington; James J. McNally, High Bridge, and Robert Falotico, Belle Mead, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 23, 1988, Ser. No. 249,043
Int. Cl.[5] A61K *31/55, 31/38;* **C07D** *223/10, 207/12*
U.S. Cl. 514—212 **17 Claims**

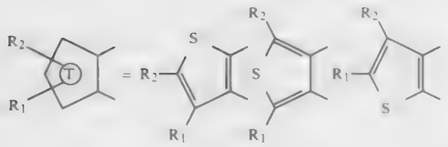
1. A compound of the formula:

wherein
R_3 and R_4 independently of each other represent hydrogen or C_3–C_8cycloalkyl which is unsubstituted of C_1–C_8alkyl or C_3–C_6-cycloalkyl which are substituted by C_1–C_8alkoxy, C_2–C_8alkoxyalkoxy, C_1–C_8alkylthio, cyano, —$COOR_7$, C_1–C_4alkylcarbamoyl, di-C_1–C_4alkylcarbamoyl, piperidinocarbonyl, pyrrolidinocarbonyl, piperidino or pyrrolidino; R_3 and R_4 further represent C_3–C_8alkenyl or C_3–C_8cycloalkenyl which is unsubstituted or substituted by halogen, C_1–C_8alkoxy, C_3–C_8cycloalkyl$_2$cyano, —$COOR_7$, C_1–C_4alkylcarbamoyl or piperidinocarbamoyl; R_3 and R_4 represent further C_3–C_8-alkynyl, which is unsubstituted or substituted by U, or R_3 and R_4 represent a radical —$(E)_mU$ or —$(E)_mQ$;
R_3 and R_4 together with the nitrogen atom, to which they are bound form a heterocycle selected from among pyrrolidine, 2-oxo-pyrrolidine, piperidine, morpholine, thiomorpholine, 2-oxo-thiomorpholine and azepine, which may be substituted by halogen, cyano, C_1–C_8alkoxy, amino, C_1–C_4alkylamino, di-C_1–C_4alkylamino, —$COOR_7$, provided that only one of R_3 or R_4 can be hydrogen,
R_7 is hydrogen, C_1–C_8alkyl, C_3–C_8cycloalkyl, C_3–C_8alkenyl, C_2–C_8alkoxyalkyl, C_3–C_8alkoxyalkoxyalkyl, C_1–C_4-haloalkyl, —$(C_1$–C_3alkylene$)_mU$, —$(C_1$–C_3alkylene$)_mQ$, C_1–C_4haloalkoxy;
U is phenyl or naphthyl, which is unsubstituted or substituted one to three times by halogen, C_1–C_4alkyl, -Y-C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4haloalkoxy, cyano, nitro, —$COOR_7$, —$CONH_2$, —$CONHR_7$, —$CONR_7$, —SO_2NHR_7, —$SO_2N(R_7)_2$, pyrrolidino, piperidino, pyrrolidino or piperidinocarbonyl;
E is a C_1–C_8alkylene or C_2C_8-alkenylene chain, which is unsubstituted or substituted by halogen, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkoxy —$CO(O)_mR_7$, —$(CO)_mA$ or —$(CO)_mQ$;
Q is a heterocyle which is bound via a carbon atom and is selected from among furan, tetrahydrofuran pyran, pentahydropyran, dioxolan, dioxan, benzdioxan, dihydrobenzdioxan, thienyl, thiazol, which may be substituted by halogen or methyl;
Y is oxygen, sulfur, —SO or SO_2
A is —$N(R_3)(R_4)$ and
M is zero or one.

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wherein



and

R_1 and R_2 are selected from hydrogen, nitro, cyano, trifluoromethyl, halogen, lower alkyl (C_{1-4}), alkanoyl (C_{2-4}), substituted alkanoyl (C_{2-4}), benzoyl, substituted benzoyl, alkanoylamino (C_{2-4}), alkoxy carbonyl (C_{1-4}), CHO, COOH, $CONH_2$, $CON(R)_2$ and NHCOR wherein R is alkyl (C_{1-4}), alkoxy (C_{1-4}), phenyl or substituted phenyl;

R_3 and R_4 are selected from hydrogen, alkanoyl C_{2-5}), alkyl (C_{1-4}), cycloalkyl (C_{3-6}), cycloalkyl carbonyl (C_{3-6}), pyridyl carbonyl, benzoyl, substituted benzoyl; or R_3R_4N together are an unsubstituted heterocyclic pyrrole, pyrrolidine or piperidine ring, an unsubstituted (C_{3-6}) lactam or an unsubstituted glycine anhydride;

R_5 is hydrogen or together with R_6 forms a double bond; R_6 is hydrogen, OH, alkoxy (C_{1-6}), alkanoyloxy (C_{2-7}), benzoyl, substituted benzoyl; and R_7 and R_8 are hydrogen or alkyl (C_{1-4}) or together form a ring having 5–8 carbon atoms.

17. A method for treating hypertension in a mammal which comprises administering to said mammal a therapeutically effective amount of a compound of claim **1**.

4,992,436

SPIRO-AZABICYCLIC MUSCARINIC AGONISTS

Raymond Baker, Much Hadham; Leslie J. Street, Harlow, and John Saunders, Bishops Stortford, all of England, assignors to Merck Sharp & Dohme, Ltd., Hertfordshire, England

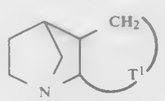
Filed Jun. 29, 1989, Ser. No. 373,001

Claims priority, application United Kingdom, Jul. 8, 1988, 8816299

Int. Cl.[5] **A61K** *31/395;* **C07D** *497/20*

U.S. Cl. 514—215 **6 Claims**

1. A compound of Formula II:



(II)

wherein —T^1— represents a group of formula



in which A and B independently represent oxygen or sulphur;

R^1 and R^2 independently represent hydrogen, straight-chained or branched C_{2-4} alkyl or C_{3-6} cycloalkyl and pharmaceutically acceptable salts thereof.

6. A method for the treatment of neurological and mental disorders, which method comprises administering to a patient in need of such treatment an effective amount of a compound according to claim **1**.

4,992,437

THIENODIAZEPINE COMPOUNDS AND THEIR PHARMACEUTICAL USE

Yoichi Naka; Yukio Hitotsuyanagi; Keiichiro Haga, all of Nakatsu, and Masahiro Hosoya, Tokorozawa, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/01278, § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO89/05812, PCT Pub. Date Jun. 29, 1989

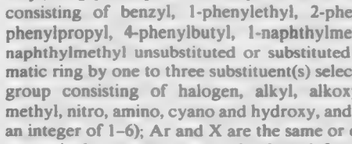
PCT Filed Dec. 16, 1988, Ser. No. 399,550

Claims priority, application Japan, Dec. 22, 1987, 62-326465; Apr. 7, 1988, 63-86960

Int. Cl.[5] **A61K** *31/55;* **C07D** *487/04, 495/00*

U.S. Cl. 514—220 **3 Claims**

1. A thienodiazepine compound of the general formula



wherein R^1 and R^2 are the same or different and respectively represent a hydrogen, a halogen, a C_{1-20} alkyl or an aralkyl selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl, 3-phenylpropyl, 4-phenylbutyl, 1-naphthylmethyl and 2-naphthylmethyl unsubstituted or substituted on the aromatic ring by one to three substituent(s) selected from the group consisting of halogen, alkyl, alkoxy, trifluoromethyl, nitro, amino, cyano and hydroxy, or wherein R^1 and R^2 together form a ring selected from the group consisting of a cyclopentene ring, a cyclopentadiene ring, a cyclohexene ring, a cyclohexadiene ring, a benzene ring, a cycloheptene ring, a cycloheptadiene ring and a cycloheptatriene ring; R^3 represents an oxygen, R^4 represent a hydrogen, a C_{1-20} alkyl, a C_{2-8} alkenyl or a group of the formula $—(CH_2)_mCOOR^6$ (wherein R^6 represents a hydrogen atom, a C_{1-20} alkyl, a C_{2-8} alkenyl or an aralkyl selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl, 3-phenylpropyl, 4-phenylbutyl, 1-naphthylmethyl and 2-naphthylmethyl unsubstituted or substituted on the aromatic ring by one to three substituent(s) selected from the group consisting of halogen, alkyl, alkoxy, trifluoromethyl, nitro, amino, cyano and hydroxy, and m represents an integer of 1–6), or R^3 and R^4 together form a group of the formula $=N—N=C(R^5)—$,

wherein R^5 represents a hydrogen, a C_{1-20} alkyl, a C_{2-8} alkenyl, an aralkyl selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl, 3-phenylpropyl, 4-phenylbutyl, 1-naphthylmethyl and 2-naphthylmethyl unsubstituted or substituted on the aromatic ring by one to three substituent(s) selected from the group consisting of halogen, alkyl, alkoxy, trifluoromethyl, nitro, amino, cyano and hydroxy, or a group of the formula $—(CH_2)_nCOOR^7$ (wherein R^7 represents a hydrogen, a C_{1-20} alkyl, a C_{2-8} alkenyl or an aralkyl selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl, 3-phenylpropyl, 4-phenylbutyl, 1-naphthylmethyl and 2-naphthylmethyl unsubstituted or substituted on the aromatic ring by one to three substituent(s) selected from the group consisting of halogen, alkyl, alkoxy, trifluoromethyl, nitro, amino, cyano and hydroxy, and n represents an integer of 1–6); Ar and X are the same or different and respectively represent an aryl selected from the group consisting of a phenyl, a phenyl substituted by 1 or 2 substituents selected from the group consisting of halogen, alkyl, alkoxy and nitro, and a 2-naphthyl or a heteroaryl selected from the group consisting of a pyridyl, an indolyl, a thienyl, a benzofuranyl, a 1H-benzimidazol-2-yl and a 2-benzothiazolyl; and p represents an integer of 1–6, or its salt.

4,992,438

PYRIMIDINE DERIVATIVES, PROCESS FOR PREPARING THE SAME AND AGRICULTURAL OR HORTICULTURAL FUNGICIDAL COMPOSITION CONTAINING THE SAME

Shigekazu Ito; Katsumi Masuda, both of Shizuoka; Shoji Kasano, Hamamatsu; Toshihiro Nagata, Shizuoka; Yoshiyuki Kojima, Kakegawa; Nobumitsu Sawai, and Shinichiro Maeno, both of Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 127,426, Dec. 2, 1987, abandoned. This application Apr. 20, 1990, Ser. No. 512,901

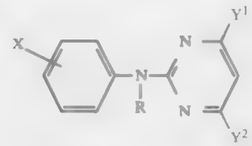
Claims priority, application Japan, Dec. 3, 1986, 61-288247

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] **A61K** *31/505;* **C07D** *239/42, 239/46;* **A01N** *43/54*

U.S. Cl. 514—275 **10 Claims**

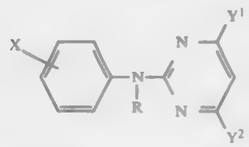
1. A pyrimidine compound of formula (I):



(I)

wherein **X** represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a halo lower alkyl group or a cyano group; Y^1 represents a lower alkyl group, a cyano lower alkyl group, a lower alkoxy group, a lower alkenyl group substituted by a hydroxy group and a halogen atom, a lower alkynyl group which may be substituted by a hydroxy group, a methylamino group, a lower alkoxyalkyloxy group, a lower alkylthioalkyl group or a group of the formula $—CH_2OR^1$ where R^1 represents a hydrogen atom, a lower alkyl group, a lower alkenyl group or a lower alkynyl group; Y^2 represents a halogen atom, a lower alkyl group or a halo lower alkyl group; **R** represents a hydrogen atom, a lower alkyl group, a nitroso group, an alkoxy lower alkyl group, a lower alkoxyalkyloxyalkyl group, a lower alkenyl group, a lower alkynyl group, or a lower alkylthioalkyl group, with the proviso that (a) when Y^1 represents a lower alkynyl group or when Y^1 represents a lower alkoxy group and Y^2 represents a halogen atom or a lower alkyl group, X and R are not a hydrogen atom simultaneously, (b) when Y^1 and Y^2 each represents a lower alkyl group, R is not a hydrogen atom, or (c) when Y^1 represents a lower alkyl group and Y^2 represents a halogen atom, X and R are not a hydrogen atom simultaneously or X is not a halogen atom nor a lower alkyl group.

6. An agricultural or horticultural fungicidal composition comprising as an active ingredient a pyrimidine compound of formula (I):



(I)

wherein **X** represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a halo lower alkyl group or a cyano group; Y^1 represents a lower alkyl group, or a cyano lower alkyl group, a lower alkoxy group, a lower alkenyl group substituted with a hydroxy group and a halogen atom, a lower alkynyl group which may be substituted with a hydroxy group, a methylamino group, a lower alkoxyalkyloxy group, a lower alkylthioalkyl group or a group of the formula $—CH_2OR^1$ where R^1 represents a hydrogen atom, a lower alkyl group, a lower alkenyl group or a lower alkynyl group; Y^2 represents a halogen atom, a lower alkyl group or a halo lower alkyl group; **R** represents a hydrogen atom, a lower alkyl group, a nitroso group, a lower alkoxyalkyl group, a lower alkoxyalkyloxyalkyl group, a lower alkenyl group, a lower alkynyl group, or a lower alkylthioalkyl group, with the proviso that (a) when Y^1 represents an lower alkynyl group or when Y^1 represents a lower alkoxy group and Y^2 represents a halogen atom or a lower alkyl group, X and R are not a hydrogen atom simultaneously, (b) when Y^1 and Y^2 each represents a lower alkyl group, R is not a hydrogen atom, or (c) when Y^1 represents a lower alkyl group and Y^2 represents a halogen atom, X and R are not a hydrogen atom simultaneously or X is not a halogen atom nor a lower alkyl group.

4,992,439

PYRIDAZINE CARBOXYLIC ACIDS AND ESTERS

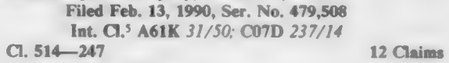
Nicholas A. Meanwell, East Hampton, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Feb. 13, 1990, Ser. No. 479,508

Int. Cl.[5] **A61K** *31/50;* **C07D** *237/14*

U.S. Cl. 514—247 **12 Claims**

1. A compound of Formula I



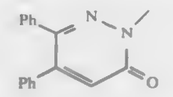
(I)

wherein

n is 6 to 9;

R is hydrogen or lower alkyl or an alkali metal ion; and

HET_1 is the heterocyclic radical



1,6-dihydro-6-oxo-3,4-diphenyl-1-pyridazinyl.

4,992,440

SUBSTITUTED 2,3-DIPHENYL-1,2-DIHYDROQUINOXALINES

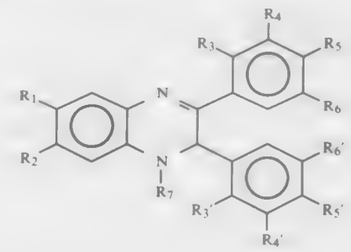
Kurt G. R. Sundelin, Wilmington, Del.; Joseph P. Salanitro, Houston, Tex., and Susan Stackhouse, Hughson, Calif., assignors to International Minerals & Chemical Corp., Northbrook, Ill.

Division of Ser. No. 260,765, Oct. 21, 1988, Pat. No. 4,886,781. This application Aug. 30, 1989, Ser. No. 402,719

Int. Cl.[5] **A61K** *31/495;* **C07D** *241/40*

U.S. Cl. 514—248 **8 Claims**

1. A method for producing a compound of the formula

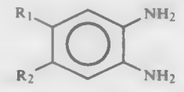


(I)

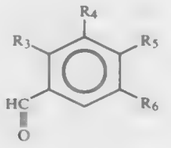
VOL 1123 ISS 2 FE 12 1991 UMI

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy; R_3 and R_3' are independently selected from the group consisting of halogen, hydroxy, lower alkoxy, lower acyloxy and lower alkylcarbonyloxy, R_4, R_4', R_5, R_5', R_6 and R_6' are independently selected from the group consisting of hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy and lower acyloxy; and R_7 is hydrogen or lower acyl; the method comprising:

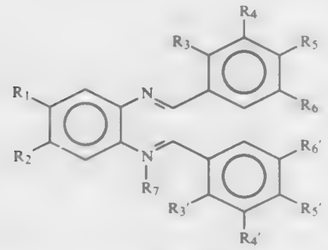
(a) reacting a phenylenediamine derivative of the formula



wherein R_1 and R_2 are as defined above, with a benzaldehyde derivative of the formula



wherein R_3, R_4, R_5 and R_6 are as defined above, to form a dibenzylidene compound of the formula



(b) treating the dibenzylidene compound produced in step (a) with sodium cyanide to produce a compound of the formula (I).

4,992,441

1-[[5-[[4-SUBSTITUTED-1-PIPERAZINYL]METHYL]-PYRROL-2-YL OR FURAN-2-YL]METHYL-2-PIPERIDINONES USEFUL IN TREATING SCHIZOPHRENIA

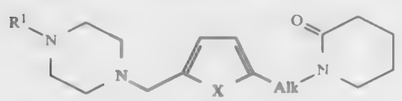
Malcolm K. Scott, Landsdale, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Continuation-in-part of Ser. No. 108,177, Oct. 14, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,723

Int. Cl.[5] **A61K** *31/495, 31/445;* **C07D** *401/14*

U.S. Cl. 514—252 **18 Claims**

1. A Mannich base of the following formula (I):



(I)

X is 0 or NR^2;

Alk is a a straight or branched chain divalent alkyl of 1–8 carbons;

R_1 is an unsubstituted or substituted phenyl ring or an unsubstituted or substituted aromatic heterocyclic ring system selected from the group consisting of:

1,3-benzodioxolyl,
pyridinyl,
pyrimidinyl
quinolyl,
isoquinolyl,
1,2-benzisoxazolyl,
indolyl,
thiophenyl,
thiophenyl,
furanyl,
pyrrolyl, po1 pyrazolyl,
imidazolyl, or
triazolyl

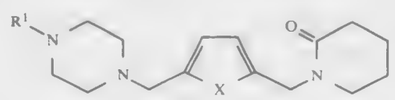
and said substitution on said phenyl ring or aromatic heterocyclic ring of R^1 is independently one or more of:

alkoxy of 1 to 6 carbons;
alkylthio of 1 to 6 carbons;
Halo,
alkyl of 1 to 6 carbons;
hydroxy;
hydroxyalyl of about 1 to 6 carbons;
alkanoyl of abut 2 to 6 carbons;
alkanoyloxy of about 2 to 6 carbons;
cyano;
phenoxy or (substituted phenyl)oxy wherein the substitution if aklyl of 1 to 6 carbons, halo, alkoxy of about 1 to 6 carbons or CF_3;
nitro;
amino;
alkylamino of 1 to 6 carbons;
dialkylamino of 1 to 6 carbons in each alkyl;
alkanoylamino of 2 to 8 carbons;
sulfonamido of the formula $R^3SO_2NR^4$
where R^3 is phenyl or phenyl independently substituted by one or more of alkyl of 1 to 6 carbons, halo, alkoxy of 2 to 6 carbons or CF_3 and R^4 is hydrogen or alkyl of 1 to 6 carbons;
cycloalkyl of 3 to 6 carbons, or
cycloakyloxy of 3 to 6 carbons. and

R_2 is hydrogen, alkyl of 1–6 carbons, phenylalkyl of 1–6 carbons, phenyl, phenylalkyl of 1–6 carbons substituted on the phenyl ring or substituted phenyl,

wherein the phenyl is substituted with one or more substituents selected from alkyl of 1 to 6 carbons, alkoxy of 1 to 6 carbons in halo; or a pharmaceutically-acceptable salt thereof.

14. A Mannich base of the following formula (Ia):



(Ia)

X is O or NR^2;

R_1 is an unsubstituted or substituted aromatic ring; is an unsubstituted or substituted phenyl ring or an unsubstituted or substituted aromatic heterocyclic ring system selected from the group consisting of:

1,3-benzodioxolyl,
pyridinyl,
pyrimidinyl
quinolyl,
isoquinolyl,
1,2-benzisoxazolyl,
indolyl,
thiophenyl,
thiophenyl, po1 furanyl,
pyrrolyl,
pyrazolyl,
imidazolyl, or
triazolyl

and said substitution on said phenyl ring or aromatic heterocyclic ring of R^1 is independently one or more of:

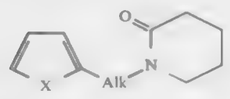
alkoxy of 1 to 6 carbons;
alkylthio of 1 to 6 carbons;
Halo,
alkyl of 1 to 6 carbons;
haloalkyl of 1 to 6 carbons;
hydroxy;
hydroxyalkyl of about 1 to 6 carbons;
alkanoyl of abut 2 to 6 carbons;
alkanoyloxy of about 2 to 6 carbons,
cyano;
phenoxy or (substituted phenyl)oxy wherein the substitution if aklyl of 1 to 6 carbons, halo, alkoxy of about 1 to 6 carbons or CF_3;
nitro;
amino;
alkylamino of 1 to 6 carbons;
dialkylamino of 1 to 6 carbons in each alkyl;
alkanoylamino of 2 to 8 carbons;
sulfonamido of the formula $R^3SO_2NR^4$
where R^3 is phenyl or phenyl independently substituted by one or more of alkyl of 1 to 6 carbons, halo, alkoxy of 2 to 6 carbons or CF_3 and R^4 is hydrogen or alkyl of 1 to 6 carbons;
cycloalkyl of 3 to 6 carbons, or
cycloakyloxy of 3 to 6 carbons. and

R_2 is hydrogen, alkyl of 1 –6 carbons, phenylalkyl of 1–6 carbons, phenyl, phenylalkyl of 1–6 carbons substituted on the phenyl ring or substituted phenyl,

wherein the phenyl is substituted with one or more substituents selected form alkyl of 1 to 6 carbons, alkoxy of 1 to 6 carbons in halo; or a pharmaceutically-acceptable salt.

16. A method for the treatment of schizophrenia which comprises administering to a mammal in need thereof, the pharmaceutical composition of claim 15.

17. A compound of the following formula (II):



(II)

wherein

X is O or NR^2;

Alk is straight or branched chain divalent alkyl of 1–8 carbon atoms;

R^2 is hydrogen, alkyl of 1–6 carbons, phenylalkyl of 1–6 carbons, phenyl, phenylalkyl of 1–6 carbons substituted on the phenyl ring or substituted phenyl,

wherein the phenyl is substituted with one or more substituents selected from alkyl of 1 to 6 carbons, alkoxy of 1 to 6 carbons in halo; or a pharmaceutically-acceptable salt thereof.

4,992,442

PYRROLO(3,2-E)PYRAZOLO(1,5-A)PYRIMIDINE DERIVATIVE AND MEDICINE COMPRISING THE SAME

Michihiko Tsujitani; Kenichi Kishii; Masato Inazu; Toshihiro Morimoto; Yoshiaki Motoki, all of Yokohama, and Ichiro Matsuo, Machida, all of Japan, assignors to Pola Chemical Industries Inc., Japan, Shizuoka, Japan

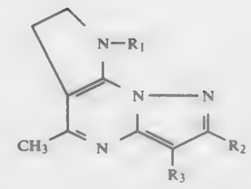
Filed Oct. 3, 1989, Ser. No. 416,524

Claims priority, application Japan, Oct. 13, 1988, 63-258084; Jan. 20, 1989, 1-11555; Jan. 20, 1989, 1-11556

Int. Cl.[5] **A61K** *31/505;* **C07D** *401/14*

U.S. Cl. 514—267 **14 Claims**

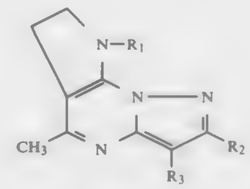
1. A pyrrolo(3,2-e)pyrazolo(1,5-a)pyrimidine having formula (I):



(I)

wherein R_1 and R_2, individually, are hydrogen, linear or branched C_{1-14} alkyl, C_{4-8} cycloalkyl, phenyl, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone; a C_{1-14} alkyl, C_{4-8} cycloalkyl, phenyl, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone substituted with a hydroxyl, alkoxy, nitro, primary amino, secondary amino, tertiary amino, carboxyl, C_{4-8} cycloalkyl, phenyl, halogen, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone group, and R_3 is a hydrogen or cyano; or a salt thereof.

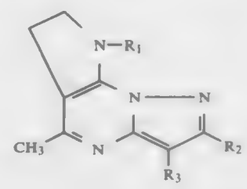
13. A method for treating circulatory disease, comprising administering to a patient in need thereof, an effective amount of a pyrrolo[3,2-e]pyrazolo[1,5-a]pyrimidine having formula (I),



(I)

wherein R_1 and R_2, individually, are hydrogen, linear or branched C_{1-14} alkyl, C_{4-8} cycloalkyl, phenyl, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone; a C_{1-14} alkyl, C_{4-8} cycloalkyl, phenyl, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone substituted with a hydroxyl, alkoxy, nitro, primary amino, secondary amino, tertiary amino, carboxyl, C_{4-8} cycloalkyl, phenyl, halogen, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone group, and R_3 is a hydrogen or cyano; or a salt thereof.

14. A method for treating bronchiectasis, comprising administering to a patient in need thereof, an effective amount of a pyrrolo[3,2-e]pyrazolo[1,5-a]pyrimidine having formula (I),



(I)

wherein R_1 and R_2, individually, are hydrogen, linear or branched C_{1-14} alkyl, C_{4-8} cycloalkyl, phenyl, pyrrole, pyrrolidine, pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone substituted with a hydroxyl, alkoxy, nitro, primary amino, secondary amino, tertiary amino, carboxyl, C_{4-8} cycloalkyl, phenyl, halogen, pyrrole, pyrrolidine,

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pyridine, piperidine, imidazole, imidazoline, morpholine or pyrrolidone group, and R_3 is a hydrogen or cyano; or a salt thereof.

4,992,443

METHOD OF TREATING MOTION SICKNESS

William Chelen, 4396 Laclamen Dr., Centerville, Ohio 45459

Filed Mar. 12, 1990, Ser. No. 491,731

Int. Cl.[5] A61K *31/415, 31/505, 31/515*

U.S. Cl. 514—269 **4 Claims**

1. A method of treating motion sickness comprising administering to a patient susceptible to or suffering from motion sickness, an anti-motion sickness effective amount of a compound selected from the group consisting of diphenylhydantoin, ethotoin and primidone, and their non-toxic, pharamaceutically acceptable acid addition salt.

4,992,444

ANTIFOLATE AGENTS

Malcolm F. G. Stevens, 35 Chantry Road, Moseley, Birmingham B13 9DL; Roger J. Griffin, 36 Denewood Avenue, Handsworth Wood, Birmingham B20 2AB, and Michelle A. Meek, 27 Hillaries Road, Erdington. Birmingham, B23 7OS, all of England

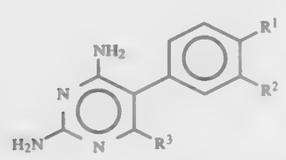
Filed Dec. 2, 1987, Ser. No. 127,452

Claims priority, application United Kingdom, Dec. 2, 1986, 8628731; Sep. 10, 1987, 8721283; Sep. 10, 1987, 8721284

Int. Cl.[5] A61K *31/505;* **C07D** *239/48*

U.S. Cl. 514—275 **15 Claims**

13. A composition for inhibiting dehydrofolate reductase comprising an effective amount of a compound of the formula:



I

wherein R^1

R^1 is an alkoxy group of 1–6 carbon atoms; an aralkoxy group which is benzyloxy; or a substituted amino group $—NR_1R_2$ wherein R_1 and R_2 are independently:

hydrogen, an alkyl group of 1–6 carbon atoms, or a phenylalkyl group of which the alkyl moiety has 1–6 carbon atoms;

with the proviso that both R_1 and R_2 are not hydrogen, R^2 is a nitro group and R^3 is an alkyl of 1 to 6 carbons, or pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutically acceptable carrier.

4,992,445

TRANSDERMAL DELIVERY OF PHARMACEUTICALS

James R. Lawter, Orange, N.Y., and John M. Pawelchak, Park Ridge, N.J., assignors to American Cyanamid Co., Stamford, Conn.

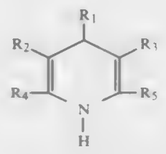
Continuation-in-part of Ser. No. 61,842, Jun. 12, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 283,204

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—279 **10 Claims**

1. A pharmaceutical composition for transdermal administration which comprises:

(a) an amount, to achieve a systemic effect, of a substantially pure enantiomer or an enantiomer mixture containing disproportionate amounts of different enantiomers of a pharmacologically active chiral compound of the formula:

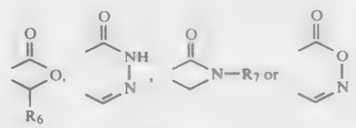


R_1 is aryl which may have one or more suitable substituents(s) or a heterocyclic group,

R_2 and R_3 are the, same or different, and are esterified carboxy, and

R_4 and R_5 are each hydrogen; cyano; lower alkyl; or substituted lower alkyl in which the substituent is cyano, hydroxy, acyloxy, hydroxyimino, hydrazino, lower alkoxyimino, hydroxy(lower)alkylimino, N′- or N′,N′-di(lower)alkylamino(lower)alkylimino, hydrazino, hydroxy(lower)alkylamino, N′- or N′,N′-di(-lower)alkylamino(lower)alkylamino a 5 or 6- membered saturated N-containing heterocyclic-lyl which may have hydroxy, lower alkyl or hydroxy(lower)alkyl, or oxo wherein the thus formed carbonyl may be protected with suitable protecting group; provided that, when one of R_4 and R_5 is hydrogen or lower alkyl, the other is always cyano or said substituted lower alkyl, both of them are a group selected from cyano and said substituted lower alkyl,

or R_4 is hydrogen or lower alkyl and R_3 and R_5 are combined to form a group of the formula:



wherein R_6 is hydrogen or methyl and R_7 is 2-(N,N-diethylamino)-ethyl or 2-hydroxyethyl; and

(b) a vehicle for said pharmacologically active chiral compound.

4,992,446

TRICYCLIC QUINOLIZINE AMIDES

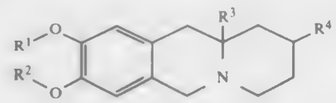
Kerry W. Fowler, Seattle, Wash., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 5, 1989, Ser. No. 402,955

Int. Cl.[5] A61K *31/435;* **C07D** *455/02*

U.S. Cl. 514—294 **31 Claims**

1. A compound of the formula



the pharmaceutically acceptable salts thereof, and the hydrated forms thereof, wherein R^1 and R^2 are independently alkyl of from 1 to 10 carbon atoms; R^3 is hydrogen in either a cis or a trans orientation; and R^4 is NHCOR′ in either a cis or a trans orientation, wherein R′ is alkyl of from 1 to 10 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, phenyl, phenyl substituted by alkyl of one to ten carbon atoms or alkoxy of from one to ten carbon atoms, halogen, or amino, fused phenylcycloalkyl, fused phenylcycloalkyl wherein phenyl is substituted by alkyl of from one to ten carbon atoms, benzofuranyl or benzofuranyl substituted by alkyl of from one to ten carbon atoms.

23. A method of regulating cardiac arrythmias in a mammal, comprising administering to said mammal a pharmacologically effective amount of a compound as claimed in claim 1.

4,992,447

CERTAIN OXO-PYRROLO 1,4-DIHYDROPYRIDINES AS ANTIALLERGY AND ANTIINFLAMMATORY AGENTS

Kelvin Cooper, Deal; Peter E. Cross; Michael J. Fray, both of Canterbury, and Kenneth Richardson, Birchington, all of England, assignors to Pfizer Inc., New York, N.Y.

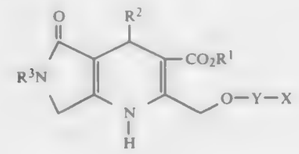
Division of Ser. No. 217,584, Jul. 11, 1988, Pat. No. 4,853,392. This application May 8, 1989, Ser. No. 348,932

Claims priority, application United Kingdom, Jul. 17, 1987, 8716971

Int. Cl.[5] A61K *31/44;* **C07D** *471/04*

U.S. Cl. 514—300 **6 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein R^1 is alkyl having one to three carbon atoms; R^2 is 2-chlorophenyl; Y is alkylene having two to five carbon atoms with at least two carbon atoms in the chain linking X to the oxygen atom; X is 2-alkylimidazol-1-yl said alkyl having from one to four carbon atoms, 2,4,5-trimethylimidazol-1-yl or 2-methylbenzimidazol-1-yl; and R^3 is benzyl or cyclohexyl.

4,992,448

BENZOCYCLOALKYLAMINOPYRIDINAMINES AND RELATED COMPOUNDS AS TOPICAL ANTIINFLAMMATORY AGENTS FOR THE TREATMENT OF SKIN DISORDERS

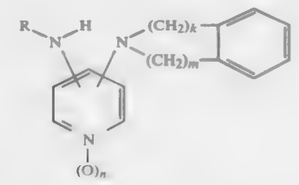
Richard C. Effland; Joseph T. Klein, both of Bridgewater; Gordon E. Olsen, Somerset, and Larry Davis, Sergeantsville, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Oct. 24, 1989, Ser. No. 425,712

Int. Cl.[5] A61K *31/47;* **C07D** *401/04*

U.S. Cl. 514—207 **14 Claims**

1. A compound having the formula,



where

R is hydrogen, loweralkyl, arylloweralkyl or loweralkylcarbonyl;

k is or 1;

m is 1, 2 or 3;

K+m is 2 or 3; and

n is 0 or 1;

or a pharmaceutically acceptable acid salt thereof.

14. A method of treating a patient in need of relief from a skin disorder which comprises administering to such a patient an effective amount of a compound as defined in claim 1.

4,992,449

7-(SUBSTITUTED)CYCLOALKYLAMINO-1-(SUBSTITUTED)-6-FLUORO-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS

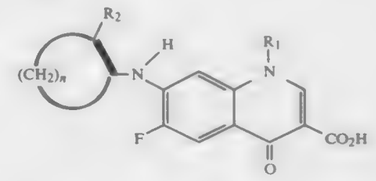
Panayota Bitha, Nanuet, and Yang-I Lin, Tappan, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 1, 1990, Ser. No. 473,498

Int. Cl.[5] A61K *31/47;* **C07D** *215/333*

U.S. Cl. 514—312 **13 Claims**

1. A compound of the formula:



wherein R_1 is alkyl (C_1–C_4), cycloalkyl (C_3–C_6), alkoxy (C_1–C_4), alkylamino (C_1–C_3), vinyl, phenyl, benzyl, $—CH_2CH_2F$ or mono or polysubstituted phenyl (wherein the substituent is halogen, CF_3, or OCH_2F); n is an integer of from 1 to 4 and; R_2 is cis or trans hydroxy, amino, mono or disubstituted alkyl (C_1–C_2) amino and the pharmacologically accepted salts thereof.

4,992,450

PIPERIDINE OPIOID ANTAGONISTS

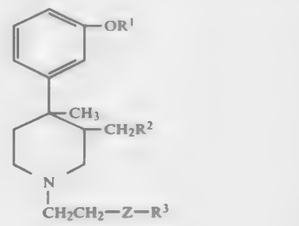
Dennis M. Zimmerman, Mooresville, and Charles H. Mitch, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 284,504, Dec. 14, 1988, Pat. No. 4,891,379, which is a continuation of Ser. No. 39,121, Apr. 16, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 448,800

Int. Cl.[5] A61K *31/445*

U.S. Cl. 514—315 **26 Claims**

1. A method of treating a disorder selected from the group consisting of spinal damage, stroke and head trauma in humans comprising administering to a human in need of such treatment an effective dose of a trans-3,4 isomer of a compound of the formula



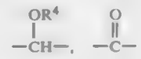
wherein:

R^1 is hydrogen or C_1–C_4 alkanoyl;

R^2 is hydrogen, C_1–C_4 alkyl or C_2–C_6 alkenyl;

R^3 is C_4–C_8 cycloalkyl, C_4–C_8 cycloalkenyl, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_1–C_4 alkyl substituted C_4–C_8 cycloalkyl, C_1–C_4 alkyl substituted C_4–C_8 cycloalkenyl or thiophene;

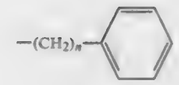
Z is



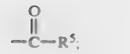
or a bond;

R^4 is hydrogen, C_1–C_6 alkyl,

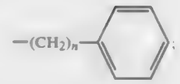
VOL 1123 ISS 2 FE 12 1991 UMI



or



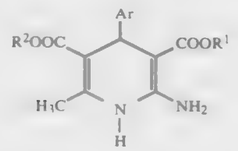
R^5 is C_1–C_4 alkyl or



n is 1, 2 or 3; or
a pharmaceutically acceptable salt thereof.

4,992,451
1,4-DIHYDROPYRIDINE DERIVATIVES
Hiroyuki Koike; Hiroshi Nishino, and Masafumi Yoshimoto, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan
Continuation of Ser. No. 146,713, Jan. 21, 1988, abandoned, which is a continuation of Ser. No. 873,946, Jun. 13, 1986, abandoned. This application Mar. 14, 1989, Ser. No. 324,981
Claims priority, application Japan, Jun. 14, 1985, 60-128346
Int. Cl.[5] **C07D** *401/12;* **A61K** *31/445*
U.S. Cl. 514—318 **11 Claims**

1. A compound of formula (I):

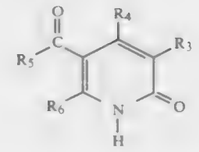


(I)

wherein
one of R^1 and R^2 is 1-benzyl-3-piperidyl and the other of R^1 and R^2 is C_1–C_8 alkyl substituted one time with nitrooxy, and
Ar is nitrophenyl,
or a pharmaceutically acceptable salt thereof.

4,992,452
CERTAIN 5-ACYL-2-(1H)-PYRIDINONES USEFUL IN TREATING CARDIAC FAILURE
Winton D. Jones; Richard C. Dage, and Richard A. Schnettler, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio
Continuation of Ser. No. 121,543, Nov. 17, 1987, Pat. No. 4,853,395, which is a division of Ser. No. 867,825, May 27, 1986, Pat. No. 4,731,371, which is a division of Ser. No. 594,767, Mar. 29, 1984, abandoned, and a continuation-in-part of Ser. No. 490,081, Apr. 29, 1983, Pat. No. 4,568,751. This application May 1, 1989, Ser. No. 345,751
Int. Cl.[5] **C07D** *213/57, 213/62, 401/12;* **A61K** *31/44*
U.S. Cl. 514—335 **12 Claims**

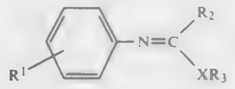
1. A compound of the formula:



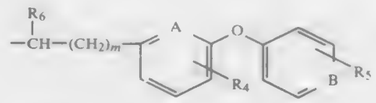
or a pharmaceutically acceptable salt thereof wherein
R_3 is H or —CN,
R_4 is hydrogen or lower alkyl,
R_5 is pyridyl, and
R_6 is hydrogen, methyl, or ethyl.

4,992,453
CERTAIN THIOIMIDATE AND AMIDINE INSECTICIDES
Michael D. Broadhurst, Novato, and Thomas H. Cromartie, Albany, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.
Division of Ser. No. 122,878, Nov. 17, 1987, Pat. No. 4,931,448. This application Jan. 22, 1990, Ser. No. 468,457
Int. Cl.[5] **C07D** *213/74;* **C07C** *251/16;* **A01N** *43/40, 33/06*
U.S. Cl. 514—338 **12 Claims**

1. A compound having the formula



in which:
R_1 is 4-halo; 4-methyl; 3,4-disubstituted in which the substituents are independently halo, methyl, trifluoromethyl, trifluoromethylthio, trifluoromethoxy; or a 3,4-alkylenedioxy group having from 1 to 4 carbon atoms, optionally substituted by up to 2 halogens;
R_2 is methyl; ethyl; n-propyl; C_3–C_7 branched alkyl; C_1–C_6 haloalkyl; or cyclopropyl, optionally substituted by up to 4 methyl groups or up to 2 halogens;
R_3 is



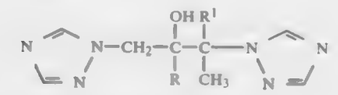
(a)

in which:
m is 0 or 1;
A is N or —CH; B is CH;
R_4 is hydrogen or halo;
R_5 is hydrogen, mono- or di-halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, cyano, C_1–C_4 alkylthio, or C_1—C_4 alkylsulfonyl; and
R_6 is hydrogen or methyl;
(b) pentafluorobenzyl; or
(c) 2-methyl,3-phenylbenzyl; provided that:
(i) if R_1 is 4-fluoro then R_2 is not cyclopropyl; and
(ii) R_2 is not 1,3-dihalopropyl and X is amino or mono-(C_1–C_4)-alkylamino.

12. An insecticidal composition comprising:
(a) an insecticidally effective amount of a compound according to claim 1; and
(b) an insecticidally suitable inert diluent or carrier.

4,992,454
ANTIFUNGAL 1,3-BIS (1H-1,2,4-TRIAZOL-1-YL)-2-ARYL BUTAN-2-OLS AND DERIVATIVES THEREOF
Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.
Filed Feb. 27, 1984, Ser. No. 584,216
Claims priority, application United Kingdom, Mar. 16, 1983, 8307232; Nov. 25, 1983, 8331475
Int. Cl.[5] **A01N** *43/40, 43/653;* **C07D** *401/14, 249/08*
U.S. Cl. 514—340 **2 Claims**

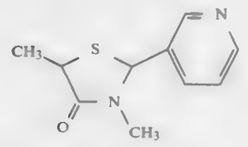
1. The compound of the formula



or an O-(C_{2-4} alkanoyl) or O-benzoyl ester thereof; or an O-(C_{1-4} alkyl), C_{2-4} alkenyl, phenyl-(C_{1-4} alkyl) or phenyl ether thereof; or a pharmaceutically or agriculturally acceptable salt thereof;
wherein R is 5-chloropyrid-2-yl and R^1 is H.

4,992,455
THIAZOLIDIN-4-ONE DERIVATIVES USEFUL FOR TREATING DISEASES CAUSED BY PLATELET ACTIVATING FACTOR
Masao Enomoto, Osaka; Atsuyuki Kojima, Takarazuka; Yoshihiro Komuro, Nishinomiya; Shigeaki Morooka, Kawanishi; Shunji Aono, Toyonaka; Yuzuru Sanemitsu, Ashiya; Masato Mizutani, and You Tanabe, both of Toyonaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan
Filed May 19, 1988, Ser. No. 196,058
Claims priority, application Japan, May 22, 1987, 62-126391; Jun. 2, 1987, 62-139304; Jun. 26, 1987, 62-160481; Jan. 22, 1988, 63-12379
Int. Cl.[5] **C07D** *413/04;* **A61K** *31/44*
U.S. Cl. 514—342 **6 Claims**

1. A thiazolidin-4-one derivative of the formula

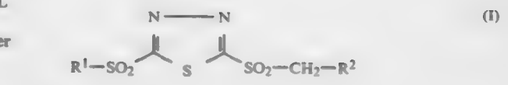


or an acid addition salt thereof.

4. A method for treatment of a disease caused by the platelet activating factor, which comprises administering to a patient a pharmaceutically effective amount of the compound of claim 1, or a pharmaceutically acceptable salt thereof.

4,992,456
FUNGICIDAL 2,5-DISUBSTITUTED 1,3,4-THIADIAZOLES
Hans-Joachim Diehr, Wuppertal; Albrecht Marhold, Leverkusen; Wilhelm Brandes, Leichlingen, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 1, 1989, Ser. No. 430,388
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 3838432
Int. Cl.[5] **C07D** *285/12;* **A01N** *43/82*
U.S. Cl. 514—363 **11 Claims**

1. A 2,5-disubstituted 1,3,4-thiadiazole of the formula

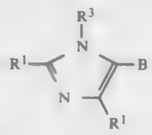


(I)

in which
R^1 represents straight-chain or branched alkyl having 1 to 6 carbon atoms or aralkyl which has 1 to 5 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part and is unsubstituted or substituted on the aryl part by one or more identical or different substitutes selected from the group consisting of halogen, nitro, cyano, alkyl and alkoxy having in each case 1 to 6 carbon atoms and halogenoalkyl, halogenoalkoxy, alkylsulphonyl, halogenoalkylsulphonyl and alkoxycarbonyl having in each case 1 to 4 carbon atoms in the individual alkyl or alkoxy parts and in the case of the halogenoalkyl, halogenoalkoxy and halogenoalkylsulphonyl having 1 to 5 identical or different halogen atoms, and
R^2 represents aryl or aralkyl having 6 to 10 carbon atoms in the aryl part and in the case of the aralkyl having 1 to 4 carbon atoms in the alkyl part and in each case unsubstituted or substituted on the aryl part by one or more identical or different substituents selected from the group consisting of halogen, nitro, cyano, alkyl and alkoxy having in each case 1 to 6 carbon atoms and halogenoalkyl, halogenoalkoxy, alkylsulphonyl, halogenoalkylsulphonyl and alkoxycarbonyl having in each case 1 to 4 carbon atoms in the individual alkyl or alkoxy parts and in the case of the halogenoalkyl, halogenoalkoxy and halogenoalkylsulphonyl having 1 to 5 identical or different halogen atoms; or represents a radical selected from the group consisting of pyridyl, pyrimidyl, pyridazyl, thienyl, furyl, pyrazolyl, thiadiazolyl, quinolyl, isoquinolyl, benzoxazolyl, benzothiazolyl, benzimidazolyl and 1,2,4-oxadiazolyl, which radical is unsubstituted or substituted by one or more identical or different substituents selected from the group consisting of halogen and alkyl having 1 to 6 carbon atoms, excluding the compound 2,5-bis-{(phenylmethyl)-sulphonyl}-1,3,4-thiadiazole.

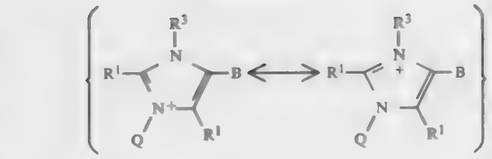
4,992,457
PHARMACOLOGICALLY ACTIVE CHOLINERGIC COMPOSITIONS, AND METHODS FOR MAKING SAME AND USE THEREOF IN TREATING DISEASE
Jerome M. Schulman, c/o City University of N.Y. at Queens College, Dept. of Chemistry, Kissena Blvd. Horace Harding Blvd., New York, N.Y. 11367, and Raj K. Goyal, c/o Beth Israel Hospital, 330 Brookline Ave., Boston, Mass. 02215
Division of Ser. No. 27,575, Mar. 18, 1987, Pat. No. 4,871,758. This application Sep. 15, 1989, Ser. No. 407,846
Int. Cl.[5] **C07D** *233/60;* **A61K** *31/415*
U.S. Cl. 514—376 **4 Claims**

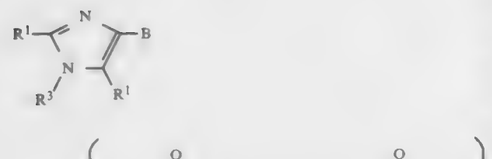
1. A compound useful as cholinergic drugs having the formula A—B or a pharmaceutically acceptable salt thereof having the formula $[(A—B)\ Q]_{+q}\ M_{-q}$ wherein M is a pharmaceutically acceptable anion, Q is a proton or lower alkylating group, q is an integer from 1 to 3, A is

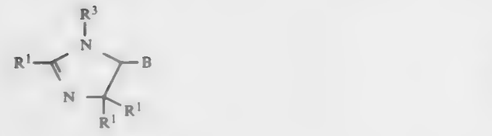


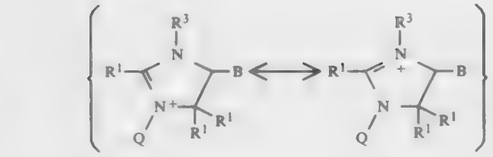
VOL 1123 ISS 2 FE 12 1991 UMI

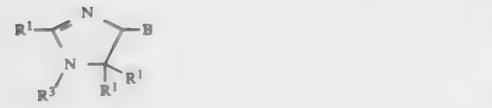
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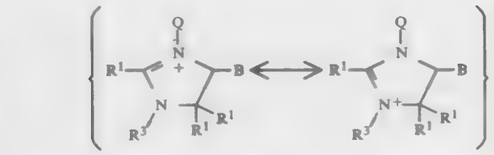


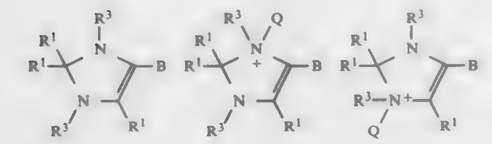




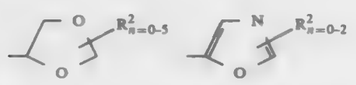








and B is



wherein R^1 and R^2 are each independently hydrogen, halo, branched or straight-chain C_1–C_6 alkyl, branched or straight-chain C_1–C_6 haloalkyl, branched or straight-chain C_1–C_6 alkoxy, hydroxyl, keto or monocyclic aryl; and R^3 is H, lower alkyl or monocyclic aryl.

4,992,458

1-PHENOXYPHENYL-1-TRIAZOLYLMETHYL-CARBINOL COMPOUND AS MICROBICIDES

Peter Riebli, Buckten, and Adolf Hubele, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

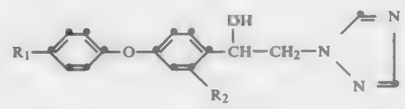
Continuation of Ser. No. 143,985, Jan. 14, 1988, abandoned. This application Jul. 6, 1989, Ser. No. 376,185

Claims priority, application Switzerland, Jan. 21, 1987, 214/87

Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **8 Claims**

1. A 1-phenoxyphenyl-1-triazolylmethyl-carbinol of formula I



(I)

in which

R_1 is fluorine, chlorine or bromine,

R_2 is fluorine, chlorine, bromine or methyl,

and the acid addition salts with phytophysiologically tolerable organic and inorganic acids.

4,992,459

DOPAMINE-β-HYDROXYLASE INHIBITORS

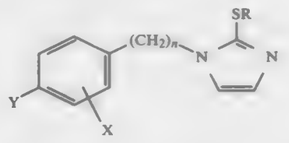
Joseph A. Finkelstein, Philadelphia, Pa.; James S. Frazee, Sewell, N.J.; Carl Kaiser, Haddon Heights, N.J.; Lawrence I. Kruse, Haddonfield, N.J., and Thomas B. Leonard, Haverford, Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation of Ser. No. 898,165, Aug. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 590,665, Mar. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 484,122, Apr. 12, 1983, abandoned. This application May 18, 1988, Ser. No. 167,610

Int. Cl.[5] **A61K** *31/415;* **C07D** *233/66, 233/30*

U.S. Cl. 514—398 **44 Claims**

1. A compound having the formula:



wherein:

X is 1–halogens or up to two substituents selected from —H, —OH, C_{1-4} alkyl, —CN, $—NO_2$, $—SO_2NH_2$, $—CO_2H$, $—COHN_2$, —CHO, $—CH_2OH$, $—CF_3$, C_{1-4} alkoxy, $—SO_2C_{1-4}$ alkyl $—SO_2C_{1-4}$ flurooalkyl, or $—CO_2C_{1-4}$ alkyl;

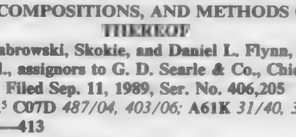
Y is —H, —OH, C_{1-4} alkoxy, halogen, C_{1-4} alkyl, —CN, $—NO_2$, $—SO_2NH_2$, $—CO_2H$, $—CONH_2$, —CHO, $—CH_2OH$, $—CF_3$, $—SO_2C_{1-4}$ aklyl, $—SO_2C_{1-4}$ fluoroalkyl, or $—CO_2C_{1-4}$ alkyl;

R is —H or C_{1-4} alkyl; and,

n is 1–4

or a hydrate or, when R is C_{1-4} aklyl, a pharmaceutically acceptable acid addition salt thereof, provided that when n is 1–3, at least one of Y and X is not —H.

25. A method of inhibiting DBH activity in mannals which comprises adminstering internally to a subject an effective amount of a compound having the formula:



wherein:

X is 1–halogens or upt to two substituents selected from —h, —OH, C_{1-4} alkyl, —CN, $—NO_2$ $—SO_2NH_2$, $—CO_2H$, $—COHN_2$, —CHO, $—CH_2OH$, $—CF_3$, C_{1-4} alkoxy, $—SO_2C_{1-4}$ alkyl, $—SO_2C_{1-4}$ fluroroalkyl, or $—CO_2C_{1-4}$ alkyl;

Y is —H, —OHm, C_{1-4} alkoxy, halogen, C_{1-4} alkyl, —C,N $—NO_2$, $—SO_2NH_2$, $—CO_2H$, $—CONH_2$, —CHO, $—CH_2OH$, $—CF_3$, $—SO_2C_{1-4}$ alkyl, $—SO_2C_{1-4}$ fluoroalkyl, or $—CO_2C_{1-4}$ alkyl;

R is —H or C_{1-4} alkyl; and

n is 0–4,

or a hydrate or, when R is C_{1-4} alkyl, a pharmaceutically acceptable acid addition salt thereof.

4,992,460

BICYCLIC TETRAHYDROXYLATED PYRROLIZIDINES

George W. J. Fleet, Oxford, United Kingdom, assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 8, 1989, Ser. No. 404,800

Int. Cl.[5] **A61K** *31/40;* **C07D** *487/04, 491/22, 493/04*

U.S. Cl. 514—413 **4 Claims**

1. 1α,2α,6α,7α,7aβ-1,2,6,7-tetrahydroxypyrrolizidine.

2. The method of inhibiting a glycosidase enzyme in a biological fluid containing said enzyme comprising subjecting said fluid to an effective amount of the compound of claim 1 suitable to inhibit said glycosidase.

3. 7-O-tert-Butyldiphenylsilyl-2,3:5,6-di-O-isopropylidene-D-glycero-D-gulo-heptono-1,4-lactone.

4. 1α,2α,6α,7α,7aβ-1,2:6,7-di-O-isopropylidene-1,2,6,7-tetrahydroxypyrrolizidine.

4,992,461

N-AZABICYCLO(3.3.0)OCTANE AMIDES OF AROMATIC ACIDS, COMPOSITIONS, AND METHODS OF USE THEREOF

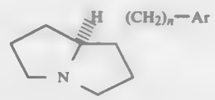
Daniel L. Zabrowski, Skokie, and Daniel L. Flynn, Mundelein, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 11, 1989, Ser. No. 406,205

Int. Cl.[5] **C07D** *487/04, 403/06;* **A61K** *31/40, 31/405*

U.S. Cl. 514—413 **50 Claims**

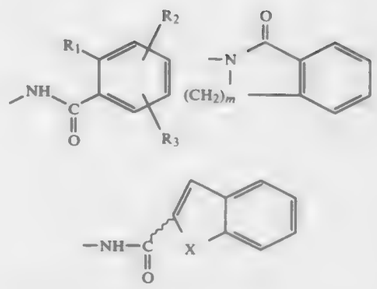
1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein

n is 0 or 1;

Ar can be



R^1 is alkoxy of 1 to 6 carbon atoms; and

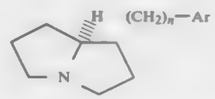
R^2 and R^3 are the same or different and are hydrogen, halogen, CF_3, hydroxy, C_{1-6} alkoxy, C_{2-7} acyl, amino, amino substituted by one or two C_{1-6} alkyl groups, C_{2-7} acylamino, aminocarbonyl or aminosulfone optionally substituted by one or two C_{1-6} alkyl groups, C_{1-6} alkyl sulfone or nitro groups;

wherein X can be NR, S, or O;

R is H, alkyl or aryl; and

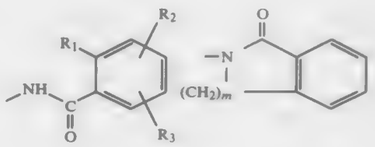
m is 1.

31. A method of treating gastrointestinal disorders comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof, wherein n is 0 or 1;

Ar can be



R^1 is alkoxy of 1 to 6 carbon atoms; and

R^2 and R^3 are the same or different and are hydrogen, halogen, CF_3, hydroxy, C_{1-6} alkoxy, C_{2-7} acyl, amino, amino substituted by one or two C_{1-6} alkyl groups, C_{2-7} acylamino, aminocarbonyl or aminosulfone optionally substituted by one or two C_{1-6} alkyl groups, C_{1-6} alkyl sulfone or nitro groups;

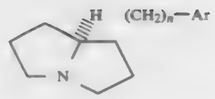
wherein X can be NR, S, or O;

R is H, alkyl or aryl; and

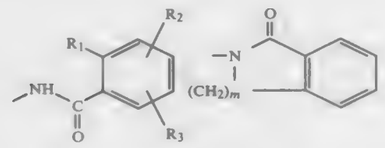
m is 1.

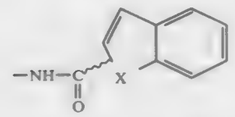
41. A method of treating a condition responsive to 5-HT3 antagonism comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula

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or a pharmaceutically acceptable salt thereof, wherein
n is 0 or 1
Ar can be





R^1 is alkoxy of 1 to 6 carbon atoms; and
R^2 and R^3 are the same or different and are hydrogen, halogen, CF_3, hydroxy, C_{1-6} alkoxy, C_{2-7} acyl, amino, amino substituted by one or two C_{1-6} alkyl groups, C_{2-7} acylamino, aminocarbonyl or aminosulfone optionally substituted by one or two C_{1-6} alkyl groups, C_{1-6} alkyl sulfone or nitro groups.
wherein X can be NR, S, or O;
R is H, alkyl or aryl; and
m is 1.

4,992,462

SUBSTITUTED PYRROLES

Walter Hübsch; Rolf Angerbauer; Peter Fey; Hilmar Bischoff, all of Wuppertal; Dieter Petzinna, Duesseldorf; Delf Schmidt, Wuppertal, all of Fed. Rep. of Germany, and Günter Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

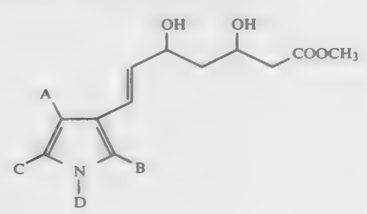
Filed Apr. 7, 1988, Ser. No. 178,956

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712720; Aug. 10, 1987, 3726528; Italy, Nov. 13, 1987, 22636 A/87

Int. Cl.[5] A61K *31/40;* **C07D** *405/06*

U.S. Cl. 514—428 **9 Claims**

1. A substituted pyrrole of the formula:



wherein
(1)
A represents a member selected from the group consisting of 4-fluorophenyl, phenyl, 4-chlorophenyl, 4-methylphenyl, 4-methoxyphenyl, 2-fluorophenyl, 2,4-difluorophenyl, 4-fluoro-2-methylphenyl, and 4-fluoro-3-phenoxyphenyl,
B represents isopropyl,
C represents phenyl, and
D represents methyl;
(2)
A represents 4-fluorophenyl,
B represents cyclopropyl,
C represents phenyl, and
D represents methyl;
(3)
A represents 4-fluorophenyl,
B represents isopropyl,
C represents a member selected from the group consisting of 4-chlorophenyl, 4-fluorophenyl, and 3-benzyloxyphenyl, and
D represents methyl;
(4)
A represents phenyl,
B represents isopropyl,
C represents a member selected from the group consisting of 3-(4-fluorobenzyloxy)phenyl and 3-(3-fluorobenzyloxy)-phenyl, and
D represents methyl;
(5)
A represents 4-fluorophenyl,
B represents isopropyl,
C represents phenyl, and
D represents a member selected from the group consisting of ethyl, isopropyl, hydrogen, phenyl, 4-chlorophenyl, 4-methylphenyl, 4-methoxyphenyl, 3,4-dichlorophenyl, 2-benzylphenyl, and benzyl;
(6)
A represents 4-fluoro-3-phenoxyphenyl,
B represents isopropyl,
C represents phenyl, and
D represents phenyl;
(7)
A represents 4-fluorophenyl,
B represents isopropyl,
C represents methyl, and
D represents a member selected from the group consisting of methyl, phenyl and 2-benzylphenyl;
(8)
A represents 4-fluoro-3-phenoxyphenyl,
B represents isopropyl,
C represents methyl, and
D represents a member selected from the group consisting of methyl and phenyl; and
(9)
A represents isopropyl,
B represents 4-fluorophenyl,
C represents methyl, and
D represents a member selected from the group consisting of phenyl, 2,6-dimethylphenyl and benzyl.

4,992,463

THIENYL PEPTIDE MIMETIC COMPOUNDS WHICH ARE USEFUL IN INHIBITING PLATELET AGGREGATION

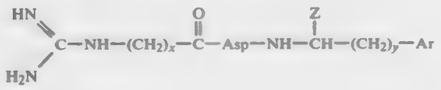
Foe S. Tjoeng, Manchester, and Steven P. Adams, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 221,703, Jul. 20, 1988, Pat. No. 4,879,313. This application Aug. 18, 1989, Ser. No. 395,615

Int. Cl.[5] A61K *31/38*

U.S. Cl. 514—438 **4 Claims**

1. A peptide mimetic compound having the following chemical structure:



wherein
x=6 to 10,

y=0 to 4,
Z=H, COOH, $CONH_2$ or C_{1-6} alkyl,
Ar=a thienyl group, and
Asp=aspartic acid residue.

4. A pharmaceutical composition which comprises a peptide mimetic compound of claim 1 in an amount effective for inhibiting platelet aggregation with a pharmaceutically acceptable carrier.

4,992,464

HETEROARYL N-HYDROXY AMIDES AND UREAS WITH POLAR SUBSTITUENTS AS 5-LIPOXYGENASE INHIBITORS

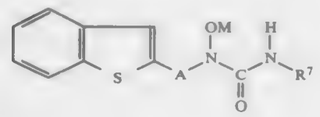
Dee W. Brooks; James B. Summers, both of Libertyville; Karen E. Rodriques, Grayslake, all of Ill.; Robert G. Maki, Kenosha, Wis.; Joseph F. Dellaria, Lindenhurst, Ill.; James H. Holms, and Jimmie L. Moore, both of Gurnee, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 138,073, Jan. 19, 1988, Pat. No. 4,873,259, which is a continuation-in-part of Ser. No. 60,784, Jun. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 12,970, Feb. 19, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,710

Int. Cl.[5] A61K *31/38;* **C07D** *333/56*

U.S. Cl. 514—443 **3 Claims**

1. A compound having the formula



wherein
A is alkylene of from one to twelve carbon atoms or alkenylene of from two to fourteen carbon atoms;
M is selected from the group consisting of
hydrogen,
a pharmaceutically acceptable cation, and
a metabolically cleavable group;
R^7 is selected from the group consisting of
hydroxyl substituted alkyl of from one to twelve carbon atoms,
carboxyl substituted alkyl of from one to twelve carbon atoms and the pharmaceutically acceptable acid addition salts thereof, and
ethoxycarbonyl substituted alkyl of from one to twelve carbon atoms.

4,992,465

3-AMINO-DIHYDRO-(1)-BENZOPYRANS

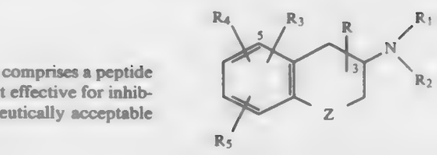
Alan J. Hutchison, Verona, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 250,007, Sep. 27, 1988, abandoned, which is a division of Ser. No. 20,054, Feb. 27, 1987, Pat. No. 4,801,605, which is a continuation-in-part of Ser. No. 902,281, Aug. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 679,182, Dec. 7, 1984, abandoned, and a continuation-in-part of Ser. No. 772,068, Sep. 3, 1985, abandoned. This application Feb. 16, 1990, Ser. No. 481,770

Int. Cl.[5] A61K *31/35, 31/395;* **C07D** *311/58*

U.S. Cl. 514—456 **22 Claims**

1. A compound of the formula



(I)

wherein Z represents O; R represents hydrogen or lower alkyl; R_1 represents lower alkyl or aryl-lower alkyl; R_2 represents lower alkyl or aryl-lower alkyl; or R_1 and R_2 together represent alkylene of 4 to 6 carbon atoms; R_3 represents hydroxy, lower alkoxy, aryl-lower alkoxy, hydroxy esterified in the form of a pharmaceutically acceptable ester, or phenoxy, and is attached only at the 5-position; R_4 and R_5 represent independently hydrogen, lower alkyl or halogen; aryl within the above definitions represents phenyl or phenyl substituted by lower alkyl, halogen or lower alkoxy; or a pharmaceutically acceptable salt thereof.

14. An antidepressant or anxiolytic pharmaceutical composition suitable for administration to a mammal comprising an effective amount of a serotonin receptor stimulating compound of claim 1 in combination with one or more pharmaceutically acceptable carriers.

4,992,466

POLYCYCLIC ETHER ANTIBIOTIC

Alexander C. Goudie, Ramsgate, and Nigel D. A. Walshe, Deal, both of United Kingdom, assignors to Pfizer Inc., New York, N.Y.

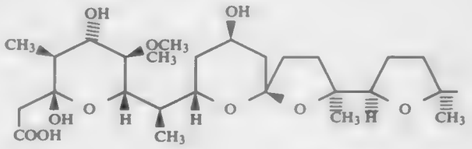
Division of Ser. No. 280,771, Dec. 6, 1988, Pat. No. 4,912,130, which is a division of Ser. No. 76,427, Jul. 21, 1987, Pat. No. 4,804,680. This application Feb. 20, 1990, Ser. No. 482,367

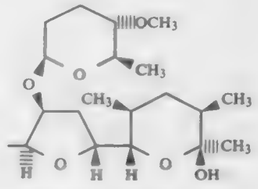
Claims priority, application United Kingdom, Aug. 1, 1986, 8618644

Int. Cl.[5] A61K *31/35*

U.S. Cl. 514—460 **5 Claims**

1. A method for controlling and/or treating coccidial infections in poultry which comprises administering to said poultry an anti-coccidially effective amount of an antibiotic compound of the formula





or a pharmaecutically acceptable cationic salt thereof.

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4,992,467

TREATMENT OF AUTOIMMUNE DISEASES WITH MYCOPHENOLIC ACID, AND DERIVATIVES AND FORMULATIONS THEREOF

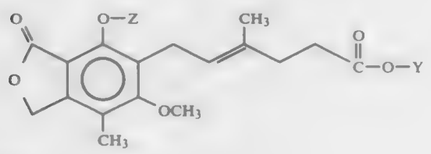
Anthony C. Allison; Elsie M. Eugui, both of Belmont; Peter H. Nelson, Los Altos; Chee-Liang L. Gu, Sunnyvale, and William A. Lee, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 373,413, Jun. 29, 1989, Pat. No. 4,948,793, which is a division of Ser. No. 233,200, Aug. 17, 1988, Pat. No. 4,868,153, which is a division of Ser. No. 146,883, Jan. 22, 1988, Pat. No. 4,786,637, which is a continuation-in-part of Ser. No. 8,717, Jan. 30, 1987, Pat. No. 4,753,935, said Ser. No. 373,413, is a division of Ser. No. 272,161, Nov. 14, 1988, which is a division of Ser. No. 93,459, Sep. 4, 1987, Pat. No. 4,808,592, which is a division of Ser. No. 8,717,. This application Mar. 28, 1990, Ser. No. 500,439

Int. Cl.[5] A61K *31/36*

U.S. Cl. 514—464 **6 Claims**

1. A method of treating autoimmune diseases, which comprises administering to a mammal in need thereof a therapeutically effective amount of a compound represented by the formula:



wherein:
Y is hydrogen; and
Z is hydrogen or —C(O)R,
where R is lower alkyl or aryl;
or a pharmaceutically acceptable salt thereof.

4,992,468

PHENYLETHENYL COMPOUNDS HAVING RETINOID-LIKE ACTIVITY

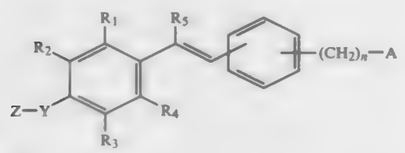
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Jul. 26, 1989, Ser. No. 385,626

Int. Cl.[5] A61K *31/215, 31/19;* **C07C** *321/28*

U.S. Cl. 514—532 **22 Claims**

1. A compound of the formula



in which:
R_1, R_2, R_3 and R_4 are hydrogen, lower alkyl, halogen or lower alkoxy;
R_5 is hydrogen or lower alkyl;
Y is oxygen or sulfur;
Z is 1–10 carbon straight or branched alkyl, or 2–10 carbon straight or branched chain alkenyl or alkynyl;
n is 0—5; and
A is COOH, $COOR_7$, $CONHR_7$, $CON(R_7)_2$, $—CH_2OH$, $—CH_2OR_7$, CH_2OCOR_7, —CHO, $CH(OR_8)_2$, $CHOR_9O$, $—COR_6$ or $CR_6(OR_8)_2$, or CR_6OR_9O where R_6 is $—(CH_2)_mCH_3$ where m is 0—4, R_7 is alkyl of 1 to 10 carbons or aryl or alkyl-aryl group, R_8 is lower alkyl, and R_9 is divalent alkyl radical of 2 to 5 carbons, or a pharmaceutically acceptable salt of said compound.

14. A pharmaceutical composition having retinoid like activity, comprising a pharmaceutically acceptable excipient and an effective amount of a compound of claim 1.

4,992,469

METHOD OF OBTAINING AN ANTIPLATELET EFFECT

Takayuki Ozawa; Morimitsu Nishikimi; Hiroshi Suzuki; Yoshiharu Shimomura, all of Nagoya; Isao Yamatsu, Inashiki; Shinya Abe, Inashiki; Kouji Yamada, Inashiki; Tohru Fujimori, Tsukuba, and Takanobu Takamura, Nagoya, all of Japan, assignors to Eisai Co., Ltd., Tokyo and Nagoya University, Nagoya, both of, Japan

Filed May 29, 1985, Ser. No. 738,936

Claims priority, application Japan, May 31, 1984, 59-111555

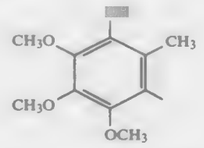
Int. Cl.[5] A61K *31/20*

U.S. Cl. 514—559 **1 Claim**

1. A method of treating a patient to obtain an antiplatelet effect, which comprises administering to a patient requiring such treatment, a therapeutically effective amount of a quinone derivative of the formula:



in which A is a group of the formula:



in which n is 2 or 3, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,992,470

METHOD OF ENHANCING IMMUNE RESPONSE OF MAMMALS

Steven L. Nissen, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 8, 1990, Ser. No. 477,240

Int. Cl.[5] A61K *31/185*

U.S. Cl. 514—578 **5 Claims**

1. The method of activating the immune function of T lymphocytes of mammals in need of such treatment, comprising administering to said mammals β-hydroxy-β-methyl butyric acid or an edible water-soluble salt thereof (HMB), said HMB being administered by a route in which the HMB enters the blood of the mammals and in an amount effective for enhancing the blastogenesis of their T lymphocytes.

4,992,471

MOLLUSCICIDES

Christopher Longhurst, Hants, England, assignor to Lilly Industries Limited, Basingstoke, United Kingdom

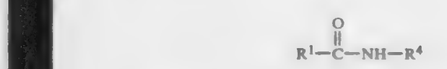
Filed Mar. 18, 1987, Ser. No. 27,597

Claims priority, application United Kingdom, Mar. 21, 1986, 8607033

Int. Cl.[5] A01N *37/18, 37/34*

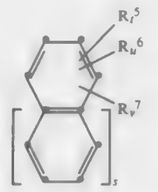
U.S. Cl. 514—613 **5 Claims**

1. A method of controlling molluscs which comprises applying to the infected locus of the molluscs a molluscicidally effective amount of a compound of the formula



(I)

wherein R^1 represents perfluorocyclohexyl, a perfluorocyclohexyl group of formula $—C_6F_{10}R^2$, a group iso-C_3F_7, or a group $—CF(CF_3)R^3$, wherein R^2 represents chloro, $—CF_3$ or $—OCF_3$ and R^3 represents $—OC_2F_5$ or $—OC_3H_7$; R^4 represents a substituted aryl group of the formula



wherein each R^5 independently represents bromo or chloro;
each R^6 independently represents iodo, nitro, cyano, CF_3 or fluorosulfonyl;
R^7 represents methyl;
t represents 0–5;
u represents 0–2;
v represents 0, or, when at least one R^5 or nitro group is present, 1;
s represents 0 to 1;
and the sum of t, u and v is 2–5 when each of u, v and s is 0 or 2–3 when any of u, v and s is at least one;
or a sodium, potassium or ammonium salt of the foregoing compound, wherein ammonium is of the following formula



wherein each R^8 independently represents alkyl of C_1–C_{20}, benzyl, 2-hydroxyethyl, 2-hydroxypropyl, or 3-hydroxypropyl; and R^9 represents hydrogen or R^8, the total number of carbon atoms in all R^8 and R^9 moieties being from 12 to 60, except that when one or more R^8 groups are 2-hydroxyethyl, 2-hydroxypropyl, or 3-hydroxypropyl, the total number of carbon atoms in all R^8 and R^9 moieties can be from 6 to 60.

4,992,472

CHEMICAL DIFFERENTIATING AGENTS

John S. Driscoll, Rockville; Alberto Haces, Frederick, and Theodore Breitman, Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 62,422, Jun. 16, 1987, Pat. No. 4,882,346. This application May 1, 1989, Ser. No. 330,509

Int. Cl.[5] A61K *31/16;* **C07C** *233/05*

U.S. Cl. 514—616 **11 Claims**

1. A differentiating agent for inducing malignant cells to differentiate to a less malignant phenotype, selected from the group consisting of
N,N'-dimethyl-N,N'-hexamethylenebis;
6-(acetylamino)-N-methyl-hexanamide; and
6-(acetylamino)-N,N-dimethylhexanamide.

5. A method for causing malignant cells to differentiate to a less malignant phenotype comprising administering to said malignant cells an effective amount of a differentiating agent selected from the group consisting of
N,N'-dimethyl-N,N'-hexamethylenebis(acetamide);
6-(acetylamino)-N-methyl-hexanamide;
6-(acetylamino)-N,N-dimethyl-hexanamide; and
N,N,N',N'-tetraacetylhexamethylenediamine.

4,992,473

GROWTH PROMOTION

David B. Anderson, Greenfield; Klaus K. Schmiegel, Indianapolis, and Edward L. Veenhuizen, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

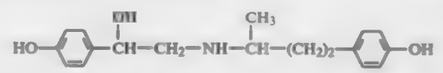
Division of Ser. No. 153,640, Feb. 8, 1988, Pat. No. 4,849,453, which is a division of Ser. No. 860,719, May 7, 1986, Pat. No. 4,734,437, which is a continuation of Ser. No. 628,002, Jul. 5, 1984, abandoned, which is a continuation of Ser. No. 462,587, Jan. 31, 1983, abandoned. This application Mar. 27, 1989, Ser. No. 328,996

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[5] A61K *31/135*

U.S. Cl. 514—653 **8 Claims**

1. A method for promoting the growth of poultry comprising administering to a the poultry a growth promoting amount of a compound of the formula



or an acid addition salt thereof.

4,992,474

PHENETHANOLAMINE DERIVATIVES

Ian F. Skidmore, Welwyn; Lawrence H. C. Lunts, Broxbourne; Harry Finch, Hitchin, and Alan Naylor, Royston, all of England, assignors to Glaxo Group Ltd., London, England

Continuation of Ser. No. 932,359, Nov. 19, 1986, which is a continuation of Ser. No. 601,444, Apr. 18, 1984. This application Aug. 23, 1989, Ser. No. 397,664

Claims priority, application United Kingdom, Apr. 18, 1983, 8310477; Jun. 23, 1983, 8317087; Nov. 4, 1983, 8329568; Jan. 25, 1984, 8401889

Int. Cl.[5] A61K *31/135;* **C07C** *215/00*

U.S. Cl. 514—653 **12 Claims**

1. 4-Hydroxy-alpha'-[[[6-(4-phenylbutoxy)hexyl]amino]methyl]-1,3-benzenedimethanol,1-hydroxy-2-naphthalenecarboxylate.

7. A method of treating a patient suffering from a disease associated with reversible airways obstruction which comprises administering to the patient an effective amount of the compound of claim 1.

4,992,475

BUTYLHYDROXYANISOLES FOR THE TREATMENT OF RETROVIRAL DISEASES

Georges Marcel, Paris, France, assignor to Roussel Uclaf, Paris, France

PCT No. PCT/FR88/00173, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/07856, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 8, 1988, Ser. No. 297,254

Claims priority, application France, Apr. 10, 1987, 87-05088

Int. Cl.[5] A61K *31/075*

U.S. Cl. 514—718 **4 Claims**

1. A method of treating retroviral diseases in warm-blooded animals comprising orally or parentally administering to warm-blooded animals in need thereof an amount of at least one compound selected from the group consisting of 3-tert.-butyl-4-hydroxy-anisole and 2-tert.-butyl-4-hydroxyanisole and their non-toxic, pharmaceutically acceptable salts sufficient to treat retroviral infections.

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4,992,476

SKIN CLEANSING AND MOISTURIZING COMPOSITION AND METHOD OF USING AND PREPARING SAME

Navin M. Geria, Warren, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 4, 1988, Ser. No. 176,907
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] A61K *9/107, 47/00*
U.S. Cl. 514—782 34 Claims

1. A cleansing and moisturizing, occlusive skin care composition comprising, based on total weight of said composition:

(1) an oil phase comprising oil selected from the group consisting of animal oils, vegetable oils, mineral oils, synthetic oils and mixtures thereof in an amount of from about 55% to about 75% and from about 5% to about 9% of a non-ionic surface active agent having an HLB number of about 7 to 12 and

(2) an aqueous phase comprising an aqueous thickening agent selected from the group consisting of natural gums, synthetic gums, gelling agents and mixtures thereof in an amount of from about 0.05% to about 5% and water from about 20% to about 40%.

and

(3) an effective amount of an abrasive to remove oily deposits, cosmetics and particulates from skin surface, wherein said composition is prepared by

(a) forming said oil phase by dissolving said non-ionic surface active agent into said oil and heating to about 60° C. to about 80° C. to facilitate solution;

(b) forming said aqueous phase by dispersing said aqueous thickening agent in water and heating to about 60° C. to about 80° C. to facilitate dispersing; and

(c) forming a stable oil-in-water emulsion by adding said oil phase to said aqueous phase with high shear mixing while maintaining said elevated temperature, wherein the addition of said oil phase to said aqueous phase is at a slow, uniform rate of at least about 10 minutes.

4,992,477

SKIN MOISTURIZING COMPOSITION AND METHOD OF PREPARING SAME

Navin M. Geria, Warren, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 4, 1988, Ser. No. 176,908
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] A61K *9/107, 47/00*
U.S. Cl. 514—782 32 Claims

1. An occlusive skin car composition comprising, based on total weight of said composition:

(1) an oil phase comprising oil selected from the group consisting of animal oils, vegetable oils, mineral oils, synthetic oils and mixtures thereof in an amount of from about 55% to about 75% and about 5% to about 9% of a non-ionic surface active agent having an HLB number of about 7 to 12; and

(2) an aqueous phase comprising an aqueous thickening agent selected from the group consisting of natural gums, synthetic gums, gelling agents and mixtures thereof in an amount of from about 0.05% to about 5% and water from about 20% to about 40%;

wherein said composition is prepared by

(a) forming said oil phase by dissolving said non-ionic surface active agent into said oil and heating to about 60° C. to about 80° C. to facilitate solution;

(b) forming said aqueous phase by dispersing said aqueous thickening agent in water and heating to about 60° C. to about 80° C. to facilitate dispersing; and

(c) forming a stable oil-in-water emulsion by adding said oil phase to said aqueous phase with high shear mixing while maintaining said elevated temperature, wherein the addition of said oil phase to said aqueous phase is at a slow, uniform rate of at least about 10 minutes.

4,992,478

ANTIINFLAMMATORY SKIN MOISTURIZING COMPOSITION AND METHOD OF PREPARING SAME

Navin M. Geria, Warren, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 4, 1988, Ser. No. 176,898
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] A61K *9/107, 47/00*
U.S. Cl. 514—782 36 Claims

1. A antiinflammatory, occlusive, moisturizing skin care composition comprising, based on total weight of said composition:

(1) an oil phase comprising oil selected from the group consisting of animal oils, vegetable oils, mineral oils, synthetic oils and mixtures thereof in an amount of from about 55% to about 75% and about 5% to about 9% of a non-ionic surface active agent having an HLB number of about 7 to 12;

(2) an aqueous phase comprising an aqueous thickening agent selected from the group consisting of natural gums, synthetic gums, gelling agents and mixtures thereof in an amount of from about 0.05% to about 5% and water from about 20% to about 40% and

(3) an effective amount of an antiinflammatory medicament, wherein the medicament is not a corticosteroid; wherein said composition is prepared by

(a) forming said oil phase by dissolving said non-ionic surface active agent into said oil and heating to about 60° C. to about 80° C. to facilitate solution;

(b) forming said aqueous phase by dispersing said aqueous thickening agent in water and heating to about 60° C. to about 80° C. to facilitate dispersing; and

(c) forming a stable oil-in-water emulsion by adding said oil phase to said aqueous phase with high shear mixing while maintaining said elevated temperature, wherein the addition of said oil phase to said aqueous phase is at a slow, uniform rate of at least about 10 minutes; and

(d) admixing an effective amount of said medicament.

4,992,479

PROCESS FOR THE PREPARATION OF METHANOL AND COMPOSITION SUITABLE FOR USE AS A CATALYST IN SAID PROCESS

Arjan Van Dijk; Elt Drent, and Andras G. T. G. Kortbeek, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 26, 1989, Ser. No. 426,643
Claims priority, application United Kingdom, Nov. 1, 1988, 8825516
Int. Cl.[5] C07C *27/26*
U.S. Cl. 518—700 12 Claims

1. A process for the preparation of methanol comprising contacting at a temperature of about 60° C.–150° C. and a pressure of about 5–100 bar a gaseous mixture comprising carbon monoxide and hydrogen with a catalytic system obtained by combining the following components:

Component (a): a copper salt of a carboxylic acid or a sulphonic acid,

Component (b): an alkanol having from 1 to 20 carbon atoms per molecule, and

Component (c): a complex hydride derived from an alkali metal selected from lithium, sodium, potassium and mixtures thereof and a Group III metal selected from boron, aluminum and mixtures thereof.

4,992,480

HOMOGENEOUS CATALYST FORMULATIONS FOR METHANOL PRODUCTION

Devinder Mahajan, Port Jefferson; Richard S. Sapienza, Shoreham; William A. Slegeir, Hampton Bays, and Thomas E. O'Hare, Huntington Station, all of N.Y., assignors to Associated Universities, Inc., Washington, D.C.

Division of Ser. No. 141,454, Jan. 7, 1988, Pat. No. 4,935,395, which is a continuation-in-part of Ser. No. 943,731, Dec. 19, 1986, abandoned. This application Mar. 29, 1990, Ser. No. 500,935
Int. Cl.[5] C07C *27/06*
U.S. Cl. 518—700 11 Claims

1. A method of producing methanol in a liquid those from synthesis gas comprising hydrogen and carbon monoxide which comprises contacting said synthesis gas with a homogeneous catalyst dissolved in methanol or methanol and a co-solvent, wherein said catalyst consists of a transition metal carbonyl complex, wherein the transition metal is selected from the group consisting of Cu, Ni, Pd, Co, Ru, Mo, Fe, and mixtures thereof, and an alkoxide.

4,992,481

FIRE RETARDANT ELEMENTS

Wulf von Bonin, Odenthal, and Ulrich von Gizycki, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 316,370
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808275
Int. Cl.[5] C08J *9/40, 9/42*
U.S. Cl. 521—54 11 Claims

1. A fire retardant element, which is

(a) a foam moulding which is elastic in the moist state and

(b) contains a liquid flameproofing impregnation, where one or both of (a) and (b) solidify after installation, and the fire retardant element is protected against loss of moisture before installation.

4,992,482

POLYPHENYLENE ETHER - ALKENYL AROMATIC POLYMER BLENDS HAVING ORGANOBROMINE ADDITIVES

James M. Joyce, Chesapeake, and Donald J. Kelley, Suffolk, both of Va., assignors to Huntsman Chemical Corporation, Salt Lake City, Utah

Division of Ser. No. 377,260, Jul. 10, 1989, Pat. No. 4,927,858. This application Mar. 12, 1990, Ser. No. 492,499
Int. Cl.[5] C08J *9/18*
U.S. Cl. 521—59 34 Claims

1. An expandable PPE/PS composition comprising:

(a) a blend comprising (i) polyphenylene ether and (ii) alykenyl aromatic polymer, and

(b) an organobromine selected from the group consisting of: (i) tetrabromocyclooctane, (ii) hexabromocyclododecane, (iii) tetrabromovinylcyclohexene, (iv) bis(allyl ether) of tetrabromobisphenol A, and (v) any combination thereof;

wherein the amount of polyphenylene ether is within the range of about 2 weight percent to about 98 weight percent; wherein the amount of alkenyl aromatic polymer is within the range of about 98 weight percent to about 2 weight percent; wherein the amount of said organobromine is within the range of about 0.1 weight percent to about 6 weight percent; and wherein said weight percentages are based upon the total weight of polyphenylene ether and alkenyl aromatic polymer.

4,992,483

POLYURETHANE FOAM PRODUCT AND PROCESS

Robert G. Sylvester, Georgetown, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Aug. 18, 1989, Ser. No. 395,515
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—131 8 Claims

1. A process for preparing flexible polyurethane foams comprising reacting polyol with polyfunctional isocyanate in the presence of an auxiliary blowing agent comprising 1 monofluoro 1,1 dichloroethane, wherein the amount of auxiliary blowing agent used is from 60 to 80 wt % of the amount of conventional auxiliary blowing agent consisting of trichlorofluoromethane that would be required to obtain comparable foam density and either firmness or compressive strength.

4,992,484

POLYURETHANE SYSTEMS INCORPORATING ALKOXYLATED DIETHYLTOLUENEDIAMINE

Glenn A. Taylor, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 20, 1987, Ser. No. 123,083
Int. Cl.[5] C08G *18/32*
U.S. Cl. 521—167 2 Claims

1. In a polyurethane foam formulation comprising an organic polyisocyanate, polyol, and cross-linker system, the improvement which comprises utilizing as said polyol, a polymeric polyol having a molecular weight of from about 300 to 15,000, and as said cross-linker, an ethoxylated or propoxylated diethyltoluenediamine having an average number of ethylene oxide or propylene oxide units from 1.5–2.5 in said ethoxylated or propoxylated diethyltoluenediamine and said ethoxylated or propoxylated diethyltoluenediamine is present in an amount from 1 to 15% by weight of the polyol.

2. In a process for the manufacture of a polyurethane foam system which comprises reacting an organic polyisocyanate, a polyether polyol having a molecular weight from about 300–5,000 and an alkoxylated aromatic diamine cross-linker, the improvement which comprises utilizing as said cross-linker an ethoxylated or propoxylated diethyl toluenediamine having an average number of ethylene oxide or propylene oxide units from 1.5 to 2.5 per mole of diethyltoluenediamine and said ethoxylated or propoxylated diethyltoluenediamine is present in an amount from 1–15% by weight of the polyol.

4,992,485

MICROPOROUS PEEK MEMBRANES AND THE PREPARATION THEREOF

Ja-Young Koo, Plymouth, Minn.; Chieh-Chun Chau, Midland, Mich.; Joel R. Racchini, St. Louis Park, Minn.; Ritchie A. Wessling, Berkeley, Calif., and Matthew T. Bishop, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. and Filmtec Corporation, Minneapolis, Minn.

Filed Oct. 11, 1988, Ser. No. 255,220
Int. Cl.[5] C08H *9/28*
U.S. Cl. 521—180 32 Claims

1. A method of forming an article of a PEEK polymer whereby a PEEK polymer is dissolved in a non-sulfonating acid solvent, the PEEK polymer solution is cast into the shape of the article, the article is coagulated in a coagulation bath which is a non-solvent for a PEEK polymer, but which is miscible with the non-sulfonating acid solvent, thereby leaching the non-sulfonating acid solvent from the membrane.

27. A microporous membrane comprising a hollow fiber of PEEK polymer having an asymmetric structure of PEEK between the lumen surface and the outer fiber wall.

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4,992,486

WHITE-PIGMENTED, MELT-STABLE ETHYLENE/CARBOXYLIC ACID COPOLYMER COMPOSITIONS

Stewart C. Feinberg, Exton, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1989, Ser. No. 436,467
Int. Cl.[5] C08K *9/10*
U.S. Cl. 523—210 18 Claims

1. A composition stabilized against thermal crosslinking and consequent reduction of its melt index, consisting esentially of a uniform dispersion of alumina-coated titanium dioxide pigment in a blend of a matrix polymer with a stabilizing polymer,

the matrix polymer being a copolymer represented by the formula E/X/Y, where E stands for ethylene; X stands for a C_3–C_7 alpha,beta-unsaturated carboxylic acid; and Y, which is optional, stands for another copolymerizable comonomer selected from the group consisting of C_3–C_7 alpha,beta-unsaturated carboxylic acids, C_{1-10} alkyl esters of such acids, vinyl esters, vinyl ethers, acrylonitrile, methacrylonitrile, carbon monoxide, and sulfur dioxide; the respective relative weight ratios of the monomers in said E/X/Y copolymer being about 96:4:0 to 40:30:30, and the melt index of said copolymer, determined according to ASTM D1238, Condition E, being about 0.1–100 dg/min; and

the stabilizing polymer beinq a high melt index copolymer of ethylene with an unsaturated carboxylic acid selected from the group consisting of acrylic acid (E/AA copolymer) and methacrylic acid (E/MAA copolymer), said high melt index copolymer having a melt index of at least about 5,000 dg/min, determined according to ASTM D1238, condition E, and containing at least about 5 weight percent of carboxylic acid monomer;

the relative weight ratio of matrix polymer to stabilizing polymer being about 95:5 to 80:20, and the amount of titanium dioxide in the blend being about 5 to 20 weight percent.

4,992,487

METHOD FOR DETERMINING FLOW BEHAVIOR INDEX AND USING INDEX TO CONTROL POLYMER RHEOLOGY AND PHYSICAL PROPERTIES

Sundar M. Rao, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1990, Ser. No. 463,897
Int. Cl.[5] C08J *3/00;* G01N *11/04*
U.S. Cl. 523—303 13 Claims

1. A process for determining the Flow Behavior Index of a molten polymer moving at a controlled temperature along a prescribed path, comprising the sequential steps of:

(a) successively diverting more than one small quantity of the molten polymer from the path to a capillary of knows length and diameter;

(b) successively moving each small quantity through the capillary at a different controlled rate and at a constant temperature;

(c) measuring the pressure drop across the capillary at each controlled rate;

(d) using the controlled rates, pressure drops, capillary length and diameter to calculate shear rate and shear stress;

(e) comparing shear rate and shear stress to determine the Flow Behavior Index.

4,992,488

GLASS FIBRE-REINFORCED EPOXIDE RESIN MOULDING COMPOSITION AND ITS USE

Peter Ruf, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 42,769, Apr. 27, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,845
Claims priority, application Switzerland, May 7, 1986, 1865/86
Int. Cl.[5] C08K *3/26, 3/40;* C08L *63/04*
U.S. Cl. 523—428 14 Claims

1. An epoxide resin molding composition for compression molding, transfer molding or injection molding consisting essentially of

(a) a solid phenol or cresol novolak epoxide resin,

(b) dicyandiamide as hardener,

(c) an accelerator suitable for hardening with dicyandiamide,

(d) 20 to 70% by weight of calcium carbonate,

(e) 10 to 60% by weight of glass fibers, the quantity of components (d) and (e) together not exceeding 80% by weight, relative to the total weight of the epoxide resin molding composition, and

(f) a mold release agent.

3. An epoxide resin moulding composition according to claim 1, which contains a phenol or cresol novolak epoxide resin and 0.1 to 40% by weight, relative to the total quantity of the epoxide resin, of an additional aromatic di- or polyglycidyl ether.

4,992,489

INDUCTION HEAT CURABLE EPOXY RESIN SYSTEMS

Rajan Eadara, East Lansing, and Robert F. Armbruster, Okemos, both of Mich., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 244,196, Sep. 14, 1988, abandoned. This application Mar. 1, 1990, Ser. No. 488,485
Int. Cl.[5] C08K *3/22, 3/10*
U.S. Cl. 523—458 17 Claims

1. A composition consisting of

(a) 4–50%, by weight, of a liquid epoxy resin having on average more than one epoxy group per molecule;

(b) 40–80%, by weight, of silica particles; and

(c) 10–50%, by weight, of a component responding to induction current selected from the group consisting of iron oxides, steel powder and mixtures thereof.

4,992,490

BASE COAT AND PRIMER FILM-FORMING COMPOSITIONS CONTAINING POLYACRYLATE FIBERS, ACRYLIC POLYMER PRECURSORS, STYRENE AND POLYESTER RESIN PARTICULARLY ADAPTED FOR AUTOMOBILE FINISHING APPLICATIONS

David L. Childress, Memphis, Tenn.; Mark A. Garner, Sr., Walls, Miss.; William L. Childress, Memphis, Tenn., and John Power, Canajoharie, N.Y., assignors to Miracle Shield Partnership, Memphis, Tenn.

Filed Mar. 31, 1988, Ser. No. 176,262
Int. Cl.[5] C08K *5/01, 5/02, 5/04;* C08L *67/06*
U.S. Cl. 523—511 32 Claims

1. A coating composition that is useful as base coats, as a primer without need for any further finishing after application thereof and prior to application of paint, and, when combined with paint, as a diluent for car paint formulations, comprising:

a. polyacrylate fibers having:

(1) a size such that said fibers form a homogeneous suspension in a solvent selected from the group consisting of toluene, methylene chloride, and xylene, and

(2) a weight average molecular weight within the range of from about 10,000 to about 1,200,000;

b. at least one monomer which forms an acrylic polymer;

c. styrene monomer;

d. unsaturated polyester resin, the ratio by weight of said resin to said styrene monomer being from about 5:1 to about 1:5;

e. a polymerization inhibitor; and

f. a volatile carrier, which does not react with said acrylic polymer-forming monomer, said styrene monomer, or said unsaturated polyester resin, in which each said acrylic polymer-forming monomer and said styrene monomer are soluble and which has a relative viscosity of 0.8 or less and a vapor pressure less than water, said carrier being from about 20% to about 90% v/v,

wherein, as weight percentages that are based on total content by weight of said acrylic polymer fibers, said polymer-forming monomer, said styrene, monomer, and said resin, the contents of said composition are within the range of about 0.5 to about 20 for said fibers, within the range of about 0.5 to about 20 for said polymer-forming monomer, within the range of about 10 to about 60 for said styrene monomer, and within the range of about 20 to about 80 for said resin.

4,992,491

CELLULOSE ESTER-COPOLYESTER ETHER BLENDS

John E. Rieth, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,441
Int. Cl.[5] C08L *1/00, 1/14, 1/08*
U.S. Cl. 524—27 4 Claims

1. A resinous film comprising

(a) greater than 0 to about 5% by weight of a polyesterether having an IV. of about 0.8 to about 1.5, a melting point above about 150° C. and being the reaction product of at least one aromatic or cycloaliphatic dicarboxylic acid having from about 8 to 12 carbon atoms and a glycol, the glycol comprising from about 75 to 96 mole percent of an aliphatic or cycloaliphatic glycol having from 8 to 12 carbon atoms, the balance being a polyether glycol having from 2 to 4 carbon atoms between ether oxygen atoms and a molecular weight of from about 200 to about 3,000 and

(b) the balance being cellulose ester.

4,992,492

PROCESS FOR PREPARING A BINDER FOR SURFACING ROADWAYS OF BITUMEN AND RECLAIMED RUBBER POWDERED BASE AND ALSO BINDER OBTAINED BY EMPLOYING THIS PROCESS

Alain Sainton, Abbeville La Riviere, France, assignor to Beugnet, Paris, France

Filed Feb. 22, 1989, Ser. No. 314,013
Int. Cl.[5] C08L *7/00, 9/00, 95/00*
U.S. Cl. 524—62 26 Claims

1. A process for preparing a bitumen and reclaimed rubber powder-based binder for surfacing roadways comprising:

(a) forming an initial mixture comprising 81% to 86% by weight of bitumen, 8% to 10% by weight of a reclaimed rubber powder, wherein said powder comprises 20% to 80% ground lorry tires which predominantly comprise a natural rubber and 80% to 20% ground light vehicles tires which predominantly comprise synthetic rubber, 4% to 6% by weight of a naphthenol-aromatic-type heavy oil, and 2% to 3% by weight of a catalyst for incorporating said rubber powder into said bitumen, wherein said catalyst comprises ethylenically unsaturated polymers which can be incorporated into sulfur-vulcanized bitumen intended for surfacing road-ways, said weight percentages being based on the total weight of said initial mixture;

(b) heating said initial mixture to a temperature of between 175° C. and 185° C., and maintaining said temperature with agitation until the viscosity of said mixture reaches from about 0.600 to about 0.650 Pa.s.; and

(c) reducing the temperature of said mixture by 15° to 20° C.

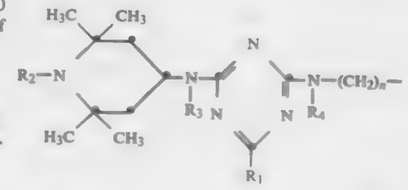
4,992,493

PIPERIDINE-TRIAZINE COMPOUNDS FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

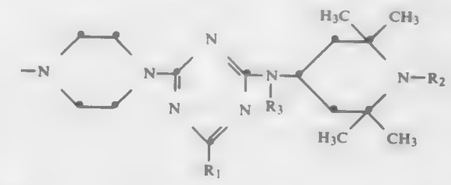
Giuseppe Cantatore, Bitonto; Valerio Borzatta, Bologna, and Franca Masina, Anzola Emilia, all of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 217,962, Jul. 11, 1988, Pat. No. 4,883,870. This application Sep. 6, 1989, Ser. No. 403,559
Claims priority, application Italy, Jul. 16, 1987, 21320 A/87
Int. Cl.[5] C08K *5/3435*
U.S. Cl. 524—97 6 Claims

1. A composition comprising a polymer, resin or lubricating oil subject to thermal, oxidative or light-induced degradation and an effective heat, oxidation or light stabilizing amount of a compound of the formula I

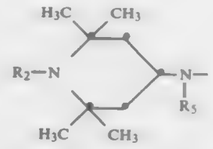


(I)



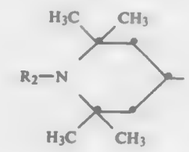
in which

R_1 is C_1–C_8-alkyloxy, allyloxy, allylamino, di(C_1–C_4-alkyl-)amino, diallylamino, 1-pyrrolidyl, 1-piperidyl, 4-morpholinyl, 1-hexahydroazepinyl, 4-methyl-1-piperazinyl, or a group of the formula (II),



(II)

R_2 is hydrogen, O—, OH, NO, CH_2CN, C_1–C_8-alkyl, allyl, benzyl, C_1–C_8-acyl, C_1–C_{18}-alkyloxy, C_5–C_{12}-cycloalkyloxy or OH-monosubstituted C_2–C_4-alkyl, R_3 and R_5 independently are hydrogen, C_1–C_{12}-alkyl, C_5–C_{12}-cycloalkyl, C_7–C_9-phenylalkyl, tetrahydrofurfuryl, C_2–C_4-alkyl monosubstituted by OH, by C_1–C_4-alkyloxy or by di(C_1–C_4-alkyl)amino, or a group of the formula (III)



(III)

with R_2 as defined above, R_4 is hydrogen, C_1–C_{12}-alkyl or cyclohexyl and n is an integer from 2 to 6.

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4,992,494

HALOGEN-CONTAINING RESIN COMPOSITION

Shoji Odaira, Meiwa; Minoru Fukuda; Nobuo Kawashima, both of Kazo; Masato Saito, Kuki, and Motoharu Nakanishi, Kazo, all of Japan, assignors to Ferro Corporation, Cleveland, Ohio

Continuation of Ser. No. 200,769, Jun. 1, 1988, abandoned. This application Dec. 19, 1989, Ser. No. 452,980

Int. Cl.[5] C08K *5/3492, 5/17, 5/09*

U.S. Cl. 524—100 7 Claims

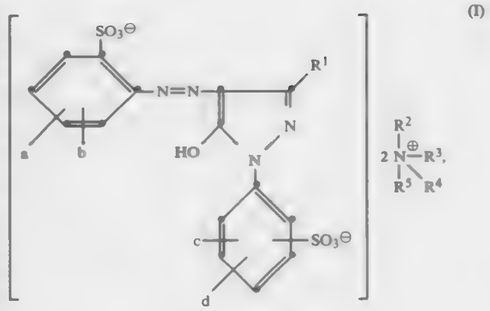
1. A halogen-containing resin composition comprising:

100 parts by weight of a halogen-containing resin,

0.1 to 10 parts by weight of at least one amino acid zinc salt selected from glycine zinc salt and zinc glutamate, and

0.1 to 5 parts by weight of at least one carboxylic acid zinc salt selected from basic zinc salts of organic carboxylic acids wherein the organic carboxylic acids are selected from the group consisting of monocarboxylic acids and dicarboxylic acids wherein the monocarboxylic acids are selected from the group consisting of formic acid, acetic acid, propionic acid, butyric acid, isobutyric acid, trimethylacetic acid, hexanoic acid, octanoic acid, decanoic acid, aluric acid, tridecanoic acid, 2-ethylhexoic acid, nonanionic acid, benzoic acid, butylbenzoic acid, toluic acid, cinnamic acid, phenylacetic acid, hydroxyacetic acid, acrylic acid, crotonic acid, acetoacetic acid, glycolic acid, lactic acid, hydroacrylic acid, propionic acid, methylacrylic acid, 12-hydroxystearic acid, oldic acid, linoleic acid, linolenic acid, tall oil fatty acid, versatic acid, thioglycolic acid and mercaptopropionic acid; and wherein the dicarboxylic acids are selected from the group consisting of oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, maleic acid, azelaic acid, levulinic acid, phthalic acid, fumaric acid and malic acid.

(I)



wherein

a and b are each —Cl,

c and d are each independently of the other hydrogen, —Cl or —CH_3,

R^1 is —CH_3, and

R^2, R^3, R^4 and R^5 are each hydrogen.

4,992,496

FLAME RETARDANT MODIFIED POLYPHENYLENE OXIDE COMPOSITION

Joseph Green, East Brunswick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 3, 1987, Ser. No. 92,854

Int. Cl.[5] C08K *5/527*

U.S. Cl. 524—109 6 Claims

1. A flame retarded polyphenylene oxide composition comprising a polystyrene modified polyphenylene oxide resin, a flame retardant amount of a polybrominated aryl phosphate ester, and a sufficient quantity of an epoxy compound to enhance the color stability of the flame retarded polyphenylene oxide composition.

4,992,495

PROCESS FOR COLORING HIGH-MOLECULAR WEIGHT ORGANIC MATERIAL USING AMINE SALTS OF AZO PIGMENTS BASED ON PYRAZOLONE DERIVATIVES

Stefan Hari, Villars-sur-Glane, and Georg Cseh, Posat, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 20,059, Feb. 27, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 207,414

Claims priority, application Switzerland, Mar. 10, 1986, 961/86

Int. Cl.[5] D06P *1/44, 5/00;* C09B *29/03, 29/10*

U.S. Cl. 524—106 4 Claims

1. A process for mass coloring high molecular weight organic material selected from the group consisting of cellulose ethers, cellulose esters, aminoplasts, alkyd resins, phenolic plastics, polycarbonates, polyolefins, polystyrene, poly(vinyl chloride), polyamides, polyurethanes, polyesters, rubber, casein, silicone resins and mixtures thereof, which process comprises

incorporating into said organic material an effective coloring amount of a pigment of formula I

4,992,497

GLASS FILLED POLY(ARYLENE SULFIDE) COMPOSITIONS AND METHODS

Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 10, 1989, Ser. No. 335,999

Int. Cl.[5] C08K *5/51*

U.S. Cl. 524—147 23 Claims

1. A glass-filled poly(arylene sulfide) composition having improved mechanical properties, comprising:

poly(arylene sulfide) resin;

glass reinforcement material in an amount in the range of from about 25% to about 55% by weight of said composition;

an epoxysilane selected from 3-glycidoxypropyltrimethoxysilane, beta-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, 3-glycidoxypropylmethyldiethoxysilane, and 2-glycidoxypropyltrimethoxysilane; and

an organic phosphite selected from triisooctyl phosphite, tricyclohexyl phosphite, triphenyl phosphite, and tri(-nonylphenyl) phosphite,

said epoxysilane being present in said composition in an amount in the range of from about 0.3% to about 1.5% by weight of said composition and said organic phosphite being present in said composition in an amount in the range of from about 0.3% to about 1.5% by weight of said composition so that said expoxysilane and said organic phosphite operate to improve the strength, elongation, and impact resistance properties of said composition.

4,992,498

VINYL CHLORIDE-BASED RESIN COMPOSITION OF LOW MALODOR

Michinori Tsuchida, Saitama, and Osamu Matsumoto, Ibaraki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1989, Ser. No. 446,765

Claims priority, application Japan, Jan. 27, 1989, 1-19183

Int. Cl.[5] C08K *5/00*

U.S. Cl. 524—180 4 Claims

1. A polyvinyl chloride resin-based composition which comprises, as a blend:

(a) a polyvinyl chloride resin;

(b) a deodorizing agent selected from the group consisting of diterpenic acids compounds and rosins; and

(c) organic tin mercaptide compound,

the total amount of the deodorizing agent as the component (b) and the organic tin mercaptide compound as the component (c) being in the range from 1 to 5 parts by weight per 100 parts by weight of the polyvinyl chloride resin as the component (a) and the weight ratio of the deodorizing agent as the component (b) to the organic tin mercaptide compound as the component (c) being in the range from 397 to 60:40.

4,992,499

STABILIZED ETHYLENE MONOXIDE COPOLYMERS

Johannes L. M. Syrier; Hendrik Van De Weg, both of Amsterdam, Netherlands, and Robert Q. Kluttz, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 308,287, Feb. 9, 1989, abandoned. This application Nov. 30, 1989, Ser. No. 444,573

Claims priority, application United Kingdom, Feb. 29, 1988, 8804726

Int. Cl.[5] C08K *5/18*

U.S. Cl. 524—194 19 Claims

1. A composition stabilized against thermal degradation comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and intimately mixed therewith a stabilizing quantity of a combination of (A) a phenolic compound selected from

(i) an alkyl ester of a monovalent carboxylic acid of from 2 to 8 carbon atoms having a terminal hydroxyphenyl substituent, the alkyl moiety of the ester having from 12 to 24 carbon atoms inclusive,

(ii) symmetrical diesters of a hydroxyphenyl-substituted aliphatic monocarboxylic acid and N,N'-di(hydroxyalkyl-)oxalamide,

(iii) symmetrical diesters of a hydroxyphenyl-substituted aliphatic monocarboxylic acid and polyoxyalkylene glycols of from 2 to 4 oxyalkylene units, inclusive, or

(iv) symmetrical hydroxyphenyl-substituted N,N'-dialkanoylhydrazides, wherein the hydroxyphenyl substituents are hindered phenolic substituents, and (B) an aromatic amine selected from

(a) diphenylamines, or

(b) 1,8-diaminonaphthalenes.

4,992,500

AQUEOUS DISPERSIONS OF POLYAMIDES EMULSIFIED WITH ROSIN DERIVATIVES

Wolfgang Klauck, Meerbusch; Gerhard Gierenz, Solingen, and Juergen Wichelhaus, Wuppertal, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 1, 1989, Ser. No. 304,995

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803524

Int. Cl.[5] C08L *93/04*

U.S. Cl. 524—270 20 Claims

1. An aqueous dispersion of polyamides in water emulsified with rosin derivatives, said dispersion comprising:

(a) 100 parts by weight of thermoplastic polyamide, of which at least 20 parts by weight has a melting points of at least 120° C.;

(b) from about 1 to about 250 parts by weight of rosin derivatives having an average acid value of at least about 120, of which rosin derivatives at least about 1 part by weight are salts; and

(c) at least about 40 parts by weight of water.

4,992,501

REPULPABLE TAPE

Robert Hanninen, Groton; Shiro G. Takemoto, Dedham, and Mildred C. Richards, Wakefield, all of Mass., assignors to The Kendall Company, Lexington, Mass.

Filed Jun. 26, 1989, Ser. No. 370,970

Int. Cl.[5] C09J *131/02, 131/04*

U.S. Cl. 524—272 26 Claims

1. In a pressure-sensitive adhesive composition for preparing repulpable pressure-sensitive tapes comprising

(1) 49 to 89 parts by weight of the neutralized reaction product of a C_6–C_{18} alkyl phenol or C_6–C_{18} alkanol containing about 4 to 30 moles combined ethylene oxide with a copolymer obtained by the polymerization of a monomer composition comprising by weight: from about 35 to 85% of acrylate monomer of the formula CH_2=C(R)—$COOR_1$ wherein R is hydrogen or C_1–C_4 alkyl, and R_1 is C_1–C_{14} alkyl; with the proviso that at least 60% is C_4 substituted (i.e. for R_1) acrylates; from about 8 to 30% of an alpha,beta-ethylenically unsaturated di-carboxylic acid anhydride and from about 8 to 30% of monomer selected from vinyl esters, vinyl ethers, vinyl halides, styrene, C_1–C_4 alkyl styrenes, lower (C_1 to C_6) alkyl methacrylates and alpha-olefins, the weight ratio of acrylate to anhydride being from about 1.5:1 to 8:1, the amount of said alkyl phenol or alkanol being sufficient to provide an alkyl phenol or alkanol:anhydride mole ratio of about 0.3 to 1.0 and at least about 0.7 when said acrylate:anhydride weight ratio is below about 4; the improvement wherein said composition further includes

(2) from about 10 to about 50 parts by weight of a partially to fully hydrogenated rosin; and

(3) at least 1 part by weight of polyethylene glycol;

said composition being characterized by retaining its adhesion properties over a wide range of humidity and temperature.

4,992,502

SOLID CORRECTION COMPOSITIONS

Rachel M. Loftin, Halifax, and John Thompson, Medfield, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Aug. 14, 1989, Ser. No. 393,615

Int. Cl.[5] C08K *3/22;* C08L *31/04, 91/06, 91/08*

U.S. Cl. 524—277 11 Claims

1. A solid correction composition comprising from about 30 to about 70 percent by weight of the total composition weight of an opacifying pigment substantially uniformly dispersed in a mixture of ingredients including from about 5 to about 15 percent by weight of a first wax having a melting point between about 60° C. to about 90° C. in combination with from about 5 to about 15 percent by weight of a second wax having a melting point between about 40° C. to about 50° C. and where the ratio of the first wax to the second wax is from about 0.25:1 to about 1:1.25 and, from about 2 to about 10 percent by weight of a film forming polymer having a melting point between about 65° C. to about 120° C. and which is sufficiently compatible with the waxes so that the polymer can be melted with the waxes to form a solution with the melted waxes, said correction composition having a hardness value of about 10 or less.

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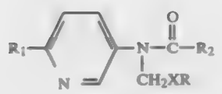
4,992,503

FUNGICIDAL PYRIDYL AMIDES

Don R. Baker, Orinda, and Keith H. Brownell, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Filed Sep. 29, 1988, Ser. No. 250,213
Int. Cl.[5] C07D *213/75*; A01N *43/40*
U.S. Cl. 514—346 9 Claims

1. A compound having the structural formula



wherein

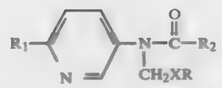
R is selected from the group consisting of C_3–C_6 cycloalkyl, C_1–C_4 alkyl, benzyl, substituted benzyl wherein the substituents are selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, halogen, -NO_3 and C═N; C_2–C_{10} alkoxyalkyl, C_1–C_4 haloalkyl and C_2–C_8 alkenyl and C_2–C_8 alkanoyl;

R_1 is selected from the group consisting of halogen, C_1–C_3 alkoxy, and C_1–C_3 haloalkoxy;

R2 is selected from the group consisting of cyclopropyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_2–C_6 alkoxyalkoxy, C_1–C_6 alkylthio, benzyl, substituted benzyl wherein the substituents are selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, halogen, -NO_3 and C N; and

X is —O or —S; or a fungicidally acceptable organic or inorganic salt thereof.

6. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein

R is selected from the group consisting of C_3–C_6 cycloalkyl, C_1–C_4 alkyl, benzyl, substituted benzyl wherein the substituents are selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, halogen, -NO_3 and C═N; C_2–C_{10} alkoxyalkyl, C_1–C_4 haloalkyl and C_2–C_8 alkenyl and C_2–C_8 alkanoyl;

R_1 is selected from the group consisting of halogen, C_1–C_3 alkoxy, and C_1–C_3 haloalkoxy;

R2 is selected from the group consisting of cyclopropyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_2–C_6 alkoxyalkoxy, C_1–C_6 alkylthio, benzyl, substituted benzyl wherein the substituents are selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, halogen, -NO_3 and C N; and

X is —O or —S; or a fungicidally acceptable organic or inorganic salt thereof.

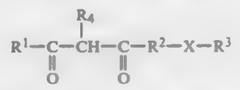
4,992,504

ETHER-CONTAINING OR THIOETHER-CONTAINING 1,3-DIKETONES AND THE USE THEREOF AS STABILIZERS FOR CHLORINE-CONTAINING POLYMERS

Hermann O. Wirth, Bensheim, and Hans-Helmut Friedrich, Lautertal, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

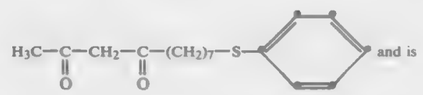
Continuation of Ser. No. 349,911, May 8, 1989, abandoned, which is a continuation of Ser. No. 239,232, Sep. 1, 1988, abandoned. This application Jan. 5, 1990, Ser. No. 463,798
Claims priority, application Switzerland, Sep. 11, 1987, 3521/87
Int. Cl.[5] C08K *5/36, 5/07*; C07C *323/00, 49/84, 49/175*
U.S. Cl. 524—357 14 Claims

1. A compound of the formula I



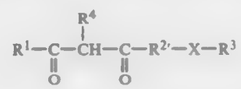
(I)

in which R^1 and R^3 independently of one another are C_1–C_{12}alkyl, phenyl or phenyl which is substituted by one to three C_1–C_{12}alkyl groups, R^2 is C_2–C_{10}alkylene, R^4 is hydrogen, and X is oxygen or sulfur, subject to the proviso that the compound of the formula



and is excluded.

7. A composition containing a chlorine-containing polymer selected from the group consisting of chlorinated homopolymers and copolymers of vinyl chloride, vinylidene chloride or chlorinated olefins, graft polymers of polyvinyl chloride with ethylene vinyl acetate, acrylonitrile-butadiene-styrene or methecrylonitrile-butadiene-styrene or mixtures thereof with polymers of acrylonitrile-butadiene styrene, methacrylonitrile-butadiene-styrene, styrene-butadiene, styrene-acrylonitrile or ethylene vinyl acetate and an effective stabilizing amount of a compound of the formula IA



(IA)

in which R^1 and R^3 independently of one another are C_1–C_{12}alkyl, phenyl or phenyl which is substituted by one to three C_1–C_{12}alkyl groups, $R^{2'}$ is C_1–C_{10}alkylene, R^4 is hydrogen, and X is oxygen or sulfur.

4,992,505

FLAME RETARDANT ELASTOMERIC COMPOUNDS

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 7, 1988, Ser. No. 216,015
Int. Cl.[5] C08K *5/53*
U.S. Cl. 524—416 31 Claims

1. A flame retardant thermoplastic composition comprising:

(A) at least one polyetherimide ester resin;

(B) a flame retardant effective amount of a mixture comprising (i) at least one polymeric pentaerythrityl polyphosphonate ester, and (ii) at least one ammonium polyphosphate.

4,992,506

COPOLYETHERESTER ELASTOMERIC COMPOSITIONS

Michael R. McCormick, Mt. Vernon, Ind.; Thomas A. Morelli, Pittsfield, Mass.; Warren J. Peascoe, West Stockbridge, Mass.; Stefan F. Rasch, Cheshire, Mass.; John A. Tyrell, Dalton, Mass., and May T. Wong, Torrance, Calif., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 2, 1988, Ser. No. 279,351
Int. Cl.[5] C08L *67/02*; C08K *3/10*
U.S. Cl. 524—513 21 Claims

1. A thermoplastic elastomeric composition having improved softness and stiffness comprising:

(A) at least one copolyetherester polymer comprising the reaction product of:

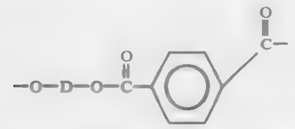
(i) one or more diols;

(ii) one or more dicarboxylic acids or an anhydride derivative thereof;

(iii) one or more long chain ether glycols having a molecular weight of from about 400 to about 12000; and, optionally

(iv) one or more lactones, wherein the long chain ether glycol and lactone, if any, comprise from about 5 to about 70 weight percent of the copolyetherester); and

(B) at least one aromatic thermoplastic polyester consisting of repeating units of the following formula:



wherein D is the divalent radical remaining after removal of the terminal hydroxy groups of a C_2 to C_{20} aliphatic or cycloaliphatic diol;

(C) a modulus reducing amount of a rubbery interpolymer consisting of a crosslinked (meth)acrylate rubbery phase and an interpenetrating, essentially graft-free crosslinked styrenic resin phase wherein said rubbery interpolymer is prepared by polymerization of a styrene with a polyethylenically unsaturated cross-linking agent in the presence of the crosslinked (meth)acrylate rubbery phase, and, optionally

(D) mineral filler.

4,992,507

AQUEOUS DISPERSION OF A NONIONIC, WATER-DISPERSIBLE POLYURETHANE

Richard G. Coogan, North Reading; Razmik Vartan-Boghossian, Belmont, and Milton Lapkin, Sudbury, all of Mass., assignors to ICI Americas, Inc., Wilmington, Del.

Continuation of Ser. No. 244,394, Sep. 14, 1988, abandoned. This application Sep. 18, 1989, Ser. No. 408,958
Claims priority, application United Kingdom, Sep. 14, 1987, 8721534; Sep. 14, 1987, 8721535
Int. Cl.[5] C08L *75/00, 75/04*
U.S. Cl. 524—591 15 Claims

1. An aqueous dispersion of a nonionic, water-dispersible polyurethane having pendent polyoxyethylene chains and free acid or free tertiary amino groups.

4,992,508

AQUEOUS DISPERSIONS OF POLYESTER AND POLYESTERAMIDES CROSS-LINKED WITH METALLIC IONS AND CASTS MADE THEREFROM

Mohan Vishnupad, Monroe, and Jose Ramirez, Trumbull, both of Conn., assignors to Imaginative Research Associates, Inc., Bridgeport, Conn.

Filed Jun. 16, 1989, Ser. No. 367,183
Int. Cl.[5] C08L *67/00*
U.S. Cl. 524—601 3 Claims

1. A cross linked aqueous dispersion composition comprising:

a water dissipatable polymer in an amount from 18 to 30 percent by weight based on the total weight of the composition;

water in an amount from 67 to 80 percent by weight based on the total weight of the composition;

a source of multivalent metallic ions in an amount of 0.1 to 5 percent by weight based on the total weight of the composition; and

humectant in an amount from 0.1 to 40 percent by weight based on the total weight of the composition.

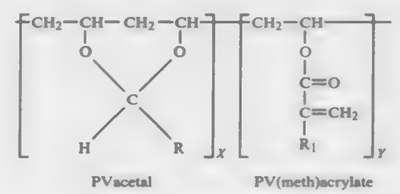
4,992,509

POLYVINYL ACETAL RESIN, USE THEREOF AS AN ADHESION PROMOTING ADDITIVE, METHOD OF PRODUCING SAME, AND ADHESIVE COMPOSITION COMPRISING SAME

Stephen J. Harris, Dublin, assignor to Loctite Corporation, Newington, Conn.

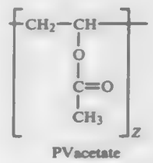
Filed Oct. 3, 1988, Ser. No. 252,831
Claims priority, application Ireland, Oct. 7, 1987, 2674/87
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—59 10 Claims

1. An acrylate- or methacrylate-substituted polyvinyl acetal resin of formula I:



I

PVacetal PV(meth)acrylate



PVacetate

wherein the weight percentages of the X, Y and Z groups are variable,

R is a hydrogen atom or an alkyl group, and

R_1 is a hydrogen atom or a methyl group.

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4,992,510

METHOD FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi; Fumio Suzuki, Otake; Hideaki Habara, Otake; Yutaro Fukuda, Otake, and Haruki Sato, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 946,058, Dec. 24, 1986, Pat. No. 4,880,877. This application Aug. 16, 1989, Ser. No. 394,720

Claims priority, application Japan, Dec. 25, 1985, 60-295369; Dec. 26, 1985, 60-293952; Jul. 17, 1986, 61-166571; Jul. 28, 1986, 61-175508

Int. Cl.[5] C08L *51/04*

U.S. Cl. 525—84 7 Claims

1. A method for producing a rubber modified thermoplastic resin comprising graft rubber polymer (1) produced by emulsion graft polymerization of a vinyl monomer on a rubber latex, thermoplastic resin (2) and thermoplastic resin (3) which comprises carrying out successively the following steps:

(I) a step of mixing the following (A), (B), (C) and thermoplastic resin (2):

(A) a latex of graft rubber polymer (1),

(B) an organic agent which is capable of dissolving thermoplastic resin (2) and has a solubility in water of 5% by weight or less at a temperature at which (A), (B), (C) and thermoplastic resin (2) are mixed, amount of the organic agent being 10–600% by weight of the sum of the graft rubber polymer (1) and thermoplastic resin (2),

(C) a water soluble agent capable of coagulating the latex (A), amount of this agent being 10% by weight or less of graft rubber polymer (1).

(II) a step of separating and removing an aqueous phase from a two-phase mixture obtained in the mixing step (I),

(III) a step of mixing the mixture from which the aqueous phase has been removed at step (II) with the whole, a part or none of thermoplastic resin (3),

(IV) a step of removing, by a thermal means, the whole or a part of the organic agent (B) and remaining water from the mixture obtained at step (III) when thermoplastic resin (3) has been mixed at step (III), or removing the whole or a part of the organic agent (B) and remaining water from the mixture from which the aqueous phase has been removed at step (II) when thermoplastic resin (3) has not been mixed at step (III),

(V) a step of mixing the remainder of the thermoplastic resin (3) when a part of the thermoplastic resin (3) has been mixed at step (III) or mixing the whole of the thermoplastic resin (3) when the thermoplastic resin (3) has not been mixed at step (III) and

(VI) a step of removing the remainder of the organic agent (B) from the mixture obtained at step (V) when a part of the organic agent (B) has been removed at step (IV).

4,992,511

CYCLO-OLEFINIC RANDOM COPOLYMER COMPOSITION AND REACTION PRODUCT THEREOF

Yohzoh Yamamoto, and Satoru Moriya, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,695

Claims priority, application Japan, Sep. 30, 1988, 63-246559

Int. Cl.[5] C08L *23/08, 23/26, 45/00, 53/02*

U.S. Cl. 525—97 24 Claims

1. A polymer composition comprising

(A) 100 parts by weight of a cyclo-olefinic random copolymer comprising an ethylene component and a cyclo-olefin component and having an intrinsic viscosity, measured in decalin at 135° C., of 0.05 to 10 dl/g, a glass transition temperature (Tg) of 50° to 230° C., and a softening point of at least 70° C.,

(B) 5 to 150 parts by weight of at least one flexible polymer having a glass transition temperature of not more than 0° C. selected from the group consisting of

(a) a flexible cyclo-olefinic random copolymer comprising an ethylene component, a cyclo-olefin component and an alpha-olefin component having 3 to 20 carbon atoms,

(b) an amorphous or low-crystalline flexible olefinic copolymer comprising at least two components selected from the group consisting of an ethylene component and alpha-olefin components having 3 to 20 carbon atoms,

(c) a flexible olefin/nonconjugated diene copolymer comprising a nonconjugated diene component and at least two components selected from the group consisting of an ethylene component and alpha-olefin components having 3 to 20 carbon atoms, and

(d) a flexible aromatic vinyl copolymer selected from the group consisting of random copolymers and block copolymers each comprising an aromatic vinyl hydrocarbon component and a conjugated diene component, and hydrogenation products of these copolymers, and

(C) 0.004 to 1.0 part by weight of an organic peroxide.

4,992,512

POLYMER ALLOYS

Brian J. Ward, Easton; David A. Williams, Ganesevoort, and Paul R. Willey, Clifton Park, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Sep. 20, 1989, Ser. No. 412,246

Int. Cl.[5] C08L *83/00*

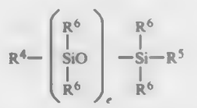
U.S. Cl. 525—100 7 Claims

1. An alloy composition comprising:

A. a silicone or organic polymer reactive with an unsaturated radical, the silicone or organic polymer having functional groups selected from the group consisting of vinyl, hydride, and epoxy groups; the silicone polymer being selected from the group consisting of silicone heat cured rubber, liquid injectable moldable silicon rubber, and fluorosilicone rubbers; and the organic polymer being selected from the group consisting of natural rubber, EPDM, nitrile rubber, chloroprene, SBR, butadiene rubber, isoprene, butyl rubber, and epoxy functional acrylates;

B. a silicone or organic polymer that is not reactive with an unsaturated radical, the silicone or organic polymer having condensable functional groups selected from the group consisting of hydroxy, alkoxy, carboxy, ester, amide, and halogen groups; the organic polymer being selected from the group consisting of epichlorohydrin, polyacrylates, polymethacrylates, chlorinated polyethylene, chlorosulfonated polyethylene, and halogenated butyl rubber; the silicone polymer being a silanol or an alkoxy terminated polysiloxane; and

C. a compatibilizer represented by the formula:



wherein R^4 is an ethylenically unsaturated radical; R^5 is a condensable functional group that is reactive with component (B) but is not reactive with component (A) and is selected from the class consisting of halogens, hydroxy, $C_{1\text{-}10}$ alkoxy, amine, $C_{1\text{-}10}$ alkylamine, mercaptan, and $C_{1\text{-}10}$ alkylmercaptan; R^6 is $C_{1\text{-}12}$ alkyl or $C_{1\text{-}12}$ aryl radical; "e" ranges from 0 to about 1000.

4,992,513

HIGH MODULUS RUBBER COMPOSITION

Richard G. Bauer, Kent; James B. Pyke, and Martin P. Cohen, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 9, 1988, Ser. No. 242,099

Int. Cl.[5] C08L *7/00, 9/00, 9/06, 51/04*

U.S. Cl. 525—184 23 Claims

1. A process for preparing a rubber composition having a high modulus which comprises reacting at least one epoxidized rubber which is derived from a conjugated diene monomer and/or a nonconjugated diene monomer with from about 2 phr to about 55 phr of at least one nylon at a temperature which is within the range of about 140° C. to about 300° C.

23. A process for preparing a rubber modified nylon composition which comprises reacting at least one epoxidized rubber which is derived from a conjugated diene monomer and/or a nonconjugated diene monomer with from about 100 phr to about 5000 phr of at least one nylon at a temperature which is within the range of about 140° C. to about 300° C.

4,992,514

PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES

Hans-Joachim Schultze, Chur, and Hanns-Joerg Liedloff, Domat, both of Switzerland, assignors to EMS-Inventa AG, Switzerland

Filed Sep. 30, 1988, Ser. No. 252,056

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734645

Int. Cl.[5] C08L *77/00;* C08J *5/00;* C08G *69/48*

U.S. Cl. 525—425 13 Claims

1. A process for the production of shaped articles from mixtures of at least 50% by weight of at least one polyamide, having a melting point and a glass transition temperature, and at least one thermotropic liquid crystalline polymer, having a glass transition temperature, and which forms an optically anisotropic melt above 200° C., said process comprising

forming a preform, deforming said preform at a transformation temperature below the melting point and above the glass transition temperature of said polyamide.

4,992,515

NYLON TERPOLYMER CROSSLINKED WITH MELAMINE FORMALDEHYDE FOR COATING SEWING THREADS

Larry Ballard, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed Jan. 9, 1990, Ser. No. 462,630

Int. Cl.[5] C08L *61/20, 77/00;* C08F *283/00;* C08G *8/28*

U.S. Cl. 525—428 6 Claims

1. A cross-linkable nylon coating solution composition for sewing threads comprising:

a nylon terpolymer;

from about 1 to 20 percent by weight of a melamine formaldehyde resin, based upon the weight of said terpolymer;

said resin containing less than about 0.1 percent by weight of formaldehyde based upon the weight of said resin;

from about 0.1 to 10 percent by weight of a catalyst for said melamine formaldehyde resin, based upon the weight thereof; and

a suitable solvent for said terpolymer in an amount sufficient to form at least a 5 percent solution by weight of said terpolymer.

4,992,516

MODIFIED EPOXY RESIN/AMINE ADDUCT BY REACTING POLYAMINE/MONOEPOXIDE MODIFIER, POLYEPOXY RESINS AND AMINES

Rudolf Schipfer; Gerhard Schmölzer, both of Graz; Günther Monschein, Kalsdorf, and Gerhard Meglitsch, Graz, all of Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

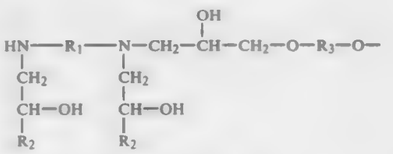
Filed Aug. 18, 1989, Ser. No. 395,514

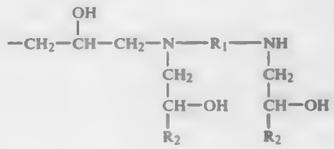
Claims priority, application Austria, Aug. 18, 1988, 2046/88

Int. Cl.[5] C08G *59/50, 59/64*

U.S. Cl. 525—526 4 Claims

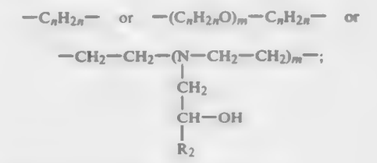
1. Cathodically depositable paint binders based on modified epoxy resins/amine adducts wherein said binders contain 5% to 30% by weight, based on the modified epoxy resin/amine adduct, of a modifier of general formula



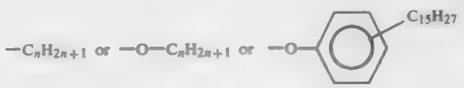


wherein

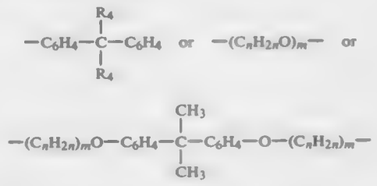
R_1 represents the same or different groups



R_2 represents the same or different groups



R_3 represents the group



R_4 represents a hydrogen atom or a methyl group, n and m are integers between 2 and 8 but, in the case of R_2, n is an integer between 8 and 20, and

which has been reacted with at least 2 mol of polyepoxy resins at least one member selected from the group consisting of a primary alkylamine, secondary dialkylamine, primary alkanol-

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amine and a secondary dialkanolamine; and a primary-tertiary alkyldiamine to form an epoxy resin/amine adduct which is free from epoxide groups, waterdilutable after neutralization with acids and has a molecular weight of 4,000 to 16,000, by the weight method, or 1,500 to 3,000, by the counting method, a glass transition temperature of +20° C. to +45° C., and an amine number of at least 20 mg KOH/g.

4,992,517

PROCESS FOR PRODUCTION OF COPOLYMERS OF MALEIC ANHYDRIDE AND AN ALKYL VINYL ETHER IN A STERICALLY HINDERED MONOETHER SOLVENT

Mohammed Tazi, Wayne, N.J., and Harold J. Harwood, Stow, Ohio, assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Apr. 19, 1989, Ser. No. 340,182
Int. Cl.[5] C08F 2/12
U.S. Cl. 526—209 3 Claims

1. A slurry polymerization process for making copolymers of maleic anhydride and a C_1–C_8 alkyl vinyl ether which comprises:

(A) precharging a reactor with a solution of maleic anhydride in methyl t-butylmonoether solvent,

(b) feeding a C_1–C_8 alkyl vinyl ether thereto, in a molar excess of about 10% or less with respect to maleic anhydride, to form a reaction mixture having about 20% by weight monomer solids, or less,

(c) polymerizing the reaction mixture in the presence of a free radical initiator at about 50° –90° C. to form a pumpable slurry of the copolymer product,

(d) pumping the product from the reactor, and

(e) recovering the copolymer product as a fine, white powder having a specific viscosity of about 2.1 or less as a 1% solution in 2-butanone and a solvent level of less than 0.5%.

4,992,518

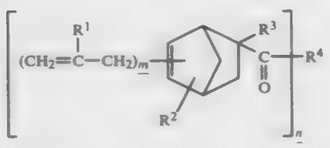
POLYMERS OBTAINED BY HEATING ALLYBICYCLO[2.2.1]HEPT-5-ENE-2-CARBOXYLIC ACID AMIDES FOR BETWEEN 6 AND 60 HOURS AT 150°–300° C.

Andreas Kramer, Düdingen, and Roland Darms, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 939,216, Dec. 8, 1986, Pat. No. 4,861,885. This application May 15, 1987, Ser. No. 351,689
Claims priority, application Switzerland, Dec. 16, 1985, 5340/85
Int. Cl.[5] C09B 36/02, 122/38
U.S. Cl. 526—282 7 Claims

1. A polymer which is obtained by heating a compound of formula (1) for between 6 and 60 hours at a temperature of from 150°–300° C.

(I)



wherein

each of R^1, R^2 and R^3, independently of the other, is hydrogen or methyl;

m is an integer from 1 to 5;

n is an integer from 2 to 5; and

R^4 is the radical of an aliphatic, cycloaliphatic, aromatic, araliphatic, or heterocyclic polyamine having n primary or secondary amino groups, each of said n primary or secondary amino groups, after removal of a single active hydrogen atom, being bound to one of the depicted n carbonyl groups to form a carboxamido group.

4,992,519

BINDER COMPOSITION WITH LOW FORMALDEHYDE EMISSION AND PROCESS FOR ITS PREPARATION

Subhankar Mukherjee, San Paulo, Brazil, assignor to Borden, Inc., Columbus, Ohio

Filed Feb. 1, 1989, Ser. No. 304,967
Int. Cl.[5] B32B 5/00; B27N 3/00; C08J 5/00; C08L 3/00
U.S. Cl. 527—300 12 Claims

1. A binder for use in production of particle board and plywood with low formaldehyde emission which consists essentially of a polymer formed by the reaction of an acidified starch hydrolyzate, urea and formaldehyde, wherein the starch hydrolyzate comprises from about 3% to about 40% by weight of the polymer on a dry solids basis and wherein the molar ratio of urea to formaldehyde in the polymer is from about 1:1 to about 1:1.5.

4,992,520

METHOD FOR PREPARATION OF POLYSILANES

John M. Zeigler, 2208 Lester Dr., NE, Albuquerque, N. Mex. 87112

Continuation-in-part of Ser. No. 851,713, Apr. 14, 1986, abandoned, and a continuation-in-part of Ser. No. 327,195, Oct. 14, 1988. This application Nov. 7, 1989, Ser. No. 432,674
Int. Cl.[5] C08G 77/00
U.S. Cl. 528—10 21 Claims

1. In a process for preparing a soluble, substantially linear high molecular weight polysilane comprising polymerizing silane monomers on a solid surface-reacting agent in a reaction medium, the improvement wherein the reaction medium is chain-transferring to a degree less than the degree of chain transfer caused by a medium whose sole pathway of chain transfer is H abstraction from unactivated alkane methylene groups, and the solid surface-reacting agent is an alloy of sodium and a second metal other than sodium, whereby there is prepared a soluble, substantially linear polysilane having a molecular weight greater than 30,000.

4,992,521

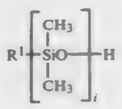
ORGANOSILOXANE AND PROCESS FOR PREPARING THE SAME

Takahiro Saho; Yoshinori Akutsu; Takaharu Nakano, and Nobumasa Ohtake, all of Yokohama, Japan, assignors to Chisso Corporation, Japan

Filed Apr. 21, 1989, Ser. No. 341,225
Claims priority, application Japan, Apr. 22, 1988, 63-99686
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—14 15 Claims

1. A siloxane compound represented by the general formula (I)

(I)



wherein i is an integer of 4 to 2000, and R^1 is a pentafluorophenyl group or a substituent which is a straight-chain or a branched fluoroalkyl group represented by the formula (II)

$$C_aH_bF_{2a-b+1} \quad \text{(II)}$$

wherein a is an integer of 3 to 18, and b is an integer of 0 to 2a.

4,992,522

POLYMER COMPATIBILIZERS

David A. Williams, Gansevoort; Paul R. Willey, Clifton Park, and Brian J. Ward, Easton, all of N.Y., assignors to General Electric Co., Waterford, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,247
Int. Cl.[5] C08G 77/20
U.S. Cl. 528—32 8 Claims

1. A compatibilizer comprised of a linear molecule represented by the general formula:



wherein R^3 is C_{2-12} alkenyl; R^4 is a C_{1-10} alkylamine; R^5 is selected from the class consisting of hydrogen and C_{1-12} alkyl; —(R_2^5Y)— is a difunctional siloxane group or a difunctional alkylene or oxyalkylene group, and "c" a number from 1 to about 100.

4,992,523

COPOLYMERS CONTAINING SI-N AND SI-SI BONDS, POLYCARBOSILAZANES OBTAINED BY PYROLYSIS OF THE SAID COPOLYMERS, AND USE OF THE SAID POLYCARBOSILAZANES FOR THE PREPARATION OF SILICON CARBONITRIDE

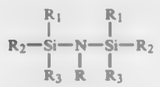
Eric Bacque, Talence; Jean-Paul Pillot, Cestas; Jacques Dunogues, Talence, and Pierre Olry, Bordeaux, all of France, assignors to Societe Europeenne De Propulsion, Suresnes, France

Filed Jun. 9, 1988, Ser. No. 204,677
Claims priority, application France, Jun. 10, 1987, 87 08091
Int. Cl.[5] C08G 77/26
U.S. Cl. 528—034 9 Claims

1. Copolymers containing —Si—N— and —Si—Si— bonds, and having in their main chains —Si—Si—N— sequences, —Si—Si—$_n$ sequences, and —Si—(Si)$_n$—Si—N— sequences wherein n≧1, said copolymers being obtained by the polycondensation of

(a) at least one silane, at least one disilane, or a mixture of said disilanes; and silane having the formula RR_1SiCl_2; and said disilane having the formula Cl_xSiMe_{3-x}—$SiMe_{3-y}Cl_7$ in which $1 \leqq x \leqq 3$ and $1 \leqq y \leqq 3$; and

(b) at least one disilazane of the formula



in which formulae:

R_2 is a halogen atom, and

R, R_1 and R_3, which are identical or different, are selected from the group consisting of a hydrogen atom, and alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkylaryl, and alkenylaryl hydrocarbon radicals.

4,992,524

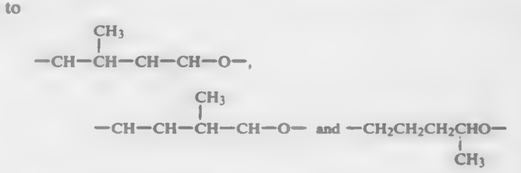
COMPOSITION FOR OPTICAL FIBER COATING COMPRISING A POLYETHER DIOL, A POLYISOCYANATE, AND A METHACRYLATE

Clive J. Coady, Des Plaines; Donald W. Fieder, Palatine, both of Ill.; Kazuaki Okabe; Katsutoshi Igarashi, both of Yokohama, and Yoshio Matsumura, Yamato, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd.; Hodogaya Chemical Co., Ltd., both of, Japan and DeSoto, Inc., Naperville, Ill.

Continuation of Ser. No. 223,098, Jul. 22, 1988, abandoned. This application Jan. 23, 1990, Ser. No. 471,661
Claims priority, application Japan, Oct. 20, 1987, 62-265197
Int. Cl.[5] C08G 18/67, 18/66
U.S. Cl. 528—49 17 Claims

1. A radiation-curable coating composition adapted for the coating of optical glass fiber, comprising an ethylenically unsaturated polyurethane which is the reaction product of compounds comprising:

(A) a polyether diol having a molecular weight in the range of 200 to 8,000 and a structural unit represented by at least one of:



(B) a polyisocyanate compound; and

(C) a polymerizable (meth)acrylate having a single hydroxy group; there being employed per equivalent of hydroxy in component (A) from 1.1 to 2 equivalents of isocyanate groups in said polyisocyanate.

4,992,525

DIESTER OF PHOSPHORIC ACID AND MONOEPOXIDE REACTED WITH EPOXIDE TO FORM PRODUCT REACTED WITH MONOISOCYANATE

Ingo Kriessmann, and Willibald Paar, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Apr. 28, 1988, Ser. No. 187,427
Claims priority, application Austria, Apr. 28, 1987, 1049/87
Int. Cl.[5] C08G 59/14, 63/66, 18/58, 79/04
U.S. Cl. 528—103 12 Claims

1. Process for producing cationic resins, water-dilutable upon protonation, based on phosphoric acid modified epoxy resins, characterized in that

(A1) 1 mole ortho-phosphoric acid is reacted with 2 moles of a monoepoxy compound, or

(A2) 1 mole of a polyphosphoric acid with n phosphorus atoms is reacted with n−1 moles of a monoalcohol with at least 4 carbon atoms and, subsequently, with n+1 moles of a monoepoxy compound, and

(B) the diesters obtained in A1 or A2 are reacted at about 60° C. to 130° C. with at least one oxirane group of a mono- or polyepoxy compound to an acid value of below 5 mg KOH/g; and

(c) any oxirane groups present after (B) above are further reacted with primary or secondary amines or with tertiary amine-acid blends or the hydroxyl groups present after (B) are reacted with basic or unsaturated monoisocyanates to provide a phosphoric acid modified epoxy resin which is, upon protonation, diluted with water.

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4,992,526

PREPARATION OF POLYARYLATE POLYMERS OF HYDROXYARYL-SUBSTITUTED 1,6-DIAZA [4.4] SPIRODILACTAMS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1989, Ser. No. 454,245
Int. Cl.[5] C08G *63/02*
U.S. Cl. 528—179 **40 Claims**

1. An interfacial polymerization process for preparing high molecular weight polyarylates which comprises reacting under interfacial polyarylate-forming conditions, (a) a hydroxyaryl-substituted [4.4] spirodilactam having the spiro ring nitrogen atoms at the 1l- and 6-positions of the spirodilactam ring having a hydroxyaryl substituent on each of said spiro ring nitrogen atoms with (b) an aromatic diacid halide with or without, (c) a di(hydroxyphenyl) compound, in the presence of an aqueous caustic solution containing an alkali or alkaline earth metal hydroxide, an inert water immisible organic solvent, which substantially dissolves the organic reactants and the polyarylate, and deemulsifying agent which does not substantially dissolve the polyarylate.

4,992,527

POLYAMIDE, POLYIMIDE, AND POLYAMIDE-IMIDE POLYMERS OF DIAMINO-T-BUTYLBENZENE

David J. Fenoglio, Wheaton; Douglas E. Fjare, Naperville; John L. Melquist, Naperville; Edwin F. Morello, Naperville, and Neal R. Nowicki, St. Charles, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 277,756, Nov. 30, 1988, which is a continuation-in-part of Ser. No. 212,510, Jun. 28, 1988, Pat. No. 4,946,934. This application Jul. 23, 1990, Ser. No. 557,185
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—350 **5 Claims**

1. A resinous condensation polymer of a tricarboxylic acid compound and a aromatic diprimary amine comprising a diamino-t-butylbenzene.

4,992,528

LIGHT WEIGHT POLYMER MATRIX COMPOSITE MATERIAL

Kenneth J. Bowles, Lakewood, and Carl E. Lowell, North Olmsted, both of Ohio, assignors to The United States of America, as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 5, 1988, Ser. No. 279,624
Int. Cl.[5] C08K *3/36*
U.S. Cl. 528—481 **5 Claims**

1. A method of altering the properties of a fully cured polyimide matrix composite having a glass transition temperature comprising the steps of

placing said composite in an inert atmosphere at ambient pressure,

heating said composite to a temperature higher than the glass transition temperature of said composite whereby said composite loses weight, and

maintaining said composite at said temperature in said inert atmosphere until said weight loss is substantially completed.

4,992,529

METHOD FOR SEPARATING METAL CONTAMINANTS FROM ORGANIC POLYMERS

Ronald J. Hoxmeier, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 29, 1987, Ser. No. 113,976
Int. Cl.[5] C08F *6/08, 6/24*
U.S. Cl. 528—486 **13 Claims**

1. A method for separating metals from a polymer comprising the steps of:

(a) contacting a solution or suspension of a polymer and metals introduced as a hydrogenation catalyst in an organic media with an oxidizing agent;

(b) contacting said solution or suspension of said polymer and said metals with an aqueous solution of an inorganic acid in the presence of a monocarboxylic acid having from about 6 to about 20 carbon atoms; and

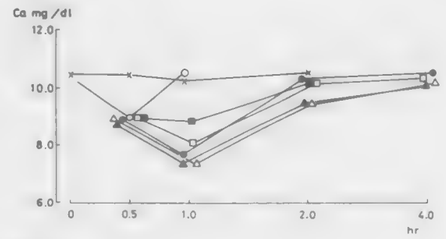
(c) recovering a polymer product having a reduced amount of metal therein.

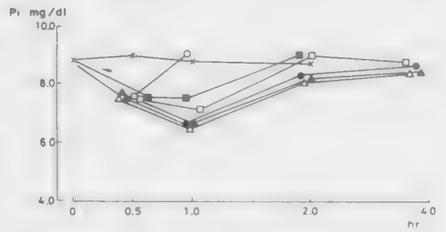
4,992,530

CALCITONIN-GENE-RELATED PEPTIDE DERIVATIVES

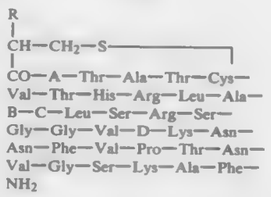
Kaoru Morita; Toyonobu Uzawa; Masayuki Hori, and Toshiharu Noda, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 21, 1988, Ser. No. 222,761
Claims priority, application Japan, Jul. 22, 1987, 62-182891
Int. Cl.[5] C07K *5/00;* **A61K** *37/02*
U.S. Cl. 530—307 **1 Claim**





1. A compound of the formula



wherein R is H or H—Ala—NH— and when A is Asp, B is Asp or Glu, C is Leu and D is Val: when A is Asn and B is Gly, C is Phe and D is Gly: when A is Asn, B is Asp or Glu and C is Leu, D is Gly: and when A is Asn, B is Asp or Glu, and C is Phe, D is Val, or a pharmaceutically acceptable salt thereof.

4,992,531

PRODUCTION OF PROTEINS IN ACTIVE FORMS

Joseph J. Patroni, West Preston, and Malcolm R. Brandon, Ivanhoe, both of Australia, assignors to Bunge (Australia) Pty. Ltd., Melbourne, Australia

Filed Jun. 13, 1988, Ser. No. 206,006
Claims priority, application Australia, Jun. 15, 1987, PI2472
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] C07K *3/12, 3/28, 15/08, 15/26*
U.S. Cl. 530—351 **6 Claims**

1. A method for the recovery of protein in a solubilized form from host cells comprising:

providing a source of host cells incorporating an insoluble synthesized or expressed protein;

providing a source of at least one cationic surfactant; and

treating the host cells with said at least one cationic surfactant in an amount sufficient to effect lysis of the host cell and subsequent solubilization of the insoluble protein to form a solubilized protein, wherein said cationic surfactant includes a cation selected from the group consisting of cetyl trimethylammonium cations, cetyl pyridinium cations, tetradecyl trimethylammonium cations, dodecyl trimethylammonium cations, mixed n-alkyl dimethyl benzyl ammonium cations and N,N-dimethyl-N-[2-[2-[4-(1,1,3,3,-tetramethylbutyl)phenoxy]ethoxy]ethyl]benzenemethanaminium cations.

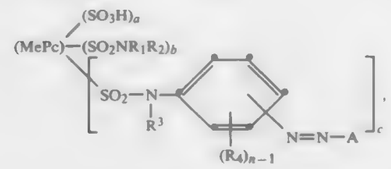
4,992,532

WATER-SOLUBLE PHTHALOCYANINE COMPOUNDS, PREPARATION AND USE THEREOF

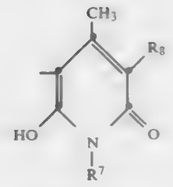
Rudolf Schaulin, Wohnsitz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 3, 1989, Ser. No. 346,688
Claims priority, application Switzerland, Nov. 5, 1988, 1786/88
Int. Cl.[5] C09B *47/04*
U.S. Cl. 534—702 **11 Claims**

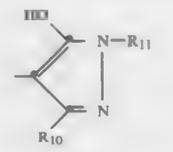
1. A compound of the formula



where R_1 and R_2 are identical to or different from one another and are each hydrogen, hydroxyalkyl of 2 or 3 carbon atoms, carboxyalkyl of 1 to 3 carbon atoms in the alkyl moiety or phenyl; or R_1 and R_2, together with the nitrogen atoms, form a heterocyclic ring with or without further hetero atoms; R_3 is hydrogen or methyl; R_4 is hydrogen, alkyl or alkoxy each of 1 to 5 carbon atoms, —$NHCOR_6$, where R_6 is alkyl or hydroxyalkyl each of 1 to 3 carbon atoms or substituted or unsubstituted phenyl, or sulfo; Me is a coordinatively bonded metal atom; Pc is an (a+b+c) valent phthalocyanine radical; n is from 1 to 3; A is a monosubstituted phenyl radical, a naphthyl radical or a heterocyclic radical, A is phenyl which is monosubstituted by C_1–C_5alkyl, C_1–C_5alkoxy, hydroxyl, carboxyl or sulfo; naphthyl which is unsubstituted or substituted by C_1–C_5alkyl, C_1–C_5alkoxy, hydroxyl, carboxyl or sulfo; a hydroxypyridonyl radical of the formula



wherein R_7 is C_1–C_4alkyl and R_8 is —CN, —$CONH_2$ or —CH_2SO_3H; or a pyrazol-5-one radical of the formula



wherein R_{10} is —COOH, methyl or ethyl and R_{11} is unsubstituted or sulfo substituted 1- or 2-naphthyl or unsubstituted of C_1–C_3alkyl-, C_1–C_3alkoxy-, chlorine-, sulfo-, methylsufonyl-, hydroxyl- or carboxyl-substituted phenyl; a is from 1 to 1.5; b is from 0.5 to 1.5; c is from 1 to 2 and the sum of (a+b+c)is from 2.5 to 4. (a+b+c) is from 2.5

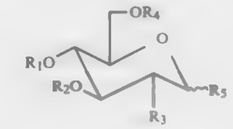
4,992,533

SULFATED OLIGOSACCHARIDES AND DERIVATIVES THEREOF

Masanori Kobayashi; Mamoru Sugimoto; Kenkichi Tomita; Yukishige Ito, all of Tokyo, and Tomoya Ogawa, Musashino, all of Japan, assignors to Rikagaku Kenkyusho, Saitama and Mect Corporation, Tokyo, both of, Japan

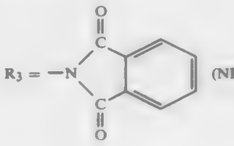
Filed Sep. 27, 1989, Ser. No. 413,441
Claims priority, application Japan, Sep. 29, 1988, 63-245748
Int. Cl.[5] C07G *3/00;* **C07H** *17/00, 19/00;* **C08B** *37/00*
U.S. Cl. 536—4.1 **2 Claims**

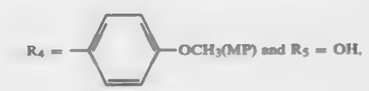
1. Sulfated oligosaccharides or their derivatives having the following formula:



wherein

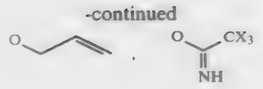
(1) $R_1=R_2=C_6H_5CH_2$ (Bn),



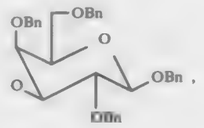


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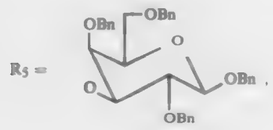
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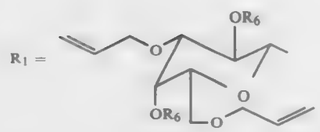
(wherein X=a halogen atom) or



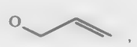
(2) $R_1=R_2=Bn$, $R_3=NHAc$ (Ac=an acetyl group), $R_4=H$, MP or SO_3M (wherein M=an alkali metal) and



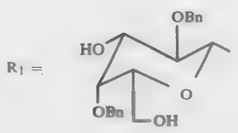
(3)



(wherein R_6=Ac, Bn or H), R_2=Bn, R_3=NPhth, R_4=MP and R_5=

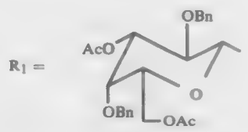


(4)



R_2=Bn, R_3=NPhth, R_4=MP and R_5=OH.

(5)

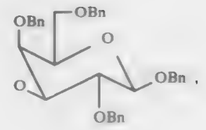


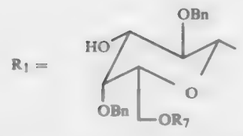
R_2=Bn, R_3=NPhth, R_4=MP and R_5=OAc, OH,



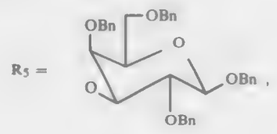
(X is a halogen atom) or

(6)

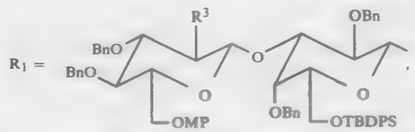




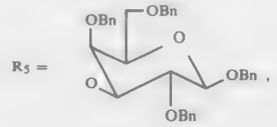
[wherein R_7=H or t-Bu(C_6H_5)$_2$Si-(TBDPS)] R_2=Bn, R_3=NPhth, R_4=MP and



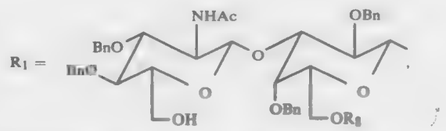
(7)



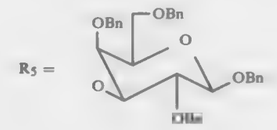
R_2=Bn, R_3=NPhth or NHAc, R_4=MP and



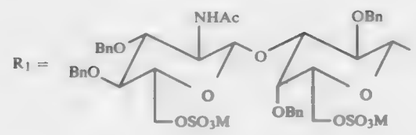
(8)



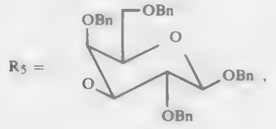
(wherein R_8=H or TBDPS), R_2=Bn, R_3=NHAc, R_4=H and



(9)

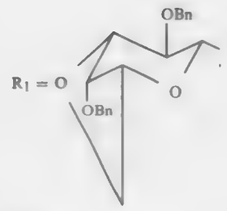


(wherein M=an alkali metal), R_2=Bn, R_3=NHAc, $R_4=SO_3M$ and

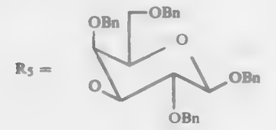


and

(10)



R_2=Bn, R_3=NPhth, R_4=MP and



4,992,534

3'-O-,5'-O-DERIVATIVES OF 2'-DEOXY-5-FLUOROURIDINE

Setsuro Fujii, Kyoto; Mitsuru Hirohashi, Ootsu; Yoshihito Yamamoto, Ootsu, and Yutaka Kojima, Ootsu, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

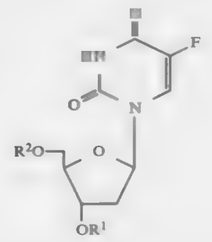
Filed Aug. 10, 1988, Ser. No. 230,557

Claims priority, application Japan, Aug. 12, 1987, 62-202316; Oct. 29, 1987, 62-274367

Int. Cl.[5] **A61K** *31/70*

U.S. Cl. 514—50 **4 Claims**

1. A 2'-deoxy-5fluorouridine compound of the formula



wherein:

R^1 is a furanylmethyl or thienylmethyl group which may be substituted by 1 to 3 halogen atoms on the furan or thiophene ring; and

R^2 is a lower alkanoyl group which may be substituted by one $—NH_2$ group; or a salt thereof.

4,992,535

METHODS OF MAKING NOVEL R AND S DIASTEREOMERS OF N^6-[(2-HYDROXYPROPYL)ARYL]ADENOSINES

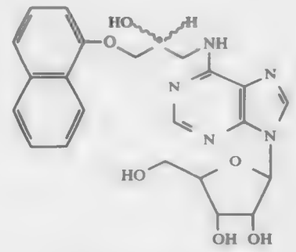
Valery Libert, Groot-Bijgaarden; Freddy Napora, Gembloux, and Zoubida Bounkhala, Wavre, all of Belgium, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Oct. 26, 1988, Ser. No. 262,859

Int. Cl.[5] **A61K** *31/70; C07H 19/67*

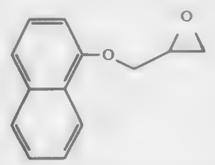
U.S. Cl. 536—26 **3 Claims**

1. A stereoselective method of making chiral compounds of the general formula;

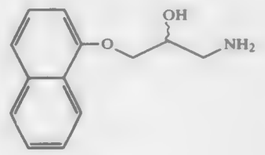


wherein * denotes the presence of a chiral carbon atom, comprising the steps of:

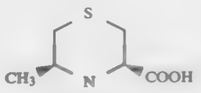
(a) aminating a compound of the formula;



in the presence of an methanol/ammonia solution at a temperature ≦30° C. to yield a compound of the formula;

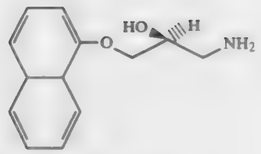


(b) reacting the product of (a) with

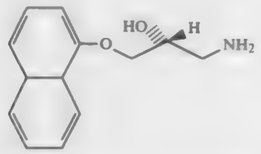


in the presence of ethanol under reflux conditions to yield, respectively, a compound of the formula;

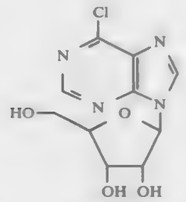
VOL 1123 ISS 2 FE 12 1991 UMI



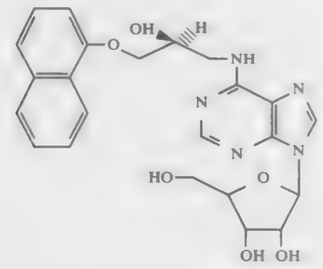
or a compound of the formula;



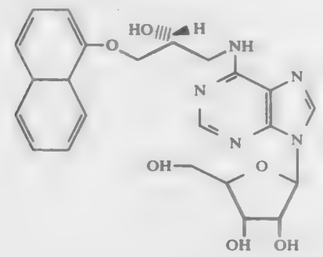
(c) reacting the desired product of (b) with a compound of the formula;



in the presence of the methanol and triethylamine under reflux conditions to yield, respectively, a compound of the formula:



or a compound of the formula;



4,992,536

PREPARATION OF POLYCATIONIC POLYSACCHARIDES BY SITE SELECTIVE REACTION

Robert L. Billmers, Stockton; Daniel B. Solarek, Bridgewater, and Ralph M. Trksak, Manville, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Oct. 31, 1989, Ser. No. 429,444
Int. Cl.[5] C08B *37/00*
U.S. Cl. 536—55.1 8 Claims

1. A polycationic polysaccharide derivative containing more than one cationic substituent per substituted hydroxyl group, which is prepared by a site selective reaction of a cationic polysaccharide ether derivative with a cationic reagent at a pH from 7.0 to 9.0.

4. A site selective reaction for the preparation of a polycationic polysaccharide derivative containing more than one cationic substituent per substituted hydroxyl group, comprising the steps:

(a) reacting a polysaccharide with a cationic etherifying reagent at a PH from 9.0 to 12.5 to form a cationic polysaccharide derivative;

(b) lowering the pH to 7.0 to 9.0; and

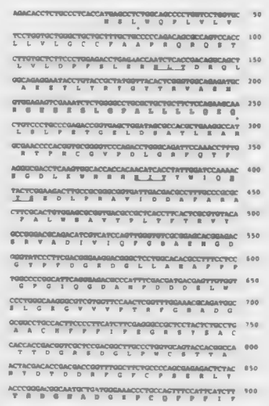
(c) reacting the cationic polysaccharide derivative with a cationic reagent which reagent selectively reacts with a cationic substituent group rather than a hydroxyl group of the cationic polysaccharide derivative.

4,992,537

CDNA ENCODING 92-KDA TYPE IV COLLAGENASE

Gregory I. Goldberg, and Arthur Z. Eisen, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Filed May 15, 1989, Ser. No. 352,078
Int. Cl.[5] C12N *15/00*
U.S. Cl. 536—27 1 Claim



1. The isolated cDNA comprising the 2335 base pair nucleotide sequence shown in FIG. 3 which encodes a 92-kDA type IV collagenase.

4,992,538

SILATED POLYSACCHARIDES

Arjun C. Sau, Newark, Del., assignor to Aqualon Company, Wilmington, Del.

Filed Jun. 5, 1989, Ser. No. 361,854
Int. Cl.[5] C08B *11/02, 11/16, 11/193;* C01B *33/04*
U.S. Cl. 536—84 8 Claims

1. An organosilyl modified cellulose ether with a hydrolytically stable silyl group covalently bonded to the modified cellulose ether wherein the number of silyl groups per anhydrosaccharide unit ranges from 0.005 to 2.0.

4,992,539

HIGH-VISCOSITY COLD-WATER-SWELLABLE GRANULAR STARCH

Norman A. Portnoy, and James E. Eastman, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Mar. 24, 1988, Ser. No. 173,333
Int. Cl.[5] C07H *15/04;* C07G *17/00*
U.S. Cl. 536—120 9 Claims

1. A method of preparing a granular cold-water-swelling starch having improved clarity in aqueous solution or dispersion comprising:

(a) contacting a granular starch with aqueous alcohol for a time and at a temperature sufficient to increase the ability of said starch to swell in water, wherein insufficient water is present in said aqueous alcohol to gelatinize said granular starch;

(b) etherifying said contacted granular starch in an alkaline aqueous slurry with an α-halocarboxylic acid or salt thereof wherein insufficient water is present in said aqueous alcohol to gelatinize said granular starch; and

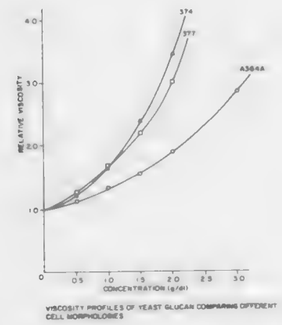
(c) isolating said etherified granular starch from said slurry under conditions which inhibit crosslinking thereof.

4,992,540

GLUCAN COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Spiros Jamas; ChoKyun Rha, and Anthony J. Sinskey, all of Boston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 675,927, Nov. 28, 1984, Pat. No. 4,810,646. This application Jan. 17, 1989, Ser. No. 297,982
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] C08B *37/00;* C12N *1/18;* C12P *19/04*
U.S. Cl. 536—123 25 Claims



VISCOSITY PROFILES OF YEAST GLUCAN COMPARING DIFFERENT CELL MORPHOLOGIES

1. Whole glucan particles isolated from glucan-containing cell walls and substantially retaining the in vivo glucan morphology.

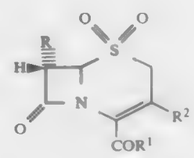
4,992,541

PROCESS FOR THE PREPARATION OF 1,1-DIOXO-7-SUBSTITUTED CEPHEMS

Thomas J. Blacklock, Clark, N.J.; John W. Butcher, Telford, Pa.; Paul Sohar, Warren, N.J., and Theresa Lamanec, Fajardo, P.R., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 1, 1989, Ser. No. 388,191
Int. Cl.[5] C07D *501/04;* A61K *31/545*
U.S. Cl. 540—221 6 Claims

1. A process for the preparation of a compound of the formula (I)



(I)

wherein:

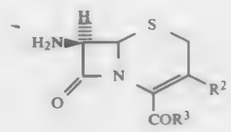
R is
(1) C_{1-6} alkoxy,
(2) C_{2-6} alkenyloxy, or
(3) phenoxy;

R^1 is
(1) C_{1-6} alkoxy,
(2) allyloxy,
(3) phenyl-C_{1-6} alkoxy,
(4) C_{1-6} alkoxycarbonyl-C_{1-6} alkoxy,
(5) di(C_{1-6} alkyl)amino,
(6) C_{1-6} alkoxycarbonyl-C_{1-6} alkylamino,
(7) carboxypyrrolinyl,
(8) C_{1-6} alkoxycarbonylpyrrolidinyl, or
(9) allyloxycarbonylpyrrolidinyl;

R^2 is
(1) C_{1-6} alkyl or
(2) C_{1-6} alkylcarbonyloxy-C_{1-6} alkyl;

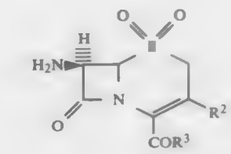
which comprises:

(A) oxidation of a compound of the formula (II)



(II)

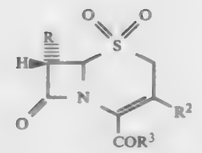
wherein R^3 is C_{1-6} alkoxy, phenyl-C_{1-6} alkoxy, allyloxy, or C_{1-6} alkoxycarbonyl-C_{1-6} alkoxy utilizing aqueous hydrogen peroxide and catalytic sodium tungstate to yield a compound of the formula (III)



(III)

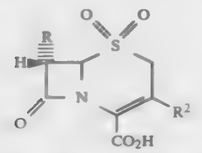
(B) diazotization of the compound of the formula (III) with standard diazotizing reagents and displacement of the diazo moiety with RH to give a compound of the formula (IV)

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(IV)

(C) where R^1 is other than C_{1-6} alkoxy, phenyl-C_{1-6} alkoxy, allyloxy, or C_{1-6} alkoxycarbonyl-C_{1-6} alkoxy, treatment of the compound of the formula (IV) wherein R^3 is t-butoxy with trifluoroacetic acid or wherein R^3 is allyloxy with $(Ph_3P)_4Pd$ and formic acid to afford a compound of the formula (V)



(V)

(D) conversion of the compound of the formula (V) to the corresponding acid halide and condensation with R^1H to result in the compounds of the formula (I).

4,992,542

2-SUBSTITUTED-6-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

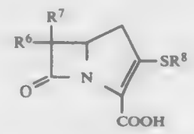
Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 573,527, Jan. 24, 1984, abandoned, which is a continuation of Ser. No. 197,856, Oct. 17, 1980, which is a continuation-in-part of Ser. No. 129,851, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 31,694, Apr. 19, 1979, which is a continuation-in-part of Ser. No. 134,381, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 933,681, Aug. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 843,378, Oct. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 134,604, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 843,375, Oct. 19, 1977, abandoned. This application Feb. 26, 1987, Ser. No. 20,189

Int. Cl.[5] **C07D** *487/04;* **A61K** *31/40*

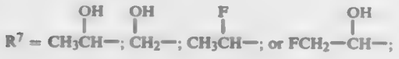
U.S. Cl. 540—350 **2 Claims**

1. A compound having the structural formula:



and pharmaceutically acceptable salt and ester derivatives thereof; wherein

R^6=H; and



and

R^8 is independently selected from the group consisting of:

(a) hydrogen;

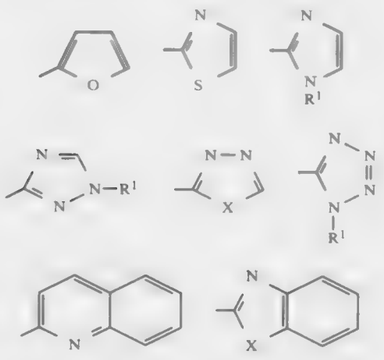
SUBSTITUTED, MONO- AND DI- SUBSTITUTED:

(b) C_1–C_6 alkyl;

(c) C_3–C_6 cycloalkyl;

(d) phenyl, phenyl C_1–C_3 alkyl;

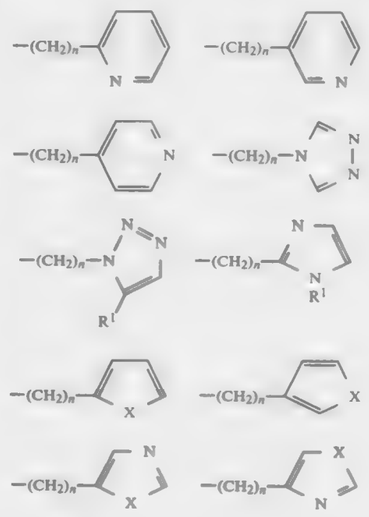
(e) heteroaryl selected from the group consisting of:



wherein:

X=S or NR^1, where R^1 is as defined further below;

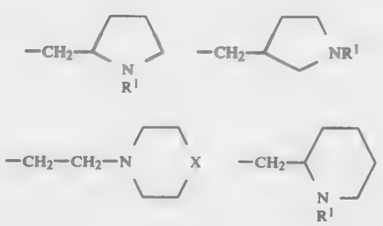
(f) heteroaralkyl selected from the group consisting essentially of:



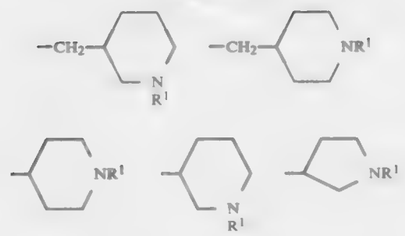
n=1, 2; and

X=O, S, or NR^1, where R^1 is as defined further below;

(g) heterocyclylalkyl selected from the group consisting essentially of:

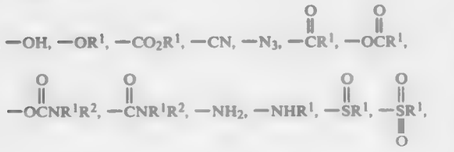


-continued



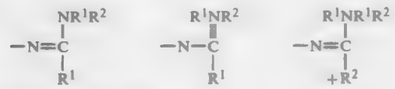
wherein:

X=O or NR^1, where R^1 is as defined further below; wherein the substituent or substituents relative to the above-named radicals are selected from the group consisting of: chloro, bromo, fluoro,

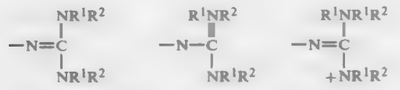


and C_1–C_3 alkyl mono-substituted by any of the above groups;

and amidines of the formula:



or guanidines of the formula:



wherein the dotted line indicates additionally that the substituents may be joined to form a ring; and wherein, R^1 and R^2=H, C_{1-6} alkyl, optionally substituted by OH, NH_2 or by up to three fluoro atoms,

PROVIDED, THAT when R^7 is $CH_3CH(OH)$, R^8 is not $-SCH_2CH_2NH_2$ or N-derivative thereof.

4,992,543

PENEM DERIVATIVES

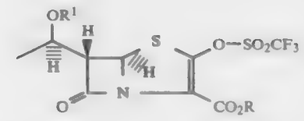
Brian T. O'Neill, and Douglas Phillips, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 260,141, Oct. 19, 1988, Pat. No. 4,895,940. This application Jul. 11, 1989, Ser. No. 378,743

Int. Cl.[5] **C07D** *499/00;* **A61K** *31/43*

U.S. Cl. 540—310 **15 Claims**

1. A compound of the formula



wherein

R is $-CH_2CX{=}CH_2$, $-CH_2CH_2Si(CH_3)_3$, p-nitrobenzyl, or a conventional radical forming an ester which is hydrolyzed under physiological conditions;

X is H or Cl; and

R^1 is a conventional silyl protecting group.

4,992,544

MONOCYCLIC BETA-LACTAMS AND PROCESS FOR THE PREPARATION THEREOF

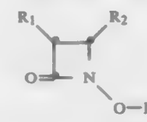
Marvin J. Miller, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Continuation of Ser. No. 612,986, May 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 358,722, Mar. 16, 1982, abandoned. This application Jul. 25, 1986, Ser. No. 890,688

Int. Cl.[5] **C07D** *205/085, 205/08, 205/09, 417/12*

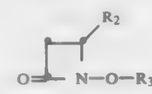
U.S. Cl. 540—355 **16 Claims**

1. A compound of the formula



wherein R_1 is C_1–C_4 alkyl; R_2 is carboxy, protected carboxy, C_1–C_4 alkyl substituted by carboxy, protected carboxy or hydroxy; and R_3 is benzyl, methoxybenzyl, nitrobenzyl, diphenylmethyl or pivaloyl.

2. A compound of the formula



wherein R_2 is carboxy, protected carboxy, C_1–C_4 alkyl substituted by carboxy, protected carboxy, hydroxy, halogen, amino or protected amino; and R_3 is benzyl, C_1–C_4 alkyl, pivaloyl or t-butyloxycarbonylmethyl.

4,992,545

PROCESS FOR PREPARING 4-SUBSTITUTED AZETIDINONES

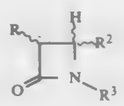
David A. Hall, deceased, Late of Indianapolis, Ind. (by Lillian C. Hall, personal representative); John M. Morin, Jr., Brownsburg; Robert J. Ternansky, Noblesville, both of Ind., and , assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 20, 1989, Ser. No. 410,173

Int. Cl.[5] **C07D** *205/095, 205/085;* **C07B** *37/04, 37/06*

U.S. Cl. 540—359 **19 Claims**

1. A process for preparing compounds of Formula (I)

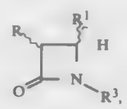


(I)

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wherein R is a protected amino group; hydroxy (C_1–C_4) alkyl, protected hydroxy (C_1–C_4) alkyl, C_2–C_4 alkenyl, C_1–C_4 alkyl or hydrogen; R^2 is C_1–C_{12} alkyl, C_1–C_{12} substituted alkyl, C_2–C_6 alkenyl, C_2–C_6 substituted alkenyl, C_2–C_6 alkynyl, C_2–C_6 substituted alkynyl; and R^3 is an amide-protecting group, C_2–C_6 alkenyl, C_2–C_6 alkynyl, or hydrogen; which comprises

(a) reaction of a compound of Formula (II):



(II)

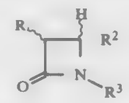
wherein R^1 is triphenylphosphonium, —SO_2R', CN, or



wherein R′ is C_1–C_6 alkyl, phenyl, substituted phenyl, phenyl C_1–C_6 alkyl, or C_1–C_6 substituted alkyl; and R and R^3 have the same meanings as defined for Formula (I); with strong base in the presence of a compound of the formula R^2-L, wherein L is a leaving group; and R^2 has the same meanings as defined for Formula (I); followed by

(b) reduction with a hydride reducing agent or reduction under dissolving metal conditions.

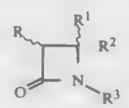
4. A process for preparing compounds of Formula (I)



wherein R is a protected amino group, hydroxy (C_1–C_4)-alkyl, protected hydroxy (C_1–C_4) alkyl, hydrogen, C_2–C_4 alkenyl, or C_1–C_4 alkyl; R^1 is triphenylphosphonium, —SO_2R', CN, or



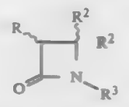
wherein R′ is C_1–C_6 alkyl, phenyl, substituted phenyl, phenyl C_1–C_6 alkyl, or C_1–C_6 substituted alkyl; R^2 is C_1–C_{12} alkyl, C_1–C_{12} substituted alkyl, C_2–C_6 alkenyl, C_2–C_6 substituted alkenyl, C_2–C_6 alkynyl, or C_2–C_6 substituted alkynyl; and R^3 is an amide-protecting group, C_2–C_6 alkenyl, C_2–C_6 alkynyl, or hydrogen which comprises subjecting a compound of Formula (III)



(a) to dissolving metal reduction; or

(b) reduction with a hydride reducing agent.

16. A process for preparing compounds of Formula (III)



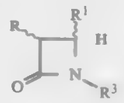
(III)

wherein R is a protected amino group; hydroxy (C_1–C_4) alkyl, protected hydroxy (C_1–C_4) alkyl, C_2–C_4 alkenyl, C_1–C_4 alkyl, or hydrogen; R^1 is triphenylphosphonium, —SO_2R', CN, or



wherein R′ is C_1–C_6 alkyl, phenyl, substituted phenyl, phenyl C_1–C_6 alkyl, or C_1–C_6 substituted alkyl; R^2 is C_1–C_{12} substituted alkyl, C_2–C_6 alkenyl, C_2–C_6 substituted alkenyl, C_2–C_6 alkynyl, C_2–C_6 substituted alkynyl; and R^3 is an amide-protecting group, C_2–C_6 alkenyl, C_2–C_6 alkynyl, or hydrogen which comprises:

reaction of a compound of Formula (II):



with strong base in the presence of a compound of the formula R^2-L, wherein L is a leaving group.

4,992,546

PROCESS FOR PREPARING 6,8-DIAZABICYCLO[3.2.2]NONANE DERIVATIVES

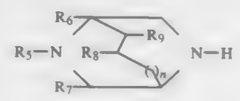
Marland P. Hutt, Jr., Saline, and John S. Kiely, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 452,180, Dec. 18, 1989, Pat. No. 4,968,799, which is a division of Ser. No. 80,113, Jul. 31, 1987, Pat. No. 4,923,879. This application Jun. 4, 1990, Ser. No. 533,259

Int. Cl.[5] C07D *487/08, 241/38*

U.S. Cl. 540—580 **8 Claims**

1. A process for the preparation of a 6,8-diazabicyclo[3.2.2-]nonane, dihydrochloride of the formula



(a)

wherein

n is 0 or 1;

R_5 and R_6 are each independently hydrogen, methyl, ethyl, or benzyl with the proviso that if R_6 is hydrogen, n cannot be 0;

R_7, R_8, and R_9 are each independently hydrogen or methyl, with the proviso that if R_6 is hydrogen and R_9 cannot both be hydrogen; which comprises:

(a) esterifying a 2, 6-diaminoheptanedioic acid to form the corresponding compound 2, 6-diaminoheptanedioic acid dialkyl ester, dihydrochloride,

(b) reacting the above esterified compound with a trialkylamine to form the corresponding compound 6,8-diazabicyclo[3.2.2]nonane-7,9-dione,

(c) reacting the above dione with alkali metal hydride and a substituted or unsubstituted benzyl halide to form 6,8-bis(substituted or unsubstituted benzyl)-6,8-diazabicyclo[3.2.2]nonane-7,9-dione,

(d) reducing the dione formed in step (c) to the corresponding compound 6,8-bis(substituted or unsubstituted benzyl)-6,8-diazabicyclo[3.2.2]nonane, and

(e) debenzylating the above compound by catalytic hydrogenation to form the desired 6,8-diazabicyclo[3.2.2-]nonane hydrochloride, dihydrochloride, or free base.

4,992,547

AMINOARYL KETONE PHOTOINITIATORS

Godwin Berner, Rheinfelden; Kurt Meier, Allschwil; Kurt Dietliker, and Rinaldo Hüsler, both of Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

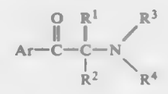
Division of Ser. No. 802,899, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 638,933, Aug. 9, 1984, abandoned. This application Jun. 14, 1988, Ser. No. 207,036

Claims priority, application Switzerland, Aug. 15, 1983, 4430/83; Aug. 29, 1983, 4722/83

Int. Cl.[5] C07C *225/10;* C07D *295/104, 295/116;* C08F *2/50*

U.S. Cl. 544—162 **5 Claims**

1. A compound of formula I



I

in which

Ar is phenyl substituted in the 4-position by di(C_1–C_4-alkyl-)amino or

R^1 and R^2 are independently C_1–C_4-alkyl, and

R^3 and R^4 are each C_1–C_4-alkyl or 2-methoxyethyl, or

R^3 and R^4 together with the N-atom to which they are attached are morpholino.

4,992,548

NEW CATALYSTS, THEIR USE FOR THE PRODUCTION OF ISOCYANURATE POLYISOCYANATES

Hans-Joachim Scholl, and Josef Pedain, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Aug. 8, 1989, Ser. No. 391,213

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827596

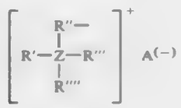
Int. Cl.[5] C07D *251/34*

U.S. Cl. 544—193 **5 Claims**

1. In a process for the preparation of polyisocyanates containing isocyanurate groups by trimerizing a portion of the isocyanate groups of an organic polyisocyanate in the presence of a catalyst, the improvement wherein the catalyst comprises a mixture of

(i) an alkali fluoride with

(ii) a quaternary ammonium or phosphonium salt which corresponds to the formula



wherein

Z represents nitrogen or phosphorus,

R′, R″, R‴ and R⁗ are the same or different and represent alkyl groups containing 1 to 18 carbon atoms, provided that one of the radicals may be an araliphatic radical containing from 7 to 15 carbon atoms and

$A^{(-)}$ represents a chloride or bromide ion.

4,992,549

HERBICIDAL COMPOSITIONS

Werner Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

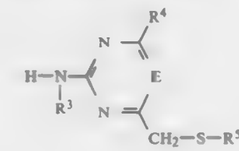
Division of Ser. No. 245,602, Sep. 19, 1988, Pat. No. 4,904,783, which is a division of Ser. No. 919,514, Nov. 24, 1986, Pat. No. 4,786,315, which is a division of Ser. No. 641,091, Aug. 15, 1984, Pat. No. 4,639,264. This application Dec. 15, 1989, Ser. No. 451,482

Claims priority, application Switzerland, Aug. 26, 1983, 4669/83

Int. Cl.[5] C07D *251/16, 251/18, 401/02, 403/02*

U.S. Cl. 544—213 **3 Claims**

1. An aminotriazine of the formula



(III)

wherein

E is nitrogen,

Z is oxygen or sulfur,

R^3 is hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or C_1–C_4-alkoxy,

R^4 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4haloalkyl, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_2–C_4alkoxyalkyl, C_2–C_4-alkoxyalkyl, cyclopropyl, —NH_2, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle bound by way of the nitrogen atom and selected from pyrrolidine, piperidine, morpholine, thiomorpholine,

R^5 is cyano, —CZ—R⁻, piperazine and hexamethyleneimine,



or an unsaturated heterocycle selected from imidazole, triazole, pyridine, pyrimidine, thiazole, oxazole, thiadiazole, oxadiazole, pyridiazine, thiophene or furan, as well as partially unsaturated derivatives thereof which are unsubstituted or substituted by a radical selected from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy and C_1–C_4-haloalkyl,

R^{13} is C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, phenyl, di-C_1–C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle bound by way of the nitrogen atom and selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine and

$R^{14}$and R^{15} independently of one another are C_1–C_4-alkyl, C_1–C_4-alkoxy, C_3–C_4-alkoxyalkoxy, C_3–C_4-alkenyloxy, C_1–C_6alkylamino or di-C_1–C_4alkylamino.

4,992,550

ANTI-TUMOUR AGENTS

Leslie R. Hughes, Macclesfield, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 30,424, Mar. 26, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,748

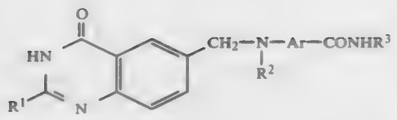
Claims priority, application United Kingdom, Mar. 27, 1986, 8607683

Int. Cl.[5] C07D *403/04*

U.S. Cl. 544—284 **7 Claims**

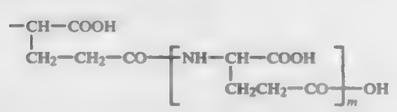
1. A quinazoline of the formula:

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wherein R^1 is alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy or alkylthio each of up to 6 carbon atoms; aryl, aryloxy or arylalkyl each of up to 10 carbon atoms; halogeno, hydroxy, mercapto, pyridylthio or pyrimidinylthio; alkyl of up to 3 carbon atoms which bears one, two or three halogeno substituents or which bears one or two substituents selected from hydroxy, amino, pyridylthio, pyrimidinylthio, alkoxy, alkanoyloxy, alkylthio, alkylamino, dialkylamino and alkanoylamino each of up to 6 carbon atoms and aroyloxy and aroylamino each of up to 10 carbon atoms; or alkoxy of up to 3 carbon atoms which bears one or two substituents selected from hydroxy and alkoxy of up to 6 carbon atoms;

wherein R^2 is hydrogen, alkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, mercaptoalkyl, alkylthioalkyl, halogenoalkyl, cyanoalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkanoylalkyl, carboxyalkyl, carbamoylalkyl or alkanoyl each of up to 6 carbon atoms or aroylalkyl of up to 10 carbon atoms; wherein Ar is phenylene, naphthylene or heterocyclene which is unsubstituted or which bears one or two substituents selected from halogeno, phenyl, cyano, nitro, hydroxy, amino and carbamoyl and alkyl, alkoxy, halogenoalkyl, alkanoylamino, alkylthio and alkoxycarbonyl each of up to 6 carbon atoms; and wherein R^3 is such that R^3—NH_2 is L-aspartic acid, L-glutamic acid, L-alanine, L-phenylalanine, L-serine, glycine, L-ornithine, L-2-aminobutyric acid or a poly-L-glutamic acid of the formula



wherein m is an integer from 1 to 10; or a pharmaceutically - acceptable salt or ester thereof.

4,992,551

DC-52 DERIVATIVES

Hiromitsu Saito, Sagamihara; Akira Sato, Machida; Masaji Kasai, Fujisawa; Makoto Morimoto, Shizuoka, and Tadashi Ashizawa, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

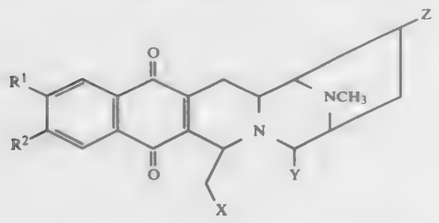
Filed Nov. 13, 1989, Ser. No. 435,246

Claims priority, application Japan, Nov. 16, 1988, 63-289565

Int. Cl.[5] A61K *31/495;* **C07D** *498/22, 471/18;* **C07B** *37/10*

U.S. Cl. 544—342 **1 Claim**

1. A DC-52 Derivative represented by the formula:



wherein each of R^1 and R^2 independently represents hydrogen or hydroxyl, X represents hydroxyl and Y represents cyano and Z represents carboxyl or hydroxymethyl, or pharmacologically acceptable salts thereof.

4,992,552

PROCESS FOR PREPARATION OF AMINO ACIDS

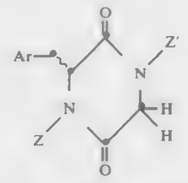
John C. Hubbs, and Charles H. Foster, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 239,492, Aug. 31, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 406,995

Int. Cl.[5] C07D *241/08*

U.S. Cl. 544—385 **6 Claims**

1. A process for the preparation of an optically pure compound of the formula



wherein Z and Z' are the same or different and are acyl or acyloxy and Ar is an aryl group comprising contacting a non-optically pure form of said compound with a suitable solvent under conditions such that an optically pure form of said compound is crystallized.

4,992,553

DIAMINE-PLATINUM (II) COMPLEX COMPOUNDS

Erwin von Angerer, Grassling; Norbert Knebel, Ingolstadt; Helmut Schönenberger, Pentling, and Jürgen Engel, Alzenau, all of Fed. Rep. of Germany, assignors to Asta Pharma Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

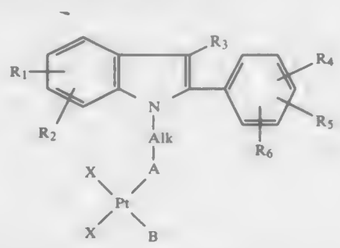
Continuation of Ser. No. 104,135, Oct. 5, 1987, abandoned. This application Nov. 20, 1989, Ser. No. 438,984

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633673

Int. Cl.[5] A61K *31/555;* **C07D** *401/12, 209/20, 209/14*

U.S. Cl. 546—12 **3 Claims**

1. A compound of the formula:



I

wherein R_1 is hydrogen, a hydroxy group or a C_2–C_6 alkanoyloxy group, R_2 is hydrogen or a halogen atom, R_3 is hydrogen or a C_1–C_6 alkyl group, R_4 is a hydroxy group or a C_2–C_6 alkanoyloxy group, R_5 is hydrogen or a halogen atom and R_6 is hydrogen or a halogen atom, Alk is a C_2–C_{10} alkylene chain where 4 neighboring CH_2 groups may also be replaced by a 1,4-phenylene ring,

is the group



and R_7 is a hydrogen atom, a C_1–C_6 alkyl group or a phenyl radical and X stands for the equivalent of a physiologically acceptable anion.

4,992,554

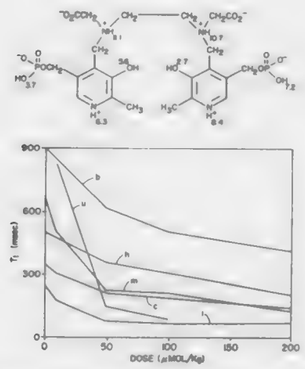
DIPYRIDOXYL PHOSPHATE CHELATING COMPOUNDS

Scott M. Rocklage, Saratoga, and Steven C. Quay, Los Altos Hills, both of Calif., assignors to Salutar, Inc., Sunnyvale, Calif.

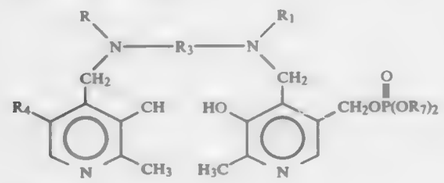
Division of Ser. No. 47,614, May 8, 1987, Pat. No. 4,933,456. This application Jun. 23, 1989, Ser. No. 370,430

Int. Cl.[5] C07D *213/62;* **C07F** *9/58*

U.S. Cl. 546—24 **9 Claims**



1. A chelatable compound, capable of forming a metal ion chelate, of the formula:



I

wherein:

R is hydrogen or



R_1 is hydrogen or



with the proviso that at least one of R and R_1 is other than hydrogen;

R_5 and R_6 are each, independently, hydroxy, alkoxy having from 1 to 18 carbons, hydroxy-substituted alkoxy having from 1 to 18 carbons, amino, or alkylamido having from 1 to 10 carbons;

R_3 is alkylene having from 1 to 8 carbons, 1,2-cycloalkylene having from 5 to 8 carbons, or 1,2-arylene having from 6 to 10 carbons;

R_4 is hydrogen, hydroxymethyl, alkyl having from 1 to 6 carbons, or



each R_7 is, independently, hydrogen, hydroxy-substituted alkyl having from 1 to 18 carbons, or aminoalkyl having from 1 to 18 carbons; or a physiologically biocompatible inorganic or organic cation salt of said chelatable compound.

4,992,555

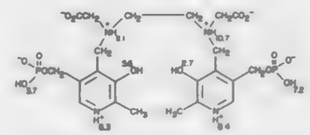
CERTAIN DIPYRIDYLPHOSPHATE CHELATABLE COMPOUNDS CAPABLE OF FORMING METAL ION CHELATES

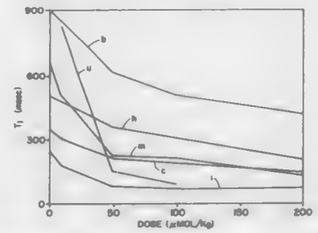
Scott M. Rocklage, Saratoga, and Steven C. Quay, Los Altos Hills, both of Calif., assignors to Salutar, Inc., Sunnyvale, Calif.

Division of Ser. No. 47,614, May 8, 1987, Pat. No. 4,933,456. This application Jun. 23, 1989, Ser. No. 370,428

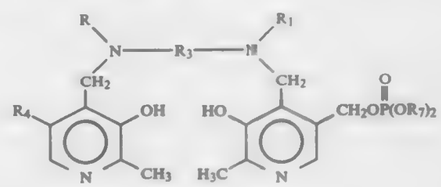
Int. Cl.[5] C07F *9/58;* **C07D** *401/12*

U.S. Cl. 546—24 **2 Claims**





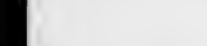
1. A chelatable compound, capable of forming a metal ion chelate, of the formula:



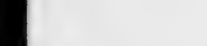
wherein:

R is hydrogen or

VOL 1123 ISS 2 FE 12 1991 UMI



R_1 is hydrogen or

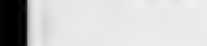


with the proviso that at least one of R and R_1 is other than hydrogen:

R_5 and R_6 are each, independently, hydroxy, alkoxy having from 1 to 18 carbons, hydroxy-substituted alkoxy having from 1 to 18 carbons, amino, or alkylamido having from 1 to 10 carbons;

R_3 is alkylene having from 1 to 18 carbons, 1,2-cycloalkylene having from 5 to 8 carbons, or 1,2-arylene having from 6 to 10 carbons;

R_4 is hydrogen, hydroxymethyl, alkyl having from 1 to 6 carbons, or



each R_7 is, independently, hydrogen, hydroxysubstituted alkyl having from 1 to 18 carbons, or aminoalkyl having from 1 to 18 carbons; or a physiologically biocompatible inorganic or organic cation salt of said chelatable compound.

4,992,556

PROCESS FOR THE PREPARATION OF INDIGO COMPOUNDS

Usaji Takaki, Kanagawa; Hiroharu Suzuki, Tokyo; Yoshihiro Yamamoto, Kanagawa; Shinobu Aoki, Kanagawa, and Isao Hara, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 314,021

Claims priority, application Japan, Feb. 23, 1988, 63-38713; Mar. 2, 1988, 63-47565

Int. Cl.[5] C07D *403/04*

U.S. Cl. 548—457 **27 Claims**

1. A process for the preparation of an indigo compound which comprises converting an indole compound which is unsubstituted at the 2- and 3-positions by reaction in one step with an organic hydroperoxide and recovering the indigo compound thus produced.

4,992,557

PROCESS FOR PREPARING BISIMIDE PRODUCTS

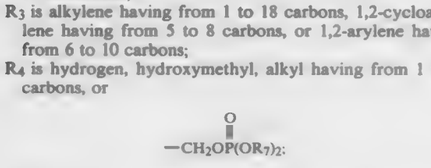
Donald O. Hutchinson; Ali M. Dadgar, and Keith G. Anderson, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 332,984, Apr. 4, 1989. This application Mar. 5, 1990, Ser. No. 487,838

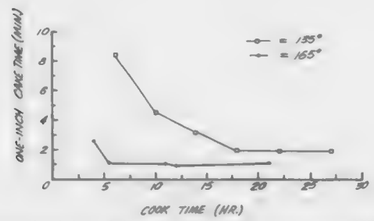
Int. Cl.[5] C07D *209/48*

U.S. Cl. 548—462 **18 Claims**

1. A process for increasing the filterability of a particle principally comprised of a bisimide having the formula,



wherein R is an alkylene radical containing 1 to 6 carbon atoms and b is 1 or 0, said process comprising, cooking the particle at a temperature within the range of from about 140° C. to about 200° C. for a period sufficient to obtain an increase in the



average sphericity of the particle, said sphericity being defined as the ratio of the surface area of a sphere having a volume of the particle being measured to the surface area of that particle.

4,992,558

DISPERSE DYES CONTAINING A TRICYANOVINYL GROUPING BONDED TO A N,N-DISUBSTITUTED ANILINE

Peter Liechti, Arisdorf, and Antoine Clément, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

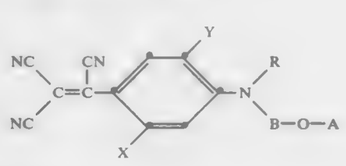
Filed Jul. 7, 1989, Ser. No. 376,790

Claims priority, application Switzerland, Jul. 11, 1988, 2644/88

Int. Cl.[5] C09B *23/04;* **D06P** *1/16, 3/54*

U.S. Cl. 548—477 **15 Claims**

1. A disperse dye of formula



(1)

wherein

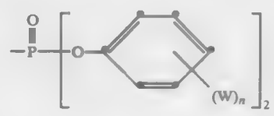
X is hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy or halogen,

Y is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy-C_1–C_4alkyl or C_1–C_4alkoxy-C_1–C_4alkoxy,

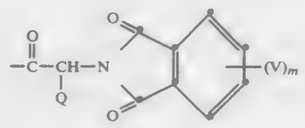
R is hydrogen, C_1–C_{12}alkyl, C_2–C_{12}alkenyl or phenyl, or Y and R, when taken together with the nitrogen atom and the two carbon atoms linking them, form a 5- or 6-membered ring,

B is straight-chain or branched C_2–C_6alkylene,

A is a radical of formula



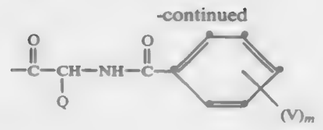
(2)



(3)

or

-continued



in which

W is C_1–C_9alkyl, C_5–C_7cycloalkyl, phenyl, halogen or C_1–C_4alkoxy,

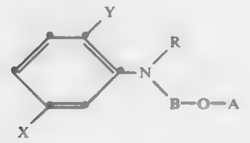
n is 0, 1, 2 or 3,

Q is hydrogen or C_1–C_4alkyl,

V is halogen, and

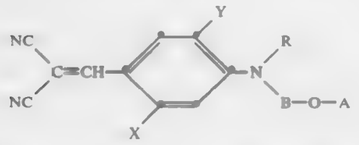
m is 0, 1, 2, 3 or 4.

14. A compound of formula



wherein X, Y, R, B and A are as defined in claim 1.

15. A compound of formula



wherein X, Y, R, B and A are as defined in claim 1.

4,992,559

POLYMERIZABLE THIOPHENE MONOMERS

Poopathy Kathirgamanathan, North Harrow; Martin R. Bryce, Hurst; David Parker, Durham; Nigel R. M. Smith, Packington Nr. Ashby, and Andre D. Chissel, Cameron Close, all of United Kingdom, assignors to Cookson Group plc, London, United Kingdom

Filed Jul. 16, 1987, Ser. No. 74,343

Claims priority, application United Kingdom, Jul. 16, 1986, 8617358; Nov. 18, 1986, 8627565

Int. Cl.[5] C07D *333/32, 333/36*

U.S. Cl. 549—65 **7 Claims**

1. A compound having the general formula



wherein

R^1 is selected from the group consisting of $—(CH_2)_mNHCOR$, $—O(CH_2)_mNHCOR$, $[—(CH_2)_mCONHR^5][—O(CH_2)_mCONHR^5][—O(CH_2)_nO(CHR^3CH_2)_pOR^4]—(CH_2)_n(OCHR^3CH_2)_pOR^4$ and aryloxyalkyl;

R is an alkyl group containing from 1 to 18 carbon atoms;

R^3 is selected from the group consisting of a hydrogen atom and a methyl group;

R^4 is selected from the group consisting of an alkyl group containing from 1 to 6 carbon atoms;

R^5 is selected from the group consisting of an alkyl group containing from 1 to 18 carbon atoms, an aryl group optionally substituted by an alkyl group and an alkylaryl group;

(4)

m is an integer of from 1 to 6;

n is selected from the group consisting of 0 and an integer of from 1 to 6;

p is an integer of from 1 to 6.

4,992,560

METHOD OF PREPARING NOVEL FLUORINATED LASER DYES

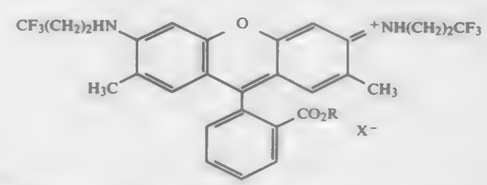
Peter R. Hammond, Livermore, Calif., and James F. Freeman, Wyomissing, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 373,316, Jun. 8, 1989, Pat. No. 4,945,176. This application May 18, 1990, Ser. No. 524,899

Int. Cl.[5] C07D *311/88*

(9) **U.S. Cl. 549—227** **5 Claims**

1. A method of preparing a compound of the formula II

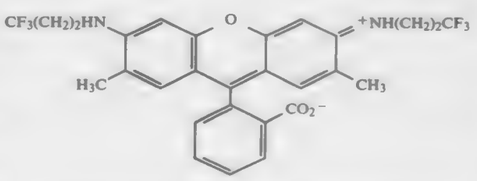


(10)

wherein R is linear or branched alkyl containing 1–10 carbon atoms and $X^{\ominus}$ is an anion, comprising the steps of:

(a) reacting substantially equimolar amount of 3-chloro-1,1,1-trifluoropropane with 3-amino-4-methylphenol in the presence of a base to form N-monoalkylated-3-amino-4-methylphenol;

(b) purifying and drying at least a portion of said N-monoalkylated phenol from step (a) and then condensing said N-monoalkylated phenol with phthalic anhydride in a suitable solvent to form a compound of the formula:



(c) treating the product of step (b) with a compound ROH in the presence of an acid to form a compound of the formula II.

4,992,561

SIMPLE CONVERSION OF ARTEMISINIC ACID INTO ARTEMISININ

Ronald J. Roth, and Nancy A. Roth, both of Fairfax, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 11, 1990, Ser. No. 521,958

Int. Cl.[5] C07D *493/18*

U.S. Cl. 549—279 **8 Claims**

1. A process for producing artemisinin from artemisinic acid comprising the steps of:

(a) dissolving artemisinic acid and nickel chloride in methanol;

(b) adding a borohydride selected from the group consisting essentially of sodium borohydride or lithium borohydride;

(c) acidifying the solution;

(d) isolating the dihydroartemisinic acid;
(e) mixing the dihydroartemisinic acid and a photosensitizer in solution with a suitable organic solvent;
(f) oxidizing the dihydroartemisinic acid in the presence of a visible light source;
(g) evaporating the solvent, leaving a residue;
(h) mixing the residue formed in step (g) with a suitable organic solvent;
(i) air-oxidizing the mixture formed in step (h) for a suitable period; and
(j) decanting the solution formed in step (i), and concentrating said solution to isolate artemisinin.

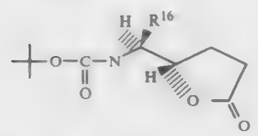
4,992,562

RENIN INHIBITORS CONTAINING 5-AMINO-2,5-DISUBSTITUTED-4-HYDROXYPENTANOIC ACID RESIDUES

Edward F. Kleinman, Groton; Robert L. Rosati, Stonington, and Jasjit S. Bindra, Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 336,697, Nov. 2, 1987, Pat. No. 4,948,913, which is a division of Ser. No. 858,324, Apr. 30, 1986, Pat. No. 4,729,985, which is a continuation-in-part of Ser. No. 764,168, Aug. 8, 1985, abandoned. This application Mar. 22, 1990, Ser. No. 497,478
Int. Cl.[5] C07D *307/20*
U.S. Cl. 549—321 2 Claims

1. A compound of the formula



(IV)

wherein
R^{16} is $(C_1–C_6)$alkyl, $(C_1–C_6)$alkenyl, phenyl, naphthyl, $(C_4–C_7)$cycloalkyl, $(C_4–C_7)$cycloalkenyl, $(C_7–C_9)$phenylalkyl, $(C_{11}–C_{13})$naphthylalkyl, $(C_5–C_{10})$-(cycloalkyl)alkyl, or one of said groups mono or disubstituted on the aromatic ring with the same or different groups selected from $(C_1–C_3)$alkyl, $(C_1–C_3)$-alkoxy, fluoro or chloro.

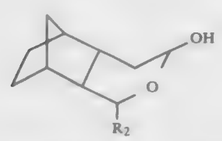
4,992,563

BENZOPYRAN INTERMEDIATES FOR USE IN MANUFACTURING THROMBOXANE A_2 ANTAGONISTS

Robert B. Garland, and Masatoru Miyano, both of Northbrook, Ill., assignors to National Research Development Corporation, London, England

Filed Dec. 13, 1988, Ser. No. 283,671
Int. Cl.[5] C07D *311/78, 413/02;* C07C *59/48, 211/01*
U.S. Cl. 549—386 3 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein R_2 is selected from the group consisting of hydrogen, c_{1-10} aliphatic hydrocarbon groups, and C_{1-10} aliphatic hydrocarbon groups substituted by Ar, OAr or SAr, where Ar represents a phenyl, napthyl, fluorenyl, dibenzocyclohexyl, dibenzocycloheptyl, pyridyl, benzthiazolyl, dihydrobenzthiazolyl, N-methyldihydrobenzthiazolyl, benzoxazolyl, dihydrobenzoxazolyl or N-methyldihydrobenzoxazolyl group or such a group substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulphamoyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups.

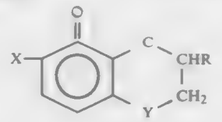
4,992,564

PREPARATION OF 6-SUBSTITUTED 4-CHROMANONES

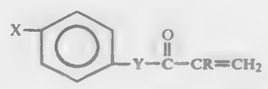
Jerry R. Patton, and Narayanasamy Gurusamy, both of Ballwin, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 151,938, Feb. 3, 1988, Pat. No. 4,918,203. This application Aug. 31, 1989, Ser. No. 401,188
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] C07D *311/22, 311/38, 335/06*
U.S. Cl. 549—401 4 Claims

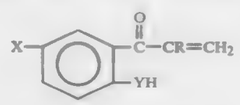
1. A process for preparing a 6-substituted 4-chromanone having the formula



where
X is a member selected from the group consisting of halogen atoms, nitro, amino and alkyl having from 1 to about 20 carbon atoms;
Y is an oxygen or sulfur atom; and
R is a member selected from the group consisting of a hydrogen atom, halogen atom, alkyl having from 1 to about 20 carbon atoms and aryl having from about 6 to about 12 carbons; which comprises
(a) effecting rearrangement of a phenolic acrylate ester of a phenol or thiophenol, said ester having the formula



where X, Y and R are as defined above, to a hydroxy- or mercapto-(vinyl ketone) having the formula



where X, Y and R are as defined above, in the presence of a Fries rearrangement-effecting amount of hydrogen fluoride under Fries rearrangement conditions comprising a substantially anhydrous liquid reaction mixture initially comprising said phenolic acrylate ester and hydrogen fluoride; and
(b) effecting cyclization of said ketone in the presence of a cyclizing amount of hydrogen fluoride under cyclization conditions to form the 6-substituted 4-chromanone, said cyclization conditions comprising a substantially anhydrous liquid reaction mixture initially comprising said ketone and hydrogen fluoride.

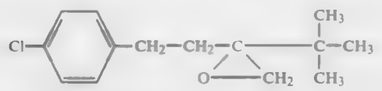
4,992,565

PREPARATION OF OXIRANES

Karl H. Mohrmann; Wolf Reiser, both of Wuppertal, Fed. Rep. of Germany; Siegfried W. Linke, Seoul, Rep. of Korea, and Rudolf Zerbes, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 258,912, Oct. 17, 1988 abandon which is a continuation of Ser. No. 598,562, Apr. 10, 1984 abandoned.
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315510
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.
Int. Cl.[5] C07D *301/02*
U.S. Cl. 549—519 9 Claims

1. A process for the preparation of an oxirane of the formula



comprising reacting dimethyl sulphide with methyl bromide in the presence of acetone thereby to produce trimethylsulphonium bromide of the formula

$(CH_3)_3S^+ \ Br^-$

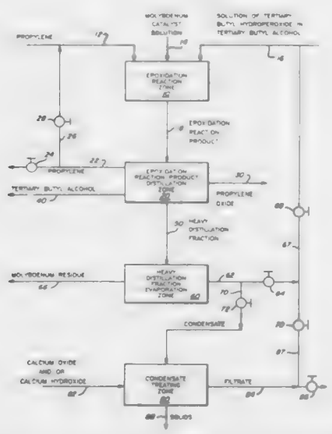
and reacting the trimethylsulphonium bromide with 1-(4-chlorophenyl)-4,4-dimethyl-3-pentanone in the presence of potassium tert.-butylate and in the presence of tert.-butanol, at a temperature between about 10° C. and 40° C., 1.0 to 2.0 moles of trimethylsulphonium bromide and 1.0 to 2.0 moles of potassium tert.-butylate being present per mole of said 1-(4-chlorophenyl)4,4-dimethyl-3-pentanone.

4,992,566

RECOVERY OF TERTIARY BUTYL HYDROPEROXIDE AND TERTIARY BUTYL ALCOHOL

Edward T. Marquis, Austin; Kenneth P. Keating, Georgetown; John R. Sanderson, Leander, and Robert A. Meyer, Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Aug. 31, 1989, Ser. No. 401,381
Int. Cl.[5] C07D *301/19*
U.S. Cl. 549—529 10 Claims



1. In a process for the preparation of propylene oxide and tertiary butyl alcohol wherein propylene and tertiary butyl hydroperoxide are reacted in an epoxidation reaction zone in solution in tertiary butyl alcohol in the presence of a soluble molybdenum catalyst to provide an epoxidation reaction product comprising unreacted propylene, unreacted tertiary butyl hydroperoxide, tertiary butyl alcohol, dissolved molybdenum catalyst and impurities and wherein the epoxidation reaction product is resolved into product fractions in a distillation zone including a distillate propylene fraction, a distillate propylene oxide fraction, a distillate tertiary butyl alcohol fraction and a heavy liquid distillation fraction composed primarily of tertiary butyl hydroperoxide, tertiary butyl alcohol and impurities, including dissolved molybdenum catalyst, the improvement for fractionating said heavy liquid fraction without substantial decomposition of the tertiary butyl hydroperoxide contained therein to tertiary butyl alcohol and without substantial decomposition of the tertiary butyl alcohol contained therein to isobutylene which comprises:
separating said heavy liquid fraction by vacuum evaporation under evaporator operating conditions including a temperature of about 25° to about 160° C. and a pressure of about 2 to about 200 mm Hg. into an evaporated overhead condensate fraction comprising about 60 to about 95 wt. % of the charged heavy liquid fraction and a clear liquid residue fraction,
said heavy liquid fraction comprising about 70 to 90 wt. % tertiary butyl alcohol, about 2 to about 20 wt. % tertiary butyl hydroperoxide, about 500 to 5,000 ppm of molybdenum and impurities,
said evaporated overhead fraction containing from about 70 wt. % to about 95 wt. % of tertiary butyl alcohol, about 1 wt. % to about 20 wt. % of tertiary butyl hydroperoxide and, correspondingly, about 15 wt. % to about 3 wt. % of impurities and said clear liquid residue fraction comprising tertiary butyl hydroperoxide, tertiary butyl alcohol and impurities, including substantially all of the molybdenum containing in said heavy liquid fraction,
said overhead fraction containing at least about 80 wt. % of the tertiary butyl hydroperoxide contained in said heavy liquid fraction.

4,992,567

ALKYLENE OXIDE PRODUCTION USING VAPOR PHASE OXIDATION OF AN ALKANE OR OLEFIN IN MOLTEN SALT AND RECIRCULATION OF ALDEHYDE BY-PRODUCTS

James L. Meyer, Lake Charles, and Pennington, B. Timothy, Sulphur, both of La., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 7, 1989, Ser. No. 362,553
Int. Cl.[5] C07D *301/06*
U.S. Cl. 549—532 14 Claims

1. A continuous vapor phase process for producing an alkylene oxide comprising:
(a) reacting an alkane or olefin having from 3 to 22 carbon atoms per molecule, or mixture thereof, with oxygen or an oxygen-containing gas, said alkane or olefin and said oxygen or oxygen-containing gas being gaseous reactants, by contacting said gaseous reactants with a bath, stream, spray or mist of at least one molten nitrate or chloride salt catalyst, said catalyst being present in an amount sufficient to absorb any heat generated during said reaction while maintaining an essentially constant reaction temperature, said reaction being conducted at a reaction temperature of between about 135° C. and about 600° C. and a reaction pressure of between about 1 and about 50 atmospheres to produce an alkylene oxide and by-products comprising substantial amounts of at lease one aldehyde;
(b) separating said aldehyde from said alkylene oxide and the other by-products, and
(c) recirculating said aldehyde in gaseous form back into the gaseous reactants in step (a) to produce a vapor phase co-oxidation reaction in which the overall yield of alkylene oxide is substantially increased, the aldehyde by-products are substantially reduced or eliminated.

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4,992,568

SYNTHESIS OF BENZOFURANS

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 25, 1989, Ser. No. 398,622
Int. Cl.[5] C07D 307/79
U.S. Cl. 549—476 10 Claims

1.

A one step method of preparing benzofurans, comprising: cyclizing an o-iodoaryl allyl ether in the presence of a palladium catalyst to yield a 3-substituted benzofuran.

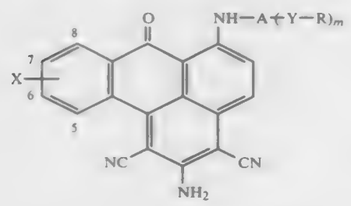
4,992,569

DICYANOBENZANTHRONE COMPOUNDS

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 1, 1989, Ser. No. 360,579
Claims priority, application Switzerland, Jun. 6, 1988, [illegible]
Int. Cl.[5] C07C 50/38
U.S. Cl. 552—287 11 Claims

1. A compound of the formula



(I)

in which X is hydrogen, halogen, nitro, NH_2, Y is —O— or —S—, A is an aliphatic, aromatic or araliphatic bridge member, m is 1, 2 or 3, R is hydrogen or a radical



in which R^1 is a substituted or unsubstituted alkyl or aryl group, with the proviso that if R is hydrogen, Y is oxygen and X is hydrogen or halogen bound to the 6 or 7 position of the benzanthrone ring, A as aliphatic bridge member is limited to a C_2–C_5aliphatic bridge member.

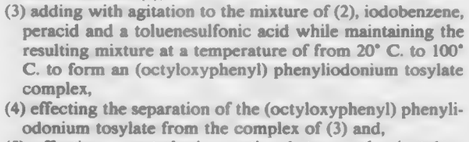
4,992,570

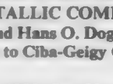
UCN-1028A AND UCN-1028C AND PROCESS FOR THE PRODUCTION THEREOF

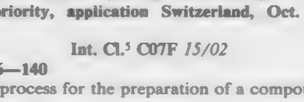
Hirofumi Nakano; Eiji Kobayashi; Isami Takahashi; Katsuhiko Ando, all of Machida; Mayumi Yoshida, Sagamihara; Shiro Akinaga, Shizuoka, and Takao Iida, Tama, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 173,174
Claims priority, application Japan, Mar. 26, 1987, 62-72378; Jul. 9, 1987, 62-171988
Int. Cl.[5] C07C 50/10, 50/00; C12P 15/00; C12N 1/14
U.S. Cl. 552—295 3 Claims

1. UCN-1028A or UCN-1028C represented by the following formula:



wherein R represents  (UCN-1028A) or



(UCN-1028C).

4,992,571

METHOD FOR MAKING OCTYLOXY SUBSTITUTED DIPHENYL IODONIUM HEXAFLUORO METALLOID SALTS

James M. Fukuyama, Clifton Park; Julia L. Lee, Schenectady, and James V. Crivello, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1989, Ser. No. 429,744
Int. Cl.[5] C07F 9/90
U.S. Cl. 556—64 6 Claims

1. A one pot method for making an (octyloxyphenyl) phenyliodonium hexafluorometalloid salt which comprises,

(1) effecting reaction between phenol and 1-bromo octane in the presence of an aqueous basic solution and a phase transfer catalyst to form n-octylphenyl ether,

(2) effecting the removal of the aqueous basic solution from the mixture of (1),

(3) adding with agitation to the mixture of (2), iodobenzene, peracid and a toluenesulfonic acid while maintaining the resulting mixture at a temperature of from 20° C. to 100° C. to form an (octyloxyphenyl) phenyliodonium tosylate complex,

(4) effecting the separation of the (octyloxyphenyl) phenyliodonium tosylate from the complex of (3) and,

(5) effecting a metathesis reaction between the (octyloxyphenyl) phenyliodonium tosylate of (4) and an alkali metal hexafluorometalloid salt to form the (octyloxyphenyl) phenyliodonium hexafluorometalloid salt.

4,992,572

PROCESS FOR THE PREPARATION OF ORGANOMETALLIC COMPOUNDS

Vincent Desobry, Marly, and Hans O. Doggweiler, Möhlin, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,544
Claims priority, application Switzerland, Oct. 26, 1987, 4203/87
Int. Cl.[5] C07F 15/02
U.S. Cl. 556—140 11 Claims

1. In the process for the preparation of a compound of formula I



(I)

wherein R is an anion of formula $C_5H_4R^1$ or C_9H_7, R^1 is hydrogen, C_1–C_6alkyl or halogen, R^2 is a π-arene, X is an anion of valence q and q is 1, 2, or 3, by reacting ferrocene or a ferrocene derivative $(C_5H_4R^3)Fe(C_5H_4R^1)$ or $(C_9H_7)_2Fe$, in which R^3 has one of the meanings of R^1, with at least one mole of a π-arene R^2, the improvement comprising carrying out the reaction of the ferrocene or ferrocene derivative in the presence of at least 1.2 mol of a mixture of Al trihalide and Zr(IV) of HF(IV) tetrahalide such that at least 0.2 mol of Zr(IV) or Hf(IV) tetrahalide and at least 0.1 mol of Al trihalide are present, the amounts being based on 1 mol of ferrocene or a ferrocene derivative.

4,992,573

RHODIUM COLLOID, METHOD OF MAKING, AND USE

Larry N. Lewis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 177,717, Apr. 5, 1988, Pat. No. 4,946,818.
This application Apr. 13, 1990, Ser. No. 508,622
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—479 2 Claims

1. A hydrosilylation method comprising effecting reaction between a silicon hydride having up to 3 chemically combined hydrogen atoms per silicon atom and an olefinically unsaturated material in the presence of an effective amount of a hydrosilylation catalyst comprising a rhodium colloid resulting from the reaction of from 10 to about 100 moles of a silicon hydride, per mole of rhodium trichloride, where the silicon hydride has a boiling point of at least 25° C. at atmospheric pressure and the silicon atom of the silicon hydride is satisfied with from 1 to 3 hydrogen atoms and at least 1, and up to 3 monovalent radicals, other than hydrogen, selected from 1 or 2 $C_{(1-13)}$ hydrocarbon radicals and 1 to 3 $C_{(1-8)}$ alkoxy, siloxy, halogen and mixtures of such monovalent radicals.

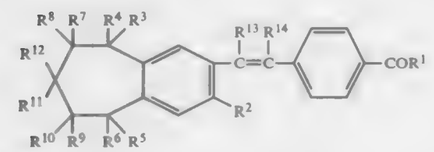
4,992,574

BENZOCYCLOHEPTENE DERIVATIVES

Michael Klaus, Weil am Rhein, Fed. Rep. of Germany, and Peter Mohr, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 27, 1988, Ser. No. 263,651
Claims priority, application Switzerland, Nov. 6, 1987, 4346/87; Aug. 10, 1988, 3018/88
Int. Cl.[5] C07C 69/76
U.S. Cl. 560—8 22 Claims

1. A compound of the formula



I

wherein

R^1 1 is hydroxy, lower-alkoxy, amino, mono- or di-lower-alkylamino;

R^2 is hydrogen, alkyl, alkoxy or halogen; R^3, R^4, R^5, R^6, and R^{12} independently are hydrogen or lower-alkyl;

R^3 and R^5 taken together are methylene or hydroxymethylene;

R^7, R^9 and R^{10} independently are hydrogen or lower-alkyl;

R^{11} and R^{12} taken together are oxo or spiro-cyclo-lower alkyl; or R^{11} is hydrogen and R^{12} is hydroxy or acetoxy; and one of the residues R^{13} and R^{14} is hydrogen and the other is lower-alkyl or trifluoromethyl,

or, when R^1 is hydroxy, a physiologically compatible salt thereof.

4,992,575

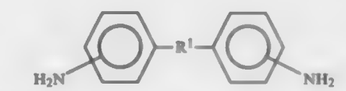
PROCESS FOR THE PREPARATION OF N,N'-DIMETHYL AROMATIC DIAMINES, INTERMEDIATES AND PRODUCTS

Dalip K. Kohli, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

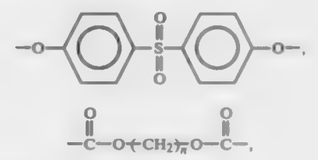
Division of Ser. No. 826,168, Feb. 5, 1986, Pat. No. 4,778,900.
This application Sep. 30, 1988, Ser. No. 252,224
Int. Cl.[5] C07C 229/00, 211/00
U.S. Cl. 560—49 3 Claims

1. A method for the preparation of a bis-N-methylamino aromatic compound comprising:

(a) reacting a diprimary amino aromatic compound of the formula:



wherein R^1 is selected from a direct bond, divalent alkylene of 1 to 20 carbon atoms,

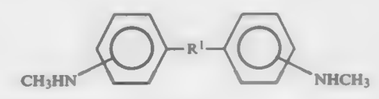


wherein n is 2 to 12,



with succinimide and formaldehyde to form the corresponding bis-N-succinimidyl methylamino aromatic compound; and

(b) treating the product of step (a) with sodium borohydride in a solvent to form a bis-N-methylamino aromatic compound as product, said compound having the formula:



wherein R^1 is above-identified.

4,992,576

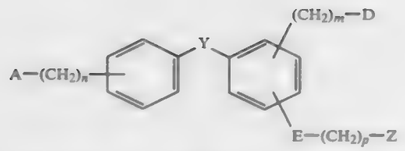
INTERMEDIATES FOR LEUKOTRIENE ANTAGONISTS

D. Mark Gapinski, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 200,350, May 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 2,479, Jan. 12, 1987, abandoned. This application Mar. 27, 1990, Ser. No. 501,339
Int. Cl.[5] C07C 12/75, 49/784
U.S. Cl. 560—52 4 Claims

1. A compound of the formula

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or a pharmaceutically acceptable base addition salt thereof, wherein A and D are each independently —COOH, —COO(C_1—C_3 alkyl), —CN, or 5—tetrazolyl;
n is 0 or 1;
Y is —CO—[, —C(=NOH)—, —CHOH—, —CH_2—or —C(=CH_2)—];
m is 0–3;
E is —O—pr —CH_2—;
p is 0—16; and
Z is —H or —G—Q, where
G is a bond, —O—, —S(O)$_t$—, —NH—, —CH=CH—, or —C≡C—,
Q is phenyl or phenyl substituted with one or two substituents selected from the group consisting of halo, C_1–C_3 alkyl, C_1–C_3 alkoxy, acetyl, nitro, amino, trifluoromethyl, hydroxy, and —S(O)$_t$—(C_1–C_3 alkyl), and
each t is independently 0–2, provided that at least one of A and D must be either —CN or —COO(C_1–C_3 alkyl); and further provided that when m is 0 or 1, p must be 4–16.

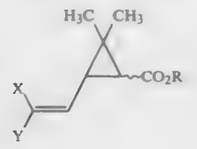
4,992,577

PREPARATION OF 3-VINYL-SUBSTITUTED 2,2-DIMETHYLCYCLOPROPANE-1-CARBOXYLIC ACIDS AND ESTERS AND INTERMEDIATES THEREFOR

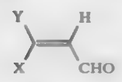
Reinhard Lantzsch, Leverkusen; Dieter Arlt, Cologne, and Manfred Jautelat, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 484,802, Apr. 14, 1983, abandoned. This application May 22, 1989, Ser. No. 355,578
Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216790; Aug. 26, 1982, 3231814
Int. Cl.[5] C07C *69/74*
U.S. Cl. 560—124 **4 Claims**

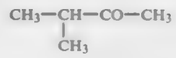
1. A process for preparing a compound of the formula



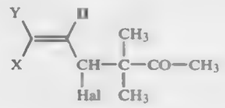
in which
Y is halogen, alkyl or cycloalkyl optionally substituted by halogen or C_{1-4}-alkoxy, alkenyl optionally substituted by halogen, aryl, heteroaryl or alkoxycarbonyl,
X is hydrogen, halogen or optionally halogen-substituted alkyl, or
X and Y, together with the adjacent C atom, form a saturated cycloaliphatic ring having up to 6 C atoms; and
R is hydrogen or C_1–C_4-alkyl, comprising reacting an aldehyde of the formula



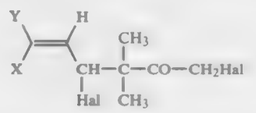
with 2-methylbutan-3-one of the formula



in the presence of a hydrohalic acid thereby to form a 4,4-dimethyl-3-halogeno-1-hexen-5-one of the formula



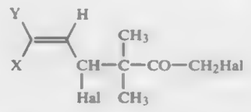
in which
Hal is halogen, halogenating said compound to produce a compound of the formula



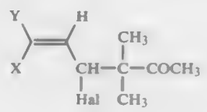
and reacting said compound with a base of the formula

R—OM

in which
M is one equivalent of an alkali or alkaline earth metal ion.
4. A process for preparing a compound of the formula



in which
Y is halogen, alkyl or cycloalkyl optionally substituted by halogen or C_{1-4}-alkoxy, alkenyl optionally substituted by halogen, aryl, heteroaryl or alkoxycarbonyl,
X is hydrogen, halogen, or optionally halogen-substituted alkyl, or
X and Y, together with the adjacent C atom form a saturated cycloaliphatic ring having up to 6 C atoms, and
Hal each independently is chlorine or bromine, comprising halogenating a 4,4-dimethyl-3-halogeno-1-hexen-5-one of the formula



4,992,578

PREPARATION OF ALKYL ALKANETHIOLSULFONATES

Altaf Husain, East Norriton, Pa., assignor to Atochem North America, Inc., Philadelphia, Pa.

Filed Mar. 9, 1990, Ser. No. 491,407
Int. Cl.[5] C07C *143/00*
U.S. Cl. 560—307 **23 Claims**

1. A process for preparing an alkyl alkanethiolsulfonate comprising contacting the corresponding alkanethiol, dialkyl disulfide or mixture thereof with aqueous hydrogen peroxide in the presence of one or more transition metal catalysts selected from the Group VIII elements of the Periodic Table of the Elements.

4,992,579

PROCESS FOR THE PRODUCTION OF TRIMELLITIC ACID

Wayne P. Schammel, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 18, 1989, Ser. No. 451,606
Int. Cl.[5] C07C *51/215*
U.S. Cl. 562—413 **26 Claims**

1. A process for the oxidation of pseudocumene with molecular oxygen to trimellitic acid under liquid-phase conditions in the presence of a catalyst comprising one or more heavy metal oxidation catalyst comprising cerium having a valence of plus three, zirconium, cobalt and manganese to provide from about 3 to about 10 milligram atoms total metals per gram mole of pseudocumene plus a source of bromine, at a temperature in the range of about 100° C. to about 275° C., the process comprising the staged addition of the bromine component in at least two stages wherein 0 to about 35 percent by weight of the total bromine is added in the first stage and the remainder is added in the last stage, and wherein all the cerium is added in the last stage, and wherein the temperature in the last stage is upward from about 175° C. to about 275° C., and the temperature in the preceding stage is between about 125° C. and about 165° C.

4,992,580

PRODUCTION OF POLYCARBOXYLIC ACIDS WITH A MOLYBDENUM-ACTIVATED COBALT CATALYST

Walter Partenheimer, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 30, 1985, Ser. No. 782,230
Int. Cl.[5] C07C *51/265, 63/26, 63/307, 63/313*
U.S. Cl. 562—416 **8 Claims**

1. A process for oxidizing polymethylbenzenes with molecular oxygen to benzene polycarboxylic acids under liquid-phase conditions wherein the process comprises conducting the oxidation in the presence of C_{1-6} aliphatic carboxylic acid or a mixture of a C_1–C_6 aliphatic acid and water, wherein the carboxylic acid is a solvent for the reaction and also for a cobalt-molybdenum-manganese-bromine catalyst, at temperatures in the range of about 100° to about 250° C. in the presence of a catalyst system consisting essentially of a source of bromine, cobalt, molybdenum, and manganese wherein molybdenum is an effective promoter for the cobalt-manganese-bromine catalyst system and wherein the gram-atom ratio of molybdenum to cobalt is in the range of about 0.001 to about 1.0 and the ratio of cobalt to manganese is in the range of about 0.01 to about 100.

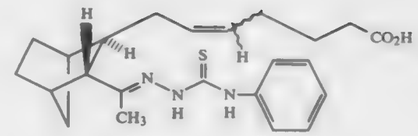
4,992,581

METHODS OF MANUFACTURING THROMBOXANE A_2 ANTAGONISTS

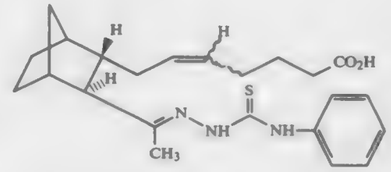
Robert B. Garland, and Masateru Miyano, both of Northbrook, Ill., assignors to National Research Development Corporation, London, England

Filed Dec. 13, 1988, Ser. No. 283,675
Int. Cl.[5] C07C *319/00*
U.S. Cl. 562—427 **4 Claims**

1. A method of making an optically active compound of the formula:

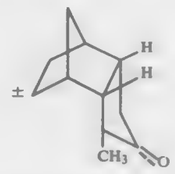


or



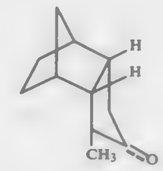
or a pharmaceutically acceptable salt thereof, which compound or salt thereof can be either the cis or the trans geometric isomer, said method comprising the steps of
(a) resolving a compound of the formula:

II



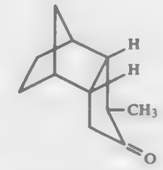
into the respective diastereoisomers of the formulae

III



and

IV



by reacting the compound of formula II with a diol whose hydroxyl functions are attached to adjacent chiral carbon atoms having symmetry element defining C_2 symmetry:
(b) hydrolyzing the product of (a);
(c) oxidizing the product of (b) by peracid oxidation using a peracid as oxidizing agent;
(d) reducing the product of (c);
(e) oxidizing the product of (d) and isomerizing the resultant product with base to provide a methyl ketone;
(f) reacting the methyl ketone product of (e) with 4-phenyl-3-thiosemicarbazide; and where appropriate
(g) forming a pharmaceutically acceptable salt of the product of (f).

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4,992,582

METHOD FOR MAKING ISOBUTYRIC ACID

Wolfgang Ruppert, Bickenbach, and Hermann-Josef Siegert, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,895

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1988, 3800473

Int. Cl.[5] C07C *51/14*

U.S. Cl. 562—521 2 Claims

1. A method for the continuous preparation of isobutyric acid by the Koch synthesis from about stoichiometric amounts of propylene, carbon monoxide, and water, under pressure and in liquid hydrogen fluoride as the Koch catalyst, which method comprises depressurizing the reaction mixture after reaction, separating undispersed gas phase created by said depressurization, said gas phase predominantly consisting of hydrogen fluoride and carbon monoxide with smaller amounts of gaseous impurities and low boiling compounds, introducing the remaining liquid phase containing dispersed gas phase into the middle to upper region of a distillation column, and removing liquid isobutyric acid from a lower plate of the column, the head of said column being kept at a pressure of 0.5 to 120 bars so that a head temperature of 0° C. to 90° C. results, and the base of said column being kept at a temperature above the boiling point of isobutyric acid at the pressure which prevails.

4,992,583

PROCESS FOR SYNTHESIZING N-CHLOROTHIO-SULFONAMIDES

Steven M. Ryba, Norton, and Timothy A. Sabo, Southington, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1989, Ser. No. 294,033

Int. Cl.[5] C07C *381/00*

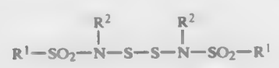
U.S. Cl. 562—821 15 Claims

1. A process for synthesizing N-chlorothiosulfonamides of the formula:



(I)

comprising reacting a N,N'-dithiobis(sulfonamide) of the formula:



(II)

with chlorine gas or sulfuryl chloride in the presence of a liquid solvent consisting of a N-chlorothiosulfonamide of formula I, wherein R^1 and R^2 are independently selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, aralkyl radicals having 7 to 20 carbon atoms, cycloalkyl radicals having 5 to 20 carbon atoms, phenyl radicals and alkaryl radicals having 7 to 20 carbon atoms, and haloaryl radicals having about 6 to about 10 carbon atoms and where R^1 is also selected from radicals having the formula:



wherein R^3 and R^4 are individually selected from said alkyl, aralkyl, cycloalkyl, phenyl, alkaryl and haloaryl radicals and wherein R^3 and R^4 can be joined together to represent radicals selected from $-CH_2-_n$, where n is an integer of 4 to 7 and $-CH_2{}_2O-CH_2{}_2$.

4,992,584

PROCESS FOR THE PREPARATION OF β-KETOCARBOXIMIDES OF α,β-UNSATURATED AMIDES

Robert J. Clemens, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1988, Ser. No. 231,565

Int. Cl.[5] C07C *231/00*

U.S. Cl. 564—134 18 Claims

1. A process for the preparation of β-ketocarboximides of acrylamide, said process comprising:

heating a combination comprising:

(i) acrylamide;

(ii) a 1,3-dioxin-4-one;

(iii) a non-nucleophilic free radical inhibitor; and

(iv) an inert solvent system comprising an alkyl ester having 4 to 10 carbon atoms.

4,992,585

PROCESS FOR PRODUCING α-CHLOROACETOACETIC ACID MONOMETHYLAMIDE

Flaviano Rigamonti, Monthey, Switzerland, and Pullissery Raghunandan, Goa, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 350,991, May 12, 1989, abandoned, which is a continuation of Ser. No. 924,382, Oct. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 738,914, May 29, 1985, abandoned. This application Oct. 16, 1989, Ser. No. 421,572

Claims priority, application Switzerland, May 29, 1984, 2636/84-0

Int. Cl.[5] C07C *235/80, 231/24*

U.S. Cl. 564—199 8 Claims

1. A process for producing α-chloroacetic acid monomethylamide which comprises the steps of

reacting chlorine with acetoacetic acid monomethylamide in an aqueous medium, at a temperature of −20° to +10° C., in the presence of urea and an alkali metal salt,

neutralizing the reaction mixture,

separating solid α-chloroacetoacetic acid from the mother liquor, and

recycling said mother liquor into a subsequent chlorination reaction of acetoacetic acid monomethyl amide,

wherein all of said mother liquor, obtained each time after the separation of α-chloroacetoacetic acid monomethylamide, is extracted, before being recycled, with 2–10% by weight of an aliphatic or aromatic hydrocarbon or a halogenated aliphatic or aromatic hydrocarbon, relative to the total amount of mother liquor

and then all of said extracted mother liquor is recycled into said subsequent chlorination reaction.

4,992,586

PROCESS FOR PREPARING 2-NITRO-META-PHENYLENEDIAMINES

Alex Junino, Livry-Gargan; Gerard Lang, Saint-Gratien; Nicole Jehanno, Brunoy, and Jean J. Vandenbossche, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

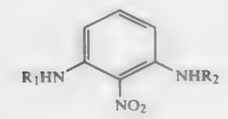
Division of Ser. No. 15,032, Feb. 17, 1987, Pat. No. 4,797,129. This application Oct. 5, 1988, Ser. No. 253,594

Claims priority, application Luxembourg, Feb. 14, 1987, 86308

Int. Cl.[5] C07C *211/00*

U.S. Cl. 564—367 7 Claims

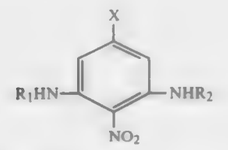
1. A process for preparing a compound having the formula



(I)

wherein

R_1 and R_2, each independently, represent hydrogen, alkyl containing 1–6 carbon atoms, monohydroxyalkyl containing 1–6 carbon atoms, polyhydroxyalkyl containing 1–6 carbon atoms, alkoxyalkyl wherein the alkyl moiety contains 1–6 carbon atoms, hydroxyalkoxyalkyl wherein the alkyl moiety contains 1–6 carbon atoms or aminoalkyl wherein the alkyl moiety contains 1–6 carbon atoms and wherein the amino moiety is unsubstituted or substituted with 1–2 alkyl or hydroxyalkyl groups wherein said alkyl has 1–6 carbon atoms or wherein the nitrogen atom of said aminoalkyl forms part of a heterocycle, said process comprising dehalogenating a compound of the formula



(II)

wherein X halogen and R_1 and R_2 have the meanings given above, with triethylamine formate in the presence of palladium on a support without involving the simultaneous reduction of the nitro group, said support being selected from the group consisting of barium sulfate, barium carbonate, alumina and calcium carbonate.

4,992,587

PROCESS OF USING A RUTHENIUM-PROMOTED, HALOGEN-CONTAINING, NICKEL AND/OR COBALT CATALYST, TO CATALYZE AN AMINATION REACTION

Juhan Köll, Stenungsund, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

Division of Ser. No. 63,530, Jun. 18, 1987, Pat. No. 4,863,890, which is a continuation-in-part of Ser. No. 647,471, Sep. 5, 1984, Pat. No. 4,701,434. This application Jun. 2, 1989, Ser. No. 361,657

Claims priority, application Sweden, Sep. 9, 1983, 8304828; Jul. 11, 1986, 8603088

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] C07C *85/08*

U.S. Cl. 564—398 5 Claims

1. The process of catalyzing an amination reaction in which a hydroxyl-containing compound is reacted with at least one of ammonia, a primary amine, and a secondary amine to provide an amine, comprising:

conducting the amination reaction in the presence of a ruthenium-promoted, halogen-containing, nickel and/or cobalt catalyst containing, based on the total weight of the catalyst:

from 4 to 40% by weight of at least one metal selected from nickel and cobalt;

from 0.1 to 5% by weight of ruthenium; and

a porous metal oxide support comprised of at least 50% by weight of a material selected from activated alumina and activated silica,

wherein the at least one metal selected from nickel and cobalt and the ruthenium are in the metallic state, and

wherein the catalyst is prepared by a process comprising:

impregnating, in one or more steps, a porous metal oxide support with a solution or slurry of at least one metallic compound selected from a nickel compound and a cobalt compound; and a solution or slurry of a ruthenium compound;

reducing in one or more steps, the at least one metallic compound and the ruthenium compound to nickel and/or cobalt and ruthenium metal; and

introducing halogen into the catalyst by adding a halide compound as a liquid, gas or in solution at any stage of the process.

4,992,588

PREPARATION OF O-ACYLAMINOMETHYLBENZYL HALIDES

Josef Mueller, Ludwigshafen; Walter-Wellant Wiersdorff, Mutterstadt; Werner Kirschenlohr, Ludwigshafen, and Gerd Schwantje, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

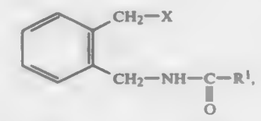
Continuation of Ser. No. 467,829, Feb. 18, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,337

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206660

Int. Cl.[5] C07C *233/66, 233/13*

U.S. Cl. 564—185 2 Claims

1. A process for the preparation of an o-acylaminomethylbenzyl halide of the formula (I)



(I)

where X is a halogen and R^1 is an aliphatic or aromatic radical which comprises: first, reacting an o-aminomethylbenzyl alkyl ether of the formula (II)

(II)

where R^2 is alkyl with an acylating agent to give the corresponding acylaminomethylbenzyl alkyl ether and thereafter reacting said ether with an aqueous hydrohalic acid at a temperature no higher than 80° C. to give the corresponding halide (I), with both reactions being carried out in the same solvent and reaction vessel, and wherein said acylaminomethylbenzyl alkyl ether intermediate is not isolated prior to reaction with said hydrohalic acid.

4,992,589

SUBSTITUTED PHENYL HYDROXYETHYL SULFONES, AND PROCESS FOR THEIR PREPARATION

Hermann Fuchs, Königstein/Taunus; Theodor Papenfuhs, Frankfurt am Main; Werner Brodt, Hattersheim am Main, and Folker Kohlhaas, Hochheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 65,295, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 756,771, Jul. 18, 1985, abandoned. This application Aug. 10, 1988, Ser. No. 231,655

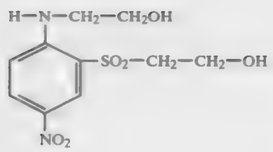
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426729; Jan. 30, 1985, 3502991

Int. Cl.[5] C07C *317/14, 321/28*

U.S. Cl. 564—440 1 Claim

1. A compound of the formula:

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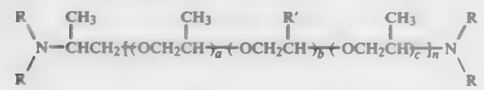
4,992,590

POLYAMINES BY AMINATION OF POLYAMINO INITIATED POLYOXYALKYLENE GLYCOLS

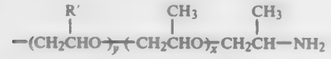
Michael Cuscurida; John M. Larkin, both of Austin; Kathy B. Sellstrom, Pflugerville, and Robert A. Grigsby, Jr., Georgetown, all of Tex., assignors to Texaco Chemical Company, White Plains, Tex.

Filed Oct. 2, 1989, Ser. No. 415,802
Int. Cl.[5] C07C *213/00, 215/00, 217/00*
U.S. Cl. 564—505 **8 Claims**

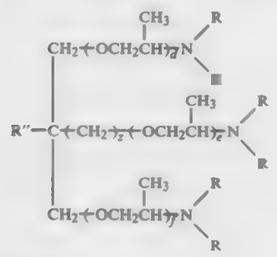
1. A polyamine selected from the group consisting of:
(1) a Type A compound of the formula:



wherein a+b+c=2—100 and R is:



R′ is selected from the group consisting of hydrogen and the methyl or ethyl radical,
x ranges from 0 to about 10,
y ranges from 2 to about 100, and
n is 0 or 1, and with the proviso that when n is 0, then R′ is the methyl or ethyl radical; and
(2) a Type B compound of the formula:



wherein
R″ is selected from the group consisting of hydrogen and the methyl or ethyl radical,
z 0 or 1,
R has the same meaning as previously described in (1) above and the sum of d+e+f ranges from 3 to about 100.

4,992,591

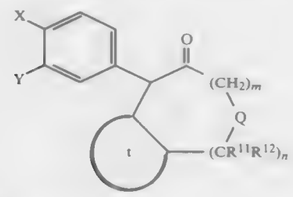
PREPARATION OF ALPHA-(3,4-DISUBSTITUTED ARYL) CYCLIC KETONES

Donald Hou, Verona, and Janet L. Mas, Scotch Plains, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

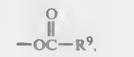
Filed Dec. 21, 1989, Ser. No. 454,670
Int. Cl.[5] C07C *45/67*
U.S. Cl. 568—315 **17 Claims**

1. A method for producing a compound of the formula

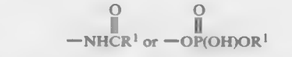
I



wherein:
R^1, R^{11} and R^{12} may be the same or different and each is hydrogen or alkyl;
Q is methylene, —O— or —S—;
m and n are independently variable and may each have a value of 0, 1 or 2;
X is hydrogen, halo, alkyl, alkylthio, alkylsulfinyl, alkylsufonyl, hydroxy, alkoxy or trifluoromethyl;
Y is hydrogen, hydroxy, alkoxy



$—N(R^1)_2$,



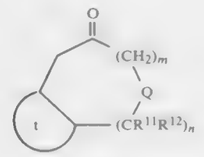
where R^1 is as defined above;
ring t represents a fused thiophen or fused benzene ring, said fused benzene ring optionally being substituted with a substituent Z as defined below;
R^2 and R^3 are independently hydrogen, alkyl, aralkyl, cycloalkyl, aryl, hydroxyalkyl, or alkoxyalkyl;
in addition, when one of R^2 and R^3 is as defined above, the other may be $—R^4NR^5NR^5R^6$ {wherein R^4 is alkanediyl, R^5 is hydrogen or alkyl and R^6 is alkyl, or R^5 and R^6 together with the nitrogen atom form a 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 1-(4-alklypiperazinyl), 4-morpholinyl or 1-(hexahydroazepinyl) group{;
in further addition, R^2 and R^3 together with the nitrogen atom may form a 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-(4-alkylpiperazinyl), 1-(4-alkoxyalkylpiperazinyl), 1-(4-hydroxyalkylpiperazinyl), 1-(3-hydroxyazetidinyl), 1-(3-aloxyazetidinyl), 1-(3-hydroxypyrrolidinyl), 1-(3-alkoxypyrrolidinyl), 1-(3- or 4-hydroxypiperidinyl), 1-(3- or 4-alkoxypiperidinyl), 1-(4-oxopiperidinyl) or 1-(3-oxopyrrolidinyl) ring;
in still further addition, when R^2 is hydrogen, R^3 may be $—CHR^7CO_2R^8$, wherein R^7 and R^8 are independently hydrogen, alkyl or aralkyl;
R^9 is alkyl, aralkyl, aryl, alkoxyalkyl, aryloxyalkyl, aralkoxyalkyl, cycloalkylalkyl, alkoxycarbonylalkyl, cycloalkyl, 1-adamantyl, cycloalkoxyalkyl, alkoxy, aralkoxy, cycloalkoxy, aryloxy or $—CHR^7NHR^8$ {wherein R^7 and R^8 are as defined above}; and

Z is X as defined above, amino, alkylamino or

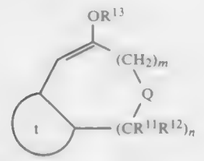


{wherein R^{10} is hydrogen, alkyl or aryl} comprising reacting a compound of the formula II or formula III:

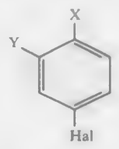
II



III



with a compound of the formula:



in the presence of a nickel transition metal catalyst or a palladium transition metal catalyst
where Hal is a halogen; and
R^{13} is acetyl, or $Si(R^{14})_3$ where each R^{14} independently is alkyl or aryl
with suitable hydroxy and amino protecting groups utilized where necessary.

4,992,592

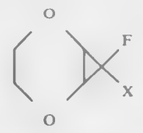
1-FLUORO-1-HALO-3,6-DIOXABICYCLO [4.1.0]HEPTANE PREPARATION, PROCESS AND USE

Huguette Molines, and Claude Wakselman, both of Paris, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Division of Ser. No. 191,047, May 6, 1988, abandoned. This application May 11, 1989, Ser. No. 351,272
Claims priority, application France, May 6, 1987, 87 06600
Int. Cl.[5] C07C *41/50*
U.S. Cl. 568—603 **6 Claims**

1. A process for preparing a fluoromalonaldehyde acetal comprising contacting a 1-fluoro-1-halo-3,6-dioxabicyclo heptane compound of the formula (I):

(I)



wherein X is selected from the group consisting of fluorine, chlorine and bromine, in a reaction mixture with a strong acid and an alcohol for a time sufficient to cause the formation of said fluoromalonaldehyde acetal.

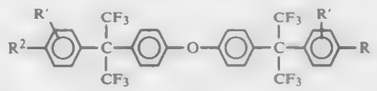
4,992,593

PARTIALLY FLUORINATED DIPHENYL ETHERS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Günter Siegemund, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,787
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739795
Int. Cl.[5] C07C *41/00*
U.S. Cl. 568—637 **6 Claims**

1. A compound of the formula



(I)

in which independently of one another R is equal to OH or lower alkyl having 1 to 4 carbon atoms, R′ is equal to hydrogen or lower alkyl having 1 to 4 carbon atoms.

4,992,594

PROCESS FOR THE PREPARATION OF POLYGLYCEROLS

Gerald Jakobson, and Werner Siemanowski, both of Rheinberg, Fed. Rep. of Germany, assignors to Deutsche Solvay-Werke GmbH, Solingen, Fed. Rep. of Germany

Filed Jan. 3, 1990, Ser. No. 460,380
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1989, 3900059
Int. Cl.[5] C07C *41/03*
U.S. Cl. 568—680 **33 Claims**

1. A process for the preparation of polyglycerols containing more than 50% by weight of diglycerol and having a low content of cyclic components from chlorohydrins, comprising the steps of:
reacting epichlorohydrin with α-monochlorohydrin in the presence of an acid or a compound with an acid reaction at a temperature of about 20° C. to 120° C., in a molar ratio of epichlorohydrin to α-monochlorohydrin of about 0.8:1 to 1:2.5;
adding a solution having an alkaline reaction to the resulting, unseparated reaction mixture, at a temperature of about 50° C. to 120°, the amount of the addition being based on the content of organically-linked chlorine in the reaction mixture;
desalinating the reaction mixture, after the addition of water, first with one or more cation exchangers and subsequently with one or more anion exchangers;
removing water by distillation; and
separating the reaction mixture into diglycerol, higher polyglycerols and glycerol, by fractional distillation.

4,992,595

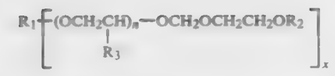
POLY(ALKOXY ETHER) MIXED FORMALS

Rolf Kleber, Neu-Isenburg; Siegfried Billenstein, Burgkirchen; Lothar Jaeckel, Flörsheim am Main, and Ignaz Wimmer, Winhöring, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

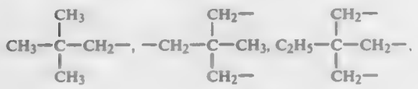
Continuation-in-part of Ser. No. 144,253, Jan. 14, 1988, abandoned. This application Nov. 23, 1988, Ser. No. 274,698
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701303
Int. Cl.[5] C07C *43/30*
U.S. Cl. 568—601 **1 Claim**

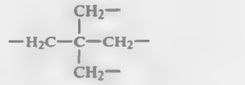
1. A polyglycol ether mixed formal of the formula

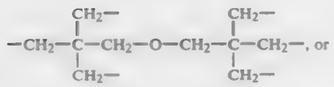
VOL 1123 ISS 2 FE 12 1991 UMI

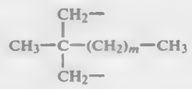


where R_1 denotes a group of the formula









R_2 denotes C_1–C_4-alkyl, R_3 denotes hydrogen or methyl, n denotes a number from 5 to 100, m denotes an integer from 0 to 4 and x denotes the number of free valences of the particular R_1 radical.

4,992,596

SELECTED TRINUCLEAR NOVOLAK OLIGOMERS AND THEIR USE IN PHOTOACTIVE COMPOUNDS AND RADIATION SENSITIVE MIXTURES

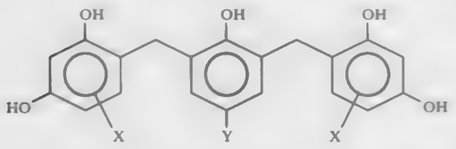
Alfred T. Jeffries, III, Providence, R.I.; Andrew J. Blakeney, Seekonk, Mass., and Medhat A. Toukhy, Barrington, R.I., assignors to Olin Hunt Specialty Products Inc., Cheshire, Conn.

Division of Ser. No. 290,009, Dec. 27, 1988, Pat. No. 4,957,846. This application Jun. 8, 1990, Ser. No. 534,908

Int. Cl.[5] C07C *39/12*

U.S. Cl. 568—720 **5 Claims**

1. A trinuclear novolak oligomer of the formula (I):



(I)

wherein each X is selected from the group consisting of hydrogen, hydroxyl group and halide group and Y is selected from the group consisting of a lower alkyl group having 1–4 carbon atoms and a halogen atom.

4,992,597

ANTIOXIDANT PROCESS

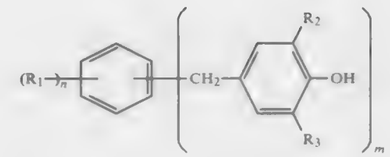
George L. Mina, and Gary D. Heidebrecht, both of Orangeburg, S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 25, 1989, Ser. No. 411,654

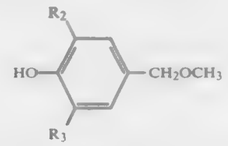
Int. Cl.[5] C07C *39/12*

U.S. Cl. 568—720 **19 Claims**

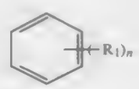
1. A process for making a compound having the structure:



by reacting a reactant having the structure:



with a benzene compound having the structure:



wherein R_1 is a C_{1-3} lower alkyl and R_2 and R_3 are independently selected from the group consisting of C_{1-8} alkyl, C_{5-8} cycloalkyl and C_{7-12} aralkyl, n is zero or an integer from 1 to 4, m is an integer from 2 to 3, and m+n does not exceed 6, in an inert solvent in the presence of an organic sulfonic acid at a temperature of about 10°–150° C. and at a pressure such that methanol by-product formed in the reaction distills out of the reaction mixture as a methanol-containing distillate as it is formed.

4,992,598

PURIFICATION OF 1, 1, 1-TRIS(4'-HYDROXYPHENYL)ETHANE

Heinz Strutz, Frankfurt, Fed. Rep. of Germany, and Werner Muëller, Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 9, 1990, Ser. No. 478,072

Int. Cl.[5] C07C *39/12*

U.S. Cl. 568—720 **20 Claims**

1. A process for the purification of 1,1,1-tris(4'-hydroxyphenyl)ethane from a substantially solid crude admixture containing 1,1,1-tris(4'-hydroxyphenyl)ethane and impurities resulting from the catalytic production of 1,1,1-tris(4'-hydroxyphenyl)ethane from 4-hydroxyacetophenone and phenol, the process comprising:

(a) washing said crude admixture with a saturated solution of 1,1,1-tris(4'-hydroxyphenyl)ethane in a solute comprising from about 60 to about 75% by weight of water and from about 25% to about 40% by weight of methanol; and

(b) isolating the thusly washed crude admixture from the formed effluent washing composition, and dissolving said washed crude admixture in methanol, and

(c) adding sufficient water and sodium borohydride to said dissolved, washed crude admixture to form a precipitate of 1,1,1tris(-4'-hydroxyphenyl)ethane, and

(d) filtering said precipitate to thereby form a purified 1,1,1-tris(-4'-hydroxyphenyl)ethane and a filtrate; and

(e) rinsing the resultant filtered precipitate of 1,1,1-tris(4'-hydroxyphenyl)ethane with a solution of sufficient methanol and water, which optionally contains 1,1,1-tris(4'-hydroxyphenyl)ethane up to the saturation point, and conducting the rinsing for a sufficient time to remove substantially all residual colored impurities from said precipitate.

4,992,599

NOVEL PURIFICATION PROCESS

Jorg Talbiersky, Dorsten; Bernhard Wefringhaus, Castrop-Rauxel; Konrad Stolzenberg, Waltrop, and Wolfgang Bergins, Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Dec. 13, 1989, Ser. No. 450,050

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, 3842693; Apr. 18, 1989, 3912670

Int. Cl.[5] C07C *37/74, 37/68*

U.S. Cl. 568—759 **8 Claims**

1. A process for simultaneously removing organic bases and sulfur compounds from phenolic fractions from tars or hydrogenation of coal comprising reacting the phenolic fraction at temperatures of about 100° to 180° with phthalic acid anhydride and distilling the mixture to obtain a purified phenol.

4,992,600

PROCESS FOR THE OXIDATION OF BENZENE TO PHENOL

Kuo-Hua Chao, and Raymond T. Moy, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1989, Ser. No. 412,755

Int. Cl.[5] C07C *37/58*

U.S. Cl. 568—802 **11 Claims**

1. A process for the oxidation of benzene to phenol which comprises contacting at a temperature ranging from about 0° C. to about 100° C. benzene and molecular oxygen with an alkali metal salt of dihydrodihydroxyanthracene-sulfonate having at least one sulfonate moiety on the 2, 3, 6 or 7 locant position(s) and which salt is dissolved in water, and subsequently separating from the reaction product phenol and the corresponding alkali metal salt of anthraquinonesulfonate.

4,992,601

PROCESS FOR THE SELECTIVE SEPARATION OF ALKENES AND ALKYNES

Mauricio Kling, Munich, Fed. Rep. of Germany, assignor to Energia Andina Ltd., New York, N.Y.

Filed Feb. 15, 1989, Ser. No. 311,157

Int. Cl.[5] C07C *27/10*

U.S. Cl. 568—840 **13 Claims**

1. A process for the separation of alkenes and alkynes from a gas of the type obtained by cracking petroleum products comprising the steps of

(a) contacting said gas containing at least two of said alkenes or alkynes with at least two consecutively arranged adsorbers, each of said adsorbers comprising the hydrogen form of a macroporous strongly acidic cation exchange resin, said contacting step selectively promoting the adsorption of one of said alkenes or alkynes to each of said adsorbers, and

(b) desorbing the adsorbed alkenes or alkynes from each of said adsorbers by contacting said adsorbers with a member from the group consisting of water, oxygen and an acid in vapor form to form at least one member from the group consisting of an alcohol, an aldehyde, and an ester.

4,992,602

PREPARATION OF TERTIARY BUTYL ALCOHOL

John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Jan. 29, 1990, Ser. No. 471,751

Int. Cl.[5] C07C *29/132, 29/50, 31/12, 29/00*

U.S. Cl. 568—909.8 **9 Claims**

1. In a continuous method for preparing t-butyl alcohol wherein isobutane is continuously reacted with molecular oxygen in an oxidation reaction zone under liquid phase oxidation reaction conditions to provide an initial reaction mixture comprising unreacted isobutane and isobutane oxidation reaction products, principally t-butyl hydroperoxide and t-butyl alcohol, and wherein unreacted isobutane is continuously separated from said initial reaction mixture in a distillation zone to provide a charge stock comprising a solution of said t-butyl hydroperoxide in said t-butyl alcohol, containing from about 5 to about 50 wt.% of t- butyl hydroperoxide, the improvement which comprises:

(a) continuously distilling said charge stock in distillation zone to provide a second distillate t-butyl alcohol fraction and a third distillation fraction consisting essentially of from about 80 to about 90 wt.% of t-butyl hydroperoxide and, correspondingly, from about 20 to about 10 wt.% of t-butyl alcohol,

(b) continuously dissolving said third distillate fraction in about 3 to about 10 parts by weight, based on the weight of said third distillate fraction, of a monocyclic aromatic solvent,

(c) continuously charging said solution to a t-butyl hydroperoxide decomposition zone,

(d) continuously adding a phthalocyanine decomposition catalyst to said solution in an amount constituting from about 0.001 to about 5 wt.%, based on the weight of the t-butyl hydroperoxide in said solution,

(e) continuously conducting a hydroperoxide decomposition reaction in the presence of said phthalocyanine decomposition catalyst in said hydroperoxide decomposition zone in liquid phase with agitation under reaction conditions including a temperature within the range of about 10° to about 80° C. and autoqenous pressure to convert said t-butyl hydroperoxide to decomposition products, principally t-butyl alcohol and to thereby provide a hydroperoxide conversion product,

(f) continuously removing a stream of said hydroperoxide conversion product from said hydroperoxide conversion zone, and

(g) continuously recovering t-butyl alcohol from said stream of said hydroperoxide conversion product.

4,992,603

PROCESS FOR PRODUCING NITROMETHANE

Roger Mari, Villers-les-Nancy, and Jacques Quibel, Maisons-Laffitte, both of France, assignors to S.E.P.P.I.C. Societe d'Exploitation de Produits pour les Industries Chimiques, Paris, France

Filed Jun. 9, 1989, Ser. No. 363,735

Claims priority, application France, Jun. 9, 1988, 88 07675

Int. Cl.[5] C07C *205/02*

U.S. Cl. 568—948 **11 Claims**

1. A process for preparing nitromethane comprising reacting an oxygen-containing nitriding agent with an oxocarbon containing raw material in the presence of a catalyst, wherein said raw material contains substantially exclusively said oxocarbon compound, said oxocarbon compound having two carbon atoms and at least one oxygen atom, and wherein the catalyst is dichloroethane.

4,992,604

STABILIZED 1,1,1-TRICHLOROETHANE COMPOSITIONS

Donald A. Reich; Catherine C. Doyen, both of Lake Charles, La., and Stephanie J. Oates, Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 24, 1989, Ser. No. 383,488

Int. Cl.[5] C07C *17/42, 19/05*

U.S. Cl. 570—110 **6 Claims**

1. Stabilized 1,1,1-trichloroethane composition which is free of 1,4-dioxane and which consists essentially of (a) 1,1,1-trichloroethane, (b) from about 2 to about 4 percent by weight 1,3-dioxolane, (c) from about 0.25 to about 0.5 percent by weight butylene oxide, (d) from about 0.25 to about 2 percent

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by weight nitromethane, (e) from about 0.2 to about 0.75 percent by weight 1-nitropropane, (f) from about 0.75 to about 2 percent by weight secondary butanol, and (g) from 0 to about 100 parts per million by weight acetaldehyde dimethylhydrazone.

4,992,605

PRODUCTION OF HYDROCARBONS WITH A RELATIVELY HIGH CETANE RATING

Wayne K. Craig, 126 Auld Crescent, Saskatoon, Saskatchewan, Canada (S7H 4W9), and Douglas W. Soveran, 7309 5th Avenue, Regina, Saskatchewan, Canada (S4T 0N2)

Continuation-in-part of Ser. No. 156,029, Feb. 16, 1988, abandoned. This application Jan. 27, 1989, Ser. No. 302,255
Int. Cl.[5] C10L *1/04*
U.S. Cl. 585—240 8 Claims

1. A process for producing liquid paraffinic hydrocarbons in the C_{15}–C_{18} range, effective as diesel fuel cetane rating improvers, comprising:

(a) hydroprocessing a feedstock selected from a group consisting of canola oil, sunflower oil, soybean oil, rapeseed oil, palm oil and fatty acid fraction of tall oil by contacting the feedstock with gaseous hydrogen under conditions of temperature and pressure including selected temperatures from about 350° C. to about 450° C. in the presence of a hydroprocessing catalyst, the conditions effective to cause hydrogenation, hydrotreating and hydrocracking of the feedstock to convert the feedstock a mixture of compounds including mainly a diesel fuel boiling range fraction consisting predominately of C_{15}–C_{18} straight-chain paraffins,

(b) separating the mixture of compounds; and

(c) removing from the mixture the diesel fuel boiling range fraction.

4,992,606

PROCESS FOR PREPARING SHORT CHAIN ALKYL AROMATIC COMPOUNDS

John D. Kushnerick, Boothwyn, Pa.; David O. Marler, Deptford, N.J.; John P. McWilliams, Woodbury, N.J., and Charles M. Smith, Princeton, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, Pat. No. 4,954,325, which is a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Jan. 25, 1990, Ser. No. 469,998
The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.
Int. Cl.[5] C07C *2/66*
U.S. Cl. 585—467 26 Claims

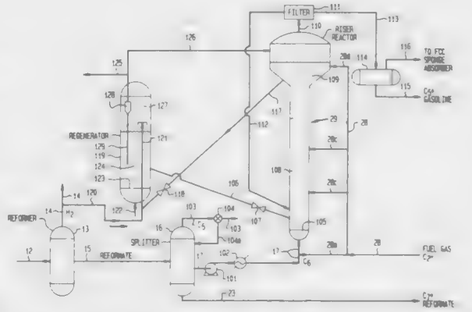
1. A process for preparing short chain alkyl aromatic compounds which comprises contacting at least one alkylatable aroxatic compound with at least one alkylating agent possessing an aliphatic group having from 1 to 5 carbon atoms under alkylation reaction conditions and in the presence of an alkylation catalyst to provide an alkylated aromatic product possessing at least one alkyl group derived from said alkylating agent, said catalyst comprising a synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table A of the specification.

4,992,607

PETROLEUM REFINERY PROCESS AND APPARATUS FOR THE PRODUCTION OF ALKYL AROMATIC HYDROCARBONS FROM FUEL GAS AND CATALYTIC REFORMATE

Mohsen N. Harandi, Lawrenceville, N.J.; John D. Kushnerick, Boothwyn, Pa., and Hartley Owen, Belle Mead, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,736
Int. Cl.[5] C07C *2/66*
U.S. Cl. 585—467 28 Claims



1. A process for the production of gasoline which comprises contacting a feed stream comprising C_4- olefin hydrocarbons with a feed stream comprising C_6 to C_8 aromatic hydrocarbons at an aromatic to olefin weight ratio of 5:1 to 20:1 over a fluidized zeolite catalyst at a temperature of 350° to 900° F. and a pressure of 20 to 650 psig in a riser reactor having multiple olefin feed injection points to alkylate the C_{6-C8}aromatics with the olefins to form C_7 to C_{11} alkyl aromatic hydrocarbon gasoline products, wherein the multiple olefin feed injection points are spaced along the height of the riser reactor and the aforesaid aromatic to olefin weight ratio is maintained throughout the riser reactor and withdrawing a portion of the catalyst from the riser for regeneration of the catalyst, said withdrawn catalyst containing only a minor amount of deposited coke.

4,992,608

METHOD FOR PREPARING CUMENE

Fabrizio Cavani, Modena, and Virginio Arrigoni, Milan, both of Italy, assignors to Enichem Synthesis SpA, Palermo and Eniricerche SpA, Milan, both of, Italy

Filed Apr. 24, 1989, Ser. No. 342,178
Claims priority, application Italy, May 6, 1988, 20495 A/88
Int. Cl.[5] C07C *2/68, 5/22*
U.S. Cl. 585—467 11 Claims

1. A process for preparing cumene by the alkylation reaction of benzene with propylene, comprising conducting the reaction in the presence of an alkylation catalyst comprising a silica and alumina gel, said catalyst being amorphous to X-rays and having a SiO_2/Al_2O_3 ratio of from 50/1 to 300/1, a surface area of from 500 to 1000 m^2/g, an overall pore volume of from 0.3 to 0.6 ml/g and a mean pore diameter of about 10 Angstroms, said catalyst being at least substantially free of pores having a diameter exceeding 30 Angstroms.

7. A process for preparing cumene by the transalkylation reaction of benzene with diisopropylbenzene, comprising conducting the reaction in the presence of a transalkylation catalyst comprising a silica and alumina gel, said catalyst being amorphous to X-rays and having a SiO_2/Al_2O_3 ratio of from 50/1 to 300/1, a surface area of from 500 to 1000 m^2/g, an overall pore volume of from 0.3 to 0.6 ml/g and a mean pore diameter of about 10 Angstroms, said catalyst being at least substantially free of pores having a diameter exceeding 30 Angstroms.

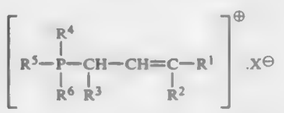
4,992,609

PHOSPHONIUM SALTS AND PROCESSES FOR PRODUCTION OF AND USES FOR THE SAME

Toshihiko Maeda; Yasuo Tokitoh, and Noriaki Yoshimura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 211,034, Jun. 24, 1988, Pat. No. 4,927,910. This application Mar. 13, 1990, Ser. No. 492,882
Claims priority, application Japan, Jun. 24, 1987, 62-158290
Int. Cl.[5] C07C *2/18*
U.S. Cl. 585—509 5 Claims

1. A process for producing a straight-chain alkadienyl compound which comprises reacting a conjugated diene with an active hydrogen compound in the presence of a telomerization catalyst, characterized in that a catalyst comprising a phosphonium salt of the general formula


(I)

wherein R^1 and R^2 each is a hydrogen atom or a hydrocarbon group of 1 to 12 carbon atoms which may optionally be substituted; R^3 is a hydrogen atom or a hydrocarbon group 1 to 5 carbon atoms which may optionally be substituted; R^4, R^5 and R^6 each is a hydrocarbon group of 1 to 8 carbon atoms which may be substituted, at least one of R^4, R^5 and R^6 being an aryl group; X is a hydroxyl group, a hydroxycarbonyloxy group or a lower alkylcarbonyloxy group and a palladium compound is used as said telomerization catalyst, the substituents of the substituted hydrocarbons being di(lower alkyl)amino, cyano, $-SO_3M$ or —COOM, wherein M is an alkali metal.

4,992,610

DIMERIZATION OF LOWER α-OLEFINS

Hiroshi Sato, Niihama; Kenshi Uchida, Takatsuki, and Hideto Tojima, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 28, 1989, Ser. No. 316,945
Claims priority, application Japan, Feb. 29, 1988, 63-47860
Int. Cl.[5] C07C *2/26, 2/24*
U.S. Cl. 585—511 14 Claims

1. A process for preparing a dimer of a lower α-olefin comprising dimerizing α-olefin in the presence of a catalyst consisting essentially of

(A) nickel chloride,

(B) a trialkylaluminum,

(C) at least one phosphorus compound selected from the group consisting of compounds of the formulae:

$$PR^1R^2R^3 \quad (I)$$

$$R(NR^1{}_2)_3 \quad (II)$$

and

$$P(OR^1)_3 \quad (III)$$

wherein R^1, $R^2$and R^3 are the same or different and each an alkyl group, a cycloalkyl group or a phenyl group and

(D) 1,1,1,3,3,3,-hexafluoroisopropanol.

4,992,611

DIRECT CONVERSION OF C_1–C_4 OXYGENATES TO LOW AROMATIC DISTILLATE RANGE HYDROCARBONS

Roger A. Morrison, Deptford, N.J., assignor to Mobil Oil Corp., Fairfax, Va.

Filed Dec. 13, 1989, Ser. No. 449,170
Int. Cl.[5] C07C *1/00*
U.S. Cl. 585—640 27 Claims

1. A process for converting C_1–C_4 oxygenates to olefinic hydrocarbons which comprises contacting a feed stream containing at least one of said C_1–C_4 oxygenates and an olefin oligomer formation-directing amount of at least one light olefin under olefinic hydrocarbon-forming conditions with a synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth below:

Interplanar d-Spacing (A)	Relative Intensity, $I/I_o \times 100$
12.36 ± 0.4	M–VS
11.03 ± 0.2	M–S
8.83 ± 0.14	M–VS
6.18 ± 0.12	M–VS
6.00 ± 0.10	W–M
4.06 ± 0.07	W–S
3.91 ± 0.07	M–VS
3.42 ± 0.06	VS

4,992,612

SOLID BASE, PROCESS FOR PRODUCING THE SAME AND PROCESS OF PREPARING INTERNAL OLEFINS

Gohfu Suzukamo, Ibaraki, and Masami Fukao, Shiga, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 9, 1989, Ser. No. 391,243
Claims priority, application Japan, Aug. 12, 1988, 63-202464; Aug. 12, 1988, 63-202465
Int. Cl.[5] C07C *5/23*
U.S. Cl. 585—664 15 Claims

1. A process for preparing an internal olefin comprising isomerizing an olefin in the presence of a solid base obtainable by heating and reacting an alkaline earth metal compound with alumina at a temperature of from 300° to 600° C. and then heating and reacting the resulting product with at least one material selected from the group consisting of alkali metals and hydrides of alkali metals in an inert gas atmosphere at a temperature of from 200° to 450° C.

4,992,613

DOUBLE-BOND ISOMERIZATION PROCESS USING BASIC ZEOLITE CATALYSTS

Thomas F. Brownscombe, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1989, Ser. No. 394,693
Int. Cl.[5] C07C *5/23*
U.S. Cl. 585—666 32 Claims

1. A process for the double bond isomerization of an olefin which comprises contacting said olefin with a catalyst comprising a zeolite and an alkali(ne-earth) metal compound wherein the sum of the amount of the alkali(ne-earth) metal in said compound and any metal cation exchanged in the zeolite is in excess of that required to provide a fully metal cation-exchanged zeolite.

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4,992,614

REACTIVATION OF PARTIALLY DEACTIVATED CATALYST EMPLOYING ULTRASONIC ENERGY

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corp., Fairfax, Va.

Continuation of Ser. No. 213,801, Jun. 30, 1988, Pat. No. 4,914,256. This application Oct. 2, 1989, Ser. No. 415,800
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[5] C07C *2/58*; B01J *37/34*; B08B *3/12*
U.S. Cl. 585—722 35 Claims

1. In a catalyzed isoparaffin-olefin alkylation process employing a solid particulate catalyst composition which undergoes a loss of activity due to accumulation of solid contaminant, the improvement which comprises subjecting the catalyst after it has undergone a partial but less than complete loss of activity due to solid contaminant accumulation with ultrasonic energy within a chemical conversion zone containing a liquid feed stock, the catalyst being present therein, the magnitude of such ultrasonic energy and its duration being sufficient to restore a substantial percentage of the lost activity of the catalyst.

4,992,615

ISOPARAFFIN-OLEFIN ALKYLATION PROCESS

Albin Huss, Jr., Chadds Ford, Pa.; Garry W. Kirker, Washington Township, Glouchester County, N.J.; Kathleen M. Keville, Woodbury, N.J., and Robert T. Thomson, Voorhees, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Jan. 25, 1990, Ser. No. 470,014
Int. Cl.[5] C07C *2/58*
U.S. Cl. 585—722 24 Claims

1. An isoparaffin-olefin alkylation process which comprises reacting isoparaffin and olefin under alkylation conditions providing an alkylate product in the presence of, as catalyst, a zeolite characterized by an X-ray diffraction pattern including values substantially as set forth below:

Interplanar d-Spacing (A)	Relative Intensity, $I/I_o \times 100$
12.36 ± 0.4	M-VS
11.03 ± 0.2	M-S
8.83 ± 0.14	M-VS
6.18 ± 0.12	M-VS
6.00 ± 0.10	W-M
4.06 ± 0.07	W-S
3.91 ± 0.07	M-VS
3.42 ± 0.06	VS.

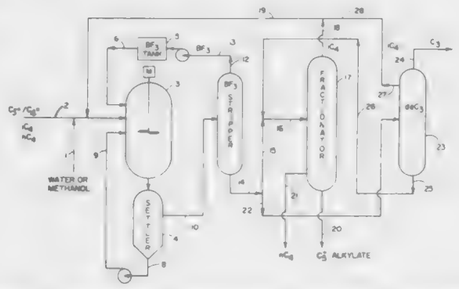
4,992,616

HETEROGENEOUS ISOPARAFFIN/OLEFIN AKLYLATION PROCESS

Tai-Sheng Chou, Pennington, N.J.; Albin Huss, Jr., Chadds Ford, and Clinton R. Kennedy, West Chester, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 219,130, Jul. 15, 1988, abandoned. This application Oct. 17, 1989, Ser. No. 425,497
Int. Cl.[5] C07C *2/58*
U.S. Cl. 585—722 23 Claims

1. An alkylation process for producing high octane gasoline comprising reacting a stream of an isoparaffin containing from 4 to 20 carbon atoms with a stream of an olefin containing from 2 to 12 carbon atoms at a temperature from about −40° C. to about 500° C. and at a pressure in the range of subatmospheric to about 5000 psig in an alkylation zone using a reaction mixture wherein a molar ratio of the isoparaffin to the olefin in the combined hydrocarbon feed is from about 1:1 to about 50:1 in the presence of added water and in contact with an alkylation



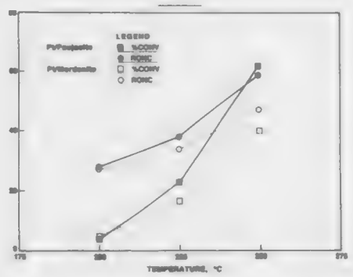
catalyst comprising a Lewis acid and a bound and/or unbound large pore zeolite.

4,992,617

ISOMERIZATION USING NOBLE METAL ACIDIC ZEOLITES

Albert E. Schweizer, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jan. 3, 1989, Ser. No. 292,690
Int. Cl.[5] C07C *5/13*
U.S. Cl. 585—739 4 Claims



1. A method for isomerizing paraffinic hydrocarbons, which method comprises contacting a paraffinic hydrocarbon, under isomerization conditions, with a noble metal containing zeolite prepared by: (a) dry-mixing a 12-ring acidic zeolite, other than mordenite, with a noble-metal compound selected from $Pt(acetylacetonate)_2$ and $Pd(acetylacetonate)_2$ for an effective amount of time to incorporate Pt and/or Pd into the pore surface regions of the zeolite, but not to disperse the Pt and/or Pd throughout the entire zeolite; and (b) calcining the so treated zeolite at a temperature from about 250° C. to about 600° C.

4,992,618

ADSORPTIVE SEPARATION PROCESS FOR THE PURIFICATION OF HEAVY NORMAL PARAFFINS WITH NON-NORMAL HYDROCARBON PRE-PULSE STREAM

Santi Kulprathipanja, Inverness, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 172,168, Mar. 23, 1988, abandoned. This application Aug. 9, 1989, Ser. No. 391,747
Int. Cl.[5] C07C *7/13*
U.S. Cl. 585—820 21 Claims

1. In a process for separating normal paraffin hydrocarbons from non-normal hydrocarbons with increased recovery of said normal hydrocarbons through the use of adsorptive separation wherein a hydrocarbon feed material comprising normal

paraffins and non-normal hydrocarbons having a range of carbon numbers greater than 10, is separated into an extract material comprising relatively adsorbed normal hydrocarbons and a raffinate material comprising the relatively non-adsorbed non-normal hydrocarbons using a column of adsorbent having selective adsorption properties for the extract material as compared to the raffinate material comprising contacting said adsorbent with said feed material, removing said relatively non-adsorbed non-normal hydrocarbons from said adsorbent and desorbing said adsorbed normal paraffin hydrocarbons with a desorbent comprising a normal hydrocarbon having lower carbon numbers than said feed material, the improvement comprising passing a non-normal hydrocaroon input stream having lower carbon numbers than said feed material into the adsorption zone of said column of adsorbent at the upstream end of said adsorption zone prior to the point at which said adsorbent is contacted with the feed material or mixed with feed material whereby the normal hydrocarbons comprising said desorbent are substantially diluted in the void volume and said normal paraffin constituents of said feed material in contact with the adsorbent are adsorbed in preference to said desorbent normal hydrocarbons also in contact with adsorbent to thereby increase the recovery of said normal paraffin hydrocarbon feed materials.



4,992,619

PROCESS FOR SEPARATING METHYL SUBSTITUTED NAPHTHALENE BY CRYSTALLIZATION UNDER PRESSURE

Shunichi Koide; Shinji Aihara; Hiroshi Takeshita, all of Tokyo; Harumasa Tanabe; Masami Takao, both of Kobe, and Hitoshi Hatakeyama, Kakogawa, all of Japan, assignors to Showa Shell Sekiyu K.K., Tokyo and Kobe Steel Ltd., Hyogo, both of, Japan

Filed Mar. 7, 1989, Ser. No. 320,008
Claims priority, application Japan, Mar. 7, 1988, 63-51740
Int. Cl.[5] C07C *7/02*
U.S. Cl. 585—817 17 Claims

1. A process for separating a methyl substituted naphthalene comprising the steps of preliminarily treating a starting mixture material containing said methyl substituted naphthalene in the presence of an acid catalyst at a raised temperature to polymerized impurities in the material, removing said polymerized impurities from the starting mixture, and crystallizing said material under pressure whereby the methyl substituted naphthalene content is increased so as to obtain the methyl substituted naphthalene in a high purity more than 98% by weight.

4,992,620

REMOVAL OF TRIALKYL ARSINES FROM FLUIDS

Gerhard P. Nowack; Marvin M. Johnson; Joseph B. Cross; Patricia A. Tooley, and Ted H. Cymbaluk, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 21, 1989, Ser. No. 439,745
Int. Cl.[5] C07C *7/12*; B01D *53/02*
U.S. Cl. 585—823 20 Claims

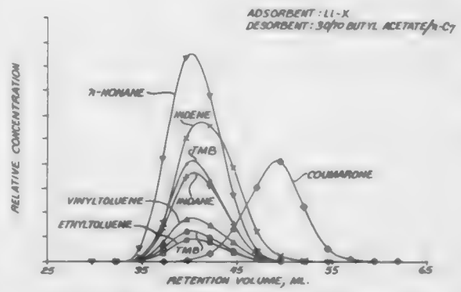
1. A process for removing trialkyl arsines from gases comprising the step of contacting a gaseous feed which contains at least one trialkyl arsine with a solid sorbent material comprising a hopcalite; wherein said contacting is carried out at such contacting conditions as to obtain a fluid product having a lower trialkyl arsine content than said feed.

4,992,621

SEPARATION OF COUMARONE FROM INDENE

Hermann A. Zinnes, Evanston, Ill., assignor to UOP, Des Plaines, Ill.

Filed Sep. 26, 1989, Ser. No. 412,951
Int. Cl.[5] C07C *7/13*
U.S. Cl. 585—826 16 Claims



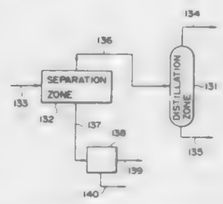
1. A process for removing oxygenated compounds from a feed mixture containing at least one oxygenated compound, indene and alkyl-substituted benzenes comprising contacting said feed mixture at adsorption conditions with an X-type zeolite exchanged with Group IA ions to selectively adsorb said oxygenated compounds and recovering said oxygenated compounds by desorption at desorption conditions with a polar desorbent selected from the group consisting of ketones, alcohols and esters which differ in boiling point from the feed boiling range by at least 5° C., said adsorption conditions and desorption conditions selected from a temperature from about 20° to about 200° C. and a pressure sufficient to maintain liquid phase.

4,992,622

METHOD OF SEPARATING 2,6-DIISOPROPYLNAPHTHALENE FROM A MIXTURE CONTAINING DIISOPROPYLNAPHTHALENE ISOMERS

Yoshimi Shiroto; Mitsunori Shimura; Kenji Shimokawa, all of Yokohama; Yoshio Fukui, Tokyo; Yakudo Tachibana, Kasukabe; Kazuhiko Tate, Yokohama, and Hiroaki Taniguchi, Kuki, all of Japan, assignors to Chiyoda Corporation and NKK Corporation, both of, Japan

Filed Aug. 2, 1989, Ser. No. 388,590
Claims priority, application Japan, Dec. 26, 1988, 63-328473; Dec. 26, 1988, 63-328474; Dec. 26, 1988, 63-328475
Int. Cl.[5] C07C *7/13*
U.S. Cl. 585—828 16 Claims



1. A method of separating 2,6-diisopropylnaphthalene from a mixture containing 2,6-diisopropylnaphthalene and structural isomers thereof, including the 1,7-isomer and the 2,7-isomer, comprising the steps of:

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(a) contacting said mixture with a first zeolite absorbent to selectively adsorb the 1,7- and 2,7-isomers and desorbing said isomers from said first zeolite to obtain a first extract containing the 1,7- and 2,7-isomers and a first raffinate containing non-sorbed isomers including the 2,6-isomer; and

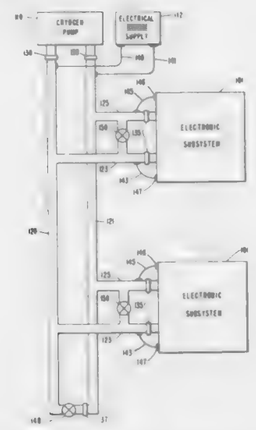
(b) contacting said first raffinate with a second zeolite to adsorb the 2,6-isomer and desorbing said 2,6-isomer from said second zeolite to obtain a second extract containing the 2,6-isomer and a second raffinate containing non-sorbed isomers.

4,992,623

SUPERCONDUCTING BUS BAR

Bruce E. Briley, Countryside; Mikiel L. Larson, St. Charles, and John Montsma, Wheaton, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 26, 1989, Ser. No. 343,971
Int. Cl.[5] H01B *12/00*
U.S. Cl. 174—15.4 19 Claims



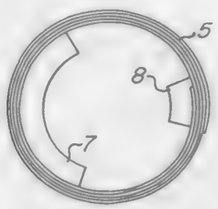
1. Apparatus for simultaneously supplying cryogenic fluid and electrical power comprising a conduit arrangement comprising conduit sections, each comprising superconducting material for conducting electrical power to an electrical subsystem and a channel for transporting cryogenic fluid at a predetermined low temperature to cool said superconductive material to conduct electrical power at or near zero level of electrical resistance, and further comprising a channel arrangement for transporting cryogenic fluid from said conduit arrangement to said electrical subsystem to cool said electrical subsystem.

4,992,624

MAGNETIC SHIELD FOR VISUAL DISPLAY TERMINALS

Brian L. Benson, Roseville, and Carl R. Haynie, Carmichael, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 12, 1989, Ser. No. 365,075
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 R 11 Claims



1. A magnetic shield for being placed over a flyback transformer of a cathode ray tube display terminal and for reducing magnetic pulse and field emissions from the flyback transformer, the magnetic shield comprising:

a sheet of metal conductor; and,

a sheet of insulation, the sheet of insulation being placed upon the sheet of metal conductor and the sheets rolled to form a spiral having greater than two windings the spiral having a ductile springiness;

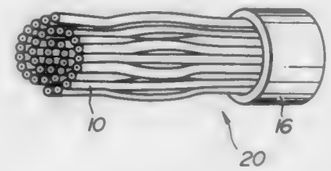
attachment means for holding the sheet of insulation and the sheet of metal conductor in a rolled spiral shape.

4,992,625

RIBBON CABLE WITH SHEATH

Isao Izui; Tetsuo Imamura, and Junichi Mori, all of Kanagawa, Japan, assignors to Oki Densen Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 25, 1989, Ser. No. 301,618
Claims priority, application Japan, Jan. 27, 1988, 63-8957
Int. Cl.[5] H01B *7/34, 7/08*
U.S. Cl. 174—36 7 Claims



1. A cable comprising:

a ribbon cable folded so as to define an S-shape cross section portion in the core of the cable, peripheral longitudinal side segments of said ribbon cable extending from the S-shaped cross section portion as a continuation thereof so as to surround the S-shaped cross section portion, said ribbon cable comprising a plurality of discrete conductors each of which is covered by an insulating member, said insulating members being bonded to each other; and

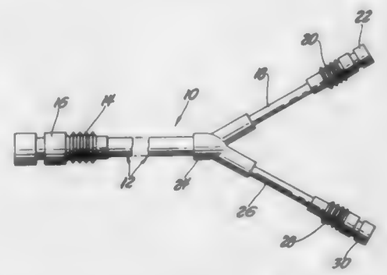
a sheath covering said ribbon cable.

4,992,626

ELECTRICAL CABLE FOR VEHICLES

John W. Monroe, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1989, Ser. No. 420,801
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—36 17 Claims



1. A cable having replaceable wire bundles, comprising:

a generally cylindrical sleeve;

a plurality of tubes running along an inside the cylindrical sleeve;

the tubes being packed closely together inside the sleeve and having low-friction outer diametrical surfaces to facilitate relative axial sliding movement between any two adjoining tubes and to facilitate relative sliding movement between the cylindrical sleeve and radially outermost tubes bearing against the cylindrical sleeve;

bundles of insulated wires running through the tubes;

the tubes having smooth, low-friction inner diametrical

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surfaces to facilitate axial sliding movement between the bundles and the tubes.

7. A method of making a cable for connecting electrical components in an assembly, comprising:

providing a plurality of round tubes having low-friction inner diametrical and outer diametrical surfaces, the tubes being elastically bendable along their longitudinal axes and being resistant to compression in a radial direction;

inserting the tubes into a cable sleeve;

inserting a bundle of wires into at least some of the tubes so that the wires extend from the ends of the tubes;

bending the sleeve into a final configuration, the final configuration being the same as the configuration of the sleeve when the sleeve is in the assembly;

fixing terminals to the wires, the terminals having leads electrically connected to the wires;

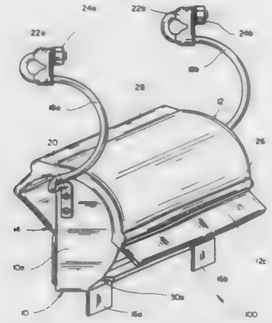
fixing the terminals to the sleeves and fixing the tubes relative to the terminals and the sleeves.

4,992,627

TELECOMMUNICATIONS TERMINAL HOUSING AND METHOD OF ENCLOSING A TELECOMMUNICATIONS TERMINAL WITH A MINIMUM CLEARANCE OPENING CONTAINER

Julian S. Mullaney, Raleigh, N.C., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 18, 1989, Ser. No. 395,862
Int. Cl.[5] H02G 7/00, 15/113
U.S. Cl. 174—41 14 Claims



1. An apparatus for enclosing an article comprising:

a base member defining an enclosure, said base member having an open face providing access to the enclosure; and

a cover affixed to a side of the base member opposite to the open face, said cover having a centrally located hinge on the side opposite to the open face thus providing for the cover to rotate about an axis of the open face.

12. A process of enclosing a telecommunications terminal block comprising:

mounting a telecommunications terminal block in a base member having an open side;

affixing a cover to the base member opposite to the open side, said cover having a hinge centrally located opposite to the open side; and

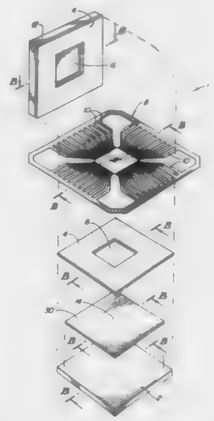
closing the cover about the opening from the centrally located hinge.

4,992,628

CERAMIC-GLASS INTEGRATED CIRCUIT PACKAGE WITH GROUND PLANE

Henry Beppu; Toshi Kushuhara, and Aki Nomura, all of San Diego, Calif., assignors to Kyocera America, Inc., San Diego, Calif.

Filed May 7, 1990, Ser. No. 519,796
Int. Cl.[5] H05K 5/06
U.S. Cl. 174—52.4 23 Claims



1. A package for housing an integrated circuit chip comprising:

(a) a base substrate having a glass material selectively deposited thereon so as to form at least one discrete void;

(b) a lead frame, having a plurality of leads, adjacent to the base substrate and partially embedded in the glass material;

(c) a ground plane electrically connected to the lead frame, but physically separated therefrom; and

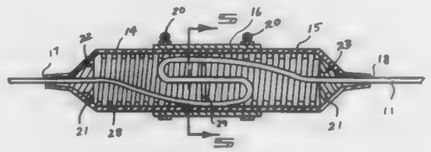
(d) a cap substrate having a glass material selectively deposited thereon so as to form at least one discrete void, whereby when the cap substrate is placed on the base substrate, the voids on the cap substrate and the voids on the base substrate form at least one glass-free cavity.

4,992,629

CABLE SHOCK ABSORBING APPARATUS

Fortunato R. Morais, 235 Parrott Ave., Bridgeport, Conn. 06606

Filed Mar. 15, 1990, Ser. No. 493,876
Int. Cl.[5] F16F 7/00; H02G 15/007
U.S. Cl. 174—69 7 Claims



1. A cable shock absorbing apparatus permitting extension and subsequent retraction of an elongate cable, wherein the apparatus comprises,

an elongate housing member composed of coaxially aligned parts including a first end and a spaced second end and a central securement tube mounted to clampingly secure the first and second ends,

and

an elongate cable directed longitudinally through the housing member,

and

a first cable clamp member mounted to the cable interiorly of the housing member,

and

a second cable clamp member mounted to the cable interiorly of the housing member spaced from the first cable clamp member,

and

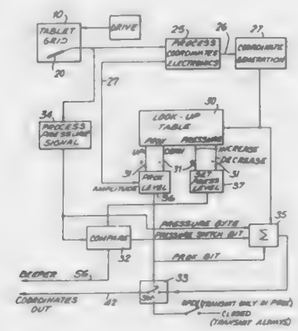
biasing means secured to the first and second cable clamp members to bias the first and second cable clamp members together interiorly of the housing member.

4,992,630

DIGITIZER TABLET WITH USER CUSTOMIZATION OF STYLUS PROXIMITY AND PRESSURE

Alfred E. Mietzko, Woodbury, Conn., assignor to Summagraphics Corporation, Seymour, Conn.

Filed Jul. 11, 1989, Ser. No. 378,372
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—18 17 Claims



1. A digitizer comprising:

(a) a digitizer tablet having a generally planar top surface and electrodes extending substantially in a plane parallel to and below said surface, said electrodes defining along their edges a first substantially rectangular area aligned with the X and Y axes of a rectangular coordinate system,

(b) a pointing device connected to the tablet and cooperating with the electrodes, when activated, to generate electrical signals representative of X and Y coordinate positions of the location of the pointing device with respect to said first substantially rectangular area,

(c) processing means connected to said electrodes and pointing device for processing said electrical signals, said processing means including:

i. means for distinguishing first digital signals representative of the pointing device location over at least one narrow marginal area adjacent a side of and within said first rectangular area from second digital signals representative of the pointing device location elsewhere over said first rectangular area,

ii. means for processing said first digital signals to vary an electrical parameter of said processing means, said processing means for said first digital signals including: means for raising and lowering an out-of-proximity threshold level representative of the height of the pointing device from the electrodes above which electrical signals are not processed, and means for raising and lowering a pointing device pressure threshold level below which electrical signals are not processed,

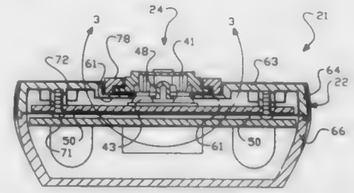
iii. means for processing said second digital signals to produce pointing device location X/Y coordinate values.

4,992,631

MULTI-DIRECTIONAL SWITCH ASSEMBLY

Cuyler Gee, San Francisco, Calif., assignor to Atari Corporation, Sunnyvale, Calif.

Filed Jun. 2, 1989, Ser. No. 360,337
Int. Cl.[5] H01H 13/70, 25/04
U.S. Cl. 200—5 A 12 Claims



1. In a multi-directional switch assembly including a printed circuit board having a plurality of switch terminals; a resilient deformable member having a plurality of electrically conductive contact elements carried thereby mounted proximate said printed circuit board with said contact elements superimposed with respect to and spaced apart from said switch terminals; a manually engageable input member mounted proximate said deformable member; and central support post means mounted under a central portion of said input member; said central support post means and said input member having mating support surfaces for tilting said input member thereabout for displacement of said deformable member by an amount sufficient to move said contact elements into engagement with said switch terminals, wherein the improvement in said switch assembly comprises:

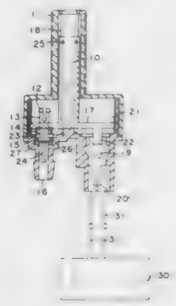
frame means mounting said support post means independently of and in spaced relationship to said printed circuit board to substantially isolate said printed circuit board from forces manually applied to said input member.

4,992,632

VACUUM VALVE/SWITCH ASSEMBLY

James R. Pescetto, Springfield, Ill., assignor to Stewart Warner Hobbs Corporation, Springfield, Ill.

Filed Jun. 12, 1989, Ser. No. 365,093
Int. Cl.[5] H01H 9/06
U.S. Cl. 200—61.86 1 Claim



1. A vacuum valve/switch assembly comprising:

housing having a vacuum valve port and a plunger port;

a plunger, including a plunger spring, within said housing having a plunger base and a plunger extension, said plunger movable from a first position totally within said housing to a second position wherein the plunger extension extends out of the plunger port;

the plunger spring biased within said housing to urge the plunger from the first position to the second position;

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a switch contact end attached to said plunger base, the switch contact movable between the first and the second positions, a pair of cantilever switch contact legs, the switch contact end engaging and disengaging the switch contact legs to close and open a torque converter clutch circuit;

a valve stem slideably mounted within the vacuum valve port, said valve stem comprising a spring base, a guide end below the spring base and lying within the valve port, a winged end above the spring base, and an "O" ring groove approximately midway between the guide end and the winged end and below the spring base, the winged end of said valve stem engaging the plunger base when said plunger is in the second position;

an "O" ring mounted in the "O" ring groove;

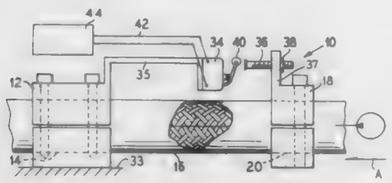
a valve spring mounted on the valve stem contacting the plunger base at one end of the valve spring and contacting the spring base at the other end of the valve spring so that the valve stem is urged toward the valve port when the plunger is in its first position and the "O" ring sealably closes said valve port and when the plunger is in its second position, the valve stem is moved from the valve port by the plunger base thereby releasing the seal formed between the "O" ring and the valve port.

4,992,633

CONTAINED PRESSURE ACTIVATED SWITCH

Norman A. Cyphers, Rogers, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Jul. 13, 1989, Ser. No. 379,109
Int. Cl.[5] H01H *35/30*
U.S. Cl. 200—81.9 R 15 Claims



1. A mechanical pressure switch comprising:

a conduit carrying a flow of pressurized fluid in a predetermined longitudinal direction;

said conduit being expandable in a lateral dimension substantially transverse to said predetermined longitudinal direction in response to an increase in pressure of said pressurized fluid, said lateral expansion effecting a longitudinal contraction of said conduit along an axis substantially parallel to said predetermined direction;

a pair of separate means spaced along said conduit for restraining two longitudinally spaced portions of said conduit against lateral expansion, said restraining means being longitudinally movable relative to one another;

switch means, carried on a first of said restraining means, for opening and closing an electrical circuit;

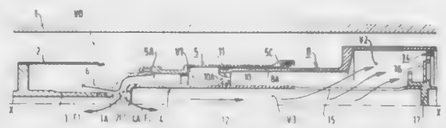
actuating means, carried on a second of said restraining means, for engagement with said switch means solely upon a selected degree of said longitudinal contraction of a section of said conduit extending between said two restraining means.

4,992,634

MEDIUM TENSION GAS BLAST CIRCUIT BREAKER

Edmond Thuries, Pusignan; Michel Perret, Tramole, and Denis Dufournet, Bron, all of France, assignors to GEC Alsthom SA, Paris, France

Filed Apr. 17, 1990, Ser. No. 509,831
Claims priority, application France, Apr. 17, 1989, 89 05050
Int. Cl.[5] H01H *33/88*
U.S. Cl. 200—148 R 7 Claims



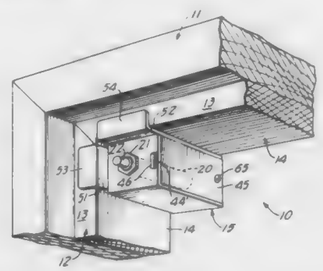
1. A medium tension circuit breaker having a dielectric blast gas, the circuit breaker comprising a cylindrical insulating casing filled with dielectric gas under pressure, a fixed main contact, a fixed arcing contact, a fixed blast piston, and moving equipment connected to an operating member and comprising a moving main contact, a moving arcing contact, and a blast cylinder associated with a blast nozzle, wherein the circuit breaker includes a drive piston whose section is not less than 1.3 times the section of said blast piston, said drive piston moving relative to a second cylinder.

4,992,635

SELF LOCATING PUSH-BUTTON SWITCH BOX

James W. Wesott, New York, N.Y., assignor to Marilyn L. Keegan, New York, N.Y., a part interest

Filed Jul. 31, 1989, Ser. No. 387,869
Int. Cl.[5] H01H *9/02;* H05K *5/02*
U.S. Cl. 200—293 3 Claims



1. A self-locating push button switch box comprising:

(a) a generally parallelpiped housing, including an elongated top wall, elongated bottom wall, two elongated side walls, rear end wall, and front end wall, one of which elongated walls is a closing panel independent of and selectively removable from the housing;

(b) spacing tab means integral with one of the nonremovable elongated side wall and an adjacent top wall and projecting from said front wall a predetermined distance;

(c) stop tab means integral with said spacing tab means and projecting perpendicularly outwardly therefrom and defining a plane;

(d) said front wall defining a push-button switch mounting opening centrally therein;

(e) said rear end wall defining an opening for electric wiring for connection to a switch means;

(f) elongated push-button switch means mounted within said suitable mounting opening and having a biased switch button projecting forwardly beyond the plane defined by said stop tabs;

(g) said closing panel having a connecting tab at one end and a mounting hole at the other end;

(h) a slot formed in one of said end walls receiving said connecting tab;

(i) a tab defining a mounting hole formed integrally with said other end wall;

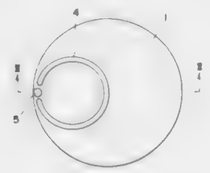
(j) whereby said closing panel may be fastened between said end walls through said connecting tab and said mounting hole.

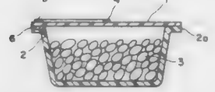
4,992,636

SEALED CONTAINER FOR MICROWAVE OVEN COOKING

Tsunehisa Namiki; Ikuo Sugiyama, both of Kanagawa; Tamio Fujiwara, Osaka; Kazuhisa Ishibashi, Tokyo; Isao Tanikawa, Kanagawa; Muneki Yamada, Kanagawa, and Kyuichi Shibasaki, Kanagawa, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

PCT No. PCT/JP88/00996, § 371 Date Jun. 5, 1989, § 102(e) Date Jun. 5, 1989, PCT Pub. No. WO89/02715, PCT Pub. Date Apr. 6, 1989
PCT Filed Sep. 30, 1988, Ser. No. 368,383
Claims priority, application Japan, Oct. 5, 1987, 62-250026; Feb. 6, 1988, 63-24941; Apr. 25, 1988, 63-100237
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E 27 Claims





1. A sealed container for containing food to be cooked within a microwave oven, comprising:

a container body having an opening defined within an upper portion thereof;

lid means, fabricated from a flexible sheet having insulative properties, for sealing said opening of said container body; and

antenna means, fabricated from an electrically conductive material, laminated upon said lid means, and having opposed ends for generating an electrical field therebetween in response to said antenna means interacting with microwaves generated within said microwave oven whereby a portion of said lid means, defined between said opposed ends of said antenna means, is heated and partially melted by means of dielectric heating so as to develop a vent opening within said lid means.

4,992,637

HIGH FREQUENCY HEATING SYSTEM AND METHOD THEREOF

Kunio Ishiyama, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 5, 1990, Ser. No. 461,360
Claims priority, application Japan, Jan. 6, 1989, 64-309
Int. Cl.[5] H05B *6/68;* H02M *7/537*
U.S. Cl. 219—10.55 B 9 Claims

4. A high frequency heating system, comprising:

a transformer having at least a primary winding fed by a DC power source and a secondary winding coupled to a magnetron;

switching means coupled in series with the primary winding for repeating a switching operation in response to an ON signal;

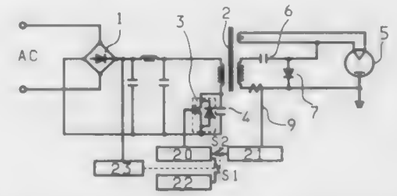
a capacitor coupled in parallel with said switching means to form a resonant circuit together with said primary winding;

means for generating said ON signal, said generating means including:

an output limit control means for producing a first control signal;

means for detecting a secondary current of said transformer and producing an output signal indicative thereof;

feedback circuit means, responsive to said output signal, for producing a second control signal;



control circuit means, responsive to said first and second control signals, for periodically producing said ON signal so as to cause said switching means to be conductive;

timer means for generating a timing signal at a predetermined time after said DC power source is energized;

first switch means, responsive to said timing signal, for connecting said output limit control means and said control circuit means; and

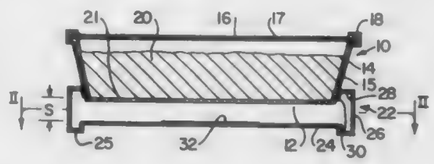
second switch means, responsive to said timing signal, for connecting said feedback circuit means and said control circuit means.

4,992,638

MICROWAVE HEATING DEVICE WITH MICROWAVE DISTRIBUTION MODIFYING MEANS

Bryan C. Hewitt, and Melville D. Ball, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 314,474, Feb. 22, 1989, abandoned. This application May 4, 1990, Ser. No. 518,324
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E 50 Claims



1. A stand for use in a microwave oven having a microwave field pattern for use with a container having at least one portion including a bottom portion transparent to microwave energy, on which bottom portion there is supported an undersurface of a substance to be heated, said stand comprising

(a) means for modifying said microwave field pattern to cause at least one mode of microwave energy of higher order than the fundamental modes of such energy to propagate in said substance to provide by means of such higher order mode a significant portion of the heating of said substance, and

(b) means for supporting the container spaced above said modifying means so that said undersurface is a distance of at least 3 mm above said field modifying means.

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4,992,639

COMBINED EDM AND ULTRASONIC DRILLING

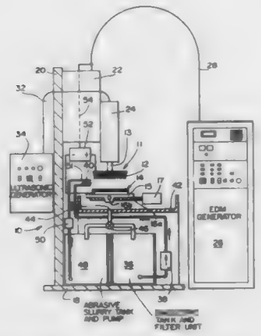
James R. Watkins, Bristol, and Mohamed F. El-Menshawy, Birmingham, both of England, assignors to Rolls-Royce plc and Spark Tec Ltd., both of, England

Filed Oct. 26, 1989, Ser. No. 426,717

Claims priority, application United Kingdom, Oct. 26, 1988, [redacted]

Int. Cl.[5] B23H *5/04*

U.S. Cl. 219—69.2 24 Claims



1. An apparatus electro discharge machining a small hole in an electricall conductive workpiece having a substantially non-conductive surface, comprising EDM electrode means the position of which relative to the workpiece is adjustable to form a machining gap, dielectric supply means for supplying dielectric fluid into the region of the machining gap, power supply means connected in use between the electrode means and the workpiece and arranged when operative to produce machining pulses for electro-discharge machining through the conductive workpiece, ultrasonic means for imparting to the electrode means ultrasonic vibrartions in an axial direction for ultrasonically machining through the non-conductive layer, control means for sequencing the ultrasonic and EDM machining operations in separate phases, and detection means responsive to establishment of electrical continuity between the EDM electrode means and the conductive substrate to commence the electro-discharge machining phase of the conductive workpiece after breakthrough of the non-conductive layer is detected in the ultrasonic machining phase.

4,992,640

WIRE ELECTRIC DISCHARGE MACHINING APPARATUS

Makoto Tanaka; Jun Aramaki, and Shiro Imai, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1990, Ser. No. 470,001

Claims priority, application Japan, Jan. 27, 1989, 1-8661[U]

Int. Cl.[5] B23H *7/02*

U.S. Cl. 219—69.12 5 Claims

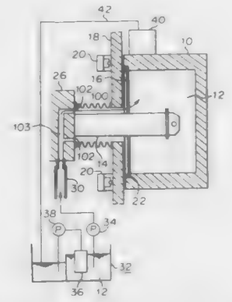
1. A wire electric discharge machining apparatus comprising:

a tank having an opening at a side surface thereof, said tank being movable in a two-dimensional plane,

a shielding body having a through hole, which is in slide-contact with the side surface having the opening of the tank so as to close the opening,

an arm having first and second ends, at least one of which is fixed to a machine body and the other is extended into the tank through the through hole and the opening, and which supports in the tank a wire guide for guiding a wire electrode to a workpiece placed in the tank,

an enclosure member capable of expansion and contraction in response to a relative movement of the tank to the arm, the enclosure member having first and second ends sealingly connected to the circumferential portion of the through hole of the shielding body and the machine body respectively, and



a working liquid supplying means for supplying a working liquid to the tank through a space formed between the arm and the enclosure member.

4,992,641

APPARATUS FOR PREPARING A MACHINING LIQUID OF AN ELECTROEROSION MACHINE

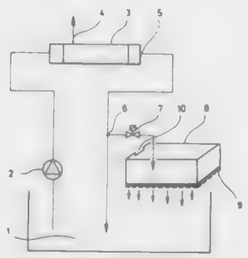
Josef Budin, Via Cadogno 3, 6648 Minusio; Hugo Kutil, Zypressenstrasse 17, 8408 Winterthur, and Gideon Levy, Via Locarno 52, 6616 Losone, all of Switzerland

Filed Aug. 18, 1989, Ser. No. 395,730

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828237

Int. Cl.[5] B23K *3/10, 1/10, 7/36*

U.S. Cl. 219—69.14 10 Claims



1. In a combination of an electroerosion machine including a working container filled with a machining liquid with an apparatus for preparing the machining liquid connected with the working container of the electroerosion machine, the apparatus comprising a concentrate tank to which the machining liquid to be prepared is supplied from said working container; a filter to which a concentrate flow is supplied from said concentrate tank and from which a permeate flow is drained; a permeate container connected to said filter to receive a permeate of said machining liquid therefrom and also connected to said working container by a permeate line to supply the permeate of said machining liquid thereto; said filter being a membrane filter; and a disposal container provided with a fleece filter and being in communication with said membrane filter so that at least a partial concentrate flow is supplied from said membrane filter to said disposal container, from which the partial flow prepared by the fleece filter is returned to said concentrate tank.

4,992,642

PLASMA TORCH WITH COOLING AND BEAM-CONVERGING CHANNELS

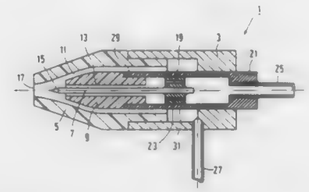
Ronald P. T. Kamp, and Johannes P. De Meij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1989, Ser. No. 326,579

Claims priority, application Netherlands, Mar. 28, 1988, [redacted]

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.52 7 Claims



1. A plasma torch for high-frequency capacitive generation of a plasma beam, said torch comprising:

a. a housing including fluid inlet means and an electrically insulating nozzle portion disposed about an axis and having a plasma outlet aperture;

b. a rod-shaped electrode including a substantial length thereof disposed in the nozzle portion on the axis and having a tip portion adjacent the plasma outlet aperture;

c. an electrically insulating tubular member having at least a substantial length thereof disposed in the nozzle portion around the electrode;

an inner surface of the tubular member and an outer surface of the electrode collectively defining a first annular channel in communication with the fluid inlet means and the outlet aperture, fluid carried in said first annular channel effecting cooling of said electrode; and

an outer surface of the tubular member and an inner surface of the nozzle portion collectively defining a second annular channel which tapers toward the plasma outlet aperture and is in communication with the fluid inlet means, fluid carried in said second annular channel effecting convergence of the plasma beam.

4,992,643

METHOD AND DEVICE FOR CONTROLLING PLUME DURING LASER WELDING

Phillip W. Fuerschbach, Tijeras; James L. Jellison, Albuquerque; David M. Keicher, Albuquerque, and William L. Oberkampf, Albuquerque, all of N. Mex., assignors to United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1989, Ser. No. 398,577

Int. Cl.[5] B23K *26/00*

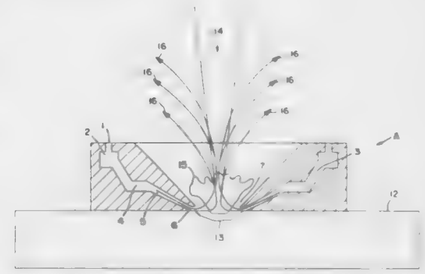
U.S. Cl. 219—121.63 10 Claims

1. A device for controlling a plume resulting during laser welding by a laser beam, comprising:

(a) a cylindrical body, a central portion of which defines an upside-down cone cavity having a base and a vertex, said vertex forming an orifice of said body, said body having an upper peripheral rim surface circumscribing said base of said cone cavity,

(b) at least one gas inlet spaced on said upper peripheral rim surface of said body, said inlet emptying into a first plenum which is a circumferential chamber around and within a wall of said body,

(c) at least one channel which transfers the gas from said first plenum to a second plenum into which said each channel is directed, and



(d) a tapered outlet nozzle leading from said second plenum to terminate at said orifice.

4,992,644

DEVICE FOR STERILIZATION, STORAGE AND DISPENSING OF LIQUIDS

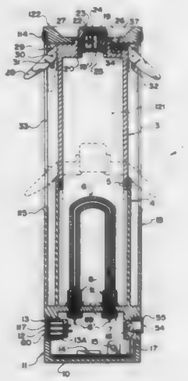
Garth T. Webb, 31521 Brookside Ave., Clearbrook, Canada V2S 6A9

Continuation-in-part of Ser. No. 181,238, Apr. 13, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 403,307

Claims priority, application Canada, Apr. 12, 1989, 596540

Int. Cl.[5] H05B *1/02;* F24H *1/20*

U.S. Cl. 392—441 18 Claims



1. A device for sterilizing and storing liquids comprising:

(a) a housing;

(b) a fluid discharge port;

(c) a chamber formed in said housing for receiving and holding said liquid, and comprising an open end for introducing said liquid to said chamber and an inner wall;

(d) a piston adapted to move within said chamber between a first and second position and having a pressure-applying face extending across said chamber for contacting and bearing against said liquid in said chamber, and wherein said piston forms a continuous fluid-tight seal with said wall of said chamber as said piston moves between said first and second positions;

(e) means for biasing said piston towards said second position to thereby apply pressure to said liquid;

(f) means for sterilizing said liquid within said chamber;

(g) valve means for selectively opening and closing said fluid discharge port; and

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(h) fluid communication means communicating between said chamber and said fluid discharge port.

4,992,645

CASH HANDLING DEVICE

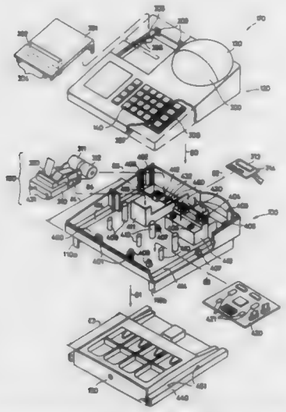
Hisayuki Kasahara, and Shinsuke Kawamoto, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 3, 1989, Ser. No. 374,917

Claims priority, application Japan, Jul. 4, 1988, 63-167177; Jul. 4, 1988, 63-167178

Int. Cl.[5] G06C *5/02;* **G07G** *1/00*

U.S. Cl. 235—1 D **5 Claims**



1. A relatively low profile cash handling device for mounting on a support structure having a recess in an upper surface thereof, said cash handling device having operation means for inputting cash handling data, a display portion to display the cash handling data, a printer to print out the cash handling data and a drawer to accommodate cash, said cash handling device comprising:;

an upper body portion on which the operation means, the display portion and the printer are located; and

a lower drawer housing being located beneath and integral with the upper body portion, for covering and protecting both sides of the drawer and accommodating the drawer slidably movable therein;

the lower drawer housing including a lower section having a smaller width dimension relative to a front of the cash handling device than the width dimension of a upper body portion;

the lower drawer housing having an outwardly extending flange portion for contacting and being supported by the upper surface of said support structure so that said lower section and said drawer resides in said recess when mounted thereon.

4,992,646

TRANSACTION SYSTEM OF THE ELECTRONIC PURSE TYPE

Thierry Collin, Courbevoie, France, assignor to Electronique Serge Dassault, Saint-Cloud, France

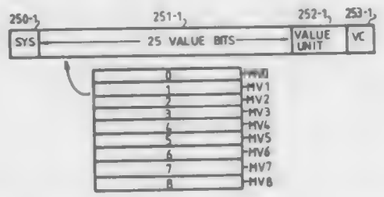
Filed May 10, 1989, Ser. No. 350,146

Claims priority, application France, May 30, 1988, 8807176; Nov. 25, 1988, 8815466

Int. Cl.[5] G06F *15/20*

U.S. Cl. 235—375 **18 Claims**

1. A transaction system of the type comprising at least one terminal and a microcircuit card suitable for cooperating with the terminal, said card including a permanent write memory having at least some of its bits associated with corresponding value units, said memory being consumable by writing, wherein the memory contains a coding zone for defining at least one base value from which a sequence of value units can be established, said value units being spaced apart at successive powers of 2, together with a plurality of value words each associated with one of the value units, and each containing a predetermined number of value bits each possessing a value



equal to said value unit, and wherein the system includes calculation means suitable for splitting up a monetary amount into binary notation on the basis of said base value, and for issuing commands to write or not to write a value bit in each of said value words as a function of the bit of corresponding significance in said binary notation, and for writing any remaining more significant bits most significant value word.

4,992,647

TICKET PROCESSING TERMINAL DEVICE WHICH ACCEPTS PREVIOUSLY ISSUED TICKETS FOR MODIFICATION OR EXCHANGE

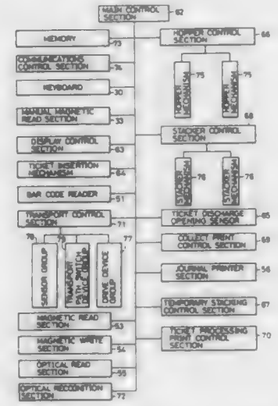
Hiroshi Konishi; Haruo Kimura; Yoshihiro Nakamura; Toshiharu Hashimoto; Tadashi Hasegawa, and Sadao Sone, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,382

Claims priority, application Japan, Apr. 23, 1987, 62-98582; May 29, 1987, 62-131489

Int. Cl.[5] G07B *1/00, 11/02;* **G06K** *1/14, 17/00*

U.S. Cl. 235—379 **12 Claims**



1. A ticket processing terminal device comprising:

an operation means for manually inputting ticket information into said device;

a display means for displaying said ticket information;

a housing having a ticket insertion opening for inserting tickets into said device and a discharge opening for discharging tickets from said device;

a plurality of hoppers for storing media comprising sheets;

a separation and pick-up means for separating and picking up one sheet of said media at a time from said hoppers;

a plurality of stackers for storing tickets inserted through said insertion opening which are to be replaced by one of said media;

a printer means for printing information on a ticket inserted through said insertion opening and for printing information on a medium from one of said hoppers before said medium is discharged through said discharge opening;

a transport means for transporting tickets inserted through said insertion opening to said stackers, for transporting said tickets and said media along a transport path to said printer means from said insert opening and said hoppers, respectively, and for transporting printed tickets and printed media to said discharge opening;

a ticket information reader means for reading information from a ticket, said ticket information reader means comprising:

an identification information read means disposed along said transport means for reading identification information on a ticket inserted through said insertion opening;

a magnetic read means disposed along said transport means for reading information from a magnetic stripe on a ticket inserted through said insertion opening and for reading information from a magnetic stripe on a medium from said hopper; and

an optical read means disposed along said transport means for reading optically-readable information on a ticket;

a magnetic write means disposed along said transport means for writing, erasing and rewriting information on a magnetic stripe on a ticket inserted through said insertion opening and for writing information from said operation means and said ticket information reader means on a magnetic stripe on a medium from said hopper;

a temporary stacking means for storing a plurality of tickets inserted through said insertion opening; and

a control means for determining the processing mode on the basis of information from said operation means and the result of reading at least one ticket by said ticket information reader means,

whereby said at least one inserted ticket is stored separately from other tickets in said temporary stacking means until said control means determines a processing mode and after the determination of the processing mode said at least one ticket in the temporary stacking means or a medium in said hopper is picked up, printed and issued.

10. A ticket processing terminal device comprising:

an operation means for inputting ticket information into said device;

a housing having a ticket insertion opening for inserting tickets into said device and a discharge opening for discharging tickets from said device;

a hopper for storing media comprising sheets;

a stacker for storing tickets inserted through said insertion opening which are to be replaced by one of said media;

a read means for reading information from the ticket that has been inserted;

a printer means for printing information on a ticket inserted through said insertion opening or a medium from said hopper before said medium is discharged through said discharge opening;

a magnetic write means for magnetically writing or erasing information on a medium from said hopper before said medium is discharged through said discharge opening;

a control means responsive to information read from the ticket inserted or information input by said operation means for selecting one of a first, a second and a third processing modes and causing the device to operate in the selected processing mode, said third processing mode being operated when a plurality of tickets are inserted into said device;

said first processing mode comprising magnetically writing information on the inserted ticket or printing information on the inserted ticket, and discharging the inserted ticket through said discharge opening;

said second processing mode comprising magnetically writing information on a medium from said hopper or printing information on a medium from said hopper when a ticket has been inserted, and discharging said medium through said discharge opening as a new ticket while the inserted ticket is stored in said stacker; and

said third processing mode comprising at least one of magnetically writing information on at least one inserted ticket, printing information on at least one inserted ticket, magnetically writing information on a medium from said hopper, and printing information on a medium from said hopper, discharging the at least one inserted ticket or said medium through said discharge opening, and storing non-discharged inserted tickets in said stacker.

4,992,648

DATA TRANSFER SYSTEM FOR CURRENCY CASSETTES

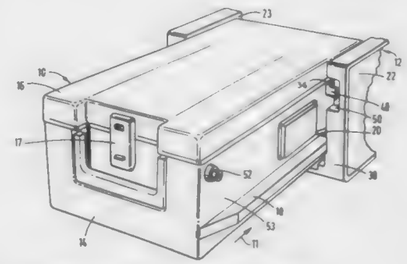
Brian G. Hutchison, Dundee, Great Britain, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 9, 1989, Ser. No. 433,816

Claims priority, application United Kingdom, Apr. 14, 1989, 8908528

Int. Cl.[5] G06F *15/30*

U.S. Cl. 235—379 **16 Claims**



1. In an automated teller machine, a system comprising:

a currency dispensing means for dispensing currency;

a cassette for storing currency to be dispensed;

a cassette receiving means located in said currency dispensing means for receiving said cassette;

said cassette having first data processing means for processing data associated with the currency to be dispensed;

said cassette receiving means having second data processing means for processing data associated with the currency to be dispensed;

said cassette also having first circuit means for processing power to be used by said first data processing means;

said cassette receiving means also having second circuit means for processing power to be used by said first data processing means; and

said first and second circuit means including first and second coils, respectively, with said first and second coils acting as a transformer when said cassette is mounted in an operational position in said cassette receiving means so as to transfer power from said second circuit means to said first circuit means.

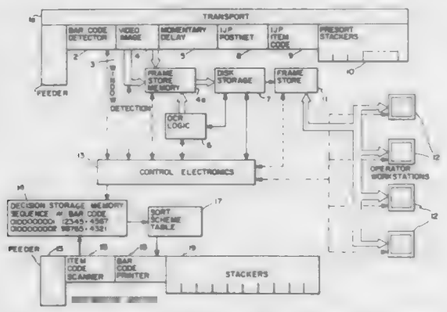
VOL 1123 ISS 2 FE 12 1991 UMI

4,992,649

REMOTE VIDEO SCANNING AUTOMATED SORTING SYSTEM

John J. Mampe, Bendersville, Pa., and Oscar L. Avant, Rockville, Md., assignors to United States Postal Service, Washington, D.C.

Filed Sep. 30, 1988, Ser. No. 251,881
Int. Cl.[5] G06K *1/12, 7/10*
U.S. Cl. 235—462 6 Claims



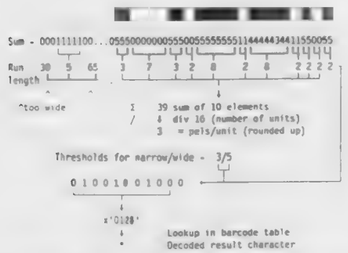
1. An apparatus for use in a mail sorting system comprising
first scanning means for obtaining video images of successively conveyed mailpieces;
means responsive to said scanning means for recognizing said video images and for generating destination codes in response thereto;
means for applying an item code to said mailpieces and for operably linking said item code to the corresponding video image for each mailpiece;
second scanning means for reading said item code applied to said mailpiece; and
means operatively associated with and responsive to said recognizing and generating means and second scanning means for applying said destination codes to said mailpieces.

4,992,650

METHOD AND APPARATUS FOR BARCODE RECOGNITION IN A DIGITAL IMAGE

Peter J. Somerville, Bethesda, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1990, Ser. No. 500,980
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—462 7 Claims



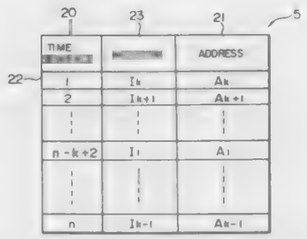
1. A computer implemented method for recognizing a barcode contained in data representing a digital image, comprising the steps of:
buffering digital image data for N raster lines of a length of x pels, where N is an integer greater than 2 and x is an integer greater than 2;
forming an array of x sums from said N raster lines of buffered data;
comparing each sum with a threshold value and attributing it as representing a black area if greater than said threshold value or attributing it as representing a white area if less than said threshold value;
forming a second array of data representing said black and white regions;
normalizing said sequence of black and white regions to a barcode standard;
dividing said normalized regions by a value related to the total number of spatial elements for the barcode standard;
characterizing each spatial area as a long or short run;
decoding each barcode character and generating an alphanumeric string represented by said barcode.

4,992,651

IC CARD AND METHOD OF RECORDING DATA THEREIN

Kenichi Takahira, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,577
Claims priority, application Japan, Apr. 13, 1987, 62-91209
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 6 Claims



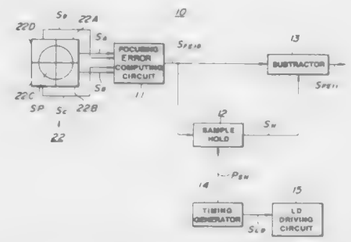
1. A method of organizing time sequential application data in an onboard semiconductor memory of an IC card, the IC card having an onboard microprocessor for controlling storage of information in the semiconductor memory and for interfacing with application programs operating in application terminals, the method comprising
dividing a first section of the semiconductor memory into a plurality of application blocks, each application block having an address and storage locations for storing application information,
providing a second section of semiconductor memory having a plurality of locations for associating application information with application block addresses in the semiconductor memory,
responding to a request for recording a new application data entry by determining if there are any unrecorded application blocks in the first section of memory,
if there are unrecorded application blocks recording the new application data in one of the unrecorded blocks,
if there are not unrecorded application blocks determining the block with the oldest recorded data by searching the second section of memory and recording the new application data in the address associated with the oldest recorded data, and
keeping a record in the second section of memory of the sequence in which data has been recorded in the application blocks, the step of keeping a record including maintaining a table relating the time sequence in which information was recorded with the block address at which the data was recorded, and updating the time sequence each time a new data entry is recorded.

4,992,652

FOCUS ERROR DETECTING CIRCUIT FOR DISK PLAYER

Hitoshi Okada, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,444
Claims priority, application Japan, Dec. 14, 1988, 63-315673
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—201.4 6 Claims



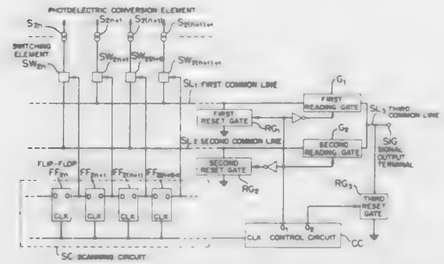
1. In a focusing error detection circuit having light detecting means for receiving laser light impinging thereon from a recording medium and provided to detect focusing errors of an optical pickup device, the combination of
first focusing error computing means for arithmetic operation on outputs from said light detecting means to produce a first focusing error signal,
means for periodically interrupting impingement of said laser light on said light detection means,
sample-and-hold means for sampling-and-holding said first focusing error signal during the period of interruption of the impingement on said light detecting means of said laser light to output a sampled-and-held signal, and
second focusing error computing means for computing the difference between said first focusing error signal and said sampled-and-held signal to produce a compensated focusing error signal.

4,992,653

LINEAR IMAGE SENSOR

Yukito Kawahara; Satoshi Machida, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Apr. 16, 1990, Ser. No. 510,158
Claims priority, application Japan, Apr. 17, 1989, 1-96791
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 2 Claims



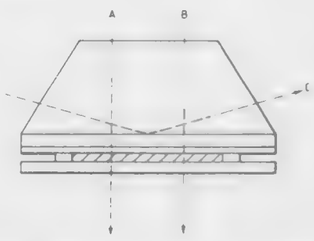
1. In an image sensor of the linear type having a plurality of photoelectric conversion elements arranged linearly on a semiconductor substrate for detecting image information, switching elements each having an input terminal connected to each photoelectric conversion element and an output terminal for reading out a detection signal produced from the corresponding photoelectric conversion element, and a scanning circuit for sequentially driving the switching elements through their control terminals, the improvement comprising: first common connecting means for connecting output terminals of odd-numbered switching elements to each other; second common connecting means for connecting output terminals of even-numbered switching elements to each other; first reading gate means having an output terminal and an input terminal connected to the first common connecting means; first reset gate means having an output terminal and an input terminal connected to the first common connecting means; second reading gate means having an output terminal and an input terminal connected to the second common connecting means; second reset gate means having an output terminal and an input terminal connected to the second common connecting means; third common connecting means for connecting the output terminals of the first and second reading gate means to each other; a signal output terminal connected to the third common connecting means for outputting externally the detection signals; a reset power source terminal connected to the output terminals of the first and second reset gate means; and control means operative in synchronization with the sequential driving of the switching elements for controlling the first and second reading gate means and the first and second reset gate means so as to output sequentially through the signal output terminal the detection signals from the plurality of the photoelectric conversion elements while sequentially resetting the photoelectric conversion elements.

4,992,654

OPTICAL LOGIC DEVICE

William A. Crossland, Harlow, and Neil Collings, Epping, both of Great Britain, assignors to STC PLC, London, England

Filed Aug. 1, 1988, Ser. No. 227,014
Claims priority, application United Kingdom, Nov. 4, 1987, 8725807
Int. Cl.[5] H01J *31/50;* G02F *1/13;* G11C *13/04;* G02B *6/26*
U.S. Cl. 250—213 A 9 Claims



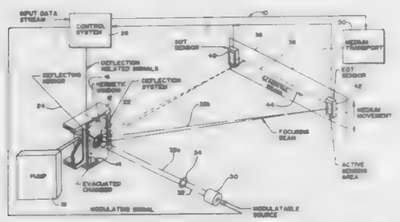
1. A bistable optical logic device, which includes a logic medium formed by a layer of a liquid crystal incorporating a dichroic dye so arranged as to exploit thermally induced changes in one or other of the refractive indices of the liquid crystal material, respective means for providing a holding light beam and directing it through the liquid crystal layer, which holding light beam serves to hold the respective device in the off state, respective means for providing a signal beam and directing it to the liquid crystal layer, which signal light beam serves to switch the respective device from the off state to the on state, reduction in the intensity of the holding beam serving to switch the respective device from the on state to the off state, and respective means for providing a further light beam and applying it to the respective device in a manner decoupled from the signal light beam, which further light beam is influenced by the off state of the device and serves to read the condition of the device.

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4,992,655
SELF-RESONANT GALVANOMETER SCANNING SYSTEM WITH EVACUATED CHAMBER

David J. Shelander, St. Paul, Minn., assignor to Printware, Inc., St. Paul, Minn.

Filed Nov. 2, 1989, Ser. No. 430,867
Int. Cl.[5] H01T *3/14;* G02B *26/08*
U.S. Cl. 250—235 29 Claims

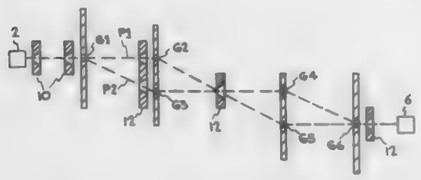


10. A method of precisely deflecting a beam of radiant energy onto a target comprising:
forming a relatively low pressure deflecting region having a vacuum level greater than 25 inches of mercury;
generating a beam of radiant energy;
directing the beam along a first path into the deflecting region;
oscillating a deflecting member to thereby change the direction of the beam from the first path to sweep at various deflection angles along a second path while the beam is within the low pressure deflecting region; and
directing the beam along the second path to the target; and
dynamically controlling the oscillating of the deflecting member so that the deflection angles through which the beam is swept are constant from one oscillation cycle to the next.

4,992,656
ROTATION, ACCELERATION, AND GRAVITY SENSORS USING QUANTUM-MECHANICAL MATTER-WAVE INTERFEROMETRY WITH NEUTRAL ATOMS AND MOLECULES

John F. Clauser, 975 Murrieta Blvd. #22, Livermore, Calif. 94550

Continuation-in-part of Ser. No. 113,620, Oct. 26, 1987, Pat. No. 4,874,942. This application Aug. 10, 1989, Ser. No. 393,285
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] H05H *3/00;* G01P *15/00*
U.S. Cl. 250—251 51 Claims

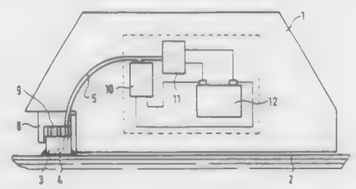


1. Apparatus for measuring the spatial gradient of a gravitational field, comprising
a means for producing neutral particles selected from atoms and molecules,
an interferometer, including propagation path defining means, in which the particles and their associated matter waves propagate along a plurality of positionally separated paths, with a geometry in which the paths are positionally separated from each other and have a negligible average lateral positional displacement from each other, wherein the paths circuit about opposite sides of two approximately equal adjacent areas in a figure-eight configuration, with each path circuiting in an opposite sense about each of the two areas, and a region where the quantum-mechanical matter-waves associated with the particles interfere,
a means for detecting the interference between the matter waves,
a means for providing some isolation between the interferometer and the vibrations of its environment.

4,992,657
APPARATUS FOR DETECTING THE CUTTING HORIZON FOR MINING MACHINES

Günter Reisner, Wachtendonk, Fed. Rep. of Germany, assignor to Ruhrkohle Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,337
Int. Cl.[5] G01J *5/04*
U.S. Cl. 250—253 18 Claims



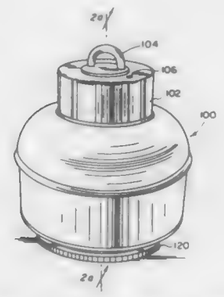
1. Apparatus for detecting the cutting horizon for mining machines by detecting the position of the coal-rock interface with the aid of light signals of selected wavelengths applied to a mine surface having a sensor head adapted to be guided along and dragged across said mine surface, optical waveguide bundles constructed as measured valued pickups connected to said sensor head, a passage in said sensor head adapted to receive said optical waveguide bundles and having a lower end sealed with a crystal window, a transmitter station mounted on said mining machine and connected to one portion of said optical waveguide bundles, a receiver station mounted on said mining machine and connected to the other portion of said optical waveguide bundles: characterized in that the passage adapted to receive the optical waveguide bundles extends into the exit of said sensor head to mount the lower end of said waveguide bundles at an angle greater than 20 degrees but less than 45 degrees with respect to the mine surface and wherein said crystal window has a lower surface which extends parallel to the floor.

4,992,658
ELECTRET ION CHAMBER FOR RADON MONITORING

Robert W. Ramsey, Jr., Damascus, and Payasada Kotrappa, Frederick, both of Md., assignors to Rad Elec Inc., Frederick, Md.

Filed Sep. 20, 1989, Ser. No. 409,695
Int. Cl.[5] G01T *1/02*
U.S. Cl. 250—253 18 Claims

1. A housing for an electret ion chamber radon monitor comprising:
a chamber formed of electrically conductive plastic having an open bottom and a narrowed neck;
electret means forming the bottom of the chamber containing an electret electrostatically charged to attract radioactive decay ions;
a cap attachable to the narrowed neck of the chamber, the cap having a vent hole for gas equalization of the chamber to the outside;
a keeper means attached to the cap so that when the cap is closed the keeper covers the electret and when the cap is opened the keeper is removed from the electret; and

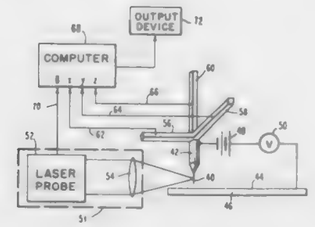


whereby opening and closing of the cap effectively turns on and off the radon monitor.

4,992,659
NEAR-FIELD LORENTZ FORCE MICROSCOPY

David W. Abraham, Ossining, and Hemantha K. Wickramasinghe, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1989, Ser. No. 386,330
Int. Cl.[5] G01R *33/30*
U.S. Cl. 250—306 50 Claims

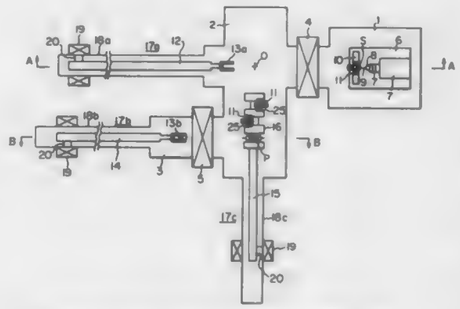


1. An apparatus for measuring a magnetic field in a sample using a scanning tunneling microscope having a tip comprising:
drive means for controlling the distance between the tip and a surface of the sample and a position of the tip for enabling scanning of the surface and for providing a signal indicative of the position of the tip relative to the sample;
generator means coupled to said tip for providing a current signal at a frequency substantially equal to the resonance frequency of said tip for generating a current between said tip and the surface for causing the tip to undergo vibratory motion in the presence of a magnetic field;
detector means disposed for measuring the motion of the tip in a direction substantially parallel to the plane of the surface of the sample and providing a signal indicative of such motion, and
computer means coupled to said detector means and said drive means for providing an output signal indicative of a position of the tip and a magnetic field magnitude corresponding to the position.

4,992,660
SCANNING TUNNELING MICROSCOPE

Hideo Kobayashi, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 543,449
Claims priority, application Japan, Jun. 26, 1989, 1-163224; Jun. 30, 1989, 1-170003; Jul. 7, 1989, 1-176920
Int. Cl.[5] H01J *37/067*
U.S. Cl. 250—306 5 Claims

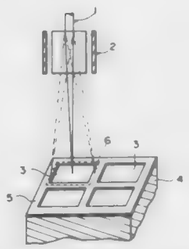


1. A scanning tunneling microscope comprising:
a tip holder having a tip;
a piezoelectric drive mechanism which drives the tip and to which the tip holder is detachably mounted;
means for holding a sample;
a replacement rod for replacing the tip holder, the replacement rod being mounted so as to be moving along the Z-axis of a coordinate system, the Z-axis extending through the tip holder and across the surface of the sample during observation; and
means for moving the sample away from the Z-axis during the replacement.

4,992,661
METHOD AND APPARATUS FOR NEUTRALIZING AN ACCUMULATED CHARGE ON A SPECIMEN BY MEANS OF A CONDUCTIVE LATTICE DEPOSITED ON THE SPECIMEN

Hifumi Tamura, Hachiohji; Yoshinori Ikebe, Katsuta; Katsuhiko Muroyama, Nakaminato, and Hiroyuki Sumiya, Ohmiyamachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Instrument Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Aug. 17, 1988, Ser. No. 233,016
Claims priority, application Japan, Aug. 20, 1987, 62-207060; Oct. 20, 1987, 62-264619
Int. Cl.[5] G01N *23/225*
U.S. Cl. 250—307 31 Claims



1. A method of neutralizing an accumulated charge on a surface of a specimen to be examined by detecting secondary charged particles which are emitted from said specimen irradi-

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ated by a primary charged particle beam said method comprising depositing an electrically conductive film on said specimen surface except at least a region to be examined, the electrically conductive film having a thickness which permits transmission therethrough of the primary charged particle beam, and irradiating said primary charged particle beam over said region so that an irradiating range of said primary charged particle beam covers at least a part of said electrically conductive film, so as to induce an electrically conductive layer in the specimen in contact with the electrically conductive film, the electrically conductive layer and electrically conductive film forming a charge flow-out path, whereby an accumulated charge can be removed from the specimen surface via the charge flow-out path.

4,992,662

MULTIPURPOSE GASEOUS DETECTOR DEVICE FOR ELECTRON MICROSCOPE

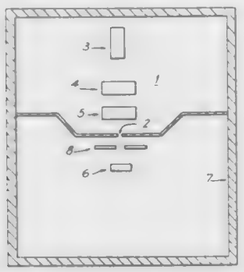
Gerasimos D. Danilatos, North Bondi, Australia, assignor to ElectroScan Corporation, Wilmington, Mass.

Continuation of Ser. No. 79,634, Jul. 30, 1987, abandoned. This application Sep. 13, 1989, Ser. No. 406,193

Claims priority, application Australia, Aug. 1, 1986, PH 07221

Int. Cl.[5] H01J *37/244*

U.S. Cl. 250—310 **24 Claims**



1. A scanning electron microscope which comprises:
(a) a vacuum envelope having a pressure limiting aperture;
(b) an electron beam source located within the vacuum envelope for emitting an electron beam;
(c) focusing means located within the vacuum envelope for directing an electron beam emitted by the electron beam source through the pressure limiting aperture;
(d) electron beam scanning means located within the vacuum envelope for scanning an electron beam emitted by the electron beam source across the diameter of the pressure limiting aperture;
(e) sample platform means, disposed outside the vacuum envelope, for maintaining a sample in registration with the pressure limiting aperture such that a surface of the sample is exposed to an electron beam emitted from the electron beam source and directed through the pressure limiting aperture so as to cause a plurality of signals of different character to be emitted from the sample;
(f) gas containment means for maintaining the sample platform means enveloped in a gaseous medium so as to allow said plurality of signals of different character emitted from the sample located on the sample platform means and exposed to an electron beam emitted from the electron beam source to come into contact with gas molecules of the gaseous medium and cause the signal-gas interacting produce a plurality of products; and
(g) said gaseous medium providing for a detector means for the detection of the plurality of signals of different character emitted from the surface of the sample to produce image signals.

4,992,663

METHOD OF JUDGING THE CORRECTNESS OR INCORRECTNESS OF A PROSPECTIVE CONTOUR POINT OF AN IRRADIATION FIELD

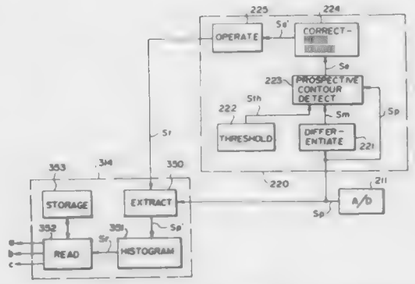
Hideya Takeo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 324,879

Claims priority, application Japan, Mar. 19, 1988, 63-66737; Jul. 26, 1988, 63-186084

Int. Cl.[5] H04N *5/30*; **G03B** *42/00*

U.S. Cl. 250—327.2 **18 Claims**



1. In a method for detecting an image signal representing a radiation image from a recording medium which has been exposed to radiation over a limited irradiation field in order to record a radiation image thereon, and detecting a prospective contour point, which is considered to be present on a contour of the irradiation field, from the image signal,

a method for judging the correctness or incorrectness of a prospective contour point of an irradiation field which comprises the steps of:

(i) judging whether a prospective contour point, which has been detected, satisfies or does not satisfy a predetermined judgement standard, wherein said judgement standard is the relationship between the distance from said detected prospective contour point to a predetermined point inside of the radiation image and distances from other prospective contour points to said predetermined point; and

(ii) in cases where said detected prospective contour point does not satisfy the predetermined judgement standard, judging that said detected prospective contour point is incorrect and is not present on a portion of an irradiated field.

4,992,664

RADIATION IMAGE READ-OUT, PROCESSING AND REPRODUCING METHODS

Kazuo Shimura, and Yuuma Adachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

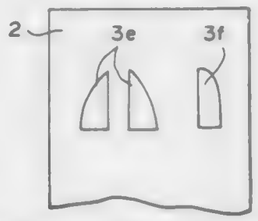
Filed Mar. 17, 1989, Ser. No. 324,788

Claims priority, application Japan, Mar. 19, 1988, 63-66756; Aug. 1, 1988, 63-192372

Int. Cl.[5] A61B *6/00*; **G01N** *23/04*

U.S. Cl. 250—327.2 **13 Claims**

1. A radiation image read-out method for use in a radiation image recording and reproducing system for recording a radiation image of an object on a recording medium, obtaining an image signal by reading out the radiation image from the recording medium and sampling the image information which has been read out, carrying out image processing of the image signal, and reproducing a visible image from the processed image signal,



the radiation image read-out method comprising the steps of changing the sampling density in accordance with characteristics of the recorded radiation image.

4,992,665

FILAMENTLESS MAGNETRON-ION SOURCE AND A PROCESS USING IT

Wolfgang Möhl, Kirchheim, Fed. Rep. of Germany, assignor to Technics Plasma GmbH, Munich, Fed. Rep. of Germany

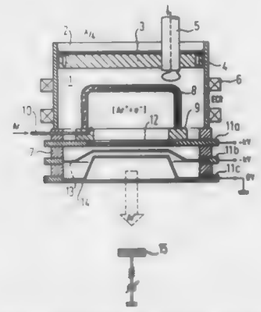
PCT No. PCT/EP88/01015, § 371 Date Jun. 26, 1989, § 102(e) Date Jun. 26, 1989, PCT Pub. No. WO89/04546, PCT Pub. Date May 18, 1989

PCT Filed Nov. 10, 1988, Ser. No. 377,841

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738352

Int. Cl.[5] H01J *3/04*

U.S. Cl. 250—423 R **7 Claims**



1. A filamentless magnetron-ion source comprising:
a magnetron (**119**) for generating microwaves;
a cylindrical cavity resonator (**1, 101**) with an input iris:
microwave guide means arrange and constructed for coupling said microwaves to said iris;
a sliding member with a quarter-wave choke disposed in said resonator for matching the performance of said resonator to said magnetron:
gas inlet means for providing a gas into said resonator;
a quartz dome disposed in said resonator for forming an ionization chamber and for shielding said gas from gas components from said microwave guide means;
ECR magnet means for ionizing said gas into ions; and
ion extracting means for extracting said plasma from said dome.

4,992,666

MEASUREMENT OF CONCENTRICITY OF CORE AND CLADDING PROFILES OF AN OPTICAL FIBER PREFORM USING FLUORESCENCE

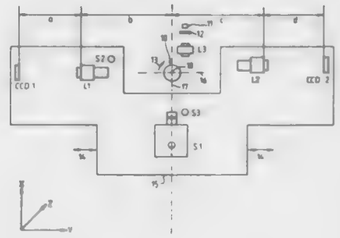
Stuart C. Robertson, Middlesex, United Kingdom, assignor to GEC Plessey Telecommunications Limited, England

Filed Aug. 17, 1989, Ser. No. 390,095

Claims priority, application United Kingdom, Aug. 24, 1988, [illegible]

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **14 Claims**



1. Apparatus for measuring the concentricity of the outer cylindrical profiles of a light-transmissive core and of a light-transmissive cladding around the core of an optical fiber preform, comprising: means for causing the core but not the cladding to fluoresce; means responsive to the fluorescent light emitted from the core to image a section of the core/cladding boundary; means responsive to light directed externally at the outer surface of the cladding adjacent the said section, to image that outer surface; and means for determining from the respective images the relative radial positions of the core/cladding boundary and the cladding outer surface.

4,992,667

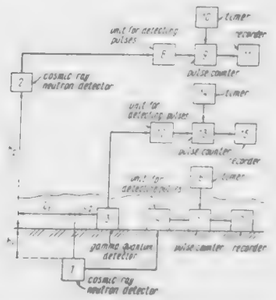
DEVICE FOR MEASURING MOISTURE CONTENT OF SOIL AND SNOW WATER STORAGE

Vladimir V. Abelentsev, ulitsa Solnechnaya, 31; Evgeny V. Kolomeets, prospekt Al-Farabi, 67, kv. 9; Vladimir V. Oskomov, ulitsa Baumana, 242, kv. 73; Vladimir N. Sevostyanov, proepekt Lenina, 192B, all of, Alma-Ata, and Shepa D. Fridman, Zheleznodorozhny, ulitsa Smelchaka, 7, kv. 64, Moskovskaya oblast, all of U.S.S.R.

Filed May 4, 1989, Ser. No. 347,510

Int. Cl.[5] G01N *23/09*

U.S. Cl. 250—390.05 **4 Claims**



1. A device for measuring moisture content of soil and snow water storage, said device comprising:
a first cosmic-ray neutron detector comprising means for

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recording cosmic-ray neutrons passed through the soil at a pre-set depth and an output;

a second cosmic-ray neutron detector comprising means for recording direct flux of neutrons in the atmosphere at an altitude which is greater than maximum snow pack thickness or height of a vegetation layer and an output, said second cosmic-ray neutron detector being displaced from said first cosmic-ray neutron detector at a distance which is not greater than path length of thermal neutrons before absorption in the atmosphere;

a first gamma-radiation detector comprising means for recording soil background gamma-quantum radiation on the soil surface, and an output, said first gamma-radiation detector being displaced from said first cosmic-ray neutron detector at a distance which is not greater than gamma-quantum path length before absorption in the soil;

first and second units for detecting pulses of a predetermined amplitude, each having an input and an output, said inputs of said first and second units for detecting pulses of a predetermined amplitude being respectively electrically coupled to said outputs of said first and second cosmic-ray neutron detectors, said first and second units for detecting pulses of a predetermined amplitude being designed for letting through only pulses corresponding to cosmic-ray neutrons passed through the soil and direct neutron flux of the atmosphere;

a third unit for detecting pulses of a predetermined amplitude having an input and an output, said input of said third unit for detecting pulses of a predetermined amplitude being electrically coupled to said output of said first gamma-radiation detector, said third unit for detecting pulses of a predetermined amplitude being designed for letting through only pulses corresponding to soil background gamma-quantum radiation;

first, second and third pulse counters, each having an input, a control input and an output, said inputs of said first, second and third pulse counters being respectively connected to said outputs of said first, second and third units for detecting pulses of a predetermined amplitude, said first, second and third pulse counters being designed for counting pulses corresponding to cosmic-ray neutrons passed through the soil, pulses corresponding to the direct neutron flux of the atmosphere and pulses corresponding to soil background gamma-quantum radiation during a pre-set exposure time;

first, second and third timers, each having an output connected to said control input of a respective pulse counter, said first, second and third timers being designed for setting-up the exposure time of said first, second and third pulse counters; and

first, second and third recorders, each having an input connected to said output of a respective pulse counter, said first, second and third recorders being designed for recording pulses corresponding to the total number of cosmic-ray neutrons passed through the soil, direct neutron flux of the atmosphere and soil background gamma-quantum radiation during the exposure time.

4,992,668

ELECTRON BEAM PATTERN GENERATOR CONTROL

John P. Swetman, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

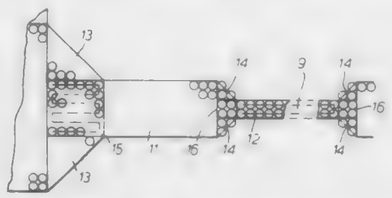
Filed May 11, 1987, Ser. No. 48,195

Claims priority, application United Kingdom, May 16, 1986, 8612009

Int. Cl.[5] H01J *37/30*

U.S. Cl. 250—492.3 **4 Claims**

1. A method of controlling an electron beam pattern generator comprising an electron beam generation and deflection system for writing a pattern on a substrate with a spot formed by an electron beam, a pattern store for holding the defining coordinates of a set of trapezia which together constitute the pattern, and a trapezium generator for taking the defining coordinates of each trapezium in turn and for generating scanning steps for the electron beam deflection system to write each trapezium in turn on the substrate, the method being characterized in that the set of trapezia in the pattern store are divided into groups which are written in turn on the substrate, successive groups comprising those trapezia which define



successively coarser to finer pattern details, and in that the groups are each preceded in the pattern store by respective data words which instruct the trapezium generator to generate the scanning steps for the successive groups at successively higher to lower frequencies respectively.

4,992,669

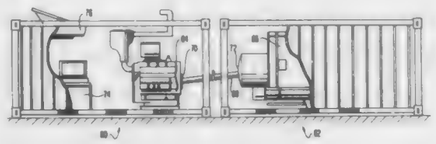
MODULAR ENERGY SYSTEM

Daniel W. Parmley, 129 E. Citation La., Tempe, Ariz. 85284

Filed Feb. 16, 1989, Ser. No. 310,988

Int. Cl.[5] F02B *65/00*

U.S. Cl. 290—1 R **20 Claims**



1. A modular energy system comprising:

a power plant adapted to supply shaft driving power;

power plant controls operatively connected to said power plant;

a power plant module container protectively enclosing said power plant and said power plant controls;

shaft drivable equipment;

equipment controls operatively connected to said shaft drivable equipment;

a driven module container protectively enclosing said shaft drivable equipment and said equipment controls;

a drive shaft operatively connectable to said power plant and to said shaft drivable equipment for transmitting the shaft driving power from said power plant to said shaft drivable equipment; and

a transfer means for allowing both said power plant module container and said driven module container together with their enclosed contents to be separately wheeled away and replaced by corresponding replacement module containers enclosing corresponding replacement power plants and controls or corresponding replacement shaft drivable equipment and controls.

4,992,670

IGNITION DISABLING ANTI-THEFT DEVICE

David E. Pastor, 3613 Hawaii Ct. S., Pleasanton, Calif. 94566

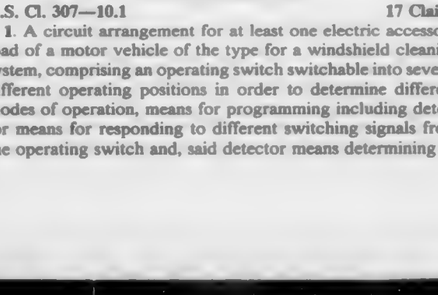
Filed Apr. 3, 1989, Ser. No. 332,575

Int. Cl.[5] B60R *25/04*

U.S. Cl. 307—10.3 **2 Claims**

1. In an engine vehicle having a battery with a pair of terminals, one of said terminals being grounded and the other providing a source of operating current for electrical circuits of the engine powered vehicle, an ignition system, an ignition switch having a run position, a start position and an off position for selectively switching battery current off or on to the ignition system in either the start or the run positions, an anti-theft device comprising:

an electrically operable circuit switching means including a first set of normally open switch contacts connected between an ignition switch run terminal and said ignition system to prevent passage of battery current from said ignition switch run terminal to said ignition system thereby preventing operation of said ignition system when said ignition switch is in the run position, and a second set of normally open switch contacts connected between said first set of normally open switch contacts and said ignition switch run terminal such that one said ignition switch is in the run position and battery current is applied to said electrically operable circuit switching means and said first set of normally open switch contacts close and in response



to said first set of normally open switch contacts closing, said second set of normally open switch contacts close and perform as a latching means to maintain the battery current applied to said electrically operable circuit switching means;

a third set of manually operable switch with a normally open contacts connected between said electrically operable circuit switching means and said battery such that upon closing said third set of normally open contacts, battery current is allowed to pass to actuate said electrically operable circuit switching means to close said first set of normally open switch contacts and allow normal passage of battery current from said ignition switch run terminal to said ignition system, and activate said latching means to maintain passage of battery current from said ignition switch run terminal to said ignition system until said ignition switch is turned to the off position.

4,992,671

CIRCUIT ARRANGEMENT FOR AT LEAST ONE ELECTRIC LOAD OF A MOTOR VEHICLE

Gunther Gille, Sersheim; Horst Goertler, Sachsenheim 2, and Horst Rachner, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/DE87/00199, § 371 Date Sep. 6, 1988, § 102(e) Date Sep. 6, 1988, PCT Pub. No. WO87/06898, PCT Pub. Date Nov. 19, 1987

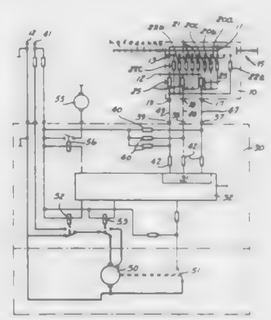
PCT Filed May 6, 1987, Ser. No. 168,118

Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615531

Int. Cl.[5] H02G *3/00*

U.S. Cl. 307—10.1 **17 Claims**

1. A circuit arrangement for at least one electric accessory load of a motor vehicle of the type for a windshield cleaning system, comprising an operating switch switchable into several different operating positions in order to determine different modes of operation, means for programming including detector means for responding to different switching signals from the operating switch and, said detector means determining an associated mode of operation of the load when the switching signal lies within a particular range of detection, a plurality of switching signal transmission paths between the operating switch and said detector means, the number of signal transmission paths being less than the number of possible operating positions of the operating switch wherein, in addition to the



ranges of detection for detecting the various modes of operation, the detector means includes at least one additional range of detection for detecting a switching signal which differs from the switching signal in each of the different operating positions of the switch and wherein said operating switch includes a contact bridge interconnected with said means for programming.

4,992,672

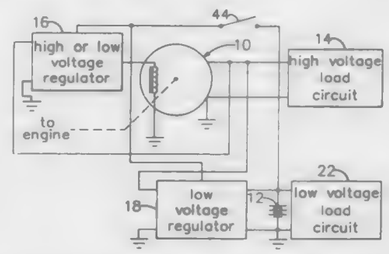
DUAL OR SINGLE VOLTAGE VEHICULAR POWER SUPPLY WITH IMPROVED SWITCH DRIVER AND LOAD PUMP

Peter Norton, 1 S. Lakeside, Lake Hopatcong, N.J. 07849

Continuation-in-part of Ser. No. 204,343, Jun. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 941,332, Dec. 15, 1986, abandoned. This application May 26, 1989, Ser. No. 358,034

Int. Cl.[5] H02P *9/30*

U.S. Cl. 307—10.1 **18 Claims**



1. In an electrical system for a vehicle, said system being of the type including a DC generator, a storage battery, a first load circuit including said storage battery and one or more load devices designed to be powered by electricity at a voltage in a first voltage range corresponding to the rated voltage of the battery, and a second load circuit including one or more load devices designed to be powered by electricity at a voltage in a second voltage range substantially higher than the rated voltage of said battery, a first regulator comprising a first switch having a control element and having an input coupled with an output of said DC generator and having an output coupled with said first load circuit, the improvement comprising:

means for providing a mode signal,

means responsive to said mode signal for controlling said

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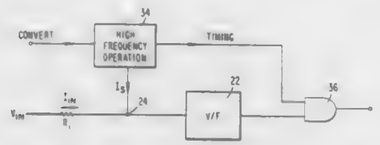
first regulator to operate either in a first mode or in a second mode,
when operating in said first mode said first regulator being adapted to convert DC power from said DC generator at a voltage in said second voltage range to DC power at a voltage in said first voltage range and to supply said converted power to said first load circuit,
and when operating in said second mode said first regulator being adapted to maintain a constant direct connection between said alternator and said first load circuit.

4,992,673

FAST SETTLING VOLTAGE TO FREQUENCY CONVERTER FOR HIGH SPEED ANALOG TO DIGITAL CONVERSION

Bill Gessaman, Everett; Paul Lantz, and Jon Parle, both of Seattle, all of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Feb. 24, 1989, Ser. No. 314,996
Int. Cl.[5] H03L *7/00*
U.S. Cl. 307—271 **20 Claims**



1. In a charge balanced voltage-to-frequency converter generating output pulses at a frequency determined by a voltage level of an input voltage provided thereto, the voltage-to-frequency converter having a first cycle for resetting an integrator thereof, and a second cycle for integrating said input voltage and balancing a charge condition in the integrator thereof, the improvement comprising:
settling time reducing means for reducing a time required by said voltage-to-frequency converter to change the frequency of output pulses provided thereby from a first frequency to a second frequency in response to a change in voltage input thereto from a first voltage level to a second voltage level,
said reducing means including:
speed-up current generating means for generating a speed-up current to reduce the time required for balancing said charge condition following a change in input voltage to said voltage-to-frequency converter, and
means for applying said speed-up current to the integrator of said voltage-to-frequency converter,
whereby initial conditions of said voltage-to-frequency converter caused by said first voltage level are removed in a shorter time than required for such removal in response to unaided integration of the input voltage.

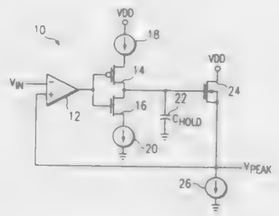
4,992,674

CONTROLLED SLEW PEAK DETECTOR

Michael D. Smith, Lewisville, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 198,166, May 24, 1988, Pat. No. 4,866,301. This application Sep. 7, 1989, Ser. No. 404,156
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—351 **8 Claims**

1. Apparatus comprising:
(a) a comparator, having a first terminal connected to receive a first voltage and a second terminal connected to receive an external voltage, and to compare said first voltage to said external voltage;
(b) a capacitive element;
(c) charging means, coupled between said comparator and said capacitive element, for charging said capacitive element at a first predetermined constant rate when said external voltage is greater than said first voltage;
(d) discharge means, coupled to said capacitive element, for discharging said capacitive element at a second predetermined constant rate, which is less than said first predetermined constant rate; and
(e) means for coupling the voltage across said capacitive element to said first voltage input terminal of said comparator;



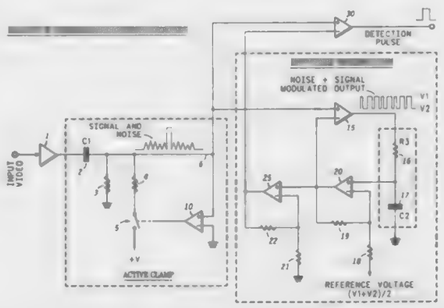
wherein said first voltage is expected to be representative of the peak voltage of said external voltage;
wherein said means for coupling includes a gate to source path through an MOS transistor;
wherein said discharge means is also coupled to said comparator, and wherein said discharge means discharges said capacitive element only when said first voltage is greater than said external voltage.

4,992,675

ADAPTIVE THRESHOLD CONTROL CIRCUIT

Leo B. Conner, Jr., Phoenix, and Robert J. Burdge, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1989, Ser. No. 330,569
Int. Cl.[5] H03K *5/08, 5/153*
U.S. Cl. 307—358 **13 Claims**



1. An adaptive threshold control circuit for distinguishing low power transponder interrogation signals from a noise component, said adaptive threshold circuit comprising:
clamp circuit means for maintaining said noise component at approximately a first voltage level, said clamp circuit means operating in response to said transponder interrogation signal and said noise component to produce a clamped signal;
threshold means connected to said clamp circuit means, said threshold means operating in response to said clamped signal to produce an output signal controlled by the voltage of said noise component, said output signal having an approximately 50% duty cycle;
said threshold means including:
tracking means operating in response to said clamped signal to produce second output signals which correspond to variations in said noise component;

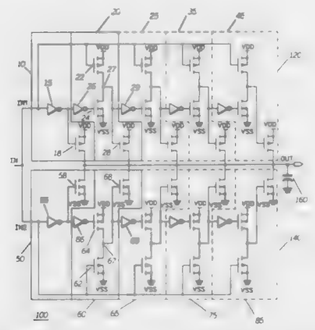
filter means connected between said tracking means and a source of a first voltage level, said filter means operating in response to said second output signals to pass low frequencies of said second output signals; and
error detecting means connected to said filter means, to said tracking means, to said source of said first voltage level and to a reference voltage source, said error detecting means operating in response to said passed second output signals to provide said output signal proportional to the voltage of said noise component; and
means for generating transponder detection pulses, said means for generating connected to said clamp circuit means and to said threshold means, said means for generating operating in response to said clamped signal and in response to said output signal to provide detection pulses in response to said lower power transponder interrogation signals.

4,992,676

OUTPUT BUFFER HAVING DISTRIBUTED STAGES TO REDUCE SWITCHING NOISE

Gianfranco Gerosa; Rene M. Delgado, both of Austin, Tex., and Carl L. Shurboff, Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1989, Ser. No. 345,735
Int. Cl.[5] H03K *17/16, 19/003, 5/13, 5/159*
U.S. Cl. 307—443 **8 Claims**



1. A circuit for producing an output signal, comprising:
a first inverter stage for inverting a first input signal and providing a pull-up output being coupled to an input of the first of a plurality of subsequent pull-up stages; each of said pull-up stages including:
a delayed pull-up means comprising integral transistors for receiving a pull-up input from the previous stage and for providing a delayed pull-up output to the subsequent pull-up stage: wherein delay time for providing said delayed pull-up output depends upon the sizing of said transistors:
a pull-up means being responsive to the delayed pull-up output for pulling-up said output signal to a first supply potential when turned on, and
a second inverter stage for inverting a second input signal for receiving a pull-down input from the previous stage and for providing a delayed pull-down output to the subsequent pull-down stage; wherein delay time for providing said delayed pull-down output depends upon the sizing of said transistors;
a pull-down means being responsive to the delayed pull-down output for pulling-down said output signal to a first supply potential when turned on,

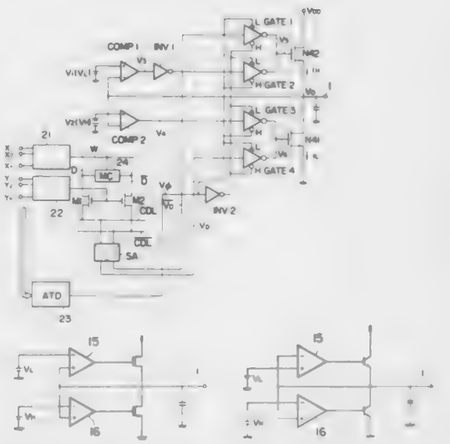
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4,992,677

HIGH SPEED MOSFET OUTPUT BUFFER WITH LOW NOISE

Koichiro Ishibashi; Osamu Minato, both of Tokyo, and Katsuhiro Shimohigashi, Musashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,439
Claims priority, application Japan, Mar. 23, 1988, 63-67375
Int. Cl.[5] H03K *17/16, 19/003, 19/094;* **G11C** *11/34*
U.S. Cl. 307—443 **9 Claims**



1. A semiconductor integrated circuit comprising:
(1) a data output terminal;
(2) a first semiconductor element having a control input terminal, whose output current path is connected between a first operating potential point and said data output terminal;
(3) a second semiconductor element having a control input terminal, whose output current path is connected between said data output terminal and a second operating potential point;
(4) a first controller connected to said control input terminal of said first semiconductor element;
(5) a second controller connected to said control input terminal of said second semiconductor element;
(6) a first generator for generating a first predetermined voltage; and
(7) a second generator for generating a second predetermined voltage, which is higher than said first predetermined voltage,
wherein the voltage of said first operating potential is higher than said second predetermined voltage, and the voltage of said second operating potential is lower than said first predetermined voltage,
wherein in the case where the voltage of said data output terminal is higher than that of said second predetermined voltage, the output of said first controller controls said control input of said first semiconductor element so that the current flowing through said output current path of said first semiconductor element is substantially zero and the output of said second controller controls said control input of said second semiconductor element so that a

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second predetermined current flows through said output current path of said second semiconductor element, so as to lower said voltage of said data output terminal to a voltage, which is substantially equal to said second predetermined voltage, and

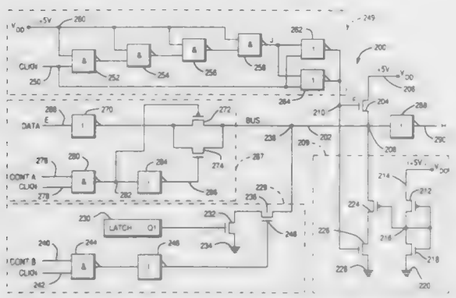
wherein in the case where the voltage of said data output terminal is lower than that of said first predetermined voltage, the output of said first controller controls said control input of said first semiconductor element so that a first predetermined current flows through said output current path of said first semiconductor element and the output of said second controller controls said control input of said second semiconductor element so that the current flowing through said output current path of said second semiconductor element is substantially zero, so as to raise said voltage of said data output terminal to a voltage, which is substantially equal to said first predetermined voltage.

4,992,678

HIGH SPEED COMPUTER DATA TRANSFER SYSTEM

Ikuo J. Sanwo, San Marcos; Gregory H. Milby, San Diego, and Moo Y. Kim, Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 15, 1988, Ser. No. 284,644
Int. Cl.[5] H03K *19/094, 5/153*
U.S. Cl. 307—451 **9 Claims**



1. A high speed computer data transfer system for transferring digital data comprising:

a data transfer bus;

a pre-charger coupled to said bus for precharging said bus to a first logic level;

a pulling circuit coupled to said bus for pulling said bus from said first logic level to a second logic level; and

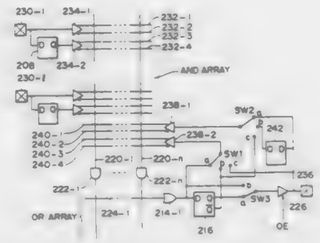
a clamping circuit coupled to said bus for preventing said bus from exceeding a threshold voltage during pre-charging, said clamping circuit providing a low impedance path from said bus to said threshold voltage when activated, whereby the time for transition from the first logic level to the second logic level is decreased.

4,992,679

PROGRAMMING LOGIC DEVICE WITH MULTIPLE INDEPENDENT FEEDBACKS PER INPUT/OUTPUT TERMINAL

Akira Takata, and Koichi Fujii, both of Toyonaka, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 343,925, Apr. 26, 1989, abandoned, which is a division of Ser. No. 199,122, Aug. 1, 1988, Pat. No. 4,857,773, which is a division of Ser. No. 903,781, Sep. 4, 1986, Pat. No. 4,763,020. This application Jul. 16, 1990, Ser. No. 555,364
Claims priority, application Japan, Sep. 6, 1985, 60-201358; Sep. 10, 1985, 60-204157; Sep. 13, 1985, 60-232992; Oct. 17, 1985, 60-198102
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 **2 Claims**



1. A programmable logic device, comprising:

a plurality of input terminals;

an AND plane connected to said plurality of input terminals, said AND plane including a plurality of input lines extending in a predetermined direction, a plurality of product term lines extending in a direction transverse to said predetermined direction, and a plurality of programmable memory elements each disposed at each of cross-over points between said input and product term lines, said plurality of input lines being paired;

an OR plane connected to said AND plane;

at least one input-output terminal selectively connectable to at least one of said AND and OR planes; and

wherein two pairs of said input lines are connected to at least one of said plurality of input terminals or to said input-/output terminal and there are two independent feedback systems for selective feedback from said input/output terminal to said input lines; and

wherein one of said paired input lines is an inverting input line and the remaining of said paired input lines is a non-inverting input line.

4,992,680

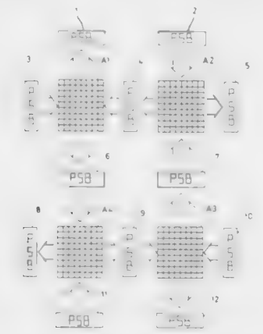
PROGRAMMABLE LOGIC DEVICE HAVING A PLURALITY OF PROGRAMMABLE LOGIC ARRAYS ARRANGED IN A MOSAIC LAYOUT TOGETHER WITH A PLURALITY OF INTERMINGLINGLY ARRANGED INTERFACING BLOCKS

Mirella Benedetti, Vimercate; Antonio Chiriatti, Reggio Calabria; Vincenzo Daniele, Brugherio, and Biagio Giacalone, Trapani, all of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Italy

Filed Dec. 27, 1989, Ser. No. 456,782
Claims priority, application Italy, Dec. 28, 1988, 83691 A/88
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 **4 Claims**

1. An integrated logic device having a plurality of bidirectional input/output pins and comprising means capable of constituting a plurality of programmable and addressable memory cell arrays, arranged in rows and columns, which cells may be individually programmed by altering their electrical conductivity status, each of said arrays having inputs and outputs; a plurality of multifunctional blocks each containing

input selection circuitry capable of receiving input signals coming from said bidirectional input/output pins and/or from outputs of said arrays, signal selection means, polarity selection means and path selection means, a plurality of registers and an output sorting circuitry capable of selecting non-stored and stored type data containing signals, selecting the polarity and the path of said signals toward enableable output buffers driving said plurality of bidirectional input/output pins and/or toward one of said arrays, circuitry capable of producing for each of said data containing signals a first, non-inverted and a second, inverted, buffered replica signals by means of which the rows of one or more of said memory cell arrays are driven for producing output signals from said arrays, each of said arrays being programmable for producing different logic functions for any combination of inputs of the same array.

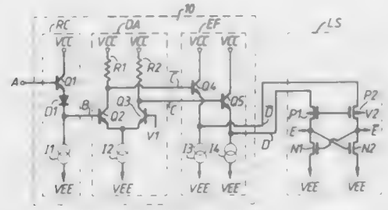


4,992,681

LOGIC LEVEL CONVERTING CIRCUIT

Yukihiro Urakawa, Kanagawa, and Masataka Matsui, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 15, 1989, Ser. No. 451,316
Claims priority, application Japan, Dec. 28, 1988, 63-333577
Int. Cl.[5] H03K *19/094, 19/20, 19/0175;* **H03L** *5/00*
U.S. Cl. 307—475 **8 Claims**



1. A logic level converting circuit for converting a ECL level input signal to a CMOS level output signal, responsive to a first and a second power source voltages comprising:

complementary signal generating means for generating complementary signals in response to the ECL level input signal and a first reference voltage;

level shifting means for outputting complementary output signals of CMOS level, and said level shifting means including

a first MOS transistor of a first conductivity type having a source electrode supplied with one of said complementary signals, a gate electrode supplied with a second reference voltage and a drain electrode,

a second MOS transistor of the first conductivity type having a source electrode supplied with the other of said complementary signals, a gate electrode supplied with said second reference voltage and a drain electrode,

a third MOS transistor of a second conductivity type having a source electrode supplied with said second power source voltage and a gate electrode connected to the drain electrode of the second MOS transistor and a drain electrode connected to the drain electrode of the first MOS transistor,

a fourth MOS transistor of the second conductivity type having a source electrode supplied with said second power source voltage, a gate electrode connected to the drain electrode of the first MOS transistor and a drain electrode connected to the drain electrode of the second MOS transistor, whereby the drain electrodes of the first and the second MOS transistors form the outputs of the logic level converting circuit.

4,992,682

CLOCK DRIVE CIRCUIT

Michio Asano, Tokorozawa; Makio Uchida, Ome, and Toshihiro Okabe, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 294,676
Claims priority, application Japan, Jan. 20, 1988, 63-8309
Int. Cl.[5] H03K *19/096, 19/10*
U.S. Cl. 307—481 **10 Claims**



1. A clock drive circuit device comprising a plurality of clock drive circuits configured to perform different logic operations, respectively, each one of said clock drive circuits including:

first and second power supply terminals connected to high and low voltage sources, respectively;

a plurality of first input terminals through which predetermined condition signals are inputted;

at least one second input terminal for receiving a clock input signal;

an output terminal through which an output signal is outputted at a timing determined by the clock input signal and the predetermined condition signals;

a first series connection of a first set of FETs connected in series between said first power supply terminal and said output terminal and a second series connection of a second set of FETs connected in series between said second power supply terminal and said output terminal, each of said first and second sets of FETs having a gate connected to a selected one of said at least one second input terminal and said first input terminals so that said first and second sets of FETs determine the logical operaton of the clock drive circuit in order to produce the output signal at said output terminal in response to the clock input signal re-

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ceived by said at least one second input terminal when the predetermined condition signals are inputted through said plurality of first input terminals; and

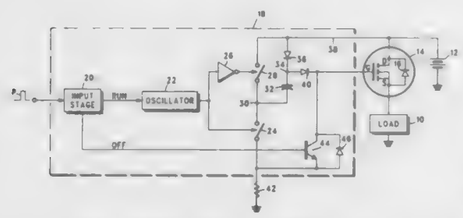
at least one third FET connected in series to at least one of said first and second series connections for compensating for a difference between an input-to-output signal delay time inherent in the clock drive circuit and an input-to-output signal delay time inherent in another of the plurality of clock drive circuits, said at least one third FET being unrelated to the logical operation of the clock drive circuit.

4,992,683

LOAD DRIVER WITH REDUCED DISSIPATION UNDER REVERSE-BATTERY CONDITIONS

Joseph F. Robin, Jr., Fox River Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1989, Ser. No. 413,933
Int. Cl.[5] H03K *17/10, 17/16, 17/687, 3/013*
U.S. Cl. 307—570 5 Claims



1. In a system which powers a load from a battery in response to an input signal, a load driver circuit that reduces power dissipation when the battery is coupled to the load with reverse polarity, comprising:

an FET (field-effect transistor) coupled between the load and the battery, the FET having a control electrode; and

bias means receiving the input signal and coupled to the FET's control electrode for turning the FET on in response to the input signal, and, responsive to the battery being coupled to the load with reverse polarity, for holding the FET on to provide a relatively low impedance current path between the battery and the load.

4,992,684

LINEAR MOTOR AND DRIVING APPARATUS USING THE SAME

Norio Matsui, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1989, Ser. No. 398,393
Claims priority, application Japan, Aug. 26, 1988, 63-210608
Int. Cl.[5] H02K *41/00*
U.S. Cl. 310—12 5 Claims

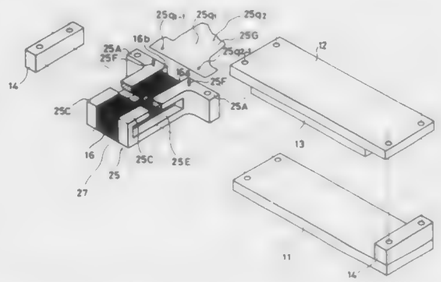
1. A linear motor comprising:

a first yoke;

a magnet disposed in opposed relationship with said first yoke with a clearance kept therebetween; and

a driving coil movable on said first yoke, said driving coil having a coil bobbin provided with a through-hole through which said first yoke extends, and a coil held on said coil bobbin;

the distance L between said first yoke and said magnet being the sum total of the height of said coil bobbin and the



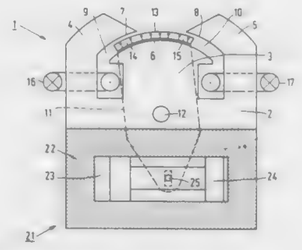
clearance between said coil bobbin and said magnet and the clearance between said coil bobbin and said first yoke.

4,992,685

RECIPROCATING MOTOR-COMPRESSOR WITH W-SHAPED CORE

Fidelus A. Boon, and Evert M. H. Kamerbeek, both of Eindoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1989, Ser. No. 416,809
Claims priority, application Netherlands, Oct. 10, 1988, 8802471
Int. Cl.[5] H02K *33/16*
U.S. Cl. 310—37 1 Claim



1. A motor-compressor comprising:

a vibration motor having a magnetizable stator formed by a single part having a W-shape, including a central limb having first and second peripheral surfaces, and first and second outer limbs spaced apart from the first and second peripheral surfaces to form first and second air gaps;

at least one coil arranged on the stator;

a motor shaft;

an armature pivotally mounted on the motor shaft and including at least one permanent magnet pole element movable into and out of the first and second air gaps;

a compressor including a linearly reciprocating piston; and

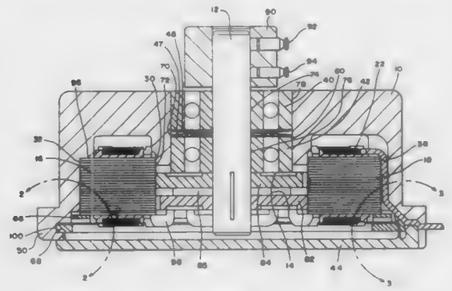
means for coupling the armature to the piston for maintaining the pole elements and the piston diametrically opposite with respect to the motor shaft.

4,992,686

SINGLE HOUSING STEPPER MOTOR

Gunter K. Heine, Oswald Kewert, Bernard Michael Seeger, Santa Cruz County; Enrique G. Klein, Santa Clara County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 296,298, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 116,374, Nov. 2, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,486
Int. Cl.[5] H02K *37/00*
U.S. Cl. 310—49 R 29 Claims



1. A stepper motor comprising

a single housing bell for supporting the elements of said motor, said housing comprising a single end wall and a cylindrical side wall,

a support shaft mounted for rotation in said housing end wall,

a rotor of said motor being mounted for rotation with said shaft in said housing bell,

a stator fixedly mounted in said housing and having a plurality of coils wound thereon, selective activation of said coil causing step-by-step rotation of said rotor, said housing including at least one inner surface internal to said housing and adapted to guide said stator into a predetermined position in said housing and support said stator in said position.

and bearing means for supporting said rotor for said selective rotation in response to said selective activation of said coils, said bearing means including front and rear bearings on opposite sides of said rotor and a rear bearing holder piloted to support a corner of the stator.

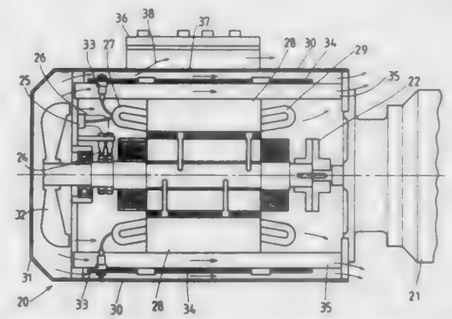
4,992,687

GENERATOR WITH INHERENT OVERLOAD LIMITING

Gert Nel, Roodepoort, South Africa, assignor to Techmarex (Properietary) Limited, Johannesburg, South Africa

Filed Feb. 15, 1989, Ser. No. 310,974
Claims priority, application South Africa, Feb. 15, 1988, 88/1020
Int. Cl.[5] H02P *9/34;* H02K *9/06*
U.S. Cl. 310—68 D 5 Claims

3. A method of providing a dynamo means with inherent output short circuit protection comprising winding a wound stator and rotor with at least one excitation winding on the stator connected to supply field excitation current to the rotor winding and wound to be operatively in phase with a stator phase winding, and utilizing stator core saturation on occurrence of a short circuit to prevent voltage induction in said excitation winding, and cause consequent cessation of field current in the rotor, and ventilating the dynamo housing with a fan mounted on the shaft end and guiding ventilation air through flow passages on both inner and outer sides of a tubular heat sink within the housing, and through a voltage controlling resistor bank to cool it.



4,992,688

PRINTED CIRCUIT BOARD WITH A METALLIC LAYER FOR SUPPORTING AN ELECTRICAL COMPONENT

Heinrich Cap, St. Georgen-Peterzell, and Georg Moosman, Tennenbronn, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,302
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 8712486
Int. Cl.[5] H02K *29/08*
U.S. Cl. 310—71 19 Claims



1. A printed circuit board having a metallic layer supporting body on which a flat insulating layer is provided, a layer with individual metallic tracks being provided on this insulating layer for the connection of electric components, wherein there is at least one depression impressed into the printed circuit board for accommodating at least one of the electric components, and wherein the depression is constructed as a pocket by cutting a tab which is essentially U-shaped and pressing it out in one direction from the plane of the printed circuit board.

4,992,689

MODULAR PROTECTOR APPARATUS FOR OIL-FILLED SUBMERGIBLE ELECTRIC MOTORS

Russell J. Bookout, Bartlesville, Okla., assignor to Camco, Inc., Houston, Tex.

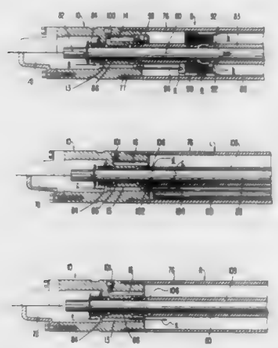
Filed Nov. 29, 1989, Ser. No. 442,633
Int. Cl.[5] H02K *5/12;* F04B *21/02*
U.S. Cl. 310—87 9 Claims

1. Modular protector apparatus for an oil-filled submergible electric motor comprising;

a plurality of chambers adapted to be interconnected physically and hydraulically to provide different systems of chambers, and body means adapted to be assembled with

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said chambers for interconnecting pairs of said chambers physically and hydraulically, said body means having a plurality of passages for providing fluid flow paths between pairs of interconnected chambers, said chambers having means for communicating with passages of said body means when pairs of said chambers are interconnected thereby, and said body means having means operable before assembly of said body means with said chambers for opening and closing different passages, respectively, of said body means in order to select from said plurality of passages particular passages to provide fluid flow paths between pairs of chambers assembled with said body means in accordance with the different systems of chambers.

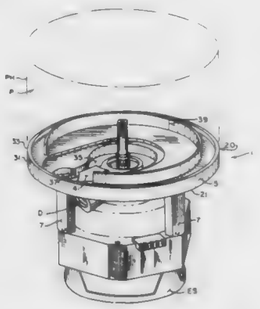


4,992,690

COMBINATION MOTOR ENDSHIELD AND PUMP HOUSING

Gerald N. Baker, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 7, 1988, Ser. No. 255,756
Int. Cl.[5] H02K *5/10, 15/14;* F04D *13/02*
U.S. Cl. 310—89 13 Claims



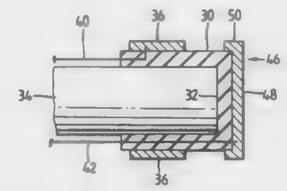
1. In a dynamoelectric machine for use with a pump or the like, the machine having a stator assembly a rotor assembly including a rotatable shaft and a rotor mounted to and rotatable with the shaft, a first endshield for rotatably supporting the shaft, the improvement comprising cover means defining a second endshield for the machine for rotatably supporting the shaft on a first side at a point intermediate the length of the shaft, the cover means defining a portion of a housing for the pump on a second side thereof, said shaft extending beyond the cover means into the operable portions of the pump and said cover means including means for aligning the shaft with operable portions of the pump, and said cover means having an outer section with an outer circumferential rim defining a mating surface with a pump housing, and a central cavity defining a drain for liquid discharged through the pump, and an upstanding wall formed inwardly of the rim and extending substantially around the circumference of the outer section, the wall and the rim defining a channel communicating with said drain.

4,992,691

SLIP RING ARRANGEMENTS

Richard Mlynarz, Cormeills En Parisis, France, assignor to General Motors France, France

Filed Nov. 3, 1989, Ser. No. 435,864
Int. Cl.[5] H01R *39/08*
U.S. Cl. 310—232 3 Claims



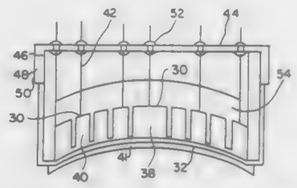
1. A slip ring assembly for supplying current to a rotor coil winding of an alternating current generator comprising, a metallic rotatable rotor shaft, an electrical insulator secured to said shaft for rotation therewith, said electrical insulator having a first portion surrounding an axially extending portion of said shaft and having an integral second portion extending entirely across an end of said shaft, said first portion of said insulator having a cylindrical outer surface, said second portion of said insulator having an outer flat surface that is substantially normal to a longitudinal axis of said shaft, a first cylindrical slip ring of electrically conducting material secured to and engaging said cylindrical outer surface of said insulator and a second flat slip ring of electrically conducting material secured to and engaging said flat surface of said insulator, said second flat slip ring entirely covering a center portion of said flat surface of said insulator.

4,992,692

ANNULAR ARRAY SENSORS

J. Fleming Dias, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 16, 1989, Ser. No. 352,526
Int. Cl.[5] H01L *41/04*
U.S. Cl. 310—335 14 Claims



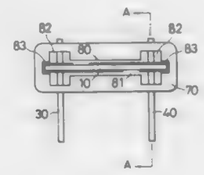
4. An ultrasonic sensor array [10] comprising:
a. a piezoelectric shell [12] having a concave side [14], a convex side [16], and a shell edge [15];
b. said convex side [16] being dissected into a central disc [38] and at least one concentric annulus [40] by at least one circular cut, [34], said cut [34] extending from said convex side [16] toward said concave side [14], so that a region [36] in proximity to said concave side [14], so that a region [36] in proximity to said concave side [14] remains uncut;
c. a conductive ring [18], having an outer edge [24], an inner edge [20], a lower end [22], and an upper end [25], said ring [18] being affixed around said piezoelectric shell [12] so that said piezoelectric shell [12] fits snugly inside said ring [18], with said lower end [22] aligned with said concave side [14];
d. a conductive coating [32] applied over said concave side [14] and said lower end [22];
e. a seal [44] applied over said upper end [25] of said ring [18], thereby forming an open space [54], between said seal [44] and said convex side [16], said open space [54] being hermetically sealed; and
f. an electrical connection [42] to said central disc [38] and to each of said concentric annuli [40]; said electrical connections [42] being made within said open space [54], at said convex side [16] of said piezoelectric shell [12], said connections [42] passing through said seal [44] to permit external connection.

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PIEZO-RESONATOR

Yoshikatsu Kishi; Mamoru Katayanagi; Haruyoshi Koyama; Hirofumi Mochitomi; Toshio Osawa, and Hiroyoshi Tanaka, all of Hiki, Japan, assignors to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1989, Ser. No. 415,705
Claims priority, application Japan, Oct. 4, 1988, 63-130241
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—348 3 Claims



1. A piezo-resonator comprising:
a supporting frame which is made of an insulating material and on which a recess if formed;
two terminals which intersect said recess to be embedded in said supporting frame;
a piezoelectric resonator element which is arranged in said recess and both end portions of which are electrically connected and fixed to said respective terminals,
wherein said recess comprises a central portion in which a vibrating portion of said piezoelectric resonator element is located, a pair of connecting portions which are arranged at respective ends of said vibrating portion and a pair of end portions which are arranged at the outside of these respective connecting portions and at which said respective end portions of said piezoelectric resonator element are located and the width W_2 of said connecting portion, the width W_1 of said vibrating portion and the width W_3 of said end portion have the relationship $W_2 > W_1 > W_3$.

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PIEZOELECTRIC CRYSTAL ELEMENT ON THE BASIS OF $GaPO_4$

Engel Günter, Leitring, and Peter W. Krempl, Graz/Ragnitz, both of Austria, assignors to AVL Gesellschaft Für Verbrennungskraftmaschinen Und Messtechnik M.B.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Nov. 17, 1989, Ser. No. 437,600
Claims priority, application Austria, Nov. 25, 1988, 2909/88
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—360 7 Claims



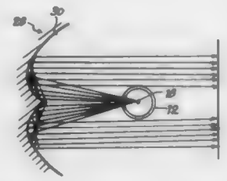
1. A piezoelectric crystal element of the type of $GaPO_4$, being cut from a raw crystal bar, said crystal element having plane-parallel, plane-convex or bi-convex top and bottom faces, defining a principal plane lying parallel to one of said plane faces or lying symmetrical to one of said bi-convex faces, wherein said principal plane of said crystal element runs parallel to a cutting plane, which cutting plane is generated by rotating a hexagonal prism face of said raw crystel bar, which hexagonal prism face is parallel to the optical axis c, around one of the two-fold crystallographic symmetry axes a_1, a_2, or a_3 through an angle θ of $-5°$ to $-22°$.

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REFLECTOR FOR HIGH-INTENSITY LAMPS

Daniel Naum, 2048 Midvale Dr., San Diego, Calif. 92105

Filed Oct. 10, 1989, Ser. No. 418,872
Int. Cl.[5] H01J *5/16*
U.S. Cl. 313—113 10 Claims



1. A reflector for concentrating the beam of a high-intensity lamp which minimizes the amount of light which is reflected back through the lamp itself, said reflector comprising:
(a) a main reflector dish having a reflective concave side, said concave side being contoured to reflect light from a substantially point source disposed in front of said concave side forwardly substantially parallel form; and,
(b) a reflective cone disposed on said concave side positioned to be just behind a substantially point light source and contoured to reflect light from said source against said main dish at such an angle of incidence that light so reflected will be re-reflected forwardly from said main dish in substantially parallel form, whereby rearwardly directed light from said point source which would pass back through the lamp at said cone is instead re-directed around said lamp.

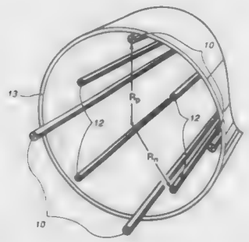
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4,992,696

APPARATUS HAVING REDUCED MECHANICAL FORCES FOR SUPPORTING HIGH MAGNETIC FIELDS

Melvin L. Prueitt; Fred M. Mueller, and James L. Smith, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 17, 1989, Ser. No. 311,998
Int. Cl.[5] H05H *1/10;* H01J *1/50*
U.S. Cl. 313—154 6 Claims



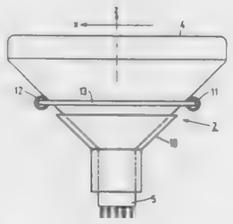
1. A magnetic plasma containment apparatus having reduced mechanical forces, which comprises in combination a set of first substantially parallel, electrically isolated, elongated conducting elements spaced apart in a substantially equally distant manner around an outer circle having a first radius, all of said first conducting elements having a first current flowing therein in a first direction, and a set of second substantially parallel, electrically isolated, elongated conducting elements spaced apart in a substantially equally distant manner around an inner circle having a second radius, each of said second conducting elements being disposed in such a manner as to be approximately equally distant from the two of said first conducting elements nearest thereto, all of said second conducting elements having second current flowing therein in a direction opposite to the direction of the first current, and wherein the ratio of the magnitude of the second current to that of the first current, and the ratio of the second radius to the first radius are selected such that the net force on said first conducting elements and on said second conducting elements is substantially zero away from the ends thereof.

4,992,697

PICTURE DISPLAY DEVICE WITH MAGNETIZABLE CORE MEANS COMPRISING COMPENSATION COILS

Johannes Penninga; Albertus A. S. Sluyterman, and Bernardus H. J. Dekkers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1989, Ser. No. 302,170
Claims priority, application Netherlands, Feb. 1, 1988, 8800235; Mar. 3, 1988, 8800540; Apr. 7, 1988, 8800884
Int. Cl.[5] H01J *29/76*
U.S. Cl. 313—440 15 Claims



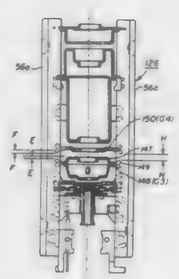
1. A picture display device having a display tube whose rear portion consists of a cylindrical neck accommodating a device for generating electron beams and whose front portion is funnel-shaped, the widest portion being present on the front side and comprising a phosphor display screen, said display device also comprising an electro-magnetic deflection unit mounted around a part of the display tube for deflecting electron beams across the display screen, said unit comprising a line deflection coil having two line deflection coil halves arranged on either side of a plane of symmetry and a field deflection coil, and a compensation coil system for generating a magnetic compensation field which is oppositely directed to the line frequency radiation field in a space in front of the display screen, characterized in that the compensation coil system includes a core means of magnetizable material which is positioned between the display screen and the deflection unit in a plane parallel to the display screen and which has two diametrically arranged coils each comprising at east one turn, the distance between the compensation coil system and the deflection unit being chosen so that, in operation, the compensation coil system produces a deflection of the electron beams which is insignificant compared to that produced by the deflection unit.

4,992,698

COLOR PICTURE TUBE INCLUDING AN ELECTRON GUN WITH AN ELECTRODE HAVING AN OPTIMIZED ATTACHMENT MEANS

Carl L. Lundvall II, Lititz, Pa., assignor to RCA Licensing Corp., Princeton, N.J.

Filed May 10, 1989, Ser. No. 349,670
Int. Cl.[5] H01J *29/46*
U.S. Cl. 313—457 5 Claims



1. In a color picture tube including an envelope comprising a faceplate panel and a tubular neck interconnected by a funnel, a three-color phosphor screen on an interior surface of said faceplate and a multi-apertured color selection electrode spaced from said screen, an electron gun disposed within said neck, said electron gun including three cathode and a plurality of spaced-apart electrodes having substantially aligned apertures therethrough for generating and directing three electron beams along paths toward said screen, each of said electrodes being secured to a plurality of longitudinally extending insulative support rods by at least two oppositely disposed, integral attachment means, each having a distal end, a proximal end and an appendage portion therebetween, each of said distal ends having a bifurcated portion comprising spaced-apart grasping members to facilitate attachment to said support rods, wherein the improvement comprises

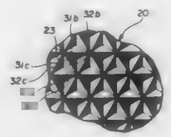
said distal ends of each of said attachment means of at least one of said electrodes being torsionally aligned at an acute angle relative to said longitudinally extending support rods, said angle being not greater than 45°, said grasping members being symmetrically disposed with respect to said appendage portions to minimize the bending moment of said one electrode so as to reduce spacing variations and to maintain aperture alignment between said one electrode and the adjacent electrodes.

4,992,699

X-RAY PHOSPHOR IMAGING SCREEN AND METHOD OF MAKING SAME

Richard J. McClure, San Diego, and Frederick J. Jeffers, Escondido, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 5, 1989, Ser. No. 403,246
Int. Cl.[5] H01J *31/50*
U.S. Cl. 313—525 15 Claims



1. A method of making a planar array corner cube surface comprising the steps of:

forming a wafer of single crystal material having a cubic lattice structure with the facial surface of the wafer oriented in a {111} plane of the cubic structure;

forming on the facial surface of the wafer a photoresist pattern of an ordered array of closely packed equilateral, triangle openings wherein adjacent openings have paired, coextensive, parallel sides, the sides of the triangle openings being parallel to the <110> directions of the cubic lattice in said {111} plane of the facial surface of the cubic structure, and said parallel sides of adjacent triangle openings being spaced apart by a predetermined amount through the array pattern;

etching said crystal material with an anisotropic etchant which will preferentially each {100} planes of the cubic lattice structure to form a corresponding array of internal corner cube pyramidal surfaces under the triangle openings of the photoresist pattern so that substantially no residual {111} plane surface remains between adjacent corner cubes;

and removing the photoresist pattern to leave a planar array corner cube surface on the wafer facial surface.

4,992,700

REPROGRAPHIC METAL HALIDE LAMPS HAVING HIGH BLUE EMISSION

William H. Lake, Macedonia, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 10, 1989, Ser. No. 322,148
Int. Cl.[5] H01J *61/18, 61/20, 61/22*
U.S. Cl. 313—639 33 Claims



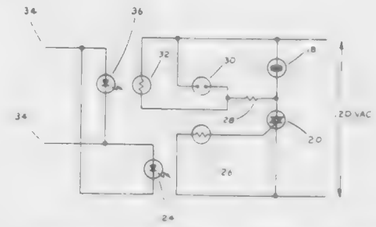
1. A metal halide arc discharge lamp emitting primarily in the blue, green and red portions of the visible light spectrum and not continuously across the visible spectrum and with a significant amount of blue emission at a wavelength of about 450 nm, said lamp comprising a light transmissive, vitreous, hermetically sealed arc chamber enclosing within a pair of electrodes, an inert gas, at least one halogen indium, zinc, lithium and thallium, wherein the amount of indium present is not greater than about 25 mole % of the total of said four metals and wherein said halogen is present in an amount sufficient to insure that said metals are present as metal halides during operation of said lamp, but not in excess of that amount.

4,992,701

MOTION DETECTING LIGHT CONTROLLER SYSTEM

Peter J. Sacchetti, Framingham, Mass., assignor to C&K Components, Inc., Newton, Mass.

Filed Jun. 26, 1989, Ser. No. 371,527
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—159 3 Claims



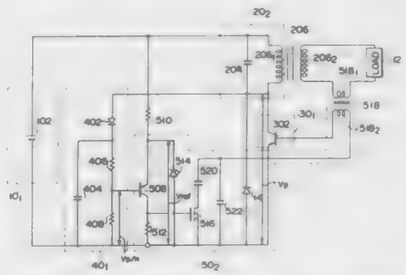
1. A motion detecting light controller system comprising a motion detector, a power source, a light bulb socket adapter, a means of connecting the system to a 120 v AC line and a light, the light bulb socket adapter including a control circuit for the light, the motion detector and the light electrically connected to the control circuit, the control circuit having a first LED and a second LED, the first and second LEDs electrically isolated from the 120 v AC lines.

4,992,702

INVERTER CAPABLE OF CONTROLLING OPERATING FREQUENCY

Keiichi Shimizu; Kenichi Inui, and Nanjou Aoike, all of Yokohama, Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,377
Claims priority, application Japan, Dec. 17, 1987, 62-317462
Int. Cl.[5] H05B *37/02, 39/04;* H02M *3/24*
U.S. Cl. 315—219 16 Claims



1. An inverter capable of controlling an operating frequency, comprising:

means for supplying a DC voltage;

switching means, including a switching transistor, for switching the voltage from said DC voltage supply means;

a parallel voltage resonance circuit including an inductor coupled in series with said switching means, said inductor and said switching means both being connected between both ends of said DC voltage supply means, and a resonance capacitor;

voltage detecting means for detecting a voltage applied to said switching means, said voltage detecting means including a series circuit comprising a diode and a capacitor, said series circuit being coupled in parallel with said switching means, to detect a voltage across said charged capacitor, wherein said voltage detecting means further includes resistors coupled across said capacitor and for

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dividing said voltage, and wherein said comparing means compares the divided voltage and the reference voltage; and

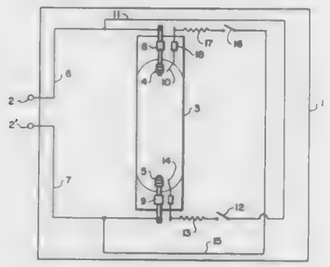
control means for controlling a switching frequency of said switching means, on the basis of the result of comparison of a voltage value detected by said voltage detecting means and a predetermined reference voltage, wherein said control means includes a comparing means for comparing said voltage detected by said voltage detecting means with the predetermined reference voltage, and a frequency control means for controlling a switching signal to be applied to said switching means according to the result of the comparison by said comparing means, wherein said comparing means includes a comparing transistor of which a base is connected to a node between said voltage dividing resistors, an emitter and a collector are respectively coupled with both ends of said DC voltage supply means, and a Zener diode reverse coupled between the emitter and the collector of said comparing transistor, said Zener diode providing the reference voltage, and said frequency control means includes a feedback current transformer whose secondary winding is connected at a first end with the base of said switching transistor, and a frequency varying means coupled between the collector of said comparing transistor and the second end of said comparing transistor.

4,992,703

METAL HALIDE LAMP WITH DUAL STARTING ELECTRODES AND IMPROVED MAINTENANCE

Raghu Ramaiah, Painted Post, N.Y., assignor to North American Philips Corp., New York, N.Y.

Continuation of Ser. No. 851,616, Apr. 14, 1986, abandoned.
This application Jan. 23, 1990, Ser. No. 469,817
Int. Cl.[5] H01J *29/00*
U.S. Cl. 315—261 **7 Claims**



1. In a metal halide high intensity discharge lamp of the type having a discharge vessel and an ionizable fill material including a metal halide ionizable for emitting highly intense visible light, the improvement comprising:

a pair of discharge electrodes disposed within said discharge vessel and spaced apart to define therebetween a discharge gap, each of said discharge electrodes consisting essentially of a straight tungsten core and a tungsten wire coil wrapped around said core, and said pair of discharge electrodes energizable for establishing an electrical discharge across the discharge gap therebetween and ionizing said fill material to emit light;

a pair of straight starting probes, each disposed within said discharge vessel adjacent a respective one of said discharge electrodes and energizable for establishing ionization between it and its respective discharge electrode adjacent thereto;

biasing means receptive of a lamp voltage applied in use to the lamp for biasing said discharge electrodes and said starting probes, said biasing means comprising means for alternately biasing each discharge electrode negative relative to its respective starting probe during alternate half cycles of the voltage applied to the lamp; and

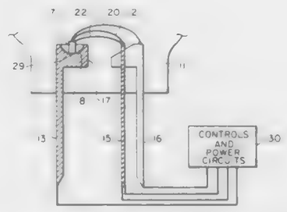
the combination of said starting probes and said biasing means being effective for shortening the glow to arc transition time of the lamp to less than one second.

4,992,704

VARIABLE COLOR LIGHT EMITTING DIODE

John W. Stinson, Stanton, Calif., assignor to Basic Electronics, Inc., Stanton, Calif.

Filed Apr. 17, 1989, Ser. No. 339,221
Int. Cl.[5] H05B *41/36*
U.S. Cl. 315—312 **3 Claims**



1. A light emitting device radiating a variety of colors and hues comprising the combination of:

at least three separate and individual light dies wherein each light die is characterized as emitting a color chosen from red, green and blue;

each of said light dies having an anode and a cathode;

means for electrically and mechanically joining said light die cathodes in common for exterior connection;

means coupled to said light die anodes for separate and individual exterior connection;

a transparent housing enclosing and supporting said light dies and said connection means in a single unitary structure;

circuit means operably connected to said anodes and said cathode for selectively energizing said anodes individually at a desired intensity level;

said common cathode means includes an elongated lead having an enlarged portion provided with a recessed cup-like reflector operably supporting said light die cathodes therein;

said anode connector means includes at least three elongated leads arranged in fixed spaced relationship with respect to each other and with respect to said common cathode lead;

said anode connector means further including a connecting wire having its opposite ends secured between a selected one of said anode leads and a selected one of said light die anodes; and

one of said light die anodes being composed of AlGaAs, another light die anode is composed of GaP, and another light die anode is composed of Silicon Carbide.

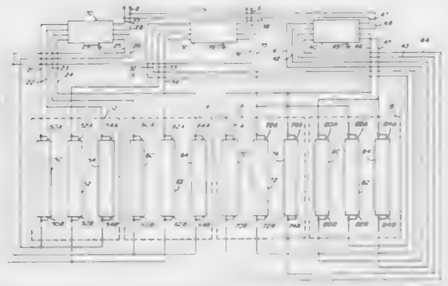
4,992,705

FLUORESCENT LIGHTING SYSTEM

Alden M. Hathaway, II, St. Louis, Mo., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 11, 1988, Ser. No. 255,571
Int. Cl.[5] H05B *41/38*
U.S. Cl. 315—324 **16 Claims**

1. A fluorescent lighting system comprising a plurality of ballast circuits, a plurality of fluorescent lighting fixtures each including a set of fluorescent lamps, circuit means for coupling each of the ballast circuits with at least one fluorescent lamp in



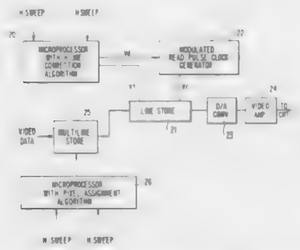
different ones of said lighting fixtures to provide illumination of said fluorescent lamps.

4,992,706

CRT RASTER DISTORTION CORRECTION CIRCUIT

Stephen T. Troemel, Jefferson City, and William F. Guerinot, Knoxville, both of Tenn., assignors to North American Philips Corporation, New York, N.Y.

Filed Feb. 21, 1990, Ser. No. 483,192
Int. Cl.[5] H01J *29/70, 29/76*
U.S. Cl. 315—368 **3 Claims**



1. A circuit for correcting distortion of the scanning line raster on the display screen of a cathode ray display tube (CRT), which raster is produced by periodic horizontal (H) and vertical (V) sweep signals supplied to the CRT, such distortion causing increased lengthening of scanning lines increasingly further from the horizontal center of the raster, such circuit comprising:

a line store for receiving and storing, prior to initiation of any scanning line by the H sweep signal, digital video data for successive pixels on such scanning line;

clock pulse generating means for supplying read-out clock pulses to said line store to produce read-out of the video data stored therein at a rate determined by the clock pulse rate, such read-out commencing when said line store is enabled by a read-enable signal supplied thereto; and

first microprocessor means for receiving said H and V sweep signals and which is programmed with a correction algorithm for determining, based on the relationship between the length of each successive scanning line and the period of said H sweep signal, a time delay value (t_{d1}) and a data rate value (R);

said time delay value (t_{d1}) for any given scanning line corresponding to the required time delay between initiation of such line by said H sweep signal and display of video data thereon in order to compensate for lengthening of such line due to distortion of said raster, said data rate value (R) being the rate at which video data is to be supplied for the pixels on such line in order to compensate for the reduced scanning time of such line due to said time delay;

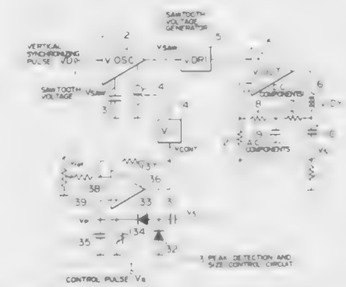
said first microprocessor means being adapted to supply a read-enable signal to said line store prior to each scanning line which is delayed by a time delay t_{d1} following initiation of the H sweep signal for such scanning line, and to further supply a pulse rate modulating signal to said pulse generating means for controlling the pulse rate thereof to correspond with said data rate (R) applicable to such scanning line.

4,992,707

VERTICAL DEFLECTION CIRCUIT OF PICTURE DISPLAY UNIT

Ikuya Arai, and Kouji Kitou, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1990, Ser. No. 508,704
Claims priority, application Japan, Apr. 17, 1989, 1-095151
Int. Cl.[5] H01J *29/70, 29/76*
U.S. Cl. 315—403 **32 Claims**



1. A vertical deflection circuit, comprising:

a vertical oscillation means which generates a deflection voltage (V_{SAW}) synchronized with a vertical synchronizing signal (VD), said vertical oscillation means including a constant current source and being capable of varying the amplitude value of said deflection voltage (V_{SAW}) by varying the current value of said constant current source;

a vertical drive means which provides a drive signal derived from said deflection voltage produced by said vertical oscillation means;

a vertical output means which applies a vertical deflection current to a vertical deflecting coil based on said drive signal produced by said vertical drive means;

an amplitude detecting means which detects the maximum amplitude value of a vertical deflection current (Vs) after said vertical deflection current (Vs) is applied to said vertical deflecting coil;

a comparison means which compares said maximum amplitude value detected by said amplitude detecting means with a reference value which is set by a setting means; and

a control means which controls the current value of said constant current source in said vertical oscillation means based on the output from said comparison means.

4,992,708

HORIZONTAL DEFLECTION AND HIGH VOLTAGE GENERATING CIRCUIT

Shigeru Kashiwagi, Noda, Japan, assignor to Victor Company of Japan, Ltd., Japan

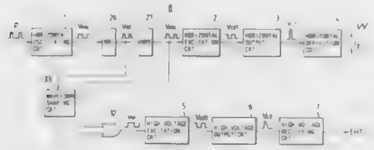
Filed Dec. 22, 1989, Ser. No. 455,064
Claims priority, application Japan, Dec. 22, 1988, 63-322144; Jan. 11, 1989, 1-3932; Jan. 25, 1989, 1-15937
Int. Cl.[5] H01J *29/70*
U.S. Cl. 315—411 **8 Claims**

1. A horizontal deflection and high voltage generating circuit having a horizontal oscillating circuit, for generating an oscillating pulse, a horizontal excitation circuit responsive to an oscillating pulse outputted thereto from said horizontal

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oscillating circuit, a horizontal output circuit excited by an output of said horizontal excitation circuit, a high voltage generating circuit responsive to an oscillating pulse outputted from said horizontal oscillating circuit, said horizontal deflection and high voltage generating circuit including:

a delay circuit for delaying by a predetermined delay time a leading edge of the oscillating pulse applied from said horizontal oscillating circuit to said horizontal excitation circuit with respect to a leading edge of the oscillating pulse applied directly from the horizontal oscillating circuit to the high voltage generating circuit without going through said delay circuit, the predetermined delay time having a value which is set in such a manner that:



(a) a trailing edge of a horizontal deflection pulse occurring in said horizontal output circuit is substantially in agreement with a trailing edge of a high voltage pulse which is generated by said high voltage generating circuit and

(b) that said high voltage pulse has a pulse duration larger than a pulse duration of the horizontal deflection pulse generated by said horizontal output circuit; and

pulse duration regulating means for regulating the pulse duration of the oscillating pulse of said horizontal oscillating circuit manually or automatically so as to initiate conduction of an output transistor of said high voltage output circuit after an end of the high voltage pulse and before a collector current of said output transistor of said high voltage output circuit meets the level of zero.

4,992,709

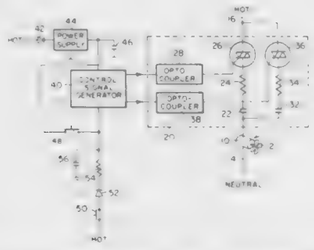
SWITCHING CIRCUIT PROVIDING ADJUSTABLE CAPACITIVE SERIES VOLTAGE DROPPING CIRCUIT WITH A FRACTIONAL HORSEPOWER MOTOR

Raymond T. Griffin, San Antonio, Tex., assignor to Lightolier, Inc., Secaucus, N.J.

Filed Jun. 20, 1989, Ser. No. 368,659

Int. Cl.[5] H02P *7/00*

U.S. Cl. 318—249 **15 Claims**



1. For use in combination with a fractional horsepower alternating current motor connected between hot and neutral wires to impose a series impedance reducing the voltage applied to the motor, a motor control system which comprises:

(a) at least two independent parallel capacitors connected in series with a motor and connected in series with the hot wire for conducting alternating current power to the motor;

(b) first and second switching devices, each thereof being connected in series with one of said capacitors, wherein said switching devices conduct alternating current flowing between the hot and neutral wires and are controllably switched between off and on states to thereby control alternating current flow through the respectively connected capacitors; and

(c) control means connected to said switching devices for providing control signals to said switching devices to selectively switch said switching devices to the on state and the off state.

4,992,710

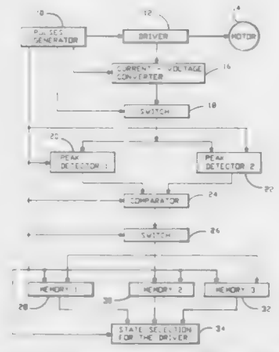
POSITION DETECTION FOR A BRUSHLESS DC MOTOR WITH SAMPLE TIME OPTIMIZATION

Alain M. Cassat, Pully, Switzerland, assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 413,311, Sep. 27, 1989. This application Jun. 29, 1990, Ser. No. 546,514

Int. Cl.[5] H02K *29/00*

U.S. Cl. 318—254 **41 Claims**



1. A commutatorless direct current motor comprising:

a plurality of stator windings connected to define m phases of said motor;

a permanent magnet or DC current excitation winding positioned relative to said stator windings and rotatable relative to said stator windings and comprising means for establishing first, fixed magnetic fields;

driver means connected to said plurality of stator windings for applying short term current pulses to energize at least one phase thereof for inducing at least one second, controlled magnetic field, and thereby inducing currents in said stator windings;

monitoring means for detecting each said current established by said applied current pulses, each said current representing the interaction of said first, fixed magnetic field and each of said second, current pulse induced magnetic field;

detection means for identifying the magnitude of the difference between the currents produced in response to said pulses; and

optimization means cooperating with said detection means for optimizing duration of each of said short term current pulses.

31. In a brushless DC motor having multiple windings arranged as a stator and a permanent magnet rotor or a DC current excitation winding, a method for controlling ordered application of electrical current to the stator windings and measuring the response thereto to determine the initial position of said rotor comprising the steps of

coupling circuit means to the stator windings for selectively establishing current paths through a

selected stator winding or windings in response to control signals,

applying short duration current pulses of first and second opposite polarities to energize each said selected stator winding,

detecting the voltage detected at a current-voltage converter connected to the energized winding by each of said applied current pulses of opposite polarities,

identifying the magnitude of the difference between the currents produced in response to said pulses applied to said selected stator winding, and

optimizing the duration of each of said short duration current pulses.

4,992,711

POSITIONING CONTROLLING DEVICE

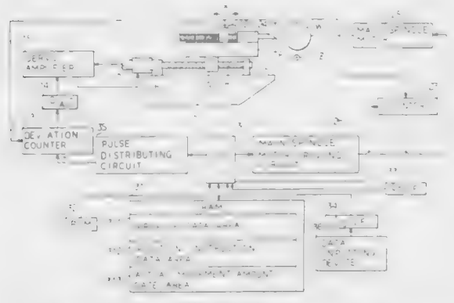
Kazuhiko Sugita, Anjo; Norio Sakakibara, Kariya; Nobumitsu Hori, Ichinomiya, and Yoichi Yamakawa, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 12, 1990, Ser. No. 480,155

Claims priority, application Japan, Feb. 17, 1989, 1-39111

Int. Cl.[5] G06F *3/14*

U.S. Cl. 318—561 **5 Claims**



1. A positioning controlling device, comprising:

a position instruction data storage means for storing therein position instruction data for successively instructing the position of a movable member which is controlled by a control axis of a numerically controlled machine tool for machining a work into a non-circular shape, the position of said movable member being variable with respect to time,

a first Fourier transformation processing means for Fourier transforming the position instruction data stored in said position instruction data storage means to obtain position instruction Fourier transformation data,

a movement amount detecting means for operating said control axis in accordance with the position instruction data to successively detect an actual amount of movement of said movable member which varies with respect to time as movement amount data,

a second Fourier transformation processing means for Fourier transforming the actual movement amount data detected by said position detecting means to obtain actual movement amount Fourier transformation data,

a correcting means for obtaining corrected position instruction Fourier transformation data from the position instruction Fourier transformation data calculated by said first Fourier transformation processing means, the actual movement amount Fourier transformation data calculated by said second Fourier transformation processing means and ideal position Fourier transformation data calculated from an ideal position which should be assumed by said movable member and which varies with respect to time, and

an inverse Fourier transformation processing means for inversely Fourier transforming the corrected position instruction Fourier transformation data calculated by said correcting means to obtain corrected position instruction data.

4,992,712

CONTROL DEVICE FOR INDUSTRIAL MACHINE

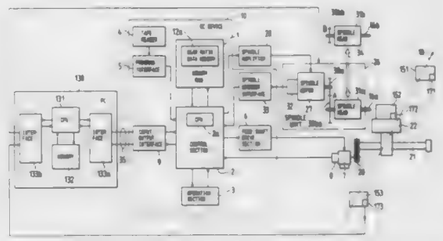
Akihiko Fujimoto, and Toshio Yamada, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 408,002

Claims priority, application Japan, Sep. 7, 1988, 63-222460; Sep. 16, 1988, 63-229897; Dec. 5, 1988, 63-306094

Int. Cl.[5] G05B *19/18*

U.S. Cl. 318—569 **4 Claims**



1. A control device for an industrial machine comprising a numerical control device and a programmable controller,

wherein said numerical control device comprises:

a data processing section essentially comprising a memory and a central processing unit, for analyzing and operating input numerical data, outputs of said data processing section being used for performing numerical control of a machine to be controlled and of rotation of a spindle head of said machine;

a gear ratio data memory for storing gear ratio data of gear means through which a spindle motor is coupled to said spindle head holding a tool, said gear ratio data being applied to said gear ratio data memory through a bus from said programmable controller adapted to perform sequence control of said machine; and

synchronous operation control means for calculating actual speed of rotation of said tool in response to said gear ratio data and a feedback signal of said spindle motor, and performing synchronous operation control of said tool and a feed shaft.

4,992,713

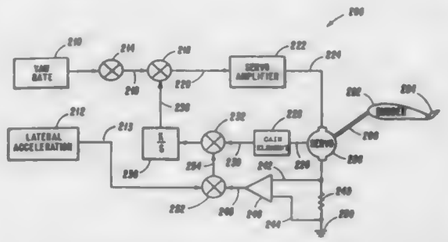
AIRCRAFT AUTOPILOT WITH YAW CONTROL BY RUDDER FORCE

James H. McCollum, and Gary E. Forquer, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 11, 1988, Ser. No. 255,222

Int. Cl.[5] B64C *13/18*

U.S. Cl. 318—586 **5 Claims**



1. An autopilot system for controlling the yaw of an aircraft by manipulating the rudder comprising:

(a) means for detecting yaw rate and generating a rudder position command in response to the detected yaw rate;

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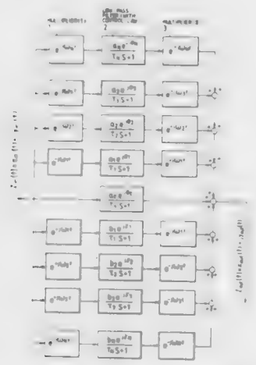
(b) means for manipulating the rudder in response to the rudder position command;
(c) means for detecting lateral acceleration and generating a rudder force signal in response thereto;
(d) means for limiting the rudder force by providing a rudder force wash-out signal;
(e) means for generating a rudder position feedback signal;
(f) means for combining the rudder force signal with the rudder force wash-out signal, and further combining with rudder position feeback signal to create a rudder feedback virtual position signal;
(g) means for summing the rudder feedback virtual position signal with the rudder position command.

4,992,714

BAND PASS FILTER DEVICE AND A METHOD OF FILTERING USING SUCH A DEVICE

Osami Matsushita, Tomobe; Michiyuki Takagi, Ushiku; Toyomi Yoshida, Shimoinayoshi; Naohiko Takahashi, Shimoinayoshi, and Ikuhiro Saitoh, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1990, Ser. No. 484,911
Claims priority, application Japan, Mar. 1, 1989, 1-46529
Int. Cl.[5] G05B *11/32*
U.S. Cl. 318—625 **26 Claims**



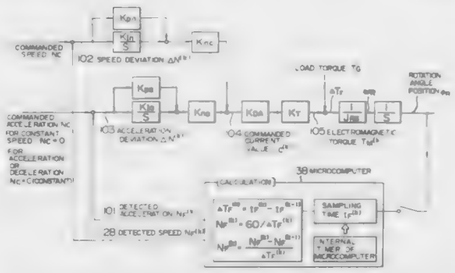
1. A band pass filter device for producing an oscillation waveform, comprising:
means for generating first trigonometric functions at a plurality of predetermined frequencies;
means for multiplying said oscillation waveform with said first trigonometric functions at said plurality of predetermined frequencies to generate a plurality of products;
means for filtering said plurality of products, to generate oscillatory complex amplitude components thereof for each of said predetermined frequencies;
means for multiplying each of said oscillatory complex amplitude components by a corresponding predetermined value, to obtain new oscillatory complex amplitude components;
means for multiplying said new oscillatory complex amplitude components for each of said predetermined frequencies with a second trigonometric function at the corresponding one of said predetermined frequencies to generate a plurality of resultant values, each of said second trigonometric functions being the inverse of a corresponding one of said first trigonometric functions, with the corresponding first and second trigonometric functions being at the same frequency; and
means for summing said resultant values and generating an output signal.

4,992,715

TORQUE CONTROL APPARATUS FOR ROTATING MOTOR MACHINE

Mitsuru Nakamura; Yozo Nakamura; Yuzo Kadomukai, all of Ibaraki; Tsunehiro Endo, Hitachiota; Kenichi Iizuka, Ashikaga, and Hiroaki Hata, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,717
Claims priority, application Japan, Aug. 4, 1987, 62-194613
Int. Cl.[5] H02P *5/28*
U.S. Cl. 318—649 **13 Claims**



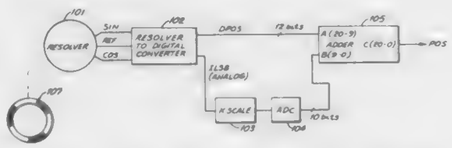
1. A torque control apparatus for a rotating motor machine having a motor element and a load element coupled to said motor element via a rotational main shaft and driven to rotate by said motor element, said torque control apparatus comprising:
means for detecting rotational acceleration of the rotational main shaft and providing an output indicative thereof; and
control means, responsive to the output of the detecting means, for comparing the detected rotational acceleration with a commanded rotational acceleration and for controlling an electromagnetic torque of the motor element so that a deviation between the detected rotational acceleration and the commanded rotational acceleration is reduced toward zero, wherein said detecting means detects rotational acceleration at a plurality of rotational angles in one revolution of the rotational main shaft said control means including:
feedback means for producing a feedback signal based on the rotational acceleration detected at each rotational angle in the one revolution of the rotational main shaft; and
means, responsive to the feedback signal, for comparing each detected rotational acceleration with the commanded rotational acceleration to derive an acceleration deviation, whereby said control means controls the electromagnetic torque of the motor element so that the acceleration deviation is reduced toward zero.

4,992,716

MOTOR CONTROL WITH DIGITAL FEEDBACK

George H. Ellis, Blacksburg, Va., assignor to Kollmorgen Corp., Simsbury, Conn.

Filed Aug. 2, 1989, Ser. No. 388,683
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—661 **7 Claims**



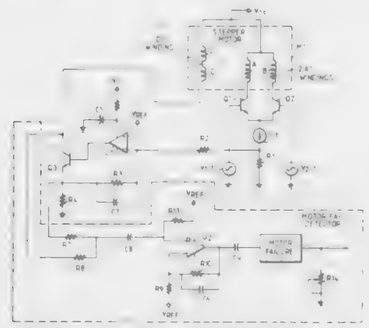
1. A digital feedback motor control system, comprising:
microcontroller means for generating a digital command representing at least one motor parameter value; resolver means having a resolver to digital converter for providing a quantized digital value representing coarse motor position and a linear analog signal representing the difference between said coarse motor position and actual motor position; means for scaling and converting said linear analog signal into a fine digital value representing fine motor position.
means for providing a digital feedback data representing the combination of said quantized digital value and said fine digital value;
means for differencing said digital command with said digital feedback data; and
means for converting data from said differencing means into excitation current for driving said motor.

4,992,717

STEPPER MOTOR DRIVE CIRCUIT

Gregg A. Marwin, Douglaston, and Tom Mazz, Huntington Station, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Jul. 19, 1989, Ser. No. 382,722
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 **14 Claims**



1. An electric motor drive circuit comprising:
a. a first periodic current source, the first current source alternately exciting a first and second winding of the motor; and
b. a second periodic current source, the second current source being 180 degrees out of phase with the first current source, the second current source exciting a third winding of the motor, and the sum of the currents from the first and second current sources developing a resultant vector of substantially constant magnitude.

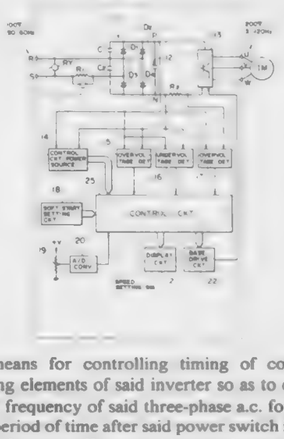
4,992,718

ELECTRIC FLOOR CLEANER WITH A SOFT START FUNCTION

Nobuyoshi Kumaki, Omiya, Japan, assignor to Nihon Patent Electric Co., Ltd., Kitamoto, Japan

Filed Sep. 11, 1989, Ser. No. 405,250
Int. Cl.[5] H02P *1/26*
U.S. Cl. 318—768 **6 Claims**

1. An electrical floor cleaner comprising:
voltage doubling and rectifying means for voltage doubling and rectifying a single-phase commercial power source voltage input through a power switch;
an inverter for converting a doubled d.c. voltage from said voltage doubling and rectifying means into three-phase a.c.;
control means for controlling voltage and frequency of said three-phase a.c. for switching elements of said inverter for a predetermined period of time after said power switch is put into an on state from an off state, said control means controlling said voltage and frequency according to a predetermined combination thereof, said voltage and frequency are different from rated values thereof, therein providing a soft start;
a three-phase motor arranged to be driven by said three-phase a.c. applied from said inverter, said three-phase motor having a rated voltage which is substantially equal to the doubled voltage; and
a floor cleaning member arranged to be driven by said three-phase motor.
6. An electrical floor cleaner comprising:
voltage doubling and rectifying means for voltage doubling and rectifying a single-phase commercial power source voltage input through a power switch;
an inverter for converting a doubled d.c. voltage from said voltage doubling and rectifying means into three-phase a.c.;



control means for controlling timing of conduction of switching elements of said inverter so as to control voltage and frequency of said three-phase a.c. for a predetermined period of time after said power switch is put into an on state from an off state, said control means including a manually operable dip switch having a plurality of circuits, and a memory means for storing a plurality of patterns of relationship between voltages and frequencies which are designated by said manually operable dip switch;
a three-phase motor arranged to be driven by said three-phase a.c. applied from said inverter, said three-phase motor having a rated voltage which is substantially equal to the doubled voltage; and
a floor cleaning member arranged to be driven by said three-phase motor.

4,992,719

STABLE HIGH VOLTAGE PULSE POWER SUPPLY

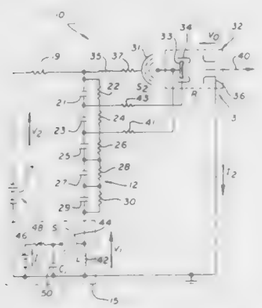
Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 24, 1989, Ser. No. 383,691
Int. Cl.[5] H02M *3/335*
U.S. Cl. 320—1 **12 Claims**

1. A high voltage stable pulse power supply comprising:
a first power supply;
first capacitive means connected in parallel with said power supply for storing a charge provided thereby;
first switch means mounted in parallel with said first capacitive means for selectively connecting said first capacitive means to a load so that said first capacitive means may discharge therethrough; and
anti-droop network means connected in series with said first capacitive means for canceling droop in the output of said

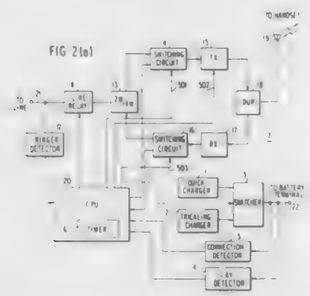
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first capacitive means as said first capacitive means discharges into said load, said anti-droop network means



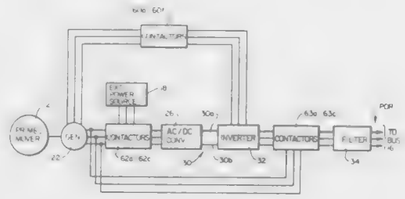
including an inductor mounted in series with said first capacitive means.

4,992,720
CHARGE CONTROL CIRCUIT FOR CORDLESS TELEPHONE SYSTEM
Mamoru Hata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jan. 30, 1989, Ser. No. 302,892
Claims priority, application Japan, Jan. 29, 1988, 63-16952
Int. Cl.[5] H02J *7/00*; H04Q *7/04*
U.S. Cl. 320—23 **10 Claims**



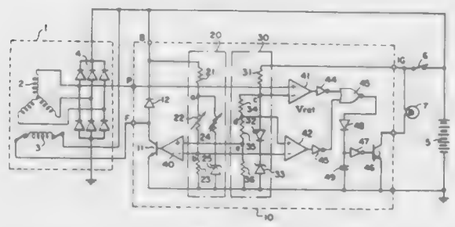
1. In a cordless telephone system including of a base unit and a handset, a charge control circuit with which a battery contained in the handset is electrically charged from a charger contained in the base unit when the handset is set to the base unit, said charge control circuit comprising:
- a connection detector for detecting connection between the handset and the base unit;
- a fully charged condition detector for detecting a fully charged condition of said battery;
- timer means for designating a predetermined period of time in response to an output of said fully charged condition detector; and
- control means responsive to the output of said or inhibit said battery from being charged within said predetermined period of time, and to quickly charge said battery after said predetermined period of time has elapsed.

4,992,721
INVERTER FOR STARTING/GENERATING SYSTEM
Thomas S. Latos, Huntley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Jan. 26, 1990, Ser. No. 470,804
Int. Cl.[5] H02M *5/45*; H02P *9/06*
U.S. Cl. 322—10 **5 Claims**



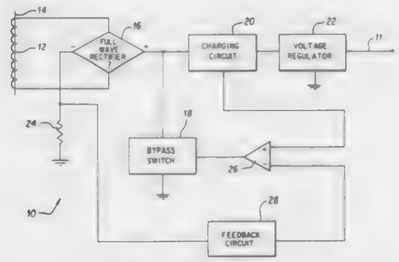
5. An inverter for use with a brushless generator having exciter and main generator portions, the exciter having a field winding and an armature winding coupled to a field winding of the main generator portion wherein the main generator portion includes an armature winding coupled by a rectifier to the inverter and wherein the inverter is operable in a generating mode to convert DC power produced by the generator and rectifier into AC power and is operable in a starting mode to convert power supplied by a power source into AC power which is applied to the generator to cause it to operate as a motor, comprising:
- an interphase transformer (IPT) having first and second end terminals and a mid-tap;
- first and second power switches connected together in series at a first junction therebetween to form a first series combination across first and second DC link conductors coupled to the rectifier, the first junction between the first and second power switches being converted to the first end terminal of the IPT;
- third and fourth power switches connected together in series at a second junction therebetween to form a second series combination across the first and second DC link conductors;
- a control unit; and
- contactors operable by the control unit in the generating mode for coupling the main generator portion armature winding to the rectifier, the second junction to the second end terminal of the IPT and the IPT mid-tap to a load and operable in the starting mode for coupling the power source to the rectifier, the IPT mid-tap to the main generator portion armature winding and the second junction to the exciter field winding;
- wherein the control unit operates the first through fourth power switches during operation in the operating mode to produce constant-frequency AC power at the load and operates the first through fourth power switches during operation in the starting mode such that AC waveforms are delivered to the exciter field winding and the main generator portion armature winding so that the generator is operated as a motor.

4,992,722
CHARGING CONTROL UNIT AND METHOD FOR MOTOR VEHICLE
Toshinori Maruyama, and Toshiaki Matsuhashi, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Feb. 9, 1989, Ser. No. 308,004
Claims priority, application Japan, Mar. 26, 1988, 63-72427
Int. Cl.[5] H02J *7/14*
U.S. Cl. 322—33 **10 Claims**



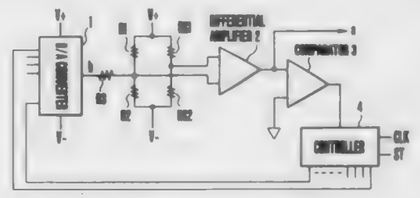
1. Apparatus for controlling a generator producing an output in response to a control signal comprising:
- means for generating a control signal for regulating an output of a generator;
- means for adjusting a temperature characteristic of said control signal;
- means for adjusting the level of said control signal independently of the temperature characteristic of said control signal;
- and
- means for controlling said generator in response to said control signal.

4,992,723
FAULT-POWERED POWER SUPPLY
Henry J. Zylstra, Alburnett, and Steven J. Flock, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.
Filed Mar. 31, 1989, Ser. No. 331,473
Int. Cl.[5] G05F *1/56*
U.S. Cl. 323—284 **27 Claims**



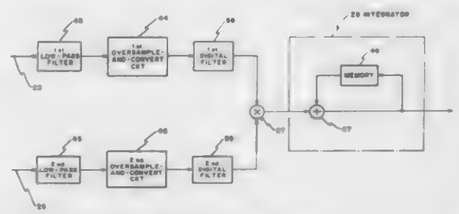
1. A power supply for a circuit breaker, comprising:
- means for providing a current signal having a magnitude correlative to the current flowing in a conductor;
- a charging circuit which is charged by said current signal and which delivers to said circuit breaker a voltage signal having a magnitude correlative to the charge stored in said charging circuit;
- means for generating a current signal correlative to said delivered voltage signal;
- means for directing said current signal through said charging circuit when the magnitude of said voltage correlative signal is below a predetermined magnitude of said current signal; and
- means for bypassing said charging circuit when the magnitude of said voltage correlative signal is above said predetermined magnitude of said current signal.

4,992,724
BRIDGE BALANCING CIRCUIT
Tetsuo Hisanaga, and Hiroshi Hatanaka, both of Kanagawa, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1990, Ser. No. 481,893
Int. Cl.[5] H03H *1/00*; H03M *1/72*
U.S. Cl. 323—367 **1 Claim**



1. A bridge balancing circuit comprising:
- a bridge having a resistance change type sensor;
- a differential amplifier for extracting a voltage difference across two central nodes of said bridge;
- a comparator connected to an output terminal of said differential amplifier;
- a D/A converter an output terminal of which is connected to one of said two central nodes; and
- a controller for controlling said D/A converter,
- wherein said differential amplifier and said comparator automatically detect a balanced point of said bridge, and said controller maintains a balanced state of said bridge.

4,992,725
METER FOR ACCURATELY MEASURING INTEGRATED ELECTRIC POWER
Masatoshi Komatsu; Shigeo Fushimi; Shigenori Wada; Hidetake Nakamura; Tadashi Kobayashi, and Toshio Takagi, all of Tokyo, Japan, assignors to NEC Corporation and the Tokyo Electric Power Company, Incorporated, Japan
Filed Dec. 21, 1989, Ser. No. 454,510
Int. Cl.[5] G01R *21/06*
U.S. Cl. 324—142 **2 Claims**



1. An electric power meter comprising:
- a first low-pass filter having a first predetermined cutoff frequency for filtering a first input signal representative of an analog electric current of an alternating current to produce a first filtered signal, said first predetermined cutoff frequency being higher than a first Nyquist rate which is substantially equal to twice a first frequency of said first input signal;
- first oversample-and-convert means connected to said first analog low-pass filter for oversampling said first filtered signal at a first sampling frequency higher than said first Nyquist rate into a first sampled signal and for converting said first sampled signal into a first digital signal;
- a second low-pass filter having a second predetermined

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cutoff frequency for filtering a second input signal representative of an analog voltage of said alternating current to produce a second filtered signal, said second predetermined cutoff frequency being higher than a second Nyquist rate which is substantially equal to twice a second frequency of said second input signal;

second oversample-and-convert means connected to said second low-pass filter for oversampling said second filtered signal at a second sampling frequency higher than said second Nyquist rate into a second sampled signal and for converting said second sampled signal into a second digital signal;

multiplying means connected to said first and said second oversample-and-convert means for calculating a product of said first and said second digital signals to produce a product signal representative of said product; and

integrating means connected to said multiplying means for integrating said product signal to produce a meter output signal representative of an integrated electric power of said alternating current.

4,992,726

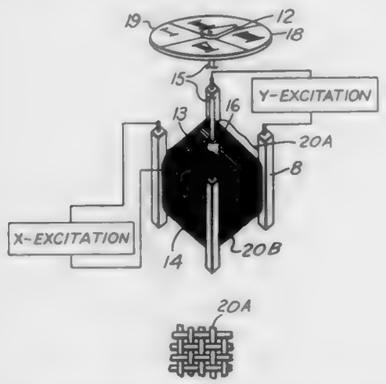
WOVEN CROSSED-COIL AIR-CORE GAUGE

Paul A. Markow, Huntsville, and William Nolle, Hazel Green, both of Ala., assignors to Acustar, Inc., Troy, Mich.

Filed Oct. 27, 1989, Ser. No. 431,356

Int. Cl.[5] G01R *1/20*; H01F *27/30*

U.S. Cl. 324—146 **8 Claims**



1. A cross-coil induction type air-core gauge for measuring electrical signals representing changes in magnitude of a measurand, said gauge comprising:

(a) a dial face having calibrated graduations thereon for designating values equivalent to the changes in magnitude of the measured, said dial face comprising four equal quadrants;

(b) a dial face pointer pivotally mounted about a pivot point and movable over said dial face for pointing to the calibrated graduations equivalent to the change in magnitude of the measurand;

(c) coil bobbin means disposed below said dial face for providing an environment for containing and concentrating electromagnetic flux lines within a cavity substantially within a central region of said bobbin means, said bobbin means having a frame structure formed from a non-magnetic material;

(d) a rotatable shaft means connected at one end to the pivot point of said dial pointer and having another end extending into the central region of said bobbin means, said shaft means having a through-shaft sleeve means alone said shaft means disposed near a top region of said bobbin means within which said shaft means rotate;

(e) permanent magnet rotor means disposed in the cavity of said bobbin means having a north and a south magnetic pole shaped equally apart about a central axis region, said central axis region being fixedly attached to the other end of said shaft means for establishing a permanent magnet flux field within the cavity of said bobbin means and for rotating said shaft means in response to magnetic field influences upon the permanent magnet flux field;

(f) first and second stator coils woven orthogonally about said bobbin means so as to be physically interchangeable and so as to generate interchangeable electromagnetic fields within the cavity of said bobbin means, wherein lengths of wire of said first stator coil are interwoven with lengths of said second stator coil in a manner that the radius of said first stator coil equals the radius of said second stator coil, said coils responding to electrical excitation commands in a manner that permit moving a resultant electromagnetic field of said first and second stator coils about said shaft means so as to cause the field of the permanent magnet rotor to align in the direction of the resultant fields which, in turn, causes said pointer to move about said dial face to graduations directly proportional to the changes in magnitude of the measurand.

4,992,727

INTEGRATED CIRCUITS

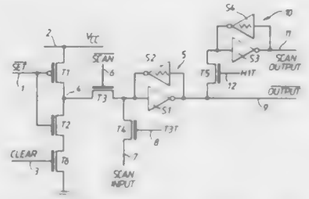
Richard D. Simpson, Houston, Tex., and Iain C. Robertson, Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1989, Ser. No. 373,123

Claims priority, application United Kingdom, Jun. 29, 1988, [illegible]5417

Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R **13 Claims**



1. A testable digital data storage circuit for use in an integrated circuit comprising:

(a) first and second two-state latch elements, each of said latch elements, in use, producing an output in the form of a selected one of two voltage levels depending only on whether an input signal applied to the particular element is above or below a predetermined threshold voltage,

(b) an input terminal for receiving an input signal to the circuit, a first output terminal connected to the output of the first latch element,

(c) switch means responsive to asynchronous input signals to establish one of two voltage levels selectively,

(d) first gating means connected to apply the voltage level established by the switch means to the input of the first latch element,

(e) test input and test output terminals,

(f) second and third gating means respectively connected from said test input terminal to the input of the first latch element and from the output of the first latch element to the input of the second latch element, the output of the second latch element being connected to said test output terminal, and

(g) means to maintain, during normal operation, the first gating means open to pass the voltage level to the first latch element and to maintain, during testing, the first gating means closed and the second and third gating means alternately opened.

4,992,728

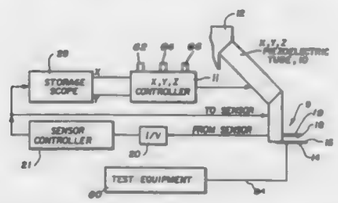
ELECTRICAL PROBE INCORPORATING SCANNING PROXIMITY MICROSCOPE

Mark A. McCord, Mohegan Lake, and Leonard Berenbaum, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1989, Ser. No. 454,677

Int. Cl.[5] G01R *31/00*; H01J *37/26*

U.S. Cl. 324—158 P **9 Claims**



1. A probe for identifying and electrically contacting submicron features of a substrate, comprising,

a scanning proximity microscope which includes,

(a) a conductive tip element which is arranged for movement adjacent a substrate,

(b) means for generating a signal which corresponds to differences in the distance between said tip element and said substrate as said tip element is moved, and

(c) means for displaying said signal so as to allow identification of portions of said substrate/ means for electrically connecting external equipment with said conductive tip element, and means for moving said conductive tip element into contact with a portion of said substrate which has been identified.

4,992,729

LOW PROFILE INKER

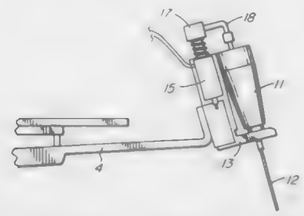
Normand Nadeau, Granby, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed May 8, 1989, Ser. No. 348,503

Claims priority, application Canada, Jun. 24, 1988, 570329

Int. Cl.[5] G01R *31/02*; G01D *15/16*

U.S. Cl. 324—158 P **12 Claims**



1. In a probe instrument provided with a movable probe test head for testing circuits on a semiconductor wafer and in response generating control signals indicative of defective ones of said circuits, a low profile inker for marking said defective circuits, comprised of:

(a) a support arm connected to said probe instrument beneath said test head,

(b) an inker reservoir rigidly mounted on said support arm for storing a quantity of marking liquid, including a substantially vertical inker filament for forcing said liquid from said reservoir,

(c) solenoid operated plunger means mounted on said support arm parallel to said reservoir, for receiving said control signals and in response moving in a substantially vertical axis,

(d) a needle extending substantially vertically downward from said reservoir for directing said liquid forced from said reservoir onto said defective circuits, and

(e) parallel activator means connecting said plunger means and said inker filament for translating vertical movement of said plunger means into parallel movement of said inker filament thereby forcing said liquid onto said defective circuits while maintaining the reservoir and needle fixed to the support arm.

4,992,730

METHOD OF COMPUTING THE ROTATING SPEED OF A ROTATING BODY BASED UPON PULSE TRAIN SIGNALS FROM A ROTATING SPEED SENSOR

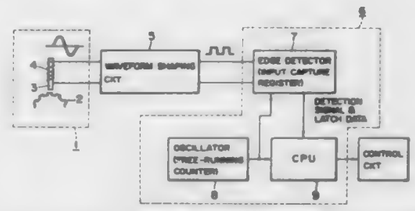
Naoyuki Hagiya, Ageo, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1989, Ser. No. 387,131

Claims priority, application Japan, Aug. 5, 1988, 63-194397

Int. Cl.[5] G01P *3/42*

U.S. Cl. 324—160 **4 Claims**



1. A method of computing a rotating speed of a rotating body, comprising the steps of:

(a) successively setting up fixed speed computation reference time periods T with respect to a pulse train signal derived from a rotating speed sensor located on the rotating body wherein a time point when a last pulse edge in a previous speed computation reference time period T is detected is the time point when speed measurement starts and a time point when a last pulse edge in a correct speed computation reference time period is detected is the time point when the speed measurement is eliminated,

(b) measuring time period from a last pulse edge of said pulse train signal in a previous speed computation reference time period T to a last pulse edge in a current speed computation reference time period T;

(c) counting the number of pulse edges that occur during said time period t wherein when the counted number of pulse edges in said time period t exceeds a predetermined number, pulse edge detection mode is switched from double-edge detection to single-edge detection by switching means in response thereto; and

(d) computing the rotating speed of said rotating body on the basis of the result of the time period measurement.

4,992,731

ROTARY SPEED SENSOR WITH BASE LINE COMPENSATION OF HALL CELL OUTPUT SIGNAL

David M. Lorenzes, Beacon Falls, Conn., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 164,313, Mar. 4, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 381,614

Int. Cl.[5] G01B *7/14*; G01P *3/48, 3/54*

U.S. Cl. 324—174 **10 Claims**

1. A rotary speed sensor system for use with a rotary element of ferrous material rotatable about an axis of rotation and having a cross-section, perpendicular to said axis of rotation, which exhibits a surface interruption, and magnet means generating a magnetic field along a magnetic path which includes said rotary element, said magnetic field having a component characterized by a base field subject to relatively slow variation, on which base field is superimposed a relatively rapid

VOL 1123 ISS 2 FE 12 1991 UMI

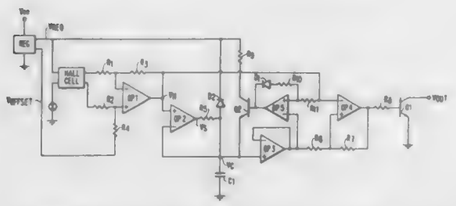
field variation in response to said surface interruption passing in proximity to said magnet means, the rotary speed sensor comprising:

transducer means to be positioned in said magnetic path for detecting the instantaneous amplitude of said magnetic field component; and

circuit means responsive to said transducer means for detecting the occurrences of said relatively rapid field variation notwithstanding the relatively slow variation of said base field, said circuit means comprising:

a first trigger means having first and second differential inputs and an output for forming the output of said circuit means;

a first amplifier means fed by said transducer means and having an output coupled to the first input of said trigger means for carrying a signal indicative of the instantaneous tangential component of said magnetic field; and



averaging means interposed between the output of said first amplifier means and the second input of said trigger means for providing a reference signal indicative of the amplitude of said base field, said averaging means comprising:

a second amplifier means having first and second differential inputs and an output for said reference voltage coupled to the second input of said first trigger means; the first input of said second amplifier means being coupled to the output of said first amplifier means; and

a capacitor connected between the output of said second amplifier means and a point of constant voltage for storing a voltage indicative of said reference voltage, the second input of said second amplifier means and the output of said second amplifier means being connected to each other.

whereby the voltage of said capacitor is maintained by said second amplifier means notwithstanding an inherent leakage characteristic of said capacitor.

4,992,732

METHOD AND APPARATUS FOR MAGNETIC TESTING OF METALLIC WORK PIECES

Karl G. Walther, Schwerte, and Ronald G. Walther, Aachen, both of Fed. Rep. of Germany, assignors to Magfoil & It GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 208,137, Jun. 16, 1988, abandoned, and a continuation-in-part of Ser. No. 208,169, Jun. 16, 1988, abandoned. This application May 1, 1989, Ser. No. 345,762

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722569; Jul. 8, 1987, 3722596

Int. Cl.[5] G01N *27/84*; G01R *33/12*

U.S. Cl. 324—216 **13 Claims**

1. An apparatus for testing metallic workpieces which comprises:

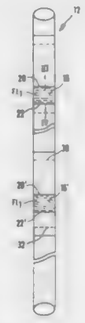
a support sheet and a transparent viewing foil attached to each other along their perimeters;

a net disposed between the support sheet and the viewing foil;

at least one openable first chamber containing a fluid and disposed between the support sheet and the viewing foil;

at least one openable second chamber containing a substance and disposed between the support sheet and the viewing foil; and

particles of magnetizable material disposed between the support sheet and the viewing foil, said particles of magnetizable material being mobile when dispersed in the fluid



and immobile when dispersed in both the fluid and the substance.

4,992,733

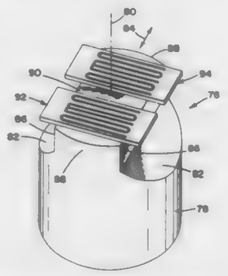
POSITION SENSING TRANSDUCER HAVING A CIRCULAR MAGNET WITH AN INTEGRAL FLUX DISTORTING MEMBER AND TWO MAGNETIC FIELD SENSORS

Elmer L. Griebeler, Streetsboro, Ohio, assignor to Visi-Trak Corporation, Cleveland, Ohio

Filed Nov. 17, 1989, Ser. No. 437,657

Int. Cl.[5] G01B *7/14*

U.S. Cl. 324—207.21 **13 Claims**



1. A transducer for producing electrical pulse signals in response to movement relative thereto of an object having alternating zones of different magnetic conductivity, comprising circular permanent magnet means having an axis and an end for facing said object, said end including field distorting means for distorting the magnetic field of said permanent magnet means on opposite sides of said axis with respect to the direction of relative movement between said object and transducer, the first and second magnetic field sensor element means on said field distorting means, said first sensor element means being offset from said axis on one of said opposite sides thereof, and said second sensor element means being offset from said axis on the other of said opposite sides thereof, said field distorting means having a length in said direction of movement generally corresponding to the diameter of said magnet means and a width transverse to said direction of movement of about one-half said diameter, and each said first and second sensor element means having a dimension transverse to said direction of movement generally corresponding to said width of said field distorting means.

4,992,734

ROTATION DETECTOR HAVING A HOUSING WITH A PROCESSING CIRCUIT AND A TRANSDUCER ELEMENT HOLDER

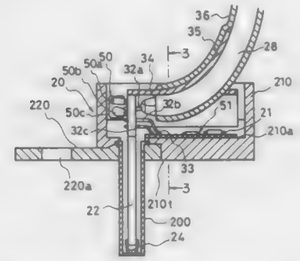
Tsuneo Adachi, Saitama, Japan, assignor to Diesel KiKi Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1990, Ser. No. 485,887

Claims priority, application Japan, Mar. 9, 1989, 1-27121[U]

Int. Cl.[5] G01B *7/14*; G01N *27/72*; G01R *33/12*

U.S. Cl. 324—207.25 **6 Claims**



1. A magnetoelectronic transducer comprising:

a housing;

a circuit board provided within said housing and having a processing circuit for processing various signals;

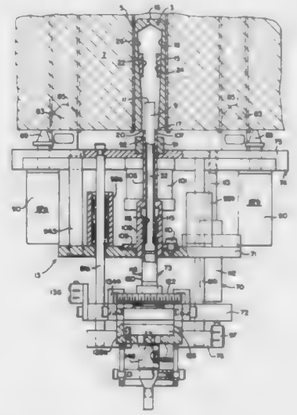
an element holder provided within said housing and having a basic section adjacent to and perpendicular to said circuit board and a front end portion extending from said basic section toward a rotary member to be detected;

a magnetoelectronic transducer element attached to a front end of said element holder;

a cable for carrying power and said various signals to and from said processing circuit; and

a power circuit provided on said basic section of said element holder and connected directly to said cable and indirectly to said circuit board via a conductor.

and selectively retracting the distal end of said probe means completely within said housing to avoid mechani-



cal interference between the distal end of said probe means and the step-wise varying widths of said cavity.

4,992,735

SYSTEM AND METHOD FOR INSPECTING METALLIC PLUGS IN HEAT EXCHANGER TUBES USING A RADIALLY EXTENDIBLE PROBE

William K. Cullen, Penn Hills; Charles H. Roth, Jr., N. Huntingdon; Lee W. Burtner; Francis X. Gradich, both of Elizabeth Township, Allegheny County; David A. Chizmar, Washington Township, Westmoreland County, and Lawrence Galata, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1989, Ser. No. 387,997

Int. Cl.[5] G01N *27/90*; G01R *33/12*

U.S. Cl. 324—220 **36 Claims**

1. A system for remotely inspecting the interior walls of a cavity within an electrically conductive material, said cavity having a step-wise varying width, comprising:

an eddy current probe means having a coil means at its distal end for engaging said cavity walls, and a proximal end;

an elongated support assembly connected to the proximal end of said probe means that is insertable within said cavity, including a tubular housing, and a radial extender means for selectively radially extending the probe means

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4,992,736

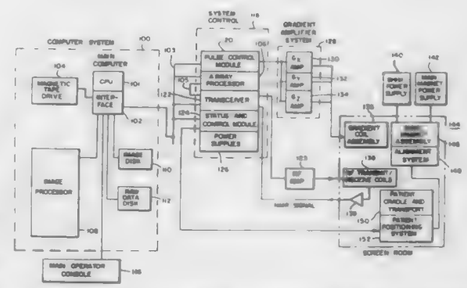
RADIO FREQUENCY RECEIVER FOR A NMR INSTRUMENT

Robert S. Stormont, Waukesha; Michael C. Anas, Germantown, and Norbert J. Pelc, Wauwatosa, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 4, 1989, Ser. No. 389,456

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **16 Claims**



1. A receiver for processing an electrical signal in a medical imaging apparatus which receives an input signal containing frequency modulated image information in a range of frequencies contained within a frequency band having a bandwidth BW, the receiver comprising:

means for demodulating the input signal to produce a resultant signal in which the image information from the input signal lies within a band of frequencies centered at a frequency which is substantially 1.5 times the bandwidth BW; and

an analog to digital converter for sampling the resultant signal at ar ate substantially equal to twice the bandwidth BW and converting the samples into a digital signal.

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4,992,737

SAMPLE HEAD FOR NMR TOMOGRAPHY

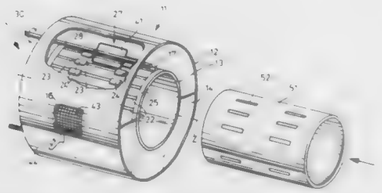
Günter Schnur, Ulm-Lehr, Fed. Rep. of Germany, assignor to Bruker Medizintechnik GmbH, Fed. Rep. of Germany

Filed Nov. 14, 1989, Ser. No. 436,487

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1988, 3839046

Int. Cl.[5] G01R *33/30*

U.S. Cl. 324—318 7 Claims



1. Sample head for NMR tomography having a cage resonator comprising a number of conductor sections arranged on a cylinder surface and directed in parallel to the cylinder axis, electrically conductive screening means enclosing the conductor sections and arranged concentrically relative to the said cylinder surface, and capacitors connected in series to the said conductor sections which, together with the conductor sections, define the electric length of the cage resonator in such a manner that the cage resonator is resonant at a first, predetermined operating frequency f_0, and having further means for exciting a TEM dipole wave in the cage resonator, characterized in that

said sample head (1) comprises an insert (51) designed as a hollow cylinder which is permeable for the electromagnetic rf field and which, when occupying a predetermined position in the cavity formed by said conductor sections (22), increases the electric length of the cage resonator to a value such that the cage resonator is resonant at a second predetermined operating frequency f_1.

4,992,738

DEVICE FOR THE MEASURING OF GAS, VAPOR OR AEROSOL FRACTIONS OF A MEASURED GAS

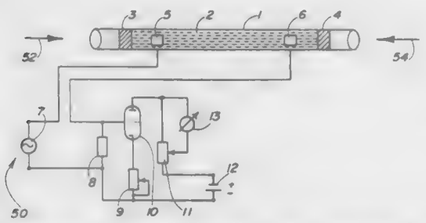
Wolfgang May, Reinfeld, and Johannes Heckmann, Lübeck, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,579

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815131

Int. Cl.[5] G01N *27/28*

U.S. Cl. 324—450 21 Claims



1. A device for measuring the gas, vapor and aerosol fractions of a gas whose characteristic is to be determined, comprising a disposable test container interchangeably connected to said device, a reaction solution in said test container of a character which will change in resistance based on a reaction between the reaction solution and the gas to be determined, a detection means for determining change of resistance of the reaction solution including spaced-apart terminals which are positioned in the reaction solution, and means for sealing said test container on at least one end comprising a material which permits passage of the gas to be detected, but which prevents passage of the reaction solution.

4,992,739

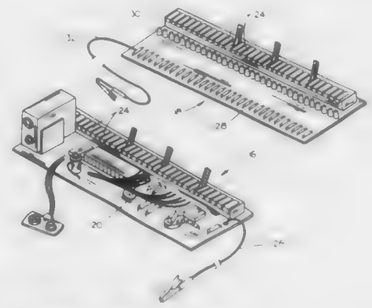
CONTINUITY TESTER

James J. Kosch, 1730 Woodland Dr., Columbus, Nebr. 68601

Filed Jul. 13, 1989, Ser. No. 379,068

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—540 2 Claims



1. A continuity tester comprising,

a continuity transmitter adapted to have the ends of a plurality of wires electrically connected thereto,

means associated with said transmitter for sequentially transmitting electrical current along the length of the wires,

a continuity receiver adapted to have the other ends of the wires electrically connected thereto,

and a plurality of visual signalling devices on said receiver which are individually actuated when current is transmitted along the length of the associated wire so that the continuity and identification of the individual wires may be ascertained.

said transmitter comprising an automatic step-down scanning device,

said step-down scanning device sequentially transmitting current along the individual wires as the continuity of the individual wires is ascertained at said receiver and electrically disconnected therefrom.

4,992,740

APPARATUS WHICH USES A SIMULATED INDUCTOR IN THE MEASUREMENT OF AN ELECTRICAL PARAMETER OF A DEVICE UNDER TEST

Tomio Wakasugi, Hachioji, Japan, assignor to Hewlett-Packard, Palo Alto, Calif.

Filed May 12, 1989, Ser. No. 351,104

Claims priority, application Japan, Jun. 28, 1988, 63-85323[U]

Int. Cl.[5] G06G *7/62;* G01R *27/00*

U.S. Cl. 324—649 7 Claims

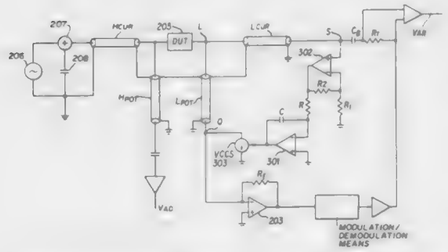
1. In a circuit element measuring apparatus having a measurement signal source, a DC bias power source, a device under test which is connected at one end thereof to both said measurement signal source and said DC bias power source, a current detecting resistor connected at one end thereof to the other end of said device, and a null detecting amplifier connected to said the other, or second, end of said device to virtually ground said second end,

the improvement which comprises:

voltage sensing amplifier means connected to said one, or first, end of said current detecting resistor to detect and amplify a voltage at said first end;

low-pass filter means connected to the output of said voltage sensing amplifier means; and

voltage controlled current source means connected at one end thereof to the output of said low-pass filter means and at the other end thereof to an input terminal of said null detecting amplifier to absorb or supply a DC current from the input end of said null detecting amplifier in accordance with the output of said low-pass filter means.



4,992,741

CAPACITIVE SENSOR AND METAL DETECTOR WITH A DISPLAY FOR QUANTITATIVELY DISPLAYING SIGNALS RESULTING FROM CONCEALED OBJECTS

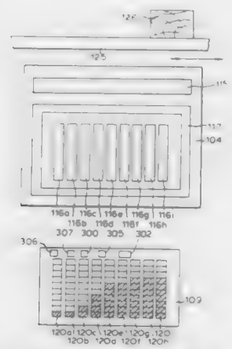
Keith Douglas, and Mark Q. Meyer, both of Cambridgeshire, United Kingdom, assignors to The Stanley Works, New Britain, Conn.

Division of Ser. No. 172,628, Mar. 24, 1987, Pat. No. 4,853,617. This application Jun. 30, 1989, Ser. No. 400,584

Claims priority, application United Kingdom, Mar. 27, 1987, 8607747

Int. Cl.[5] G01R *27/26*

U.S. Cl. 324—671 6 Claims



1. A device for detecting objects behind a surface comprising a support adapted to be held adjacent and traversed over the surface, a multiplicity of separate capacitor sensor plate means at spaced intervals along the support each for separately sensing the dielectric constant of an adjacent portion of the surface on which said support is placed, a circuit for separately sensing the dielectric constant of a region of the surface local to each of said sensor plate means resulting from the presence of concealed objects and variations therein among the separate sensors, and display means including a multiplicity of quantitative display elements arranged at intervals along said display means, each display element being associated with one of said plate means so that the quantitative value displayed by each element has an appearance depending upon the dielectric constant of the local region of the associated plate means, without any relative movement of the device over the surface and, during use, provide a quantitative display indicative of an and, as the support is traversed past an object behind the surface during use, the display elements increase and decrease in their quantitative display and change appearance according to the positions of their associated plate means relative to the object and edges of the object are imaged on said elements of said display means.

4,992,742

CHARGED-PARTICLE DISTRIBUTION MEASURING APPARATUS

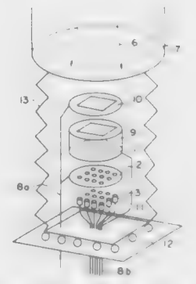
Soichiro Okuda; Shigeo Sasaki; Kazuo Yoshida; Yoshio Yamane, and Fumiharu Yabunaka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 15, 1989, Ser. No. 436,664

Claims priority, application Japan, Dec. 22, 1988, 63-327032; Apr. 13, 1989, 1-93717

Int. Cl.[5] G01N *27/00*

U.S. Cl. 324—71.3 15 Claims



1. A charged-particle distribution measuring apparatus comprising:

a particle passing member including a plurality of through-holes disposed substantially perpendicular to the path of a beam of charged particles;

a particle trapping member for trapping the charged particles that have passed through said through-holes in said particle passing member;

a recoil particle trapping member disposed between said particle passing member and said particle trapping ember for trapping the charged particles that have recoiled from said particle trapping member; and

means for moving said particle passing, particle trapping, and recoil particle trapping members in a plane generally perpendicular to the path of the beam of charged particles.

4,992,743

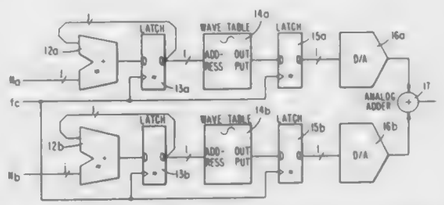
DUAL-TONE DIRECT DIGITAL SYNTHESIZER

Tzafrir Sheffer, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 15, 1989, Ser. No. 436,634

Int. Cl.[5] H03C *1/50;* H03B *19/00*

U.S. Cl. 328—14 8 Claims



1. A plural-tone direct digital synthesizer comprising in combination:

at least one phase accumulator means receiving a clock

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signal input and phase increment input for producing a sequence of phase information signals,

at least one phase-to-amplitude converter means for producing a sequence of amplitude signals in response to said sequence of phase information signals, and

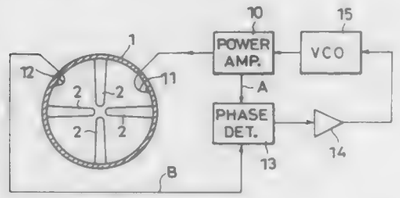
means for combining an output of an additional one of a phase accumulator means and a phase-to-amplitude converter means with the output of at least one of said at least one phase accumulator means and said at least one phase-to-amplitude converter means.

4,992,744

RADIO FREQUENCY LINEAR ACCELERATOR CONTROL SYSTEM

Hiroyuki Fujita, Osaka, and Akira Hirakimoto, Kyoto, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed May 30, 1989, Ser. No. 358,827
Claims priority, application Japan, May 30, 1988, 63-132467
Int. Cl.[5] H01J *23/00*
U.S. Cl. 328—233 **2 Claims**



1. A radio frequency linear accelerator control system for controlling the frequency of a radio frequency power to a resonant cavity type radio frequency linear accelerator, said system comprising:

a loop coupler for taking out a signal from said resonant cavity type radio frequency linear accelerator;

a voltage-controlled oscillator for feeding a radio frequency power to said resonant cavity type radio frequency linear accelerator; and

a phase detector for outputting a frequency control signal according to a relative phase difference between a signal picked up by said loop coupler and a signal made to branch from said radio frequency power being fed to said resonant cavity type radio frequency linear accelerator, said frequency control signal being fed back to said voltage-controlled oscillator for maintaining a frequency of said radio frequency power at a predetermined value.

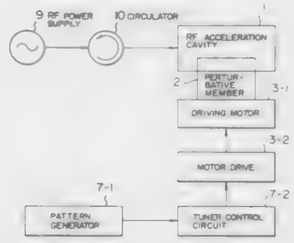
4,992,745

METHOD OF SYNCHROTRON ACCELERATION AND CIRCULAR ACCELERATOR

Junichi Hirota, Hitachi; Kenji Miyata; Masatsugu Nishi, both of Katsuta, and Akinori Shibayama, Isehara, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,989
Claims priority, application Japan, Nov. 30, 1987, 62-300235
Int. Cl.[5] H05H *13/04*
U.S. Cl. 328—235 **14 Claims**

1. A method of synchrotron acceleration of charged particles by using a circular accelerator having a RF acceleration cavity through which RF power from a RF oscillator is supplied, as acceleration energy, to said charged particles, said method comprising the steps of controlling: (1) the detuned amount defined as the difference between the oscillation frequency of said RF power supplied to said RF acceleration cavity and the resonance frequency of said RF acceleration cavity, and (2) said RF power for supplying said charged particles with acceleration energy during acceleration of said charged particles; according to changes in energy of said



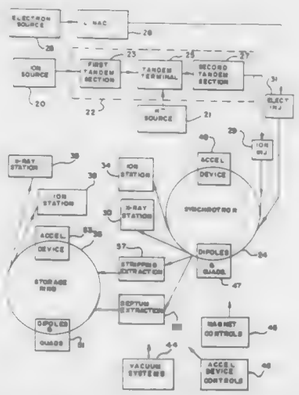
charged particles without changing said oscillation frequency of said RF oscillator.

4,992,746

APPARATUS FOR ACCELERATION AND APPLICATION OF NEGATIVE IONS AND ELECTRONS

Ronald L. Martin, LaGrange, Ill., assignor to Acctek Associates, LaGrange, Ill.

Filed Apr. 26, 1988, Ser. No. 186,183
Int. Cl.[5] H05H *13/04;* **G21K** *5/00;* **A61N** *5/10*
U.S. Cl. 328—235 **17 Claims**



1. An accelerator comprising an electron source, an electron preaccelerator connected to the source to produce preaccelerated electrons, means for accelerating the preaccelerated electrons to a final desired energy, and means for storing high current electron beams for long periods of time, the means for storing including a storage ring containing a nonevaporable getter strip disposed to form a distributed vacuum pump to achieve high pumping speed and very high vacuum and also to produce clearing fields to remove positive ions created by collisions of the electrons with residual gas inside the accelerator.

4,992,747

MULTIPLE REUSE OF AN FM BAND

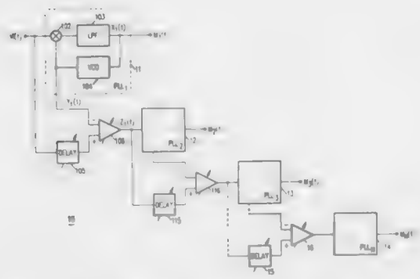
Glen A. Myers, 279 Laureles Grade Rd., Salinas, Calif. 93908

Continuation-in-part of Ser. No. 232,691, Aug. 16, 1988, Pat. No. 4,859,958. This application May 15, 1989, Ser. No. 352,400
Int. Cl.[5] H03D *3/00*
U.S. Cl. 329—316 **17 Claims**

1. A signal receiving system for receiving an input signal having a plurality of modulated carrier signals included therein, said system comprising:

first phase lock loop means for receiving said input signal, said first phase lock loop means for generating a first signal representing the demodulated message of the most dominant carrier signal of said input signal and for generating a first replica signal of said most dominant carrier signal;

delay means coupled to said first phase lock loop means for receiving said input signal, said delay means for producing a delayed signal identical to said input signal, said delayed signal being selectively delayed with respect to said input signal;



output means coupled to said delay means and to said first phase lock loop means for receiving and combining said delayed signal produced by said delay means and said replica signal generated by said first phase lock loop means, said output means for producing an output signal representing said input signal for said most dominant carrier signal suppressed; and

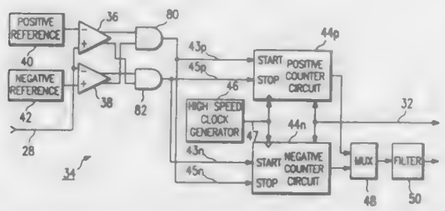
second phase lock loop means coupled to said output means for receiving said output signal produced thereby and for generating a second signal representing the demodulated message of the second most dominant carrier signal of said input signal and for producing a second replica signal of said second most dominant carrier signal.

4,992,748

PERIOD-INVERTING FM DEMODULATOR

Michael F. Gard, New Berlin, Wis., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 13, 1989, Ser. No. 406,582
Int. Cl.[5] H03D *3/00;* **H03K** *9/06*
U.S. Cl. 329—321 **24 Claims**



1. A discriminator for demodulating a frequency modulated signal, comprising:

means for identifying a first point in time at which the amplitude of the signal exceeds a first threshold value, and a second point in time at which the amplitude of the signal is less than a second threshold value, wherein said first threshold value is greater in amplitude than said second threshold value;

means, coupled to said identifying means, for measuring the duration between said first point in time and said second point in time; and

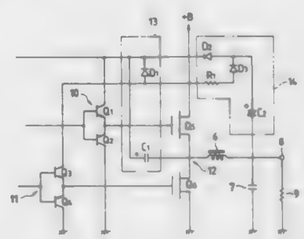
means, coupled to said measuring means, for translating said measured duration into an amplitude value descriptive of modulating information.

4,992,749

PULSE-WIDTH MODULATING AMPLIFIER CIRCUIT

Akio Tokumo; Masayuki Kato; Takeshi Sato, and Tatsuzo Hasegawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,882
Claims priority, application Japan, Dec. 28, 1988, 63-328809
Int. Cl.[5] H03F *3/38*
U.S. Cl. 330—10 **3 Claims**



1. In a pulse-width modulating amplifier circuit of the type having drive circuits, a power amplifier receiving inputs from said drive circuits, and a filter demodulator connected to the output of said power amplifier, the improvement comprising:

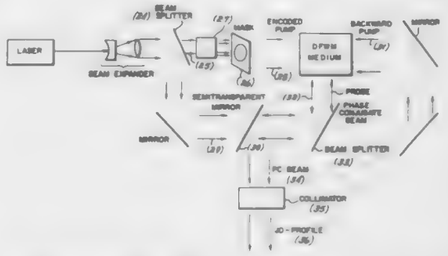
first and second bootstrap circuits for providing a power voltage to one of said drive circuits; said first bootstrap circuit being connected between said power amplifier output and said one drive circuit; said second bootstrap circuit being connected between an output of said filter demodulator and said one drive circuit.

4,992,750

COUPLING MECHANISM FOR EFFICIENT CONVERSION OF AXISYMMETRIC BEAM PROFILES INTO PROFILES SUITABLE FOR DIFFRACTION

B. W. Stewart, 5745 Pandora Ave., Cincinnati, Ohio 45213

Filed Jul. 18, 1989, Ser. No. 380,890
Int. Cl.[5] H01S *3/23;* **G21K** *1/06;* **G02C** *5/18*
U.S. Cl. 330—43 **6 Claims**



1. Apparatus comprising:

a laser for providing coherent light along a first optical path;

optics disposed along said first optical path for first expanding and then splitting said coherent light into a higher intensity segment, directed along the first optical path, and a lower intensity segment, directed along a second optical path;

optics disposed along said second optical path for converting the transverse intensity profile of said lower intensity segment into a ring profile;

mask containing an annular slit and disposed along said

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second optical path, the inner radius of which is appropriately matched to that of the ring-profiled lower intensity segment for receiving and filtering said ring-profiled light;

optics disposed along said first optical path for the purpose of forming forward and backward pump beams from the higher intensity segment and to focus said pump beams into the dfwm medium;

optics disposed along said second optical path for the purpose of directing and focusing said lower intensity, ring-profiled segment into the dfwm medium and redirecting the amplified pc beam along the third optical path;

optics disposed along said third optical path for collimating said amplified pc beam, producing the Jo-profiled beam;

phase conjugation means disposed at termination of the first and second optical paths and at the beginning of the third optical path for substantially amplifying the encoded, lower-intensity segment at the expense of the power carried in the higher-intensity pump beams.

4,992,751

AUDIO AMPLIFIER WITH PHASE MODULATED PULSE WIDTH MODULATION

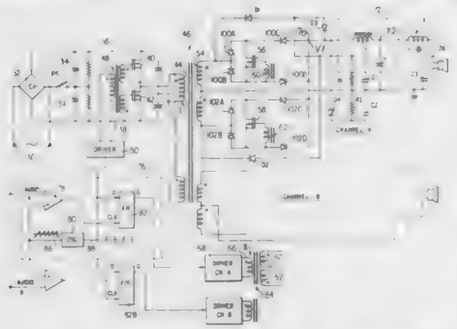
Brian E. Attwood, Horsham, United Kingdom; Larry E. Hand, and Lee C. Santillano, both of Meridian, Miss., assignors to Peavey Electronics Corporation, Meridian, Miss.

Filed Oct. 17, 1989, Ser. No. 422,518

Claims priority, application United Kingdom, Mar. 4, 1989, 8905007

Int. Cl.[5] H03F *3/393*

U.S. Cl. 330—10 **28 Claims**



3. A digital controlled switching circuit comprising a dc power source, first switching means connected to said power source and operable to provide a square wave output, second switching means having a forward conduction mode connected to receive said square wave output, phase control means connected to control the switching of said second switching means at a phase angle relative to the square wave output which is a function of a control signal, and steering diode means for controlling the polarities of the outputs of said second switching means to operate in said forward conduction mode to provide a phase modulated pulse width modulation thereof.

4,992,752

METHOD AND APPARATUS FOR BROADBAND IMPEDANCE MATCHING

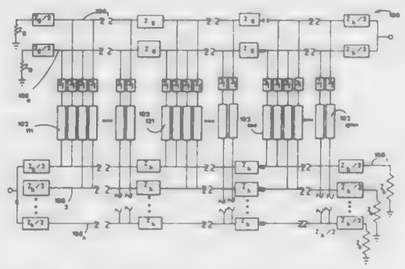
Kenneth R. Cioffi, Anaheim Hills, Calif., assignor to Rockwell International, El Segundo, Calif.

Filed Jun. 9, 1989, Ser. No. 364,058

Int. Cl.[5] H03F *3/60*

U.S. Cl. 330—54 **33 Claims**

6. Apparatus for performing impedance transformations, comprising a plurality of qn distributed amplifiers, with $q>2$, each having a plurality of m active elements disposed between first and second synthetic transmission lines, there being q first and at least n second transmission lines with n amplifiers having at least one of said q first transmission lines but not said n second transmission lines in common, whereby q common first



transmission lines are formed, with said q first transmission lines being further connected in parallel to form a single first impedance interface, and said second transmission lines being further connected in parallel to form a single second impedance interface.

4,992,753

POWER AMPLIFIER FOR A RADIO FREQUENCY SIGNAL

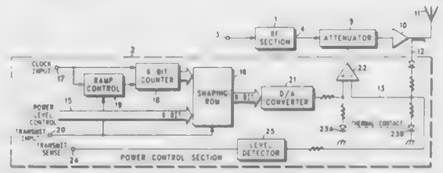
Ole H. Jenson, Kobenhavn, Denmark; Richard I. Little, Barrington, and Joseph J. Schuler, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1989, Ser. No. 415,675

Claims priority, application United Kingdom, Nov. 17, 1988, 8926910

Int. Cl.[5] H03G *3/20*

U.S. Cl. 330—129 **15 Claims**



14. A method of controlling output power in amplification of a radio frequency signal by a pulsed power amplifier, comprising the steps of:

producing a series of values in response to a control pulse, each value having a different predetermined amplitude related to a predetermined response function;

converting each value to an analog signal and controlling the amplifier output power in accordance with said analog signal.

4,992,754

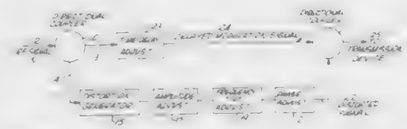
PREDISTORTER FOR LINEARIZATION OF ELECTRONIC AND OPTICAL SIGNALS

Henry A. Blauvelt, and Howard L. Loboda, both of Los Angeles, Calif., assignors to Ortel Corporation, Alhambra, Calif.

Filed Sep. 7, 1989, Ser. No. 404,186

Int. Cl.[5] H03F *1/32*

U.S. Cl. 330—149 **23 Claims**



1. A predistortion circuit comprising:

means for splitting an input modulation signal for a nonlinear device into a primary electrical path and a secondary electrical path;

means for generating at least second order intermodulation products in the secondary electrical path having a relative amplitude corresponding to the amplitude of distortion in the nonlinear device and for suppressing fundamental frequencies of the modulation signal;

filtering means in series with the means for generating intermodulation products for adjusting the amplitude of the signal on the secondary electrical path as a function of frequency for providing frequency dependent predistortion on the secondary path;

means for adjusting the relative phase of the intermodulation products and the distortion of the nonlinear device; and

means for additively recombining the primary and secondary paths into a single path to form a signal composed of the fundamental signal and frequency dependent intermodulation product predistortion for application to the nonlinear device.

4,992,755

TRANSISTOR CIRCUIT

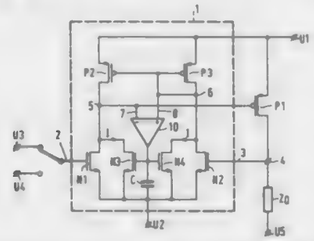
Evert Seevinck; Jan Dikken, and Hans-Jürgen Schumacher, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 352,425, May 16, 1989, abandoned. This application Jan. 19, 1990, Ser. No. 467,340

Claims priority, application Netherlands, Jan. 17, 1989, 8900095

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—253 **29 Claims**



1. A transistor circuit comprising a first and a second transistor connected as a first differential amplifier and coupled to a common node via a common electrode, a current mirror having an input network connected to a main channel of the first transistor via a first output terminal, an output network of said current mirror being connected to a main channel of the second transistor via a second output terminal, a second differential amplifier having a first and second input coupled to the first and the second output terminal, respectively, an output of said second differential amplifier being coupled to controllable current conductor means for the common mode supply of current to and the common mode draining of current from the first and the second output terminal.

4,992,756

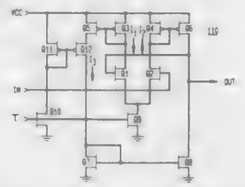
LOW OFFSET TRANSCONDUCTANCE AMPLIFIER IN AN ANALOG ELECTRONIC COCHLEA

David J. Anderson, East Windsor, N.J., assignor to Siemens Corporate Research, Inc., Princeton, N.J.

Filed Jun. 12, 1989, Ser. No. 365,061

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—253 **9 Claims**



1. A low offset transconductance amplifier comprising:

first and second differentially connected input transistors;

an output current source transistor;

an output current sink transistor;

first means for inducing a current in said output current source transistor in response to said first input transistor, said first input transistor having a main conduction path, and said first current inducing means comprising a current mirror including a first current mirror transistor having a main conduction path coupled in series with said main conduction path of said first input transistor, and the junction of said main conduction paths of said first input transistor and said first current mirror transistor being coupled to control electrodes of said first current mirror transistor and said output current source transistor; and

second means for inducing a current in said output current sink transistor in response to said second input transistor, including a cascode transistor.

4,992,757

DIFFERENTIAL AMPLIFYING CIRCUIT

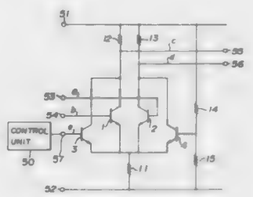
Toshifumi Shin'e, Tokyo, Japan, assignor to NEC Corp., Japan

Filed Sep. 26, 1989, Ser. No. 412,669

Claims priority, application Japan, Sep. 26, 1988, 63-242055

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—254 **3 Claims**



1. A differential amplifying circuit, comprising:

a differential pair of transistors for differentially amplifying input signals supplied thereto;

an output signal fixing transistor for fixing output signals supplied from said differential pair of transistors, said output signal fixing transistor being connected to one of said differential pair of transistors;

a capacitance element having the same capacitance value as a parasitic capacitance of said output signal fixing transistor, said capacitance element being connected to the other of said differential pair of transistors; and

a control unit for supplying said output signal fixing transistor with a control signal, said output signal fixing transistor being connected to said one of said differential pair of transistors, such that when said output signal fixing transistor is turned on the output of said one of said differential pair of transistors is maintained at a first voltage value while the output of the other of said differential pair of transistors is maintained at a second, different voltage value.

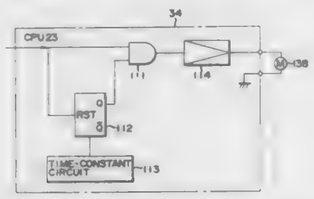
VOL 1123 ISS 2 FE 12 1991 UMI

4,992,758

POWER AMPLIFYING APPARATUS FOR OPTICAL DISK APPARATUS

Ryoji Takeuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1988, Ser. No. 277,175
Claims priority, application Japan, Nov. 30, 1987, 62-302627; Nov. 30, 1987, 62-302650
Int. Cl.[5] H03G *3/20*; H03K *3/284*
U.S. Cl. 330—281 18 Claims



1. A power amplifying apparatus for amplifying an input signal to drive a load, comprising:

means for amplifying the input signal for generating an output signal for driving said load;

means for converting the output signal current generated by said amplifying means to a voltage and feeding back the converted voltage to said amplifying means for controlling an amplitude of the output signal which flows into the load; and

means for determining a current-to-voltage conversion ratio of said converting means, wherein the amplitude of the converted voltage converted by said converting means may be controlled in accordance with the current-to-voltage conversion ratio, said determining means including a first time constant circuit for decreasing the amplitude of the output signal and a second time constant circuit for increasing the amplitude of the output signal.

4,992,759

FILTER HAVING ELEMENTS WITH DISTRIBUTED CONSTANTS WHICH ASSOCIATE TWO TYPES OF COUPLING

Patrick Giraudeau, Paris, and Philippe Rousseau, Cesson Bourg, both of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 30, 1988, Ser. No. 175,211
Claims priority, application France, Mar. 31, 1987, 87 04486
Int. Cl.[5] H01P *1/203*
U.S. Cl. 333—204 10 Claims



1. A microwave filter having a plurality of U-shaped resonators, wherein each of said resonators includes two parallel arms with one end of each arm being connected to a base and the other end of each arm being an open end, wherein any two successive resonators of said plurality of resonators being coupled in series by a respective electromagnetic coupling zone provided therebetween, a first one and a last one of said plurality of resonators being respectively connected to filter input/output connection means, wherein said filter has a longitudinal axis oriented transverse to each of said arms and an axis of symmetry oriented parallel to said arms and wherein said respective electromagnetic coupling zone between certain successive resonators is so arranged that adjacent open ends of said successive resonators are located on the same side of said longitudinal axis, and said respective coupling zone between certain other successive resonators sc arranged that said ends are located in opposite relation with respect to said longitudinal axis; and

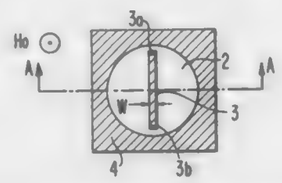
wherein said plurality of U-shaped resonators are disposed symmetrically with respect to said axis of symmetry of said filter, and wherein two symmetrically disposed U-shaped resonators have their bases connected electrically together by means of a variable capacitor.

4,992,760

MAGNETOSTATIC WAVE DEVICE AND CHIP THEREFOR

Shigeru Takeda, Kumagaya; Kohei Ito, Fukaya; Yasuaki Kinoshita, Hachioji, and Sadami Kubota, Tottori, all of Japan, assignors to Hitachi Metals, Ltd.; Hitachi, Ltd. and Hitachi Ferrite, Ltd., all of Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 274,246
Claims priority, application Japan, Nov. 27, 1987, 62-297480
Int. Cl.[5] H01P *7/00*
U.S. Cl. 333—219.2 13 Claims



1. A chip for magnetostatic wave device comprising;

a base substrate consisting of a flat dielectric monocrystalline base plate and a ferrimagnetic monocrystalline film formed on the base plate, said ferrimagnetic film having essentially constant thickness within a given planar area surrounding a film center portion and having edge portions spaced from said center portion;

excitation means at least closely adjacent said center portion for generating magnetostatic waves in the ferrimagnetic film when a bias magnetic field is applied to the chip and high frequency electric signals are applied to said excitation means; and

reflection means disposed on said planar area and substantially surrounding said center portion for reflecting the generated magnetostatic wave toward the center portion of the film before it reaches the edge portions of the ferrimagnetic film.

4,992,761

PASSIVE 180 DEGREE BROADBAND MMIC HYBRID

Warren L. Seely, and Joseph Staudinger, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 319,037, Mar. 6, 1989, abandoned. This application Dec. 26, 1989, Ser. No. 453,204
Int. Cl.[5] H03H *7/48*
U.S. Cl. 333—118 10 Claims

1. A 180 degree hybrid comprising:

a first input to receive an RF signal;

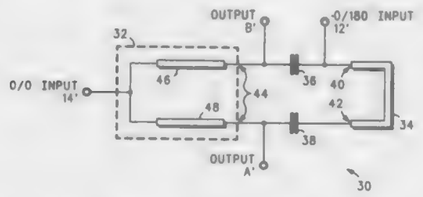
means for splitting said RF signal coupled to said first input;

positive phase shift means for shifting a first of said split signals in phase approximately +45 degrees;

negative phase shift means for shifting a second of said split signals in phase approximately −135 degrees;

said negative phase shift means comprising a transmission line and a capacitive element;

said positive phase shift means and said negative phase shift means coupled to said means for splitting;



said positive phase shift means and said negative phase shift means further coupled to first and second outputs, respectively;

said transmission line and said capacitive element coupled in series between said positive phase shift means and said second output; and

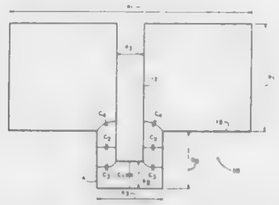
a means for isolating said split signals, said means for isolating coupled to said first and second outputs.

4,992,762

RIDGE-TROUGH WAVEGUIDE

Edward M. Godshalk, Beaverton, and Keith E. Jones, Aloha, both of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Filed Apr. 16, 1990, Ser. No. 510,695
Int. Cl.[5] H01P *3/123*
U.S. Cl. 333—239 4 Claims



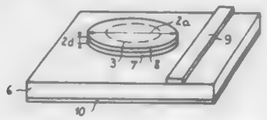
1. A ridge-trough waveguide, comprising a conductive tubular waveguide having an internal longitudinal ridge directly opposing an internal longitudinal trough.

4,992,763

MICROWAVE RESONATOR FOR OPERATION IN THE WHISPERING GALLERY MODE

Alain Bert, Gif Sur Yvette; Narguise Mamodaly, Paris; Pierre Guillon, Limoges, and Luis Bermudez, Limoges, all of France, assignors to Thomson-CSF, Paris, France

Filed Jun. 1, 1988, Ser. No. 200,853
Claims priority, application France, Jun. 5, 1987, 87 07940
Int. Cl.[5] H01P *7/08, 7/10*
U.S. Cl. 333—219 18 Claims



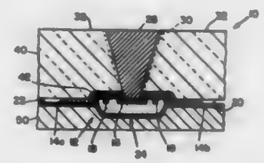
1. A microwave resonator having a resonant element for operation in the whispering-gallery mode, wherein the resonant element includes a flat circular disk having a diameter and a thickness, wherein said diameter is considerable larger than said thickness, and wherein said flat disk, when excited by an external excitation means, provides electromagnetic waves having resonant frequencies which are proportional to the diameter of the disk, said electromagnetic wave being confined in the whispering-gallery mode between a radius located at a periphery of the disk and a caustic internal surface having a radius smaller than the radius of said disk.

4,992,764

HIGH-POWER FET CIRCUIT

Yalcin Ayasli, Lexington, Mass., assignor to Hittite Microwave Corporation, Woburn, Mass.

Filed Feb. 21, 1989, Ser. No. 313,012
Int. Cl.[5] H01P *5/00*
U.S. Cl. 333—247 6 Claims



1. An FET circuit comprising:

a substrate of semi-insulating material having a top side and a ground side;

an FET including a drain electrode, a gate electrode and a source electrode fabricated on the ground side of said substrate;

conductor means in said substrate extending from said drain electrode and said gate electrode on said ground side to the top side of said substrate; and

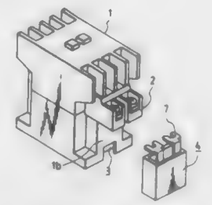
a ground plane on the ground side of said substrate contacting the source electrode of said FET and spaced from said gate and drain electrodes to form a dome for minimizing ground inductance and maximizing heat transfer from the FET independent of the thickness of the substrate.

4,992,765

ELECTROMAGNETIC CONTACTOR

Takato Hirota; Kuniyuki Kogawa, and Shigeaki Otake, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 8, 1989, Ser. No. 390,548
Claims priority, application Japan, Aug. 10, 1988, 63-105848[U]; Apr. 12, 1989, 1-42589[U]
Int. Cl.[5] H01H *67/02*
U.S. Cl. 335—131 9 Claims



1. An electromagnetic contactor with an attachment, comprising:

a body having a side surface;

at least one terminal provided on the side surface of the body;

at least one engaging portion formed on the side surface and disposed below the at least one terminal; and

an attachment releasably attachable to the body, the attach-

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ment including a casing containing an electric component and at least one plate-like connecting element projecting outwardly from the casing;

the casing having at least one resilient projection formed on a side surface thereof, the at least one resilient projection being releasably engageable with the at least one engaging portion of the body to secure the casing to the body,

the at least one plate-like connecting element being a unitary member having a first portion extending outwardly from the casing in a first direction and a second portion being connectable with the at least one terminal.

4,992,766

LINEAR ACTUATOR

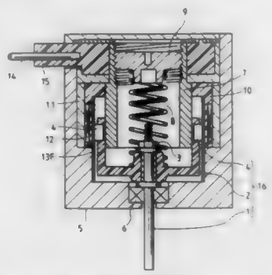
Hidemi Suzuki; Horiyuki Yamada, and Mikio Nakagawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 377,345

Claims priority, application Japan, Jul. 25, 1988, 63-97291[U]; Jul. 23, 1988, 63-97292[U]; Jul. 25, 1988, 63-97293[U]; Jul. 25, 1988, 63-97294[U]; Jul. 25, 1988, 63-97295[U]

Int. Cl.[5] H01F *7/08*

U.S. Cl. 335—223 6 Claims



1. A linear actuator comprising a magnet, a coil disposed within the magnetic field of said magnet, an output shaft mechanically connected to either of said magnet and said coil and supported by a casing so as to be linearly reciprocated in the axial direction of its own and consequently allowed to form a movable member, and coil spring means fitted between said movable member and a stationary member within said casing so as to resist the electromagnetic force generated by the interaction between the electric current fed to said coil and the magnetic field of said magnet and serving to drive said movable member in one direction of said output shaft, which linear actuator is characterized by being provided with

a projecting part formed on at least one of the portions of said movable member and said stationary member which are engaged to the opposite ends of said coil spring and

a cup-like washer interposed between the end of said coil spring and said projecting part in such a manner as to allow said projecting part to collide with the inner bottom part thereof.

4,992,767

MAGNET ROLL

Waichi Hozumi, Fukaya, and Keitaro Yamashita, Kamisato, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 5, 1990, Ser. No. 461,301

Claims priority, application Japan, Feb. 3, 1989, 1-25223

Int. Cl.[5] H01F *13/00*

U.S. Cl. 335—284 6 Claims

1. A magnet roll comprising:

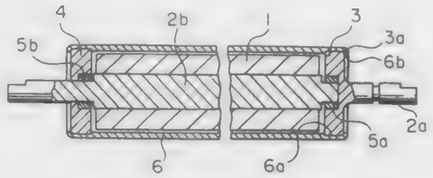
(a) first and second shafts rotatable around the same axis relative to each other;

(b) a permanent magnet member fixed around said second shaft and having a plurality of magnetic poles extending along the axis of said second shaft on its outer surface;

(c) a first flange member connected to said first shaft and rotatably supporting one end of said second shaft;

(d) a second flange emember rotatably supported by said second shaft;

(e) a hollow cylindrical sleeve made of a plastically deformable non-magnetic material and fixed to said first and second flange members on both ends such that it encircles said permanent magnet member rotatably relative to said permanent magnet member; and



(f) an inner diameter-increased area provided in each side end portion of said sleeve, which receives each flange member and is folded inward over each flange member to fix said sleeve to each flange member.

4,992,768

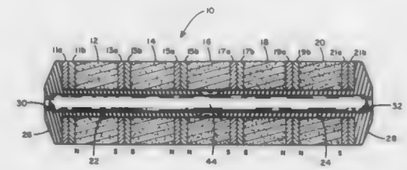
COW MAGNET

Byron G. Mozis, and William E. Edmundson, Jr., both of Burnsville, Minn., assignors to Power Magnets, U.S.A., Burnsville, Minn.

Filed May 15, 1990, Ser. No. 523,385

Int. Cl.[5] H01F *7/02*

U.S. Cl. 335—306 5 Claims



1. A permanent magnet assembly adapted to be located in the reticulum stomach chamber of a ruminant animal comprising:

(a) a plurality of cylindrical magnets, each with a center bore of a predetermined diameter formed through the length dimension thereof;

(b) a plurality of cylindrical spacer members, each having an outer diameter generally the same as that of said cylindrical magnets and a center bore generally of the same diameter as said predetermined diameter;

(c) means for maintaining said plurality of magnets and said plurality of spacer members in a stack with at least one of said spacer members interposed between two adjacent cylindrical magnets, said means including:

(i) a pair of molded plastic tubular sleeves of an outer diameter creating a predetermined interference fit when inserted through said center bores of said cylindrical magnets and said spacer members from opposed ends of said stack, said tubular sleeves each having a central bore of a second predetermined diameter and an integrally formed end cap member on one end thereof; and

(ii) a cylindrical rod of a length slightly less than the stack's length and an outer diameter greater than said second predetermined diameter, said rod being inserted through said central bores of said tubular sleeves following insertion of said tubular sleeves through said central bores in said plurality of magnets and said plurality of spacer members whereby the insertion of said rod expands said tubular sleeves to tightly engage the wall surfaces defining said central bores in said plurality of magnets and said plurality of spacer members.

4,992,769

LINE TRANSFORMER

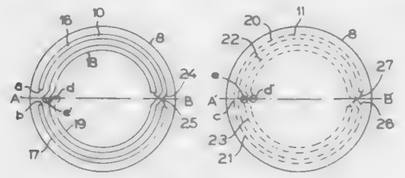
Ralph Oppelt, Weiher, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 442,541

Claims priority, application European Pat. Off., Nov. 28, 1988, 88119827.9

Int. Cl.[5] H01F *27/28*

U.S. Cl. 336—180 4 Claims



1. A line transformer comprising:

a dielectric substrate having two opposite flat major faces;

a strip-line interconnect structure disposed on each of said major faces, said interconnect structures being in registry on the respective major faces;

each interconnect structure consisting of two mirror-symmetric patterns arranged relative to a symmetry axis thereby forming a plurality of concentric strip-lines; and

the respective symmetry axes on said major faces being parallel and in registry.

4,992,770

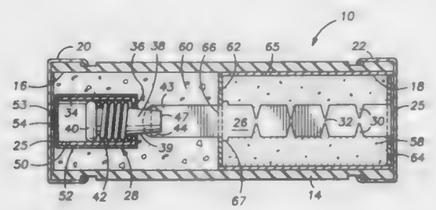
FUSE WITH IMPROVED SPRING TIMER

Keith A. Spalding, Fenton; Fred Levko, Chesterfield; Donald Johnston, St. Louis, all of Mo.; John Ackermann, Belleville, Ill., and Arlie Ehlman, Barnhart, Mo., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 11, 1989, Ser. No. 405,336

Int. Cl.[5] H01H *85/04*

U.S. Cl. 337—164 21 Claims



1. A fuse comprising;

an insulating tube having opposed first and second ends;

electrically conductive ferrules disposed on said first and second ends;

a short circuit strip extending from said first end in conductive engagement with said ferrule thereon inward said tube through a solid matrix filler;

a timer fuse assembly disposed adjacent said second end, having

a spring loaded bullet disposed within and projecting outward from one end of an open ended barrel assembly;

an insulative cap member mounted on said barrel sealing the end thereof opposite said bullet; and

a planar heater strip in conductive engagement with said ferrule covering said second open end and extending therefrom;

said bullet, short circuit strip and heater strip mechanically and electrically interconnected in a fusing alloy.

4,992,771

CHIP RESISTOR AND METHOD OF MANUFACTURING A CHIP RESISTOR

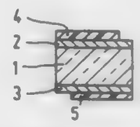
Didier Y. F. Caporali, and Frans L. A. Geerinckx, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1989, Ser. No. 333,483

Claims priority, application Netherlands, Apr. 5, 1988, 8800853

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—22 R 2 Claims



1. A chip resistor comprising a cuboid resistor body **1** of ceramic material and solderable, metal, current-supply strips **8** and **9** located at a first pair of opposite side faces of the resistor body, characterized in that electrically insulating strips **6** and **7** are present between the solderable metal strips **8** and **9** and the resistor body, and in that a second pair of opposing side faces of the resistor body is covered with electrically conductive layers **2** and **3**, which layers are partly covered with electrically insulating layers **4** and **5**, in such a way that each of the solderable metal strips **8** and **9** is electrically conductively connected to one of the electrically conductive layers **2** and **3**, the electrically insulating layers being made of a ceramic material.

4,992,772

METAL OXIDE FILM RESISTOR

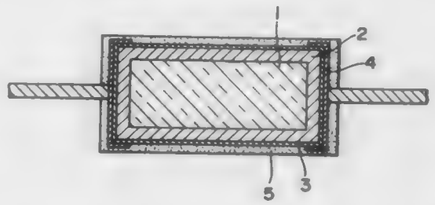
Itaru Kubota; Kazuyuki Oshima; Koichi Mizozoe; Yoshiyuki Aoshima, and Toshiya Nakamura, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 323,567

Claims priority, application Japan, Mar. 14, 1988, 63-59841; Dec. 28, 1988, 63-328870

Int. Cl.[5] H01C *1/012*

U.S. Cl. 338—308 23 Claims



1. A metal oxide film resistor comprising a ceramic substrated coated with a metal oxide film comprising tin oxide and connecting terminals attached to the surface of said metal oxide film, said metal oxide film comprising a first metal oxide film layer having a thickness of 0.1–5 μm that is in direct

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contact with the surface of said ceramic substrate and a second metal oxide film layer having a thickness of 0.003–1 μm that is coated on said first metal oxide film layer and which has a lower specific resistance than said first metal oxide film layer;

said first metal oxide film layer comprising tin oxide as a main component and at least one element, as an auxiliary component for increasing the specific resistance of the first metal oxide layer without impairing its crystallinity, selected from the group consisting of iron, indium, nickel and phosphorus; and

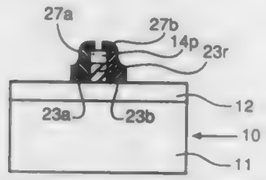
said second metal oxide film layer comprising tin oxide as a main component and at least one element, as an auxiliary component for adjusting the specific resistance of the second layer without impairing its crystallinity, selected from the group consisting of antimony, nickel, chromium, fluorine, phosphorus, arsenic, iron, manganese, barium, bismuth, cobalt, zinc, copper, boron, cadmium and vanadium.

4,992,773

RESISTOR WITH SIDE WALL CONTACT

Nan-Hsiung Tsai, Cupertino, Calif., assignor to MOS Electronics Corporation, Sunnyvale, Calif.

Filed Oct. 7, 1988, Ser. No. 255,074
Int. Cl.[5] H01C 7/00
U.S. Cl. 338—314 5 Claims



1. A resistor for use in an integrated circuit in which resistive material is formed on an insulating layer which is above a semiconductor substrate, said resistive material being patterned into a resistor having a laterally extending top surface, a laterally extending bottom surface contacting said insulating layer, two opposing upwardly extending side surfaces, and between said side surfaces two upwardly extending end surfaces, said top surface being completely covered by insulating material, and in which conductive contacts to said resistor are made against said upwardly extending end surfaces.

4,992,774

METHOD FOR POWERING REMOTE VISUAL DISPLAYS AND ALLOWING FOR DATA EXCHANGE OVER THE SAME WIRE PAIR

Robert K. McCullough, 8236 E. 71st St., Suite 356, Tulsa, Okla. 74133

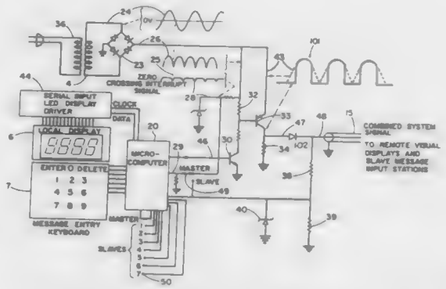
Filed Jan. 27, 1989, Ser. No. 302,663
Int. Cl.[5] H04M 11/04
U.S. Cl. 340—310 A 15 Claims

1. A system for providing both power delivery and signal transmission from a master station to a remote visual display comprising

a master station having means for connecting to a power source of alternating current, means for rectifying the alternating current to produce a pulse waveform, a keyboard, a microcomputer having the keyboard connected for data input thereto, means for pulse width modulating said pulse waveform with a serial binary signal from said microcomputer including a power output transistor means, said microcomputer providing, in response to keyboard data input, a serial pulse width modulated signal from said power output transistor means;

a single wire pair connected to receive the output of said power output transistor means; and

at least one remote station having a visual display and a serial to parallel shift register with its output connected to control said visual display, said shift register having an input coupled to said wire pair for receiving said serial binary pulse width modulated signal therefrom and for converting such signal to drive said visual display, and, in parallel with said wire pair, a capacitor charged by said modulated signal, said capacitor being connected to provide a direct current power source for said visual display.

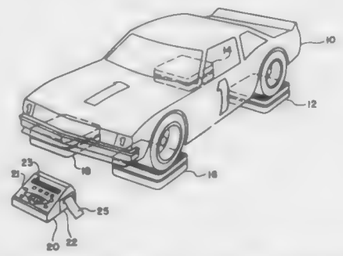


4,992,775

SYSTEM FOR ENSURING VALID COMMUNICATIONS BETWEEN A CENTRAL CONTROL AND A PLURALITY OF REMOTE MODULES

Jonathan Castle, Mission Hills, and Bruce H. Osterberg, Escondido, both of Calif., assignors to Moore Industries-International, Inc., Sepulveda, Calif.

Filed Oct. 14, 1988, Ser. No. 257,626
Int. Cl.[5] G08B 25/00; G06F 15/20
U.S. Cl. 340—525 19 Claims



1. An annunciation system for a wireless communications apparatus having a plurality of channels which provides for communications between a central control and a plurality of remote modules and having a plurality of means for selecting individual channels for communication, said annunciation system comprising:

means included in the central control for receiving said communications;

a plurality of means for visually annunciating whether a particular selected channel is communicating, each annunciating means being located in physical proximity to a corresponding means for selecting a channel so that the operator associates an annunciation with a selected channel;

means for determining whether a channel is communicating information validly to said central control;

said annunciating means further including,

a first light emitting diode having an emission spectrum of essentially a first color;

a second light emitting diode having an emission spectrum of essentially a second color;

said first and second diodes being connected in parallel and oppositely poled to form a two terminal visual annunciation means, wherein said annunciating means will display said first color if current is applied to said terminals in a first direction and will display said second color if current is applied to said terminals in the opposite direction; and

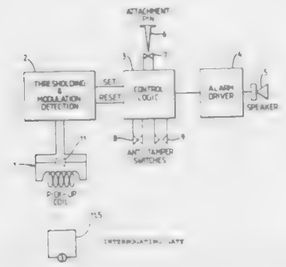
said annunciating means displaying a third color, which is a combination of said first color and second color, when current is applied to/said terminal in an alternating manner.

4,992,776

ANTIPILFERAGE TAGS AND THEIR USE

Michael D. Crossfield, Clare House, Halse, Brackley, Northamptonshire, England NN13 6DY

Filed Apr. 10, 1989, Ser. No. 335,493
Claims priority, application United Kingdom, Apr. 8, 1988, 8808244; Apr. 8, 1988, 8808245; Apr. 29, 1988, 8810177
Int. Cl.[5] G08B 13/18
U.S. Cl. 340—551 7 Claims



1. A magnetic antipilferage tag which comprises a housing containing means for detecting an external magnetic field; a power supply; a tone generator; and an electric circuit powered by said power supply and arranged to activate said tone generator in response to an output from said magnetic field detector means, wherein said means for detecting an external magnetic field includes at least one pick-up having a piezoelectric material surrounded about its circumference by a thin layer of magnetostrictive material.

4,992,777

SWITCH DEVICE WITH A TROUBLE DETECTING AND INDICATING FUNCTION

Konishi Keisuke; Shinohara Kenji, both of Osaka; Iwakiri Norio, Kyoto, and Kurashige Tomofumi, Tottori, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

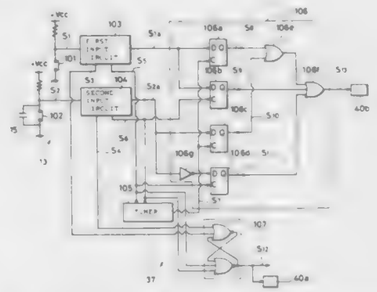
Filed Aug. 4, 1988, Ser. No. 228,063
Claims priority, application Japan, Aug. 10, 1987, 62-200678; Aug. 10, 1987, 62-200679; Aug. 11, 1987, 62-201529; Aug. 11, 1987, 62-201530; Aug. 20, 1987, 62-207707
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—644 9 Claims

8. A switch device having a trouble detecting and indicating function, comprising:

first switch means for outputting a first state signal and a second state signal;

second switch means provided near said first switch means for outputting a first state signal and a second state signal;

trouble detecting means for detecting trouble when an output signal of said second switch means does not change from the first state signal into the second state signal within a predetermined time period after the change of an output signal of said first switch means from the first state signal into the second state signal; and



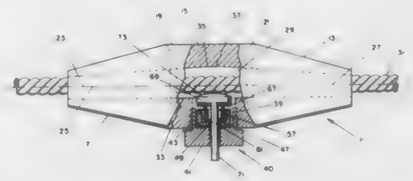
warning means for providing warning in response to detection of trouble by said trouble detecting means.

4,992,778

PRE-FAILURE TENSION WARNING DEVICE

Robert G. McKeen, Albuquerque, and Robert W. Spake, Placitas, both of N. Mex., assignors to The University of New Mexico, Albuquerque, N. Mex.

Filed Dec. 22, 1989, Ser. No. 455,545
Int. Cl.[5] G08B 21/00; G01L 5/04
U.S. Cl. 340—668 11 Claims



1. A method of detecting and providing visible warning of a predetermined status of cordage comprising the steps of:

a. providing for attachment to the cordage a visible element in an intact condition related to a first level of status of the cordage, said intact condition being caused by a bend in the cordage produced and maintained by the attachment of the element thereto whereby said element imposes stress on the cordage, and

b. permitting the intact condition of said element to visibly change to a different condition in response to a different level of status corresponding to the predetermined status of the cordage in which the bend is essentially straightened.

4,992,779

INFORMATION INPUT DEVICE

Toshio Sugino, Tokyo, and Yoji Furuya, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,174
Claims priority, application Japan, Mar. 30, 1988, 63-74781
Int. Cl.[5] G09G 3/02
U.S. Cl. 340—712 5 Claims

1. An information input device for inputting information into an information processing apparatus by means of contact on an input panel provided on a picture surface of a display device, said information input device comprising:

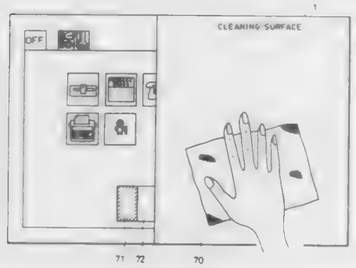
mode setting means for setting a cleaning mode of the input panel on the picture surface of said display device;

input control means for setting an input-prohibiting area of information on said input panel in response to setting the cleaning mode by said mode setting means;

prohibiting-area display means for displaying an indication

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on the picture surface of said display device that the input-prohibiting area of information has been set on said input panel by said input control means; and



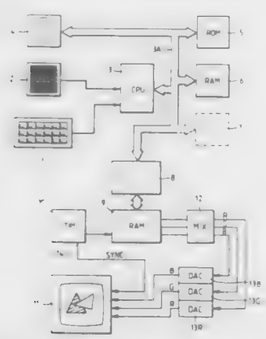
brightness control means for increasing the brightness of a displayed picture on the picture surface of said display unit in response to setting the cleaning mode by said mode setting means.

4,992,780

METHOD AND APPARATUS FOR STORING A TWO-DIMENSIONAL IMAGE REPRESENTING A THREE-DIMENSIONAL SCENE

David E. Penna, Red Hill, England, and Eric H. J. Persoon, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1988, Ser. No. 251,633
Claims priority, application United Kingdom, Sep. 30, 1987, 8722900
Int. Cl.[5] G09G *1/02*
U.S. Cl. 340—729 17 Claims



1. A method of generating in the form of an array of picture elements (pixels) a two-dimensional image representing a three-dimensional scene, the method comprising:

(a) storing in a memory a set of foreground pixel data defining a foreground colour and depth for each pixel of the image;

(b) selectively modifying the stored foreground data in response to a series of input pixel data defining colour and depth for a series of pixels of the image; and

(c) forming output pixel data using the stored foreground colour for each pixel; characterized in that:

the step (a) further comprises storing at least one set of background pixel data, each such set defining a background colour and depth for each pixel of the image; in that

the step (b) comprises selectively modifying both the stored foreground and background data in response to the input pixel data; and in that

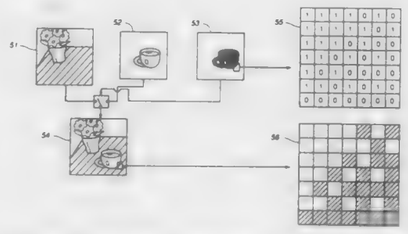
the step (c) comprises forming the output pixel data by combining the stored foreground and background colours for each pixel in proportions defined by a mixing value associated with that pixel.

4,992,781

IMAGE SYNTHESIZER

Keisuke Iwasaki, Nara; Masaki Takakura, Osaka; Yasukuni Yamane, Nara, and Noritoshi Kako, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 14, 1988, Ser. No. 219,287
Claims priority, application Japan, Jul. 17, 1987, 62-179657; Aug. 4, 1987, 62-195669
Int. Cl.[5] G09G *1/14*
U.S. Cl. 340—747 1 Claim



1. An image synthesizer comprising

memory means storing image data of a plurality of source image,

display means with pixels for displaying an image according to received image data,

a pattern memory for storing, when two or more source images are synthesized for a composite image display with boundary areas therebetween, a pattern according to which those of said pixels displaying one of said synthesized source images are scattered at a varying rate inside another of said synthesized source images within said boundary areas, said boundary areas containing a boundary line and said pattern being such that the density of said scattered pixels varying gradually from said boundary line in said boundary areas, and

data processing means for effecting said composite image display on said display means according to said pattern such that parts of said one of said synthesized source images are scattered within said another synthesized source image within said boundary areas, thereby causing said boundary areas to become controllably less conspicuous.

4,992,782

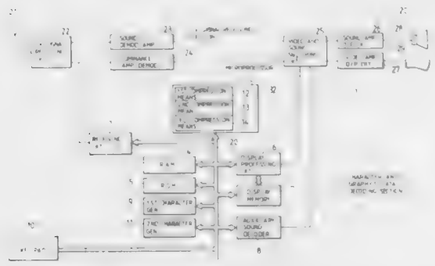
CHARACTER AND GRAPHICS DATA DISPLAY APPARATUS HAVING DATA COMPRESSION CAPABILITY

Ken Sakamoto, Kyoto; Hidemi Henmi, Ootsu; Tomoji Kondo, Osaka; Hiroyasu Shimbo, Osaka, and Shin Fukuda, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 22, 1988, Ser. No. 223,695
Claims priority, application Japan, Jul. 24, 1987, 62-186238
Int. Cl.[5] G09G *1/14*
U.S. Cl. 340—747 10 Claims

1. In a character and graphics display apparatus for enabling substantially simultaneous display of a television picture and a set of character and graphics data by a display device, having receiving circuit means for receiving a signal carrying encoded therein character and graphics data, said character and graphics data including display control data, data memory means for storing said character and graphics data received by said receiving circuit means, data decoding means for decoding said character and graphics data to obtain character and graphics picture data, display memory means for temporarily storing

said character and graphics picture data, and display processing circuit means for processing said stored character and graphics picture data to suitable form for display by said display device, the improvement comprising conversion means for converting said character and graphics picture data, prior to storage in said display memory means, to compressed character and graphics picture data representing a display picture having a display density that is different from a display density specified by said display control data, and in which said character and graphics picture data include pattern data corresponding to bi-state picture elements of a display picture, and said conversion means comprises first compression means for converting each of a plurality of sets of data elements of said pattern data, respectively corresponding to rectangular arrays of m_1 by m_2 of said picture elements, to a corresponding single data element in said compressed character and graphics picture data, wherein m_1 and m_2 are respective positive integers each having a value greater than one.



4,992,783

METHOD AND APPARATUS FOR CONTROLLING ACCESS TO A COMMUNICATION SYSTEM

Kenneth J. Zdunek, 428 Linsey Ave., Schaumburg, Ill. 60194, Phillip A. Bieri, 4345 Mumford Dr., Hoffman Estates, 60195, all of Ill., and Eric R. Schorman, 1304 Wedgles Dr., Bedford, Tex, 76021, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1988, Ser. No. 176,951
Int. Cl.[5] H04Q *9/00*
U.S. Cl. 340—825.340 14 Claims

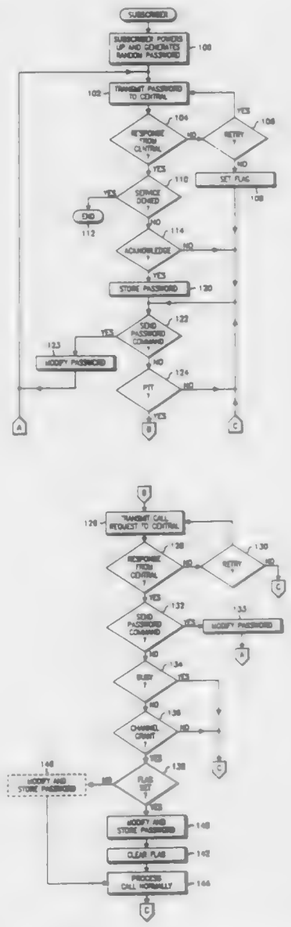
1. In a two-way communication system having a central unit and a plurality of subscriber units each having at least an identification code stored therein, a method of controlling access to the two-way communication system comprising the steps of:

in at least one of said plurality of subscriber units:

(a) generating a first random number as a first password code;

(b) transmitting at least said first password code and said identification code;

(c) receiving a command code and generating a second random number as a second password code in response thereto;



(d) transmitting at least said second password code and said identification code.

4,992,784

REMOTE CONTROL SET

Anton Rüttiger, Wildflecken, Fed. Rep. of Germany, assignor to Preh, Elektrofeinmechanische Werke, Bad Neustadt, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,700
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738532
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.720 3 Claims

1. A remote control set for controlling two devices by remote control independently, comprising:

first receiver for receiving signals directed to controlling a first device;

second receiver for receiving signals directed to controlling a second device;

a first remote control transmitter;

a second remote control transmitter;

said first remote control transmitter and said second remote

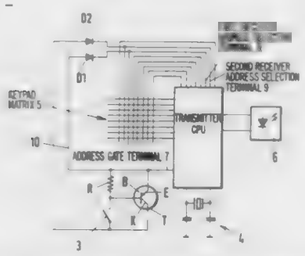
VOL 1123 ISS 2 FE 12 1991 UMI

control transmitter each comprising a device selector switch, wherein:

said first remote control transmitter communicates with said first receiver when the device selector switch of said first remote control transmitter is in a first position;

said second remote control transmitter communicates with said second receiver when the device selector switch of said second remote control transmitter is in said first position;

said first remote control transmitter communicates with said second device when said device selector switch of said first remote control transmitter is in a second position;



said second remote control transmitter communicates with said first device when said device selector switch of said second remote control transmitter is in said second position;

said device selector switches being in said second position only while being manually depressed, so that as long as said selector switch of said first remote control transmitter is manually depressed, operation of said second receiver is controlled by said first remote control transmitter, and so that as long as said device selector switch of said second remote control transmitter is manually depressed, operation of said first receiver is controlled by said second remote control transmitter.

4,992,785

INSTALLATION FOR CONTROLLING AND MONITORING THE DIFFERENT CODED LOCKS OF AN ASSEMBLY

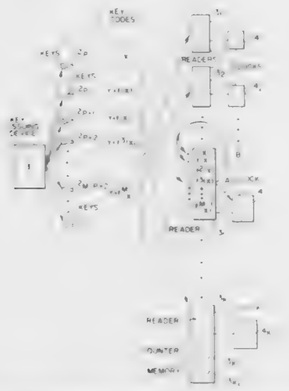
Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

Continuation of Ser. No. 755,794, Jul. 17, 1985, abandoned. This application Jul. 8, 1987, Ser. No. 71,601

Claims priority, application France, Jul. 18, 1984, 84 11399

Int. Cl.[5] H04Q *9/00;* **E05B** *49/00*

U.S. Cl. 340—825.34 **4 Claims**



1. In an installation for controlling and monitoring the differently coded locks of a system of such locks, said installation comprising: key issuing means for producing a plurality of coded keys having codes recorded thereon for controlling said locks and a reader means associated with each lock, for unlocking the associated lock in response to the simple presentation thereto of a correctly coded key, said key issuing means and reader means being adapted so that detection by said reader means of a code y recorded by said key issuing means on each new key of order p assigned to the lock associated with this reader means results in the invalidation of a code x recorded on the key of order p−1 previously assigned to this lock, each code y being derived from code x by an algorithm $y=f(x)$ stored in at least the key issuing means, the improvement wherein said reader means is at all times during the intended operation thereof responsive simultaneously to a number m, greater than 2, of codes of an increasing succession of ranked codes x, $f(x)$, $f^2(x)$ . . . $f^m(x)$ which have not been previously invalidated and provides, responsive to reading any one of these codes, for automatically invalidating all codes in the succession of ranked codes which are of a lower rank than the one code read thereby.

4,992,786

ELECTRICAL CONDUCTOR DETECTOR

James L. Kirkland, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1973, Ser. No. 386,482

Int. Cl.[5] H04B *13/02*

U.S. Cl. 340—850 **9 Claims**



1. Apparatus for detecting and determining location of a conductive metal object having at least a portion covered by electrical insulation material, said apparatus comprising:

vehicle means for traversing an area likely to contain said insulated portion of said object;

cutter means, coupled to said vehicle means, for cutting through said insulation means and making electrical contact with said object;

injection signal generating means, connected to said cutter means, for energizing said cutter means with an electrical injection signal having a predetermined radio frequency component whereby upon said contact of said object with said cutter means, said object radiates electromagnetic energy having said radio frequency component; and

radio direction finder means for receiving said electromagnetic energy and providing said electromagnetic energy and providing location information with respect to said object.

4,992,787

METHOD AND APPARATUS FOR REMOTE SIGNAL ENTRY INTO MEASUREMENT WHILE DRILLING SYSTEM

Walter A. Helm, Plainville, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Sep. 20, 1988, Ser. No. 247,033

Int. Cl.[5] G01V *1/00*

U.S. Cl. 340—854 **8 Claims**

1. A method for remote signal entry from first computer means into a measurement-while-drilling (MWD) system when the MWD system is located on the surface, the MWD system including existing magnetometer means and second computer means in an electronics package, the electronics package being supported inside a drill collar, the magnetometer means normally measuring direction and magnitude of the earth's magnetic field with respect to the MWD system's local coordinates, including the steps of:

generating a first signal from the first computer means when the MWD system is located on the surface;

converting said first signal to a magnetic field when the MWD system is located on the surface;



delivering said magnetic field to the electronics package in the MWD system using wireless delivery means when the MWD system is located on the surface;

detecting said magnetic field in the electronics package using said existing magnetometer means in said MWD system when the MWD system is located on the surface;

converting said detected magnetic field back to said first signal when the MWD system is located on the surface; and

delivering said first signal to the second computer means using hardwired delivery means when the MWD system is located on the surface.

4,992,788

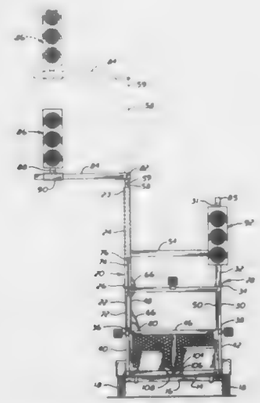
TRAFFIC CONTROL TRAILER SYSTEM

Rudolf P. Arndt, Lakeland, Fla., assignor to International Traffic Systems, Inc., Lakeland, Fla.

Filed Oct. 2, 1989, Ser. No. 416,119

Int. Cl.[5] G08G *1/095*

U.S. Cl. 340—908 **13 Claims**



1. A traffic control trailer system comprising a trailer having a base with a front portion and a rear portion and an axle with wheels mounted thereon said trailer further comprising;

a first signal support and a second signal support connected to said base, with each said signal support extending upwardly and having an upper end;

actuating means connected to said base and to said signal supports for selectively urging said upper ends of said signal supports pivotally away from said base, such that said signal supports may be elevated and lowered between an operating position and a transporting position by selective operation of said actuating means;

a transverse arm having opposing ends, one of said ends being connected to said upper end of said first signal support, such that, when said first signal support is in said operating position, said transverse arm extends substantially horizontally from said first signal support laterally outwardly of said trailer; and

a first traffic control signal head attached to said transverse arm and

a second traffic control signal head connected to said upper end of said second signal support.

4,992,789

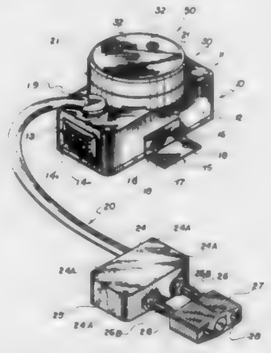
MARINE LOCK AND ALARM APPARATUS

Daniel Czerwinski, 18442 S.W. 92 Ct., Miami, Fla. 33157

Filed Oct. 31, 1989, Ser. No. 436,451

Int. Cl.[5] G08B *13/06*

U.S. Cl. 340—984 **16 Claims**



1. A theft prevention device for use with a boat which is either docked or securely mounted on a parked trailer, said boat having a twelve volt battery mounted therein; said theft prevention device comprising control box means and audible alarm means responsive to said control box means; said control box means housing electronic circuit means therein; said electronic circuit means comprising an electronic circuit means including activating means and electrical connection means to the twelve volt battery of the boat being protected, back-up battery means and normally open, energized relay means; whereby cutting a cable of said boat's battery de-energizes said relay means and comprises a circuit to said audible alarm means to sound an alarm indicating an attempted theft.

4,992,790

DIGITAL PHASE-LOCKED LOOP BIPHASE DEMODULATING METHOD AND APPARATUS

Michael A. Montgomery, Cedar Park, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 19, 1989, Ser. No. 409,618

Int. Cl.[5] H03M *7/12*

U.S. Cl. 341—70 **12 Claims**

1. A method for decoding digitally-encoded transmission signals where transitions within the transmission signal represent a combination of transmitted clock and data signals, the frequency of the transmitted clock signal is known, successive transitions over a period of time equal to one transmitted clock or bit cycle represent one transmitted clock cycle and a transmitted data signal of one polarity, and successive transitions over one bit cycle with an additional transition occurring midway through the bit cycle represent a transmitted clock cycle and a transmitted data signal of the opposite polarity, comprising the steps of:

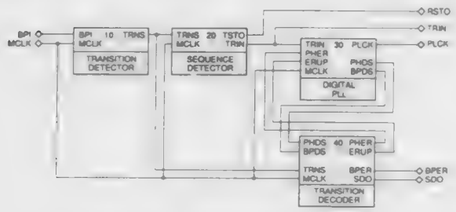
VOL 1123 ISS 2 FE 12 1991 UMI

sampling the transmission signal at a rate equal to some multiple of the transmitted clock frequency;

detecting whether or not a transition of the transmission signal occurred within said sample and successively storing with respect to time binary representations of whether or not a transition occurred within said sample;

generating a clock signal with a digital phase-locked loop which can be either advanced or retarded in phase in response to a phase-error signal and a phase-error direction indicator;

maintaining a known and constant phase relationship between the phase-locked loop clock and the received clock



of the transmission signal by periodically testing the stored transition representations and generating a phase-error signal and direction indicator when a phase error between the phase-locked loop clock and the received clock signal exists and then using the phase-error signal and direction indicator to advance or retard the phase-locked loop clock accordingly; and

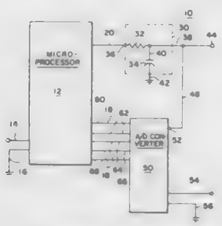
using the phase-locked loop clock to decode a stored transition representation as the most probable of either the start of a new bit cycle or a mid-bit transition according to the known length of the input bit cycle, wherein a transition occurring before a time interval containing the ¾-bit time as measured by the phase-locked loop clock is decoded as a mid-bit transition while a transition occurring after a time interval containing the ¾-bit time is decoded as the start of a new bit cycle.

4,992,791

APPARATUS AND METHOD FOR DIGITAL TO ANALOG SIGNAL CONVERSION USING AN ANALOG TO DIGITAL SIGNAL CONVERTER

John C. Olson, Shoreview, Minn., assignor to American Standard Inc., New York, N.Y.

Filed Apr. 13, 1989, Ser. No. 340,115
Int. Cl.[5] H03M *1/00*
U.S. Cl. 341—126 **14 Claims**



1. A digital to analog signal converter comprised of:

a processor portion including a first processor input for receiving a first digital signal, and a processor output for transmitting a second digital signal, said processor portion further sampling said first digital signal and controlling said second digital signal in response thereto;

a low pass filter portion having a filter input for receiving said second digital signal and a filter output for transmitting an analog signal;

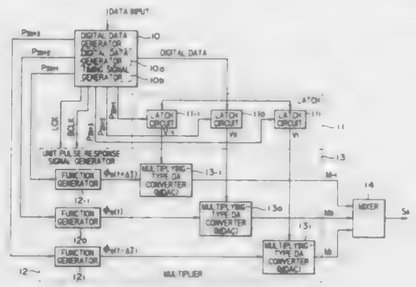
an analog to digital converter portion having a converter input for receiving said analog signal and a converter output for transmitting said first digital signal to said processor portion.

4,992,792

DIGITAL-ANALOG CONVERTER FOR CONVERTING DIGITAL AUDIO SIGNALS

Ryoichi Mori, 1-24-12, Hakusan, Bunkyo-ku, Tokyo 113; Kazuo Toraichi, 1-14-2, Irimagawa, Sayama-shi, Saitama 350-13; Takashi Tokuyama, Iwaki; Youichi Hashimoto, Wako, and Koichi Endo, Iwaki, all of Japan, assignors to Ryoichi Mori, Tokyo; Kazuo Toraichi, Saitama and Alpine Electronics Inc., Tokyo, all of, Japan

Filed May 22, 1989, Ser. No. 354,998
Claims priority, application Japan, May 24, 1988, 63-126773
Int. Cl.[5] H03M *1/82*
U.S. Cl. 341—147 **8 Claims**



1. A digital-analog converter, comprising:

a unit pulse response signal generator for successively generating unit pulse response signals, including first, second and third function generators, each unit pulse response signal having a period of 3·ΔT, successively delayed in phase by a predetermined time interval ΔT, where ΔT represents sampling time of digital data;

a data generator for outputting an item of the digital data at the predetermined time interval;

three memories, operatively connected to said data generator, for successively storing three latest items of the digital data output by said data generator;

three multiplying-type digital/analog converters, each operatively connected to one of said first, second and third function generators and one of said three memories, for multiplying the unit pulse response signals by the digital data stored in said three memories, respectively and for outputting results of the multiplication as outputs; and

a mixer for combining the outputs from said three multiplying-type digital/analog converters into an analog signal which is delivered as an output.

4,992,793

DEVICE FOR REJECTING PULSE REPEATER DECEPTION JAMMING

James F. Dibrell, Washington, D.C., and Donald L. Hendrix, Corona, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 9, 1969, Ser. No. 826,061
Int. Cl.[5] G01S *7/36*
U.S. Cl. 342—16 **5 Claims**

1. In a device for rejecting pulse repeater deception jamming signals, the combination comprising:

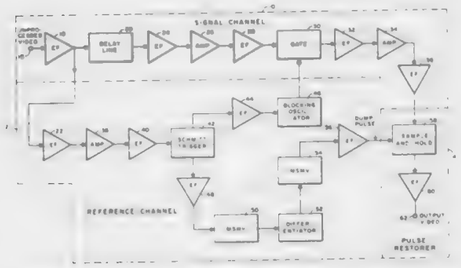
(a) Input circuit means for receiving video input pulses from a radar receiver,

(b) gate circuit means having a first input coupled to said input circuit means, a second input and an output,

(c) trigger pulse generating means having first and second outputs and an input coupled to said input circuit means for generating a pulse in response to received target pulse,

(d) narrow gate pulse generating circuit means having an input coupled to said first output of said trigger pulse generating means and an output coupled to the second input of said gate circuit means for supplying a gate pulse to said gate circuit means in response to a trigger pulse from said trigger pulse generating means,

(e) circuit storage means having a first input coupled to the output of said gate circuit means for receiving and holding a charge when a gate pulse is supplied to said gate circuit



means by said narrow gate pulse generating circuit, a second input and an output,

(f) discharge circuit means coupled between the second output of said trigger pulse generating means and the second input of said circuit storage means for discharging said circuit storage means in response to a trigger pulse and after a predetermined time delay to produce a restored video pulse at the output of said circuit storage means.

4,992,794

TRANSPONDER AND METHOD FOR THE PRODUCTION THEREOF

Arnoldus M. Brouwers, Wierden, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 10, 1989, Ser. No. 419,043
Int. Cl.[5] G01S *9/02*
U.S. Cl. 342—51 **12 Claims**

1. A transponder comprising:

a plastic holder having a hollow interior;

a transmit/receive unit within the hollow interior of said holder, said transmit/receive unit including a core and coil assembly impregnated with wax.

an electronic element electrically connected to said transmit/receive unit within the hollow interior of said holder; and

wherein the hollow interior of said holder is at least partially filled with a plastic filler material.

4,992,795

METHOD AND DEVICE FOR THE VALIDATION OF PLOTS, FOR RADAR, WITH SELF-ADAPTIVE UPDATING

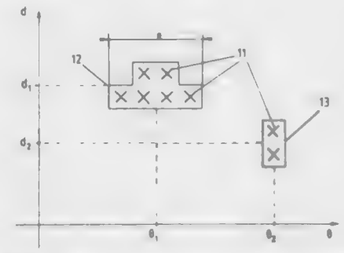
Jean-Luc Lassallette, Evry; Guy Desodt, Massy, and Eric Potier, Velizy, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Oct. 10, 1989, Ser. No. 418,868
Claims priority, application France, Oct. 11, 1988, 88 13340
Int. Cl.[5] G01S *7/02*
U.S. Cl. 342—90 **14 Claims**

1. A method for the validation of plots for radar, notably designed to be interposed between an extractor and a tracking unit of said radar to associate an estimated value of validity with each plot given by the extractor, wherein said method comprises the steps of:

selecting a first set and a second set of attributes, said sets of attributes being designed for a preparation of coeffecients of probability, for each plot, of its corresponding to a true plot or to a false plot, respectively;

quantifying each attribute of said first and second sets, in defining intervals in the range of values taken by said attribute;



associating, with each combination of the quantified values of said first and second sets of attributes, a first coefficient and a second coefficient of the probability of corresponding to a true plot and to a false plot, respectively;

defining, for each plot, an estimated value of validity formed by a ratio of said first and second coefficients of probability.

4,992,796

COMPUTED-INTERFEROMETRY RADAR SYSTEM WITH COHERENT INTEGRATION

John T. Apostolos, Merrimack, N.H., assignor to Lockheed Sanders, Inc., Nashua, N.H.

Filed Feb. 20, 1990, Ser. No. 482,164
Int. Cl.[5] G01S *13/48*
U.S. Cl. 342—156 **3 Claims**



1. A method of radar detection comprising the steps of:

(A) providing a platform and an irregular array of antenna elements mounted on the platform for producing electrical element outputs in response to radiation received thereby;

(B) calibrating the irregular array by:

(i) irradiating the irregular array with radiation of a calibration frequency from each of a plurality of calibration directions and recording a calibration output, associated with each combination of antenna element and calibration direction, representing the relative amplitude and phase of the electrical element output produced by the associated antenna element in response to radiation from the associated calibration direction; and

(ii) for each of a plurality of desired beam patterns, computing an element coefficient associated with each antenna element such that the beam pattern that results from application of the element coefficients to the calibration outputs approximates the desired beam pattern;

(C) transmitting radiation of the calibration frequency into a target region so positioned with respect to the platform that it includes area covered by one of the desired beam patterns; and

(D) producing a beam signal from the resultant element outputs by employing the element coefficients computed for the desired beam pattern.

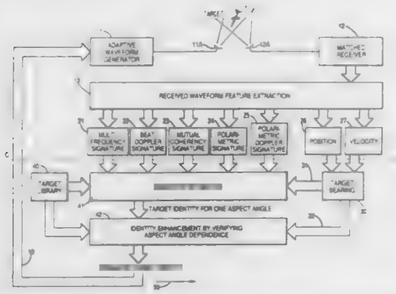
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4,992,797

METHOD OF DETECTION AND IDENTIFICATION OF ONE OR MORE REMOTE OBJECTS

Dag K. T. Gjessing, Skedsmokorset, and Jens F. Hjelmstad, Tretten, both of Norway, assignors to Norges Teknisk-Naturvitenskapelige Forskningsrad, Olso, Norway

PCT No. PCT/NO85/00046, § 371 Date May 21, 1987, § 102(e) Date May 21, 1987, PCT Pub. No. WO87/00930, PCT Pub. Date Feb. 12, 1987
PCT Filed Jul. 29, 1985, Ser. No. 45,001
Int. Cl.[5] G01S *13/526*
U.S. Cl. 342—192 8 Claims



1. Method of detection and identification of one or more remote objects by transmitting wave energy towards the object and receiving wave energy reflected from the object as well as processing of information associated with the wave energy received, wherein said processing comprises a number of separate signal parameters pertaining to the wave energy received, said parameters together forming a measured signature relating to the object, and the measured signature is compared with a number of prestored signatures comprising the same separate signal parameters relating to known objects being of interest to the detection and the identification, characterized in that

(A) said separate signal parameters are selected to relate to a number of independent observation domains,

(B) there is effected a recording of those signatures among the prestored signatures which within predetermined tolerances correspond to the measured signature,

(C) subsequent transmission and reception of wave energy is used for updating the separate parameters and thereby the measured signature,

(D) the updated measured signature is compared with the recorded restored signatures for updated recording of a smaller number of prestored signatures which within predetermined tolerances correspond to the updated measured signature,

(E) and steps (C) and (D) are repeated until there remains a small number of recorded prestored signatures, preferably only one such signature, which defines a small number of objects, preferably only one such object, being of interest.

4,992,798

INTERFERENCE CANCELLER

Yoshihiro Nozue, Nishinasuno, and Toshiyuki Takizawa, Otawara, both of Japan, assignors to Fujitsu Limited, Kawasak, Japan

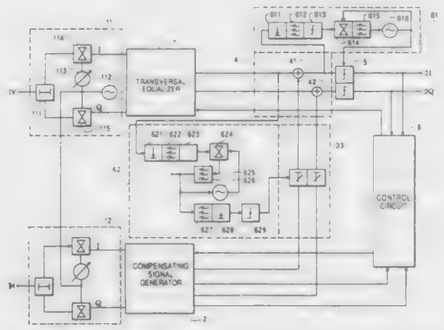
Continuation of Ser. No. 265,511, Nov. 1, 1988, abandoned. This application Jul. 17, 1990, Ser. No. 554,984
Claims priority, application Japan, Nov. 10, 1987, 62-282053; Dec. 11, 1987, 62-312038
Int. Cl.[5] H01Q *21/06, 21/24;* H04B *7/10*
U.S. Cl. 342—362 23 Claims

1. An interference canceller for cancelling interference in a first signal in a communication system that simultaneously processes more than one signal, said interference canceller comprising:

equalizer means for equalizing the first signal;

compensating signal generating means for generating a compensating signal from a second signal;

first timing recovery means, operatively connected to said equalizer means, for detecting the interference in the equalized first signal by detecting and extracting a beat element of amplitude based on a frequency difference



element of a pair of data rates of the first and second signals; and

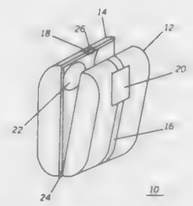
first control means, operatively connected to said first timing recovery means and said compensating signal generating means, for controlling application of the compensating signal to the first equalized signal based on the detected interference.

4,992,799

ADAPTABLE ANTENNA

Oscar M. Garay, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1989, Ser. No. 414,168
Int. Cl.[5] H01Q *1/24*
U.S. Cl. 343—702 6 Claims



1. An antenna system comprising:

a first antenna portion;

a second antenna portion rotatably coupled to the first antenna portion, the antenna system being movable from an open position to a closed position, in which the first antenna portion is coupled to the second antenna portion to operate as a loop antenna, and movable from the closed position to the open position;

a first patch antenna element coupled to the first antenna portion; and

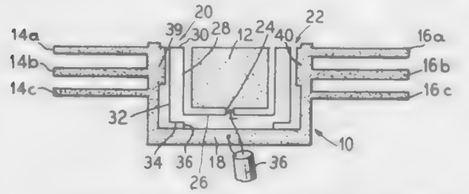
a second patch antenna element coupled to the second antenna portion, so that the antenna system is coupled to operate as two patch antennas when the antenna system is in the open position.

4,992,800

WINDSHIELD MOUNTED ANTENNA ASSEMBLY

Dale R. Parfitt, Lantana, Fla., assignor to Martino Research & Development Co., West Palm Beach, Fla.

Filed Jan. 23, 1989, Ser. No. 300,130
Int. Cl.[5] H01Q *1/32*
U.S. Cl. 343—713 4 Claims



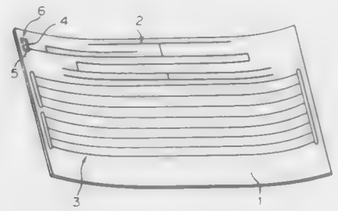
1. A window-mounted antenna assembly comprising a printed circuit board, said printed circuit board having a central panel adapted to be connected to the central conductor of a coaxial cable, a U-shaped conductive area surrounding said central panel on at least two opposite sides thereof and joined together on a third side thereof, and inductive means comprising a pair of printed circuit inductors interconnected between said central panel and a central portion of said U-shaped conductive area, for matching the impedance of said coaxial cable to an active antenna element, said antenna element having an electrical length greater than a quarter wavelength capacitively connected to said central panel.

4,992,801

GLASS ANTENNA DEVICE FOR AN AUTOMOBILE

Toshihiko Saito, Ebina; Michio Ono, Yokohama; Hijiri Ichihara, Tokyo; Mitsuo Takabatake, Yokohama; Shinichi Watanabe, Yokohama; Kenji Oda, Yokohama, and Masanobu Ogawa, Kanagawa, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 383,525
Claims priority, application Japan, Jul. 25, 1988, 63-185128; Sep. 2, 1988, 63-220204; Sep. 2, 1988, 63-115710[U]
Int. Cl.[5] H01Q *1/32, 1/12*
U.S. Cl. 343—713 12 Claims



1. A glass antenna device comprising:

an antenna conductor formed to a vehicle window glass plate, said antenna conductor defining a power feeding point;

a connecting metal fitting having at least two legs, a raised portion intermediate said legs and an output terminal, wherein said legs are connected to said glass plate for attaching said connecting metal fitting to said glass plate; and

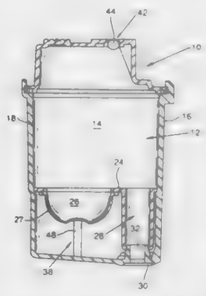
an antenna peripheral circuit module mechanically mounted to said connecting metal fitting and electrically connected to said output terminal, wherein said circuit module is also connected to said power feeding point via an electrical connection independent of at least one of said legs, whereby damage to the connection of said at least one of said legs to said glass plate will not affect an electrical continuity of said circuit module.

4,992,802

METHOD AND APPARATUS FOR EXTENDING THE ENVIRONMENTAL OPERATING RANGE OF AN INK JET PRINT CARTRIDGE

John H. Dion, and Thomas H. Winslow, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 22, 1988, Ser. No. 289,876
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—1.1 13 Claims



1. An ink jet printing apparatus comprising:

an ink reservoir;

a print head for ejecting ink from the reservoir, the ejection of ink from the reservoir decreasing the pressure in the reservoir;

first pressure control means for limiting the decrease in the pressure in the ink reservoir by controllably introducing replacement fluid into the reservoir; and

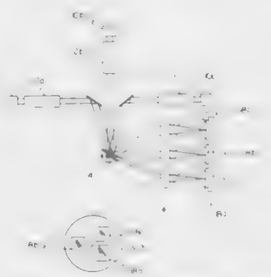
second pressure control means for limiting the decrease in the pressure in the ink reservoir by changing the volume thereof.

4,992,803

SIMULTANEOUS LASER WRITING OF MULTIPLE LALC CELLS

Brent D. Larson, Bellbrook, and Benjamin C. Stone, Alpha, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 21, 1988, Ser. No. 287,822
Int. Cl.[5] G01D *9/00, 15/16;* G02F *1/13*
U.S. Cl. 346—1.1 18 Claims



1. A method of writing multiple, discrete images simultaneously onto at least one photosensitive surface, comprising the steps of:

modulating a first laser beam in accordance with image information corresponding to a first image, and simultaneously and independently modulating a second laser

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beam in accordance with image information corresponding to a second image;

directing said first laser beam onto a scanning mirror at a first angle of incidence A_1, and simultaneously directing said second laser beam onto said scanning mirror at a second angle of incidence A_2;

scanning said scanning mirror; and

while scanning said scanning mirror, focusing said first laser beam from said scanning mirror onto said photosensitive surface to write said first image thereon, and simultaneously focusing said second laser beam from said scanning mirror onto said liquid crystal surface to write said second image thereon spatially remote from said first image.

4,992,804

MODULATED BEAM SCANNING WITH PIXAL EXPOSURE CONTROL

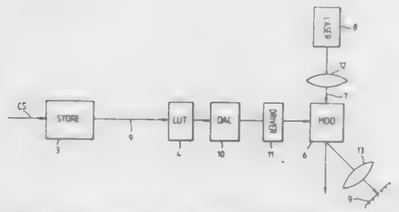
Malcolm D. M. Roe, Herts, England, assignor to Crosfield Electronics Limited, London, England

Filed May 8, 1989, Ser. No. 348,523

Claims priority, application United Kingdom, Jun. 20, 1988, [illegible]

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 **9 Claims**



1. A method of modulating a radiation beam during relative scanning movement between said beam and a record medium in which the power level of said beam is modulated in accordance with a binary control signal to record an image on said record medium, each bit of said control signal corresponding to a respective output pixel of said image wherein prior to said modulation step, determining the pattern of said control signal bits corresponding to image pixels in an area containing the pixel to be exposed, and causing said radiation beam to take up an output power level corresponding to said determined pattern during exposure of that pixel.

4,992,805

IMAGE RECORDING APPARATUS

Atsutomo Yoshizawa; Hiroshi Sugiyama, both of Tokyo, and Nobuyuki Watanabe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 366,211, Jun. 15, 1989, abandoned, which is a continuation of Ser. No. 230,442, Aug. 10, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 492,295

Claims priority, application Japan, Aug. 14, 1987, 62-201819; Aug. 14, 1987, 62-201820; Aug. 14, 1987, 62-201821; Aug. 14, 1987, 62-201822; Aug. 14, 1987, 62-201824

Int. Cl.[5] B41V *2/01, 2/165, 2/175*

U.S. Cl. 346—134 **17 Claims**

1. An apparatus for recording an image on a recording medium, comprising:

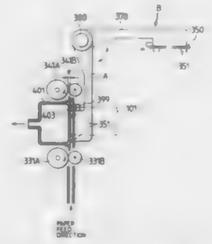
a platen;

a recording head arranged to oppose said platen for recording the image on the recording medium;

first conveying means arranged upstream of said platen along a conveying direction of the recording medium for conveying the recording medium;

second conveying means arranged downstream of said platen along the conveying direction of the recording medium for conveying the recording medium;

guide means for guiding the recording medium when the recording medium is fed from said first conveying means to said second conveying means; and



driving means for causing said guide means to set at an operative position where said guide means guides the recording medium and a retracted position where said guide means is retracted from the operative position.

4,992,806

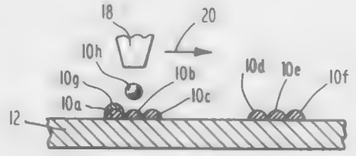
METHOD OF JETTING PHASE CHANGE INK

Thomas R. Peer, Londonderry, N.H., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 830,345, Jan. 17, 1986, abandoned. This application Dec. 8, 1987, Ser. No. 131,318

Int. Cl.[5] G01D *15/16*

U.S. Cl. 346—140 R **27 Claims**



1. A method of operating a system for jetting ink capable of undergoing a thermally-reversible liquid-to-solid phase transition, the method comprising the following steps:

elevating the temperature of the ink so as to effect a solid-to-liquid phase transition;

ejecting a first volume of ink in the liquid state toward a target;

contacting the target with said first volume;

lowering the temperature of said first volume of ink so as to effect a liquid-to-solid phase transition after contact with said target;

ejecting a second volume of ink in the liquid state toward the target;

contacting said first volume of ink with said second volume of ink such that said second volume of ink lies substantially within the outline of said first volume of ink; and

lowering the temperature of the ink of said second volume so as to effect a liquid-to-solid transition after contact with said first volume.

4,992,807

GRAY SCALE PRINTHEAD SYSTEM

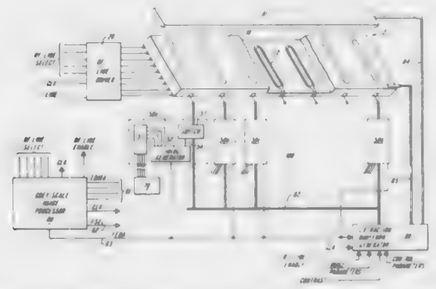
Christopher W. Thomson, Etobicoke, Canada, assignor to Delphax Systems, Randolph, Mass.

Filed May 4, 1990, Ser. No. 518,955

Int. Cl.[5] G01D *15/06*

U.S. Cl. 346—155 **13 Claims**

1. A printhead assembly for effecting a write operation by depositing a pointwise charge distribution on a dielectric member, and comprising a printhead and a printhead controller, said printhead including for each pixel an array of electrode structures including a first electrode structure for forming a charge breakdown region from which charge carriers may be accelerated, a third electrode structure impressed with an extraction potential for accelerating charge carriers from the charge breakdown region, and a second electrode structure interposed between the first and third electrode structures for controlling the extraction of said charge carriers, said first



electrode structure receiving an actuating signal during a write operation for the pixel, and said controller including means for applying between said second and third electrode structures a varying potential which changes in voltage level during the duration of said actuating signal, and means for providing a gating voltage for said second electrode structure synchronized with said actuating signal and with said varying extraction potential to cause a selected amount of charge to be deposited by the printhead assembly on the dielectric member.

4,992,808

MULTI-CHANNEL ARRAY, PULSED DROPLET DEPOSITION APPARATUS

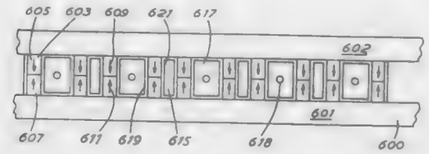
W. Scott Bartky, Chicago, Ill.; Anthony D. Paton; Stephen Temple, both of Cambridge, England, and A. John Michaelis, Glen Ellyn, Ill., assignors to XAAR Limited, Cambridge, United Kingdom

Division of Ser. No. 140,764, Jan. 4, 1988, Pat. No. 4,879,568. This application Sep. 5, 1989, Ser. No. 402,329

Claims priority, application United Kingdom, Jan. 10, 1987, 8700531; Jan. 10, 1987, 8700533

Int. Cl.[5] B41J *2/045*

U.S. Cl. 346—140 R **9 Claims**



1. A multi-channel array, pulsed droplet deposition apparatus comprising opposed top and base walls and shear mode actuator walls of piezo-electric material extending between said top and base walls and arranged in pairs of successive actuator walls to define a plurality of separated liquid channels between the walls of each of said pairs, a nozzle means providing nozzles respectively communicating with said channels, liquid supply means for supplying liquid to said channels for replenishment of droplets ejected from said channels and field electrode means provided on said actuator walls for forming respective actuating fields therein, said actuator walls being so disposed in relation to the direction of said actuating fields as to be laterally deflected by said respective actuating fields to cause change of pressure in the liquid in said channels to effect droplet ejection therefrom.

4,992,809

ZOOM FINDER SYSTEM

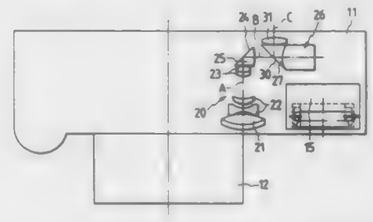
Katsuhiko Nozaki, and Tetsuya Abe, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1989, Ser. No. 426,655

Claims priority, application Japan, Oct. 28, 1988, 63-140823[U]; Dec. 27, 1988, 63-330466; Dec. 27, 1988, 63-330467

Int. Cl.[5] G03B *15/03, 3/00, 13/10, 13/08*

U.S. Cl. 354—149.11 **8 Claims**



1. In a finder apparatus for use with a lens-shutter type camera having a zoom imaging optical system, a zoom finder optical system separate from said zoom imaging optical system, and an electronic flash device, the improvement wherein said zoom finder optical system is made as a real-image zoom finder apparatus, with part of the associated optical elements being disposed behind the electronic flash device, and part of the optical path from the objective lens to the eyepiece being bent backward of the electronic flash device to pass through said optical element disposed behind the electronic flash device.

4,992,810

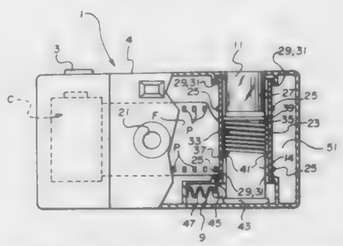
COMPACT CAMERA WITH FLASH UNIT

Joseph J. Schappler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,686

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—149.11 **6 Claims**



1. A compact camera comprising (a) a camera housing, (b) a pop-up electronic flash unit supported for movement between a storage position at least partly within said camera housing and a flash-emitting position elevated above the camera housing, and (c) a film take-up drum rotatable within said camera housing to wind a filmstrip onto said drum, characterized in that said take-up drum includes a central longitudinal cavity for receiving said flash unit when the flash unit is in its storage position.

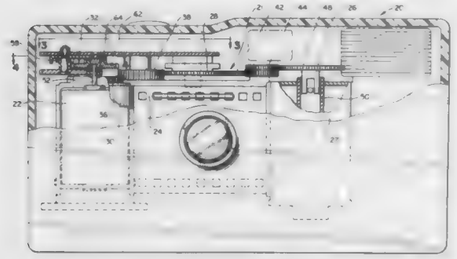
VOL 1123 ISS 2 FE 12 1991 UMI

4,992,811

FILM ADVANCING AND REWINDING MECHANISM

Vladimir Fridman, New City, N.Y., assignor to Keystone Camera Corporation, Clifton, N.J.

Filed Feb. 21, 1990, Ser. No. 483,080
Int. Cl.[5] G03B *1/12*
U.S. Cl. 354—173.1 20 Claims



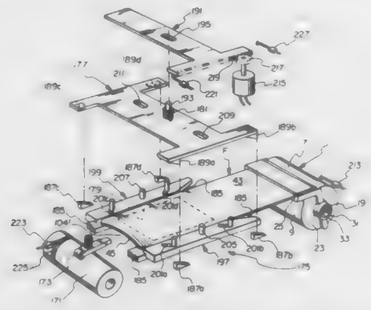
1. A film winding and rewinding mechanism for a camera in which the mechanism automatically switches from wind to rewind when the end of a film is reached, comprising:
- a rotatable take up member for advancing a film;
- a rotatable supply member for supporting the film and affecting rewinding of the film;
- first mechanical coupling means for coupling to said rotatable take up member and to said rotatable supply member to allow transfer of the film from one said rotatable member to the other;
- a motor mechanism;
- second mechanical coupling means coupled to said motor and to said first mechanical coupling means, said second mechanical coupling means having two modes of operation, a first mode which results in transfer of said film from said supply member to said take up member, and a second mode which results in transfer of said film from said take up member to said supply member; and
- mechanical means for changing the mode of operation of said second mechanical coupling means from said first to said second mode of operation in response to a completion of advancement of the film from the supply member to the take up member.

4,992,812

PHOTOGRAPHIC CAMERA WITH FILM THREADING APPARATUS

David C. Smart, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1989, Ser. No. 379,744
Int. Cl.[5] G03B *1/44, 1/50*
U.S. Cl. 354—203 7 Claims



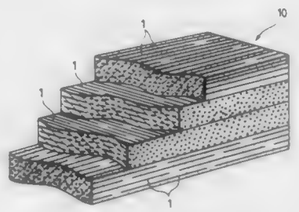
1. An improved camera adapted to be used with a film cassette including a film spool rotatable to unwind a filmstrip off the spool to thrust a non-protruding leader portion of the filmstrip out of the cassette to enable the leader portion to be propelled in said camera forward along a film advance path from a cassette-receiving chamber, wherein the improvement comprises:
- film bowing means including a pair of film guide members located along opposite sides of the film advance path for transversely bowing the leader portion to increase the longitudinal stiffness of the leader portion to facilitate its being propelled forward along the film advance path responsive to unwinding rotation of the film spool, said film guide members being supported for relative movement to a bowing position in which they are moved closer together to transversely bow the leader portion and for relative movement to a guiding position in which they are moved apart to relieve the filmstrip; and
- change-over means for moving said film guide members from their bowing position to their guiding position only after at least a forward-most part of the leader portion is propelled clear of the film guide members.

4,992,813

LIGHT-SHIELDING BLADE

Takashi Matsubara, Tokyo, Japan, assignor to Niko Corporation, Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 512,428
Claims priority, application Japan, Apr. 27, 1989, 1-108068
Int. Cl.[5] G03B *9/10*
U.S. Cl. 354—250 4 Claims



1. A light-shielding blade comprising:
- a carbon fiber-reinforced plastic plate material which is composed of three or more reinforced plastic sheets each consisting of continuous carbon fibers arranged in a direction and matrix resin enveloping said carbon fibers, said sheets being laminated plane symmetrically in such a manner that the directions of fibers in said sheets are mutually perpendicular or substantially perpendicular, and which has a thickness of 60 to 120 μm;
- wherein carbon black is incorporated only in the outermost ones of said sheets constituting said carbon fiber-reinforced plastic plate, and said plate is provided with a black coating of a thickness of 0.1 to 3 μm on the surfaces.

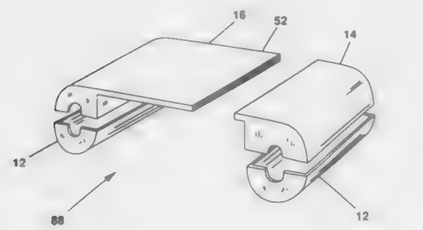
4,992,814

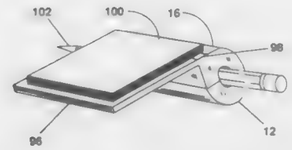
CONVERTIBLE FILM CARTRIDGE AND TOY DEVICE

Charles J. Hsiung, 500 S. Altantic Blvd., Monterey Park, Calif. 91754

Filed Apr. 2, 1990, Ser. No. 502,769
Int. Cl.[5] G03B *17/26;* A63H *17/00*
U.S. Cl. 354—275 19 Claims

1. An article of manufacture comprising:
- a plurality of basic components capable of frictional attachment in a first configuration to form a film cartridge and assemblable in at least one other configuration to form another desired device,
- at least one of said basic components being a half cylinder having a pair of closed ends each formed with a central recess and having a flange extending along at least one edge of said half cylinder for frictional engagem :nt with an adjacent component.



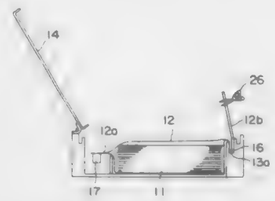


4,992,815

SHEET LOADING MAGAZINE

Tomohiro Kudo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1989, Ser. No. 439,580
Claims priority, application Japan, Nov. 26, 1988, 63-299224
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—277 6 Claims



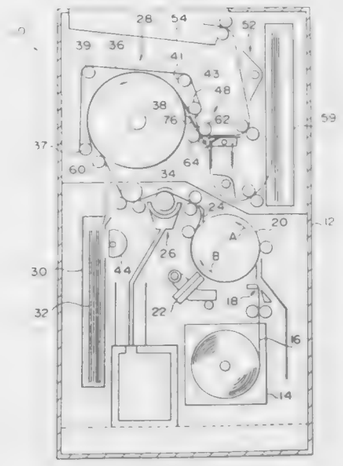
1. A sheet loading magazine having:
- a housing for containing therein sheets placed in a flexible bag having a light intercepting property;
- a guide portion provide near the end portion of the interior of said housing;
- a keep portion shiftable to a position in which it is engaged with said guide portion with one end of said bag being interposed therebetween;
- a rotatable take-up portion provided within said housing for holding down one end of said bag when said keep portion is engaged with said guide portion, and clamping the other end of said bag and taking up said bag after said one end of said bag which protrudes outwardly is unsealed; and
- an openable-closable lid member provided on the upper portion of said housing for shielding from light the interior of said housing having said guide portion and said take-up portion when said bag is taken up onto said take-up portion.

4,992,816

IMAGE RECORDING APPARATUS AND METHOD

Hiroshi Nakamura, and Nagao Ogiwara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 8, 1989, Ser. No. 405,819
Claims priority, application Japan, Sep. 9, 1988, 63-226201; Sep. 9, 1988, 63-226202; Sep. 9, 1988, 63-226203
Int. Cl.[5] H05B *1/00;* G03B *27/30*
U.S. Cl. 354—301 8 Claims



1. An image recording apparatus for obtaining an image by heat developing a heat developable light-sensitive material and for transferring the image onto an image-receiving material, comprising:
- a heating drum adapted to be rotated in a predetermined direction;
- superposing means disposed on an outer periphery of said heating drum and adapted to superpose said heat-developable light-sensitive material and said image-receiving material on each other;
- pressing means for pressing and winding said superposed heat-developable light-sensitive material and said image-receiving material around said outer periphery of said heating drum over a predetermined range in the rotating direction of said heating drum so as to obtain an image by heat developing said heat-developable light-sensitive material and transfer the image onto said image-receiving material, said pressing means including an endless belt, which is brought into contact with said outer periphery of said heating drum over said predetermined range, and a plurality of winding rollers around which said endless belt is wound and which press said endless belt over said predetermined range, a first winding roller defining an end of a roller train formed by said winding rollers over said predetermined range being disposed in such a manner that a predetermined gap is provided between said endless belt and said outer periphery of said heating drum on a line connecting an axis thereof and an axis of said heating drum; and
- a separating device for separating said heat-developable light-sensitive material and said image-receiving material from each other after said transfer is effected and said heat-developable light-sensitive material and said image receiving material are released from said heating drum.

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4,992,817

FOCUS DETECTING DEVICE SWITCHING BETWEEN PASSIVE AND ACTIVE DETECTION

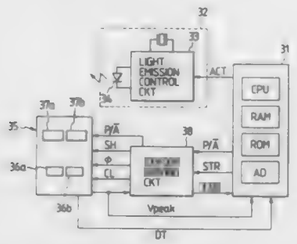
Keisuke Aoyama; Kenji Suzuki; Akira Ishizaki; Yasuo Suda, and Keiji Ohtaka, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,953

Claims priority, application Japan, Aug. 6, 1988, 63-195320; Aug. 6, 1988, 63-195321

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—403 15 Claims



1. A focus detecting device or a distance detecting device having (1) a first mode in which light from an object is accumulated in a light accumulation type receiving portion without light from a light source being projected onto the object and focus detection or distance calculation is effected on the basis of the accumulated output of said light receiving portion, and (2) a second mode in which by a light from a light source is projected onto the object, the light from the object is accumulated in said light receiving portion and focus detection or distance calculation is effected on the basis of the accumulated output of said light receiving portion, said device including:

(a) an accumulation control circuit for controlling said accumulation operation performed by said light-receiving portion;

(b) a processing circuit for performing the focus detection or distance calculation on the basis of an accumulated output accumulated by said light receiving portion after controlling of the accumulation operation by said control circuit; and

(c) a change-over circuit for automatically changing over between said first and second modes on the basis of the accumulation state during the accumulation operation before the control of the accumulation operation by said accumulation control circuit is terminated.

4,992,818

FOCUS DETECTING DEVICE

Toshihiko Karasaki, and Kazumi Sugitani, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 6, 1988, Ser. No. 191,016

Claims priority, application Japan, May 8, 1987, 62-113186

The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.

Int. Cl.[5] G03B *13/36;* G02B *7/34*

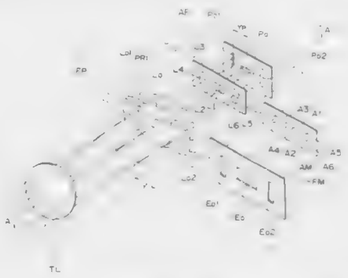
U.S. Cl. 354—407 9 Claims

1. A focus detecting device, comprising:

an objective lens for forming an image of an object;

a plurality of optical blocks each of which is composed of a condenser lens, located behind the objective lens, for converging the light passed through the objective lens; and a pair of image re-forming lenses, located behind the condenser lens, for re-forming a pair of secondary images of the image formed by the objective lens;

a light receiving means for receiving the pair of the secondary images formed by the secondary image forming means to produce a light intensity distribution signal representing the light intensity distribution of the secondary images, said light receiving means including a plurality of light receiving units, each of which corresponds to each of the plurality of optical blocks; and



a focus condition calculating means for calculating a focus condition of the objective lens by means of detecting the distance between the pair of the secondary images in accordance with the light intensity distribution signal.

4,992,819

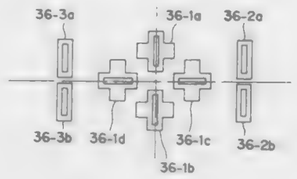
FOCUS DETECTING DEVICE HAVING A PLURALITY OF DETECTING AREAS AND CAMERA PROVIDED WITH THE SAME

Keiji Ohtaka; Takeshi Koyama, both of Yokohama, and Yasuo Suda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,607

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—408 18 Claims



1. A focus detecting device for detecting a focus condition of an objective lens, comprising:

at least three pairs of secondary imaging lenses formed on an image plane side of the objective lens, each lens pair forming a pair of light distributions corresponding to an image of an object to be photographed, said three lens pairs being disposed so that at least two pairs of light distributions have light segments which intersect each other and at least one other pair of light distributions has light segments which do not intersect each other, each pair of secondary imaging lenses having lenses with contacting peripheral portions.

4,992,820

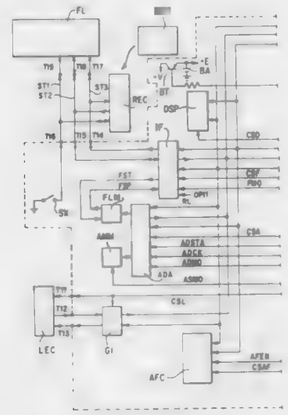
CAMERA SYSTEM

Yoshiiku Kikukawa, Kishiwada; Masayuki Nakasa, Sennan; Tadahiro Yoshida, Takatsuki; Mashio Kitaura, Tondabayashi; Masaaki Nakai, Kawachinagano; Takanobu Omaki, Sennan, and Nobuyuki Tanijuchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 328,551, Mar. 24, 1989, which is a continuation of Ser. No. 820,656, Jan. 21, 1986, Pat. No. 4,816,853. This application Oct. 13, 1989, Ser. No. 421,619

Int. Cl.[5] G03B *7/08, 17/36*

U.S. Cl. 354—410 2 Claims



1. A camera accessory attachable to a camera body, comprising:

means for receiving light measuring data which indicate a light measuring amount measured in the camera body;

means for setting a frame number to be photographed successively to produce a frame number signal indicating the set frame number;

means for setting a shifting amount of an exposure value between successive frames to produce a shifting amount signal indicating the set shifting amount;

means for counting a frame number which has been photographed to produce a count signal indicating the counted frame number;

means for calculating an exposure value used at a next photographing in accordance with the light measuring data, the frame number signal, the shifting amount signal and the count signal; and

means for transmitting the calculated exposure value towards the camera body in order to control the exposure amount in accordance with the calculated exposure value.

4,992,821

CAMERA

Masayoshi Kiuchi; Ichiro Ohnuki, both of Kanagawa; Tsunemasa Ohara, and Tetsuya Nishio, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1989, Ser. No. 390,523

Claims priority, application Japan, Aug. 16, 1988, 63-203577; Aug. 16, 1988, 63-203578

Int. Cl.[5] G03B *7/26*

U.S. Cl. 354—484 9 Claims

1. A camera comprising:

(a) a film feeding mechanism for feeding a film to take an exposure on a next frame;

(b) a charging mechanism;

(c) a focusing mechanism;

(d) a first actuator serving as a drive source for driving said film feeding mechanism;

(e) a second actuator serving as a drive source for driving said charging mechanism;

(f) a third actuator serving as a drive source for driving said focusing mechanism;

(g) voltage detecting means for detecting a voltage of a power source; and

(h) control means for controlling said first, second and third actuators, said control means permitting, when the voltage of said power source detected by said voltage detecting means has a value not less than a predetermined value, said third actuator to operate when said first actuator is in process of operating, and said control means prohibiting, when the voltage of said power source detected by said voltage detecting means has a value less than the predetermined value, said third actuator from operating when said first actuator and said second actuator are in process of operating.

4,992,822

OPTICAL PRINTING SYSTEM

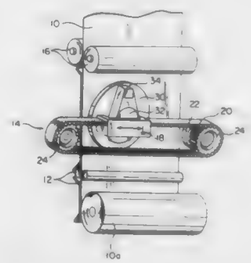
Takemi Yamamoto; Koji Kobayakawa; Ichiro Sasaki; Ryohei Komiya; Akira Sago; Izumi Takagi; Jun Sakai, and Yumio Matsumoto, all of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 185,832, Apr. 25, 1988, Pat. No. 4,851,881. This application Jul. 24, 1989, Ser. No. 384,748

Claims priority, application Japan, Apr. 1, 1986, 61-76282; May 19, 1986, 61-113877; May 19, 1986, 61-113876; May 19, 1986, 61-113872; May 19, 1986, 61-11387.; Jul. 9, 1986, 61-105432; Jul. 25, 1986, 61-175897; Aug. 1, 1986, 61-182529; Nov. 20, 1986, 61-277595

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 26 Claims



1. An optical printing system for printing an image on a recording sheet, the improvement which comprises in

that said recording sheet is coated with microcapsules on one surface thereof, each said microcapsule enveloping a first component which changes color when reacted with second component, said microcapsule further enveloping a third component which varies the mechanical strength of microcapsule when light is projected thereto;

that said printing is carried out by means for selectively exposing a light against said one surface of the recording sheet in accordance with an image to be printed on said recording sheet, said exposing being carried out by repeating a predetermined-period exposure at a predetermined interval against the same portion of said one surface of the recording sheet in accordance with the same image, and means for rupturing the microcapsules whose mechanical strength is low; and

that said optical printing system includes control means for carrying out said printing in accordance with a predetermined sequence.

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4,992,823

IMAGE RECORDING APPARATUS FEASIBLE FOR REPLACEMENT OF IMAGE RECORDING MEDIUM

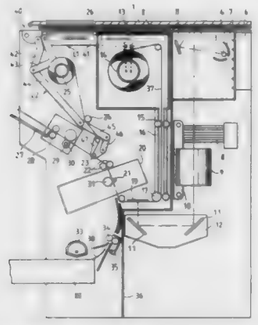
Tsuyoshi Suzuki, Nagoya; Osamu Nagata, Aichi; Makoto Yamada, Gifu; Toshio Sugiura, Nagoya; Eiji Shibata, Nagoya; Kazuhito Ishida, Nagoya, and Kazumasa Makino, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 8, 1988, Ser. No. 281,215

Claims priority, application Japan, Dec. 15, 1987, 62-191014[U]; Feb. 12, 1988, 63-17646[U]

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 14 Claims



1. An image recording apparatus for forming an image on an elongated web like image recording medium, said apparatus defining a sheet path in which the elongated web like image recording medium moves in one direction and comprising:

a main frame defining an upper opening;

an exposure unit provided in said main frame and including an exposure table located along said sheet path for exposing said elongated web like image recording medium to light;

a developing unit provided in said main frame and disposed on said sheet path downstream of said exposure table with respect to said sheet path for developing said light exposed image recording medium;

a sheet roll cartridge provide in said main frame disposed on said sheet path upstream of said exposure table with respect to said sheet path for accommodating therein non-light exposed elongated web like image recording medium, said sheet roll cartridge having a cartridge shaft detachable from said main frame; and

a detachable take-up means provided in said main frame and disposed on the sheet path downstream of said developing unit with respect to said sheet path for winding already exposed image recording medium thereover; said detachable sheet roll cartridge and said detachable take-up means being geometrically positioned at an upper portion of said main frame.

4,992,824

APPARATUS AND METHOD UTILIZING AN LCD FOR PRINTING

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 31, 1989, Ser. No. 386,951

Int. Cl.[5] G03B *27/80*

U.S. Cl. 355—38 16 Claims

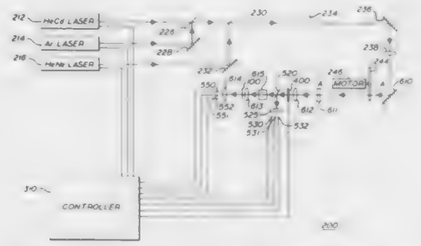
1. Apparatus for determining exposure levels for printing or enlarging an image recorded in a medium, said apparatus comprising:

an LCD modulator array consisting of a plurality of liquid crystal pixels each of which has an open state for transmitting radiation incident thereto and a closed state for blocking radiation incident thereto;

means for irradiating said LCD modulator array with at least one color or light;

first photosensor means disposed for detecting at least a portion of the radiation transmitted by said LCD modulator array;

second photosensor means disposed for detecting at least a



portion of the radiation which impinges upon and is affected by the medium; and

controller means for:

(a) sending signals to the LCD modulator array to cause said pixels to open and close in sequence, one at a time, at a rate which is faster than the larger of the opening or closing time of said pixels; and

(b) receiving responses from said first and second photosensor means.

4,992,825

METHOD OF FORMING PATTERN AND PROJECTION ALIGNER FOR CARRYING OUT THE SAME

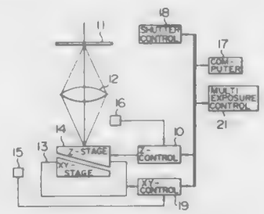
Hiroshi Fukuda, Kokubunji; Norio Hasegawa; Toshihiko Tanaka, both of Tokyo, and Toshiei Kurosaki, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 83,211, Aug. 10, 1987. This application Jun. 21, 1989, Ser. No. 369,150

Claims priority, application Japan, Aug. 8, 1986, 61-185087; Sep. 5, 1986, 61-207835

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 13 Claims



1. A reduction projection aligner comprising:

first means for holding a mask having a predetermined mask pattern;

an exposure shutter;

second means for controlling said exposure shutter;

a stage for holding a substrate on which a pattern is to be formed;

third means for positioning said substrate at predetermined plural positions;

an optical system for projecting said mask pattern on said substrate;

fourth means for storing the number of image planes or said mask pattern, the positions of each said image planes on an optical axis of said optical system and the quantity of light incident on each image plane; and

fifth means for controlling said second and third means such that a plurality of said image planes of said mask pattern are formed on said substrate spaced from each other in the direction of said optical axis.

4,992,826

CONTACT EXPOSURE APPARATUS

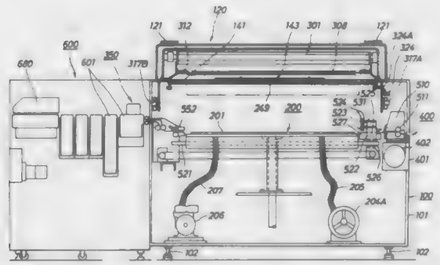
Hiromitsu Nakabayashi, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Oct. 10, 1989, Ser. No. 418,547

Claims priority, application Japan, Oct. 13, 1988, 63-260336

Int. Cl.[5] G03B *27/20*

U.S. Cl. 355—84 21 Claims



1. A contact exposure apparatus wherein a film original is on a photosensitive material, a transparent cover sheet covers said original, said original and said photosensitive material are in contact with each other by vacuum suction, and said original is exposure-scanned by an exposure unit through said cover sheet,

wherein said exposure unit comprises light collimating means for collimating light emitted from a light source, an original table in a first chamber which forms a bright room or a darkroom using an openable light-shielding cover, and

a photosensitive material mounting table in a second chamber which is shielded from light by a light-shielding curtain.

4,992,827

IMAGE FORMING APPARATUS

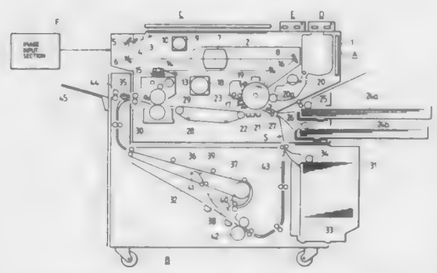
Kenji Kobayashi, and Akimaro Yoshida, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,637

Claims priority, application Japan, Dec. 28, 1987, 62-329681; Dec. 28, 1987, 62-329682; Dec. 28, 1987, 62-329683; Dec. 28, 1987, 62-329684

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—202 19 Claims



1. An image forming apparatus comprising:

reading means for reading image data from external memory means storing image data in advance, wherein said external memory means is detachable from said reading means;

first image forming means for forming a first image on a recording material;

second image forming means for forming a second image on the recording material in accordance with the image data outputted from said reading means;

feed means for feeding the recording material to an image forming position; and

control means for controlling said feed means so as to provide such a control that after formation of the first image or the second image on one side of the recording material by either said first image forming means of said second image forming means, the second image or the first image is either formed on the same side or the other side of the recording material by the other image forming means.

4,992,828

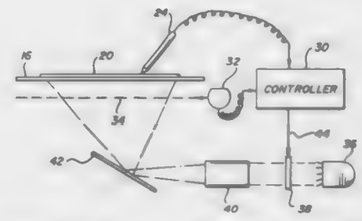
DIGITIZER HAVING SELECTED AREA DESIGNATION

Christopher B. Liston, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1989, Ser. No. 448,398

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—202 20 Claims



1. Apparatus for designating and area on a top side of an original document which is to receive special editing, said apparatus comprising:

means for selecting an area, including size and location of the area, on the top side of the original document which is to be edited;

means for producing a two-dimensional light image which is shaped to distinguish the selected area; and

means for projecting said two-dimensional light image through the original document from a bottom side to the top side to make the selected area distinguishable from other areas on the original document.

4,992,829

FLASH LAMP INTENSITY CONTROL FOR ELECTROSTATOGRAPHIC REPRODUCTION MACHINES

Charles F. Sander, Webster; Thomas J. Hammond, Penfield; Edward A. Powers, Penfield, and Winston J. Powers, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1989, Ser. No. 344,776

Int. Cl.[5] G03G *15/04*; G03B *27/80*

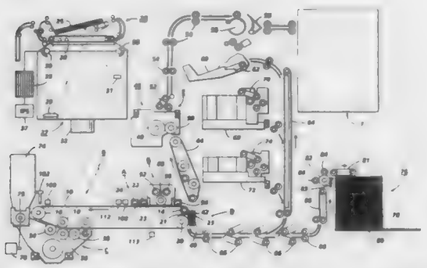
U.S. Cl. 355—208 7 Claims

1. A process for assuring that the intensity at which images are exposed to the photoreceptor in a reproduction machine is sufficient, said machine having at least one main flash lamp for image exposure, chargeable capacitor means for driving said main flash lamp to provide a predetermined image exposure intensity, a power source for charging said capacitor means to a level sufficient to provide said predetermined image exposure intensity, and a relatively small preflash lamp for calibrating image intensities, comprising the steps of:

(a) actuating said preflash lamp to expose each image prior to exposure of said image by said main flash lamp;

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(b) determining the exposure intensity required to expose said image from the light reflected from said image on exposure by said preflash lamp;
(c) where the exposure intensity for said image is greater than the predetermined image exposure intensity provided



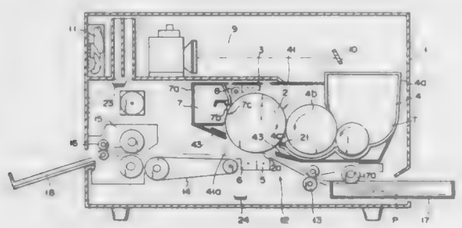
by said main flash lamp, increasing power to said capacitor means by an amount sufficient to raise the exposure intensity of said main flash lamp to a level greater than said predetermined image exposure intensity whereby to provide the increased exposure intensity required for said image.

4,992,830

IMAGE RECORDING APPARATUS THAT PREVENTS TONER DISPERSION

Mitsuaki Kohyama, Higashikurume, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 16, 1990, Ser. No. 494,448
Claims priority, application Japan, Mar. 17, 1989, 1-63801
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—215 12 Claims



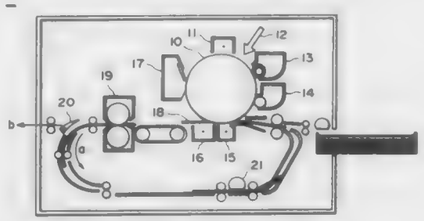
1. An apparatus for forming an image on a recording medium, comprising:
an image bearing member;
means for forming the latent image on said image bearing member;
means for developing the latent image on said image bearing member with a developing powder;
means for transferring the developed image formed on said bearing member to the recording medium;
means for removing the developing powder remaining on the image bearing member to clean the image bearing member, after the developed image is transferred onto the recording medium;
a unit having said developing means and said removing means;
means for housing said unit, said image forming means and said transferring means, said receiving unit being detachably mounted in said housing means; and
means for collecting the developing powder which is dispersed or fallen from said unit, which includes a means for chemically processing the collected developed powder.

4,992,831

IMAGE FORMING APPARATUS WITH PLURAL DEVELOPING DEVICES

Tsuyoshi Kunishi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,594
Claims priority, application Japan, Jan. 19, 1987, 62-9448; Jan. 19, 1987, 62-9449; Jan. 19, 1987, 62-9451
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 15 Claims



1. An image forming apparatus, comprising:
an image bearing member;
means for forming first and second latent images on said image bearing member;
first developing means for developing the first latent image on said image bearing member into a first toner image;
second developing means for developing the second latent image on said image bearing member into a second toner image; and
toner image processing means for transferring the first and second toner images from said image bearing member onto a transfer material, for separating the transfer material from said image bearing member by electric discharge, and for fixing the transferred toner images on the transfer material;
wherein the second latent image is formed on said image bearing member after the first toner image formed by said first developing means has been transferred to the transfer material, wherein the second toner image is transferred to the transfer material after the transfer material has received the first toner image, has been separated from said image bearing member, and has been subjected to the image fixing by said toner image processing means and wherein a developer of said second developing means has a toner deposition parameter which is larger than that of a developer of said first developing means.

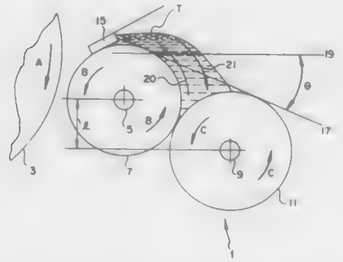
4,992,832

DEVELOPING APPARATUS WITH A DEVELOPER REGULATING MEMBER

Takeshi Watanabe, Toyonaka; Kikunosuke Tsuji, Sakai; Masahiko Sakae, Ikoma; Setsuo Hori, Izumi; Satoshi Kuroyanagi, Kaminoyama, and Yoshiyuki Uehara, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 14, 1989, Ser. No. 435,929
Claims priority, application Japan, Nov. 15, 1988, 63-288243
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—259 1 Claim

1. A developing apparatus comprising:
a developing roller which conveys developer, on a surface thereof, by rotating in a predetermined direction, said developer being conveyed to a top of said developing roller and supplied therefrom to an image-holding means to develop a latent image thereon;
a supply roller which rotates to convey said developer to a top thereof to said developing roller, said supply roller and said developing roller keeping contact with each other and moving in opposite directions from each other at contact faces thereof; and
a regulating member which regulates an amount of said developer to be conveyed onto the surface of said developing roller,
wherein said supply roller is so disposed that an axis thereof is positioned lower than an axis of said developing roller while the top of said supply roller is positioned lower than



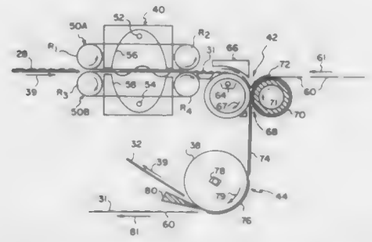
the top of said developing roller, and a tangent, which extends from a surface of said supply roller at a point near the top thereof as well as extends from the surface of said developing roller at a point near the top thereof, forms an angle of approximately 20 to 40 degrees with a horizontal line.

4,992,833

FIXING METHOD AND APPARATUS HAVING A TRANSFER-FIXING CHILLING DRUM

John E. Derimiggio, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 10, 1989, Ser. No. 391,899
Int. Cl.[5] G03G *15/14, 15/20*
U.S. Cl. 355—282 2 Claims



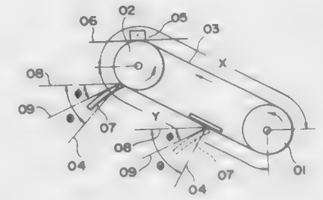
1. In an electrostatographic copier or printer, in which loose toner images can be formed on an image bearing member, apparatus for fixing such loose toner images to a suitable receiver or copy sheet, the apparatus including:
(a) an intermediate fixing member for receiving the unfused loose toner images completely from the image bearing member;
(b) means for heating the received toner images to form completely fused toner images directly on said intermediate fixing member; and
(c) means for transfer-fixing said fused toner images from said intermediate fixing member onto an unheated receiver or copy sheet, said means for transfer-fixing said fused images further including:
(i) means for sandwiching the fused images on said intermediate fixing member with a registered unheated receiver or copy sheet of paper; and
(ii) transfer-fixing means for causing the sandwiched fused images to transfer from the intermediate fixing member and be fixed to the registered receiver or copy sheet of paper, said transfer-fixing means including a pressure plate and a chilling drum around which the sandwiched images are wrapped such that said intermediate fixing member is against said drum.

4,992,834

CLEANING BLADE ARRANGEMENT FOR IMAGE FORMING APPARATUS

Akira Yamamoto, Zama; Takahisa Yamada, Sagamihara; Tadashi Nishio, Hino, and Kazuo Noda, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,608
Claims priority, application Japan, Dec. 21, 1987, 62-321431
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—299 6 Claims



1. In an image forming apparatus comprising:
a main body;
an image carrier rotatably disposed in said main body and having an image carrier surface;
means for forming a toner image on said image carrier surface;
transfer means located near said image carrier and having a transfer unit for transferring the toner image formed on said image carrier surface to a recording member; and
cleaning means located in a downstream side of said transfer unit in a rotational direction of said image carrier and having a cleaning blade for scraping a residual toner left on said image carrier surface,
the improvement in which
said transfer unit is located on a portion of said image carrier such that an imaginary normal extending outward from said image carrier surface is directed upward with respect to a horizontal direction and said transfer unit transfers the toner image to a lower surface of the recording member; and
said cleaning blade is brought into contact with a downward moving portion of said image carrier which has passed through said transfer unit at a contact angle of not less than 90° relative to the downstream portion of the carrier in a "with" contact state, and the residual toner scraped by said cleaning blade is moved downward along an upper surface of said cleaning blade.

4,992,835

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Hideki Matsuzaka, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 5, 1990, Ser. No. 533,288
Claims priority, application Japan, Jun. 12, 1989, 64-148583
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—312 12 Claims

1. An electrophotographic image forming apparatus comprising:
an upper housing portion;
a lower housing portion, said upper housing portion being rotatably supported to said lower housing portion around an end portion of said lower housing portion;
paper feed means for feeding a sheet of paper;
a paper transport path having a first end coupled to said

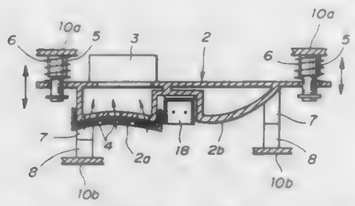
VOL 1123 ISS 2 FE 12 1991 UMI

paper feed means and a second end opposite to said first end;

image recording means, provided in said lower housing portion, for recording an image on said paper on said paper transport path;

suction transport means, provided in said upper housing portion, for sucking said paper on said paper transport path and transporting said paper along said paper transport path, said suction transport means having a paper transport surface on which said paper is transported in a state where said paper is sucked;

paper eject means, coupled to the second end of said paper transport path, for ejecting said paper on said paper transport path;



supporting means for flexibly supporting said suction transport means to said upper housing portion;

a first group of projections projecting downward from said suction transport unit; and

a second group of projections projecting upward from said lower housing portion;

wherein when said upper housing portion is closed, said first group of projections come into contact with said second group of projection so that said paper transport surface of said suction transport means is positioned with respect to said paper transport path by said first and second groups of projections.

4,992,836

DEVICE FOR CONTROLLING THE ELECTRICAL SUPPLY TO A LOAD, IN A "SMART" POWER INTEGRATED CIRCUIT

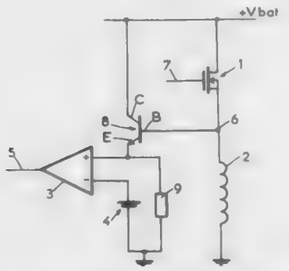
Thierry M. A. Sicard, Fenouillet, France, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 324,164

Claims priority, application France, Mar. 16, 1988, 88 03374

Int. Cl.[5] H01L *29/90*

U.S. Cl. 357—13 **8 Claims**



1. A device for controlling the electrical supply to a load, in a "smart" power integrated circuit, comprising a circuit (3) sensitive to the voltage at the terminals of the load, a supply circuit of the load and a protective component installed between a terminal of the load and an input of the sensitive circuit to protect the latter from excess voltages developed at the terminals of the load, wherein this protective component comprises a "vetrtical" bipolar transistor (8) integrated in the device and connected in an emitter-follower circuit on the input of the sensitive circuit in such a manner as to oppose its emitter-base junction of maximum breakdown reverse voltage Vebo to a maximum voltage Vc less than Vebo developed at the terminals of the load (2) to avoid any deterioration of the sensitive circuit, said sensitive circuit being connected with the transistor's emitter and not with its base, and said load being connected with the transistor's base and not with its emitter.

4,992,837

LIGHT EMITTING SEMICONDUCTOR DEVICE

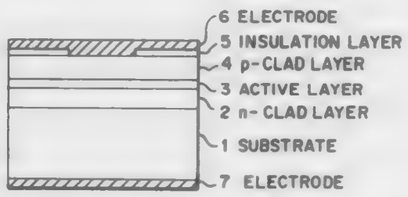
Kazuo Sakai; Yukitoshi Kushiro, and Kohsuke Nishimura, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,641

Claims priority, application Japan, Nov. 15, 1988, 63-286895; Jan. 24, 1989, 1-13127; Jan. 24, 1989, 1-13128

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 **9 Claims**



1. A light emitting semiconductor device comprising;

a substrate,

an active layer and a pair of clad layers sandwiching said active layer, deposited on said substrate,

said substrate being made of one selected from GaAs, GaP, InP, Si, Ge, ZnSe and mixed crystal of GaAsP,

said active layer being made of at least one selected from II-VI group compound semiconductor, I-III-VI_2 group compound semiconductor, and II-IV-V_2 group compound semiconductor,

said clad layer being made of II-transition metal-VI group compound semiconductor, which is substantially lattice-matched to semiconductor of said active layer, and has higher energy gap than that of said active layer.

4,992,838

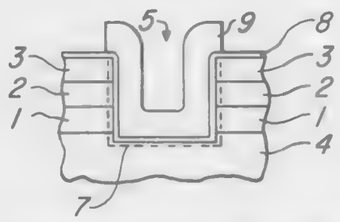
VERTICAL MOS TRANSISTOR WITH THRESHOLD VOLTAGE ADJUSTMENT

Kiyoshi Mori, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 29, 1988, Ser. No. 161,706

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.4 **8 Claims**



1. A metal-oxide-semiconductor transistor comprising:

A. a substrate, said substrate presenting at least a base region;

B. a doped lower source-drain layer of a first conductivity type formed on said base region, and presenting at least a first substantially vertical sidewall extending upwardly from said base region;

C. a channel layer, more heavily doped than said lower source-drain layer, of a second conductivity type formed on said lower source-drain layer and presenting at least a second substantially vertical sidewall, said second sidewall extending upwardly from said first sidewall and at least said channel layer including a counterdoped threshold-voltage-adjustment region in at least a margin of said second sidewall;

D. an upper source-drain layer of said first conductivity type, less heavily doped than said channel layer, formed on said channel layer and presenting at least a third substantially vertical sidewall, said third sidewall extending upwardly from said second sidewall;

E. an insulating oxide layer on at least said base region, first, second and third sidewalls; and

F. a gate electrode on said insulating oxide layer opposite at least said channel layer.

4,992,839

FIELD EFFECT THIN FILM TRANSISTOR HAVING A SEMICONDUCTOR LAYER FORMED FROM A POLYCRYSTAL SILICON FILM CONTAINING HYDROGEN ATOM AND HALOGEN ATOM AND PROCESS FOR THE PREPARATION OF THE SAME

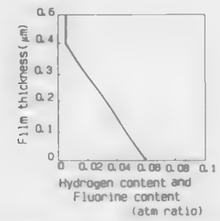
Shigeru Shirai, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,862

Claims priority, application Japan, Mar. 23, 1987, 62-68305; Mar. 24, 1987, 62-69776

Int. Cl.[5] H01L *27/01, 27/13, 29/78, 45/00*

U.S. Cl. 357—23.7 **1 Claim**



1. A field effect thin film transistor comprising a substrate, a gate electrode, an insulating layer, a semiconductor layer, first and second n^+ type layers being disposed on said semiconductor layer, a source electrode being disposed on said first n^+ type layer and a drain electrode being disposed on said second n^+ type layer, characterized in that said semiconductor layer is formed from a polycrystal silicon film with a localized state density of $10^{17}\,cm^{-3}ev^{-1}$ or less which contains silicon atoms as the matrix, hydrogen atoms at a concentration of 0.1 atomic ratio or less and fluorine atoms at a concentration of 0.05 atomic ratio or less, said concentration of at least one of said hydrogen atoms and said fluorine atoms being enhanced in a region of said semiconductor layer adjacent to said substrate and being reduced in a region of said semiconductor layer on the side opposite the substrate side.

4,992,840

CARBON DOPING MOSFET SUBSTRATE TO SUPPRESS HIT ELECTRON TRAPPING

Homayoon Haddad; Leonard Forbes, and Wayne P. Richling, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 21, 1989, Ser. No. 412,067

Int. Cl.[5] H01L *29/78, 29/10, 29/06*

U.S. Cl. 357—23.15 **13 Claims**

1. In an integrated circuit, a hot-electron aging-resistant metal-oxide-silicon field effect transistor (MOSFET) comprising:

a silicon substrate having an upper substrate surface;

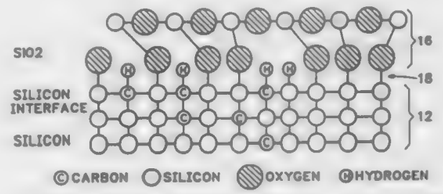
a gate oxide layer covering a first portion of the substrate and forming an oxide-silicon interface at the substrate surface;

a conductive gate contact overlying the gate oxide;

a conductive source contact covering a second portion of the substrate on one side of the gate oxide layer;

a conductive drain contact covering a third portion of the substrate on an opposite side of the gate oxide layer;

a channel diffusion of dopant impurities in the first portion of



the substrate under the gate oxide defining a threshold voltage of the transistor;

source and drain diffusions of dopant impurities in the second and third portions of the substrate, respectively;

the source and drain diffusions being spaced so that field strength in the drain is at least 10^5 volts per centimeter such that hot carriers are generated in the first portion of the silicon substrate; and

the first portion of the silicon substrate being doped with carbon atoms in a concentration of at least $1E16/cm^3$ at the interface so that trapping of the hot carriers at the interface is suppressed and a shift in the threshold voltage over time is minimized.

4,992,841

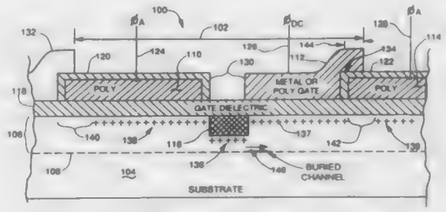
PSEUDO UNIPHASE CHARGE COUPLED DEVICE

James Halvis, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 66,292, Jun. 25, 1987, abandoned. This application Oct. 6, 1989, Ser. No. 420,611

Int. Cl.[5] H01L *29/78, 27/14, 31/00*

U.S. Cl. 357—24 **16 Claims**



1. A pseudo uniphase charge coupled device cell comprising the combination of

a semiconductor substrate member of a first type electrical conductivity having a second type electrical conductivity buried channel signal charge communicating doped layer disposed thereon;

a gate dielectric layer disposed over said doped layer;

a clock gate electrode element disposed over said gate dielectric layer adjacent said signal charge communication channel in said doped layer at the input end of said cell, said clock gate electrode element being overlaid by a layer of electrical insulation and being connected to a pulsed source of single phase clock signal;

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a clocked gate well region of first impurity concentration and said second type electrical conductivity disposed in said signal charge communicating channel below the central and trailing edge portions of said clock gate electrode element;

a clocked barrier region of second electrical conductivity type and second impurity concentration decreased from said first impurity concentration and located below the input leading edge of said clock gate electrode in said signal charge communicating channel adjacent said clocked well region;

a second gate electrode element disposed over said gate dielectric layer adjacent said signal charge communication channel in said doped layer at the output end of said cell, said second gate electrode having at the cell output end thereof an electrode portion which overlays the electrically insulated clock gate electrode element of the next following cell and at the mid cell end thereof a separation gap with the output end of said clock gate electrode, said second electrode element being connected to a source of fixed electric potential;

a second well region of second type electrical conductivity and their impurity concentration disposed in said signal charge communicating channel below said second gate electrode element;

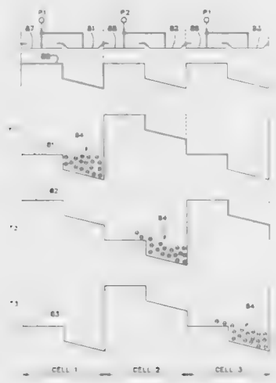
a reverse signal charge flow opposing virtual gate region of said first electrical conductivity type located in said signal charge communicating channel underlying said separation gap, said virtual gate region being of a fourth and greater impurity concentration than said clocked gate well region.

4,992,842

CHARGE-COUPLED DEVICE CHANNEL WITH COUNTINOUSLY GRADED BUILT-IN POTENTIAL

Kei-Wean C. Yang, and John E. Taggart, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 7, 1988, Ser. No. 216,079
Int. Cl.[5] H01L *29/78*; G11C *19/28*
U.S. Cl. 357—24 10 Claims



1. A cell for a two-phase, charge-coupled device comprising:

a semiconductor substrate;

an insulator layer formed above said substrate; and

an electrode formed above said insulator layer, the substrate including a channel region of length coextensive with said electrode in one lateral direction for conducting charge carriers under said electrode,

the channel region comprising a first portion of substantial and continuous dimension in said lateral direction having a substantially homogeneous built-in potential in said lateral direction providing minimal electric field in said lateral direction and

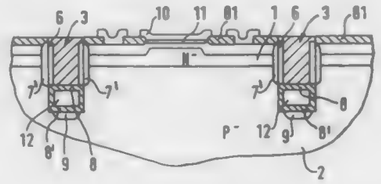
the channel region further comprising a second portion of substantial and continuous dimension in said lateral direction, said second portion including substantially all of the channel region other than said first portion, said second portion having a built-in potential continuously graded in said lateral direction so as to provide an electric field for propelling charge carriers in said lateral direction, said first and second portions of said channel region being aligned in said lateral direction.

4,992,843

COLLECTOR CONTACT OF AN INTEGRATED BIPOLAR TRANSISTOR

Lothar Blossfeld, Freiburg, and Christoph Volz, Emmendingen, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Continuation of Ser. No. 123,830, Nov. 23, 1987, abandoned.
This application Nov. 3, 1989, Ser. No. 433,406
Claims priority, application European Pat. Off., Dec. 18, 1986, 86117692
Int. Cl.[5] H01L *29/72, 27/12, 29/06*
U.S. Cl. 357—34 2 Claims



2. An improved collector contact to a collector zone of a lateral bipolar transistor in an integrated multi-device circuit, said collector zone being generally planar, extending horizontally to define a horizontally extending surface, and having a depth substantially less than any horizontal dimension, said collector zone being isolated at least in part by a vertically extending moat, said moat having a depth, a vertical sidewall and a bottom, comprising:

a thin vertically extending conductive layer disposed on said vertical sidewall of said moat, said conductive layer comprising a layer of polycrystalline silicon with dopants of the same conductivity type of said collector zone;

a highly doped contact zone of said conductivity type of said collector zone defined in said collector zone and adjacent to said vertical sidewall;

a collector contact electrically coupled to an upper rim segment of said vertically extending conductive layer so that a minimal amount of said horizontal extending surface of said collector is required for said collector contact; and

a first insulating layer disposed on and covering said bottom of said moat, said depth of the moat being at least equal to the thickness of the collector zone.

4,992,844

SEMICONDUCTOR DEVICE

Shigenori Yakushiji, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 22, 1988, Ser. No. 147,273
Claims priority, application Japan, Jan. 23, 1987, 62-12253
Int. Cl.[5] H01L *29/74, 29/78*
U.S. Cl. 357—38 18 Claims

1. A semiconductor device comprising:

an anode terminal;

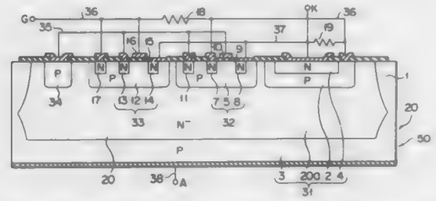
a cathode terminal;

a gate terminal for receiving a gate signal;

a thyristor that can be turned on at any phase of a voltage applied across the anode and cathode terminals, comprising an anode, a cathode, a cathode base, and an anode base, said anode being connected to said anode terminal, said cathode being connected to said cathode terminal, and said cathode base being connected to said gate terminal, wherein the thyristor is turned on in response to the applying of the gate signal to the gate terminal;

a first resistor connected between said gate terminal and said cathode base of said thyristor;

a first switch element of a normally conductive type having a control terminal and a current path, said current path being connected between said cathode terminal and said



cathode base of said thyristor, wherein the thyristor cannot be turned on at times when the first switch element is conductive; and

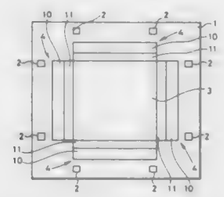
a second switch element of a normally nonconductive type for controlling said first switch element, having a control terminal and a current path, said current path of said second switch element being connected between said cathode terminal and said control terminal of said first switch element, and said control terminal of said second switch element being connected to said gate terminal, wherein the second switch element is conductive at times when the gate signal is applied to the gate terminal to render the first switch element nonconductive.

4,992,845

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING INPUT/OUTPUT BUFFER CELLS EACH COMPRISING A PLURALITY OF TRANSISTOR REGIONS ARRANGED IN A SINGLE LINE

Takahiko Arakawa; Kazuhiro Sakashita; Satoru Kishida; Toshiaki Hanibuchi; Ichiro Tomioka; Masahiro Ueda, and Yoshihiro Okuno, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,020
Claims priority, application Japan, Dec. 2, 1988, 63-306542
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—42 20 Claims



1. A semiconductor integrated circuit device comprising:

an internal logic gate portion provided in the central portion of a semiconductor chip;

an input/output buffer in which a plurality of input/output buffer cells are provided to surround said internal logic gate portion; and

a plurality of bonding pads respectively provided in the peripheral portions of said semiconductor chip corresponding to said plurality of input/output buffer cells;

each of said input/output buffer cells comprising first transistor region of a first conductivity type for output, a second transistor region of a second conductivity type for output, a third transistor region of the first conductivity type for input and logic, and a fourth transistor region of the second conductivity type for input and logic, the first through fourth transistor regions being disposed in a single line in a direction from said bonding pads to said internal logic gate portion, wherein said transistor regions for output are positioned adjacent each other and said transistor regions for input and logic are positioned adjacent each other.

4,992,846

POLYCRYSTALLINE SILICON ACTIVE LAYER FOR GOOD CARRIER MOBILITY

Nobuyoshi Sakakibara; Mitutaka Katada, both of Nishio; Seizi Huzino, Anjo, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 172,572, Mar. 24, 1988, abandoned.
This application Jul. 9, 1990, Ser. No. 549,547
Claims priority, application Japan, Mar. 25, 1987, 62-70740
Int. Cl.[5] H01L *29/04, 29/78, 27/12, 45/00*
U.S. Cl. 357—59 4 Claims



1. A semiconductor device comprising a silicon substrate, a silicon oxide film formed on said substrate and a polycrystalline silicon transistor formed on said oxide film, wherein said transistor comprises:

a first polycrystalline silicon layer having a thickness in a range between 0.5 μm to 1.5 μm and containing crystal grains having their (110) axes oriented perpendicular to a surface thereof, said first polycrystalline silicon layer being formed on said oxide film and having first asperities formed on a surface thereof;

a second polycrystalline silicon layer formed on said first polycrystalline silicon layer for defining source, channel and drain regions, and having a crystallinity substantially lattice-matched to that of said first polycrystalline silicon layer, said second polycrystalline silicon layer having a structure to compensate for the asperities on the surface of said first polycrystalline silicon layer and to flatten said surface and being used as an active region;

a polysilicon gate, and a gate insulating film formed with said gate through said gate insulating film on the second polycrystalline silicon layer of said channel region;

source, drain and gate electrodes respectively formed on the second polycrystalline silicon layer of said source reg.on, drain region and said polysilicon gate; and

an interlayer insulator film insulating said polysilicon gate and said gate electrode at least from said source and drain electrodes.

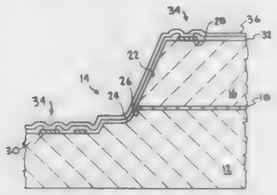
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4,992,847

THIN-FILM CHIP-TO-SUBSTRATE INTERCONNECT AND METHODS FOR MAKING SAME

David B. Tuckerman, Livermore, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Jun. 6, 1988, Ser. No. 202,296
Int. Cl.[5] H01L *29/04, 27/04*
U.S. Cl. 357—68 10 Claims



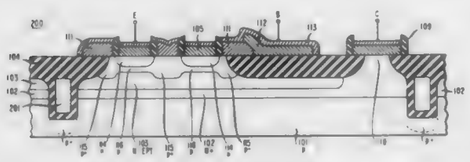
1. An interconnected hybrid integrated circuit structure, comprising:
an interconnect substrate;
one or more integrated circuit chips each having a back surface thereof bonded to a top surface of the substrate to form a hybrid integrated circuit structure;
a ground surface formed on one or more lateral sides of each chip and extending across the chip-to-substrate bond into the adjoining substrate after bonding to form a smooth flush chip-to-substrate joint;
electrical contacts on the chips;
electrical contacts on the substrate;
thin film metal wires formed on the ground surface on each chip to electrically connect the chip contacts to the substrate contacts.

4,992,848

SELF-ALIGNED CONTACT TECHNOLOGY

Gen M. Chin; Tzu-Yin Chiu, both of Marlboro; Te-Yin M. Liu, Red Bank, and Alexander M. Voshchenkov, Freehold, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 20, 1990, Ser. No. 482,444
Int. Cl.[5] H01L *21/28, 29/70, 23/48*
U.S. Cl. 357—68 9 Claims



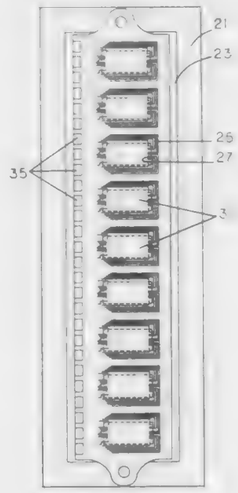
1. A semiconductor device comprising:
first semiconductor regions and second semiconductor regions formed in a semiconductor substrate;
a digitated electrode having fingers, each finger disposed over only one of said second semiconductor regions;
a contiguous conductive region self-aligned with said digitated electrode, said contiguous conductive region at least disposed over portions of said first semiconductor regions positioned between the fingers of said digitated electrode such that a common electrode is formed to electrically contact said first semiconductor regions; and
an insulating region interposed between the fingers of said digitated electrode and said contiguous conductive region, said digitated electrode, contiguous conductive region and insulating region being substantially planar and non-overlapping.

4,992,849

DIRECTLY BONDED BOARD MULTIPLE INTEGRATED CIRCUIT MODULE

Tim J. Corbett, and Alan G. Wood, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 15, 1989, Ser. No. 311,727
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] H01L *23/28, 23/16, 39/02, 27/10*
U.S. Cl. 357—72 28 Claims



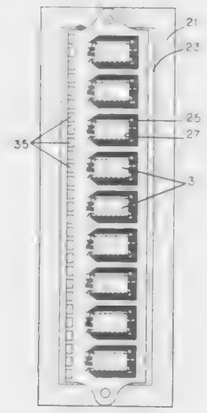
1. Board level integrated circuit in which a plurality of semiconductor circuit devices are arranged on a flexible circuit board and each of the semiconductor circuit devices is a distinct integrated circuit chip, characterized by:
(a) a support structure which includes a single polymeric sheet, the polymeric sheet having a plurality of die receiving portions thereon, having tape automated bond (TAB) pads thereon and having a first set of electrical circuit traces on one side of the polymeric sheet, the tape automated bond pads being in electrical communication with the circuit traces;
(b) the plurality of integrated circuit devices each consisting of circuit elements deposited on a substrate and having conductive bumps deposited thereon, the integrated circuit devices being located within separate ones of the die receiving portions of the single polymeric sheet, mounted to the polymeric sheet and connected to the polymeric sheet by being attached to the tape automated bond pads at the conductive bumps, and each of the integrated circuit devices being connected to the TAB leads on the polymeric sheet within its respective die receiving portion;
(c) a second set of circuit traces on a plane which is separate from said one side of the polymeric sheet, the second set of circuit traces being in electrical communication with the first set of electrical circuit traces;
(d) circuit terminals in electrical communication with the circuit traces, the circuit terminals configured in a pattern which conforms to a predetermined external circuit connection protocol; and
(e) means to mechanically stabilize the polymeric sheet with the integrated circuit devices mounted thereon so that the polymeric sheet, the integrated circuit devices and the circuit terminals are maintained in electrical communication during normal service.

4,992,850

DIRECTLY BONDED SIMM MODULE

Tim J. Corbett, and Alan G. Wood, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 15, 1989, Ser. No. 311,728
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] H01L *23/28, 23/16, 39/02, 27/10*
U.S. Cl. 357—72 13 Claims



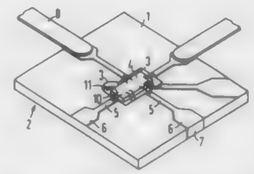
1. A memory array in which a plurality of memory circuit devices are arranged in a manner such that memory information is obtained by addressing bits of information from a selected number of the memory devices in the array in a format, and the format of bits forms a byte of memory data such that each byte includes bits from each memory device in the selected number of the circuit devices, and wherein the bits are addressed as rows and columns of information in a matrix on each memory device, characterized by:
(a) a support structure which includes a single polymeric sheet, the polymeric sheet having a plurality of die receiving portions thereon, having tape automated bond (TAB) leads thereon and having a first set of electrical circuit traces on one side of the polymeric sheet, the tape automated bond pads being in electrical communication with the circuit traces;
(b) a plurality of integrated circuitry memory devices, each device consisting of circuit elements deposited on a substrate and having conductive bumps deposited thereon, the integrated circuit devices being located within separate ones of the receiving portions of the single polymeric sheet, and connected to the polymeric sheet by being attached to the tape automated bond pads at the conductive bumps, and each of the integrated circuit devices being connected to the TAB leads on the polymeric sheet within its respective die receiving portion;
(c) a second set of circuit traces on a plane which is separate from said one side of the polymeric sheet, the second set of circuit traces being in electrical communication with the first set of electrical circuit traces;
(d) circuit terminals in electrical communication with the circuit traces, the circuit terminals configured in a pattern which conforms to a predetermined external circuit connection and memory address protocol; and
(e) means to mechanically stabilize the memory array so that the polymeric sheet, the memory devices and the circuit terminals are maintained in electrical communication during normal service.

4,992,851

CHARACTERISTIC IMPEDANCE-CORRECT CHIP CARRIER FOR MICROWAVE SEMICONDUCTOR COMPONENTS

Karl Platzoeder, Haimhausen, and Walter Zimmermann, Oberdorfen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 766,193, Sep. 16, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 163,198
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440171
Int. Cl.[5] H01L *23/12, 23/48*
U.S. Cl. 357—74 11 Claims



1. A chip carrier for microwave components comprising:
a chip support having a single electrically conductive region;
a dielectric substrate having upper and lower surfaces and at least one opening of a prescribed shape and size, said dielectric substrate being arranged on said support such that said lower surface rests on said support including the single electrically conductive region with said opening disposed over the single electrically conductive region, said dielectric substrate having larger lateral dimensions than said support, and thereby having portions protruding laterally outward away from said single electrically conductive region, the chip support and dielectric substrate defining an area of contact having an outer border;
at least one microwave semiconductor component including a ground terminal and arranged on said support within said opening and the ground terminal electrically connected to said single electrically conductive region within said opening; and
a plurality of microwave strip lines disposed on the upper surface of the dielectric substrate and electrically connected to the component, the strip lines each defining a width transition portion located substantially above the outer border as projected to the upper surface of the dielectric substrate, a narrow portion extending outward from the component to the width transition portion, and a widened portion extending outward from the width transition portion, wherein the strip lines are widened at the width transition portion such that the impedance of the strip lines remain substantially constant along the length of the strip lines;
the widened portions also functioning to facilitate the electrical connection of other materials which will later be applied to the chip carrier.

4,992,852

CIRCUIT WITH A COMB FILTER FOR CAUSING COLOR DIFFERENCE SIGNALS TO COINCIDE ON EACH SCANNING LINE

Ikuhisa Sekizawa, and Kazuo Okada, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 258,145
Claims priority, application Japan, Oct. 3, 1987, 62-249110
Int. Cl.[5] H04N *11/22*
U.S. Cl. 358—11 8 Claims

1. A circuit for producing a chroma signal which includes both a first and a second color difference signal on each scanning line in response to a line-sequential color difference signal

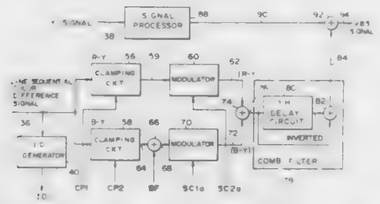
VOL 1123 ISS 2 FE 12 1991 UMI

in which a first and a second color difference signal appear alternately on consecutive scanning lines, comprising:

carrier generating means for generating a first color subcarrier of a first phase and a second color subcarrier of a second phase, said first and second phase being different from each other and in synchronism with the line-sequential color difference signal;

first modulator means for applying balanced modulation to the first color subcarrier by using the first color difference signal;

second modulator means for applying balanced modulation



to the second color subcarrier by using the second color difference signal;

first adder means for adding an output of said first modulator means to an output of said second modulator means;

delay means for delaying an output of said first adder means by a period of time which is substantially equal to one horizontal scanning period to produce a resultant, delayed output in a phase opposite to a phase of the output of said first adder means; and

second adder means for adding an output of said delay means to the output of said first adder means to produce the chroma signal.

4,992,853

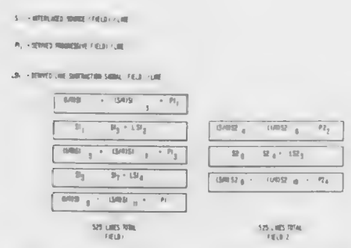
SYSTEM FOR TRANSMISSION AND RECEPTION OF A HIGH DEFINITION TIME MULTIPLEXED ANALOG COMPONENT (HDMAC) TELEVISION SIGNAL HAVING AN INTERLACED INPUT/OUTPUT FORMAT

Alan P. Cavallerano, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 271,136

Int. Cl.[5] H04N *11/02, 7/12*

U.S. Cl. 358—12 **7 Claims**



1. A method of encoding an interlaced television signal having a predetermined number of frames per second, each frame consisting of a plurality of fields each having a plurality of lines, each line comprising a luminance component having a predetermined luminance bandwidth and at least one chrominance component, for transmission or recording with a channel bandwidth more narrow than said luminance bandwidth, comprising the steps of:

processing said plurality of lines in groups, each group containing information from a multiplicity of said lines, to generate a plurality of signal packets, said signal packets comprising a first luminance component, having a first time compression ratio, a second luminance component having a second time compression ratio, said second time compression ratio being different from said first time compression ratio, said first and second luminance components being formed from at least two lines at mixing ratios which change at field rate, at least one chrominance component separate from said luminance components, and first and second line subtraction components; and

combining said signal packets to generate a time multiplexed line signal having said signal packets in time slots thereof.

4,992,854

VIDEO SIGNAL PROCESSING CIRCUIT OF A VIDEO CAMERA

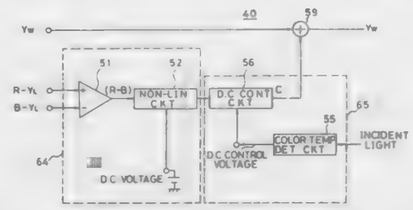
Michihiro Aso; Taro Watanabe, and Kazuhiko Ueda, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 13, 1988, Ser. No. 243,906

Claims priority, application Japan, Sep. 18, 1987, 62-235675

Int. Cl.[5] H04N *9/75*

U.S. Cl. 358—29 **9 Claims**



1. A video signal processing circuit of a single chip color camera comprising:

a color separation filter for performing a color separation on incident light passing therethrough so as to output color separated light;

a solid state pickup device for outputting a video signal in response to the color separated light passed through said color separation filter and projected on said pickup device;

main circuit means for generating a first luminance signal, a second luminance signal, a first color difference signal and a second color difference signal from said video signal; and

a luminance error compensation means for compensating a luminance error in said first luminance signal based on a color temperature of the incident light detected thereby, said luminance error compensation means comprising false color signal suppressing means for suppressing a false color signal included in said first and second color difference signals, compensation signal generating means for detecting the color temperature of the incident light and generating, in accordance with the detected color temperature, a compensation signal output from a signal output from said false color signal suppressing means, and operational means for adding said compensation signal output to said first luminance signal to produce an output luminance signal.

4,992,855

IMAGE PICKUP APPARATUS WITH WHITE BALANCE CONTROL BASED ON AMBIENT LIGHT FLICKER

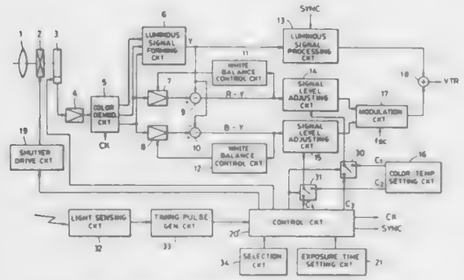
Masahiro Takei, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 3,771, Jan. 16, 1987, Pat. No. 4,879,591. This application Aug. 3, 1989, Ser. No. 388,977

Claims priority, application Japan, Jan. 31, 1986, 61-18191; Jan. 31, 1986, 61-18192; Jan. 31, 1986, 61-18193

Int. Cl.[5] H04N *9/73*

U.S. Cl. 358—29 **13 Claims**



1. An image pickup apparatus comprising:

image pickup means for producing an image signal in response to a received image;

detecting means for detecting (1) a phase of a flicker component associated with a light source, and (2) a relationship between the detected phase of the flicker component and a timing of producing the image pickup signal by said image pickup means; and

control means for controlling a white balance of the output of said image pickup means based on the phase relationship detected by said detection means.

4,992,856

COLOR TELEVISION DECODER FOR SEPARATING CHROMINANCE SIGNALS FROM A COLOR SIGNAL

Roger N. Robinson, Windsor, Great Britain, assignor to Vistek Electronics Limited, United Kingdom

Continuation of Ser. No. 99,229, Sep. 21, 1987, abandoned

Claims priority, application United Kingdom, Sep. 19, 1986, 8622680

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 **29 Claims**

1. A colour television decoder comprising:

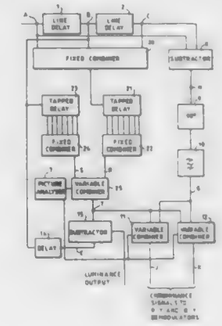
continuously variable two dimensional finite impulse response filter means having a variable vertical response whereby said filter means can operate as a two dimensional filter and can approximate the operation of a one dimensional filter, said filter means having an input for receiving an input colour video signal representing picture information and having an output for supplying chrominance signals;

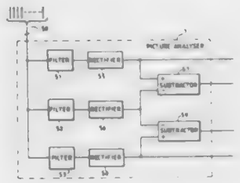
said continuously variable two dimensional finite impulse response filter means comprising:

first delay means coupled to said input for providing a plurality of signals representing a two dimensional pattern of picture points;

first variable combining means for linearly combining the plurality of signals; and

first control means for continuously controlling the first variable combining means, said first control means including a fixed two dimensional filter having a diagonal response that controls the vertical response of the two dimensional filter means by determining proportions of the plurality of signals to be combined in accordance with the picture information.





4,992,857

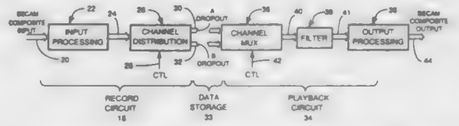
SYSTEM FOR DISTRIBUTING AND RECOVERING DIGITIZED COMPOSITE SECAM SAMPLES IN A TWO CHANNEL DIGITAL APPARATUS

Robert A. Williams, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 30, 1988, Ser. No. 252,727

Int. Cl.[5] H04N *9/64*

U.S. Cl. 358—36 **14 Claims**



1. A system for concealing lost data composed of video samples of a non-synchronous color television standard video signal which includes luminance and chrominance in a given frequency spectrum, comprising:

means for supplying said video samples at a sampling rate which is non-synchronous to said chrominance;

means receiving said non-synchronously sampled digitized video samples for distributing at a related non-synchronous rate a sample distribution pattern of alternate groups, said groups being formed of a number of samples consistent with the non-synchronous sampling rate which provides sufficient recovery of the luminance and chrominance frequency spectrum to allow concealing the lost data;

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means for selectively recovering said alternate groups formed of said number of samples; and

means coupled to the recovering means and responsive to the loss of data for replacing the lost data with the luminance and chrominance information within said frequency spectrum.

4,992,858

LASER BEAM SCANNING APPARATUS

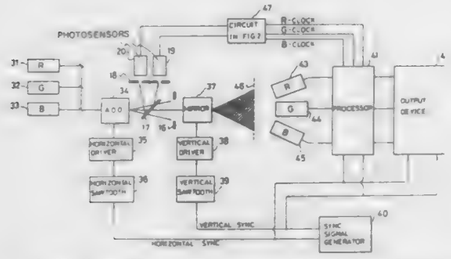
Koji Kobayashi, Hino, Japan, assignor to Kowa Company Ltd., Japan

Filed Sep. 29, 1988, Ser. No. 251,507

Claims priority, application Japan, Sep. 30, 1987, 62-243587

Int. Cl.[5] H04N *9/10*

U.S. Cl. 358—53 **24 Claims**



1. A laser beam scanning apparatus adapted for use in deflecting a laser beam to scan an object or medium in at least one direction, comprising:

a laser source for producing a plurality of laser beams each having a different wavelength;

a signal source for producing a drive signal having a frequency which can be changed during one scanning time period of the laser beam;

an acousto-optical deflector responsive to the drive signal for deflecting the laser beams simultaneously at an angle of scanning deflection which is dependent on the drive signal frequency and the wavelength of each laser beam, causing color dispersion in the laser beam deflected by the deflector;

detecting means disposed at a plane corresponding to a focal plane on which the laser beams are focussed;

a pair of photosensors each sensitive to all of the plurality of the laser beam wavelengths transmitted through or reflected on said detecting means and responsive thereto to produce start and end signals during said one scanning time period, respectively;

means for generating a plurality of clock signal trains each of which corresponds to one of the plurality of laser beam wavelengths and each of which begins and ends in response to the start and end signals; and

means for adjusting the number of the clock signals in the clock signal trains to be substantially the same for each laser beam during the scanning period.

4,992,859

AUTOMATIC FOCUS CONTROL APPARATUS USING PRIMARY COLOR SIGNALS

Masanobu Yoshida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,646

Claims priority, application Japan, Mar. 29, 1988, 63-077545

Int. Cl.[5] H04N *5/232*

U.S. Cl. 358—55 **9 Claims**

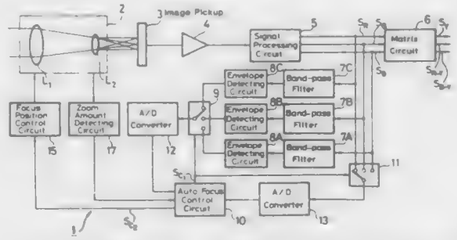
1. An automatic focus control apparatus comprising:

a) lens means having chromatic aberration;

b) means for converting an optical signal obtained through said lens means to an electrical signal;

c) means for processing said electrical signal to obtain a plurality of primary color signals;

d) means for detecting the amplitude level of each of said primary color signals;



e) means for generating a control signal according to levels of said primary color signals derived from said level detecting means; and

f) means for controlling the position of said lens in response to said control signal.

4,992,860

COLOR SCANNING SYSTEM

Tadahiko Hamaguchi; Masatoshi Katoh, and Tsuneo Sato, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 27, 1989, Ser. No. 329,280

Claims priority, application Japan, Mar. 29, 1988, 63-75043; Mar. 31, 1988, 63-131382; Mar. 31, 1988, 63-131383; Mar. 31, 1988, 63-131384

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 **3 Claims**

1. A color scanning system comprising:

illumination means for illuminating an original,

a plurality of picture elements disposed in an array, each picture element including a plurality of detectors by which a color image formed by illuminating the original is converted into electric signals, the signals of one of the plurality of detectors of each picture element to be employed as brightness signals,

focusing means for focusing the color image on said detectors,

a plurality of color filters which discriminate respective color components of the focused color image and which are disposed on respective detectors of said plurality of detectors for each picture element, and

color signal conversion means including brightness signal extraction means for deriving the brightness signals detected by detectors of (n−1)-th, n-th, and n+1)-th picture elements, where n denotes a plus integer, the corresponding brightness signals existing at an identical time, detection means for detecting differences between the (n+1)-th and n-th derived brightness signals and between the nth and (n−1)-th derived brightness signals, interpolation means for interpolating color signals of respective color components detected by respective detectors of the n-th picture element and one of the (n−1)-th and the (n+1)-th picture element to find a color signal, and selection means for delivering one of the n-th color signal, the (n−1)-th color signal, the (n+1)-th color signal, and the interpolated signal produced by said interpolation means as an n-th color signal output in accordance with the detected difference signals produced by said detection means.

4,992,861

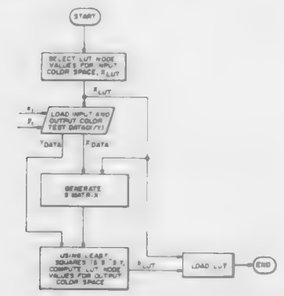
COLOR IMAGE REPRODUCTION APPARATUS HAVING A DIGITALLY OPERATED LOOK-UP TABLE CONSTRUCTED BY MEANS OF A LEAST SQUARES ALGORITHM

John R. D'Errico, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1988, Ser. No. 259,548

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 **2 Claims**



2. In image composition apparatus including a scanner for scanning a photographic film to produce a tristimulous signal representative of colors in the film, a 3-dimensional look-up table storing a set of discrete tristimulous signal values and a corresponding set of discrete reproduction signal values related in a non-linear manner to the set of tristimulous signal values and representative of colorants to be recorded on a particular photosensitive medium, and electronic computer means, coupling said scanner and said look-up table, for linearly interpolating between neighboring tristimulous signal values in said look-up table as a function of an actual tristimulous signal produced by said scanner, to compute a reproduction signal relating colors in the film to colorants actually to be recorded on the photosensitive member, wherein the improvement comprises:

the discrete reproduction signal values in said look-up table having respective values that are altered by means of a least squares algorithm from exact values defined by the aforementioned non-linear relationship, to drive the average error, between the reproduction signal values computed and exact reproduction signal values, to zero when interpolating between neighboring tristimulous signal values in said look-up table.

4,992,862

COLOR CONVERSION DISPLAY APPARATUS AND METHOD

Akiva P. Gabor, Ra'anana, Israel, assignor to Scitex Corporation, Ltd., Herzlia, Israel

Filed Mar. 31, 1989, Ser. No. 331,347

Claims priority, application Israel, Apr. 18, 1988, 86107

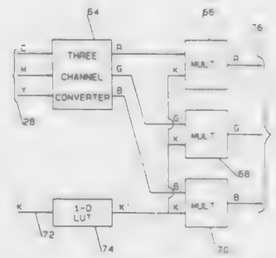
Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—76 **21 Claims**

1. A color conversion apparatus for video display of color images represented by printing data associated with a non-additive system of color components, including a plurality of non-additive color components, said apparatus comprising:

means for generating a first set of values each of which depends on one of said plurality of non-additive color components in accordance with a selected color reproduction function;

means for generating a second set of values each of which depends on only two of said plurality of non-additive color components in accordance with the selected color reproduction function; and



means for generating an output signal including a summation of said first and second sets of values, said summation representing the value of a component of an additive system associated with video data color components for use in display of the color image.

4,992,863

COLORED IMAGE READING APPARATUS

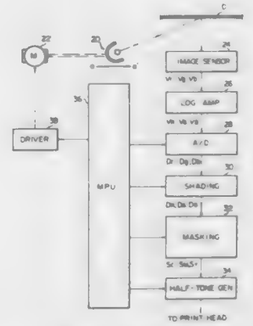
Shigeru Moriya, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1988, Ser. No. 286,884

Claims priority, application Japan, Dec. 22, 1987, 62-325090; Dec. 22, 1987, 62-325091; Jul. 4, 1988, 63-166390; Jul. 4, 1988, 63-166391

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—80 **10 Claims**



1. A colored image reading apparatus for use in reproducing multi-color images with toning materials of different colors and having different properties, comprising:

a) a color image sensor operative to optically scan a document bearing multi-color images to read the images on the document and produce color-density signals respectively variable with the intensities of light of red, green, and blue components of said images;

b) masking means for converting said color-density signals into signals dictated by the properties of the toning materials with which said images are to be reproduced, said masking means comprising,

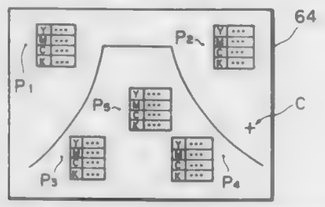
b/1) first memory means of the random-access type, and

b/2) second memory means storing data representative of a plurality of sets of parameters, each set of parameters being provided in respect of each of a plurality of colors each having a limited range of hues and being prescribed to enable reproduction of images of particular hues preferentially over images of other hues;

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c) calculating means operative to,
selectively fetch any of said plurality of sets of parameters from said second memory means,
generates data representative of products of multiplication between the parameters of the selected set and numerical values respectively represented by said color-density signals, and
load the data representative of the products of multiplication into said first memory means, and
d) input/output means operative to,
supply to said first memory means address signals provided by the color-density signals input to said masking means,
fetch the data stored in said first memory means in response to the address signals, and
generate data representative of the sum of the fetched data concerning the red, green, and blue components of said images output as data effective to reproduce said multicolor images.

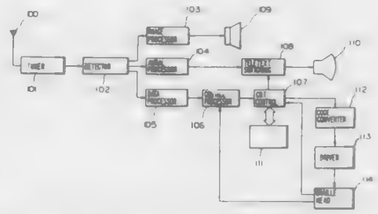
4,992,864
IMAGE PROCESSOR HAVING DENSITY INDICATOR
Kazuya Akiyama, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Dec. 13, 1988, Ser. No. 283,821
Claims priority, application Japan, Dec. 29, 1987, 62-332840
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—80 **24 Claims**



20. A method of correcting image data, comprising the steps of:
(a) preparing an original image,
(b) arbitrarily selecting a plurality of reference points on said original image,
(c) obtaining reference image data representing respective density levels of said reference points,
(d) correcting said reference image data according to a predetermined image correction rule, to obtain corrected image data expressing respective corrected density levels of said reference points,
(e) visually indicating said respective corrected density levels of said reference points on visual means, simultaneously,
(f) adjusting said image correction rule to a desired correction rule while monitoring said respective corrected density levels indicated in said visual means, and
(g) correcting the entirety of image data of said original image according to said desired correction rule.

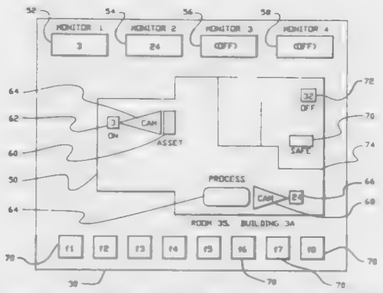
4,992,865
TELETEXT RECEIVING DEVICE FOR THE BLIND
Kwan Park, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea
Filed Aug. 10, 1989, Ser. No. 391,992
Int. Cl.[5] H04N *7/08*
U.S. Cl. 358—94 **2 Claims**

1. A teletext receiving device for the blind to display teletext data in a video memory on a visual display, comprising:
first means providing a teletext code for converting a letter similar to a teletext letter displayed on the visual display into Braille symbols;
second means providing an output signal for converting the teletext code into Braille code; and



third means for driving the first means by means of the output signal of the second means.

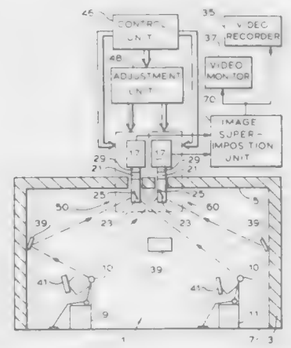
4,992,866
CAMERA SELECTION AND POSITIONING SYSTEM AND METHOD
Jack B. Morgan, 2040 Pheasant Hill La., Auburn, Calif. 95603
Filed Jun. 29, 1989, Ser. No. 373,383
Int. Cl.[5] H04N *5/247, 7/18*
U.S. Cl. 358—108 **18 Claims**



1. A video camera system, comprising: a plurality of video cameras, each of said plurality of video cameras monitoring portions of a physical area;
at least one monitor for displaying images from said plurality of video cameras;
video switching means coupled between said plurality of video cameras and said monitor for switching selected ones of said video cameras to said monitor;
computer means coupled to said video switching means for controlling said video switching means for generating from said computer a graphical icon simulation of at least a portion of said physical area and displaying said simulation on a display screen; and means located in said computer means for producing signals to effect a display of at least one of said plurality of video cameras on said monitor in response to a designation of said graphical icon simulation.

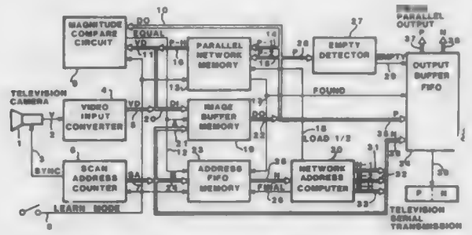
4,992,867
TECHNIQUE FOR MONITORING MAGAZINE READERS WHILE PERMITTING A GREATER CHOICE FOR THE READER OF POSSIBLE READING POSITIONS
Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666
Filed Feb. 28, 1990, Ser. No. 487,019
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—108 **20 Claims**

1. Apparatus for monitoring an individual performing as a test subject who has been placed within a room and is reading a magazine, comprising:
camera means for recording an image and including a lens and an image detecting means responsive to light from said lens for producing a signal representative of a recorded image, said camera means having (a) a first portion not visible to the test subject, and (b) a second portion at least partially visible to the test subject;
means to direct light from an eye of said individual and from said magazine to said camera means, said light directing



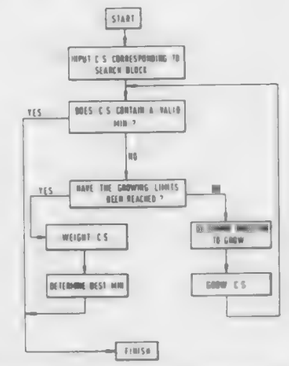
means including first means positioned on a surface of said room for directing light it receives from one of said test subject and said magazine toward said second portion of the camera means; and
means for adjusting the orientation of a field of view of said camera means, after said individual is seated at any one position selected by the individual out of a plurality of seating positions in said room, to enable monitoring by said camera means of the at least an eye of the individual and said magazine being read by the individual.

4,992,868
TRUE INFORMATION TELEVISION (TITV) AND VISION SYSTEM
Klaus E. Holtz, 631 O'Farrell #710, San Francisco, Calif. 94109
Filed Feb. 28, 1989, Ser. No. 316,925
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—135 **3 Claims**



1. An apparatus for reducing the data transmission for digital image sequences comprising:
means of scanning a digitized input image into an image buffer memory containing a plurality of storage locations for storing the image pixel descriptive values and the data cascade address codes;
means of identifying and storing the addresses of input pixels, that have changed their descriptive value since the previous input scan, into an address fifo memory, through a pixel by pixel comparison between the input pixel value and the value stored in said image buffer memory;
means of generating hierarchical data cascades from the address codes in said address fifo memory, through a multi-level comparison between hierarchical image portions in said image buffer memory and a plurality of previously "learned" hierarchical image portions stored in an image pattern memory;
means of identifying said generated data cascades in said image buffer memory, which are found to be identical to the stored data cascades in said image pattern memory, by a first code while identifying the area of the input image containing said data cascade with a second code,
means of transmitting "Superpixel" codes comprised of a combination of said first code identifying said data cascade with said second code identifying said image area.

4,992,869
MOTION DEPENDENT VIDEO SIGNAL PROCESSING
Raphael Samad, Basingstoke, and John W. Richards, Chilbolton, both of United Kingdom, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 20, 1990, Ser. No. 511,799
Claims priority, application United Kingdom, Apr. 27, 1989, 8909654
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 **8 Claims**

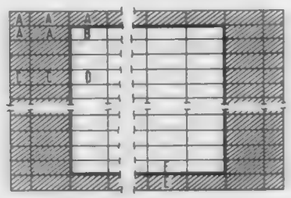


1. A motion compensated video standards converter for converting a video signal conforming to a first video standard to a converted video signal conforming to a second video standard, said video signal being provided as a sequence of intervals selected from field and frame intervals, each said interval being arranged in a plurality of blocks each representing a portion of a video image represented by said interval, comprising:
comparing means for comparing a respective one of said blocks in a first interval of the video signal with a plurality of blocks in an adjacent interval thereof for deriving motion vectors representing motion of the portion of an image represented by said respective one of said blocks between said first interval and said adjacent interval, by generating a respective correlation surface for said respective one of said blocks, said correlation surface representing a difference between the portion of the image represented by said respective one of said blocks in said first interval and the respective portions of the image represented by each of said plurality of blocks in said adjacent interval;
first testing means for testing said respective correlation surface to detect a clear minimum;
block sizing means for increasing the size of said respective one of said blocks and of said plurality of blocks for generating a new correlation surface therefrom;

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second testing means for testing each said new correlation surface to detect a clear minimum;
motion vector producing means for deriving said motion vectors in dependence on a clearest one of the clear minimums detected by the first and second testing means; and
interpolator means for producing said converted video signal controlled in dependence on said motion vectors derived by said motion vector producing means.

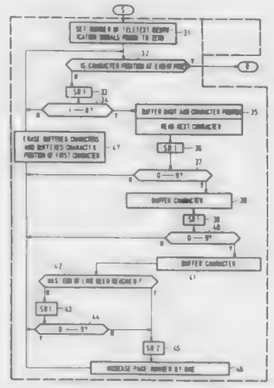
4,992,870
MOTION DEPENDENT VIDEO SIGNAL PROCESSING
Raphael Samad, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 20, 1990, Ser. No. 512,253
Claims priority, application United Kingdom, Apr. 27, 1989, 8909652
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 **6 Claims**



1. A motion compensated video standards converter for converting an input video signal having a first standard format to a motion compensated video signal having a second standard format, said converter comprising:
receiving means for receiving said input video signal having said first standard format;
comparator means coupled to said receiving means for comparing blocks in a first field or frame of the received video signal with a plurality of blocks in the following field or frame of said received video signal, said comparator means deriving motion vectors which represent the motion of the content of the respective blocks compared between said first field or frame and said following field or frame;
assignment means for assigning to each of said blocks in a border region of each field or frame of said received video signal the motion vector derived for the block nearest said block in said border region which lies outside said border region; and
interpolator means for interpolating said received video signal in dependence on said motion vectors to produce said motion compensated video signal having said second standard format.

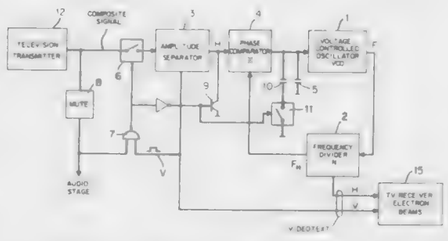
4,992,871
METHOD AND APPARATUS FOR PROCESSING IDENTIFICATION SIGNALS
Uwe G. W. Bensch; Ralph A. von Vignau, and Thomas E. F. Wille, all of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 15, 1988, Ser. No. 233,107
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727756
Int. Cl.[5] H04N *7/04*
U.S. Cl. 358—142 **34 Claims**

1. A method for processing identification signals present in a data signal providing at least one teletext page which can be displayed as a television picture on a television display, said data signal comprising a plurality of signal sequences which are assigned respective associated character positions on said television picture, said method comprising the steps of:
(a) searching said teletext page character position by character position and identifying at least one group of three successive signal sequences each representing a digit and each group being directly preceded and followed by



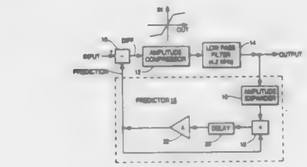
signal sequences not representing a digit, each group of sequences representing a three digit natural number; and
(b) storing a first identification signal assigned to said teletext page and representing said group of signal sequences.

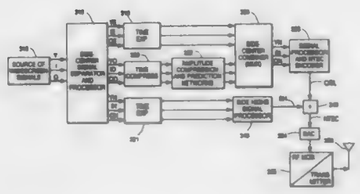
4,992,872
METHOD OF SYNCHRONIZING THE HORIZONTAL DEFLECTION OF ELECTRON BEAMS IN TELEVISION RECEIVERS
Uwe Hartmann, Villingen-Schwenningen; Udo Mai, VS-Tannheim, and Fritz Ohnemus, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 910,226, Jun. 23, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 162,293
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438366
Int. Cl.[5] H04N *7/09, 3/24*
U.S. Cl. 358—148 **7 Claims**



1. A method of synchronizing horizontal deflection of electron beams in television receivers having a reproduced picture with a visible component, when no transmission signals from a television transmitter are present, comprising the steps of: storing video text in a memory; reading out said video text from said memory by read-out generator means; deflecting said electron beams by deflection generator means; maintaining a predetermined relationship between the frequencies of said deflection generator means and said read-out generator means; switching off a synchronization circuit that synchronizes said horizontal deflection during the visible component of said reproduced picture; and activating said synchronization circuit to display said video text only while said reproduced picture is being blanked.

4,992,873
VIDEO SIGNAL NOISE REDUCTION APPARATUS USING AMPLITUDE COMPANDING AND PREDICTIVE SIGNAL PROCESSING TECHNIQUES
Joshua L. Koslov, East Windsor, and Joel W. Zdepski, Lebanon, both of N.J., assignors to General Electric, Princeton, N.J.
Filed Sep. 7, 1989, Ser. No. 404,023
Claims priority, application United Kingdom, Nov. 11, 1988, 8826463
Int. Cl.[5] H04N *5/20*
U.S. Cl. 358—167 **18 Claims**

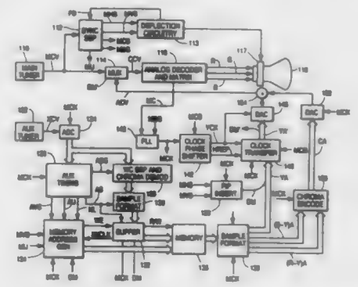




1. A video signal processing system for reducing the effect of noise on transmitted video signals, comprising:
amplitude compressor means for compressing the amplitude of video signals in accordance with a given transfer function;
predictive means responsive to an output signal from said compressor means for producing a predictive signal as a function of the magnitude of a previous video signal sample, said predictive means including amplitude expander means having a transfer function substantially the inverse of said given transfer function; and
means for providing a difference signal, indicating difference in magnitude between an input video signal and said predictive signal, to an input of said amplitude compressor.

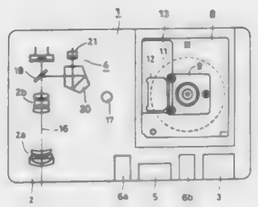
4,992,874
METHOD AND APPARATUS FOR CORRECTING TIMING ERRORS AS FOR A MULTI-PICTURE DISPLAY
Donald H. Willis, and Barth A. Canfield, both of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.
Filed Jul. 3, 1989, Ser. No. 375,113
Int. Cl.[5] H04N *5/262, 5/272, 9/74, 9/45*
U.S. Cl. 358—183 **12 Claims**

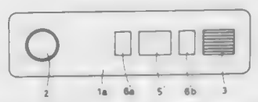
1. In a video signal processing system including a source of main video signal having a horizontal line synchronizing signal component and including memory means for holding sampled data representing a second video signal, apparatus for processing the sampled data in synchronism with said main video signal comprising:
means for providing a clock signal;
means for retrieving said sampled data from said memory means in synchronism with said clock signal;
means for shifting the phase of said clock signal to generate a phase shifted clock signal that is substantially aligned with said horizontal line synchronizing signal, and for generating a reference signal phase aligned to said phase shifted clock signal and representing a delayed version of said horizontal line synchronizing signal; and



clock transfer means, responsive to said phase shifted clock signal and said reference signal, for providing said sampled data, retrieved from said memory means, in synchronism with said phase shifted clock signal.

4,992,875
STILL VIDEO CAMERA
Dai Shintani; Takeo Hoda; Toshio Yamaki; Yoshihiro Tanaka; Etsuko Nakai, and Sadafusa Tsuji, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jul. 18, 1989, Ser. No. 381,519
Claims priority, application Japan, Jul. 18, 1988, 63-178797; Sep. 30, 1988, 63-246765; Sep. 30, 1988, 63-246766
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—209 **8 Claims**





1. A still camera for recording an object image by making use of an electronic signal wherein a recording medium is positioned nearly in parallel with an optical axis of a taking lens system and also in the lateral direction to said taking lens system.

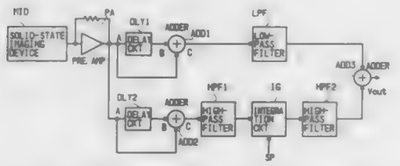
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4,992,876

NOISE REDUCTION CIRCUIT FOR AN IMAGING AND RECORDING APPARATUS WITH AN MOS SOLID-STATE IMAGING DEVICE

Shigeki Nishizawa, Mobara; Toshio Miyazawa, Chiba; Iwao Takemoto, and Tetsuro Izawa, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 386,698
Claims priority, application Japan, Aug. 5, 1988, 63-195713; Aug. 5, 1988, 63-195714
Int. Cl.[5] H04N 3/14
U.S. Cl. 358—213.1 S 6 Claims



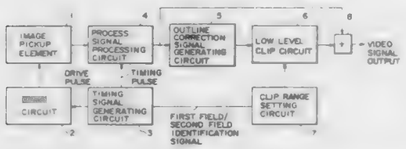
1. A noise reduction circuit, comprising first and second circuits each consisting of a delay circuit for delaying a received periodic input signal for a predetermined time within a constant period of said input signal to provide a delay signal and an addition circuit for adding said input signal and said delay signal; a low-pass filter connected to receive an output signal from said first circuit; a first high-pass filter connected to receive an output signal from said second circuit; an integrating circuit connected to receive an output signal of the first high-pass filter and for integrating said output signal during a period of time when an addition output of said input signal and delay signal is generated; a second high-pass filter connected to receive an output signal of said integrating circuit; and an output addition circuit for adding an output of said low-pass filter and an output signal of the second high-pass filter to form an output signal from which noise has been eliminated.

4,992,877

IMAGE PICKUP APPARATUS WITH SUPERVISION OF NOISE LEVEL DIFFERENCES BETWEEN FIELDS

Tsutomu Takayama, Kawasaki, Japan, assignor to Canon Kabushiki Kaishi, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,402
Claims priority, application Japan, Mar. 16, 1988, 63-060603
Int. Cl.[5] H04N 3/14, 5/335
U.S. Cl. 358—213.15 14 Claims



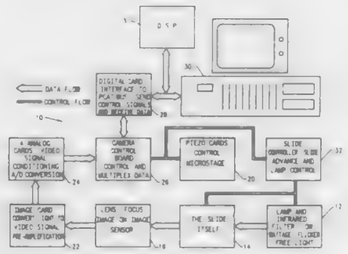
1. An image pickup apparatus comprising:
(a) an image pickup element for dividing a photoelectrically converted video signal of one frame into first and second fields and sequentially reading out the first and second fields;
(b) suppressing means for suppressing the signal of a predetermined band in the video signal from said image pickup element; and
(c) control means for controlling said suppressing means so as to change characteristics of suppression with respect to the first and second fields, respectively.

4,992,878

IMAGE TRANSDUCING APPARATUS USING LOW RESOLUTION TRANSDUCERS TO ACHIEVE HIGH RESOLUTION IMAGING

Clifford Hersh, Berkeley, Calif., assignor to Array Technologies, Inc., Oakland, Calif.

Continuation of Ser. No. 262,820, Oct. 26, 1988, abandoned.
This application Mar. 16, 1990, Ser. No. 471,493
Int. Cl.[5] H04N 3/14
U.S. Cl. 358—213.28 6 Claims



1. An image transducing apparatus comprising:
means defining an object plane for supporting a fixed object to be imaged in an image plane;
leans means for focusing the image of said object upon said image plane;
photoelectric array transducing means having a first resolution and comprising a plurality of congruent, discrete, spaced apart transducing elements, arranged in an array, in said image plane for providing an electrical signal representative of the light intensity thereon;
means for mechanically displacing said photoelectric array transducing means in said image plane, in two axes, in a plane parallel to said image plane, from a first position to a plurality of subsequent positions, wherein the distance from one position to an immediate adjacent position is less than the dimension of a transducing element along the direction of said displacement;
means for moving and stopping said photoelectric array transducing means at each of said subsequent positions;
means for generating an electrical signal from each transducing element of said photoelectric array at each of said subsequent positions; and
means for processing said electrical signals from each of said subsequent positions to form an electrical representation of the image of said object having a second resolution greater than said first resolution.

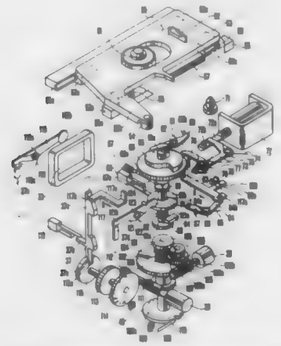
4,992,879

IMAGE PICK-UP APPARATUS

Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 911,175, Sep. 24, 1986, abandoned. This application May 18, 1989, Ser. No. 355,840
Claims priority, application Japan, Sep. 25, 1985, 60-213047
Int. Cl.[5] H04N 5/30
U.S. Cl. 358—224 39 Claims

1. An image pick-up apparatus comprising:
(a) means for converting incident radiation into an electrical signal;
(b) means for recording said electrical signal on a medium;
(c) means for reproducing an electrical signal recorded on said medium;
(d) a view finder having a visual field arranged to permit observation of said incident radiation;
(e) means for selection of a reproducing mode for operation of said reproducing means or a recording mode for operation of said recording means; and



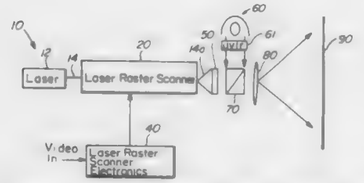
(f) means for displaying a warning indicium in said visual field of said view finder indicative of the selection of said reproducing mode.

4,992,880

HIGH DEFINITION VIDEO-RATE LASER-ADDRESSED LIQUID-CRYSTAL LIGHT-VALVE PROJECTION DISPLAY

John A. Trias, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1989, Ser. No. 359,786
Int. Cl.[5] H04N 5/74
U.S. Cl. 358—236 3 Claims



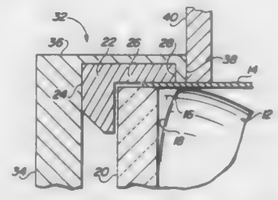
1. An apparatus for displaying high definition projected images on a distant screen in accordance with a greater than 1000 TV-line resolution at video-image signal rates comprising:
a laser providing a beam of coherent light;
means disposed to receive the beam of coherent light for modulating it at the video-image signal rates;
means disposed to receive the modulated beam of coherent light for tracking the modulated beam of coherent light in a horizontal direction;
an acousto-optic traveling wave lens disposed to receive the modulated and tracked beam of coherent light for chirping the modulated and tracked beam of coherent light to scan a focused spot along a horizontal line to thereby increase the resolution thereof;
means disposed to receive the modulated, tracked and chirped beam of coherent light for imparting a scan thereof in the vertical direction;
means connected to the modulating means, the tracking means, the acousto-optic traveling wave lens and the imparting means for providing signals to control the modulation, horizontal tracking, horizontal chirping and vertical imparting of the beam of coherent light;
means aligned to receive the modulated, horizontally tracked, horizontally chirped and vertically imparted beam of coherent light for selectively changing the polarization orientation of linearly polarized light incident thereon in direct response to the voltage pattern directly produced therein by the modulated, horizontally tracked, horizontally chirped and vertically imparted beam of coherent light;
means disposed for projecting a high intensity light beam in a light path to the light polarization orientation changing means; and
a liquid-crystal light valve interposed in said light path between the light polarization orientation changing means and the high intensity light beam projecting means for reflecting linearly polarized high intensity light onto the light polarization orientation changing means and for directing modulated reflected high intensity light modulated in accordance with the modulated, horizontally tracked, horizontally chirped and vertical imparted beam of coherent light onto the distant screen in the form of real-time, high definition images at video-image signal rates at greater than 1000 TV-line resolution.

4,992,881

PROTECTIVE COVER FOR FLIGHT INSTRUMENT FILTER GLASS

Robert J. Tomasek, and Sharon E. Runyon, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 14, 1989, Ser. No. 339,329
Int. Cl.[5] H04N 5/65
U.S. Cl. 358—245 10 Claims



6. A protective cover for a filter glass for a flight instrument display unit having a display screen mounted in an opening of the display unit, said display unit including a chassis, a frame-like bezel mounted on said chassis in front of said filter glass, said bezel having a front surface and a rear edge spaced from said front surface, said protective cover comprising:
a. a faceplate,
b. a siderail mounted on said faceplate,
c. a lip spaced from said faceplate by said siderail, and
d. said spacing between said faceplate and said lip being approximately equal to the space between said front surface and said rear edge.

4,992,882

PRINTER

Yoshikazu Ikenoue; Takashi Morikawa, and Ikunori Yamaguchi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1988, Ser. No. 291,460
Claims priority, application Japan, Dec. 29, 1987, 62-334024
Int. Cl.[5] H04N 1/29; G01D 15/14
U.S. Cl. 358—300 4 Claims

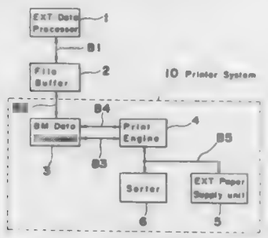
4. A printer comprising:
a receiving means for receiving print data and control data;
an analyzing means for analyzing the received data by said receiving means;
a memory means for memorizing print data image;
an image writing means for writing data image in said memory means according to a result of analysis by said analyzing means;
a printing means for effecting printing;

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an output means for outputting the print data image stored in said memory means;

a requesting means for requesting feeding of the printing medium to be used for the printing means to effect output of said output means, and

a control means having a first mode for starting said requesting means and said output means after completion of the image writing by said image writing means, and a second



mode for starting said requesting means before completion of the image writing by said image writing means and for starting said output means after completion of the image writing by said image writing means, and being so arranged that, in said second mode, the mode is temporarily changed over to said first mode by the output from said analyzing means so as to be again returned to said second mode upon termination of said output from said analyzing means.

4,992,883

IMAGE SENSING ARRANGEMENT

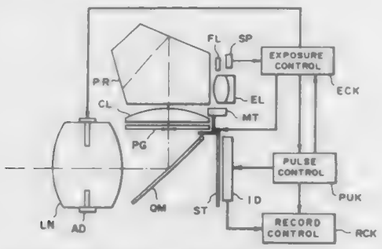
Tokuichi Tsunekawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 33,885, Apr. 2, 1987, abandoned, which is a continuation of Ser. No. 885,816, Jul. 21, 1986, abandoned, which is a continuation of Ser. No. 462,187, Jan. 31, 1983, abandoned. This application Jan. 2, 1990, Ser. No. 455,778

Claims priority, application Japan, Feb. 10, 1982, 57-20994; Feb. 10, 1982, 57-20995; Feb. 10, 1982, 57-20996; Feb. 10, 1982, 57-20997

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—335 44 Claims



1. An image sensing arrangement comprising:

(a) solid-state image sensing device for converting an image of an object into a corresponding electrical signal;

(b) a shutter means for controlling an exposure time of said image sensing device;

(c) release switch means for operating said shutter means;

(d) an aperture member for controlling an aperture to regulate light incident on said solid-state image sensing device;

(e) selecting means for selecting between a single image pick-up mode for picking up a single image of the object and a continuous image pick-up mode for continuously picking up the image of the object; and

(f) controlling means for controlling said shutter means to open from a closed state in response to said release switch means for a predetermined exposure time for a single image and controlling said aperture member according to said predetermined exposure time and a luminance of the object when the single image pick-up mode is selected, and for maintaining said shutter means open during imaging and reading out the electrical signal a plurality of times from said solid-state image sensing device and controlling said aperture member according to a storing time of said electrical signal in said solid-state image sensing device and the luminance of the object when the continuous image pick-up mode is selected.

4,992,884

COPIER WITH AN OPTIONAL FACSIMILE FUNCTION AND METHOD OF CONTROLLING THE SAME

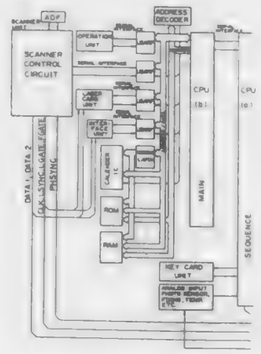
Seiji Sakata, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

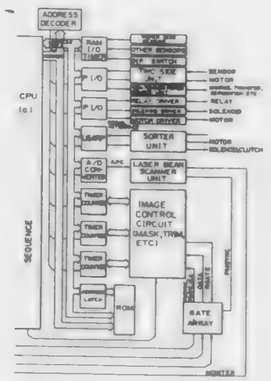
Filed May 9, 1988, Ser. No. 191,382

Claims priority, application Japan, May 9, 1987, 62-113075; Apr. 1, 1988, 63-78156

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—401 8 Claims





1. In a method of controlling a copier with an optional facsimile function, the improvement wherein when said facsimile function completes reception of facsimile data while said copier is in a preheat mode, a facsimile mode is set up to print out the facsimile data.

4,992,885

METHOD OF RECORDING AND REPRODUCING AUDIO INFORMATION IN CORRELATION WITH DIVIDED SCREEN GRAPHICS INFORMATION

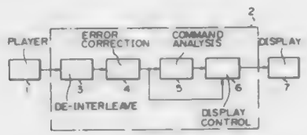
Junichi Yoshio, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,718

Claims priority, application Japan, Jan. 29, 1988, 63-18783; Nov. 7, 1988, 63-280859

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—341 10 Claims



1. A music and graphics information storage and reproducing system comprising:

storage means for storing therein an information signal including a plurality of music data groups and a plurality of graphics data groups distributed along the same time axis as said music data groups,

said graphics data groups including a first type of divided screen data group and at least one separate second type of divided screen data group defining a complement of said first type of divided screen data group to form a single-frame image; and

means responsive to both said types of divided screen data groups for providing an output signal representing said single-frame image.

4,992,886

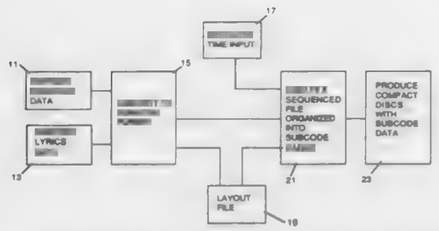
METHOD AND APPARATUS FOR ENCODING DATA WITHIN THE SUBCODE CHANNEL OF A COMPACT DISC OR LASER DISC

Walter R. Klappert, Topanga, Calif., assignor to WNM Ventures, Inc., Burbank, Calif.

Filed Dec. 20, 1988, Ser. No. 287,423

Int. Cl.[5] G11B *7/00*

U.S. Cl. 358—342 13 Claims



1. An apparatus for encoding at least two sets of data within a subcode channel of a compact disc or laser disc, said compact disc or laser disc including a main channel having a start time, and said subcode channel, said encoding being performed within separate bands of said subcode channel for each said set of data, wherein the encoded data, after being decoded, may be displayed on a video display such that said at least two sets of data are displayed synchronously with each other, said apparatus comprising:

(a) means for converting analog graphical data representing at least one picture to a digitized graphical data form having no more than sixteen colors for each of said at least one picture and saving each of said pictures in said digitized graphical form in a first set of separate files;

(b) means for converting binary data representing at least one line of lyrics to a digitized graphical data form having no more than sixteen colors for each of said at least one line of lyrics and saving each of said at least one line of lyrics in said digitized graphical form in a second set of separate files;

(c) means for converting the at least one picture and the at least one line of lyrics in said digitized graphical data form in said first and second sets of separate files to subcode format, and adding information specifying the band in which said data in said subcode format is to be located and saving each of said pictures in said subcode format and each of said lyrics lines in said subcode format including said band information in subcode format in a respective third and fourth sets of separate files;

(d) means for creating a sequenced file which includes each of said pictures in subcode format and each of said lyrics lines in subcode format, wherein each said picture in subcode format and each said lyric line in subcode format is sequenced according to the band information associated with each file in said third and fourth sets of files and a time offset from the start time of the main channel.

4,992,887

METHOD OF STORING AND TRANSMITTING IMAGE DATA AS AN IMAGE FILE SUITABLE FOR AN IMAGE SEARCH

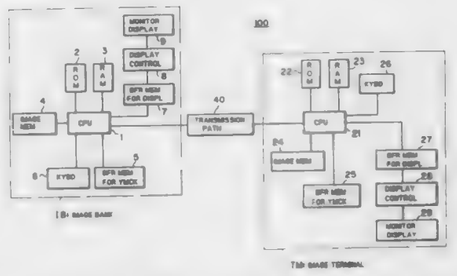
Masami Aragaki, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Feb. 3, 1989, Ser. No. 306,573

Claims priority, application Japan, Feb. 6, 1988, 63-26161

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—403 25 Claims



1. A method of storing an image file in a memory means which is provided in an image processing system having an image display usable for an image search, the method comprising the steps of:

(a) preparing first image data expressing an original image;

(b) generating second image data expressing a reduced image of said original image, a size of said reduced image being equal to or smaller than a display size of said image display;

(c) producing a file header including identification data for identifying said image file; and

(d) storing a combination of said file header and said first and second image data in said memory means as said image file.

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4,992,888

IMAGE READING APPARATUS USING A MOTOR AND CONTROLLING DRIVING PULSES SUPPLIED TO THE MOTOR

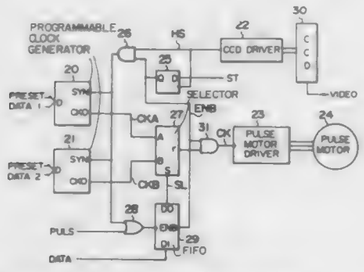
Nao Nagashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,549

Claims priority, application Japan, Oct. 18, 1985, 60-233033; Oct. 18, 1985, 60-233034; Oct. 18, 1985, 60-233035

Int. Cl.[5] H04H *1/36*

U.S. Cl. 358—410 **20 Claims**



1. An image reading apparatus comprising:

charge-accumulating image reading means for reading an original image, said image reading means periodically repeating a charge accumulating operation;

moving means for moving an image reading position of said image reading means with a stepping motor;

determining means for determining plural sets of numbers of pulses to be supplied to said stepping motor according to an image reading magnification or an image reading density with which said image reading means is to read said original image; and

selecting means for selecting one of the plural sets of numbers of pulses in accordance with the progress of the charge accumulating operation of said image reading means; and

supplying means for supplying pulses to said stepping motor, said supplying means supplying the number of pulses in a selected one of the plural sets to said stepping motor during a respective charge accumulating operation of said image reading means.

4,992,889

ENCODING APPARATUS FOR COMPRESSING AND OUTPUTTING IMAGE DATA

Taku Yamagami, Yokohama, and Makoto Takayama, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 374,627, Jun. 30, 1989, abandoned, which is a continuation of Ser. No. 117,959, Nov. 9, 1987, abandoned. This application Jan. 9, 1990, Ser. No. 468,248

Claims priority, application Japan, Nov. 13, 1986, 61-271467

Int. Cl.[5] H04N *1/417*

U.S. Cl. 358—430 **14 Claims**

1. An encoding apparatus for compressing and outputting image data by performing prediction differential encoding of the image data, said apparatus comprising:

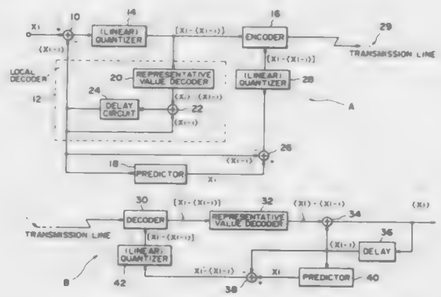
(A) first differential data forming means for receiving image data and first prediction data and for forming and outputting first differential data equal to the difference between the image data and the first prediction data;

(B) first quantizing means for quantizing the first differential data output from said first differential data forming means and for outputting the quantized first differential data as first quantization differential data;

(C) first prediction data forming means for forming and outputting the first prediction data by use of the first quantization differential data output from said first quantizing means;

(D) second prediction data forming means for forming and outputting second prediction data by use of the first prediction data output from said first prediction data forming means;

(E) second differential data forming means for forming and outputting second differential data equal to the difference between the first prediction data output from said first prediction data forming means and the second prediction data output from said second prediction data forming means;



(F) second quantizing means for quantizing the second differential data output from said second differential data forming means and for outputting the quantized second differential data as second quantization differential data; until

(G) variable length encoding means for receiving the first quantization differential data and the second quantization differential data, for assigning a code length for the first quuantization differential data in accordance with the second quantizaton differential data, and for outputting a code having the assigned code length in accordance with the first quantization differential data.

4,992,890

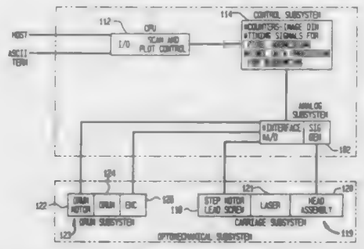
SYSTEM FOR PLOTTING AND SCANNING GRAPHIC IMAGES

Alward I. Pinard, Westford; Gary Girzon, Somerville, and Andrew Warner, Harvard, all of Mass., assignors to Intergraph Corporation, Huntsville, Ala.

Filed Mar. 17, 1989, Ser. No. 325,212

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—474 **7 Claims**



1. An improved system, for plotting a graphic image, of the type having light source means for providing a beam of light, a scanning head, and first and second axis translation means for translating the scanning head along first and second axes respectively in relation to an image being plotted, wherein the improvement comprises:

deflection means, disposed in the scanning head, having an electrical input, for deflecting along a path a portion of the beam of light by an amount dependent upon the frequency of a signal that is present at the electrical input;

signal generator means for generating a plurality of signals, each having a different frequency and for supplying each of the signals to the deflection means, such generation means including means for modulating separately the amplitude of each of the plurality of signals in response to a corresponding plurality of generator inputs, so that the amplitude of a given generator input controls the amplitude of the portion of the beam deflected by the frequency signal to which the generator input relates;

wherein the plurality of signals includes a first set of signals below an established frequency and a second set of signals above the established frequency, and the signal generator means includes means for supplying simultaneously to the deflection means a signal from the first set and a signal from the second set in successive pairs of signals so as to cause scanning of portions of the beam of light parallel to the second axis simultaneously at two different and proximate locations on the first axis.

4,992,891

DUAL RECORD/READ HEAD VIDEO RECORDING AND PLAYBACK APPARATUS WITH FADE-IN FUNCTION

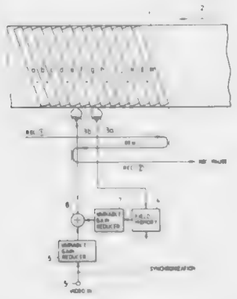
Keiichi Komatsu, Katsuta; Shinji Ozaki, Funabashi; Shigeyuki Itoh, Yokohama; Hikaru Masui, Ashiya, and Yoshizumi Watatani, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 303,749

Claims priority, application Japan, Jan. 29, 1988, 63-17040

Int. Cl.[5] H04N *5/782*

U.S. Cl. 360—14.3 **3 Claims**



1. A magnetic tape recordation apparatus comprising:

first and second magnetic recording heads mounted along a first plane on a rotary cylinder for recording a video signal on a magnetic recording tape, the first recording head having a first azimuthal angle and the second recording head having a second azimuthal angle, the second azimuthal angle being different from the first azimuthal angle;

first and second reading heads mounted along a second plane on the rotary cylinder for reading the video signal recorded on the magnetic tape, the first reading head having the first azimuthal angle and the second reading head having the second azimuthal angle, the first and second planes being offset along an axial direction of the rotary cylinder;

a mixing circuit operatively connected with at least one of the reading heads for mixing at least a first component of the video signal read from the magnetic recording tape by the at least one read head with a second video signal from a video signal source, the mixing circuit being operatively connected with at least one of the recording heads for supplying the mixed video signal to at least one of the recording heads to be recorded on the magnetic tape.

4,992,892

MUSIC START SIGNALS IN A MAGNETIC RECORDING/REPRODUCING DEVICE

Tomoyasu Yamada; Tetsuro Nagao; Nobutoshi Fukuda; Masashi Tanabe; Yoshiki Furuta; Shinichi Yamamisaka, and Naoto Arifuku, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 22, 1987, Ser. No. 5,981

Claims priority, application Japan, Jan. 22, 1986, 61-11298; Sep. 18, 1986, 61-142892

Int. Cl.[5] G11B *5/02, 5/00*

U.S. Cl. 360—27 **4 Claims**



1. A magnetic recording/reproducing device in which an input analog signal is converted into a digital signal, a first code signal is added to the digital signal, and the digital signal containing the code signal added thereto is modulated and then recorded on a magnetic tape by a rotary head, said device being characterized by the improvement comprising: detection circuit means for detecting the head of each program in the non-sound portion of the input signal before the input signal is modulated and for producing a corresponding detection signal: time measuring circuit means for measuring a prescribed time interval beginning with the detection signal produced by said detection circuit means; and code control circuit means for setting start information of the code signal at a prescribed value for the prescribed time interval and for recording the code signal on the tape.

4,992,893

ALIGNMENT DISK FOR MAGNETIC DISK DRIVING APPARATUS AND METHOD AND APPARATUS FOR VERIFYING TRACKING ERROR OF THE MAGNETIC DISK DRIVING APPARATUS

Hiroshi Kanai; Takeo Sonobe, both of Hitachi; Selichi Hayashi, Mito; Masayoshi Sunada; Kazuo Kikuchi, both of Hitachi; Yasumasa Saito, Katsuta; Toshiaki Suematsu, Hitachi; Tetsuro Hatakeyama, Hitachi; Yousuke Nagano, Hitachi; Shinji Mizunuma, Hitachi; Hitoshi Ishida; Junichi Enomoto, Hitachi, and Kazuei Saito, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,786

Claims priority, application Japan, Feb. 19, 1986, 61-33070; Apr. 4, 1986, 61-76566; Jun. 6, 1986, 61-130128

Int. Cl.[5] G11B *5/55, 5/596, 23/36*

U.S. Cl. 360—78.13 **30 Claims**

1. An alignment disk for a magnetic disk drive apparatus having magnetic head means for recording and reproducing data on and from a magnetic recording medium, a head carriage for carrying the magnetic head means, and drive means having a stepping motor for driving the head carriage relative to the magnetic recording medium so as to radially cross a plurality of tracks of the magnetic recording medium, said alignment disk being loadable and unloadable to said magnetic disk drive apparatus and utilized for maintaining data interchangeability of said disk drive apparatus, said alignment disk comprising:

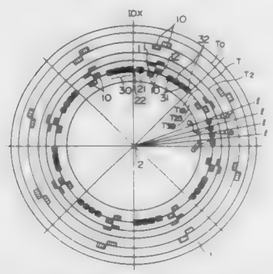
a magnetic disk medium member having a plurality of tracks;

a set of track diameter adjust signal pairs recorded on a number of tracks of said alignment disk, the number of tracks being equal to or larger in number than the number

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of phases of the stepping motor, the number of tracks respectively corresponding to at least the phases of said stepping motor, a set of track diameter adjust signal pairs being recorded on a track in the vicinity of at least one of an innermost track and an outermost track;

said set of track diameter adjust signal pairs each having an inner track signal and an outer track signal extending inward and outward from a center of a track, said inner and outer track signals being substantially equal in width and spaced along the track with a distance therebetween; and



said set of track diameter adjust signal pairs being arranged symmetrically around a rotation axis of said disk;

wherein an amount and direction of displacement of the head means from a predetermined track can be detected by a ratio of a pair of output signal values respectively read from the predetermined track by the head means by tracing the inner and outer track signal of a set of track diameter adjust signal pairs disposed on the predetermined track, thereby enabling detection of an accumulated error of a drive force transmission system of the stepping motor accumulated through the relative movement of the head means between the inner track and the outer track.

4,992,894

CASSETTE LOADING MECHANISM

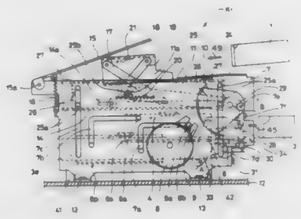
Keiichi Ohashi, Tochigi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1989, Ser. No. 370,335

Claims priority, application Japan, Jun. 24, 1988, 63-157823; Jun. 24, 1988, 63-157824

Int. Cl.[5] G11B *15/60*

U.S. Cl. 360—94 **2 Claims**



1. A cassette loading mechanism for a magnetic recording and/or reproducing device adapted for selectively loading a plurality of kinds of different size cassettes at a recording and/or reproducing position, each said cassette enclosing a magnetic tape as the magnetic recording medium, comprising:

a casing provided with an inserting opening for a large size cassette and an inserting opening for a small size cassette each contoured to conform to the large size cassette and the small size cassette to be introduced;

large size cassette holding means for holding at a predetermined position the large size cassette introduced via said large size cassette inserting opening into said casing;

large size cassette shifting means for shifting said large size cassette holding means between a position of inserting said large size cassette and a position for recording and/or reproduction;

small size cassette holding means for holding at a predetermined position the small size cassette inserted into said casing via said inserting opening for said small size cassette;

small size cassette shifting means for shifting said small size cassette holding means between a position of inserting said small size cassette and a position for recording and/or reproduction;

said small size cassette holding means being attachable to said large size cassette holding means that has been shifted to the position for recording and/or reproduction;

a lid movable mounted to said casing for opening or closing the inserting opening for said large size cassette;

first engaging means provided to one of mutually confronting edge portions of said lid, said first engaging means being engageable with said lid and movable between a position engaging with said lid and a position out of engagement with said lid;

second engaging means provided to the other of said mutually confronting edge portions of said lid and operated separately for said first engaging means, said second engaging means being engageable with said lid and movable between a position engaging with said lid and a position out of engagement with said lid;

first urging means for urging said first engaging means and holding said first engaging means at said position engaging with said lid; and

second urging means for urging said second engaging means at said position of engaging with said lid;

said first engaging means including a first abutment portion abutting against said cassette introduced via said inserting opening for the large size cassette to shift said first engaging means to said position out of engagement with the lid responsive to the inserting operation of said cassette;

said second engaging means including a second abutment portion abutting against the cassette introduced via said inserting opening for the large size cassette to shift said second engaging means to said portion out of engagement with the lid responsive to the inserting operation of said cassette;

both of said first and second abutment portions abutting against said large size cassette introduced via said inserting opening for the large size cassette, one of said first and second abutment portions being able to abut against said small size cassette inserted via the inserting opening for a large size cassette.

4,992,895

IDLING ROTATION MECHANISM USED IN THE HOUSING OF A VIDEO CASSETTE TAPE RECORDER

Young-Chan Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co. Ltd., Kyungki, Rep. of Korea

Filed Sep. 30, 1988, Ser. No. 252,512

Claims priority, application Rep. of Korea, Sep. 30, 1987, 87-16926

Int. Cl.[5] G11B *5/448*

U.S. Cl. 360—96.5 **7 Claims**

1. An idling rotation mechanism in a housing of a video cassette tape recorder comprising:

a speed-variation means drivingly connectable to a motor so as to vary the transmitted rotational speed thereof;

a cassette transporting holder engagable with a video cassette tape, said transporting holder is movable between an initial position and a mounted position;

a drive means connectable to the cassette transporting holder and the speed-variation means so as to move the transporting holder between mounted position;

a cut off means on said drive means to cut off the transmission of rotational forces from the motor to the drive means so as to prevent the transporting holder from continuing to move after reaching the mounted position;

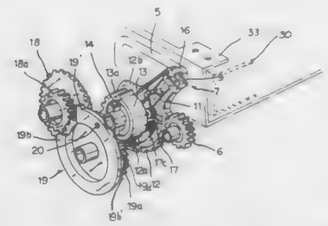
said speed-variation means comprising;

a worm drivingly connectable to an output shaft of said motor;

a worm gear in meshing engagement with said worm; and

a bevel gear, mounted on a first shaft extending from the housing, in meshing engagement with said worm gear to vary the transmitted rotational speed of said motor, and

said means for cutting off rotation comprising:



a timing gear, rotatably mounted on a second shaft extending from said housing, in meshing engagement with a small gear on a back side of said bevel gear, said timing gear having a gear part, with a portion of the gear covered by a sliding part, and a rotating plate having a cut out portion; and

an arm gear, rotatably mounted on a third shaft extending from said housing, having a geared part that can be in meshing engagement with said gear part, said geared part having a pin at an end portion so that when said pin is rotated, along with the arm gear, the pin passes through the cut out portion so as to contact an edge part of the rotating plate and cut off the transmission of rotational forces of said motor after the geared part has been disengaged from the gear part.

4,992,896

CARTRIDGE SHUTTER ACTUATING DEVICE IN RECORDING AND/OR REPRODUCING APPARATUS

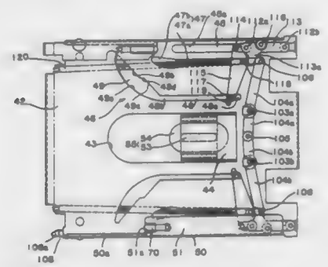
Yoshihisa Inoue, Hanno, and Yasunori Arai, Kodaira, both of Japan, assignors to Nakamichi Corporation, Japan

Continuation of Ser. No. 265,212, Oct. 31, 1988, Pat. No. 4,899,238. This application Dec. 13, 1989, Ser. No. 450,247

Claims priority, application Japan, Oct. 31, 1987, 62-276778

Int. Cl.[5] G11B *17/04*

U.S. Cl. 360—99.06 **13 Claims**



1. In a magneto optical recording and/or reproducing apparatus for performing recording and/or reproducing operation with respect to a magneto optical disc contained in a disc cartridge, having a holder for accommodating the disc cartridge, a bias magnet secured to the holder in opposition to one side of the disc in the disc cartridge in a full-loaded position in the holder, a base for mounting thereon an optical head in opposition to the other side of the disc in the full-loaded disc cartridge, and a spindle motor for rotating the disc in the full-loaded disc cartridge, and a shift mechanism for relatively shifting the base with respect to the disc cartridge to make operative the optical head and the spindle motor along with insertion of the disc cartridge into the holder,

a cartridge shutter actuating device for opening a laterally slidable shutter of the disc cartridge along with insertion thereof into the holder in a direction substantially perpendicular to the sliding direction of the cartridge shutter, which comprises:

at least one arm member rotatable about a pivot provided at one end thereof and having first and second engaging elements substantially at the other end thereof, said first engaging element being engageable with a corresponding abutment formed in the cartridge shutter during insertion of the disc cartridge into said holder;

first guide means extending in an oblique direction between the cartridge inserting direction and the shutter sliding direction for guiding therealong said second engaging element to thereby rotate said arm member about said pivot;

supporting means for movably supporting said pivot of said arm member in the cartridge inserting direction; and

spring means for biasing said arm member toward a direction opposite to the cartridge inserting direction;

said second engaging portion being guided by said first guide means to rotate said arm member up to a certain rotational angle about said pivot to thereby open the cartridge shutter due to engagement between said first engaging element and said abutment of the cartridge shutter, during insertion of the disc cartridge into said holder from an unloaded position to a half-loaded position, and during succeeding insertion from the half-loaded position to a full-loaded position, said pivot being supported by said supporting means to move in the cartridge inserting direction with said certain rotational angle of said second engaging element being unchanged.

4,992,897

DEVICE FOR READING AND WRITING ON A MAGNETIC MEDIUM

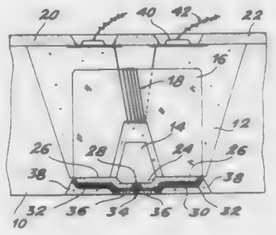
Patrice Deroux-Dauphin, Saint Egreve, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 13, 1989, Ser. No. 337,289

Claims priority, application France, Apr. 15, 1988, 88 05015

Int. Cl.[5] G11B *5/60*

U.S. Cl. 360—103 **12 Claims**

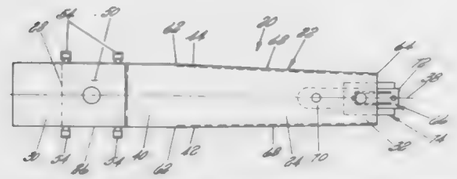


1. A device for reading and writing information on a magnetic medium, comprising at least one magnetic writing and reading head on a monocrystalline silicon base, said base having a catamaran-type profile and having a front face intended to be opposite said magnetic medium and a rear face, the front and rear faces being oriented according to the crystallographical plan **100** of silicon wherein the magnetic reading and writing head comprises:

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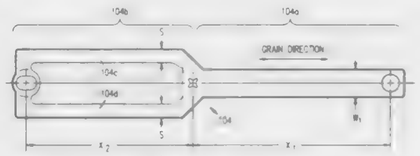
means defining at least one hole in the rear face of the base, said hole having a bottom and walls slanted according to the crystallographical planes 111 of the silicon;
a magnetic circuit seated in said hole, said circuit having a pair of spaced-apart extremities between said walls and facing the front face of the base, and a pair of electrical connections;
a magnetic flux concentrator in contact with the magnetic circuit extremities;
a non-magnetic electrically conductive layer covering said flux concentrator;
a masking layer covering said conductive layer except at a selected area thereof; and
a writing and reading pole piece contacting said conductive area in said selected area thereof, said pole piece being substantially flush with the front face of the base.

4,992,898
MAGNETIC HEAD SLIDER SUSPENSION ASSEMBLY HAVING INVERTED LOAD RAILS
Dana T. Wanlass, Santa Barbara, Calif., assignor to Applied Magnetic Corporation, Goleta, Calif.
Filed Mar. 31, 1988, Ser. No. 176,037
Int. Cl.[5] G11B *5/48, 21/16*
U.S. Cl. 360—104 **14 Claims**



1. A magnetic head slider suspension assembly for loading a magnetic head slider having an air bearing surface onto the surface of a rotating magnetic disk forming one of a plurality of aligned rotating magnetic discs having a predetermined spacing therebetween, said magnetic head slider suspension comprising
an elongated slider arm which extends along an elongated axis and which includes a central arm section having a generally rectangular shape and two ends, said central arm section including means for defining at one end thereof a support end having a predetermined width and which is adapted to be operatively coupled to an arm mounting support, said central arm section including a deflection section located adjacent said support end for enabling said central arm section to be deflected from an angle of deflection in the absence of a loading force and in a "free position" to one of an "unloaded position" wherein a magnetic head/slider assembly having an air bearing surface is positioned away from the surface of a rotating magnetic disc and a "loaded position" wherein a magnetic head slider assembly having an air bearing surface is positioned to fly over the surface of a rotating magnetic disc relative to said support end about said deflection section, said central arm section including means for defining at its other end a head/slider loading end which is located along said elongated axis and in an opposed, spaced relationship to said support end; and
at least one, raised load rail extending substantially perpendicular from said central arm section and being positioned to extend from said central arm section in the same direction as that of a head slider adapted to be supported from the head/slider loading end, said at least one raised load having a length which extends from a first rail end located adjacent the deflection section so as to not interfere with the deflection of the central arm section between its "free position" and one of the "unloaded position" and the "loaded position" to a second rail end located at about said head/slider loading end, the first rail end of said said at least one load rails being located forward of said deflection section and the second rail end of said at least one load rail being located adjacent said head/slider loading end, said at least one load rail having a predetermined height which is substantially less than that of the predetermined spacing defined by the aligned rotating magnetic discs and said second rail end of said at last one raised load rail having a selected height which is less than the predetermined height, said at least one load rail including means for defining an outer edge which extends from said selected height of the second rail end at said head/slider loading end to the greater predetermined height of the first rail end at said support end.

4,992,899
LOW INERTIA, SINGLE COMPONENT ARM ACTUATOR FOR OPEN-LOOP TYPE DISK DRIVES
Steven L. Kaczeus, and Gregory T. Kudo, both of San Jose, Calif., assignors to Kalok Corporation, Sunnyvale, Calif.
Filed Apr. 4, 1988, Ser. No. 176,823
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—106 **2 Claims**

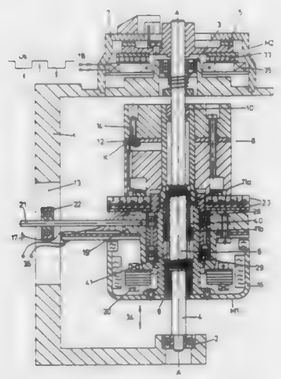


1. A data storage system comprising:
means for storing data;
means for reading and writing data at selected positions on said means for storing data;
means for positioning said means for reading and writing data at selected positions, said means for positioning having:
an arm;
a flexure having two ends, wherein said means for reading and writing data is connected to a first end of said flexure and a second end of said flexure is attached to said arm at a single point;
a stepper motor having a shaft;
a capstan mounted on said shaft of said stepper motor; and
a band having two ends, a first portion and a second portion, wherein:
said first portion comprises a substantially rectangular strip having a first selected length x_1 and a first selected width w_1;
said second portion comprises two parallel substantially rectangular strips each having a second selected length x_2 and a second selected width s; and
further wherein the upper limit for said first selected width w_1 is determined from the relationship

$$w_1 = \frac{2s\,x_1\,(\Delta x - 2C)}{x_2\,(\Delta x + 2C)}$$

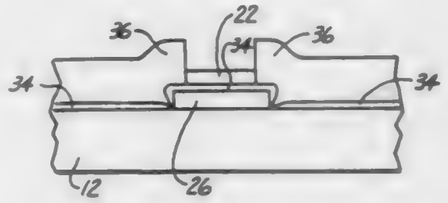
a first end of said band is anchored to a first selected position on said arm;
a second end of said band is anchored to a second selected position on said arm; and
said band is secured to said capstan so that as said stepper motor turns said capstan, the motion of said capstan is transferred to said arm; and
a platform on which said means for storing data, said means for reading and writing, and said means for positioning are operatively mounted; and
means for compensating for the difference in thermal expansion of said flexure, said arm and said means for storing data so as to reduce displacement of said means for reading and writing relative to said means for storing data caused by changes in temperature wherein said means for compensation of thermal expansion comprises said band, said band having a selected stiffness and a coefficient of thermal expansion such that upon a net expansion per degree Fahrenheit, Δx, due to thermal expansion of said band, thermal expansion of said arm, and thermal expansion of said capstan, said arm moves a distance, C, said distance C offsetting a displacement of said means for reading and writing relative to said disk caused by thermal expansion of said flexure, said thermal expansion of said arm, and thermal expansion of said platform.

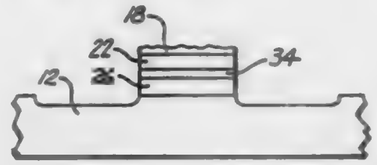
4,992,900
HEAD WHEEL ARRANGEMENT HAVING A ROTATING NUTS WITH REDUCED BACKLASH FOR A RECORDER
Adelbert Schalk, Furtwangen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
Filed Jan. 11, 1989, Ser. No. 295,705
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801622
Int. Cl.[5] G11B *5/52, 21/10*
U.S. Cl. 360—107 **9 Claims**



1. A head wheel arrangement for a recorder, comprising:
a head wheel having an axis about which said head wheel is rotatable;
a first nut portion connected to said head wheel;
a second nut portion;
means for connecting said second nut portion to said first nut portion such that twisting of one of the two nut portions;
means for rotating the two nut portions about said axis;
means for biasing one of the two nut portions relative to the other one in a direction of said axis; and
a spindle rotatable about said axis for engaging said nut portions in such a way that a relative rate of rotation between said spindle and said nut portions varies in a periodic manner that causes said head wheel to move periodically in a lift movement along said axis.

4,992,901
SELF ALIGNED MAGNETIC POLES USING SACRIFICIAL MASK
Beat Keel, Prior Lake; Arthur Calderon, Minnetonka, both of Minn., and Simon Liao, Santa Barbara, Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.
Filed Feb. 15, 1990, Ser. No. 480,278
Int. Cl.[5] G11B *5/127*; B44C *1/22*; C03C *15/00*; C23F *1/00*
U.S. Cl. 360—110 **52 Claims**





1. A method of manufacturing a thin film magnetic transducer comprising:
forming a first magnetic layer upon a nonmagnetic substrate;
forming a gap material layer upon the first magnetic layer;
depositing a layer having an aperture of a defined structure upon the gap material layer;
forming a second magnetic layer over the gap layer and in the aperture;
depositing a sacrificial mask layer upon the second magnetic layer and in the aperture;
removing the layer having an aperture, exposing a portion of the gap material layer and a portion of the first magnetic layer; and
exposing the thin film magnetic transducer to a material removal process.

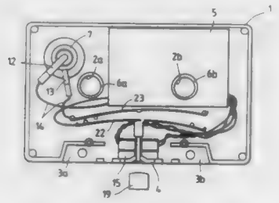
13. A thin film magnetic transducer formed by the method defined in claim 1.

4,992,902
CASSETTE DEVICE FOR DEMAGNETIZING THE MAGNETIC HEAD IN A CASSETTE-TYPE RECORDER
Sachima Tani, Tokyo, Japan, assignor to Teac Corporation and Access Corporation, both of Tokyo, Japan
Filed Mar. 13, 1989, Ser. No. 322,465
Claims priority, application Japan, Mar. 22, 1988, 63-37523[U]
Int. Cl.[5] G11B *5/10, 5/127, 5/41*
U.S. Cl. 360—128 **7 Claims**

1. A device for demagnetizing at least one head in a cassette-type tape recorder, said device comprising:
a case having a configuration adapted to be received into said cassette-type tape recorder;
at least one demagnetization electromagnet disposed within and rigidly affixed to said case, said electromagnet being juxtaposed to said head when said case is inserted in said recorder;
means in said case for electrically exciting said electromagnet;
switch means in said case for electrically connecting said electromagnet to said exciting means, said switch means

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including an operating member, said operating member having a first extremity adjacent said electromagnet and disposed to engage said head whereby insertion of said



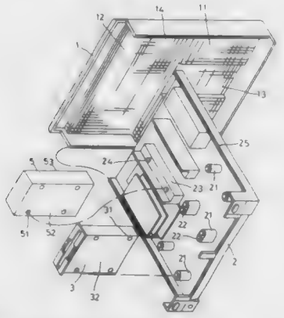
cassette into said recorder causes said head to contact said first extremity and move said operating member such that said switch is closed and said electromagnet is excited.

4,992,903

STRUCTURE OF COMPUTER MAIN FRAME

Charlie Chen, 5F, No. 3, Lane 521, Chung Cheng Rd., Hain Tien City, Taipei, Taiwan

Filed Dec. 28, 1989, Ser. No. 458,275
Int. Cl.[5] G11B *00/00*
U.S. Cl. 360—137 1 Claim



1. A computer main frame, including:

an upper cover comprising two raised side boards at its opposed lateral sides defining therebetween a stepped slotted inner wall surface having thereon tangent planes in shape and depth conforming to the geometry of two floppy discs and a hard disc received therein, said floppy discs and said hard disc having enclosures with a plurality of holes;

a bottom block comprising a plurality of posts having stub tenons upstanding therefrom, two chair-like holder plates having stub tenons made thereon, two channels on its two lateral side walls;

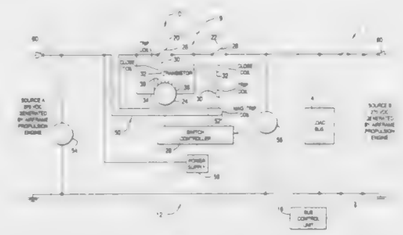
wherein said floppy discs and said hard disc are mounted on said bottom block permitting the stub tenons of said posts and said chair-like holder plates, respectively, to be inserted into the holes thereof, and said upper cover is mounted on said bottom block to retain said floppy discs and said hard disc therein with its two side boards respectively seated in the two channels of the two lateral side walls of said bottom block.

4,992,904

HYBRID CONTACTOR FOR DC AIRFRAME POWER SUPPLY

William M. Spencer, and Joseph S. Breit, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 14, 1989, Ser. No. 436,021
Int. Cl.[5] H02H *3/087*
U.S. Cl. 361—5 35 Claims



9. A contact for controlling connection of a DC power supply to an electrical load comprising:

a series circuit disposed between a non-ground DC power supply potential and a load having first and second relays each having a pair of contacts, the first relay and the second relay having a conducting state when the pair of contacts are closed and a non-conducting state when the pair of contacts are open which control current flow between the DC power supply and the load with the states being controlled by control signals applied to the relays;

a semiconductor switch having a conductive state controlled by an applied control signal which turns on the semiconductor switch to connect terminals of the semiconductor switch together and in parallel with the contacts of the first relay and a non-conductive state controlled by an applied control signal which turns off the semiconductor switch to disconnect the terminals of the semiconductor switch; and

a control signal generator for generating the control signals for connecting the DC power supply to the load by sequentially in time closing the contacts of the second relay, causing the semiconductor switch to turn on to connect the semiconductor switch terminals together, causing the contacts of the first relay to close and turning off the semiconductor switch and for disconnecting the DC power supply from the load by sequentially in time causing the semiconductor switch to turn on to connect the semiconductor switch terminals, causing the terminals of the first relay to be disconnected, causing the semiconductor switch to turn off and causing the terminals of the second relay to be disconnected.

4,992,905

HIGH CURRENT PRESSURE SENSITIVE INTERRUPTERS

Frederick W. MacDougall, Marion, and Pamela E. Hardy, Mattapoisett, both of Mass., assignors to Aerovox Incorporated, New Bedford, Mass.

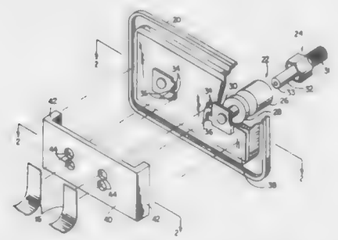
Filed Nov. 21, 1988, Ser. No. 274,198
Int. Cl.[5] H02H *7/16*
U.S. Cl. 361—15 21 Claims

1. A self-interrupting electrical device comprising an electrical element;

an container housing said element, said container comprising a wall having a first, peripheral region and a second, center region spaced from said first, peripheral region, said wall in said first region being joined to an adjacent element of said container, said all, upon generation of gas within said container, being adapted to bulge to a greater degree in said second region than in said first region,

a rigid electrical terminal extending through a hole in wall of said container;

a bridge element disposed between said wall and said electrical element, said bridge having at least one opening offset from an axis lying normal to said wall sat the center of said hole, said at least one opening being spaced from said first region and being positioned relatively closer to said sec-



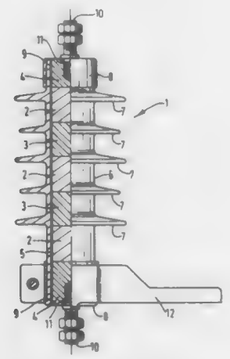
ond region compared to the position of said hole, at least one opening being aligned with a corresponding portion of said terminal; and an electrical connection made between said electrical element and said terminal via said at least one opening in said bridge, said connection being configured so that bulging of said wall causes said connection break.

4,992,906

USE OF A SURGE ARRESTER AS A COMBINED SURGE ARRESTER AND SUPPORT INSULATION

Rodney M. Doone, and Henry J. Colbert, both of Burgess Hill, England, assignors to Bowthorpe EMP Limited, Brighton, England

Division of Ser. No. 924,486, Oct. 29, 1986, Pat. No. 4,851,955.
This application Jun. 15, 1989, Ser. No. 366,841
Claims priority, application United Kingdom, Jan. 29, 1986, 8602112
Int. Cl.[5] H02H *1/04*
U.S. Cl. 361—117 15 Claims



1. An electric power distribution riser pole system comprising

(a) a power distribution pole;

(b) an overhead power line insulatingly supported by said power distribution pole;

(c) a riser cable affixed to and supported by said pole; and

(d) means coupling a conductor of said riser cable to said overhead power line;

(e) said coupling means comprising a surge arrester mounted on said pole and having a first terminal end coupled to and supporting a terminal end of said riser cable conductor and a second terminal end connected to electrical ground,

and an electrically conducting connecting lead coupled between said first terminal end of said surge arrester and said overhead power line, said surge arrester thereby serving additionally as a support insulator supporting said riser cable conductor terminal end;

(f) said surge arrester being of gapless configuration and comprising an elongate rigid core constituted by a stack of varistor blocks held in face-to-face contact between first and second terminal blocks by virtue of said varistor blocks and terminal blocks being encased within a rigid shell of reinforced rigid plastic material bonded to peripheral surfaces of said terminal blocks, and a shedded outer housing for said core, interfaces between said varistor blocks and said terminal blocks and their encasing shell and between said shell and said outer housing being voidless and free of

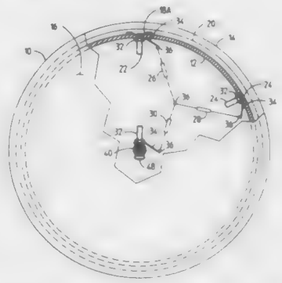
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4,992,907

ELECTROSTATIC DISCHARGE PROTECTION SYSTEM

Robert W. Shreeve, and John M. Herrmann, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 12, 1989, Ser. No. 351,355
Int. Cl.[5] H01L *23/60*; H05F *3/02, 3/04*
U.S. Cl. 361—220 18 Claims



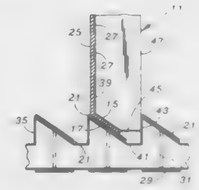
14. An electrostatic discharge protection system for use in connection with a guide having a central rim portion and first and second side portions on opposite sides of said rim portion; wherein said rim portion is electrically non-conductive; and wherein each side portion includes a conductive portion which is electrically connected to ground through a zener diode.

4,992,908

INTEGRATED CIRCUIT MODULE

Allen L. Solomon, Fullerton, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 24, 1989, Ser. No. 383,429
Int. Cl.[5] H05K *7/02*
U.S. Cl. 361—400 12 Claims



1. An integrated circuit module comprising:

a plurality of integrated circuit layers, each of said layers having upper and lower surfaces and first and second

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vertical edges, at least a first of said vertical edges being beveled along at least a portion thereof;

a first contact board disposed orthogonal to the integrated circuit layers and connected to the respective first vertical edge thereof, said first contact board having a first and second surface, said first surface having a plurality of layer receiving channels each formed to receive and support a plurality of the integrated circuit layers, each of said channels having a beveled portion, formed to abut against and support the respective circuit layer first edge beveled portion, and a vertical portion formed to abut against and support the respective circuit layer lower surface;

each of said integrated circuit layers having an integrated circuit structure formed on the upper surface thereof;

each of said integrated circuit layers also having first conductive pads formed on the first edge beveled portion, said first conductive pads being in electrical connection with the integrated circuit structure formed on the respective layer;

said first contact board further having second conductive pads formed on each of the beveled portions thereof for abutting electrical connection with the first conductive pads formed on the integrated circuit layer;

said first contact board further having a plurality of third conductive pads formed on the second surface thereof, each of said third conductive pads being connected to a dedicated second conductive pad by a conductive via extending through the first contact board.

4,992,909

TELECOMMUNICATIONS INSTALLATION BOX

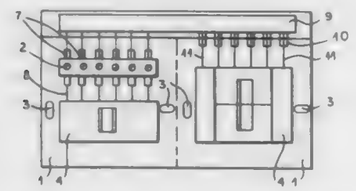
Harald Rutenbeck, Schalksmühle, Fed. Rep. of Germany, assignor to Wilhelm Rutenbeck GmbH & Co., Schalksmühle, Fed. Rep. of Germany

Filed May 24, 1989, Ser. No. 356,991

Claims priority, application Fed. Rep. of Germany, May 26, 1988, 3817869

Int. Cl.[5] H05K *1/14*

U.S. Cl. 361—413 **7 Claims**



1. A telecommunications installation comprising:

a plurality of stationary and physically similar base plates including one main plate and a plurality of secondary plates mounted stationarily immediately adjacent one another and each formed with mounting holes;

respective printed circuit boards each carrying different electrical components and each mounted on a respective one of the plates and each provided with an array of stiff connectors;

a terminal strip mounted on the main plate and provided with an array of stiff connectors mating with the connectors of the main plate;

a bus extending from the strip of the main plate and having a plurality of conductors connected to the connectors of the terminal strip, the bus mounted to and extending along the secondary plates and provided at each of the secondary plates with an array of stiff connectors mating with the connectors of the respective secondary plates and

respective caps releasably secured to each of the plates over each of the respective printed circuit boards.

4,992,910

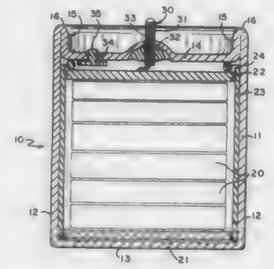
ELECTRICAL COMPONENT PACKAGE

David A. Evans, Seekonk, Mass., assignor to The Evans Findings Company, Inc., East Providence, R.I.

Continuation-in-part of Ser. No. 431,930, Nov. 6, 1989, abandoned. This application Apr. 9, 1990, Ser. No. 506,519

Int. Cl.[5] H01G *9/00, 9/12*

U.S. Cl. 361—502 **27 Claims**



13. A packaged double layer capacitor comprising:

at least one double layer capacitor element including carbon and an electrolyte in aqueous solution permeating the carbon that generates carbon dioxide gas during operation at a rate R;

a metal container having an opening, the double layer capacitor element being disposed within and electrically connected to the container, the container providing a second electrical terminal of the double layer capacitor element;

a metal cover engaging the container, closing the opening, and thereby enclosing the double layer capacitor element in a package that can withstand a maximum internal pressure of P_i without damage;

a first electrical terminal electrically insulated from and passing through one of the container and cover and electrically connected to the double layer capacitor element; and

means for selectively venting carbon dioxide gas generated in the package without exposure of the double layer capacitor element to ambient comprising a selectively permeable body disposed on the crimped engagement of the container and cover having a relatively high permeability to carbon dioxide and a relatively low permeability to water vapor, the permeable body having an area A and a thickness t through which carbon dioxide can permeate, wherein the ratio t/A is no more than $\sigma P_i/R$ where σ is the permeability of the body to the carbon dioxide and R is the rate of generation of the carbon dioxide, and is sufficiently large to limit the permeation of water vapor and thereby avoid premature failure of the capacitor whereby the carbon dioxide generated within the package escapes from the package by permeation through the permeable body without exposure of the double layer capacitor element to the ambient by any of rupture, fusion, expulsion, and displacement of the permeable body.

4,992,911

MOTOR VEHICLE HEADLIGHT

Alessio Ressia, Cirie, Italy, assignor to Carello S.P.A., Turin, Italy

Filed Nov. 21, 1989, Ser. No. 439,495

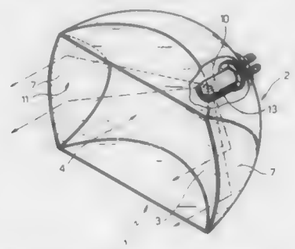
Claims priority, application Italy, Nov. 22, 1988, 53550 B/88[U]

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **4 Claims**

1. A motor vehicle headlight comprising a reflecting body which includes a rear wall that defines a rear paraboloid of rotation having a focus point and an optical axis, and two lateral end walls; and a light source located at the focus point of said rear paraboloid; characterised by the fact that said two

lateral end walls define respective lateral paraboloids of translation arranged with concave sides thereof facing each other,



and having substantially horizontal focal axes parallel to the optical axis of said rear paraboloid.

4,992,912

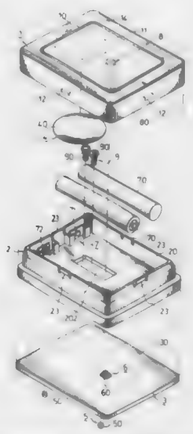
MULTIFUNCTIONAL SOUNDING AND LIGHTING DEVICE

Yeou-Ching Lee, Taipei, Taiwan, assignor to Alvin Lee Jewelry, Inc., Taipei, Taiwan

Filed Aug. 25, 1989, Ser. No. 398,736

Int. Cl.[5] F21V *9/16*

U.S. Cl. 362—86 **11 Claims**



1. A multifunctional sounding and lighting device comprising:

a housing unit composed of an upper case and a lower case, said upper case having an open section formed in one side thereof and a locating slot provided in a bottom surface of said open section, and said lower case having an upper open room with an inclined round edge thereof formed in conjunction with the open section of said upper case and a concave surface provided on a bottom side of said upper open room with an elongated opening located in a middle portion thereof;

a circuit means installed in the concave surface of said lower case for effecting various electrical functions therewith;

a sound-generating means fixed in the locating slot of said upper case and electrically connected to said circuit means for being energized to produce sound thereat;

a light-emitting means installed in said circuit means and electrically connected thereto for being activated to emit light thereat;

a switching means disposed at said circuit means in conjunction with the elongated opening of said lower case and electrically coupled with said sound and light circuits for being actuated to turn on and off said sound-generating means and light emitting means;

a power supply means provided in the upper open room of said lower case and electrically coupled with said circuit means through said switching means for effecting power supply operations thereat;

an actuating means fixed on the bottom surface of the open section of said upper case in conjunction with said switching means for being operated to turn on and off said switching means; and

an elastic means installed in said housing unit so as to provide a biasing action between said upper case and said lower cases; whereby, when pressure is applied to either side of said housing unit, said switching means will be operated to turn on and off said circuit means for controlling the operations of said sound generating means and said light emitting means therewith.

4,992,913

LIGHT-BULB HOLDER FOR HOUSEHOLD APPLIANCES

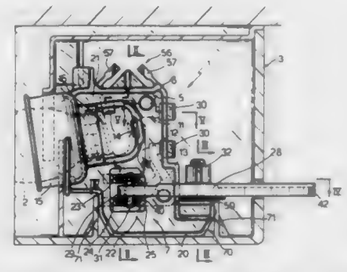
Claudio Buscella, Verolengo, Italy, assignor to ITW Fastex Italia, S.p.A., Turin, Italy

Filed Mar. 7, 1990, Ser. No. 489,630

Claims priority, application Italy, Mar. 10, 1989, 52929/89[U]

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—94 **8 Claims**



1. A light-bulb holder for household appliances, comprising:

a board structure fabricated from an electrically insulating material and bound by means of a peripheral edge and a pair of oppositely disposed lateral surfaces;

an electrically conductive plate divided into sections and adapted to define an electrical circuit including a pair of power supply contacts for a light bulb of said appliance, and disposed inside said board structure so as to be parallel to said oppositely disposed lateral surfaces;

electrical power supply means for said circuit; and

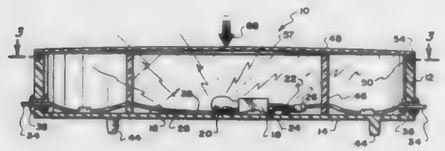
a light-bulb holder sleeve integral with and projecting outwardly from said board structure in line with a first hole passing through said lateral surfaces of said board structure, said first hole communicating with the inside of said sleeve and housing said power supply contacts projecting internally into said first hole;

said electrical power supply means for said circuit comprises at least one pair of electrical plate terminals integral with said conductive plate and projecting outwardly from said board structure, a pair of second electrical contacts disposed inside a second hole passing through said surfaces of said board structure, and a pivotable lever pivotably mounted upon said board structure against the biasing action of an elastic means of said board structure about a fulcrum disposed substantially parallel to said lateral surfaces, said pivotable lever having a first end disposed in line with said second hole and equipped with an electrically conductive element which is disposed parallel to said fulcrum and being adapted, at a first travel end position of

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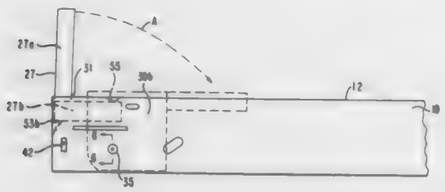
said lever, to come simultaneously into contact with both of said second electrical contacts.

4,992,914
ILLUMINATED STEPPING STONES
Charles E. Heim, 4798 Coyote Well Cir., Westlake Village, and Lawrence S. Gluck, 2252 Hollowpark Ct., Thousand Oaks, both of Calif. 91362
Filed Oct. 2, 1989, Ser. No. 415,861
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—153.1 15 Claims



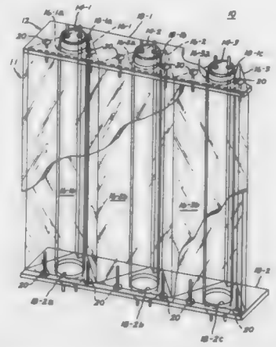
1. An illuminated stepping stone comprising:
a base having a side wall enclosing an internal chamber, said base having a top and a bottom, said bottom adapted to be embedded within a supportive surface, said top constructed of a translucent material;
a light source mounted within said internal chamber; and
support means mounted on said base, said support means located within said internal chamber, said support means being spaced from said side wall, said support means assuming a spaced relationship from said top when said stepping stone in its normal at rest position, said support means physically contacting said top once said top encounters a pressing force of sufficient magnitude.

4,992,915
LIGHTING FIXTURE HAVING UNITARY FOLD-OUT LAMP SOCKETS
Barry J. Meister, North Caldwell, N.J., assignor to Steelcraft Fluorescent Company, Newark, N.J.
Filed Oct. 4, 1989, Ser. No. 416,873
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—217 25 Claims



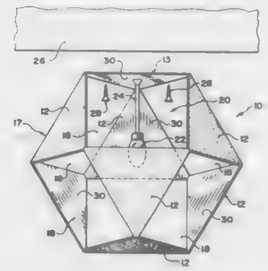
1. A lighting fixture comprising a U-shaped channel member having a first end and a second end comprising a web and first and second upstanding side walls including a first end joined to said web and a second end, and at least one unitary socket member mounted at at least one of said first and second ends of said channel member for removably mounting a lamp thereon, said socket member comprising a base member between said first and second upstanding side walls of said channel member and normally located at a position spanning said second ends of said first and second upstanding side walls of said channel member, said base member including mounting means for mounting a lamp receptacle above said upstanding side walls, a pair of downturned side walls extending from said base member along said upstanding side walls of said channel member within said channel member, an end wall extending from said base member between said upstanding side walls at said first and second ends of said channel member, pivoting means providing a pivot connection between said unitary socket member and said channel member, said pivoting means pivotally interconnecting said first and second upstanding side walls of said channel member with said pair of downturned side walls of said unitary socket member, and locking means on said unitary socket member and at said at least one of said first and second ends of said channel member cooperating to lock said unitary socket member in said normal position so that said base member spans said second end of said first and second upstanding side walls of said channel member, said locking means comprising protrusions struck from said downturned side walls of said socket member and corresponding apertures in said first and second upstanding side walls of said channel member which engage to lock said socket member in said normal location, whereby upon pivoting said unitary socket member about said pivoting means, said socket member can be disposed in a compact shipping position entirely within said channel member, and said socket member can be locked in said normal location.

4,992,916
PRISMATIC ILLUMINATOR FOR FLAT PANEL DISPLAY
John L. Henkes, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jun. 8, 1989, Ser. No. 363,645
Int. Cl.[5] F21V *5/02*
U.S. Cl. 362—255 20 Claims



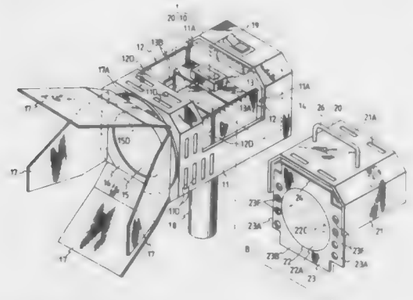
1. An illuminator for substantially uniformly illuminating a flat panel display, comprising:
at least one light source, each having at least one elongated light producing region, the light-producing region of any source being positioned parallel to the light-producing region of any other source if more than one light source is present; and
at least one elongated prism member, each having a front surface and at least one other surface not parallel to the front surface, each member being located with its elongated dimension at a fixed relationship to a selected elongated light-producing region of an associated source and exhibiting substantially total-internal-reflection of light incident upon any surface, other than said front surface, from within the prism member, to provide multiple images of the associated light source from said front surface.

4,992,917
LIGHT REFLECTOR FOR GROWING PLANTS
John Earnshaw, 1103 Davie Street, Victoria, British Columbia, Canada V8S 3E2
Continuation-in-part of Ser. No. 253,823, Oct. 6, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,248
Int. Cl.[5] F21V *7/00*
U.S. Cl. 362—346 22 Claims



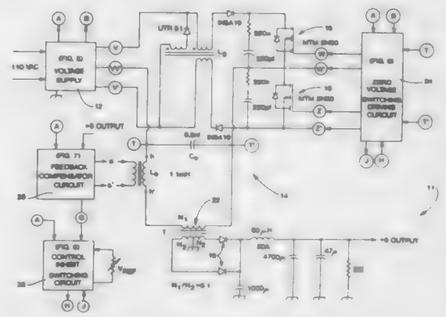
1. A light reflector comprising:
a plurality of opaque, generally triangular panels having three sides of equal length, the panels being connected together to form a three-dimensional geometric figure surrounding an inside space, each said panel having a reflective surface facing said inside space, each corner of each of said panels being adjacent a corner of an adjacent said panel and said panels being spaced apart from each other by rectangular, open areas.

4,992,918
ILLUMINATOR HAVING AN EASILY REPLACEABLE LIGHT SOURCE UNIT
Shigeo Shioiri, Chiba; Makoto Tateyama, Saitama, and Youichi Akaishi, Tokyo, all of Japan, assignors to Somar Corporation, Tokyo, Japan
Filed Jan. 26, 1989, Ser. No. 301,552
Claims priority, application Japan, Jan. 26, 1988, 63-14939; Apr. 25, 1988, 63-101910
Int. Cl.[5] F21V *19/00*
U.S. Cl. 362—368 17 Claims



1. An illuminator comprising:
a frame having an opening defined therein; and
a light source unit for removable mounting via said opening in said frame in an operative position in said frame, said light source unit including a light source and mounting portions attached thereto such that in said operative position, said light source is pointed in a direction perpendicular to the direction in which said light source unit was moved when mounted;
wherein said frame has a unit support member mounted therein for removably supporting said mounting portions of said light source unit when said light source unit is placed in said operative position in said frame, said unit support member having guide slits which guide said light source unit and a retainer member which retains said light source unit.

4,992,919
PARALLEL RESONANT CONVERTER WITH ZERO VOLTAGE SWITCHING
Chu-Quon Lee; Kasemsan Siri, both of P.O. Box 4348, Chicago, Ill. 60608, and Anand K. Upadhyay, 2006 Chinkapin Oak Dr., Mt. Prospect, Ill. 60056
Filed Dec. 29, 1989, Ser. No. 458,993
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—17 16 Claims



1. A parallel resonant converter, comprising:
(a) inductor impedance means and capacitor impedance means, one of said impedance means being variable over a pre-determined impedance;
(b) a load electrically connected in series with said one impedance means to form a series circuit, said series circuit being connected electrically in parallel with the other impedance means, said load being characterized by an output voltage;
(c) switched source of power means, comprising at least one switch operated by a driving circuit, for switching voltage through said series circuit and said other impedance means,
(d) control circuit means, operating in response to said output voltage, for varying said one impedance means to maintain said output voltage within a pre-determined voltage range; and
(e) feedback means, using a feedback voltage derived across said other impedance means, for supplying a control signal to said driving circuit to operate said switch under zero voltage switching conditions and continuous current flow through said load.

4,992,920
REGULATED AC POWER SYSTEM ENERGIZED BY VARIABLE SPEED PRIME MOVER
Donald E. Davis, 7151 Helsmen Bend, Dallas, Tex. 75230
Filed Sep. 13, 1989, Ser. No. 406,720
Int. Cl.[5] H02M *5/458*
U.S. Cl. 363—36 6 Claims

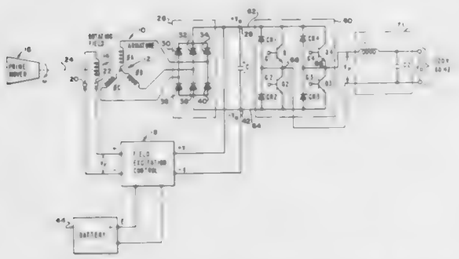
1. A system for supplying controlled frequency power at a predetermined RMS value and predetermined fixed frequency derived from a prime mover having an operating RPM which is variable over a range from a minimum RPM to a maximum RPM comprising:
an alternator having a rotor field winding adapted for mechanical coupling to said prime mover, and having a stator armature winding inductively coupled to said field winding for producing alternating current in response to rotation of said field winding, said field winding and armature

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winding being adapted to produce an alternating output voltage on said armature winding which has an RMS value substantially equal to said predetermined RMS value when the prime mover is operating at the minimum RPM;

a rectifier circuit connected to said armature winding for converting an alternating current input signal to a direct current output signal;

a field excitation control circuit having an input terminal



connected to receive said rectified DC output signal and having an output terminal connected to said field winding for controlling the amplitude of field excitation applied to said rotor field winding;

a switching circuit having an input terminal connected to the output of said rectifier circuit for producing alternating positive and negative amplitude power output pulses; and,

a control logic circuit coupled to said switching circuit for controlling the timing and width of each positive and negative power output pulse, respectively.

4,992,921

CIRCUIT ARRANGEMENT FOR SUPPLYING A LOAD

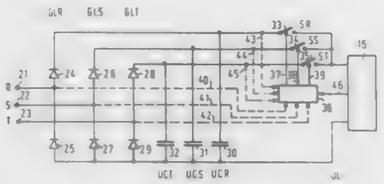
Manfred Albach, Aachen, Fed. Rep. of Germany, and Hubert Raets, Nieuwenhagen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1989, Ser. No. 445,582

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1988, 3840304

Int. Cl.[5] H02M *1/12, 1/14*

U.S. Cl. 363—44 **30 Claims**



1. A circuit arrangement for supplying a load with energy from a power supply mains conveying at least one alternating voltage comprising: a rectifier arrangement which for each terminal of the power supply mains comprises a rectifier stage constituted as a first branch of a bridge rectifier, for each rectifier stage an energy storage device can be charged via and is connected to said stage in accordance with a complementary branch of the bridge rectifier, for each terminal a switching element is provided for connecting each energy storage device to the load and a control circuit by which the switching elements are switchable to conduct outside charge time intervals (conducting phases of the rectifier stages) cyclically following the charge of the energy storage devices from the power supply mains via the rectifier stages.

4,992,922

VARIABLE HIGH-VOLTAGE GENERATING CIRCUIT

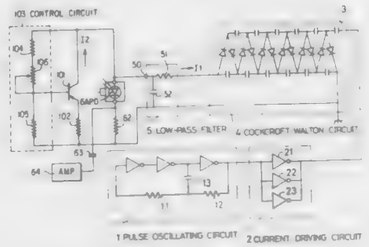
Katsuhiro Ishimura, and Shusei Aoki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 298,024, Jan. 18, 1989, abandoned. This application Aug. 11, 1989, Ser. No. 392,293

Claims priority, application Japan, Jan. 20, 1988, 63-8381

Int. Cl.[5] H02M *7/26*

U.S. Cl. 363—59 **5 Claims**



1. A variable high-voltage generating circuit for use with an avalanche photodiode, comprising:

a pulse oscillating circuit to generate pulses;

a current driving circuit to current-amplify the pulses;

a Cockcroft-Walton circuit to receive the current-amplified pulses and to provide a boosted and rectified voltage;

a low-pass filter connected to the Cockcroft-Walton circuit to remove the ripple components from the boosted and rectified voltage, the low-pass filter having a voltage output node;

a first resistor connected in series with the avalanche photodiode, the series connection of the first resistor and the avalanche photodiode being connected to the voltage output node of the low-pass filter;

a transistor;

a second resistor connected in a series with the transistor, the series connection of the second resistor and the transistor being connected in parallel with the series connection of the first resistor and the avalanche photodiode; and

a control circuit to apply a variable signal to the base of the transistor.

4,992,923

ELECTRICAL POWER SUPPLY, FUSING APPARATUS AND RECORDING APPARATUS USING THE SAME

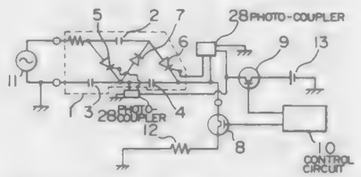
Teruaki Mitsuya; Yasuro Hori, both of Katsuta; Takao Kumasaka, Takahagi; Shinichi Nishino, Katsuta, and Shigetaka Fujiwara, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 393,956

Claims priority, application Japan, Aug. 19, 1988, 63-204703

Int. Cl.[5] G03G *15/20;* H02M *7/19*

U.S. Cl. 363—61 **11 Claims**



1. An electrical power supply for supplying momentarily a DC high voltage to a load, comprising:

a DC high voltage circuit including a plurality of stages, each stage including a capacitor and a rectifier element, and connected to receive an AC low voltage at a first stage and to electrically charge the capacitor of a last stage to a DC high voltage, at least one of the rectifier elements of the stages being a rectifying control element;

a switching element connected between the capacitor of the last stage and a load; and

control means selectively operating in one of:

a first mode wherein the at least one rectifier element is rendered conductive while the switching element is rendered non-conductive, thereby allowing the capacitors of the stages to be electrically charged through the associated rectifier elements of the stages so that the capacitor of the last stage is electrically charged to the DC high voltage; and

a second mode wherein the at least one rectifier element is rendered non-conductive and then the switching element is rendered conductive, thereby allowing the electric charge of the capacitor of the last stage to be discharged momentarily into the load.

4,992,924

DRIVE CIRCUIT FOR A POWER TRANSISTOR

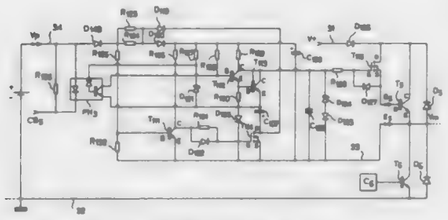
Alain Gousset, Rueil Malmaison, and Jean Lafontaine, Maisons Laffitte, both of France, assignors to Telemecanique, France

Filed Nov. 22, 1989, Ser. No. 440,189

Claims priority, application France, Nov. 22, 1988, 88 15162

Int. Cl.[5] H02M *1/08*

U.S. Cl. 363—132 **13 Claims**



1. A power switching circuit including:

(a) at least one bipolar transistor stage having a control input and a control circuit for said stage, said control circuit including first bias means for applying forward bias to said stage during first time intervals and second bias means for applying reverse bias to said stage during second time intervals different from said first time intervals, said reverse bias preventing charge accumulating in said transistor while said transistor is subjected to a reverse voltage,

(b) a DC voltage source,

(c) said first bias means comprising a first capacitor and a first switching circuit selectively charging said first capacitor means from said DC voltage source outside said first time intervals, and for discharging said first capacitor into said control input of said stage; and

(d) said second bias means comprising a second capacitor and a second switching circuit for selectively charging said second capacitor from said voltage source outside said second time intervals, and for discharging the second capacitor into said control input.

4,992,925

CONVERTER WITH INTERMEDIATE D.C. CIRCUIT

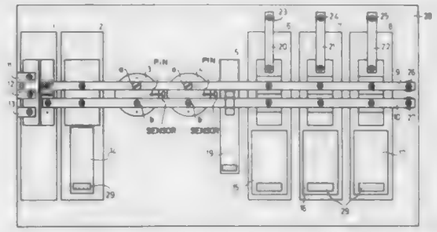
Helmut Meyer, Dossenheim, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 302,834

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802593

Int. Cl.[5] H02M *5/45;* H05K *7/02*

U.S. Cl. 363—141 **14 Claims**



1. Converter with an intermediate d.c. circuit, comprising power components grouped together in a plurality of modules having respective printed-circuit boards for control circuits disposed thereon, and bus bars to which said modules are connected, and a mounting plate formed with cutouts, said modules projecting through said cutouts formed in said mounting plate in a manner that said modules are removable from a side of said mounting plate located opposite said bus bars.

4,992,926

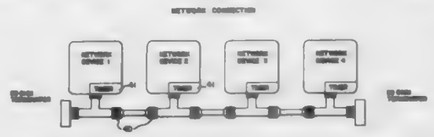
PEER-TO-PEER REGISTER EXCHANGE CONTROLLER FOR INDUSTRIAL PROGRAMMABLE CONTROLLERS

Donald R. Janke; Kim J. Watt, both of Milwaukee, Wis.; Dirk I. Gates, Woodland Hills, Calif., and Joseph T. Bronikowski, Brown Deer, Wis., assignors to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 179,674, Apr. 11, 1988, Pat. No. 4,897,777. This application Oct. 17, 1988, Ser. No. 258,779

Int. Cl.[5] G06F *15/46, 15/16*

U.S. Cl. 364—134 **8 Claims**



1. A peer-to-peer communications network for high-speed transfer of data in registers and control data between devices comprising, in combination:

a communications network having an update time that is a function of the number of devices on the network, said update time being the time required for every device to be updated by every other device on the network,

at least two programmable logic controller devices connected to communicate with said network, a memory means for each of said devices, said memory means having at least two ports, means for connecting each of said devices to have direct access to each of said memory means, means for allocating a transmission time slice for each of said devices, said time slice comprising a block transmit time and an interblock gap time, means for determining the total interblock gap time, said time representing the total gap time between each said devices subsequent transmission time slices, and an interblock gap timer for each device for timing when the associated device is not receiving data and for holding its count when data is being sent on said communications network.

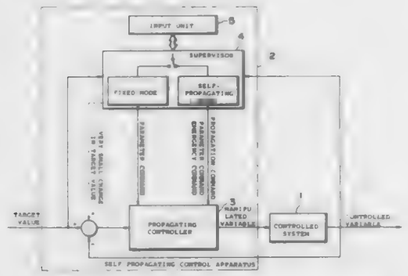
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SELF-PROPAGATING CONTROL APPARATUS AND METHOD, PROPAGATING-TYPE CONTROLLER USED BY SAID APPARATUS, METHOD OF OPERATING AND CONTROLLING SAME, AND SUPERVISOR

Mitsuhiko Araki, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 15, 1989, Ser. No. 311,342
Claims priority, application Japan, Feb. 20, 1988, 63-36488
Int. Cl.[5] G05B *13/02*
U.S. Cl. 364—160 8 Claims



1. A self-propagating control apparatus comprising:

a propagating-type controller, to which a controlled variable obtained from a controlled system and a given target value are applied as inputs, for calculating and outputting a manipulated variable for the controlled system; and

a supervisor for controlling said propagating-type controller;

said propagating-type controller including:

a proportional integration element and a plurality of phase elements; and

control means which, in accordance with a command from said supervisor, creates a serially arrayed structure of the proportional integration element and a commanded number of the phase elements and applies commanded parameters to the integration and phase elements, and which, in response to an offset between the target value and the controlled variable outputs, as the manipulated variable, a response of said serially arrayed structure; and

said supervisor including:

means for judging the status of a control system based on the given target value and the controlled variable; and

propagating control means for calculating a characteristic quantity of the controlled system when the judging means determines that the controlled system has a predetermined status, and applying a command relating to the number of phase elements and the parameter of each element to said propagating-type controller based on the characteristic quantity or an inputted initial command.

4,992,928

MULTIPLE ERROR PROCESSOR IN AUTOMATIC WORK HANDLING APPARATUS

Akira Ishihara; Matsuro Kinbara; Kazuhiro Noda, and Kenji Nonomura, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 3, 1989, Ser. No. 292,969
Claims priority, application Japan, Feb. 8, 1988, 63-26760
Int. Cl.[5] G05B *11/01, 9/02, 23/02;* G06F *11/00*
U.S. Cl. 364—183 5 Claims

1. A multiple error processor in an automatic work handling apparatus, comprising;

a plurality of operating mechanisms disposed successively along a direction in which a work is transferred;

a plurality of operation controlling means for controlling each of the operating mechanisms individually, and for setting and sending an error code when an error arises:

an operation sequence indicating means for controlling the sequence of operation of said operating mechanisms through said operation controlling means:

an apparatus control means for controlling the automatic work handling apparatus;

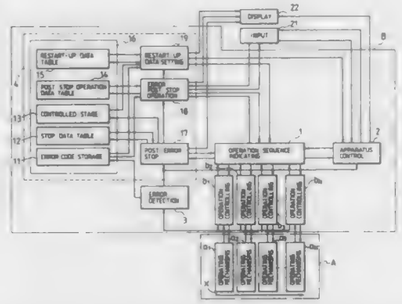
an error detection means for detecting an error arising on each of said operating mechanisms, and for transferring a control of the apparatus from said apparatus control means to an error recovery means upon detection of an error, and for outputting the error code received from said operation controlling means;

an error code storage means constituting a part of said error recovery means, which receives a first error code from said error detection means and stores the first error code;

a stop data table constituting a part of said error recovery means, which stores stop mode data for each of said operating mechanisms according to an error code;

a post-error stop means constituting a part of said error recovery means, which receives an error code from said error detection means, reads a corresponding stop mode data from said stop data table according to the received error code and sends the read stop mode data to each operation controlling means through said operation sequence indicating means, thereby controlling the stop mode of each of said operating controlling means according to the read stop mode data;

a controlled state storage means constituting a part of said error recovery means, which stores a control data on each operating mechanism after each operating mechanism is stopped by said post-error stop means;



a post-stop operating data table constituting a part of said error recovery means, which stores beforehand an error post-stop operation mode data of each operating mechanism according to an error code;

an error post-stop operation means constituting a part of said error recovery means, which reads the error post-stop operation mode data from said post-stop operating table after each of said operating mechanisms is stopped and which sends the error post-stop operation mode data to each operation controlling means through said operation sequence indicating means;

a restart-up data table constituting a part of said error recovery means, which stores beforehand a restart-up mode data of each operating mechanism according to an error code;

a restart-up data setting means constituting a part of said error recovery means, which reads the restart-up mode data from said restart-up data table, reads the control data from said controlled state storage means, creates a restart-up data from said restart-up mode data and the control data, and sends the restart-up data to each operation controlling means through said operation sequence indicating means;

wherein,

said error code storage means stores a first error code from said error detection means, and also stores an ensuing error code when another error is supplied from said error detection means, the ensuing error code being detected by said error detection means after the first error code but before all the operating mechanisms come to a stop;

said stop data table having a stop mode data which represents stopping an erroneously operating mechanism instantaneously, which represents stopping an operating mechanism disposed upstream relative to the work transfer direction from the erroneously operating mechanism at a fixed point and which represents stopping according to a clear out operation an operating mechanism disposed downstream from said erroneously operating mechanism;

said post-error stop means being operable for creating a new stop mode data representing stopping each of the erroneously operating mechanisms instantaneously, representing stopping an operating mechanism disposed upstream from the most downstream erroneously operating mechanism at a fixed point, and representing stopping according to a clear out operation an operating mechanism disposed downstream from the most downstream erroneously operating mechanism according to the first error code and the ensuing error code;

said error post-stop operating means being operable for carrying out, in sequence, error post-stop operations according to each of the stored error codes after all of the operating mechanisms come to a stop;

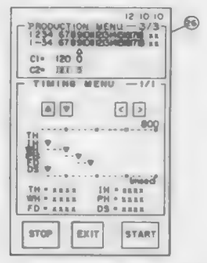
said restart-up data setting means being operable for setting restart-up data according to all of the stored error codes after the error post-stop operations are completed.

4,992,929

METHOD OF SYSTEM OPERATION

Seiji Yamada, Kyoto; Katsuaki Kono, and Kiichi Terashima, both of Shiga, all of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Shiga, Japan

Division of Ser. No. 931,230, Nov. 14, 1986, Pat. No. 4,811,256.
This application Nov. 8, 1988, Ser. No. 268,763
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—189 5 Claims



1. A method of setting a plurality of parameters of a system comprising the steps of

selecting parameter values by which operating conditions of said system are adjustably set,

identifying a group of said parameters which assume the same value under different conditions of use of said system, said group of parameters being less than all of said plurality of parameters,

storing in a memory the parameter value of said group as a combination, and

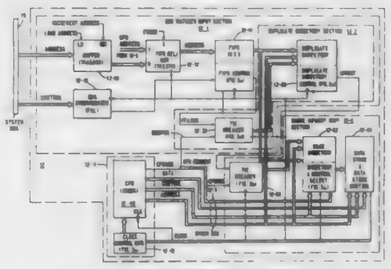
assigning a reservation number to said combination.

4,992,930

SYNCHRONOUS CACHE MEMORY SYSTEM INCORPORATING TIE-BREAKER APPARATUS FOR MAINTAINING CACHE COHERENCY USING A DUPLICATE DIRECTORY

Amy E. Gilfeather, Charlestown, and George J. Barlow, Tewksbury, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed May 9, 1988, Ser. No. 191,319
Int. Cl.[5] G06F *13/14*
U.S. Cl. 364—200 35 Claims



1. A private write through cache memory system included in one of a number of processing units for providing fast access to main memory information and which is updated in response to main memory write requests transferred over an asynchronous bus network, said cache memory system comprising:

a main cache unit including a main directory having a plurality of addressable locations for storing addresses identifying which information words are stored in said main cache unit and for generating signals indicating whether or not information requested by said one processing unit is stored in said cache unit;

a FIFO buffer circuit coupled to said bus network for storing at least one main memory request for information applied to said bus network;

a duplicate directory having a plurality of addressable locations for storing a copy of said addresses stored in said main directory, said duplicate directory generating hit signals indicating whether or not said information being requested from main memory by a write request received from said FIFO buffer circuit, is stored in said cache unit;

a first tie-breaker circuit connected to apply requests for access from said FIFO buffer circuit and said one processing unit to said duplicate directory for updating the status of said addresses during duplicate directory cycles of operation;

a second tie-breaker circuit connected to apply requests for access from said duplicate directory and from said one processing unit to said main directory during main directory cycles of operation; and,

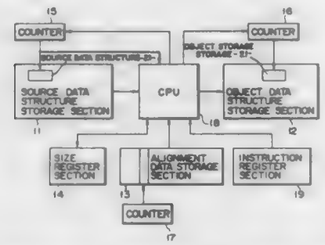
timing means coupled to said directories, said tie-breaker circuits and said processing unit, said timing means generating clocking signals for synchronizing the operations of said directories, said cache store and said tie-breaker circuits with said one processing unit, each of said tie-breaker circuits including means responsive to said directory signals for detecting conditions during said directory cycles of operation which could cause cache incoherency, said means generating signals in response to said conditions for causing said directories to perform uninterrupted synchronized directory cycles of operation to maintain cache coherency.

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4,992,931
DATA ALIGNMENT CORRECTION APPARATUS FOR PROPERLY FORMATTING DATA STRUCTURES FOR DIFFERENT COMPUTER ARCHITECTURES

Yutaka Hirasawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,674
Claims priority, application Japan, Dec. 26, 1986, 61-315330
Int. Cl.[5] G06F *3/00, 9/45*
U.S. Cl. 364—200 **12 Claims**



1. A data alignment apparatus for aligning a source data structure for use in a different computer architecture, comprising:

first storage means for storing a source data structure, the source data structure including a plurality of source data blocks;

second storage means for sequentially storing an object data structure, the object data structure including a plurality of object data blocks each corresponding to at least one of said source data blocks;

alignment data storage means for storing alignment data corresponding to the source data structure, the alignment data including a plurality of alignment data blocks each corresponding to one of said source data blocks; and

central process or means, connected to said first storage means, said second storage means and said alignment data storage means, for selectively reading out said source data blocks from said first storage means, said selection being made in accordance with the corresponding alignment data blocks from said alignment data storage means, and for outputting the selected source data blocks to said second storage means for storage as object data blocks in said object data structure.

4,992,932
DATA PROCESSING DEVICE WITH DATA BUFFER CONTROL

Toshiharu Ohshima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

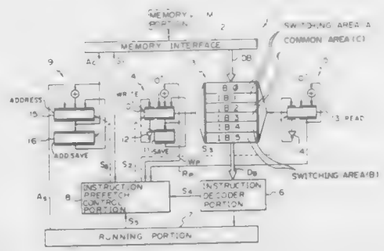
Filed Dec. 27, 1988, Ser. No. 290,335
Claims priority, application Japan, Dec. 29, 1987, 62-333719
Int. Cl.[5] G06F *9/06, 9/30, 9/32*
U.S. Cl. 364—200 **19 Claims**

1. A data processing device comprises:

a buffer storing instructions, fetched from a memory, into a first area, a second area and a common area thereof;

a decoder means, connected to said buffer, for receiving and for decoding said instructions stored in said first, second and common areas of said buffer; and

a control means, connected to said buffer and said decoder means, for controlling which of said first, second and common areas are to be used for prefetching instructions, wherein said common area is used to prefetch instructions with either one of the first and second areas as a combined area, and wherein when a condition jump instruction is detected by said decoder means, a destination instruction, which corresponds to said conditional jump instruction, is prefetched into the other of said first and second areas designated by said control means as an uncombined area, and when a condition of said conditional jump instruction is fulfilled, said control means designates the other of said

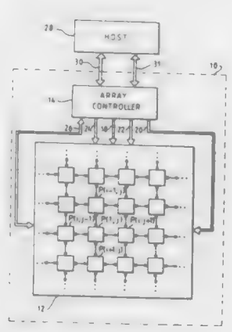


first and second areas to be used with said common area to prefetch instructions.

4,992,933
SIMD ARRAY PROCESSOR WITH GLOBAL INSTRUCTION CONTROL AND REPROGRAMAMBLE INSTRUCTION DECODERS

James L. Taylor, Eastleigh, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 250,595, Sep. 27, 1988, abandoned. This application May 4, 1990, Ser. No. 519,332
Claims priority, application United Kingdom, Oct. 27, 1986, 8725116
Int. Cl.[5] G06F *15/16, 9/30*
U.S. Cl. 364—200 **10 Claims**



1. A SIMD array processor comprising:

a multidimensional array of processing elements, each said processing element including decoding means for individually decoding a global instruction for local execution in said processing element;

control logic for issuing said global instruction to said array of processing elements;

an instruction bus connecting said control logic to each of said processing elements such that said global instructions are received in parallel by each said processing element, said instruction bus comprising a plurality of bus lines;

said decoding means of at least one of said processing elements comprising;

programmable modifying means connected to selected bus lines for locally modifying selected bits of said global instruction and outputting locally modified bits onto local bit lines; and

fixed decoding means connected to said local bit lines for receiving said locally modified bits from said programmable modifying means, said fixed decoding means further connected to said bus lines for receiving unmodified bits of said global instruction;

storage for receiving control information and/or data, each said processing element being associated with and having access to a respective block of said storage, said programmable modifying means of each said processing element being connected to said respective block of storage for receiving said control data for individually programming each said programmable modifying means;

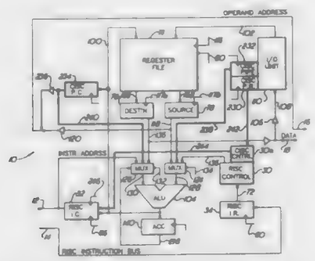
means for said control logic to access said storage and store control data for each said programmable modifying means in said respective blocks of storage;

said fixed decoding means of each said processing element being simultaneously responsive to unmodified bits of a global load instruction on said instruction bus to cause said control data to be loaded from said respective blocks of storage into said programmable modifying means, irrespective of the value of said locally modified bits.

4,992,934
REDUCED INSTRUCTION SET COMPUTING APPARATUS AND METHODS

Gregory A. Portanova, and Brian J. Sprague, both of Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 941,450, Dec. 15, 1986. This application Mar. 30, 1990, Ser. No. 504,055
Int. Cl.[5] G06F *9/40*
U.S. Cl. 364—200 **11 Claims**



1. A microprocessor for executing complex instruction set (CIS) instructions provided by an external source, comprising:

a source of reduced instruction set (RIS) instructions;

a reduced instruction set computer (RISC) having an internal data bus and an internal instruction bus separate from said data bus, each of said buses extending externally of said RISC, said RISC being connected to said RIS source by said instruction bus and being connected to the external source by said data bus, said RISC including means for accessing RIS instructions in said RIS source and executing said RIS instructions; and

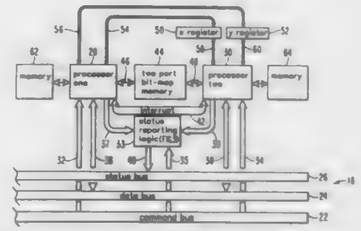
emulator means associated and integrally operative with said RISC, and operative in response to receipt of CIS instructions and data over said data bus for causing said RISC to respond to each CIS instruction received by accessing said RIS source for and executing, one at a time, a corresponding series of RIS instructions;

whereby execution of each of said series of RIS instructions emulates execution of a corresponding one of said CIS instructions.

4,992,935
BIT MAP SEARCH BY COMPETITIVE PROCESSORS

Liam D. Comerford, Carmel, and Barry C. Goldstein, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1988, Ser. No. 218,174
Int. Cl.[5] G06F *12/06*
U.S. Cl. 364—200 **11 Claims**



1. In a computer system, apparatus for determining the allocation of memory pages, comprising:

a central processor;

a memory, including n, where is an integer, memory pages, with said memory connected to said central processor;

a bit map which includes n bits, each of said n bits being indicative of the allocation state of an associated page in said memory;

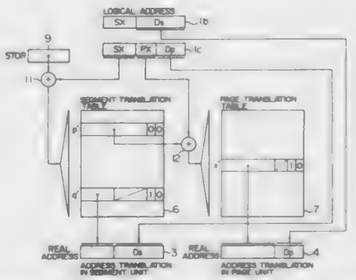
a pair of processors, each of which is connected to said central processor and said bit map, and each of which implements a different competitive search procedure of said bit map, to determine an un-allocated page in said memory; and

means for the first processor of said pair of processors to determine an un-allocated page in said memory as the result of said search procedure, to communicate the location of the un-allocated page in said main memory to said central processor.

4,992,936
ADDRESS TRANSLATION METHOD AND APPARATUS THEREFOR

Hisashi Katada, Sagamihara; Yasuhiro Inagami, Kodaira; Yoshiko Tamaki, Kunitachi, and Shigeo Nagashima, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 269,058
Claims priority, application Japan, Nov. 11, 1987, 62-283279
Int. Cl.[5] G06Z *12/08, 12/10*
U.S. Cl. 364—200 **16 Claims**



1. A method of translating a logical address of a main storage designated by a program into a real address, comprising:

a first step of preparing an address translation table for each of a plurality of address translation sizes;

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a second step of fetching said logical address designated by said program;

a third step of first identifying an entry of an address translation table whose address translation size is larger than those of the other address translation tables among said plurality of address translation sizes, based on said fetched logical address;

a fourth step of checking a first information on an address translation size validity included in said first identified entry;

a fifth step of performing address translation in units of translation size of said address translation table including said first identified entry, when said first information incidates valid;

a sixth step of second identifying, when said first information indicates invalid, an entry of an address translation table whose address translation size is next smaller than that of said address translation table including said first identified entry, based on the top address of said address translation table including said second identified entry and based on said fetched logical address; and

a seventh step of performing said fourth step after said sixth step.

4,992,937

MICROCOMPUTER HAVING A PROGRAM MODE SETTING CIRCUIT

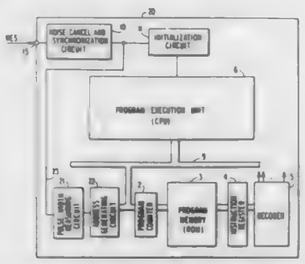
Toru Hemmi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 820,341, Jan. 21, 1986, abandoned. This application Mar. 22, 1990, Ser. No. 501,332

Claims priority, application Japan, Jan. 18, 1985, 60-6802

Int. Cl.[5] G06F *11/30, 15/46*

U.S. Cl. 364—200 15 Claims



1. A microcomputer comprising a program memory storing a plurality of instructions for a program, a program counter for accessing said program memory to read an instruction from an address location of said program memory designated by address information of said program counter, a central processing unit executing the instruction read from said program memory, a reset terminal supplied with a reset pulse signal made of a variable width of single pulse, an initialization circuit coupled to said reset terminal and said central processing unit and initializing said central processing unit in response to said reset pulse signal, a pulse width measuring circuit having an input node coupled to said reset terminal and a plurality of output nodes provided in correspondence with different pulse widths of said reset signal, said pulse width measuring circuit measuring the pulse width of said reset pulse signal and producing a selection signal at one of said output nodes in response to the measured pulse width of said reset pulse signal, and an address generating circuit storing a plurality of program start addresses and coupled between each of said output nodes of said pulse width measuring circuit and said program counter, said address generating circuit selectively applying one of said program start addresses to said program counter in response to said selection signal produced at said one of said output nodes, whereby said central processing unit is initialized by the received reset pulse signal and thereafter starts to execute the instructions stored in said program memory from an instruction that is stored in an address location of said program memory designated by the program start address which is applied to said program counter in accordance with the pulse width of said received reset pulse signal.

4,992,938

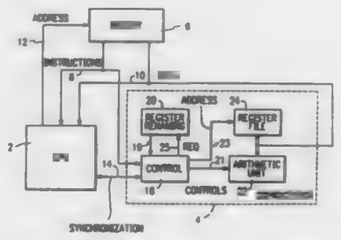
INSTRUCTION CONTROL MECHANISM FOR A COMPUTING SYSTEM WITH REGISTER RENAMING, MAP TABLE AND QUEUES INDICATING AVAILABLE REGISTERS

John Cocke, Austin; Gregory F. Grohoski, Cedar Park, both of Tex., and Vojin G. Oklobdzija, Carmel, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 68,597, Jul. 1, 1987, abandoned. This application Apr. 23, 1990, Ser. No. 469,813

Int. Cl.[5] G06F *9/00, 15/31, 12/02*

U.S. Cl. 364—200 5 Claims



1. A register renaming apparatus for a computing system having a main memory comprising addressable locations containing data and instructions, said instructions including a plurality of fields including an operation field specifying an operation to be performed and at least one register designation field, each such register designation field being indicative to two of n architectures registers for receiving data according to the operation specified in said operation field, said computing system including m physical registers, where m>n, comprising:

a map table having n locations indicative of said n architected registers, with each entry in said n locations containing the number of different ones of said m physical registers, with the architected register designation in said register designation field being replaced by the physical register number in the corresponding location in said map table prior to the associated instruction being executed;

a free list of the ones of said m physical registers which are currently not assigned to architected register locations in said map table, and which are available for future assignment to said map table;

a holding register queue which receives remapped physical register designations from said map table of certain ones of said physical registers which are being utilized by instructions presently being executed, with said holding register queue temporarily storing said certain one of said physical register designations prior to entering them in said free list of physical registers following the execution of their associated instructions; and

a store queue which has a physical register designation stored therein of a store operation to a register designated in said map table;

means for comparing physical register designations stored in the store queue with the physical register designations stored in said holding register queue, which have executed their associated instructions, with all such physical register designations in the holding register queue which do not compare being made available to the free list; and

means for determining that all stores are complete for the physical register designations that do compare, with such physical register designations that compare being made available to the free list following the determination that all associated stores are complete.

4,992,939

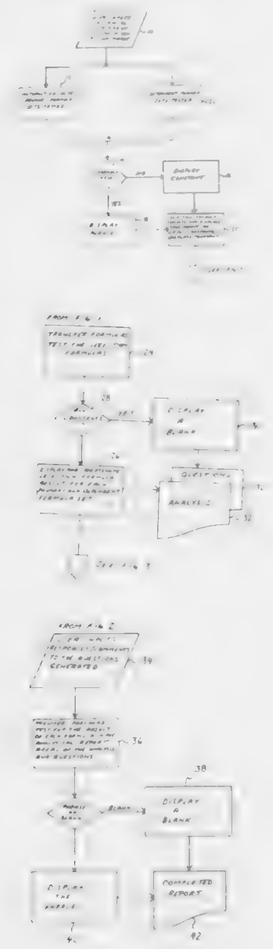
METHOD OF PRODUCING NARRATIVE ANALYTICAL REPORT

Brian G. Tyler, 2671 S. Seamans Neck Rd., Seaford, N.Y. 11763

Filed Aug. 5, 1988, Ser. No. 229,346

Int. Cl.[5] G06G *7/52*

U.S. Cl. 364—401 16 Claims



1. A method of providing a narrative analytical report comprising the steps of:

(a) entering data into a data base in a processing unit;

(b) processing said data into a predetermined format for use in analyzing same;

(c) providing a plurality of predetermined mutually exclusive narrative conclusions which are determined by a predetermined group of mutually exclusive formulas, said narrative conclusions comprising a narrative formed from whole sentences, sentence fragments, words, phrases and/or data base items;

(d) providing a plurality of such predetermined groups, each such groups containing a plurality of said narrative conclusions which are mutually exclusive in such respective groups;

(e) analyzing said data in said predetermined format and based upon such analysis generating a respective predetermined conclusion, if a conclusion applies, from each group for a plurality of said groups; and

(f) providing an output comprising an analytical report generated as a result of said analysis wherein said report is in the narrative form and comprises a plurality of said predetermined narrative conclusions which will depend upon the data entered into the database and the analysis thereof.

4,992,940

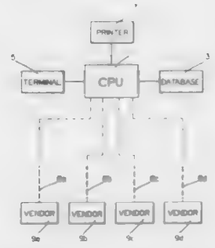
SYSTEM AND METHOD FOR AUTOMATED SELECTION OF EQUIPMENT FOR PURCHASE THROUGH INPUT OF USER DESIRED SPECIFICATIONS

Ross E. Dworkin, Parkside, Pa., assignor to H-Renee, Incorporated, Wallingford, Pa.

Filed Mar. 13, 1989, Ser. No. 322,105

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—401 12 Claims



1. Apparatus for assisting a user in locating and purchasing computer equipment, comprising:

(a) means for displaying, to the user, a menu of types of computer equipment,

(b) means for accepting, from the user, a choice of one of said types of computer equipment,

(c) means for displaying, to the user, a set of technical specifications relating to the equipment chosen by said user,

(d) means for receiving, from the user, a choice of at least one specification relating to the chosen equipment,

(e) means for searching for a database to locate all items of equipment belonging to the type of equipment chosen by the user and having the chosen specifications, the set of items retrieved being called a product set, and

(f) means for displaying the product set to the user, including for each item in the product set, the seller and the price of the item.

6. Apparatus for assisting a user in locating and purchasing equipment, comprising:

(a) means for accepting, from the user, an indication of the type of equipment which the user desires to purchase,

(b) means for displaying to the user, a template of specifications, said template of specifications being related to the type of equipment indicated in step (a),

(c) means for accepting, from the user, a choice of at least one of said specifications,

(d) means for searching a database to locate all items of equipment belonging to the type indicated by the user and having the chosen specifications, the searching step including the step of retrieving items belonging to the type indicated by the user and having the chosen specifications, the items retrieved by said means for searching being called a product set, and

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(e) means for displaying, to the user, information about each member of the product set.

4,992,941

COMPUTER TOMOGRAPHY APPARATUS WITH PERIODIC FOCUS DEFLECTION

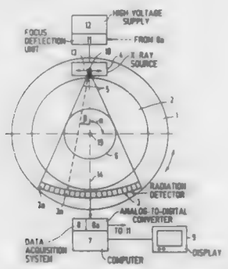
Horst Bruening, Goessweinstein; Julius Brunner, Rueckersdorf; Günter Hahn, Neunkirchen Am Brand, and Albrecht Baer, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,508

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1988, 3812896; May 19, 1988, 3817148

Int. Cl.[5] G06G *7/60*

U.S. Cl. 364—413.15 4 Claims



1. A computer tomography apparatus for examining a patient comprising:

a frame having an opening for receiving a patient and rotatable around a central longitudinal axis extending through said opening;

x-radiator means mounted on said frame for generating a fan-shaped x-ray beam in a plane perpendicular to said longitudinal axis for irradiating said patient in said opening, said x-radiator means having a focus from which said x-ray beam emanates;

a radiation detector including a plurality of detector elements mounted on said frame and disposed to receive and detect x-radiation attenuated by said patient in said opening, each detector element generating a measured value corresponding to the x-radiation incident thereon, said radiation detector having a center normal;

said frame with said x-radiator means and said radiation detector being rotatable around said patient in said opening to irradiate said patient from different directions;

means for periodically deflecting said focus in the plane of said x-ray beam perpendicular to said center normal of said radiation detector;

data processing means for acquiring said measured values of said detector elements and forming a mean value of the measured value of each detector element over a selected portion of the period of deflection of said focus, said selected portion being chronologically offset from detector element to detector element; and

computer means for constructing an image of a cross-section of said patient from said mean values.

4,992,942

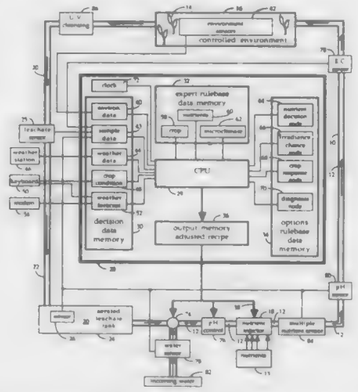
APPARATUS AND METHOD FOR CONTROLLING A SYSTEM, SUCH AS NUTRIENT CONTROL SYSTEM FOR FEEDING PLANTS, BASED ON ACTUAL AND PROJECTED DATA AND ACCORDING TO PREDEFINED RULES

William L. Bauerle, and Robert P. Fynn, both of Wooster, Ohio, assignors to Bahm, Inc., St. Louis, Mo.

Filed Jan. 25, 1989, Ser. No. 302,765

Int. Cl.[5] A01D *46/00;* A01G *13/00, 27/00*

U.S. Cl. 364—420 48 Claims



1. An apparatus for controlling, during a given period of time, component quantities of a system affected by one or more stochastic variables and by one or more measured variables to direct the system toward a desired status, said apparatus comprising:

controller means for controlling the component quantities of the system;

determining means for determining the stochastic variables and the measured variables preceding the given period of time; memory means for storing initial data corresponding to the stochastic variables and the measured variables determined by said determining means; and

computer control means including:

estimating means for estimating projected stochastic variables for the given period of time based on the initial data in the memory means;

calculating means for calculating projected component quantities having the highest probability of producing the desired status of the system based on the initial data in the memory means and based on the projected stochastic variables; and

means, resPonsive to the calculating means, for controlling the controller means to adjust, during the given Period of time, the component quantities as a function of the projected component quantities.

4,992,943

APPARATUS FOR DETECTING AND STORING MOTOR VEHICLE IMPACT DATA

Jack J. McCracken, 401 S. Jameson St., Lima, Ohio 45805

Filed Feb. 13, 1989, Ser. No. 309,172

Int. Cl.[5] G06F *15/74;* G01P *15/00;* G01L *5/00*

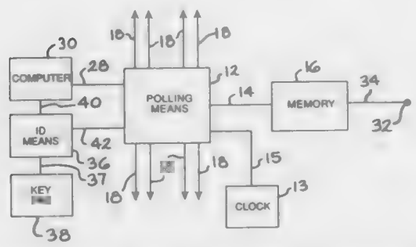
U.S. Cl. 364—424.04 30 Claims

30. Apparatus for detecting and storing motor vehicle status data, responsive to an impact, comprising:

(a) a plurality of impact detection means, located adjacent exterior surfaces of said motor vehicle, for sensing motor vehicle impacts exceeding a predetermined impact threshold level;

(b) a source of motor vehicle status data; wherein said source of motor vehicle status data further comprises a plurality of polling lines, each of said polling lines connecting said polling means to an activation switch for said motor vehicle system being monitored, said polling line capable of transmitting a signal from said polling means to said activation switch, and a plurality of signal return lines connecting each of said activation switches to said polling means and capable of receiving said signal transmitted to said activation switch only when said activation switch is in an activated position, so that said data values representative of said motor vehicle status are determined from the signals received by said polling means from said activation switches signal return lines;

(c) a microprocessor, connected to said source of motor vehicle status data and responsive to said impact detection means, which upon activation of at least one of said impact detection means, is programmed to determine data values representative of said motor vehicle status, wherein said data values identify said activated impact detection means, said activation time and date, said motor vehicle speed, said vehicle passenger restraint systems status, said vehicle lights status, and said vehicle directional signals status at substantially the time of activation of said impact detection means;



(d) an EPROM, connected to said microprocessor, which provides continuous storage of said data values, said EPROM being responsive to said microprocessor which periodically erases said data values stored in said EPROM whenever a predetermined number of motor vehicle impacts exceeding a predetermined impact threshold level are sensed by said impact detection means; and

(e) a serial output port for retrieval of said stored data values from said EPROM.

4,992,944

POWER STEERING CONTROL SYSTEM

Yasuo Noto, Tokyo; Noboru Sugiura, Mito, and Hideyuki Ouchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 8,263, Jan. 29, 1987, abandoned. This application May 25, 1989, Ser. No. 356,866

Claims priority, application Japan, Jan. 30, 1986, 61-18589

Int. Cl.[5] B62D *5/04*

U.S. Cl. 364—424.05 5 Claims

2. An electrically-operated power steering apparatus for controlling rotating power of a motor in accordance with a predetermined function of the steering power applied to a steering wheel thereby to apply an auxiliary steering power from the motor to the steering wheel, including

a torque sensor for detecting through a steering shaft said steering power applied to said steering wheel as a torque signal;

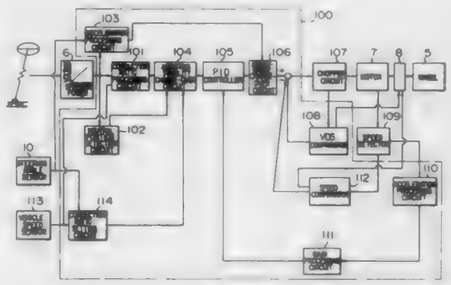
a steering angle sensor for detecting a steering angle of a road wheel and for producing a signal indicative thereof;

processing means for effecting a comparison between a rate of change of the signal from said steering angle sensor and a change of the torque signal delivered from said torque sensor;

conduction ratio processing means for determining a conduction ratio based on at least a value obtained form the steering power delivered from said torque sensor;

means for determining a control mode for said motor based on the outputs from said conduction ratio processing means and said processing means; and

chopper means controlled in accordance with the determined control mode by said determining means thereby to control said motor, whereby said motor is controlled in accordance with the conduction ratio based on the comparison between the change of the torque signal delivered from said torque sensor in a predetermined interval of time and the rate of change of signal from said steering angle sensor in said predetermined interval of time.



4,992,945

METHOD AND APPARATUS FOR DISTINGUISHING SKIDDING WHEELS OF A VEHICLE FROM DRIVE TRAIN VIBRATIONS

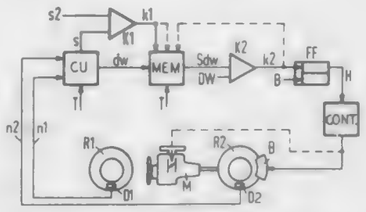
Hans-Georg Kumpfmueller, Donaustauf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 10, 1989, Ser. No. 419,123

Claims priority, application European Pat. Off., Oct. 13, 1988, 88117057.2

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 12 Claims



1. A method for distinguishing skidding wheels of a vehicle from driven train vibrations comprising the following steps:

determining when a kinetic parameter exceeds a threshold value;

calculating, in clocked fashion, a set of difference values between a first comparison parameter corresponding to a driven wheel and a second comparison parameter corresponding to a non-driven wheel, when the kinetic parameter is greater than a threshold value;

adding the difference values;

comparing the sum of the calculated difference values to a predetermined maximum value; and

triggering a control signal indicating skidding wheels when the sum of the difference values is greater than said predetermined maximum value.

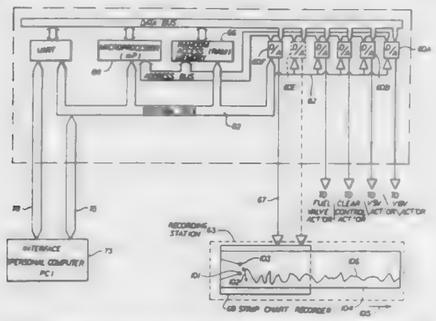
VOL 1123 ISS 2 FEB 12 1991 UMI

4,992,946

DATA LINK FOR GAS TURBINE ENGINE CONTROL

Mark G. Butz, Cincinnati, and James A. Berg, Maineville, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 20, 1988, Ser. No. 208,720
Int. Cl.[5] G01K *7/02*; F02C *9/00*
U.S. Cl. 364—431.02 18 Claims



6. In a digital electronic control for a gas turbine engine, the improvement comprising:

(a) a processor for

(i) receiving information as to

(A) memory addresses of data and,

(B) for each address, types of computational processing to be performed on the data located there,

the information being sent by a computer located external to the engine, which comprises means for performing one or more of the following procedures:

(A) masking the data,

(B) shifting the data,

(C) scaling the data, and

(D) biasing the data; and

(ii) sending the data, after the processing, to a digital data bus; and

(b) one or more digital-to-analog signal convertors for

(i) receiving processed data from the bus;

(ii) converting the processed data to analog form; and

(iii) sending the data in analog form to a recording device external to the engine.

4,992,947

VEHICULAR NAVIGATION APPARATUS WITH HELP FUNCTION

Mitsuhiro Nimura; Shoji Yokoyama; Koji Sumiya, and Shuzo Moroto, all of Anjo, Japan, assignors to Aisin Aw Co., Ltd., Anjo and Kabushiki Kaisha Shinsangyokaihatsu, Tokyo, both of, Japan

Filed Dec. 27, 1988, Ser. No. 290,118
Claims priority, application Japan, Dec. 28, 1987, 62-333056
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—444 10 Claims

1. A vehicular navigation apparatus for outputting guidance information for travel to a destination by an automotive vehicle having a navigation help function, which comprises:

destination input means for inputting said destination;

present position input means for inputting a present position;

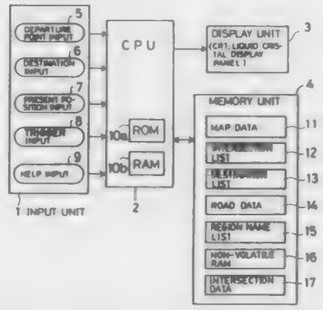
help function input means for initiating said navigation help function and inputting a selected help item;

data base means having map data, intersection data in road data;

display means for displaying guide information and help information;

route guide means for setting a guide route by conducting a predetermined processing in accordance with a predetermined sequence based upon said destination and said present position and data from said data base, and delivering to said display means said guide information in accordance with said guide route;

help function executing means for initiating said help function upon receipt of an input from said help function input means, delivering a menu of a plurality of help items to said display means, receiving said selected help item, and returning to said processing performed by said route guide means at a step corresponding to said selected help item;



first memory means for storing information corresponding to said guide route; and

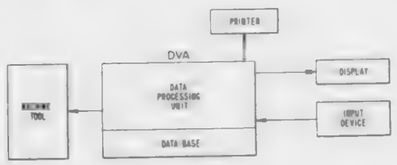
secondary memory means having anon-volatile RAM for storing information stored in said first memory means when said navigation help function is initiated by said help function input means.

4,992,948

PROCESS FOR THE CONTROL OF A MACHINE TOOL

Ulrich Pilland, deceased, late of Hochdorf; by Gerhard Ascherl, heir, Weiden; by Robert Ascherl, heir, Herbrechtingen; Franz Ray, Reichenback/Fils, all of Fed. Rep. of Germany, and Ake Hofvenstam, Jerbu, Sweden, assignors to AB Sandvik Coromant, Sandviken, Sweden

Filed Oct. 13, 1988, Ser. No. 257,203
Claims priority, application European Pat. Off., Oct. 14, 1987, 87115015
Int. Cl.[5] G06F *15/46*; G05B *13/00*
U.S. Cl. 364—474.15 16 Claims



1. A process for controlling a machine tool by means of a data processing unit, comprising the steps of:

(a) storing a data base for a given machine tool in the data processing unit, said data base containing:

(i) data concerning specific characteristics of the given machine tool;

(ii) data relating to properties of possible workpieces;

(iii) data describing the characteristics of tools usable in the given machine, including cutting bit materials and edge cutting geometries of the tools;

(iv) data relating to individual processing methods;

(v) data describing general boundary conditions in the machining of a workpiece; and

(vi) subroutines for determining possible corresponding machining data from said stored data, including bit material grade and bit configuration suitable for use in the given machine tool;

(b) manually entering the material of the workpiece, the type of tool and the surface quality desired of the article to be produced into the data processing unit,

(c) determining in the data processing unit, by means of said subroutines, (i) the suitability of a plurality of cutting bit materials for the workpiece material, (ii) the suitability of a plurality of edge cutting geometries for the article to be produced, and (iii) the suitability of a plurality of sets of machining data each of which includes a combination of a bit material and a cutting edge geometry whose suitability is determined in steps (i) and (ii);

(d) displaying said plurality of sets of machining data; and

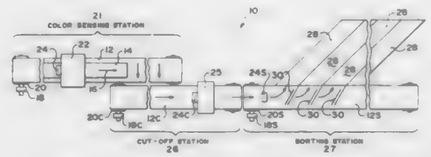
(e) controlling the machine tool in accordance with one of the sets of displayed data.

4,992,949

COLOR SORTING OF LUMBER

Terence J. Arden, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 302,337, Jan. 27, 1989, abandoned. This application Jun. 16, 1989, Ser. No. 367,622
Int. Cl.[5] G06F *15/20*; G01R *27/00*
U.S. Cl. 364—478 19 Claims



1. A method of sorting wood pieces by color comprising scanning a surface of a wood piece using a scanning camera, generating at least separate red and green image data from said camera while moving said surface of said wood piece past said camera, synchronizing said camera with said wood piece to correlate the acquisition of frames of said red and green image data with their position on said surface, each said frame representing one of a plurality of increments of length along said surface, processing said image data from each of said red and green color images by developing a histogram representing frequency distribution of color intensity for each of said red and green colors for each of said frames, analyzing said histograms for each of said frames to determine a designated color for each said frame, characterizing each said increment of length based on said designated color for its respective frame and activating a sorter to segregate wood pieces of selected colors into selected bins.

4,992,950

MULTIPLE PROCESSING STATION MESSAGE COMMUNICATION

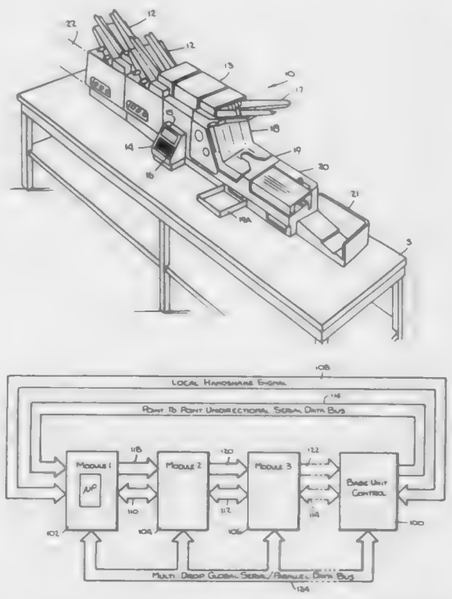
Robert Francisco, New Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,150
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—478 11 Claims

1. In a material processing system comprising a plurality of material processing stations, a base material processing station, and means directing material to be processed serially through said plurality of stations in a given order to said base station;

the improvement wherein each of said plurality of stations and said base station comprise a separate data and control processor, and further comprising a communication loop interconnecting the processors of said plurality of stations in said given order to the processor of said base station and interconnecting the processor of said base station to the processor of the first of said plurality of stations;

the processor of each respective one of said plurality of stations comprising means, responsive to a signal from the processor of said base station, for passing to the processor of the next succeeding station identification data that the respective one of said plurality of stations has assigned to itself, whereby the processor of said base station receives from the last of said plurality of stations data corresponding to the number of said plurality of stations connected to said communication loop; and wherein said base station includes a display, each of said processors of said plurality



of stations comprises means for generating error and status messages concerning the respective station, and means for passing to the next succeeding station error and status messages generated therein and received from the preceding adjacent station, whereby the processor of said base station receives said error and status messages from the last of said plurality of stations, the processor of said base station comprising means for displaying said error and status messages received thereby on said display.

4,992,951

UTILIZATION OF A RESET OUTPUT OF A REGULATOR AS A SYSTEM LOW-VOLTAGE INHIBIT

Thomas Glowczewski, Washington Township, Macomb County, and Keith B. Carle, Hartland, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,619
Int. Cl.[5] G05F *1/00*
U.S. Cl. 364—483 2 Claims

1. In a control system including a microcomputer unit, a voltage supply, and peripheral circuitry, a dual regulator circuit for regulating at least two voltage outputs, comprising:

a dual regulator having a first output port transmitting a voltage output which is switchable;

said dual regulator having an input port;

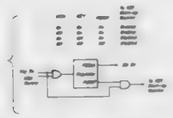
said dual regulator having a second output port transmitting a RESET during a powerdown condition of the switchable voltage output of the first output port of said dual regulator;

a first gate connected to said input port for enabling of the switchable voltage output in the dual regulator to an on

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condition during a "key on" requirement or as instructed by the microcomputer unit; and

a second gate connected to said second output port and said



first gate for enabling a reset signal to the microcomputer unit in response to a "key-on" signal and a powerdown condition of the switchable voltage output of the dual regulator.

4,992,952

PAINT DISCHARGE RATE CONTROL SYSTEM

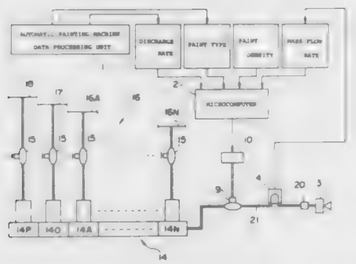
Hitoshi Sasaki, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 20, 1988, Ser. No. 247,069

Claims priority, application Japan, Sep. 21, 1987, 62-234925; Sep. 24, 1987, 62-237465; Sep. 24, 1987, 62-237466

Int. Cl.[5] B05B *12/14*; G06F *15/46*

U.S. Cl. 364—510 **11 Claims**



1. A paint discharge rate control system for controlling the rate at which paints are discharged from a paint nozzle, said system comprising:

a color changing valve group having valves, connected to a paint supply line between a paint supply means for accommodating paints and a paint discharge nozzle, for facilitating a supply of paints through the supply line toward the paint discharge nozzle;

a washing liquid valve, connected to the paint supply line between washing liquid supply means for accommodating washing liquid and the paint discharge nozzle, for facilitating a supply of washing liquid through the paint supply line toward the paint discharge nozzle;

a paint flow regulator, provided in the paint supply line between said color changing valve group and the paint discharge nozzle, for regulating the flow of paint through the paint supply line to the paint discharge nozzle;

flow meter means, provided in the paint supply line between said paint flow regulator and the paint discharge nozzle, for measuring the mass flow rate of fluid flowing in the paint supply line to the paint discharge nozzle and for issuing mass flow rate signals indicative of the mass flow rate measured; and

control means operatively connected to said flow meter means for receiving the signals issued thereby and for calculating the volumetric flow rate of the fluid on the basis of said mass flow rate signals, and

said control means operatively connected to said paint flow regulator for controlling said paint flow regulator on the basis of said mass flow rate during a main step of painting a workpiece, and for controlling said paint flow regulator subsequent to the main step of painting on the basis of said volumetric flow rate during a push-out operation, in which the valves of said color changing valve group are closed and the washing liquid valve is opened, to regulate the rate at which paint remaining in the paint supply line is pushed out of the paint discharge nozzle by the washing fluid to that at which the paint is discharged from the paint discharge nozzle during the main step of painting.

4,992,953

COMPUTER ASSISTED DESIGN METHOD AND APPARATUS

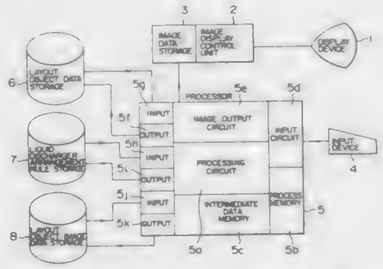
Naoto Yoshida; Toshiaki Yoshinaga; Hisao Murakawa, and Kenji Hayashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,943

Claims priority, application Japan, Jun. 19, 1987, 62-151164

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—512 **19 Claims**



1. A design assistance apparatus for interactively changing an image of a layout object on a screen of a display device, comprising:

means for determining a position of a liquid stay area relative to a liquid discharger to be connected thereto in a layout object specified by an input means; and

means for graphically displaying on said display device said determined position of said liquid discharger.

4,992,954

METHOD OF STORING CHARACTER PATTERNS AND CHARACTER PATTERN UTILIZATION SYSTEM

Haruo Takeda, Kawasaki, and Minoru Fukasawa, Yuuki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,718

Claims priority, application Japan, Aug. 5, 1987, 62-194471; Jan. 20, 1988, 63-8312

Int. Cl.[5] H03M *11/00*

U.S. Cl. 364—518 **9 Claims**

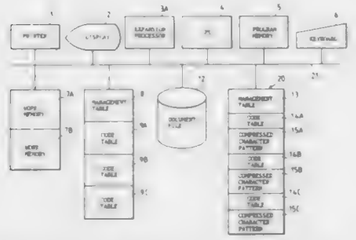
1. A character pattern utilization system provided with a plurality of different types of character patterns for each of a plurality of character, each character having a corresponding character code, said system comprising:

a plurality of code table means for defining particular coding rules corresponding to the character pattern types;

pattern file means having a plurality of file areas each of which corresponds to a character pattern type and has stored therein a set of compressed character patterns obtained by encoding a set of original character patterns according to one of said coding rules which corresponds to the character pattern type of said original character patterns; and

reading and restoring means for reading from said pattern file means, upon designation of a character code and a

character pattern type, a compressed character pattern of said designated character pattern type corresponding to the designated character code, and for restoring the com-



pressed character pattern to an original character pattern according to a coding rule defined in one of said code table means which corresponds to said designated character pattern type.

4,992,955

APPARATUS FOR REPRESENTING CONTINUOUS TONE AND HIGH CONTRAST IMAGES ON A BILEVEL DISPLAY

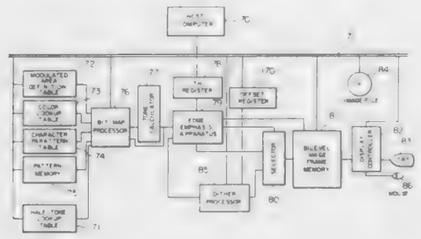
Shigeru Yabuuchi, Tokyo; Satoshi Yoshizawa, Kawasaki; Masakazu Ejiri, Tokorozawa; Seiji Kashioka, Hachioji; Yasuo Kurosu, Yokohama, and Hiroaki Aotsu, Yokohama, all of Japan, assignors to Hitzchi, Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,330

Claims priority, application Japan, Oct. 28, 1987, 62-270199

Int. Cl.[5] G06F *15/66, 3/14*; H04N *1/40*

U.S. Cl. 364—518 **9 Claims**



1. A display apparatus for displaying a half tone image on a bilevel display, comprising:

means for inputting multi-level image data, including characters, patterns or photographic images, to be displayed on a bilevel display;

means for detecting edges in the characters, patterns, or photographic images;

edge emphasis means for obtaining a level difference between a noted pixel bordering the edges and a pixel adjacent to the noted pixel and for forcibly defining a display value of the noted pixel as the value of a white or black pixel when the level difference is not larger than a predetermined threshold, whereby contours of the characters, patterns, or photographic images displayed on the bilevel display are emphasized;

dither means for applying dither conversion to other pixels not bordering the edges and for determining display values of the other pixels; and portion pixel, provided that the level difference is not larger than a predetermined threshold, and for applying dither conversion to pixels other than edge portion pixels;

wherein a dither conversion pattern is used so that adjacent pixels on an odd-numbered raster and an even-numbered raster may be simultaneously displayed as white pixels when a CRT of an interlace scheme is used.

4,992,956

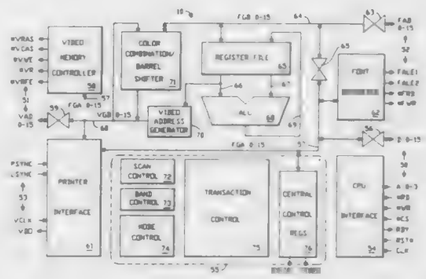
APPARATUS FOR ASSEMBLING DATA FOR SUPPLY TO A SCANNING OUTPUT DEVICE

Shinkyo Kaku, Los Gatos; Chung-Li Yu, San Jose; Greg W. Barr, Sunnyvale; Steven Gary, Campbell; David R. Staab, Atherton; George W. Li, Sunnyvale; Anan Nagarajan, Mountain View, and Shabbir M. Latif, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 8, 1987, Ser. No. 107,723

Int. Cl.[5] G06F *3/12*; G09G *5/36*

U.S. Cl. 364—519 **40 Claims**



1. An apparatus for assembling image data words for supply to a two-dimensional scanning device under control of a processor that generates control words, image data words being stored in a source memory accessible in response to source addresses and image data words being assembled in an assembly memory accessible in response to assembly addresses, comprising:

a control interface means, adapted for communication with the processor, for receiving the control words;

storage means, in communication with the control interface means, for storing and outputting the control words;

control means, in communication with the control interface means and the storage means, for generating transaction control signals in response to the control words;

address generating means, in communication with the storage means and the control means, for generating the source addresses and the assembly addresses in response to the transaction control signals and the control words;

image data interface means, adapted for communication with the source memory and the assembly memory and coupled to the control means and address generating means, for reading and writing image data words in the source memory and the assembly memory in response to transaction control signals, source addresses and assembly addresses; and

scanner interface means, adapted for communication with the scanning device and coupled to the image data interface means, for supplying image data words from the assembly memory to the scanning device;

wherein the control words include a control command word indicating one of a plurality of modes of operation, one of the plurality of modes of operation being a dispatch mode and the control words include a source command word including a source address of a source image block and a destination command word including a destination virtual address of a memory storage location, a source image block including one or more image data words and a memory storage location including data locations addressable by one or more real assembly addresses, and wherein:

the control means is responsive to the control words to generate transaction control signals in the dispatch mode so that the address generating means translates the destina-

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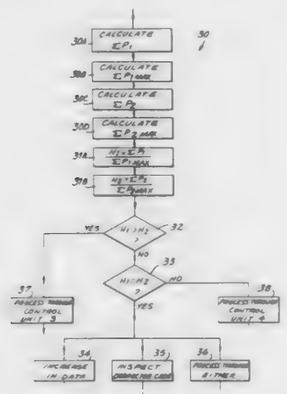
tion virtual address to a real assembly address, the source interface means reads the image data word in the real source address and transfers the image data word to the image data interface means, and the image data interface means stores the image data word in the real assembly address.

4,992,957

PRINTER AND METHOD FOR UTILIZING CHARACTER CODES AND CONTROL CODES WITHIN A PRINTER

Tsuyoshi Aoyama, and Tetsuro Takahashi, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,283
Claims priority, application Japan, Mar. 17, 1988, 63-64192; May 13, 1988, 63-117416
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—519 7 Claims



1. A method for printing data received by a printer from one of a plurality of host units, wherein the data includes a plurality of control codes and character codes associated with one of a plurality of host units and a printer including an input data storage means for storing the data received from the host unit and at least two print control means for controlling the printing of the data in accordance with the plurality of control codes and character codes associated with the host unit, each print control means having internal control code and character code groups associated therewith, comprising the steps of:

assigning a point value to each character code and control code stored in the input data storage means;

assigning a maximum point value for the control code and character code groups associated with each print control means;

comparing a point value of the character code and control code stored in the input data storage means with the maximum point value of the internal code groups of the associated print control means to obtain a numerical value representative of the comparison; and

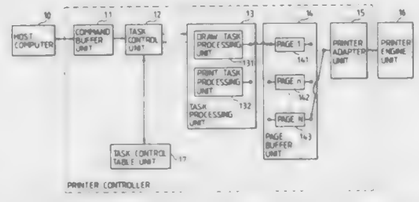
choosing a print control means to process the characters defined by the character codes stored in the input data storage means based upon the numerical value obtained.

4,992,958

METHOD AND APPARATUS FOR CONTROLLING PRINTER

Seiji Kageyama, Fuchuu; Keiichi Nakane, Yokohama, and Hiroaki Kambayashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 373,262
Claims priority, application Japan, Jun. 27, 1988, 63-158481
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 10 Claims



1. A printer controller for controlling an image data transfer to a printer engine unit, comprising:

a command buffer unit for a command series containing a drawing command for instructing a drawing operation and a printing command for instructing a printing operation;

a page buffer unit for storing the image data drawn by said drawing command;

a task process unit for executing said drawing command and printing command as a drawing task and a printing task, and,

a task control unit for performing a task controlling operation for processing each of said tasks in the task process unit.

4,992,959

METHOD AND APPARATUS FOR ROTATING CHARACTER ARRAY IMAGE

Akira Hamada, Osaka; Yasuji Obuchi; Hirokatsu Akiyama, both of Nara, and Yasuhisa Nakamura, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 203,467, Jun. 7, 1988, abandoned. This application Dec. 8, 1989, Ser. No. 449,088
Claims priority, application Japan, Jun. 8, 1987, 62-142679
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—519 8 Claims



5. A word processor comprising

a display device with a display area,

a font memory storing a character font,

a printer means connected to said font memory and capable of printing said character font in rotated orientations as well as in normal upright orientation, and

control means connected to said display device and said printing means and capable of

identifying individual characters of initial character arrays displayed on said display area and contained in a plurality of quadrangular areas defined on said display area of said display device, each of said quadrangular areas having symmetry axes and a symmetry point associated therewith, each of said individual characters being displayed in a first orientation at an initial position inside one of said quadrangular areas, and

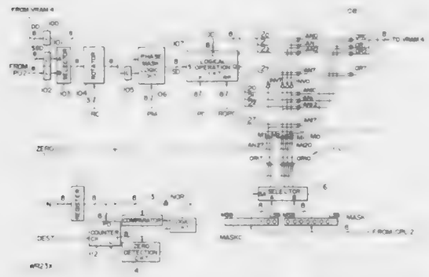
causing said identified characters to be printed by said printer means in a second orientation at target positions, said second orientation being rotated from said first orientation by a specified angle, said target positions being in a symmetrical relationship with said initial positions with respect to one of said symmetry axes or said symmetry point associated with a corresponding one of said quadrangular areas according to said specified angle such that said printed characters in said target positions within each of said quadrangular areas form a new character array which may be rotated from but reads the same, when seen in said second orientation, as the initial character array in the same one of said quadrangular areas.

4,992,960

APPARATUS FOR PROCESSING IMAGE DATA FOR DISPLAYING AN IMAGE ON A DISPLAY UNIT

Shigemitsu Yamaoka; Kenji Iwamoto, and Kazuyuki Ito, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Filed Dec. 10, 1987, Ser. No. 131,212
Claims priority, application Japan, Dec. 11, 1986, 61-295229; Dec. 27, 1986, 61-313401
Int. Cl.[5] G06F *3/153*
U.S. Cl. 364—521 11 Claims



1. An image processing apparatus which processes image data stored in a memory to thereby display an image on a display screen of a display unit under control of a central processing unit comprising:

(a) transfer data generating means for reading source data from data sources, including one word area, and an area of continuing two words provided within a source area, so as to generate transfer data of one word having bits which are required for a certain word area within a destination area, said transfer data being obtained by shifting bits of said source data such that bit positions of shifted source data correspond to those of destination area and by extracting predetermined continuing bits of one word from said shifted source data;

(b) first and second memory means which are written by first and second mask data respectively, each of said first and second mask data selectively permitting a data transfer to be performed on every bit of first and last words within one line of said destination area;

(c) mask means for masking said first and last words within one line based on said first and second mask data stored in said first and second memory means when said transfer data are written in said destination area; and

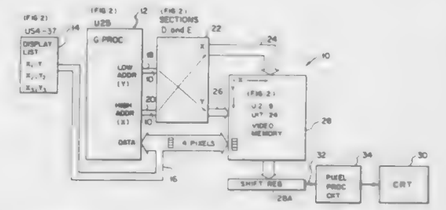
(d) a display unit coupled to the central processing unit and having a display screen for displaying an image represented by the image data.

4,992,961

METHOD AND APPARATUS FOR INCREASING IMAGE GENERATION SPEED ON RASTER DISPLAYS

Roger J. Petersen, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 1, 1988, Ser. No. 278,873
Int. Cl.[5] G06F *3/14*; G09G *5/36*
U.S. Cl. 364—521 20 Claims



1. Apparatus for increasing the speed of displaying images on raster display means for displaying image data in the form of images, comprising:

a graphics system processor for receiving information to be displayed, at least a portion of the information being in the form of X,Y coordinate data, the graphics system processor for transposing each received set of X and Y coordinates so that X,Y becomes Y,X and then for processing at least one adjacent pair of transposed coordinates to generate at least one line segment by using a first set of transposed coordinates as the starting point and a second set of transposed coordinates as the end point to generate image data and addresses for storage of the image data;

a video memory connected by means of an I/O data bus to the graphics system processor, the video memory for storing image data, the video memory being connected to the raster display means; and

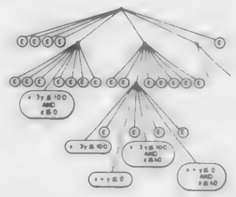
an address translator circuit connected by first address lines to the graphics system processor and by second address lines to the video memory, the address translator circuit for retransposing each received set of Y and X coordinate data from the graphics system processor so that Y,X is restored to X,Y, thereby enabling the writing of image data into the video memory so that the image data is properly fed under control of the graphics system processor to modulate the electron beam of the raster display means.

4,992,962

AREA SET OPERATION APPARATUS

Tomotoshi Ishida; Shiro Nonaka; Yasumasa Kawashima, all of Hitachi, and Kumiko Itoh, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,513
Claims priority, application Japan, Apr. 30, 1987, 62-104304
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—522 9 Claims



1. An apparatus for effecting a set operation of a plurality of data of a n-dimensional area positioned in an n-dimensional

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finite space, wherein n (n>2) is a natural number, said apparatus comprising:

means for inputting a plurality of data defining said n-dimensional area positioned in said n-dimensional finite space;

means for repeatedly processing in sequential order division of said n-dimensional finite space to generate a plurality of divided spaces, division of said n-dimensional area to generate a plurality of divided areas, corresponding to the divided spaces, and generation of data defining each divided area in each divided space, from said data defining said area, until said data defining said area satisfy conditions determined by data representing areas each having an empty part and a full part as indicated by a plurality of inequality expressions, said inequality expressions being related to each other, conditions of data representing empty areas and conditions of data representing full areas; and

means for effecting a set operation of said plurality of data of said n-dimensional area by executing a set operation of said data defining said divided areas corresponding to said divided spaces.

4,992,963

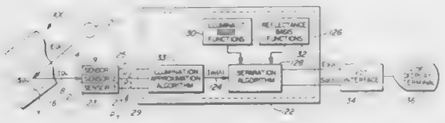
METHOD AND APPARATUS FOR DETERMINING AMBIENT LIGHT AND SURFACE REFLECTANCE

Brian V. Funt, West Vancouver; Jian Ho, Nepean, and Mark S. Drew, Vancouver, all of Canada, assignors to Simon Fraser University, Burnaby, Canada

Filed Dec. 2, 1988, Ser. No. 279,168

Int. Cl.[5] G06F *15/62;* **G01J** *3/50;* **G01N** *21/55*

U.S. Cl. 364—526 **27 Claims**



1. An apparatus for dividing light reflected by an illuminated surface into constituent parts of illuminating light and surface spectral reflectance of the surface, the apparatus comprising:

(a) means for receiving spectral power distribution signals produced by performing a band-limited spectral analysis of light reflected by said illuminated surface, said spectral power distribution signals representing measured spectral power distribution Im(λ) of the light reflected by the illuminated surface;

(b) data processing means for:

generating a weighting coefficient ϵ_i for each of M illuminant basis functions $Eb_i(\lambda)$ describing the illuminating light,

said processing means generating a weighting coefficient σj for each of N reflectance basis functions $Sb_j(\lambda)$ describing the reflectance of the surface,

said processing means comparing an approximation Ia(λ) of the measured power distribution Im(λ), to the measured spectral power distribution Im(λ), Ia(λ) being defined by the relation:

$$Ia(\lambda) = \left(\sum_{i=1}^{M} \epsilon_i Eb_i(\lambda)\right)\left(\sum_{j=1}^{N} \sigma_j Sb_j(\lambda)\right)$$

the set of product pairs $Eb_i(\lambda)Sb_j(\lambda)$ being forming a linearly independent set,

said processing means regenerating different weighting coefficients until said Ia(λ) is generally equal to said Im(λ);

said processing means generating output spectral power distribution signals representing at least one of said constituent parts of illuminating light and said surface spectral reflectance based on said weighting coefficients ϵ_i and σ_j generated to make said Ia(λ) generally equal to Im(λ),

said processing means generating said output spectral power distribution signals representing illuminating light according to the equation:

$$Ea(\lambda) = \sum_{i=1}^{M} \epsilon_i Eb_i(\lambda).$$

and said processing means generating said output spectral power distribution signals representing surface spectral reflectance according to the equation:

$$Sa(\lambda) = \sum_{j=1}^{N} \sigma_j Sb_j(\lambda)$$

where ϵ_i and σ_j are coefficients for which the approximation Ia(λ) is generally equal to said Im(λ).

26. A method of operating a computer for dividing light reflected by an illuminated surface into constituent parts of the illuminating light and surface spectral reflectance of the surface, the method comprising the steps of:

(i) receiving spectral power distribution signals produced by performing a band-limited spectral analysis of light reflected by said illuminated surface, said spectral power distribution signals representing measured spectral power distribution Im(λ) of the light reflected by the illuminated surface;

(ii) generating a weighting coefficient ϵ_i for each of M illuminant basis functions $Eb_i(\lambda)$ describing the illuminating light;

(iii) generating a weighting coefficient σ_j for each of N reflectance basis functions $Sb_j(\lambda)$ describing the reflectance of the surface;

(iv) comparing an approximation Ia(λ) of the measured spectral power distribution Im(λ), to the measured spectral power distribution Im(λ), Ia(λ) being defined by the relation:

$$Ia(\lambda) = \left(\sum_{i=1}^{M} \epsilon_i Eb_i(\lambda)\right)\left(\sum_{j=1}^{N} \sigma_j Sb_j(\lambda)\right)$$

the set of product pairs $Eb_i(\lambda)Sb_j(\lambda)$ forming a linearly independent set,

(v) re-generating different weighting coefficients until said Ia(λ) is generally equal to said Im(λ); and

(vi) generating output spectral power distribution signals representing at least one of said constituent parts of illuminating light and said surface spectral reflectance based on said weighting coefficients ϵ_i and σ_j when said approximation Ia(λ) and said spectral power distribution Im(λ) are generally equal, said processing means generating said output spectral power distribution signals representing illuminating light according to the equation:

$$Ea(\lambda) = \sum_{i=1}^{M} \epsilon_i Eb_i(\lambda)$$

said processing means generating said output spectral power distribution signals representing surface spectral reflectance according to the equation:

$$Sa(\lambda) = \sum_{j=1}^{N} \sigma_j Sb_j(\lambda)$$

Where ϵ_i and α_j are coefficients for which the approximation Ia is generally equal to Im(λ).

4,992,964

CONTROL APPARATUS AND METHOD FOR PREVENTING SEIZURE IN A SPINDLE APPARATUS OF A MACHINE TOOL

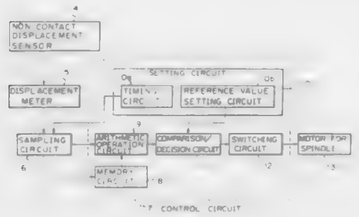
Norio Sagara, and Shinya Nakamura, both of Maebashi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,736

Claims priority, application Japan, Aug. 4, 1987, 62-118931

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—550 **14 Claims**



1. Apparatus for preventing seizure of a spindle rotatably supported in a housing by way of rolling bearings, said spindle having a characteristic of showing an elongation in the direction of the longitudinal axis thereof during rotation, said elongation being variable with respect to an amount of heat generated by the rotation of said spindle, said apparatus comprising:

means for sensing an amount of the elongation of said spindle during rotation and outputting a monitoring signal representing the amount of the elongation;

means for receiving said monitoring signal for calculating variation values in said monitoring signal at specified time intervals; and

means for receiving said variation values for said specified time intervals and operable to stop the rotation of said spindle when one of said variation values is equal to or greater than a preset reference value which indicates that the seizure at said spindle is about to occur.

4,992,965

CIRCUIT ARRANGEMENT FOR THE EVALUATION OF A SIGNAL PRODUCED BY A SEMICONDUCTOR GAS SENSOR

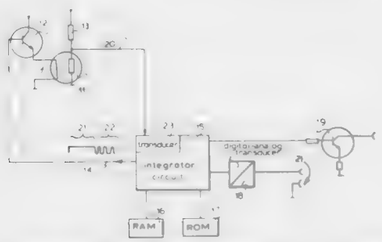
Heinz Hölter, Gladbeck; Hanns Rump, Unna-Massen, both of Fed. Rep. of Germany, and Helmut Vietze, Frauenfeld, Switzerland, assignors to Eftag-Entstaubungs- und Fordertechnik AG, Biel, Switzerland

Filed Nov. 30, 1988, Ser. No. 294,606

Claims priority, application Switzerland, Apr. 2, 1987, 1308/87; Apr. 2, 1987, 1306/87; PCT Int'l Appl., Mar. 31, 1988, PCT/EP88/00269

Int. Cl.[5] G08B *17/10;* **F25B** *29/00;* **G06F** *7/00*

U.S. Cl. 364—551.01 **8 Claims**



1. A gas-sensing system for controlling an air-recirculation valve in a motor vehicle having an interior to which air from outside can be supplied or in which air can be recirculated in accordance with a setting of the air-recirculation valve, said sensing system comprising:

a semiconductor sensor providing an output signal corresponding to a concentration of external noxious gases having a critical high level of the concentration;

an adjustable electricity source connected in series with said sensor and forming therewith a voltage divider;

control means connected with said divider and receiving the output signal for realizing a time delay of said output signal with a time constant higher than a time needed for forming said critical level of said noxious gases and for producing a control signal and feeding the control signal to the source to modify the output signal of the sensor when the time constant is exceeded so as to compensate for a gradual change in concentration exceeding the time delay; and

a comparator receiving said control signal and operatively connected with said voltage divider and with said control means, said comparator processing said control signal and a reference signal corresponding to said critical high level, said comparator switching the air-recirculation valve from an exterior air-supply position to an interior air-recirculation position upon said control signal exceeding said reference signal during a time at least equal to said time constant.

4,992,966

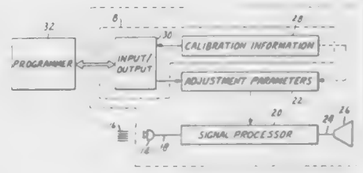
CALIBRATION DEVICE AND AUDITORY PROSTHESIS HAVING CALIBRATION INFORMATION

Gregory P. Widin, West Lakeland, Minn.; Stephan E. Mangold, Alingsas, and Mats B. Dotevall, Gothenburg, both of Sweden, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1988, Ser. No. 192,213

Int. Cl.[5] H04R *25/00*

U.S. Cl. 364—571.04 **18 Claims**



3. An individual programmable hearing aid having a relationship between an auditory input signal and an output signal, said programmable hearing aid being programmably adjustable through the use of a set of digital adjustment parameters by a programming system, comprising:

a microphone for converting said auditory input signal into an electrical input signal;

a signal processor responsive to said electrical input signal for processing said electrical input signal in accordance with said set of digital adjustment parameters and producing a processed electrical signal;

a receiver responsive to said processed electrical signal for converting said processed electrical signal to said output signal which is perceptible to a person; and

calibration means for storing calibration information characteristic of information intrinsic to said individual programming hearing aid, said calibration information representing a sufficient subset of said set of digital adjustment parameters which are required in order to calculate said relationship, said calibration information being used by said programming system to adjust said adjustment parameters.

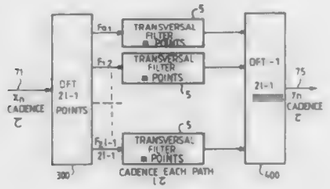
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4,992,967

DIGITAL FILTER USING FOURIER TRANSFORMATION

Gérard Auvray, Longpont Sur Orge, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 17, 1988, Ser. No. 258,814
Claims priority, application France, Oct. 16, 1987, 87 14291
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.18 7 Claims



1. A digital filter using Fourier transformation for filtering sampled input data comprising samples at a predetermined rate arranged in successive blocks of I samples, said filter comprising:

first means for calculating a discrete Fourier transform on sets of 2I−1 points, each set of 2I−1 samples being shifted by I samples with respect to the preceding one;

second means for processing data including I parallel filtering paths arranged in a sequence and connected to said first means, wherein said 2I−1 points of the discrete Fourier transform are applied to each of said paths and wherein said parallel paths comprise respective delay means whereby said delay means are selected for introducing a constant relative delay between each two successive paths in said sequence, said relative delay being equal to I times a sampling interval of said input data; and

third means connected to said parallel paths for combining signals processed in said paths, said third means having an output delivering filtered data at said predetermined rate, in response to said input data.

4,992,968

DIVISION METHOD AND APPARATUS INCLUDING USE OF A Z—Z PLOT TO SELECT ACCEPTABLE QUOTIENT BITS

Matthew J. Adiletta, Worcester, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 17, 1989, Ser. No. 312,085
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—761 22 Claims

1. A method for implementing an optimized division circuit having as inputs a divisor and a dividend and producing as an output a quotient composed of a succession of quotient digits chosen from a set of acceptable digits determined according to a given radix, each successive digit of said quotient being formed by examining a succession of partial remainder values and said divisor wherein a next partial remainder value is equal to the difference between a most recently determined partial remainder value and a most recently determined divisor multiple value, and wherein said most recently determined divisor multiple value is equal to the product of the most recently formed quotient digit and said divisor, a first value for said most recently determined partial remainder value being said dividend, said method comprising the steps of:

(a) determining a Z—Z plot relationship for said set of acceptable quotient digits representing, for each of said set of acceptable digits for said quotient, a relationship between a first divisor ratio and a second divisor ratio, the first divisor ratio being proportional to a range of most recently determined partial remainder values divided by the divisor, and the second divisor ratio being equal to a range of next partial remainder values divided by the divisor;

(b) automatically building a complete table of next quotient digits from said Z—Z plot relationship including, for each different valid combination of divisor and next partial remainder values, either a corresponding one of said acceptable quotient digits or a DON'T CARE indicator for the ones of said combinations having more than one corresponding quotient digit; and

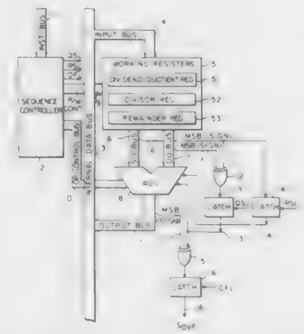
(c) assigning a different state value to each different quotient digit, said state values used in the implementation of said optimized division circuit.

4,992,969

INTEGER DIVISION CIRCUIT PROVIDED WITH A OVERFLOW DETECTOR CIRCUIT

Hitoshi Yamahata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,077
Claims priority, application Japan, Jul. 19, 1988, 63-181018
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—761 8 Claims



1. A division circuit for performing a division operation on dividend and divisor data each accompanied with sign information comprising:

first storage means for temporarily storing sign control data which takes a first logic value when both of said sign information of said dividend and divisor data are equal to each other and takes a second logic value when said sign information of said dividend data is different from said sign information of said divisor data,

second storage means for temporarily storing said dividend data in an absolute value form,

third storage means for temporarily storing said divisor data in an absolute value form,

means for performing a division operation on said data stored in said second and third storage means to produce quotient data,

means responsive to said sign control data stored in said first storage means for performing a sign correction operation on said quotient data to produce sign-corrected quotient data accompanied with corrected sign information, and

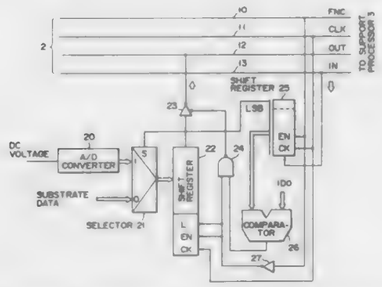
means for generating an overflow signal when said sign control data takes a first logic value and said corrected sign information represents a negative sign.

4,992,970

SYSTEM FOR READING OR SETTING PRINTED CIRCUIT BOARDS VOLTAGE OF COMPUTER BY SUPPORT PROCESSOR

Tetsu Igarashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 17, 1987, Ser. No. 122,132
Claims priority, application Japan, Nov. 18, 1986, 61-272942
Int. Cl.[5] G06F *11/00*
U.S. Cl. 364—900 7 Claims



1. A system for reading a voltage of a printed circuit board, the system comprising:

a support processor for producing board identification data and for inputting voltage data;

first registering means for storing board identification data and selecting data from said support processor through an input data line;

converting means for converting voltage of said printed circuit board to voltage data representing voltage supplied to said printed circuit board;

selecting means for selecting one of board data of said printed circuit board and voltage data converted by said converting means in accordance with said selecting data stored in said first registering means;

second registering means for storing said data selected by said selecting means;

comparing means for comparing said board identification data stored in said first registering means with special board identification data preset in said printed circuit board; and

gate means for outputting said data stored in said second registering means to said support processor through an output data line, when said sorted board identification data are identical to said preset special board identification data.

4,992,971

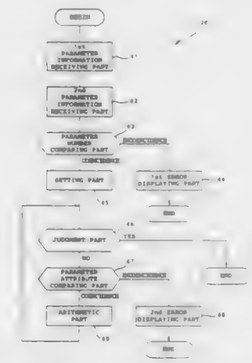
METHOD AND APPARATUS FOR AN AUTOMATIC CHECK OF WHETHER OR NOT CALLING PARAMETERS CORRESPOND TO CALLED PARAMETERS DURING LINKAGE OPERATION

Kazuhisa Hayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 10, 1988, Ser. No. 192,697
Claims priority, application Japan, May 11, 1987, 62-112519
Int. Cl.[5] G06F *7/20*
U.S. Cl. 364—900 2 Claims

1. A method for use in a language translating and linking system including a language translator for translating a plurality of source programs into object programs, respectively, a memorizing unit for storing said object programs as memorized object programs, and a linker for linking said memorized object programs to a load program, one of said source programs including a calling program while another of said source programs including a called program, said calling program passing control to said called program, said calling program having a first number of calling parameters, said called program having a second number of called parameters, each of said calling parameters having calling attribute which represents a data item containing information descriptive of each of said calling parameters, each of said called parameters having a called attribute which represents a data item containing information descriptive of each of said called parameters, said method comprising the steps of:

extracting, in said language translator, said first number and said calling attributes from said calling program to generate first parameter information representing said first number and said calling attributes;



extracting, in said language translator, said second number and said called attributes from said called program to generate second parameter information representing said second number and said called attributes;

storing said first and said second parameter information in said memorizing unit as first and second output parameter information; and

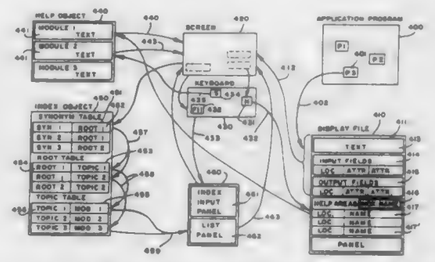
comparing, in said linker, said first output parameter information with said second output parameter information to check whether or not said calling parameters correspond to said called parameters, respectively.

4,992,972

FLEXIBLE CONTEXT SEARCHABLE ON-LINE INFORMATION SYSTEM WITH HELP FILES AND MODULES FOR ON-LINE COMPUTER SYSTEM DOCUMENTATION

Wayne A. Brooks, Stewartville; Dennis A. Charland, Rochester; Jose V. DiCecco, Rochester; Devon D. Snyder, Rochester; Robert G. Waite, Rochester, all of Minn., and Christopher B. Young, Amherst, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,154
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—900 6 Claims



1. A system for providing on-line information for a data

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processor capable of executing an interactive application program having associated therewith a display file including a set of definitions for command panels, comprising:

a display for presenting display panels to a user, said display including a movable cursor;

an input device coupled to the system for accepting commands and data from said user;

a plurality of help modules contained in at least one help object or file stored in the system;

a plurality of command-panel definitions stored in the system, at least some of said command-panel definitions having a help area contained therein, said help area including a set of help-area entries each associating a help module with a location area for said cursor;

a context-sensitive selection means, coupled to the display and to the input device, for selecting a help module which the command-panel definition associates with a location area containing the cursor, said means being responsive to the position of the cursor and to a command received from the user via the input device;

at least one index object or file stored in the system, including a plurality of synonym table entries each associating a synonym word specifying a potential search argument by said user with a root word associated with at least one of said help modules, a plurality of root table entries each associating one of said root words with a topic pertaining to one of said help modules, and a plurality of topic table entries each associating one of said topics with one of said help modules, wherein a synonym word is associated with an associated help module if and only if said synonym word is associated with an associated root word by a synonym table entry, said associated root word is associated with an associated topic by a root word table entry, and said associated topic is associated with said associated help module by a topic table entry;

a search argument input means, coupled to said display and to said input device, for displaying an index input panel and for accepting from said user at least one of said synonyms as search arguments;

an index-sensitive selection means, coupled to said display and to said input device, for displaying a list panel listing those of said help modules associated with said search argument synonyms by said index object or file, and for accepting from said user a designation of at least one of said modules for presentation from said help object on said display, said index-sensitive selection means being responsive to said search argument input means; and

a help display means for displaying information contained in a selected help module, said help display means being responsive to the context-sensitive selection means and the index-sensitive selection means.

4,992,973

DATA TRANSMISSION APPARATUS WITH LOOPBACK TOPOLOGY

Toshiyuki Tamura; Shinji Komori; Hidehiro Takata, all of Itami; Tetsuo Yamasaki, Amagasaki; Hiroaki Terada, Suita, and Katsuhiko Asada, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 217,002

Claims priority, application Japan, Jul. 15, 1987, 62-177836

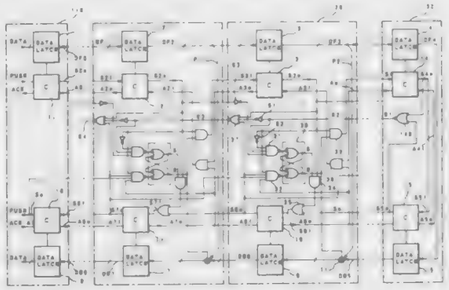
Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—900 **20 Claims**

1. A data transmission apparatus including a first shift register having a plurality of stages forming a forward path of a data transmission line, a second shift register having a plurality of stages forming a backward path of the data transmission line and a loop-back part coupling an output part of the forward path and an input part of the backward path, comprising:

a bypass for data transmission formed between an input of a first stage of the second shift register on the backward path and an output of a particular stage on the forward path;

a first detecting means for detecting whether significant data is latched in any one of a second plurality of stages forming said forward path after said particular stage and forming said backward path before said first stage, said detecting means asserting a first signal if any one of said second plurality of stages has latched significant data:



a second detecting means for detecting whether a data clog is present at said first stage on said backward path and for asserting a second signal if said data clog is present; and

a controlling means, responsive to said first and second signals, for controlling data transmission through said bypass.

4,992,974

DATA PROCESSING DEVICE FOR PROCESSING A COMBINATION OF DATA ITEMS

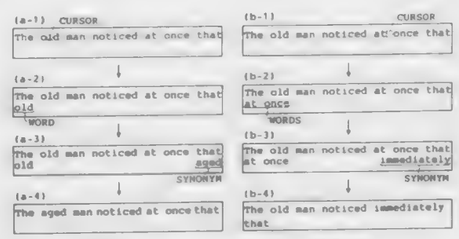
Hiroshi Onoda, Kariya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 192,359, May 10, 1988, abandoned. This application Jan. 5, 1990, Ser. No. 462,949

Claims priority, application Japan, May 12, 1987, 62-70543

Int. Cl.[5] G06F *12/00, 15/40*

U.S. Cl. 364—900 **13 Claims**



1. A data processing device having:

display means for displaying plural data items and spaces in display sites, where adjacent data items are separated by a space;

a memory for storing said plural data items and spaces in storage sites that correspond to the display sites of the display means;

pointing means for pointing at any one of the display sites of the display means, where the display site at which the pointing means points is a desired display site;

data processing means for reading out a selected data item from the memory when a data item is displayed at least in part at the desired display site and for processing the selected data item according to a preset procedure, where the selected data item is the data displayed at least in part at the desired display site;

combination processing means for reading a combination data item from the memory and for processing the combination data item according to the preset procedure when a space is displayed at the desired display site, where the combination data item is the two data items separated by the space displayed at the desired display site;

initiating means for initiating operation of the data processing means and the combination processing means; and

error signal display means for displaying an error signal on the display means if, when the data processing means and the combination processing means are initiated, a space is displayed at the desired display site and data items do not exist on both sides of the desired display site.

Patent Not Issued For This Number

4,992,975

4,992,976

METHOD OF ALLOCATING BOARD SLOT NUMBERS WITH ALTERING SOFTWARE

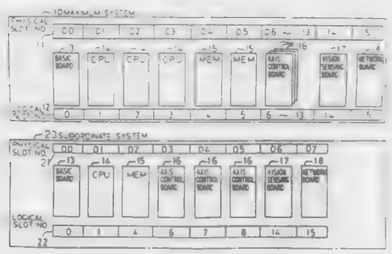
Mikio Yonekura, Hachioji, and Jiro Kinoshita, Yamato, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 143,134, Dec. 7, 1987, abandoned. This application Mar. 23, 1990, Ser. No. 501,306

Claims priority, application Japan, Apr. 18, 1986, 61-89641

Int. Cl.[5] G06F *13/14, 12/10*

U.S. Cl. 364—900 **1 Claim**



1. A system provided with a back panel having slots, the back panel having a plurality of boards, for performing various functions, mounted in respective slots, each of the slots having a first physical slot number indicating locations of the slots in which the plurality of boards are actually mounted, the first physical slot numbers are referred to as logical slot numbers indicating addresses of the plurality of boards, software created based on the logical slot numbers controls the system, a control system is provided for automatically converting second physical slot numbers, set after replacement of the back panel, to logical slot numbers when replacement of the back panel causes the first physical slot numbers not to be in agreement with the second physical slot numbers, said system comprising:

a plurality of buses including an address bus, data bus and control signal bus;

a basic board containing a slot number loader for assigning the second physical slot numbers to respective boards corresponding to said logical slot numbers when a power supply of said control system is switched on;

a plurality of boards interconnected by said address bus, each of said boards including:

a slot number control unit for converting each of the second physical slot numbers to logical slot numbers and selectively accessing one of said plurality of boards corresponding to one of the logical slot numbers when accessed by the logical slot numbers; and

means, connected to said slot number control unit, for assigning a module identification number, indicating a function of each of said plurality of boards, to said slot number control unit and supplying said module identification number to said slot number loader, said slot number control unit comprising:

an address decoder, coupled to said address bus, for producing first, second and third signals in accordance with address data on said address bus;

a slot number storing register, coupled to said address bus and said address decoder, for storing any one of the second physical slot numbers and the logical slot numbers;

a first comparator, coupled to said slot number storing resister and said address bus, for receiving data from said slot number storing register and address data from said address bus and producing a first coincidence signal when the data in address data coincide;

a second comparator, coupled to said slot number storing register and said address bus, for receiving data from said slot number storing register and address data from said address bus corresponding to the second one of the physical slot numbers and the logical slot numbers and producing a second coincidence signal when the data and address data coincide;

a first AND circuit, coupled to said address decoder and said slot number storing register, for receiving said first signal from said address decoder and said first coincidence signal from said first comparator and producing an AND signal thereof as a selection signal from each of said plurality of boards;

a second AND circuit, coupled between said address decoder and said slot number storage register and coupled to said data bus and said control signal bus, for receiving said second signal from said address decoder, a control signal from said control signal bus and data from said data bus and for supplying an AND signal to said slot number storing register to set a data address of said address bus to said slot number storing register; and

a third AND circuit, coupled to said address decoder, said second comparator and said control signal bus, for receiving said third signal from said address decoder, said control signal and said second coincidence signal from said second comparator and for supplying a module identification number to said data bus; and

control means provided in any one of said plurality of boards and coupled to said slot number control unit, for reading said module identification number from each of said plurality of boards, converting the second physical slot number to one of said logical slot numbers in accordance with said module identification number and storing the module identification number in said slot number storing register after the second physical slot number is stored in said slot number storing register of each of said plurality of boards by said basic board.

4,992,977

CACHE MEMORY DEVICE CONSTITUTING A MEMORY DEVICE USED IN A COMPUTER

Tsukasa Matoba, Kawasaki; Takeshi Aikawa, Tokyo; Ken-ichi Maeda, Kamakura; Mitsuo Saito, Yokosuka, and Mitsuyoshi Okamura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,296

Claims priority, application Japan, Mar. 28, 1987, 64-73000

Int. Cl.[5] G06F *12/08*

U.S. Cl. 364—900 **11 Claims**

1. A cache memory device comprising:

a processor;

a main memory having an instruction code area and a data area;

data cache memory means connected to and located between said processor and said main memory;

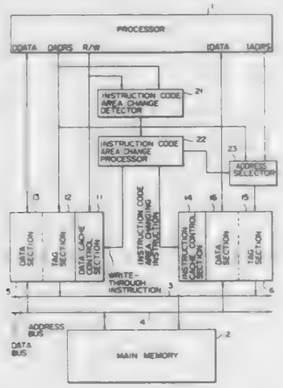
VOL 1123 ISS 2 FE 12 1991 UMI

instruction cache memory means connected to and located between said processor and said main memory;

instruction code area change detector means for determining the area in the main memory where an instruction code from said processor is to be sent;

instruction code area change processor means, connected to said instruction code area change detector means and said data cache memory means, for sending, when said instruction code is intended for said instruction code area of said main memory, said instruction code directly to said instruction code area of said main memory;

said instruction code area change processor means having means for outputting an instruction code changing instruction to said instruction cache memory means; and



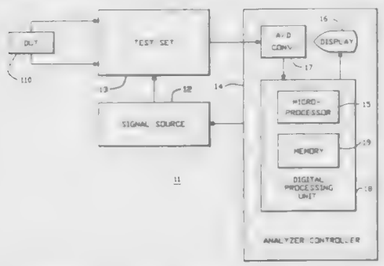
wherein said instruction code area change detector means and said processor means are located between said processor and said data cache memory means and said instruction cache memory means.

4,992,978

CROSS-PATH OPTIMIZATION IN MULTI-TASK PROCESSING

Douglas R. Thornton, Felton, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Mar. 31, 1988, Ser. No. 176,096
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—900 30 Claims



1. A method in a data processing system for optimizing processing of a given set of data with more than one operation selectable based upon a selection specification to produce more than one result, comprising the steps of:

(a) partitioning each operation of the system into at least one process step;

(b) sharing results of common process steps between at least a first and a second operations; and

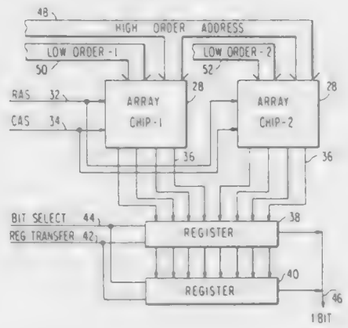
(c) bypassing execution of said common process steps in one of said first and second operations.

4,992,979

MEMORY STRUCTURE FOR NONSEQUENTIAL STORAGE OF BLOCK BYTES IN MULTI BIT CHIPS

Frederick J. Aichelman, Jr., Hopewell Junction, and Vincent F. Sollitto, Jr., Rhinebeck, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 791,833, Oct. 28, 1985, Pat. No. 4,796,222. This application Aug. 12, 1988, Ser. No. 231,813
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[5] G06F *9/3, 13/16, 12/04, 12/06*
U.S. Cl. 364—900 10 Claims



1. A random access memory, for storing multi-word blocks of N-bit words, comprising:

at least one single pair of memory array chips for each of N bit positions in said words, each of said chip pairs storing data for a respective bit position in said words in said multi-word blocks in the form of a plurality of contiguously stored bits output by said each chip pair over a first group and a second group of parallel output lines;

a register, a first portion of which is connected by said first group of parallel output lines to a first one of said chips in said at least one pair of chips and a second portion of which is connected by said second group of parallel output lines to a second one of said chips in said at least one pair of chips;

means responsive to a first address for applying in parallel a first group of bits from said first chip over said first group of output lines to said first portion of said register;

means responsive to a second address for applying in parallel a second group of bits from said second chip over said second group of output lines to said second portion of said register;

means for determining an arbitrary starting address for a block serial transfer of bits from said register in a predetermined sequencing order of addresses of said words; and

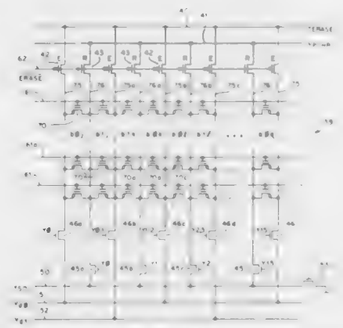
means responsive to said determining means for providing said first and second addresses according to the value of said starting address to said first and second address responsive means, respectively, said first and second addresses producing said first and second groups of bits for a given word bit position in a given multi-word block to said register, wherein one of said first or second groups of bits contains at least the bit at said starting address, and the other of said first or second groups of bits contains a plurality of bits with addresses which consecutively follow in said predetermined sequencing order the last bit that consecutively follows from said starting address bit in said predetermined sequencing order in said one group of bits.

4,992,980

NOVEL ARCHITECTURE FOR VIRTUAL GROUND HIGH-DENSITY EPROMS

Chin S. Park, Sunnyvale; Gregory E. Atwood, San Jose, and Lubin Y. Gee, Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 7, 1989, Ser. No. 390,159
Int. Cl.[5] G11C *7/00, 11/40, 11/407*
U.S. Cl. 365—104 18 Claims



8. An electrically programmable memory device comprising:

a plurality of memory cells formed in a semiconductor substrate and arranged in rows and columns so as to form an array, each cell including a control electrode and first and second regions having a conductivity type different from that of said substrate;

a plurality of row lines, the controlled electrode of all cells in each row being coupled to the row line, each row of said cells storing bits from a plurality of data bytes;

alternate first and second column lines, the first and second regions of all cells in each column being coupled to said first and second column lines, respectively, said first column lines selectively functioning as output lines and said second column lines selectively functioning as ground lines during accessing of said array;

precharging means for precharging said first and second column lines to a positive potential;

row decoding means for selecting a row line to simultaneously access a pair of adjacent memory cells within said array;

column decoding means for coupling a second column line to ground and for coupling the pair of first column lines immediately adjacent to said second column line to separate output lines to simultaneously access said pair of said adjacent memory cells within a row by conditionally discharging said pair of first column lines through said pair of cells, said pair of cells storing two different bits of a single data byte.

4,992,981

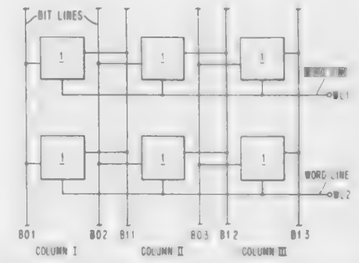
DOUBLE-ENDED MEMORY CELL ARRAY USING INTERLEAVED BIT LINES AND METHOD OF FABRICATION THEREFORE

Kurt Ganssloser, Böblingen; Dieter F. Wendel, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 58,459, Jun. 5, 1987, abandoned. This application Aug. 24, 1989, Ser. No. 399,359
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—154 19 Claims

1. A memory array comprising a plurality of bipolar memory cells arranged in rows and columns each said row of said memory cells having an associated word line, each of said memory cells including first and second pairs of complementary transistors spaced from each other by an isolation region, a plurality of pairs of bit lines, each pair of bit lines being connected to portions of memory cells in an associated column of memory cells, each of said pair of bit lines of each column being interleaved with the bit line of an adjacent column of memory cells and being disposed over a portion of each of said memory cells of an adjacent column of memory cells,

a first polycrystalline element connected to a region of first conductivity type of one of said first pair of complementary transistors, said first element having a finger-like extension extending across said isolation region and terminating in the vicinity of a region of second conductivity type of one of said second pair of complementary transistors, and



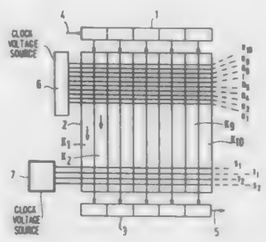
a second polycrystalline element connected to a region of fist conductivity type of said one of said second pair of complementary transistors, said second element having a finger-like extension extending across said isolation region and terminating in the vicinity of a region of second conductivity type of aid one of said first pair of complementary transistors, said extensions being connected to said regions of second conductivity type by metallic interconnections.

4,992,982

SPS TYPE CHARGE COUPLED DEVICE MEMORY SUITABLE FOR PROCESSING VIDEO INFORMATION WITH INCREASED SPEED

Frits A. Steenhof, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,847
Claims priority, application Netherlands, Oct. 20, 1987, [illegible]
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—183 8 Claims



1. A semiconductor memory comprising a charge-coupled device of the SPS type having a series input register, a parallel section and a series output register, the number of data that can be stored per line in the parallel section being the n-multiple (where n = integer and larger than or equal to 2) of the number of data that can be stored in the series input register and the series output register, while at the transition between the parallel section and the series output register an electrode configura-

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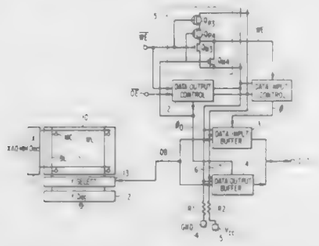
tion is present (designated as de-interlacing electrodes), by means of which a line of data in the parallel section can be split up into n sublines, which can be transported successively in the series output register, the parallel section being provided with clock voltage means with the aid of which the data are transported at an adjustable speed through the parallel section, characterized in that means are provided for activating the de-interlacing electrodes according to n different procedures, which each correspond to one of the sublines and can be carried out in order of succession with an adjustable difference in time, which is determined by the speed at which the data are transported through the parallel section to the de-interlacing electrodes.

4,992,983

SEMICONDUCTOR MEMORY DEVICE WITH AN IMPROVED WRITE CONTROL CIRCUIT

Toru Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,426
Int. Cl.[5] G11C *8/02*
U.S. Cl. 365—189.05 7 Claims



1. A semiconductor memory device comprising a memory cell array including a plurality of read/write memory cells, selection means for selecting at least one memory cell in said memory cell array, a first input means for receiving a write enable signal, a second input means for receiving a read enable signal, a data input/output terminal, a write circuit for operatively writing data applied to said input/output terminal to the selected memory cell when enabled, a read circuit for operatively outputting data from the selected memory cell to said input/output terminal when enabled, a first control circuit coupled to said first and second input means, said first control circuit enabling said read circuit only when said read enable signal is active in level, and a second control circuit coupled to said first input means and said first control circuit, said second control circuit enabling said write circuit only when said write enable signal is active in level and said first control circuit disenables said read circuit.

4,992,984

MEMORY MODULE UTILIZING PARTIALLY DEFECTIVE MEMORY CHIPS

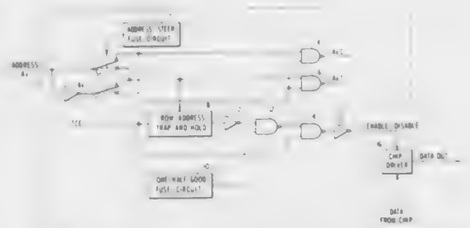
Robert E. Busch, Colchester; Wayne F. Ellis, Jericho; Theodore M. Redman, Milton, and Endre P. Thoma, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,001
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—200 14 Claims

1. A memory device comprising:

a plurality of memory chips each having a plurality of arrays of storage cells, a data output, and an address signal input for receiving an address signal corresponding to a selected one of the plurality of storage cells, at least one of the plurality of arrays of storage cells of each of the plurality of memory chips being non-functional, such that only one of the plurality of memory chips contains a functional storage cell which can be addressed by the address signal received on the address signal input; and

control means for receiving at least a portion of the address signal received on the address signal input, and for controlling, in response to said portion of the address signal, the plurality of memory chips such that only that one of the plurality of memory chips that has said functional storage cell corresponding to the address signal is enabled.

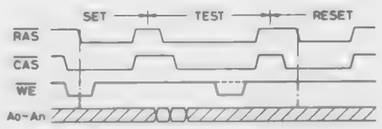


4,992,985

METHOD FOR SELECTIVELY INITIATING/TERMINATING A TEST MODE IN AN ADDRESS MULTIPLEXED DRAM AND ADDRESS MULTIPLEXED DRAM HAVING SUCH A CAPABILITY

Kazuyuki Miyazawa, Iruma; Katsuhiro Shimohigashi, Musashimurayama; Jun Etoh, Hachiohji, and Katsutaka Kimura, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 41,070, Apr. 22, 1987, Pat. No. 4,811,299.
This application Mar. 7, 1989, Ser. No. 319,693
Claims priority, application Japan, Apr. 23, 1986, 61-92056
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—201 33 Claims



1. A method of entering into a test mode from a normal operation mode in an address multiplexed dynamic RAM having at least a first external terminal for receiving a row address strobe signal, a second external terminal for receiving a column address strobe signal and a third external terminal for receiving a write enable signal, comprising the steps of:

(a) setting said column address strobe signal at a logic "low" level;

(b) setting said write enable signal at a logic "low" level; and

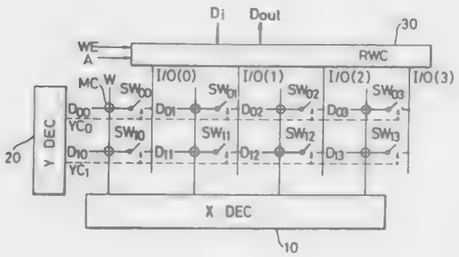
(c) setting said row address strobe signal at a logic "low" level subsequent to said steps (a) and (b).

4,992,986

SEMICONDUCTOR MEMORY

Kiyoo Itoh, Higashikurume, and Ryoichi Hori, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 171,772, Mar. 22, 1988, Pat. No. 4,825,418, which is a continuation of Ser. No. 38,370, Apr. 14, 1987, Pat. No. 4,748,591, which is a division of Ser. No. 717,490, Mar. 29, 1985, Pat. No. 4,675,845, which is a continuation of Ser. No. 380,409, May 20, 1982, abandoned. This application Apr. 25, 1989, Ser. No. 342,903
Claims priority, application Japan, May 29, 1981, 56-81042
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—207 33 Claims



1. A memory device comprising:

a plurality of sub-arrays, each having a plurality of word lines, a plurality of pairs of data lines which extend along a direction intersecting with the plurality of word lines, and a plurality of memory cells which are each respectively disposed at a point of intersection between a word line of the plurality of word lines and a data line of the plurality of pairs of said data lines, wherein the data lines of the pairs of said data lines have differential signals, wherein the data lines of each pair of data lines intersect each other, and wherein each memory cell includes a capacitor for storing a signal, and a transistor for connecting the capacitor and a corresponding data line;

a plurality of common lines, each of which is arranged in common with at least two data lines belonging to different sub-arrays, wherein said plurality of common lines are arranged in a direction intersecting the data lines;

a plurality of differential amplifiers, each of which is provided in common for groups of four data lines formed with two data lines from one sub-array and two data lines from another sub-array, each differential amplifier including means for differentially amplifying two signals on two of the data lines, which two data lines are selected by a first switching means;

a plurality of first means for connecting one of the data lines belonging to different sub-arrays to the differential amplifiers, each of which first means connects one of the data lines belonging to different sub-arrays to the corresponding differential amplifiers;

a plurality of second means for connecting one of the data lines belonging to different sub-arrays to the common line, each of which first means connects one of the data lines belonging to different sub-arrays to a corresponding common line;

a plurality of control lines, each of which controls at least a corresponding one of the second means to control connection of the data line to the common line;

a first decoder for selecting at least one of the plurality of word lines; and

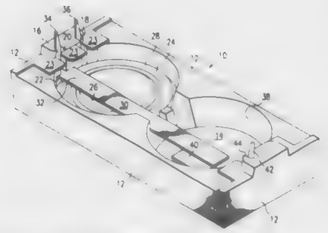
a second decoder for controlling the selection of the data lines by the control lines.

4,992,987

BATTERY PACKAGE FOR INTEGRATED CIRCUITS

Robert E. Echols, Lewisville, Tex.; John R. Sanderson, Chicago, Ill.; Richard D. Cyr, Appleton, and Robert J. Bosben, Madison, both of Wis., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex. and Rayovac Corporation, Madison, Wis.

Continuation of Ser. No. 330,977, Mar. 29, 1989, abandoned, which is a continuation of Ser. No. 52,777, May 21, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 397,643
Int. Cl.[5] G11C *11/24;* H01M *2/10;* H02J *7/00*
U.S. Cl. 365—229 20 Claims



1. A battery package which comprises:

(a) a generally hollow container member defined by a floor and side walls attached to the floor, said side walls having an open upper lip surface; a groove through the inside surface of one of said side walls extending from said upper lip surface to said floor; a second groove through the inside surface of one of said side walls extending from said upper lip, part of the distance toward said floor, thus defining a platform at the lowermost portion of said second groove; and

(b) a battery disposed within the hollow container, said battery having upper and lower terminals; and

(c) first and second generally planar, electrically conductive contacts each having a generally perpendicular, integral, pin portion formed on one end thereof; said first contact being attached to said lower battery terminal such that its pin is positioned within said first groove and extends above said upper lip surface; said second contact being attached to said upper battery terminal such that its pin is positioned within said second groove and extends above said upper lip surface and the portion of said second contact next adjacent said pin is positioned on said platform; and

(d) a sealing composition enveloping said battery, contacts, and the portion of said pins below said lip surface.

4,992,988

UNDERWATER ACOUSTIC CONTROL SYSTEM

Russell K. Koehler, Hyattsville, Md., and Glenn A. McLeod, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1973, Ser. No. 421,364
Int. Cl.[5] H04B *1/59*
U.S. Cl. 367—2 2 Claims

1. An underwater control device which is responsive to acoustic signals for producing a control pulse comprising:

means for detecting said acoustic signals and producing electronic signals representative thereof;

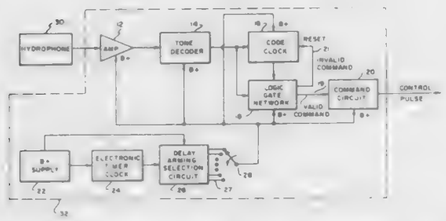
tone decoder means for conducting said electronic signals having a frequency falling within a predetermined range;

code clock means responsive to said conducted electronic signals for producing logic setting signals;

logic network means responsive to said logic setting signals for detecting the time interval spacing of said conducted electronic signals and providing an invalid command pulse to reset said code clock means upon detecting said

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conducted electronic signals which do not fall into said predetermined time intervals and producing a valid command pulse upon detecting said conducted electronic signals which do fall into said predetermined time intervals



command circuit means for producing a control signal responsive to the detection of said valid command pulse; and,

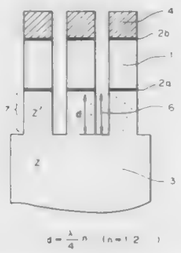
delayed activating means for selectively delaying the activation of said underwater control device.

4,992,989

ULTRASOUND PROBE FOR MEDICAL IMAGING SYSTEM

Kazuhiro Watanabe, Tokyo; Atsuo Iida, Yokohama; Fumihiro Namiki, Machida, and Kenji Kawabe, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 2, 1989, Ser. No. 346,527
Claims priority, application Japan, May 19, 1988, 63-122438
Int. Cl.[5] G03B *42/06*
U.S. Cl. 367—7 **6 Claims**



1. An ultrasound probe for a medical imaging system having an ultrasound absorber and a piezoelectric vibrator mounted on said ultrasound absorber, said ultrasound probe being cut by a plurality of cutting grooves, extending in the direction from the surface of said piezoelectric vibrator to said ultrasound absorber, into an array the cutting depth d of each said cutting groove in said ultrasound absorber being determined by the following equation:

$$d=n\cdot(\lambda/4)$$

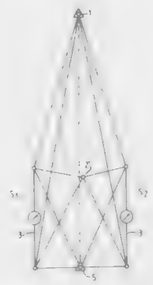
where, reference λ is the wave length corresponding to the center frequency f_0 of the ultrasound waves radiated from said piezoelectric vibrator, and the coefficient n is a natural number.

4,992,990

METHOD FOR DETERMINING THE POSITION OF SEISMIC STREAMERS IN A REFLECTION SEISMIC MEASURING SYSTEM

Jan-Åge Langeland, Garnes; Stein ÅSheim; Bjorn Nordmoen, both of Oslo, and Erik Vigen, Drammen, all of Norway, assignors to Geco A.S., Sandvika, Norway

PCT No. PCT/NO89/00055, § 371 Date Jan. 30, 1990, § 102(e) Date Jan. 30, 1990, PCT Pub. No. WO89/12236, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 6, 1989, Ser. No. 460,146
Claims priority, application Norway, Jun. 6, 1988, 882495
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—19 **18 Claims**



1. A method for determining the position of at least two seismic streamers, each having a fore end and an aft end, in a reflection seismic measurement system in 3-dimensional marine seismic surveys, wherein each seismic streamer is equipped with a plurality of compasses and comprises a plurality of active sections having known lengths inserted between a fore stretch section and an aft stretch section at each end, respectively, of the seismic streamers, said active sections being equipped with a plurality of hydrophones or hydrophone groups having known locations, wherein the fore stretch section is connected with a towing arrangement attached to a towing vessel and the end of the aft stretch section is provided with a tailbuoy having equipment for determining the position of the tailbuoy and an acoustic transceiver, and the measurement system further includes at least one seismic source provided with an acoustic transceiver and at least one towing vessel each equipped with an onboard computer system for positioning and navigational purposes and at least one acoustic transceiver, the method comprising:

towing a float by at least one vessel;

locating said float off and between the fore ends of said seismic streamers;

providing said float with position determining means and an acoustic transceiver;

disposing a plurality of acoustic transceivers at specific locations in each stretch section;

providing further acoustic transceivers at certain locations in at least one of said active sections adjacent to a stretch section, so that said seismic streamers, vessels and seismic sources constitute a 3-dimensional structure;

connecting said seismic streamers, seismic sources and floats with said at least one vessel in an arrangement forming at least one triangle network;

providing at least one reference position at the at least one vessel position and at least one reference position at the position of at least one of the float and a tailbuoy;

determining the position of the streamers by trilateration between the acoustic transceivers and the at least two reference positions, said trilateration comprising an acoustic distance measuring method producing hydroacoustic signals between the transceivers and determining the mutual distances between the acoustic transceivers by measuring the transit time of the hydroacoustic signals therebetween;

evaluating the thus determined reference positions and distances in the at least one triangle network in a first step, and evaluating in a second step the position of said seismic streamers and the position of every hydrophone or group of hydrophones in the seismic streamers; and

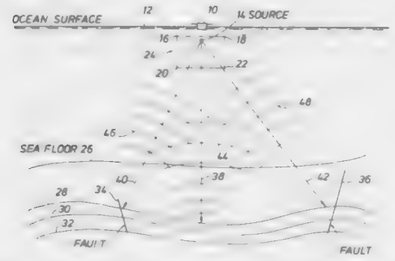
implementing said first and second steps as calculation procedures in said onboard computer system.

4,992,991

MARINE SEISMIC RECEIVING SYSTEM EMPLOYING MULTIPLE DEPTH HYDROSTREAMER CABLE

Dewey R. Young, Houston, and Richard E. Duren, Spring, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 265,248, Oct. 31, 1988, abandoned.
This application Nov. 28, 1989, Ser. No. 443,065
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—20 **9 Claims**



1. Marine seismic receiving apparatus for receiving direct acoustical seismic reflections from seismic reflecting interfaces, comprising

a towing vessel, and

a plurality of at least three hydrostreamer cables connected to said vessel, each of said cables having a plurality of hydrophone detectors spaced therealong, said cables being provisioned for towing so that at least one of said cables is towed at a depth different from the other of said cables, thereby placing detectors from different ones of said cables in a vertically dispersed arrangement in a plane different from a plane longitudinally parallel with said cables, thus forming a multisided geometrical configuration defined by respective ones of said detectors from each of said cables establishing an array for determining directionality of a common wavefront detected by said respective detectors.

4,992,992

PROCESSING FOR SEISMIC DATA FROM SLANTED CABLE

William H. Dragoset, Jr., Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Oct. 21, 1988, Ser. No. 260,793
Int. Cl.[5] G01V *1/36, 1/38*
U.S. Cl. 367—21 **18 Claims**

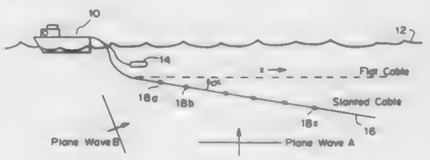
1. A method of marine seismic exploration comprising:

recording seismic data utilizing detectors positioned on a cable towed behind a vessel at substantially a determinable angle;

processing said seismic data to substantially remove the time offset in the recorded data resulting from the cable slant for seismic signals arriving at said slanted cable at varying plane wave angles, wherein said processing comprises:

transforming shot gather data from time-offset domain data to horizontal wavenumber-frequency domain data;

mapping horizontal wave numbers of events in the transformed data to new horizontal wavenumbers so that events appear as if recorded by a horizontal cable thereby generating remapped data; and



transforming said remapped data back to the time-offset domain.

4,992,993

CORRECTION FOR VARIABLE WATER-COLUMN VELOCITY IN SEISMIC DATA

Ronald E. Chambers, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 18, 1990, Ser. No. 539,239
Int. Cl.[5] G01V *1/22, 1/38*
U.S. Cl. 367—21 **7 Claims**



1. In conjunction with a marine seismic survey, a method for correcting erratic arrival times of seismic events associated with earth layers beneath a body of water due to a rough water bottom and variations in the water velocity, comprising:

generating an acoustic wave field in a body of water at a source point;

at a receiver point, offset from said source point by a preselected distance, detecting reflections of said acoustic wave field from discrete discontinuities within said body of water;

using said detected reflections, calculating the RMS velocity as a function of water thickness at said source and receiver points and using said calculated RMS velocity, computing the wavefield travel time through said body of water to derive a first model of said body of water;

forming a second model of said body of water in terms of a preselected average replacement velocity as a function of water thickness at said source and receiver points and using said replacement velocity, computing the wavefield travel time through said second model;

calculating the travel-time differential between said first and second models and applying said travel-time differential to the arrival times of the seismic events associated with said earth layers.

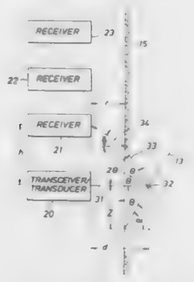
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4,992,994

BOREHOLE TELEVIEWER FOR FRACTURE DETECTION AND CEMENT EVALUATION

Frederick H. K. Rambow, Houston, and Edward A. Clerke, Missouri City, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 29, 1989, Ser. No. 330,384
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—25 4 Claims



1. A method for acoustically logging a borehole in the earth to detect anomalies in the earth formation beyond the wall of said borehole, said method comprising:

(a) generating a plurality of narrow beam acoustic pulses with a rotating transducer at a first location in the borehole, wherein the complete circumference of the borehole at said first location is scanned by said pulses;

(b) receiving at said first location the reflected responses of said acoustic pulses and producing a first electrical signal;

(c) receiving at a second location vertically spaced from said first location the reflected responses of said acoustic pulses with a single element annular thin film omnidirectional receiver and producing a second electrical signal;

(d) recording said first and second electrical signals to provide a visual display of the elapsed time between the generating of said acoustic pulses and the occurrence of reflection events from said anomalies in said first and second electrical signals; and

(e) analyzing said display to locate the position of said anomalies.

4,992,995

METHODS FOR ATTENUATING NOISE IN SEISMIC DATA

Paul D. Favret, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

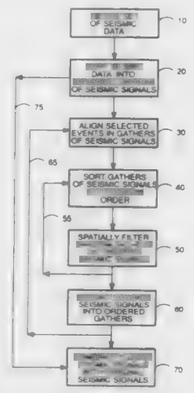
Filed Oct. 24, 1989, Ser. No. 426,127
Int. Cl.[5] G01V *1/36, 1/28*
U.S. Cl. 367—43 22 Claims

1. A method for enhancing seismic data, comprising the steps of:

(a) obtaining a set of seismic data having gathers of seismic signals;

(b) aligning selected coherent events in each gather of seismic signals;

(c) transforming the remaining coherent events in each gather of seismic signals into incoherent events; and



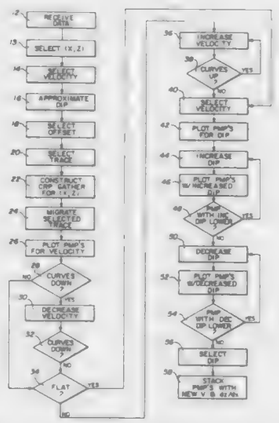
(d) attenuating the incoherent events from each gather of seismic signals.

4,992,996

INTERVAL VELOCITY ANALYSIS AND DEPTH MIGRATION USING COMMON REFLECTION POINT GATHERS

Shein S. Wang; Doublas W. Hanson, and Thomas D. Cavanaugh, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 31, 1990, Ser. No. 472,935
Int. Cl.[5] G01V *1/36*
U.S. Cl. 367—53 5 Claims



1. A method for determining velocity with actual dip comprising the steps of:

receiving seismic data including a velocity model;

selecting an offset;

selecting a single trace;

calculating an initial velocity;

approximating an initial dip of said selected portion of said single trace;

constructing a common reflection point gather;

migrating each trace of said common reflection point gather to form a post migrated part;

plotting said post migrated part for said initial velocity;

varying said initial velocity to determine a true velocity for said selected offset;

plotting said post migrated part for said initial dip;

increasing the initial dip;

comparing said post migrated part having the initial dip and the increased dip;

determining an actual dip by increasing the dip again whenever said post migrated part with the increased dip is deeper and decreasing the dip whenever said post migrated part with the increased dip is shallower; and

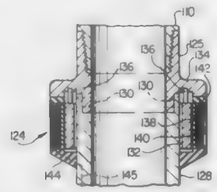
stacking said post migrated part using said true velocity with the actual dip.

4,992,997

STRESS WAVE TELEMETRY SYSTEM FOR DRILLSTEMS AND TUBING STRINGS

Amjad A. Bseisu, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 29, 1988, Ser. No. 188,231
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—82 12 Claims



1. A system for transmitting signals along one of an elongated tubular drillstem and tubing string between a point in a wellbore and a point at or near the earth's surface, said system comprising:

an elongated tubular stem extending into a wellbore and supported by support means at the earth's surface;

means associated with said stem for sensing a condition in said wellbore related to wellbore operations;

means for converting signals related to said condition to a digital signal;

means interposed in said stem for generating a compressional wave at a selected frequency in said stem for transmission along said stem toward the earth's surface, said means for generating including a sub having a transverse flange, a generally annular member of magnetic material connected to said flange and disposed for oscillatory axial vibration for imparting compressional waves to said flange and to said stem, and a solenoid coil disposed in proximity to said annular member and adapted to be energized to oscillate said annular member at a selected oscillatory frequency for transmitting compressional stress waves along said stem; and

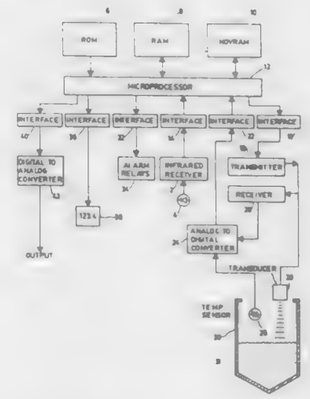
means connected to said stem for sensing said vibrations and for transmitting signals related to said vibrations to receiving means at or near the earth's surface whereby information related to said condition in said well bore is transmitted to said receiving means through conversion of vibrations propagated along said stem.

4,992,998

ACOUSTIC RANGE FINDING SYSTEM

Steven J. Woodward, Port Hope, Canada, assignor to Federal Industries Industrial Group Inc., Toronto, Canada

Continuation-in-part of Ser. No. 190,391, May 5, 1988, Pat. No. 4,890,266, which is a continuation-in-part of Ser. No. 41,877, Apr. 22, 1987, Pat. No. 4,831,565, which is a continuation-in-part of Ser. No. 916,013, Oct. 3, 1986, Pat. No. 4,821,215. This application Sep. 12, 1989, Ser. No. 406,283
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] G01S *15/08*
U.S. Cl. 367—99 9 Claims



1. In an acoustic ranging system comprising at least one electro-acoustic transducer directed towards the surface of material whose level is to be determined, a transmitter to transmit pulses of electrical energy to energize selectively each said transducer whereby to cause it to emit at least one shot of acoustic energy at a predetermined frequency, a receiver receiving and amplifying electrical energy from said at least one shot regenerated by said transducer from acoustic energy at the same frequency received by the transducer over a subsequent period, the time lapse after a shot before receipt by said receiver of energy regenerated from an echo from said surface being proportional to the distance of the origin of the echo, signal processing means comprising analog to digital converter means to sample repeatedly the output amplitude of the signal from the receiver at defined intervals and to digitize the samples; memory means to store an extended sequence of digitized samples so produced in respect of at least one shot and form therefrom a digital data base file depicting an amplitude/time profile of the received signal with a resolution dependent on the sampling intervals; and computing means programmed to utilize the amplitude profile depicted by the data in said data base to help isolate relative to a time axis a portion of the output signal produced by said at least one shot deemed most probable to correspond to a wanted echo, and to determine a range represented by an echo within said portion of the time axis;

the improvement wherein the computing means is programmed to generate a time varying threshold file derived from said digital database file, to compare said files to produce a comparison file of data relating to peaks in the echo profile, and to manipulate the data in at least one of said database file and said threshold file prior to or during comparison to reduce the likelihood that spurious features of the profile of the received signal representing the database file will affect recognition of a true echo from the data in said comparison file.

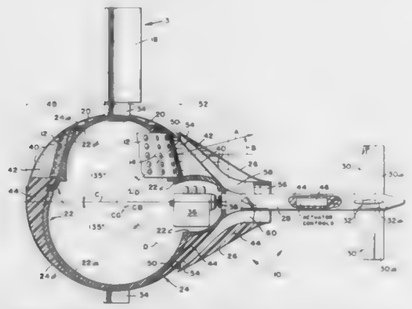
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4,992,999

SUBMARINE DRONE FOR CARRYING A BARREL STAVE-TYPE TRANSDUCER ARRAY

Henry T. Yerby, Pasadena, Calif.; Thomas G. Lang, State College, Pa., and Horace E. Karig, Pasadena, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 28, 1966, Ser. No. 569,560
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—130 3 Claims



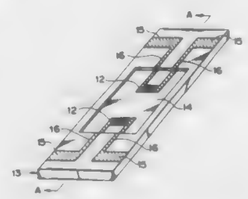
1. A dirigible underwater drone vehicle for carrying an annular sonar signal receiving array formed from a plurality of linear arrays arranged as staves aligned in generally axial directions along the circumference of the annular array, comprising:
(a) a hydrodynamic casing having a longitudinal axis of symmetry and a first spherical frontal and middle section forming a shape comprising more than half of a spherical surface so that the casing forms a spherically shaped outer surface at the vehicle maximum diameter and the rear edge of said first section is formed as a rearwardly converging spherical outer surface, said hydrodynamic casing having a second rear section forming a shape comprising a rearwardly converging frustoconical surface adjoining and extending from the rear edge of the first section, said second section of the hydrodynamic casing starting at an axial position ahead of the rear limit of the normal boundary layer separation point along the length of the surface of the spherical shape of the first section under forward motion in the direction of the hydrodynamic axis,
(b) a tail boom affixed to the rear end of the rear section of the hydrodynamic casing and aligned about the hydrodynamic axis,
(c) rudder and elevator control surfaces affixed to the rear end of the tail boom,
(d) a set of wings in cruciform arrangement in the pitch and yaw planes at an axial position near to the maximum diameter of the first spherical section of the hydrodynamic casing,
(e) an annular afterbody shroud disposed about the rear section of the hydrodynamic casing and about a forward section of the tail boom adjoining the point at which it is affixed to the hydrodynamic casing, the inner surface of said afterbody shroud co-operating with the frustoconical surface of the second rear section of the hydrodynamic casing to form an annular boundary layer induction and pump jet ducting channel, said boundary layer induction and pump jet induction channel comprising a first forward converging rearwardly extending axial section about the rear section of the hydrodynamic casing and a second axially extending rear section about said forward section of the tail boom,
(f) self contained propulsion means including pump jet blades disposed in said second section of the boundary layer induction and pump jet ducting channel, and journaled about the tail boom,
(g) means for supporting the annular sonar array in the upper hemispherical half of the hydrodynamic casing in concentric relationship about a vertical diametric reference line through the first spherical frontal and middle section of the hydrodynamic outer casing, and
(h) the space between the hydrodynamic casing and the outer surface of the annular array being flooded with ambient water, and the wall of the hydrodynamic casing about said outer surface of the array being made of a material of the type forming an acoustically transparent material when backed with water.

4,993,000

SURFACE ACOUSTIC WAVE DEVICE

Teruo Niitsuma, and Syuichi Mitsutsuka, both of 35-2, Hakusan 5-chome, Bunkyo-ku, Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,163
Claims priority, application Japan, Dec. 22, 1988, 63-324399
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—140 13 Claims



1. A surface acoustic wave device comprising:
a substrate having a piezoelectric outer surface on one side, said substrate having on said one side a recessed portion extending part-way through said substrate to define a recess with a piezoelectric floor on which a pair of spaced excitation portions are applied, each excitation portion having excitation transducer electrodes formed on the piezoelectric surface of said recess floor and a propagating portion between said excitation portions;
taking-out electrodes applied upon said substrate and extending from each of said transducer electrodes to the surface of said substrate outside of said recessed portion;
a plate-shaped covering body covering said recessed portion, said recessed portion being sufficiently deep that an air gap remains on the inner side of said covering body over said exciting portions and said propagating portion;
an encapsulation body sealingly covering at least the outer surfaces of said covering body; and
leads connected to said take-out electrodes and projecting beyond said encapsulation body to make connection to an external circuit.

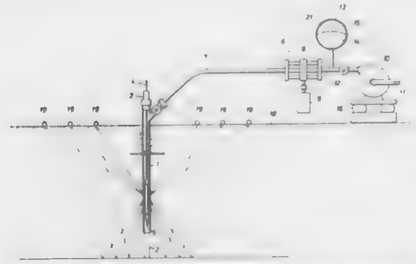
4,993,001

METHOD AND APPARATUS FOR CONVERTING TUBE WAVES TO BODY WAVES FOR SEISMIC EXPLORATION

Graham A. Winbow, Houston; Mark S. Ramsey, Spring, and J. David Fox, Stafford, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 164,154, Mar. 4, 1988, abandoned. This application Mar. 15, 1990, Ser. No. 496,089
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—144 13 Claims

1. A method for downhole generation of compressional and shear waves having sufficient strength for use in seismic exploration of earth formations surrounding a liquid filled wellbore comprising:
creating at least one pressure pulse in the liquid in the wellbore at a first location in the wellbore to create a tube wave guided downhole by the wellbore; and
positioning at a second separate location at a pre-selected depth downhole in the liquid in the wellbore, a tube wave converter with a generally cylindrical center section and tapered ends having a diameter sufficient to substantially fill the borehole diameter, a length in the range of from about $\frac{1}{4}$ and up to about one wave length of a formation compressional wave at the desired operating frequency or



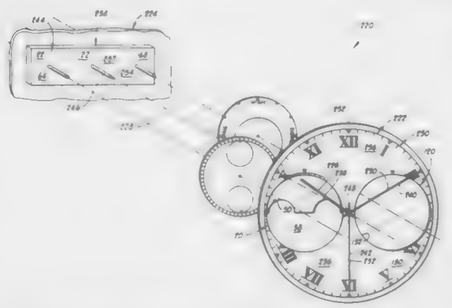
at the central frequency of the swept frequency pulse for a swept frequency tube wave, and having a strong acoustic impedance contrast with the liquid in the wellbore, wherein the tube wave converter converts the tube wave into compressional and shear waves that radiate into the earth for use in seismic exploration.

4,993,002

NAUTICAL MOON AND TIDE CLOCK APPARATUS

Breene M. Kerr, 1200 Davinbrook, Oklahoma City, Okla. 73118

Filed Oct. 16, 1989, Ser. No. 422,991
Int. Cl.[5] G04B *19/26*
U.S. Cl. 368—19 14 Claims



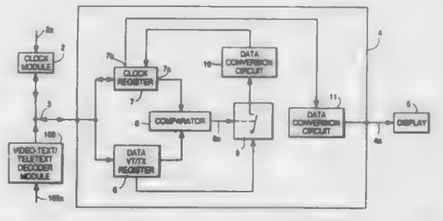
1. A moon clock for indicating a phase of the moon comprising:
a base;
a moon disk attached to said base and rotatable about a central axis perpendicularly extending therefrom, said moon disk including:
a front surface;
moon representation means fixedly disposed on said surface for representing a moon; and
a continuous graduated scale fixedly disposed on said surface adjacent to the periphery thereof, said continuous scale having a plurality of equally spaced divisions, each division representing one 24 hour day of a lunar month;
drive means attached to said base for rotating said moon disk about said axis in a clockwise direction at a rate corresponding to the rate of the lunar orbit;
marker means fixedly attached to said base in a position adjacent to said continuous scale of said moon disk for marking a position of said moon representation means with respect to said base that indicates a phase of the moon at a given time and marking a division of said continuous scale whereby the number of divisions of said continuous scale in a counterclockwise direction from said marker means to said moon representation means indicates the number of days before said phase will occur and the number of divisions of said continuous scale in a clockwise direction from said marker means to said moon representation means indicates the number of days after said phase last occurred; and
a vernier scale fixedly attached to said base in a position adjacent to said continuous scale of said moon disk for measuring a fractional part of said division of said continuous scale marked by said marker means.

4,993,003

APPARATUS FOR UPDATING TIME-OF-DAY INFORMATION IN A SIGNAL

Rainer Fechner, VS-Villingen, and Thomas Békesi, Niederaschach, both of Fed. Rep. of Germany, assignors to Electronic-Werke Deutschland GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 389,913
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827837
Int. Cl.[5] G04C *11/02*
U.S. Cl. 368—47 6 Claims



1. An apparatus for generating an updated output signal containing a time-of-day or date information, comprising:
a source of a video-text/teletext input signal containing a time-of-day or date reference information;
a clock generator responsive to a timing signal that is independent of said input signal for generating an output signal containing a time-of-day or date information; and
means coupled to said clock generator and responsive to said input signal for automatically updating, in accordance with the reference information, the information contained in said output signal, such that when the reference information is not used for updating said output signal, said output signal is updated in said clock generator in a free running manner in accordance with said timing signal and:
wherein said updating means comprises a comaprator means responsive to said output and input signals for generating a correction signal that is coupled back to said click generator when a difference oetween the information of each is detected, said correction signal correcting the information of said output signal in accordance with said input signal.

4,993,004

PASSIVELY ACTIVATED LAP COUNTER AND TIMER

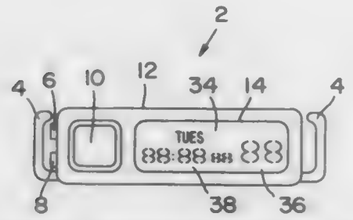
Marion A. Loizeaux, 45 Zaccheus Mead, Greenwich, Conn. 06831

Filed Jan. 11, 1989, Ser. No. 295,783
Int. Cl.[5] G04C *17/00*
U.S. Cl. 368—107 27 Claims

1. A portable device for counting and measuring the repetitions of an athletic activity, comprising:
(a) a case;
(b) fastening means for attaching said case to a hand or a foot of a participant in the activity;

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(c) counting means enclosed within said case for counting the completion of a repetition;
(d) display means for displaying to the participant the status of said counting means;
(e) single area pressure means for activating said counting means disposed upon said case such that pressure is applicable thereto through contact with a solid surface as part of the participant's natural action in completing a repetition; said single area pressure means being the sole raised



area at least a predetermined distance from a portion of said case actuatable in a direction toward said case; and
(f) measuring means for determining at least one of the duration of plural repetitions of said athletic activity, a distance travelled by said participant in the course of said athletic activity, a speed attained by the participant in the course of said athletic activity and a split time of said athletic activity.

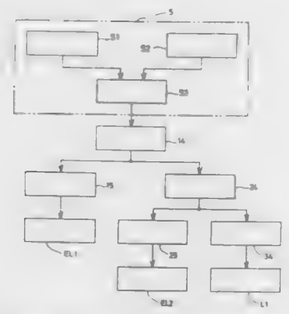
3. A device as in claim 1, wherein said counting means comprises a microprocessor.

4,993,005

POWER SUPPLY SYSTEM FOR LUMINOUS HANDS

Isato Watanabe, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1990, Ser. No. 541,562
Claims priority, application Japan, Jun. 29, 1989, 1-163175
Int. Cl.[5] G04B *19/32*
U.S. Cl. 368—226 8 Claims



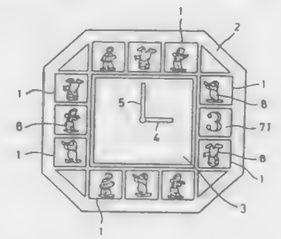
1. A power supply system for luminous hands of a timepiece having hour and minute hands with electroluminescence elements and a second hand having a light-emitting diode, comprising:
drive signal generating means for generating a mixed signal including a high-frequency signal and a low-frequency signal;
a fixed member;
an hour hand brush conductor device placed between said fixed member and said hour hand and connected to receive said mixed signal;
an hour hand filter for passing only said low-frequency signal of the mixed signal sent to said hour hand brush conductor device and connected to send said low-frequency signal to said electroluminescence element of the hour hand;
a minute hand brush conductor device placed between said hour hand and said minute hand and connected to receive said mixed signal from said hour hand brush conductor device;
a minute hand filter for passing only said low-frequency signal of the mixed signal sent to said minute hand brush conductor device and connected to send said low-frequency signal to said electroluminescence element of the minute hand; and
a rotary transformer provided between said minute hand and said second hand, said rotary transformer being connected to transfer said mixed signal from said minute hand brush conductor device to said light-emitting diode of the second hand.

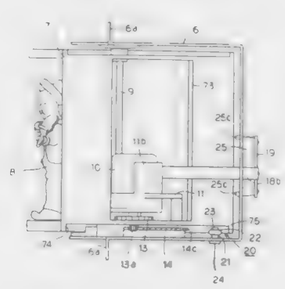
4,993,006

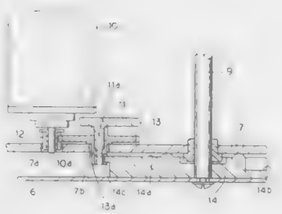
DEVICE FOR TURNING DECORATION FOR TIMEPIECE

Kenji Oshima; Hiroshi Yamazaki; Shigeru Shimozono, and Shinya Tamura, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Nov. 17, 1989, Ser. No. 438,711
Claims priority, application Japan, Nov. 24, 1988, 63-296982
Int. Cl.[5] G04B *19/16, 21/00*
U.S. Cl. 368—231 6 Claims







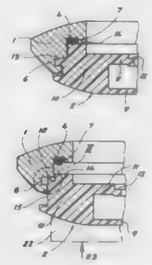
1. In a timepiece having a housing, and at least one decorative element, means mounting each at least one decorative element for rotation relative to the housing: a rotary member supporting the decorative element and rotatably mounted on a shaft connected to the housing, a stationary gear mounted on the shaft, a drive motor mounted on the rotary member for rotation therewith, and means for engaging the drive motor with the stationary gear to effect rotation of the decorative element.

4,993,007

METHOD FOR ASSEMBLING A WATCH CASE

Leonhard Meister, Selzach, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Grenchen, Switzerland

Division of Ser. No. 168,019, Mar. 14, 1988, abandoned. This application Jun. 22, 1989, Ser. No. 370,112
Claims priority, application Switzerland, Mar. 23, 1987, 01097/87; Oct. 15, 1987, 04035/87
Int. Cl.[5] B23B *31/16;* G04B *37/00*
U.S. Cl. 368—294 15 Claims



1. A method of assembling a watch case of the type including a caseband at least a peripheral portion of which is formed of plastic material, a back, a metallic bezel covering the caseband and extending over at least a part of an outer edge face of the caseband and impermeable assembly means for the caseband and the bezel, said assembly means comprising a first annular seat extending radially in the bezel, an annular protuberance integrally formed with the caseband portion of the plastic material and extending radially into the interior of the first seat, a second annular seat conjointly defined by said caseband and said bezel and a packing occupying said second annular seat said method comprising: exerting a pressure to move said caseband and said bezel toward each other and, while said pressure is being exerted, thermically deforming at high frequency a localized zone of said caseband so that the thermically deformed material of said localized zone of said caseband is forced into said first annular seat in said bezel to form said annular protuberance as the packing is compressed in said annular seat.

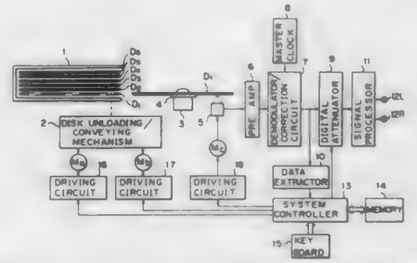
4,993,008

MULTIPLE-DISK PLAYER WITH AUTOMATIC FADE-OUT FUNCTION

Takahumi Shiba, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,618
Claims priority, application Japan, Dec. 19, 1987, 62-322505
Int. Cl.[5] H04Q *11/04;* G11B *27/02*
U.S. Cl. 369—3 3 Claims

1. In a multiple-disk player for playing disks, each of said disks carrying thereon an information signal including a plurality for music pieces having a time axis and time data distributed along said time axis of said music pieces while automatically selecting any one of said disks, the improvement, comprising in combination:
time-setting means for setting a certain time period;
period-measuring means for measuring an intermediate time period spent until said player completes a non-playback mode after issuance of a playback start command;
extracting means for consecutively extracting said time data from said information signal obtained from a selected one of said disks being played back;
calculating means for calculating a difference between consecutive neighboring ones of said time data, for calculating a playback time period on the basis of said difference and for calculating a total time period by adding said intermediate time period to said playback time period; and



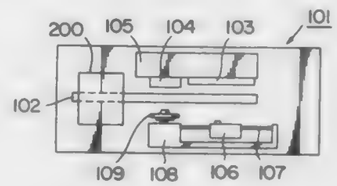
fade-out control means for carrying out a fade-out operation when a value of said total time period reaches a corresponding value of said certain time period.

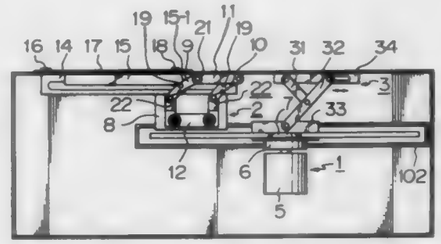
4,993,009

OPTO-MAGNETIC RECORDING APPARATUS WITH A BIAS MAGNETIC FIELD GENERATING MEANS MOVABLE PARALLEL TO A RECORDING SURFACE OF A RECORDING MEDIUM

Makoto Shinbo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 71,082, Jul. 8, 1987, abandoned. This application Mar. 22, 1990, Ser. No. 501,440
Claims priority, application Japan, Jul. 14, 1986, 61-165067
Int. Cl.[5] G11B *13/04, 11/12, 11/10*
U.S. Cl. 369—13 7 Claims





1. An opto-magnetic recording apparatus comprising:
loading means for loading a recording medium through a side of said recording apparatus, from an insertion position to a recording position along an insertion path substantially parallel to a recording surface of the medium;
an optical head for applying a light beam to the medium in the recording position;
magnetic field generating means for applying a magnetic field to the medium in the recording position;
driving means for receiving the recording medium from said

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loading means and for moving the medium relative to the light beam in the recording position;

a clamp mechanism for clamping the medium having been carried by said loading means to said driving means; and

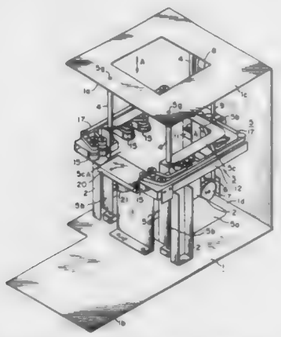
a moving mechanism associated with said clamp mechanism for moving said magnetic field generating means in at least a direction substantially perpendicular to the recording surface of the medium and for maintaining a surface of said magnetic field generating means substantially parallel to the recording surface of the medium, said moving mechanism for moving said magnetic field generating means away from the insertion path of the medium during loading of the medium, and for moving said magnetic field generating means to a position near the recording surface of the medium when the medium is clamped by said clamp mechanism.

4,993,010

LASER DISK CASSETTE SELECTING SYSTEM

Yuhei Kishimura; Osamu Nakajima, both of Tokyo, and Takashi Miura, 3-2-306 Sakae-cho, Itabashi-ku Tokyo, all of Japan, assignors to Sysmic Co., Ltd.; Taco Co., Ltd. and Takashi Miura, all of Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,044
Claims priority, application Japan, Dec. 21, 1987, 62-192794
Int. Cl.[5] G11B *17/00*
U.S. Cl. 369—36 6 Claims



1. A laser disk cassette forwarding means for inserting and retracting a laser disk or cassette into or from a laser disk player comprising:

first and second arms having a first plurality of rollers;

a first band operatively connected to and engaging said first plurality of rollers;

a motor which operatively drives said band to turn said first plurality of rollers in a desired direction; and

means for creating an open or closed condition between said arms allowing the cassette to be engaged or disengaged by said rollers, respectively;

a first plurality of pulleys associated with said forwarding rollers and said motor to allow said motor to engage said band and thus engage said forwarding rollers;

wherein said arms pivotally rotate relative to each other, and the forwarding means further comprises a second plurality of pulleys, a second band engaging said second plurality of pulleys, and a second plurality of rollers engaging said second plurality of pulleys located upon said second arm and driven by said second band, and wherein said first plurality of rollers engaging said first plurality of pulleys are located on said first arm and driven by said first band engaging said first plurality of pulleys, allowing said first and second plurality of forwarding rollers to be driven in complementary directions to engage the laser disk or cassette and selectively retract or eject the laser disk or cassette, respectively;

wherein said means for creating an open or closed condition includes

(a) a spring between said arms creating a tension pulling said arms together;

(b) a motor; and

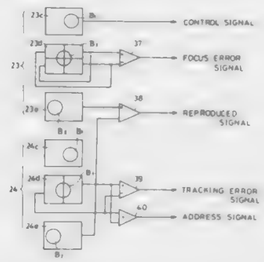
(c) a cam which can be rotated by said motor to spread apart said arms against said tension of said spring to create an open condition allowing movement of the forwarding means within a selecting system, and thereby disengaging said forwarding rollers from the laser disk or cassette, wherein said cam can be rotated to allow said spring to pull said arms together creating a closed condition to engage said forwarding rollers against the laser disk or cassette, thereby forwarding the laser disk or cassette into or out of said selecting system, respectively.

4,993,011

OPTICAL RECORDING APPARATUS WITH SIMULTANEOUS ERASING AND RECORDING

Kenji Torazawa, Ogaki; Satoshi Sumi, Gifu; Seiji Murata, Gifu, and Shigekazu Minechika, Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 27,382, Mar. 18, 1987, abandoned. This application Oct. 20, 1989, Ser. No. 425,503
Claims priority, application Japan, Mar. 19, 1986, 61-62450; Mar. 20, 1986, 61-62526
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.37 5 Claims



1. An optical recording and reproducing apparatus erasing an already recorded information signal and recording a new information signal simultaneously on a record medium including, tracks on which a non-erasable address signal and an erasable information signal are recorded in an optically readable manner, said tracks being in a spiral form or a coaxial form, said optical recording apparatus comprising:

beam emitting means, having at least two beam emitting points, for emitting simultaneously an erasing beam and one of a recording beam and a reproducing beam, an optical axis of said erasing beam and an optical axis of one of said recording beam and said reproducing beam being spaced from each other;

optical means for focusing said erasing beam on one of said tracks and for focusing one of said recording beam and said reproducing beam on a different track located a distance from said one of said tracks;

a first photoelectric converting means, disposed at a position for receiving a reflected beam or a transmitted beam of only said erasing beam applied to said one of said tracks, for converting said reflected beam or said transmitted beam into said address signal; and

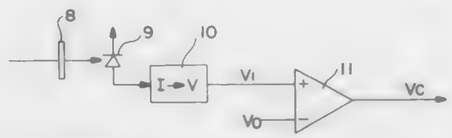
a second photoelectric converting means, disposed at a position for receiving a reflected beam or a transmitted beam of only said recording beam applied to said different track, for converting said reflected beam or said transmitted beam into a focus error signal and a tracking error signal.

4,993,012

RECORD FACE IDENTIFYING DEVICE FOR MAGNETO-OPTIC RECORD MEDIUM

Hiroshi Fuji; Tomiyuki Numata; Tsuneo Fujiwara, all of Tenri, and Kentaroh Tsuji, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1988, Ser. No. 201,908
Claims priority, application Japan, Jun. 5, 1987, 62-142086
Int. Cl.[5] G11B *7/00, 11/14*
U.S. Cl. 369—58 14 Claims



1. In a magneto-optic recorded signal processing system in which a linearly polarized light beam is projected onto a magneto-optic recording medium and a recorded signal is reproduced by using polarized conditions of a reflected light beam from the recording medium, the processing system includes a recording face identifying device for identifying the magnetization of the recording face of the magneto-optic recording medium, comprising:

initialized area projecting means for projecting a light beam onto an initialized area of a magneto-optic recording medium;

transducing means for converting a slant in a polarization plane of a light beam reflected from said initialized area into a light having an intensity related to said slant;

photo-detecting means, operatively connected to said transducing means, for detecting said intensity of said light outputted from said transducing means;

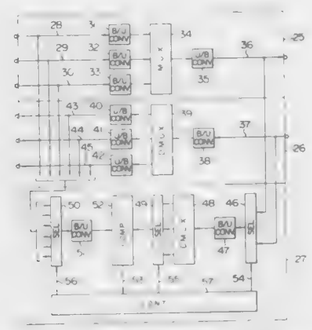
comparing means, operatively connected to said photo-detecting means, for comparing an output from said photo-detecting means with a reference level, thereby determining the magnetization of the recording face.

4,993,013

MONITOR SYSTEM FOR MULTIPLEX EQUIPMENT

Shigeo Shinada, and Hiroyuki Fujita, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 257,890, Oct. 14, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 414,599
Claims priority, application Japan, Oct. 16, 1987, 62-259688
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—13 2 Claims



1. A method of monitoring a multiplex equipment which includes a multiplexing unit for multiplexing low speed group input signals of plural channels into a high speed group output signal and a demultiplexing unit for demultiplexing a high speed group input signal into low speed group output signals of plural channels, wherein said high speed group output signal and said low speed group input signals and said high speed group input signal and said low speed group output signals are monitored through comparison on the basis of the low speed group signal, comprising:

(a) a step of performing comparison of said high speed group output signal and said low speed group input signals in accordance with the order of the channel sequence of the low speed group signals and subsequently performing comparison of said high speed group input signal and said low speed group output signals in accordance with the order of the channel sequence of said low speed group signals, said step being repeated until discrepancy is detected from said comparison;

(b) a step in which, when discrepancy between said high speed group output signal and a low speed group input signal is first detected in a given one of the signal channels of said low speed group signals, step (a) is discontinued and comparison is then performed between the high speed group input signal and the low speed group output signal in another channel differing from said given one channel of the low speed group signals, said comparison being subsequently performed in said order of comparison; and

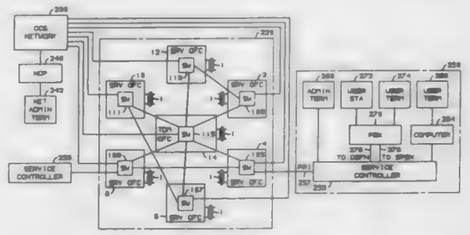
(c) a step in which, when discrepancy is first detected between the high speed group input signal and the low speed group output signal in a certain channel of the low speed group signals, step (a) is discontinued and comparison is then performed between the high speed group output signal and the low speed group input signal in another channel differing from said certain channel, said comparison being performed in accordance with said order of comparison.

4,993,014

DYNAMIC SHARED FACILITY SYSTEM FOR PRIVATE NETWORKS

Travis H. Gordon, Madison, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 30, 1989, Ser. No. 359,015
Int. Cl.[5] H04L *1/00*
U.S. Cl. 370—16 36 Claims



1. In a communications network comprising a plurality of serving offices and a plurality of transmission facilities for interconnecting ones of said serving offices, each facility comprising t lest one communication channel, a method of interconnecting access links connecting said network to a private network customer for providing private service, comprising the steps of:

responsive to a request message from said private network customer specifying communication capacity requirements and comprising data for identifying first access link and second access links to be connected, selecting channels from a pool of channels of said transmission facilities, said pool dedicated to providing private network service to a plurality of private network customers, identities of channels of said pool being stored in data tables of said network, for providing a number of channels between said first and second access links of said customer meeting said capacity requirements; and

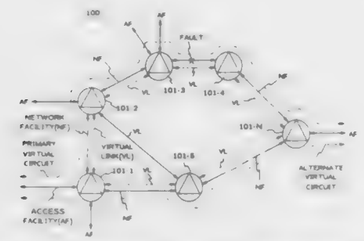
connecting said first and second access links via said selected channels via a switched connection through ones of said plurality of serving offices.

4,993,015

AUTOMATIC FAULT RECOVERY IN A PACKET NETWORK

Franklin D. Fite, Jr., Aberdeen, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 6, 1989, Ser. No. 431,797
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—16 **26 Claims**



1. Apparatus in a packet node for recovering from faults in transmission paths including at least one virtual circuit in a network including a plurality of packet nodes, the apparatus comprising:

means for detecting faults in at least one transmission path associated with the node;

first means for determining if any virtual circuit affected by a detected fault is terminated in the node;

means for generating a fault indication message for each virtual circuit affected by the detected fault that is not terminated in the node;

first means for transmitting each of said generated fault indication messages on their associated virtual circuits away from the fault to some other node in the network; and

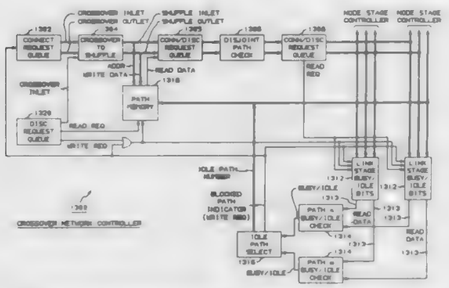
means for switching any affected virtual circuits determined to be terminated in the node to associated alternate virtual circuits for transmission toward a destination node.

4,993,016

NETWORK CONTROL ARRANGEMENT FOR PROCESSING A PLURALITY OF CONNECTION REQUESTS

Gaylord W. Richards, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 8, 1989, Ser. No. 349,027
Int. Cl.[5] H04Q *11/00*
U.S. Cl. 370—54 **34 Claims**



1. A method for use in an arrangement comprising a network for interconnecting any of a plurality of inlets with any of a plurality of outlets, said arrangement further comprising means for storing busy/idle information for path components of said network, said method comprising

reading said storing means to identify an idle path from a first one of said inlets through said network to a first one of said outlets,

after identifying an idle path from said first inlet to said first outlet, marking path components of said identified path busy in said storing means and

before said marking, accessing said storing means to fine an idle path from a second one of said inlets through said network to a second one of said outlets, said method further comprising

determining whether all paths of said network from said first inlet to said first outlet are disjoint from all paths of said network from said second inlet to said second outlet, and

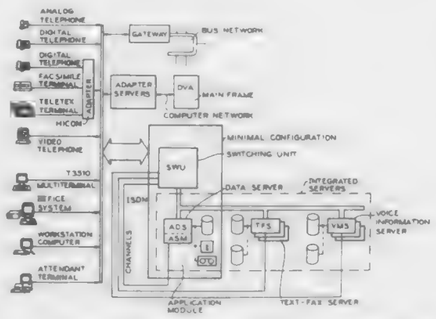
said accessing being in response to a determination that all paths of said network from said first inlet to said first outlet are disjoint from all paths of said network from said second inlet to said second outlet.

4,993,017

MODULARLY STRUCTURED ISDN COMMUNICATION SYSTEM

Gerhard Bachinger, Sauerlach; Thomas Barkmeyer, Munich; Ehrard Kroesa, Groebenzell; Wolfgang Siegmund, Munich, and Bernhard Werres, Graefelfing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 22, 1989, Ser. No. 313,508
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808639; Sep. 30, 1988, 3833351
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—58.2 **13 Claims**



1. A modularly structured ISDN communication system, having at least one switching unit (SWU);

(I) to which equipment and networks are connectable via periphery modules; and

(II) that has a switching matrix array,

having a memory-programmed system processor (uPA);

(I) that has a real-time operating system;

(1) for controlling,

(A) the access to the system resources,

(B) the communication between program sub-systems (PSS; tasks), and

(C) the reaction to stimuli (interrupt handling),

(2) having an information transport system (INF) eminent in the operating system,

(A) having program sub-system-associated input and output memories (EAS) operated mailbox-like for message to and from the program sub-systems (PSS),

having a system memory (MEA):

(I) with memory segments addressable via descriptors for storing;

(1) data files, and

(2) the program sub-systems, having a system table memory that contains system table descriptors referenced to the memory segments of the real-time operating system,

comprising:

an application module (ASM):

(I) having a time-sharing operating system;

(II) having a program sub-system (PSS) fashioned as a sluice sub-system (SUB);

(III) having a module table memory selectable alternatively to the system table memory that;

(1) contains module table descriptors referenced to memory segments of the time-sharing operating system under which at least,

(A) a (TS) time-sharing status segment descriptor referenced to a status segment (TS-TSS) of the time-sharing operating system intermediately stores system process data,

(2) contains a (TS) time-sharing code segment descriptor referenced to the code segment of an interrupt transition routine (RUB) of the time-sharing operating system,

(3) and that further contains communication descriptors referenced to intercommunication segments of the real-time operating system, these communication descriptors being interruptable identically to the system table descriptors that are contained in the system table memory and are referenced to the intercommunication segments and under which are situated at least,

(4) a code segment descriptor for the access onto the code segment of the sluice sub-system (SUB),

(5) a status segment descriptor for the access onto a status segment (RT-TSS) in the real-time operating system that is assigned to the sluice sub-system (SUB), and

(6) a data segment descriptor for the access onto an intercommunication data segment (IKD), whereby the intercommunication data segment (IKD),

(a) intermediately stores the input information required by each of the two operating systems for a transition from one operating system to the other operating system and further

(b) contains a data field (DF) for the acceptance of messages from one operating system that can be exchanged with program sub-systems (PSS, PSST) of the other operating system.

4,993,018

SELF-ROUTING SWITCHING SYSTEM WITH MULTIPLE LINK CONNECTIONS BETWEEN INCOMING AND OUTGOING LINES

Kazuo Hajikano, Machida; Koso Murakami; Shunji Abe, both of Yokohama; Tetsuo Nishino, Kawasaki; Toshimasa Fukui, Kawasaki; Osamu Isono, Kawasaki; Tetsuo Tachibana, Kawasaki; Eisuke Iwabuchi, and Hichiro Hayami, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

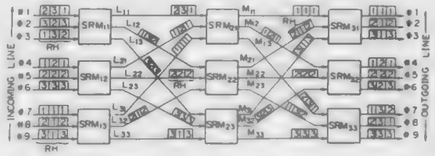
PCT No. PCT/JP88/00113, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/05982, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 5, 1988, Ser. No. 280,723
Claims priority, application Japan, Feb. 6, 1987, 62-26164; Mar. 18, 1987, 62-63554; Mar. 18, 1987, 62-63555; May 19, 1987, 62-120296; May 20, 1987, 62-121054; Jul. 15, 1987, 62-176466; Jul. 16, 1987, 62-175950; Sep. 16, 1987, 62-231816; Sep. 16, 1987, 62-231817
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—60 **29 Claims**

1. A self-routing switching system for switching between a plurality of incoming lines and a plurality of outgoing lines, comprises:

route setting means for receiving transmission information and identification information from the plurality of incoming lines, for generating control information for setting a path from an incoming line to an outgoing line designated by said identification information, and for adding said control information to said transmission information, said route setting means includes a call processor having a call setting phase and a transfer phase said call processor including

means for receiving, in a call setting phase, notification from a calling party of transmission of said transmission information and said identification information and a destination party of said transmission information, and

a table for storing a predetermined correspondence relationship between said identification information and said control information, and



means for reading, in a transfer phase, said control information from said table in accordance with the received identification information and

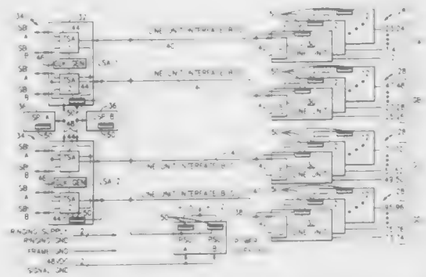
multipath self-routing speech path means for creating a plurality of paths between said plurality of incoming lines and outgoing lines from each one incoming line to each one outgoing line, for monitoring said control information and selecting and setting a path for said transmission information from said incoming line to said outgoing line from among said plurality of paths, and for autonomously transferring said transmission information to said outgoing line through said set path.

4,993,019

LINE UNIT INTERFACE CIRCUIT

Gary B. Cole, Knightdale; Michael J. Gingell, Raleigh; Joseph E. Sutherland, Raleigh, and Paul M. Matsumura, Raleigh, all of N.C., assignors to Alcatel NA, Hickory, N.C.

Filed Dec. 15, 1989, Ser. No. 451,436
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—67 **46 Claims**



1. An interface circuit for use on a line unit in a line shelf of a digital loop carrier for interfacing with a bus connected to line shelf common equipment, said bus conveying signaling data, time slot configuration data and provisioning data for a plurality of line units, said interface circuit comprising:

means, connected to said bus, for receiving and directing said signaling data to appropriate circuit elements within the line unit;

means, connected to detectors on the line unit, for receiving signaling therefrom and multiplexing said signaling onto said bus for transmission to the common equipment;

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means, connected to said bus, for receiving and reconfiguring the provisioning data and shifting the reconfigured provisioning data to the line unit for use in a subscriber line circuit; and

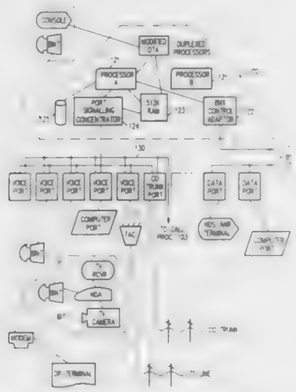
means, connected to said bus, for receiving and decoding said time slot configuration data and for activating the line unit in accordance with the decoded time slot configuration data.

4,993,020

INTEGRATED COMMUNICATIONS SYSTEM

Emil D. Hopner, 211 Prospect Ave., Los Gatos, Calif. 95030

Filed Jun. 12, 1989, Ser. No. 365,175
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—68.1 **10 Claims**



1. Apparatus for connecting an originating port to a receiving port in a communication system, said apparatus comprising:

a distributed control switching matrix having a plurality of originating group submatrices, a plurality of intermediate group submatrices and a plurality of terminating group submatrices;

said originating port transmitting a first control signal for selecting an originating group submatrix;

said originating group submatrix selecting a path to a terminating group submatrix via an intermediate group submatrix in response to the combination of a second control signal produced by said intermediate group submatrix with said first control signal;

said intermediate group submatrix selecting a path to the receiving port via a terminating group submatrix in response to the combination of a third control signal produced by said terminating group submatrix with said second control signal;

said terminating group submatrix producing and transmitting a fourth control signal to said originating port which represents verification that connection from said originating port to said receiving port has been made.

4,993,021

AUTOMATIC TRANSMIT POWER LEVEL CONTROL IN RADIO LINKS

Maurizio Nannicini, Monza, and Luigi Vismara, Vimercate, both of Italy, assignors to Telettra-Telefonia Elettronica e Radio Spa, Italy

Filed Mar. 23, 1989, Ser. No. 261,443
Int. Cl.[5] H04J *3/12, 1/16, 3/14*
U.S. Cl. 370—77 **5 Claims**

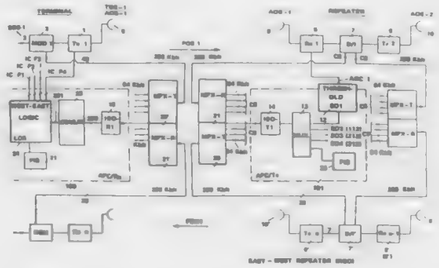
1. A transmit power control system for multiline radio links using microwave signal digital modulation, specifically multilevel QAM modulation, in each RF transmitter which receives, from a respective receiver associated therewith, a signal indicating the levels of useful signals received on that RF channel and sends said signal back to said associated transmitter in order to regulate said transmit power level, comprising:

means for deriving a threshold signal for each RF channel in each receiver;

means for multiplexing each threshold signal from each receiver;

means for inserting an appropriate signal in said multiplexer as necessary to identify the station which it comes from;

means for further multiplexing said multiplexed signal with other service signals;



means for inserting the twice-multiplexed signal in the frame of the main information signal sent to the other direction of transmission;

means for receiving and twice demultiplexing the received signal;

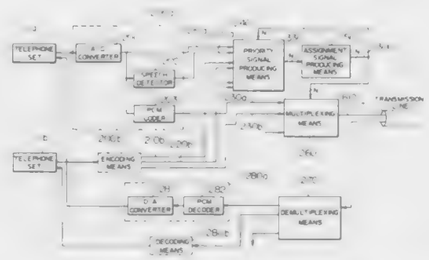
means for processing said demultiplexed signal so as to derive: (i) a transmit power level control signal protected from possible faults or malfunctions of the main transmit digital channel and (ii) the station identification signal; and means to apply said control signal to the predistortion circuit in the transmit power amplifier.

4,993,022

SYSTEM FOR AND METHOD OF MULTIPLEXING SPEECH SIGNALS UTILIZING PRIORITY SIGNALS FOR INDIVIDUAL TRANSMISSION CHANNELS

Kazuhiro Kondo, Fuchu, and Toshiro Suzuki, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,605
Claims priority, application Japan, Feb. 12, 1988, 63-30160
Int. Cl.[5] H04L *5/22*
U.S. Cl. 370—79 **11 Claims**



1. A system for multiplexing digital speech signals produced from analog speech signals inputted from a plurality of terminals, each of said digital speech signals including a plurality of speech unit signals, the system comprising:

means for producing a weighted priority signal for the speech unit signal of each of said speech signals from said

terminals, each speech signal occupying one transmission channel;

means responsive to said priority signals for producing an assignment signal indicative of which of said speech unit signals is to be selected for transmission in the form of a train of multiplexed speech unit signals in a cyclic transmission period of time; and

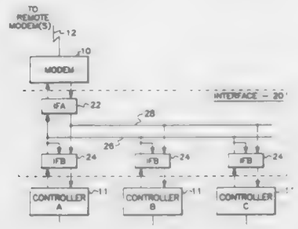
means for receiving said speech unit signals and said assignment signal for multiplexing said speech unit signals on the basis of said assignment signal.

4,993,023

APPARATUS FOR PROVIDING MULTIPLE CONTROLLER INTERFACES TO A STANDARD DIGITAL MODEM AND INCLUDING MULTIPLEXED CONTENTION RESOLUTION

Thomas L. Phinney, Boulder City, Nev., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 9, 1989, Ser. No. 363,842
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] H04J *3/04;* **H04B** *1/38*
U.S. Cl. 370—85.130 **40 Claims**



1. In a communication system, having a modem for providing an interface to a communication link, said communication system further having a plurality of controllers whereby each of said controllers is connected to said modem via an interface apparatus, and further wherein said modem and said controllers comply with a predetermined protocol, said interface apparatus comprising:

(a) bus means, for providing a medium to transfer signals between said controllers and said modem;

(b) first interface means, connected to said bus means, for interfacing said modem to said bus means, said first interface means implementing a modem-associated multi-state state machine which responds to signals on said bus to maintain the predetermined protocol between said modem and said first interface means; and

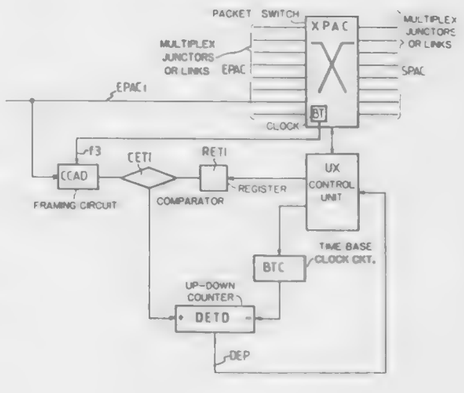
(c) a plurality of second interface means, each of said second interface means being connected to said bus means and to a corresponding controller, for interfacing each of said plurality of controllers to said bus means, each of said second interface means implementing a controller-associated multi-state state machine which responds to signals on said bus means and further responds to signals from the corresponding controller, each of said second interface means maintaining the predetermined protocol between the second interface means and the corresponding controller.

4,993,024

SYSTEM AND PROCESS FOR CONTROLLING THE FLOW OF EITHER DATA PACKETS OR CHANNEL SIGNALS IN AN ASYNCHRONOUS TIME MULTIPLEXER

Jean-Paul Quinquis, Perros Guirec; Michel Servel, Lannion, and Joël Francois, Perros-Guirec, all of France, assignors to L'Etat Francais represente par le Ministre des PTT Centre National d'Etudes des Telecommunications 5CNet, France

Filed Apr. 18, 1988, Ser. No. 182,912
Claims priority, application France, May 26, 1987, 87 07555
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—94.1 **5 Claims**



1. A process for controlling the flow of data packets carried by asynchronous time multiplex channels of a system comprising an up-down counter means having a down counting input which receives pulses of the communication at a maximum peak rate that is allocated to the pertinent communication and having another counting input which receives a pulse upon the transmission of each data packet belonging to the pertinent communication, each of the data packets from any one communication carried by said channel being identified by its label and by an identity of the multiplex channel which carries it, said process comprising the steps of:

A. allocating to each communication a predetermined clock frequency and a predetermined threshold value representing a particular difference between a number of entering data packets and a number of clock pulses generated at said predetermined clock frequency, and operating said up-down counter means in response to said received data packets;

B. determining an actual difference between a number of entering data packets belonging to the communication and a number of pulses generated at said predetermined clock frequency;

C. setting a boundary for this difference determined in step B; and

D. if said difference reaches the said predetermined threshold, triggering a signalling process which starts a deletion of data packets belonging to the pertinent communication until said difference returns to a value which does not reach said predetermined threshold, a maximum count output of the up-down counter means generating a signalling requesting a reduction in rate of said received pulses of said communication.

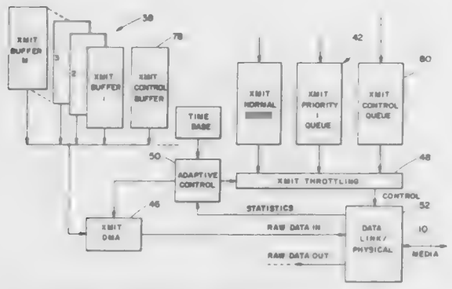
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4,993,025

HIGH EFFICIENCY IMAGE DATA TRANSFER NETWORK

John F. Vesel, Willowick; Fred C. Mailey, S. Euclid; Pradipa Subramaniam, Richmond Hts., and Robert A. Cecil, Solon, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 21, 1989, Ser. No. 439,859
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—94.1 20 Claims



1. A data transfer network comprising:

a network media extending between each of a plurality of nodes including first and second nodes which have first and second clocking rates that are the same to at least three decimal places;

a means for generating image representations connected with one of the nodes, each image representation including a block of image data;

means for processing image data connected to another of the nodes;

the first node including:

buffer means for storing each of a plurality of image data packets, which taken together comprise an image data block, each image data packet being sufficiently large that a difference in a time for clocking the data packet at the first and second clocking rates is at least one clock cycle of the faster of the first and second clocking rates, whereby during an image data packet transfer between the first and second nodes, one of the nodes would attempt to clock at least one more element of data than the other,

a first data link means for transmitting each data packet and synchronization information on the network media, the synchronization information being related to the difference in clocking time,

a transmit data management means for controlling the transfer of data and synchronization information between the buffer means and the data link means;

the second nodes including:

a second data link means for receiving the data packet from the network media;

an elasticity buffer into which data is clocked at the first clocking rate from the network media and out of which data is clocked at the second clocking rate, the elasticity buffer having sufficient storage to accommodate an accumulation of bits of data attributable to any excess in the speed of the first clocking rate relative to the second clocking rate,

a synchronization information means for receiving the synchronization information causing a delay in clocking out the data from the elasticity buffer to accommodate any excess in speed of the second clocking rate relative to the first clocking rate,

a receiver memory means for storing at least one image data block,

a receive data management means for transferring image data packets from the second data link means to the receiver memory means, and,

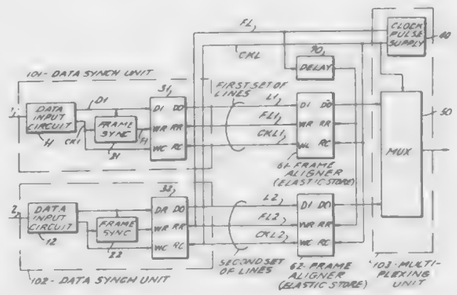
a receiver memory address control means for monitoring addresses of the receiver memory means at which prior image packets are stored and providing receiver memory addresses for each received image data packet.

4,993,026

MULTIPLEXER APPARATUS WITH AUXILIARY SYNCHRONIZATION FOR COMPENSATING FOR CABLE DELAYS

Mikio Yamashita, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 27, 1989, Ser. No. 413,333
Claims priority, application Japan, Sep. 27, 1988, 63-243682
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—100.1 5 Claims



1. A multiplexer apparatus for time division digital combining transmission, comprising:

clock supply means for supplying a set of timing pulses including reference clock pulses and reference frame pulses;

first synchronizer means for receiving a plurality of lower-order data pulse streams each of which is assigned to and has a predetermined frame beginning with frame timing information, and for generating a first set of data pulse streams the frames of which are aligned in phase with each other and synchronized with the reference frame pulses;

delay means for providing a delay to the reference frame pulses to produce delayed reference frame pulses;

second synchronizer means for receiving the first set of data pulse streams via electric wirings and for generating a second set of data pulse streams the frames of which are aligned in phase with each other and synchronized with the delayed reference frame pulses, the delay of the delayed reference frame pulses being determined by respective differences in delay of the arrival of the first set of data pulse streams to said second synchronizer means; and

multiplexing means responsive to the second set of data pulse streams for multiplexing a multiplex higher-order pulse stream, the second synchronizer means being disposed closer to the multiplexing means, compared to the first synchronizer means.

4,993,027

METHOD AND APPARATUS FOR DETERMINING MICROPROCESSOR KERNAL FAULTS

Joseph M. McGraw, Lewisburg, and David E. Campbell, Maxwelton, both of W. Va., assignors to Pace, Incorporated, Laurel, Md.

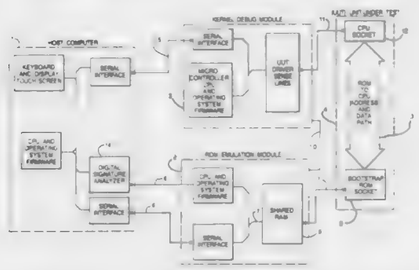
Filed Sep. 9, 1988, Ser. No. 242,685
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.2 12 Claims

1. Apparatus for testing the address/data paths between the ROM and CPU of a computer where said computer includes first means adapted to connect the ROM to said address/data paths so that data can be transferred between the CPU and the ROM via the data paths of the address/data paths and second means adapted to connect the CPU to said address/data paths so that addresses can be applied to an address decoder for the ROM via the address lines of the address/data paths and, said apparatus comprising

memory means connected to said address decoder and said data liens via said first means, said memory storing test signals at a plurality of memory locations; and

kernel debugging means connected to said address/data paths via said second means and including

(a) means for successively applying the addresses of said memory locations to said address decoder and for successively applying read signals which emulate those



provided by said CPU to successively apply the test signals stored at the memory locations respectively corresponding to said addresses to said data lines of the tested address/data paths;

(b) means for storing predetermined data corresponding to the test signals as they occur at at least one selected node in address/data paths between the CPU and the ROM known to be fault free;

(c) means for enabling the sensing of data at the selected node; and

(d) comparison means for successively comparing (i) the test signals as they occur at said one selected node of the tested address/data paths with (ii) the said predetermined data until all said test signals have been applied to said data lines to thus determine if the tested address-/data paths are fault free at said selected node.

4,993,028

ERROR DETECTION AND CORRECTION CODING

W. Daniel Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

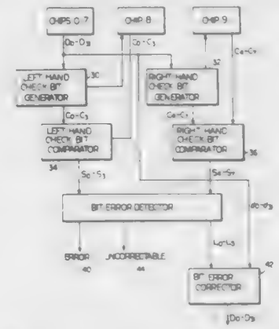
Filed Sep. 7, 1988, Ser. No. 241,921
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—39.1 19 Claims

1. A method of detecting bit errors in a possibly corrupted version of an original data word, the bits of said original data word being organized in nibbles of four bits each, each nibble being stored in a single four-bit memory chip, in which

a first set of four original check bits are derived from bits of the original data word, each check bit of the first set being based on a unique combination of data word bits, each data bit of a given nibble of the data word being used in forming each bit of a unique combination of exactly three of the check bits of the first set,

a first set of four new check bits are derived from bits of the possibly corrupted version of the original data word, each new check bit of the first set corresponding to one of the original check bits, each new check bit being based on the same unique combination of bits as its corresponding original check bit,

a first set of syndrome bits are formed by comparing each original check bit with the corresponding new check bit, the unique combinations of data word bits used for deriving the check bits being chosen so that the existence of any three bit errors or four bit errors within a single nibble of



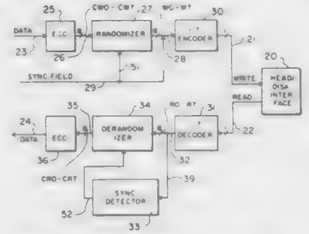
the possibly corrupted version will be detectable based on the syndrome bits.

4,993,029

METHOD AND APPARATUS FOR RANDOMIZING DATA IN A DIRECT ACCESS STORAGE DEVICE

Richard L. Galbraith, Rochester, Minn., and Nyles N. Heise, Houston, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,588
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—40.1 26 Claims



1. Binary data storage apparatus, comprising;

writing/reading transducer means associated with non volatile data storage media means to form a transducer/media interface,

a write channel having

first data-input means adapted for the reception of binary data to be written to said media means, said binary data comprising a plurality of multi-byte data fields,

second data-input means adapted for the reception of an identifying data field for each of said multi-byte data fields,

randomizer means having first input means connected to said first data-input means to thereby receive said multi-byte data fields, said randomizer means having second input means connected to said second data-input means and being responsive to said identifying data field to begin a repetitive sequence of data randomizing for each byte of said multi-byte data field, and providing an output comprising a plurality of randomized multi-byte data fields, and

means connecting said transducer/media interface to the output of said randomizer means and to said second data-input means, whereby randomized data comprising a plurality of multi-byte data fields, each data field including an identifying data field, is written on said non volatile media means, and

a read channel having

read interface means comprising said transducer/media interface whereby said randomized data is read back from said non volatile meadia means,

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read-data input means connected to said transducer/media interface for the reception of said read-back randomized data,

identifying data detector means having an output, and having an input connected to said read-data input means for detecting the identifying data field of each read-data field, and

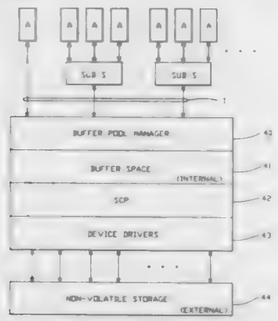
complementary derandomizer means having first input means connected to said read-data input means, to receive said randomized data, said derandomizer means having second input means connected to the output of said identifying data detector means, said derandomizer means being responsive to detection of an identifying data field to begin a complementary sequence of derandomizing of each byte of said read-data field.

4,993,030

FILE SYSTEM FOR A PLURALITY OF STORAGE CLASSES

Arno S. Krakauer, San Jose; Dieter Gawlick, Palo Alto; John A. Colgrove, Mountain View, and Richard B. Wilmot, II, Lafayette, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Apr. 22, 1988, Ser. No. 185,179
Int. Cl.[5] G11C *8/00*; G06F *13/00, 11/00*
U.S. Cl. 371—40.1 68 Claims



1. An apparatus for controlling accesses to data in data files by a plurality of users of a data processing system, the data processing system including internal storage, external storage storing data files, a plurality of access paths between internal storage and external storage, and a file user interface by which the plurality of users request access to data files, the apparatus comprising:

first means, coupled to the file user interface and the internal storage, for allocating the internal storage for temporary storage of current data to be accessed by the plurality of users, for deallocating internal storage from old data stored in the internal storage, and for generating requests for accesses with external storage for transfer of the current data to the allocated internal storage, and of updated old data from the deallocated internal storage; and

second means, coupled to the first means and the external storage and responsive to the requests for accesses, for managing transfers between internal storage and external storage through the plurality of access paths.

4,993,031

BROADBAND RAMAN BEAM COMBINER

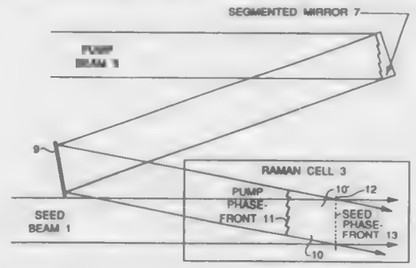
Frederic H. White, III, Poway, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1990, Ser. No. 487,369
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—3 19 Claims

1. A Raman cell beam combiner apparatus comprising:

(a) combining means for combining a seed beam with a pump beam being introduced into a Raman cell; and

(b) tilt correction means for individually spatially displacing discrete portions of the wavefront of said pump beam with



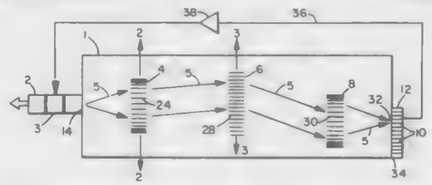
respect to the wavefront of said seed beam as said pump beam and said seed beam are introduced into said Raman cell wherein said tilt correction means includes an array of piston-like wavefront shifting elements in order to produce a flat wavefront output.

4,993,032

MONOLITHIC TEMPERATURE STABILIZED OPTICAL TUNING CIRCUIT FOR CHANNEL SEPARATION IN WDM SYSTEMS UTILIZING TUNABLE LASERS

Eric M. Bradley, San Diego, Calif., assignor to General Dynamics Corp., Electronics Divn., San Diego, Calif.

Filed Dec. 28, 1989, Ser. No. 458,134
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—20 16 Claims



1. A feedback control loop for temperature stabilization of a tunable diode laser comprising:

a substrate comprising a laminar body of ultra-low thermal expansion glass;

a waveguide extending along a light path comprising a plurality of dielectric layers deposited on said substrate, a first dielectric layer having a refractive index and a second dielectric layer abutting said first dielectric layer which exhibits temperature dependent change in refractive index opposite to that of said first layer, in which is formed along said light path a first lens, a diffraction grating to deflect light at a varying angle depending on a light wavelenqth, and a second lens;

a detector array disposed in the focal plane of said second lens; and

a feedback means to convert the wavelength detected by said detector array to a signal for tuning said tunable diode laser to the desired wavelength.

4,993,033

HIGH POWER FAST SWITCH

Shiow-Hwa Lin, San Diego, Calif., assignor to Thermo Electron Technologies Corp., San Diego, Calif.

Filed Dec. 18, 1989, Ser. No. 452,002
Int. Cl.[5] H01S *3/097*
U.S. Cl. 372—30 7 Claims

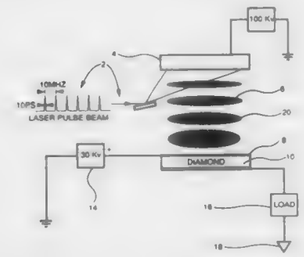
1. A high power fast switch for generating pulses of current, said pulses being triggered by laser pulses comprising:

(a) a photoemission cathode having an electron emitting surface and a connection means for connecting said emitting surface to a high voltage biasing source,

(b) a diamond target positioned so as to be illuminated by electrons emitted from said emitting surface when said emitting surface is illuminated by said laser pulses,

(c) a first conductor means attached to said diamond target for connection to a high voltage power source, and

(d) a second conductor means, attached to said diamond target but not in contact with said first conductor, for connecting said diamond target to a load,



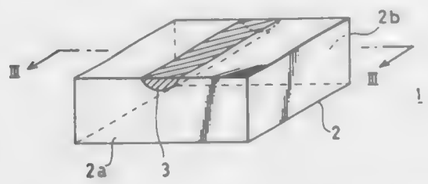
(e) said cathode, said connection means, said target and said first and second conductor means being arranged so that then when said connection means is connected to said high voltage biasing source, said first conductor means is connected to said high voltage power source, second conductor means is connected to said load, and a pulse of said laser pulses illuminates said cathode, said high power fast switch closes permitting a high voltage, high current pulse of electric current to flow from said high voltage power source to said load.

4,993,034

OPTICAL WAVEGUIDE LASER AND A MEDIUM FOR USE IN THE OPTICAL WAVEGUIDE LASER

Hiroshi Aoki, Kanagawa, and Osamu Maruyama, Tokyo, both of Japan, assignors to Hoya Corporation, Japan

Filed Jun. 12, 1990, Ser. No. 536,785
Claims priority, application Japan, Mar. 30, 1990, 2-86142
Int. Cl.[5] H01S *3/17*
U.S. Cl. 372—40 12 Claims



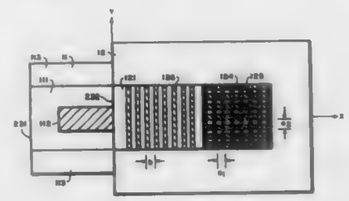
1. A waveguide laser medium having a laser glass substrate and an optical waveguide for effecting light amplification or laser oscillation, said laser glass substrate being made of laser glass containing alkaline ions and laser active ions, said optical waveguide being formed in a predetermined portion of said laser glass substrate and having a refractive index higher than the refractive index of the other portions of said laser glass substrate, said optical waveguide being formed by performing the ion exchange of the alkaline ions contained in the predetermined portion of said laser glass substrate for another kind of ions capable of operating to increase the refractive index of the laser glass, wherein said laser glass substrate is made of phosphate glass containing neodymium ions as the laser active ions and further containing 0.01～8.0 mol % of Na_2O, from which Na^+ ions are obtained as the alkaline ions, and the ions operating to increase the refractive index of the predetermined portion are Ag^+ ions.

4,993,035

HIGH POWER SEMICONDUCTOR LASER USING OPTICAL INTEGRATED CIRCUIT

Boris Laikhtman, 26 Spring St., Mount Kisco, N.Y. 10549

Filed Apr. 3, 1989, Ser. No. 332,786
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 16 Claims



1. In combination

a semiconductor laser for emitting radiation which propagates along an optical axis of said laser,

a resonator having an optical axis oriented perpendicular to the optical axis of said laser, and

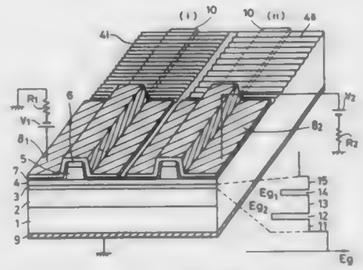
an optical integrated circuit coupled to said laser, said optical integrated circuit comprising means for coupling radiation emitted in said laser to a particular resonant mode of said resonator to cause said laser to operate stably in the lowest order lateral mode.

4,993,036

SEMICONDUCTOR LASER ARRAY INCLUDING LASERS WITH REFLECTING MEANS HAVING DIFFERENT WAVELENGTH SELECTION PROPERTIES

Sotomitsu Ikeda, and Masahiro Okuda, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Sep. 26, 1989, Ser. No. 412,983
Claims priority, application Japan, Sep. 28, 1988, 63-240965; Oct. 20, 1988, 63-262890
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 23 Claims



1. A semiconductor laser array comprising a plurality of lasers having, within an active layer, a quantum well structure with at least two quantum well levels for generating, respectively and independently of each other, laser light beams of mutually different oscillation wavelengths and reflecting means associated with each of said quantum well levels and having wavelength selection properties corresponding to each of said mutually different oscillation wavelengths.

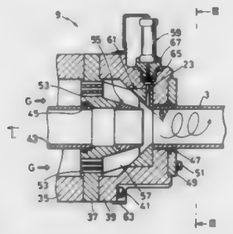
VOL 1123 ISS 2 FE 12 1991 UMI

4,993,037

HIGH SPEED AXIAL FLOW GAS LASER GENERATOR

Rxoji Koseki, La Habra, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Division of Ser. No. 24,032, Mar. 10, 1987, Pat. No. 4,823,355.
This application Feb. 1, 1989, Ser. No. 304,597
Int. Cl.[5] H01S *3/22*
U.S. Cl. 372—58 2 Claims



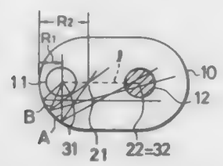
1. A high-speed axial-flow gas laser generator comprising:
a laser tube means having a gas inflow means for supplying a laser gas into said tube means and a gas outflow means for discharging said laser gas out of said laser tube means, wherein a first hollow passageway is formed inside said inflow means;
means for generating a spiral rotation motion in said laser gas through said laser tube means;
means for disposing said spiral rotation motion generating means so that any and all gas particles of said laser gas must pass through said spiral rotation motion generating means before entering said laser tube means;
pumping means for generating a population inversion in said laser gas; and
optical resonator means for resonating radiation emitted from said population inversion to generate a laser beam.

4,993,038

LASER DEVICES, LASER SYSTEM INCLUDING THE LASER DEVICES AND OUTPUT MIRROR FOR THE LASER SYSTEM

Noboru Nakano, Chiba; Naoki Kubota, Setagaya, and Yoshihisa Miyazaki, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Sep. 1, 1989, Ser. No. 401,922
Claims priority, application Japan, Sep. 5, 1988, 63-221657; Sep. 12, 1988, 63-227778; Jun. 30, 1989, 1-169080; Jun. 30, 1989, 1-169061
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—92 46 Claims



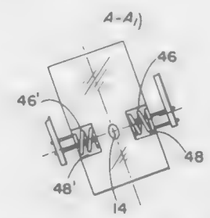
1. A laser device comprising:
at least one axially symmetrical columnar laser medium;
at least one axially symmetrical columnar pump light source arranged in parallel to said at least one laser medium; and
a beam converger having reflective surfaces including at least two partial cylindrical curved surfaces and at least two partial plain surfaces, said plain surfaces being parallel to said at least one laser medium and said at least one pump light source, said curved surfaces and said plain surfaces being interconnected to surround said at least one laser medium and said at least one pump light source in the axial direction thereof;
wherein the center lines of said partial cylindrical curved surfaces, the axis of said at least one laser medium and the axis of said at least one pump light source are coplanar; and
at least one axis of the at least one laser medium and the at least one pump light source is shifted to a position closed to one of the partial cylindrical curved surfaces than the center line thereof, thereby improving efficiency and providing a high uniformity of the distribution of light intensity emitted from the at least one laser medium.

4,993,039

RING LASER GYRO

Uwe Esskuchen, Hanau, and Werner Hansli, Alsbach, both of Fed. Rep. of Germany, assignors to Honeywell Regelsysteme GmbH, Fed. Rep. of Germany

Filed May 25, 1990, Ser. No. 529,243
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3918050
Int. Cl.[5] H01S *3/083*
U.S. Cl. 372—94 9 Claims



1. A ring laser gyro including a laser block comprising a symmetrical electrode arrangement for producing a gas discharge in two partial gas discharge paths so as to produce two counter-propagating laser beams in a cavity resonator formed by bores in the laser block, and further comprising at least one ion trap formed in the laser block outside of the gas discharge path.

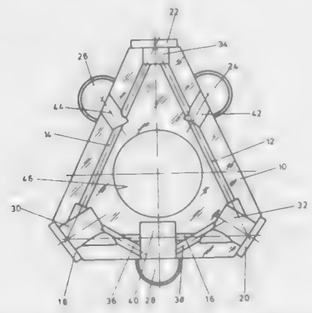
4,993,040

RING LASER GYRO

Uwe Esskuchen, Hanau, and Werner Hansli, Alsbach, both of Fed. Rep. of Germany, assignors to Honeywell Regelsysteme GmbH, Fed. Rep. of Germany

Filed May 25, 1990, Ser. No. 529,249
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3918048
Int. Cl.[5] H01S *3/083*
U.S. Cl. 372—94 3 Claims

1. In a ring laser gyro having a triangular-shaped block and a symmetrical electrode arrangement on three sides of said triangular block, including a base leg and side legs, said block having mirrors and gas reaming bores in corner points of said triangular block, and a laser path parallel to the legs of said triangular block, the improvement comprising: connecting bores connecting the electrode on said base leg to the adjacent



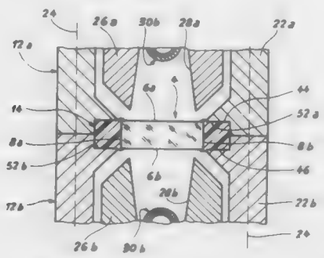
gas reaming bores wherein the connecting bores are inclined to said base leg of the block and at an angle to the laser path.

4,993,041

LASER PROVIDED WITH AN IMPROVED SECURING ARRANGEMENT FOR ITS ACTIVE MEDIUM AND SECURING ARRANGEMENT INTENDED FOR THE LASER

Thomas Sidler, Coffrane, and Jean-Charles Poli, La Chaux-de-Fonds, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Feb. 8, 1990, Ser. No. 476,950
Claims priority, application France, Feb. 9, 1989, 89 01797
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—98 18 Claims



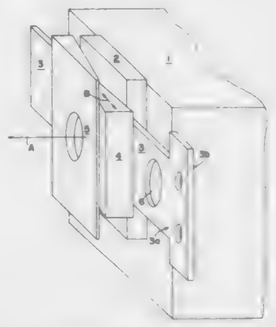
1. An optically pumped laser in which a laser medium comprises a bar having at least two opposed faces between which a generated laser beam propagates along a zigzag path by total reflection from said opposed faces, and two lateral faces extending perpendicularly to said opposed faces, a framework in which said bar is positioned, said bar and said framework together bounding at least two opposed cavities with said opposed faces of said bar forming wall portions of said cavities, each said cavity having therein optical excitation means and a circulation channel for a cooling fluid, said laser further including bar securing means comprising an elastically deformable fitting of plastic material, said fitting gripping said bar and bearing on said framework to rigidly position said bar relative to said framework while thermally insulating said lateral faces.

4,993,042

DEVICE FOR MOUNTING A WINDOW ON A GAS-DISCHARGE LASER

Bernd Mehmke, Bad Sachsa, and Gerd Ahlborn, Bovenden, both of Fed. Rep. of Germany, assignors to Lambda Physik Forschungs-und Entwicklungsgesellschaft, Gottingen, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 343,028
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818128
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—103 24 Claims



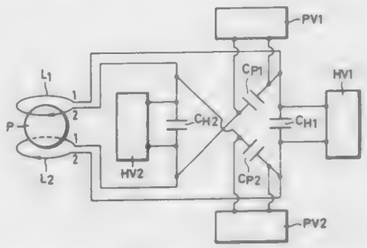
1. A device for mounting a window (6) on a gas-discharge laser (1), characterized by a slide (3) which is displaceable transversely of the beam axis (A) of the laser and at least one window (6) on said slide, wherein said slide is positionable in at least two different positions with respect to the beam axis (A), such that in a first said position the window (6) is aligned with the beam axis (A) and in a second said position the window (6) is not aligned with the beam axis (A) thereby providing for removal and cleaning of the window (6).

4,993,043

DEVICE FOR POSITIONING AND MELTING ELECTRICALLY CONDUCTIVE MATERIALS WITHOUT A RECEPTACLE

Georg Lohoefer, Aachen, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fur Luft-und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,056
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1988, 3836239
Int. Cl.[5] H05B *6/02*
U.S. Cl. 373—138 16 Claims



1. A device for melting and positioning electrically conductive materials without a receptacle, comprising a coil arrangement of two coils arranged on opposite sides of a melting area, both coils having high-frequency currents flowing therethrough, characterized in
that the two coils, together with at least one first capacitor,

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are connected to form a first oscillating circuit in such a manner that, in the first oscillating circuit, current is flowing through the two coils in the same direction,

that the two coils, together with at least one second capacitor, are connected to form a second oscillating circuit in such a manner that, in the second oscillating circuit, current is flowing through the two coils in opposite directions, and

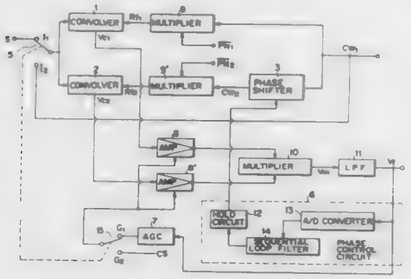
that each of the two oscillating circuits is connected to an amplifying means for compensating the energy losses in the oscillating circuits.

4,993,044

SPREAD-SPECTRUM COMMUNICATION RECEIVER

Shigeo Akazawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,823
Claims priority, application Japan, Sep. 2, 1988, 63-221073
Int. Cl.[5] H04K *1/02*
U.S. Cl. 375—1 4 Claims



1. A spread-spectrum communication receiver comprising:

a first route including first correlating means;

a second route including a phase shifter and second correlating means;

a first switch for selectively applying an input signal or a CW signal to said first and second correlating means;

demodulating means for demodulating data, based on outputs of said first and second correlating means;

a phase control circuit for controlling the phase-shifting amount of said phase shifter;

an AGC circuit responsive to said demodulating means to control gains of said outputs of both said correlating means; and

means for locking said gains.

4,993,045

MODEM DIAGNOSTIC LOOP

Lazaro E. Alfonso, Miami Lakes, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

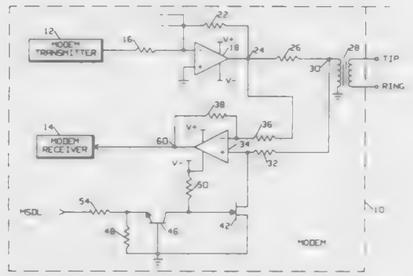
Filed Oct. 31, 1988, Ser. No. 264,914
Int. Cl.[5] H04B *1/38*
U.S. Cl. 375—7 13 Claims

1. A diagnostic loopback apparatus, comprising in combination:

means for coupling a transmitter and a receiver to a two wire transmission line;

converting means for converting said two wire transmission line into separate transmit and receive paths, said converting means including removing means having a differential input amplifier stage with balanced differential inputs, for removing signals produced by said transmitter from signals to be supplied to said receiver; and

unbalancing means for selectively disabling said removing means by unbalancing said differential inputs so that said



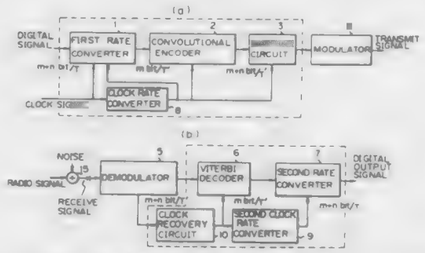
signals produced by said transmitter are supplied to said receive.

4,993,046

CODED MODULATION COMMUNICATION SYSTEM

Yoichi Saito; Yasuhisa Nakamura; Satoru Aikawa, and Hitoshi Takanashi, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,573
Claims priority, application Japan, Jun. 24, 1988, 63-154923; Oct. 24, 1988, 63-266249
Int. Cl.[5] H04L *5/12, 23/02*
U.S. Cl. 375—39 9 Claims



1. A coded modulation communication system comprising a transmitter for providing a coded modulations signal; and a receiver for obtaining and reproducing the signal by demodulating and decoding the signal received from said transmitter wherein

said transmitter has

a first rate converter which receives an input digital signal having a first clock rate in parallel form having a first number of bits in every first period for converting the first clock rate of said digital signal to a second clock rate which is higher than said first clock rate, and for providing an output signal in parallel form having a second number of bits in every second period wherein said first number of bits is larger than said second number of bits, and said first period is longer than said second period,

a convolutional encoder coupled with the output signal of said first rate converter for encoding said second number of bits by adding an additional bit so that a total number of parallel bits at an output of the convolutional encoder is equal to said first number of bits,

a mapping circuit coupled with the output signal of said convolutional encoder for determining amplitude and phase of each said output signal on a modulated signal space, and

a modulator coupled with an output of said mapping circuit for providing a modulated signal for transmission, and further

said receiver has

a demodulator for receiving and demodulating said modulated signal from said transmitter,

a decoder coupled with an output of said demodulator for decoding the the output of said demodulator originally encoded by said convolutional encoder and for providing a decoded digital signal in parallel form having said second number of bits in every said second period,

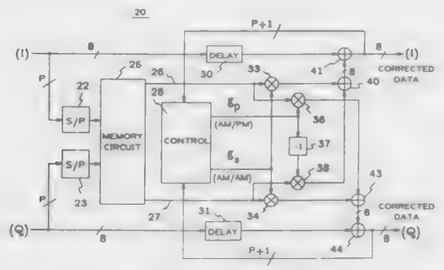
a second rate converter coupled with said decoded digital signal from said decoder for converting a clock rate of said decoded digital signal from said second clock rate to said first clock rate and for providing a digital output signal in parallel form having said first number of bits in every first period.

4,993,047

VOLTERRA LINEARIZER FOR DIGITAL TRANSMISSION

James P. Moffatt, Salem, and Mitchell A. Skinner, Hampton, both of N.H., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 5, 1989, Ser. No. 402,750
Int. Cl.[5] H04L *27/38*
U.S. Cl. 375—39 16 Claims



1. A digital linearizer (**20**) for reducing the intersymbol interference due to a characterized nonlinearity in a QAM transmission channel in which data symbols comprise a combination of p bits on an I rail and p bits on a Q rail comprising:

address means (**22, 23**) connected to said I and Q rails for forming at least one address from a sequence of n of said data symbols;

memory means (**26**) connected to said address means for producing first and second correction words in response to said address; and

correcting means (**28–44**) connected to said memory means and said I and Q rails for generating and adding to the Q rail portion of one of the symbols of said sequence a first AM/AM correction factor that is the product of a first gain factor g_a and said second correction word and a first AM/PM correction factor that is the product of a second gain factor g_p and said first correction word and for generating and adding to the I rail portion of said one symbol of said sequence a second AM/AM correction factor that is the product of said first gain factor and said first correction word and a second AM/PM correction factor that is the negative of the product of said second gain factor and said second correction word.

4,993,048

SELF-CLOCKING SYSTEM

Bruce H. Williams, Sandy; Glenn A. Arbanas, Salt Lake City, and Valjean P. Snyder, West Valley City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 18, 1990, Ser. No. 510,526
Int. Cl.[5] H04L *27/06*
U.S. Cl. 375—97 3 Claims

1. A self-clocking system for demodulating phase encoded data signals which have a variable frequency, comprising in combination;

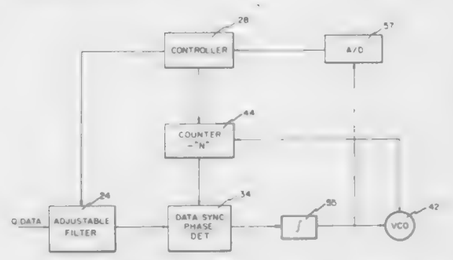
means for generating a baseband data signal;

means coupling said baseband signal to an input of a filter having a pass band matched to the frequency of said phase encoded data signal, said filter producing a filtered output data signal in response to said baseband signal input;

means for comparing said filtered output data signal with a clock signal, said comparing means producing an output voltage which is a function of a phase difference between said filtered output data signal and said clock signal;

means for coupling the output of said filter to the input of said comparing means;

a variable counter;



a voltage controlled oscillator, means for coupling said comparing means output voltage to the input of said voltage controlled oscillator;

means for coupling an output of said voltage controlled oscillator to an input of said variable counter, which counter divides the output of said oscillator by a count "N" to generate said clock signal; and

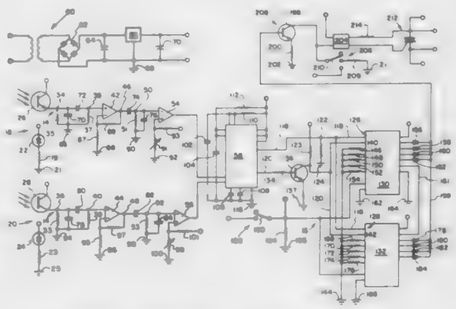
a controller responsive to said comparing means output to vary said pass band of said filter to match said phase encoded data signal frequency and to vary "N" to maintain the voltage input to said voltage controlled oscillator within the deviation band width of said voltage controlled oscillator.

4,993,049

ELECTRONIC MANAGEMENT SYSTEM EMPLOYING RADAR TYPE INFRARED EMITTER AND SENSOR COMBINED WITH COUNTER

Halbert D. Cupps, 1025 Steeplechase Ct., Apt. 2B, Fort Wayne, Ind. 46804

Filed Sep. 28, 1988, Ser. No. 250,305
Int. Cl.[5] G07C *9/00*; G08B *13/18*
U.S. Cl. 377—6 36 Claims



1. An electronic management system, comprising:

means for emitting infrared light;

means combined with said emitting means for sensing infra-

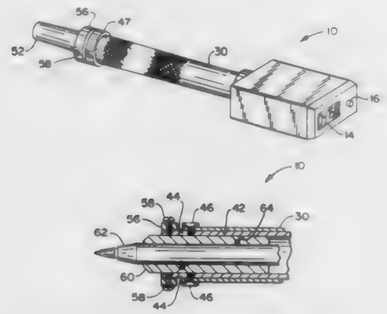
red light reflected from an object within a range of view of a certain zone of detection;
means for comparing pulses triggered by said sensing means to a reference value;
means connected with said comparing means for timing each of said pulses triggered to provide error free delayed clock-like pulses;
means for mounting said emitting means next to said sensing means to provide same side detection with said range of view of said certain zone;
means connected with said timing means for controlling an electronic means such as a light means, an audio device, a video device, and the like, said control means including means for counting in one of a positive value and a negative value in relation to a reference value when triggered by one of said delayed pulses;
means for mounting said controlling means whereby said controlling means is connected to said electronic means; and
means for manually operating said counting means.

4,993,050

PORTABLE TOUCH ACTIVATED COUNTER/MARKER

Harry L. Carpenteri, 4 Dailey Cir., Vernon, Conn. 06066, and Donald E. Hayes, P.O. Box 324, Brownville, Me. 04414

Filed Mar. 20, 1989, Ser. No. 325,908
Int. Cl.[5] G06M *3/00*; H03K *21/38*
U.S. Cl. 377—15 **5 Claims**



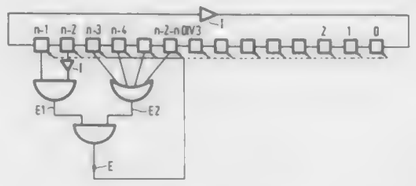
1. A counter/marker apparatus which comprises:
a head assembly including an electronic counter mechanism;
a first elongated sleeve fixed to said head assembly;
a second elongted sleeve dimensioned and configured for sliding axial concentric movement within said first sleeve, said second elongated sleeve having an elongated slot therein extending in a generally axial direction;
a momentary switch;
means for mounting said momentary switch to cause actuation of said momentary switch upon relative axial movement of said first and second elongated sleeves;
means for coupling said momentary switch to said counter;
means for physically coupling said second sleeve to an associated pen;
a set screw extending through said first to said elongated slot in said second sleeve;
means biasing said second sleeve away from said momentary switch;
said first sleeve having a first ring shaped member disposed proximate to one axial extremity thereof;
a second ring shaped member and means for securing said second ring shaped member to the associated pen, said first and second rings being spaced apart from said first sleeve in one axial position of said second sleeve and in abutting relationship to said first sleeve in a second axial position of said second sleeve; and
wherein said physically coupling means comprises a third sleeve shaped member dimensioned and configured for securing the pen therein and for engagement within the interior of said second sleeve shaped member.

4,993,051

JOHNSON COUNTER CIRCUIT WITH INVALID COUNTER POSITION DETECTION AND CORRECTION MECHANISM

Fredericus H. J. Feldbrugge, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1989, Ser. No. 308,695
Claims priority, application Netherlands, Feb. 17, 1988, 8800390
Int. Cl.[5] H03K *27/00, 21/40*
U.S. Cl. 377—28 **21 Claims**



1. A Johnson counter circuit comprising an end-around coupled shift register chain of n bit stages, an inversion element which is included in the chain in order to form a counter having 2n valid counter positions, and a correction mechanism for forming a valid counter position from an invalid counter position, characterized in that, when n is an arbitrary natural number not equal to 8 and more than four, the correction mechanism comprises:
a first logic sub-circuit means, which is fed by a first group consisting of two successive bit stages, for detecting antivalent values in these two successive bit stages;
a second logic sub-circuit means, which is fed by a second group comprising more than one and less than n−2 other bit stages, for detecting when any bit stage of said second group has a value which, when said antivalent values are present in said two successive bit stages of said first group, indicates an invalid counter position; and
a combination stage means, which is fed by the first and the second logic sub-circuit means, for detecting coincidence of detections by said first and second logic sub-circuit means and for forming, in response thereto, a detection signal for an invalid counter position which is applied as a set signal to at least all bit stages of said second group having said value.

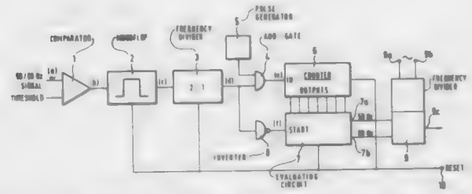
4,993,052

DIGITALLY-OPERATING ELECTRICAL EQUIPMENT WITH COUNTER FOR AUTOMATICALLY ADAPTING OUTPUT TO 50HZ OR 60HZ INPUT

Karlheinz Hammelsbacher, Schwabach, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Aug. 1, 1989, Ser. No. 388,145
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1988, 3826107
Int. Cl.[5] G06M *3/02*; G01R *23/15*
U.S. Cl. 377—52 **5 Claims**

1. Digitally-operating electronic equipment, automatically handling power-supply frequencies of 50 Hz or 60 Hz; comprising means utilizing a full wave of the power supply frequency for generating a waveform having a pulse width referenced thereto; means connected to an output of said waveform generating means for counting into a counter, from the beginning to the end of the reference pulse waveform, a sequence of pulses generated independently of the power-supply frequency and which is of an essentially higher frequency than the power-supply frequency; means connected to an output of said counter for subsequently discriminating the content of the counter at a threshold value which is associated with about 55 Hz; finally in dependence upon the obtained result, means generating a first signal which is associated with frequency of 50 Hz or generating a second signal associated with a frequency of 60 Hz generated; and a frequency divider responsive to said first or second signal for switching respectively between a dividing ratio of either 50:1 or 60:1 so as to generate at an output of said frequency divider constant frequency pulses for said digital equipment synchronized to the power supply regardless of whether it is 50 Hz or 60 Hz.

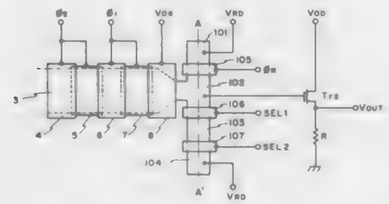


4,993,053

CHARGE TRANSFER DEVICE PROVIDED WITH AN IMPROVED OUTPUT STAGE

Hiroaki Itoh, and Kazuo Miwada, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 21, 1988, Ser. No. 287,835
Claims priority, application Japan, Dec. 22, 1987, 62-326178
Int. Cl.[5] G11C *19/28*; H01L *29/78*
U.S. Cl. 377—60 **4 Claims**



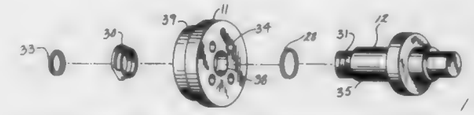
1. A charge transfer device comprising:
a semiconductor substrate of one conductivity type;
a charge transfer section formed on said semiconductor substrate for transferring charges in a direction;
a first region formed in said semiconductor substrate with the other conductivity type to receive said charges transferred through said charge transfer section;
a second region formed in said semiconductor substrate with said other conductivity type in a region adjacent to said first region;
a first gate electrode formed on said semiconductor substrate between said first and second regions via an insulator film to form a switch for controlling the connection between said first and second regions; and
means for deriving an output signal from said first region, said means including a MOS transistor having a gate connected to said first region, a drain, and a source; a resistive load element coupled between said source of said MOS transistor and a circuit point which is held at a reference potential; and an output terminal coupled to said source of said MOS transistor.

4,993,054

BRAZED X-RAY TUBE ANODE ASSEMBLY

Paul U. Ujari, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Sep. 27, 1989, Ser. No. 413,423
Int. Cl.[5] H01J *35/24*; B23K *20/00*
U.S. Cl. 378—125 **5 Claims**



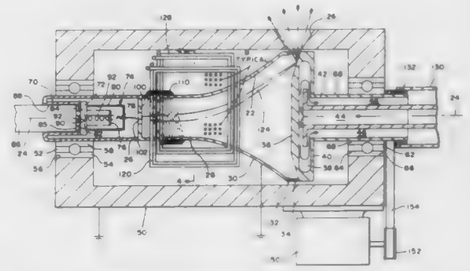
1. An improved rotating X-ray target wherein a rotor stud member is fastened to a hub portion, wherein both the stud member and the hub portion are composed of refractory metals the improvement wherein said fastening of said rotor stud member to said hub portion comprises in part a metal bonding composed of a metal alloy including the following metals in the following ranges with the designated amounts expressed in terms of weight percent: 30–70 copper, 10–55 palladium; and 5–28 nickel.

4,993,055

ROTATING X-RAY TUBE WITH EXTERNAL BEARINGS

Roy E. Rand, Palo Alto; Douglas P. Boyd, Hillsborough, and Kristian R. Peschmann, San Francisco, all of Calif., assignors to Imatron, Inc., South San Francisco, Calif.

Filed Nov. 23, 1988, Ser. No. 275,780
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—125 **13 Claims**



1. An x-ray tube comprising:
an envelope for containing a vacuum;
a target means mounted within said envelope for emitting x-rays;
an electron beam accelerator assembly including:
an indirectly heated cathode means for emitting an electron beam; a primary anode plate having formed therein an aperture through which the electron beam is accelerated and
means for focusing said electron beam on said target means;
support means external of said envelope for supporting said envelope for rotational movement; and
means for deflecting said electron beam along a selected path as said envelope rotates such that said electron beam strikes selected portions of said target means mounted within said envelope as said envelope rotates.

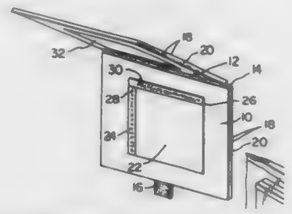
VOL 1123 ISS 2 FE 12 1991 UMI

4,993,856

SPECIMEN APPARATUS AND METHOD OF USE

Banning G. Lary, Suite 411, 6280 Sunset Dr., Miami, Fla. 33143

Filed Jun. 8, 1990, Ser. No. 534,860
Int. Cl.[5] H05G *1/28*
U.S. Cl. 378—164 15 Claims



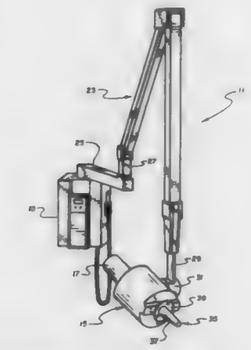
1. A specimen apparatus comprising:
a specimen board;
an absorbent square attached to the specimen board;
radio-opaque indicia attached to the specimen board in proximity to the absorbent square;
a compression sheet hingedly connected to the specimen board; and
means for removably attaching the specimen board and compression sheet together at a point distal from their hinge connection.

4,993,057

X-RAY TUBE HEAD ASSEMBLY WITH STERILIZABLE HANDLE

Robert R. Russells, Kaysville, Utah, assignor to MDT Corporation, Torrance, Calif.

Filed Oct. 31, 1989, Ser. No. 429,400
Int. Cl.[5] H05G *1/02*
U.S. Cl. 378—197 8 Claims



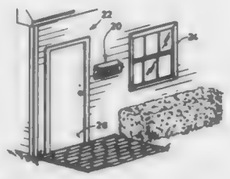
1. In combination,
an X-ray tube head assembly comprising a housing with a front surface through which an X-ray beam is emitted;
a structural support system anchored at a first location and carrying said tube head assembly at a remote location, said structural support system constituting means whereby the position of said assembly and the orientation of said front surface may be adjusted;
mounting structure carried by said housing in non-interfering relation with respect to said front surface; and
a removable handle element releasably coupled to said mounting structure;
said mounting structure and handle being mutually adapted to couple with and decouple from each other; and said handle constituting means whereby said structural support system may be operated to effect changes in the spatial location of said assembly and the orientation of said front surface.

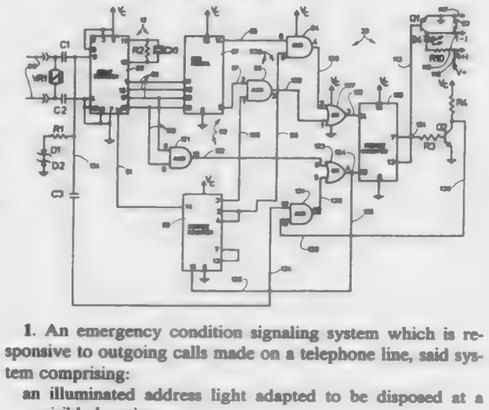
4,993,058

PHONE ACTIVATED EMERGENCY SIGNALING SYSTEM

Edward W. McMinn, Rte. 1, Box 406, Paragould, Ark. 72450; Thomas L. Lloyd, 2010 Rosemond, and Jack Middleton, 726 W. Washington, both of Jonesboro, Ark. 72401

Filed Oct. 2, 1989, Ser. No. 415,779
Int. Cl.[5] H04M *11/04*
U.S. Cl. 379—37 19 Claims





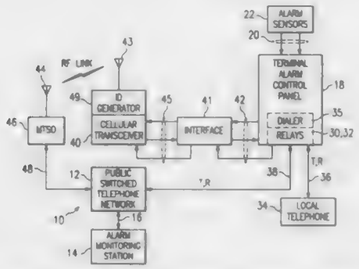
1. An emergency condition signaling system which is responsive to outgoing calls made on a telephone line, said system comprising:
an illuminated address light adapted to be disposed at a visible location;
electronic circuit means for interconnection with said telephone line for generating an alarm signal in response to the sequential dialing of the digits comprising a preselected sequence by a telephone connected to said telephone line, said circuit means comprising:
decoder means interconnected with said telephone line for outputting coded signals corresponding to the digits dialed by said telephone;
initiation means responsive to said decoder means for generating a first initiation signal if the first digit dialed corresponds to the first digit of said predetermined sequence, and for generating successive initiation signals if the successive digits dialed correspond to successive digits of said predetermined sequence;
incrementing means responsive to said first and successive initiation signals for outputting an alarm signal;
off hook reset means for normally resetting said initiation means and said incrementing means whenever a call is made by said telephone; and,
means for preventing reset of said initiation means and said incrementing means when said predetermined sequence has been dialed and hang up of the telephone occurs immediately thereafter;
alarm means activated by said electronic circuit means for signaling for assistance, said alarm means disposed within said address light;
whereby emergency personnel summoned by said preselected sequence will be attracted by said system.

4,993,059

ALARM SYSTEM UTILIZING WIRELESS COMMUNICATION PATH

James L. Smith, and Gregory M. Howison, both of Dallas, Tex., assignors to Cableguard, Inc., Dallas, Tex.

Filed Feb. 8, 1989, Ser. No. 308,188
Int. Cl.[5] H04M *11/04;* H04Q *7/00*
U.S. Cl. 379—39 19 Claims



1. An alarm system for a protected premises, comprising:
an alarm sensor for generating an alarm signal in the event of an alarm condition at the protected premises, said alarm sensor including communication means to communicate said alarm condition to an alarm monitoring station;
a cellular-type radio transceiver located at the protected premises including means for generating a unique identification number for wireless communication with a cellular site; and
means for connecting said communication means to said cellular-type radio transceiver, such that upon generation of the alarm signal, said cellular-type radio transceiver will transmit said unique identification number and said send signal to the cellular site with no transmission of a telephone number of an alarm monitoring station to thereby enable the cellular site to establish a communication path between said communication means and said alarm monitoring station to allow the alarm condition to be communicated to the alarm monitoring station via said cellular-type radio-transceiver.

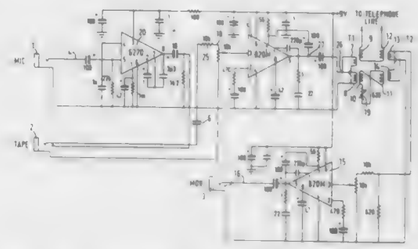
4,993,060

PORTABLE DEVICE FOR USE BY A NEWS REPORTER

Gavan E. Kelly, 9 Richmond Court, 4 Queens Road, Kingston, Surrey KT2 7ST, United Kingdom

Continuation of Ser. No. 159,386, Feb. 23, 1988, abandoned.
This application Oct. 18, 1989, Ser. No. 423,634
Int. Cl.[5] H04M *9/00, 1/64, 1/00*
U.S. Cl. 379—55 12 Claims

1. A portable device to be carried by a reporter and for coupling to a telephone line, the device comprising:
an input for a voice signal;
voice controlled gain adjustment means coupled to said input for adjusting the voice signal to provide an output signal with reduced amplitude fluctuation;
a first transformer arrangement comprising a primary winding connected to said voice controlled gain adjustment means to receive said output signal, a secondary winding inductively coupled to the primary winding and adapted to be connected to the telephone line for transmitting to the broadcast station said output signal in a form suitable for broadcast transmission, and a first coupling winding;
a second transformer arrangement having a primary winding adapted to be connected to the telephone line for receiving a signal from the broadcast station, secondary winding means inductively coupled to the primary winding of said second transformer arrangement and having a first and second distinct winding, and a second coupling winding;
cross-coupling means intercoupling said first and second coupling windings whereby said output signals to be transmitted can be substantially, but not entirely, cancelled from a signal being received from the broadcast station;



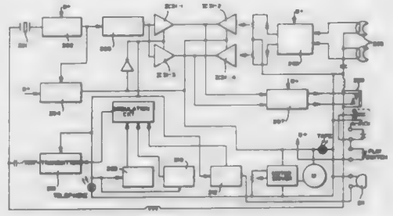
a first, audio, output for coupling to an audio monitor;
a second output for coupling to a tape recorder;
a first receiving circuit coupling said first distinct winding to the first output to provide an audio monitor signal; and
a second receiving circuit coupling said second distinct winding to said second output to provide a tape recorder signal.

4,993,061

PORTABLE MINIATURE HIGH FIDELITY STEREO TAPE PLAYER AND CORDLESS RADIO TELEPHONE SYSTEM

Sheng-Yu Hsieh, 3Fl., No. 48, Sec. 2, Chung Chen Rd., Shih-lin, 11125, Taipei, Taiwan

Filed Jul. 20, 1989, Ser. No. 382,443
Int. Cl.[5] H04Q *7/04*
U.S. Cl. 379—61 4 Claims



1. A portable tape player and radio telephone system, comprising a telephone base unit, a telephone handset unit and tape player,
said tape player including a receiver having means for receiving a carrier signal transmitted from the base unit, and means for demodulating the carrier signal; pilot signal filter means for filtering the demodulated signal; pilot signal decoder means for comparing a frequency of the demodulated signal with a frequency of a pilot signal decoder; a tape drive motor; means for stopping said tape drive motor if the demodulated signal frequency matches said frequency of the pilot signal decoder; a set of pilot signal oscillators; means for causing said pilot signal oscillators to oscillate upon stoppage of said tape drive motor; a microphone and microphone amplifier means for causing a signal from said microphone to be amplified and modulated by an output signal of said set of pilot signal oscillators; and means for transmitting said modulated signal from said tape player to said base unit,

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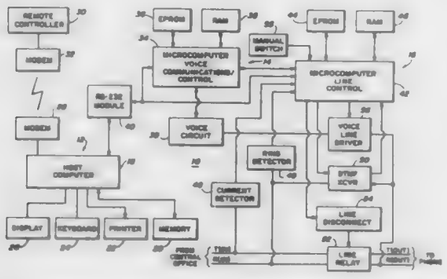
said base unit including a receiver having means for receiving a carrier signal transmitted from said tape player and means for demodulating said carrier signal; pilot signal filter means for filtering the demodulated signal transmitted from the tape player; pilot signal decoder means for comparing a frequency of the demodulated signal transmitted from the tape player with a frequency of a pilot signal decoder; a tape player lock circuit; means for locking up the tape player lock circuit if the frequency of the demodulated signal transmitted from the tape player is the same as the frequency of the pilot signal decoder; a relay switchable between a service line and the tape player lock circuit; means for switching the relay to connect the service line with the tape player lock circuit; and transmitter means for transmitting a signal from said service line to said tape player; such that said signal from said service line is demodulated and played through said tape player.

4,993,062

TELEPHONE CONTROL SYSTEM INCLUDING STORED BLOCKED AND ALLOWED TELEPHONE NUMBERS

Eric S. Dula, Ft. Lauderdale, and Lawrence R. Hughes, Lauderdale Lakes, both of Fla., assignors to Communications Equipment and Engineering Company, Plantation, Fla.

Filed Feb. 10, 1989, Ser. No. 309,340
Int. Cl.[5] H04M *1/66, 11/00*
U.S. Cl. 379—88 12 Claims



1. A telephone control system for use between central office telephone equipment and a telephone line pair connected to a predefined telephone station comprising:

monitoring means coupled to said telephone line pair for monitoring said telephone line pair to identify predetermined signals, said monitoring means including means for detecting loop current and means for detecting dialed signals;

means for storing a plurality of both blocked and allowed telephone numbers;

comparator means coupled to said means for detecting dialed signals and said means for storing and responsive to said means for detecting dialed signals for comparing detected signals with both blocked and allowed numbers stored by said means for storing;

means coupled to said comparator means and said telephone line pair and responsive to said comparator means for selectively preventing or enabling a telephone call;

first event detecting means for detecting a first predetermined event;

means coupled to said first event detecting means and said telephone line pair and responsive to said first event detecting means for disconnecting said telephone line pair from the central office telephone equipment;

second event detecting means for detecting a second predetermined event;

means coupled to said second event detecting means and said telephone line pair and responsive to said second event detecting means for connecting said telephone line pair to the central office telephone equipment;

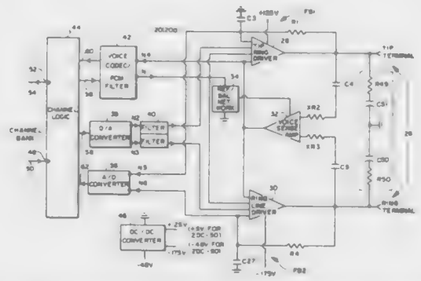
voice generating means for generating a plurality of predetermined voice messages and line control means associated with said telephone line pair and coupled to said voice generating means for selecting one of the predetermined voice messages for generation and for transmitting said selected voice message on said associated telephone line pair.

4,993,063

CHANNEL UNIT INTERFACE CIRCUIT

Frederick J. Kiko, 3561 Donna Dr., Carlsbad, Calif. 92008

Continuation-in-part of Ser. No. 21,385, Mar. 3, 1987, Pat. No. 4,852,160. This application Dec. 27, 1988, Ser. No. 289,810
Int. Cl.[5] H04M *11/04, 7/16*
U.S. Cl. 379—405 16 Claims



1. In a communication system including a channel unit interface circuit for interconnecting a two-wire, bidirectional signal transmitting means and a four-wire digital signal transmitting means, and a two-wire port having tip and ring terminals adapted for connection to the two-wire means, the improvement comprising:

tip terminal transconductance amplifier driver means having a first input coupled to receive incoming tip terminal "DC band" frequency signals from said four-wire means, a second input coupled to receive incoming tip terminal "voice band" frequency signals from said four-wire means, a third input coupled to the tip terminal of said two-wire port, and an output connected to the tip terminal;

first feedback impedance means coupled between the tip terminal and the third input of said tip terminal transconductance amplifier driver means and being responsive to incoming tip terminal "DC band" frequency signals from said two-wire means for generating a simulated tip terminal impedance;

ring terminal transconductance amplifier driver means having a first input coupled to receive the incoming ring terminal "DC band" frequency signals from said four-wire means, a second input coupled to receive the incoming ring terminal "voice band" frequency signals from said four-wire means, a third input coupled to the ring terminal of said two-wire port, and an output connected to the ring terminal;

second feedback impedance means coupled between the ring terminal and the third input of said ring terminal transconductance amplifier driver means and being responsive to incoming ring terminal "DC band" frequency signals from said two-wire means for generating a simulated ring terminal impedance;

said tip terminal transconductance driver means being formed of a first switching operational amplifier having a non-inverting input, an inverting input, and an output, said tip driver means further including a first input resistor coupled between its first input and the non-inverting input of said first switching operational amplifier to receive the tip terminal "DC band" frequency signals from said four-wire means, a second input resistor coupled between its

third input and the inverting input of said first switching operational amplifier, an output sense resistor coupled between the output of said first switching operational amplifier and the output of said tip driver means, a negative feedback resistor coupled between the output of said first switching operational amplifier and the inverting input of said first switching operational amplifier, and a positive feedback resistor coupled between the output of said tip driver means and the non-inverting input of said first switching operational amplifier;

said ring terminal transconductance driver means being formed of a second switching operational amplifier having a non-inverting input, an inverting input, and an output, said ring driver means further including a first input resistor coupled between its first input and the non-inverting input of said second switching operational amplifier to receive the ring terminal "DC band" frequency signals from said four-wire means, a second input resistor coupled between its third input and the inverting input of said second switching operational amplifier, an output sense resistor coupled between the output of said second switching operational amplifier and the output of said ring driver means, a negative feedback resistor coupled between the output of said second switching operational amplifier and the inverting input of said second switching operational amplifier, and a positive feedback resistor coupled between the output of said ring driver means and the non-inverting input of said second switching operational amplifier;

each of said first and second switching operational amplifiers including of a low voltage transconductance amplifier, high voltage comparator means, a filter network having an input and an output, and feed forward compensation amplifier means;

said low voltage transconductance amplifier having a non-inverting input defining the non-inverting input of said switching operational amplifier, an inverting input defining the inverting input of said switching operational amplifier, and an output for generating a slowly varying control signal;

said high voltage comparator means having a first input, a second input, and an output, the first input of said high voltage comparator means being coupled to the output of said low voltage transconductance amplifier;

the input and output of said filter network being coupled between the output of said high voltage comparator means and the output of said switching operational amplifier; and

said feed forward compensation amplifier means being coupled between the output of said low voltage transconductance amplifier and the output of said filter network.

4,993,064

SUBSCRIBER LINE INTERFACE CIRCUIT AND TRANSFORMER THEREFOR NORTHERN TELECOM LIMITED

Gyula Jakab, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 61,593, Jun. 15, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 326,448
Int. Cl.[5] H01F *27/28;* H04M *19/00*
U.S. Cl. 379—413 11 Claims

1. A line circuit for a two-wire communication line, comprising:

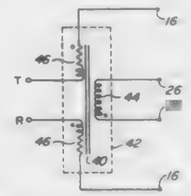
two terminals for connection to the line;

two active circuits for passing direct current on the line;

and two resistive feed means each coupled between an output of a respective one of the active circuits and a respective one of the terminals;

wherein each resistive feed means is constituted substantially entirely by a winding of resistance wire of a transformer, and there is substantially no other resistance in series with each winding of resistance wire between the output of the respective one of the active circuits and the respective one of the terminals.

7. A transformer comprising two substantially identical



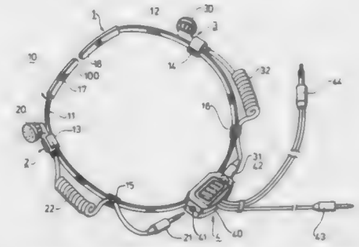
windings of resistance wire each for providing a predetermined resistance, and a third winding magnetically coupled to said two windings and having a predetermined turns ratio with respect to said two windings.

4,993,065

ACCESSORY COMMUNICATION DEVICE FOR TELEPHONE SETS

Oliver C. Chiou, Taipei, Taiwan, assignor to Gamma Inc., Taipei, Taiwan

Filed Apr. 4, 1989, Ser. No. 334,152
Int. Cl.[5] H04M *1/05;* H04R *1/08*
U.S. Cl. 379—430 13 Claims



8. An accessory communication device comprising:

a collar member to be worn around a user's neck, said collar member having an open section to permit a user to place said collar around the user's neck;

a first retaining means and a second retaining means located at opposite sides of said collar member;

receiving means detachably disposed on said collar member by said retaining means, so that a user can detach said receiving means from said collar for placement in the user's ear; and

transmitting means for effecting transmitting and receiving operations.

4,993,066

METHOD FOR TELEVISION SCRAMBLING

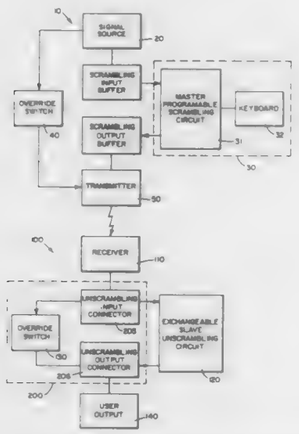
Henry H. Jenkins, 220 N. Smith Ave., Corona, Calif. 91720

Filed Feb. 26, 1987, Ser. No. 19,301
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—16 9 Claims

1. In a device incorporating a scrambling transmitter and a receiver incorporating an unscrambling circuit having key elements for secured passage of a signal, the improvement of means to incorporate more than one scrambling technique into

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the scrambling transmitter and means for the selective interchange of the key elements of the unscrambling circuit so as to



allow selective reception of the signals incorporating the differing scrambling techniques.

4,993,067

SECURE SATELLITE OVER-THE-AIR REKEYING METHOD AND SYSTEM

Raymond J. Leopold, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

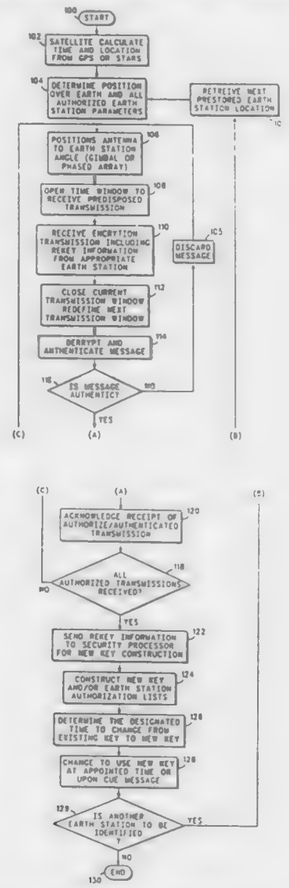
Filed Dec. 27, 1988, Ser. No. 289,948
Int. Cl.[5] H04L *9/00;* H04K *1/10*
U.S. Cl. 380—21 21 Claims

1. A secure satellite over-the-air rekeying method for rekeying a satellite via a message transmission between a ground station system and said satellite, said over-the-air rekeying method comprising the steps of:

receiving said message transmission including rekeying data from said ground station system;

determining by said satellite whether the geometric position of said ground station system corresponds to a predetermined allowable position with respect to said satellite; and

processing said received message transmission including said rekeying data by said satellite, if said geometric position of



said ground station system corresponded to a predetermined allowable location.

4,993,068

UNFORGEABLE PERSONAL IDENTIFICATION SYSTEM

Gerald V. Piosenka, Scottsdale, and Ronald V. Chandos, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 27, 1989, Ser. No. 441,573
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 32 Claims

1. An unforgeable personal identification system for identifying users at remote access control sites, said unforgeable personal identification system comprising:

means for generating encrypted physically immutable identification credentials of a user;

said means for generating including processor means for processing digital data;

text input means connected to said processor means, said text input means for transmitting text data including privilege information to said processor means in digital form;

means for encrypting said physically immutable identification credentials and said text data according to a predefined one-way encryption algorithm to produce encrypted identification credentials;

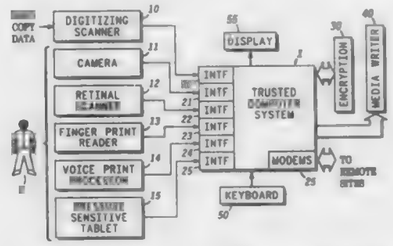
portable memory means for storing said encrypted identification credentials;

said remote access control site including:

means for reading said encrypted identification credentials from said portable memory means;

means for directly inputting physically immutable identification of said user;

means for comparing said input physically immutable



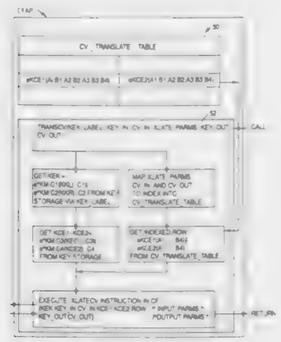
identification of said user with said identification credentials read from said portable memory means, said means for comparing further operating to indicate a successful or an unsuccessful comparison of said directly input identification credentials of said user with said identification credentials of said user from said portable memory means and to allow an access by said user according to said privilege information, if said comparing is successful.

4,993,069

SECURE KEY MANAGEMENT USING CONTROL VECTOR TRANSLATION

Stephen M. Matyas, Manassas, Va.; Dennis G. Abraham, Concord, N.C.; Donald B. Johnson, Manassas, Va.; An V. Le, Arlington, Va.; Rostislaw Prymak, Dumfries, Va.; John D. Wilkins, Somerville, Va., and Phil C. Yeh, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1989, Ser. No. 443,418
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 19 Claims



1. In a data processing system which includes a control vector based cryptographic facility, a method for translating from a first control vector to a second control vector, comprising the steps of:

storing a masking vector corresponding to the relationship between said first control vector and said second control vector, in a table in a first form encrypted with a first encrypting key and in a second form encrypted with a second encrypting key;

inputting a working key encrypted under a key encrypting key exclusive-ORed with said first control vector;

inputting said first control vector and inputting said second control vector into which said first control vector is to be translated;

recovering said working key and continuing said method for translation only if said first control vector satisfies control vector checking;

accessing said first encrypted form and said second encrypted form of said masking vector from said table;

decrypting said first encrypted form of said masking vector and comparing the result with the result of decrypting said second form of said masking vector, and continuing said method for translating only if both results are the same;

logically combining said first control vector and said masking vector producing a logical product and continuing said method for translation only if said logical product satisfies logical product checking;

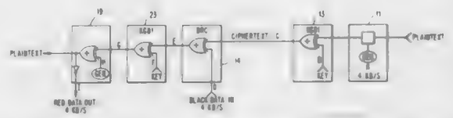
outputting said working key encrypted under said key encrypting key exclusive-ORed with said second control vector.

4,993,070

CIPHERTEXT TO PLAINTEXT COMMUNICATIONS SYSTEM AND METHOD

Steven C. Taylor, Hillsborough, Calif., assignor to Verilink Corporation, San Jose, Calif.

Filed Nov. 16, 1989, Ser. No. 437,876
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—48 31 Claims



7. A ciphertext to plaintext communications system using a first data-bit sequence having a predetermined bit pattern for communicating, on an encoded-bit sequence, and a second data-bit sequence comprising a plurality of first and second bits, comprising:

means responsive to the first bits in the second data-bit sequence for modifying the encoded-bit sequence as a modified-encoded-bit sequence; and

means coupled to said modifying means for decoding the modified-encoded-bit sequence as a third data-bit sequence, and for comparing the third data-bit sequence with the predetermined bit pattern, for generating the second data-bit sequence.

4,993,071

POST-LARYNGECTOMY SPEECH AID

Peter Griebel, Freiburg, Fed. Rep. of Germany, assignor to Dr. Kuhn & Co. GmbH, Cologne, Fed. Rep. of Germany

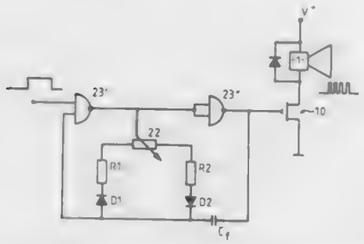
Continuation of Ser. No. 897,011, Aug. 15, 1986, abandoned.
This application Oct. 11, 1988, Ser. No. 255,703
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529553
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—70 7 Claims

1. A speech aid to be used by post-laryngectomy patients, comprising:

(a) an electromechanical transducer responsive to electrical signals having frequencies in the human voice range producing human voice sounds, and non-responsive to electrical signals having frequencies above the human voice range;

(b) means for generating a basic rectangular pulse signal having a first fundamental frequency in the human voice range;

(c) means for chopping said basic signal to produce an adjusted basic signal, wherein each rectangular pulse of said basic signal includes a plurality of rectangular pulses having a second fundamental frequency above the human voice range and having a prescribed pulse ratio, said chopping means including means for varying said pulse



ratio, said varying means including a potentiometer to permit manual adjustment of said pulse ratio;

(d) power switch means, electrically coupled to said transducer, for opening and closing an electrical circuit path through said transducer in response to said adjusted basic signal;

whereby said transducer is driven at said first frequency with the power determined by the pulse ratio of the pulses at said second frequency.

4,993,072

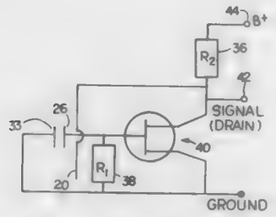
SHIELDED ELECTRET TRANSDUCER AND METHOD OF MAKING THE SAME

Preston V. Murphy, Geneva, Switzerland, assignor to Lectret S.A., Geneva, Switzerland

Filed Feb. 24, 1989, Ser. No. 315,505

Int. Cl.[5] H04R *3/00*

U.S. Cl. 381—113 **9 Claims**



1. An electret transducer and preamplifier combination comprising

a pair of spaced electrodes, one said electrode being a flexible electrode so as to change the spacing between electrodes in response to force on said one electrode, the other said electrode being fixed,

an electret between said electrodes,

an insulator on the outer surface of the other said electrode,

a conductive layer on the other side of said insulator,

said conductive layer being a silicon backplate on which said electret and insulator are supported, and

a preamplifier having near unity gain, said conductive layer being connected to the output of said preamplifier,

whereby said conductive layer can be used to shield said other electrode to reduce stray capacitance between said other electrode and other components of said transducer.

4,993,073

DIGITAL SIGNAL MIXING APPARATUS

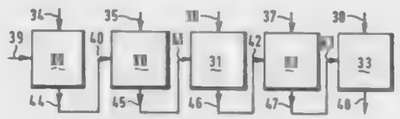
Kevin J. Sparkes, 8 Pelham Road, Lea Park, Thame Oxon, OX 9 3WH, United Kingdom

Filed Oct. 3, 1988, Ser. No. 253,084

Claims priority, application United Kingdom, Oct. 1, 1987, 8723086; Dec. 29, 1987, 8730251

Int. Cl.[5] H04B *1/00*

U.S. Cl. 381—119 **20 Claims**



1. A digital signal mixing device for generating an output signal from a plurality of analogue signals applied to the device on inputs of respective separate signal processing channels, in which the analogue input signals are sequentially sampled to generate a train of sequential digital number input signals each representing the instantaneous magnitude of the analogue signal, a plurality of digital number signal processing units connected in sequence, each said signal processing unit being individually connected to and part of a respective said signal processing channel and being operative to condition the incoming digital number signal, and each digital number signal processing unit having means to add the conditioned incoming digital number signals to the signals output from a respective immediately preceding unit in the sequence.

4,993,074

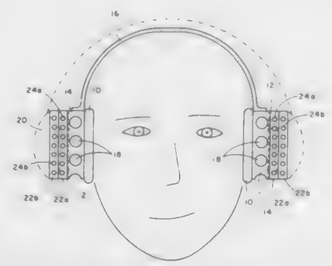
EARPHONE SPACER

Robert J. Carroll, 107 Highland Ave., Winchester, Mass. 01890

Continuation-in-part of Ser. No. 181,397, Apr. 13, 1988, abandoned. This application Jan. 11, 1989, Ser. No. 295,493

Int. Cl.[5] H04R *1/28*

U.S. Cl. 381—187 **6 Claims**



1. An adjustable earphone spacer for holding an earphone a selected distance from the ear comprising in combination:

a. A cylindrical base for contacting the head having a plurality of ports to allow the unimpeded transmission of external sound to the ear; and

b. A cylindrical earphone support coaxially threadably engageable with said base to vary the distance between the earphone and the ear, said support having a plurality of ports to allow the unimpeded transmission of external sound to the ear.

4,993,075

IMAGE RECONSTRUCTION METHOD IN NMR IMAGING

Kensuke Sekihara, Musashimurayama, and Kideki Kohno, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,725

Claims priority, application Japan, Jul. 6, 1988, 63-166707

Int. Cl.[5] G06K *9/00;* **G01V** *3/00*

U.S. Cl. 382—6 **5 Claims**

1. An image reconstruction method in a nuclear magnetic resonance imaging system comprising magnetic field generating means for generating a static magnetic field, field gradients and an RF magnetic field, signal detecting means for detecting a nuclear magnetic resonance signal from an object to be examined, a computer for performing an operation on a signal detected by said signal detecting means, and output means for outputting the results of operation by said computer, said method comprising:

(i) a step of detecting the nuclear magnetic resonance signal after nuclear spins in a predetermined space including said object to be examined have been excited and in a state in which there exist a first field gradient along a first direction of said predetermined space which is temporarily steady and a second field gradient along a second direction of said predetermined space which has a sense periodically inverted, thereby obtaining an actual measurement data train having on a k-space a k-trajectory which has a gradient caused by said first and second field gradients;

(ii) a step of subjecting a predetermined trial image m(I, J) to a phase shift $\xi(\mu, J)$ corresponding to the gradient of said k-trajectory and thereafter to inverse Fourier transformation, thereby obtaining a first virtual measurement data train $M_P(\mu, \nu)$;

(iii) a step of subjecting a version of said trial image m(I, J) having an inverted sign of I to said phase shift $\xi(\mu, J)$ and thereafter to inverse Fourier transformation, thereby obtaining a second virtual measurement data train $M_N(\mu, \nu)$;

(iv) a step of determining a difference (M_P-F_P) between each of data in said actual measurement data train in periods when said second field gradient is positive and data in said first virtual measurement data train at a position on said k-space corresponding thereto and a difference ($M_N - F_N$) between each of data in said actual measurement data train in periods when said second field gradient is negative and data in said second virtual measurement data train at a position on said k-space corresponding thereto and making the sum of the absolute values of all of the differences or the sum of squares of the absolute values of all of the differences;

(v) a step of modifying said trial image m(I, J) so that said sum of the absolute values of the differences or said sum of squares of the absolute values of the differences becomes small; and

(vi) a step of repeating said steps (i) to (v) to obtain an estimated image representative of the distribution of nuclear spins in said predetermined space.

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DESIGN PATENTS

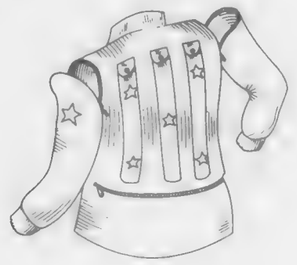
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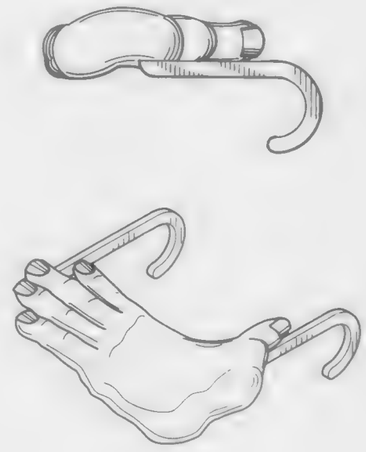
For CLASS	Set PATENT NO.
D08-380	314,505
D14-210	314,546

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JACKET
Mark Campbell, 1199 Hosipital Rd., Block 208, Franklin, Ind. 46131
Filed Nov. 19, 1986, Ser. No. 932,396
Term of patent 14 years
U.S. Cl. D2—184



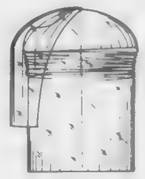
314,467
VISOR
Ronnie W. Hall, P.O. Box 131321, Tyler, Tex. 75713
Filed Sep. 14, 1987, Ser. No. 96,328
Term of patent 14 years
U.S. Cl. D2—248



314,466
SHIRT
Philip S. Pritulsky, 2618 Whitman Dr., Wilmington, Del. 19808
Filed Jun. 23, 1989, Ser. No. 370,584
Term of patent 14 years
U.S. Cl. D2—215

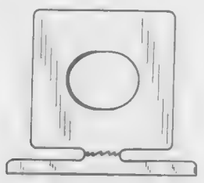


314,468
GOLF BAG COVER
Richard A. Wolever, 102 Pine View Dr., Hot Springs, Ark. 71901
Filed Nov. 2, 1987, Ser. No. 115,105
Term of patent 14 years
U.S. Cl. D3—37

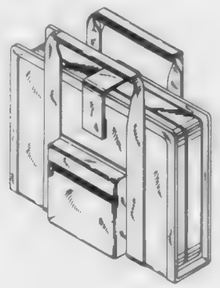


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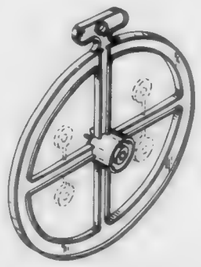
314,469
TREE STAND GUN HOLDER
Robert W. Chilcutt, 22 Henderson Dr., Paris, Tenn. 38242
Filed May 2, 1988, Ser. No. 189,684
Term of patent 14 years
U.S. Cl. D3—38



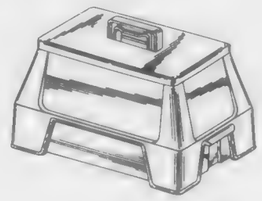
314,470
TOOL CASE
Walter J. Hutchins, West Hartford, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Sep. 2, 1988, Ser. No. 241,092
Term of patent 14 years
U.S. Cl. D3—48



314,471
SAW BLADE HOLDER OR SIMILAR ARTICLE
Richard H. Lueth, 19715 Streit Rd., Harvard, Ill. 60033
Filed Apr. 28, 1988, Ser. No. 187,418
Term of patent 14 years
U.S. Cl. D3—73



314,472
COMBINED TOOL BOX AND STOOL
Mark Brantingham, 6137 State Rte. 45, Lisbon, Ohio 44432, and Robert Coffee, Jr., 32701 Coffee School Rd., Salem, Ohio 44460
Filed Apr. 24, 1987, Ser. No. 41,922
Term of patent 14 years
U.S. Cl. D3—73



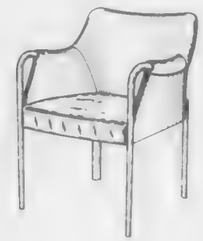
314,473
ADJUSTABLE SETTEE
Randy R. Culler, High Point, N.C., assignor to Thayer Coggin, Inc., High Point, N.C.
Filed Oct. 14, 1987, Ser. No. 108,562
Term of patent 14 years
U.S. Cl. D6—367



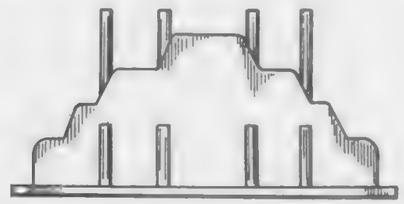
314,474
CHAIR
Larry A. Schwartz, Hartsdale, N.Y., assignor to Omni Products International, Inc., Fairfield, N.J.
Filed Aug. 10, 1987, Ser. No. 84,495
Term of patent 14 years
U.S. Cl. D6—370



314,475
ARM CHAIR
Francesco Binfare', Milan, Italy, assignor to Cassina Spa, Meda, Italy
Filed Oct. 23, 1987, Ser. No. 113,143
Claims priority, application Italy, Apr. 24, 1987, 21456/87[U]
Term of patent 14 years
U.S. Cl. D6—379



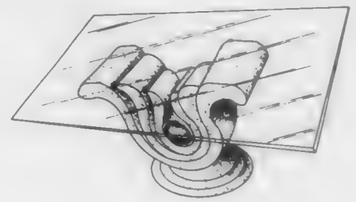
314,476
SUPPORT RACK FOR BOTTLES & CAPS
Dan A. Behrman, 25 Winsor Pl., Glen Ridge, N.J. 07028
Filed Nov. 10, 1987, Ser. No. 119,416
Term of patent 14 years
U.S. Cl. D6—467



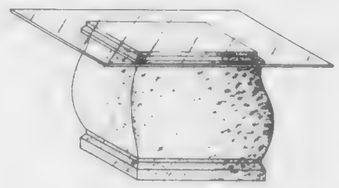
314,477
SHELF UNIT
Albin P. Richter, 11007 Peace River Road, Fort St. John B.C., Canada (V1J 4J4)
Filed Aug. 4, 1987, Ser. No. 81,882
Claims priority, application Canada, Feb. 20, 1987, 2002871
Term of patent 14 years
U.S. Cl. D6—479



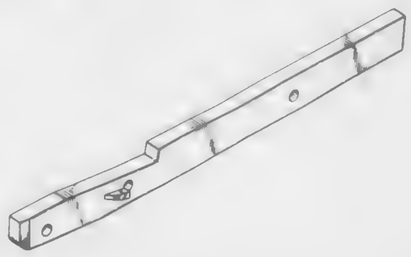
314,478
TABLE
Isaac Kubryk, 6161 E. Hwy. 12, Lodi, Calif. 95240
Filed Apr. 4, 1988, Ser. No. 177,010
Term of patent 14 years
U.S. Cl. D6—486



314,479
TABLE
Isaac Kubryk, 6161 E. Hwy. 12, Lodi, Calif. 95240
Filed Apr. 4, 1988, Ser. No. 177,023
Term of patent 14 years
U.S. Cl. D6—486

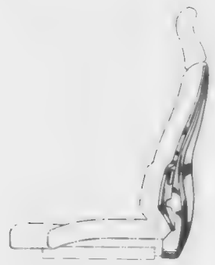


314,480
DRAWER RUNNER
Terence Hardy, Derbyshire, England, assignor to L.B. Plastics Limited, England
Filed Oct. 26, 1987, Ser. No. 114,146
Claims priority, application United Kingdom, Apr. 28, 1987, 1041830
Term of patent 14 years
U.S. Cl. D6—491

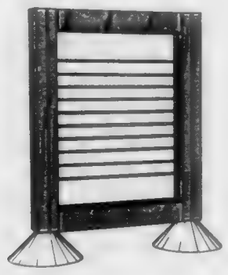


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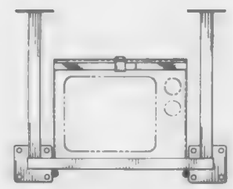
314,481
FRAME FOR A VEHICLE SEAT BACK
Edward A. Stulik, Roseville, Calif., assignor to Sears Manufacturing Co., Davenport, Iowa
Filed Apr. 12, 1988, Ser. No. 180,858
Term of patent 14 years
U.S. Cl. D6—500

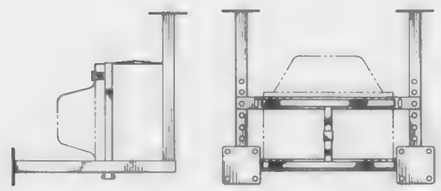


314,482
MERCHANDISE DISPLAY RACK
Herbert Walter, Mullheim/Zunzigen, Fed. Rep. of Germany, and Antonio Citterio, Milan, Italy, assignors to Fehlbaum & Co., Riehen, Switzerland
Filed Jun. 17, 1987, Ser. No. 63,592
Claims priority, application Int'l Pat. Institute, Dec. 17, 1986, DM007929
Term of patent 14 years
U.S. Cl. D6—409

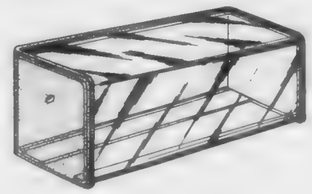


314,483
TELEVISION SUPPORT UNIT
Judy A. Zimprich, 312 W. Allyn, Janesville, Minn. 56048, and Larry W. Fennert, Rt. #1, Box 128, Waldorf, Minn. 56091
Filed Feb. 16, 1989, Ser. No. 311,206
Term of patent 14 years
U.S. Cl. D6—513

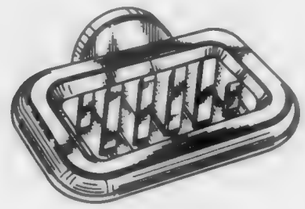




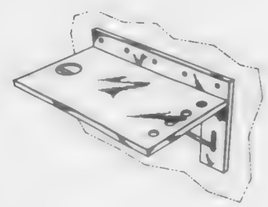
314,484
FOLDED PAPER TOWEL DISPENSER
John A. Richter, Cincinnati, Ohio, and Benito J. Hermann, Jr., Charlotte, N.C., assignors to Serendee, Inc., Cincinnati, Ohio
Filed Oct. 6, 1988, Ser. No. 254,126
Term of patent 14 years
U.S. Cl. D6—522



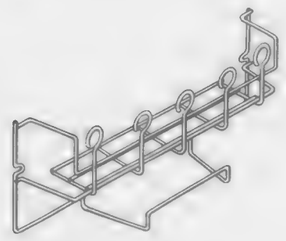
314,485
SOAP DISH
John P. Chap, Lemont, and Dorothy Greenberg, Oak Park, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Aug. 12, 1988, Ser. No. 231,239
Term of patent 14 years
U.S. Cl. D6—540



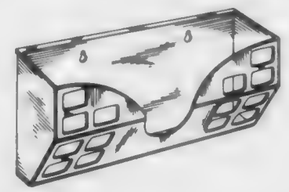
314,486
SHELF FOR AN AUTOMOBILE SPRAY PAINT BOOTH OR THE LIKE
Edward Day, 556 Broughton Ave., Bloomfield, Essex County, N.J. 07003
Filed Mar. 13, 1989, Ser. No. 322,702
Term of patent 14 years
U.S. Cl. D6—555



314,487
WALL-MOUNTABLE CADDY
Thomas R Bajek, LaGrange Park, and John P. Chap, Lemont, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Jan. 17, 1989, Ser. No. 297,595
Term of patent 14 years
U.S. Cl. D6—566



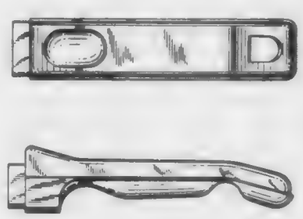
314,488
WALL MOUNTED RECEPTACLE
Eric R. Aaldenberg, Bayside, and Robert Schmidt, Freeport, both of N.Y., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Apr. 13, 1989, Ser. No. 337,732
Term of patent 14 years
U.S. Cl. D6—567



314,489
ELECTRIC MIXER
Gary Van Deursen, Upper Saddle River, N.J., and Alvaro Correa, Cheshire, Conn., assignors to Black & Decker, Inc., Newark, Del.
Filed Jun. 27, 1988, Ser. No. 211,415
Term of patent 14 years
U.S. Cl. D7—379

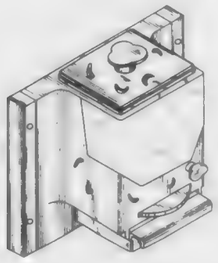


314,490
HANDLE FOR A COOKING PAN
Francois Elie, Paris, France, assignor to Terraillon, Annemasse, France
Filed Feb. 2, 1988, Ser. No. 151,259
Claims priority, application France, Aug. 6, 1987, 874669
Term of patent 14 years
U.S. Cl. D7—395



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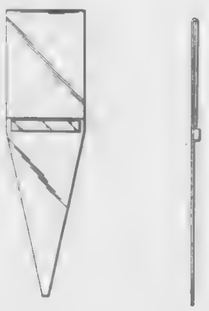
314,491
HERB AND SPICE DISPENSER OR SIMILAR ARTICLE
Judith Carter, 1143 Koster St., Eureka, Calif. 95501, and Frederick D. Spenhoff, 4716 E. San Gabriel, Fresno, Calif. 93726
Filed Apr. 25, 1988, Ser. No. 185,830
Term of patent 14 years
U.S. Cl. D7—589



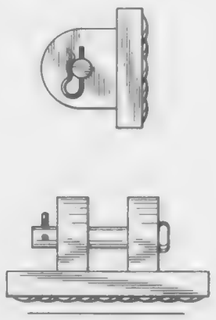
314,492
CONTAINER WITH A HANDLE
Peter D. G. Weller, Burnside, Stithians, Truro, Cornwall, and Simon N. White, Cornerways, 9 Belyars Court, The Belyars, St. Ives, Cornwall TR26 2BT, both of United Kingdom
Filed Oct. 23, 1987, Ser. No. 111,575
Claims priority, application United Kingdom, Apr. 24, 1987, 1041762
Term of patent 14 years
U.S. Cl. D7—623



314,493
PLANT MARKER STAKE
Joseph P. Keane, 11910 Franklin St., Moreno Valley, Calif. 92388
Filed Feb. 1, 1989, Ser. No. 304,840
Term of patent 14 years
U.S. Cl. D8—1



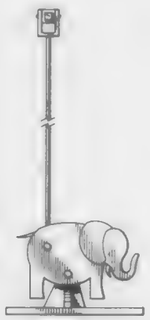
314,494
CAR EXTRACTION TOOL
Randolf O. Baldwin, 411 Hollyberry La., Lugoff, S.C. 29078
Filed Oct. 2, 1987, Ser. No. 104,032
Term of patent 14 years
U.S. Cl. D8—14



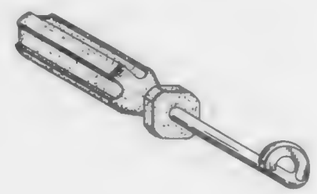
314,495
INTEGRATED-CIRCUIT PACKAGE REMOVAL TOOL
Derek J. Zupancic, 7143 Owensmouth Ave., Canoga Park, Calif. 91303
Filed Mar. 7, 1988, Ser. No. 164,640
Term of patent 14 years
U.S. Cl. D8—14



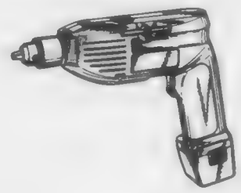
314,496
CHILD'S LIGHT SWITCH EXTENSION
Joel M. Anderson, P.O. Box 864 Westlake Dr., Montauk, N.Y. 11954
Filed Nov. 6, 1987, Ser. No. 117,653
Term of patent 14 years
U.S. Cl. D8—14



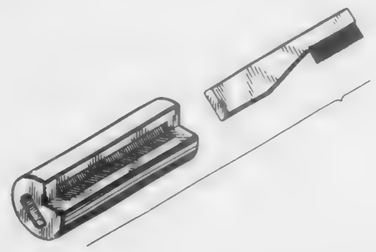
314,497
WINDSHIELD WASHER NOZZLE REMOVING TOOL
Douglas J. Symiczek, 29891 Coalinga Ct., Sun City, Calif. 92381, and Jose L. Cardenas, 20003 Rainbow Way, Cerritos, Calif. 90701
Filed Aug. 9, 1988, Ser. No. 230,115
Term of patent 14 years
U.S. Cl. D8—14



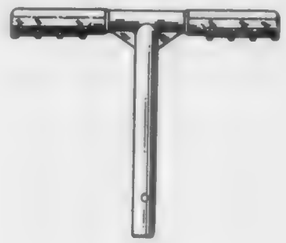
314,498
PORTABLE ELECTRIC DRILL
Kiyoshi Hoshino, Tokyo, and Shumi Akazawa, Hiroshima, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jan. 4, 1988, Ser. No. 140,836
Claims priority, application Japan, Jul. 8, 1987, 62-28089
Term of patent 14 years
U.S. Cl. D8—68



314,499
COMBINED SKI SHARPENER AND BRUSH
Frederick R. Sherman, 525 Willard, Pocatello, Id. 83201
Filed Oct. 8, 1987, Ser. No. 105,692
Term of patent 14 years
U.S. Cl. D8—91



314,500
HANDLE FOR A HAND TOOL
Robert A. Germain, Ashtabula, Ohio, assignor to Emhart Industries, Inc., Towson, Md.
Filed Jan. 19, 1988, Ser. No. 146,146
Term of patent 14 years
U.S. Cl. D8—107

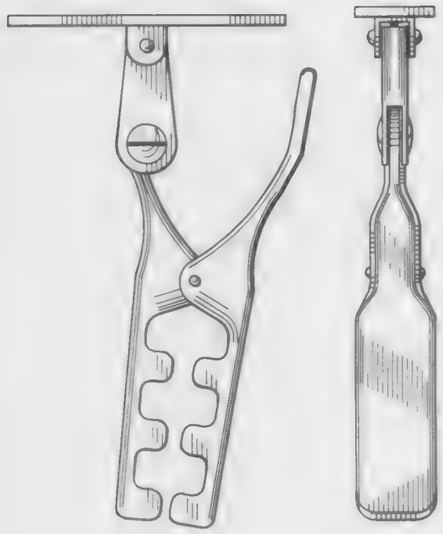


314,501
VIDEO CAMERA BRACKET
Raymond V. Pagano, 2675C Lithonia Industrial Blvd., Lithonia, Ga. 30058
Filed Jan. 11, 1988, Ser. No. 142,409
Term of patent 14 years
U.S. Cl. D8—363

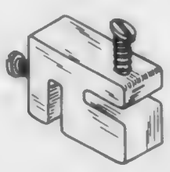


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314,502
ADJUSTABLE HAIR DRYER HOLDER
Lillie M. Weldin, 9710 NE. 142 Ave., Vancouver, Wash. 98682
Filed Nov. 8, 1988, Ser. No. 268,525
Term of patent 14 years
U.S. Cl. D8—373



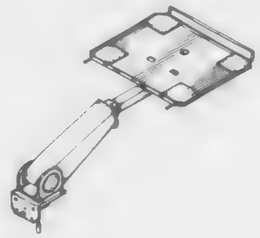
314,503
SIGN CLAMP
John W. Gilman, 1731 John Arthur Way, Lakeland, Fla. 33803
Division of Ser. No. 180,810, Apr. 11, 1988. This application Jul. 2, 1990, Ser. No. 548,490
Term of patent 14 years
U.S. Cl. D8—394



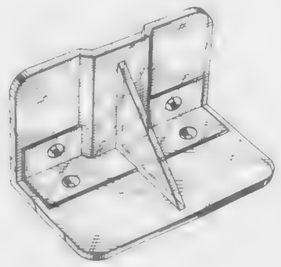
314,504
COMBINED PERFUME BOTTLE AND CLOSURE
Rene Barre, Paris, France, assignor to Brosse U.S.A., Inc., New York, N.Y.
Filed Dec. 19, 1988, Ser. No. 286,524
Term of patent 14 years
U.S. Cl. D9—307



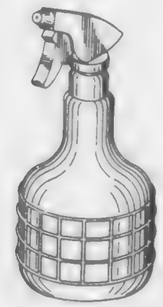
314,505
SUPPORT FOR A COMPUTER MONITOR
Chin-Fong Chen, 13F-7, No. 230, Hsin Yi Rd., Sec. 2, Taipei, Taiwan
Filed Feb. 27, 1989, Ser. No. 316,101
Term of patent 14 years
U.S. Cl. D8—380



314,506
SNOW GUARD
John R. McMullen, 1405 Brandton Rd., Mechanicsburg, Pa. 17055
Filed Nov. 2, 1988, Ser. No. 266,030
Term of patent 14 years
U.S. Cl. D9—499



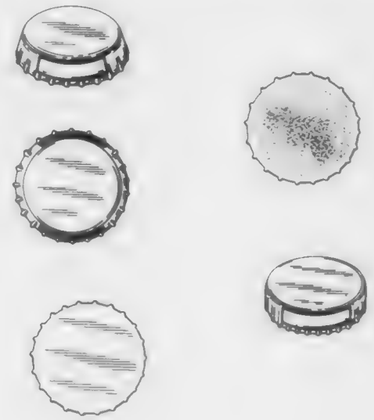
314,507
SPRAY BOTTLE
Gary Brabeck, Arlington Heights; Bruce Cohen, Winnetka; James Cohen, Northbrook; Robert Kleckauskas, Downers Grove, and Craig Scherer, Evanston, all of Ill., assignors to Arrow Plastic Manufacturing Co., Elk Grove Village, Ill.
Filed Oct. 23, 1989, Ser. No. 424,972
Term of patent 14 years
U.S. Cl. D9—300



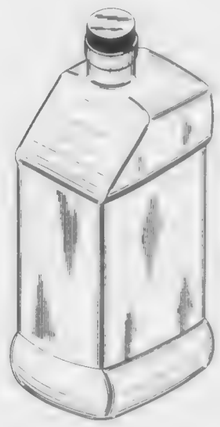




314,508
MATCH CONTAINER
Manuel E. R. Pascual, Jerez de la Frontera, Spain, assignor to Phosphosherry Corporation S.A., Jerez de la Frontera, Spain
Filed Aug. 17, 1987, Ser. No. 86,674
Claims priority, application Spain, Jul. 15, 1987, 113508
Term of patent 14 years
U.S. Cl. D9—307



314,509
BOTTLE
John S. Frazer, Barnegat Light, N.J., assignor to Castrol Limited, Wiltshire, England
Filed Jan. 22, 1986, Ser. No. 821,388
Term of patent 14 years
U.S. Cl. D9—367

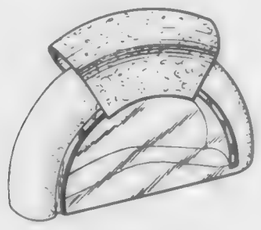


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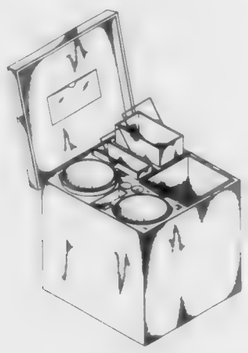
314,510
BOTTLE
Richard L. Platte, Sr., Ann Arbor, Mich., assignor to Ann Arbor International Inc., Ann Arbor, Mich.
Filed Mar. 21, 1988, Ser. No. 171,302
Term of patent 14 years
U.S. Cl. D9—376



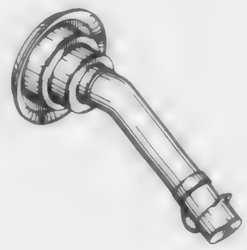
314,511
COMBINED PERFUME BOTTLE AND CLOSURE
Pierre F. Dinand, Levallois-Perret, France, assignor to R. P. Denis S.p.A., Italy
Filed Sep. 28, 1988, Ser. No. 250,427
Claims priority, application Italy, Apr. 1, 1988, 210168/88
Term of patent 14 years
U.S. Cl. D9—412



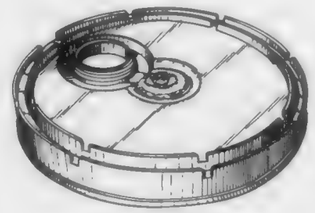
314,512
RECYCLE CONTAINER WITH REMOVABLE BINS AND THE LIKE
John E. Mazzarisi, and Catherine A. Mazzarisi, both of 29 Claverack Rd., Clifton, N.J. 07013
Filed Sep. 6, 1988, Ser. No. 239,971
Term of patent 14 years
U.S. Cl. D9—414



314,513
SPOUT
R. Steven Hardin, 324 E. Sunburst Pl., Tucson, Ariz. 85704
Filed Feb. 29, 1988, Ser. No. 161,840
Term of patent 14 years
U.S. Cl. D9—435



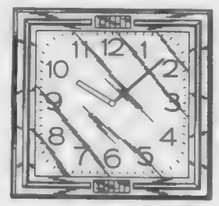
314,514
DRAINING LID
Robert J. Ten Eyck, St. Paul; Gerald L. Burns, Eagan, and Melvin A. Franzwa, Inver Grove Hts., all of Minn., assignors to Ecolab Inc., St. Paul, Minn.
Filed May 13, 1987, Ser. No. 49,683
Term of patent 14 years
U.S. Cl. D9—447



314,515
CLOCK
Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jul. 14, 1987, Ser. No. 72,848
Claims priority, application Japan, Jan. 14, 1987, 62-1087
Term of patent 14 years
U.S. Cl. D10—8



314,516
CLOCK
Masumi Mukoyama, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed May 18, 1987, Ser. No. 51,675
Claims priority, application Japan, Nov. 18, 1986, 61-45509
Term of patent 14 years
U.S. Cl. D10—24

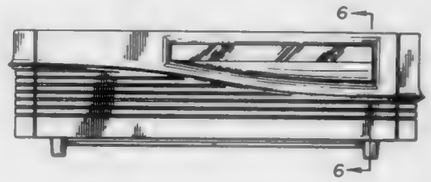


314,517
WRIST WATCH
Jean-Daniel Dubois, 8, Rue de la Sagne, 1347 - Le Sentier, Switzerland
Filed Nov. 12, 1987, Ser. No. 119,171
Claims priority, application Hague, May 12, 1987, DMA/000625
Term of patent 14 years
U.S. Cl. D10—39

314,518
WRIST WATCH
Kazuyo Kawashima, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1988, Ser. No. 147,913
Term of patent 14 years
U.S. Cl. D10—39



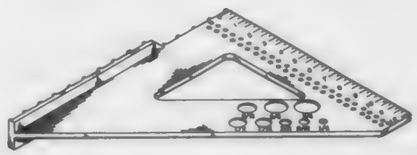
314,519
TIMING MEASURING INSTRUMENT HOUSING OR SIMILAR ARTICLE
William R. Worrell, Hopkins, Minn., assignor to Wave Technologies Corporation, Edina, Minn.
Filed May 11, 1987, Ser. No. 49,443
Term of patent 14 years
U.S. Cl. D10—40



314,520
CONSTRUCTION STUD LAYOUT TOOL
Chandra Haas, P.O. Box 1182, Modesto, Calif. 95353
Filed Oct. 11, 1988, Ser. No. 256,377
Term of patent 14 years
U.S. Cl. D10—64

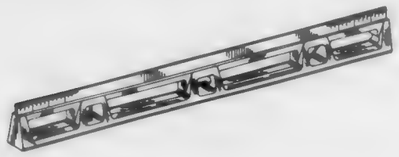


314,521
SAW GUIDE
Burtis M. Tyler, Delmar, Del., assignor to Delsquare, Inc., Delmar, Del.
Filed Oct. 31, 1988, Ser. No. 264,495
Term of patent 14 years
U.S. Cl. D10—65

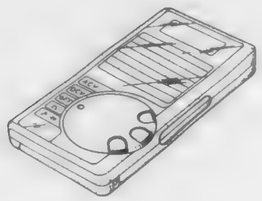


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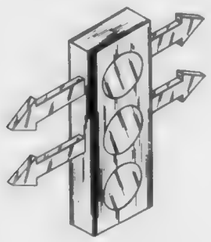
314,522
LEVEL
Randall J. Wright, 2000 Moraine End, Delafield, Wis. 53018
Filed Apr. 21, 1988, Ser. No. 184,159
Term of patent 14 years
U.S. Cl. D10—69



314,523
MULTIMETER
Makoto Omuro, Nagano, Japan, assignor to Hioki Denki Kabushiki Kaisha, Nagano, Japan
Filed Sep. 28, 1988, Ser. No. 251,170
Claims priority, application Japan, Mar. 31, 1988, 63-12954
Term of patent 14 years
U.S. Cl. D10—78



314,524
FLASHING TRAFFIC SIGNAL LIGHT
Cecilia Perry, 5646 Lucas & Hunt Rd., St. Louis, Mo. 63136
Filed Dec. 12, 1988, Ser. No. 283,525
Term of patent 14 years
U.S. Cl. D10—115



314,525
JACK STONE PENDANT
Jeffery A. Alward, Chicago, Ill., assignor to Strombecker Corporation, Chicago, Ill.
Filed Feb. 11, 1988, Ser. No. 154,873
Term of patent 14 years
U.S. Cl. D11—2



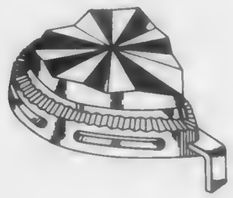
314,526
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Jul. 13, 1988, Ser. No. 218,032
Claims priority, application Hague, Jan. 14, 1988, DM/010065
Term of patent 14 years
U.S. Cl. D11—3



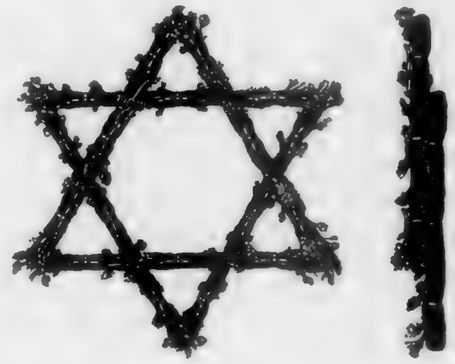
314,527
WATCHBAND
Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Oct. 13, 1988, Ser. No. 257,501
Claims priority, application Japan, Apr. 13, 1988, 14964/88
Term of patent 14 years
U.S. Cl. D11—3



314,528
JEWELRY LINK
Meang Chia, and Cheo Chia, both of Ste. #1104, Los Angeles, Calif. 90014
Filed Nov. 15, 1989, Ser. No. 436,672
Term of patent 14 years
U.S. Cl. D11—93



314,529
STAR-SHAPED WREATH
Marlene Willard, 3249 Weidner Ave., Oceanside, N.Y. 11572
Filed Oct. 16, 1987, Ser. No. 111,556
Term of patent 14 years
U.S. Cl. D11—120



314,530
HANGING FOOTBALL PLAYER PLAQUE
Victor A. Eyal, 161 Crown Cir., Longwood, Fla. 32779
Filed Aug. 12, 1987, Ser. No. 85,631
Term of patent 14 years
U.S. Cl. D11—136



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314,531
SOFT SCULPTURE WALL HANGING
Kathy Shantz, 2832 Garfield, Highland, Ind. 46322
Filed Mar. 24, 1988, Ser. No. 172,343
Term of patent 14 years
U.S. Cl. D11—137



314,532
FIGURINE
Luciano Tosanotti, 130/A Via Ferrara, I-16100 Genova, Italy
Filed Mar. 16, 1988, Ser. No. 168,740
Claims priority, application Italy, Sep. 23, 1987, 15225B/87
Term of patent 14 years
U.S. Cl. D11—160



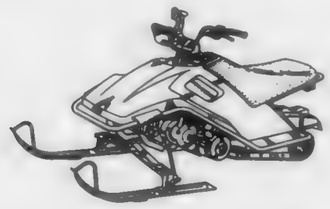
314,533
BUCKLE FASTENER
Elwood M. Fossum, 223 Douglas Dr., Soquel, Calif. 95073
Filed Oct. 7, 1988, Ser. No. 254,134
Term of patent 14 years
U.S. Cl. D11—210



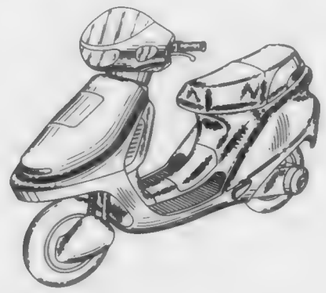
314,534
ZIPPER PULL
Oralei A. Eubank, P.O. Box 2114, Winter Haven, Fla. 33883
Filed Mar. 11, 1988, Ser. No. 166,611
Term of patent 14 years
U.S. Cl. D11—221



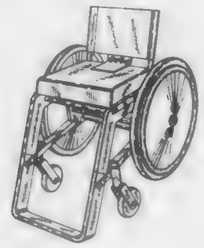
314,535
SNOWMOBILE
Yukihiko Matsue, Tokyo, Japan, assignor to Yamaha Hatsudoki K.K., Japan
Filed Mar. 16, 1987, Ser. No. 25,934
Claims priority, application Japan, Sep. 13, 1986, 61-36304
Term of patent 14 years
U.S. Cl. D12—7



314,536
MOTORCYCLE
Bean Shung Yeh, Chu Tung, Taiwan, assignor to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan
Filed Aug. 12, 1988, Ser. No. 231,786
Term of patent 14 years
U.S. Cl. D12—110



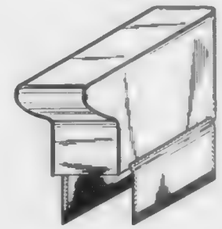
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WHEEL CHAIR
Scott F. Raney, No. 13, 564 Lindale, Springfield, Oreg. 97477
Filed Jul. 25, 1988, Ser. No. 225,135
Term of patent 14 years
U.S. Cl. D12—131



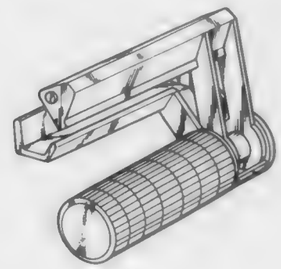
314,538
TIRE FOR VEHICLES
John Martin, Wylde Green, United Kingdom, assignor to SP Tyres UK Ltd., Birmingham, England
Filed Apr. 7, 1987, Ser. No. 35,292
Claims priority, application United Kingdom, Oct. 15, 1986, 1037407
The portion of the term of this patent subsequent to Aug. 21, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



314,539
AUTOMOBILE ARMREST
James A. Swanner, Irvine, Calif., assignor to Performance Marketing, Inc., Santa Ana, Calif.
Filed Jun. 22, 1989, Ser. No. 369,916
Term of patent 14 years
U.S. Cl. D12—155



314,540
MANUAL SUNROOF LATCH HANDLE
Werner T. Huehn, Milford, and D. Mark Trostle, Canton, both of Mich., assignors to ASC Incorporated, Southgate, Mich.
Filed Dec. 3, 1987, Ser. No. 128,516
Term of patent 14 years
U.S. Cl. D12—156

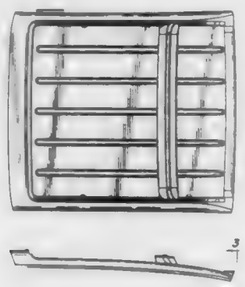


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VEHICLE ARTICLE CARRIER UNIT
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Sep. 20, 1988, Ser. No. 246,647
Term of patent 14 years
U.S. Cl. D12—157

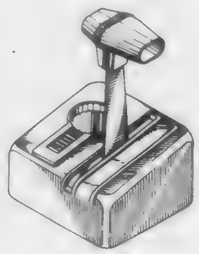


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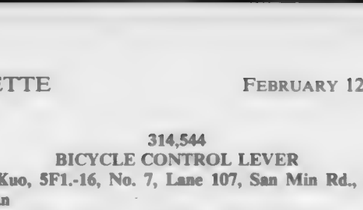
314,542
VEHICLE ARTICLE CARRIER
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Sep. 20, 1988, Ser. No. 246,648
Term of patent 14 years
U.S. Cl. D12—157



314,544
BICYCLE CONTROL LEVER
Jie H. Kuo, 5F1.-16, No. 7, Lane 107, San Min Rd., Taipei, Taiwan
Filed Dec. 21, 1987, Ser. No. 135,746
Term of patent 14 years
U.S. Cl. D12—179



314,545
TRUCK SPOILER
Joseph P. Hutchins, Strongsville, Ohio, assignor to Promotional Trim Conversions, Inc., Elyria, Ohio
Filed Nov. 14, 1988, Ser. No. 270,297
Term of patent 14 years
U.S. Cl. D12—181



314,543
VEHICLE TRAILER HITCH ADAPTED BICYCLE CARRIER
Stanley G. Ott, R.R. 1, Box 13 R, Marble Rock, Iowa 50653, and Roger E. Jacobson, 10890 Fieldcrest Rd., Eden Prairie, Minn. 55344
Filed Aug. 9, 1988, Ser. No. 230,151
Term of patent 14 years
U.S. Cl. D12—158



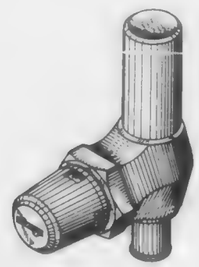
314,546
CAR SPEAKER ENCLOSURE
Claudio A. Insaurralde, 461 Poplar Ave., San Bruno, Calif. 94066
Filed Jul. 5, 1988, Ser. No. 215,453
Term of patent 14 years
U.S. Cl. D14—210



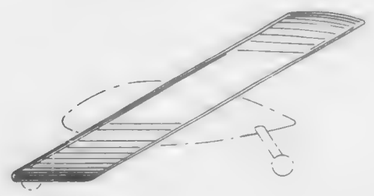
314,547
TRICYCLE
Ray G. Kelly, Kirkwood, Mo., assignor to Angeler Nursery Toys, Inc., Pacific, Mo.
Division of Ser. No. 131,522, Dec. 11, 1987, Pat. No. D. 304,813.
This application Jul. 31, 1989, Ser. No. 387,120
Term of patent 14 years
U.S. Cl. D12—112



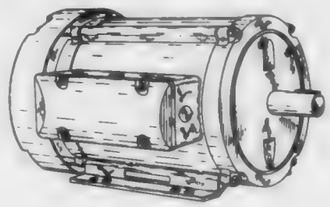
314,548
GAS TANK VENT FOR BOATS
Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Jul. 1, 1988, Ser. No. 214,652
Term of patent 14 years
U.S. Cl. D12—317



314,549
AIRCRAFT WING
David A. Myers, Rte. 1, Box 326A, New London, Wis. 54961
Filed Jul. 28, 1988, Ser. No. 225,706
Term of patent 14 years
U.S. Cl. D12—345



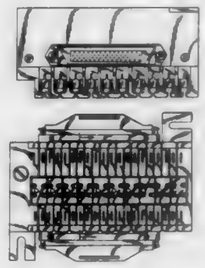
314,550
DYNAMOELECTRIC MACHINE
Robert L. Sieber, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Filed Feb. 27, 1987, Ser. No. 20,256
Term of patent 14 years
U.S. Cl. D13—114



314,551
ELECTRIC CABLE
Bruce A. Brisson, 3037 Grass Valley Hwy., Auburn, Calif. 95603
Filed Dec. 1, 1988, Ser. No. 278,929
Term of patent 14 years
U.S. Cl. D13—133



314,552
TELEPHONE CONNECTOR BLOCK OR SIMILAR ARTICLE
Helmuth Neuwirth, Garden City, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Oct. 1, 1987, Ser. No. 103,373
Term of patent 14 years
U.S. Cl. D13—147

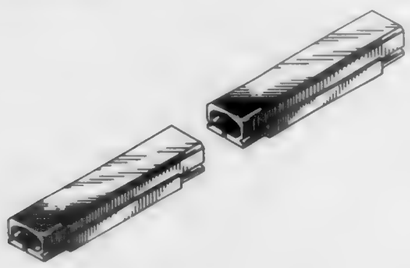


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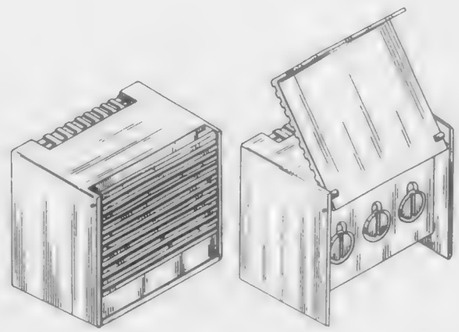
314,553
ILLUMINATED MARINA ELECTRICAL POWER CENTER
Donald H. Stoll, and Paul H. Prahl, both of Mankato, Minn., assignors to General Electric Company, New York, N.Y.
Filed Aug. 24, 1988, Ser. No. 235,578
The portion of the term of this patent subsequent to Jan. 1, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—152



314,554
PROTECTIVE RESILIENT ENCLOSURE FOR WIRES, CABLES AND OTHER ELONGATE ARTICLES
Dennis D. Betts, Euclid, Ohio, assignor to Specialty Creations, Inc., Euclid, Ohio
Filed Oct. 5, 1987, Ser. No. 105,684
Term of patent 14 years
U.S. Cl. D13—155



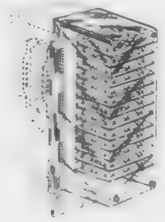
314,555
MODULE FOR SELECTIVE SIGNAL RESPONSE
Robert J. Brown, Jr., Boca Raton, Fla.; Bahattin ERturk, Rollingmeadows, and Jon W. Hauser, Geneva, both of Ill., assignors to Teletimer International, Inc., Boca Raton, Fla.
Filed Nov. 16, 1987, Ser. No. 121,582
Term of patent 14 years
U.S. Cl. D13—164



314,556
SWITCH GUARD
Robert D. Aggson, Boulder, Colo., assignor to Aggson Family, Inc., Boulder, Colo.
Filed Jul. 18, 1989, Ser. No. 381,513
Term of patent 14 years
U.S. Cl. D13—173



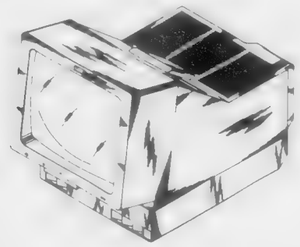
314,557
TELEPHONE SURGE SUPPRESSOR
James T. Fesmire, and James A. Ford, both of Greensboro, N.C., assignors to Power Integrity Corp., Greensboro, N.C.
Filed Feb. 15, 1990, Ser. No. 481,374
Term of patent 14 years
U.S. Cl. D13—178



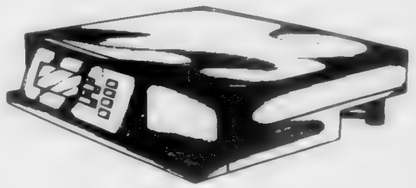
314,558
ELECTRONIC COMPUTER
Masaaki Iino, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Aug. 22, 1988, Ser. No. 234,837
Claims priority, application Japan, Feb. 25, 1988, 63-7192
Term of patent 14 years
U.S. Cl. D14—106



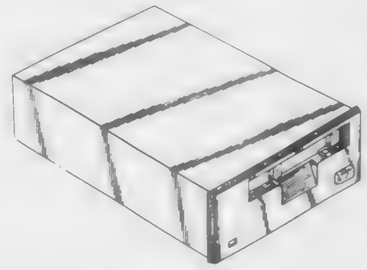
314,559
COMPUTER DISPLAY STATION
Larry S. Foster, Lexington, Ky.; Richard F. Sapper, Montagnola, Switzerland; Steven A. Silverstein, and James P. Wang, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 11, 1989, Ser. No. 419,858
Term of patent 14 years
U.S. Cl. D14—106



314,560
MODEM OR SIMILAR ARTICLE
Peter H. Muller, Los Gatos; Peter E. Lowe, Palo Alto, and Randy J. Bleske, San Jose, all of Calif., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.
Continuation-in-part of Ser. No. 47,058, May 8, 1987, Pat. No. D. 304,936. This application Jun. 2, 1988, Ser. No. 201,675
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—107

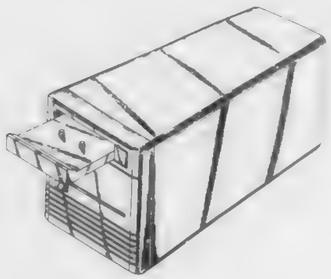


314,561
STREAMING CASSETTE TAPE DRIVE
Takao Watanabe, Tokyo, Japan, assignor to TEAC Corporation, Japan
Filed May 8, 1989, Ser. No. 348,765
Claims priority, application Japan, Nov. 11, 1988, 63-44194
Term of patent 14 years
U.S. Cl. D14—108

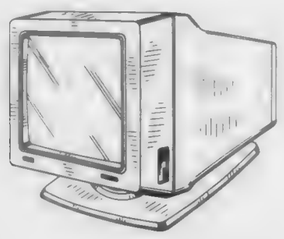


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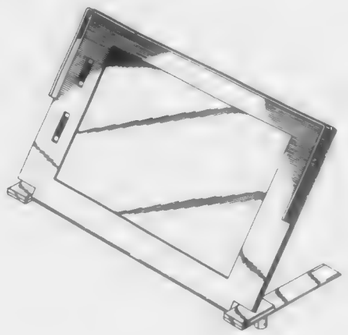
314,562
STREAMING CASSETTE TAPE DRIVE
Masafumi Ito, Tokyo; Shigeru Hasegawa, Kodaira; Minoru Sube, Hachioji, and Katsuhiro Takashima, Yokohama, all of Japan, assignors to TEAC Corporation, Japan
Filed Jul. 18, 1989, Ser. No. 381,163
Claims priority, application Japan, Sep. 26, 1988, 63-37642
Term of patent 14 years
U.S. Cl. D14—108



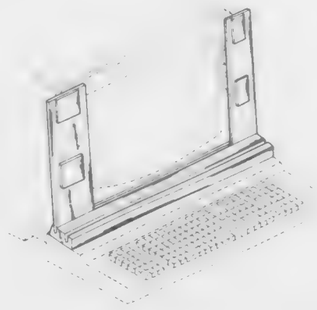
314,563
VIDEO DISPLAY MONITOR
Bernard Maurer, Melrose; Robert Faranda, Acton, both of Mass., and Hirotomi Teranishi, Monterey Park, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Apr. 23, 1987, Ser. No. 41,591
Term of patent 14 years
U.S. Cl. D14—113



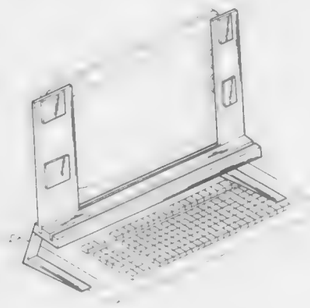
314,564
DISPLAY FOR PERSONAL COMPUTER
Douglas R. Grundstrom, San Jose; Dennis J. Boyle, Menlo Park; Nelson S. Au, Foster City; Michael J. Nuttal, Palo Alto, and Matthew A. Herron, Menlo Park, all of Calif., assignors to Dynabook Technologies Corporation, Westlake Village, Calif.
Filed Dec. 22, 1988, Ser. No. 288,109
Term of patent 14 years
U.S. Cl. D14—113



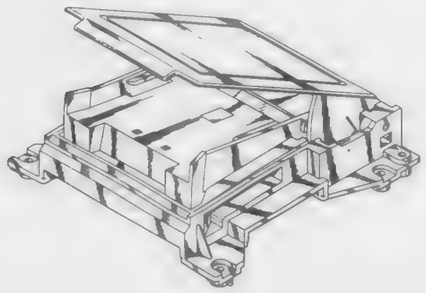
314,565
DOCUMENT HOLDER FOR ATTACHMENT TO A COMPUTER KEYBOARD
Dale G. Davis, Warren, Mich., and Shane E. Davis, 8228 Paige, Warren, Mich. 48089, assignors to Shane E. Davis, Warren, Mich.
Filed Sep. 2, 1987, Ser. No. 92,286
The portion of the term of this patent subsequent to Feb. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



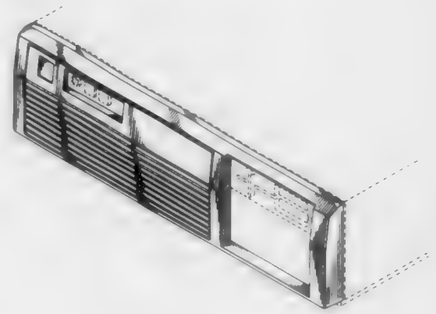
314,566
DOCUMENT HOLDER FOR COMPUTER KEYBOARD
Dale G. Davis, Warren, Mich., and Shane E. Davis, 8228 Paige, Warren, Mich. 48089, assignors to Shane E. Davis, Warren, Mich.
Filed Sep. 2, 1987, Ser. No. 92,287
The portion of the term of this patent subsequent to Feb. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



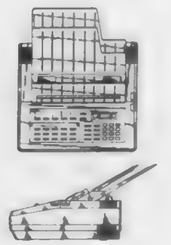
314,567
MEMORY CARTRIDGE HOLDER
Norio Ichitsubo, Yao, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan
Filed Feb. 21, 1989, Ser. No. 312,251
Claims priority, application Japan, Aug. 24, 1988, 63-33513
Term of patent 14 years
U.S. Cl. D14—114



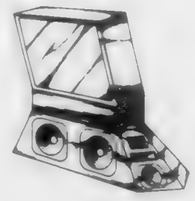
314,568
FRONT PANEL FOR PERSONAL COMPUTER
George E. Martin, Austin, Tex., assignor to Compuadd Corporation, Austin, Tex.
Filed Nov. 11, 1988, Ser. No. 270,125
Term of patent 14 years
U.S. Cl. D14—115



314,569
FACSIMILE TRANSCEIVER
Hideo Tsuruoka, Chiba, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Mar. 15, 1988, Ser. No. 168,328
Claims priority, application Japan, Aug. 21, 1987, 33690/87; Aug. 21, 1987, 33691/87; Aug. 21, 1987, 33692/87
Term of patent 14 years
U.S. Cl. D14—118

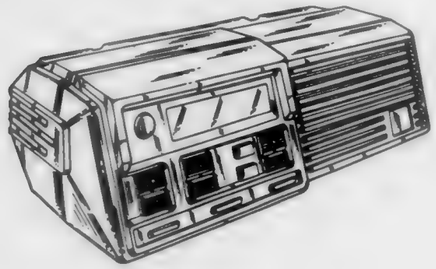


314,570
STEREO TV
Joel C. Newman, 110 Drury Rd., Shoals, Ala. 35630
Division of Ser. No. 61,172, Jun. 10, 1989. This application Dec. 7, 1989, Ser. No. 447,504
Term of patent 14 years
U.S. Cl. D14—126

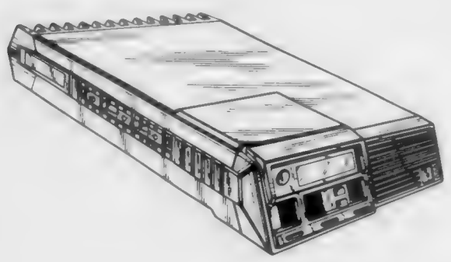


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314,571
TWO-WAY MOBILE RADIO
Douglas M. Dickson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Aug. 1, 1988, Ser. No. 226,573
Term of patent 14 years
U.S. Cl. D14—137



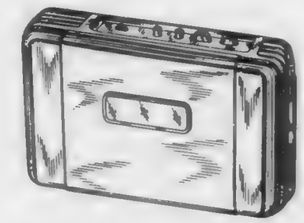
314,572
TWO-WAY MOBILE RADIO
Douglas M. Dickson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Aug. 1, 1988, Ser. No. 226,576
Term of patent 14 years
U.S. Cl. D14—137

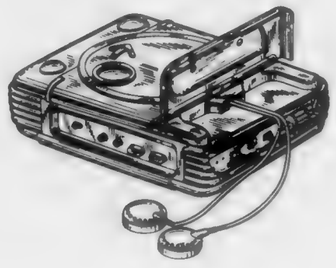


314,573
PORTABLE RADIO TELEPHONE SET
Fumiyuki Kobayashi, and Kozo Maemura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 26, 1989, Ser. No. 427,290
Claims priority, application Japan, Apr. 28, 1989, 1-16178
Term of patent 14 years
U.S. Cl. D14—138



314,574
COMBINED TAPE PLAYER AND EARPHONE
Kazue Kato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 16, 1988, Ser. No. 232,877
Claims priority, application Japan, Feb. 19, 1988, 63-6652
Term of patent 14 years
U.S. Cl. D14—163

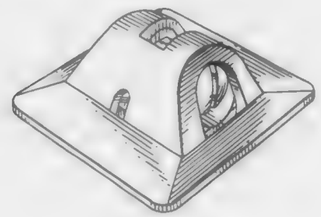




314,575
LOUDSPEAKER CABINET
Arthur C. Wegner, Spokane, Wash., assignor to Soundhour Electronics Corporation, Spokane, Wash.
Filed Feb. 12, 1985, Ser. No. 700,759
Term of patent 14 years
U.S. Cl. D14—210

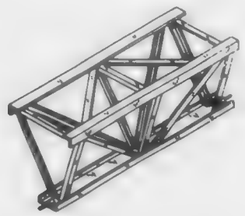


314,576
COMBINED BASE AND COVER FOR AN ANTENNA
David A. Hutchison, Solon, and James Hadzoglou, Mayfield Hts., both of Ohio, assignors to Orion Industries, Inc., Solon, Ohio
Filed Aug. 27, 1987, Ser. No. 90,202
Term of patent 14 years
U.S. Cl. D14—238

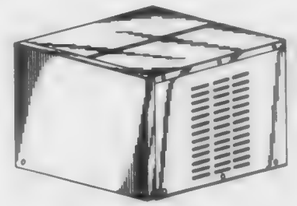


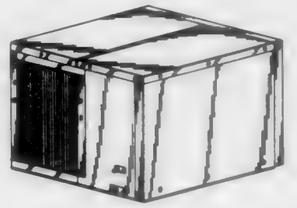
314,577
TELEPHONE PROTECTOR OR SIMILAR ARTICLE
Andrew Strauss, FreshMeadows, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Dec. 18, 1987, Ser. No. 135,151
Term of patent 14 years
U.S. Cl. D14—240

314,578
MATERIAL SPREADER FRAME
Donald R. Morrison, Charlotte, N.C., assignor to Amida Industires, Inc., Rock Hill, S.C.
Filed Feb. 23, 1988, Ser. No. 159,568
Term of patent 14 years
U.S. Cl. D15—13

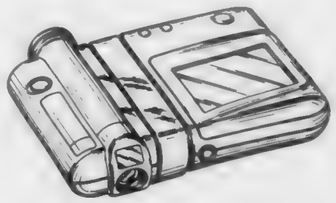


314,579
ICE MAKER CABINET
Richard D. Maxwell, and James S. Guffey, both of Spirit Lake, Iowa, assignors to Crystal Tips, Inc., Spirit Lake, Iowa
Filed Jul. 27, 1988, Ser. No. 225,073
Term of patent 14 years
U.S. Cl. D15—80



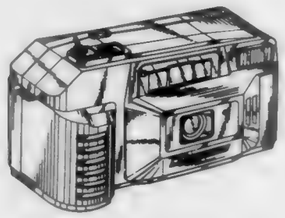


314,580
MAGNETIC DISC STILL CAMERA
Toru Shinano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 2, 1989, Ser. No. 346,607
Claims priority, application Japan, Nov. 8, 1988, 63-43792
Term of patent 14 years
U.S. Cl. D16—202

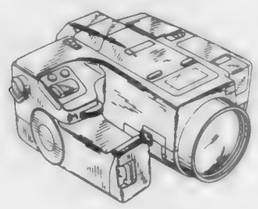


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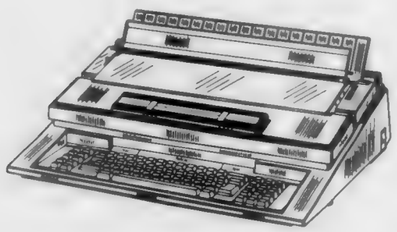
314,581
CAMERA
Eunhi Ko, Seoul, Rep. of Korea, assignor to Samsung Precision Industries, Co. Ltd., Changwon, Rep. of Korea
Filed Jan. 8, 1987, Ser. No. 1,550
Term of patent 14 years
U.S. Cl. D16—209



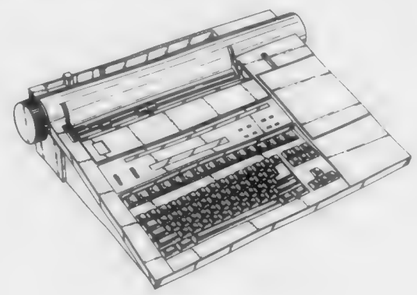
314,582
CAMERA
Yoshihisa Minakawa, Tokyo, and Tetsuya Goto, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 8, 1988, Ser. No. 179,131
Claims priority, application Japan, Oct. 9, 1987, 041,233/87
Term of patent 14 years
U.S. Cl. D16—217 R



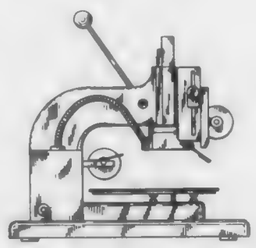
314,583
ELECTRONIC TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Jul. 20, 1988, Ser. No. 221,629
Claims priority, application Italy, Feb. 22, 1988, 52911/88[U]
Term of patent 14 years
U.S. Cl. D18—1



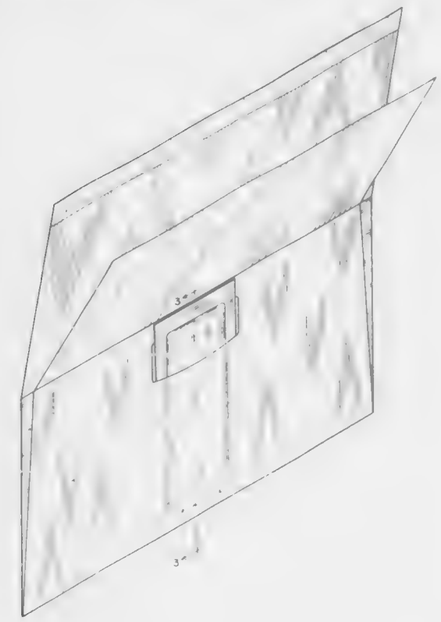
314,584
COMBINED THERMAL LETTERING AND PAGE LAYOUT PRINTER
Jeffrey J. Ivarson, San Rafael; Courtney D. Reeser, Mill Valley, and Daniel J. Riley, San Francisco, all of Calif., assignors to Varitronic Systems, Inc., Minneapolis, Minn.
Filed Jan. 12, 1989, Ser. No. 296,535
Term of patent 14 years
U.S. Cl. D18—13

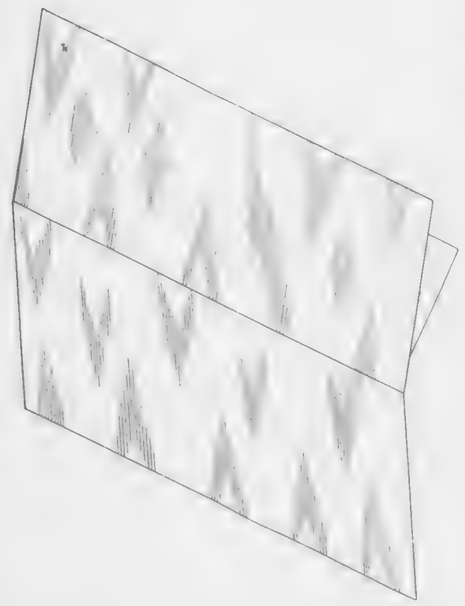


314,585
PRINTING MACHINE
Chun M. W. Chan, Hong Kong, Hong Kong, assignor to Space Lab (Hong Kong) Enterprises Limited, Hong Kong, Hong Kong
Filed Dec. 31, 1986, Ser. No. 911
Term of patent 14 years
U.S. Cl. D18—14

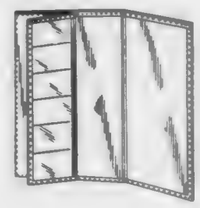


314,586
COMBINED MAILING ENVELOPE AND SAMPLER THEREFOR
Gaines P. Campbell, Jr., Lookout Mountain, Tenn., assignor to Arcade, Inc., Chattanooga, Tenn.
Filed Jan. 17, 1989, Ser. No. 297,317
Term of patent 14 years
U.S. Cl. D19—3



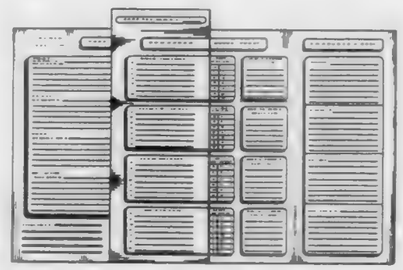


314,587
BRIEFCASE
Raymond W. Young, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.
Filed Mar. 31, 1988, Ser. No. 176,395
Term of patent 14 years
U.S. Cl. D19—26



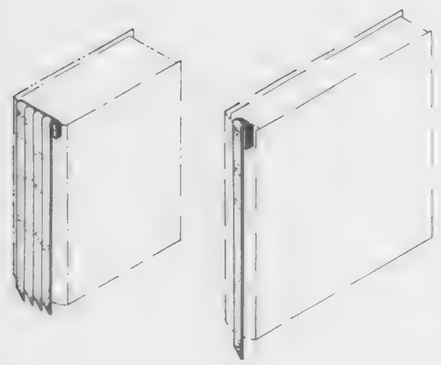
314,588
MEDICATION RECORD
Charles R. Denham, 3011 IH 35, Austin, Tex. 78722
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Term of patent 14 years
U.S. Cl. D19—26





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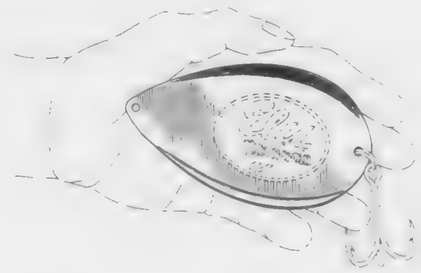
314,589
BOOKMARK
Joel F. Cooley, 4311 Forest Park Blvd., St. Louis, Mo. 63108
Filed Nov. 27, 1989, Ser. No. 441,412
Term of patent 14 years
U.S. Cl. D19—34



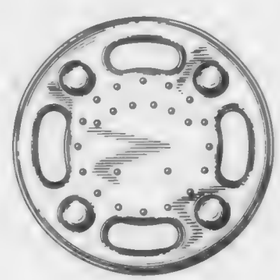
314,590
PEN
Alfonso R. Molina, 44 Calle 2-00 Zona 12, Colonia Monte Maria, Guatemala
Filed Nov. 13, 1984, Ser. No. 670,281
Term of patent 14 years
U.S. Cl. D19—42



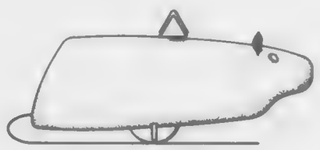
314,591
ADVERTISING SIGN
Donald O. Carstensen, 3660 W. 78th Ave., Merrillville, Ind. 46410
Filed Nov. 12, 1987, Ser. No. 119,432
Term of patent 14 years
U.S. Cl. D20—29



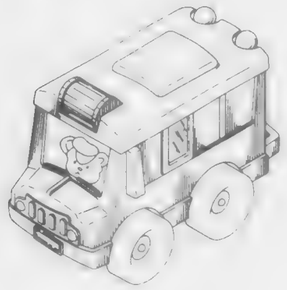
314,592
ELECTRONIC GAME HOUSING
Joe Feurey, 29 Washington Sq. W., New York, N.Y. 10011
Filed Dec. 1, 1988, Ser. No. 278,422
Term of patent 14 years
U.S. Cl. D21—13



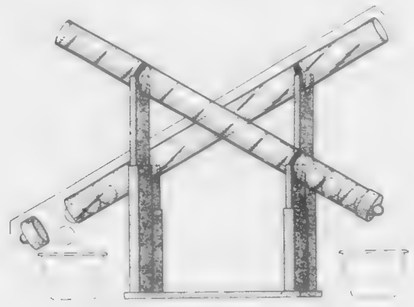
314,593
SIMULATIVE MOUSE TOY
Angela R. Crist, and Ronald L. Brookshire, both of 11345 Post Hill Rd., Lakeside, Calif. 92040
Filed Mar. 14, 1988, Ser. No. 167,428
Term of patent 14 years
U.S. Cl. D21—188



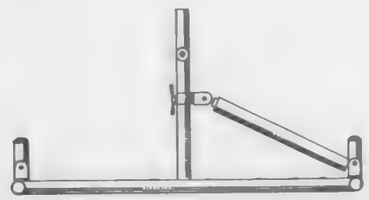
314,594
TOY VEHICLE
Martin M. Trossman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 11, 1988, Ser. No. 256,295
Term of patent 14 years
U.S. Cl. D21—140



314,595
TUBULAR BALL-RUN GAME
Marcia Stevenson, 314 E. 84th St., New York, N.Y. 10028
Filed Jul. 10, 1987, Ser. No. 71,820
Term of patent 14 years
U.S. Cl. D21—143



314,596
ARM AND SHOULDER PHYSICAL EXERCISER
Morris J. Cherry, P.O. Box 443, Shelbyville, Ind. 46176, and John W. Coan, 3549 Brookside Pkwy., Indianapolis, Ind. 46201
Filed Jun. 7, 1988, Ser. No. 203,214
Term of patent 14 years
U.S. Cl. D21—195



314,597
LOW IMPACT STAIR CLIMBING EXERCISE APPARATUS
Timothy O. Armstrong, Bellevue, Wash.; John W. Bull, Irvine, Calif., and David B. Smith, Bellevue, Wash., assignors to Precor Incorporated, Bothell, Wash.
Continuation-in-part of Ser. No. 109,103, Oct. 21, 1987, Pat. No. D. 304,358, which is a continuation-in-part of Ser. No. 12,119, Feb. 6, 1987, Pat. No. D. 302,451. This application Feb. 9, 1989, Ser. No. 307,373
Term of patent 14 years
U.S. Cl. D21—195

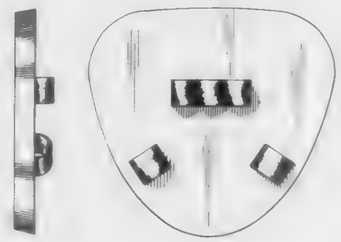


314,598
TOY BALL
James O. Capper, 4 Waverley Drive, Cheadle Hulme Cheshire, and Ian T. Revell, 3 Whitebear Yard, Canute Place, Knutsford, both of England
Filed Jun. 23, 1988, Ser. No. 210,125
Claims priority, application United Kingdom, Jan. 14, 1988, 1047709
Term of patent 14 years
U.S. Cl. D21—204



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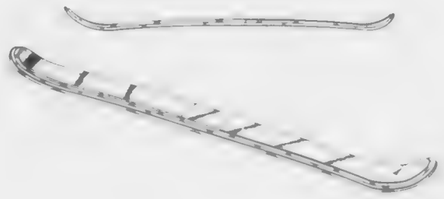
314,599
BASEBALL TRAINING ARTICLE
Peter C. Birmingham, 117 Pumpkin La., Syracuse, N.Y. 13219
Filed Oct. 13, 1987, Ser. No. 107,531
Term of patent 14 years
U.S. Cl. D21—213



314,600
GOLF CLUB GRIP
John Tosti, 5727 Buena Vista Dr., Vancouver, Wash. 98661
Filed Nov. 23, 1987, Ser. No. 124,470
Term of patent 14 years
U.S. Cl. D21—222

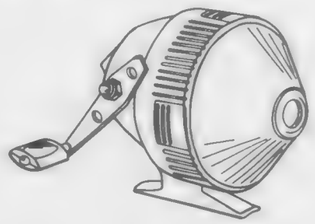


314,601
SKI WITH TRANSPARENT UPPER FOREPORTION
Adrian J. Floreani, Lakewood, Colo., assignor to Richard Floreani and Eleanor Floreani, both of Denver, Colo.
Filed Apr. 15, 1987, Ser. No. 39,599
Term of patent 14 years
U.S. Cl. D21—229

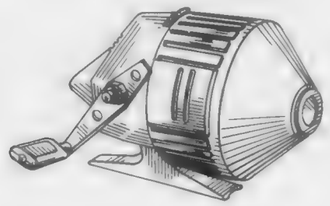


314,602
ARROW REST
Roger Grover, 1605 Treanor, Saginaw, Mich. 48601
Filed Jul. 17, 1989, Ser. No. 380,269
Term of patent 14 years
U.S. Cl. D22—107

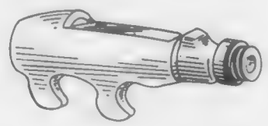
314,603
SPIN CAST FISHING REEL
Dennis R. Jackson, Tulsa, Okla., and Richard J. Robbins, Derby, Kans., assignors to Zebco Corporation, Tulsa, Okla.
Filed Jul. 27, 1988, Ser. No. 225,011
Term of patent 14 years
U.S. Cl. D22—141



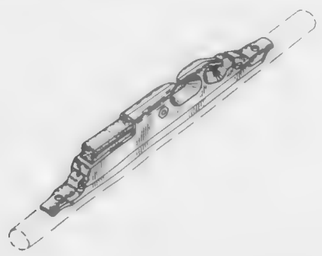
314,604
FISHING REEL
Dennis R. Jackson, Tulsa, Okla., and Richard J. Robbins, Derby, Kans., assignors to Zebco Corporation, Tulsa, Okla.
Filed Jul. 27, 1988, Ser. No. 225,012
Term of patent 14 years
U.S. Cl. D22—141



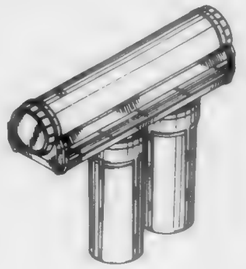
314,605
DOUBLE TRIGGERED REEL SEAT
Jackie W. Justis, Coconut Creek, Fla., assignor to Zebco Corporation, Tulsa, Okla.
Filed Jul. 25, 1988, Ser. No. 223,996
Term of patent 14 years
U.S. Cl. D22—142



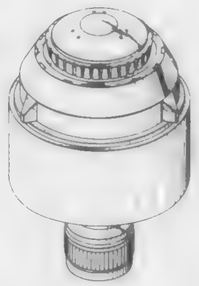
314,606
LINE CUTTING TOOL
Larry D. Banta, Hillsboro, Oreg., assignor to LCD American, Inc., Hillsboro, Oreg.
Filed Dec. 21, 1987, Ser. No. 135,617
Term of patent 14 years
U.S. Cl. D22—149



314,607
WATER PURIFIER
Jeffrey Kapec, West Port; Samuel Montague, Norwalk, and Kazuma Tanaka, Cos Cob, all of Conn., assignors to Electrolux Water Systems, Inc., Marietta, Ga.
Filed Nov. 16, 1989, Ser. No. 438,900
Term of patent 14 years
U.S. Cl. D23—209

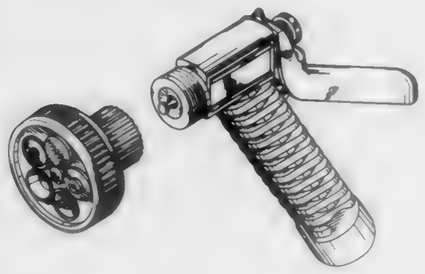


314,608
HEAD FOR A SHOWER OR HAND SPRAY
Constantin Presman, Bat-Yam, Israel, assignor to AMCOR Ltd., Tel Aviv, Israel
Filed Dec. 23, 1988, Ser. No. 290,285
Claims priority, application Israel, Aug. 18, 1988, 14085
Term of patent 14 years
U.S. Cl. D23—213

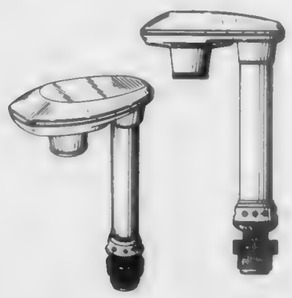


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314,609
WATER SPRAY GUN
Maw-Shian Liaw, No. 5, Alley 2, Lane 124, Sec. 3, Chien-Kuo Rd., Minhsiung Hsiang Chiayi Hsien, Taiwan, R. O. C., Taiwan
Filed Sep. 30, 1988, Ser. No. 252,358
Term of patent 14 years
U.S. Cl. D23—226



314,610
TOILET TANK FILL VALVE
Shu-Yuan Chen, No. 15, Alley 5, Lane 217, Chung Hsiao East Road, Sec. 3, Taipei, Taiwan
Filed Sep. 21, 1988, Ser. No. 247,301
Term of patent 14 years
U.S. Cl. D23—236



314,611
BATHTUB OR THE LIKE
Donald W. Doman, Janesville, Wis.; Paul P. Kolada, Bexley, Ohio, and Todd D. Dannenberg, Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jul. 23, 1987, Ser. No. 76,665
Term of patent 14 years
U.S. Cl. D23—281

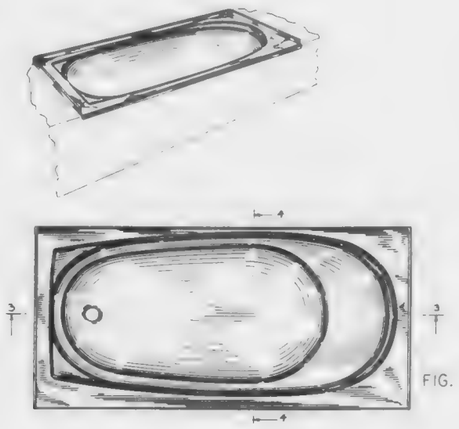
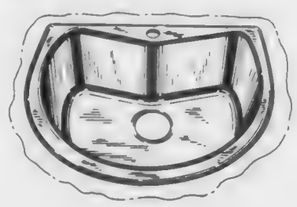
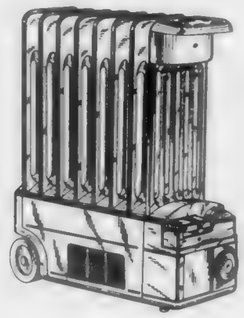


FIG.

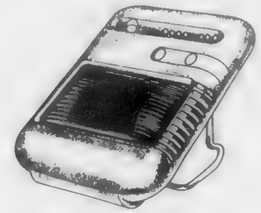
314,612
SINK
Bruce M. Sauter, Kohler, Wis., and James G. Bruni, Glendale, Calif., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 30, 1987, Ser. No. 44,997
Term of patent 14 years
U.S. Cl. D23—294



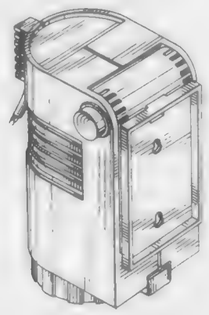
314,613
MOBILE ELECTRIC RADIATOR
Giuseppe De'Longhi, Treviso, Italy, assignor to De'Longhi S.p.A., Treviso, Italy
Filed Dec. 11, 1987, Ser. No. 131,545
Term of patent 14 years
U.S. Cl. D23—330



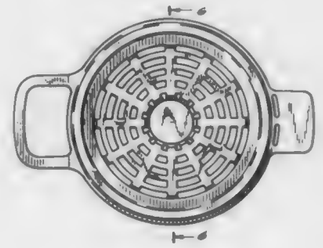
314,614
HEATER OR COOLING FAN
Lih-Sheng Ko, 3F, No. 245, Jaho St, Taipei, Taiwan
Filed Nov. 20, 1989, Ser. No. 438,229
Term of patent 14 years
U.S. Cl. D23—328



314,615
PORTABLE ELECTRIC HEATER
Michael W. Hetherington, R.R. #1, Mount Albert, Ontario, Canada L0G 1M0
Filed Aug. 4, 1988, Ser. No. 228,046
Claims priority, application Canada, Feb. 5, 1988, 05028816
Term of patent 14 years
U.S. Cl. D23—335



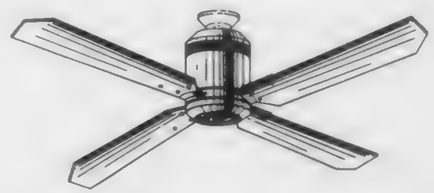
314,616
DISPOSABLE FILTER HOLDER
Kenneth V. Pepper, Plymouth, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.
Continuation-in-part of Ser. No. 51,362, May 19, 1987, abandoned. This application Sep. 11, 1987, Ser. No. 96,143
Term of patent 14 years
U.S. Cl. D23—365



314,617
COMBINED PORTABLE FAN AND LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Apr. 21, 1987, Ser. No. 41,761
Claims priority, application United Kingdom, Nov. 18, 1986, 1038140
Term of patent 14 years
U.S. Cl. D23—370

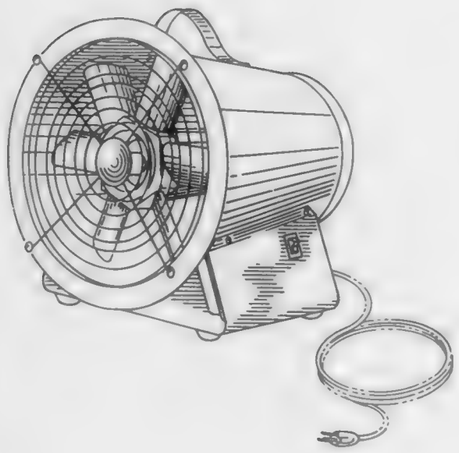


314,618
CEILING FAN
Fong S. Yen, Floor 7 Alley No. 147 Ta An Road, Section 1, Taipei, Taiwan
Filed Nov. 9, 1989, Ser. No. 432,399
Term of patent 14 years
U.S. Cl. D23—377



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314,619
AXIAL AIR BLOWER
Allan E. Beavers, 638 S. Surrey Ct., Grand Junction, Colo. 81501, and Robert A. Fulcher, 3229 N. Ridge Dr., Grand Junction, Colo. 81506
Filed Jun. 26, 1989, Ser. No. 371,708
Term of patent 14 years
U.S. Cl. D23—383



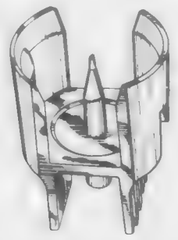
314,620
MASSAGER
Anthony Battaglia, 386 NE. 191st St., North Miami Beach, Fla. 33179
Filed Jan. 25, 1988, Ser. No. 148,227
Term of patent 14 years
U.S. Cl. D24—36



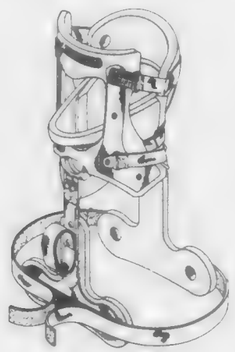
314,621
TEETHING RING
Michael S. Bernstein, Natick; Michael I. Lerner, Brookline, both of Mass., and David W. Crossley, Woonsocket, R.I., assignors to Safety 1st, Inc., Chestnut Hill, Mass.
Filed May 15, 1989, Ser. No. 352,818
Term of patent 14 years
U.S. Cl. D24—45



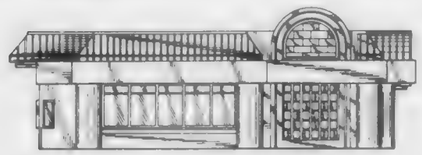
314,622
TRANSFER CANNULA
Lars-Erik Andersson, Mjolby; Arne T. Eek, Trosa; Anders T. Kers, Nykvarn; Nils B. Nilson, Mjolby, and Nils-Ake W. Ternerot, Sodertalje, all of Sweden, assignors to AB Astra, Sodertalje, Sweden
Filed Dec. 16, 1987, Ser. No. 133,515
Claims priority, application Sweden, Jun. 18, 1987, 87-1422
Term of patent 14 years
U.S. Cl. D24—53



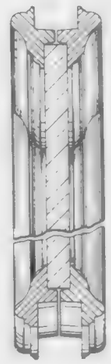
314,623
COMBINED EMERGENCY MEDICAL COLLAR, STABILIZER AND HEAD IMMOBILIZER
Anthony Calabrese, Philadelphia, and Sandy Scuilli, Richboro, both of Pa., assignors to Charles Greiner & Company, Inc., Westville, N.J.
Filed Mar. 18, 1988, Ser. No. 169,808
Term of patent 14 years
U.S. Cl. D24—64



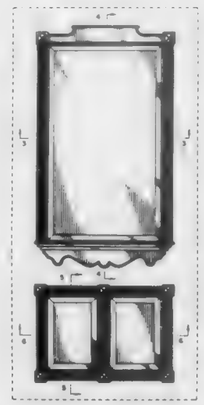
314,624
BUILDING
William F. Babcock, Akron, and Juerg Schmid, Bath, both of Ohio, assignors to Nathan's Famous, Inc., New York, N.Y.
Filed Sep. 15, 1988, Ser. No. 245,066
Term of patent 14 years
U.S. Cl. D25—25



314,625
DOOR PANEL
Roger C. Hall, Jasper, Tex., assignor to Visador Company, Jasper, Tex.
Filed Oct. 24, 1988, Ser. No. 261,059
Term of patent 14 years
U.S. Cl. D25—48

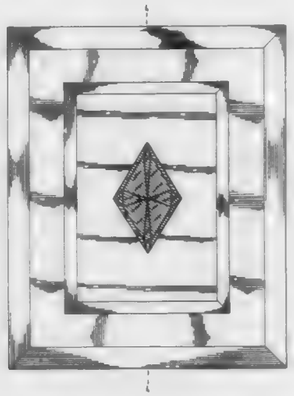


314,626
DOOR PANEL
Roger C. Hall, Jasper, Tex., assignor to Visador Company, Jasper, Tex.
Filed Oct. 24, 1988, Ser. No. 261,061
Term of patent 14 years
U.S. Cl. D25—48

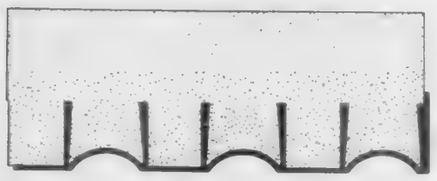


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314,627
CERAMIC TILE
Paloma Picasso, Paris, France, assignor to Villeroy & Boch AG, Mettlach, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 191,236
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 7AR111/87
Term of patent 14 years
U.S. Cl. D25—138



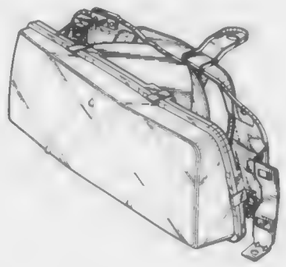
314,628
SHINGLE
Robert L. Jenkins, Coatesville; Husnu M. Kalkanoglu, Swarthmore; John R. Klein, deceased, late of Malvern (by Helen B. Klein, legal representative); Michael J. Noone, Wayne; Kermit E. Stahl, North Whales, all of Pa., and Phillip H. Whitford, Casselberry, Fla., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Oct. 20, 1987, Ser. No. 110,801
Term of patent 14 years
U.S. Cl. D25—139



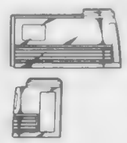
314,629
FLUORESCENT LAMP
Masashi Sangen, Hyogo; Naoyuki Nakamura, and Masaru Yamaguchi, both of Okayama, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Jan. 15, 1988, Ser. No. 144,449
Claims priority, application Japan, Jul. 20, 1987, 62-29392
Term of patent 14 years
U.S. Cl. D26—3



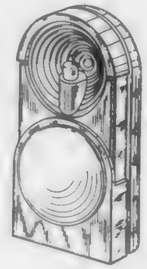
314,630
HEAD LAMP FOR AN AUTOMOBILE
Kazumi Fukagawa, Tokyo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,089
Term of patent 14 years
U.S. Cl. D26—28



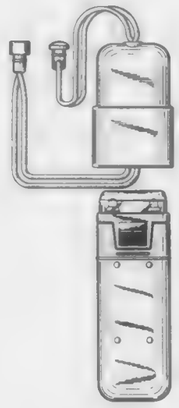
314,631
REAR COMBINATION LAMP FOR AUTOMOBILE
Hiroshi Yamamoto, 6-24-11, Midorien, Izumi-ku, Yokohama-chi, Kanagawa-ken, Japan
Filed Apr. 28, 1988, Ser. No. 188,787
Term of patent 14 years
U.S. Cl. D26—35



314,632
FLASHLIGHT
Judith Van Brunschot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 11, 1988, Ser. No. 256,889
Claims priority, application United Kingdom, Apr. 18, 1988, 1.050.040
Term of patent 14 years
U.S. Cl. D26—37



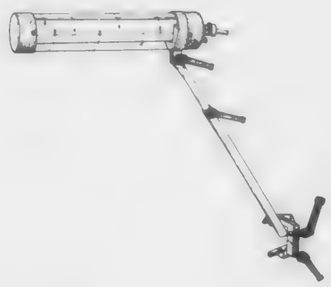
314,633
COMBINED FLASHLIGHT AND WATER TIGHT HOUSING THEREFOR
Wing H. Lam, Room 902, Chevalier House, 45-51 Chatham Road South, Tsimshatsui, Kowloon, Hong Kong
Filed Aug. 25, 1987, Ser. No. 89,610
Term of patent 14 years
U.S. Cl. D26—38



314,634
FLASHLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Continuation-in-part of Ser. No. 49,086, May 13, 1987. This application Jul. 22, 1988, Ser. No. 223,177
Term of patent 14 years
U.S. Cl. D26—46



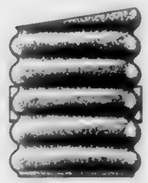
314,635
ADJUSTABLE FLUORESCENT LAMP
Lennart Berg, Ostersund, Sweden, assignor to Polarn Innovation Aktiebolag, Ostersund, Sweden
Filed Nov. 3, 1987, Ser. No. 116,332
Term of patent 14 years
U.S. Cl. D26—60



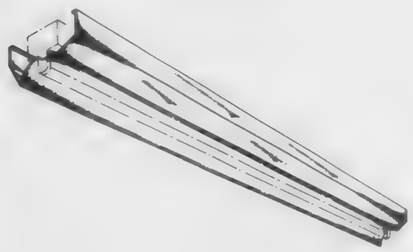
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314,636
OFF ROAD AUTOMOBILE AUXILIARY HEADLIGHT HOOT
Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.
Filed Jan. 6, 1988, Ser. No. 141,346
Term of patent 14 years
U.S. Cl. D26—113

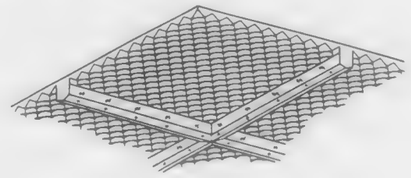




314,637
FLUORESCENT LIGHT FIXTURE REFLECTOR
Joseph H. Holcomb, Stockton, Calif., assignor to Albert L. Kramp, Stockton, Calif.
Filed Mar. 28, 1988, Ser. No. 174,482
Term of patent 14 years
U.S. Cl. D26—120



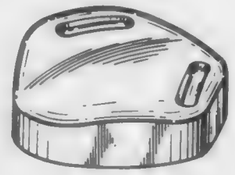
314,638
PRISMATIC LIGHT TRANSMITTING PANEL
David M. Kelley, St. Louis, Mo., assignor to K-S-H, Inc., St. Louis, Mo.
Division of Ser. No. 821,220, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 525,054, Aug. 22, 1983, abandoned.
This application May 12, 1988, Ser. No. 192,894
Term of patent 14 years
U.S. Cl. D26—122



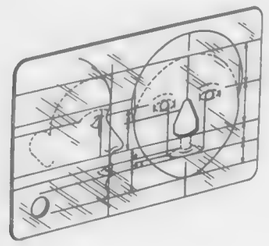
314,639
CIGAR CUTTER
Xavier Rousseau, Paris, France, assignor to S. T. Dupont S.A., Paris, France
Filed Jan. 4, 1989, Ser. No. 293,510
Claims priority, application France, Jul. 5, 1988, 88 4370
Term of patent 14 years
U.S. Cl. D27—195



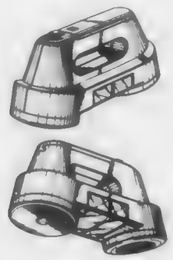
314,640
TABLET
Peter J. Rue, Bishop Stortford; Glenda Spray, Long Eaton, and Fiona R. Bird, Welwyn, all of England, assignors to Glaxo Group Limited, London, England
Filed Oct. 19, 1988, Ser. No. 259,603
Claims priority, application United Kingdom, Apr. 26, 1988, 1050279
The portion of the term of this patent subsequent to Feb. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2



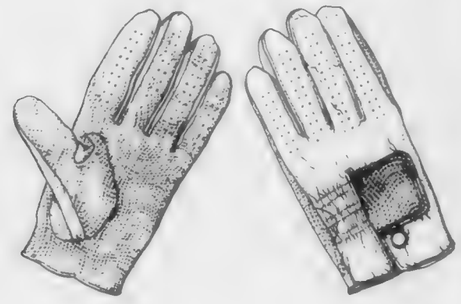
314,641
HAIR-CUTTING AND MAKE-UP APPLICATION GUIDE
Ginger S. Weigel, 22238 24th Ave. S., Des Moines, Wash. 98198
Filed Nov. 16, 1987, Ser. No. 120,814
Term of patent 14 years
U.S. Cl. D28—10



314,642
COMBINED LINT REMOVER AND VACUUM CLEANER
Chan M. Ying, Stanley, Hong Kong, assignor to C. Art Ltd., Kowloon, Hong Kong
Filed Aug. 29, 1988, Ser. No. 237,569
Claims priority, application United Kingdom, Apr. 20, 1988, 1050104
Term of patent 14 years
U.S. Cl. D28—50



314,643
GOLF GLOVE
Kenneth J. Kotowski, Marion, Mass., assignor to Acushnet Company, New Bedford, Mass.
Filed Jan. 11, 1988, Ser. No. 142,885
Term of patent 14 years
U.S. Cl. D29—22



314,644
PET BED
Robert Kosharek, and Mary Kosharek, both of 1222 N. 15th St., Allentown, Pa. 18102
Filed Nov. 17, 1988, Ser. No. 272,691
Term of patent 14 years
U.S. Cl. D30—118

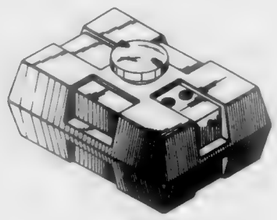


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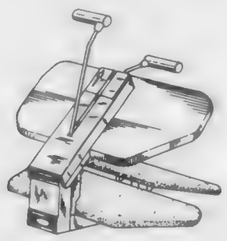
314,645
HORSE MUZZLE
Remi L. Boucher, 51 Wilson St., Manchester, N.H. 03103
Filed Mar. 26, 1990, Ser. No. 499,074
Term of patent 14 years
U.S. Cl. D30—152



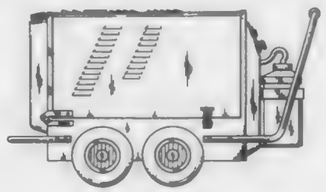
314,646
REFILLING DEVICE FOR GOLF BALL WASHER
Larry E. Brookman, Reinbeck, Iowa, assignor to Standard Golf Company, Cedar Falls, Iowa
Filed May 31, 1988, Ser. No. 200,294
Term of patent 14 years
U.S. Cl. D32—1



314,647
IRONING PRESS WITH SLEEVE BOARD
Antonio Jimenez, Meyrin, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Jan. 19, 1988, Ser. No. 145,248
Claims priority, application Switzerland, Jul. 16, 1987, 116012
Term of patent 14 years
U.S. Cl. D32—9



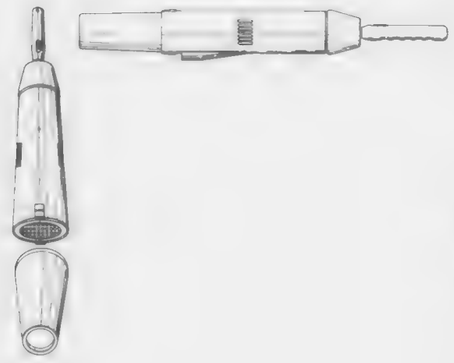
314,648
HOT WATER PRESSURE WASHING MACHINE
Paul W. Linton, 17911 NE. 72nd St., Vancouver, Wash. 98682
Filed Mar. 29, 1988, Ser. No. 174,636
Term of patent 14 years
U.S. Cl. D32—16



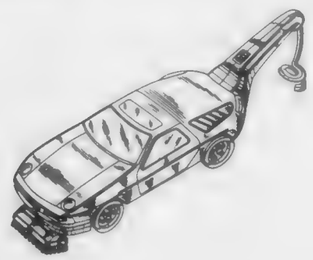
314,649
POWER WASHER WAND
Glenn M. Campbell, Sr.; Glenn M. Campbell, Jr., both of Plymouth; H. David Dalquist, III, Minnetonka; Douglas J. Kluge, Golden Valley, and John N. Taylor, St. Louis Park, all of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.
Filed May 22, 1989, Ser. No. 354,700
Term of patent 14 years
U.S. Cl. D32—17



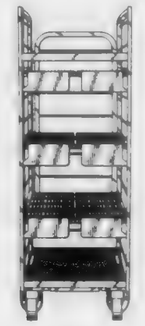
314,650
ANIMAL LITTER COLLECTION DEVICE
Horst J. Pudwill, Ah Kung Wan, Hong Kong, assignor to Marco Polo Industries and Merchandising Co., Ltd., Kowloon, Hong Kong
Filed Dec. 19, 1989, Ser. No. 452,949
Claims priority, application United Kingdom, Jun. 30, 1989, 1060535
Term of patent 14 years
U.S. Cl. D32—18



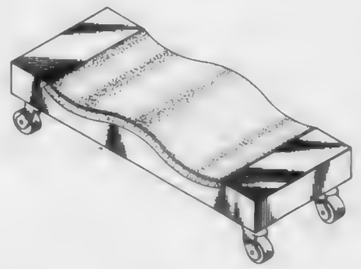
314,651
AUTOMOBILE-SHAPED VACUUM CLEANER
Robert M. Ross, Jr., Garland, and Robert J. McNally, Richardson, both of Tex., assignors to Great Western Trading Co., Inc., Plano, Tex.
Filed Jan. 30, 1990, Ser. No. 472,614
Term of patent 14 years
U.S. Cl. D32—18



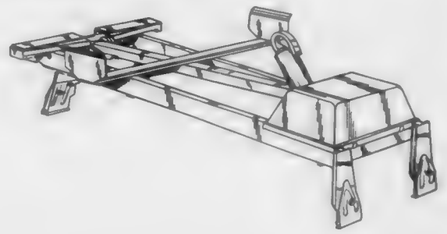
314,652
TRANSPORT CART
Lars Nyström, Lund, Sweden, assignor to Roby Teknik Aktiebolag, Lund, Sweden
Filed Nov. 30, 1988, Ser. No. 278,153
Claims priority, application Sweden, May 30, 1988, 881321
Term of patent 14 years
U.S. Cl. D34—21



314,653
KNEE COASTER
Harry Jackson, late of 332 Rolfe Rd., De Kalb, Ill. 60115 (Rhea V. Smith, executrix)
Filed Feb. 21, 1988, Ser. No. 170,466
Term of patent 14 years
U.S. Cl. D34—23

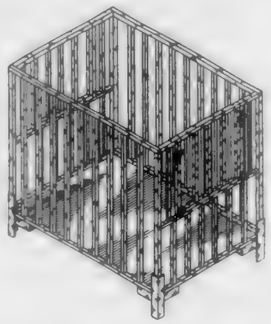


314,654
WHEELCHAIR HOIST FOR VEHICLES
Meindert A. Olyslagers, Coults Crossing, Australia, assignor to Grafton Industries Pty Ltd., Australia
Filed Aug. 30, 1988, Ser. No. 238,164
Claims priority, application Australia, Jun. 21, 1988, 2051/88
Term of patent 14 years
U.S. Cl. D34—28

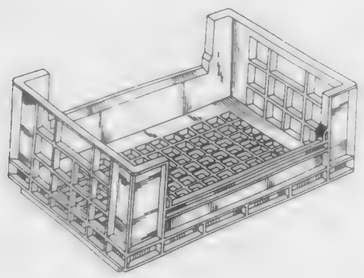


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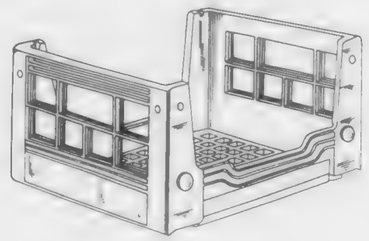
314,655
STORAGE AND SHIPPING CONTAINER
Jimmy D. Hosmer, Rte. 4, Box 533, Scottsboro, Ala. 35768
Filed Sep. 30, 1988, Ser. No. 252,342
Term of patent 14 years
U.S. Cl. D34—40



314,656
BEVERAGE CRATE CASE
Thomas Box, 744 Sycamore Ave., Tinton Falls, N.J. 07701
Continuation of Ser. No. 86,651, Aug. 17, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,630
Term of patent 14 years
U.S. Cl. D34—43



314,657
BEVERAGE CASE
Thomas Box, 774 Sycamore Ave., Shrewsbury, N.J. 07702
Continuation of Ser. No. 118,632, Nov. 9, 1987. This application Sep. 25, 1989, Ser. No. 412,631
Term of patent 14 years
U.S. Cl. D34—40



314,658
HOLDER FOR WET CLEANING ACCESSORIES
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Continuation-in-part of Ser. No. 447,257, Dec. 7, 1989. This application Mar. 26, 1990, Ser. No. 499,082
Term of patent 14 years
U.S. Cl. D34—45

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF FEBRUARY, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Hall, David A., deceased; Morin, John M., Jr.; Ternansky, Robert J.; and , 4,992,545, Cl. 540-359.000.

A. E. Staley Manufacturing Company: *See*—
Portnoy, Norman A.; and Eastman, James E., 4,992,539, Cl. 536-120.000.

AB Sandvik Coromant: *See*—
Pilland, Ulrich, deceased; Ascherl, Gerhard, heir; Ascherl, Robert, heir; Ray, Franz; and Hofvenstam, Ake, 4,992,948, Cl. 364-474.150.

Abbott Laboratories: *See*—
Apperson, Curtis R.; Finger, Richard; and Weisenbach, Robert A., 4,991,267, Cl. 24-30.50R.
Brooks, Dee W.; Summers, James B.; Rodriques, Karen E.; Maki, Robert G.; Dellaria, Joseph F.; Holms, James H.; and Moore, Jimmie L., 4,992,464, Cl. 514-443.000.
De, Biswanath; Jae, Hwan-Soo; and Plattner, Jacob J., 4,992,421, Cl. 514-19.000.

Abbott Laboratories/Ross Laboratories: *See*—
Osip, Thomas W.; and Pezzoli, Paul A., 4,991,731, Cl. 215-232.000.

Abe, Shinya: *See*—
Ozawa, Takayuki; Nishikimi, Morimitsu; Suzuki, Hiroshi; Shimomura, Yoshiharu; Yamatsu, Isao; Abe, Shinya; Yamada, Kouji; Fujimori, Tohru; and Takamura, Takanobu, 4,992,469, Cl. 514-559.000.

Abe, Shunji: *See*—
Hajikano, Kazuo; Murakami, Koso; Abe, Shunji; Nishino, Tetsuo; Fukui, Toshimasa; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Hayami, Hichiro, 4,993,018, Cl. 370-60.000.

Abe, Tetsuya: *See*—
Nozaki, Katsuhiko; and Abe, Tetsuya, 4,992,809, Cl. 354-149.110.

Abe, Yasunao: *See*—
Ito, Mikio; Kondo, Masao; and Abe, Yasunao, 4,991,486, Cl. 84-611.000.

Abelentsev, Vladimir V.; Kolomeets, Evgeny V.; Oskomov, Vladimir V.; Sevostyanov, Vladimir N.; and Fridman, Shepa D. Device for measuring moisture content of soil and snow water storage. 4,992,667, Cl. 250-390.050.

Abels, Daniel G.: *See*—
Hoying, John F.; and Abels, Daniel G., 4,991,826, Cl. 267-140.100.

Abex Corporation: *See*—
Hummel, Alan R.; and Welch, Ernest R., 4,991,697, Cl. 188-250.00B.

ABG-Werke GmbH: *See*—
Heims, Dirk, 4,991,995, Cl. 404-118.000.

Abila, Ernesto M.; and Ciminello, Vito J., to Hamilton Kent Manufacturing, Inc. Connector seal. 4,991,858, Cl. 277-205.000.

Able Corporation: *See*—
Acosta, Allan J., 4,992,027, Cl. 417-47.000.

Abraham, David W.; and Wickramasinghe, Hemantha K., to International Business Machines Corporation. Near-field lorentz force microscopy. 4,992,659, Cl. 250-306.000.

Abraham, Dennis G.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Le, An V.; Prymak, Rostislaw; Wilkins, John D.; and Yeh, Phil C., 4,993,069, Cl. 380-23.000.

Access Corporation: *See*—
Tani, Sachima, 4,992,902, Cl. 360-128.000.

Acctek Associates: *See*—
Martin, Ronald L., 4,992,746, Cl. 328-235.000.

Ackermann, John: *See*—
Spalding, Keith A.; Levko, Fred; Johnston, Donald; Ackermann, John; and Ehlman, Arlie, 4,992,770, Cl. 337-164.000.

Acosta, Allan J., to Able Corporation. Hydraulic control valve for fuel pumping system. 4,992,027, Cl. 417-47.000.

Acustar, Inc.: *See*—
Markow, Paul A.; and Nolle, William, 4,992,726, Cl. 324-146.000.

Adachi, Tsuneo, to Diesel KiKi Co., Ltd. Rotation detector having a housing with a processing circuit and a transducer element holder. 4,992,734, Cl. 324-207.250.

Adachi, Yuuma: *See*—
Shimura, Kazuo; and Adachi, Yuuma, 4,992,664, Cl. 250-327.200.

Adam, Jean-Marie, to Ciba-Geigy Corporation. Dicyanobenzanthrone compounds. 4,992,569, Cl. 552-287.000.

Adams, James H., Sr., to GTE Valenite Corporation. Roller assembly. 4,991,275, Cl. 29-123.000.

Adams, Lawrence J.; Fruda, Thomas R.; and Hughett, Paul P., to Petro Chemical Products, Inc. Composition for cleaning an internal combustion engine. 4,992,187, Cl. 252-50.000.

Adams, Steven P.: *See*—
Tjoeng, Foe S.; and Adams, Steven P., 4,992,463, Cl. 514-438.000.

Adendorff, Keith T.: *See*—
Meintjes, Anthony A.; Coetzer, Johan; and Adendorff, Keith T., 4,992,345, Cl. 429-103.000.

Adenis, Daniel J.: *See*—
Tartaglia, John M.; Cox, Thomas B.; and Adenis, Daniel J., 4,992,110, Cl. 148-2.000.

Adiletta, Matthew J., to Digital Equipment Corporation. Division method and apparatus including use of a Z—Z plot to select acceptable quotient bits. 4,992,968, Cl. 364-761.000

Advanced Micro Devices, Inc.: *See*—
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Ishibashi, Kazuhisa: *See—*
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Ishibashi, Koichiro; Minato, Osamu; and Shimohigashi, Katsuhiro, to Hitachi, Ltd. High speed MOSFET output buffer with low noise. 4,992,677, Cl. 307-443.000.

Ishida, Hitoshi: *See—*
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Ishida, Noboru: *See—*
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Ishida Scales Mfg. Co., Ltd.: *See—*
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Ishida, Tomotoshi; Nonaka, Shiro; Kawashima, Yasumasa; and Itoh, Kumiko, to Hitachi, Ltd. Area set operation apparatus. 4,992,962, Cl. 364-522.000.

Ishida, Yoshinori: *See—*
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Ishiguro, Kazuyoshi: *See—*
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Ishihara, Akira; Kinbara, Matsuro; Noda, Kazuhiro; and Nonomura, Kenji, to Nitto Denko Corporation. Multiple error processor in automatic work handling apparatus. 4,992,928, Cl. 364-183.000.

Ishii, Hiroyoshi; Suzuki, Kenzo; Kaneko, Misao; and Ishikawa, Noboru, to Kabushikikaisha Riken & Simizu Construction Co. Magnetic-shielding sheet. 4,992,329, Cl. 428-328.000.

Ishii, Mamoru: *See—*
Nakagaki, Tomonari; Ishii, Mamoru; and Ishibashi, Haruo, 4,992,262, Cl. 424-63.000.

Ishikawa, Kazunori; Tsukamoto, Kazumasa; Taniguchi, Takuji; Kashihara, Yuji; Iwatsuki, Kunihiro; and Taniguchi, Hiroji, to Aisin Aw Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Engine brake control device for an automatic transmission. 4,991,464, Cl. 74-866.000.

Ishikawa, Noboru: *See—*
Ishii, Hiroyoshi; Suzuki, Kenzo; Kaneko, Misao; and Ishikawa, Noboru, 4,992,329, Cl. 428-328.000.

Ishimura, Katsuhiro; and Aoki, Shusei, to Oki Electric Industry Co., Ltd. Variable high-voltage generating circuit. 4,992,922, Cl. 363-59.000.

Ishiyama, Kunio, to Hitachi, Ltd. High frequency heating system and method thereof. 4,992,637, Cl. 219-10.55B.

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Ito, Atsushi: *See—*
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Ito, Kazuyuki: *See—*
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Ito, Kohei: *See—*
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Ito, Masaya; Takagi, Shunichi; and Ishida, Noboru, to NGK Spark Co., Ltd. Joint structure between a ceramic shaft and a metallic shaft. 4,991,991, Cl. 403-30.000.

Ito, Mikio; Kondo, Masao; and Abe, Yasunao, to Yamaha Corporation. Electronic musical instrument having a rhythm performance function. 4,991,486, Cl. 84-611.000.

Ito, Shigekazu; Masuda, Katsumi; Kasano, Shoji; Nagata, Toshihiro; Kojima, Yoshiyuki; Sawai, Nobumitsu; and Maeno, Shinichiro, to Kumini Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Pyrimidine derivatives, process for preparing the same and agricultural or horticultural fungicidal composition containing the same. 4,992,438, Cl. 514-275.000.

Ito, Shinichi: *See—*
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Ito, Shoko: *See—*
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Ito, Yukishige: *See—*
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Itoh, Kumiko: *See—*
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Itoh, Shigeyuki: *See—*
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Izumiya, Tooru, to Nippon Nature Roman Corporation Limited. Ozone generating means and water quality improving apparatus using the same. 4,992,169, Cl. 210-221.200.

J. Buder & Co. Inc.: *See—*
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Jackson, Francis G., to Harter Corporation. Foot and leveling mechanism for panels in a relocatable wall. 4,991,365, Cl. 52-126.600.

Jackson, Samuel D., to Imperial Chemical Industries plc. Catalyst for use in effluent treatment. 4,992,408, Cl. 502-328.000.

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Jaffe, Edward E.; and Babler, Fridolin, to Ciba-Geigy Corporation. Process for the preparation of opaque diketopyrrolo-pyrrole pigments. 4,992,101, Cl. 106-498.000.

Jain, Kantilal. High precision alignment system for microlithography. 4,991,962, Cl. 356-349.000.

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Jenson, Ole H.; Little, Richard I.; and Schuler, Joseph J., to Motorola, Inc. Power amplifier for a radio frequency signal. 4,992,753, Cl. 330-129.000.

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Davidson, Harvey D. Rose plant named Western Sunlight. 7,442, 2-12-91, Cl. 16.000.
Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Big Surprise. 7,444, 2-12-91, Cl. 68.000.
Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Western Red. 7,445, 2-12-91, Cl. 68.000.
Plant Company, The: *See*—
Fleming, Margaret M., 7,444, Cl. 68.000.
Fleming, Margaret M., 7,445, Cl. 68.000.
Sheehan, Timothy P.: *See*—
Weinberger, John H.; and Sheehan, Timothy P., 7,443, Cl. 38.000.
Sun World, Inc.: *See*—
Weinberger, John H.; and Sheehan, Timothy P., 7,443, Cl. 38.000.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Dark Neoga. 7,446, 2-12-91, Cl. 74.000.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Redding. 7,447, 2-12-91, Cl. 82.000.
Weinberger, John H.; and Sheehan, Timothy P., to Sun World, Inc. Plum cv. Suplumeighteen. 7,443, 2-12-91, Cl. 38.000.
Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 7,446, Cl. 74.000.
VandenBerg, Cornelis P., 7,447, Cl. 82.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 12, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

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60 4,991,859
62 4,991,860

CLASS 280
87.042 4,991,861
421 4,991,862
432 4,991,863
441 4,991,864
477 4,991,865
631 4,991,866
4,991,867
711 4,991,868
731 4,991,869
732 4,991,870
777 4,991,871
788 4,991,872
4,991,873
4,991,874
816 4,991,875

CLASS 283
36 4,991,877
4,991,878

CLASS 285
21 4,991,876
236 4,991,879
321 4,991,880
330 4,991,881
331 4,991,882
334.4 4,991,883

CLASS 290
1 R 4,992,669

CLASS 292
4,991,884
113 4,991,885
161 4,991,886
251.5 4,991,887
296 4,991,888
327 4,991,889

CLASS 293
118 4,991,890
128 4,991,891

CLASS 294
1.1 4,991,892
17 4,991,893
19.2 4,991,896
170 4,991,894

CLASS 296
6 4,991,895
29 4,991,897
37.2 4,991,898
39.2 4,991,899
75 4,991,900
98 4,991,901
107 4,991,902
112 4,991,903
121 4,991,904
155 4,991,905
180.2 4,991,906

CLASS 297
408 4,991,907
439 4,991,908

CLASS 301
37 P 4,991,909

CLASS 303
109 4,991,910

CLASS 305
24 4,991,911

CLASS 307
10.1 4,992,671
4,992,672
10.3 4,992,670
271 4,992,673
351 4,992,674
4,992,675
443 4,992,676
4,992,677
451 4,992,678
4,992,679
4,992,680
475 4,992,681
4,992,682
570 4,992,683

CLASS 310
12 4,992,684
37 4,992,685

4,992,686
D 4,992,687
71 4,992,688
4,992,689
4,992,690
232 4,992,691
335 4,992,692
4,992,693
4,992,694

CLASS 312
236 4,991,912
275 4,991,913
319 4,991,914

CLASS 313
4,992,695
4,992,696
4,992,697
457 4,992,698
525 4,992,699
639 4,992,700

CLASS 315
159 4,992,701
219 4,992,702
261 4,992,703
312 4,992,704
324 4,992,705
4,992,706
403 4,992,707
411 4,992,708

CLASS 318
249 4,992,709
254 4,992,710
4,992,711
4,992,712
586 4,992,713
625 4,992,714
4,992,715
4,992,716
4,992,717
4,992,718

CLASS 320
1 4,992,719
23 4,992,720

CLASS 322
4,992,721
33 4,992,722

CLASS 323
4,992,723
367 4,992,724

CLASS 324
71.3 4,992,742
142 4,992,725
4,992,726
158 P 4,992,728
4,992,729
158 R 4,992,727
160 4,992,730
174 4,992,731
207.21 4,992,733
207.25 4,992,734
216 4,992,732
220 4,992,735
309 4,992,736
318 4,992,737
450 4,992,738
4,992,739
4,991,915
4,992,740
671 4,992,741

CLASS 328
14 4,992,743
233 4,992,744
235 4,992,745
4,992,746

CLASS 329
316 4,992,747
321 4,992,748

CLASS 330
10 4,992,749
4,992,751
43 4,992,750
4,992,752
129 4,992,753
149 4,992,754
253 4,992,755
4,992,756
254 4,992,757
263 4,991,916
281 4,992,758

CLASS 333
118 4,992,761
204 4,992,759
219 4,992,763
219.2 4,992,760
239 4,992,762
247 4,992,764
131 4,992,765
223 4,992,766
4,992,767
306 4,992,768

CLASS 336
4,992,769

CLASS 337
4,992,770

CLASS 338
22 R 4,992,771
4,992,772
314 4,992,773

CLASS 340
310 A 4,992,774
525 4,992,775
551 4,992,776
4,992,777
668 4,992,778
712 4,992,779
729 4,992,780
747 4,992,781
4,992,782
825.34 4,992,785
4,992,783
4,992,784
4,992,786
4,992,787
908 4,992,788
4,992,789

CLASS 341
70 4,992,790
126 4,992,791
147 4,992,792

CLASS 342
4,992,793
51 4,992,794
90 4,992,795
156 4,992,796
192 4,992,797
362 4,992,798

CLASS 343
702 4,992,799
713 4,992,800
4,992,801

CLASS 346
1.1 4,992,802
4,992,803
4,992,804
134 4,992,805
140 R 4,992,806
4,992,808
155 4,992,807

CLASS 360
3.71 4,991,917
96.10 4,991,918
96.14 4,991,920
4,991,921
96.15 4,991,922
4,991,923
4,991,924
4,991,925
4,991,926
96.19 4,991,919
96.20 4,991,927
4,991,928
4,991,929
96.21 4,991,930
96.24 4,991,931
4,991,932
129 4,991,933
162.21 4,991,934
239 4,991,935
317 4,991,936
333 4,991,939
338 4,991,940
347 E 4,991,941
4,991,937
403 4,991,938
423 4,991,942
427 4,991,943
4,991,944
455 4,991,945
471 4,991,946
4,991,947
4,991,948
4,991,949
4,991,950

CLASS 361
41 4,991,951
120 4,991,952
4,991,953
221 4,991,954

CLASS 352
4,991,955

CLASS 353
30 4,991,956

CLASS 354
149.11 4,992,809
4,992,810
173.1 4,992,811
4,992,812
4,992,813
275 4,992,814
277 4,992,815
4,992,816
4,992,817
4,992,818
4,992,819
410 4,992,820
4,992,821

CLASS 355
27 4,992,822
4,992,823
4,992,824
53 4,992,825
84 4,992,826
4,992,827
4,992,828
4,992,829
215 4,992,830
4,992,831
259 4,992,832
282 4,992,833
4,992,834
312 4,992,835

CLASS 356
241 4,991,957
244 4,991,958
251 4,991,959
307 4,991,960
4,991,961
4,991,962
353 4,991,963
371 4,991,964
373 4,991,965
375 4,991,966
376 4,991,967
4,991,968
4,991,969
402 4,991,970
446 4,991,971

CLASS 357
13 4,992,836
17 4,992,837
23.15 4,992,840
23.4 4,992,838
23.7 4,992,839
24 4,992,841
4,992,842
34 4,992,843
4,992,844
4,992,845
59 4,992,846
68 4,992,847
4,992,848
4,992,849
4,992,850
74 4,992,851

CLASS 358
11 4,992,852
12 4,992,853
29 4,992,854
4,992,855
31 4,992,856
36 4,992,857
53 4,992,858
55 4,992,859
75 4,992,860
4,992,861
76 4,992,862
4,992,863
4,992,864
4,992,865
108 4,992,866
4,992,867
135 4,992,868
4,992,869
4,992,870
142 4,992,871
148 4,992,872
Re.33,535
167 4,992,873
183 4,992,874
4,992,875
213.1 S 4,992,876
213.15 4,992,877
213.28 4,992,878
4,992,879
236 4,992,880
245 4,992,881
4,992,882
335 4,992,883
341 4,992,885
342 4,992,886
4,992,884
401 4,992,887
410 4,992,888
430 4,992,889
474 4,992,890

CLASS 360
14.3 4,992,891
27 4,992,892
78.13 4,992,893
4,992,894
96.5 4,992,895
4,992,896
103 4,992,897
4,992,898
4,992,899
4,992,900
110 4,992,901
4,992,902
137 4,992,903

CLASS 361
4,992,904
15 4,992,905
117 4,992,906
4,992,907
400 4,992,908
413 4,992,909
4,992,910

CLASS 362
4,992,911
4,992,912
4,992,913
153.1 4,992,914
217 4,992,915
255 4,992,916
4,992,917
4,992,918

CLASS 363
17 4,992,919
4,992,920
4,992,921
4,992,922
4,992,923
132 4,992,924
141 4,992,925

CLASS 364
134 4,992,926
4,992,927
183 4,992,928
4,992,929
200 4,992,930
4,992,931
4,992,932
4,992,933
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4,992,935
4,992,936
4,992,937
4,992,938
4,992,939
4,992,940
413.15 4,992,941
420 4,992,942
424.04 4,992,943
424.05 4,992,944
426.02 4,992,945
431.02 4,992,946
4,992,947
474.15 4,992,948
478 4,992,949
4,992,950
4,992,951
510 4,992,952
512 4,992,953
518 4,992,954
4,992,955
519 4,991,972
4,992,956
4,992,957
4,992,958
4,992,959
521 4,992,960
4,992,961
522 4,992,962
526 4,992,963
4,992,964
551.01 4,992,965
571.04 4,992,966
724.18 4,992,967
761 4,992,968
4,992,969
4,992,970
4,992,971
4,992,972
4,992,973
4,992,974
4,992,976
4,992,977
4,992,978
4,992,979

CLASS 365
4,992,980
154 4,992,981
4,992,982
189.05 4,992,983
200 4,992,984
4,992,985
207 4,992,986
4,992,987

CLASS 366
141 4,991,973
279 4,991,974

CLASS 367
4,992,988
3 4,992,989
4,992,990
4,992,991
21 4,992,992
4,992,993
25 4,992,994
43 4,992,995
53 4,992,996
82 4,992,997
4,992,998
4,992,999
140 4,993,000
144 4,993,001

CLASS 368
4,993,002
47 4,993,003
107 4,993,004
226 4,993,005
231 4,993,006
4,993,007

CLASS 369
3 4,993,008
13 4,993,009
4,993,010
44.37 4,993,011
4,993,012

CLASS 370
4,991,975
13 4,993,013
16 4,993,014
4,993,015
4,993,016
4,993,017
4,993,018
4,993,019
4,993,020
4,993,021
4,993,022
85.130 4,993,023
94.1 4,993,024
4,993,025
100.1 4,993,026

CLASS 371
16.2 4,993,027
39.1 4,993,028
40.1 4,993,029
4,993,030

CLASS 372
3 4,993,031
20 4,993,032
4,993,033
4,993,034
50 4,993,035
4,993,036
4,993,037
4,993,038
94 4,993,039
4,993,040
4,993,041
4,993,042

CLASS 373
4,993,043

CLASS 374
135 4,991,976

CLASS 375
4,993,044
7 4,993,045
4,993,046
4,993,047
97 4,993,048

CLASS 376
282 4,992,231
4,992,232

CLASS 377
6 4,993,049
15 4,993,050
4,993,051
52 4,993,052
4,993,053

CLASS 378
125 4,993,054
4,993,055
4,993,056
197 4,993,057
CLASS 379
37 4,993,058
4,993,059
55 4,993,060
4,993,061
4,993,062
4,993,063
413 4,993,064
4,993,065

CLASS 380
16 4,993,066
21 4,993,067
23 4,993,068
4,993,069
4,993,070

CLASS 381
70 4,993,071
113 4,993,072
119 4,993,073
187 4,993,074

CLASS 382
4,993,075
Re.33,536
65 4,991,977

CLASS 383
4,991,978
25 4,991,979
4,991,980

CLASS 384
4,991,981
4,991,982

CLASS 385
441 4,992,644

CLASS 386
105 4,991,983
335 4,991,984

CLASS 401
4,991,985
78 4,991,987
111 4,991,988
155 4,991,989

CLASS 402
53 4,991,990

CLASS 403
4,991,991
359 4,991,992
365 4,991,993

CLASS 404
10 4,991,994
118 4,991,995

CLASS 405
14 4,991,996
73 4,991,997
4,991,998
151 4,991,999
163 4,992,000
4,992,001
237 4,992,002
4,992,003
4,992,004
4,992,005

CLASS 406
109 4,992,006

CLASS 407
53 4,991,986
110 4,992,007
114 4,992,008

CLASS 408
67 4,992,009
4,992,010

CLASS 409
126 4,992,011
4,992,012

CLASS 410
29.1 4,992,013
4,992,014
4,992,015

CLASS 414
27 4,992,016
140.5 4,992,017
4,992,018
525.2 4,992,019
723 4,992,020

CLASS 415
52.1 4,992,021
121.2 4,992,022
171.1 4,992,023
229 4,992,024

CLASS 416
4,992,025
4,992,026

CLASS 417
4,992,027
4,992,028
4,992,029
4,992,030
4,992,031

CLASS 418
4,992,033
4,992,032
4,992,034

CLASS 419
4,992,233
4,992,234
4,992,235
4,992,236
4,992,237
4,992,238

CLASS 420
4,992,239
4,992,240
4,992,241
4,992,242

CLASS 422
4,992,243
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4,992,246
4,992,247

CLASS 423
4,992,248
4,992,249
4,992,250
4,992,251
4,992,252
4,992,253
Re.33,537
4,992,254

CLASS 424
4,992,255
4,992,256
4,992,257
4,992,258
4,992,259
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4,992,261
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4,992,270
4,992,271
4,992,272
4,992,273
4,992,274
4,992,275
4,992,276
4,992,277
4,992,278

CLASS 425
4,992,035
4,992,036
4,992,037
4,992,038

CLASS 426
4,992,279
4,992,280
4,992,281
4,992,282
4,992,283
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4,992,292
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4,992,294
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CLASS 427
4,992,296
4,992,297
4,992,298
4,992,299
4,992,300
4,992,301
4,992,302
4,992,303
4,992,304
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4,992,307
4,992,308
4,992,309

CLASS 428
4,992,311
4,992,312
4,992,313
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4,992,315
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4,992,310
4,992,331
4,992,332
4,992,333
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4,992,337
4,992,338

CLASS 429
4,992,339
4,992,340
4,992,341
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4,992,343
4,992,344
4,992,345

CLASS 430
4,992,346
4,992,347
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4,992,356
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4,992,358
4,992,359
4,992,360
4,992,361
4,992,362

CLASS 431
4,992,039
4,992,040
4,992,041
4,992,042

CLASS 432
4,992,043
4,992,044

CLASS 433
4,992,045
4,992,047
4,992,046
4,992,048
4,992,049

CLASS 434
4,992,050

CLASS 435
4,992,363
4,992,364
4,992,365
4,992,366
4,992,367
4,992,368
4,992,369
4,992,370
4,992,371
4,992,372
4,992,373
4,992,051
4,992,374
4,992,375
4,992,376
4,992,377
4,992,378

CLASS 436
4,992,379
4,992,380
4,992,381
4,992,382
4,992,383
4,992,384
4,992,385

CLASS 437
4,992,386
4,992,387
4,992,388
4,992,389
4,992,390
4,992,391
4,992,392
4,992,393
4,992,394

CLASS 439
4,992,052
4,992,053
4,992,054
4,992,055
4,992,056
4,992,057
4,992,058
4,992,059
4,992,060
4,992,061
4,992,062
4,992,063
4,992,064

CLASS 440
4,992,065
4,992,066

CLASS 441
4,992,067

CLASS 446
4,992,068
4,992,069
4,992,070
4,992,071
4,992,072

CLASS 449
4,992,073

CLASS 450
4,992,074

CLASS 452
4,991,260

CLASS 455
4,992,075

CLASS 966
4,992,076

CLASS 901
4,992,395
4,992,396
4,992,397
4,992,398

CLASS 902
4,992,400
4,992,401
4,992,402
4,992,403
4,992,404
4,992,405
4,992,406
4,992,407
4,992,408
4,992,409
4,992,410

CLASS 903
4,992,411
4,992,412
4,992,413
4,992,414

CLASS 909
4,992,415

CLASS 912
4,992,416

CLASS 514
4,992,417
4,992,418
4,992,419
4,992,420
4,992,421
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CLASS 518
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CLASS 523
4,992,486
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4,992,490

CLASS 526
4,992,491
4,992,492
4,992,493
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4,992,497
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4,992,499
4,992,500
4,992,501
4,992,502
4,992,504
4,992,505
4,992,506
4,992,507
4,992,508

CLASS 528
4,992,509
4,992,510
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4,992,512
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CLASS 526
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CLASS 527
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CLASS 528
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4,992,526
4,992,528
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CLASS 530
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4,992,531

CLASS 534
4,992,532

CLASS 536
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CLASS 540
4,992,541
4,992,543
4,992,542
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CLASS 544
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CLASS 549
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4,992,563
4,992,564
4,992,568
4,992,565
4,992,566
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CLASS 562
4,992,569
4,992,570

CLASS 556
4,992,571
4,992,572
4,992,573

CLASS 560
4,992,574
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CLASS 562
4,992,579
4,992,580
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CLASS 564
4,992,584
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CLASS 568
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01 :	4,991,344	4,991,657	4,992,422	08 :	4,991,248	4,991,346		4,991,796
	4,991,470	4,991,662	4,992,426		4,991,407	4,991,355		4,991,800
	4,991,690	4,991,665	4,992,453		4,991,743	4,991,391		4,991,819
	4,991,863	4,991,667	4,992,467		4,992,110	4,991,398		4,991,842
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	4,991,953	4,991,836	4,992,656		4,991,606	4,991,893		4,992,157
	4,992,024	4,991,839	4,992,670		4,991,689	4,992,139		4,992,209
	4,992,669	4,991,847	4,992,678		4,991,746	4,992,187		4,992,267
	4,992,675	4,991,885	4,992,686		4,991,747	4,992,249		4,992,341
	4,992,761	4,991,891	4,992,692		4,991,763	4,992,268		4,992,380
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	4,993,067	4,991,906	4,992,699		4,991,817	4,992,340		4,992,421
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Harry F. Manbeck, Jr., *Commissioner*

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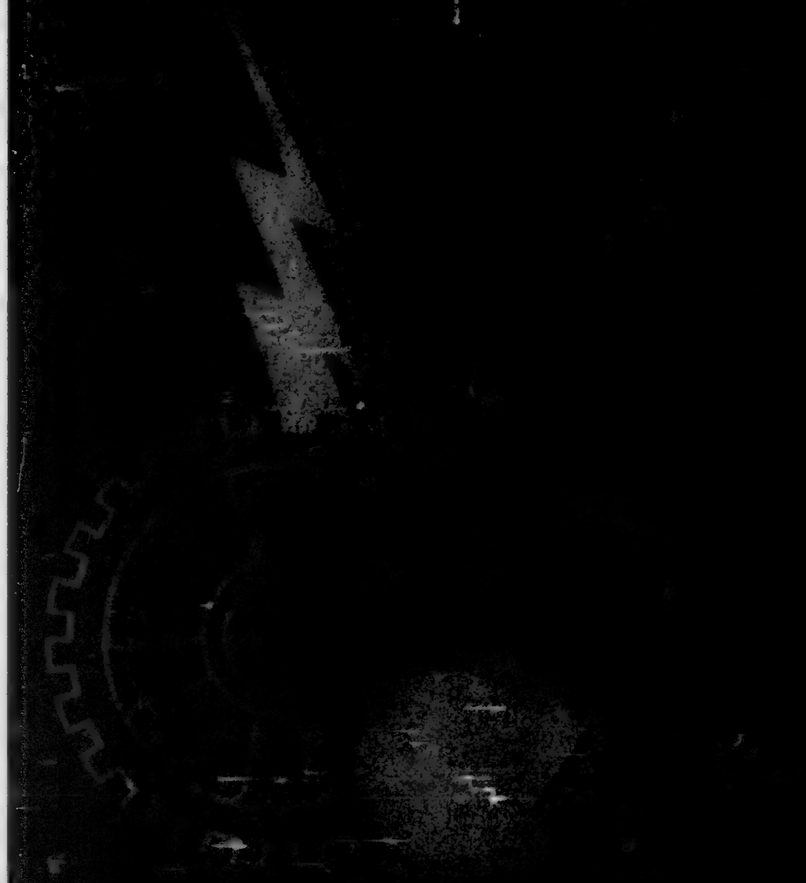
Vol. 1123 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS
February 19 1991



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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
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COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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[26] In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 14 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17,1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 566 on Jan 1, 1991.

International fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 6, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 16, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,724,546 through 4,726,073
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 14, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,4230,759 through 4,432,098
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 9, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,361,914	06/347,538	12/07/82
4,361,922	06/222,878	12/07/82
4,361,926	06/226,296	12/07/82
4,361,929	06/247,827	12/07/82
4,361,936	06/282,929	12/07/82
4,361,957	06/227,533	12/07/82
4,361,965	06/221,441	12/07/82
4,361,969	06/217,177	12/07/82
4,361,974	06/266,204	12/07/82
4,361,979	06/251,885	12/07/82
4,361,980	06/361,503	12/07/82
4,362,020	06/233,436	12/07/82
4,362,023	06/287,965	12/07/82
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4,362,091	06/253,596	12/07/82
4,362,092	06/307,527	12/07/82
4,362,095	06/239,176	12/07/82
4,362,119	06/235,790	12/07/82
4,362,147	06/224,295	12/07/82
4,362,167	06/231,928	12/07/82
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4,362,194	06/229,453	12/07/82
4,362,204	06/309,740	12/07/82
4,362,219	06/250,210	12/07/82
4,362,222	06/250,254	12/07/82
4,362,259	06/235,837	12/07/82
4,362,260	06/215,944	12/07/82
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4,362,604	06/292,854	12/07/82
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4,362,766	06/279,345	12/07/82
4,362,772	06/244,895	12/07/82
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4,362,793	06/263,429	12/07/82
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4,362,820	06/278,900	12/07/82
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4,362,843	06/262,251	12/07/82
4,362,852	06/302,907	12/07/82
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4,362,908	06/235,534	12/07/82
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	06/779,031	12/09/86
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	06/677,798	12/09/86
	06/792,678	12/09/86
	06/790,811	12/09/86
	06/735,233	12/09/86
	06/641,877	12/09/86
	06/725,426	12/09/86
	06/754,122	12/09/86
	06/498,956	12/09/86
	06/728,441	12/09/86
	06/773,373	12/09/86
	06/790,808	12/09/86
	06/642,677	12/09/86
	06/668,333	12/09/86
	06/675,260	12/09/86
	06/664,124	12/09/86
	06/671,114	12/09/86
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	06/680,977	12/09/86
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	06/521,370	12/09/86
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	06/715,920	12/09/86
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	06/796,703	12/09/86
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	06/657,006	12/09/86
	06/747,847	12/09/86
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	06/721,598	12/09/86
	06/706,639	12/09/86
	06/522,568	12/09/86
	06/772,764	12/09/86
	06/843,870	12/09/86
	06/494,220	12/09/86
	06/764,578	12/09/86
	06/584,601	12/09/86
	06/651,300	12/09/86
	06/671,129	12/09/86
	06/639,585	12/09/86
	06/584,177	12/09/86
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	06/695,279	12/09/86
	06/668,075	12/09/86
	06/728,688	12/09/86
	06/674,895	12/09/86
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	06/647,625	12/09/86
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	06/750,526	12/09/86
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	06/771,889	12/09/86
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	06/743,262	12/09/86
	06/615,009	12/09/86
	06/672,070	12/09/86
	06/652,304	12/09/86
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	06/739,426	12/09/86
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	06/778,180	12/09/86
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NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,429,508	06/312,691	2/07/84	10/19/81	7/31/90
4,568,007	06/573,295	2/04/86	1/23/84	10/31/90
4,584,679	06/747,432	4/22/86	6/21/85	11/30/90
4,617,615	06/682,561	10/14/86	12/07/84	10/31/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,271,140, Re. S. N. 07/629,020, Filed Dec. 18, 1990, Cl. 424, METHOD AND COMPOSITION FOR DOUBLE RECEPTOR SPECIFIC BINDING ASSAYS, James R. Bunting, Owner of Record: *Barter Travenol Laboratories, Deerfield, Ill.*, Attorney or Agent: Bart G. Newland, Ex. Gp.: 180

4,645,591, Re. S. N. 07/623,345, Filed Dec. 7, 1990, Cl. 210/108, SELF-CLEANING FLUID FILTER, Benedict Gerulis, Owner of Record: *C. I. B. Inc., Minneapolis, Minn.*, Attorney or Agent: Lawrence M. Nawrocki, Ex. Gp.: 130

4,795.035, Re. S. N. 07/635,942, Filed Dec. 28, 1990, Cl. 206/616, TEAR-STRIP OPENING DEVICE, Myun Ho Kim, Owner

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of Record: *Inventor*, Attorney or Agent: Fritz L. Schweitzer, Ex. Gp.: 244

4,798,523, Re. S. N. 07/637,239, Filed Jan. 3, 1991, Cl. 417/407, TURBOCHARGER BEARING AND LUBRICATION SYSTEM, Jerry Glaser, et al., Owner of Record: *Allied-Signal Inc., Morristown, N.J.*, Attorney or Agent: Ken C. Decker, Ex. Gp.: 340

4,806,981, Re. S. N. 07/633,391, Filed Dec. 21, 1990, Cl. 355/298, CLEANING UNIT IN ELECTROPHOTOGRAPHIC COPIER, Yasuyuki Ishiguro, et al., Owner of Record: *Mita Industrial Co., Ltd., Osaka-Shi, Japan*, Attorney or Agent: Mary Jane Boswell, Ex. Gp.: 215

4,818,394, Re. S. N. 07/635,954, Filed Dec. 28, 1990, Cl. 210/198, SEPARATIN AGENT, Yoshio Okamoto, et al., Owner of Record: *Daicel Chemical Industries, Ltd., Osaka, Japan*, Attorney or Agent: Terryence F. Chapman, Ex. Gp.: 136

4,896,099, Re. S. N. 07/637,572, Filed Jan. 3, 1991, Cl. 324/667, METHOD OF ANNOUNCING LOW LEVEL OF REMAINING LIQUID IN DROPPER, Takeo Suzuki, Owner of Record: *Toho Plastic Co., Ltd., Kawasaki-Shi, Japan*, Attorney or Agent: Mel R. Quintos, Ex. Gp.: 260

4,902,388, Re. S. N. 07/634,854, Filed Dec. 27, 1990, Cl. 204, METHOD FOR ELECTROPLATING NICKEL ONTO TITANIUM ALLOYS, Donald E. Fornwalt, et al., Owner of Record: *United Technoloigies Corp., Hartford, Conn.*, Attorney or Agent: James M. Rashid, Ex. Gp.: 112

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,126,546, Reexam. No. 90/002,246, Requested Jan. 7, 1991, Cl. 210/019, METHOD FOR THE FILTRATION OF A SUSPENSION OR EMULSION, Ulf R. Hjelmner, et al., Owner of Record: *Axel Johnson Engineering AB, Nynarshamn, Sweden*, Attorney or Agent: Brumbaugh, Graves, Donohue & Raymond, New York, N.Y., Ex. Gp.: 136, Requester: Irving Powers, St. Louis, Mo.

4,154,087, Reexam. No. 90/002,245, Requested Jan. 2, 1991, Cl. 434/365, DEMONSTRATION CALCULATOR FOR CLASSROOM USE AND THE LIKE, Wallace P. Judd, Owner of Record: *Inventor, Nevada City, Calif.*, Attorney or Agent: Thomas M. Olson, Mountain View, Calif., Ex. Gp.: 332, Requester: Anonymous, San Francisco. Calif.

4,260,005, Reexam. No. 90/002,247, Requested Jan. 4, 1991, Cl. 411/003, SELF-LOCKING FASTENER, FASTNER SYSTEM AND PROCESS, Edgar L. Stencel, Owner of Record: *VSI Corp., Pasadena, Calif.*, Attorney or Agent: Christie, Parker & Hale, Pasadena, Calif., Ex. Gp.: 352, Requester: Lowell Anderson, Knobbe, Martens, Olson & Bear, Newport Beach, Calif.

4,383,353, Reexam. No. 90/002,248, Requested Jan. 4, 1991, Cl. 029/517, PROCESS OF FORMING A JOINT WITH A PREDETERMINED CLAMP-UP LOAD, Edgar L. Stencel, Owner of Record: *VSI Corp., Pasadena, Calif.*, Attorney or Agent: Christie, Parker & Hale, Pasadena, Calif., Ex. Gp.: 321, Requester: Lowell Anderson, Knobbe, Martens, Olson & Bear, Newport Beach, Calif.

4,445,114, Reexam. No. 90/002,251, Requested Jan. 9, 1991, Cl. 340/726, APPARATUS FOR SCROLLING A VIDEO DISPLAY, David R. Stubben, Owner of Record: *Atari Copr., Sunnyvale, Calif.*, Attorney or Agent: Jerry T. Sewell, Knobbe, Martens, Olson & Bear, Newport Beach, Calif., Ex. Gp.: 269, Requester: Owner

4,552,899, Reexam. No. 90/002,249, Requested Jan. 2, 1991, Cl. 514/568, COUGH/COLD MIXTURES COMPRISING NON-STERIODAL ANTI-INFLAMATORY DRUGS, Abraham Sunshine, et al., Owner of Record: *Analgesic Associates, Larchmont, N.Y.*, Attorney or Agent: Norman H. Stepno, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 125, Requester: McNeil-PPC Inc., Fort Washington, Penna.

4,799,695, Reexam. No. 90/002,237, Requested Dec. 26, 1990, Cl. 277/231, METAL GASKET, Nobuo Yoshino, Owner of Record: *Nikon Metal Gasket Kabushiki Kaisha, Saitama, Japan*, Attorney or Agent: Flynn, Theil, Boutell & Tanis, Kalamazoo, Mich., Ex. Gp.: 246, Requester: Kanesaka & Takeuchi, Arlington, Va.

4,913,396, Reexam. No. 90/002,250, Requested Jan. 9, 1991, Cl. 248/649, ADJUSTABLE INCLINE SYSTEM FOR EXERCISE EQUIPMENT, William t. Dalebout, et al., Owner of Record: *Weslo, Inc., Logan, Utah*, Attorney or Agent: Laurence B. Bond, Trask, Britt & Rossa, Salt Lake City, Utah, Ex. Gp.: 355, Requester: Jerard E. Nagae, Christensen, O'Connor, Johnson & Kindness, Seattle, Wash.

INTERLOCUTORY DECISIONS BY THE TRADEMARK TRIAL AND APPEAL BOARD

Only final decisions of the Trademark Trial and Appeal Board are subject to judicial review. Some confusion may exist in *inter partes* trademark proceedings as to whether certain decisions of the Board are "final" for purpose of judicial review.

An example where confusion may arise is a case in which (1) an opposition is filed, (2) applicant counterclaims for cancellation of a registration relied upon by an opposer, and (3) the Board renders a decision (generally on summary judgment) on the opposition, but sets the counterclaim for trial. Under these circumstances, there is no final order of the Board, because a decision has not been entered on the counterclaim.

The party losing the opposition may feel compelled to seek judicial review within two months of the Board's decision to "preserve" its rights. But such an appeal appears to be premature under *Copelands' Enterprises, Inc. v. CNV, Inc.*, 887 F.2d 1065, 12 USPQ2d 1563 (Fed. Cir. 1989) (in banc). *Copelands* is not the only appeal which has been dismissed because it was taken from an interlocutory decision of the Board. *See Cortex Corporation v. W.L. Gore & Associates, Inc.*, No. 91-1016 (Fed. Cir. January 14, 1991) (unpublished), and *Kellogg Co. v. Pack'Em Enterprises, Inc.*, No. 90-1336 (Fed. Cir. Sept. 27, 1990) (unpublished).

In an effort to (1) minimize disruption in proceedings pending before the Board, (2) eliminate unnecessary appeals and filing of civil actions, only to have the appeal or civil action dismissed as premature, and (3) provide some certainty to parties and their attorneys as to when an appeal is timely, the Board will, when resolving a merits issue prior to final judgment, generally indicate that it has entered an "interlocutory" order in the proceeding and further set the time for seeking judicial review of the "interlocutory" order to expire two months from the date a final order is entered in the proceeding.

Jan. 22, 1991 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

NOTICE OF EXAMINATION FOR REGISTRATION WEDNESDAY, AUGUST 21, 1991

Pursuant to the provisions of 37 CFR §§10.5, 10.6 and 10.7, an examination for persons seeking registration before the United States Parent and Trademark Office as patent attorneys and agents will be held on Wednesday, AUGUST 21, 1991. The deadline for filing applications along with the $270.00 examination fee and *all* necessary showings required by 37 CFR §10.7(a) and (b) is May 31, 1991.

With the exception of those persons who actively served four years or more in the examining corps of the United States Patent and Trademark Office for whom the examination may be waived, all persons who wish to become recognized to practice before the United States Patent and Trademark Office in patent cases must, pursuant to the above noted rules, pass the examination. Note that passing the examination does not qualify one for recognition for practice before the Patent and Trademark Office in trademark cases. Such recognition is governed by 37 CFR §10.14 which does not require the passing of an examination.

There is no limit on the number of times the registration examination may be taken. The examination consists of two parts, a morning section and an afternnon section. To pass the examination, an applicant must pass both sections. An applicant who passes one section of the examination, but who fails the other section, will not be required to retake the section passed, *provided* the applicant takes and passes the section failed in one of the next three examinations regularly scheduled by the Patent and Trademark Office. If the applicant does not pass the section failed in one of the next three examinations scheduled, the applicant must retake both sections of the examination. No extensions of time will be granted except in extraordinary circumstances, e.g., an accident or hospitalization just prior to the examination which prevented the applicant from taking the examination.

Application forms may be obtained from the Office of Enrollment and Discipline, Suite 810, Crystal Park One, 2011 Crystal Park Drive, Arlington, Va., or my mail address to U. S. Patent and Trademark Office, Box OED, Washington, D. C. 20231.

Jan. 18, 1991 CAMERON WEIFFENBACH
Office of Enrollment and Discipline

U. S. DEPARTMENT OF COMMERCE

Agency: Patent and Trademark Office.
Action: Notice.
Summary: In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92-463), announcement is made of the open meeting of the Public Advisory Committee for Trademark Affairs.
Date: The Public Advisory Committee for Trademark Affairs will meet from 10:00 a.m. until 4:00 p.m. on February 26, 1991.
Place: U. S. Patent and Trademark Office, 2121 Crystal Drive, Crystal Park 2, Room 912, Arlington, Virginia.
Status: The meeting will be open to public observation; seating will be available for the public on a first-come-first-served basis.

Members of the public will be permitted to make oral comments of three (3) minutes each. Written comments and suggestions will be accepted before or after the meeting on any of the matters discussed. Copies of the minutes will be available upon request.
Matters to be Considered: The agenda for the meeting is as follows:

(1) Finance
(2) Automation
(3) Strategic Planning
(4) Current Trademark Office Practice Issues
(5) International Trademark Law

Contact Person for More Information: For further information, contact Lynn Beresford, Office of the Assistant Commissioner for Trademarks, Room CPK2-910, Patent and Trademark Office, Washington, D.C. 20231. Telephone: (703) 557-7464.

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

Iraqi Sanctions Regulations

On January 18, 1991, the Department of the Treasury, Office of Foreign Assets Control (OFAC), published the Iraqui Sanctions Regulations (Regulations) (31 CFR Part 575). 56 Fed. Reg. 2112. The regulations implement Executive Orders 12722 (August 2, 1990) and 12724 (August 9, 1990) relating to certain property and transactions in which the Government of Iraq and persons in Iraq may have an interest.

It appears that the provisions of the Executive Orders and Regulations prohibit transactions relating to the filing or prosecution of applications for patents or for registration of trademarks, where an Iraqi interest is involved. The prohibited transactions, however, may be authorized by a specific license issued pursuant to the procedures described in Section 575.801 of Subpart H of the Regulations.

This notice is intended to alert practitioners and applicants to the prohibitions which may apply to matters before the Patent and Trademark Office ,(PTO) if Iraqi interests are involved. This notice is further intended to advise that where such interests or potential interests come to the attention of the PTO, an appropriate specific license from OFAC may be required.

Jan. 29, 1991 HARRY F. MANBECK, Jr.
Commissioner of Patent and Trademarks

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PATENT NOTICES

Certificates of Correction For Week of February 19, 1991

B13,965,838	4,869,877	4,885,290	4,896,422
4,153,998	4,870,950	4,885,515	4,896,514
4,710,718	4,871,072	4,885,538	4,896,686
4,754,922	4,871,246	4,885,734	4,897,188
4,793,981	4,871,386	4,886,149	4,899,017
4,794,455	4,871,638	4,886,462	4,899,207
4,799,137	4,871,741	4,886,619	4,899,568
4,803,277	4,871,885	4,887,612	4,900,166
4,807,353	4,874,253	4,888,322	4,900,195
4,827,939	4,875,064	4,888,903	4,900,265
4,828,450	4,875,189	4,889,519	4,900,434
4,836,504	4,875,426	4,889,604	4,900,603
4,839,605	4,875,836	4,889,854	4,900,681
4,839,696	4,876,206	4,889,858	4,900,716
4,839,740	4,876,273	4,890,046	4,900,762
4,842,019	4,877,168	4,890,183	4,900,876
4,843,210	4,878,110	4,890,365	4,901,205
4,843,320	4,879,173	4,890,366	4,901,355
4,846,470	4,879,265	4,891,047	4,901,558
4,847,257	4,879,685	4,891,054	4,902,695
4,850,334	4,880,511	4,891,106	4,902,804
4,851,211	4,880,757	4,891,421	4,903,491
4,855,594	4,881,387	4,891,431	4,904,185
4,856,234	4,882,048	4,891,465	4,905,937
4,857,364	4,882,272	4,891,726	4,906,468
4,861,233	4,882,561	4,892,140	4,906,689
4,861,418	4,882,669	4,893,107	4,909,149
4,863,807	4,882,718	4,893,573	4,910,576
4,865,004	4,882,862	4,893,951	4,913,860
4,866,004	4,883,208	4,894,421	4,915,915
4,866,102	4,883,864	4,894,559	4,925,550
4,866,246	4,883,866	4,894,907	4,939,132
4,866,444	4,884,168	4,894,977	4,941,770
4,867,232	4,884,199	4,895,459	
4,868,571	4,884,372	4,895,713	
4,869,697	4,884,662	4,895,736	

Disclaimers

3,632,645.—*John Bernard Bream*, Redbourn Herts, and *Claude W. Picard*, Welwyn Garden City, Herts, England. SUBSITUTED PHENYL-ACETYL DERIVATIVES OF GUANIDINE, O-ALKYLSOUREAS, S-ALKYLISOTHIOUREAS, AND P-NITROBENZYLISOTHIOUREA. Patent dated Jan. 4, 1972. Disclaimer filed Sept. 27, 1990, by the assignee, Sandoz Pharmacueticals Corp.

The term of this patent subsequent to Oct. 25, 1990, has been disclaimed.

4,671,964.—*Reghina Davidescu*, Princeton Junction: *Randy F. Striebel*, Mount Holly, both of N.J.; *Roger E. Hawks*, St. Augustine, Fla. UPGRADING OF LOW QUALITY GREEN COFFEE. Patent dated June 9, 1987. Disclaimer filed Dec. 14, 1990, by the assignee, Kraft General Foods, Inc.

The term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

4,678,698.—*Arlene J. Mencke*, St. Paul, Minn. CONTACT LENS CLEANING ARTICLE. Patent dated July 7, 1987. Disclaimer filed Nov. 5, 1990, by the assignee, Minnesota Mining and Manufacturing Co.

The term of this patent subsequent to Nov. 11, 2006, has been disclaimed.

4,894,914.—*David E. Mead*, Co. Durham, United Kingdom. GRASS TRIMMING DEVICE. Patent dated Jan. 23, 1990. Disclaimer filed Aug. 24, 1990, by the assignee, Electrolux Northern Ltd.

Hereby enters this disclaimer to claim 9 of said patent.

4,965,284.—*Vijay G. Nair*, Nanuet; *Ramson B. Conrow*, Pearl River; *Bosco S. Wang*, Cranbury; *V.M. Ruszala-Mallon*, New City, all of N.Y. SUBSTITUTED DIBENZOTHIOPHENES. Patent dated Oct. 23, 1990. Disclaimer filed Nov. 5, 1990, by the assignee, American Cyanamid Co.

Hereby enters this disclaimer to claims 17, 18, and 19 of said patent.

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Expiration of patents: The patents within the range of numbers indicated below expire during January 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,778,914 to 3,789,426 inclusive
Plant Patents ..... 3,413 to 3,462 inclusive

REEXAMINATIONS

FEBRUARY 19, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,142,101 (1414th)

LOW INTENSITY X-RAY AND GAMMA-RAY IMAGING DEVICE

Lo I. Yin, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Reexamination Request No. 90/001,637, Nov. 15, 1988.

Reexamination Certificate for Patent No. 4,142,101, issued Feb. 27, 1979, Ser. No. 817,415, Jul. 20, 1977.

Int. Cl.[5] **G01T** *1/20;* **H05G** *1/04*

U.S. Cl. 250—363.01

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 10, 21, 22** and **37** are cancelled.

Claims **1, 3–5, 11, 12, 14, 15, 17–20, 23–25** and **29** are determined to be patentable as amended.

Claims **6–9, 13, 16, 26–28** and **30–36**, dependent on an amended claim, are determined to be patentable.

New claims **38–148** are added and determined to be patentable.

1. Apparatus for *providing and* converting *invisible* radiation to visible light, comprising:

invisible radiation source means;

means for converting incoming invisible radiation to visible light;

means for visible light intensification, *including a vacuum tube housing,* which means *further* includes a microchannel plate amplifier [; and means for light coupling said means for converting incoming radiation and said means for visible light intensification.] *within said housing, said housing having a fiber optic means for visible light and mechanical coupling of said means for converting incoming invisible radiation and the portion of the means for visible light intensification within said housing.*

said means for converting incoming invisible radiation and said means for visible light intensification being in a rigidly abutting relationship, with said means for converting incoming invisible radiation being outside of said housing and,

said invisible radiation source means and said means for visible light intensification being substantially directly mechanically coupled and attached.

148. Apparatus for converting radiation to visible light, comprising:

means for converting incoming invisible radiation to visible light;

means for visible light intensification, which means includes a microchannel plate amplifier; and

means for light coupling said means for converting incoming radiation and said means for visible light intensification;

wherein said means for converting incoming radiation is a luminescent layer deposited on a fiber optic plate independent of said means for visible light intensification, is mechanically connected to said means for visible light intensification in a mechanically interchangeable fashion, and is light coupled to said means for visible light intensification through fiber optic

B1 4,315,398 (1415th)

OPEN-END SPINNING APPARATUS

Alan Parker, Bolton, and William M. Farnhill, Burnley, both of England, assignors to Platt Saco Ltd., London, England

Reexamination Request No. 90/001,914, Dec. 15, 1989.

Reexamination Certificate for Patent No. 4,315,398, issued Feb. 16, 1982, Ser. No. 88,262, Oct. 25, 1979.

Claims priority, application United Kingdom, Oct. 26, 1978, 42074/78; Jun. 6, 1979, 7926163; Aug. 4, 1979, 7927295

Int. Cl.[5] **D01H** *4/16, 4/34*

U.S. Cl. 57—401

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–8, 19–22, 27** and **28** are cancelled.

Claims **9–17** and **23–26** are determined to be patentable as amended.

Claim **18** dependent on an amended claim, is determined to be patentable.

23. Apparatus for open end spinning of yarn comprising a yarn formation surface,

a fiber feed means,

a fiber feed duct formed with [a] *an elongate* mouth at one end adjacent said surface *to define therewith a yarn formation line* and having walls extending from said *fiber feed* means to said mouth wherethrough fibers from said fiber feed means may pass to said surface for deposit thereon, *said fiber feed duct being inclined to said yarn formation line whereby the fibers in said fiber feed duct have a component of movement parallel to said yarn formation line,*

means for moving said surface for twisting said fibers to form yarn *along said yarn formation line* at said surface, and

means for withdrawing said formed yarn from said surface in a direction transverse to the direction of movement of said surface,

wherein said duct is formed with an opening intermediate its length and

wherein means are provided for developing an airstream in said *fiber feed* duct for movement toward said mouth such that at least some of the air thereof is caused to turn toward said opening and to exit therethrough *in a direction of said component of movement of the fibers in said fiber feed duct.*

B1 4,618,354 (1416th)

METHOD, APPARATUS AND BURNER FOR FABRICATING AN OPTICAL FIBER PREFORM

Hiroyuki Suda; Shuichi Shibata, and Motohiro Nakahara, all of Mito, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka and Nippon Telegraph & Telephone Public Corporation, Tokyo, both of, Japan

Reexamination Request No. 90/001,613, Oct. 3, 1988.

Reexamination Certificate for Patent No. 4,618,354, issued Oct. 21, 1986, Ser. No. 705,362, Feb. 25, 1985.

Claims priority, application Japan, Feb. 27, 1984, 59-34300; Mar. 1, 1984, 59-37223; Feb. 12, 1985, 60-23486; Feb. 12, 1985, 60-23487; Feb. 12, 1985, 60-23488

Int. Cl.[5] **C03B** *37/018*

U.S. Cl. 65—2

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AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 6–10 is confirmed

Claim 1 is determined to be patentable as amended.

Claims 2–5, dependent on an amended claim, are determined to be patentable.

1. An optical fiber preform fabrication method comprising the steps of:

using a burner having a central raw material supply orifice for supplying a glass raw material and a plurality of flame forming orifices disposed around said raw material supply orifice sequentially for forming a plurality of flames, respectively, the number of flames being at least equal to k+1;

determining and controlling the flame speed V_k of [,] a kth flame, the flame speed V_{k+1} of a (k+1)th flame outwardly surrounding said kth flame and the flow speed Vm of the glass raw material supplied through the center of the [buner] *burner* in such a way that the following relations are satisfied:

$$0.1V_{k+1} \leqq Vk \leqq 2.5V_{k+1},$$

$$Vm \leqq V_{k+1} \text{ and}$$

$$Vm \leqq V_k;$$

supplying combustion gases to said flame forming orifices and combusting to provide said flames;

supplying said glass raw material to the multiflame produced by said burner in which the kth flame is positioned axially rearwardly of the (k+1)th flame to synthesize fine glass particles;

depositing said fine glass particles on a seed rod to form a porous preform; and

consolidating said porous preform into a transparent optical fiber preform.

B1 4,626,441 (1417th)

DIETETIC FROZEN DESSERTS CONTAINING ASPARTAME

Melvin Wolkstein, 24 Mayhew Dr., South Orange, N.J. 07079

Reexamination Request Nos. 90/001,350, Oct. 15, 1987 and 90/001,465, Mar. 9, 1988 and 90/001,585, Aug. 25, 1988.
Reexamination Certificate for Patent No. 4,626,441, issued Dec. 2, 1986, Ser. No. 539,661, Oct. 6, 1983.
Int. Cl.[5] A23G *9/02*; A23L *1/236, 1/307, 1/308*
U.S. Cl. 426—548

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 6, 8, 20–23 and 27 are cancelled.

Claims 1–5, 7, 11–19, 24 and 26 are determined to be patentable as amended.

Claims 9, 10 and 25, dependent on an amended claim, are determined to be patentable.

1. A sweetener-bulking agent composition suitable for use in dietetic frozen desserts comprising:

(a) as the sweetener, mixtures of aspartame with a synergistic sweetener selected from the group consisting of thaumatin, acesulfame K, saccharin, chalcone, stevioside, cyclamate, glycyrrhizin and mixtures thereof or aspartame alone, and

(b) as the bulking agent,

(i) a material selected from the group consisting of polydextrose *in the presence of fermented whey*, microcrystalline cellulose *in the presence of fermented whey*, fermented whey, [a mixed culture of Lactobacillus bulgaricus and Streptococcus thermophilus, soy bean protein,] sucrose polyester and mixtures thereof; or

(ii) a material selected from the group consisting of polydextrose *in the presence of fermented whey*, microcrystalline cellulose *in the presence of fermented whey*, fermented whey, [soy bean protein,] sucrose polyester and mixtures thereof, in combination with a minor amount of a material selected from the group consisting of sugar alcohols, sugars, whey, rennet, lactase and mixtures thereof; *or*

(iii) a material selected from the group consisting of polydextrose, microcrystalline cellulose, fermented whey, sucrose polyester and mixtures thereof, in combination with a minor amount of rennet

with the proviso that when aspartame alone is the sweetener, the bulking agent is not polydextrose alone or a mixture of polydextrose and microcrystalline cellulose, and when polydextrose alone is the bulking agent, the sugar alcohol, if present, is not sorbitol.

REISSUES

FEBRUARY 19, 1991

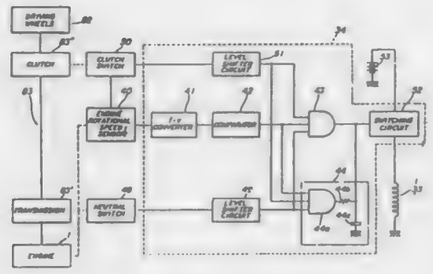
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,538

VALVE OPERATION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

Yoshikatsu Nakano, Kawagoe, and Masaaki Matsuura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 4,535,732, dated Aug. 20, 1985, Ser. No. 624,572, Jun. 26, 1984. Continuation of Ser. No. 87,629, Aug. 20, 1987, abandoned. Application for reissue Feb. 27, 1989, Ser. No. 315,195
Claims priority, application Japan, Jun. 29, 1983, 58-117826; Jun. 29, 1983, 58-117827; Jun. 29, 1983, 58-117828; Jun. 29, 1983, 58-117829
Int. Cl.[5] F01L *1/00*
U.S. Cl. 123—90.16 **32 Claims**



1. A valve [disabling] *operation control* device for use in an internal combustion engine having inlet valve means, exhaust valve means, at least one of which comprises a plurality of valves, an output shaft, and power transmission means for selectively establishing and interrupting power transmission between said output shaft and a load on said engine, the device comprising:

[disabling] *valve operating* means for selectively holding said at least one of said inlet valve means and said exhaust valve means in a first state wherein part of said valves thereof are inoperative, and in a second state wherein all said valves thereof are operative for alternate closing and opening actions;

transmission state detecting means for detecting whether said power transmission means is in a connected state wherein said power transmission is allowed, or in a disconnected state wherein said power transmission is inhibited; and

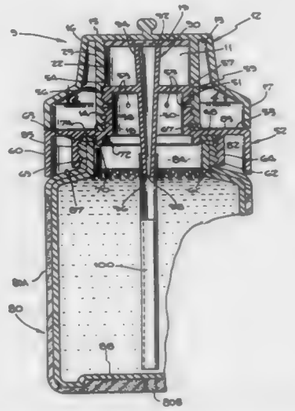
control means responsive to an output from said detecting means to cause said [disabling] *valve operating* means to hold said at least one of said inlet valve means and said exhaust valve means in said first state when said power transmission means is in said disconnected state, irrespective of the rotational speed of said engine.

Re. 33,539

REFILLABLE CONTAINER WITH DEPRESSURIZATION MEANS

David Karpal, 461-204 Wellesley Dr., Corona, Calif. 91719

Original No. 4,623,076, dated Nov. 18, 1986, Ser. No. 708,157, Mar. 4, 1985. Application for reissue Nov. 17, 1988, Ser. No. 272,525
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—482 **9 Claims**



1. A venting type container, to relieve *pressure of* pressurized carbonated liquids and the like therefrom without discharging said liquid while equalizing interior container pressure with atmospheric pressure, comprising:

a flexible wall [container] *bottle* having a threaded neck portion terminating in a circumferential lip defining an opening to said [container] *bottle;*

a removable dispensing cap [for said container] having [: an integrally formed] *a* dispensing spout terminating in a circumferential lip defining an opening to said spout; an [integrally formed] externally threaded boss [having an external and internal surface] defining a [central torodial] *centrally disposed* type cavity with a plurality of vent holes; and an [integrally formed] internally threaded annular cap skirt for engaging the threads on said [container] *bottle*, whereby the opening to said [container] *bottle* is redefined by said vent holes and *said* spout opening as said dispensing cap is brought into full threaded engagement with said [container] *bottle*; and

a depressurization sealing assembly having [: an integral] *a* internally threaded annular assembly skirt for engaging the external threads on said boss, said annular skirt terminating in a circumferential lip defining an open internal cavity within said sealing assembly; [an insert gasket received within the top of said cavity whereby] *said depressurization sealing assembly causing* the opening to said spout [is] *to be* sealed as said sealing assembly is brought into full threaded engagement on said boss [; and a lip gasket received on said lip whereby] *and causing* the opening to said cavity [is] *to be* sealed as said sealing assembly is brought into full threaded engagement with said boss, whereby the orientation of said depressurization sealing assembly in relation to said dispensing cap assembly permits gases and not liquid within [said] *the* container to vent from inside out or from outside into the

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container through said vent holes depending on the relative pressures within and without [said] *the* container.

Re. 33,540

SKI BRAKE

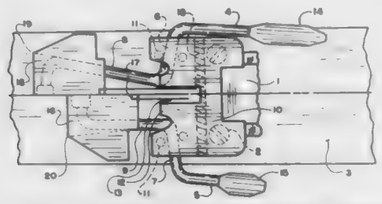
Gerhard J. Sedlmair, Farchant, Fed. Rep. of Germany, assignor to Marker Patentverwertungsgesellschaft mbH, Barr, Switzerland

Original No. 4,470,614, dated Sep. 11, 1984, Ser. No. 368,276, Apr. 14, 1982. Application for reissue Mar. 5, 1990, Ser. No. 489,344

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3116039

Int. Cl.[5] A63C *7/10*

U.S. Cl. 280—605 **9 Claims**



1. A ski brake mountable on a ski for impeding movement of the skier down a slope when the ski is detached from a skier's boot, the ski having a top surface, a bottom skiing surface, longitudinal side edges and a longitudinal middle section intermediate the longitudinal side edges, said ski brake comprising:

at least one braking spur rotatable about an axis transverse to the longitudinal side edges of the ski between a raised skiing position and a lowered braking position, said braking spur having an end disposed below the bottom skiing surface of the ski for engaging the snow when said braking spur is in the braking position:

an inner portion connected to said braking spur for controlling the movement of said braking spur;

pedal means movable between a lowered skiing position and a raised non-skiing position, said pedal means moving said inner portion to rotate said braking spur to the raised skiing position when said pedal means is in the lowered skiing position, and to the lowered braking position when said pedal means is in the raised non-skiing position;

biasing means for biasing said pedal means to the raised non-skiing position and said braking spur to the lowered braking position;

housing means for housing at least part of said inner portion of said ski brake, said housing means including top means for limiting the rotation of said braking spur in said lowered braking position and for engaging said inner portion to prevent lateral movement of said braking spur while in said braking position, said inner portion being disengaged from said stop means when said braking spur is in said raised skiing position to enable lateral movement of said braking spur with respect to said housing means.

Re. 33,541

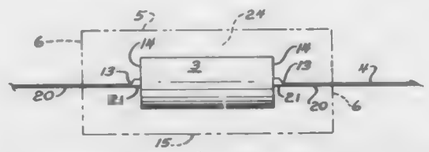
SURFACE-MOUNTED POWER RESISTORS

Theodore S. Pryst, 404 Huber La., Glenview, Ill. 60025, and John G. Kirschner, 3320 Overland Pass, Northbrook, Ill. 60062

Original No. 4,672,358, dated Jun. 9, 1987, Ser. No. 864,777, May 19, 1986. Application for reissue Jun. 9, 1989, Ser. No. 364,472

Int. Cl.[5] H01C *1/02*

U.S. Cl. 338—226 **20 Claims**



14. An improved method of manufacturing a surface-mounted electrical device which is intended for use on printed circuit boards and the like, which has a conventional design, and which includes a first body having opposite ends and having a pair of electrical leads that exit axially from the opposite ends of the first body and that have a generally circular cross-section along their lengths from the opposite ends of the first body to their free ends, the improved method comprising the steps of:

flattening a portion of each of the electrical leads, this portion extending form the free end of the electrical lead to a predetermined transition point that is spaced from but is adjacent to the opposite ends of the first body; and

embedding the first body in a second body of moldable, hardenable, electrically insulative and heat conductive material, with the second body encapsulating the first body and each of the axial leads from the first body beyond the transition points so that the second body, when the material hardens, provides a rigid structural support for the transition points of the electrical leads.

PLANT PATENTS

GRANTED FEBRUARY 19, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,448

MINIATURE ROSE PLANT NAMED SAVARAIN

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 20, 1989, Ser. No. 410,308

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by attractive lavendar toned flowers.

7,449

MINIATURE ROSE NAMED 'TEENY BOPPER'

Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif. (by Susan M. O'Brien, administrator), assignor to Susan O'Brien, Chula Vista, Calif.

Filed Jan. 2, 1990, Ser. No. 460,231

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant named, 'Teeny Bopper' of hardy, dwarf, compact growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea form blooms in near white with margins, ranging from near Cardinal Red to near Chrysanthemum Crimson to near Carmine, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,450

MINIATURE ROSE PLANT NAMED FOUTWIST (LEMON TWIST)

Betty A. Jacobs, 525 Butler Rd., Bakersfield, Calif. 93304

Filed Sep. 27, 1989, Ser. No. 413,380

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, very bushy, rounded to upright, much branched habit; substantially as illustrated and described, characterized by buds and flowers of bright yellow (near Lemon Yellow 4/1 or similar); the bud and flower resembling the variety Starina (U.S. Plant Pat. No. 2,646) in form; and further characterized by a plant of vigorous and compact growth habit, said plant being more bushy and compact than Great Day (its paternal parent), with flowers being slightly smaller, of greater average petalage, and more abundant than on Great Day; easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy foliage (color near Spinach Green o960/1 or lighter) and an abundance of flowers borne both singly and in loose clusters of 3 to 5 or more.

7,451

RASPBERRY PLANT NAMED PSI 114

Stephen M. Ackerman, Salinas, Calif., assignor to Plant Sciences, Inc., Watsonville, Calif.

Filed Aug. 25, 1989, Ser. No. 398,436

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—46 **1 Claim**

1. A new distinct variety of red raspberry plant named PSI 114, as herein described and illustrated.

7,452

KALANCHOE PLANT NAMED CONTENDER

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 16, 1989, Ser. No. 421,679

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct plant of Kalanchoe named Contender, as described and illustrated.

7,453

CHRYSANTHEMUM PLANT NAMED CREAM TARA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 2, 1989, Ser. No. 388,895

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Cream Tara, as described and illustrated.

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PATENTS

GRANTED FEB. 19, 1991

ERRATA

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452-169	4,993,111
452-134	4,993,112
452-136	4,993,113
452-136	4,993,114
452-169	4,993,115
452-116	4,993,116
047-040	4,993,176
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606-100	4,993,410
606-007	4,993,412
335-078	4,993,787
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378-007	4,995,107
378-168	4,995,108
379-107	4,995,109
379-155	4,995,110
379-382	4,995,111
380-025	4,995,112
381-117	4,995,113

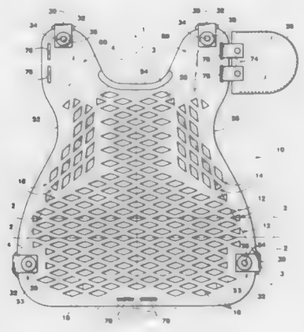
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PATENTS

GRANTED FEBRUARY 19, 1991

GENERAL AND MECHANICAL

4,993,076
CHEST PROTECTOR
Edward G. Dierickx, 2927 Hunter Way, West Linn, Oreg. 97068
Filed Jul. 21, 1989, Ser. No. 383,867
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 28 Claims



1. An article for protecting a person's upper body, comprising:
a first lightweight flexible shock absorbing pad;
said first pad having concave midsection edges providing openings for the person's arms;
said first pad having convex upper sections providing protection for the person's shoulders;
a plurality of diamond-shaped apertures extending through said first pad, said apertures being arranged in a net-like lattice pattern with apertures offset in alternate rows and in nested relation for allowing the article to flex with and conform to the person's body; and
means for attaching the article to the person.

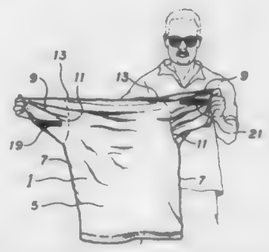
4,993,077
ALL WEATHER GARMENT
Maurice L. Robison, 3465 Owen St., Idaho Falls, Id. 83406
Filed Mar. 8, 1990, Ser. No. 490,352
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—82 17 Claims

1. A multi-layer all weather garment which provides protection from the elements comprising:
contiguous leg, torso and bib sections,
said leg and torso sections having inner and outer shells defining first and second layers,
said first layer comprising an inner textile fabric bound compositely to an insulating, textile batting,
said second layer comprising an outer waterproof textile fabric,
a third layer of waterproof textile fabric sandwiched between said first and second layers,
said third layer further comprising a plurality of thermoplastic coated panels secured together to form an undergarment structure including a continuous inseam joining front and back seams of said undergarment structure,
said inseam, said back seam and said front seam being heat sealed by bonding said thermoplastic coating thereby rendering said seams watertight,
said heat sealed seams being free of sewn stitching,
the panels of said third layer being disposed and dimensioned relative to said first and second layers to overlay and



conform to an upper portion of said leg sections extending continuously to a lower portion of said torso section.

4,993,078
SHIRT CONVERTIBLE TO HEADDRESS
William E. Seitz, Jr., 2358 Kelly St., Ramona, Calif. 92065
Filed Nov. 28, 1989, Ser. No. 442,506
Int. Cl.[5] A41B *1/00*
U.S. Cl. 2—115 16 Claims

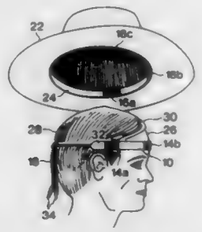


1. In a shirt of the type having a front side and a back side and comprising first and second shoulder and torso-covering panels joined together at seams formed along their respective side and top edges, a pair of spaced-apart arm holes formed in said seams adjacent the shoulder areas, including a pair of sleeves attached thereabout and extending outward therefrom and having a respective front side and back side corresponding to the front side and back side of said shirt and a head opening formed in said top seam, the improvement of rendering said shirt convertible to a headdress for covering the head and the back of the neck, comprising first and second strips of releasable, press-together bonding material, each attached to a different sleeve near said panel-sleeve seam, said strips being attached on the same side of said shirt, said strips arranged one above the other so that when the upper portion of said shirt is folded away and downward from said strips a distance of about one half the depth of said sleeves, said strips become positioned on opposite sides of the folded shirt, so that when said torso-covering panels are draped over the wearer's head and down

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over the rear of the wearer's neck, said folded sleeves may be wrapped rearward about the head and brought into overlapping contact at the back of the head along said strips to form the headdress.

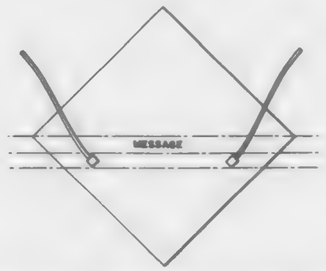
4,993,079
DEVICE FOR SECURING HAT
Charlotte W. Johnson, 1075 Dana Dr., Laramie, Wyo. 82070
Filed May 1, 1989, Ser. No. 345,963
Int. Cl.[5] A42B *1/00*
U.S. Cl. 2—181 3 Claims



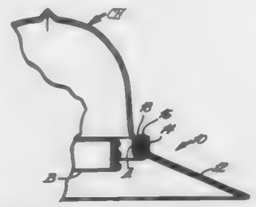
1. A headband and hat combination for holding a hat securely on the head of a wearer in adverse wind conditions comprising:
(a) an elongated band of elastic material having a first end and a second end;
(b) said first and second ends having mitered corners;
(c) an elongated strip of thin porous semi-transparent foam material adhered to a backside of said elastic band;
(d) first and second equal lengths of decorative string secured to said mitered corners of said first and second ends by means of stitching whereby said first and second equal lengths of decorative string may be tied together so as to secure said headband around the head of a wearer;
(e) three individual elongated strips of woven looped material attached to a frontside of said elastic band, the first strip of woven looped material positioned adjacent said first end, the second strip of woven looped material positioned adjacent said second end, the third strip of woven looped material positioned halfway between said first and second strips of woven looped material;
(f) three individual elongated strips of hook material attached to a hatband of said hat and positioned in mating relationship with said three strips of woven looped material.

4,993,080
HEADBAND
Robert M. Doty, 1075 N. Miller Rd. #149, Scottsdale, Ariz. 85271
Filed Mar. 27, 1989, Ser. No. 328,861
Int. Cl.[5] A42B *1/24*
U.S. Cl. 2—181 3 Claims

1. A headband comprising an imperforate piece of cloth having edges, a nominal fold axis, and ends of reduced width at the ends of said axis, said reduced width enabling said ends to be tied together, said piece having a message strip contiguous to and parallel to said axis, said message strip having a substantial lateral dimension of width and being adapted to bear a message, said head band having been folded along said axis along a principal fold, and roll-folded from the lateral edges of said piece toward said principal fold to leave the message strip flat and exposed when said ends are tied together, with the headband around the head,
said piece including a tassel strip contiguous to and parallel to said message strip on the opposite side of said message strip from said nominal axis, said tassel strip having a substantial lateral dimension of width, and at least one elongated tassel attached to and depending from said tassel strip at a location substantially spaced from the tied ends of the folded piece of cloth, said folds being so proportioned that the tassel strip in the folded configuration abuts the head when the headband is wrapped around the head and the tassel is fully exposed.



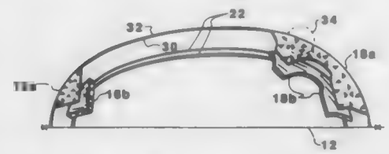
4,993,081
FLEXIBLE SUN SHIELD
David D. Fulgham, 9009 9th Ave. NW., Bradenton, Fla. 34209
Filed Feb. 28, 1990, Ser. No. 486,509
Int. Cl.[5] A42B *1/06*
U.S. Cl. 2—191 10 Claims



1. A flexible sun shield detachably connectable to a hard hat comprising:
a brim formed of a curved length of flexible, pliable flat material formed generally into the shape of a portion of an oval ring in-the-flat having generally parallel, spaced inner and outer margins and spaced apart ends;
said brim being fully bendable and readily deformable in response to the imposition of force;
an upstanding flexible flange connected along substantially the entire length of said inner margin;
releasable attaching means for connecting said flange circumferentially around the hard hat, said brim extending downwardly and sloping outwardly from the hard hat forming a sun shade for the user's head, neck and eyes;
said brim having first and second ends which, when connected around the hard hat, overlap.

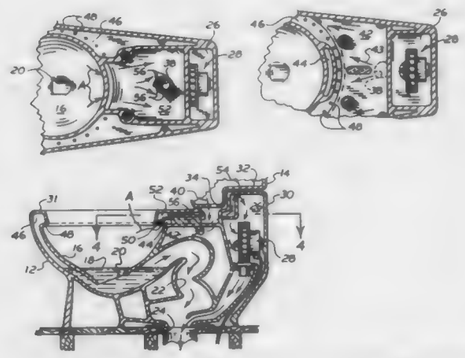
4,993,082
METHOD FOR MAKING HELMET WITH INDELIBLY ORNAMENTED COVER
James J. Gentes, Soquel, and Steven K. Sasaki, Santa Cruz, both of Calif., assignors to Giro Sport Design, Inc., Soquel, Calif.
Filed Jan. 5, 1990, Ser. No. 461,496
Int. Cl.[5] A42B *3/00*
U.S. Cl. 2—410 7 Claims

1. A method for forming a helmet having a molded helmet cover for decorating and protecting the exterior surface of a helmet body, comprising the steps of:
applying a decorative layer of material to at least a portion of a thin substantially translucent layer of plastic material;
molding the plastic material into a cover shell having an interior surface shaped to fit over the exterior surface of the helmet body, wherein the decorative layer of material is on the interior surface of the cover shell and is visible from the exterior of the cover shell; and



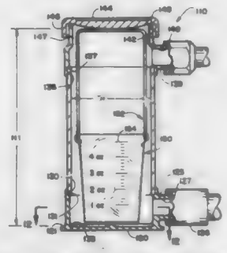
affixing the cover shell to the exterior surface of the helmet body, whereby both the helmet body and the decorative layer are protected by the cover shell, and the perceived depth of the decorative layer is enhanced by its placement under the cover shell.

4,993,083
VENTILATED TOILET
Charles E. Lemieux, 1117, des Escoumins, Lachenaie, Quebec J6W 3T8, Canada
Filed Jun. 18, 1990, Ser. No. 539,147
Int. Cl.[5] E03D *9/04*
U.S. Cl. 4—213 5 Claims



1. In a self-ventilating toilet adapted to store flushing water received from a water supply,
a bowl having a cavity adapted to retain a portion of said flushing water, a water outlet passage extending in said bowl for allowing a flow of flushing water from said water supply to said cavity in said bowl, said passage having a vertical tubular member extending above said bowl and a horizontal channel leading from said tubular member to said cavity;
an air intake chamber extending between said cavity and an air suction device for sucking air from said cavity, said air intake chamber horizontally extending above said horizontal channel and surrounding said tubular member, said tubular member being provided with small apertures for supplying small amount of flushing water to said air intake chamber, and
stop means for preventing said small amount of water to flow in the direction of the suction device.

4,993,084
CANISTER FOR DEODORANT/DISINFECTANT MATERIAL
Charles R. McCauley, P.O. Box 1932, and Robert E. Nicholson, 2339 Highview La., both of, Spring Valley, Calif. 92077
Continuation-in-part of Ser. No. 348,909, May 8, 1989, abandoned. This application Feb. 27, 1990, Ser. No. 485,554
Int. Cl.[5] E03D *9/02*
U.S. Cl. 4—224 5 Claims



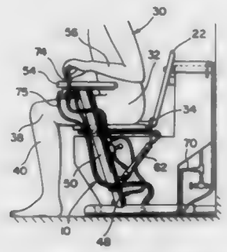
1. In a recreational vehicle or the like having a water tank, a pump, a toilet and water line tubes connecting the same together in series, wherein the improvement comprises:
a canister for a cake of deodorant/disinfectant material in said water line tube between said pump and said toilet;
said canster being formed from a cylindrical base member, a vertically oriented cylindrical body member, a cylindrical upper body member and a removable lid;
said cylindrical base member has a tubular boss extending laterally therefrom having an inlet port with a one-way valve mounted therein, said cylindrical base member has a bottom wall having an outwardly extending flange whose outer configuration is substantially square, a plurality of apertures are formed in said flange for receiving screws for fastening said canister to a support structure;
said cylindrical upper body member has a tubular boss extending laterally therefrom having an outlet port;
said removable lid having a horizontal top wall and means for removably securing said lid to the top end of said cylindrical upper body member;
said canister having a predetermined internal height H1 and a predetermined internal diameter D1; and
a measuring bucket having an outer diameter less than D1 removably inserted into the interior of said canister, an inverted U-shaped handle having downwardly extending leg portions that are secured to said measuring bucket and when the handle is extending upwardly the combined height of said measuring bucket and handle is less than H1.

4,993,085
POWER ASSISTED TOILET SEAT
Frank B. Gibbons, Mesa, Ariz., assignor to Harry D. Lockhart and Mackie G. Lockhart, both of Russell, Ky.
Filed Oct. 3, 1989, Ser. No. 416,473
Int. Cl.[5] A47K *13/10, 13/00*
U.S. Cl. 4—251 8 Claims

1. A power assisted toilet seat comprising a pair of vertically extending, inclined lift assemblies adapted to be oriented on opposite sides of a commode, a toilet seat mounted between the lift assemblies for movement along a vertically inclined path, piston and cylinder means interconnecting the toilet seat and the lift assemblies for moving the toilet seat in an inclined path for pivoting the rearward portion of the toilet seat upwardly about the connection between the toilet seat and lift assemblies for moving the toilet seat in an inclined path thereby inclining the toilet seat as it is moved upwardly in an inclined path to an upwardly inclined position for lifting and supporting a user of the toilet when moving between a sitting position and a standing position and manual control means accessible to a user of the toilet seat to enable control of the lifting and tilting func-

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tions of the toilet seat, a pair of armrests mounted on said lift assemblies above the toilet seat to provide a stable support for a user, said control means being mounted on one of said armrests, each of said lift assemblies for moving the toilet seat in a vertically inclined path including an upper tubular member attached rigidly to an armrest and depending therefrom in an



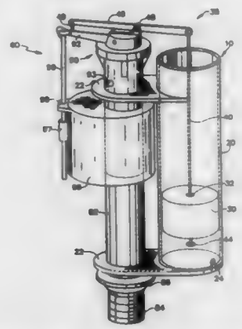
inclined manner, a lower tubular member telescopically received in the upper tubular member and stationarily supported, and a fluid pressure operated piston and cylinder positioned within each of said upper and lower tubular members to move the toilet seat generally vertically in an inclined path when fluid pressure is introduced between the cylinder and piston.

4,993,066

EMERGENCY SHUT-OFF MECHANISM FOR FLUSH TANK

Willice C. Palmer, 2446 Crestline Dr., Oceanside, Calif. 92054

Continuation-in-part of Ser. No. 390,639, Aug. 7, 1989, abandoned. This application Aug. 17, 1990, Ser. No. 568,786
Int. Cl.[5] E03D *1/00*
U.S. Cl. 4—363 6 Claims



1. Emergency shut-off means for connection to a valve activation lever of a liquid replenishment valve of a flush tank for moving the valve to a closed position if liquid level has not risen to a predetermined height within a predetermined shut-off time after the tank has been flushed; said emergency shut-off means comprising:

replenishment valve connection mechanism means including a rigid lever having a first end and a second end; said first end for connection to the liquid replenishment valve activation lever such that when said second end is depressed the liquid replenishment valve is closed;

container means for disposition in the flush tank including:

valve means for controlling ingress of tank liquid into said container such that during tank filling the liquid level in said container approximates that of the flush tank and for controlling liquid egress from said container at a predetermined rate such that following flushing the liquid level in said container is above that of the flush tank;

buoy means disposed in said container means for moving up and down dependent upon the liquid level in said container means; said buoy means when in a down position defining a predetermined shut-off height; and

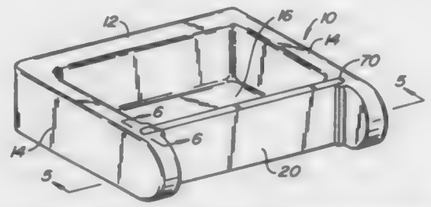
vertical activation means connected to said buoy means and said second end of said rigid lever for depressing said second end of said rigid lever thereby closing the valve in response to said buoy means reaching the predetermined shut-off height.

4,993,067

BATHING APPARATUS FOR HANDICAPPED PEOPLE AND THE LIKE

Joseph P. A. Roquebrune, 6415 East Broadway, Burnaby, B.C., Canada

Filed Aug. 2, 1989, Ser. No. 388,795
Int. Cl.[5] A47K *3/02*
U.S. Cl. 4—555 3 Claims



1. A bathing apparatus for handicapped people and the like comprising:

a bathtub having one fixed vertical side joined to two end walls extending up from a bottom surface,

a sliding panel representing the other vertical side of the bathtub in a raised position, the sliding panel mounted in track means in the two end walls external of the bathtub, the track means extending vertically downwards allowing the sliding panel to be lowered vertically from a raised position to a lowered position to permit entry and exit to the bathtub,

wherein the sliding panel is tapered having a narrow thickness at the top and fits in mating tapered slots defining said track means in the two end walls.

means to raise and lower the sliding panel between the lowered position and the raised position, and

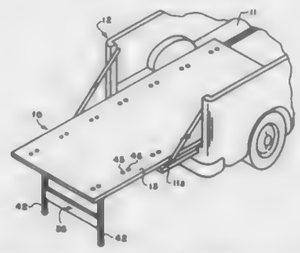
sealing means to effect a seal for the sliding panel in the raised position.

4,993,088

PORTABLE BED ASSEMBLY FOR MOTOR VEHICLES

David Chudik, 329 Douglas Dr., Bloomingdale, Ill. 60108

Filed Nov. 20, 1989, Ser. No. 439,163
Int. Cl.[5] A47C *19/12*
U.S. Cl. 5—118 3 Claims



1. A free standing portable bed assembly for use with rear opening decked motor vehicles comprises:

a pair of elongated rails adapted for being mounted in parallel spaced relation along the length of a motor vehicle deck on which said assembly is to be mounted,

an elongated framework slidably mountable on said elongate rails including a plurality of roller means disposed in dual longitudinal file relation along the length of an underside of said framework for easing movement of said framework along said pair of elongate rails,

selectably releasable means on one of said elongate rails and said elongate framework for stopping sliding movement therebetween,

a pair of opposed folding leg assemblies mounted transversely across said framework, one assembly mounted adjacent each end of the underside of said framework, each assembly being foldable within a space substantially defined by the underside of said framework and the height of said roller means, each folding leg assembly including a pair of legs positioned in spaced relation transversely across said assembly, and including at least one means thereon for adjusting the length of said legs on said assembly, and

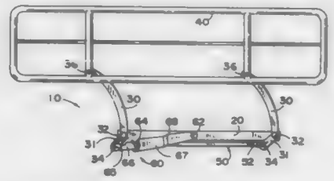
a pair of frame rail guides adapted for being mounted on a motor vehicle tailgate on which said bed assembly is to be mounted.

4,993,[illegible]

BED RAIL MECHANISM

Robert A. Solomon, Kalamazoo, and Stanley J. Axe, Sr., Plainwell, both of Mich., assignors to AmFab, Incorporated, Division of Bissell, Inc., Kalamazoo, Mich.

Filed Mar. 21, 1990, Ser. No. 496,784
Int. Cl.[5] A47C *21/08*
U.S. Cl. 5—430 19 Claims



10. A hospital-type bed comprising:

a bed frame;

a mechanism for connecting a bed rail to said bed frame such that the bed rail can be moved between a lowered position and a raised and locked position comprising:

a mounting bar for mounting said mechanism to said bed frame;

a pair of bed rail support arms, each having a first and a second end, said support arms being pivotally connected at an intermediate point, near said second end to each end of said mounting bar;

a bed rail having first and second ends and being pivotally connected, near each end, to said first end of said support [illegible]

a stabilizer bar pivotally connected between said second ends of said support arms; and

a linkage connected at one point to said mounting bar and connected at another point spaced from said one point to said stabilizer bar for locking said mechanism in the raised position.

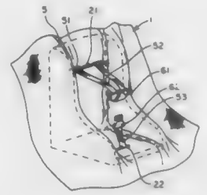
4,993,090

BABY BLANKET FOR USE IN CAR SEAT

Tracey L. Ranalli, 1263 Alice Dr., Santa Clara, Calif. 95050

Filed May 2, 1990, Ser. No. 518,039
Int. Cl.[5] A47G *9/02*
U.S. Cl. 5—482 11 Claims

1. A blanket for wrapping a child restrained in a child's car seat, the car seat being equipped with a plurality of restraining members which are anchored to the car seat at spaced-apart locations and which can be releasably secured to each other to provide a restraining harness around a child placed in the seat, the blanket comprising a plurality of apertures through which said restraining members can be passed so that, when a child is restrained in the seat, the blanket comprises (a) an interior



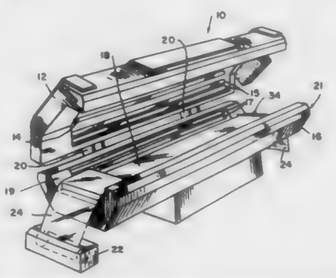
portion which lies between the child and the seat and which comprises the apertures through which the restraining members pass, and (b) an exterior portion having a width such that it can be wrapped around and cover the child outside the restraining members after the restraining members have been secured to each other to provide the restraining harness around the child.

4,993,091

TANNING BED LINER ASSEMBLY

Beverly Draper, and Gayle Parkevich, both of Cutler, Ind., assignors to Tan Sense, Inc., Cutler, Ind.

Filed Feb. 16, 1989, Ser. No. 311,648
Int. Cl.[5] A47G *9/02*
U.S. Cl. 5—487 27 Claims



21. A liner assembly for covering a surface used to support a person, the assembly comprising

a film sheet for covering the surface, the film sheet having a percent transmittance for ultraviolet light of at least 75 percent for permitting the transmission of rays between the supported person and through the film sheet, and

a dispenser for storing an unused portion of the film sheet to permit a user to remove a section of the unused portion to cover the surface prior to each use.

4,993,092

PATIENT CARRIER COVER AND METHOD

David B. Weeks, 233 Felch St., Holland, Mich. 49424

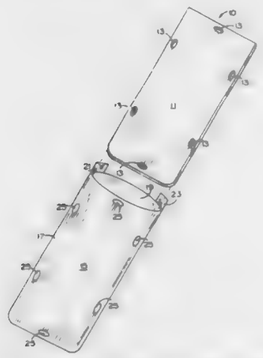
Filed Nov. 13, 1989, Ser. No. 434,314
Int. Cl.[5] A61G *1/01;* A47C *31/00;* A47G *9/00*
U.S. Cl. 5—508 11 Claims

1. A cover for a backboard having a flat surface with spaced handholds about the periphery thereof comprising:

a flexible fluid impermeable cover having an upper and

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lower surface joined along three sides, each of said upper and lower surfaces having apertures therein in substantial



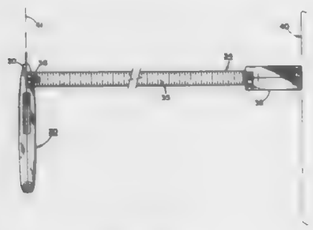
alignment with said handholds in said backboard to enable said handholds to be gripped.

4,993,093

MULTI-PURPOSE UTILITY KNIFE FOR PRECISION MEASURING

Brian L. Goldwitz, 342 Country La., Orange, Conn. 06477

Filed Nov. 16, 1989, Ser. No. 437,123
Int. Cl.[5] B26B *11/00*
U.S. Cl. 7—163 **9 Claims**



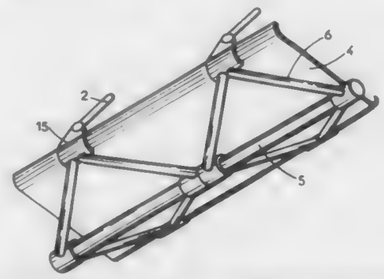
1. A utility knife incorporating
A. a housing;
B. a cutting blade
a. retainingly engaged with the housing, and
b. having a cutting edge formed thereon, said cutting edge lying in and establishing a cutting edge plane; and
C. an elongated slot
a. formed in one surface of the housing
b. positioned in juxtaposed, spaced, aligned relationship with the cutting edge plane defined by the cutting edge of the cutting blade, and
c. having at least one edge thereof aligned with and lying substantially in the cutting edge plane defined by the cutting edge of the cutting blade and having a length
whereby the utility knife can quickly and easily securely retain the leading edge of a measuring tape for positioning the measuring tape in precise, direct, aligned relationship with the cutting edge of the cutting blade for attaining direct measurement therewith.

4,993,094

BRIDGE COMPRISING A BRIDGE FLOOR AND ELEMENTS SUPPORTING SAID FLOOR, PARTICULARLY A LONG SPAN CABLE-STAYED BRIDGE, AND PROCESS OF CONSTRUCTION

Jean Muller, Suresnes, France, assignor to Scetauroute, Paris, France

PCT No. PCT/FR88/00157, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/07604, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 25, 1988, Ser. No. 297,865
Claims priority, application France, Mar. 27, 1987, 87 04338
Int. Cl.[5] E01D *11/00, 9/06, 7/02, 21/04*
U.S. Cl. 14—1 **21 Claims**



1. A bridge composed of a deck and of means for supporting the deck, the deck comprising:
an upper chord forming a roadway slab having a horizontal mid-plane,
a lower chord forming a continuous longitudinal element having a vertical longitudinal plane of symmetry in relation to said upper chord and a longitudinal axis of symmetry in said longitudinal plane,
connecting girders, called "diagonals", connecting the upper and lower chords, having an axis, and directed obliquely both relative to the vertical and relative to the length of the bridge, and forming, with the chords, a three-dimensional lattice, wherein the axis at a first end of each of two adjacent diagonals converges on the longitudinal axis of symmetry of the lower chord, and the axis at a second end of each of two adjacent diagonals converges with the mid-plane of the upper chord, with the diagonals which are subjected to high tensile forces being prestressed by at least one continuous prestressing means which is connected to a first edge of the upper chord, bisects the longitudinal plane of symmetry of the lower chord and is connected to a second edge of the upper chord which is in the same plane as said first edge of the upper chord.

19. A process for constructing a bridge composed of a deck and of means for supporting this deck, the deck comprising:
an upper chord forming a roadway slab,
a lower chord forming a continuous longitudinal element,
connecting girders, called "diagonals", connecting the upper and lower chords and directed obliquely both relative to the vertical and relative to the length of the bridge, and forming, with the chords, a three-dimensional lattice, the axes of the diagonals converging on the longitudinal axis of the lower chord or the mid-plane of the upper chord, the diagonals which are subjected to high tensile forces being prestressed by means which are common to two concurrent diagonals,
comprising the following steps:
placing, on a deck part already mounted, two longitudinal temporary edging girders on either side of the upper chord, so as to be overhung by a length at least equal to the longitudinal dimension of one mesh of the three-dimensional lattice, each girder being retained by means of

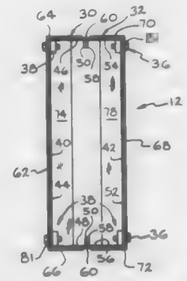
two successive nodes of the three-dimensional lattice already mounted,
bringing up a new mesh of the three-dimensional lattice, this mesh comprising at least one node located on the lower chord, two nodes located on the upper chord and the diagonals corresponding to these nodes,
fixing together this new mesh and the deck part already mounted, the new mesh being supported by means of the temporary edging girders,
starting the operations again by advancing the temporary edging girders along the mesh which has just been fixed.

4,993,095

SPLICE FOR A STRUCTURAL MEMBER

Richard W. Lautensleger; John N. Macadam, both of Middletown; Daniel F. Seaf, West Chester, and David C. Trimmer, Cincinnati, all of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Nov. 9, 1989, Ser. No. 434,948
Int. Cl.[5] E04C *3/02*
U.S. Cl. 14—17 **17 Claims**



1. A spliced structural member, comprising:
a plurality of girder segments placed end to end,
each of said girder segments including a pair of juxtaposed members,
each of said juxtaposed members having substantially identical cross-section shape and including a web, an upper flange and a lower flange, said flanges substantially perpendicular to said web,
each said flange including a free edge,
each said free edge including a flange stiffener substantially parallel to said web,
said flange stiffener of one of said juxtaposed members structurally connected to said flange stiffener of the other of said juxtaposed members,
a splice channel nested around the adjacent ends of said girder segments,
said splice channel structurally connected to said adjacent ends of said girder segments for forming a spliced joint,
whereby said spliced joint provides continuity for structural strength and rigidity for the spliced structural member.

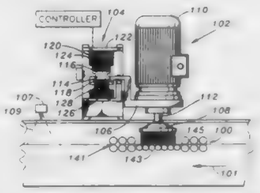
4,993,096

CIRCUIT BOARD DEBURRING SYSTEM

Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada

Filed Jul. 31, 1989, Ser. No. 388,111
Int. Cl.[5] A46B *13/02*
U.S. Cl. 15—77 **8 Claims**

1. A deburring system for finishing the surface of a printed circuit board passing along a moving conveyor, comprising:
a rotating brush head for abrading against a first surface of the printed circuit board;
a motor for driving the rotating brush head;
an elevational servo for moving the brush head vertically with respect to the printed circuit board first surface;
a three phase wattmeter connected to the motor for monitoring three phase power consumption of the motor and for generating an output signal in response thereto;
a control circuit connected to the three phase wattmeter and the elevation servo, the control circuit being operative to generate a first signal for regulating the operation of the elevational servo in response to an output signal from the three phase wattmeter and



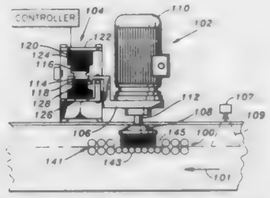
a scanner for sensing the surface characteristics of the printed circuit board first surface after being abraded by the brush head and for generating an output signal in response thereto; and
wherein said control circuit is further operative to generate a signal for regulating the operation of the elevation servo in response to the scanner output signal.

4,993,097

CIRCUIT BOARD DEBURRING SYSTEM

Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada

Continuation-in-part of Ser. No. 388,111, Jul. 31, 1989. This application Jan. 22, 1990, Ser. No. 468,094
Int. Cl.[5] B08B *13/02*
U.S. Cl. 15—77 **10 Claims**



1. A deburring system for finishing the surface of a printed circuit board passing along a moving conveyor, comprising:
a rotating brush head for abrading against a first surface of the printed circuit board;
a motor for driving the rotating brush head;
an elevational servo for moving the brush head vertically with respect to the printed circuit board first surface;
a three phase wattmeter connected to the motor for monitoring three phase power consumption of the motor and for generating ann output signal in response thereto;
a control circuit connected to the three phase wattmeter and the elevation servo, the control circuit being operative to generate a first signal for regulating the operation of the elevational servo in response to an output signal from the three phase wattmeter; and
a scanner disposed adjacent the moving conveyor before the rotating brush head for sensing the surface characteristics of the printed circuit board first surface before being abraded by the brush head and for generating an output signal in response thereto; and
wherein said control circuit is further operative to generate a signal for regulating the operation of the elevation servo in response to the scanner output signal to effect preadjustment of the position of the brush head before it meets the circuit board.

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4,993,098

APPARATUS FOR VIBRATORY CLEANING THE SURFACE OF AN ARTICLE FROM FOREIGN MATTER

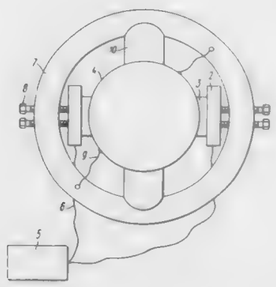
Vladimir D. Kharitonov, ulitsa Krupskoi, 8, korpus 1, kv. 21; Vadim Y. Granovsky, Volgogradsky prospekt, 157, korpus 2, kv. 14; Pavel V. Kuznetsov, ulitsa Rustaveli, 19, kv. 51, all of Moscow; Alexandr P. Odnoral, ulitsa Krasny Oktyabr, 3, kv. 34, Moskovskaya oblast, Dedovsk, and Anatoly V. Voronov, ulitsa Lenina, 13, kv. 4, Moskovskaya oblast, Istra, all of U.S.S.R.

PCT No. PCT/SU88/00041, § 371 Date Oct. 18, 1989, § 102(e) Date Oct. 18, 1989, PCT Pub. No. WO89/07492, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 19, 1988, Ser. No. 427,112

Int. Cl.[5] B08B *9/02*; F28G *7/00*

U.S. Cl. 15—91 3 Claims



1. An apparatus for vibratory cleaning the surface of an article from foreign matter, comprising at least one exciter of mechanical pulses, including an electromagnetic inductor connected to a source of pulsed electric current and a plate made of an electrically conductive material, arranged between the electromagnetic inductor and the surface of the article to be cleaned, characterized in that it further comprises a frame (7) having fixedly mounted thereon the electromagnetic inductor (2) and the plate (3) closely adjoining this electromagnetic inductor (2), and at least one striking member (10) arranged between the frame (7) and the surface of the article (4) to be cleaned in the area of the most probable location of the foreign matter, the striking member (10) being fixedly mounted on the frame (7).

4,993,099

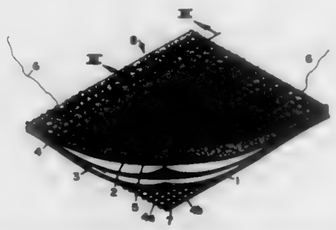
CLEANING AND POLISHING PAD

Akira Esmura, and Hisao Nishiyama, both of Tokyo, Japan, assignors to Yachiyo Micro Science Company Limited, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,240

Int. Cl.[5] A47L *13/16*

U.S. Cl. 15—118 3 Claims



1. A pad for cleaning and polishing, comprising:

(a) a first outer sheet made of a very fine stainless steel filament with a diameter between 3 and 15 micrometers;

(b) a second outer sheet made of a very fine stainless steel filament with a diameter between 3 and 15 micrometers;

(c) an inner sheet of elastic material that is sandwiched between said first outer sheet and said second outer sheet; and

(d) two mesh sheets, wherein said inner sheet and said outer sheets are sandwiched between said mesh sheets.

4,993,100

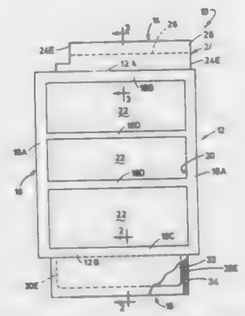
DEVICE FOR CLEANING ELECTRICAL CONNECTOR MALE AND FEMALE CONTACT PINS AND RECEPTACLE

Llewellyn J. Halboth, 3320 S. Richfield Way, and David F. Pascuzzi, 15703 E. Caspian Cir., #306, both of Aurora, Colo. 80013

Filed Sep. 20, 1989, Ser. No. 410,080

Int. Cl.[5] A47L *25/00*

U.S. Cl. 15—118 14 Claims



1. An electrical connector contact cleaning device, comprising:

(a) an elongated body;

(b) a support member attached on and projecting outwardly from said body, said support member having opposite lateral sides, an outer end extending between said sides and spaced from said body, and a slot defined in said support member extending inwardly from said outer end toward said body and between said lateral sides of said support member;

(c) a cleaning material attached to said support member at least within said slot so as to define a cleaning cavity therein for receiving and cleaning at least one male electrical connector contact pin, the lateral length of said slot defined between said lateral sides of said support member being greater than the depth of said slot defined into said support member from said outer end thereof such that said cleaning cavity has a lateral length greater than its depth;

(d) a support flange attached on and projecting outwardly from said body, said support flange having opposite lateral sides, opposite surfaces extending between said lateral sided, and an outer end extending between said opposite sides and surfaces and being spaced from said body; and

(e) a cleaning material attached to said support flange and overlying said opposite surfaces and said outer end thereof so as to define a cleaning protrusion thereon for inserting into and cleaning a female electrical connector contact receptacle, the lateral length of said support flange defined between said lateral sides thereof being greater than the depth of said support flange defined from said outer end thereof toward said body such that said cleaning protrusion has a lateral length greater than its depth.

4,993,101

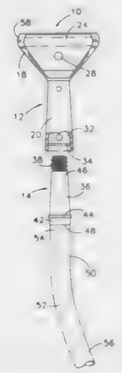
TOOL SYSTEM WITH ROTATABLE TOOL

Robert D. Newman, Sr., and Robert D. Newman, Jr., both of Greenwood, Mo., assignors to Mr. Longarm, Inc., Greenwood, Mo.

Filed Oct. 12, 1989, Ser. No. 421,018

Int. Cl.[5] A47L *1/06*

U.S. Cl. 15—245 5 Claims



1. A tool system comprising:

an elongated adaptor presenting a longitudinal axis and including an adaptor head having a body portion presenting a circumferential rib disposed about the exterior thereof;

a tool including a functional member and a hollow handle member presenting an inner surface for rotatably receiving said adaptor head therein integrally depending from said functional member, the inner surface including a portion forming a female groove; and

elongated extension member presenting a curved portion and having a connection end non-rotatably secured within said adaptor,

said inner surface of said handle being configured to receive a portion of said adaptor head including said circumferential rib therein for pivotal movement of said tool about said longitudinal axis, said female groove of said tool releasably, matingly receiving said rib whereby said tool is axially fixed relative to said adaptor, the fit between said handle and said adapter when said rib is received in said groove being sufficiently low in friction to permit relative pivotal movement therebetween.

4,993,102

VARIABLE-DRIVING UNIT FOR WIPERS AND A WIPER DEVICE INCORPORATING THE SAME

Yukio Honda, Kosai; Mikihiro Kondoh, Okazaki, and Hiroshi Takahashi, Aichi, all of Japan, assignors to Asmo Co., Ltd., Kosai, Japan

Filed Sep. 2, 1988, Ser. No. 239,746

Claims priority, application Japan, Sep. 3, 1987, 62-133885[U]; Nov. 19, 1987, 62-290475; Jul. 18, 1988, 63-93943

Int. Cl.[5] B60S *1/34*

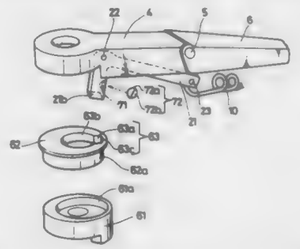
U.S. Cl. 15—250.20 3 Claims

1. An automobile wiper device comprising a pivot spindle rotatably mounted in a pivot holder secured to a vehicle body, a wiper arm connected at one end to the pivot spindle and connected at an opposite end to a retainer supporting a wiper blade, and an arm spring connected at one end with the retainer, wherein the wiper device further comprises:

an adjustment lever pivotally disposed on the wiper arm and having a spring end connected to an end of the arm spring that is opposite the retainer;

an eccentric bushing journaled on the pivot spindle and having a circular recess which is eccentric to a longitudinal axis of the pivot spindle;

a cylindrical actuating bushing slidably received in said circular recess of said eccentric bushing and rotatable relative to said eccentric bushing, said actuating bushing having an engagement portion for receiving an engagement end of said adjustment lever, said engagement end



positioned opposite said spring end of said adjustment lever; and

a variable-driving unit for rotating said eccentric bushing so as to displace said engagement portion of said actuating bushing and said engagement end of said adjustment lever according to said eccentrically disposed circular recess and thus adjust the effective length and hence the force of the arm spring.

4,993,103

WIPER BLADE APPARATUS

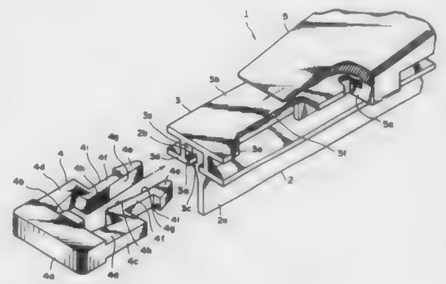
Tsuyoshi Takahashi, Yokohama, and Nobuo Matsumoto, Tokyo, both of Japan, assignors to Jidosha Denki Kogyo K.K., Yokohama and Metac Sangyo Co., Ltd., Tokyo, both of, Japan

Filed Nov. 14, 1989, Ser. No. 435,871

Claims priority, application Japan, Nov. 17, 1988, 63-150432[U]

Int. Cl.[5] B60S *1/32*

U.S. Cl. 15—250.31 3 Claims



1. A wiper blade assembly comprising:

at least one yoke adapted to be connected to a lever carried by a wiper arm;

vertebra means carried by said yoke;

a rubber blade adapted to be disposed in contact with a surface to be wiped slidably supported on aid vertebra means; and

connector means having a pair of arms detachably connected to said yoke and said vertebra means at a common connecting point and having serrated blade engaging means on said arms at said common connecting point engaging opposite sides of said rubber blade when pressed inwardly toward said rubber blade by said yoke to secure said rubber blade, said yoke and said vertebra means together at said common point.

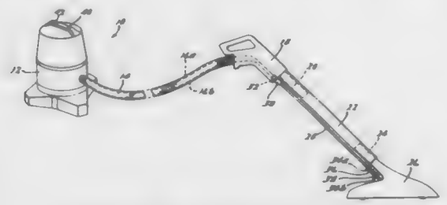
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4,993,104

ELECTRICAL SAFETY INTERLOCK AND PULSE-TYPE RESET CIRCUIT FOR A VACUUM CLEANER SYSTEM

Gary A. Kasper, Cadillac; Jeffrey R. Kassien, LeRoy, and Dean R. Rohn, Cadillac, all of Mich., assignors to Rexair, Inc., Cadillac, Mich.

Filed Aug. 11, 1989, Ser. No. 392,826
Int. Cl.[5] A47L 9/28
U.S. Cl. 15—319 37 Claims



1. An electrical safety interlock circuit for automatically interrupting current flow through a vacuum hose and handle of a vacuum cleaner whenever an electrical cleaning accessory is detached from said handle, said electrical safety interlock circuit comprising:

detection means for detecting an interruption in said current flow to said electrical cleaning accessory when said electrical cleaning accessory is detached from said handle; and

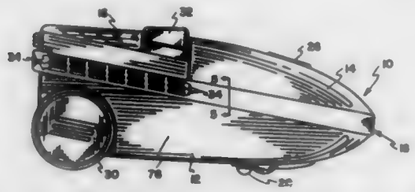
switching means responsive to said detection means for further interrupting said current flow through said vacuum hose and said handle whenever said electrical cleaning accessory is detached from said handle.

4,993,105

FURNITURE GUARD WITH EXHAUST SLOTS

Dean H. Buchtel, Canton, and Nick M. Bosyj, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Oct. 26, 1989, Ser. No. 426,851
Int. Cl.[5] A47L 5/00
U.S. Cl. 15—325 5 Claims



5. A vacuum cleaner having a housing and a furniture guard mounted on said housing including;

(a) said housing provided with vertically elongated ventilating slots,

(b) said furniture guard provided with horizontally elongated ventilating slots,

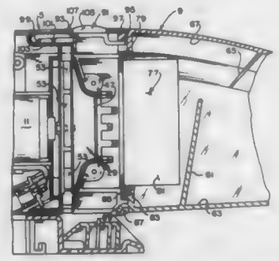
(c) said vertically and horizonally elongated ventilating slots being disposed overlapping each other in a crossing pattern.

4,993,106

PORTABLE HAND HELD VACUUM CLEANER

David R. Hult, and Mark J. Tomasiak, both of O'Fallbon County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 229,494, Aug. 8, 1988, Pat. No. 4,920,608. This application Dec. 21, 1989, Ser. No. 454,357
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] A47L 5/24
U.S. Cl. 15—339 4 Claims



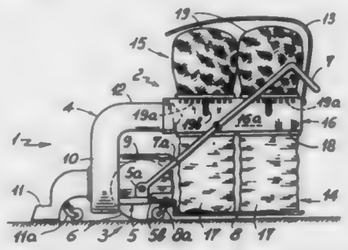
1. A portable hand held vacuum cleaner comprising a housing having a handle permitting a user to lift and operate said vacuum cleaner and a nozzle/debris container releasably secured to said housing, said housing having a motor and a blower driven by said motor which is in communication with said nozzle/debris container for forcibly drawing air and debris entrained in the air into the nozzle/debris container, a debris filter extending partially within and substantially across the nozzle/debris container to retain debris in the nozzle/debris container while also allowing air to be exhausted from the nozzle/debris container through exhaust openings in said housing to atmosphere, and said nozzle/debris container being transparent along a substantial portion thereof in order that a user may readily visually observe the debris filter including the amount of debris in the nozzle/debris container piled up against the debris filter for determining the efficiency of operation of said vacuum cleaner.

4,993,107

FILTERING AND COLLECTING DEVICE OF SOLID AND POWDER REFUSE FOR INDUSTRIAL AND CIVIL SUCTION APPARATUS

Sergio Zoni, Parma, Italy, assignor to Dulevo S.p.A., Sanguinaro di Fontanellato, Italy

Filed May 15, 1989, Ser. No. 351,520
Claims priority, application Italy, May 20, 1988, 20603 A/88
Int. Cl.[5] A47L 5/28
U.S. Cl. 15—352 10 Claims



1. In a filtering and collecting device of solid and powder refuse for industrial and civil suction apparatus, including at least one flexible, removable storage bag (17) and a suction and conveyance means (4) for conveying the refuse to at least one

said storage bag (17) and adapted to form a flow of air and refuse, the improvement comprising:

a wall defining a sorting zone (16*a*) for the air and the refuse supplied with the flow of air and refuse;

at least one substantially rigid filter (19) of the cartridge type placed in communication with said sorting zone (16*a*) and adapted to allow air from said flow to escape; and

at least one said storage bag (17) placed in communication with said sorting zone (16*a*) and made of substantially impervious material and of the disposable type, to be thrown away together with the refuse matter collected therein,

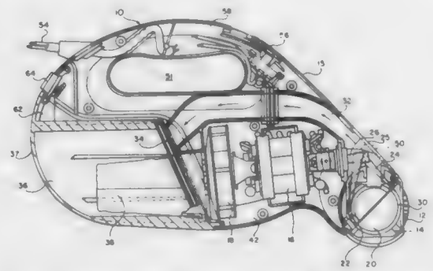
wherein cleaning members are provided for said at least one filter (19) of the cartridge type which comprise at least one brush element (21) inserted into said at least one filter (19) and at least one knob (22) engaged with said brush element (21) and passed through said filter (19).

4,993,108

VACUUM CLEANER WITH ADJUSTABLE NOZZLE SHIELD

Kevin Genge; Mmarco Ferrari, and Scott Bolbock, all of Bloomington, Ill., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jul. 24, 1989, Ser. No. 383,665
Int. Cl.[5] A47L 5/26
U.S. Cl. 15—383 4 Claims



1. In a vacuum cleaner having a nozzle with an opening, a brush roller mounted within said nozzle adjacent said opening for rotation about a given axis, means for rotating said brush roller, and a vacuum pump connected to draw dirt laden air into said nozzle via said opening from exteriorly of said vacuum cleaner,

the improvement comprising a shield and means for movably mounting said shield to said vacuum cleaner on the exterior of said nozzle to have a first position at which a first part of said opening is blocked from passing air and a second position at which a second part of said opening is blocked from passing air, said second part being different from said first part, said shield blocking a part of said opening and covering a portion of said brush roller when the shield is in either of said first and second positions.

4,993,109

THREE-POSITION HINGE FOR FOLDING TABLE

Kenneth V. Stevens, Brooklyn, N.Y., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Feb. 16, 1989, Ser. No. 311,924
Int. Cl.[5] E05D 7/08
U.S. Cl. 16—379 11 Claims

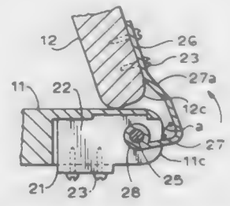
1. A three-position hinge, for mounting a generally flat, movable member of a given thickness to be pivotable between upward, horizontal, and downward positions relative to a flat, stationary member of a given thickness extending in a horizontal direction and having upper and lower horizontal surfaces, comprising:

a first mounting plate secured to one horizontal surface proximate a lateral edge of said stationary member;

a recess formed adjacent said first mounting plate which is recessed a given depth into said one horizontal surface in the direction of the thickness of said stationary member and has a given width in a lateral direction parallel to said lateral edge of said stationary member;

a first pivot member formed integrally with said first mounting plate positioned along one lateral side of said recess and having a pivot pin mounted thereto extending in said lateral direction across said width of said recess, wherein said pivot pin has a pivot axis along said lateral direction positioned approximately halfway between the thickness of said stationary member and spaced from said lateral edge thereof by a distance approximately equal to one-half of said thickness;

a second mounting plate secured to a corresponding horizontal surface proximate an opposing lateral edge of said movable member, wherein said opposing lateral edges of said movable and stationary members are parallel in said lateral direction and are closely spaced by a small spacing facing each other, and further wherein said second mounting plate mounted to said movable member has one end



extending along said corresponding horizontal surface of said movable member toward said pivot pin in said recess of said stationary member; and

a second pivot member having one end integrally fixed to said one end of said second mounting plate and its opposite end provided with a pivot sleeve which is coaxially mounted on said pivot pin,

whereby said movable member can be pivoted to upward, horizontal, and downward positions relative to said stationary member while keeping its lateral edge spaced closely to that of the stationary member at the three positions, and

wherein said lateral edges of and said small spacing between said movable and stationary members are configured such that the lateral edge of said movable member abuts the upper horizontal surface of said stationary member at a contact point spaced by a small distance away from the position of said pivot pin when said movable member is pivoted to the upward position, such that the upward position of said movable member is defined at greater than 90 degrees from the horizontal position, and said movable member is held stably in the upward position with a leverage effect by gravity.

4,993,110

DEVICE FOR BONING PIECES OF MEAT WITH SHAPED STAMPS

Christianus P. Langen, and Johannes C. Langen, both of Culjk, Netherlands, assignors to Langen Research B.V., Culjk, Netherlands

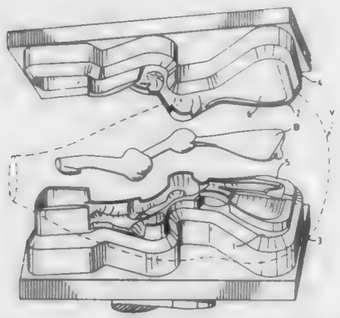
Filed Oct. 27, 1989, Ser. No. 427,640
Claims priority, application Netherlands, Nov. 9, 1988, 8802759; Dec. 21, 1988, 8803131
Int. Cl.[5] A22C 17/04
U.S. Cl. 452—138 2 Claims

1. In a set of mould which close around a bone to remove the bone from a body of meat, the moulds having complimentary mould elements each of which has a bone accommodating

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cavity therein which has a perimeter edge that extends around the cavity along a path that has a plurality of tight bends where the radius of curvature generated from within the cavity which is substantially less than that of the remainder of the path, the improvement wherein;

at least one of said mould elements has a raised edge portions that project a substantial distance from the cavity and extend along each of the tight bends of said path, said



raised edge portions serving to penetrate the meat surrounding the bone during the initial stage of the closing of the mould to confine the bone within the perimeter edge and to compressively preload the bone both axially and radially prior to the application of the major meat removing loads thereby to substantially eliminate bone breakage during the application of the major meat removing loads resulting from the final closing of the mould.

4,993,111

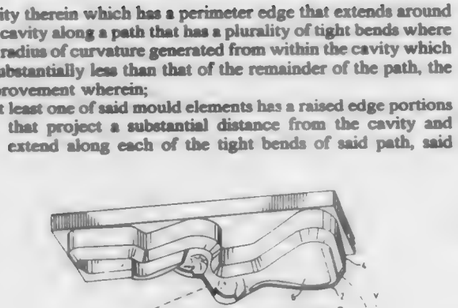
WING CUTTER ATTACHMENT

Eugene Martin, Ephrata; Scott Cook, Strasburg, and Michael E. Lease, Kinzers, all of Pa., assignors to Foodcraft Equipment Company, Inc., Lancaster, Pa.

Filed Jan. 30, 1990, Ser. No. 472,059

Int. Cl.[5] A27C *21/00*

U.S. Cl. 452—169 **3 Claims**



1. An apparatus for cutting breast-attached chicken wings into parts, comprising

a stationary frame,

a pair of panels affixed to the frame, said panels being coplanar, and having generally parallel edges facing one another, with a gap between the edges through which a wing can fit,

means for moving the wing along said gap,

a rotary auger conveyor positioned adjacent one of said panels, and extending substantially parallel to said gap,

means for holding a flat segment of the wing in engagement with said auger conveyor, and

a blade positioned adjacent said gap, between said gap and said auger conveyor, for cutting the elbow joint of the wing, and means for centering the elbow joint over said blade.

4,993,112

CARCASS FAT TRIMMER

Donald L. Burnett, 2143 Altura Ave., Orange, Calif. 92667, and J. Hampton Riley, 3261 Santa Maria, Fullerton, Calif. 92635

Continuation of Ser. No. 353,915, May 18, 1989, abandoned. This application Dec. 8, 1989, Ser. No. 449,119

Int. Cl.[5] A22B *5/16*

U.S. Cl. 452—134 **19 Claims**



1. A power-driven hand-held trimming device comprising:

a housing having a hollow interior;

a multiple cutter blade assembly mounted axially within the interior of the housing, the cutter blade assembly including separate elongated blades, each spaced radially outwardly from and extending generally axially, with respect to the blade assembly, the cutter blades being spaced apart around a hollow interior region within the cutter blade assembly;

means for rotating the cutter blade assembly about its axis, including means for positioning the blade assembly for rotation relative to the housing so that material adjacent the housing which is cut by the outer cutting edges of the blades can be drawn into the housing and into the interior region within the blade assembly; and

discharge means mounted in said hollow interior region within the blade assembly for cooperating with the rotating cutter blades for applying an axial force on the material cut off by the cutter blades and entering the housing for causing said material to be conveyed axially along the discharge means and toward an end of the housing for continuous discharge, in which the discharge means comprise an auger mounted in the housing in a stationary position inside the rotating cutter blade assembly.

4,993,113

ON-LINE THIGH DEBONER

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands

Continuation-in-part of Ser. No. 331,968, Apr. 3, 1989, Pat. No. 4,932,102. This application Jan. 30, 1990, Ser. No. 472,631

Int. Cl.[5] A22C *25/16*

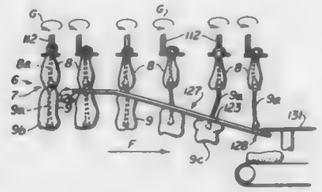
U.S. Cl. 452—136 **23 Claims**

1. A method of deboning poultry thighs while connected to their legs, comprising the steps of:

moving connected legs and thighs in spaced series along a processing path with the connected legs and thighs in an inverted attitude;

cutting into the meat between the leg and thigh as each connected leg and thigh moves along the processing path;

engaging the meat at the cut formed in the meat between the leg and thigh with a meat stripping means, moving the meat stripping means and the thigh bone with respect to each other so that the meat stripping means passes along



the length of the thigh bone away from the leg and strips the meat from the thigh bone; and

separating the thigh bone from the leg bone.

4,993,114

METHOD AND APPARATUS FOR MECHANICALLY OBTAINING MEAT FROM POULTRY BODIES

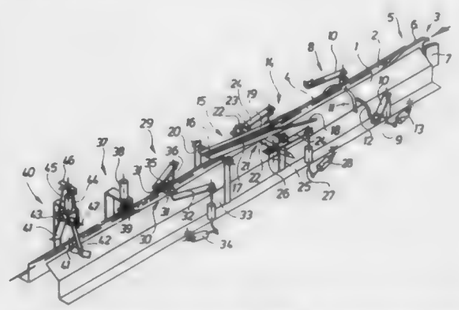
Detlef Meyer, Lübeck; Heinrich Lindert, Halle, and Theo M. Schaarschmidt, Lübeck, all of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lubeck, Fed. Rep. of Germany

Filed Jan. 25, 1990, Ser. No. 470,331

Claims priority, application European Pat. Off., Jan. 28, 1989, 89101487.0

Int. Cl.[5] A22C *25/16*

U.S. Cl. 452—136 **17 Claims**



1. A method for mechanically obtaining meat from bodies of slaughtered poultry comprising a body-cavity-surrounding skeleton and meat on said skeleton, which bodies include two inner and outer fillets of meat, each, and define a longitudinal direction, in which method said bodies are present in a form freed from their extremities and said skeleton essentially comprises a breast-bone (sternum) constituted by a crest (crista sterni) and a breast-bone plate (corpus sterni), and wing joints carried by coracoid bones (coracoidae) and carrying a wishbone (clavicula). as well as at least parts of ribs possibly present, depending on previous preparation in the course of slaughtering, which bodies are conveyed in a conveying direction through a series of processing stations with said wing joints leading and in said longitudinal direction with an orientation of the part of said breast-bone plate (corpus sterni) facing said body cavity substantially parallel to said conveying direction, said method including the steps of

(a) detaching said outer fillets from said coracoid bones and any of said ribs present, as well as severing connections present between said outer fillets and said inner fillets, essentially up to said crest (crista sterni) of said breast-bone;

(b) severing a connection present between said outer fillets and said wing joints while detaching said outer fillets from said wishbone;

(c) tearing off in one piece said two outer fillets from crest;

(d) tearing skin surrounding said inner fillets; and

(e) stripping said inner fillets from said skeleton.

4,993,115

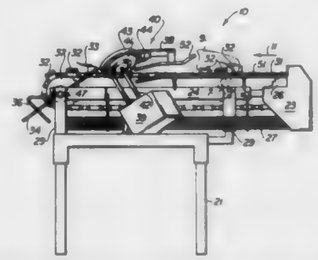
COMPACT WING CUT-OFF MACHINE

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands

Filed Dec. 8, 1989, Ser. No. 447,902

Int. Cl.[5] A22C *25/18*

U.S. Cl. 452—169 **14 Claims**



1. A method for removing wings from the upper carcass of a previously eviscerated bird which was previously separated from the lower back and legs of the bird comprising:

advancing a plurality of upper carcasses in series along a processing path with a surface conveyor with the upper back portions of each upper carcass facing downwardly and supported on the surface conveyor, with the neck portions facing rearwardly of the path and the breast portion facing upwardly;

as the upper carcasses are advanced along the processing path by the surface conveyor, progressively urging the wings of each upper carcass downwardly relative to the carcass to progressively urge the wing shoulder joints toward an open position;

while the wings are urged downwardly, precutting on each side of the carcass into the wing shoulder joints to form a guide incision into each wing shoulder joint so that the guide incisions formed into the shoulder joints and the downward urging of the wings tend to partially separate the bones of the wing shoulder joints; and

while the wings are urged downwardly and the wing shoulder joints are partially separated, cutting through the guide incision and between the bones in each wing shoulder joint on each side of the upper carcass to separate the wings from the carcass.

4,993,116

METHOD AND APPARATUS FOR GUTTING FISH

Seiichi Urushibara, Ninohe, and Kuniya Yusa, Tokyo, both of Japan, assignors to Taiyo Fishery Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,377

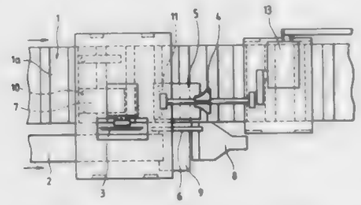
Claims priority, application Japan, Mar. 1, 1989, 1-46481

Int. Cl.[5] A22C *25/14*

U.S. Cl. 452—116 **7 Claims**

1. An apparatus for gutting fish, which comprises in combination a conveyor (1) including a number of segments (1*a*) at given intervals in a direction substantially perpendicular with respect to its moving direction and operating at a given speed in a certain direction, a rotary cutter (3) for cutting off a head (14*a*) of a fish (14) placed and carried on said conveyor (1) while the venter (14*b*) located within said segment (1*a*) leads and said head (14*a*) is projected from one side edge of said conveyor (1), a retainer (7) for retaining said fish (14) to be beheaded in place by said rotary cutter (3), a plate (5) for

forcing the dorsal region (14c) of the beheaded fish (14) onto said conveyor (1) by the action of a spring (11), a guide plate (6) fixed at a position where it comes into engagement with a cut end (14g) of the beheaded fish (14) forced onto said con-



veyor (1) by said plate (5), and a guts squeezer member (4) formed of an elastomer adapted to be forcedly slid over the venter (14b) of the fish (14) from the anus (14e) toward the cut end (14g), said fish (14) being now in engagement with said fixed guide plate (6) and forced by said plate (5).

4,993,117

OPENING DEVICE WITH METAL DETECTOR AND STOP-OFF

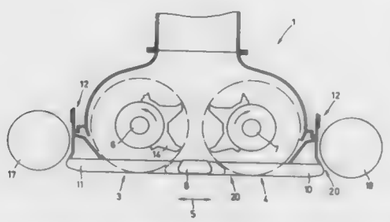
Akiva Pinto, Duesseldorf Wittlaer; Guenter LucaBen, Haltern, and Reinhard Schmidt, Gescher, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Dilmen, Fed. Rep. of Germany

Filed Jan. 31, 1990, Ser. No. 472,994

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 8904766[U]; Apr. 17, 1989, 3912564

Int. Cl.[5] D01G *9/20*

U.S. Cl. 19—80 R **6 Claims**



1. In a device for opening pressed fibre bales by means of a reduction device movable over the surface of a bale or a row of bales, the reduction device having at least one opening roll, pressure rolls being disposed axially parallel on both sides of the reduction device, milling discs provided on each of the opening rolls, meshing with a grate having bars between the milling discs that engage the bale surface, and a metal detector device, the improvement wherein:

the grate bars extend towards the pressure rolls to the immediate vicinity thereof; and

wherein the metal detector device includes the grate bars and said pressure rolls, said grate bars forming a first contact surface, and said pressure rolls forming a second contact surface, defining a gap therebetween whereby said pressure rolls and said grate bar serve as a metal detector.

4,993,118

CLEANING MACHINE FOR TEXTILE FIBRES HAVING IMPROVED GRATE BAR ARRANGEMENT

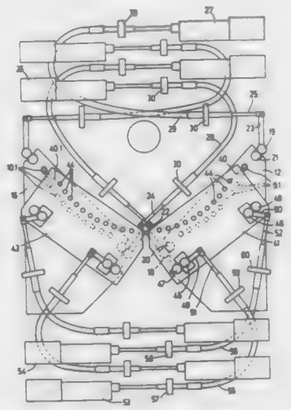
René Schmid, Niederneunforn, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jan. 29, 1990, Ser. No. 471,515

Claims priority, application Switzerland, Jan. 31, 1989, 321/89-0

Int. Cl.[5] D01G *9/14*

U.S. Cl. 19—85 **16 Claims**



1. A cleaning machine for textile fibers transported in a current of delivery air, comprising a casing, a horizontal opening roller rotatably mounted in the casing, the roller being fitted with beater elements and below the underside of the roller at least one discrete group of adjacent approximately parallel grate bars being arranged so as to be adjustable with respect to a setting angle of each of the grate bars, the group of the grate bars being adjustable with reference to the opening roller in order to alter a clearance between the group of grate bars and the opening roller, the group of grate bars being supported by swivel means for swiveling each of the grate bars such that the setting angle of each of the grate bars can be simultaneously increased or decreased individually within the group of the grate bars in a circumferential direction of rotation of the opening roller.

4,993,119

FIBER OPENING, MIXING, AND FLOW REGULATING APPARATUS AND METHOD

James H. Roberson, 10 Ashwood Ave., Greenville, S.C. 29607

Filed Apr. 14, 1989, Ser. No. 338,294

Int. Cl.[5] D01G *7/00, 7/04, 7/06*

U.S. Cl. 19—97.5 **32 Claims**

1. A textile feeder apparatus for processing textile fibers of the type which opens and mixes textile fibers in a reserve chamber and regulates the flow of fibers from said feeder, said apparatus comprising:

a reserve chamber means for containing fibers under pressure;

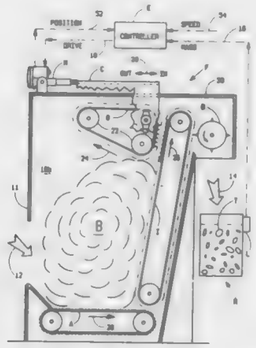
a first fiber opening means having working elements for impaling and tearing loose some of the fibers contained in said reserve chamber and carrying said impaled fibers forward in the process thereby partially opening said impaled fibers;

a second fiber opening means having working elements for stripping a portion of said impaled fibers from the working elements of said first fiber opening means and returning said stripped fibers to said reserve chamber means for additional processing thereby increasing the degree of opening of said stripped fibers;

a working gap defined between said first and second fiber opening means;

a sensor means for sensing a function of a quantity of fibers flowing from said feeder and generating a fiber quantity signal;

control means responsive to said fiber quantity signal for producing a driving signal; and



an actuation means responsive to said driving signal for moving at least one of said first and second fiber opening means relative to the other thereby modulating said gap and regulating the amount of fibers flowing out of said feeder by governing the proportion of fibers stripped from said first opening means and returned to said reserve chamber for additional opening and mixing by said second fiber opening means.

4,993,120

APPARATUS AND METHOD FOR PREVENTING PERMANENT IMPRESSIONS IN A FIBER WEB DELIVERED FROM A FEED CHUTE DURING A MACHINE STOPPAGE

Paul Stahli, Wilen b. Wil, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed May 8, 1989, Ser. No. 349,413

Claims priority, application Switzerland, May 11, 1988, 01794/88

Int. Cl.[5] D01G *23/02*

U.S. Cl. 19—105 **19 Claims**

19. A method of minimizing irregularities in carding machine slivers occasioned by temporary carding machine shutdowns, comprising removing substantially, during carding machine shutdowns, a compressive force on a web of fiber flocks in position to be fed into the carding machine so as to minimize setting of a portion of the then stationary web in a more highly compacted condition.

4,993,121

APPARATUS FOR PREVENTING THE ESCAPE OF FIBRE SLIVER FROM FULL CANS

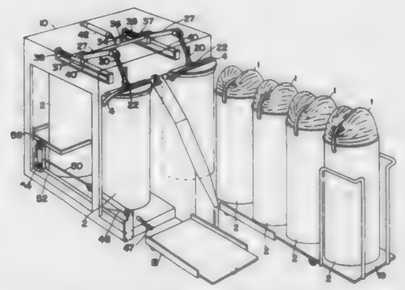
Sandro Sartoni, and Gian F. Bonanni, both of Bologna, Italy, assignors to Savio, SpA, Pordenone, Italy

Filed May 17, 1989, Ser. No. 353,346

Claims priority, application Italy, Mar. 24, 1989, 19895 A/89

Int. Cl.[5] B65H *54/76*

U.S. Cl. 19—159 R **4 Claims**



1. A device in an automatic change-over system for cans containing fibers wherein said device fits a semicircular strip on said cans for keeping said fibers in said cans, and wherein said semicircular strip pivots at two opposing points below an upper rim of the cans, comprising:

(a) means for positioning the semicircular strip in the exit direction of the cans; and

(b) a manipulator for grasping and positioning the semicircular strip above the can for preventing the fibers from escaping from the can.

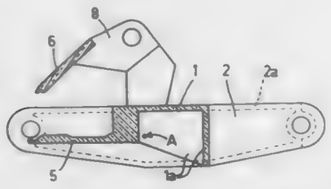
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4,993,122

NIPPER FOR A COMBING MACHINE USING BONDED FIBER MATERIAL

Walter Ackerot, Seuzach, and Gian-Carlo Mondini, Winterthur, both of Switzerland, assignors to Reiter Machine Works, Ltd., Winterthur, Switzerland

Filed Nov. 6, 1989, Ser. No. 432,804
Claims priority, application Switzerland, Nov. 4, 1988, 04101/88
Int. Cl.[5] D01G *19/16*
U.S. Cl. 19—225 25 Claims



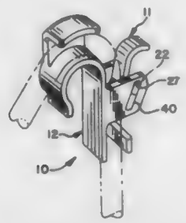
1. A nipper for a combing machine comprising
a lower jaw having a pair of parallel side arms and a lower nipper plate mounted on said side arms; and
an upper jaw having a pair of parallel side arms pivotally mounted on said side arms of said lower jaw and an upper nipper plate mounted on said side arms thereof wherein at least one component of said nipper plates and said pairs of said arms is made of bonded fiber material.

4,993,123

ADJUSTABLE NAUTICAL ROPE LOCK

Thomas J. Siwek, 1945 Hampton Dr., Wheaton, Ill. 60187

Filed Jan. 7, 1990, Ser. No. 534,731
Int. Cl.[5] F16G *11/00*
U.S. Cl. 24—136 R 21 Claims



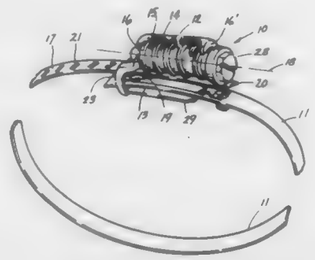
1. An adjustable nautical rope lock comprising:
a hooked hanger having a downwardly open hook for engagement with a boat rail means, the hook joining a downward leg having at a side opposite the hook a pair of standout flanges formed with opposing slot means, a rope guide hook means formed with said hooked hanger above said engageable hook for guiding a rope thereabove and second guide hook means below said standout flanges for receiving a rope passed from between said standout flanges to extend therethrough, said downward leg including a serrated means therealong generally between said standout flanges; and
slide cam means engageable with the opposing slot means of the standout flanges, said slide cam means including a plate terminating in a lower lobe portion having a serrated face and outwardly extending tab means, the tab means being slide engageable with said slot means whereby said slide cam means is slidable to move said serrated face relative to said serrated means of the hooked hanger whereby to be capable of frictionally locking a rope therebetween.

4,993,124

WORM DRIVE CLAMP WITH AUTOMATIC SPRING LEVER

Serge Ouimet, 330 Dufresne, Ile Bizard, Quebec, Canada H9C 2C3

Filed Jan. 22, 1990, Ser. No. 468,604
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—274 R 15 Claims



1. A worm drive clamp comprising a flexible metal band having a housing secured to a connecting portion thereof, a worm screw having a spiral thread supported in said housing for free axial rotation thereof adjacent a first side of said band, said worm screw having its rotational axis co-extending with the longitudinal axis of said metal band, flexible biasing means is provided on said first side of said band adjacent said worm screw, said band having spaced-apart screw thread engaging means formed in at least a portion thereof from a free end of said band, said housing having an inlet and outlet port disposed above said first side of said connecting portion of said band to permit entry and passage of said free end of said band through said housing, said flexible biasing means permitting a length of said free end portion of said band to be slidingly displaced adjacent said worm screw without arresting threaded engagement between said spiral thread and said screw thread engaging means, said flexible biasing means is a resilient member having a biasing section disposed at a predetermined position with respect to said worm screw and permitting passage of said band adjacent said spiral thread of said worm screw, without engaging said thread, said resilient member also having a displaceable section to permit said biasing section to be displaced toward said worm screw for urging said free end of said band in engagement with said worm screw when clamping pressure is applied to said displaceable connection in the direction of said screw by clamping said band about an object.

4,993,125

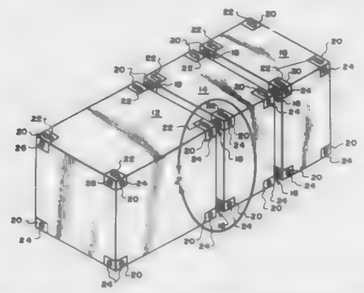
CONTAINER CONNECTOR

Mark E. Capron, Oxnard; Craig Sarsfield, Ojai, and Bradley Posadas, Oxnard, all of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1990, Ser. No. 481,923
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—287 3 Claims

1. A connector for joining and holding together cargo containers having openings therein comprising:
a threaded shaft;
first and second locking ends said first locking end integrally formed with said threaded shaft and said second locking end rotatably connected to said threaded shaft and removable therefrom;
said first locking end including a fixed head integral with one end of said threaded shaft, a first nut communicating with and affixed to said threaded shaft, a first washer affixed and abutting to said first nut on a first side of said first washer, a first journal communicating with said threaded shaft and abutting on one end a second side of said first washer and on the other end said fixed head and a spacer

rotatably located over said first journal and between said second side of said first washer and said fixed head;
said second locking end including a second nut rotatably communicating with said threaded shaft, a second washer affixed and abutting said second nut on a first side of said second washer, a second journal rotatably communicating with said threaded shaft and affixed on one end to a second side of said second washer, a rotating head pivotally



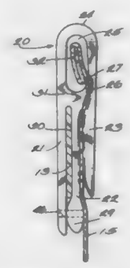
communicating with said threaded shaft and abutting and affixed to a second side of said second journal, a second spacer pivotally located over said second journal and between said second side of said second washer and said rotating head, said second locking end rotatable about said threaded shaft;
means in said first and said second locking ends for locking said first and said second ends in an unlocked or locked position.

4,993,126

TOWEL HOLDERS FOR LOUNGE CHAIRS

John W. Collins, 2853 N. 122nd St., Wauwatosa, Wis. 53222

Filed May 14, 1990, Ser. No. 522,919
Int. Cl.[5] A44B *21/00*; A47H *13/00*
U.S. Cl. 24—336 10 Claims



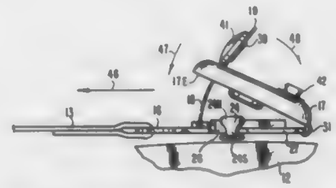
1. A holder for securing towels or similar flexible sheet materials to a lounge chair comprising:
(a) said holder being generally elongated and having a front and back portion;
(b) first means for attaching said back portion to said chair;
(c) second means for receiving and retaining an end of a towel or sheet when inserted in a longitudinal direction and permitting removal laterally;
(d) said second means including an open bottom portion for receiving said towel or sheet inserted in a longitudinal direction;
(e) said second means including a downwardly extending first leg member biased into contact with a downwardly extending second leg member for receiving said towel or sheet between said second leg members;
(f) a cavity contiguous to the upper portions of said first and second leg members and spaced from said bottom portion for receiving the end of said towel or sheet; and
(g) holding ridge means formed within said cavity for resisting withdrawal of said towel in a longitudinal direction once inserted between said first and second leg members into said cavity.

4,993,127

LOCKING ATTACHMENT FOR GUITAR STRAPS AND THE LIKE

Larry J. Mechem; Larry J. Mechem, Jr.; G. Michael Fox, all of Anderson, Ind., and James V. Weston, Fountain Run, Ky., assignors to Standtastic, Anderson, Ind.

Filed Sep. 29, 1989, Ser. No. 415,624
Int. Cl.[5] A41F *1/00*; G10D *3/00*
U.S. Cl. 24—701 5 Claims



1. A strap lock comprising:
a base having first and second slots therein, said first slot being oriented and configured to receive a strap through it, and said second slot being oriented and configured to receive an anchor post;
a blocker associated with said base and operable between an unlocking position and a locking position, said blocker being positionable in said locking position to limit movement of an anchor post in said second slot;
a blocker retainer on the base and movable to a retaining position to hold said blocker in said locking position;
said base and blocker being made of one material in one piece with an integral living hinge connecting the base to the blocker;
said blocker including a blocking wall therein movable into position blocking a portion of the second slot when said blocker is in said locking position;
said blocker retainer being a retainer strap having two ends, with one end anchored in said base and the other end having the first part of a snap fastener thereon, and
a second part of the snap fastener being fixed on said blocker,
the location of said snap fastener parts being such that when said blocker is in said locking position, and said retainer strap is in said retaining position, said first and second parts of said snap fastener are connectable and oriented in a position relative to said blocker and said base such that said blocker has no effective fastener-opening leverage on said retainer strap.

4,993,128

CLOSURE MECHANISM

Danny Gold, 27 Barker Road, Apt. E-2, Hong Kong, Hong Kong

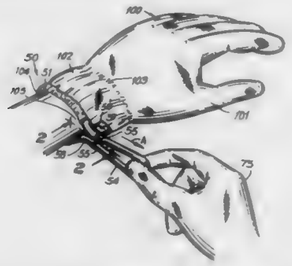
Continuation of Ser. No. 200,057, May 28, 1988, Pat. No. 4,864,695. This application Jul. 13, 1989, Ser. No. 379,411
Int. Cl.[5] A41F *1/00*
U.S. Cl. 24—715.3 36 Claims

1. A closure mechanism for an open-ended container, comprising:
channel means coupled at or near the end of the container for forming a channel of an opened length, corresponding to a distance around the open end of the container, having a channel cross-sectional area and terminating with two closely spaced openings having an opening cross-sectional

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stretchable cord means, within the channel and extending outward beyond both openings, having an unstretched cross-sectional area and a stretched cross-sectional area, the unstretched cross-sectional area being larger than the stretched cross-sectional area and the opening cross-sectional area;

whereby pulling on the portion of the stretchable cord means extending out of both openings causes the stretchable cord means to take on the stretched cross-sectional area at least proximate the openings to freely slide in the



channel and then releasing the stretchable cord means causes the stretchable cord means to return to the unstretched cross-sectional area proximate the openings, thereby locking the stretchable cord means in the openings and shortening the channel to a closed length less than the open length and securing the open end of the container in a closed position, wherein the channel means is formed of a crushable material means for gathering when the channel is shortened from the open length to the closed length.

4,993,129

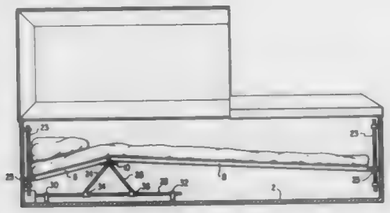
CASKET HAVING THORACIC ADJUSTMENT

Benjamin A. Underwood, 7304 Hunting Creek Dr., Prospect, Ky. 40059, and Richard K. Merryweather, Louisville, Ky., assignors to Benjamin A. Underwood, Prospect, Ky.

Filed Jun. 30, 1989, Ser. No. 373,516

Int. Cl.[5] A61G *17/00*

U.S. Cl. 27—12 **12 Claims**



1. Apparatus for providing adjustment of the thoracic area of a human body comprising bed means for supporting said body, said bed means comprising first and second parts connected to each other by pivot means for permitting said first part to pivot with respect to said second part, and positioning means for vertically positioning said pivot means with respect to opposed ends of said bed, wherein said pivot means is positioned along said bed means to be adjacent said thoracic area.

4,993,130

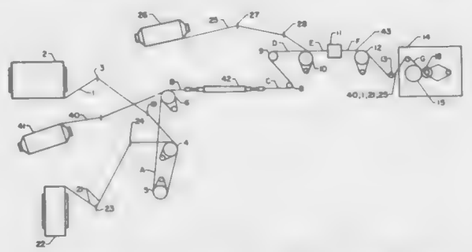
CONTINUOUS HIGH SPEED METHOD FOR MAKING A COMMINGLED CARPET YARN

Andrew M. Coons, III, Anderson, and James P. Sullivan, Seneca, both of S.C., assignors to BASF Corporation, Williamsburg, Va.

Division of Ser. No. 243,170, Sep. 8, 1988, which is a continuation of Ser. No. 895,648, Aug. 12, 1986, abandoned. This application May 1, 1990, Ser. No. 345,876

Int. Cl.[5] D02G *1/16*; D02J *1/08*

U.S. Cl. 28—271 **2 Claims**



1. A continuous high speed process for the manufacture of a "berber" effect carpet yarn comprising the steps of:

overfeeding at least one primary bundle of drawn, crimped carpet filaments of 18 to 35 denier per filament with an accent bundle of drawn, uncrimped carpet filaments, the total denier of the primary bundle and accent bundle being 2,000–4,000, through the mixing chamber of an intermixing jet, the chamber having a length to diameter ratio of about 2.4 and further having a slit of about 180° around the chamber for admitting steam under supersonic flow conditions; providing said steam to said chamber to continually intermix the crimped filaments along the entire length thereof, the accent yarn remaining substantially intact and thereafter winding the yarn at a speed of at least 800 meters per minute.

4,993,131

METHOD AND APPARATUS OF INFINITELY SIZING A MINI BLIND

Delbert B. Graves, Nora, and Roger L. Anderson, McConnell, both of Ill., assignors to Newell Operating Company, Freeport, Ill.

Filed Aug. 19, 1988, Ser. No. 234,709

Int. Cl.[5] B23D *19/04*

U.S. Cl. 29—24.5 **46 Claims**



1. A method of sizing a mini blind having a plurality of slat means and a first ladder means at an undisturbed end of said slat means and a second ladder means at a cuttable end of said slat means to an exact, specified width at the time of purchase by an operator, said method including the steps of:

locating the second ladder means at the cuttable end of the mini blind in a position remote from the final position of the ladder cord,

forming the mini blind into a rigid structure,

forming an aperture through the rigid structure for a ladder cord for the second ladder means,

sizing the mini blind to the specified width by separating excess mini blind material from the balance of the mini blind,

positioning several of the ladder links of the second ladder means on each side of the aperture, and

threading a ladder cord through the aperture and securing it in fixed relationship to the lower portion of the slat means.

4,993,132

DEVICE FOR CONNECTING A TOOL TO A ROBOT ARM

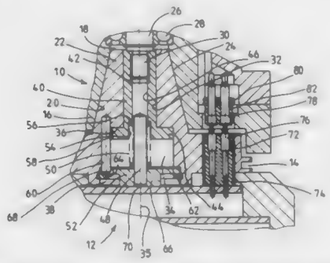
Bernard Manz, Seestrasse 5, 7770 Überlingen, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,440

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802122

Int. Cl.[5] B23Q *3/155*; H01R *4/64*

U.S. Cl. 29—26 A **9 Claims**



1. Device for connecting a tool to a robot arm, comprising:

(a) the robot arm (10) having a recess (18), the recess (18) having a conical peripheral surface (20), and

(b) a tool cone (22) attached to the tool (12) and complementary to the peripheral surface (20) of the recess (18),

(c) a motor-driven threaded spindle (26) extending from the bottom of the recess (18) into the recess (18), and

(d) a threaded sleeve (40) being axially movable in the tool cone (22) and held against rotation, said threaded sleeve (40) engaging a stop means under the action of a spring (50) and capable of being pushed back in the tool cone (22) while compressing the spring (50), the threaded spindle (26) being thread-engageable into said threaded sleeve.

5. Device as set forth in claim 1, wherein the tool (12) being held in defined position in a tool accommodation means and the accommodation means holding the tool against axial movement, the tool being detachable from said tool accommodation means by radial driving forces.

6. Device as set forth in claim 5, wherein:

(a) a plate (70) being attached to the tool (12), fixed contacts (76) being located on said plate laterally of the tool cone (22), and

(b) elastic contact pins (78) being attached to the robot arm (10) for elastic engagement with the fixed contacts (76) when the robot arm (10) is pulled against the tool (12).

4,993,133

INTERFERENCE FIT ROLLER WITH LIQUID SEAL

Manfred H. Goeserich, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1990, Ser. No. 501,566

Int. Cl.[5] B21B *31/08*

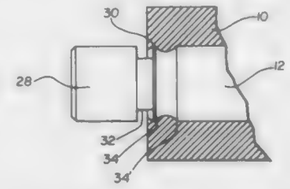
U.S. Cl. 29—129.5 **9 Claims**

3. An interference fit elastomer covered roller for use in contact with fluids, comprising:

a. a cylindrical shaft;

b. an elastomeric tube having an inside diameter smaller than the outside diameter of the cylindrical shaft when the tube is in a relaxed state, the elastomeric tube being stretched over the cylindrical shaft;

c. a compression seal at each end of the tube, each compression seal comprising a topographical feature on the shaft defining at least one circumferential edge at a change in radius of the shaft effective for concentrating stress in the elastomeric tube around said edge to provide liquid sealing action; and



d. one or more secondary compression seals defined by topographical features adjacent at least one end of the shaft.

4,993,134

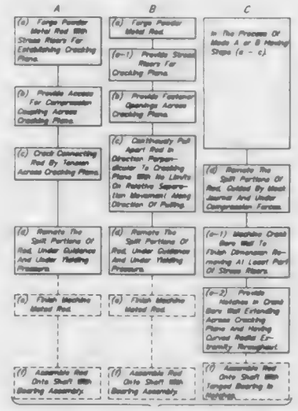
MAKING A FRACTURED POWDER METAL CONNECTING ROD

Peter Y. Hoag, Milford, and David A. Yeager, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 17, 1988, Ser. No. 194,750

Int. Cl.[5] B21D *53/10*

U.S. Cl. 29—888.092 **22 Claims**



1. A method of making a connecting rod for attachment to a bearing journal by separation of the connecting rod, comprising the steps of:

(a) forging a powder metal sintered preform to provide a one-piece connecting rod having an annular wall defining a crank opening with a center axis and with stress risers for establishing a cracking plane that extends across said crank opening;

(b) providing access for a compression coupling across said cracking plane;

(c) while at ambient conditions, applying tension substantially uniformly across said cracking plane to propagate fracture from said stress risers along said cracking plane and thereby separate said connecting rod into a cap and body with cracked surfaces; and

(d) remating said cap and body by applying a compression coupling through said access to draw said cap and body together under guidance and under metal yielding pressure to effect substantially an exact rematch of said cracked surfaces.

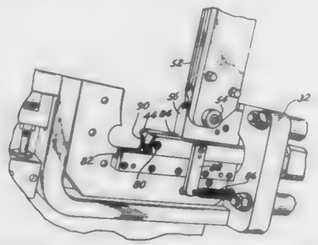
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4,993,135

HEAVY DUTY CLIPPER

David Seeley, Ashville, and Ray Hutley, Stow, both of N.Y., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Filed Jul. 12, 1989, Ser. No. 378,903
Int. Cl.[5] B23P *11/00, 19/04;* B65B *51/04*
U.S. Cl. 29—243.56 8 Claims



1. An improved, heavy duty clipper comprising in combination:

a support stand for the clipper;

a carriage mounted on the stand with a punch drive cylinder supported by the carriage, said punch drive cylinder having a piston and an extendible drive rod;

said carriage defining a channel for receipt of a U-shaped metal clip, said carriage supporting a die at the end of the channel for deforming the legs of the U-shaped metal clip as a closure, and also defining an open throat for receipt of material for application of a clip as a closure,

a pivotal gate attached to the carriage and pivotal between a throat open position and a throat closed position, said gate pivotally attached to the carriage on the side of the open throat opposite the die and including a manual handle for manipulation of the gate extending radially from the pivot connection the carriage, said gate including a portion of the channel when in the closed position,

a gate locking hook mechanism supported on the carriage adjacent the die cooperative to engage and retain the gate in the closed position;

means for feeding a clip into the channel;

a punch attached to the drive rod, and slidable in the channel to engage a clip against die; and

an elongated gathering bar slidably mounted on the carriage in a channel parallel to the punch, said gathering bar cooperative with the drive rod for movement simultaneous with the punch toward the die for engaging a filled package intermediate the package contents and a clip to be attached thereto and defining means for prevention of tearing of the package as a clip is attached.

4,993,136

METHOD OF CONVERTING A VACUUM TEST FIXTURE ON A BOARD TESTING APPARATUS TO A MECHANICAL TEST FIXTURE

Ronald K. Kerschner; Bullock Michael L., and James M. Hayes, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

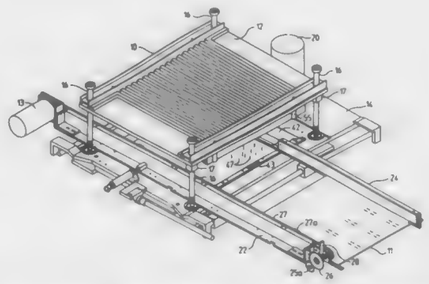
Filed Jan. 19, 1989, Ser. No. 368,732
Int. Cl.[5] B23P *23/00*
U.S. Cl. 29—401.1 13 Claims

1. A method for converting a vacuum test fixture on a tester apparatus to a mechanical test fixture for the testing of a board or card having electronic devices thereon at fixed predetermined locations, wherein said vacuum test fixture is of the type including a lower probe plate, handles on first and second opposite sides thereof, one or more upstanding alignment pins supported by said lower probe plate, a horizontal support plate disposed above said lower probe plate, and a gasket member disposed between said lower probe plate and said support plate; said method including the steps of:

(a) removing said handles from said lower probe plate;

(b) securing an elongated latch member to each of said first and second opposite sides of said lower probe plate; wherein each said latch member comprises spaced-apart cantilever strips; wherein said strips are separated by a first distance; wherein at a predetermined location in each said latch member said strips are spaced from each other a second distance which is greater than said first distance to form a keyhole opening;

(c) detachably securing said lower probe plate to said tester apparatus;



(d) providing board handling apparatus and detachably securing said apparatus to the top of said tester apparatus;

(e) providing an upper probe plate;

(f) providing alignment means for aligning a printed circuit board to be tested between said upper and lower probe plates; and

(g) supporting said upper probe plate in said board handling apparatus in a manner such that it is aligned vertically over said lower probe plate and is adapted to be moved toward said lower probe plate for testing said printed circuit board.

4,993,137

METHOD OF MANUFACTURING HARD CAPSULES

Hiroaki Muto, Joetu; Yuichi Nishiyama, Kubiki; Toru Chiba, Joetu, and Kiyoshi Araume, Iwatsuki, all of Japan, assignors to Shin-Etsu Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 46,433, May 6, 1987, abandoned. This application Dec. 13, 1989, Ser. No. 449,354
Claims priority, application Japan, May 12, 1986, 61-108275; Nov. 17, 1986, 61-274781
Int. Cl.[5] B29C *41/14*
U.S. Cl. 29—451 2 Claims

1. A method of manufacturing hard capsules consisting of pairs of a capsule body and a capsule cap for medicament use, said method comprising:

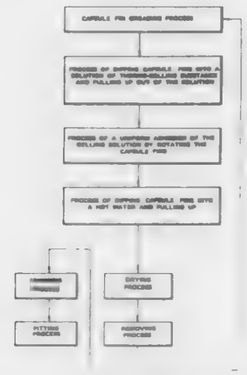
dipping capsule pins in an aqueous solution of a non-ionic cellulose ether, said solution having a gelling temperature, and removing said capsule pins therefrom;

revolving said capsule pins upside down at least 180°;

gelatinizing said solution adhered to said capsule pins by contacting said capsule pins with a thermally controlled water, said water being maintained at a higher temperature than the gelling temperature of said solution;

drying the gelatinized solution to form capsule bodies and capsule caps;

removing capsule bodies and capsule caps from said capsule pins; and



fitting a capsule body into a capsule cap to provide said hard capsule.

4,993,138

TOOL MILLING MACHINE OR THE LIKE TYPE COMPLEX PROCESSING MACHINE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jul. 7, 1989, Ser. No. 376,991
Int. Cl.[5] B23C *7/00;* B23Q *37/00*
U.S. Cl. 29—560 1 Claim

1. In a milling machine of the type having a machine body including an upper portion a horizontal milling attachment unit including a horizontal arbor and an overarm having a length, the overarm being horizontally disposed on the upper portion of the machine body, the improvement thereupon comprised of:

the overarm having respective guideways formed in opposite sides thereof extending along at least a portion of the length of the overarm;

a vertical milling attachment unit disposed in and carried by each respective guideway of the overarm for horizontal movement of the vertical unit in opposite forward and backward directions along the length of the overarm; and

a vertical milling attachment for vertical movement of the vertical milling attachment in the vertical milling attachment unit in opposite upward and downward directions, such that horizontal movement of the vertical milling attachment unit along the overarm horizontally moves the vertical milling attachment therewith;

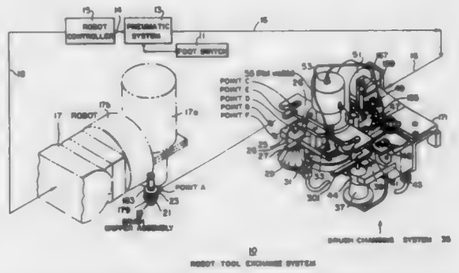
whereby the vertical milling attachment unit and the vertical milling attachment may be moved independently of one another.

4,993,139

SYSTEM FOR EXCHANGING TOOLS AND END EFFECTORS ON A ROBOT

David B. Barry, Westminster, and Paul M. Williams, Lafayette, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 2, 1990, Ser. No. 502,962
Int. Cl.[5] B23Q *3/155*
U.S. Cl. 29—568 12 Claims



1. A robot system having automatic exchange of tools on a robot structure, said exchange being effected by a mechanism apart from said robot structure thereby freeing said robot of the exchange structure and reducing robot mass, comprising:

a tool gripper assembly extending from said robot structure;

a tool changing device for actuating said tool gripper and placing a tool in said tool gripper and extracting it therefrom, wherein said tool changing device is separate from said robot structure and is located within the reach of said robot;

a pneumatic system connected to operate and power said tool changing device and to provide signals of the operation thereof;

an operator control switch connected to operate said pneumatic system; and

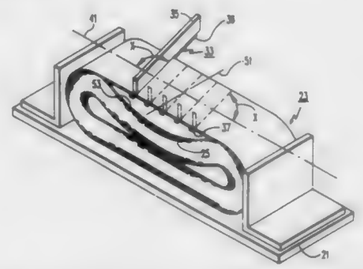
a robot controller unit connected to receive signals from said pneumatic system and connected to said robot structure to control the operation thereof.

4,993,140

METHOD OF MAKING TRANSFORMERS AND CORES FOR TRANSFORMERS

Frank H. Grimes, and Eugenius S. Hammack, both of Athens, Ga., assignors to ABB Power T & D Co., Inc., Blue Bell, Pa.

Division of Ser. No. 293,162, Jan. 3, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 466,144
Int. Cl.[5] H01F *41/02*
U.S. Cl. 29—606 7 Claims



1. The method of making a transformer having a core and coil means whose turns are wound into an integrated coil structure having an opening therein for telescoping onto said

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core, said core being formed of a web of magnetic metal of small thickness; the said method including:

(a) winding said web into a generally spiral core structure having a plurality of superimposed laminations about a window;

(b) subdividing said laminations of said core structure into groups, said groups being stacked to form said core structure;

(c) producing first cuts through the laminations of each of alternate groups in said core structures, each said cut in the laminations of said alternate groups along said core structure being inclined to the center line of said web in one direction at an angle appreciably different from 90°;

(d) producing second cuts through the laminations of each of the groups along said core structure intervening between alternate groups, each of said second cuts in the laminations of said intervening groups along said core structure being inclined to the center line of said web in a direction opposite to said one direction at an angle appreciably different from 90°;

(e) separating said laminations at said cuts and converting said core structure into a generally U-shaped structure whose arms terminate in said cuts;

(f) telescoping said coil structure in the arms of said U-shaped structure; and

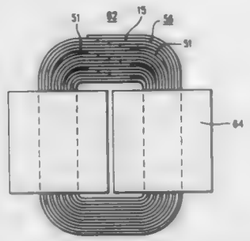
(g) guided by the difference between the inclination of the severed ends of the laminations, rejoining the ends of the laminations of said groups, group by group, by folding the portions of the laminations extending from each said cut into position in which said cut ends of said laminations of said each group are aligned thus abutting the ends of the lamination of each group only to the opposite ends of the lamination of the same group from which said first-named ends were severed, precluding the joining of the ends of the laminations of one group to the ends of the laminations of adjacent groups.

4,993,141

METHOD OF MAKING TRANSFORMERS AND CORES FOR TRANSFORMERS

Frank H. Grimes, and Eugenius S. Hammack, both of Athens, Ga., assignors to ABB Power T&D Co., Inc., Blue Bell, Pa.

Filed Jul. 19, 1989, Ser. No. 382,150
Int. Cl.[5] H01F *7/06*
U.S. Cl. 29—606 **14 Claims**



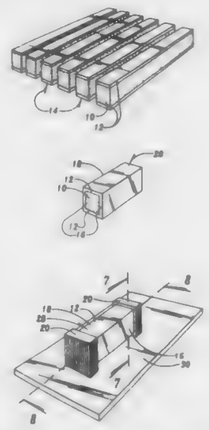
4. The method of making a product composed of a web of magnetizable material for use in producing a core for a transformer; said method comprising: winding said web on a first mandrel having a first perimeter to form a first spiral structure, cutting groups of steps into said spiral structure, each step including at least one turn of said spiral structure, and the steps of each group being cut in a succession in which each step of each group is offset peripherally along said structure and in depth in said structure with respect to the steps succeeding and/or preceding said each step thereby producing a plurality of separable strips of turns, each strip constituting the turns bounding a step, separating said strips from said spiral structure, winding said separated strip on a second mandrel having a second perimeter shorter in length than said first perimeter to form a second spiral structure, and while so forming said second spiral structure overlapping contiguous steps of each group thereby to produce said product.

4,993,142

METHOD OF MAKING A THERMISTOR

Francis M. Burke, and William L. Buchanan, both of El Paso, Tex., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed Jun. 19, 1989, Ser. No. 368,281
Int. Cl.[5] H01C *17/28*
U.S. Cl. 29—621 **3 Claims**



1. A method of making a thermistor, comprising:

making a layer of thermistor ceramic material having upper and lower surfaces;

placing a first dielectric material on said upper and lower surfaces of said layer, cutting said layer into a plurality of elongated strips with dielectric material on the upper and lower surfaces, and with sides and ends thereof being exposed, placing a second dielectric material on said exposed sides of said strips, wherein said first and second dielectric materials form an insulating and chemical resisting envelope over said upper and lower surfaces and sides of each said strip; and

placing conductive terminals over the ends of said strips by placing on the ends thereof successive layers of silver, Ni, Sn, and Pb with portions of the terminals extending over the envelope.

4,993,143

METHOD OF MAKING A SEMICONDUCTIVE STRUCTURE USEFUL AS A PRESSURE SENSOR

Diane W. Sidner, Noblesville; Douglas J. Yoder, Sharpsville, and David E. Moss, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Division of Ser. No. 319,023, Mar. 6, 1989, Pat. No. 4,945,769.
This application Mar. 27, 1990, Ser. No. 488,349
Int. Cl.[5] G01L *7/08, 9/06*
U.S. Cl. 29—621.1 **8 Claims**

8. A process for forming a pressure sensor comprising the steps of:

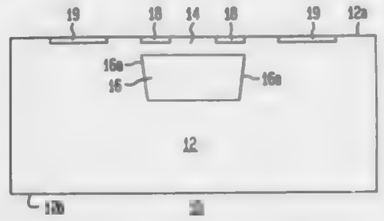
forming an aperture in a masking layer which covers a first surface of a monocrystalline silicon body to expose the underlying silicon surface at each location where it is desired to form a diaphragm portion in the silicon body;

etching a moat in the silicon body at each location below an aperture in the masking layer with an etchant that etches faster vertically through the silicon body than in lateral directions;

forming a silicon oxide on side walls and a bottom surface of each moat;

removing the silicon oxide from the bottom surface of each moat while leaving it on the side walls of each moat;

etching the exposed silicon at the bottom surface of each moat to deepen each moat and widen its lateral dimensions;



removing the silicon oxide remaining in each moat;

filling a top portion of each moat with monocrystalline silicon to define a buried cavity having a lateral extent which defines a surface of a monocrystalline overlying diaphragm layer; and

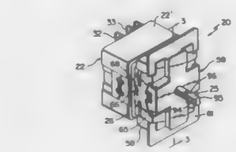
forming at least one pressure sensitive device in a portion of the diaphragm layer.

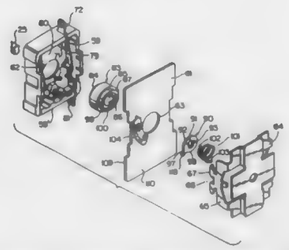
4,993,144

METHOD OF MAKING A CYCLABLE ELECTRICAL SWITCH CONSTRUCTION

David T. Llewellyn, Ebensburg, and William J. Lichtenberger, Murrysville, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 216,801, Jul. 8, 1988, Pat. No. 4,883,983.
This application Sep. 19, 1989, Ser. No. 409,467
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] H01H *11/00*
U.S. Cl. 29—622 **5 Claims**





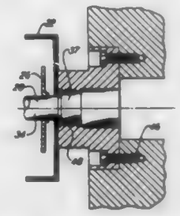
1. In a method of making a cyclable electrical switch construction that comprises the step of forming a housing means having a cyclable electrical switch means disposed completely therein and a rotatable actuator shaft that extends from said housing means for setting the duty cycle of said switch means in relation to the rotational position of said shaft in either rotational direction thereof from an "off" position thereof, the improvement comprising the steps of forming an electrical switch unit that is adapted to be carried on said housing means and operatively interconnected with said shaft so that said switch unit is adapted to be actuated from one condition thereof to another condition thereof only when said shaft is rotated from said "off" position thereof in one rotational direction thereof, and attaching said electrical switch unit to said housing means so that said switch unit is carried by said housing means and said actuator means is operatively interconnected to said shaft.

4,993,145

APPARATUS FOR GRIPPING TUBES IN MULTIROW PLATE FIN COILS

Kenneth P. Gray, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,485
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—726 **3 Claims**



1. An apparatus for gripping a prebelled tube end of a tube extending a predetermined distance beyond a tube sheet of a plate fin heat exchanger having a plurality of apertured plate fins parallelly spaced between two apertured tube sheets and a plurality of hairpin tubes extending through the apertures for expanding the heat exchanger comprising:

a clamping fixture having a pair of movable support means, said support means movable both longitudinally along an axis of the tubes toward the tube ends of the tubes and radially toward the axis of the tubes said support means positioned outside a plane of the tube ends; and

coacting rigid jaw pairs fixedly mounted on said pair of movable support means, said rigid jaw pairs arranged to longitudinally move through the plane of the tube ends and along the tube extending a predetermined distance beyond the tube sheet and arranged to open and close radially with the movement of said movable support means about the extending tube.

4,993,146

MANUFACTURING APPARATUS FOR A DISC CARTRIDGE

Shinichiro Oda, Ibaraki, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 26, 1990, Ser. No. 498,630
Claims priority, application Japan, Mar. 29, 1989, 01-75010
Int. Cl.[5] B65B *25/24, 5/04*
U.S. Cl. 29—773 **7 Claims**

1. An apparatus for producing a disc cartridge including a cartridge case rotatably accommodating a disc therein and formed with apertures for allowing access of a head to the disc, and a shutter made of a synthetic resin, slidably fitted to said cartridge case, said shutter having a pair of flat plate portions joined at first ends thereof to form a joined portion and open at second ends thereof to form free ends thereof, said apparatus comprising:

a cartridge case conveying path means for conveying said cartridge case;

a shutter conveying path means, joined with said cartridge case conveying path means at a downstream end thereof, for conveying said shutter;

an opening jig, disposed along said shutter conveying path means, for opening said shutter at said free ends of said flat

plate portions thereof, opposite to said joined ends and holding said free ends in an open condition, and

fitting means, disposed at said joined portion of said cartridge case conveying path means and said shutter conveying path means, for fitting said shutter to said cartridge case,

said shutter being fitted to said cartridge case, said free ends of said shutter being maintained in an open condition as said shutter is passed over said opening jig.

4,993,147

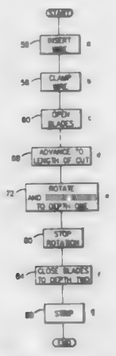
AUTOMATED WIRE INSULATION CUTTING AND STRIPPING METHOD WITH IMPROVED MEANS TO PREVENT CONDUCTOR SCORING

Thomas S. Carpenter, and David D. Hand, both of Cazenovia, N.Y., assignors to Carpenter Manufacturing Co., Inc., Manlius, N.Y.

Continuation-in-part of Ser. No. 318,672, Mar. 3, 1989. This application Sep. 5, 1989, Ser. No. 402,891

Int. Cl.[5] H01R *43/00*

U.S. Cl. 29—825 **22 Claims**



8. A method of cutting a layer of insulation covering an electrical or optical conductor, said method comprising:

(a) positioning and holding a linear portion of said insulation-covered conductor in a first, fixed position on a predetermined axis;

(b) positioning the cutting edges of at least two cutter blades in spaced relation at radial distances from said axis great enough to permit said insulation-covered conductor to pass through the space between said edges;

(c) moving said cutting edges simultaneously in directions both transversely and radially inwardly with respect to said axis to a first position wherein said cutting edges each extend into said insulation and are spaced from said conductor by first, predetermined distances;

(d) stopping said transverse movement and moving said edges simultaneously radially inwardly with respect to said axis to a second position wherein said edges are spaced from said conductor by second, predetermined distances.

4,993,148

METHOD OF MANUFACTURING A CIRCUIT BOARD

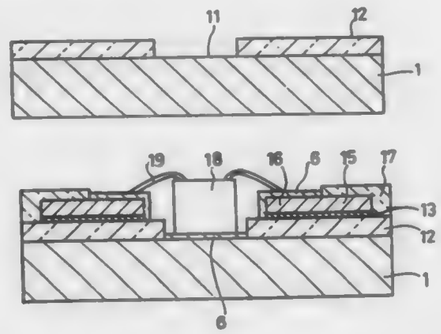
Kohei Adachi; Mitsuyuki Takada; Atsushi Endo; Eishi Gofuku, and Hayato Takasago, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 195,635, May 17, 1988. This application Sep. 12, 1989, Ser. No. 406,401

Claims priority, application Japan, May 19, 1987, 62-74892; May 19, 1987, 62-74893; May 19, 1987, 62-74894

Int. Cl.[5] H05K *3/30*

U.S. Cl. 29—832 **12 Claims**



1. A method of manufacturing a circuit board, comprising the steps of:

preparing a metal substrate having a major surface;

forming an insulating layer selectively, with at least one open space therein, on the major surface of said metal substrate, to expose the major surface of said metal substrate to enable at least an electronic component to be mounted in the at least one open space of said insulating layer; and

forming a conductor layer selectively, with at least one open space therein, on said insulating layer in accordance with a predetermined pattern, said conductor layer being formed to enable said electronic component to be at least electrically connected.

4,993,149

PROCESS FOR FORMING A TERMINATION ON AN ELECTRICAL CONDUCTOR

James A. Zilligen, Simpsonville, and Richard J. Feeny, Greenville, both of S.C., assignors to FTZ Industries, Inc., Simpsonville, S.C.

Continuation of Ser. No. 6,318, Jan. 14, 1987, abandoned, which is a division of Ser. No. 780,190, Sep. 26, 1985, abandoned, which is a division of Ser. No. 502,615, Jun. 9, 1983, Pat. No. 4,547,240. This application Aug. 31, 1989, Ser. No. 403,025

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—859 **1 Claim**

1. A process for forming a termination on an electrical conductor for mechanical attachment into an electrical circuit comprising the steps of:

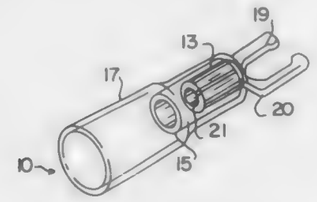
providing an electrical connector comprising;

a crimpable ferrule,

a transparent outer sleeve surrounding said ferrule in a longitudinal direction, said outer sleeve formed of coextruded, multi-layer material, with at least one layer thereof being oriented and heat shrinkable, and with the inner layer thereof being a heat-activable adhesive, and

an exposed connector unsurrounded by said outer sleeve in electrical communication with said ferrule, said exposed connector being generally U-shaped or annularly shaped, said exposed connector defining means for receipt of a mechanical connection through the center thereof in a direction transverse to said longitudinal direction,

said outer sleeve being preshrunken on one end thereof into conformity with said ferrule on an end thereof closest to said exposed connector, said outer sleeve being of greater diameter and generally unshrunken on



the end thereof opposite said preshrunken one end for receipt of a conductor therein;

placing an end of said conductor into said unshrunken opposite end of said sleeve and into said crimpable ferrule;

viewing the location of said conductor through said transparent outer sleeve to assure proper location of said conductor for the crimping thereof;

applying pressure to said outer sleeve to crimp said crimpable ferrule through said outer sleeve into electrical communication with said conductor; and

applying heat to said outer sleeve to shrink said outer sleeve into conformity with said electrical conductor and to activate said heat activable adhesive to bond said outer sleeve with said conductor.

4,993,150

PROCESS FOR PRODUCING CUP TAPPETS FOR RECIPROCATING-PISTON MACHINES

Rudolf Reinhardt, Esslingen, and Hans Zechmann, Kernen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Aug. 15, 1989, Ser. No. 393,785

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 3828635

Int. Cl.[5] B21K *1/22*

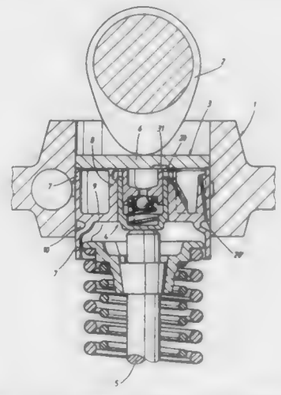
U.S. Cl. 29—888.43 **16 Claims**

1. Process for producing cup tappets for reciprocating-piston machines, the cup tappets including a cup casing and a pressure plate forming a cup bottom of the cup casing, the pressure plate being made of a blank of wear-resistant alloyed tool steel with a wall thickness greater by a multiple than a wall thickness of the cup casing, the cup casing being welded to the pressure plate and being made from a blank of cold-extrudable steel having a carbon content of less than 0.2%, wherein the pressure plate and the cup casing are manufactured as separate blanks, the cup casing being manufactured substantially by a cold-extrusion process, the pressure plate and cup casing blanks being welded to one another at a welding region in the desired relative position during a welding step, and subsequently the cup tappets being machine finished, the process comprising the steps of:

(a) forming the pressure plate as a round which is flat at a region to be welded and has an outside diameter which is approximately 5% to 15% larger than an outside diameter of the cup casing such that a radial projection extending beyond a circumference of the cup casing is formed;

(b) carbonizing the cup casing to a carbon content of at least about 0.3% with a carbonizing depth of at least approximately 30% of the wall thickness of the cup casing prevailing at a region to be welded to the pressure plate; then

(c) friction-welding the pressure plate to the cup casing by rotating the pressure plate relative to the cup casing, while



clamping the pressure plate at its radial projection, thereby forming an outer welding burr and

(d) removing in chips the radial projection of the pressure-plate blank and the outer welding burr.

4,993,151

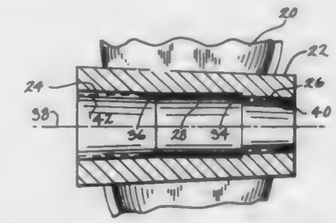
METHOD OF MAKING AN EASILY REMOVED MARINE PROPELLER

Ronald M. Steiner; Roger E. Koepsel, both of Oshkosh; Hubert S. Gilgenbach, Butte des Morts, and Terence C. Reinke, Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 114,459, Oct. 28, 1987, Pat. No. 4,925,369. This application Apr. 25, 1990, Ser. No. 514,128

Int. Cl.[5] B21D *53/00*

U.S. Cl. 29—889.6 **1 Claim**

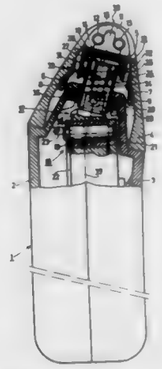


1. A method of making a propeller hub for a marine drive having a propeller shaft with a tapered outer diameter receiving said propeller hub therearound, the method comprising providing a propeller hub with a two stage bore having a first section of given inner diameter and a second section of larger inner diameter than said given inner diameter, machining said bore along a taper angle to form a first tapered inner diameter section at the first bore section for flush contact with said propeller shaft, a second tapered inner diameter section at said second bore section for flush contact with said propeller shaft, and a central inner diameter section at said second bore section and between said first and second tapered inner diameter sections, said central inner diameter section meeting said second tapered inner diameter section at a transition angle defined by said taper angle of said machining, mounting said propeller hub on said propeller shaft, said central inner diameter section meeting said first tapered inner diameter section at the inter-

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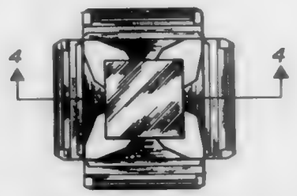
face between said first and second bore sections, said central inner diameter section being spaced from said propeller shaft by a maximum gap at said interface, and by no gap at said transition angle.

4,993,152
DRY-SHAVING APPARATUS
Hans Deubler, Klagenfurt, Austria, assignor to U.S. Philips Corp., New York, N.Y.
Filed Jan. 9, 1990, Ser. No. 462,683
Claims priority, application Austria, Jan. 18, 1989, 87/89
Int. Cl.[5] B26B *19/02*
U.S. Cl. 30—43.92 4 Claims



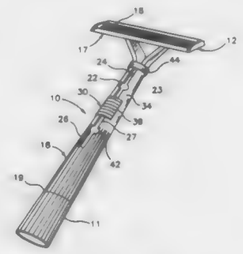
1. A dry-shaving apparatus comprising a shaving head frame carrying an arcuate shear foil, a cutter which is resiliently urged against said arcuate shear foil and which is reciprocatingly drivable by a swing lever which is pivotable about an axis and which is offset relative to its plane of reciprocation, said cutter being connected to a drive member so as to be pivotable about an axis transverse to the plane of reciprocation of the driving end of the swing lever, the drive member being arranged on the driving end of the swing lever so as to be axially movable relative to said end and so as to be pivotable relative thereto, and wherein the axis about which the cutter is pivotably connected to the drive member extends parallel to the axis about which the offset swing lever is pivotable.

4,993,153
MULTIPLE BLADE STAND UP RAZOR
James G. Henry, 9681 N. W. 6th Crt., Plantation, Fla. 33324
Filed Oct. 27, 1989, Ser. No. 428,509
Int. Cl.[5] B26B *21/00, 21/06, 21/14*
U.S. Cl. 30—50 4 Claims



1. A razor device, comprising:
(a) a handle including a base means, said base means being flat and of sufficient size to provide a stable base when the longitudinal center of said handle is perpendicular to the counter or other support on which said handle rests; said base means for supporting said razor device in a stable and upright position when placed upon a counter top, sink area, or other support surface;
(b) a plurality of razor blades protruding outwardly from said handle, said blades being generally perpendicular to radials extending from the longitudinal axis of said handle;
(c) means for integrally and non-removably attaching said razor blades to said handle wherein said razor blades are functionally positioned in relation to said handle such that rotation of said handle about its longitudinal axis rotates the previously functional razor blade to a non-functional position and simultaneously rotates a previously non-functional razor blade into a functional position.

4,993,154
SHAVING APPARATUS
Allan Radcliffe, 12459 Floresta Ct., San Diego, Calif. 92128
Filed Mar. 1, 1990, Ser. No. 486,810
Int. Cl.[5] B26B *21/14, 21/52, 21/00, 21/16*
U.S. Cl. 30—85 9 Claims



4. A shaving apparatus comprising:
a. a handle;
b. a base;
c. at least one razor blade on the base;
d. at least one spacer on the base;
e. a plurality of elongated retainer ports in the base, in the blades and in the spacers; and
f. a plurality of retainer means in the elongated retainer ports to retain the blades and the spacers in a sliding relationship with the base to allow the blades and the spacers longitudinal movement when the curvature of the base, the blades and the spacers is changed;
g. a bifurcated expansion means with one end attached to the handle and an other end attached to the base to provide a tensional force that changes a curvature of the base, the blades and the spacers;
h. a passageway formed between a first arm and a second arm of the bifurcated expansion means;
i. a first channel and a second channel formed between the edges of the first arm and the second arm of the bifurcated expansion means; and
j. an adjustment means in the bifurcated expansion means to expand the bifurcated expansion means.

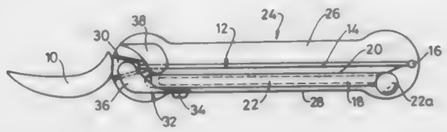
4,993,155
FRUSTUMIC PRESS
Roger O. Andrews, Rte. 2, Box 351, Westville, Fla. 32464
Filed Aug. 7, 1989, Ser. No. 390,382
Int. Cl.[5] A47J *43/26*
U.S. Cl. 30—120.2 10 Claims

1. In a nutcracker of the type comprising top and bottom plates, the top plate having an aperture for the insertion of nuts to be cracked, and a plurality of levers, each of which is pivotably connected at its end portion to said plates; said levers being positioned relative to each other in such a way as to correspond to the shape of a frustum, the base of which is at the nut inserting end, said levers being spaced and disposed in an array defining together with said plates an enclosure for retaining a nut within; so that rotating one plate with respect with the other constricts said enclosure to crack nuts; the improvement, wherein said levers contain knurling, ridges, grooves, etching



or abrasive plating to restrict upward movement of the nut whereby the overall taper of said levers permit nuts to be retained and cracked within said levers near said bottom plate.

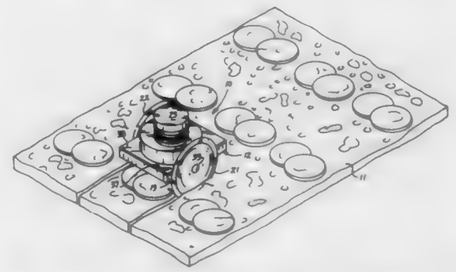
4,993,156
SPOONS AND OTHER HAND HELD UTENSILS
Mark E. Craven, Staffordshire, England, assignor to Tamworth Plastics Limited, United Kingdom
Filed Aug. 28, 1989, Ser. No. 399,157
Int. Cl.[5] B25F *3/00;* A47J *43/28;* G01G *19/56*
U.S. Cl. 30—142 8 Claims



1. A hand held implement comprising an implement such as a spoon bowl, scoop, fork pronga with a longitudinal inner stem, and a co-axial outer stem serving as a handle within which the inner stem is free to rotate about an axis, characterised by a pendulum weight carried on the inner stem for urging said formation to a position of most effective load engagement or retention independently of the orientation of the outer stem about said axis, and locking means for selectively freeing or braking relative rotation of the inner and outer stems, a substantial proportion of the weight being carried at the end of the inner stem remote from the load carrying formation, and wherein the weight includes a rod removably received in a portion of the inner stem and extending in spaced parallel relationship to said axis, and a head portion constituting said substantial proportion of said weight.

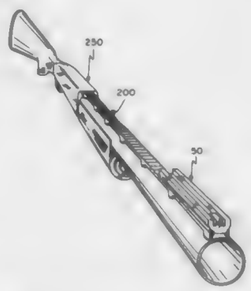
4,993,157
FOOD CUTTING APPARATUS
John J. Wang, 1111 39th Ave. S.E., Puyallup, Wash. 98374
Filed May 7, 1990, Ser. No. 519,808
Int. Cl.[5] B26B *3/00, 9/00, 7/02;* A21C *5/08*
U.S. Cl. 30—307 8 Claims

1. A food cutting apparatus comprising,
a central housing container, the container including a first wall spaced from and parallel to a second wall, and
a floor coextensively and orthogonally mounted to the first wall and second wall of the container, and
a first aperture directed orthogonally through the first wall, and
a second aperture orthogonally directed through the second wall, the first and second aperture offset relative to one another, and



first wheel means mounted through the first aperture, and second wheel means mounted through the second aperture, wherein the first and second wheel means are positioned for simultaneous reciprocation relative to the housing container.

4,993,158
GUNSIGHT
Julio A. Santiago, 13713 Susan La., Burnsville, Minn. 55337
Continuation-in-part of Ser. No. 441,621, Nov. 27, 1989, and a continuation-in-part of Ser. No. 214,726, Jul. 1, 1988, Pat. No. 4,918,823, which is a continuation-in-part of Ser. No. 145,030, Jan. 19, 1988, abandoned. This application Mar. 15, 1990, Ser. No. 493,696
Int. Cl.[5] F41G *1/00*
U.S. Cl. 33—253 26 Claims



1. A weapon with two precise sighting positions to permit the user to aim and shoot from either precise shooting position with both eyes open comprising:
a weapon having a front and a rear;
a channel sight mounted on the front of said weapon, said channel sight comprising a channel member having a front and a rear, said channel member having a first sidewall extending upward, said first sidewall having a first surface extending upward;
said channel member having a second sidewall extending upward, said second sidewall having a first surface extending upward, said channel member having a front and a rear;
said channel member having a bottom section connecting said first sidewall to said second sidewall, said first surface of said first sidewall and said first surface of said second sidewall forming an open sighting channel with no obstructions to the user viewing said first surface of said first sidewall and said first surface of said second sidewall from

a sighting position behind the rear of said channel member;

a sight post extending upward from said bottom section, said sight post spaced between said first surface of said first sidewall and said first surface of said second sidewall, said sight post and said sidewalls forming a first precise sighting position to thereby enable a user to precisely aim a weapon attached to said channel sight by sighting through and channel and around said sight post; and

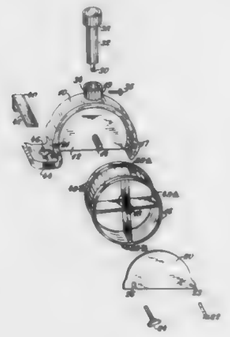
a rear sight located on said weapon, said rear sight positionable between an up condition that permits the user to use said rear sight in combination with said channel sight to form a second precise aiming position and a down condition not useable as a sight, said rear sight located on the rear of said weapon, said rear sight having a lower sight edge and a pair of vertical sight edges so that when said rear sight is positioned in the up condition it permits a user to precisely sight an object with both eyes open by aligning a target with said sight post between said pair of vertical sight edges and said lower edge and when said rear sight in the down condition it permits the user to solely use said channel sight for either quick aiming or as the first precise aiming position.

4,993,159

NAILING SCHEDULE CENTER MARKER

Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Ronald W. Birmingham, P.O. Box 7664, Crystal Bay, Nev. 89450

Filed Aug. 20, 1990, Ser. No. 569,862
Int. Cl.[5] B43L *13/00*
U.S. Cl. 33—41.3 16 Claims



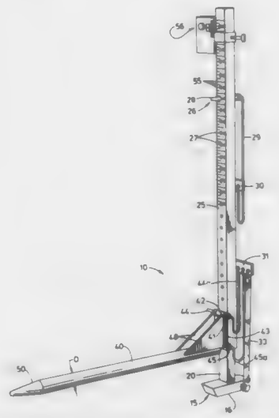
1. A marking apparatus for marking a workpiece into increments comprising; an open bottom housing, said housing being substantially in the form of a half-circle, said housing having first and second side walls, said first side wall having a shaft secured to substantially its center portion, a marking drum rotatably mounted on said shaft, spacing means spacing said marking drum from said first and second side walls, said second side wall being removably secured to said housing, a marking means, said housing having support means to removably support said marking means, said marking drum having at least one raised projection on its outer most circumferential edge, said projection communicating with said marking means at least once each revolution of said marking drum, whereby, said housing, said marking drum, said projections and said marker cooperate together to deposit a mark on said workpiece when said drum is rotated.

4,993,160

PIPE ALIGNMENT DEVICE AND METHOD

Glenn W. Fraley, 6372 Trenton-Franklin Rd., Middletown, Ohio 45042

Filed Oct. 6, 1989, Ser. No. 418,118
Int. Cl.[5] G01C *5/02*
U.S. Cl. 33—286 25 Claims



1. A device for aligning and preliminarily supporting hollow conduit and pipe along a predetermined rectilinear axis, said device comprising:

a base;

a standard attached adjacent its lower and to said base and extending upwardly therefrom;

a jack sleeve adjustably mounted relative said standard;

means for selectively adjusting the position of said jack sleeve relative said standard, as desired;

an alignment bar attached to said jack sleeve and extending outwardly therefrom to support a length of conduit or pipe to be aligned along said rectilinear axis; and

means for monitoring the proper alignment of said alignment bar along said rectilinear axis comprising vertical reference means provided on said jack sleeve for use with elevation grading equipment to monitor the grade of a supported hollow conduit or pipe.

4,993,161

LASER BEAM LEVEL INSTRUMENT

Henry S. Borkovitz, Menomonee Falls, Wis., assignor to David White, Inc., Germantown, Wis.

Filed Jan. 4, 1990, Ser. No. 461,067
Int. Cl.[5] G01B *11/26*
U.S. Cl. 33—291 8 Claims

1. A laser beam level instrument comprising:

a frame

a platform,

means for suspending said platform from said frame so that said platform moves freely under the force of gravity,

a laser light source mounted on said platform and emitting a vertical beam,

means for transmitting power to the laser light source without interfering with the movement of said platform, and

rotatable prism means mounted on said frame for redirecting the vertical beam to a substantially horizontal direction;

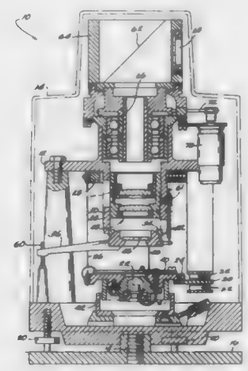
wherein said means for suspending includes a plurality of thin, flexible strips and

wherein said flexible strips are made of Mylar or equivalent and wherein said strips are twisted;

wherein said instrument is powered by a d.c. voltage source and wherein the means for transmitting power to said laser light source includes,

an electrically conductive material applied to said flexible strips,

means connected between the d.c. voltage source and said flexible strips for converting d.c. to a.c. voltage, and



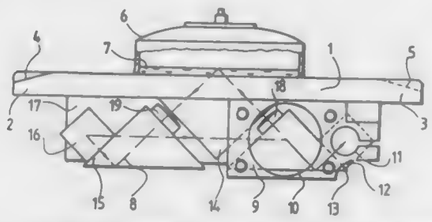
means on said platform and connected between said flexible strips and said laser light source for converting a.c. to d.c. voltage.

4,993,162

APPARATUS FOR MEASURING INCLINATIONS OF A COMPONENT

Thomas Scholian, Rombach, Switzerland, assignor to Kern & Co. Ltd., Aarau, Switzerland

Filed Jul. 19, 1988, Ser. No. 221,209
Claims priority, application Switzerland, Jul. 24, 1987, 02824/87
Int. Cl.[5] G01C *9/06, 9/32*
U.S. Cl. 33—366 13 Claims



1. Apparatus for measuring inclinations of a component with respect to the direction of gravity comprising:

a dimensionally stable carrier plate;

mounting means bonded to said carrier plate;

an optical source replaceably attached to said mounting means for generating the rays of an optical path;

means sensitive to the direction of gravity carried by said carrier plate at a location to be contacted by said rays and serving to deviate said optical path; detector means replaceably attached to said mounting means and detecting deviations of said optical path caused by inclinations of said component; and

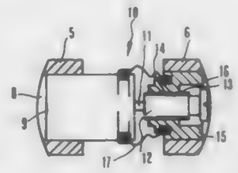
an optical path conducting system made up of first light conducting means rigidly bonded to said dimensionally stable carrier plate and second light conducting means rigidly bonded to said first light conducting means, said light conducting means being constructed and arranged to conduct said optical path from said source via said means sensitive to the direction of gravity to said element detecting deviations of the optical path.

4,993,163

GAUGE FOR CHECKING LINEAR DIMENSIONS OF MECHANICAL PIECES

Mario Possati, Bologna; Narciso Selleri, Monteveglio, and Guido Golinelli, Bologna, all of Italy, assignors to Marposs Societa' per Azioni, S. Marino di Bentivoglio, Italy

Continuation of Ser. No. 238,177, Aug. 30, 1988, abandoned, which is a division of Ser. No. 453,108, Dec. 27, 1982, Pat. No. 4,787,149. This application Mar. 23, 1990, Ser. No. 498,477
Claims priority, application Italy, Jan. 15, 1982, 3307 A/82
Int. Cl.[5] G01B *7/00*
U.S. Cl. 33—542 8 Claims



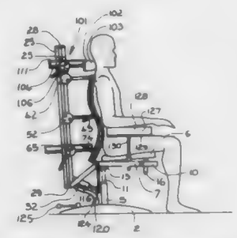
1. A gauge for checking linear dimensions of mechanical pieces, comprising a support, at least an arm that is movable with respect to the support along a measurement direction, a feeler element associated with the movable arm in order to touch a piece to be checked, a position transducer with two reciprocally movable elements, one of the two transducer elements comprising a threaded part and being coupled to the movable arm, the transducer being adapted to provide a signal responsive to the dimension of the checked piece, and mechanical zero-setting means including a screw and nut-screw zero-setting device, for zero-setting the transducer signal by adjusting the mutual position of the two transducer elements, the threaded part defining one of the screw and nut-screw of the device, the zero-setting device including a thread insert, located between the screw and the nut-screw, the thread insert having at least a friction coil to provide a stable zero-setting.

4,993,164

MEASURING DEVICE

Joseph M. Jacobsen, 2 Fr. Griffin Avenue, Galway, Ireland

Continuation of Ser. No. 191,649, May 9, 1988, abandoned. This application Jul. 5, 1990, Ser. No. 548,206
Claims priority, application Ireland, May 13, 1987, 1239/87
Int. Cl.[5] G01B *5/20;* A47C *3/00*
U.S. Cl. 33—561.3 14 Claims



1. Apparatus for measuring the contour of the back of an individual in a seated position, the apparatus comprising a chair which comprises:

a seat portion,

an upstanding back portion comprising at least one upstanding member extending upward from the seat portion,

a back engaging member formed from an elongated flexible member extending in a generally upward direction and being deformable to take up the vertical contour of at least part of the individual's back,

a first mounting means for mounting the back engaging

member to the upstanding back portion, the first mounting means comprising a first support member mounted on the upstanding member of the back portion,

a second mounting means for mounting the back engaging member to the upstanding back portion at a position spaced apart from the first mounting means, the second mounting means comprising:

a second support member mounted on the upstanding member of the back portion,

a first mounting member slidably engagable with the back engaging member to permit relative movement between the second mounting means and the back engaging member longitudinally relative to the back engaging member, the first mounting member being mounted on the second support member and being pivotal relative to the second support member about a pivot axis transverse of the back engaging member, and

first clamping means being provided on the first mounting member for releasably clamping the back engaging member to the first mounting member, and

at least one of said support members being slidably mounted on the upstanding member of the back portion so that the said at least one of said mounting means is slidable on the upstanding member of the back portion relative to the other mounting means in a direction longitudinally of the back engaging member for deforming the back engaging member to take up the contour of the back of the individual; and

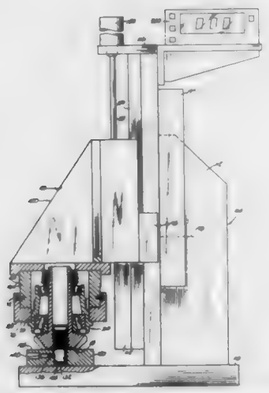
datum means for permitting the relative positions of the mounting means on the upstanding back portion to be recorded for determining the contour of the back of the individual.

4,993,165

METHOD AND APPARATUS FOR DETERMINING NECESSARY SHIM THICKNESS FOR A MARINE PROPULSION DEVICE PINION AND BEARING CARRIER ASSEMBLY

Michael G. French, Selma, Ala., and Larry A. Mathis, Lexington, Tenn., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 31, 1989, Ser. No. 387,196
Int. Cl.[5] G01B *1/00*; G01D *2/00*
U.S. Cl. 33—606 **18 Claims**



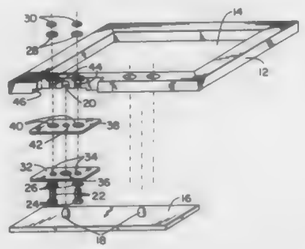
1. An apparatus for use with a device including a housing having a wall surface, and including a pinion and bearing carrier assembly having a first surface and a second surface, and also including a shim or shims located between the first surface and the wall surface, said apparatus comprising a frame including a reference point, and a surface adapted to support the second surface of the assembly, and means for determining the required thickness of the shim or shims in order to space the second surface a predetermined distance from the wall surface, said means including a member including a surface adapted to engage the first surface of the assembly, means for moving said member relative to said frame so as to move said member surface into and out of engagement with the first surface of the assembly, and means for indicating the location of said member relative to said reference point.

4,993,166

ADJUSTABLE PIN GUIDE FOR USE IN SCREEN PRINTING

Carlos Bradley, 418 First Ave. E., Kalispell, Mont. 59901

Filed Apr. 10, 1989, Ser. No. 335,853
Int. Cl.[5] B05C *17/08*
U.S. Cl. 33—619 **1 Claim**



1. An adjustable pin-receiving guide for use with a pin bar having an upright pin when printing from screens held by a frame, the adjustable pin-receiving guide comprising:

a clamping bolt for threadably receiving a clamping nut;

a first plate having an upright pin-receiving bore sized to slidably receive the upright pin and a bolt-receiving bore sized to be substantially larger in cross section than the corresponding cross-sectional area of the clamping bolt to be received;

a second plate having an upright pin-receiving bore sized to be substantially larger in cross section than the corresponding cross-sectional area of the upright pin and a bolt-receiving bore sized to slidably receive the clamping bolt;

the frame having a bolt-receiving bore therethrough for slidably receiving the clamping bolt and having a pin-receiving recess substantially larger in cross section than the corresponding cross-sectional area of the upright pin;

the frame further including a recess sized to receive the first plate;

the upright pin positioned within the pin-receiving bores of the first and second plates and within the pin-receiving recess of the frame;

the clamping bolt being positioned to extend through the bolt-receiving bore of the frame, the bolt-receiving bore of the first plate and the bolt-receiving bore of the second plate;

the clamping bolt having a head larger in cross-sectional area than the bolt-receiving hole of the second plate; and

the clamping nut being larger in cross section than the cross-sectional area of the bolt-receiving hole of the frame.

4,993,167

DRESSING TOOL GAUGE FOR POSITIONING CUTTING TOOLS IN REMOVABLE HEAD TYPE DRESSERS

David L. Durfee, Jr., Meadville, Pa., assignor to Susan M. Durfee, Meadville, Pa.

Filed Apr. 3, 1989, Ser. No. 332,153
Int. Cl.[5] B27G *23/00*
U.S. Cl. 33—626 **16 Claims**

1. A dresser gauge for positioning an adjustable cutting tool on a removable head type dressing device which comprises:

a holding means

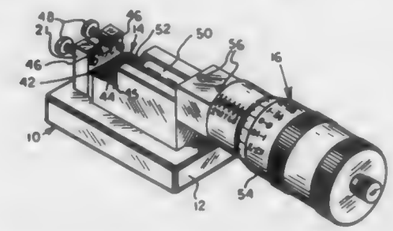
said holding means having a cavity in said holding means defined by a bottom surface, a datum surface and a shoulder,

said cavity being adapted to receive said removable head,

said datum surface lying in a first plane,

said datum surface being disposed generally perpendicular to said bottom surface,

said shoulder having engaging means adapted to engage a rear surface on said removable head to hold a reference surface of said removable head of said dressing device against said datum surface of said holding means,



a cutting tool positioning device supported on said removable head extending along an axis perpendicular to said first plane and having an end surface lying in a second plane parallel to said first plane,

said end surface being movable through a suitable range of positions,

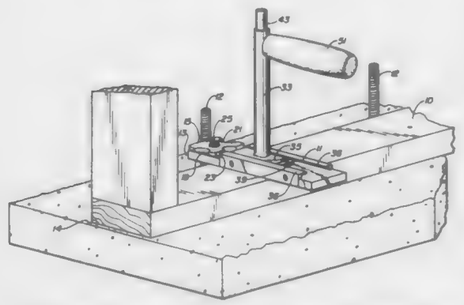
said cutting tool positioning device being movable to a desired position relative to said datum surface whereby said cutting tool may be moved into engagement with said end surface of said positioning device and fastening means on said head for holding a carrying tool member in place on said head to provide a predetermined shaped cut when said head is placed in said dressing device.

4,993,168

ANCHOR BOLT MARKER

Thomas J. Acuna, 1353 Virginia, Berkeley, Calif. 94702

Filed Oct. 23, 1989, Ser. No. 425,242
Int. Cl.[5] B23B *49/02*; B25H *7/04*
U.S. Cl. 33—666 **7 Claims**



1. An anchor bolt marker for marking the location of holes to be drilled in a wood plate to permit the plate to be placed over a series of fixed-position studs comprising

a base member having a positioning end formed integral thereto for engaging fixed position studs, said base member formed for supporting a marking punch perpendicular thereto in spaced relation to said positioning end and for permitting said marking punch to penetrate through said base member to mark the wood plate, said positioning end being provided with variable sized locating means for contacting in close-fitting relation various sized studs for which the holes are to be drilled in the wood plate,

a marking punch formed for being stuck vertically downward from above by a hammer, said punch being supported in perpendicular reciprocating relation to said base member and having a lower end formed to mark positions for holes to be drilled in a wood plate, said base member being provided with means for permitting limited movement of said marking punch along said base member between at least two predetermined positions whereby said punch is mounted in adjustable spaced relation to the positioning end of said base member, and

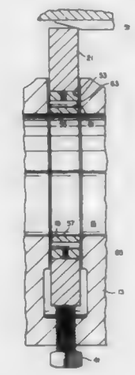
spring means for biasing the lower end of said marking punch to a retracted location within said base member when it is not marking hole positions on a plate and for returning said punch to said retracted location after it has been actuated to mark a hole position on a plate.

4,993,169

SEAT SLOT GAGE TOOL

James H. Foster, 5050 Ambassador Way, No. 301, Houston, Tex. 77056, and H. George Butler, 714 Cherry Bark La., Houston, Tex. 77079

Filed Jun. 12, 1990, Ser. No. 537,021
Int. Cl.[5] G01B *5/00*
U.S. Cl. 33—783 **9 Claims**



1. Gaging means for measuring between opposed seat faces in an orifice fitting of the type having a body with a flow passage for connecting into a pipeline, and a seat slot located in the flow passage, defining the opposed seat faces, the gaging means comprising in combination:

a carrier;

means in the body for moving the carrier from an inactive position out of the flow passage to an active position in the seat slot;

at least one deformable member;

mounting means for mounting the deformable member to the carrier for protruding from the carrier in opposite directions from the carrier;

the deformable member having dimensions selected so that the distance from the outer extent of the deformable member on one side of the carrier to the outer extent of the deformable member on the other side of the carrier being greater than the nominal width of the seat slot, so that the deformable member will contact the opposed seat faces when the carrier is moved into the seat slot; and

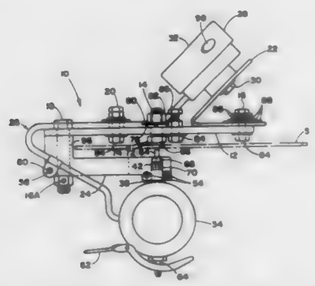
the deformable member being of a material which deforms when contacted by the seat faces and which retains the deformation when the carrier is removed from the seat slot, enabling one to measure the deformable member to determine the actual width of the seat slot.

4,993,170

HANDS-OFF MICROMETER

David L. Burk, Pittsburgh, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Mar. 26, 1990, Ser. No. 499,110
Int. Cl.[5] G01B 5/00
U.S. Cl. 33—794 12 Claims



1. A portable apparatus for automatically measuring and displaying a workpiece thickness without operator intervention, said apparatus comprising:

a base plate for positioning above an upper surface of a workpiece during operation of said apparatus;

means carried by said base plate for contacting said upper surface such that the center of gravity of said apparatus passes through said means for contacting said upper surface, said apparatus being supported and balanced on said upper surface solely by said means for contacting during operation of said apparatus;

means carried by said situated below said base plate for automatically measuring said workpiece thickness, said means for automatically measuring being positioned below a lower surface of said workpiece during operation of said apparatus; and

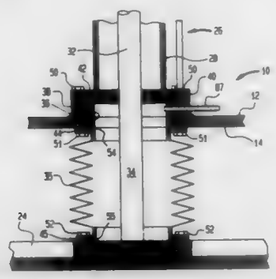
means carried by and situated above said base plate for automatically displaying the workpiece thickness measured by said means for measuring said means for automatically displaying providing a prominent and readily visible display, while said apparatus is positioned on and borne solely by said workpiece, of a value representing the workpiece thickness measured by said means for measuring.

4,993,171

COVERING FOR A HYDRAULIC RAM OF A FREEZE DRYER

Ernesto Renzi, Youngstown, N.Y., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Nov. 22, 1989, Ser. No. 440,919
Int. Cl.[5] F26B 13/30
U.S. Cl. 34—92 3 Claims



1. In a freeze dryer of the type including: a pressure vessel having a sterile freeze drying chamber for receiving a stack of containers holding a sterile material to be freeze dried; a pressure plate located within the freeze drying chamber and adapted to be driven against the stack of containers for mechanically stoppering the containers; and a double-acting hydraulic ram connected to the pressure vessel and having an actuating arm projecting into the freeze drying chamber and connected to the pressure plate, the actuating arm extendible for driving the pressure plate against the containers, retractable for removal of the containers from the pressure vessel, and having a non-sterile surface, the improvement comprising;

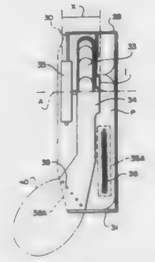
elongated covering means configured to expand and contract with extension and retraction of the actuating arm, and covering the non-sterile surface of the actuating arm for preventing contamination of the freeze drying chamber and therefore, the sterile material by the non-sterile surface of the actuating arm.

4,993,172

HAND DRIER WITH BACKWARD CURVED IMPELLER FAN

Peter W. Allen, Studley, United Kingdom, assignor to Airdri Limited, Oxford, England

Filed Aug. 17, 1989, Ser. No. 395,279
Claims priority, application United Kingdom, Aug. 18, 1988, 8819612.6; Jan. 26, 1989, 8901730.5
Int. Cl.[5] F26B 19/00
U.S. Cl. 34—202 7 Claims



1. A hand drier comprising: a rigid housing having an air inlet and an air outlet, a flow passage extending through the housing having as an upstream end the air inlet and as a downstream end the air outlet, an impeller located in the flow passage and rotatable about an axis for conveying air from the air inlet to the air outlet, a heating means located in the flow passage, a motor for driving the impeller, and control means for operating the motor and heating means; wherein the impeller is in the form of a backward curved multi-bladed radial flow device having an outside diameter relative to said axis which is substantially greater than the width of its blades measured in a direction parallel to said axis; and the motor is a brushless direct current device having a length, measured in the direction of said axis, which is substantially less than its overall width in a direction perpendicular to said axis.

4,993,173

SHOE SOLE STRUCTURE

James T. Gardiner, 5316 Magenta Ct., Las Vegas, Nev. 89108

Filed Aug. 29, 1989, Ser. No. 399,863
Int. Cl.[5] A43B 07/06
U.S. Cl. 36—3 B 18 Claims

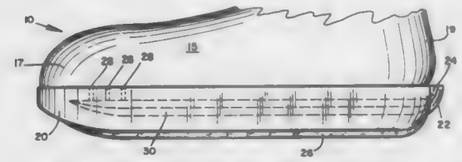
1. An article of manufacture comprising:

a flexible sole having at least one longitudinal passageway therein,

(b) a vertical outlet vent extending upwardly from the longitudinal passageway,

(c) an extension member joined to the sole, said extension member having an upwardly extending intake passageway for drawing outside air into the longitudinal passageway to be pumped to the vertical outlet vent, and

(d) a longitudinal ridge attached to the bottom of the sole and extending generally the length of thee longitudinal passageway for affecting the momentary closure of the longitudinal passageway at progressive locations along the length of the longitudinal passageway during a step whereby air is pumped along the longitudinal passageway from the intake passageway to the outlet vent.

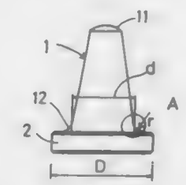


4,993,174

CERAMICS SPIKE PIN

Masamichi Yamada; Yoshinori Hattori, and Masakatsu Hayakawa, all of Nagoya, Japan, assignors to NGK Spark Plug Company, Ltd., Aichi, Japan

Filed Apr. 23, 1990, Ser. No. 511,429
Claims priority, application Japan, May 3, 1989, 1-51976
Int. Cl.[5] A43B 5/00
U.S. Cl. 36—134 10 Claims



1. A ceramics spike pin comprising a pin body having a horizontal cross section of a substantially circular shape, said pin body being provided with a rounded free end portion having a predetermined radius of curvature and a connecting base portion having a predetermined radius of curvature, and a horizontally expanded base connected to said connecting base portion, wherein a diameter (d) of said connecting base portion in horizontal cross section, the radius of curvature (r) of said connecting base portion, and a maxiumum diagonal length (D) of said horizontally expanded base satisfy the relationship of $0<r<d<D$ and $r^2 \times d/D \geqq 1.36$.

4,993,175

SOLEPLATE STEAM SLOT ARRANGEMENT

William E. Davidson, Trumbull, Conn., assignor to Black & Decker, Inc., Newark, Del.

Filed Aug. 12, 1988, Ser. No. 231,367
Int. Cl.[5] D06F 75/38
U.S. Cl. 38—93 6 Claims

1. A metal soleplate for a steam iron for pressing and drying a fabric comprising:

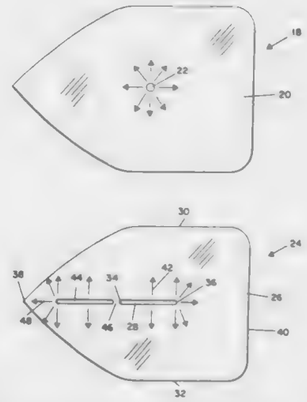
a generally planar soleplate surface;

at least one steam slot in said soleplate surface;

spaced sidewalls defining therebetween the width of the slot said at least one slot having a forward end and a rear end, with the forward end of said slot being axially closer to a forward edge of said soleplate relative to the position of the rear end of the slot with respect to a rear edge of said soleplate and relative to the position of the sidewalls of the slot with respect to a side edge of said soleplate.

said at least one steam slot being laterally centered in said soleplate surface, with an axis thereof disposed parallel to a forward-backward axis of said soleplate;

said steam slot including means for preventing an entry therein of an edge of the fabric, said means for preventing including said width being less than a predetermined value of about 0.1 inch; and



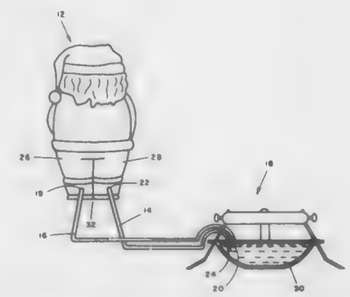
a nearest approach of said at least one steam slot to a perimeter of said soleplate being at least great enough to limit lost steam over at least 180 degrees of direction of linear motion of the soleplate relative to the fabric.

4,993,176

CHRISTMAS TREE STAND WATERING SYSTEM

Vincent D. Spinosa, 284 Hovendon Ave., Brockton, Mass. 02402

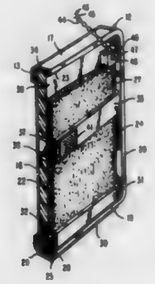
Filed Oct. 27, 1989, Ser. No. 428,340
Int. Cl.[5] A47G 7/02
U.S. Cl. 40—40.5 4 Claims



1. A water system for a stand for a botanical specimen comprising a reservoir, a water hose, an air hose and a plant container, the water hose having a first terminal end and a second terminal end, the first terminal end extending into the reservoir, the second terminal end extending into the plant container, the air hose having a first end and a second end, the first end extending into the reservoir, the second and extending into the plant container, whereby with water in the reservoir and in the plant container covering the first end and the first and second terminal ends and the second end above the water, water will flow from the reservoir to the plant container.

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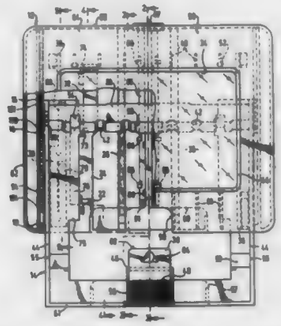
4,993,177
AIR FRESHNER SUPPORT
Teresa L. Hudson, 34631 Bayview, Westland, Mich. 48185
Filed Oct. 10, 1989, Ser. No. 418,518
Int. Cl.[5] G09F 1/12
U.S. Cl. 40—152.1 6 Claims



1. A photographic display device for supporting a flat air freshener panel, said display device comprising:
a front wall having an opening therein through which to view a photograph;
retention means to retain the photograph in place to be viewed through the opening, the retention means comprising a back surface facing away from the front wall, the retention means being molded of plastic as a substantially rectangular plate having first and second edges parallel to each other, and third and fourth edges parallel to each other;
holding means to hold the retention means to the front wall;
receiving means behind the back surface of the retention means to receive an air freshener panel, the receiving means comprising a barrier spaced rearwardly relative to the retention means to hold the air freshener panel with more than half of one surface thereof exposed to the air;
attachment means to attache the photographic display device to a separate support, the attachment means comprising slotted projection means extending rearwardly of the back surface of the retention means to receive and grip a chain by which to suspend the display device from the separate support; and
the slotted projection means and the receiving means being integrally molded with the plate as a unitary structure, the receiving means comprising a shelf molded adjacent the first edge of the rectangular plate, and the projection means comprise two projections molded adjacent the two corners of the plate at the ends of the second edge, the projections and the shelf defining, between them, a space large enough to receive the air freshener panel, and the barrier comprising an elongated wall having ends joined integrally with central parts of the third and fourth edges and extending over an open area of the plate between those central parts.

4,993,178
DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Continuation of Ser. No. 148,966, Jan. 27, 1988, Pat. No. 4,960,473, which is a division of Ser. No. 888,333, Jul. 11, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 316,500
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441451
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[5] G09F 11/30
U.S. Cl. 40—513 37 Claims

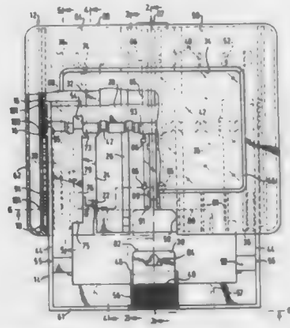
1. An apparatus for cyclic rearrangement of a stack of substantially rectangular sheets, the apparatus comprising a first frame part and a second frame part which is reciprocable relative to said first frame part in a predetermined direction between an inner end position and an outer end position, the apparatus further comprising means for removing, upon an outward stroke of said second frame part from said inner end position toward said outer end position, an individual sheet from one end of said stack leaving at least one remaining sheet and for adding said individual sheet to the other end of said stack upon an inward stroke of said second frame part from said outer end position toward said inner end position, said individual sheet having a first side facing said at least one remaining sheet prior to a reciprocation and a second side opposite said first side and facing said at least one remaining sheet after said reciprocation, said means including:
means for separating said individual sheet from said stack,



means for feeding said individual sheet to said separating means;
first means for retaining said individual sheet in said first frame part,
second means for retaining said at least one remaining sheet in said second frame part, and
means for transferring said individual sheet from a first level defined by said one stack end to a second level defined by said other stack end, and wherein said first retaining means includes a pincer device comprised of a first pincer member which is displaceable relative to said individual sheet so as to engage its first side and press its second side against a second pincer member mounted on said first frame part, and including means for controlling displacement of said first pincer member in response to relative movement of said frame parts.

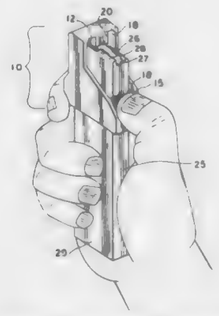
4,993,179
DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Continuation of Ser. No. 890,023, Jul. 11, 1986, Pat. No. 4,787,162. This application Sep. 30, 1988, Ser. No. 252,874
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 34414827
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] G09F 11/30
U.S. Cl. 40—513 129 Claims

1. An apparatus for cyclic rearrangement of a stack of rectangular sheets, the apparatus comprising a first frame part, a second frame part reciprocable relative to said first frame part in a predetermined direction between an inner end position and an outer end position, and means for removing a sheet from a first stack end upon movement of said second frame part from said inner end position to said outer end position and for adding said sheet to a second end of said stack upon movement of said second frame part from said outer end position to said inner end position, said means including:
separating means for separating an individual sheet from remaining sheets of said stack,
feeding means for feeding sheets to said separating means, said feeding means being mounted on said first frame part,
first retaining means for holding said individual sheet in said first frame part,
second retaining means for holding said remaining sheets in said second frame part, and
transfer means for transferring said individual sheet after its being separated from said sheets to said second stack end,



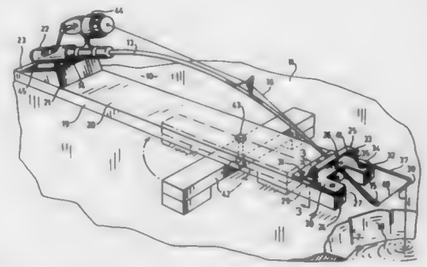
wherein said feeding means include at least one contact element extending in piling direction of said stack, said contact element engaging, under spring bias, a transverse edge of said individual sheet, said edge being trailing in movement direction of said individual sheet, said contact element engaging said transverse edge with a retaining force to hold said transvere edge against a counter force transmitted to said individual sheet by said second frame part during its movement from said inner end position toward said outer end position, said contact element being deflectable against said spring bias thereby releasing said remaining sheets.

4,993,180
MAGAZINE LOADING ASSISTANCE APPARATUS
Lewis E. Upchurch, 2381 Gulf To Bay Mobile Home Park, Lot #702, Clearwater, Fla. 34625
Filed Dec. 23, 1988, Ser. No. 289,223
Int. Cl.[5] F41A 9/83
U.S. Cl. 42—87 2 Claims



1. An apparatus useful in assisting a person in loading ammunition into an ammunition magazine or clip, said apparatus comprising;
a generally rectangular and hollow shell with one completely open lower end and an upper end;
said hollow portion of said shell being of generally rectangular cross-section and of adequate size to permit a particular ammunition magazine or clip to be slidably inserted and guided with a narrow range of precision;
said interior hollow portion being adapted at one end with a rigid plunging member, said plunging member extending substantially over said upper end from one of said narrow rectangular sides and being further adapted with a plunging shaft, said plunging shaft extending a distance down into the interior of said hollowed upper end adequate to engage and plunge a round of ammunition therein; and
the exterior surface of said apparatus being adapted with at least one serrated area sufficiently large for a person's finger to make firm contact therewith.

4,993,181
SEMI-AUTOMATIC FISHING APPARATUS
Warren Cooper, 1378 Rich Road, Vinemount, Ontario, Canada LOR 2G0
Filed Jan. 30, 1990, Ser. No. 472,141
Int. Cl.[5] A01K 97/12
U.S. Cl. 43—15 7 Claims



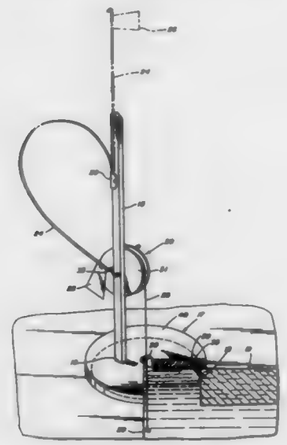
1. A device for use with a fishing rod having a handle at one end, a tip at the opposite other end and a line extending from the handle beyond the tip, said device comprising:
an elongated generally planar base member adapted on its upper surface adjacent a first end for mounting of the handle so as to hold the rod in an unflexed configuration at an angle acute to the upper surface, with the tip of the unflexed rod overlying the second end of the base member;
latching means positioned on the base member adjacent its second end and adapted to be movable under urging from the fishing rod from a latched configuration wherein the rod is held in a flexed configuration with the tip below the upper surface to an unlatched configuration wherein the rod is released and allowed to return to the unflexed configuration;
tripping means positioned on the base member adjacent its second end and adapted to urge the latching means from the latched to the unlatched configuration in response to tensioning of the line;
stabilizing means connected to the base member intermediate between the first end and the latching means so as to laterally stabilize the base member and so as to upwardly incline said second end relative to said first end; and,
an axially aligned slot provided in the base member at the second end so as to allow the downward passage therethrough of the fishing rod in the flexed configuration.

4,993,181
ICE FISHING DEVICES
Arthur M. Monsen, Box 800, Palermo, Me. 04354
Filed Aug. 23, 1989, Ser. No. 397,267
Int. Cl.[5] A01K 97/12
U.S. Cl. 43—17 8 Claims

1. An ice fishing device for use at a hole through the ice, said

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device including a post having first and second ends, a reel having inner and outer walls between which a line is wound and by which the line is confined, means rotatably connecting the reel to the post between the ends thereof with said inner wall proximate to the post and with a space between them, a length of a straight, narrow spring having first and second ends, means (slidably) connecting the first end to the post with the second end (adjacent the second end thereof, the second end of the spring length) extending away from the first end of the post and including a catch and provided with a flag adja-



cent the (hook) catch, the inner wall of the reel including a flanged latch extending freely into the space between the post and said inner wall, whereby said latch engageable by the catch to set the device when a wanted length of line is withdrawn from the reel and the spring length is then manually curved in the appropriate direction and to the appropriate extent to enable the catch to entrap the latch, to releasably retain the latch until the reel has been partially turned to release said catch, and a support to which the first end of the post is connected and which is dimensioned to be seated on the ice marginally of the hole.

4,993,183

BANANA OIL IMPREGNATED FISHING LURES

Robert G. Carver, Many, La., assignor to Mr. Twister, Inc., Minden, La.

Filed May 14, 1990, Ser. No. 522,807
Int. Cl.[5] A23K *1/18*; A01K *85/00*
U.S. Cl. 43—42.06 14 Claims

1. A plastic fishing lure having sufficient banana oil to impart a banana taste to said plastic fishing lure.

4,993,184

HEART SHAPED, FREE STANDING, LIVING HORTICULTURAL PLANTS

Gene L. Howe, Miami, Fla., assignor to P.W. Chisholm, Inc., Boynton Beach, Fla.

Filed Aug. 13, 1990, Ser. No. 565,717
Int. Cl.[5] A01G *17/04*
U.S. Cl. 47—4 21 Claims

1. A free-standing, growing, horticultural plant formed into a heart-shaped plant, comprising:

at least two living plants providing a left plant and a right plant, each plant having a lower root end, an intermediate trunk section, and a foliage end, the root ends of each plant secured together and disposed in ground, each intermediate trunk extending upwardly and bowed outwardly forming an upper arcuate bend, each intermediate trunk further extending downwardly and inwardly to form lobe configurations of the heart-shaped plant where the left plant forms the left lobe and the right plant forms the right lobe, where the left and right trunks meet at an internal



midsection of the heart-shaped plant, the foliage end of each plant directed laterally outwardly and disposed between the upper lobes and the lower roots of the heart-shaped plant to form a lateral foliage area.

4,993,185

PROCESS FOR IMPROVING QUALITY OF FRUIT

Takashi Adachi; Takafumi Ishii, and Hidemasa Hidaka, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 168,764
Claims priority, application Japan, Mar. 17, 1987, 62-60061
Int. Cl.[5] A01G *7/06*
U.S. Cl. 47—58 5 Claims

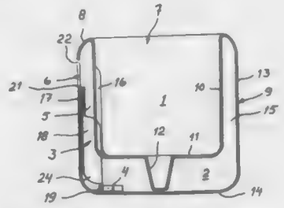
1. A process for improving the quality of fruit which comprises applying alginic acid oligosaccharide(s) to a fruit tree.

4,993,186

SELF-WATERING PLANTER

Henrik Immonen, Tampere, Finland, assignor to Sarvis Oy, Tampere, Finland

Continuation of Ser. No. 256,435, Oct. 12, 1988, abandoned.
This application Feb. 20, 1990, Ser. No. 481,699
Claims priority, application Finland, Oct. 12, 1987, 874468
Int. Cl.[5] A01G *25/00*
U.S. Cl. 47—79 4 Claims



1. A self-watering planter comprising:

an outer member and an inner member inserted into said outer member, and radially and axially spaced therefrom;

a soil space defined inside said inner member;

a water space defined between the bottom of said inner and outer members;

means for fluid communication between said soil and water spaces to allow passing of the water into the soil;

a channel formed between side walls of inner and outer members, said channel being in communication with said water space;

means for receiving a water supply into said channel provided in a side wall of said outer member;

a water level indicating means including an elongated member freely movable within said channel in the longitudinal direction along a guiding means formed in one of said inner or outer members, said elongated member at one end being provided with a water level indicator and at the opposite end having a float member for adjusting position of said water level indicator depending on the water amount present in said water space, said float member being eccentrically connected to said elongated member, the position of said water level indicator being visible through said means for receiving water supply;

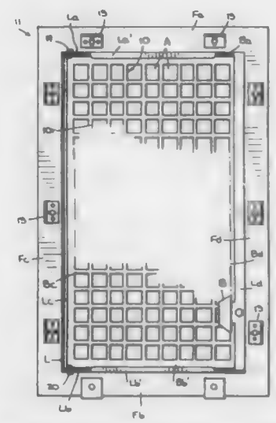
wherein said elongated member is dimensioned to completely cover said means for receiving the water supply into said channel, by said water level indicator, when said water space is fully filled.

4,993,187

RELEASABLE WINDOW GUARD ASSEMBLY

Kenneth K. Schweiss, Wyoming; Charles D. Flack, Jr.; Harold E. Flack, II, both of Dallas, all of Pa., and Lawrence P. Simms, New York, N.Y., assignors to Exeter Architectural Products, Inc., Wyoming, Pa.

Filed Oct. 13, 1989, Ser. No. 421,344
Int. Cl.[5] E06B *3/68*
U.S. Cl. 49—56 14 Claims



1. A releasable screen and frame assembly mountable on the jamb of a window to prevent an intruder from gaining access to a building through the window, the screen when released permitting exit from the building through the window, the assembly comprising:

(a) a screen fabricated from a single sheet of metal whose margins are folded in to define upper and lower end branches and right and left side branches, which branches border a planar filed that is perforated in a predetermined pattern to admit light and air;

(b) a planar metal frame dimensioned to overlie or nest within the jamb of the window and being attachable to the walls of the jamb, said frame defining a rectangular opening whose height matches that of the screen and whose width is smaller than that of the screen whereby the screen can only swing out from the opening when the screen assumes an angle with respect thereto;

(c) a slideway socket including upper and lower legs formed on the rear surface of the frame and surrounding the opening to accommodate the screen; and

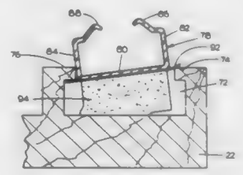
(d) hinge pins slidable in the upper and lower end legs to hinge the screen at its upper and lower end branches to the socket whereby the screen is slidable from a security mode position wherein it lies parallel to the frame and is blocked thereby to guard the window, to an access mode position in which the hinged screen can be caused to assume an angle with respect to the opening and swung out therefrom to permit exit through the window.

4,993,188

SINGLE HUNG WINDOW JAMBLINER

Steven E. Erickson, and Craig A. Anderson, both of Lincoln, Nebr., assignors to SealRite Windows, Inc., Lincoln, Nebr.

Filed Apr. 17, 1989, Ser. No. 315,784
Int. Cl.[5] E05D *13/00*; E06B *7/16*, *1/04*
U.S. Cl. 49—419 5 Claims



1. In combination,

a window frame having a pair of vertical jambs and at least one slidable sash removably mounted therein, each said jamb having an inner face directed toward said sash, and an outer face mounted to a surrounding wall;

each said jamb including a vertically-extending pocket open along the inner face of the jamb for receiving a jambliner;

each said jamb having a pair of vertical lips adapted to form said pocket with a generally T-shaped cross-section;

a jambliner means removably mounted in each of said jamb pockets, comprising an elongated channel member having a base portion, a pair of opposite longitudinal sides extending therefrom, and a pair of resilient leg portions adapted for slidably receiving the sash;

a resilient, flexible material layer operatively secured to said jambliner means base and protruding beyond the longitudinal sides thereof,

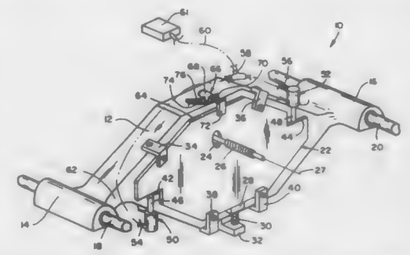
a resiliently compressible pad secured between said material layer and said jamb and adapted to fill the depth of the pocket and bias said material layer against the jamb lips to form a seal to prevent air movement.

4,993,189

FLOATING FIXTURE PLATEN

Daniel R. Cloutier, Clayton, and Gerry R. Schnitzler, Oakville, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Sep. 1, 1989, Ser. No. 401,757
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—72 R 20 Claims



1. Improved means for supporting a workpiece having a surface to be operated on by a rotating tool comprising a support structure, a workpiece supporting member including means to support the supporting member on the support structure in position so that the supporting member is able to move relative to the support structures in a plane normal to the axis of rotation of a rotating tool, first and second fluid assemblies each including a piston portion, spaced surfaces on the sup-

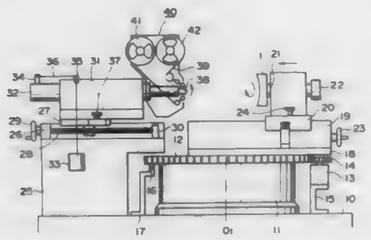
porting member engagable respectively with the piston portions so as to oppose movement of the supporting member when a rotating tool is engaged with a workpiece, and means communicating the fluid assemblies to equalize the fluid pressures produced therein.

4,993,190

POLISHING APPARATUS

Toyohiko Hiyoshi, Ushiku; Mikio Iwata, Ibaraki; Kazuo Watanabe, Ushiku; Shinkichi Ohkawa, Tsuchiura, and Masanori Suzuki, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 169,429, Mar. 17, 1988, abandoned.
This application Jan. 8, 1990, Ser. No. 535,982
Int. Cl.[5] B24B *21/02*
U.S. Cl. 51—145 T 6 Claims



1. A polishing apparatus for polishing a work piece having a curved surface to be polished comprising:

rotating means for holding the work piece and rotating the work piece around a rotational axis which is coincident with a center line of the curved surface;

pivoting means for pivoting the curved surface of the work piece around a pivot axis which is perpendicular to the center line of the curved surface;

supply means for supplying a polishing tape, said supply means comprising a polishing tape supply portion, a polishing tape winding portion, a pressing member for pressing the polishing tape onto the curved surface of the work piece, and applying means for applying a pressing force to said pressing member, wherein said pressing member presses the polishing tape onto the curved surface of the work piece, which rotates around the center line of the curved surface and pivots around the pivot axis, and said pressing member has a rounded portion of a predetermined curvature at one end thereof, and is adapted to feed, over said end, the tape running between said tape supply portion and said tape winding portion;

measuring means for measuring a displacement of said pressing member;

a detecting means for detecting the pivot angle of said pivot [illegible]

memory means for memorizing design data of the work piece; and

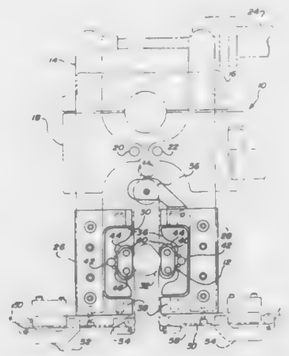
a computer for controlling each said means, said computer determining the amount of work to be done on the work piece by a process wherein the polishing tape is detached from said pressing member of said polishing tape supply means and directly abuts said pressing member against the work piece, the pivot angle of said pivoting means is reset to an origin point, the work piece is pivoted by said pivoting means and displacement is measured by said measuring means, and an amount of correction work and a correction work position is determined by the measured data and the design data in said memory means.

4,993,191

ROLLER CAM MICROFINISHING TOOLING

Edward E. Judge, and Fred J. Burrows, both of Lansing, Mich., assignors to Industrial Metal Products Corporation, Lansing, Mich.

Filed Apr. 28, 1989, Ser. No. 344,681
Int. Cl.[5] B24B *5/42, 5/00, 19/12, 21/00*
U.S. Cl. 51—154 4 Claims



1. A microfinishing tool for a microfinishing machine in which said tool presses an abrasive coated film against a workpiece cam lobe which is rotated with respect to said tool such that said film machines the cam lobe surface of said workpiece, comprising:

support means for mounting said tool to said machine,

roller plate means for attachment to said support means by a pivot which permits said roller plate means to pivot with respect to said support means, and

a pair of separated roller elements affixed to said roller plate means by bearing means which allows said roller elements to freely rotate, wherein said film if positioned between said workpiece cam lobe surface and said roller elements such that said roller elements directly press said film against said workpiece cam lobe surface and said pivot and said bearing means allow said roller plate means and said roller elements to closely follow the cam lobe shape of said workpiece wherein said roller elements are permitted to rotate slightly during a machining operation in which said workpiece surface is roated with respect to said tool.

4,993,192

POWER SANDING DEVICE

Kris D. Demetrius, 2843 State St., Apt. #4, Santa Barbara, Calif. 93105

Filed Nov. 24, 1989, Ser. No. 440,802
Int. Cl.[5] B24B *23/00*
U.S. Cl. 51—170 PT 19 Claims

1. (The device of Claim 3 further) A power-driven abrading device comprising:

a motor,

a housing enclosing said motor,

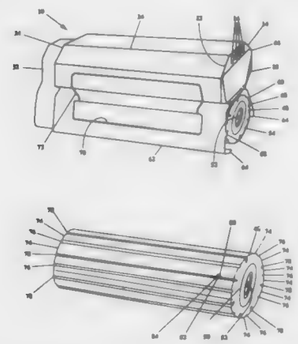
a drive shaft extending parallel to and below the axis of said housing,

means coupling said motor to drive said drive shaft,

a drum releaseably mountable about said drive shaft for rotation with said drive shaft, said drum being formed of resilient material and having a plurality of alternate ridges and recesses disposed about the periphery of said drum extending lengthwise of said drum and having a slit extending lengthwise along each of said ridges,

(a flange projecting radially outward from said shaft adjacent the mounting end of said shaft and having a plurality of radial slots formed in said flange,) and

(a plurality of scraping blades each releasably mountable in a respective one of said slits and having tongue means



engageable with said slots of said flange to retain said blades in position during operation)

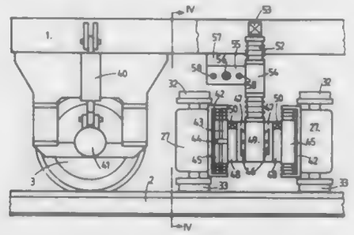
abrading means releasably mountable on said drum.

4,993,193

RAILROAD VEHICLE FOR REPROFILING AT LEAST ONE RAIL OF A RAILROAD TRACK

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Dec. 5, 1989, Ser. No. 446,199
Claims priority, application Switzerland, Mar. 2, 1989, 765/89
Int. Cl.[5] B24B *23/00, 27/08*
U.S. Cl. 51—178 4 Claims



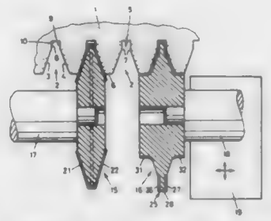
1. Railroad vehicle for the reprofiling of at least one rail of a railway track comprising a frame provided with wheels resting on each rail; at least two reprofiling units having each a motor having an output shaft which carries at each end a rotative tool; a support carrying said at least two reprofiling units; connecting means connecting said support to said frame and permitting displacing said support vertically and transversely with respect to said frame; said reprofiling units comprising further means to apply one of their tools against a rail; said support being displaceable with respect to said frame in at least one of rotation and translation; and in which each said reprofiling unit is mounted on said support by means of a rotating table the rotation axis of which is perpendicular to the axis of rotation of the motor of said reprofiling unit and by means of a slide extending perpendicularly to the longitudinal axis of the rail so that the motor shafts of the motors of said at least two reprofiling units can be displaced the one with respect to the other, firstly, in rotation around an axis parallel to the longitudinal axis of the rail, and secondly, in translation parallel to a plane which is perpendicular to the longitudinal axis of the rail.

4,993,194

GRINDING DISKS FOR PROFILING CYLINDRICAL WORMS

Jakob Cadisch, Gossau, Switzerland, assignor to Reishauer AG, Wallisellen, Switzerland

Filed Jan. 23, 1989, Ser. No. 299,381
Claims priority, application Switzerland, Feb. 12, 1988, 529/88
Int. Cl.[5] B23F *21/03;* B24B *33/00;* B24D *5/00, 7/00*
U.S. Cl. 51—206 R 10 Claims



9. A tool for profiling in one operation a cylindrical grinding worm (1), in turn used to grind gear wheels, said tool comprising:

(a) a first rotatable disk (15) having radially converging side surfaces (21, 22) coated with hard abrasive particles for contouring opposite flanks (3, 4) of a helical groove (2) in said worm, and

(b) a second simultaneously rotatable disk (16) disposed axially parallel to and spaced from the first disk, said second disk having:

(1) a rectangularly sectioned radially outermost tip portion (25) coated with hard abrasive particles for contouring a root portion (5) of the groove, and

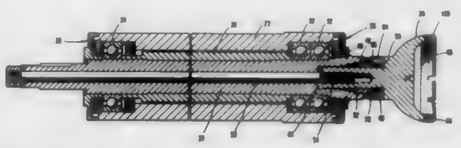
(2) a pair of radially inner, generally cylindrical surfaces (31, 32) flanking said outermost surface, having outturned facing edges (34), and coated with hard abrasive particles for cooperatively contouring a crest portion (6) of the groove.

4,993,195

LENS CUTTING METHODS FOR EFFECTING RAPID REPLACEMENT OF LENS CUTTING TOOLS

Roy R. Gray, Muskogee, Okla., assignor to Coburn Optical Industries, Inc., Tulsa, Okla.

Division of Ser. No. 172,553, Mar. 24, 1988, Pat. No. 4,928,433, which is a continuation-in-part of Ser. No. 937,251, Dec. 3, 1986, abandoned. This application Mar. 8, 1990, Ser. No. 496,547
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—281 R 8 Claims



1. A method of replacing lens cutting tools in a lens cutting machine of the type comprising a rotary driven shaft to which cutting tools are removably attachable in order to be driven about a longitudinal axis, the shaft including a first stop surface engageable with a second stop surface carried by said tool for positioning said tool such that a cutting edge of said tool is aligned with a reference plane that is fixed relative to said machine, said shaft being adjustable to orient said cutting edge in a particular manner relative to a lens to be cut, said method comprising the steps of:

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gauging a longitudinal dimension defined by said replacement tool with said replacement tool disposed off-machine, while longitudinally displacing, as necessary, said second stop surface to change said longitudinal dimension until said longitudinal dimension coincides with a predetermined dimension determined with respect to said first stop surface and said reference plane whereby said cutting edge will be positioned within said reference plane when said tool is attached to said shaft, and

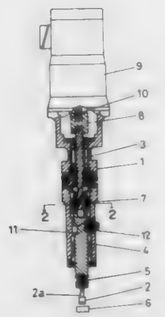
attaching said replacement cutting tool to said shaft in place of a removed cutting tool.

4,993,196

METHOD FOR REMOVING BURRS FROM WORKPIECES

Hisamine Kobayashi, and Toshiharu Shimizu, both of Nagoya, Japan, assignors to Tipton Manufacturing Corporation, Nagoya, Japan

Filed Jul. 3, 1989, Ser. No. 374,919
Claims priority, application Japan, Aug. 5, 1988, 63-196617
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—281 P **2 Claims**



1. A method of removing any burrs from a workpiece having a bore which consists of causing a rotary tool to be inserted into a workpiece having a bore from which any burrs are to be removed, causing the rotary tool to be rotated a number of times n per said unit time, causing the rotary tool to travel forward and backward inside the bore a number of times N per said unit time, and removing the burrs from the marginal edge and interior of the bore,

wherein the ratio of the number of revolutions (n) and number of reciprocating motions (N) is $\frac{1}{2} \leqq n/N \leqq 1$.

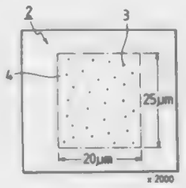
4,993,197

MAGNETIC TAPE CASSETTE HAVING IMPROVED GUIDE POLE STRUCTURE

Takahito Miyoshi; Minoru Kanazawa; Tsutomu Sugisaki; Takuzi Yamada, and Yasutoshi Okuzawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 205,759, Jun. 13, 1988, Pat. No. 4,930,032. This application Dec. 19, 1989, Ser. No. 452,444
Claims priority, application Japan, Jun. 15, 1987, 62-90717[U]; Jun. 26, 1987, 62-97437[U]
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—326 **4 Claims**

1. A method for manufacturing a guide pole for a cassette tape, comprising the steps of: providing a cylindrical stainless steel base member; subjecting said base member to centerless grinding to roughen a surface of said base member; subjecting said base member to barrel finishing and further finishing said base member until a number of scratch-like grooves in said surface in sliding contact with a magnetic surface of said tape in a sliding direction of said tape on said surface is less than 11



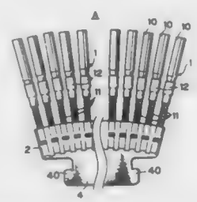
per millimeter; and subjecting said base member to surface rolling.

4,993,198

BRUSH ROLL FOR BRUSHING METAL PLATES

Setsuo Hotani, Wakayama, Japan, assignor to Hotani Co., Ltd., Japan

Filed Oct. 13, 1988, Ser. No. 257,226
Claims priority, application Japan, Oct. 14, 1987, 62-258549
Int. Cl.[5] B24B *9/02*
U.S. Cl. 51—334 **11 Claims**



1. A brush roll comprising:

a shaft having an axis and a plurality of substantially dovetail shaped grooves on the surface thereof, said grooves extending longitudinally of the shaft and being spaced circumferentially around the shaft; and

a plurality of circular assemblies of brush disk segments mounted on said shaft, said circular assemblies of brush disk segments being spaced longitudinally along said shaft, each circular assembly of brush disk segments comprising a plurality of brush disk segments, each of said brush disk segments comprising

a wedge-shaped board which extends about 15° to 60° around said shaft axis, said board having a dovetail shaped key for engaging one of said dovetail shaped grooves on said shaft, and

at least one circumferentially extending row of abrasive members attached to said board, each abrasive extending outwardly from said board,

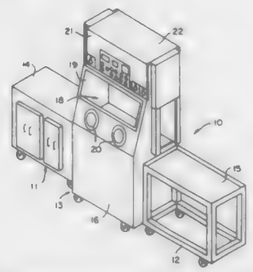
each of said dovetail shaped keys being capable of being inserted in a corresponding dovetail shaped groove when said key is parallel to said axis of said shaft and capable of engaging said corresponding dovetail shaped groove when said key is rotated perpendicularly to said axis after being inserted in said groove parallel to said axis, adjacent boards in adjacent grooves having rows of abrasive members extending circumferentially around said axis of said shaft.

4,993,199

PORTABLE SELF-CONTAINED DECONTAMINATION BOOTH

Joel J. Hughes, Wilmington, N.C., assignor to Container Products Corporation, Wilmington, N.C.

Continuation-in-part of Ser. No. 31,611, Mar. 30, 1987, Pat. No. 4,928,440. This application Mar. 15, 1990, Ser. No. 493,773
Int. Cl.[5] B24C *3/00*
U.S. Cl. 51—426 **12 Claims**



1. A portable self-contained decontamination booth including an atmospherically sealed cabinet having a source of vacuum connected thereto for creating a negative pressure within the cabinet, as well as a cleaning fluid application gun within the work area of the cabinet comprising:

(a) a portable booth assembly including a cabinet and associated side work tables,

(b) a work area within said cabinet including a work piece supporting grating disposed in horizontal alignment with the top surfaces of said side work tables,

(c) said cabinet including an inclined viewing window for said work area and work glove ports, and an eye-level vertical control panel,

(d) a pair of access side doors for said work area including pneumatic cylinders positioned exteriorly of said cabinet and having their movable pistons operatively connected to the outside of said doors for moving the same through a vertical plane into an open or closed position,

(e) an exhaust system carried by one of said work tables and providing communication with said work area of said cabinet for creating a source of vacuum therein and a negative pressure throughout the cabinet, and

(f) a dual filter assembly carried by said one of said work tables and providing communication with said work area of said cabinet for recovering the waste laden exhaust of said cabinet.

4,993,200

POLLUTION FREE BLASTER SYSTEM AND BLASTER HEAD THEREFOR

Junichi Morioka, Chiba; Hiromitsu Mouri, Tokyo, and Iwao Atsuchi, Osaka, all of Japan, assignors to Kawasaki Steel Techno-Research Corp; Kawatetsu Kinzi Kogyo Co., both of Tokyo and Atsuchi Tekko Co., Osaka, all of, Japan

Filed Mar. 10, 1987, Ser. No. 24,149
Claims priority, application Japan, Mar. 11, 1986, 61-54376; Mar. 11, 1986, 61-54377; Mar. 11, 1986, 61-54378; Mar. 11, 1986, 61-35749; Mar. 11, 1986, 61-35750
Int. Cl.[5] B24C *3/06*
U.S. Cl. 51—426 **40 Claims**

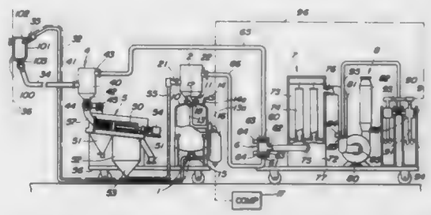
1. A blaster head assembly for sandblasting comprising:

a blaster hood defining a blaster chamber therein exposed toward a surface to be treated,

a sealing means, cooperative with sand blaster hood, for establishing a seal between said blaster hood and said surface to block communication between said blaster chamber and the atmosphere;

a blaster nozzle inserted into said blaster chamber through a first opening formed through said blaster hood, said blaster nozzle connected to an external abrasive blast source to supply a pressurized abrasive blast directed toward said surface; and

a suction nozzle inserted into said blaster chamber through a second opening formed through said blaster hood and oriented at a different position to that of said first opening,



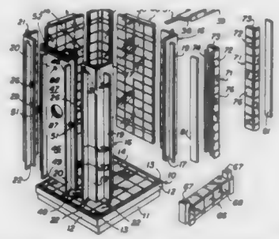
and connected to an external vacuum source separated from said external abrasive blast source, for creating vacuum pressure in said blaster chamber for sucking out a mixture of said abrasive blast and pollutant generated during blasting operation.

4,993,201

PRE-CAST STALL SHOWER PANEL ASSEMBLY

Robert Bunyard, 500 Upton St., Redwood City, Calif. 94062

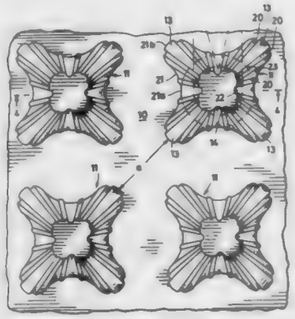
Filed Apr. 26, 1989, Ser. No. 343,431
Int. Cl.[5] E04B *1/00*; A47K *3/16, 3/22*
U.S. Cl. 52—35 **19 Claims**



1. A shower assembly comprising a horizontal base having upstanding panel supports around the perimeter of said base, a vertical back backing panel, opposed vertical side backing panels perpendicular to opposed edges of said back backing panel, corners on the sides of said side backing panels, said corners having first and second corner backing panels perpendicular to each other, external vertical ribs on said back and side backing panels and on said corner backing panels, said ribs having upper and lower edges first means securing the lower edges of said external vertical ribs to said panel supports, said back, side and corner panels each having opposed vertical edges and upper and lower ends, second means engaging the adjacent vertical edges of said back, side and corner backing panels to each other, third means securing the upper edges of said vertical ribs, the adjacent edges of one pair of second corner backing panels being spaced apart to provide an entrance opening for the shower, curb means between said second corner backing panels on said base at the bottom of said entrance opening, header means between the upper ends of said second corner backing panels, and tiles lining the upper surface of said base and the interior surfaces of said back and side backing panels and said corner backing panels.

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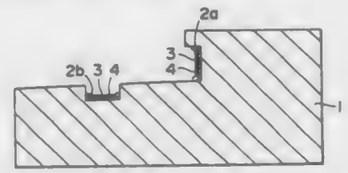
4,993,202
CAVITY FLOOR
Dieter Thiel, Siegberg, Fed. Rep. of Germany, assignor to Schmidt Reuter Ingenieurgesellschaft mbH & Co. K.G., Fed. Rep. of Germany
PCT No. PCT/EP87/00413, § 371 Date Jan. 27, 1989, § 102(e) Date Jan. 27, 1989, PCT Pub. No. WO88/00997, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 29, 1987, Ser. No. 327,913
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3620530[U]; Nov. 7, 1986, 8637987[U]
Int. Cl.[5] E04C *2/32*
U.S. Cl. 52—220 18 Claims



1. A cavity floor comprising:
a profiled foil having a thickness and comprising a sheet material provided with formed out parts defining substantially rigid portions and substantially flexible portions, the substantially rigid portions forming support feet that are arranged at mutual distances and the substantially flexible portions defining horizontal upper areas between the support feet, each support foot having a height, an end surface defining a peripheral circle and an open end defining an inner circle,
said horizontal upper areas constituting deformation areas for automatic vertical adjustment of the support feet relative to one another when under load and said support feet comprising ribs that extend up to the deformation areas, and
a lime floor layer that covers the support feet and provides a flat floor surface over the foil, characterized in that
said support feet are provided with a lateral surface having a height and being free of horizontal kink lines;
the ribs extend over the whole height of the lateral surface; the thickness of the foil and the mutual distances for the support feet being selected so that the foil is sufficiently rigid to support a person standing on the foil and sufficiently flexible to adapt to an uneven floor surface and the peripheral circle at the end surface of each support foot and the inner circle at the open end of said support foot both lie on a conical lateral surface with a maximum top angle of 50°.

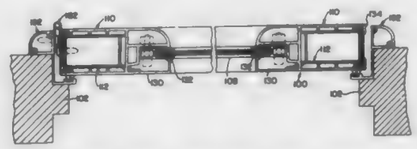
4,993,203
FIREPROOF FRAME STRUCTURE IN A BUILDING OPENING PORTION
Kiyoshi Tanaka, Kawaoki, and Kazushige Hori, Narashino, both of Japan, assignors to Mitsui Wood Products, Inc., Tokyo, Japan
Filed Oct. 30, 1989, Ser. No. 428,762
Int. Cl.[5] E04C *2/00*
U.S. Cl. 52—232 3 Claims

1. A fireproof frame structure for building opening portions comprising:
an opening member,
a wooden frame disposed to a building opening portion, said wooden frame having a groove on a surface of an entire circumference thereof,
a non-combustible sealing material filled in said groove which foams upon application of heat and



a thin film covering a surface of said sealing material, said thin film having an excellent heat conductivity and being bonded to a surface of said sealing material by self adhesion thereof.

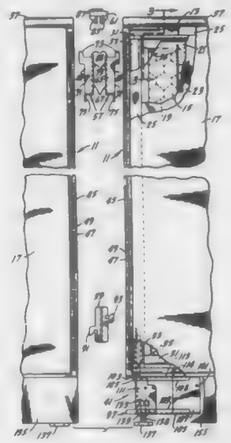
4,993,204
COMPOSITE METAL AND PLASTIC FRAME STRUCTURE FOR WINDOWS AND DOORS
Harold Kuritsky, Lido Beach, N.Y., and Brendan J. O'Connor, West Milford, N.J., assignors to Robert T. Feury, Kearny and Herbert Smilowitz, West Orange, both of, N.J.
Filed Mar. 15, 1990, Ser. No. 493,911
Int. Cl.[5] E04C *1/00, 3/30*; E06B *1/04*
U.S. Cl. 52—309.15 32 Claims



1. A composite metal and plastic frame structure for windows and doors comprising a rigid self-supporting metal inner frame, a rigid self-supporting plastic outer frame having an enclosed hollow interior, said plastic outer frame having open outer edges about the outer periphery thereof and closed inner edges about the inner periphery thereof, and plastic members attached to the open outer edges of said plastic outer frame to close said open outer edges thereat, said metal inner frame contained within the enclosed hollow interior of said plastic outer frame to provide said frame structure, whereby the exterior of said metal inner frame is completely surrounded by said plastic outer frame.

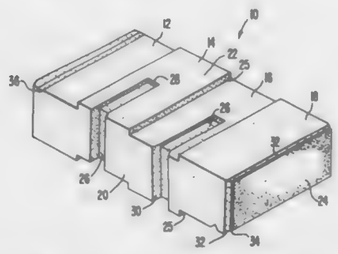
4,993,205
OPEN OFFICE SYSTEM PARTITION PANEL ASSEMBLY
Raymond P. Dull, Spring Lake; Bernard R. Lavas, and William D. Baxter, both of Muskegon, all of Mich., assignors to The Shaw-Walker Company, Muskegon, Mich.
Division of Ser. No. 275,718, Nov. 23, 1988, abandoned. This application Apr. 9, 1990, Ser. No. 506,218
Int. Cl.[5] E04B *2/76*
U.S. Cl. 52—584 1 Claim

1. A top connector for interconnecting the end walls of a pair of adjacent panels of an open office system partition, the top connector including:
an elongated body of U-shaped, transverse cross-section having a front wall connecting two side walls, with said side walls having end edges which contact the end rail of a panel,
an upwardly opening hook rearwardly extending from the end edge of each connector side wall at the upper end thereof for insertion in a pair of spaced apart slots formed in the end rail of the partition panel,
a tab located at the lower end of the connector body and aligned with the end edges of the side walls, the tab having an opening extending therethrough to receive a fastener to attach the tab to the end rail of the partition panel,
a projection extending outwardly from said front wall,



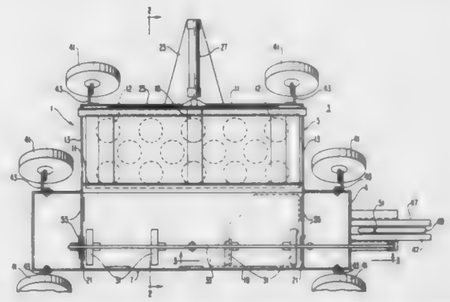
a slot complementary in size and shape to said projection formed in said front wall,
said projection and said slot being located symmetrically relative to each other about a vertical centerline through said front wall, and
a rearwardly-bent tab formed on the top edge of said front wall to receive a clamp nut.

4,993,206
INTERLOCKING BUILDING UNITS AND WALLS CONSTRUCTED THEREBY
Jorge Pardo, Reston, Va., assignor to National Concrete Masonry Association, Herndon, Va.
Continuation-in-part of Ser. No. 305,829, Feb. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,152, Aug. 4, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,016
Int. Cl.[5] E02D *29/02*
U.S. Cl. 52—589 28 Claims



1. An interfitting modular construction unit comprising:
a block having a top, a bottom parallel to the top, a front, a rear and two sides, said block including a plurality of sections each generally defining a parallelepiped, each said section having a top, a bottom, two sides defined by the sides of the block, a width between said two sides of said section, a height between said top and said bottom of said section, and a depth transverse to said height and said width of said section, the height and depth of each section being substantially the same as the height and depth of each other section, each said section extending from one of said two sides of said block to the other of said two sides, each said section being offset from adjacent sections in a direction transverse to the top and the bottom of the block to define at least one plateau and at least one recess in the block and ledges perpendicular to the top and bottom of the block, the plateau of said block being sized to fit into the recess of said block, whereby a plurality of said blocks can interfit with one another,
said block further having a drainage groove defined in at least one of said sections, said drainage groove extending from said top of said block midway between said two sides of said block, along one of said sides of said block, and across said bottom of said block to midway between said two sides of said block.

4,993,207
ROOF SHINGLE LAYING MACHINE
Jerome F. Burke, 28635 N. Jackson, Wauconda, Ill. 60084
Filed Aug. 7, 1989, Ser. No. 390,235
Int. Cl.[5] E04D *15/02*
U.S. Cl. 52—749 20 Claims

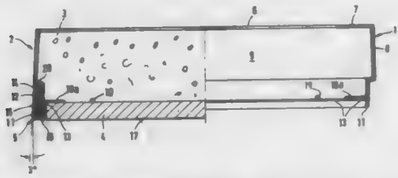


15. A device for automatically laying and securing shingles to a roof surface, comprising:
a frame;
a storage compartment attached to said frame for holding a plurality of shingles to be laid;
a placement compartment attached to said frame for holding a single shingle at a desired position on the roof surface;
transfer means for transferring a single shingle from said storage compartment to said placement compartment;
attachment means for attaching the single shingle held by said placement compartment to said roof surface; and
a plurality of wheels attached to said frame, wherein said wheels are adjustable relative to said frame so as to conform to a sloped roof surface whereby the wheels are maintained perpendicular to the ground.

4,993,208
MOLD FOR PRODUCING TILE-SHAPED FLOOR ELEMENTS FOR FORMING A DOUBLE FLOOR CONSTRUCTION AND A CORRESPONDING TILE-SHAPED FLOOR ELEMENT
Martin Bard, Amberg, and Gottefried Cremer, Koln Junkersdorf, both of Fed. Rep. of Germany, assignors to Buchtal Gesellschaft mit beschrankter Haftung, Schwarzenfeld/Opa, Fed. Rep. of Germany
Filed Sep. 26, 1988, Ser. No. 249,313
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732802; Dec. 17, 1987, 3742907; Feb. 8, 1988, 3803740
Int. Cl.[5] E04F *19/02*; E04C *2/38*
U.S. Cl. 52—802 16 Claims

1. A mold for producing a tile-shaped floor element for a

double floor construction, comprising a trough made of a material with high tensile strength for taking up a flowable, hardenable core layer made of rigid material that, in a compound with the core layer and the trough, forms the floor element, characterized in that the mold, in its totality, is part of the floor element (2) since the trough (1) and ceramic cover tile



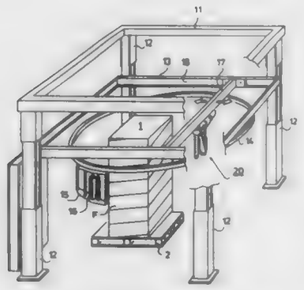
(4) are stabilized by spacers (10, 10a) and firmly interconnected to form the mold by a joint-forming, viscoplastic material (12) along the peripheral edge of the cover tile (4), and in that the flowable core layer (3) is poured into this mold and, after hardening, forms a compound having high shear strength with the trough (1) and ceramic cover tile (4).

4,993,209

PROCESS AND MEANS FOR SEAMING AND CUTTING OFF A WRAPPING FILM

Matti Haloila, Poikko, Finland, assignor to Newtec International, Aix-les-Bains, France

Filed Apr. 13, 1990, Ser. No. 509,038
Int. Cl.[5] B65B *11/00, 13/00*
U.S. Cl. 53—399 12 Claims



1. In a process for seaming and cutting off a wrapping film in a wrapping machine, comprising the steps of providing the wrapping machine with a film holder having first and second jaws and winding wrapping film about a product to be packaged with the wrapping machine, the improved process characterized by the steps of:

locking the wrapping film between the first and second jaws subsequent to the step of winding wrapping film about the product;

moving the first and second jaws against the surface of the wrapping film wound about the product;

seaming the wrapping film locked between said first and second jaws to the wrapping film about the product by blowing hot air through at least one seaming aperture in the first jaw; and

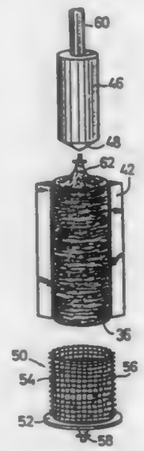
cutting off the wrapping film by blowing hot air through a cut-off aperture in the first jaw.

4,993,210

METHOD FOR PACKING A TUBULAR CASING LENGTH GATHERED INTO A HOLLOW CYLINDRICAL SHIRRING INTO A TUBULAR NET FOR SUBSEQUENT PROCESSING AS SAUSAGE CASING IN AN AUTOMATIC SAUSAGE-MAKING MACHINE

Günter Kollross, Am Wallerstädter Weg 20, D-6080 Gross Gerau-Dornheim, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 490,441
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 2907485
Int. Cl.[5] B65B *63/04, 9/15*
U.S. Cl. 53—428 7 Claims



1. A method for packing a shirred tubular casing segment in a tubular net which packed segment is subsequently used with an automatic sausage-making machine comprising the steps of:

thrusting an unshirred tubular casing with a shirring tool onto a shirring tube extending into an opened end of the tubular casing while air is conducted out of the shirring tube whereby the tubular casing is shirred about the shirring tube, said thrusting step including the step of initially thrusting an initial portion of the tubular casing over a first abutment provided on the shirring tube to a second abutment where the first abutment is configured to be slightly smaller than the opened tubular casing so that the initial portion is not shirred;

separating the shirred tubular casing from the remaining unshirred tubular casing to form the shirred tubular casing segment;

removing the shirring tube and first abutment from the shirred tubular casing and initial portion;

sealing the initial portion to form a casing tip;

pushing against the casing tip axially to initially push the casing top into the shirred tubular casing segment and then to push the shirred tubular casing segment through a cylindrical carrier to engage a sealed end of a tubular net which tubular net is drawn from around the cylindrical carrier and turned inside out in passing through the cylindrical casing to surround the shirred tubular casing segment pushed therethrough;

sealing the tubular net at two points along the length thereof adjacent the casing tip; and

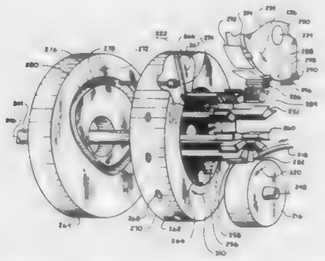
separating the tubular net between the two points to separate the surrounded tubular casing segment from a remainder of the tubular net and from the sealed point of the remaining tubular net which subsequently engages the next shirred tubular casing segment.

4,993,211

SOFT CHEWING GUM WRAPPING MACHINE AND METHOD

Anthony P. Piano, Sparta, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1989, Ser. No. 435,143
Int. Cl.[5] B65B *11/28, 47/06;* B26D *7/06*
U.S. Cl. 53—435 18 Claims



14. A method of cutting and wrapping sticks of gum, comprising the steps of:

cutting sticks of gum from a gum supply with a plurality of cutting heads; and

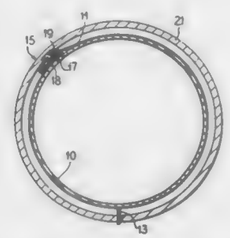
sequentially moving said cutting heads in an arcuate path eccentrically about an axis between a cutting position wherein each said cutting head is adjacent a next cutting head to engage said gum supply to cut a stick of gum, and a wrapping position wherein each said cutting head is separated a predetermined distance from said next cutting head.

4,993,212

METHOD AND APPARATUS FOR GUIDING A ZIPPERED FILM IN FORM, FILL AND SEAL PACKAGE MAKING MACHINES

Stanley Veoukas, Wheeling, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Feb. 1, 1990, Ser. No. 473,467
Int. Cl.[5] B65B *9/08, 41/12;* B31C *13/00*
U.S. Cl. 53—451 14 Claims



10. A method of retaining a sheet or package making material against lateral drifting as the material is directed upwardly along a slanting body of a forming shoulder associated with a forming and filling tube of a form, fill and seal machine, and then over a crest edge from which a skirt of said forming shoulder extends downwardly about the filling tube and shapes the sheet tubularly about the tube, comprising:

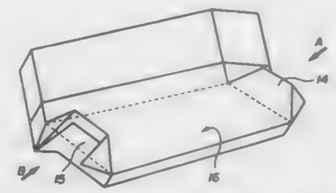
running a longitudinally extending zipper area on said sheet through guide means on said skirt and which guide means faces toward said tube.

4,993,213

PACKAGING METHOD AND PACKAGE OBTAINED BY THIS METHOD

Erwin Kobler, Lausanne; Pierre Therond, Morges, and Jacques Mury, Auboane, all of Switzerland, assignors to SAPAL, Societe Anonyme des Plieuses Automatiques, Switzerland

Continuation-in-part of Ser. No. 730,287, May 30, 1985, abandoned. This application Apr. 29, 1988, Ser. No. 188,733
Claims priority, application Switzerland, May 7, 1984, 2211/84
Int. Cl.[5] B65B *11/02*
U.S. Cl. 53—463 5 Claims



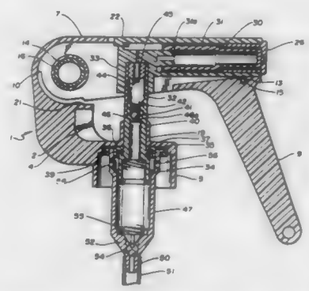
1. A method of packaging a rectangular moulded chocolate bar having a predetermined thickness, an upper face and a bottom face and bevelled longitudinal and lateral side faces, with a packing material consisting of a sheet of a web of heat sealable, composite multilayer material, comprising the steps of forming a longitudinal tube of said packing material completely around the bar, so that the bar is located in a central part of said tube and so that one longitudinal edge of the sheet projects over and past another longitudinal edge and forms a covering flap, heat sealing said tube longitudinally throughout its length by sealing ssid other longitudinal edge against an inner surface of the base of said covering flap along a longitudinal edge of said bottom face of the bar, forming lateral folds which are first applied against the bevelled lateral side walls and then bent and applied on the ends of the bottom face near said lateral side walls, said lateral folds being made at each end of said tube, and folding said covering flap down over said bottom face in overlying relationship to said lateral folds.

4,993,214

METHOD OF ASSEMBLING A TRIGGER SPRAYER DEVICE

Robert E. Corba, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

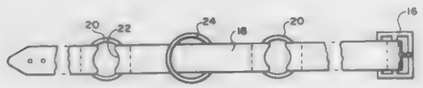
Division of Ser. No. 165,220, Mar. 8, 1988, abandoned. This application Oct. 11, 1989, Ser. No. 419,932
Int. Cl.[5] B65B *7/28*
U.S. Cl. 53—471 4 Claims



1. A method for assembling a trigger sprayer which includes a container for holding a product, a pump module for pumping the product, and a pump actuating module for actuating the pump, said method comprising the steps of:

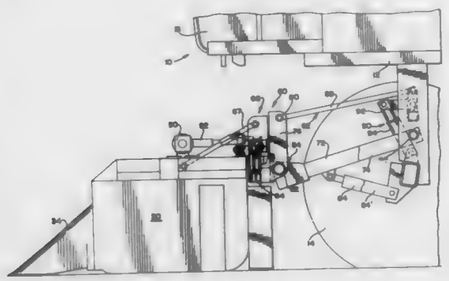
adding the product to the container;
placing the pump module into the container; and
relatively advancing the pump actuating module and the container holding the pump module so that locking means locks the container, the pump module and the pump actuating module together, and so that mating means join complementary portions of the pump module and the pump actuating module, thereby to allow operation of the trigger sprayer.

4,993,215
HORSE COLLAR
June Schutte, 29 Glade Rd., East Hampton, N.Y. 11937
Filed Sep. 18, 1989, Ser. No. 408,733
Int. Cl.[5] B68B *3/04*; A01K *27/00*
U.S. Cl. 54—19 R 3 Claims



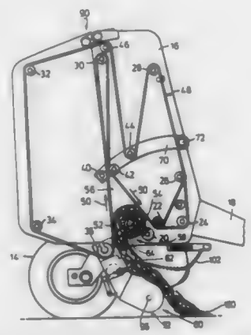
1. A horse collar for temporarily hitching a horse to a post disposed to the side of the horse comprising:
a belt consisting of a single run strap with only three flexible sections, said sections comprising a pair of straps end sections, an intermediate strap section, a ring fixedly interposed respectively between each of said strap end sections and the adjacent intermediate strap section and means for removably fastening said strap end sections together to provide a single loop of fixed length about the neck of the horse animal; said sections being dimensioned such that said fixed rings are positioned on opposite sides of the horse's neck when said collar is fastened thereabout.

4,993,216
COTTON HARVESTER MOUNTING AND SUPPORTING SYSTEM WITH HIGH LIFT CAPACITY
Michael J. Covington, LaGrange; G. Neil Thedford, Naperville, and Jesse H. Orsborn, Hinsdale, all of Ill., assignors to J. I. Case Company, Racine, Wis.
Filed Dec. 4, 1989, Ser. No. 445,455
Int. Cl.[5] A01D *46/08*
U.S. Cl. 56—15.9 14 Claims



1. A system for mounting and supporting a harvesting unit on a fore-and-aft extending frame of a cotton harvester, said system allowing for vertical movement of said harvesting unit relative to said frame, said system comprising:
a lift arm pivotally attached at a rear end to said frame and at a forward end to said harvesting unit;
means for effecting angular displacement of said lift arm and thereby vertical displacement of the harvesting unit connected thereto between lowered and raised positions;
a tension arm pivotally connected at a rear end to said frame and at a forward end to said harvesting unit, said tension arm extending substantially parallel to said lift arm such that said harvesting unit maintains a generally level attitude in its lowered and raised positions; and
harvesting unit tilting means for pivoting the harvesting unit about its pivotal attachment to said lift arm from said raised position to a tilted position to facilitate an increase in ground clearance for the harvesting unit, said harvesting unit tilting means including a lever pivotally connected between said frame and the rear end of said tension arm and a linearly distendable driver connected to the fame for pivotally moving said lever, wherein the operative length of said driver controls the tilted position of said harvesting unit.

4,993,217
MACHINE FOR FORMING CYLINDRICAL BALES OF CROP
Ernest Pfrimmer, Roulhing, and Raymond Bertrand, Sarreguemines, both of France, assignors to Deere & Company, Moline, Ill.
Filed Jan. 16, 1990, Ser. No. 465,866
Claims priority, application United Kingdom, Jan. 30, 1989, 8901956
Int. Cl.[5] A01D *57/26*
U.S. Cl. 56—341 4 Claims

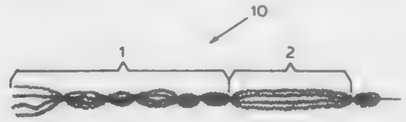


1. In a baler for forming large cylindrical bales of crop having a baling chamber defined by a plurality of belts trained side-by-side over a plurality rolls and being operative for rolling the crop into a bale with an inlet for the crop and one of said plurality of rolls being at an inlet to the chamber so that crop can be fed to the baling chamber between the one of said plurality of rolls and the bale, the improvement comprising: said one of said plurality of rolls having discs mounted thereon between adjacent belts and having radial protrusions projecting beyond the thickness of the belts so as to assist in advancing the crop into the chamber.

4,993,218
TEXTURED YARNS AND FABRICS MADE THEREFROM
Nathan G. Schwartz, Bryn Mawr, Pa., and Harry A. Proscano, Wilmington, Del., assignors to Textured Yarn Company Inc., Kennett Square, Pa.
Filed Jan. 9, 1990, Ser. No. 462,654
Int. Cl.[5] D02G *3/04*, *3/24*
U.S. Cl. 57—208 6 Claims

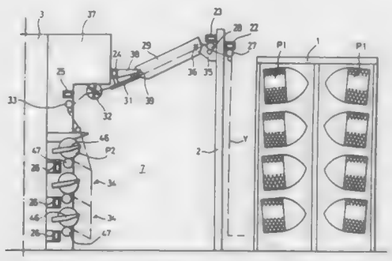
1. A yarn useful for novel knitted and woven fabrics comprising:
(a) a bundle of one or more multifilament continuous supply yarns with two sequentially alternating lengths in a preselected ratio of lengths;
(b) the first length comprising two sequentially alternating sections;
(c) the first section comprising a node of substantially entangled, crimped filaments;

(d) the second section comprising a node of substantially unentangled, crimped filaments;
(e) the sections alternating in closely, substantially randomly-variably spaced sequence with a preselected degree of randomness;
(f) the second length comprising substantially unentangled crimped filaments;



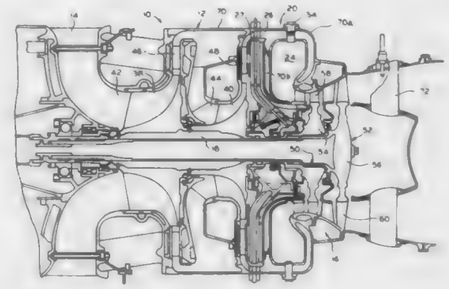
(g) the yarn is characterized by substantially uniform linear denier; and
(h) the yarn is further characterized in that the distance between nodes of the second length is greater than the distance between nodes of any of the second sections of the first length.

4,993,219
FALSE TWIST PROCESSING APPARATUS
Yoshiyasu Maeda, Yamatokooriyama; Toshiyuki Uno, Kusatsu, and Yoshikazu Tanaka, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Feb. 9, 1989, Ser. No. 309,411
Claims priority, application Japan, Feb. 13, 1988, 63-31259
Int. Cl.[5] D02G *1/02*
U.S. Cl. 57—291 13 Claims



1. In a yarn processing apparatus having a false twisting device, a heater provided with a yarn passage and an entrance to the yarn passage which is substantially linearly aligned with the false twisting device, and a yearn take-up device, the improvement comprising support structure for supporting the heater and at least one of the false twisting device and the yarn take-up device, to minimize the transmission toward the heater of vibrations produced by the operation of the false twisting device or the yarn take-up device, the support structure comprising:
first support means for supporting the false twisting device, the first support means being inherently vibratory upon operation of at least one of the false twisting device and the yarn take-up device; and
second support means for supporting the heater in substantial isolation of the vibrations of the first support means;
wherein the transmission of vibrations produced by the operation of the false twisting device or the yarn take-up device, toward the heater, is minimized; and
wherein one end of said heater is supported by the second support means and another end of said heater is supported through a damper device to a support bracket connected to the first support means.

4,993,220
AXIAL FLOW GAS TURBINE ENGINE COMBUSTOR
Jack R. Shekleton, San Diego, and Ken W. Sawyer, Escondido, both of Calif., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Jul. 24, 1989, Ser. No. 384,164
Int. Cl.[5] F02C *7/00*; F23R *3/16*
U.S. Cl. 60—39.36 20 Claims



1. A gas turbine engine, comprising
radial compressor means for compressing air entering through a compressor inlet opening;
axial turbine means in axially spaced relation to said radial compressor means;
said radial compressor means being operatively associated with said axial turbine means;
radial combustor means intermediate said radial compressor means and axial turbine means;

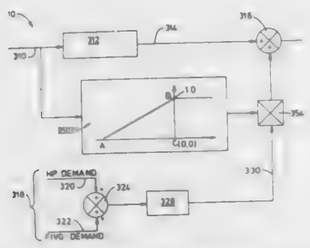
turbine nozzle means proximate said axial turbine means for directing gases of combustion thereto;
said radial combustor means defining a radial combustion space in communication with both said radial compressor means and said turbine nozzle means, said radial combustor means including means for introducing compressed air generally tangentially into said radial combustion space upstream of said turbine nozzle means and at a point radially outwardly of said turbine nozzle means and said turbine nozzle means being disposed radially inwardly of said radial combustion space to define a generally radial flow path therebetween, said radial combustor means generating said gases of combustion by combusting fuel from a source and air from said radial compressor means; and
fuel injection means operatively associated with said radial combustor means radially outwardly of said turbine nozzle means for injecting a fuel/air mixture generally tangentially into said radial combustion space;
whereby a tangential swirl flow is established within said radial combustion space.

4,993,221
GAS TURBINE ENGINE CONTROL SYSTEM
Michael S. Idelchik, Swampscott, Mass., assignor to General Electric Company, Cincinnati, Ohio
Filed Dec. 21, 1988, Ser. No. 287,231
Int. Cl.[5] F02C *9/28*
U.S. Cl. 60—39.03 12 Claims

9. A method for controlling a gas turbine engine comprising the steps of:
receiving an error signal and processing the error signal to form a primary control signal;
receiving at least one anticipatory demand signal and processing the signal to form an anticipatory fuel control signal;

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adjusting the value of the anticipatory fuel control signal based on the value of the error signal; and



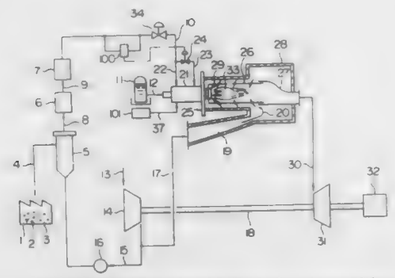
combining the primary fuel control signal and the adjusted anticipatory fuel control signal to form a fuel command signal.

4,993,222

METHOD FOR BURNING GASEOUS FUEL, WHEREIN FUEL COMPOSITION VARIES

Kazumi Iwai, Mito; Akira Arai, Tsukuba; Hiromi Koizumi, and Katsuo Wada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 153,607, Feb. 8, 1988, Pat. No. 4,890,453. This application Sep. 6, 1989, Ser. No. 404,947
Claims priority, application Japan, Feb. 6, 1987, 62-24573
Int. Cl.[5] F02C *3/28*
U.S. Cl. 60—39.06 **3 Claims**



1. A method for burning gaseous fuel, the composition of the fuel varying at times, wherein the fuel is divided into a main part and a sub-part, which are then injected through main injection ports and sub-injection ports, respectively, into a combustion chamber, in which the fuel injected through the sub-injection ports is burnt by a flame produced from the fuel injected through the main injection ports, said method being characterized in that the flow ratio of the main part to the sub-part is controlled so that the proportion of the fuel to be injected through the main injection ports is increased as the composition of the gaseous fuel varies from one having a relatively lower burning rate to one having a relatively higher burning rate.

4,993,223

ANNULAR RECUPERATOR

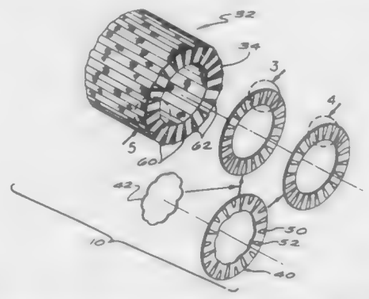
Karl F. Kretzinger, Simi Valley, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 11, 1989, Ser. No. 405,366
Int. Cl.[5] F02C *7/10*
U.S. Cl. 60—39.511 **17 Claims**

1. A recuperated turbine engine power plant comprising:

a turbine engine means including compressor, combustor, and turbine sections for ingesting and compressing ambient air, combusting said compressed air with fuel to produce hot gases, and expanding said hot gases to rotationally drive said turbine and produce useful work output; and

recuperator means for pre-heating said compressed ambient air prior to combustion in heat exchange relationship with said expanded turbine exhaust gases, said recuperator means including an annular core section receiving said combustion gases internally to said annular core said annular core defined by a stacked plurality of generally disk shaped plates, each of said plates including a first plurality of inlet passageways alternately arranged in-paired sets with a second -plurality of outlet passageways,



each of said passageways bordered at least partially by ridges extending a height of between the spacing between adjacent plates and a fractional portion thereof; said stacked plurality of plates thereby forming a stacked plurality of partially counter-flow partially cross-flow plate-fin heat exchange elements wherein said turbine exhaust combustion gases flow radially outward through a generally constant cross-section, finned passageway; and

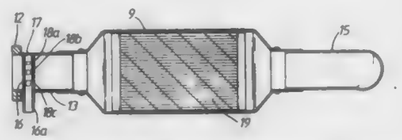
means for allowing thermal growth of said stacked plurality of heat exchange elements during repetitive cyclic operation of the power plant.

4,993,224

FLUID MIXING APPARATUS

Colin N. Phelps, Pyrford, and William J. Southgate, Farnborough, both of England, assignors to Calor Gas Limited, Slough, England

Filed Sep. 8, 1989, Ser. No. 404,580
Claims priority, application United Kingdom, Oct. 27, 1988, 8825149
Int. Cl.[5] F01N *3/18, 3/30*
U.S. Cl. 60—274 **25 Claims**



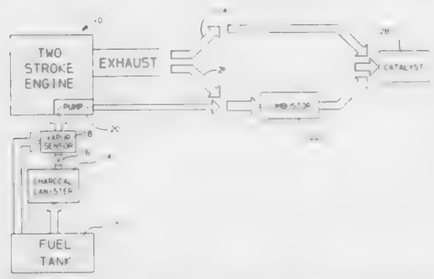
1. Apparatus for introducing a first gas into a stream of a second gas comprising a first duct for supply with the second gas and a second duct extending into a portion of said first duct transversely with respect to the axis of said first duct portion, said second duct having an open end for connection to a supply of the first gas at a pressure above that of the first gas, a closed end and opening means opening into said first duct for flow of the first gas into said first duct to mix with the second gas, said opening means extending longitudinaily of said second duct, the flow section of said opening means decreasing in the direction of said closed end thereof.

4,993,225

TWO CYCLE ENGINE VAPOR EMISSION CONTROL

Roy A. Giacomazzi; Mark G. Kosowski, both of Rochester Hills; Steven D. Stiles, Clarkston, and Jeffrey S. Stueven, Auburn Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1989, Ser. No. 369,594
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—283 **5 Claims**



1. An emission control system in combination with a source of fuel vapor and a two cycle engine of the type having exhaust splitter means that separate exhaust gas into relatively fuel rich exhaust blowdown gas discharged through a first outlet and relatively fuel lean scavenging air discharged through a second outlet, said emission control system comprising

a combustor for burning evaporative emissions from the the fuel vapor source,

exhaust treatment means for treating exhaust gases from the engine and combustor,

first means connecting the first outlet with the treatment means for conducting exhaust blowdown gas directly to the treatment means,

second means connecting the second outlet with the combustor for conducting scavenging air to the treatment means for use in burning fuel vapor, and

third means connecting the fuel vapor source with the combustor for conducting fuel vapor to the combustor for burning.

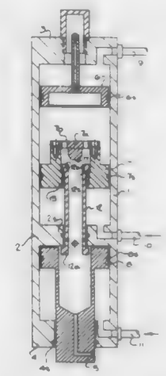
4,993,226

MULTI-PISTON AIR-OIL PRESSURE INTENSIFIER WITH AUTOMATICALLY VARIABLE WORKING STROKE LENGTH

John De Kok, 68 Glebe Crescent, Brampton, Ontario, Canada L7L 4X8

Filed Nov. 20, 1989, Ser. No. 440,357
Int. Cl.[5] F15B *3/00*; F04B *3/00*
U.S. Cl. 60—547.1 **8 Claims**

6. A stepped-fluid-medium pressure creating cylinder arrangement comprising a closed cylindrical housing provided with first and second axially spaced chambers separated by a partition, axially spaced first and second floating piston located in the first chamber, the second floating piston and the partition being provided with fluid medium by-pass ports, a hollow cylidrical member extending through the aperture in the partition and provided with limited movement with respect thereto and providing a direct fluid medium conduit between the second chamber and the port in the second floating piston whereby there is provided a fluid medium communication between the second chamber and the space between the first and second floating pistons, a two part valve means for closing the port in the second floating piston, one part of the valve means being constituted by the hollow member and the other by a closure member for the hollow member which closure member moves in unison with the second floating piston, the hollow member being sealed into the port of the second floating piston and having biased and limited movement with respect thereto, means to apply a primary fluid pressure to opposed sides of the first and second floating pistons to maintain the valve means open and force fluid medium from between the spaced first and second floating pistons through the hollow member into the second chamber to create a first pressure therein and means to remove said primary fluid pressure from the second floatig piston to initiate closure of the valve means whereby the hollow member moves with the second floating



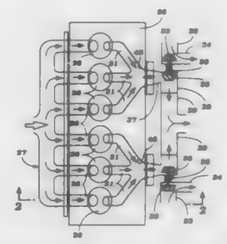
piston, upon continued application of primary fluid pressure to the first floating piston, to act as a piston to create a second and increased pressure in the second chamber of the arrangement, there being means connected with the second chamber to utilize the pressurized fluid medium to perform a work function.

4,993,227

TURBO-CHARGED ENGINE

Takahiro Nagura, and Kazutoshi Suzuki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 10, 1989, Ser. No. 295,483
Claims priority, application Japan, Jan. 11, 1988, 63-2416
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—605.1 **8 Claims**



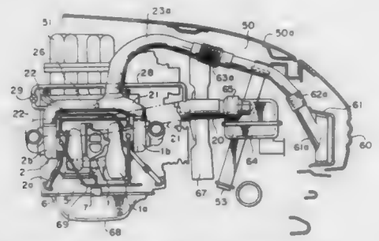
1. A turbo-charger arrangement for an internal combustion engine having a plurality of combustion chambers defined at least in part by a cylinder head, a turbo-charger having a turbine inlet stage, a plurality of exhaust ports in said cylinder head for discharging exhaust gases from said combustion chambers, and a collector section comprised of a plurality of exhaust passages each extending substantially in a common plane from one of said exhaust ports to a common exhaust gas outlet lying within said plane and formed completely in said cylinder head, said exhaust gas outlet of said collector section lying substantially at the midpoint within said plane between said exhaust ports for maintaining substantially equal lengths for said exhaust passages and a short length therefor, said turbo-charger turbine inlet stage being in direct communication with said exhaust gas outlet.

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4,993,228
INTERNAL COMBUSTION ENGINE WITH TURBO SUPERCHARGER

Seiji Tashima; Haruo Okimoto; Toshimichi Akagi, all of Hiroshima, and Naoyuki Matsumoto, Yamaguchi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 26, 1989, Ser. No. 357,290
Claims priority, application Japan, May 27, 1988, 63-130839
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—612 22 Claims

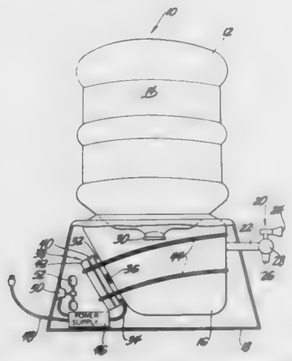


1. An internal combustion engine comprising:
a plurality of turbo supercharger means, including primary turbo supercharger means operated in substantially a full range of engine operating conditions of a vehicle and a secondary turbo supercharger means operated in a specific range of engine operating conditions, the plurality of turbo supercharger means being arranged in parallel with regard to the engine, and
a cooling fan disposed forward of said primary turbo supercharger means in a fore and aft direction of the vehicle, the primary turbo supercharger means being disposed between the secondary turbo supercharger means and the cooling fan in said fore and aft direction of the vehicle so that the secondary turbo supercharger means is shielded, by the primary turbo supercharger means, from cooling air blown rearward by said cooling fan and is subjected to air which has been warmed by said primary turbo supercharger means.

4,993,229
BOTTLED WATER COOLING UNIT

Wayne A. Baus, Elyria, and Frederick W. Haushalter, Kenton, both of Ohio, assignors to Aqua-Form Inc., Elyria, Ohio

Filed May 31, 1990, Ser. No. 531,102
Int. Cl.[5] F25B *21/02*
U.S. Cl. 62—3.64 18 Claims

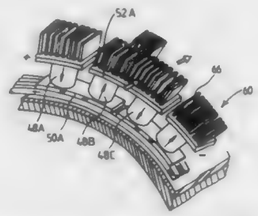


1. A method of manufacturing a thermoelectric cooling unit for bottled water dispensing systems, comprising the steps of:
providing a bottled water dispensing system including,
a hollow housing having a top portion and defining a first aperture in the top portion;
a water bottle containing water and having an opening insertable within the first aperture of the housing,
a water receptacle positioned within the hollow housing and defining a second aperture corresponding to the first aperture, and
a water release means attached to the water receptacle, whereby the opening of the water bottle is insertable in the first aperture of the housing such that the opening of the bottle extends through the second aperture of the water receptacle so that the water flows from the bottle, through the receptacle, and is released by the water release means;
installing a heat sink including a base plate, the base plate having a first side and a second side, and the heat sink further including a plurality of fins bonded to and extending outwardly from the first side of the base plate, the heat sink being installed in the housing;
applying a bonding process for bonding at least one thermoelectric chip to the second side of the base plate wherein the at least one thermoelectric chip has a cold side which is in direct contact with the water receptacle to lower the temperature of the water contained within and flowing through the water receptacle, and further has a hot side which is in direct contact with the heat sink, wherein the base plate is located between the at least one thermoelectric chip and the plurality of fins, the at least one thermoelectric chip being connectable to an electrical energy source;
mounting a power supply within the housing, the power supply being capable of providing a current through the at least one thermoelectric chip; and
mounting a fan within the housing for circulating air between the plurality of fins of the heat sink whereby (A) the heat sink collects heat from the hot side of the at least one thermoelectric chip thereby allowing current to continue flowing through the at least one thermoelectric chip and maintaining the cold side of the at least one thermoelectric chip in a cold state sufficient to continue cooling the water receptacle, and (B) the fan pulls the collected heat away from the heat sink to cool the heat sink thereby allowing the heat sink to continue collecting heat from the hot side of the at least one thermoelectric chip.

4,993,230
COOLING APPARATUS UTILIZING THE JOULE-THOMSON EFFECT

Uwe Hingst, Rebenstrasse 18, 7991 Oberteuringen, Fed. Rep. of Germany

Filed Dec. 8, 1989, Ser. No. 447,648
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841635
Int. Cl.[5] F25B *21/02*
U.S. Cl. 67—512 6 Claims

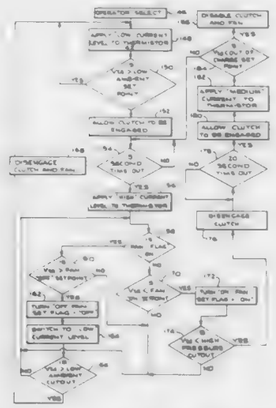


1. A cooling apparatus utilizing the Joule-Thomson effect, comprising:
a lead conduit having an inlet end and an outlet end;
said inlet end containing connecting means for connection to a source of pressurized gas;
a pressure relief nozzle provided at said outlet end of said lead conduit and causing the pressurized gas which flows from said inlet end through said lead conduit, to be cooled upon depressurization at the pressure relief nozzle;
a return flow path for the cooled and depressurized gas;
a countercurrent heat exchanger providing heat exchange between the pressurized gas which is infed through said lead conduit, and the cooled and depressurized gas which flows out along said return flow path;
a predetermined number of Peltier elements;
each one of said Peltier elements having a warm side and a cold side;
said cold side of said Peltier elements being connected with the inlet end of said lead conduit for cooling said inlet end of said lead conduit;
heat exchanger means connected with the warm side of said Peltier elements; and
said heat exchanger means being arranged in a flow of depressurized gas effluxing from said return flow path.

4,993,231
THERMOSTATIC EXPANSION VALVE WITH ELECTRONIC CONTROLLER

Robert J. Torrence, Addison, and Marvin F. Gaudette, Rockton, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 2, 1990, Ser. No. 487,312
Int. Cl.[5] F25B *39/04, 49/02*
U.S. Cl. 62—115 7 Claims

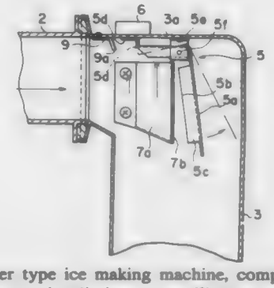


4. A method of controlling a refrigeration system for the type having compressor circulating refrigerant through a condenser then through an expansion means and then through an evaporator and then returning to the compressor comprising the steps of:
(a) providing a thermistor in the refrigerant flow between the condenser and the expansion means;
(b) flowing a first level of electrical current through said thermistor and heating said thermistor sufficiently to boil refrigerant impinging thereon and measuring the voltage across said thermistor;
(c) comparing said measured voltage with a table of known properties of said thermistor for determining the saturation temperature of the flow;
(d) providing a blower for directing a flow of air over said condenser and energizing said blower when saturation temperature exceeds a preselected upper limit and disabling said blower when said saturation temperature reaches a preselected lower limit;
(e) flowing a second substantially lower level of current through said thermistor insufficient to boil refrigerant impinging thereon and measuring the voltage across said thermistor; and
(f) comparing voltage measured with known properties of said thermistor and determining the refrigerant flow temperature disenabling the compressor when said temperature is below a preselected threshhold.

4,993,232
AUGER TYPE ICE MAKING MACHINE

Susumu Tatematsu; Junichi Hida; Hideyuki Ikari, and Naoya Uchida, all of Toyoake, Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

Filed May 8, 1990, Ser. No. 520,468
Claims priority, application Japan, May 12, 1989, 1-53961[U]; May 12, 1989, 1-53963[U]
Int. Cl.[5] F25C *5/18*
U.S. Cl. 62—137 14 Claims

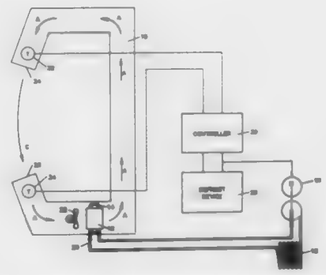


1. An auger type ice making machine, comprising an ice making section, an ice discharge port (2) connected to said ice making section for receiving manufactured ice, an ice storage section for storing said ice, an ice guide barrel (3) for interconnecting said ice discharge port (2) and said ice storage section, and an ice storage level detecting apparatus (5) including an ice storage level sensing plate (5*a*) disposed swingably within said ice guide barrel (3) at a position opposite to said ice discharge port (2), characterized in that first guide means (7*a*) for guiding the ice discharged from said ice discharge port (2) toward a center portion of said ice storage level sensing plate (5*a*) is mounted on both side walls of the said ice guide barrel (3) at a position closely adjacent to said ice storage level sensing plate (5*a*).

4,993,233
DEMAND DEFROST CONTROLLER FOR REFRIGERATED DISPLAY CASES

David N. Borton, Troy, N.Y., and David H. Walker, Winchester, Mass., assignors to Power Kinetics, Inc., Troy, N.Y.

Filed Jul. 26, 1989, Ser. No. 385,103
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—155 20 Claims



1. Demand defrost control apparatus for automatically controlling defrost of a refrigerated display case, comprising:
first temperature sensing means located near an outlet of the

discharge air curtain of the display case for measuring discharge air temperature;

second temperature sensing means located near an inlet of the air return of the display case for measuring return air temperature; and

control means, connected to said first and second temperature sensing means, for ascertaining a temperature difference between the measured return air temperature at the inlet and the measured discharge air temperature at the outlet and for determining whether said temperature difference exceeds a temperature difference setting for a predetermined sustained period of time.

4,993,234

SOLAR COLLECTOR ABSORPTION COOLING SYSTEM

Peter Korsgaard, Copenhagen, Denmark, assignor to Henry Soby A/S, Hornslet, Denmark

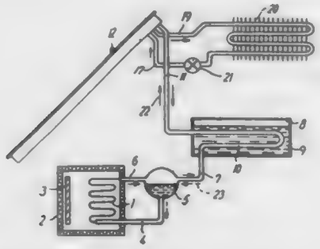
PCT No. PCT/DK88/00063, § 371 Date Jan. 2, 1990, § 102(e) Date Jan. 2, 1990, PCT Pub. No. WO88/08109, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 6, 1988, Ser. No. 457,709

Claims priority, application Denmark, Apr. 6, 1987, 1738/87

Int. Cl.[5] F25B *27/00*

U.S. Cl. 62—235.1 4 Claims



1. A solar collector absorption cooling system with a primary cooling circuit having an evaporator (1) which is connected with absorber ducts (26) in an absorber formed as a solar collector (12) and positioned in a solar collector frame (12) beneath and parallel to a glass layer (15) with said absorber having a side facing incident solar radiation a thermal insulating layer (36) being provided on an opposite side of the absorber, said absorber ducts (26) including a coolant absorbing compound for the suction of coolant at night hours, and a secondary self-circulating cooling circuit with evaporator ducts (29) connected to a condenser (20; 34) and located in heat transferring contact with the absorber ducts (26) of the primary circuit, said secondary circuit being selectively operable to provide an enhanced cooling of the absorber ducts (26) during the absorption process, characterized in that the absorber of the primary circuit is formed from at least one sheet welded absorber panel (24, 25) by joining two plate members (24*a*, 24*b*) pressed into a wave-shaped profile in adjacent valleys, the evaporator ducts (29) of the secondary circuit being made from highly heat-conducting material and being positioned in the valleys of the absorber panel (24, 25) facing the insulating layer (36).

4,993,235

WINDOW, FACADE AND WALL SYSTEM

Erich Frantl, Vienna, Austria, assignor to Coproject Handelsvertretung und techn. Buro fur Maschinenbau, Vienna, Austria

Filed Jun. 1, 1989, Ser. No. 359,798

Claims priority, application Austria, Jun. 6, 1988, 1467/88

Int. Cl.[5] F25B *27/00*

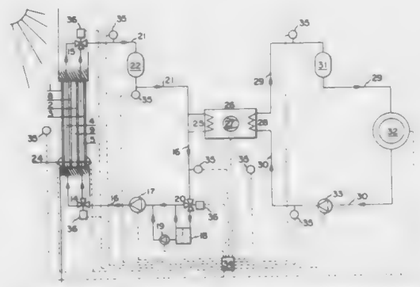
U.S. Cl. 62—235.1 10 Claims

1. A window, facade or wall system comprising:

a construction having at least three panes formed of light-permeable and heat-permeable material, the panes being separated from each other to form a number, n, of intermediary spaces therebetween;

conduits for providing a fluid flow circuit to conduct a heat-transfer medium through at least one of the intermediary spaces;

switching means for regulating the flow of heat-transfer medium through no more than n−1 of the intermediary spaces to prevent the intermediary space nearest a first side of the construction from conducting heat-transfer



medium when such first side is exposed to air having a relatively higher ambient temperature than the air which exposes the opposite side of the construction and to conduct heat-transfer medium through the intermediary space nearest the opposite side; and

a heat pump provided in the fluid flow circuit for circulating the heat-transfer medium, the heat pump cooling heat-transfer medium flowing out of the intermediary space nearest the opposite side to a temperature below the ambient temperature at the first side of the construction.

4,993,236

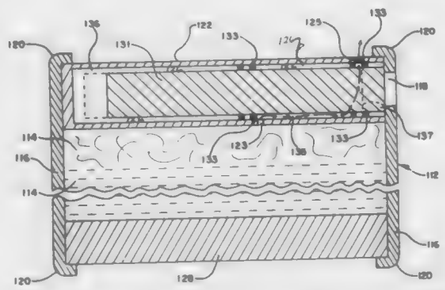
SENSITIVE PRESSURE ACTUATED AUTOMATIC SELF-COOLING DEVICE FOR BEVERAGE CONTAINERS

John J. Wilson, 723 Camino, Ste. 181, San Bruno, Calif. 94066-4315

Continuation-in-part of Ser. No. 286,525, Dec. 19, 1988, which is a division of Ser. No. 118,413, Oct. 6, 1987, Pat. No. 4,791,789. This application Apr. 6, 1990, Ser. No. 506,445

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—293 11 Claims



1. A self-cooling device for insertion in a beverage container or the like, comprising

a refrigerant vessel means for holding a pressurized evaporative refrigerant comprising upright sidewalls terminating in upper and lower rims, a first plug hermetically sealing a lower end of said body, a second plug hermetically sealing upper end of said body, a vent hole being formed in said sidewall near said upper end adjacent to said upper plug,

an off-set metering orifice comprising an inner segment and an outer segment for regulating the rate of escape of said refrigerant from said vessel formed axially in said upper plug,

an automatic pressure actuated means for releasing said refrigerant comprising a plug cylinder formed radially at least partially through said second upper end plug and intersecting said inner and outer metering orifice segments, a pressure actuated piston positioned in and movable in said cylinder carrying two rings, a circular channel defined between said piston and said cylinder and between said rings whereby when said container is slightly pressurized, said pressure is transmitted to said piston via said vent hole, positioning said piston carrying said rings at a closed position in said cylinder where said channel is beyond said outer orifice segment, but when said container is depressurized upon opening, compressed air in said cylinder ejects said piston to an open position where said channel adjoins said outer orifice segment allowing said refrigerant to expand into said container and self-cool said device, and cooling said beverage.

4,993,237

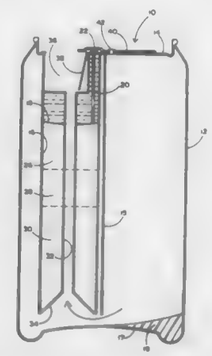
SELF-COOLING CONTAINERS

James R. Bond, Vancouver, Canada, and Scott V. Murray, Huntington Beach, Calif., assignors to Heritage Ventures U.S., Ltd., Las Vegas, Nev.

Filed Sep. 21, 1989, Ser. No. 410,690

Int. Cl.[5] F25D *3/10*

U.S. Cl. 62—294 23 Claims



11. An endothermic-reaction-containing device for use in self-cooling beverage containers of the type which can be selectively activated for cooling a beverage contained therein; the device comprising:

inner and outer tubes having substantially parallel axes, the outer tube completely encircling the inner tube to form an enclosed chamber therebetween for holding a mixture of endothermically reactive materials, said inner tube providing a flow channel for said beverage to be cooled upon contact with said inner tube.

4,993,238

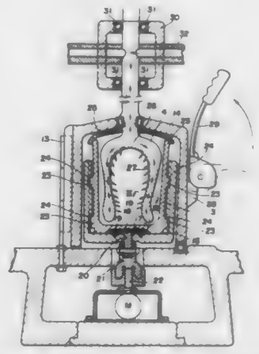
MANUFACTURING METHOD FOR ICE-CREAM PRODUCTS AND ITS APPARATUS FOR THE SAME

Jitsuo Inagaki, 71, Aza Kamiyashiki, Oaza Itsusiki, Itsusikicho Hazugun, Aichi, Japan

Division of Ser. No. 317,755, Mar. 2, 1989, abandoned. This application Nov. 6, 1989, Ser. No. 432,454

Int. Cl.[5] A23G *9/10*

U.S. Cl. 62—306 7 Claims



1. An apparatus for manufacturing ice-cream products comprising a rotatable container to produce ice-cream products having a driving force beneath thereof, said container having a groove formed in its bottom and a connector coupled to a motor drive shaft for the driving force fitted in said groove, a cooling whirl disposed in said container, the interior of the cooling whirl formed in a hollow shape and provided with a plurality of discharge orifices, and means for introducing a liquid nitrogen or a liquid nitrogen based gas into said container through said orifices in the cooling whirl.

4,993,239

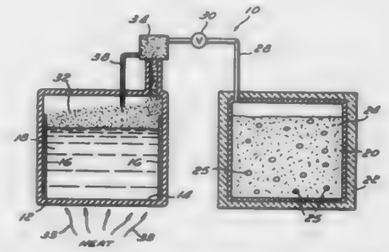
COOLING DEVICE WITH IMPROVED WASTE-HEAT HANDLING CAPABILITY

Gary V. Steidl, Olivenhain; Cullen M. Sabin, San Diego, and Dennis A. Thomas, Malibu, all of Calif., assignors to International Thermal Packaging, Inc., Carlsbad, Calif.

Division of Ser. No. 420,337, Oct. 12, 1989, Pat. No. 4,949,549, which is a continuation-in-part of Ser. No. 208,371, Jun. 22, 1988, Pat. No. 4,901,535, which is a continuation-in-part of Ser. No. 70,973, Jul. 7, 1987, Pat. No. 4,759,191. This application May 18, 1990, Ser. No. 526,240

Int. Cl.[5] F25B *17/08*

U.S. Cl. 62—480 9 Claims



1. A self-contained cooling apparatus capable of storing evolved waste heat, comprising:

an evaporation chamber containing a refrigerant liquid;

a sorbent chamber containing a sorbent for said liquid;

a conduit connecting said sorbent chamber and said evaporation chamber;

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a valve for preventing flow of vaporized refrigerant through said conduit until said valve is opened; and

a phase change heat sink material thermally coupled to said sorbent chamber for removing heat from said sorbent to change the phase of said heat sink material and to store said heat by preventing reversal of said phase change.

4,993,240

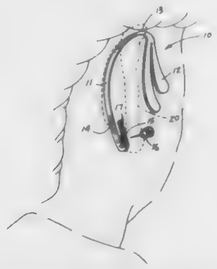
FACIAL ADORNMENT

C. J. Pounder, 225 Northtown, Spokane, Wash. 99207

Filed Sep. 28, 1989, Ser. No. 414,196

Int. Cl.[5] A44C *7/00*

U.S. Cl. 63—12 8 Claims



1. A facial adornment adapted to be worn on the ear in conjunction with a conventional earring, comprising:

a C-shaped support adapted to rest over the back of an ear in a position adjacent to the head of a wearer, the support having first and second ends adapted to be located at the top front corner of the ear and immediately behind the earlobe, respectively, the support being substantially planar;

a decorative member at the first end of the support, the decorative member being adapted to extend downwardly along the face of a wearer at a location forward of the ear;

an elongated extension integrally bent back from the second end of the support to form a U-shaped end section across a first plane substantially perpendicular to the plane of the support;

the extension lying within a second plane substantially parallel to and spaced from the plane of the support, the extension being adapted to be positioned against the back of an earlobe of a wearer;

an opening formed through the extension, the opening being adapted to adjustably receive the mounting pin of a conventional earring along the length of the extension;

the U-shaped end section being adapted to hold the support against the head of a wearer when the mounting pin of a conventional earring is clamped within the opening and through the earlobe of a wearer with the extension engaged behind and against the earlobe.

4,993,241

METHOD OF KNITTING

Frederick H. Carrotte, 9 Barry Drive, Kirby Muxloe, Leicestershire, United Kingdom

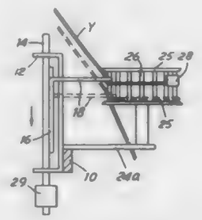
Continuation of Ser. No. 384,217, Jun. 2, 1982, abandoned, which is a continuation of Ser. No. 81,540, Oct. 3, 1979, abandoned. This application May 14, 1984, Ser. No. 609,623

Claims priority, application United Kingdom, Oct. 3, 1978, 7839183; Mar. 28, 1979, 7910889

Int. Cl.[5] D04B *15/48, 15/52*

U.S. Cl. 66—132 T 10 Claims

1. A method of knitting an item of fabric on a knitting machine of the type in which changes in yarn feed rate occur during the knitting process, comprising feeding said yarn in a path extending around a portion of the periphery of a feed wheel; driving said wheel by frictional engagement of a flexible endless belt with said portion of the wheel perhiphery, the width of said belt being less than the axial width of the said wheel periphery; and wherein said yarn is selectively guidable between a first axial position on said wheel wherein said yarn is axially spaced from said belt, and a second axial position wherein said yarn is nipped between said belt and said wheel



and thereby positively fed; and when said yarn is positively fed, guiding said yarn from said second position into said first position prior to a change in the yarn feed rate, and, when said yarn is not positively fed, retaining said yarn in said first position whereby said change in yarn feed rate occurs when said yarn is out of positive feed.

4,993,242

CLEANING AID FOR DYEING APPARATUS

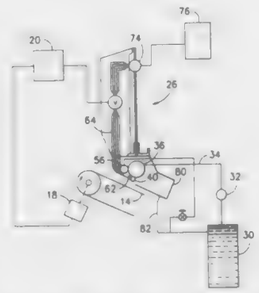
Kyle W. Poor, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 423,633, Oct. 18, 1989, abandoned.

This application Jun. 27, 1990, Ser. No. 544,813

Int. Cl.[5] D06B *3/04*

U.S. Cl. 68—13 R 7 Claims



1. Apparatus for applying liquids to a moving substrate comprising means for conveying the substrate in a predetermined path of travel, liquid applicator means having a row of outlets extending across and positioned above the substrate path for discharging a corresponding row of generally parallel, undeflected streams of liquid on a trajectory directed toward the substrate path, a source of electrically encoded pattern data, gas passage means positioned adjacent to said row of outlets and aligned with the discharge axes of the outlets for selectively deflecting, in accordance with pattern data from such data source, the trajectory of said streams of liquid emerging from said outlets with streams of gas from said gas passage means which intersect said streams of liquid, a liquid collection chamber positioned adjacent to said outlets and opposite from said gas passage means, said liquid collection chamber having an opening which extends along said row of outlets and which is positioned to receive said gas streams and liquid streams deflected by said gas streams and thereby prevent said streams from contacting said substrate, and a liquid containment barrier, said barrier being comprised of a movable shield which may be selectively interposed between said row of outlets and said substrate to prevent said parallel undeflected streams of liquid discharged from said outlets from contacting said substrate, or withdrawn to a position which allows said parallel undeflected streams to contact said substrate.

4,993,243

FLESHING TOOL

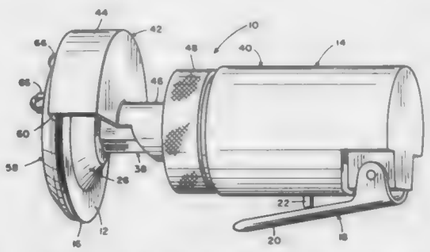
Dale E. Guinn, 410 West Kiowa, Cleveland, Okla. 75020

Continuation of Ser. No. 209,183, Jun. 20, 1988, abandoned.

This application Sep. 1, 1989, Ser. No. 403,901

Int. Cl.[5] C14B *19/00*

U.S. Cl. 69—37 10 Claims



1. A portable, hand-held fleshing tool mountable upon a drive shaft of a source of power, comprising:

a housing encompassing the source of power,

a thin, circular fleshing blade having a plurality of fine cutting members around the periphery thereof mounted on the drive shaft in a plane perpendicular to the axis of the drive shaft,

a guard assembly removably mountable on the housing and adjustable to restrict a depth of cut of the fleshing blade, the guard assembly comprising:

a drive shaft guard member including means for connecting the guard assembly to the housing,

a rear guard member having a cylindrical portion to cover a substantial portion of the fleshing blade, and

a front guard member of slightly less diameter than the fleshing blade and vertically adjustable for adjusting a depth of cut of the fleshing blade.

4,993,244

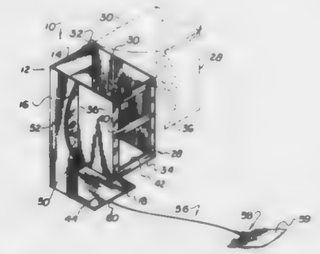
LOCKING APPARATUS FOR A CELLULAR PHONE

Craig Osman, 6447 Miami Lakes Dr. East, #212, Miami Lakes, Fla. 33014

Filed May 9, 1990, Ser. No. 520,764

Int. Cl.[5] E05B *73/00*

U.S. Cl. 70—30 14 Claims



1. A lock assembly for a portable phone powered by a self-contained battery structure, said assembly comprising:

a. a base including a first and a second elongated wall portion disposed in substantially transverse relation to one another and oriented to overly a rear portion and one side portion respectively of the phone when attached thereto,

b. a shield member secured at one end of said base and dimensioned to extend transversely outward from both said wall portions,

c. said shield member disposed and configured to overly and cover a lower end of the phone and access to the battery therein,

d. a cover movably connected to said base and disposable into a closed position defined by overlying, covering relation of said cover to a front portion and an opposite side portion of the phone while said base is disposed in overlying relation to said rear portion and said one side portion respectively of the phone,

e. lock means mounted in part on both said base and said cover and disposed and structured for locking connection of said base and said cover in said closed position,

f. said cover comprising an outer exposed face having an apertured construction defined by at least one access opening overlying a dial portion of the phone when said cover and said base are in said closed position.

4,993,245

SECURITY TAG FOR USE ON ARTICLES OF CLOTHING AND THE LIKE

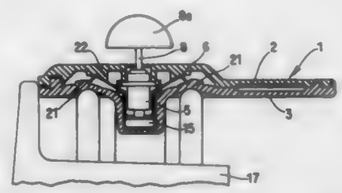
Heinz Ott, Homburg-Bruchhof, Fed. Rep. of Germany, assignor to Frank Ott, Homburg-Bruchhof, Fed. Rep. of Germany and Etsuji Yokoyama, Hiroshima, Japan

Filed Apr. 20, 1989, Ser. No. 341,127

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1989, 3910064

Int. Cl.[5] F16B *21/00*; G08B *13/14*

U.S. Cl. 70—57.1 14 Claims



1. A reusable security tag for application to garments and other commodities, comprising a housing consisting of a non-metallic material and defining a chamber; a signal generator secured to said housing; a retaining member having a first portion including an elongated shank and extending into said chamber, and a second portion outwardly adjacent said housing and arranged to retain a portion of a commodity between itself and the housing, said second portion including a head at one end of said shank; means for releasably locking the first portion of said retaining member in said housing, said locking means being disengageable from said first portion of said retaining member in response to mechanical deformation of a selected component of said housing and in response to the application of magnetic force to thus permit extraction of the first portion of said retaining member from said housing with attendant separation of said portion of a commodity from the housing, said housing comprising a first section and a second section and said second section constituting said component, said locking means including a non-magnetic casing having an inlet for said shank, at least one clamping element movable into and from engagement with the shank, displacing means for moving said at least one clamping element into engagement with said shank, and magnetically and mechanically displaceable ferromagnetic means for disengaging said at least one clamping element from said shank by way of said displacing means, said displacing means including a reciprocable carrier, a pusher provided on said carrier adjacent said at least one clamping element and means for biasing said carrier in a direction to urge said pusher against said at least one clamping element and to thereby maintain said at least one clamping element in engagement with said shank, said ferromagnetic means being disposed in said housing outwardly adjacent said casing and being connected with said carrier; and resilient

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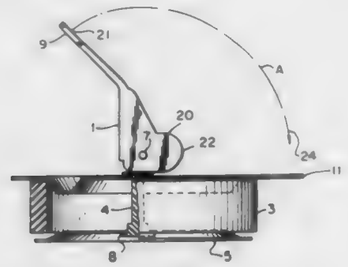
means disposed in said housing and arranged to move said ferromagnetic means in response to deformation of said second section to thereby permit disengagement of said at least one clamping element from said shank.

4,993,246

EXPANSION PLUG WITH LOCKABLE LEVER

Jan Kopper, Marco Island, Fla., assignor to Shaw Aero Development, Inc., Naples, Fla.

Filed Mar. 8, 1990, Ser. No. 490,342
Int. Cl.[5] B65D *55/14*
U.S. Cl. 70—166 4 Claims



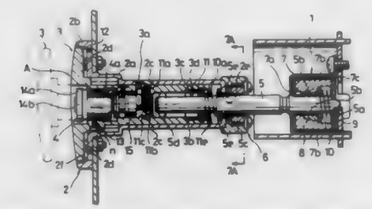
1. An expansion plug comprising:
a bottom plate;
a top plate having a flange with a first hole therein;
a rubber stopper disposed between said bottom and top plates for expanding radially when compressed between said bottom and top plates;
a stem connected to said bottom plate and extending centrally through said rubber stopper and said top plate; and
cam lever means, including a pin connecting said cam lever means to said stem in a non-adjustable manner above said top plate, for drawing said stem and said bottom plate toward said top plate during engagement, thereby expanding radially said rubber stopper, said cam lever means having a securing portion with a second hole therein;
wherein when said cam lever means is fully engaged, said securing portion is adjacent to said flange, thereby aligning said second hole in said securing portion with said first hole in said flange.

4,993,247

LOCK FOR AUTOMATIC VENDING MACHINES

Toshio Minemura, Tokyo, Japan, assignor to Sanpo Lock Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1990, Ser. No. 461,863
Claims priority, application Japan, Oct. 31, 1989, 1-235563
Int. Cl.[5] E05B *13/10*
U.S. Cl. 70—208 2 Claims



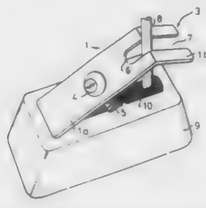
1. A lock for securing a door to a casing body of an automatic vending machine of the type including a nut or female assembly fixed to the casing body; a handle housing fixed to the door or said automatic vending machine; a bolt or male assembly mounted to said handle housing to permit advance movement and thread-engagement with said nut or female assembly; a handle spring-biased outward from said handle housing and equipped with a cylindrical latchkey to permit locking or unlocking of said handle to said handle housing in response to locking or unlocking operation of said cylindrical latchkey, wherein the improvement comprises: a slide locking mechanism including a slide plate which is responsive to rotation of said bolt or male assembly caused by rotation of said handle for sliding longitudinally into engagement with catching means on the casing body of said automatic vending machine, and said handle is equipped with coupling means responsive to the unlocking of said handle from said handle housing for permitting said handle to spring out of said handle housing and at the same time, connect to said bolt or male assembly for rotating and driving said bolt or male assembly into said nut or female assembly.

4,993,248

LOCKABLE ANTI-THEFT DEVICE FOR VEHICLES

Agneta Nordberg, Nidarosgatan 5, S-163 34 Spånga, Sweden

PCT No. PCT/SE87/00614, § 371 Date Nov. 17, 1989, § 102(e) Date Nov. 17, 1989, PCT Pub. No. WO88/09275, PCT Pub. Date Dec. 1, 1988
PCT Filed Dec. 18, 1987, Ser. No. 435,451
Claims priority, application Sweden, May 20, 1987, 8702083
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—247 3 Claims



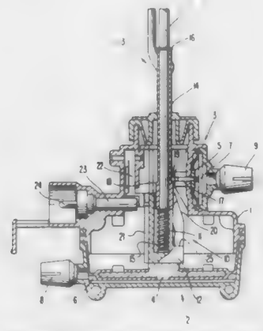
1. An anti-theft device for a motor vehicle having a transmission control lever movably mounted in a housing having a top surface, a front surface, an opposing rear surface and opposing side surfaces, the top surface having an elongated slit extending in one direction towards the front face and in the other direction towards the rear face and the lever extending from the top surface, which device comprises:
a plate shaped to fit the contour of the top surface of the housing;
a fork at one end of the plate, the tines of which define an open-ended slot for receiving the control lever;
a boss depending from the other end of the plate and extending therefrom, the boss having a width narrower than the width of the elongated slit in the top surface of the housing so that the boss may be inserted into the slit to position the plate on the top surface with the control lever being received within the slot of the fork and so that the boss may be inserted under the top surface with a portion of the boss engageable with the rear of the top surface slit to prevent any substantial upward or rearward movement of the plate after it is positioned on the top surface of the housing;
the plate being dimensioned such that when it is placed over the top surface of the housing with the boss underlying the top surface and engaging the rear of the top surface slit, the control lever is received within the fork slot with the closed end of the slot preventing any substantial rearward movement of the control lever within the top surface slit; and
a lock mounted on the plate and having depending locking bolts which are movable between an unlocked position in which the bolts do not extend beyond the width of the top surface slit to a locking position in which the bolts extend beyond the width of the slit and underlie the top surface to thereby lock the plate to the housing.

4,993,249

ADJUSTING ELEMENT FOR THE UNLOCKING, LOCKING AND BREAK-IN SECURITY OF A DOOR OR LID LOCK

Josef Schumacher, Reutlingen; Dieter Feichtiger, Aidlingen; Peter Robitschko; Klaus Claar, both of Sindelfingen; Hans Deischl, Jettingen, and Rainer Seitz, Frankfurt, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG and VDO Adolf Schindling AG, both of, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 308,467
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 3804838
Int. Cl.[5] E05B *65/38*
U.S. Cl. 70—264 19 Claims



1. An arrangement for unlocking and locking of a door or lid lock means comprising:
power-actuatable main adjusting drive means including an adjusting member movable by the main adjusting drive means, said adjusting member being coupled with a latching lever of said lock means and with at least an interior lock actuating means, power-actuatable security-adjusting drive means, actuatable independently of the main adjusting drive means, to prevent unlocking of said lock means without key or power-assist, said security-adjusting drive means including a locking member actuatable by the security-adjusting drive means to be brought into and out of a form-locking engagement with the adjusting member, thereby blocking said adjusting member and said latching lever and the interior lock actuating means coupled therewith, unlocking means, operatively coupled with a lock cylinder of the lock means, movable relative to said adjusting member and to said locking member in response to key actuation of the lock cylinder, said unlocking means being adapted to force the locking member mechanically into a position releasing the adjusting member during said relative movement initiated by key actuating of the lock cylinder, and force storage means adapted to absorb a force generated during the mentioned relative movement between the adjusting member and the unlocking means, said force storage means releasing the absorbed force to the adjusting member after release of the adjusting member, for movement of the adjusting member unlocking the lock means.

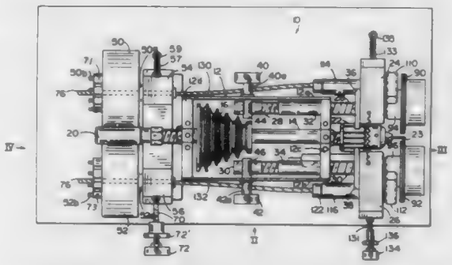
4,993,250

VARIABLE GEAR RATIO COILING MACHINE

Stephen A. Platt, Grand Haven, Mich., assignor to S. A. Platt, Inc., Grand Haven, Mich.

Filed Nov. 17, 1989, Ser. No. 437,606
Int. Cl.[5] B21F *3/04*
U.S. Cl. 72—145 24 Claims

1. A wire coiling machine comprising:
a rotary powered spindle;
a pair of driven rolls in operative relation with one end of said spindle and astraddle thereof;
a coiling mandrel at the opposite end of said spindle;
a pair of coiling rolls astraddle said coiling mandrel in operative coiling association therewith;
flexible drive shafts operably associated with said driven rolls;
a pair of drive gears connected to said flexible drive shafts;
a pair of idler gears intermeshed respectively with said pair of drive gears;



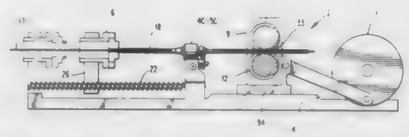
a pair of driven gears coaxial with and in driving association with said coiling rolls, said driven gears being intermeshed respectively with said idler gears, whereby driving of said driven rolls by said spindle will drive said flexible drive shafts, said drive gears, said idler gears and said driven gears, to drive said coiling rolls;
said drive gears having a removable connection for removal and substitution of drive gears of another diameter; and
said idler gears being shiftable relative to said drive gears to accommodate different diameter drive gears while still meshing with said driven gears, so that the power to said coiling rolls can be varied.

4,993,251

ROLLSTAND HAVING EASILY REPLACEABLE ROLL DIES

David J. Szendre, Kennewick; Jon L. Osborne, Richland; Charles S. Rutkowski; Anthony A. Duerring, both of Kennewick, and Bruce O. Foster, Benton City, all of Wash., assignors to Sandvik Special Metals Corporation, Kennewick, Wash.

Filed Jul. 7, 1989, Ser. No. 376,576
Int. Cl.[5] B21B *21/00, 31/00*
U.S. Cl. 72—214 10 Claims



1. A rollstand adapted for reciprocation in a front-to-rear direction for reducing the diameter of elongated cylindrical workpieces in a rocker mill, comprising:
upper and lower vertically superimposed bearing block means,
adjusting means for adjusting a vertical spacing between said upper and lower bearing block means,
first and second bearings mounted in said upper bearing block means, and third and fourth bearings mounted in said lower bearing block means,
an upper arbor rotatably mounted in said first and second bearings for rotation about an upper axis extending from a first side of said rollstand to a second side thereof perpendicular to said front-to-rear direction, said upper arbor including first and second outer peripheral portions on which said first and second bearings, respectively, are

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mounted, said first outer peripheral portion tapering toward said first side of said rollstand, and said second outer peripheral portion tapering toward said second side of said rollstand,

a lower arbor rotatably mounted in said third and fourth bearings for rotation about a lower axis extending parallel to said upper axis, said lower arbor including third and fourth outer peripheral portions on which said third and fourth bearings, respectively, are mounted, said third outer peripheral portion tapering toward said first side of said rollstand, and said fourth outer peripheral portion tapering toward said second side thereof,

upper and lower roll dies mounted on fifth and sixth outer peripheral portions of said upper and lower arbors, respectively, for rotation therewith, said fourth and fifth peripheral portions tapering toward said first side of said rollstand, each of said roll dies including a groove on its outer periphery, said roll dies being arranged such that said grooves are vertically superimposed to form a nip zone therebetween for compressing a workpiece,

an upper tapered sleeve tightly mounted radially between an inner peripheral portion of said upper roll die and said fifth outer peripheral portion,

a lower tapered sleeve tightly mounted radially between an inner peripheral portion of said lower roll die and said sixth outer peripheral portion,

upper and lower driven gears connected coaxially to said upper and lower arbors, respectively, at said second side of said rollstand and being in meshing engagement, and

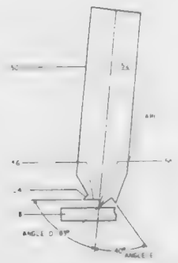
a drive gear disposed at said second side of said rollstand and connected coaxially with one of said driven gears, said drive gear adapted to meshingly engage a rack whereby reciprocation of said rollstand produces rotation of said drive gear which, in turn, drives the other driven gear for rotating said arbors and said roll dies.

4,993,252

EXTRUSION PULLER JAWS

Robert M. Scanlon, Sand Lake, and Gregory A. Berrevoets, Greenville, both of Mich., assignors to Granco-Clark, Inc., Belding, Mich.

Filed Mar. 30, 1990, Ser. No. 502,347
Int. Cl.[5] B21C *35/02*
U.S. Cl. 72—257 **16 Claims**



1. In an extrusion puller having an upper jaw, lower jaw, and mounting means for mounting the upper and lower jaws for reciprocable movement with respect to each other, the upper jaw comprising a plurality of fingers with radially extending gripping teeth circumferentially spaced about a bottom portion thereof for penetrating a workpiece, the lower jaw having a serrated upper face for gripping, and wherein the mounting means for the upper and lower jaws are adapted for reciprocal movement with respect to each other to alternatively grip and release the extruded workpieces, the improvement comprises:

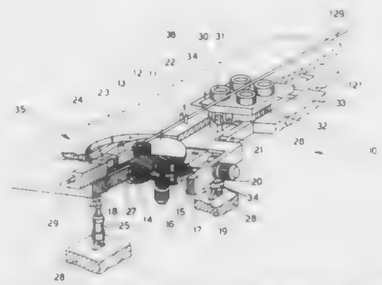
the teeth on the upper jaw fingers having an attack angle and a spacing angle between adjacent teeth selected so that substantially full penetration of at least one of the gripping teeth into the workpiece can be achieved without interference from an adjacent tooth during gripping of a workpiece between the upper and lower jaws.

4,993,253

DRAWING UNIT DOWNSTREAM OF A BENDING ASSEMBLY AND METHOD TO BEND THE TRAILING END OF BARS

Marcello Del Fabro, Udine, and Giorgio Del Fabro, Cassacco-Fraz.Montegnacco, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy

Filed Jan. 10, 1990, Ser. No. 463,313
Claims priority, application Italy, Jan. 18, 1989, 15904 A/89
Int. Cl.[5] B21D *7/022*
U.S. Cl. 72—307 **12 Claims**



1. A method for bending bars in a bending-shaping machine having a working platform that can be positioned as desired in relation to the horizontal and having a bending assembly located downstream of a feeding-straightening assembly for bars unwound from a reel, said method comprising:

unwinding a bar from a reel;

straightening said bar and feeding said bar to said bending assembly with said feeding-straightening assembly;

bending a leading end of said bar with said bending assembly;

feeding said bar having a bend in said leading end at least partially with said feeding-straightening assembly so that said bar having a bend is fed past an auxiliary drawing unit located downstream of said bending assembly and positioned in a retracted nonworking position below said working platform;

shearing said bar with shears to create a residual bar having a trailing end; and then

moving said auxiliary drawing unit from said retracted position below said working platform to a working position and

moving said residual bar axially by said auxiliary drawing unit while in said working position; and

bending said trailing end with said bending assembly.

4,993,254

METHOD AND APPARATUS FOR BENDING MATERIAL

John W. Mullett, Jr., Rockledge, Fla., assignor to JL Manufacturing, Rockledge, Fla.

Filed Jun. 28, 1989, Ser. No. 372,319
Int. Cl.[5] B21D *5/04*
U.S. Cl. 72—319 **6 Claims**

1. An apparatus for use with a vise for bending material such as metal and plastic consisting essentially of a base of a size which is adapted to be clamped between the jaws of a vise, a movable member movable between an upright position located above the base and the jaws of a vise when the base is clamped between the jaws of the vise and a second position where the movable member is turned at an angle of at least 90° with respect to the upright position and the base for bending a material over one of the jaws of the vise, hinge means connecting said movable member and said base so that said movable member can be pivoted about said hinge means with respect to said base between said upright position and said second position when said base is clamped between the jaws of a vise for bending a material clamped between the jaws of the vise with said base, a stop for engaging a jaw of the vise and means mounting said stop on said movable member such that the position of said stop on said movable member can be adjusted to set the apparatus for the thickness of the material to be bent



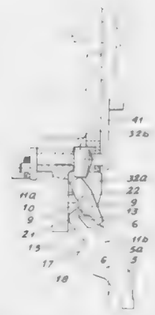
wherein said hinge means is located toward a working side of said base and said movable member against which said material to be bent is located when said base and said material are clamped in a vise, said stop being mounted by said mounting means on a side of said movable member opposite to said working side thereof, and wherein a handle is connected to said movable member for moving the movable member to bend a material.

4,993,255

DEVICE FOR FIXING AN ELONGATED PART SUCH AS PUNCH, DIE OR SIMILAR TOOL ON THE PLATEN OF A BENDING-PRESS

Jean P. H. Treillet, Boulogne-Billancourt, France, assignor to Amada, Saint-Denis, France

Filed Feb. 22, 1990, Ser. No. 482,975
Claims priority, application France, Mar. 2, 1989, 89 02694
Int. Cl.[5] B21D *37/14*
U.S. Cl. 72—462 **9 Claims**



1. A device for rigidly fixing a tool of elongated shape such as a punch or die (**5**) on the platen of a bending-press or on an intermediate support (**2**), said platen having a vertical surface (**19**) and a horizontal surface (**20**) adapted to provide bearing surfaces for two matching reference surfaces (**17**, **18**) of a heel (**15**) of the tool (**5**), said device comprising:

a clamping member (**6**), disposed facing said vertical surface (**19**) of said support (**2**) and adapted to grip between itself and said vertical surface (**19**) said heel (**15**) of said tool (**5**),

said clamping member (**6**) being pivotally mounted about a horizontal axle (**7**) supported in bearings (**8***a*, **8***b*) carried by said support (**2**), for rotation about a horizontal axis of rotation,

said clamping member (**6**) having a raised portion (**9**) in the form of a shoulder located above said pivotal axle (**7**),

said heel (**15**) having a recess (**13**) having a shape matching and receiving said shoulder (**9**) and terminating endwise in a nose (**21**) adapted to bear against a corresponding bearing surface (**22**) on said clamping member (**6**) above the enlargement (**9**),

said heel (**15**) having a convex cylindrical surface (**14**) whose center coincides with said axis of rotation of the clamping member (**6**) when the tool is in place with said enlargement nested in said heel recess,

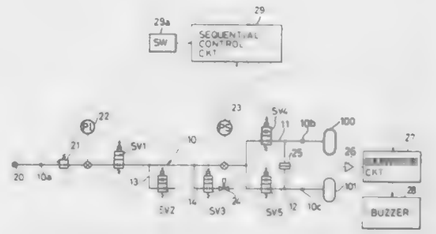
and a movable locking member adapted to contact an upper portion of said clamping member on the same side of said clamping member as said vertical surface (**19**), thereby to hold said clamping member (**6**) against said heel (**15**) of the tool (**5**).

4,993,256

LEAKAGE TEST METHOD AND APPARATUS

Akira Fukuda, Tokyo, Japan, assignor to Kabushiki Kaisha Fukuda, Tokyo, Japan

Filed Apr. 19, 1989, Ser. No. 340,469
Claims priority, application Japan, Apr. 20, 1988, 63-95702; Apr. 28, 1988, 63-104307
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—49.2 **7 Claims**



1. A leakage test apparatus for detecting leakage in a hollow object, comprising:

(a) means for generating an initial pressure;

(b) passage means for connecting said initial pressure-generating means to the object;

(c) communication-controlling means provided on said passage means and capable of being switched between a first condition and a second condition, wherein in said first condition said communication-controlling means interrupts communication between said initial pressure-generating means and the object, and in said second condition, said communication-controlling means communicates said initial pressure-generating means with the object so as to supply the initial pressure into the object from said initial pressure-generating means via said passage means;

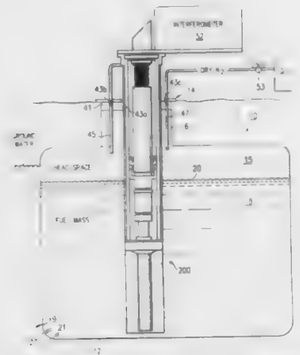
(d) pressure relieving means for relieving part of the initial pressure within the object when said communication-controlling means is in its first condition, thereby bringing the pressure within the object to a test pressure; and

(e) pressure detection means for detecting a variation in the test pressure within the object when said communication-controlling means is in its first condition, so as to determine whether there is any leakage in the object;

in which said initial pressure-generating means comprises a pressure source connected to said passage means and a solenoid on-off valve provided on said passage means, wherein a pressure switch is connected to said passage means between said solenoid valve and the object, said pressure switch detecting creation of the initial pressure within the object when the object is in communication with the pressure source to generate a detection signal,

and said solenoid valve closing in response to said detection signal.

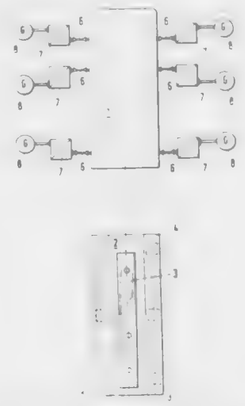
4,993,257
METHOD FOR STORAGE TANK LEAK DETECTION HAVING GROUND WATER COMPENSATION
Peter J. Legergren, Dallas, Tex., assignor to Pandel Instruments, Inc., Grand Prairie, Tex.
Continuation-in-part of Ser. No. 312,864, Feb. 21, 1989, Pat. No. 4,914,943. This application Feb. 16, 1990, Ser. No. 480,801
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—49.2 5 Claims



1. A method for leak detection of an underground storage tank surrounded by a water table, the tank for supporting a fluid product and including a head space between the fluid product and a top portion thereof, comprising the steps of:
(a) sealing a test probe in the tank, the test probe having an elongated substantially hollow core with first and second ends, a housing for receiving the second end of the hollow tube and being vented to the fluid product, a low temperature coefficient medium supported in the substantially hollow core of the elongated tube, and a liquid seal supported in the housing between the medium and the fluid product;
(b) maintaining the hollow core of the test probe and the head space in pressure equilibrium; and
(c) introducing a gas into the head space to overpressurize the head space by an amount sufficient to reestablish a leak at any break in the storage tank despite presence of the water table surrounding the storage tank.

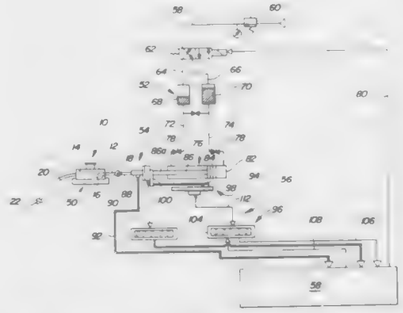
4,993,258
TEST BENCH FOR VEHICLES
Constantin Pana, Mannheim, and Hans-Walter Weyland, Kallstadt, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany
Filed Apr. 20, 1990, Ser. No. 511,623
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1989, 3913345
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.1 5 Claims

1. Test bench for vehicles, comprising a testing zone for testing vehicles, and a preparation zone separate from said testing zone, said preparation zone including a lifting platform, an air cushion transport system, and an air drive system for



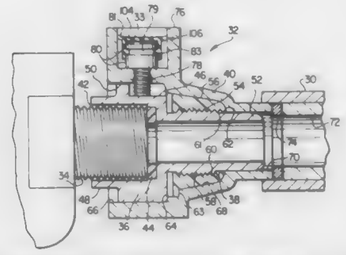
driving said air cushion transport system into said testing zone with the vehicle prepared for testing.

4,993,259
METHOD AND APPARATUS FOR TESTING PREFILLED HYDRAULIC SYSTEMS
Robert H. LaFountain, Rochester, Mich. 48063, assignor to Automotive Products plc, Warwickshire, England
Filed Apr. 3, 1989, Ser. No. 331,755
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—168 16 Claims



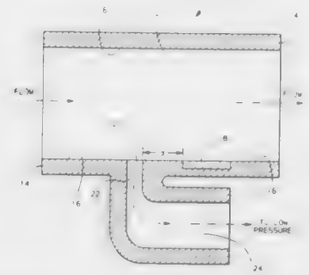
1. A method of testing a prefilled hydraulic system of the type including a prefilled hydraulic cylinder member having a bore and conduit means communicating with the bore proximate one end of the bore, and a piston member positioned within the bore, said method comprising the steps of:
(A) closing the system to substantially preclude escape of hydraulic fluid from said cylinder bore through said conduit means;
(B) applying a predetermined force to at least one of said members in a sense to urge said piston member to move in said cylinder member bore toward said one end of said bore;
(C) measuring the magnitude of relative movement of said piston and cylinder members in response to said predetermined force; and
(D) accepting or rejecting the hydraulic system dependent upon the magnitude of the measured relative movement.

4,993,260
UNIVERSAL EXPANSION CONNECTION AND INTEGRAL LOCK
James W. Bednarz, 1025 W. Crosby, Slaton, Tex. 79364
Filed Jun. 20, 1989, Ser. No. 368,577
Int. Cl.[5] G01F *15/18*
U.S. Cl. 73—201 34 Claims



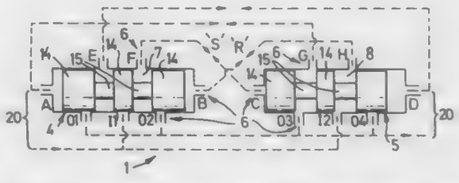
1. An apparatus for universaly connecting and locking a first fluid carrier to a second fluid carrier, comprising:
an expansion tube having a first open end receiving and sealingly engaging the first fluid carrier, said tube having exterior threads distal the first fluid carrier;
a packer constructed from a single member threaded onto said exterior threads on said tube;
a lock case having a first open end for receiving said tube and said packer and having a second end sealingly engaging the second fluid carrier, said lock case locking said tube in said first end in sealing engagement with said first fluid carrier and with the second fluid carrier in said second end such that the first fluid carrier is connected and locked to the second fluid carrier; and
said expansion tube further including a plurality of spaced-apart locking bars positioned on an external circumferential surface of said tube between said first open end and said exterior threads, a lock member carried by said lock case for engaging said locking bars to prevent relative rotation between said expansion tube and lockcase, a seal ring abutting said locking bars distal said threads to seal against debris and reduce accessibility to said locking bars from exterior said lock case, and a reduced diameter collar extending axially from said seal ring to form said first open end.

4,993,261
FLOWMETER WITH BOUNDARY LAYER CONTROL
David K. Lambert, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 21, 1989, Ser. No. 396,405
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—204.21 2 Claims



1. In a fluid flowmeter in which a sensor is mounted on or in the inner surface of a fluid flow conduit where the sensitivity of the sensor is dependent upon the thickness of the fluid boundary layer extending over the sensor, an improvement including means for drawing fluid out of the conduit through an aperture located in the conduit wall a predetermined distance upstream of the sensor to remove the fluid boundary layer developed upstream of the sensor so as to render the sensor immune to fluctuations in the thickness of the removed boundary layer thereby improving the repeatability and reproducibility of the fluid flowmeter.

4,993,262
APPARATUS FOR MONITORING FLOW OF A FLUID ALONG A CONDUIT
Andrew M. Storrar, 11 Torpel Way, Maxey, Peterborough PE6 9EQ, Great Britain
PCT No. PCT/GB87/00600, § 371 Date Jun. 28, 1988, § 102(e) Date Jun. 28, 1988, PCT Pub. No. WO88/01729, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 25, 1987, Ser. No. 187,526
Claims priority, application United Kingdom, Aug. 28, 1986, 8620012
Int. Cl.[5] G01F *3/18*
U.S. Cl. 73—242 25 Claims



1. An apparatus for measuring flow of a fluid along a conduit, comprising
a piston and cylinder arrangement having a plurality of cylinder sections and a piston freely slidable in each respective cylinder section;
said arrangement having a main inlet and a main outlet for being connected in series with the conduit;
each of the cylinder sections having an inlet valve port communicating with the main inlet, two bidirectional valve ports communicating with respective ends of the other cylinder section, and outlet valve port means communicating with the main outlet;
each of the plurality of pistons including valve operator means which (a) connects the inlet valve port to one of the bidirectional valve ports and connects the other bidirectional valve port to the outlet valve port means when the piston is at one end of the cylinder section, (b) closes the inlet valve port when the piston is at an intermediate position in the cylinder section, and (c) connects the inlet valve port to the other bidirectional port and connects the one bidirectional port to the outlet valve port means when the piston is at the other end of the cylinder section;
said valve ports, said valve port means and said valve operator means being such as to alternately move each piston of the pluraiity of pistons;
means for sensing movement of at least one of the pistons to measure the flow of the fluid;
said valve operator means of each piston including cylindrical enc piston portions, a cylindrical intermediate piston portion, and shaft means connecting the end piston portions to the intermediate piston portion;
each inlet valve port being positioned in the wall of the cylinder section so as to be opened on a respective side of the intermediate piston portion when the piston is at either end position;
each of the bidirectional valve ports being open on respec-

tive opposite sides of the intermediate piston portion at any position of the piston; and

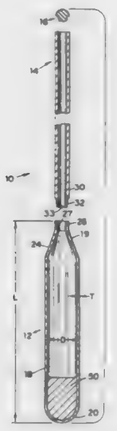
each outlet valve port means including two outlet valve ports opened when the corresponding end piston portion is at its end position but closeed by the corresponding end piston portion when the corresponding end piston portion is spaced from its end position.

4,993,263

PLASTIC HYDROMETER

Ravinder C. Mehra, Fairport, and Paul V. Comeau, Macedon, both of N.Y., assignors to Naige Company, Rochester, N.Y.

Filed May 19, 1989, Ser. No. 354,014
Int. Cl.[5] G01N *9/12*
U.S. Cl. 73—448 **13 Claims**



1. A sealed constant mass plastic hydrometer comprising:

an elongated plastic bulbous section, having an upper end and a lower closed end, said upper end terminating in an upper mating end, said upper end includes an annular conical seat;

a generally cylindrical plastic stem having an upper end and a lower end, said lower end of said stem having a lower mating section for mating engagement and attachment with said upper mating end of said bulbous section, said lower end of said stem having a contact mating surface mating engagement with said conical seat; and

an end cap for engagement with said upper end of said stem and for providing sealing engagement therewith.

4,993,264

PASSIVE ACOUSTICS PROCESS TO MONITOR FLUIDIZED BED LEVEL

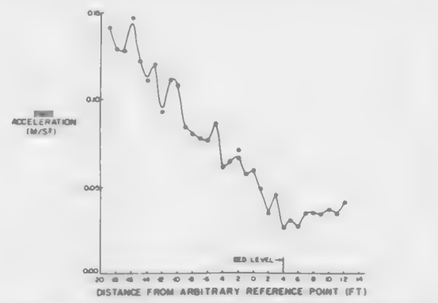
George D. Cody, Princeton; Charles L. Baker, Morris Plains, both of N.J., and Eugene R. Elzinga, Jr., Marquette, Mich., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 2, 1989, Ser. No. 317,872
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—579 **5 Claims**

1. A method for the non-intrusive determination of the bed level in a two phase fluidized bed in a structure for processing material comprising:

(a) measuring wall vibrations of said structure and then determining the power spectrum as a function of frequency, said wall vibration measurements being taken at several positions along the structure wall in the vertical direction;

(b) determining the area of the power spectrum which includes a resonance peak for each of said positions;



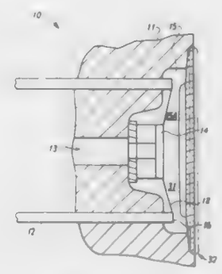
(c) correlating a change in said area of the power spectrum in said vertical direction with said bed level.

4,993,265

PROTECTED PRESSURE SENSOR AND METHOD OF MAKING

Edward F. Koen, Pleasanton, and Richard Tasker, San Jose, both of Calif., assignors to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 163,598, Mar. 3, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 362,113
Int. Cl.[5] G01L *7/00*; H01R *43/00*
U.S. Cl. 73—706 **34 Claims**



1. A method of forming a pressure sensor environmentally protected by a diaphragm, comprising:

providing a body having in a first face thereof a cavity, wherein said cavity has a first interior surface for receiving a pressure sensor element and a second generally upward facing surface for supporting the diaphragm;

mounting said pressure sensor on said first surface;

filling at least part of said cavity around said pressure sensor element with a volume of a pressure transfer material less than the volume of said cavity around said sensor element below said body face; and

pouring a volume of a flexible, pourable-in-place diaphragm material above said pressure transfer material sufficient to seal said cavity, wherein said diaphragm material and said pressure transfer material are chemically incompatible.

10. A measurand sensor produced by the method comprising the steps of:

providing a body having in a first face thereof a cavity, wherein said cavity has a first interior surface for receiving a pressure sensor element and a second generally upward facing surface for supporting a diaphragm;

mounting said pressure sensor on said first surface;

filling at least part of said cavity around said pressure sensor element with a volume of pressure transfer material less than the volume of said cavity around said sensor element below said body face; and

pouring a volume of flexible, pourable-in-place diaphragm material above said pressure transfer material sufficient to seal said cavity,

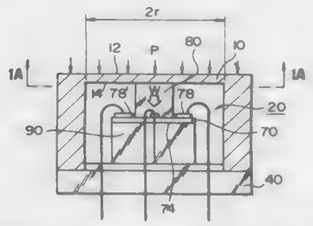
wherein said first surface is substantially level with the first face, wherein said diaphragm material forms a substantially impermeable barrier having a first, outward facing surface and a second surface facing said pressure transfer material, and wherein said diaphragm material and said pressure transfer material are chemically incompatible and characterized by the absence of chemical interaction between the pressure transfer material and the diaphragm.

4,993,266

SEMICONDUCTOR PRESSURE TRANSDUCER

Yoshiteru Omura; Kouji Tsukada; Masaharu Takeuchi; Sadayuki Hayashi, and Sanae Tokumitsu, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jul. 25, 1989, Ser. No. 384,817
Claims priority, application Japan, Jul. 26, 1988, 63-186329; Jul. 26, 1988, 63-186330; Jul. 26, 1988, 63-186331; Jul. 26, 1988, 63-186332; Jul. 26, 1988, 63-186333; Jul. 26, 1988, 63-98933[U]; Jul. 26, 1988, 63-98934[U]
Int. Cl.[5] G01L *9/04*
U.S. Cl. 73—720 **22 Claims**



1. A semiconductor pressure transducer comprising:

a diaphragm; and

a pressure detector;

said pressure detector including:

an Si single crystal which is so formed as to have a crystal face of {110} as the surface to which a compression force is applied, and which is attached to said pressure detector such that said crystal face is parallel to said diaphragm;

a first pair of opposing electrodes provided on said Si single crystal in the direction having an angle of 45 degrees with the direction of <001> on said crystal face of {110} and a second pair of opposing electrodes provided on said Si single crystal in the direction having an angle of 45 degrees with the direction of <110> of said Si single crystal, either of said first or second pair of electrodes serving as output electrodes and the other pair serving as input electrodes;

a composite seat with one end portion and the other end portion being made of different materials from each other, said one end portion being bonded to said crystal face of {110} of said Si single crystal and said other end portion being in contact with said diaphragm so as to transmit the pressure applied to said diaphragm perpendicularly to said crystal face of said Si single crystal as a compression force; and

a support base which is bonded to the opposite surface of said Si single crystal relative to the surface to which said seat is bonded and which supports said Si single crystal;

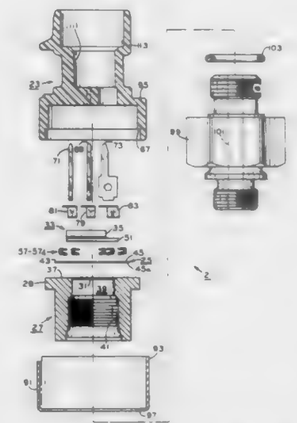
said semiconductor pressure transducer converting the pressure applied to said diaphragm into a compression force which acts perpendicularly to said crystal face of said Si single crystal and outputting the voltage corresponding to said compression force from said output electrodes.

4,993,267

ELECTRONIC TRANSDUCER

John J. Allard, Morrison; Merle L. Kemp, Prophetstown, and Alan J. Janicek, Morrison, all of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 179,202, Apr. 8, 1988, Pat. No. 4,918,833. This application Aug. 4, 1989, Ser. No. 389,495
Int. Cl.[5] G01L *9/04*
U.S. Cl. 73—726 **23 Claims**



1. An electronic transducer for association with a fluid pressure source, a DC power source, and a DC power energized circuit, the electronic transducer comprising:

a dielectric casing member including at least one recess therein having an open end, a set of terminals mounted to said dielectric casing member and each terminal having a supporting section within said at least one recess and an electrical connector section exteriorly of said dielectric casing member, said electrical connector section of two of said terminals adapted to be connected across the DC power source and said electrical connector section of another of said terminals adapted to be connected with the DC power energized circuit;

a metallic casing member arranged in assembly relation with said dielectric casing member and including an end wall extending across said at least one recess so as to close said open end thereof, another recess adjacent said end wall and adapted to be connected in pressure fluid communication with the fluid pressure source, and a generally disc shaped section in said end wall having a thickness predeterminately less than the rest of said end wall and defining a resilient diaphragm adapted to be deflected when said another chamber is subjected to fluid pressure;

means for retaining said dielectric casing member and said metallic casing member against displacement from the assembly relation thereof;

a strain gauge in said at least one recess including a flexible resilient dielectric carrier having a pair of generally opposite sides, one of said opposite sides being adhered to said end wall so that at least a part of said carrier is conjointly deflected with said diaphragm, and resistance means on the other of said opposite sides defining a four active arm bridge circuit and spanning at least in part said carrier part for establishing an output voltage indicative of the deflection of said diaphragm;

an electronic device in said at least one recess including a substrate having a pair of generally opposite faces, one of said opposite faces being disposed in opposed spaced apart relation with said other opposite side of said carrier, and a plurality of solid state components on the other of said opposite faces and connected in circuit relation, respectively, one of said solid state components comprising

amplifier means for receiving the established output voltage from said resistance means and for amplifying it;

a set of conductive spring clips bridging between said substrate and said carrier to maintain the spaced apart relation thereof, some of said spring clips being connected in circuit relation with both said resistance means and said electronic device and another of said spring clips being connected in circuit relation with at least said amplifier means on said electronic device; and

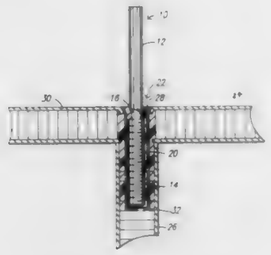
a set of contact blades, two of said contact blades being connected in circuit relation between said supporting sections of said two terminals and two of said some spring clips and another of said contact blades being connected in circuit relation between said supporting section of said another terminal and said another spring clip.

4,993,268

METHOD OF TESTING A HONEYCOMB JOINING PIN AGAINST SEATING FAILURES

Kenneth W. Thompson, Clearwater, Fla., assignor to ATR International, Inc., Clearwater, Fla.

Filed May 16, 1990, Ser. No. 524,927
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—827 **7 Claims**



1. A method of testing the seating strength of a joining pin connecting two honeycomb panels comprising inserting into the joining pin filled with an adhesive a substantially cylindrical solid test pin having a necked down middle portion separating a first stem portion and a threaded second portion, the necked down portion of the test pin being located adjacent to a flare at a head of the joining pin, ensuring that the test pin second portion is firmly seated in the adhesive, and pulling the test pin at the first portion with a tool to exert a force on the test pin until either the test pin separates at the necked down portion or the test pin is dislodged from the honeycomb panel joining pin.

4,993,269

VARIABLE ORIFICE FLOW SENSING APPARATUS

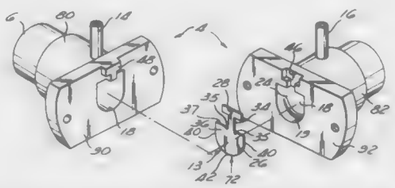
Darrell W. Guillaume, Corona; Michael G. Norton, Riverside, and Douglas F. DeVries, Redland, all of Calif., assignors to Bird Products Corporation, Riverside, Calif.

Filed Dec. 16, 1988, Ser. No. 285,086
Int. Cl.[5] G01F *1/22*
U.S. Cl. 73—861.53 **31 Claims**

20. An obstruction assembly for a flow sensing apparatus used to measure a fluid flow in a channel, comprising:

a secured element outside the channel fixed relative to said flow sensing apparatus;

an elastically flexible, substantially planar flow obstruction element configured such that a substantial portion of the periphery of said obstruction element is disposed proximal to the periphery of said channel when no fluid is flowing through said channel; and



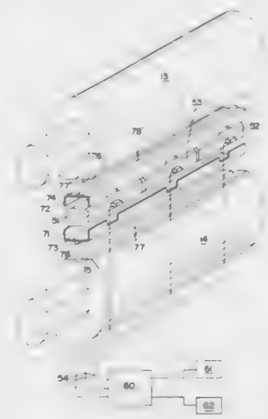
a hinge element hingeably connecting said secured element to said obstruction element.

4,993,270

PROCESS AND DEVICE FOR MEASURING THE PRESSING FORCE BETWEEN THE ROLLS OF A ROLL STAND

Pierre Petit, Maizieres-les-Metz; Patrice Ratte, Indre; Jacques Loubet, and Michel Machet, both of Metz, all of France, assignors to IRSID, Maizieres-les-Metz, France

Filed Mar. 17, 1989, Ser. No. 160,447
Claims priority, application France, Feb. 25, 1987, 87 02959
Int. Cl.[5] G01L *5/00*
U.S. Cl. 73—862.55 **12 Claims**



1. Device for measuring pressing forces between rolls (13 14) of a roll stand (1), said device comprising a plurality of aligned load sensors in the form of extended load cells (51, 52, 53) of uniform thickness arranged between two bearing plates (73, 74, 73', 74') and comprising means for keeping said load cells in alignment, said bearing plates being constructed of malleable material capable of being cold-rolled under the action of compression forces to which said plates are subjected when said device is pressed between said rolls.

4,993,271

LIQUID IN SITU MULTIPORT MONITORING SYSTEM

Rick D. Vargason, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 12, 1988, Ser. No. 283,313
Int. Cl.[5] G01N *15/06, 1/10*
U.S. Cl. 73—863.33 **20 Claims**

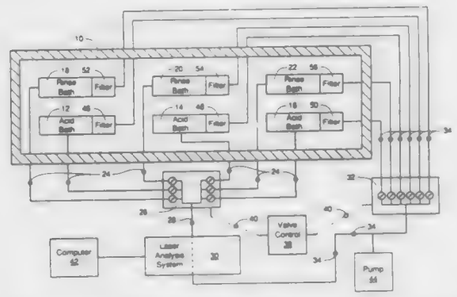
1. A method of sequentially analyzing the contamination of a plurality of liquid sources, comprising:

(a) interconnecting each of the plurality of liquid sources to a first control valve;

(b) withdrawing a representative stream of liquid from each of the liquid sources;

(c) controlling the flow from each of the plurality of of liquid sources by separate valve means within the first control valve;

(d) measuring the particulate contamination of each of the plurality of liquid sources;



(e) returning the stream of liquid through a second control valve to the respective liquid source; and

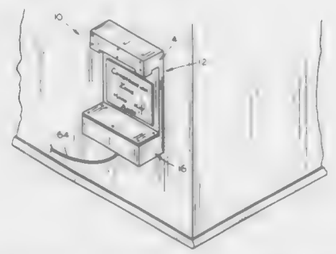
(f) automatically controlling the withdrawal and return of the liquid stream through the first and second control valves with a common controller.

4,993,272

AIR SAMPLER

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed Nov. 8, 1989, Ser. No. 433,562
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—863.33 **3 Claims**



1. An air sampler comprising,

a horizontally disposed, substantially block shaped upper housing portion having a front, a back, an upper end and a lower end,

a horizontally disposed, substantially block shaped lower housing portion having a front, a back, an upper end and a lower end,

a vertically disposed connecting housing portion extending between said upper and lower housing portions at the backs thereof, said connecting housing portion having a front portion for displaying a sign thereon,

at least one air sampling cassette holder means positioned in said upper housing portion in a recessed manner in the said lower end thereof,

an air sampling cassette positioned in said holder means so as to be substantially hidden from view when observing the same from either the front or sides thereof,

at least one air pump means in said lower housing portion for drawing air into said air sampling cassette,

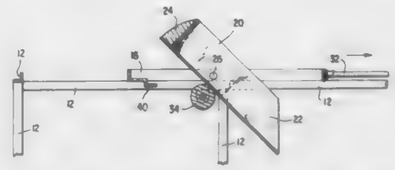
and hose means interconnecting said air pump means and said holder means, said hose means extending through said connecting housing portion.

4,993,273

WOOD CHIP SAMPLING APPARATUS

Jan S. Tessler, Spanish Fort, Ala., assignor to International Paper Company, Purchase, N.Y.

Filed Oct. 11, 1989, Ser. No. 420,073
Int. Cl.[5] G01N *1/20*
U.S. Cl. 73—864.32 **8 Claims**



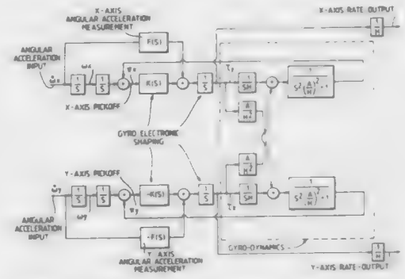
1. A wood chip sampling apparatus for taking a sample of wood chips from a downwardly flowing stream of wood chips and then dumping the sample to a sample collection bin for analysis, the sampling apparatus including a horizontally reciprocating cradle, means coupled to said cradle for moving the frame reciprocatingly back and forth between a chip collecting location and a chip dumping location, supporting rails for supporting said cradle for movement in a horizontal plane, a sample collecting tray pivoted about a horizontal axis and supported within said cradle, a weight carried by said tray, the tray being open at one side to permit wood chips therein to discharge from the tray when the tray is tilted toward said open side, said weight located on that tray side opposite to said open tray side, a first abutment, said first abutment preventing the tray from tipping and dumping chips at said collecting location, the tray tilting at said dumping location when filled with collected wood chips, the; tray tilting back to a horizontal position after dumping, a second supporting abutment engaging the tray and preventing the tray from tipping when empty due to the force of said weight.

4,993,274

GYROSCOPE SYSTEM

Geoffrey Downton, Bracknell, England, assignor to British Aerospace PLC, London, England

Filed Feb. 3, 1989, Ser. No. 305,760
Claims priority, application United Kingdom, Feb. 10, 1988, [redacted]
Int. Cl.[5] G01C *19/28, 19/30*
U.S. Cl. 74—5.46 **4 Claims**



1. A dual-axis rate gyroscope system comprising:

a support platform;

a rotor mounted for rotation relative to the support platform and for angular displacement relative thereto, said rotor having a rate of rotation;

transducer means, coupled to the rotor, for forming a first electrical signal representative of said angular displacement of the rotor relative to the platform; torque applying

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means, coupled to the rotor and responsive to a torque signal, for precessing said rotor and for cancelling said angular displacement of said rotor for a range of values independent of said rate of rotation;

angular acceleration sensing means, supported by said platform, for forming a second electrical signal representative of angular acceleration of the platform; and

control loop means, connected to said transducer means, said angular acceleration sensing means and said torque applying means, for combining said first and second electrical signals forming said torque signal.

4,993,275

CAM MECHANISM FOR PERIODICALLY SWIVELING A SWIVEL DEVICE

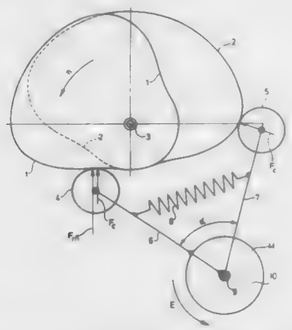
Gerhard Pollich, Heidelberg; Norbert Thünker, Hirschberg, and Roland Loreaz, Heidelberg, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 405,570

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1988, 3830946

Int. Cl.[5] F16H *53/08*

U.S. Cl. 74—54 5 Claims



1. Cam mechanism for periodically swiveling a swivel device,

a rotatable first cam disk carrying a first cam serving as a main cam,

a rotatable second cam disk carrying a second cam serving as an auxiliary cam,

a first roller engaging said first cam under spring force and rollable on said first cam during rotation of said first cam disk,

a second roller engaging said second cam under spring force and rollable on said second cam during rotation of said second cam disk,

and a lever arrangement swivelable by said two rollers and having at least one spring for providing said spring force, including a swivel lever swivelable about a swivel axis and carrying said first roller, a swiveling movement corresponding to said first cam being impressable by said swivel lever upon the swivel device, said swivel axis and said two rollers having axes of rotation extending parallel to one another, and normals to said axes of rotation of said two rollers intersecting one another on said axis of rotation of said swivel axis and forming an angle α which is a measure for the spring force under which said two rollers engage said two cams,

said auxiliary cam having a contour for varying said angle α as a function of inertial forces resulting, respectively, from accelerations and decelerations of said lever arrangement and of machine parts connected therewith during rotation of said two cam disks.

4,993,276

DRIVE ASSEMBLY WITH OVERSPEED BRAKE

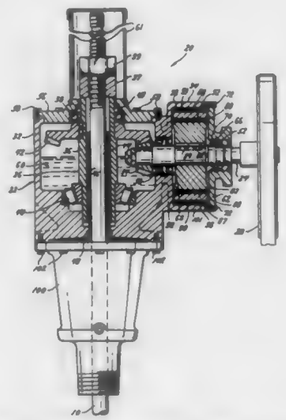
Wallace L. Edwards, Stockton, Mo., assignor to Superior Gear Box Company, Stockton, Mo.

Filed Mar. 13, 1987, Ser. No. 25,399

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[5] F04B *49/10*

U.S. Cl. 74—411.5 3 Claims



1. In a drive assembly connecting a motor to a submersible pump by means of a horizontal input shaft connected to the motor and a vertical output shaft rotated at a lower speed by the input shaft and connected to the submersible pump by a tubing string, an improvement comprising:

(a) a gearbox including a first housing portion carrying the input shaft and a second housing portion carrying the output shaft, the first housing portion including a brake-receiving chamber having a brake shoe engageable surface,

(b) a brake shoe carried by the input shaft within the brake-receiving chamber and movable radially outwardly under centrifugal force into engagement with said brake shoe engageable surface when the input shaft reversely rotates above a critical speed, and

(c) means disengaging the brake shoe when the input shaft rotates below the critical speed.

4,993,277

CONFIGURATION FOR LIMITING THE AXIAL PLAY OF THE SHAFT OF A MOTOR-DRIVE MECHANISM

Peter Adam, Hoechberg; Rolf Deynet, Wuerzburg, and Ronald Gleixner, Ochsenfurt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 25, 1990, Ser. No. 514,177

Claims priority, application European Pat. Off., Apr. 25, 1989, 89107466.8

Int. Cl.[5] F16H *1/16*

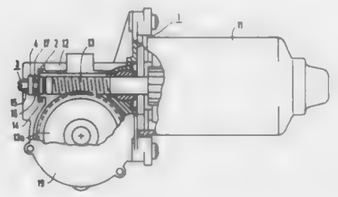
U.S. Cl. 74—425 13 Claims

1. An apparatus for limiting the axial play of a motor drive shaft disposed in a housing of a motor drive mechanism, said apparatus comprising:

at least one guard plate, disposed in the housing of the motor drive mechanism, said guard plate being anchored on its marginal sides, placed axially in front of a first end of said shaft and having an axially movable contact zone;

a setscrew having one end inserted through said housing from the outside of the motor drive mechanism, said setscrew contacting said contact zone;

whereby movement of the setscrew sets the axial play of the shaft by axially pressing the contact zone to a defined clearance from the first shaft end depending upon a comparison between the actual axial play and the desired axial play of the shaft.



4,993,278

COLUMN-MOUNTED GEAR SELECTOR MECHANISM FOR AUTOMATIC TRANSMISSION

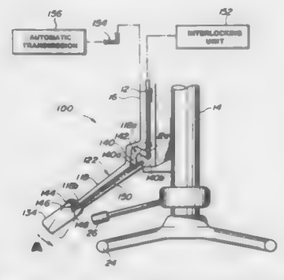
Yoshiyuki Nakanishi, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 16, 1990, Ser. No. 509,448

Claims priority, application Japan, Apr. 24, 1989, 1-105576

Int. Cl.[5] G05G *9/06*

U.S. Cl. 74—484 R 4 Claims



1. A column-mounted gear selector mechanism for an automatic transmission, comprising:

a reciprocative compression rod in parallel relation to a steering column assembly;

a shift tube movably receiving therein said compression rod and rotatably supported on the steering column assembly;

said shift tube being operatively connected to a control cable of the transmission in such a manner as to be capable of shifting gear when rotated about its axis;

said compression rod being reciprocative between first and second positions and operatively connected to an interlocking device in such a manner that the interlocking device prevents rotation of said shift tube when said compression rod is in the first position and allows rotation of said shift tube when said compression rod is in the second position;

a gear shift lever assembly operatively connected to said compression rod and said shift tube for operating the [illegible]

said gear shift lever assembly including a hollow control arm secured at an end to said shift tube and projecting radially outwards therefrom to have a free end, a bell crank pivotally installed in said control arm and having a first lever arm connected to said compression rod and a second lever arm, a knob pivotally installed on the free end of said control arm and formed with an elongated guide opening, a guide pin movably received in said elongated opening of said knob and a connecting rod interconnecting said second lever arm of said bell crank and said guide pin such that rotations of said knob in the opposite directions about a pivot axis thereof are transferred through said connecting rod and said bell crank to said compression rod to cause said compression rod to reciprocate between said first and second positions.

4,993,279

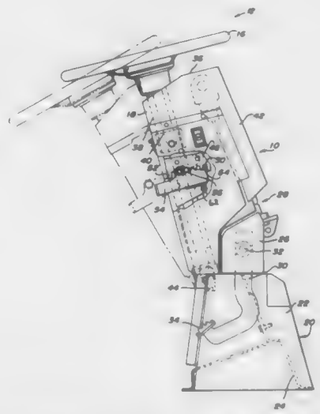
TILT STEERING COLUMN LATCH RELEASE

Robert D. Doescher, Bolingbrook, and Roger L. Anliker, Plainfield, both of Ill., assignors to J.I. Case Company, Racine, Wis.

Filed Jul. 27, 1989, Ser. No. 385,742

Int. Cl.[5] B62D *1/18*

U.S. Cl. 74—493 4 Claims



1. A tilt steering wheel system including a tilt steering column latch release, the steering system comprising:

an elongated steering column having first and second ends;

a base support structure having at least one pin defining a tilt axis, said base support structure mounting said steering column to pivot about said tilt axis;

a steering wheel rotatably mounting said second end of said steering column;

means for pivoting said steering column about said tilt axis to position said steering wheel in a respective one of a plurality of adjusted positions defined by a plurality of radial extensions of said steering column about said pivot axis;

latch means between said steering column and said base support structure for maintaining said steering column in a selected one of said adjusted positions; and

latch release means for releasing said steering column to pivot said steering column to an extreme position remotely away from said adjusted positions;

wherein said support structure includes a strut extending therefrom generally parallel to one of said adjusted positions of said steering column; and

said latch means includes a latch rack attached to one of said steering column and said strut, a latch lever pivotally attached to the other of said steering column and said strut, and a latch pawl attached to and extending generally perpendicular from said latch lever, said latch lever having a pivot travel between positions whereat said latch pawl is engagable with said latch rack to hold said steering column in one of said adjusted positions and positions whereat said latch pin is disengaged from said latch rack to move said steering column to another of said adjusted positions;

wherein said latch rack includes a plurality of notches, said latch pawl being engagable with a respective notch to hold said steering column in one of said adjusted positions;

wherein the latch rack has two opposite ends, said notches being disposed in discrete positions on said latch rack as said latch rack extends between said two ends, said latch rack having an integral stop at each of said two ends;

biasing means attached to said latch lever for biasing said latch lever into engagement with said respective one of said notches, said latch pawl being disengagable by means pivoting said latch lever against said bias;

wherein said latch lever is pivotally attached to the other of said steering column and said strut by a pin connected to one of said steering column and said strut, said latch pawl being located at one end of said latch lever and said latch lever having a free end located at said other end of said latch lever, said means pivoting said latch lever against said bias moving said free end against said bias to release said latch pawl from a respective notch;

wherein said latch rack is rigidly attached to said strut and said latch lever is pivotally connected to said steering column;

wherein said lever is pivotally connected to said steering column by being connected to a cover which is connected to said steering column; and

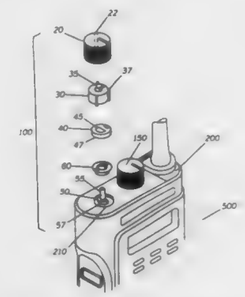
limiting means for limiting said pivot travel of said latch lever, so that said latch pawl will be engagable against one of said integral stops when said latch lever is pivoted to disengage said latch pawl from a notch adjacent said stop.

4,993,280

ROTATIONAL CONTROL ASSEMBLY

Jill C. Olkoski, Ft. Lauderdale; Mark S. Bresin, Coral Springs, and John F. Murray, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 17, 1989, Ser. No. 380,245
Int. Cl.[5] G05G *1/10*
U.S. Cl. 74—553 **11 Claims**



1. A rotary control assembly, comprising:

a hollow knob having an interior portion;

a control element having a rotary shaft, said rotary shaft being locked to said knob;

a friction element having a peripheral boundary, said friction element being locked to said control element;

said interior portion of said knob is frictionally engaged to said peripheral boundary of said friction element such that rotational torque of said rotary control assembly is increased when the knob is rotated.

4,993,281

FLEXIBLE STEERING WHEEL HEAT SHIELD

Jess J. Miller, 220-C Lakewood Cir., Margate, Fla. 33063

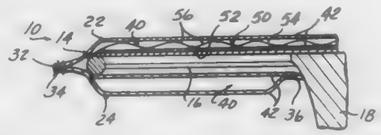
Filed May 5, 1989, Ser. No. 347,992
Int. Cl.[5] G05G *1/04, 1/10*
U.S. Cl. 74—558.5 **12 Claims**

1. A steering wheel cover removably positionable on a steering wheel, the steering wheel cover comprising:

an overlying front panel having an outer edge and outer dimensions larger than the steering wheel; and

a secondary rear panel attached to the overlying front panel along a portion of the outer edge, the attached secondary panel forming a pocket into which the steering wheel can be slidably and releasably received;

the overlying front panel and the secondary rear panel each constructed from at least two sheets of metallized plastic film, each sheet having outer selvages, the outer selvages bonded to each other to form at least one sealed air pocket therebetween;



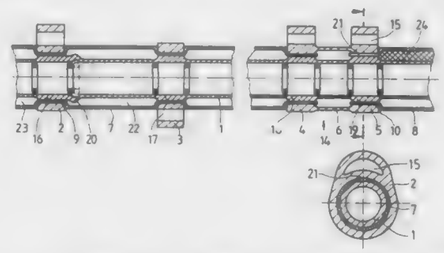
wherein the metallized plastic film is selected from the group consisting of metallized nylon, metallized polyethylene, metallized polyester, metallized polypropylene, metallized polycarbonate, metallized polysulfone and mixtures thereof.

4,993,282

ASSEMBLED SHAFT, ESPECIALLY CAMSHAFT, CRANKSHAFT OR DRIVESHAFT

Helmut Swars, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft für Emissionstechnologie mbH

Continuation-in-part of Ser. No. 305,431, Feb. 1, 1989, abandoned. This application Oct. 17, 1989, Ser. No. 423,681
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1988, 3803683
Int. Cl.[5] F16H *53/00*
U.S. Cl. 74—567 **15 Claims**



1. An assembled shaft comprised of a tubular member; individually slid-on driving cam elements which are attached to the tubular member; and a sleeve slid-on between each two driving elements, the slid-on sleeve having a diameter larger than that of the tubular member and having collar regions which have a reduced diameter and are guided on the tubular member, the collar regions being extended underneath the driving elements and fixed between the tubular member and the driving elements.

4,993,283

ENGINE CONTROL SYSTEM FOR VEHICLE WITH AUTOMATIC

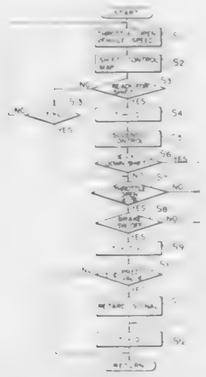
Toshiyuki Kikuchi, Higashihiroshima; Maski Fujii, Hiroshima; Mitsutoshi Abe, Hiroshima, and Yuji Matsuno, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 16, 1990, Ser. No. 480,860
Claims priority, application Japan, Feb. 17, 1989, 1-39128
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—858 **11 Claims**

1. An engine control system for a vehicle provided with an automatic transmission comprising

engine output control means for reducing an engine output in response to a shift operation of the automatic transmission,

brake detecting means for detecting a braking operation of the vehicle,



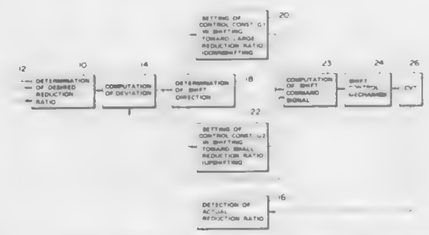
restricting means for restricting the engine output control means from reducing the engine output when the braking operation is detected during the shift operation.

4,993,284

CONTROL DEVICE FOR VEHICULAR ENGINE CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM

Katsunori Oshiage, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 16, 1984, Ser. No. 610,794
Claims priority, application Japan, May 27, 1983, 58-92414
Int. Cl.[5] B60K *41/18*
U.S. Cl. 74—866 **4 Claims**



1. A control device for a vehicular engine continuously variable transmission system, comprising:

first determining means for determining a desired reduction ratio and generating a desired reduction ratio indicative signal;

second determining means for determining an actual reduction ratio of the continuously variable transmission and generating an actual reduction ratio indicative signal;

third determining means responsive to said desired reduction ratio indicative signal and said actual reduction ratio indicative signal for determining whether an upshifting is needed to achieve the desired reduction ratio indicated by said desired reduction ratio indicative signal or a downshifting is needed to achieve the desired reduction ratio indicated by said desired reduction ratio indicative signal;

means for setting a first control constant when said third determining means determines that downshifting is needed and for setting a second control constant when said third determining means determines that upshifting is needed and generating a control constant indicative signal indicative of the control constant set;

fourth determining means for determining a speed at which the actual reduction ratio of the continuously variable transmission is to be shifted toward the desired reduction ratio in response to said control constant indicative signal; and

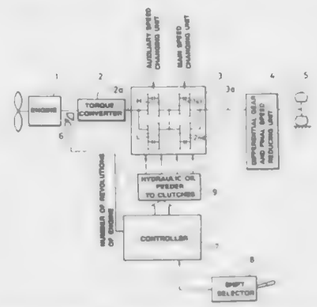
means for adjusting the actual reduction ratio of the continuously variable transmission toward the desired reduction ratio in response to the speed determined by said fourth determining means.

4,993,285

METHOD AND APPARATUS FOR CONTROLLING SPEED CHANGING UNIT

Yoshio Asayama; Makio Tsubota; Yasunori Okura, and Takayuki Sato, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00364, § 371 Date Dec. 7, 1988, § 102(e) Date Dec. 7, 1988, PCT Pub. No. WO88/08094, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 11, 1988, Ser. No. 290,200
Claims priority, application Japan, Apr. 10, 1987, 62-88305
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—869 **11 Claims**



1. An apparatus for controlling a speed changing unit comprising:

a transmission including a plurality of auxiliary speed changing clutches at a first stage and a plurality of main speed changing clutches at a second stage as viewed from an input shaft of said transmission,

a plurality of pressure control valves individually connected to the plural clutches in the transmission to generate in a pertinent clutch a hydraulic pressure corresponding to an electrical command inputted therein,

a hydraulic pump for feeding pressurized hydraulic oil to said plural pressure control valves,

means for detecting an amount of hydraulic oil delivered from said hydraulic pump,

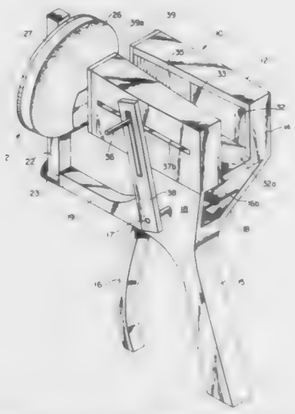
means for determining, during speed changing, whether clutches to be engaged comprise both an auxiliary speed changing clutch and a main speed changing clutch and also determining whether an output from said means for detecting an amount of hydraulic oil delivered by the hydraulic pump is below a predetermined value, and

means selecting an auxiliary clutch and a main clutch corresponding to a desired speed stage during speed changing and for controlling respective pressure control valves corresponding to the auxiliary speed changing clutch and the main speed changing clutch thus selected in such a manner that when results derives from determinations made by said determining means are identified as yes, feeding of hydraulic oil to the auxiliary speed changing clutch thus selected is first started, and thereafter feeding of pressurized hydraulic oil to the main speed changing clutch thus selected and gradual increasing of clutch pressure of the auxiliary speed changing clutch thus selected are started at the time point when a predetermined period of time has elapsed.

4,993,286
HOLDING APPARATUS FOR SPRING-HINGE SPECTACLE FRAMES

John P. Shaw, P.O. Box 2037, Clanton, Ala. 35045

Continuation of Ser. No. 441,153, Nov. 22, 1989, abandoned, which is a continuation of Ser. No. 263,650, Oct. 28, 1988, abandoned. This application May 29, 1990, Ser. No. 528,911
Int. Cl.[5] B25B *7/00*
U.S. Cl. 81—3.6 12 Claims



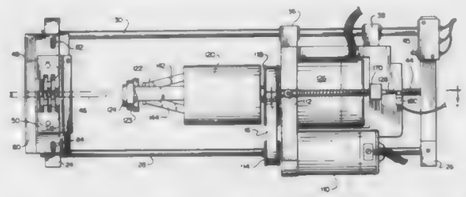
1. Apparatus for use with spring-hinge type spectacles to facilitate removal and replacement of temple screws pivotally connecting apertured ear portions of companion hinge parts mounted on the lens frame and the forwardmost ends of the temple members, comprising a body member having a slide channel portion and a forwardly extending rigid support arm, an elongated post carried by said support arm, a lens frame holding subassembly adjustably supported on said post including a lens-engaging pad and a lens-restraining arm in spaced overlying relation to lens-engaging surface portions of said pad to receive and support a lens portion of the spectacle lens frame against said pad, said slide channel portion including a temple holding subassembly comprising a pair of confronting temple gripper pads spaced to define an upwardly opening temple-receiving recess therebetween and pad adjusting means for moving said gripper pads toward and away from each other to grip and release a temple member located therebetween, and means for supporting the body member at a selected position with the lens frame and temple members releasably restrained against movement relative each other in their respective holding subassemblies.

4,993,287
AUTOMATED WIRE INSULATION CUTTER AND STRIPPER

Thomas S. Carpenter, Cazenovia, and Arthur C. Goldsmith, Lafayette, both of N.Y., assignors to Carpenter Manufacturing Co., Inc., Manlius, N.Y.

Filed Mar. 3, 1989, Ser. No. 318,672
Int. Cl.[5] H02G *1/12*
U.S. Cl. 81—9.51 22 Claims

1. Apparatus for cutting through a cylindrical layer of material on a wire to a desired depth and at a desired distance from a terminal end of the wire, said apparatus comprising:
(a) a pair of cutter blades having linear, parallel cutting edges;
(b) means for moving said blades relative to one another between a first position wherein said cutting edges are substantially in mutual contact and a second position wherein said edges are equally spaced from a fixed, linear axis perpendicular to and passing between said edges;
(c) a bushing having an opening therethrough for passage of said wire at a position adjacent said blades, the center of said opening lying upon said axis;
(d) a pair of reciprocally movable gripping jaws positioned on the side of said bushing opposite said blades and each having a gripping surface for releasable engagement of said wire;
(e) means for moving said jaws while maintaining said gripping surfaces symmetrically arranged on opposite sides of said axis between a spaced position and a gripping position of said gripping surfaces with respect to a wire extending therebetween;

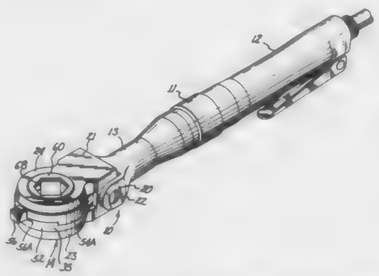


(f) operating means for sequentially positioning said blades in said first position and said jaws in said spaced position, whereby said wire may be extended axially between said gripping surfaces and through said bushing opening to abut said terminal end against said blades, and then moving said gripping surfaces to said gripping position and said blades to said second position, preparatory to making a cut through said layer;
(g) a shaft, rotatable about said axis, to which said blades and said bushing are commonly connected; and
(h) a first motor for imparting rotation to said shaft, and thereby to said bushing and blades, while moving said blades between said first and second positions.

4,993,288
POWER DRIVEN REPLACEMENT SOCKET RATCHET WRENCH

Marvin L. Anderson, Williston, N. Dak.; Gerald O. Irvine, Crosby, Minn., and Christopher A. Lindenberger, Arvada, Colo., assignors to Circle A Products, Inc., Sioux City, Iowa

Continuation of Ser. No. 82,974, Aug. 3, 1987, abandoned, which is a continuation of Ser. No. 866,594, May 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 762,115, Aug. 2, 1985, abandoned. This application Jan. 10, 1989, Ser. No. 296,357
Claims priority, application Taiwan, Jun. 28, 1986, 75102960; Canada, Apr. 27, 1987, 535628
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—57.39 9 Claims



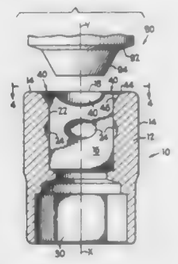
1. A wrench adapted for power operation of a socket having teeth on the exterior thereof comprising:
a frame including ahead, said head having first and second aligning support plates with a first through opening defined through the plates along a socket axis perpendicular to the first and second support plates;

a pawl drive plate positioned between said support plates for reciprocation centered on said axis, and including a second opening of size to align with the first through opening and having a base end;
a pawl mounted at said base end of the pawl drive plate, adapted to be moved to a drive position extending into the second opening;
socket retainer means mounted between said first and second support plates and on one side of said pawl drive plate and guided for reciprocal movement in a plane generally parallel to the plates; said socket retainer means having at least one lug extending into the opening of the pawl drive plate to provide a socket retainer lug, said socket retainer means having an opening of such size that a socket will pass through the opening defined in the support plates past the socket retainer lug;
means for urging said socket retainer means to move the socket retainer lug to position protruding into the through opening defined by the support plates so that a socket fitting into the through opening is engaged and retained in position by said socket retainer lug; and
pawl drive means to reciprocate the pawl drive plate and pawl thereon to affect a drive in at least one direction of a socket having pawl engagable teeth on the exterior thereof and which is retained by the socket retainer lug, said socket retainer means being movable to a second position wherein the socket retainer lug clears the through opening of the support plates and permits a socket to move axially of the through opening of the support plates.

4,993,289
DRIVE ELEMENT WITH DRIVE BORE HAVING COMPOUND ENTRY SURFACE

James R. Parks, Franklin, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Continuation of Ser. No. 428,928, Oct. 27, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 566,862
Int. Cl.[5] B25B *00/00*
U.S. Cl. 81—124.6 20 Claims

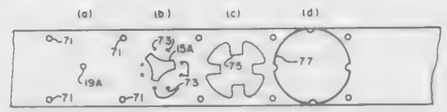


1. A drive element for use with a driver comprising: a body including an outer surface, a drive bore formed in said body including an entry end at said outer surface and an inner end, said drive bore including a central axis and a plurality of intersecting flat side surfaces parallel to said axis, and a sloping entry surface formed at the entry end of said drive bore around the perimeter thereof, said entry surface extending from said outer surface partially into said drive bore and including multiple discrete portions with each portion being a surface such that the intersection of said entry surface with a plane including said central axis defines a plurality of generally straight lines respectively having different slopes.

4,993,290
METHOD OF STAMPING ROTOR AND STATOR LAMINATIONS

Ilija J. Obradovic, Belgrad, Yugoslavia, assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 7,608, Jan. 28, 1987. This application Dec. 21, 1989, Ser. No. 454,078
Int. Cl.[5] H02K *15/02*
U.S. Cl. 83—32 7 Claims

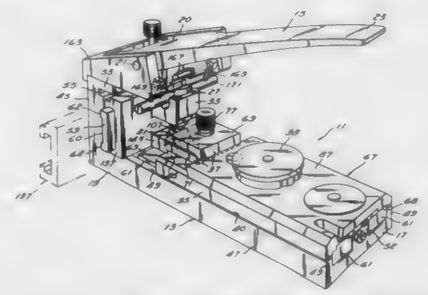


1. A method of stamping rotor and stator laminations for a doubly salient electric motor from a single piece of metal, said rotor laminations having a first number of teeth and said stator laminations having a second, larger number of teeth, comprising the steps of:
stamping a rotor lamination out of the piece of metal;
stamping the stator lamination out of the piece of metal offset from the stamping of the rotor lamination so that a tooth of the rotor lamination stamping is taken from the gap between two teeth of the stator lamination, the centroids of the rotor and stator laminations in their stamped locations in the piece of metal being offset from one another.

4,993,291
KEY CUTTING APPARATUS

Riley M. Sopko, Palos Verdes Estate, Calif., assignor to Keymak Company, Anaheim, Calif.

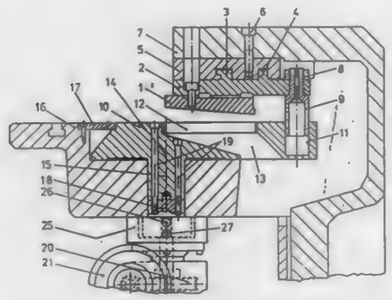
Filed Jun. 13, 1988, Ser. No. 206,187
Int. Cl.[5] B26F *1/12*
U.S. Cl. 83—39 18 Claims



18. A method of cutting notches in a key blank with an apparatus, including a clamp, a punch and a die forming an aperture for receiving said punch, comprising the steps of:
securing said key blank within said clamp;
resiliently supporting said clamp so that said key blank is biased away from the upper surface of said die;
aligning said aperture of said die with the desired notch position on said key blank;
driving said punch against and through said key blank, forcing said key blank against the upper surface of said die and said punch into said aperture, thereby cutting a notch in said key blank;
disengaging said punch from said aperture and said key blank; and
aligning said aperture of said die with the next desired notch position on said key blank.

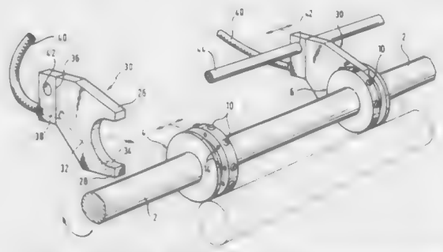
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4,993,292
NOTCHING MACHINE
Peter Kunz, Wiesenring, Fed. Rep. of Germany, assignor to Ludwig Boschert Maschinen-und Apparatebau GmbH & Co KG, Lorrach-Hauingen, Fed. Rep. of Germany
Filed Oct. 17, 1989, Ser. No. 422,688
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1988, 3835775.5
Int. Cl.[5] B21D *28/02*
U.S. Cl. 83—76.1 4 Claims



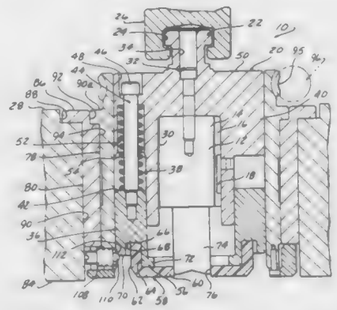
1. A notching machine having a vertically moving ram provided with a projecting head holding an upper knife of a blade assembly which also has a lower knife that is attached to a machine table, said upper and lower knives mounted on upper and lower set collars which may be turned in common around a vertical axis of rotation in common with a central pivot member of said lower set collar, extending in parallel with the longitudinal axis of said ram, by means of an angular drive adjustment mechanism having a central pivot member and whereby each notching of a workpiece with a notching angle greater than a predetermined coinciding vertex angle of said upper and lower knives with respect to a predetermined zero reference position is accomplished by a first and a successive second working stroke of said ram in two angularly different turning positions of said upper and lower set collars up to a maximum notching angle, said notching machine further comprising:
an electric motor;
an angular gear mechanism with a final gear on said central pivot member and directly driven by said electric motor with no clutch;
a shaft brake means on said central pivot member for braking said upper and lower set collars when rotating;
a program control unit for controlling said successive first and second working strokes of said ram and for synchronously controlling said shaft brake means and said electric motor, said program control unit activating said shaft brake means and switching-off said electric motor in each of said two angularly different turning positions of said upper and lower set collars and said program control unit deactivating shaft brake means and switching on said electric motor only after said first working stroke of said ram to turn said upper and lower set collars from said first to said second turning position; and
a pulse generator for controlling said electric motor in both of said turning positions of said upper and lower set collars, said pulse generator counting the angular rotation of said central pivot member with respect to said predetermined zero reference position for recording each of said two angularly different turning positions of said upper and lower set collars.

4,993,293
APPARATUS FOR THE REMOVAL OF MATERIAL PUNCHED OUT FROM MATERIAL IN SHEET FORM
Bjoern Christoffersson, Helsingborg, Sweden, and Joergen Gerhardt, Roenne Alle 40, DK-2791, Denmark, assignors to Joergen Gerhardt, Kastrup, Denmark
Filed Apr. 4, 1990, Ser. No. 503,934
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918470
Int. Cl.[5] B26D *7/1*
U.S. Cl. 83—098 13 Claims



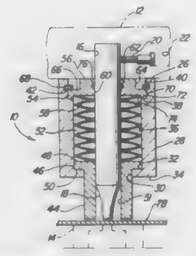
1. An apparatus for the removal of material punched out from a material in sheet form comprising:
at least one rotating punching cylinder including a circumferential surface with projecting, closed punching edges;
outlet openings located within the closed punching edges connected to assigned inlet openings arranged in a side face of said punching cylinder; a member at least partially embracing said punching cylinder in a guided manner; and
a feed opening located in a side face of said member said side face being closely adjacent to said face of said punching cylinder, whereby compressed air can be fed from said feed opening through said inlet openings to said outlet openings to remove said punched out material.

4,993,294
PUNCH HOLDER WITH A STRIPPER ARRANGEMENT
Victor L. Chun, Holland, and George Jaworski, Bala Cynwyd, both of Pa., assignors to Murata Wiedemann, Inc., King of Prussia, Pa.
Filed May 15, 1989, Ser. No. 351,343
Int. Cl.[5] B26F *1/14*
U.S. Cl. 83—139 10 Claims



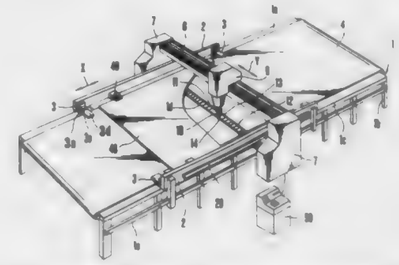
1. A punch holder (10) for holding a punch (12) having a shank (14), and a punch portion (74) protruding therefrom, said punch holder (10) having a stripper arrangement and including a holder member (20) having a cavity (30) receiving the shank (14) of the punch (12) fixed therein, said holder member (20) including a head (22) for engagement with a punch press ram (25), characterized by an outer sleeve (78) having a bore (79), a sleeve (36) disposed beneath said holder member (20) and coaxially aligned therewith, both said holder member (20) and said sleeve (36) axially movable in said bore (79) to maintain concentricity therebetween, a stripper spring (38) interposed between said holder member (20) and said sleeve (36) urging said holder member (20) and sleeve (36) to an axially spaced apart condition, a cup piece (58) of a soft resilient material covering the lower end (56) of said sleeve (36), said lower end (56) of said sleeve (36) receiving said protruding punch portion (14), the lower end covered by said cup piece (58).

4,993,295
PUNCH STRIPPER
Ernest A. Dacey, Jr., Highland, Mich., assignor to Utica Enterprises, Inc., Sterling Heights, Mich.
Continuation of Ser. No. 281,522, Dec. 8, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 494,901
Int. Cl.[5] B26D *7/06*
U.S. Cl. 83—140 11 Claims



1. A punch stripper assembly which can be removably mounted to a punch rigidly mounted to a press ram, said punch stripper assembly comprising:
a housing having a generally cylindrical exterior configuration, said housing having an aperture extending therethrough, one end of said housing abutting against said press ram when said punch stripper assembly is mounted to said punch;
a plunger disposed within a portion of said aperture in telescoping arrangement therewith, said plunger having a flange that coacts with a flange formed as an integral part of said housing at an end of said housing opposite said one end, said plunger containing an axially aligned bore sized to receive said punch therethrough;
a cap disposed in said aperture of said housing at said one end adapted to receive said punch therethrough, said cap having a centrally positioned cylindrical bore;
a snap ring securing said cap within said aperture;
a circumferentially extending groove provided in a wall of said cylindrical bore;
friction means disposed in said groove for frictionally retaining said cap to said punch, said friction means protruding outwardly from said wall to frictionally engage said punch;
an array of spring elements disposed in said aperture between said cap and said flange of said plunger, said array of spring elements biasing said flange of said plunger against said flange formed as an integral part of said housing and said cap against said snap ring when said array of spring elements are in a state of compression; and
whereby said punch stripper assembly is removably mounted to said punch and said press ram by sequentially inserting said punch through said centrally positioned cylindrical bore of said cap, through said friction means, and through said axially aligned bore of said plunger, said punch stripper assembly being retained on said punch by said friction means, said punch stripper assembly thereby being removable as a discrete unit from said punch and press ram without requiring simultaneous removal of said punch or disassembly of said punch stripper assembly.

4,993,296
APPARATUS FOR CUTTING LAMINATED SHEET MATERIAL
Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Hiroshima, Japan
Filed Mar. 29, 1990, Ser. No. 502,997
Claims priority, application Japan, Apr. 14, 1989, 1-94393
Int. Cl.[5] D06H *7/00*; B26D *1/00*
U.S. Cl. 83—422 7 Claims

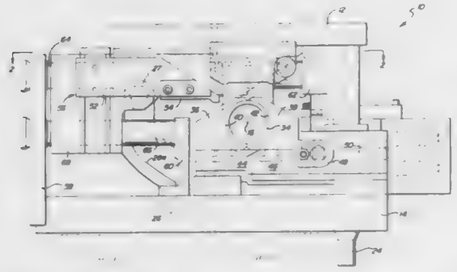


1. An apparatus for cutting a laminated sheet material, comprising:
a pedestal having a supporting surface provided with a guide groove extending transversely of said supporting surface;
a cutter receiving plate having a cutter receiving sleeve and accommodated in the guide groove;
a closure member connected to both ends of said receiving plate and accommodated in the guide groove;
a belt for supporting the laminated sheet material, said belt being supported on the supporting surface on front and back sides of the guide groove, upper surfaces of said cutter receiving plate, said closure member and said supporting surface being disposed so as to be or substantially with a horizontal plane;
belt moving members disposed on both sides of said belt longitudinally thereof for reciprocating said belt longitudinally;
a cutter head supported above and opposing said cutter receiving plate;
a cutter vertically movably mounted on said cutter head and having a lower end inserted into said cutter receiving sleeve;
a transverse drive mechanism connected to said cutter head and said cutter receiving plate for synchronously reciprocating the cutter head and the cutter receiving plate transversely;
a turning mechanism connected to said cutter and said cutter receiving sleeve for synchronously turning the cutter and the cutter receiving sleeve about a vertical axis; and
a longitudinal drive mechanism to which said belt moving members are connected for longitudinally reciprocating, in unison, said belt moving members, said belt and the laminated sheet material supported on said belt.

4,993,297
SHEARING BLADE MOUNT FOR CUT-OFF DIE SET
John H. Nolan, Mt. Clemens, and Dennis Skvarce, Wixom, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.
Continuation of Ser. No. 255,315, Oct. 11, 1988, abandoned. This application Aug. 3, 1990, Ser. No. 563,795
Int. Cl.[5] B26D *7/26*
U.S. Cl. 83—698 7 Claims

1. A shearing blade assembly for use in mounting a shearing blade to a platen of a cut-off die set comprising:
a platen;
a mounting block, including a top portion and two separate, flat plate portions extending downwardly therefrom, fixed to the platen;
a shearing blade;

a shearing blade cartridge;
first means for mounting the shearing blade in the shearing blade cartridge; and



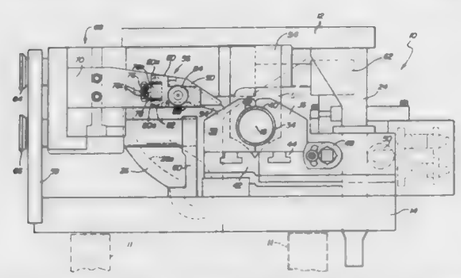
second means provided on said first and second plate portions for retaining the shearing blade cartridge in the socket of the mounting block.

4,993,298

APPARATUS FOR MOUNTING A NOTCHING BLADE

Steven A. Chamulak, Canton, and Dennis H. Skvarce, Wixom, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Filed Oct. 4, 1989, Ser. No. 417,035
Int. Cl.[5] B23D *21/00*; B26D *7/26*
U.S. Cl. 83—698 11 Claims



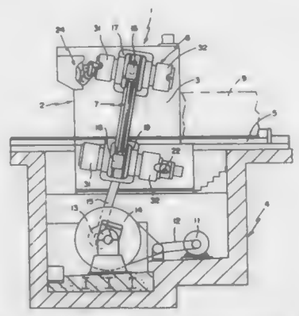
1. An apparatus for mounting a notching blade to a carriage secured to a cross slide of a double-cut tube cut-off die set comprising:
- a carriage having front and rear faces, said carriage having a keyhole extending through and between said front and rear faces, said keyhole comprising a generally circular bore having a U-shaped groove adjacent thereto;
- a clamp member having a keyhole comprising a generally circular bore having a u-shaped groove adjacent thereto so as to correspond in shape to the keyhole in said carriage;
- a notching blade having a keyhole corresponding to the keyhole in said carriage, said notching blade being placed between said clamp member and said carriage at a point wherein the axes of the corresponding keyholes are aligned;
- a locking stud extending through said corresponding keyholes, said locking stud having a lock pin mounted at one end thereof and a shoulder portion at the opposite end, so that when the pin is placed through the clamp member, the notching blade and the carriage, the lock pin acts upon said carriage when said locking stud is rotated.

4,993,299

VERTICAL GANG SAW APPARATUS

Charles P. Hallez, Tellin, Belgium; Kurt Brach, Rodgau, Fed. Rep. of Germany; Vincent J. M. G. Favart, Cortil-Noirmont, Belgium; Jean-Claude O. P. Decroly, Brussels, Belgium; Pierre L. H. G. Ledru, Gembloux, Belgium; Werner Haag, Marktredwitz, and Josef Hecht, Mitterteich, both of Fed. Rep. of Germany, assignors to General Electric Company, Worthington, Ohio

Filed Apr. 24, 1989, Ser. No. 308,163
Claims priority, application Belgium, Mar. 25, 1988, 8800347
Int. Cl.[5] B27B *3/10*
U.S. Cl. 83—751 1 Claim



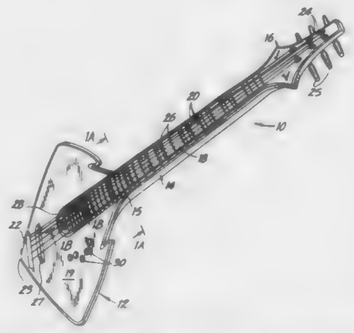
1. A vertical gang saw capable of simultaneous and synchronized reciprocating, rectilinear up-and-down movement and reciprocating, rectilinear movement in a horizontal plane, comprising a structure supporting a frame having a plurality of upper and lower corners and a series of saw blades held vertically on said frame, wherein said frame is linked at each corner by a pivot means to a corner foot that is engaged in one of a plurality of upper slide bars and lower slide bars, and wherein the lower slide bars are brought into translation by a first small drive rod driven by an eccentric gear and wherein the upper slide bars are brought into translation by a second small drive rod driven by an oscillating pinion having a double cam B'.

4,993,300

METHOD OF PLAYING A FRETTED STRING INSTRUMENT

Gary Ejen, 120-3J DeKruif Pl., Bronx, N.Y. 10475

Division of Ser. No. 731,817, May 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,244, Feb. 13, 1984, abandoned. This application Sep. 24, 1987, Ser. No. 100,792
Int. Cl.[5] G10D *3/06*
U.S. Cl. 84—314 R 1 Claim



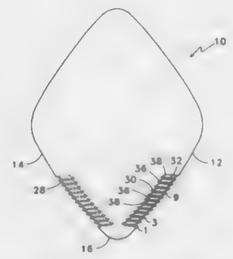
1. A method of playing a fretted string instrument having a body, a neck, a single elongated fingerboard on said neck and conventional strings in tension over said body between a head and bridge thereof; said fingerboard extending rearwardly of said neck over said body and including at least about twenty-five frets, a substantial number of which frets overlie said body, means for retaining said instrument against the body of the instrumentalist and angularly disposed relative to the vertical, said fingerboard being outwardly convexed, the forward edges of said body adjacent the fingerboard diverging rearwardly, said fingerboard thereby being accessible to the fingers of both hands approaching said fingerboard from opposite sides throughout the length of said fingerboard, neck and body, said method comprising the instrumentalist retaining the instrument against the instrumentalist's body and angularly disposed relative to the vertical with the single fingerboard facing outwardly, approaching said strings with the fingers of one hand from one side of said fingerboard and with the fingers of the other hand from the other side of said fingerboard, and tapping, bending and pulling at least one of the strings along the length of said fingerboard with the fingers of both hands by applying the fingers of one hand to the at least one string, then applying the fingers of the other hand in advance of the position of the one hand and then applying the fingers of the other hand again in a position in advance of the position of the other hand in either direction.

4,993,301

JAGGED EDGE PICK FOR A STRINGED MUSICAL INSTRUMENT

Federico E. de los Santos, 2068 E. Libra Dr., Tempe, Ariz. 85283, assignor to Federico E. de los Santos, Tempe, Ariz.

Filed May 16, 1990, Ser. No. 525,337
Int. Cl.[5] G10D *3/16*
U.S. Cl. 84—322 20 Claims



1. A pick having substantially parallel faces on opposite sides of a central plane with two angularly disposed picking edges converging to form an end used for picking strings of a stringed instrument, said pick having:
- each of said two edges being defined by an edge of a beveled surface;
- one of said beveled surfaces extending from a first face through the central plane toward a second face and the other of said beveled surfaces extending from the second face through the central plane toward the first face; and
- peaks and valleys forming a jagged surface on each of said beveled surfaces and being arranged so that by holding the pick in one playing position, beveled surfaces on opposite faces engage a string of a stringed instrument during both an up-pick stroke and a down-pick stroke to provide a first sound and by holding a pick in a second reversed playing position, a different second sound is provided by the same two angularly disposed edges.

4,993,302

NON SLIP GUITAR PICK

Fred F. Jonathan, 100 Wyandotte Ave., Buffalo, N.Y. 14207

Filed Jan. 19, 1989, Ser. No. 367,743
Int. Cl.[5] G10D *3/16*
U.S. Cl. 84—322 4 Claims



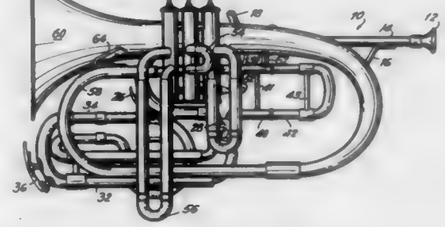
1. A non-slip string plucking device, comprising:
- a main body consisting of a piece of hard, flexible material which can be repeatedly bent without fracturing;
- at least one piece of soft, flexible material attached to a major surface of said main body; and
- a non-hardening adhesive thinly coated on the outside of said at least one piece of soft, flexible material.

4,993,303

HORNETTE

John Clark, 711 Amsterdam Ave., #18N, New York, N.Y. 10025

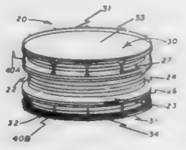
Filed Feb. 28, 1989, Ser. No. 317,000
Int. Cl.[5] G10D *7/10*
U.S. Cl. 84—394 16 Claims



1. A brass wind instrument comprising:
- a mouthpiece;
- a lead pipe with a first end engaging said mouthpiece and a second end engaging a tonal valve, wherein an air path is formed from said mouthpiece to said tonal valve;
- wherein said lead pipe and said mouthpiece are substantially equivalent to those of a French Horn;
- a tonal extension;
- an intermediate pipe;
- a valve assembly including a plurality of valves, various permutations of said valves extending the air path by lengths corresponding to successive half-step increments in a tone of said instrument;
- bell tubing;
- a bell substantially equivalent to that of a tenor trombone bell;
- said tonal valve having a closed and an open position, said closed position diverting the air path directly through the valve to said intermediate pipe, said open position diverting the air path from said valve through said tonal exten-

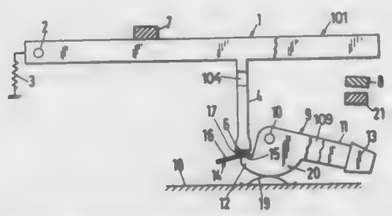
sion back to said tonal valve thereby changing a key of the instrument;
wherein the air path exits from said tonal valve to said intermediate pipe;
wherein the air path exits from said intermediate pipe to said valve assembly;
wherein the air path exits from said valve assembly to said bell tubing; and
wherein the air path exits from said bell tubing to said bell.

4,993,304
MULTI-ANNULAR MUSICAL DRUM
Ken S. Lovelet, P.O. Box 65, Mt. Tremper, N.Y. 12457
Filed Apr. 19, 1990, Ser. No. 511,211
Int. Cl.[5] G10D *13/02*
U.S. Cl. 84—411 R 20 Claims



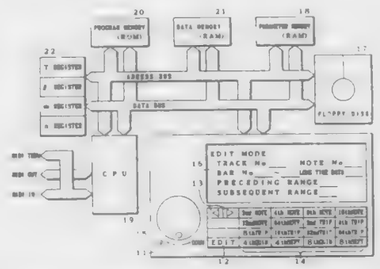
1. A multi-annular music drum comprising:
a plurality of annular shell rings, each ring being non-jointed along its circumference, said plurality of shell rings axially aligned and permanently connected to form a generally cylindrical drum shell.

4,993,305
MANUAL WITH PIANO EFFECT FOR USE IN ELECTRONIC ORGANS
Reinhard Franz, Emmelshausen, and Walfried Dost, Koblenz, both of Fed. Rep. of Germany, assignors to Wersi GmbH & Co., Halsenbach, Fed. Rep. of Germany
Filed Feb. 23, 1990, Ser. No. 484,866
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905645
Int. Cl.[5] G10D *3/12*
U.S. Cl. 84—439 26 Claims



1. A manual with piano effect for use in musical instruments, comprising an action including a key pivotable about a first axis between an idle position and a depressed position; a reaction member pivotable about a second axis which is spaced apart from said key, said member having an arm including a motion receiving portion; and a pusher fixedly secured to said key and having a motion transmitting end arranged to contact only said motion receiving portion so as to pivot said member from a first to a second position in response to pivoting of said key from said idle position to said depressed position, said end of said pusher contacting said portion of said arm at a first distance from said key and said key being disposed at a lesser second distance from said second axis in the idle position thereof.

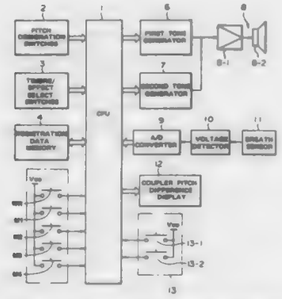
4,993,306
DEVICE FOR CORRECTING TIMING OF MUSIC PLAYING INFORMATION FOR USE IN MUSIC AUTO PLAY DEVICE
Noriyuki Ueta, Hamaamtsu; Akihiro Fujita, Iwata, and Shu Eitaki, Hamakita, all of Japan, assignors to Kawai Musical Inst. Mfg. Co., Ltd., Sizuoka, Japan
Filed May 19, 1989, Ser. No. 354,296
Claims priority, application Japan, May 22, 1988, 63-124773; Jun. 9, 1988, 63-142614
Int. Cl.[5] G10H *1/00, 1/36, 1/40*
U.S. Cl. 84—601 7 Claims



1. A device for correcting a timing of music playing information for use in an auto play device, comprising:
music playing information memorizing means for memorizing a timing of a change of a performance of a piece of music;
long time data memorizing means for memorizing a long time data, the timing of the change of the performance of a piece of music being corrected to an exact timing occurring at each interval of said long time data;
short time data memorizing means for memorizing a short time data, a time length of said short time data being shorter than a time length of said long time data, said short time data being set around a timing occuring at each interval of said long time data;
determining means for determining whether or not the timing of the change of the performance of a piece of music is within a range of said short time data; and
correcting means for correcting the timing of the change of the performance of a piece of music, which is outside the range of said short time data, to a timing within the range of said short time data, in response to a determination by said determining means.

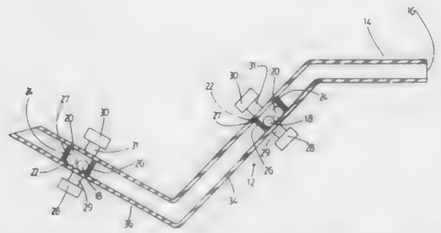
4,993,307
ELECTRONIC MUSICAL INSTRUMENT WITH A COUPLER EFFECT FUNCTION
Shigeo Sakashita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Mar. 15, 1989, Ser. No. 324,223
Claims priority, application Japan, Mar. 22, 1988, 63-36418
Int. Cl.[5] G01H *1/18, 1/36*
U.S. Cl. 84—615 16 Claims

1. An electronic musical instrument, comprising:
pitch designation means for designating a first pitch;
pitch difference data designating means for designating pitch difference data representing an arbitrary pitch difference with respect to said first pitch to be designated by said pitch designation means;
pitch difference memory means for storing plural pieces of pitch difference data designated by said pitch difference data designating means;
a plurality of pitch difference data selecting means for individually selecting said plural pieces of pitch difference data stored in said pitch difference data memory means;
instructing means for, when said first pitch is designated by said pitch designation means with corresponding pitch difference data being selected by said pitch difference data selecting means, instructing at a same time a second pitch having a pitch difference corresponding to said pitch difference data selected by said pitch difference data selecting means;
air flow detecting means for detecting an air flow state induced by a player; and



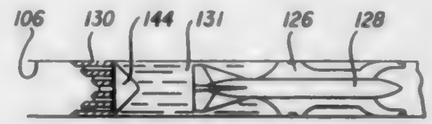
tone generating means for, when an air flow state is detected by said air flow detecting means, generating an original tone at said first pitch and a coupler tone at said second pitch in accordance with an instruction from said instructing means.

4,993,308
DEVICE FOR BREATH CONTROL OF APPARATUS FOR SOUND OR VISUAL INFORMATION
Norman A. Villeneuve, Oasis Trailer Park, R.R. #4, North Bay, Ontario, Canada P1B 8G5
Continuation-in-part of Ser. No. 187,421, Apr. 28, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 330,803
Int. Cl.[5] G01H *9/00;* H03K *17/968*
U.S. Cl. 84—724 7 Claims



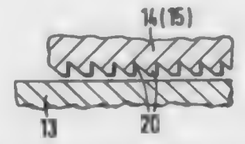
1. A device for producing signals for the operation of apparatus for producing sound or visual information in response to said signals, the device comprising:
a mouth piece having a plurality of air pipes adapted for the selective passage of sucked and blown air from an operator, at least a portion of each air pipe comprising a light transmitting wall adapted to allow transmission of light through the pipe;
light responsive means located on one side of the pipe adapted to receive light from the other side of the pipe through the light transmitting wall;
light emitting means on a side of each pipe opposed from the light responsive means, the light emitting means being adapted to illuminate said transmitting wall;
actuating means comprising a ball within each pipe movable under the action of air displacement within the pipe from a first position i which it blocks the transmission of light through the pipe into a second position in which it allows transmission of light through the light transmitting wall, the actuating means being biased, in use, into its first position wherein the ball is confined against movement other than between the first and second positions by partition through which air flows freely and located upstream and downstream off the ball in the pipe; and
photosensitive signal generating means for each actuating means located in a path of transmitted light.

4,993,309
LIQUID PROPELLANT WEAPON SYSTEM
Melvin J. Balman, Colchester, Vt., assignor to General Electric Company, Pittsfield, Mass.
Division of Ser. No. 300,638, Dec. 18, 1988, which is a division of Ser. No. 150,351, Dec. 16, 1987, Pat. No. 4,852,458. This application Jan. 22, 1990, Ser. No. 471,310
Int. Cl.[5] F41F *1/04;* F42B *5/16*
U.S. Cl. 87—7 1 Claim



1. A mode of operation for a round of annumition which includes in sequential train, a projectile, a volume of liquid propellant, a cavity generator, a volume of solid propellant and a primer:
said primer, when detonated, serves to ignite said volume of solid propellant to provide a volume of combustion gas;
said volume of combustion gas serves to forwardly accelerate said cavity generator, said volume of liquid propellant and said projectile;
said cavity generator, during acceleration, serves to pass combustion gas through said cavity generator to the aft face of said volume of liquid propellant to ignite, and to form a Taylor cavity in, said liquid propellant.

4,993,310
SEALING FOR THE DIFFERENTIAL PRESSURE PISTON-FUEL CHAMBER SYSTEMS OF FIREARMS
Hans Sackenreuter, Ruckersdorf, and Gerhard Onderka, Nuremberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Sep. 6, 1983, Ser. No. 532,509
Int. Cl.[5] F41F *1/04*
U.S. Cl. 89—7 5 Claims



1. In a sealing arrangement for differential pressure piston-combustion chamber systems which serve for the generation of propellant gases for barreled firearms from liquid, and particularly hypergolic propellant components; including a differential pressure piston axially movable within a firearm housing and being coaxial with the barrel of said firearm; and a support piston being arranged within a hollow shaft of the differential pressure piston, including propellant infeed and propellant discharge passageways; the improvement comprising: a combustion chamber connected with the firearm barrel, said combustion chamber widening conically at a flat angle; the head of the differential pressure piston forming an injector provided with overflow passageways and nozzles and having an external contour correlated with the cone of said combustion chamber, and the conical outer surface of the injector including annularly arranged recesses or grooves.

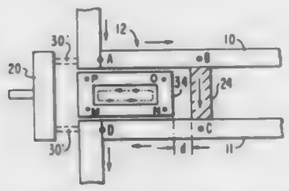
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4,993,311

ELECTROMAGNETIC PROJECTILE LAUNCHER WITH AN IMPROVED FIRING ARRANGEMENT

George A. Komeny, Wilkins Township, Allegheny County, and Dennis Pavlik, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 20, 1987, Ser. No. 17,303
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 13 Claims



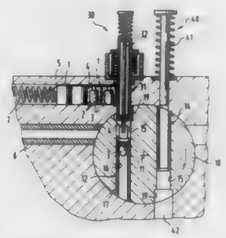
1. Electromagnetic projectile launcher apparatus, comprising:
(A) a pair of generally parallel conducting rails having a breech end and a muzzle end;
(B) a source of high current;
(C) an armature for conducting current between said rails and for propelling a projectile along said rails;
(D) a breech loop including said breech end of said rails and said armature, and into which current from said source is injected to commence projectile acceleration;
(E) switch means connected to said breech loop to initiate said injection of said current; and
(F) a shorted stationary current conducting loop proximate said breech loop and being electrically insulated therefrom and in substantial flux linking relationship therewith.

4,993,312

AUTOMATIC HAND WEAPON

Rainer Achterholt, Sportplatzweg 7, Durach/Weidach, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 253,096
Int. Cl.[5] F41A *3/04*
U.S. Cl. 89—155 9 Claims



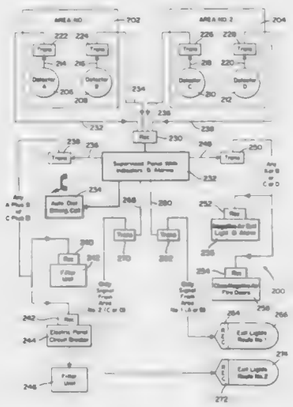
1. An automatic hand weapon comprising a barrel held stationary in a weapon housing and having an axially symmetrical bore located perpendicularly to the axis of the barrel; cylinder-shaped cartridge chamber housing being disposed within said bore and wherein said chamber housing is successively moved by positive intermittent rotary movement in the same direction about its axis of rotation into a firing position and into a loading position; and for receiving a cartridge from a magazine tunnel of a magazine mounted on the side of the weapon housing; and including two cartridge members located within said cylinder-shaped chamber housing wherein said two cartridge members are mutually disposed centrosymmetrically relative to the rotational axis of said cartridge chamber housing, wherein the intermittent rotary movement of the cartridge chamber housing is in 90° increments and wherein each of said cartridge members includes a loading opening at one end and a firing opening at the opposite end and is offset to the rotational axis of the cartridge chamber housing.

4,993,313

CONTROL SYSTEM FOR DOORS OF A NEGATIVE AIR PRESSURE ENCLOSURE

Eugene E. Newman, Maple Shade, and Anthony Natale, Mt. Holly, both of N.J., assignors to Gpac, Inc., Pennsauken, N.J.

Continuation-in-part of Ser. No. 346,621, May 2, 1989, Pat. No. 4,922,806. This application May 7, 1990, Ser. No. 519,216
Int. Cl.[5] F24F *11/00*
U.S. Cl. 98—1.5 11 Claims



1. A system for controlling access to and allowing air to flow into a sealed work area which is under negative air pressure and from which asbestos-containing material is removed, said system comprising:
access means for gaining access into the sealed work area,
wall means for isolating the sealed work area, said wall means defining at least one opening,
said access means including a rigid door pivotably mounted in said at least one opening for entrance and exit of personnel to and from the sealed work area,
swinging means for moving said door to provide an air flow path into the work area to maintain a predetermined negative air pressure,
at least one sensor means for detecting smoke or fire and for generating a signal upon detection of fire or smoke,
control means for receiving a signal from each of said at least one sensor means indicative of the presence of smoke or fire, and
means for disabling said swinging means to seal said air flow path by said door upon receipt by said control means of at least one signal from said at least one sensor means.

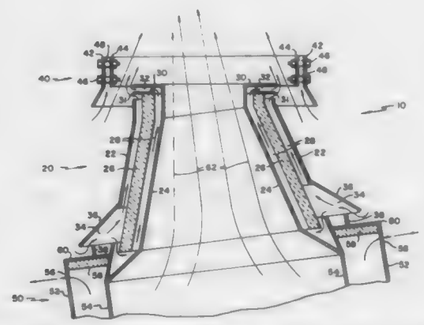
4,993,314

CONVECTIVELY COOLED HOT GAS EXHAUST STRUCTURE TO REDUCE INFRARED RADIATION

John R. Braden, Annapolis; Robert H. Burns, Arnold, and Melvin Greenberg, Annapolis, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1976, Ser. No. 660,200
Int. Cl.[5] F23J *11/04*
U.S. Cl. 98—58 6 Claims

1. A smokestack for exhausting hot gases that reduces the infrared radiation of the stack and blocks the low elevation angle view into the hot smokepipe comprising:
a watchcap having inner and outer walls forming a peripheral thermal insulating plenum chamber surrounding a portion of the smokepipe;
insulation means mounted between and in spaced relation to said walls;
a first air passage in said plenum chamber between said inner wall and said insulation;
a second air passage in said plenum chamber between said outer wall and said insulation;



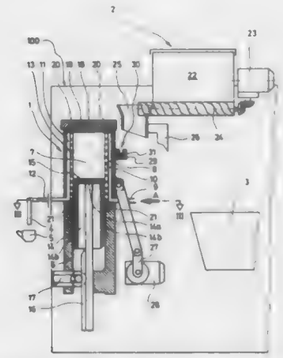
thereby allowing convection flow of cooling air in said plenum chamber;
means for causing said air in said passages to exit peripherally away from the stack gases at the top of said watchcap; and
means for inducting said cooling air into said passages at the bottom of said watchcap.

4,993,315

COFFEE PERCOLATOR

Siegfried Huber, Kuchen; Hans Motsch, Geislingen/Steige; Hermann Riegert, Treffelhausen; Rolf Ritter, Geislingen/-Steige; Erwin Schöll, Kuchen; Konrad Walter, Altheim/Alb, and Gehard Wittlinger, Geislingen/Steige, all of Fed. Rep. of Germany, assignors to WMF Wurttembergische Metallwarenfabrik AG, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 208,179
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720149
Int. Cl.[5] A47S *31/00*
U.S. Cl. 99—289 R 19 Claims



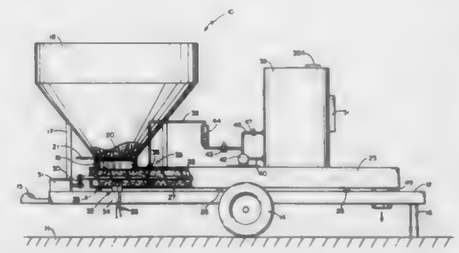
1. A sieve for use as a brewing sieve in a brewing chamber of a coffee making machine, said brewing chamber containing at least a first side wall and a second side wall opposite to the first side wall, the first side wall being moveable for adjusting and varying the volume of the brewing chamber, the sieve having a first end adapted to be arranged near the first side wall of the brewing chamber, a second end adapted to be arranged near the second side wall, and a surface adapted to face the brewing chamber, the sieve containing openings of differently sized cross-sectional areas, the openings being distributed over the surface of the sieve such that the size of the cross-sectional areas of the openings decreases in the direction from the first end towards the second end for increasing extraction time during brewing of smaller quantities of coffee.

4,993,316

SEED GRAIN CONDITIONING APPARATUS

David G. Greer, Anoka, Minn., assignor to Agrichem, Inc., Anoka, Minn.

Continuation-in-part of Ser. No. 191,378, May 9, 1988, Pat. No. 4,898,092. This application Jan. 5, 1990, Ser. No. 461,305
Int. Cl.[5] A23N *17/00*
U.S. Cl. 99—487 23 Claims



1. A seed grain conditioning apparatus to prepare seed grain for planting through the addition of moisture to raise the moisture content of the seed grain to an approximate target moisture content to promote germination of the planted seed grain, comprising:
a frame;
a seed grain hopper mounted on the frame for holding a supply of seed grain prepatory to addition of moisture;
a supply of seed grain located in the hopper;
seed grain conveying means on the frame for moving seed grain from the hopper in a downstream direction to a discharge location;
an outlet from the hopper to the grain conveying means;
a sensing station and a wetting station on the grain conveying means between the hopper outlet and the discharge location, the wetting station being located downstream of the sensing station;
a moisture sensor of the type to substantially continuously monitor moisture content of passing seed grain and convert the measurement into an electronic signal, positioned at the sensing station located to intercept a sample of passing seed grain for substantially continuous measurement of the moisture content of the sample and translation of the measurement into an electronic signal;
liquid applicator means located at the wetting station positioned to disburse liquid derived from a liquid supply upon passing seed grain;
a liquid supply container mounted on the frame and containing a supply of liquid comprised as water and a surfactant type solution;
control means to regulate the rate of moisture addition to the seed grain, and means connecting the moisture sensor to the control means so that the control means operates responsive to the electric signal generated by the moisture sensor according to the difference between the moisture content of the seed grain sample as sensed by the moisture sensor and the target moisture content, said means including calibrated means connected between the moisture sensor and the control means for regulation of the control

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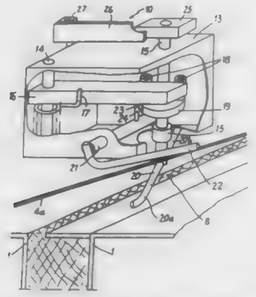
means by the signal from the moisture sensor calibrated according to a known moisture content of the type of seed grain to be conditioned.

4,993,317

DEVICE FOR CONTROLLING THE BINDING OF PRESSED MATERIAL

Thierry Collot, Rue-Champy, Gondreville la Franche, and Serge Pin, 21 rue des pervenches, 45700 Villemandeur, both of France

Filed May 8, 1989, Ser. No. 348,415
Claims priority, application France, May 11, 1988, 88 06402
Int. Cl.[5] B65B *57/10*
U.S. Cl. 100—4 5 Claims



1. A device for controlling the binding of bales of material formed on an agricultural baling press fitted with a binding system, in which the loop of a binding material is made around the bale progressively during compression of the material, wherein the device comprises:

a first finger for detecting presence of the binding material, the first finger is placed above the binding material at a distance therefrom so that an upper horizontal strand of the binding material is brought into contact during shaping of the bale to progressively raise the first finger;

a second detecting finger for detecting shaping of the binding loop, the second finger is placed in an active position between the binding material and the bale and is movable to a retracted position, the second finger being carried along with an axle substantially perpendicular to the binding material by the passage of a rear vertical strand of the binding material:

a motor member cooperating with the second finger to return the second finger from the retracted position to the active position in response to raising of the first finger by the binding material; and

a signal transmitter which is energized upon rotation of the axle, the transmitter indicating one of absence and rupture of the binding material during formation and knotting of the binding loop.

4,993,318

NEWSPAPER BUNDLER

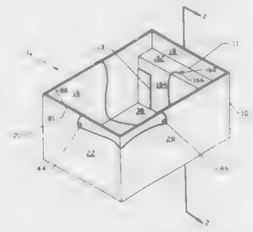
William G. Bollinger, 838 N. 10th St., Manitowoc, Wis. 54220

Filed May 15, 1989, Ser. No. 352,045
Int. Cl.[5] B65B *13/18*
U.S. Cl. 100—34 24 Claims

13. A device for bundling newspapers comprising:

(a) a first paperboard blank having a side wall comprising a string end panel, a back panel, two side panels and an attachment panel extending from an edge of one of the panels, the panels being defined in part by fold lines and the first blank being bendable along the fold lines so that the attachment panel on the one panel is connected to another panel and the side wall forms a closed rectangular side wall, and a plurality of bottom panels depend from the side wall panels along a fold line and engage together in assembled relation to form a bottom for the closed rectangular side wall, and the side wall has at least one score line in spaced relation to the fold line which lies along the bottom panels, the score line defining the top edge of the side wall panels, and interior flaps extend from the side wall panels adjacent the score line, each flap being approximately the same size as the side wall panel from which it extends, and each interior flap is folded on the score line to lie adjacent to the side wall panel from which it extends to form a double wall;

(b) a second paperboard blank having a front panel and a top panel, the panels being defined in part by fold lines and the second blank is folded along the fold lines and inserted within the rectangular side wall of the first blank adjacent the string end panel with the front panel substantially parallel to and spaced from the string end panel, the top panel positioned at an angle to the string end panel and spaced from the bottom of the second blank, and the string end panel, top panel, front panel and bottom panel define



a string compartment for containing a ball of string, the top panel of the second blank having portions defining a hole for feeding a length of string from the string compartment, wherein the back panel of the first blank, the two side panels of the first blank, and the front panel of the second blank define a paper compartment sized to receive folded newspapers in flat, stacked relation;

(c) a plurality of gripping fingers for gripping a ball of string located on at least one of the string end panel and the interior string end panel of the first blank, the gripping fingers being disposed around an opening for retaining a ball of string substantially within the opening and the string compartment to permit a length of string to be removed from the gripped ball and to be fed through the hole in the second blank in a continuous manner; and

(d) string fastener means engaged on the two side panels and the back panel of the side wall in spaced relation to the bottom for retaining the length of string around stacked newspapers in the paper compartment to facilitate tying the stacked newspapers in a bundle.

4,993,319

IMPRINTING DEVICE EQUIPPED WITH AN ADJUSTABLE COUNTERPRESSURE CYLINDER

Karl Klappenecker, Constance, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 342,862
Int. Cl.[5] B41F *5/00*
U.S. Cl. 101—216 5 Claims

1. Imprinting device comprising:

a rotary stamp;

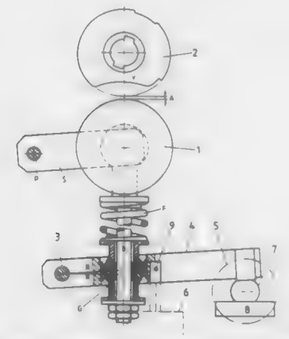
a rocker pivoting around a first point;

a counterpressure cylinder disposed a distance from the rotary stamp;

means for elastically attaching the counterpressure cylinder to the rocker comprising a spring and a means for guiding the spring, the counterpressure cylinder thereby moving toward and away from the rotary stamp;

a stop; and

a detent pin associated with the stop, the detent pin interposed between the rocker and the stop defining a first terminal position for the rocker, and the detent pin re-



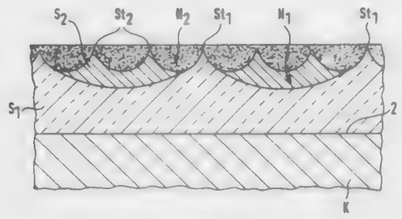
moved from between the rocker and the stop, whereby the rocker contacts the stop, defining a second terminal position for the rocker, whereby the distance between the counterpressure cylinder and the rotary stamp is decreased and increased, respectively.

4,993,320

INKING ROLLER AND METHOD FOR THE PRODUCTION THEREOF

Hans-H. Kochsmeier, Bovenden, Fed. Rep. of Germany, assignor to W. Haldenwanger Techn., Berlin, Fed. Rep. of Germany

Filed Jul. 5, 1989, Ser. No. 375,838
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1988, 3822692; Feb. 4, 1989, 3903372
Int. Cl.[5] B41F *31/26*
U.S. Cl. 101—148 15 Claims



1. A method for the production of an inking roller for an inking mechanism comprising the steps of:

(a) applying an outer abrasion-resistant layer to a dynamically balanced roller cylinder;

(b) engraving a pattern in the abrasion-resistant layer by laser beam to define a first surface screen system, the pattern leaving upstanding webs between exposed depressions;

(c) filling the engraved depressions substantially completely with hydrophobic lining material;

(d) partially removing the lining material until the webs are exposed; and

(e) forming a plurality of cells in the lining material, the cells being independent of the depressions as regards arrangement and structure thereof, for receiving ink therein for a printing process.

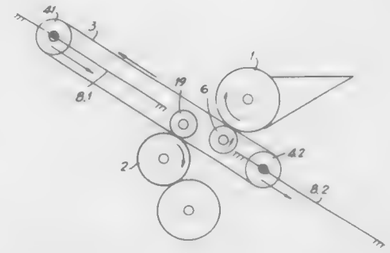
5. An apparatus for transferring ink, comprising a dynamically balanced roller cylinder, a ceramic layer applied to its surface and having a plurality of depressions formed in the surface thereof and defining between them first webs; a layer of hydrophobic lining material at least partially filling the depressions, the layer of hydrophobic material having a plurality of cells formed therein, the cells defining second webs therebetween.

4,993,321

INKER UNIT FOR HIGH-SPEED ROTARY PRINTING PRESS

Wolfgang Dennstedt, Leipzig, German Democratic Rep., assignor to VEB Kombinat Polygraph "Werner Lamberts" Leipzig, Leipzig, German Democratic Rep.

Filed Dec. 4, 1989, Ser. No. 445,746
Claims priority, application German Democratic Rep., Dec. 23, 1988, 3238343
Int. Cl.[5] B41F *31/06, 31/10*
U.S. Cl. 101—350 7 Claims



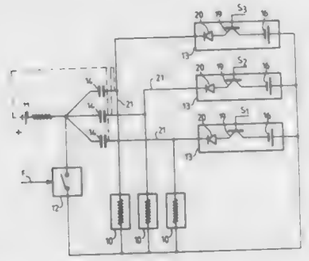
1. An inker unit for a high-speed printing press having a drive, said inker unit comprising an ink fountain roll continuously rotatable in a predetermined direction; an ink transfer roll; and endless ink transfer band arranged between said ink fountain and ink transfer rolls for transfering ink from said ink fountain roll to said ink transfer roll, said ink transfer band revolving in the predetermined direction of rotation of said ink fountain roll and having a first run spaced from an outer surface of said ink fountain roll, and a second run constantly engaging an outer surface of said ink transfer roll, said ink transfer band being driven by said ink transfer roll; an ductor roll for moving said first run of said ink transfer band periodically into engagement with said ink fountain roll; two spaced guide rollers supporting said ink transfer band for revolving movement thereof; means for supporting said two guide rollers for joint translational reciprocating movement; and means for translationally reciprocating said two guide rollers synchronously with a ductor roll cycle, whereby said ink transfer band is tangentially linearly displaceable relative to said outer surface of said ink fountain roll in synchronism with the ductor roll cycle, said ink transfer band being linearly displaceable, when engaging said ink fountain roll, in a direction opposite to the direction of rotation of said ink fountain roll, speeds of revolving and linear movements of said ink transfer band and a rotational speed of said ink fountain roll being chosen so that, at engagement of said ink transfer band with said ink fountain roll, a resulting speed vector of a contact surface area of said ink transfer band and speed vector of a respective surface area of said outer surface of said ink transfer roll have the same magnitude and direction.

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4,993,322
DEVICE FOR SELECTION AND TRIGGERING OF FIRING CIRCUIT

Boucard Jean, Boulogne, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Aug. 18, 1988, Ser. No. 234,021
Claims priority, application France, Aug. 14, 1987, 87 11582
Int. Cl.[5] F23Q *3/00*
U.S. Cl. 102—218 13 Claims

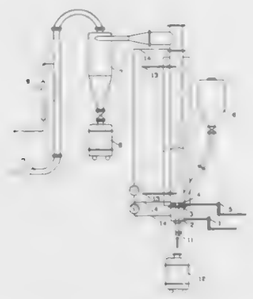


1. A device for selection and selective triggering of detonator comprising, for each detonator of said detonators (10), an electrical triggering chain (14,21) to communicate a firing electrical pulse to each said detonator, a single energy source (11) for said triggering chains, a single switch (12) to apply said pulses in said electrical triggering chains (14) and means for inactivating a chain of said triggering chains before the switch (12) is commutated so as to make those detonators which are not to be triggered inoperative, each said triggering chain having a capacitor (14) used to deliver, to each operative detonator of said detonators said pulse with energy sufficient for each said operative detonator to be triggered.

4,993,323
FLUIDIZED BED COMBUSTION OF ALUMINUM SMELTING WASTE

Ronald S. Tabery, 1300 Crystal Creek Dr., Austin, Tex. 78746, and Ky Dangtran, 8210 Beat Tree Rd., #229, Austin, Tex. 78758

Division of Ser. No. 242,526, Sep. 8, 1988, abandoned. This application May 1, 1989, Ser. No. 345,824
Int. Cl.[5] F23G *5/00, 7/00*
U.S. Cl. 110—346 8 Claims

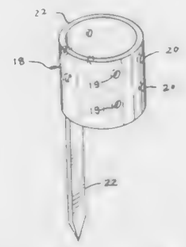


1. An thermo-chemical process for consuming Spent Potliner and the contaminant compounds present in Spent Potliner, the process comprising:
granulating a fuel blend of a lignite, b. limestone, and c. Spent Potliner, in proportions ranging from 1:1:1 to 3:1:1;
burning the granulated mixture in a fluidized bed combustor at a temperature of from 800° C. to 1000° C.;
chemically forming a free-flowing ash from the consumed mixture.

4,993,324
RETAINER FOR GRENADE BODY LOADING ASSEMBLIES FOR DEMOLITION OF UNEXPLODED ORDANCE

David Stefanye, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 6, 1989, Ser. No. 407,385
Int. Cl.[5] C06C *5/06*
U.S. Cl. 102—275.12 9 Claims

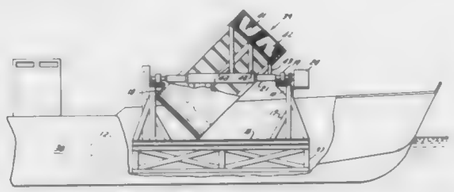


1. A retainer for retaining a detonating means and a body loading assembly of a general purpose grenade in firm, intimate contact for using said grenade for demolition purposes, said retainer comprising:
a cylindrical body formed of a composite material with an interior diameter equal to an exterior diameter of said body loading assembly,
said cylindrical body being capable of receiving and retaining said body loading assembly by friction;
one pair of oppositely disposed holes near an end of said retainer for accepting and retaining said detonating means,
a second pair of oppositely disposed holes with said second pair of holes at least one hole diameter below and at right angles to said first pair of holes to accept and retain said detonating means to provide coverage of a lead cup primer of said body loading assembly by more than one detonating component to ensure high-reliability functioning.

4,993,325
MAGNETIC FIELD GENERATOR

James C. Slone, Jr.; John A. Hudson, and Bernard Deleman, all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1970, Ser. No. 59,796
Int. Cl.[5] F42B *22/42*
U.S. Cl. 102—402 9 Claims



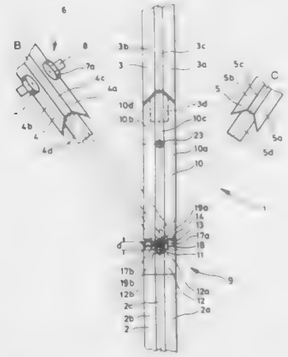
1. A magnetic field generating means comprising in combination:
coil assembly means for generation of a magnetic field in response to electrical current flowing therein;
axle means attached to said coil assembly means and passing through the center thereof for rotatable support thereof;

bearing means on opposite sides of said coil assembly means and journaled about said axle means for rotatably supporting said axle means therein;
support means attached to said bearing means for support thereof, along with said axle means and said coil assembly means carried therewith;
drive means effectively attached to said axle means for selective rotation thereof within said bearing means, said drive means including an electric motor and a speed reduction means effectively interconnecting the output of said electric motor and the aforesaid axle means for the transmission of rotational driving energy thereto;
generator means electrically connected to said coil assembly means for supplying electrical current thereto; and
control means electrically connected to said generator means for reversing the direction of the current output thereof to thereby reverse the polarity of the magnetic field produced by said coil assembly means.

4,993,326
RAIL SWITCH

Horst Bergemann, Landsberg, Fed. Rep. of Germany, assignor to Veit Transpo GmbH, Landsberg/Lech, Fed. Rep. of Germany

Filed Jun. 1, 1989, Ser. No. 360,180
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3819029
Int. Cl.[5] E01B *25/22, 25/26;* E05D *11/00;* B61B *13/06*
U.S. Cl. 104—89 17 Claims

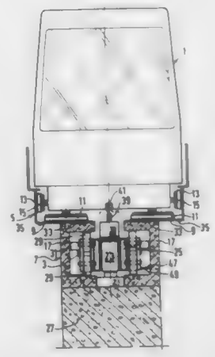


1. A rail switch for connecting a free end of a first rail to free ends of at least two other similarly shaped rails, each of said rails having a centerline and a runway formed of two angularly inclined runway surfaces on either side of the centerline which are adapted to carry a pair of similarly angularly inclined casters of a conveyor carriage, said rail switch comprising a switch portion having a corresponding runway connected at one end to the free end of said first rail by a hinge means that permits said switch portion to pivot about an axis located on the centerline of aid first rail for selective connection of an end opposite said one end to the free ends of said other rails, at least a portion of the runway surfaces of the switch portion at said one end adjacent said hinge means overlapping a portion of the runway surfaces of the free end of said first rail and at least a part of said overlapped portion of the runway surfaces of the first rail being inclined inwardly at an angle α in a direction towards the centerline of said first rail.

4,993,327
APPARATUS FOR COLLECTIVE TRANSPORTATION OF PASSENGERS, OF METROPOLITAN TYPE WITH AUTOMATIC DRIVE BY INDEPENDENT TRACTION TRUCKS USING PROPULSION NOTABLY BY LINEAR MOTOR

Andre Labarre, 6 rue du Mont-Perdu, 31240 - L'Union, and Francois Passemard, 53 rue Devic, 31400 Toulouse, both of France

Filed Jun. 22, 1989, Ser. No. 370,278
Claims priority, application France, Jun. 27, 1988, 88 08618
Int. Cl.[5] B60L *13/00*
U.S. Cl. 104—290 15 Claims



1. Apparatus for collective transportation of passengers with automatic drive of passenger cabins (1), characterized in that the cabins (1) are driven by independent trucks (3) moving over a track (7) parallel to the cabin track (5), these trucks being coupled in relatively loose or flexible connection to the cabins so that their path will not be affected by that of the cabins and vice versa, said trucks (3) being disposed under the cabins (1) and in their median plane, guided on an underlying track (7) contiguous to the cabin track (5), and said trucks (3) being connected to the cabins (1) by means of a retractable current collector (37) carrying the coupling element (39) between cabins and trucks.

4,993,328
TROLLEY ASSEMBLY

Bernard J. Wendt, Davisburg, and Thomas L. Beno, Farmington Hills, both of Mich., assignors to Allor Manufacturing, Inc., Novi, Mich.

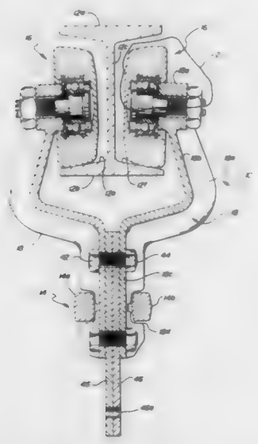
Continuation of Ser. No. 234,552, Aug. 22, 1988, abandoned. This application Apr. 10, 1990, Ser. No. 508,547
Int. Cl.[5] A47H *15/00*
U.S. Cl. 105—150 13 Claims

1. A trolley wheel assembly for use with a conveyor system, said wheel assembly comprising:
(A) a roller comprising a solid generally cylindrical body including a circumferential surface for rolling engagement with a track of the conveyor system, an outboard sidewall, an inboard sidewall, and a blind bore opening in said outboard sidewall and extending to a location proximate said inboard sidewall but spaced therefrom by a solid body portion of said roller defining a blind end face of said bore;
(B) a shaft positioned in said blind bore and having a free outboard end projecting out of said bore for connection to a trolley hanger and an inboard end;
(C) means, including a bearing positioned in said blind bore in surrounding relation to said shaft, operative to preclude axial movement of said shaft relative to said roller and maintain said inboard end of said shaft in a position proximate but spaced outboard from said blind end face of said

bore, said bearing comprising an outer race carried by said roller, an inner race carried by said shaft and defining an annular space between said inner and outer races, and bearing members positioned rollably between said inner and outer races;

(D) a ring seal positioned in said blind bore outboard of said bearing members sealingly and contiguously coacting at its outer periphery with an outboard annular face of said outer race and sealingly and contiguously coacting at its inner periphery with an outboard annular face of said inner race; and

(E) a second annular seal positioned in said blind bore between said bearing members and said ring seal and sealing said annular space.

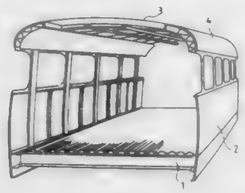


4,993,329

CAR BODY FOR RAILWAY ROLLING STOCK AND METHOD OF FABRICATING THE CAR BODY

Michifumi Takeich; Sumio Okuno; Keiji Ohmura; Masato Okazaki, and Hitoshi Tsuruda, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,045
Claims priority, application Japan, Jun. 6, 1988, 63-137568
Int. Cl.[5] B61D *17/00*
U.S. Cl. 105—401 18 Claims



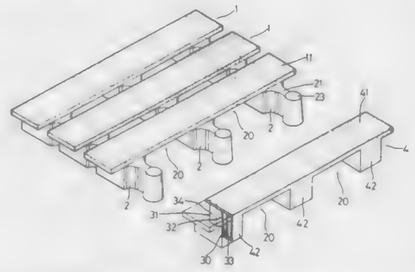
18. A method of fabricating a car body for a railway rolling stock in which modules forming the car body are separately constructed, said modules being subsequently combined to fabricate the car body, the method comprising the steps of arranging and connecting a roof outer sheet and a laterally extending member of one of the modules between two upper connecting members arranged in parallel to each other in a spaced relationship adjusted to a width of the car body to constitute an upper construction module of the car body, arranging and connecting cross beam means between two lower connecting members arranged parallel to each other in a spaced relationship adjusted to the width of the car body to constitute a lower construction module of the car body, holding the upper construction module of the car body, above the lower construction module of the car body leaving a space corresponding to a vertical dimension of a window opening portion of the car body, and connecting the opposed upper connecting members and lower connecting members through said post means.

4,993,330

COMBINED PALLET

Neng-Tung Yen, Yung Kang Hsiang, Taiwan, assignor to Jiun Dean Enterprise Co., Ltd., Tainan Hsien, Taiwan

Filed Jun. 28, 1990, Ser. No. 545,057
Int. Cl.[5] B65D *19/12*
U.S. Cl. 108—56.1 3 Claims



1. A combined pallet comprising:

a plurality of pallet units and an end unit attached one after another to form a pallet of desired width, each of said pallet units including:

a molded rectangular board member; and at least three attachments arranged in spaced relation below said board member and each being formed with a socket member having a substantially cylindrical side wall extending downwardly from a bottom portion of said board member and defining a chamber, a neck member extending laterally from one side of the cylindrical side wall of the socket member and in a direction transverse to longitudinal direction of the board member and a projection attached to outer end of the neck member, said chamber being conformed to the projection and at least a portion of the neck member attaching the projection;

said end unit including:

a molded rectangular board member same in dimension as board members of the pallet units; and

at least three attachments arranged in spaced relation under the board member of the end unit and each attachment being formed with a socket member having a substantially cylindrical side wall extending downwardly from a bottom surface of the board member of the end unit and defining a chamber being conformed to the projection and at least a portion of the neck member attaching the projection of the pallet unit.

4,993,331

TREATMENT OF WASTE AND A ROTARY KILN THEREFOR

Kenneth L. White, Kenmore, and Harold B. Wight, Glen Waverley, both of Australia, assignors to Neutralysis Industries Pty. Ltd., Rocklea, Australia

Continuation of Ser. No. 240,127, May 20, 1988, Pat. No. 4,890,563. This application Oct. 31, 1989, Ser. No. 429,473
Claims priority, application Australia, Oct. 2, 1986, PH8282
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] A47J *36/00, 36/21*
U.S. Cl. 110—246 14 Claims



1. A method for the treatment of waste materials including the steps of:

mixing solid and/or liquid wastes with a binding material;

forming pellets of waste material from said mixture;

passing the pellets through a pyrolysis zone in a kiln to drive off at least a portion of the volatile gases in the waste;

passing the pellets through an oxidation zone in a kiln where the oxygen causes the remaining volatile gases and at least a portion of the fixed carbon in the waste to be oxidized;

passing the pellets through a vitrification zone in a kiln to vitrify the silicates present in the pellets to form a solid aggregate, and wherein

the volatile gases from the pyrolysis zone are used as fuel gas for combustion in the oxidation and/or vitrification zones.

4,993,332

HYBRID FLUIDIZED BED AND PULVERIZED COAL COMBUSTION SYSTEM AND A PROCESS UTILIZING SAID SYSTEM

László Boross, Budapest; Sandor Kovacs, Tatabanya; Karoly Remenyi, Budapest; Pal Resch, Budapest; László Vörös, Budapest; Ferenc Horvath, Budapest, and Tibor Gerlai, Budapest, all of Hungary, assignors to Villamosenergiapari Kutato Intezet, Budapest and Tatabanyai Hoeromu Vallalat, Tatabanya, both of, Hungary

PCT No. PCT/HU88/00070, § 371 Date Sep. 13, 1989, § 102(e) Date Sep. 13, 1989, PCT Pub. No. WO89/04940, PCT Pub. Date Jun. 1, 1989
PCT Filed Oct. 27, 1988, Ser. No. 416,312
Claims priority, application Hungary, Nov. 17, 1987, 4645/86
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—347 9 Claims

1. A hybrid combustion system comprising: a portion for fluidized bed combustion comprising:

a fluidized bed chamber;

a coal mill without air separator;

a recycling duct connected to said coal mill serving for recycling a flue gas;

a coal supply duct for supplying coal;

a spray feeder and at least one air supply duct for fluidization and combustion; and

a portion for pulverized coal combustion comprising:

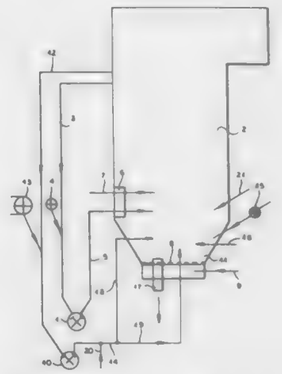
a pulverizing coal mill with air separator;

a blowing duct for blowing in coal ground in said pulverizing coal mill;

at least one pulverized coal burner;

a recycling duct connected to said pulverizing coal mill serving for recycling a flue gas; and

wherein said fluidized bed combustion takes place in a lower part of said system and pulverized coal combustion takes place above said fluidized bed combustion, each of said portions being independent in operation of the other, and a main combustion chamber being provided so as to be common to said fluidized bed portion and to said portion for pulverized coal combustion for burning rising fuel and said pulverized coal.

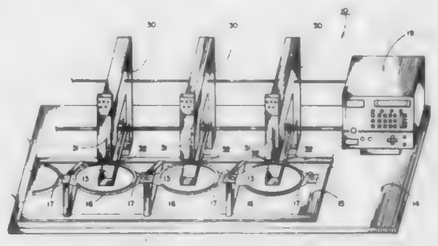


4,993,333

SEWING APPARATUS

Edgar F. Moore, III, 4447 Old Randleman Rd., Greensboro, N.C. 27406

Continuation of Ser. No. 348,943, May 8, 1989, Pat. No. 4,932,341. This application Apr. 9, 1990, Ser. No. 506,921
Int. Cl.[5] D05C *9/04*
U.S. Cl. 112—103 14 Claims



1. A framing hoop comprising a rim, a flange attached to said rim, said flange defining a tension member receiving port said flange defining a ramp, said ramp positioned forward of said receiving port away from said rim.

4,993,334

SEWING STATION FOR PIECES OF MATERIAL

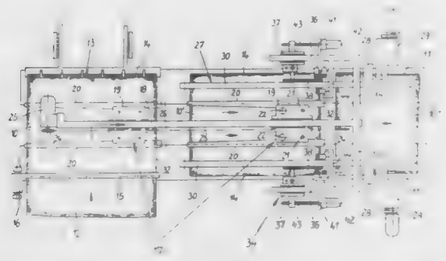
Siegfried Henze, Raiffeisenstr. 10, D-8741 Hobenroth, and Hubert Kaluza, Hauptstr. 45, D-8732 Kleinwenkheim, both of Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,267
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818796
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 10 Claims

1. In a sewing station for pieces of material incorporating processing stations, comprising a first conveyance device and a second conveyance device for the pieces of material, the first conveyance device serving to deliver said pieces of material from a source to the second conveyance device, a lifting device for lifting the second conveyance device for introduction

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of one of the said pieces of material and for lowering the second conveyance device so that the piece of material can be picked up and conveyed further to at least one processing station, the improvement wherein, in an area of the second conveyance device (27) and viewed from a direction of movement of the piece of material (10), there is provided an alignment device (34), means for moving said alignment device (34) vertically and horizontally in front of a processing station (28,29) for engagement with the piece of material (10) and for



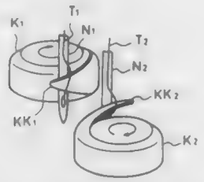
alignment of a front edge (32) of the piece of material (10), sensing elements (45,46) for sensing a position of the front edge (32) of the piece of material (10) and for controlling the alignment device so that it can be placed on the piece of material (10) and then can be shifted according to the position of a forward moving front edge (32) of the piece of material (10) in a direction of or counter to the direction of movement of the piece of material (10) to adjust its position before it is conveyed further to the processing station (28,29) by the second conveyance device (27).

4,993,335

HOOKING ARRANGEMENT FOR TWO-NEEDLE LOCKSTITCH SEWING MACHINES

Minoru Ozaku, Chofu, Japan, assignor to Juki Corporation, Tokyo, Japan

Continuation of Ser. No. 186,705, Apr. 20, 1988, abandoned, which is a continuation of Ser. No. 912,339, Sep. 26, 1986, abandoned. This application May 23, 1989, Ser. No. 356,573
Claims priority, application Japan, Sep. 26, 1985, 60-213272
Int. Cl.[5] D05B *1/12, 57/08*
U.S. Cl. 112—163 **1 Claim**



1. A hooking arrangement for a two-needle lockstitch sewing machine, comprising

a first thread hook and a second thread hook, each of said thread hooks rotating horizontally in the same direction;

a first needle and a second needle, each of said needles positioned between said first and second thread hooks and having an opening oriented such that a first needle thread and a second needle thread passes through the openings in said first and second needles, respectively, in the same direction;

said first thread hook having a first hook point which hooks said first thread between said first needle and said second needle; and

said second thread hook having a second hook point which hooks said second thread between said second needle and said second hook.

4,993,336

NEEDLE LOCKER IN AN OVERLOCK SEWING MACHINE

Masanori Mizunuma, Tochigi, Japan, assignor to SSMC Inc., Edison, N.J.

Filed Jun. 12, 1989, Ser. No. 364,295
Claims priority, application Japan, Jul. 15, 1988, 63-93835[U]
Int. Cl.[5] D05B *55/02*
U.S. Cl. 112—226 **4 Claims**



1. A needle locker for an overlock sewing machine having a given direction of material feed, said locker comprising;

a vertical locker body having a vertical recess extending downwardly therein from an upper end of the body, said recess extending perpendicular to said direction of feed;

a first vertical bore disposed in said body and aligned with said recess, the bore having an upper end disposed adjacent but below said recess and a lower open end, said first bore having a cross section in the shape of an ellipse;

a second vertical bore disposed in said body and offset from but parallel to the first bore,

first, second, and third vertical needles, the first and second needles being disposed removably in parallel adjacent relationship in said first bore and having downwardly pointed lower the extending below said body, the third needle being disposed removably in said second bore and having a downwardly pointed lower end extending below said body;

first manually operated means for detachably securing said first needles in said first and second bore; and

second manually operated means for detachably securing said third needle in said second bore.

4,993,337

SEWING MACHINE WITH AUTOMATIC THREAD CONTROL AND THREAD BREAKAGE DETECTING DEVICES

Kenji Matsubara, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 22, 1990, Ser. No. 526,709
Claims priority, application Japan, Jul. 5, 1989, 1-173756
Int. Cl.[5] D05B *69/36*
U.S. Cl. 112—273 **12 Claims**

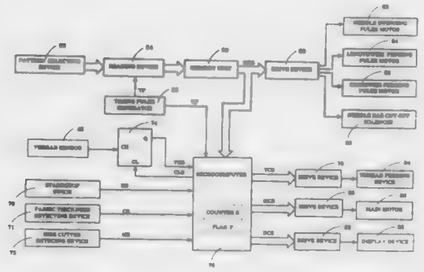
6. A sewing machine comprising:

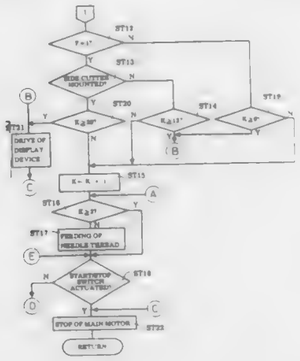
position detecting means for detecting a predetermined rotational angular position of a main shaft driven by a main motor and generating a position signal;

thread feeding means for feeding out a needle thread toward a needle;

first control means for driving said thread feeding means based on the position signal generated by said position detecting means;

thread breakage detecting means disposed in a path of the needle thread between said thread feeding means and the needle for detecting the needle thread along the path and generating a thread breakage signal when the needle thread is out of the path;





count means for counting the position signals generated during the time the thread breakage signal is generated by said thread breakage detecting means;

second control means for stopping the main motor when a count value of said count means has reached first predetermined value; and

third control means for stopping said thread feeding means when the count value of said count means has reached a second predetermined value which is smaller than the first predetermined value.

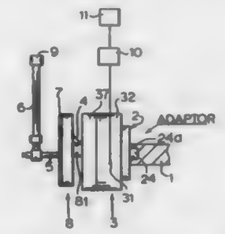
4,993,338

STITCH SWITCHING MECHANISM FOR A CHAIN STITCH SEWING MACHINE

Robert Bouthillier, Dayville, Conn., assignor to Aberdeen Manufacturing Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 12,438, Feb. 9, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 230,868
Int. Cl.[5] D05B *27/22*
U.S. Cl. 112—315 **6 Claims**

1. In a chain stitch sewing machine having a movable stitch eccentric shaft for switching between a bunch stitch and a long stitch and rotatable main drive shaft, the improvement comprising means mounted on the main shaft for rotation therewith and for moving the eccentric shaft relative to the main shaft to effect a switching from one stitch to the other while the machine is in operation, the means for moving comprising a cam follower connected to the eccentric shaft, means normally biasing the cam follower in one position corresponding to one stitch and activatable means for moving the cam follower to a second position corresponding to the other stitch, said activat-



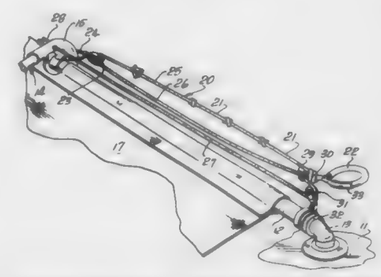
able means comprising a stationary hollow bore air cylinder with a rotatable bearing, a shaft extending through the cylinder and receiving the cam follower therein, whereby air supplied to said cylinder causes at least a portion of said cylinder to engage and move said cam follower to thereby move the eccentric shaft to another position to change the switch length.

4,993,339

UPHAULER FOR BOARDSAILING

Frank H. Cooper, 896 Via Ondulando, Ventura, Calif. 93003, and Donald E. Watkins, 6837 Zelzah Ave., Ventura, Calif. 93003

Filed Feb. 2, 1990, Ser. No. 474,341
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—39.2 **7 Claims**



1. An improved uphauler assembly for use in facilitating the uphauling of the sail of a sailboard by a boardsailer wearing a harness including a harness hook, said sailboard being of the type having a board, a mast connected to the board, said mast having a base, a sail affixed to the mast, a boom including a nose, said boom being affixed to the mast, wherein the improvement comprises:

an upper pulley affixed adjacent the nose of the boom;

a lower pulley affixed near the base of the mast;

an uphauler line formed in a large loop, said uphauler line passing through said upper pulley and said uphauler line including a small loop, said large loop extending about from the upper pulley to the lower pulley;

an elastic cord having an upper end and a lower end, said elastic cord being affixed at its upper end to the nose of the boom, passing through the lower pulley and affixed at its lower end to the uphauler line near said small loop thereof, said elastic cord being of sufficient length and elasticity to pull said uphauler line into a flat loop when the assembly is in a released configuration and to stretch sufficiently to permit the small loop to be hooked onto the harness hook of a boardsailer, whereby the sail may be uphauled by grasping the small loop and hooking it onto

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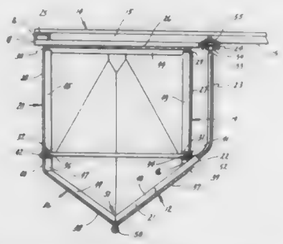
the harness hook, next, one side of the large loop is grasped and pulled inwardly by the boardsailer to provide the mechanical advantage of the pulley to assist the boardsailer to uphaul the sail and when the sail is fully raised, the uphauler assembly is retracted by the elasticity of the elastic cord which pulls the large loop against the mast.

4,993,340

BOAT STRUCTURE

Orlyn G. Pepper, 4093 Carpenter Rd., Ypsilanti, Mich. 48197

Filed Sep. 25, 1989, Ser. No. 411,824
Int. Cl.[5] B63B *3/00*
U.S. Cl. 114—61 **19 Claims**



1. A boat structure comprising:

an elongated buoyant pontoon hull comprising a deck and a keel region, each extending longitudinally along the hull;

rigid means affixed to, and extending transversely with respect to, the deck and beyond the deck on at least one side thereof;

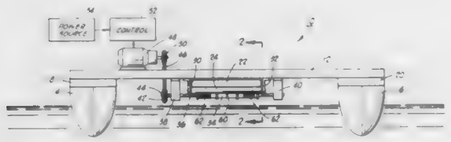
adjusting means attached to a first point of attachment on the hull at a location spaced from the deck in the direction toward the keel region and to a second point of attachment on the rigid means offset transversely from a position directly above the first point of attachment, the adjusting means being settable to determine the distance between the first and second points of attachment to set the position of the keel region transversely relative to the longitudinal direction of the hull.

4,993,341

CONTROLLABLE GANGPLANK FOR PONTOON BOAT

Don C. Merkel, P.O. Box 207, Perryton, Tex. 79070

Filed Jan. 24, 1990, Ser. No. 469,211
Int. Cl.[5] B63B *27/14*
U.S. Cl. 114—61 **6 Claims**



1. An extendable gangplank for a pontoon boat having a main deck portion and spaced lateral pontoons, comprising:

parallel spaced guide means secured longitudinally to the under side of the main deck portion between said pontoons;

a gangplank having front and rear ends and being slidably retained by said guide means to extend forward of the pontoon boat;

reversible drive means including a rotatable drum positioned transverse the boat and proximate the bow underside the main deck portion, said drum being selectively controlled to effect forward and reverse rotation;

a first cable wound on said drum and extending rearward for connection to said gangplank rear end;

a second cable having first and second ends oppositely wound on said drum and extending rearward around a pulley support disposed adjacent the gangplank rear end;

idler pulley means secured to the rear end of said gangplank and receiving the second cable forward thereover; and

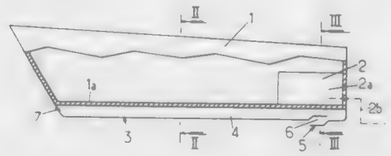
control means operable from the main deck portion to control selectively said drive means to rotate the drum with the first cable winding up and the second cable unwinding to position the gangplank forward of the main deck portion, and to rotate the drum in the opposite direction with the first cable unwinding and the second cable winding up to position the gangplank withdrawn and beneath the main deck portion.

4,993,342

KEELS OF CRAFT

Michel Eymard, Toulouse, France, assignor to Zodiac International, Issy les Moulineaux, France

Filed Jun. 27, 1989, Ser. No. 372,074
Claims priority, application France, Jun. 29, 1988, 88 08758
Int. Cl.[5] B63B *3/38*
U.S. Cl. 114—140 **8 Claims**



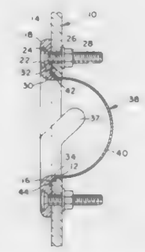
1. A craft comprising at least one keel, said keel essentially constituted by an elongated capacity formed out of a distortable and resilient sleeve made of a watertight material and attached to a hull of the craft, said keel comprising at least one water inlet opening provided in a sleeve wall of said elongated capacity, said water inlet being oriented towards the bow of the craft and permanently maintained in fluid communication to the elongated capacity whereby a variable back pressure in the keel is created by the dynamic pressure of the intercepted water resulting from the variable speed of the craft moving in the forward direction.

4,993,343

FLUSH MOUNT SKI TOW HOOK

John Czipri, 229 Palm Island S.W., Clearwater, Fla. 34630

Filed May 21, 1990, Ser. No. 526,451
Int. Cl.[5] B63B *21/10, 21/58*
U.S. Cl. 114—218 **4 Claims**



1. A flush mount ski tow hook for mounting in conjunction with a hole formed in the transom of a boat hull comprising;

(a) a flange bolted to said transom externally thereof,

(b) said flange having an opening therein in registration with the opening in the transom,

(c) a lip formed on said flange and projecting into said opening in spaced relationship thereto,

(d) a groove formed in said flange and extending about the periphery of the opening in said flange and overlying the external surface of the transom adjacent the opening in the transom,

(e) a ski tow hook formed on said flange at the base of said opening therein and extending inward of the transom and upwardly of said flange,

(f) a cup shaped sealing element projecting inwardly of the transom and overlying said tow hook,

(g) said cup element abuttingly and sealingly engaging the opening in the transom, and

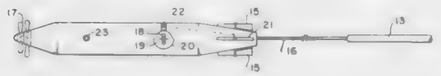
(h) said cup element having peripheral flange formed thereon in sealing registration with the said groove formed in said flange.

4,993,344

TORPEDO DEFENSE FOR SHIPS

Louis F. Jones, Panama City, Fla., assignor to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1965, Ser. No. 515,715
Int. Cl.[5] B63G *9/00*
U.S. Cl. 114—240 R **3 Claims**



1. A torpedo defense system for ships comprising in combination:

a guidable, unfettered, self-propelled, tractor vehicle capable of independently traveling a predetermined underwater course;

an elongated explosive streamer;

cable means, including strain and electrical conductor cables, connected between said guidable, unfettered, self-propelled, tractor vehicle and said elongated explosive streamer for the towing thereof thereby;

means disposed entirely within and on said guidable, unfettered, self-propelled, tractor vehicle for effecting the guidance thereof along said underwater course and at depths and speeds in accordance with a program set therein immediately prior to the launching thereof, with said underwater course, depths, and speeds being such as would probably cause the aforesaid attacking torpedo to timely intercept said elongated explosive streamer and be disabled thereby at a predetermined safe distance from said ship; means disposed in said guidable, unfettered, self-propelled, tractor vehicle and connected to said elongated explosive streamer for the arming thereof when said guidable unfettered, self-propelled, tractor vehicle reaches a predetermined depth, as it travels along its preprogrammed underwater course; and

means effectively mounted on a gunwale of said ship to be protected for the timely launching of the aforesaid interconnected guidable, unfettered, self-propelled, tractor vehicle and elongated explosive streamer into the water after an attacking torpedo is detected and immediately after the aforesaid vehicle guidance means has been manually programmed to guide said guidable, unfettered, self-propelled, tractor vehicle in such manner along its underwater course as to effect interception of said elongated explosive streamer by said torpedo.

4,993,345

FLOATING DEGAUSSING CABLE SYSTEM

David W. Feldman, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1981, Ser. No. 237,546
Int. Cl.[5] B63G *9/00*
U.S. Cl. 114—240 R **12 Claims**



1. A system for degaussing a ship having a predetermined waterline perimeter, said system comprising:

a cable comprising insulated electrical conductor means extending from one end to the other and comprising flotation means for supporting said cable in a floating condition, said cable being longer than said waterline perimeter of sad ship;

barge means connected to one end portion of said cable whereby said cable can be deployed in said floating condition about said ship with the opposite end portions of said cable being brought substantially together aboard said barge; and

current source means for energizing said conductor means when said cable is deployed about said ship as a degaussing coil.

4,993,346

OUTRIGGER SYSTEMS FOR MOTORBOATS

Herbert E. Rupp, 4761 Anchor Ave., Pt. Salerno, Fla. 33492

Continuation-in-part of Ser. No. 395,817, Aug. 18, 1989, abandoned. This application Mar. 26, 1990, Ser. No. 498,552
Int. Cl.[5] B63B *35/14*
U.S. Cl. 114—255 **13 Claims**



1. In an outrigger device installed on a top equipped motorboat to permit the outrigger of said device located above said top to move from a stowage position to a trolling position and vis versa, the improvement that permits said movement to be performed by an operator standing in the boat in the shelter of said top which comprises:

a tubular member comprising an upper end portion and a lower end portion joined integrally to a central portion that extends through said top with said upper end portion positioned above said top and said lower end portion positioned below said top,

a tubular outrigger comprising a bottom portion having a lower end including an arcuate section, and an elongated fishing line support portion extending upwardly from said bottom portion,

said bottom portion of said outrigger being rotatably journalled in said tubular member, and

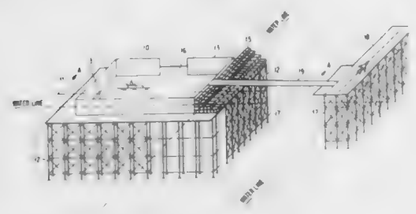
locking means associated with said lower end portion of said tubular outrigger from rotating in said tubular member.

4,993,347

OFFSHORE HARBOR

Floréncio d. O. Filho, Curitiba, Brazil, assignor to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Continuation of Ser. No. 139,229, Dec. 29, 1987, abandoned. This application Jan. 8, 1990, Ser. No. 463,797
Claims priority, application Brazil, Dec. 29, 1986, PI8606465
Int. Cl.[5] E02B *17/00*
U.S. Cl. 114—258 **10 Claims**



1. An offshore harbour, comprising:

a first support structure firmly fixed to the sea bed;

a first flat slab supported by said first support structure, said first flat slab being submerged below the surface of the sea;

a plurality of vertical side walls resting on said first slab and being joined together to form a hollow shell which defines an inside portion, the inside portion of the shell housing a portion of the sea, and one of said plurality of vertical side walls being provided with an opening so that the inside portion of the hollow shell is in communication with the rest of the sea through the opening; and

an assembly of blocks disposed on said first flat slab between an edge thereof and one of said vertical side walls, said assembly of blocks comprising a plurality of horizontal layers stacked upon each other to form a staircase configuration.

4,993,348

APPARATUS FOR HARVESTING ENERGY AND OTHER NECESSITIES OF LIFE AT SEA

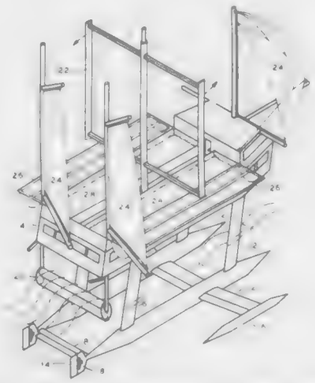
Leonard H. Wald, 679 Tiffany Ct., Sunnyvale, Calif. 94087

Continuation-in-part of Ser. No. 87,469, Aug. 20, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,866
Int. Cl.[5] B63B *1/12*
U.S. Cl. 114—265 **18 Claims**

1. A vessel adapted for operating at the surface of the ocean, said vessel comprising: a first hull and a second hull, said first hull being vertically aligned with said second hull, said first hull to be fully submerged and said second hull to be fully unsubmerged; streamlined struts coupling said first hull and said second hull together; fixed and moveable lift and stabilization means coupled to said first hull for operating said vessel at near neutral buoyancy; and lift means adjusted to operate said vessel at a depth so that the average waterline is approximately halfway between said first hull and said second hull, thus providing a small vessel area at the waterline even when the overall vessel displacement is large; said stabilization means comprising a combination of fixed passive lift and stabilization surfaces which automatically stabilize said vessel without requiring control movements for use when the vessel is in motion, said combination comprising:

first, substantially horizontal appendages (sea-stabilizers) of such an area as to provide stabilizing moments around the center of gravity for stabilizing said vessel in pitch and fixedly coupled to the first hull to the rear of the center-of-gravity of the vessel and having an angular tilt with respect to the horizontal plane fixed to provide stabilizing moments to suppress combination roll, pitch, and yaw instabilities;

second, substantially vertical appendages (sea-fins) of such an area as to provide stabilizing moments around the center of gravity for stabilizing said vessel in yaw and fixedly coupled to the first hull to the rear of the center-of-



gravity of said vessel and having a tilt with respect to the vertical plane fixed to provide stabilizing moments to suppress combination roll, pitch, and yaw instabilities;

third, substantially horizontal appendages (sea-wings) of such an area as to provide lift and stabilizing moments around the center of gravity for supporting and stabilizing said vessel in roll and fixedly coupled to the first submerged hull near the center-of-gravity, having a tilt or dihedral with respect to the horizontal plane fixed to provide stabilizing moments to ensure roll stability;

fourth, fixed stabilization reservoir means for providing stability automatically when the vessel is not moving, said stabilization reservoir means comprising at least two tanks coupled to the tips of the sea-wings, each said tank capable of containing the amount of air and water needed for zero-velocity stability, said tanks and wings being capable of being pivoted into vertical position when said vessel is docked.

4,993,349

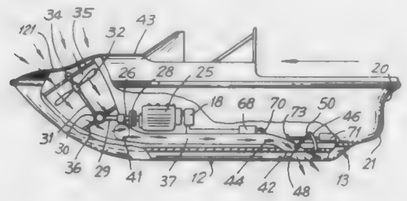
PROPULSION FOR BOATS CONSISTING OF JETS OF AIR DRAWN INTO A PAIR OF LONGITUDINAL CHANNELS UNDER THE HULL

Franco Solari, Marcantonio Colonna, 59, 20149 Milan, Italy

PCT No. PCT/IT86/00072, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/00903, PCT Pub. Date Feb. 11, 1988
PCT Filed Sep. 24, 1986, Ser. No. 331,663
Claims priority, application Italy, Jul. 31, 1986, 21336 A/86
Int. Cl.[5] B63B *1/32*
U.S. Cl. 114—289 **10 Claims**

1. A boat propulsion and braking system comprising a central channel extending underneath a substantially flat bottom

hull along the entire length of the hull bottom and having an open bottom and a first width; two substantially identical rectilinear parallel channels extending beneath the boat hull on opposite sides of said central channel and having open bottoms and a second width smaller than the first width of said central channel; an inclined outlet located at the summits of each of said two rectilinear parallel channels, forward and backward propulsion and braking of the boat being effected by thrust from jets of compressed air generated inside the hull and emit-



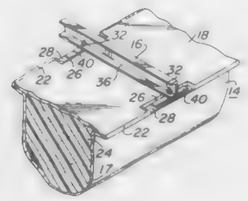
ted through said two inclined outlets with the boat being supported on three air cushions created by respective vertical components of air acting in said rectilinear parallel channels and flow of air into said central channel between the hull and the water surface due to movement of the hull; two on-off valves for controlling air jet flow through said two inclined outlets respectively; and two directional deflectors for changing directions of the air jets flowing from said two inclined outlets, respectively.

4,993,350

PONTOON LOG AND METHOD OF MAKING SAME

Geoffrey T. Pepper, Lebanon, Mo., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 19, 1990, Ser. No. 540,368
Int. Cl.[5] B63B *1/12*
U.S. Cl. 114—292 **12 Claims**



1. A method of attaching a deck beam to a pontoon log, said pontoon log comprising a substantially U-shaped sheet metal hull member having outwardly directed flanges at the upper edges therof and a top plate having side edges extending over said hull member flanges for welded attachment thereto along the peripheral edges thereof, said method comprising the steps of;

cutting out portions of said top plate side edges in the regions beneath said deck beam to expose portions of said hull member flanges;

welding said top plate to said hull member around the edges of said top plate including the edges of said cut out portions; and

fastening said deck beam to said pontoon log by bolting said beam to said exposed portions of said hull member flanges.

4,993,351

ROUNDED TOP HEADER EXTRUSION FOR BOAT WINDSHIELDS

Albert W. Zirkelbach; Alan P. Zirkelbach, and Donald A. Zirkelbach, all of Sarasota, Fla., assignors to Aldon Industries, Inc., Bradenton, Fla.

Filed Sep. 19, 1989, Ser. No. 409,655
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—361 **6 Claims**



1. A unitary member for rigidly engaging a boat windshield providing a curved, upper surface and providing means for supporting a boat canopy, the member comprising an elongated extrusion having a generally uniform cross-section along its length, the extrusion being defined in cross-section by:

a pair of generally parallel arms having a windshield-engaging channel between them for receiving the boat windshield and with each arm having means along the channel for gripping the windshield;

a generally semi-circular rail portion across the channel between the arms; and

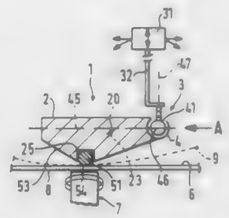
means comprising a recessed channel extending inwardly into the extrusion within at least one plane of the windshield for permitting engagement of the boat canopy to the extrusion.

4,993,352

SQUEEGEE DEVICE

Johannes Zimmer, Ebentaler Strasse 133, 9020 Klagenfurt, Austria

PCT No. PCT/EP88/00431, § 371 Date Jul. 13, 1989, § 102(e) Date Jul. 13, 1989, PCT Pub. No. WO89/03256, PCT Pub. Date Apr. 20, 1989
PCT Filed May 18, 1988, Ser. No. 381,680
Claims priority, application European Pat. Off., Oct. 10, 1987, 87730126.7; Oct. 10, 1987, 87730128.3; Oct. 10, 1987, 3734747.0; Oct. 10, 1987, 8713789.5; Oct. 10, 1987, 8713788.7
Int. Cl.[5] B05C *11/04*; B41F *15/42*
U.S. Cl. 118—112 **21 Claims**



1. A squeegee apparatus for applying materials having varying viscosities to an application surface comprising at least one squeegee extending in a longitudinal direction of the apparatus, said squeegee being pressed onto the application surface by a magnetic force and having a profile member with a longitudinal axis extending in the direction of the longitudinal axis of the squeegee, and bearing means for articulating the profile member, at least one of said squeegee and said profile member being formed of magnetic material, and

said bearing means being a pivot bearing means for pivotally

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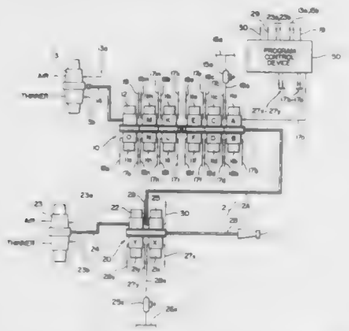
supporting the profile member with respect to the squeegee apparatus such that the profile member is freely tiltable with respect to a position wherein the profile member is parallel to the application surface about at least one pivot axis that is perpendicular to the longitudinal axis of the profile member.

4,993,353

AUTOMATIC COLOR CHANGE PAINT SPRAY SYSTEM

Toshifumi Ogasawara, Kure, and Yuichi Okada, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 18, 1988, Ser. No. 233,505
Claims priority, application Japan, Aug. 18, 1987, 62-204338
Int. Cl.[5] B05C *5/00*
U.S. Cl. 118—302 **10 Claims**



1. An automatic color change paint spray apparatus for painting vehicle bodies passing along a production line comprising

a carriage located adjacent to the production line;

said carriage including a vertical portion and a boom portion extending from the vertical portion to adjacent to the vehicle bodies passing along the production line;

a paint sprayer mounted on the boom portion;

first color change manifold means for supplying any one of a plurality of paints selectively to the paint sprayer and including cleaning and drying means for cleaning and drying the first color change manifold means during a paint change;

conduit means connecting the first color change manifold means to the paint sprayer;

second color change manifold means for supplying any one of a plurality of paints selectively to the paint sprayer;

the second color change manifold means being interposed in the conduit means and located on the boom portion in proximity to the paint sprayer such that a distance between the second color change manifold means and the paint sprayer is shorter than a distance between the first color change manifold means and the paint sprayer and a number of paint sources available from the second color change manifold means being less than a number of paint sources available from the first color change manifold means;

the second color change manifold means including cleaning and drying means for cleaning and drying the second color change manifold means, the paint sprayer and that portion of the conduit means extending from the second manifold means to the paint sprayer, and

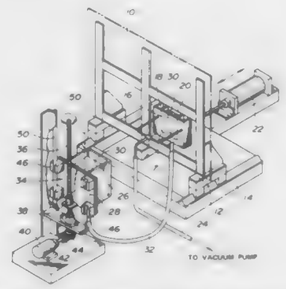
the second color change manifold means including at least one paint different from those of the first color change manifold means.

4,993,354

APPARATUS FOR COATING THIN LIQUID FILM ON SOLID SURFACE

Kensuke Makita, Mie; Toshiaki Itoh, Tsu, and Nsohiko Matuda, Matsusaka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 3, 1988, Ser. No. 227,673
Claims priority, application Japan, Aug. 6, 1987, 62-195239
Int. Cl.[5] B05C *3/09*
U.S. Cl. 118—407 **8 Claims**



1. An apparatus for coating a thin liquid film on a surface of a solid member, the apparatus comprising:

means for holding the solid member;

an incomplete liquid container having an opening of a shape similar to the shape of said surface of the solid member on a lateral side thereof;

means for bringing the solid member and said incomplete container into tight contact with each other such that said opening of the incomplete container is closed by said surface of the solid member thereby completing the container and keeping the container and the solid body stationary in the tightly contacting state;

means for introducing a coating liquid into the container kept in contact with the solid member; and

means for extracting the coating liquid from the container kept in contact with the solid member at a predetermined rate, thereby gradually lowering the liquid level in the container and gradually decreasing the area of contact of the coating liquid with said surface of the solid member.

4,993,355

SUSCEPTOR WITH TEMPERATURE SENSING DEVICE

Wiebe B. deBoer, GB Eersel, Netherlands, and Albert E. Ozias, Aumsville, Oreg., assignors to Epsilon Technology, Inc., Phoenix, Ariz.

Continuation of Ser. No. 32,474, Mar. 31, 1987, Pat. No. 4,821,674. This application Apr. 17, 1989, Ser. No. 339,310
The portion of the term of this patent subsequent to Aug. 18, 2006, has been disclaimed.
Int. Cl.[5] B05C *11/00, 13/00*; C23C *16/52*
U.S. Cl. 118—641 **6 Claims**

1. A chemical vapor deposition mechanism comprising:

(a) a reaction chamber defining a reactant gas flow path therethrough and having a bottom surface with a tubular shaft depending therefrom;

(b) drive shaft means defining a rotational axis, said drive shaft means having a top end disposed in said reaction chamber and depending in spaced coaxial relationship through the tubular shaft to provide an intermediate portion and a lower portion which extends below the tubular shaft of said reaction chamber, said drive shaft means including an axial bore;

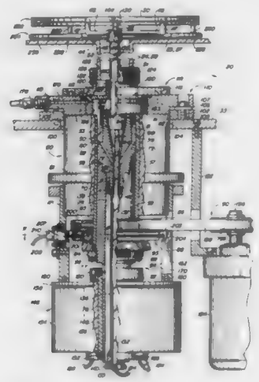
(c) a support plate in downwardly spaced relationship with said reaction chamber and defining an opening coaxial with said drive shaft means;

(d) mounting means on said support plate attached to the tubular shaft of said reaction chamber, said mounting means defining an axial opening coaxial with the opening of said support plate and through which said drive means axially extends;

(e) bearing means for supporting and rotatably journaling said drive shaft means;

(f) drive means coupled to said drive shaft means for rotating said drive shaft means;

(g) a susceptor defining a top surface for demountably receiving a substrate for deposition purposes in a position wherein the center of the substrate is in a substantially



aligned overlaying relationship with the center of said susceptor said susceptor including a blind cavity in the center of its bottom surface;

(h) temperature sensing means disposed in the axial bore of said drive shaft means and extending therefrom into the blind cavity of said susceptor for sensing the temperature at the center of said susceptor and for producing a signal indicative of the sensed temperature; and

(i) spider means disposed on the top end of said drive shaft means for supporting and rotating said susceptor.

4,993,356

MAGNETIC BRUSH DEVELOPMENT STATION HAVING A READILY ACCESSIBLE INTERIOR

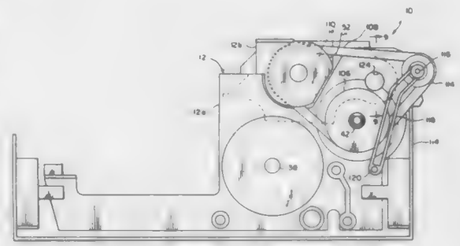
Vladimir S. Guslits, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

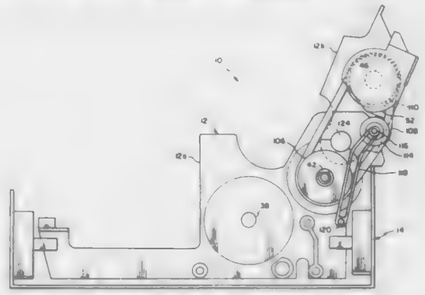
Filed Sep. 20, 1988, Ser. No. 246,597
Int. Cl.[5] G03G *15/09*
U.S. Cl. 118—657 **20 Claims**

1. An improved magnetic brush developer station having a plurality of members including at least one set of magnets, a developer transport mechanism, and a developer material mixer, the improvement comprising;

a housing having an upper portion and a lower portion, said upper portion including means for rotatably supporting said set of magnets, and said lower portion providing a reservoir adapted to contain developer material, and including means for rotatably supporting said transport mechanism and said mixer;

means for connecting said upper housing portion to said lower housing portion for pivotable movement about an axis to a closed position wherein said set of magnets is in operative relation with said transport mechanism and said mixer, and to an open position wherein said set of magnets, transport mechanism, and mixer in the interior of said housing are readily accessible; and





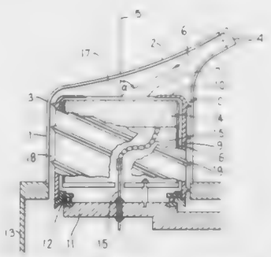
means, operable when said upper housing portion is in its closed or open position, for rotating said set of magnets, said transport mechanism, and said mixer respectively.

4,993,357

APPARATUS FOR ATOMIC LAYER EPITAXIAL GROWTH

Christoph Scholz, Schliersee, Fed. Rep. of Germany, assignor to CS Halbleiter -und Solartechnologie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 21, 1989, Ser. No. 287,903
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743938
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—715 **10 Claims**



1. An apparatus for carrying out atomic layer epitaxial growth of a thin semiconductor layer on a substrate surface by the use of reactant gases, said apparatus comprising a cylindrical chamber having an upper and a lower end and a vertically disposed axis; a substrate holder coaxially mounted within said cylindrical chamber so as to define an annular gap therebetween, said substrate holder comprising means for supporting a substrate in a plane located at a central portion of said cylindrical chamber upper end and disposed perpendicular to said cylindrical chamber vertical axis; a reactant gas inlet posi-

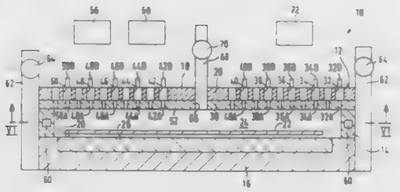
tioned above said substrate holder; and a funnel-shaped hood connecting said reactant gas inlet with said cylindrical chamber upper end, said funnel-shaped hood having a base portion attached to said cylindrical chamber upper end and tapering upwardly toward an upper end thereof provided at said reactant gas inlet, said funnel-shaped hood additionally having a lengthwise disposed axis that forms an acute angle with said cylindrical chamber vertical axis.

4,993,358

CHEMICAL VAPOR DEPOSITION REACTOR AND METHOD OF OPERATION

Imad Mahawili, Sunnyvale, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.

Filed Jul. 28, 1989, Ser. No. 386,903
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—715 **29 Claims**



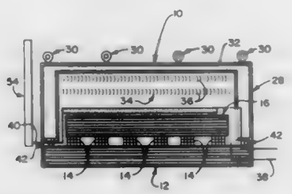
1. A chemical vapor deposition (CVD) reactor comprising
a housing forming a closed cylindrical chamber suitable for maintaining a deposition substrate in an environment of selected pressure,
means arranged at one axial end of the cylindrical chamber for supporting the substrate,
a wall spaced apart from the support means and arranged at the other axial end of the cylindrical chamber,
means for introducing reactant gas into the chamber,
multiple exhaust vents spaced apart from each other and arranged in communication with the cylindrical chamber about its periphery, and
valve means operatively coupled with the individual exhaust vents and sequentially operable for inducing a selected pattern of flow vectors for the reactant gas in the chamber adjacent the deposition substrate in order to enhance deposition uniformity and/or conformance.

4,993,359

APPARATUS FOR AND METHOD OF CHROMIZING ARTICLES

Everett C. Lewis, McDonald, and Harley A. Grant, Harrison, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 210,906, Jun. 24, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 451,706
Int. Cl.[5] C23C *16/00, 20/00*
U.S. Cl. 118—717 **5 Claims**



1. An apparatus particularly suited for applying a chromium coating to one or more of the surfaces of large size articles comprising:
a. support means including a stationary foundation operative as a thermal insulation barrier and a plurality of supports positioned on said stationary foundation in spaced relation one to another, said plurality of supports being operative as a thermal insulation barrier;
b. a retort mounted on said plurality of supports, said retort having a bottom and embodying sufficient internal size to accommodate therewithin one or more layers of large size articles;
c. a one-half inch thick layer spread evenly over said bottom of said retort of a powder containing as a source of chromium 3% ammonium chloride and 42% ferrochromium, the balance consisting of alumina;
d. a layer of large size articles to which a chromium coating is to be applied to one or more surfaces thereof positioned on said layer of powder spread over said bottom of said retort;
e. a four inch thick layer spread evenly over said layer of large size articles of a powder containing as a source of chromium 3% ammonium chloride and 42% ferrochromium, the balance consisting of alumina;
f. a cover sealed on said retort;
g. a furnace positioned in surrounding relation to said retort, said furnace embodying electrical heating elements, said furnace by means of said electrical heating elements heating uniformly throughout said retort and thereby also said layer of large size articles emplaced in said retort to a temperature of 2100° F. and thereafter maintaining said retort and said layer of large size articles uniformly heated throughout at a temperature of 2100° F. for a period of time of about 10 hours;
h. sealing means interposed between said furnace and said support means to effectuate a sealing off of said furnace and thereby of also said retort from the surrounding atmosphere;
i. first inlet passage means formed at a first location in said retort for supplying an inert gas to the interior of said retort for purging air therefrom;
j. first outlet passage means formed at a second location in said retort for conveying out of said retort the inert gas after the inert gas has flowed through said retort and by means of the inert gas the fumes entrained therewith that have been generated in said retort as said retort and said layer of large size articles are being heated uniformly throughout by means of said electrical heating elements of said furnace;
k. second inlet passage means formed at a first location in said furnace for supplying an inert gas within said furnace in surrounding relation to said retort for purging air from in surrounding relation to said retort; and
l. second outlet passage means formed at a second location in said furnace for discharging from said furnace the inert gas after the inert gas has flowed within said furnace in surrounding relation to said retort and by means of the inert gas the fumes entrained therewith.

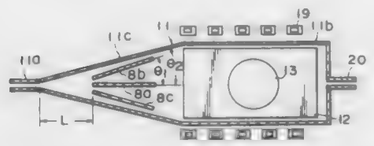
4,993,360

VAPOR GROWTH APPARATUS HAVING A DIFFUSER SECTION CONTAINING A FLOW REGULATING MEMBER

Yoshiaki Nakamura, Yokohama, Japan, assignor to Kasbushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 23, 1989, Ser. No. 327,895
Claims priority, application Japan, Mar. 28, 1988, 63-71845
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—719 **11 Claims**

1. A vapor growth apparatus comprising:
a reaction chamber including a gas inlet, a diffuser section, the cross section of which gradually increases in a direction of flow of gas supplied through said gas inlet, and a reaction section which is coupled to said diffuser section and in which a substrate is arranged on which a thin film is to be formed; and
a flow regulating member including at least a pair of first plates which are arranged vertically substantially in the direction of gas flow, and substantially symmetrically within said diffuser section and separated from each other in a direction perpendicular to the direction of flow of the gas supplied through said gas inlet, so as to render the flow speed of the gas through said reaction section substantially uniform, said first plates being positioned at a first angle with respect to the central axis of said reaction chamber.

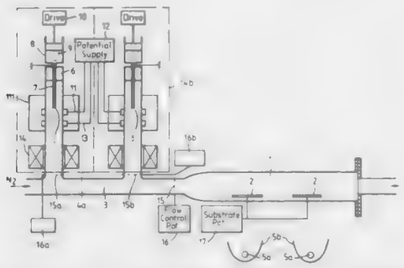


4,993,361

CHEMICAL VAPOR DEPOSITION

Bhikhu A. Unvala, London, United Kingdom, assignor to Unvala Limited, London, England

Continuation of Ser. No. 71,517, Jul. 9, 1987, abandoned. This application Sep. 22, 1989, Ser. No. 411,226
Claims priority, application United Kingdom, Jul. 11, 1986, 8616989; Mar. 4, 1987, 8705062
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—723 **13 Claims**



1. Apparatus for performing chemical vapour deposition, comprising:
electrostatic means for atomising and ionising a liquid precursor,
means for vapourising the atomised ,ionised precursor, said means for vapourising including heater means for vapourising said atomised, ionised precursor by heating said atomised, ionised precursor, and
means for depositing the vapourised precursor on a surface.

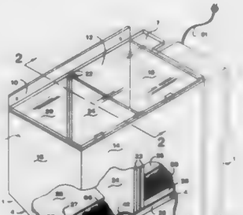
4,993,362

ARTIFICIAL FISH BED

Kanichi Jimbo, Tokyo, Japan, assignor to Toppan Printing Co., Ltd., Japan

Filed Jul. 19, 1989, Ser. Nc. 382,260
Claims priority, application Japan, Jul. 22, 1988, 63-97139[U]
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 **9 Claims**

1. An artificial fish bed comprising,
a base,
a plurality of parallel supporting poles having first ends connected to said base and free ends extending away from said base, each one of said plurality of poles being separated from an adjacent one of said plurality of poles by a preselected distance,
a plurality of shelves arranged on said plurality of poles, each of said plurality of shelves being formed from an assembly of substantially square planar frames and elongated planar plates, said frames having an aperture disposed in each corner, said apertures being separated by said preselected distance, and said elongated plates having a pair of apertures separated by said preselected distance, said apertures in said frames and said apertures in said elongated plates being superposed for accommodating one of said plurality of poles,



a plurality of spacing members having a predetermined axial length and an axial aperture for assembly on said plurality of poles, said plurality of shelves and said plurality of spacing members being slidably assembled in alternating layers on said plurality of poles, whereby said plurality of spacing members supports and separates said plurality of shelves above said base, and
retaining means for retaining said alternating layers of shelves and spacing members in assembled condition.

4,993,363

METHOD OF RAISING FARM ANIMALS BY EXPOSING THEM TO TOYS

Gadi Gvaryahu, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jul. 12, 1988, Ser. No. 217,977
Int. Cl.[5] A01K *15/02*
U.S. Cl. 119—29 **6 Claims**

1. A method for raising commercial farm fish comprising the step of:
providing commercial farm fish with one or more toys that stimulate play to reduce the mortality rates and increase the body weights of said commercial farm fish.

4,993,364

AUTOMATICALLY OPERATED PET FOOD DISPENSER

John N. Hessenauer, 1073 Chokecherry Dr., Winter Springs, Fla. 32707

Filed Jun. 12, 1990, Ser. No. 536,976
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—51.11 **18 Claims**

1. An automatic pet feeding dispenser including a housing for containing feed, an elongated opening at the bottom of said housing for discharging feed from said housing, a feed measur-

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ing and dispensing means for receiving feed from said opening, a single outlet means for directing feed dispersed from said feed measuring and dispensing means to a desired location, said feed measuring and dispensing means comprising a cylindrical tube, a divider disk in said cylindrical tube at a mid-point lengthwise divides said cylindrical tube into two axially aligned cylindrical compartments, said cylindrical tube being mounted for rotation, said cylindrical tube having tube openings 180° apart, one tube opening entering into each compartment, means for rotating said cylindrical tube, one tube opening will allow feed to be directed into its associated compartment from said housing through said elongated opening when the one tube opening faces the elongated opening, when the one tube opening faces the elongated opening the other tube opening 180° therefrom is aligned to dump feed out of its associated compartment into said single outlet means, said means for rotating said cylindrical tube alternates the alignment of each tube opening with said elongated opening and single outlet means at each half turn of said cylindrical tube.

4,993,365

FLOW RATE METER AND AUTOMATIC ANIMAL FEEDER INSTALLATION EMPLOYING SUCH FLOW METER

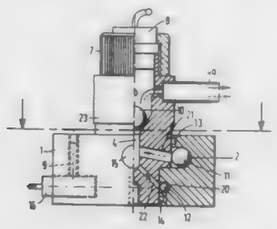
Rienk Weerstra, Leeuwarden, Netherlands, assignor to Centrale Veevoederfabriek "Sloten" C.V., Deventer, Netherlands

Filed Sep. 30, 1988, Ser. No. 251,368

Claims priority, application Netherlands, Sep. 30, 1987, 8702329; Sep. 30, 1987, 8702330

Int. Cl.[5] A01K *9/00;* **G01F** *3/08*

U.S. Cl. 119—71 **5 Claims**



1. A flow rate meter having a flow passage at least locally in the form of at least one circular channel within which a ball is constrained in said at least one circular channel to be driven by a fluid in proportion to the flow velocity of the fluid, said ball thereby passing a sensor that signals the ball revolutions, and said flow passage being formed with a fluid inlet conduit opening substantially tangentially into said at least one circular channel and an outlet conduit extending from the at least one circular channel upstream of, and adjacent to, the inlet opening and forming an angle with the said at least one circular channel; further there being more than one circular channel, each channel having its own ball, its own sensor, its own inlet conduit and its own outlet conduit; the outlet conduits of the circular channels merging into a single, common outlet channel.

4. An apparatus for automatically feeding animals liquid food, comprising at least one nipple, a supply conduit for supplying liquid food under pressure towards the nipple, said supply conduit having a valve controlled by a pressure sensor therein so that when, due to sucking action of an animal exerted on the nipple, a pressure variation in the said supply conduit is sensed by the pressure sensor, the valve is opened; and a flow rate meter for establishing the amount of food consumed, located between the valve and the nipple said flow rate meter having at least one flow passage; each flow passage being at least locally in the form of at least one circular channel within which a ball is constrained in said at least one circular channel to be driven by a fluid in proportion to the flow velocity of the fluid, said ball thereby passing a sensor that signals the ball revolutions, and each flow passage being formed with a fluid inlet conduit opening substantially tangentially into said at least one circular channel and an outlet conduit extending from said at least one circular channel upstream of, and adjacent to the inlet opening and forming an angle with the said at least one circular channel, further there being more than one circular channel, each channel having its own ball, its own sensor, its own inlet conduit and its own outlet conduit; the outlet conduits of the circular channels merging into a single, common outlet channel.

4,993,366

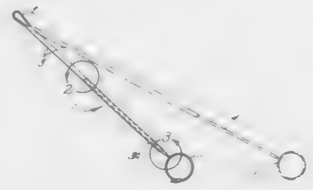
LEASH

Thomas W. Sager, 2909 High St., Eugene, Oreg. 97405

Filed Mar. 29, 1990, Ser. No. 501,006

Int. Cl.[5] A01K *27/00*

U.S. Cl. 119—109 **5 Claims**



1. A pet leash comprising,

an elongate tubular member of a nonelastic nature, said tubular member of a pliable nature,

an elongate elastic member normally housed in said tubular member and attached at one end to said tubular member at a point along the interior of said tubular member, and

another end of said elastic member adapted for attachment to a pet collar.

4,993,367

HEAT EXCHANGER

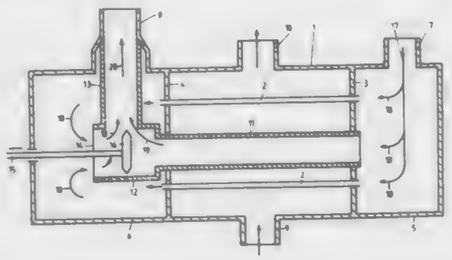
Wolfgang Kehrer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 9, 1989, Ser. No. 391,458

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1988, 3828034

Int. Cl.[5] F28D *7/00*

U.S. Cl. 122—7 R **6 Claims**



1. A waste heat boiler comprising: a sheaf of heat-exchanging pipes with opposite ends; a flow entrance chamber having an entrance connection; a flow exit chamber having an exit connection; said entrance chamber and said exit chamber being located at said opposite ends of said heat-exchanging pipes and being interconnected through said heat-exchanging pipes; a partial flow pipe extending axially substantially through the center of said waste heat boiler and parallel to said heat-exchanging pipes; said partial flow pipe having an entrance end connected to said entrance chamber; said partial flow pipe having a cylindrical exit end with cross-section larger than the cross-section of the remainder of said partial flow pipe; said cylindrical exit end having an opening for connecting the interior of said cylindrical end with said exit chamber; flow entering said flow entrance chamber through said entrance connection passing through said heat-exchanging pipes and said partial flow pipe and exiting from said flow exit chamber through said exit connection; a positioning element within said cylindrical end for selectively closing said partial flow pipe or said opening of said cylindrical end communicating with said exit chamber; a mixing pipe perpendicular to a longitudinal axis of said cylindrical end and located within said exit chamber, said mixing pipe connecting tightly said cylindrical end with said exit connection of said exit chamber; said mixing pipe having an interior space for thorough mixing of uncooled and cooled partial flows and preventing exiting of uncooled flow into said exit chamber when substantially all flow passes through said partial flow pipe.

4,993,368

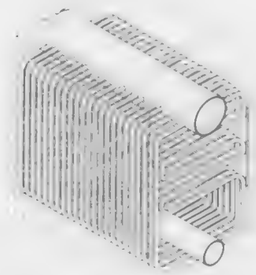
BOILER TUBE STRUCTURE

Harry P. Jones, Emmaus, Pa., and Roger M. Woodward, Brunswick, Me., assignors to Armada Investment Group Inc., Broomfield, N.J.

Filed Jun. 12, 1990, Ser. No. 536,836

Int. Cl.[5] F22B *15/00, 25/00, 37/20*

U.S. Cl. 122—235 K **8 Claims**



1. A boiler comprising a housing having a top provided with a gas outlet, bottom, left and right sides and a front and back, the housing containing an upper manifold and a lower manifold substantially parallel to the top, bottom and side walls, first and second sets of tubes each comprising a plurality of tubes, one set joining the upper manifold to the lower manifold on the left and the other set joining the upper manifold to the lower manifold on the right, the tubes of the first set rising from the lower manifold upwardly along their side wall, crossing the housing to the opposite side wall, re-crossing the housing to their respective side wall, rising therealong and eventually joining the upper manifold so as to form a plurality of superposed passages, the tubes of the second set rising from the lower manifold upwardly along their side wall and then joining the upper manifold, individual tubes of the first set being differently bent so as to form access openings from each passage to the passages above and below, the openings from passage to passage being offset so as to require a gas flowing through said passages to traverse one passage from front to back and the next passage from back to front, means for introducing liquid into one of the manifolds and for withdrawing the liquid from the other manifold and means for introducing a hot gas into the lowermost of the superposed passage, the hot gas rising successively through the passages which it successively and alternatively traverses from front to back and then from back to front until it exits from the uppermost passage through the gas outlet in the top, liquid flowing through the manifolds and tubes being heated by the hot gas.

4,993,369

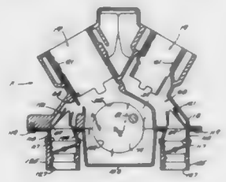
INTERNAL COMBUSTION ENGINE

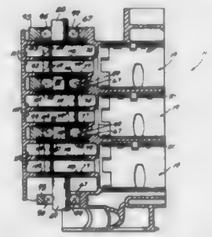
Paul W. Breckenfeld, Kenosha, Wis.; George L. Broughton, Zion, and Duane W. Forquer, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 316,153, Feb. 27, 1989, abandoned. This application May 18, 1990, Ser. No. 526,065

Int. Cl.[5] F02B *75/18, 33/04*

U.S. Cl. 123—52 MV **20 Claims**





1. A two-stroke internal combustion engine comprising an engine block including an exterior planar surface portion having therein a pair of spaced bearing surfaces and a crankcase-defining cavity which includes a pair of spaced semi-cylindrical surfaces, a crankshaft including a pair of spaced bearing portions and a central part which is located between said bearing portions and which includes a pair of spaced and enlarged cylindrical surfaces, a pair of bearing blocks respectively including bearing surfaces, means fixing said bearing blocks to said exterior planar surface portion with each of said crankshaft bearing portions retained between a respective one of said bearing surfaces of said engine block and a respective one of said bearing surfaces of said bearing blocks and with each of said crankshaft cylindrical surfaces in coplanar relation to a respective one of said semi-cylindrical surfaces of said engine block, a crankcase cover including a mounting surface having therein a crankcase-defining cavity including a pair of spaced semi-cylindrical surfaces, and means fixedly connecting said mounting surface of said crankcase cover to said exterior planar surface portion of said engine block with each of said semi-cylindrical surfaces of said crankcase cover in generally coplanar relation to a respective one of said semi-cylindrical surfaces of said engine block.

4,993,370

VALVE DRIVING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Kouichi Hashiyama, Hiroshima; Junichi Okita, Iwakuni; Kouichi Hatamura, Hiroshima; Ryoji Abe, Hiroshima, and Noriyuki Iwata, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 27, 1989, Ser. No. 427,471

Claims priority, application Japan, Oct. 29, 1988, 63-274258; Oct. 29, 1988, 63-274259

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **19 Claims**

1. A valve driving mechanism comprising:

a first cam shaft for driving either an intake valve or an exhaust valve,

a second cam shaft for driving the other of the intake valve and the exhaust valve,

first transmitting means provided on the first cam shaft for driving said first cam shaft,

second transmitting means provided on the first cam shaft for transmitting a driving power from said first transmitting means to second cam shaft,

phase varying means for varying a relative rotation phase among said first cam shaft, said first transmitting means and said second transmitting means,

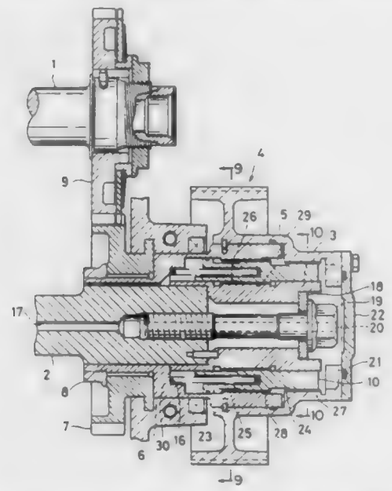
said first cam shaft and said first and second transmitting means being connected with one another to produce a rotative phase change relative to one another through said phase varying means so that the first cam shaft is rotated in an opposite direction to the second transmitting means with regard to the first transmitting means,

said first transmitting means being provided with a boss portion extending along the first cam shaft,

said second transmitting means being provided with tubular joint means extending along the first cam shaft for connecting the second transmitting means to the first transmitting means while permitting a relative rotative movement between the first and second transmitting means,

said joint means being permitted to make a rotative movement relative to both the boss portion and the first cam shaft,

said phase varying means having an annular piston device disposed between said first cam shaft and said joint means and between said first cam shaft and the boss portion, end engaging means for engaging an end portion of said annu-



lar piston device with said boss portion, first middle engaging means for engaging a middle portion of said annular piston device with said joint means and second middle engaging means for engaging the first cam shaft with a middle portion of the annular piston device,

said first middle engaging means producing a rotative movement of the joint means relative to the annular piston device due to axial movement of the annular piston device,

said second middle engaging means producing a rotative movement of the first cam shaft relative to the annular piston device due to the axial movement of the annular piston device,

said rotative movement between the annular piston device and the first cam shaft being produced in a reverse direction to that between the annular piston device and the joint means.

4,993,371

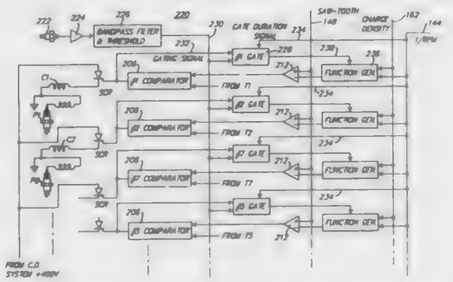
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM AND CLEANING DEVICE

John A. McDougal, 2801 S. Port Hwy., A-4, Flint, Mich. 48507, and John W. Lennington, Ypsilanti, Mich., assignors to John A. McDougal, Detroit, Mich.

Continuation of Ser. No. 310,837, Feb. 14, 1989, which is a continuation of Ser. No. 187,933, Apr. 29, 1988, Pat. No. 4,809,662, which is a continuation of Ser. No. 137,195, Dec. 23, 1987, abandoned, which is a division of Ser. No. 873,075, Jun. 2, 1986, Pat. No. 4,718,381, which is a continuation of Ser. No. 651,042, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 374,803, May 14, 1982, Pat. No. 4,471,737, which is a continuation of Ser. No. 161,282, Jun. 10, 1980, abandoned, which is a division of Ser. No. 934,322, Aug. 16, 1978, Pat. No. 4,257,373, which is a division of Ser. No. 800,959, May 26, 1977, Pat. No. 4,116,173, which is a continuation of Ser. No. 572,167, Apr. 28, 1975, abandoned, which is a division of Ser. No. 336,559, Feb. 28, 1973, Pat. No. 3,903,856. This application Jan. 3, 1990, Ser. No. 460,289

Int. Cl.[5] F02P *5/155*

U.S. Cl. 123—425 **5 Claims**



1. In a multi-cylinder engine haivng an ignition system, single sensor means for detecting detonations in a plurality of cylinders of said engine, and electronic gating means having a gating period for time isolating an output signal from a signal stream emanating from said single sensor means such that said output signal is representative of either a detonating or a non-detonating condition in a specific one of said cylinders.

4,993,372

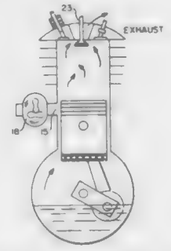
TWO STROKE INTERNAL COMBUSTION ENGINE WITH DECOMPRESSION VALVE

Constantin Mott, 10 Grenoble Dr., Apt. 812, and Constantin Noe, 10 Grenoble Dr., Apt. PH16, both of Don Mills, Ontario M3C-1C7, Canada

Filed Oct. 19, 1989, Ser. No. 421,662

Int. Cl.[5] F02B *75/02*

U.S. Cl. 123—65 BA **2 Claims**



1. A two-stroke internal combustion engine having an inlet means formed by a permanently open inlet port positioned in a cylinder wall for exposure by a piston passing through bottom

dead center to admit air into the cylinder during exhaust and intake cycles; a supercharger connected to the inlet port for supplying fresh air under pressure thereto; and, outlet means in the cylinder head formed by an exhaust valve operable independently of the piston for closure during the compression and combustion stroke and for opening during the entire time the inlet port is uncovered by the piston wherein a decompression valve is mounted in the cylinder head and electromechanical means are provided for opening the decompression valve to enable starting of the engine by release of the cylinder pressure and admittance of air into the cylinder and for closure thereof while the engine is running.

4,993,373

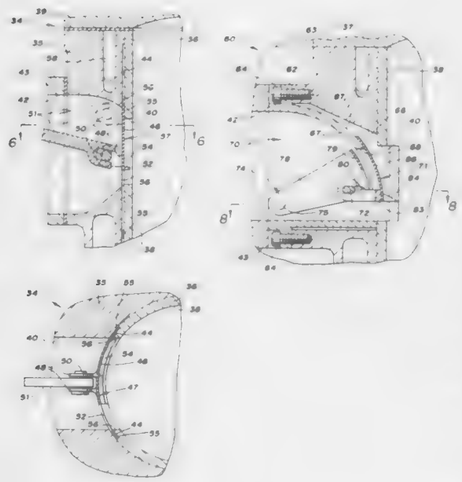
SEALING SHROUD PORT TIMING VALVE FOR TWO CYCLE ENGINE

Edward D. Klomp, Mount Clemens; Edward G. Groff, Troy; Donald T. French, Warren, and Paul M. Heck, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 369,360, Jun. 21, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 480,176

Int. Cl.[5] F02B *75/02*

U.S. Cl. 123—65 PE **15 Claims**



1. A timing valve in combination with a two wall of the cylinder and a slot above the exhaust port for receiving a flow blocking shroud, said timing valve including a generally horizontal body disposed in the exhaust port for pivotal motion therein to cause upward and downward travel of a curved edge distal from the pivot and generally conforming to and closely aligned with the cylinder wall, and the shroud extending upwardly from the body and extending into said slot, and the improvement wherein

said shroud is formed as a flexible sheet which is responsive to cylinder pressure to sealingly and slidably bear against a side of the slot and against port sealing surfaces provided on edges of the port near and facing toward the cylinder to effectively seal the shroud against the leakage of exhaust gas therepast while allowing adjusting movement of the valve with a limited amount of restraining friction.

4,993,374

ENGINE UNIT FOR MOTOR VEHICLE

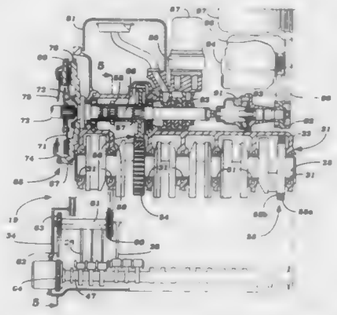
Kaoru Oku, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 270,260, Nov. 14, 1988, Pat. No. 4,915,070. This application Jan. 8, 1990, Ser. No. 461,832

Claims priority, application Japan, Mar. 31, 1988, 63-78538; Mar. 31, 1988, 63-78537; Mar. 31, 1988, 63-78536; May 11, 1988, 63-112573

Int. Cl.[5] F01L *1/04*

U.S. Cl. 123—90.31 **40 Claims**



1. In a camshaft drive arrangement for an internal combustion engine having a cylinder block with plurality of cylinders aligned in a bank, a plurality of pistons each received in a respective one of said cylinders and driving a crankshaft for rotation about a first axis, a cylinder head affixed to said cylinder block, an intermediate shaft rotatable about a second axis parallel to said first axis and offset to one side of said cylinder block and adjacent said cylinder head, first drive means for driving said intermediate shaft from said crankshaft at a location spaced from one end of said crankshaft a camshaft supported for rotation about a third axis parallel to said first and said second axis, by said cylinder head a plurality of valves in said cylinder head operated by said camshaft, and second drive means for driving said camshaft at one end thereof from said intermediate shaft.

4,993,375

ENGINE CYLINDER HEAD COVER

Sobue Akihiko, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed May 11, 1990, Ser. No. 521,965

Claims priority, application Japan, Jun. 19, 1989, 1-156348

Int. Cl.[5] F01M *9/10*

U.S. Cl. 123—90.38 **7 Claims**

1. An engine cylinder head cover formed with a chain casing and a middle longitudinal recessed portion extending along a cylinder arrangement direction, comprising:

(a) an external air inlet;

(b) an external air outlet formed near and on the same head cover end side as said external air inlet so as to communicate with an engine crank case;

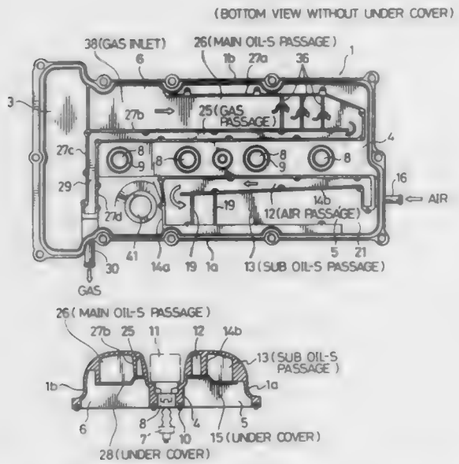
(c) an external air passage formed along one side surface of the middle longitudinal recessed portion and having a first end connected to said external air inlet;

(d) a subsidiary oil-separation passage formed in parallel with and outside said external air passage and having a first end connected to said external air outlet, a second end

of said external air passage being connected to a second end of said subsidiary oil-separation passage in U-shaped fashion;

(e) a blow-by gas inlet formed diagonally remote from said external air outlet so as to communicate with the engine crank case;

(f) a blow-by gas outlet formed on the same head cover end side as said blow-by gas inlet;



(g) a blow-by gas passage formed along the other side surface of the middle longitudinal recessed portion and having a first end connected to said blow-by gas outlet; and

(h) a main oil-separation passage formed in parallel with and outside said blow-by gas passage and having a first end connected to said blow-by gas inlet, a second end of said blow-by gas passage being connected to a second end of said main oil-separation passage in U-shaped fashion.

4,993,376

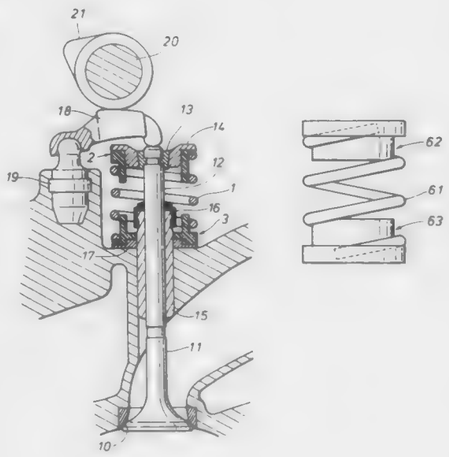
SPRING SYSTEM

Taizo Fukutome, Saitama; Atsushi Ishida, Kanagawa; Akihiko Inooku, Tokyo; Noritoshi Takamura; Kaoru Hatayama, both of Nagano; Yuichi Nagase, Kanagawa; Toyoyuki Higashino, Kanagawa, and Hideo Yamamoto, Kanagawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha NHK Spring Co., Ltd., Japan

Filed Apr. 28, 1989, Ser. No. 345,328
Claims priority, application Japan, Apr. 29, 1988, 63-106739
Int. Cl.[5] F01L *3/10*
U.S. Cl. 123—90.65 **11 Claims**

1. A spring system for applying a restoring force to a reciprocating member, comprising:

a helical compression spring comprising an intake valve spring or an exhaust valve spring for an internal combustion engine, said spring having open ends and consisting of titanium or an alloy thereof; and



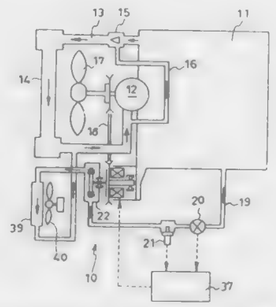
a spring seat supporting one of the two ends at said helical spring.

4,993,377

AUTOMOBILE HEATING APPARATUS AND HEAT GENERATOR FOR THE SAME

Masato Itakura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 5, 1990, Ser. No. 488,945
Claims priority, application Japan, Mar. 21, 1989, 1-68496
Int. Cl.[5] F02N *17/02*
U.S. Cl. 123—142.1 R **8 Claims**



1. A heat generator for an automobile heating apparatus comprising:

a heat generating chamber having a labyrinth groove and containing viscous fluid therein;

a housing disposed adjacent to said heat generating chamber and having a heat receiving path constituting part of a hot water circuit for heating an automobile room;

a shaft held rotatably in said housing and receiving the rotary torque of an automobile water-cooling engine by way of clutch means; and

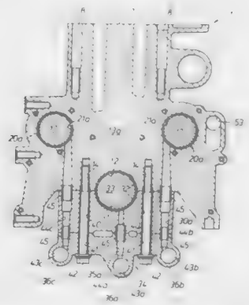
a rotor fixed on said shaft at an end thereof and having a labyrinth groove disposed in said heat generating chamber.

4,993,378

LUBRICATING OIL PASSAGE STRUCTURE FOR A CYLINDER BLOCK

Kazuo Sakurahara, and Keiji Ohtus, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 478,305
Claims priority, application Japan, Feb. 13, 1989, 1-33343
Int. Cl.[5] F01M *1/00*
U.S. Cl. 123—196 R **19 Claims**



1. A lubricating oil passage structure for a cylinder block having a plurality of cylinders separated from each other by journal walls and arranged in a row, first bearing bores formed in said journal walls in cooperation with bearing caps attached to associated end portions of said journal walls by threaded bolts for rotatably supporting a crankshaft in parallel with said cylinder row along longitudinal ends of said cylinders, and second bearing bores formed in said journal walls for rotatably supporting a rotary shaft in parallel with said crankshaft on one side of said cylinder row, comprising:

a hollow gallery member internally defining an oil gallery extending in parallel with said crankshaft in said hollow gallery member, and mechanically connecting said bearing caps with each other; and

lubricating oil passages each branching out from said oil gallery defined in said hollow gallery member into an associated one of said second bearing bores and extending in parallel with holes for receiving said threaded bolts for attaching said bearing caps to said journal walls.

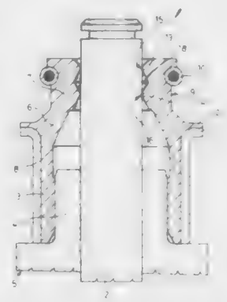
4,993,379

SLIDING STEM SEAL, PARTICULARLY FOR VALVE STEMS

Roberto Viazzi, Turin, Italy, assignor to RFT S.p.A., Turin, Italy

Filed Nov. 2, 1989, Ser. No. 432,140
Int. Cl.[5] F01L *3/00*
U.S. Cl. 123—188 P **6 Claims**

1. A sliding stem seal, particularly for the stem (2) of an internal combustion engine valve, comprising a first portion (3) fitted integral with an element (5) supporting said stem (2) and a second portion (7) inside which a top annular lip (13) and a bottom annular lip (14) are formed, said lips contacting a circumferential surface of said stem and defining therebetween and together with said circumferential surface of said stem a fluid-tight annular chamber (18), wherein said top lip is more rounded and higher than said bottom lip so that said lips cooperate differentially with said stem in order to admit lubricant oil past said upper lip and inside said chamber when said stem is moving relative to said lips and to trap said lubricant oil



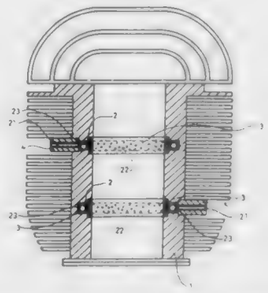
inside said chamber when said stem is not moving relative to said lips.

4,993,380

LUBRICATION MECHANISM OF ENGINE CYLINDER

Shin-I Hsu, 10F-1, No. 450, Cheng Te Road, Taipei, Taiwan

Filed Jan. 2, 1990, Ser. No. 460,244
Int. Cl.[5] F01B *3/110*
U.S. Cl. 123—193 C **7 Claims**



1. A lubrication system for an engine cylinder having an inner wall comprising:

(a) a first ring trough defined by the inner wall of the cylinder, the first trough opening into the cylinder;

(b) a second ring trough defined by the inner wall of the cylinder, the second trough opening into the cylinder and being axially spaced from the first ring trough;

(c) oil distribution means located in the first ring trough and communicating with a lubricating oil source such that lubricating oil is distributed on the inner wall of the cylinder; and,

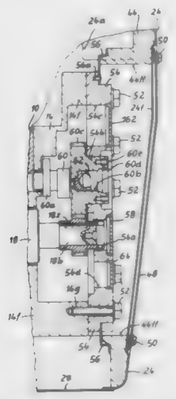
(d) oil collecting means located in the second ring trough having an oil outlet pipe to collect oil from the inner wall of the cylinder and direct it to the outlet pipe.

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4,993,381
INTERNAL COMBUSTION ENGINE HAVING A SOUND-DAMPING CASING

Erich Abenger, Passau, Fed. Rep. of Germany, assignor to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed Sep. 13, 1989, Ser. No. 406,709
Claims priority, applicatio: Fed. Rep. of Germany, Sep. 15, 1988, 3831334
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 E **5 Claims**



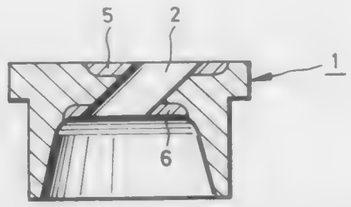
1. An internal combustion engine having a casing which comprises interconnected elements and is connected to an engine housing with interposed vibration-damping means, said engine having a cooling air blower driven by an engine crankshaft which draws in cooling air through an inlet opening in said casing and conveys such cooling air through an interior space between the engine housing and the casing, the exhaust air from such interior space exiting through an outlet opening in said casing, said inlet and outlet openings being disposed in a single element of the casing which element is disposed as a closure for said casing at a side of the engine remote from the blower and is equipped with at least one sound-damping layer, said sound damping layer having casing element passages formed therein which are separate from one another and communicate said interior space respectively with the inlet and outlet openings, and including across openings provided in said casing element and in its sound-damping layer in a region of the end of the crankshaft remote from the blower, which access openings are closable by a removable cover which, after it has been removed, affords access to transmission means which are disposed in said region and are coupled to the crankshaft for driving external units.

4,993,382
INSERT FOR AN INDIRECT INJECTION DIESEL ENGINE

Makoto Suzuki, and Toshio Mizobuchi, both of Kumagaya, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,610
Claims priority, application Japan, Feb. 22, 1989, 1-42469; Aug. 16, 1989, 1-210064
Int. Cl.[5] F02B *19/00, 75/08, 77/02*
U.S. Cl. 123—254 **2 Claims**

1. An insert for an indirect injection diesel engine, the insert comprising a cylindrical body having a top wall formed of heat resistant steel with a hole through the top wall, the upper and lower ends of the hole being surrounded by an alloy layer having a greater heat resistance than the top wall and comprising: up to 0.5% C; up to 1.0% Si; up to 2.0% Mn; 5–15% of Ni;

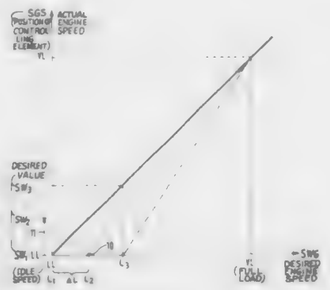


10–30% of Cr; 10–20% of W; 5–25% of Fe; and the balance Co, except for impurities.

4,993,383
CONTROLLER UNIT

Andreas Wokan, Darmstadt; Gerald Helmstädter, Weiterstadt, and Kurt Probst, Schwalbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,940
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722528
Int. Cl.[5] F02D *11/10*
U.S. Cl. 123—399 **3 Claims**



1. A control system comprising:

an automatic controller unit and a controlling element, the controller unit providing a plurality of control functions for controlling the controlling element and for regulating a position thereof as a function of at least two input variables, one of the input variables being the position of an accelerator pedal, the controlling element serving in particular for regulating engine output of an internal combustion engine;

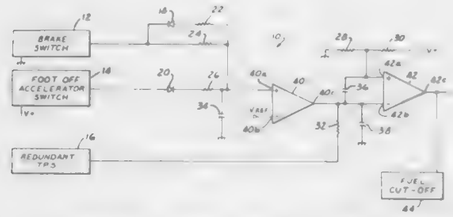
a position reporter, the controlling element driving an output unit via the position reporter, the reporter outputting a signal indicating a position of the output unit; and wherein

said controller unit comprises an adjusting device connected to an output of the reporter, the adjusting device outputting a control signal to the controlling element in response to the signal outputted by the reporter to establish a first end position set instantaneously on a basis of one of the control functions, the adjusting device detecting and storing a position of the output unit as effective desired-value end position for all remaining correcting variables in the controller unit, the controller unit employing the effective desired-value end position to offset a curved representing actual engine speed as a function of desired engine speed to linearize a relationship between defection of the accelerator pedal and engine speed for differing values of engine load.

4,993,384
ELECTRIC MOTOR OPERATED THROTTLE FOR I.C. ENGINE POWERED AUTOMOTIVE VEHICLE

Kregg S. Wiggins, Clarkston, Mich., and Danny O. Wright, Newport News, Va., assignors to Siemens Automotive L.P., Troy, Mich.

Filed Apr. 4, 1990, Ser. No. 505,083
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—399 **9 Claims**



1. In an automotive vehicle powered by an internal combustion engine having a combustion air passage which is selectively throttled by a throttle mechanism that is selectively positioned between full open and idle positions by an electric motor in accordance with certain signals to an electric control circuit for the electric motor, one of said signals being an accelerator pedal signal indicating whether or not an accelerator pedal for accelerating the engine is being depressed, the improvement which comprises a second one of said signals being a brake pedal signal indicating whether or not a brake pedal for braking the vehicle is being depressed, a third one of said signals being a throttle position signal indicating the position of said throttle mechanism, and means for allowing operation of the engine to continue as long as the throttle position signal indicates at least a certain selected degree of throttling by said throttle mechanism when the accelerator pedal signal and the brake pedal signal concurrently respectively indicate that the accelerator pedal is not being depressed and that the brake pedal is being depressed and for disallowing operation of the engine to continue if the throttle position signal fails to indicate at least said certain selected degree of throttling when the accelerator pedal signal and the brake pedal signal concurrently respectively indicate that the accelerator pedal is not being depressed and that the brake pedal is being depressed.

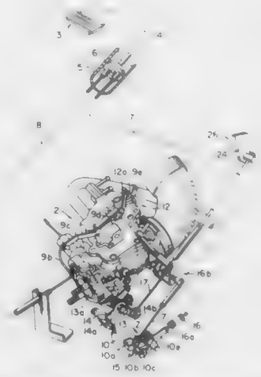
4,993,385
DEVICE FOR CONTROLLING SPEED OF AN ENGINE

Yasuhiko Miyamoto, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1990, Ser. No. 502,623
Claims priority, application Japan, Apr. 4, 1989, 1-40252[U]
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—400 **4 Claims**

1. A device for controlling the speed of an engine having an accelerator, a carburetor with a throttle valve operatively connected to a rotatable throttle shaft and an accelerating pump for supplying additional fuel to the engine, and means for governing the speed of the engine, comprising;

connecting means for connecting the accelerator to the throttle shaft and the accelerating fuel pump, respectively,

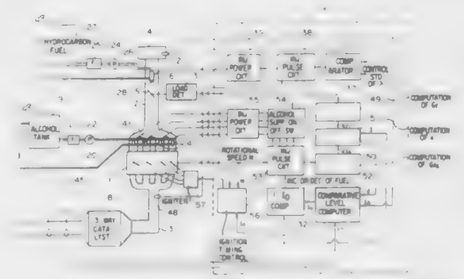


to operate the shaft and the pump separately responsive to the operation of the accelerator.

4,993,386
OPERATION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshihiro Ozasa; Shigeo Suzuki; Keiichi Saji; Haruyoshi Kondo, and Hideaki Takahashi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 29, 1989, Ser. No. 459,421
Claims priority, application Japan, Dec. 29, 1988, 63-334181; Dec. 29, 1988, 63-334182; Dec. 29, 1988, 63-334183
Int. Cl.[5] F02B *5/04, 47/02, 75/12;* **F02M** *51/00*
U.S. Cl. 123—417 **20 Claims**



1. An operation control system for an internal combustion engine, comprising:

(a) means for supplying an air-fuel mixture of fuel and air, into a combustion chamber;

(b) means for detecting vapor concentration in exhaust gas;

(c) means for detecting an air excess ratio of the air-fuel mixture supplied to the combustion chamber;

(d) means for computing a supply condition of the fuel on the basis of said vapor concentration and said air excess ratio;

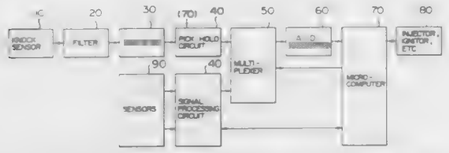
(e) means for computing an amount of control determining a characteristic of the engine, on the basis of said supply condition of the fuel; and

(f) means for controlling the engine on the basis of said amount of control.

4,993,387
KNOCK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Koji Sakakibara, Hekinan, and Yoshihiko Hirata, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 13, 1989, Ser. No. 366,509
Claims priority, application Japan, Jun. 14, 1988, 63-146588; Jun. 15, 1988, 63-147885
Int. Cl.[5] F02P *5/15*
U.S. Cl. 123—425 **14 Claims**

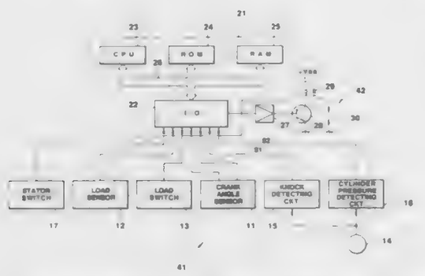


1. A knock control system for the internal combustion engine, comprising a knock sensor for detecting a knocking of the internal combustion engine, knock intensity value detection means for detecting a knock intensity value V effective for knock detection from a signal produced by the knock sensor, knock decision means for deciding the presence or absence of a knocking by comparing the knock intensity value with a knock decision level, knock control means for controlling knock control factors in accordance with the result of the decision, cumulative percentage point detection means for detecting a cumulative percentage point V_P of distribution of a substantially logarithmic conversion value of the knock intensity value, standard deviation detection means for detecting a value S corresponding to the standard deviation of the substantially logarithmic conversion value of the knock intensity value V, and knock decision level preparation means for preparing the knock decision level V_{KD} on the basis of the cumulative percentage point V_P and the value S corresponding to the standard deviation.

4,993,388
SPARK IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE ADAPTED TO MIXTURE FUEL OF MORE THAN ONE INDIVIDUAL FUELS HAVING MUTUALLY DIFFERENT COMBUSTION CHARACTERISTICS

Hisashi Mitsumoto, Ebina, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 27, 1990, Ser. No. 514,036
Claims priority, application Japan, Apr. 27, 1989, 1-110879
Int. Cl.[5] F02P *5/14, 5/15*
U.S. Cl. 123—425 **14 Claims**



1. A spark ignition timing control system for an internal combustion engine adapted for combustioning with a fuel composed of more than one mutually different fuels, comprising:

first sensor means for monitoring a preselected basic engine operating parameters to produce a first sensor signal representative of the monitored engine operating condition;

second sensor means for monitoring variation of internal pressure in an engine cylinder to produce a second sensor signal indicative of the monitored internal pressure;

third means for deriving a basic fuel advance angle on the basis of said first sensor signal,

fourth means for detecting lag period between spark ignition and occurrence of the maximum pressure in said engine cylinder to predict concentration of the selected one of the fuels in said blended fuel;

fifth means for deriving a first correction value on the basis of said second sensor signal;

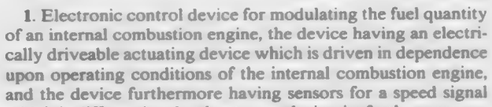
sixth means for deriving a second correction value on the basis of the predicted concentration of the selected one of the fuels; and

seventh means for correcting said basic fuel advance angle with said first and second correction values for deriving a spark advance angle to control the spark ignition timing.

4,993,389
ELECTRONIC CONTROL DEVICE FOR CONTROLLING THE FUEL QUANTITY OF AN INTERNAL COMBUSTION ENGINE

Frank Ahlborn, Tübingen; Wolfgang Dühlmeyer, Schwieberdingen; Volker Schäfer; Albrecht Sieber, both of Ludwigsburg; Rainer Buck, Tamm; Herbert Käberer, Waldstetten, and Alf Löffler, Markgröningen-Talhausen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00352, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO88/03607, PCT Pub. Date May 19, 1988
PCT Filed Aug. 12, 1987, Ser. No. 353,669
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638214; Feb. 19, 1987, 3705278
Int. Cl.[5] F02D *41/14, 41/10, 41/34*
U.S. Cl. 123—436 **16 Claims**



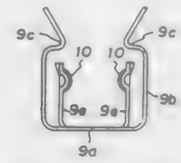
1. Electronic control device for modulating the fuel quantity of an internal combustion engine, the device having an electrically driveable actuating device which is driven in dependence upon operating conditions of the internal combustion engine, and the device furthermore having sensors for a speed signal which is differentiated at least once during its further processing with the fuel quantity being modulated in dependence upon the differentiated speed signal in such a manner that bucking vibrations are counteracted, characterized in that the fuel quantity metered to the internal combustion engine is reduced when the first derivative of the speed signal exceeds a first threshold (S1); and, in that the reduction is ended when the first derivative of the speed signal drops below a second threshold (S2) with the second threshold being greater than the first threshold.

4,993,390
INJECTOR POSITIONING DEVICE

Takashi Ono; Hiroyuki Nishizawa, and Akira Takahashi, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Akbushiki Kaisha, Tokyo, Japan

Filed May 23, 1989, Ser. No. 356,439
Claims priority, application Japan, May 27, 1988, 63-69340[U]
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—470 **4 Claims**

1. A device for positioning an injector in a predetermined mounted state so that a plurality of nozzle holes formed at one end of the injector connected at the other end to a delivery pipe in an internal combustion engine can be accurately directed toward corresponding intake ports respectively, said device comprising a clip non-rotatably mounted on part of said

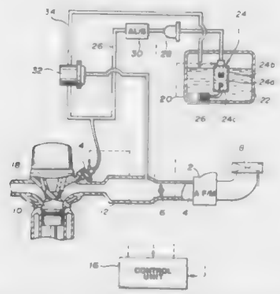


delivery pipe, said clip including retaining portions extending along diametrically opposite wall portions of said injector and having confronting projections adapted to engage mating holes bored in the diametrically opposite wall portions respectively of said injector thereby positioning said injector.

4,993,391
FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Masaru Kuribara, and Kazumitsu Kobayashi, both of Gunma, Japan, assignors to Japan Electronic Control Systems Company Limited, Isezaki, Japan

Filed Apr. 27, 1990, Ser. No. 514,039
Claims priority, application Japan, Apr. 27, 1989, 1-50623[U]
Int. Cl.[5] F02M *37/10*
U.S. Cl. 123—482 **6 Claims**



1. A fuel supply control system for an internal combustion engine, comprising:

a fuel tank which stores a fuel therein;

a fuel pump associated with said fuel tank to pressurize the fuel and supply same into a fuel line which is connected to fuel feed means at its downstream end, said fuel feed means feeding a controlled amount of the fuel to be combustioned in engine combusted chamber means, said fuel pump adapted to vary its discharge rate depending on a voltage value applied thereto;

sensor means for monitoring an alcohol concentration contained in the fuel to produce a signal indicative of the monitored alcohol concentration;

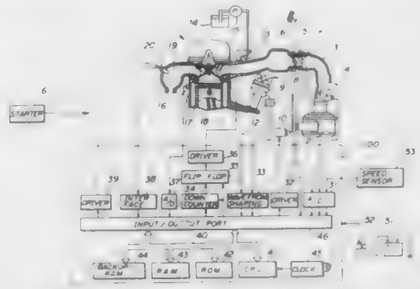
first means for deriving said voltage value to be applied to the fuel pump based on a value of said alcohol concentration indicative signal;

second means, responsive to said first means, for applying said derived voltage value to the fuel pump to allow the latter to supply a controlled amount of the fuel which corresponds to the value of said alcohol concentration indicative signal.

4,993,392
APPARATUS FOR CONTROLLING HEATER FOR HEATING OXYGEN SENSOR

Hiroshi Tanaka; Koichi Hoshi; Masaru Goudo; Mitsuhiro Suzuki, and Ritsuo Masaki, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 3, 1990, Ser. No. 503,833
Claims priority, application Japan, Apr. 24, 1989, 64-104159; Jul. 28, 1989, 64-197528
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—489 **17 Claims**



1. An apparatus for controlling a heater for heating an oxygen sensor provided in an exhaust gas flow passage of an internal combustion engine disposed in an automotive vehicle comprising:

detecting means for detecting a driving condition parameter of said automotive vehicle;

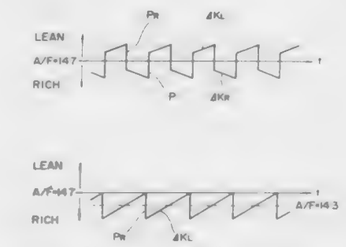
decision means for determining, from a driving condition represented by said driving condition parameter detected by said detecting means, whether or not a power supply control to said heater should be executed; and

power supply control means for supplying, during a predetermined period of time, said heater with an amount of power which is smaller than that to be supplied thereto in a normal driving condition when it is determined that said power supply control to said heater should be executed by said decision means so that a resistance value of said heater is controlled to a target resistance value.

4,993,393
AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Fumio Hosoda; Sachito Fujimoto; Hiroshi Ono, and Katsushi Watanabe, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,907
Claims priority, application Japan, Aug. 7, 1989, 1-204387
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—489 **7 Claims**



1. In a method of controlling the air-fuel ratio of a mixture supplied to an internal combustion engine in a feedback manner responsive to an output signal from an exhaust gas concen-

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tration sensor for detecting the concentration of a component in exhaust gases from said engine, the method including the steps of:

comparing the value of said output signal with a predetermined reference value; and

controlling the air-fuel ratio of said mixture to a desired value by means of proportional control applying a first correction value to correct the air-fuel ratio when the value of said output signal has changed from a rich side to a lean side or vice versa with respect to said predetermined reference value, and integral control applying a second correction value to correct the air-fuel ratio whenever a predetermined period of time elapses so long as the value of said output signal remains on the lean side or on the rich side with respect to said predetermined reference value;

the improvement comprising the step of:

inhibiting said correction by said first correction value, when the value of said output signal has changed from the lean side to the rich side with respect to said predetermined reference value while said engine is operating in one of a predetermined high load condition and a predetermined high rotational speed condition.

4,993,394

FUEL INJECTION INTERNAL COMBUSTION ENGINES

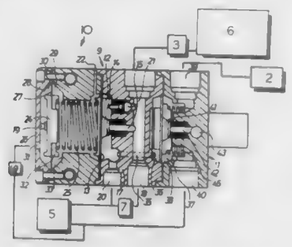
Michael L. McKay, Willetton, and Steven R. Ahern, Claremont, both of Australia, assignors to Orbital Engine Company Propriety Limited, Balcatta, Australia

Continuation of Ser. No. 51,463, Mar. 11, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 394,168

Claims priority, application Australia, Jul. 19, 1985, PH01560

Int. Cl.[5] F02M *67/02*

U.S. Cl. 123—533 22 Claims



1. A method of controlling the fuel distribution in the combustion chamber of a spark ignited internal combustion engine comprising entraining a metered quantity of fuel in a gas under pressure to form a fuel-gas charge, the quantity of fuel being metered in response to the engine load as the fuel is delivered for entrainment into the gas, directly injecting the fuel-gas charge into the combustion chamber through a nozzle under an injection pressure determined by the pressure of the gas so the fuel penetrates into the combustion chamber a distance dependent upon said injection pressure, the fuel-gas charge being injected at one injection pressure when the engine is operation with at least one of engine speed and engine load below a preselected value, and increasing the fuel-gas charge injection pressure in response to said at least one of engine speed and engine load exceeding said preselected value so that the fuel penetrates into the combustion chamber a greater distance at engine loads or speeds above said preselected value, the fuel being maintained at a predetermined pressure differential above the gas over substantially the whole of said at least one of engine speed and engine load.

4,993,395

HIGH-VOLTAGE OPTO-ELECTRONIC SWITCHING CIRCUIT

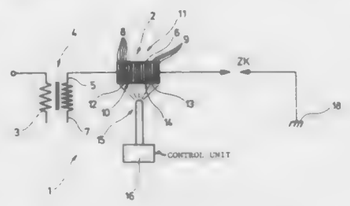
Manfred Vogel, Ditzingen Heimerdingen, and Werner Herden, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 24, 1990, Ser. No. 557,207

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935379

Int. Cl.[5] F02P *7/03, 7/73;* H03K *17/78, 17/10*

U.S. Cl. 123—643 12 Claims



1. High-voltage opto-electronic switching circuit, particularly for control of application of ignition energy to a spark plug (ZK) of an internal combustion (IC) engine, having

a high-voltage switch (2) including a photo responsive array (6) formed by a plurality of optically responsive semiconductor elements (8) and electrically connected in a cascade circuit (66);

a control means (16);

and light emitting means (15) controlled by the control means for emitting light and optically coupled to said array (6) of the semiconductor elements (8);

wherein, in accordance with the invention,

said semiconductor elements comprise a stack of disk or plate-shaped semiconductor chips (9) forming said cascade circuit and each having light sensitive or optically responsive control regions (13),

wherein said chips are located with their major surfaces against each other;

said control regions (13) are located at an outer surface of said chips; and

wherein said control regions (13) of the chips (9) of the cascaded circuit (6) are optically coupled to said light emitting means.

4,993,396

METHOD FOR DRIVING AN INSULATED GATE SEMICONDUCTOR DEVICE

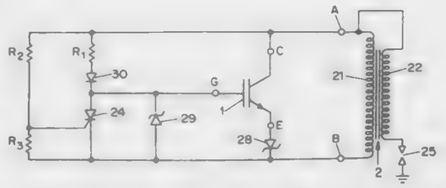
Shunji Miura, Matumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 11, 1989, Ser. No. 405,741

Claims priority, application Japan, Sep. 16, 1988, 63-232003

Int. Cl.[5] F02P *1/08*

U.S. Cl. 123—651 16 Claims



5. A method for providing electrical energy to an ignition plug of an internal combustion engine, utilizing an insulated gate semiconductor device of the type having gate and first main electrodes at the surface of a semiconductor substrate, a second main electrode at a second substrate surface, and a gate, to second main electrode capacitance which is a multiple of the gate to first main electrode capacitance under low voltage conditions, comprising the steps of:

(a) rotating a flywheel magnet through the field of an ignition coil alternately to generate voltages of a first and reverse polarity in the primary winding of said coil;

(b) accumulating a charge between said gate and second main electrodes in response to a first voltage coupled across said main electrodes in a non-conductive polarity;

(c) preventing leakage of said charge as it accumulates by providing electrical isolation for charges of the resulting polarity;

(d) causing the accumulated charge to discharge charge between said gate and first main electrodes in response to the reverse voltage applied across said main electrodes, thereby temporarily biasing said gate electrode to a potential adequate to cause the semiconductor device to enter a conductive state;

(e) causing said semiconductor device to rapidly change from a conductive to a non-conductive state, thereby generating an increased voltage in the primary winding of said ignition coil; and

(f) coupling resulting energy generated in the secondary winding of said coil to the ignition plug of the engine.

4,993,397

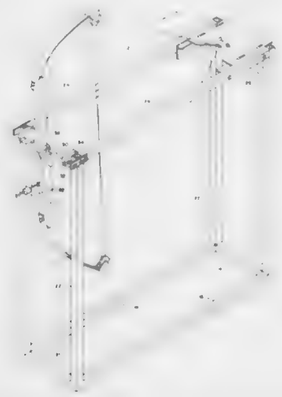
APPARATUS FOR CALIBRATING ARCHERY BOWS

Alfred Cryar, 5116 Jefferson Cir., Guntersville, Ala. 35976; Bobby G. Cryar, 1002 Par Circle Dr., Hope, Ark. 71801, and Charles G. Cryar, 18 Hanes Dr., Moody, Ala. 35004

Filed Aug. 28, 1989, Ser. No. 398,913

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—23.1 11 Claims



1. Apparatus for calibrating an archery bow comprising:

an upright frame having a pair of spaced-apart side members;

a shaft;

means connected to said side members for supporting said shaft thereon for rotation in a horizontal position;

means for securing a bow to said shaft in alignment wherein the length of the bow is generally perpendicular to the shaft, said frame defining sufficient open space to enable said bow secured in said alignment to be fully rotated around the axis of said shaft without obstruction; and

means supported by said frame spaced apart from the shaft for releasably securing a bowstring in fully drawn position, whereby, upon releasing said bowstring and shooting an arrow, said bow is free to rotate around the axis of said shaft and to be returned to the alignment that existed before shooting the arrow.

4,993,398

ARCHERY BOW SUPPORT STAND

James R. Wallace, 5109 Graston Ct., Louisville, Ky. 40216

Filed Oct. 27, 1989, Ser. No. 427,773

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—23.1 2 Claims



1. An archery bow support stand in combination with a first and second arrow, comprising,

a main angulated cylindrical body including a first cylindrical body portion defined by a first axis and a second cylindrical body portion defined by a second axis, wherein each first and second cylindrical body portion are integrally secured to one another in an end to end relationship at an obtuse included angle,

strap means secured to the main cylindrical body for encompassing a body of an archery bow,

clamp means securable to a free and of the first and second cylindrical body portions for securement of a forward terminal end of the first and second arrows in a preselected rotative relationship relative to the first and second axes,

wherein the clamp means includes a first cylindrical clamp jaw and a second cylindrical clamp jaw formed with a through-extending aperture therethrough coaxially aligned relative to one another, a clamp member formed with an internally threaded bore, a first rod means extending coaxially of and exteriorly of the free end of the first cylindrical body portion and a second rod extending coaxially of and exteriorly of the free end of the second body portion, the first and second rods include a first smooth shank portion of a first length equal to a length defined by an axial width of the first and second cylindrical clamp jaws, each of said first and second rods including a threaded free end threadedly receiving the clamp member thereon to frictionally secure the first and second clamp jaws between the free ends of the first and second cylindrical body portions and the respective clamp member,

wherein each clamp jaw includes a semi-cylindrical bore directed through an end surface of each clamp jaw, wherein each semi-cylindrical bore is aligned in a confronting relationship relative to one another and each semi-cylindrical bore is defined by a diameter an equal distance to a further diameter of each arrow to receive the respective arrow clampingly therewithin,

wherein the strap means includes a first strap and a second strap, the first strap includes an apertured end and the second strap includes a buckled end for surroundingly encompassing the archery bow, the first and second straps being mounted within the second bore, and

wherein the first and second straps are secured within the second bore by a washer member securing the first and second straps on a bottom surface of the second bore, and a threaded bolt member directed through the first bore into the second bore to secure the washer member against the bottom surface of the second bore to thereby fixedly secure the first and second straps therewithin.

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4,993,399

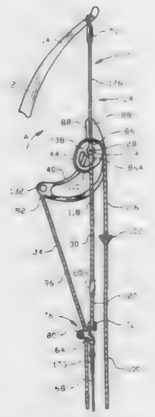
BOWSTRING APPARATUS

Jesse Chattin, 3409 - 22nd St. Causeway, Tampa, Fla. 33619

Continuation of Ser. No. 132,958, Dec. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 827,642, Feb. 10, 1986, Pat. No. 4,724,820. This application Jun. 6, 1989, Ser. No. 363,343

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—25.6 44 Claims



1. A bowstring apparatus for use with an archer's bow including a handle, upper and lower flexible limbs extending from the handle and each limb terminating in an upper and lower limb tip, respectively, comprising:

a first and second axle pin;

a first ring member rotatably mounted on said first axle pin and a second ring member mounted on said second axle pin, to enable rotation relative each said axle pin and wherein each said first and second ring members are eccentric ring members relative to said first and second axle pins, respectively;

as first arc member rotatably mounted on said first axle pin and a second arc member rotatably mounted on said second axle pin, axially spaced and extending away from said respective ring member and each said arc member having a proximal and distal end, said first and second arc members each comprising:

a first curved member having a first tapered radius of curvature;

a second curved member having a second tapered radius of curvature larger, at least along a portion of said member, than said first radius of curvature, said tapering curvatures causing said first and second curved members to intersect at two points to form said proximal and distal ends of said arc members;

each of said proximal end of said first and second arc member being securely attached to each of said first and second ring members respectively to enable in use simultaneous rotation about said first and second axle pins upon rotation of said ring member;

a tip interconnector means attachably securing in use each upper and lower limb tip to each said first and second axle pins respectively;

said tip interconnector means further interconnects said first axle pin and said second axle pin to interlink in use the upper blow limb and the lower bow limb and to suspend from the upper limb tip and from the lower limb tip in use said first ring member and said first arc member rotatably mounted on said first axle pin and said second ring member and said second arc member rotatably mounted on said second axle pin thereby positioning between the upper bow limb tip and the lower bow limb tip said first ring and first arc members and said second ring and second arc members to enable rotation of said first ring member and said second ring members about said first axle pin and said second axle pin respectively without interference from the upper and lower bow limbs of the archer's bow;

flexible cord means extending between and attachably securing together each said distal end of said arc member to enable simultaneous tensioning with said ring member when said ring member is tensioned;

a bowstring secured to each of said first and second rotatably mounted ring members and extending between each of said first and second rotatably mounted ring members; and

each said second curved member of said first and second arc members further including a guiding channel on their outer periphery whereby drawing said bowstring tensions the upper and lower limbs and enables said first and second ring members to rotate thereby permitting said bowstring to be rotatably released from said first and second rotatably mounted rings and further enables a flexible cable member to be guidably and rotatably received by each said guiding channel of each said first and second arc members thereby mechanically storing the force to tension said bowstring and enabling said bowstring to be held in a firing position and upon release of said bowstring said flexible cord means guidably and rotatably received on said arc members and said first and second rotatably mounted rings cooperate to apply substantially all of said stored force to said bowstring.

4,993,400

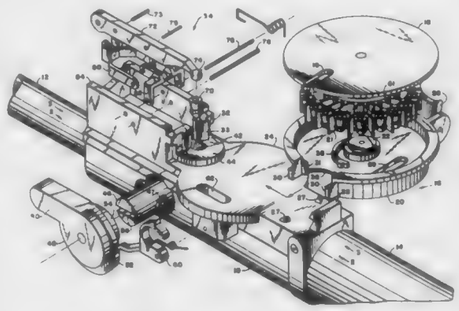
PELLET FEED SYSTEM FOR AN AIR GUN

Edwin Fitzwater, 1370 Bryant St., Rahway, N.J. 07065

Filed Aug. 11, 1989, Ser. No. 392,546

Int. Cl.[5] F41B *11/00*

U.S. Cl. 124—48 11 Claims



1. A pellet feeding system for an air gun having a loading cylinder, comprising:

a magazine removably attached to said gun, said magazine having a carousel formed with a plurality of compartments dimensioned to permit the containment of pellets having a variety of shapes;

means for incrementally rotating said carousel to position the carousel for loading said pellets singly into the loading cylinder and for rotating said loading cylinder to receive said pellets singly;

a pellet setting device mounted adjacent to and cooperating with said magazine to advance the pellets singly down into said loading cylinder so that the skirt or an advanced pellet is sized within the bore diameter of said loading cylinder.

4,993,401

CONTROL SYSTEM FOR GLASS-TOP COOKING UNIT

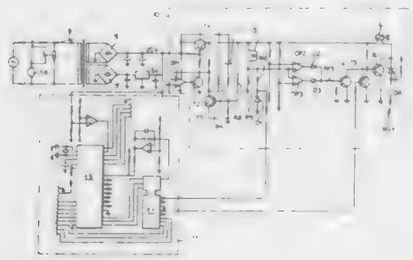
Helmut Diekmann, Menden; Günter Krohn, Hemer, and Wilhelm Cramer, Sundern, all of Fed. Rep. of Germany, assignors to Cramer GmbH & Co., Kommanditgesellschaft, Menden, Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 441,904

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1988, 3844082

Int. Cl.[5] F24C *15/30*

U.S. Cl. 126—39 E 4 Claims



1. A cooking unit comprising:

a ceramic cooking surface;

a gas burner underneath the surface;

gas supply means including a solenoid valve for feeding a combustible gas to the burner;

an electric igniter juxtaposed with the burner and electrically energizable to ignite the combustible gas issuing from the burner;

electric supply means connected to the igniter and to the gas supply means for electrically energizing the igniter whenever the valve is open and supplying gas to the burner; and

electronic control means connected to the valve and to the electric supply means for monitoring current consumption of the igniter and for closing the valve when the current consumption of the igniter indicates same is malfunctioning, the control means including a digital circuit and an analog circuit connected parallel to each other, both of these circuits including means for controlling opening and closing of the valve.

4,993,402

FUEL EFFICIENT RAPID RESPONSE WATER HEATING MODULE

Chester D. Ripka, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,654

Int. Cl.[5] F24H *1/00*

U.S. Cl. 126—361 16 Claims

1. A fuel efficient rapid response water heating module comprising:

a water heating tank;

a burner cavity disposed within said water heating tank;

a burner disposed within said burner cavity;

means for supplying a mixture of fuel and air to said burner;

preheater jacket means, surrounding said water heating tank;

flue means disposed within said water heating tank forming a path for the transfer of combustion gases from said burner cavity to said preheater jacket means;

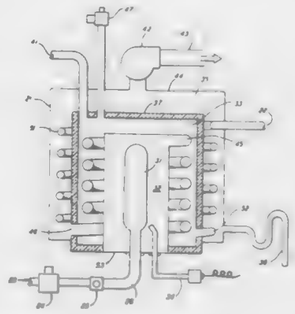
means for supplying cold water to said module;

outlet means for providing service hot water from said module;

preheater means disposed within said preheater jacket means both to preheat water coming into said module from said cold water supply means and to condense combustion gases within said jacket means;

means for transferring preheated water from said preheater jacket means to said water heating tank;

means, in flow communication with said preheater jacket means, for draining condensate from said preheater jacket means; and



means for causing a flow of said fuel and air mixture to said burner and for causing a flow of combustion gases from said burner cavity, through said flue means and through said preheater jacket means to the atmosphere.

4,993,403

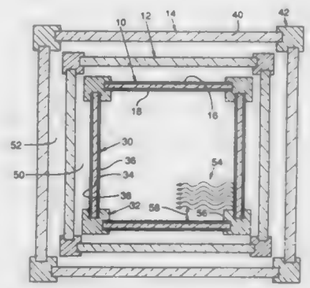
METHOD AND APPARATUS FOR TRAPPING HEAT ENERGY

Charles W. Downs; Elaine I. Downs, and Jennifer L. Downs, all of 8563 SE. Kane Rd., Gresham, Oreg. 97080

Filed Mar. 11, 1988, Ser. No. 166,999

Int. Cl.[5] F24J *2/56*

U.S. Cl. 126—450 8 Claims



7. An apparatus for trapping heat energy comprising:

a hollow enclosure formed of an opaque wall structure including at least one glass panel, an exterior surface of said enclosure including a heat absorbent material, an interior surface of said enclosure being reflective with respect to heat energy within the enclosure; and

means adjacent the exterior surface of the enclosure for collecting heat, said means being adapted to permit radiant heat energy to pass therethrough and strike the exterior surface of said enclosure.

4,993,404

FLUOROSCOPY SWITCHING DEVICE

Timothy G. Lane, 255 Madrid Ct., Merritt Island, Fla. 32953

Filed Jun. 26, 1989, Ser. No. 371,382

Int. Cl.[5] A61B *6/02, 1/04;* G21K *4/00;* H04N *5/321*

U.S. Cl. 128—4 12 Claims

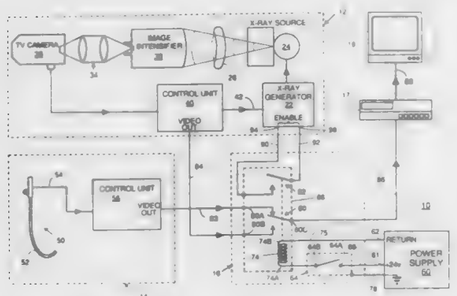
9. A switching device for use with a pair of video devices generating video signals, comprising:

a video output for connection to a video monitor;

a pair of video inputs for receiving video signals from said pair of video devices;

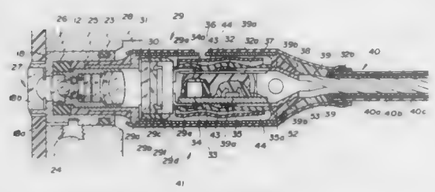
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means for selecting from between said pair of video inputs for output to said video monitor; and



means responsive to selection of the video input from one of said devices for disabling the other of said devices.

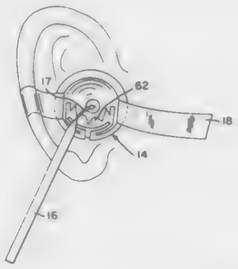
4,993,405
IMAGING APPARATUS
Kohji Takamura, Hachioji, and Kiyoshi Tsuji, Musashino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 25, 1990, Ser. No. 514,642
Claims priority, application Japan, May 15, 1989, 1-120870
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—6 **17 Claims**



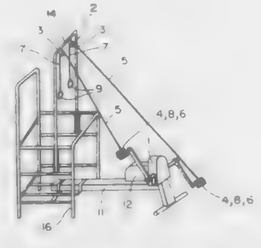
1. An imaging apparatus comprising:
a solid state imaging device for imaging an object to be imaged;
an electronic circuit connected operatively to said solid state imaging device and generating heat; and
a heat conducting means for leading said heat in a direction different from said solid state imaging device side at a thermal conductivity higher than the thermal conductivity of said heat generated from said electronic circuit to said solid state imaging device side.

4,993,406
DEVICE FOR DAMPENING UNCONTROLLED MOVEMENT OF SURGICAL INSTRUMENTS
William V. Reynolds, 348 Rte. 32, Central Valley, N.Y. 10917
Filed Sep. 14, 1989, Ser. No. 407,822
Int. Cl.[5] A61B *1/22*
U.S. Cl. 128—9 **14 Claims**

1. A stabilizing support for a surgical instrument used with a speculum, wherein the speculum has a wall with an inner surface formed about an axis for guiding the instrument, the stabilizing support comprising:
a peripheral flange adapted to be mounted on the speculum, the peripheral flange enclosing an open area;
a relative rigid plate disposed in the open area, the relatively rigid plate having between ends thereof a plurality of grooves therein opening toward the axis of the support in which grooves the surgical instrument is adapted to rest; and
resilient support means connecting the rigid plate to the peripheral flange wherein the surgical instrument is stabilized due to damping of the unintentional forces imparted to the instrument by the surgeon.



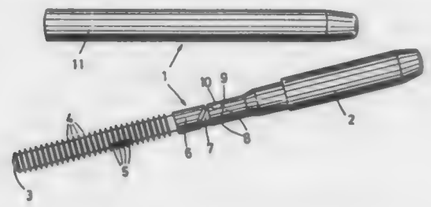
4,993,407
EXERCISER FOR DISEASED AND/OR AGED PEOPLE'S ARMS AND LEGS
Ko Chuan Chen, No. 125, Kuei-Lin Road, Taipei, 108, Taiwan
Filed Feb. 13, 1989, Ser. No. 309,135
Int. Cl.[5] A61H *1/02*; A63B *21/00*
U.S. Cl. 128—25 R **3 Claims**



1. A device for helping diseased or aged people do exercises with their legs and arms to improve their health, said device comprising:
a chair having a seat for supporting an exerciser,
a frame mounted on said chair,
pulleys mounted on said frame directly above the seat of said chair,
a motor plank mounted at one end to said chair,
a variable speed motor mounted on said motor plank at an opposite end of said motor plank from said one end mounted to said chair,
control means mounted on said chair and accessible to a person sitting on said chair for controlling a speed of said variable speed motor and for providing power to said variable speed motor,
power means extending through said motor plank and electrically connected to said motor and said control means,
a motor shaft of said motor,
pedal bars mounted on said motor shaft,
a pedal mounted on each of said pedal bars,
two wires, each wire connected at one end to a respective pedal and being threaded through said pulleys,
means for connecting the arms or legs of the exerciser to the opposite ends of said wires for movement of the arms or legs of the exerciser when the exerciser is sitting on the seat of said chair during actuation of said motor,
said motor mounted on said motor plank being located with respect to said chair so that an exerciser is able to do exercises with his arms or legs, respectively, in a circular motion with his hands or legs connecting directly to said pedals when the exerciser sits on the seat of said chair,

said wires being arranged through the pulleys fixed on said frame to change the directions of said wires, said one end of each of said wires being fastened to a respective pedal and the other end of each of said wires being held by or fastened to the user's arms when the exerciser sits on the seat of said chair so that when said motor turns at a desired speed as set by said control means, said pedals, wires and the user's arms also move vertically at the same speed.

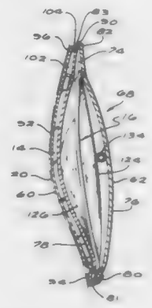
4,993,408
MASSAGE DEVICE
Günter Schweisfurth, Am Glaskopf 68, 5244 Daaden-Biersdorf, Fed. Rep. of Germany
Continuation of Ser. No. 330,972, Mar. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 157,118, Feb. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 669,593, Nov. 8, 1984, abandoned. This application Feb. 22, 1990, Ser. No. 483,999
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 8332382[U]; Apr. 12, 1984, 8411456[U]; Sep. 4, 1984, 8426025[U]
Int. Cl.[5] A61H *15/00, 7/00*
U.S. Cl. 128—57 **24 Claims**



1. Massage device for rolling massage of skin zones and reflex zones of the human body comprising a single handle, at least one axis (3 or 21) attached only to said single handle (2 or 28), freely rotatable massage rings (4 or 22) arranged on the axis, each massage ring comprising a plurality of pyramid-shaped needle tips distributed uniformly in circumferential direction of the massage rings, the needle tips being of a non-deformable material, the height, of the needle tips from the massage rings being between 1 and 2 mm.

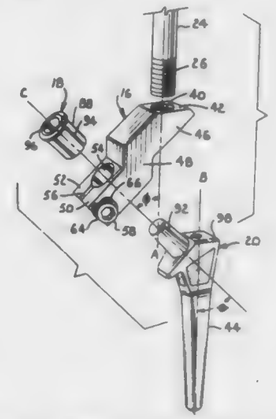
4,993,409
BACK SUPPORT
Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Westlake Village, Calif.
Filed Feb. 8, 1989, Ser. No. 308,687
Int. Cl.[5] A61F *5/02*
U.S. Cl. 128—78 **17 Claims**

1. A back support comprising:
a brace constructed of elastic fabric and generally dimensioned to fit around a lower torso of a user, said brace including an inner surface, an outer surface, a first section, a second section, a third section intermediate said first section and said second section, and means for releasably attaching said first section to said second section when said brace is stretched around said torso, said third section being adapted for positioning adjacent a lower back of a user, said third section having a first pocket adjacent said inner surface and a second pocket intermediate said first pocket and said outer surface;
a pad of gel-like material removably received by said first pocket;
an air bladder generally co-extensive with said pad, said bladder being removably received by said second pocket; and



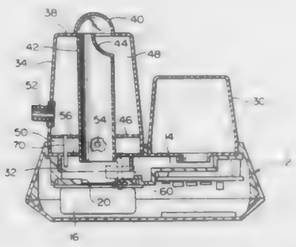
means for inflating said air bladder to press said pad against said lower back.

4,993,410
PROSTHETIC REMOVAL DEVICE
Timothy P. Kimsey, 14801 E. 44th St., Independence, Mo. 64055
Filed May 1, 1989, Ser. No. 345,401
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—100 **20 Claims**



1. A prosthesis manipulation advice adapted for attachment to a surgical prosthesis having an elongated shank defining a first longitudinal axis, an elongated smooth-sided, tapered connection stem located opposite said shank and defining a second longitudinal axis oriented at an oblique angle relative to the first axis, said first axis comprising:
an elongated, force-transmitting element; and
means for releasably securing said element to said prosthesis for manipulation of the latter, including—
coupling means having structure defining a stem-receiving opening therein;
a sleeve disposed within said opening and presenting a smooth-sided tapered inner surface complemental with the stem for clamping engagement with said stem;
means for operatively clamping said opening-defining structure and said sleeve to said stem; and
means for operatively interconnecting said element and said coupling means with the longitudinal axis of the element being generally parallel with said first longitudinal axis, whereby axial forces transmitted through said element will affect manipulation of said prosthesis.

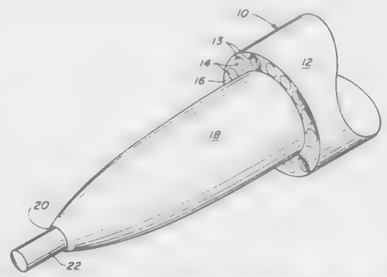
4,993,411
ULTRASONIC OXYGEN HUMIDIFIER
James J. Callaway, Franklin, Tenn., assignor to Medway, Franklin, Tenn.
Filed Apr. 6, 1990, Ser. No. 505,510
Int. Cl.[5] A61M *11/00*
U.S. Cl. 128—204.14 13 Claims



1. A gas humidifying apparatus defining a reservoir containing a liquid therein to a predetermined level, closure means defining a closed vertical chamber above said level, closed at its lower end by said liquid, an electro-acoustical transducer operatively associated with said reservoir below said level and in conjunction with said liquid in said reservoir to said level and by vibration of said liquid at ultrasonic frequency and with sufficient amplitude to develop a localized column of said liquid above said level as well as finely divided water particles emanating from said column, an upright tube within said chamber including open upper and lower ends, said lower end being vertically registered with said column, spaced outwardly therefrom and closely spaced above said level, partition means in said chamber adjacent and spaced above said level and about the lower end portion of said tube and dividing said chamber, outwardly of said tube, into upper and lower chamber sections into which the upper and lower ends, respectively, of said tube open, gas inlet means opening into said lower chamber section for discharging gas under controlled pressure into said lower chamber section, and humidified gas outlet means opening outwardly of said upper chamber section, a foraminated gas distribution partition in said chamber spaced below said partition means above said level and about the lower end portion of said tube defining a gas inlet chamber below and above said upper and lower chamber sections into which said gas inlet means opens.

4,993,412
METHOD AND APPARATUS FOR REMOVAL OF OBSTRUCTIVE SUBSTANCE FROM BODY CHANNELS
Douglas R. Murphy-Chutorian, Palo Alto, Calif., assignor to Eclipse Surgical Technologies, Inc., Mountain View, Calif.
Filed Aug. 2, 1989, Ser. No. 388,685
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—7 17 Claims

1. A catheter device for removing an obstruction in a human body channel, said device comprising:
- a catheter having an elongated body with a distal end portion adapted to be inserted within a channel and a proximal end portion, said catheter body comprising a forwardly extending tapered nose member at its distal end, said nose member having a large end whose diameter is smaller than the diameter of said catheter body, thereby forming an annular distal end face of said catheter body surrounding said large end of said nose member;
- a lumen extending lengthwise through said catheter body;
- a guidewire having a distal end extending through said catheter lumen and longitudinally through said nose member beyond the catheter's distal end;
- expandable means mounted on said guidewire near its distal end and means for controlling said expandable means at said proximal end portion;
- a series of fiber members extending through said catheter body, said fiber members being parallel and having distal ends that are closely spaced at said annular distal end face of said catheter and extending to its proximal end;



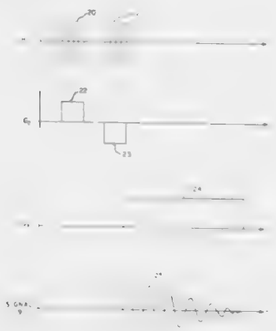
laser means connected to said fiber members near the proximal end of said catheter for delivering laser energy through said fiber members and forwardly therefrom at said catheter end face.

4,993,413
METHOD AND APPARATUS FOR INDUCING A CURRENT AND VOLTAGE IN LIVING TISSUE
Kenneth J. McLeod, Setauket, and Clinton T. Rubin, Port Jefferson, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.
Filed Sep. 22, 1988, Ser. No. 247,965
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 F 8 Claims



1. A surgically non-invasive method of treating living tissues and/or cells comprising the step of:
- inducing, by a time-varying magnetic field, a time varying electric field which in turn induces voltage and concomitant current signals within said tissue and/or cells, wherein said voltage and current signals are substantially symmetric and have a frequency of between about 1 Hertz and about 1 K Hertz, and wherein the induced time-varying electric field has a peak intensity of between about .08 microvolts per centimeter and about 80 microvolts per centimeter when the voltage and current signals have a frequency of between about 1 Hertz and about 100 Hertz, and has a peak intensity of between about .8 microvolts per centimeter and about 800 microvolts per centimeter when the voltage and current signals have a frequency of between about 100 Hertz and about 1 K Hertz.

4,993,414
MOVING MATERIAL PROJECTION IMAGING SYSTEM USING NUCELAR MAGNETIC RESONANCE
Albert Macovski, Menlo Park, and Dwight G. Nishimura, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.
Continuation of Ser. No. 195,490, May 17, 1988, abandoned, which is a continuation of Ser. No. 766,752, Aug. 16, 1985, abandoned. This application Aug. 28, 1989, Ser. No. 401,491
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653 AF 11 Claims

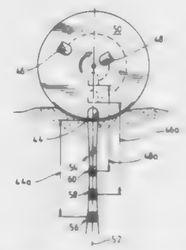


1. A method of imaging moving material in a volume using magnetic resonance comprising the steps of:
- substantially spatially uniformly exciting the magnetic moments in the volume during an excitation period so that static material will produce no net received signals following the excitation and static material magnetic moments will be returned to their equilibrium position whereby only moving material in said volume will produce net received signals,
- applying a static magnetic gradient waveform to said volume in said excitation period, and
- processing received signals to form a two-dimensional projection image of the moving material in the volume.

4,993,415
MAGNETIC RESONANCE IMAGING WITH PERFLUOROCARBON HYDRIDES
David M. Long, El Cajon, Calif., assignor to Alliance Pharmaceutical Corp., Otisville, N.Y.
Division of Ser. No. 234,193, Aug. 19, 1988, Pat. No. 4,951,673. This application Jul. 12, 1990, Ser. No. 551,884
Int. Cl.[5] A61L *15/00*
U.S. Cl. 128—653 A 7 Claims

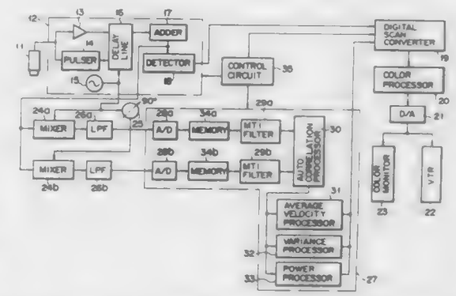
1. A fluorocarbon emulsion for use in an animal body, comprising:
- a physiologically acceptable aqueous phase;
- a perfluorocarbon mixture, comprising a perfluorocarbon bromide having from 6 to 10 carbon atoms, and at least 0.1% of a perfluorocarbon hydride having from 6 to 10 carbon atoms, at a total concentration of 20% to 125% weight per volume in said emulsion; and
- an effective amount of an emulsifying agent.

4,993,416
SYSTEM FOR ULTRASONIC PAN FOCAL IMAGING AND AXIAL BEAM TRANSLATION
Jonathan Ophir, Houston, Tex., assignor to Board of Regents The University of Texas System, Austin, Tex.
Filed Apr. 25, 1989, Ser. No. 343,405
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.06 19 Claims



1. Apparatus for tissue characterization measurement of a target body comprising:
- (a) a plurality of matched ultrasonic transducers;
- (b) a moveable mounting member adapted to mount the transducers in a spaced array such that movement of the mounting member sequentially positions the transducers in an axially staggered pattern along one or more common ultrasonic radiation axes to transmit and receive ultrasonic signals to and from the target body along the one or more common ultrasonic radiation axes up, and
- (c) means coupled to said matched transducers for performing tissue characterization measurements using said received ultrasonic signals.

4,993,417
METHOD AND SYSTEM FOR CONTROLLING ULTRASOUND SCANNING SEQUENCE
Yasutsugu Seo, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 228,590, Aug. 5, 1988, abandoned. This application Oct. 18, 1989, Ser. No. 423,713
Claims priority, application Japan, Aug. 12, 1987, 62-201244
Int. Cl.[5] A61B *8/06*
U.S. Cl. 128—661.09 7 Claims



1. A method for controlling an ultrasound scanning sequence, the method comprising the steps of:
- setting a number of ultrasound beams transmitted to a subject in a same direction;
- setting a detection ratio used for detecting a flow velocity of the subject; and
- controlling the ultrasound scanning sequence in accordance with the number of ultrasound beams and the detection ratio, so as to increase a transmission interval of the ultra-

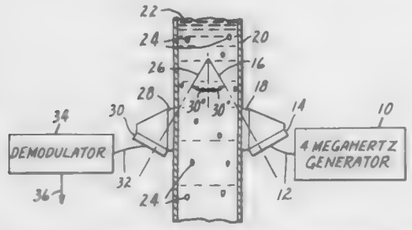
sound beams in the same direction without changing a generation interval of an ultrasound pulse.

4,993,418

DOPPLER BLOOD FLOW SYSTEM AND METHOD USING LOW FREQUENCY NOISE SIGNAL PROCESSING

Billy L. Weaver, Eagan, and Dirk R. Smith, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 26, 1989, Ser. No. 302,406
Int. Cl.[5] A61B 5/026
U.S. Cl. 128—661.08 2 Claims



2. For use in a system having a fluid containing particles flowing at a rate of flow having a value through a tube, an apparatus for determining said value of said rate of flow of said fluid, comprising:

an ultrasonic signal transmitter arranged to transmit an ultrasonic signal through said tube at an oblique angle thereto;

a receiver arranged to receive the ultrasonic signal which has been reflected off of said particles contained in said fluid having a received ultrasonic signal having time domain characteristics as an output;

converter means coupled to said receiver and receiving said received ultrasonic signal for converting said received ultrasonic signal into a frequency domain signal having frequency domain characteristics;

analyzer means coupled to said converter means and receiving said frequency domain signal for analyzing said frequency domain signal for a low frequency hump;

signal processing means coupled to said analyzer means for removing said low frequency hump from said frequency domain signal creating a modified frequency domain signal having an average frequency;

determining means coupled to said signal processing means for determining said average frequency of said modified frequency domain signal; and

calculating means coupled to said determining means and receiving said modified frequency domain signal for calculating said value of said rate of flow of said fluid from said average frequency of said modified frequency domain signal using Doppler techniques.

4,993,419

RADIATION DETECTOR SUITABLE FOR TYMPANIC TEMPERATURE MEASUREMENT

Francesco Pompei, Wellesley Hills, Mass.; Joseph M. Looney, Jr., Clearwater, Fla., and Philip R. Gaudet, Jr., Concord, Mass., assignors to Exergen Corporation, Natick, Mass.

Filed Dec. 6, 1988, Ser. No. 280,546
Int. Cl.[5] A61B 6/00
U.S. Cl. 128—664 28 Claims

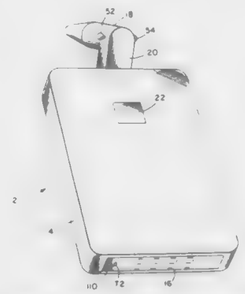
1. A radiation detector comprising:

a thermopile mounted within a thermal mass and having a junction thermally coupled to the thermal mass;

a thermally conductive tube coupled to the thermal mass for guiding radiation to the thermopile from an external target; and

a thermal barrier surrounding the thermal mass and tube;

the outer thermal RC time constant for thermal conduction through the thermal barrier to the thermal mass and tube is at least two orders of magnitude greater than the inner



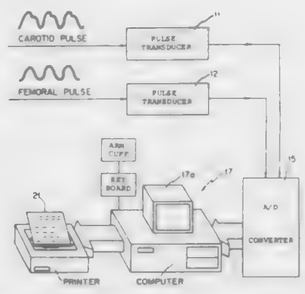
thermal RC time constant for the temperature response of the cold junction to heat transferred to the tube and thermal mass through the thermal barrier.

4,993,420

METHOD AND APPARATUS FOR NONINVASIVE MONITORING DYNAMIC CARDIAC PERFORMANCE

Walter Welkowitz, Metuchen; Qing Cui, Highland Park, and Yun Qi, Piscataway, all of N.J., assignors to Rutgers University, Piscataway, N.J.

Filed Mar. 30, 1990, Ser. No. 502,409
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—668 18 Claims



1. Apparatus for noninvasively monitoring dynamic cardiac output and cardiovascular system parameters of a living subject comprising, means for sensing a carotid pulse waveform above the carotid artery externally on the body of the living subject and for converting the sensed pulse waveform to a carotid pressure electrical waveform and means for sensing a femoral pulse waveform above the femoral artery externally on the body of the living subject and for converting the sensed pulse waveform to a femoral pressure electrical waveform, means receptive of each electrical waveform for digitizing each electrical waveform individually, means for defining a simulated electrical circuit simulating an aorta in terms of lumped electrical parameters, means for applying the digitized carotid pressure electrical waveform as a simulated electrical voltage input to said simulated electrical circuit comprising lumped electrical parameters, means for driving the simulated electrical circuit receptive of the digitized carotid pressure electrical waveform and for variable adjustment of the electrical parameters thereof, means for comparing an output electrical waveform of the simulated circuit simulating the femoral pressure electrical waveform and the sensed femoral pressure electrical waveform, and means for adjusting individually the simulated circuit electrical parameters until corresponding

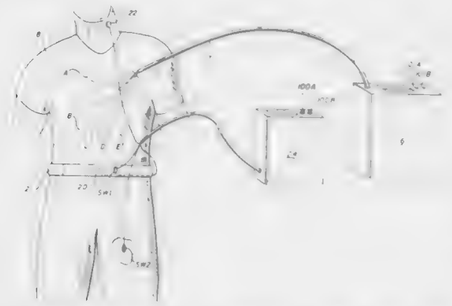
instantaneous values of the last-mentioned two electrical waveforms match said simulated circuit electrical parameters.

4,993,421

CARDIAC MONITORING SYSTEM

William E. Thornton, 701 Coward's Creek Rd., Friendswood, Tex. 77546

Filed Jul. 20, 1990, Ser. No. 555,307
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—670 5 Claims



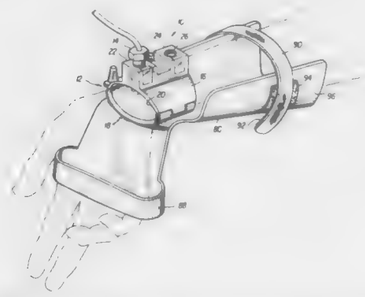
1. A monitoring system for detecting and processing parameters affecting the cardiovascular system of a subject and for correlating the parameters with the EKG of the subject, said monitoring system including: EKG sensor means for generating EKG signals relating to a subject; second sensor means for detecting selected activities of the subject and for generating electric signals corresponding thereto; and processing means responsive to said EKG signals and to said electric signals from said second sensor means for correlating said electric signals from said second sensor means with predetermined values to yield statistical information related to the activities of the subject and to correlate said information with the EKG signals generated by said EKG sensor means.

4,993,422

APPARATUS FOR MEASURING BLOOD PRESSURE

Edward H. Hon, and Edward D. Hon, both of Bradbury, Calif., assignors to The Hon Group, Encino, Calif.

Continuation of Ser. No. 858,713, May 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 780,398, Sep. 26, 1985. This application Dec. 19, 1988, Ser. No. 287,715
Int. Cl.[5] A61B 5/021
U.S. Cl. 128—672 17 Claims



1. Blood pressure monitoring apparatus for measuring the pressures in an isolated portion of skin in the vicinity of an artery, comprising:

a. at least one sensing means having an active surface;

b. a means for retaining at least one of said transducer sensing means against the skin;

c. said transducer means having an annular isolating ring surrounding said transducer sensing means for isolating a portion of the skin, said isolating ring having a width small in relationship to the inner diameter of said annular isolating ring so as to prevent flattening of the skin in the vicinity of said transducer and causing a raised portion of skin to form within said isolating ring;

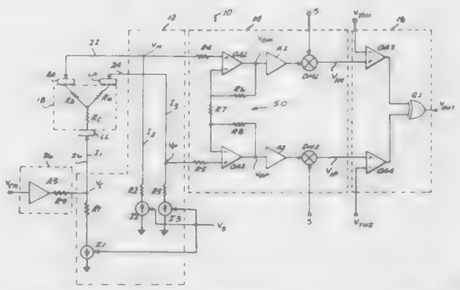
d. the output of the transducer sensing means being responsive to changes in pressure in said raised portion of isolated skin.

4,993,423

METHOD AND APPARATUS FOR DIFFERENTIAL LEAD IMPEDANCE COMPARISON

John R. Stice, Redmond, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Continuation of Ser. No. 219,349, Jul. 13, 1988, Pat. No. 4,917,099. This application Jan. 12, 1990, Ser. No. 464,380 The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—696 12 Claims



1. An apparatus, for use with devices employing a first lead having a first lead impedance, a second lead having a second lead impedance and a reference lead having a reference lead impedance, said first, second and reference leads being coupleable to electrodes, that senses the integrity of lead connections comprising:

(a) a current source means coupleable to said first lead, said second lead and said reference lead, wherein said current source means:

(i) produces a first AC current and applies said first AC current to said first lead;

(ii) produces a second AC current and applies said second AC current to said second lead; and,

(iii) produces a reference AC current and applies said reference AC current to said reference lead;

(b) a receiver coupleable to said first and second leads for receiving a first voltage produced by said first AC current and said first lead impedance and a second voltage produced by said second AC current and said second lead impedance;

(c) differential amplifying means for differentially amplifying said first and second voltages to produce first and second differential impedance voltages, wherein said first differential impedance voltage is proportional to a first difference between said first and second lead impedances and wherein said second differential impedance voltage is proportional to a second difference between said first and second lead impedances; and

(d) an output means coupled to said differential amplifying means for receiving said first and second differential impedance voltages and producing a leads-off output signal when one and only one of said first and second differential

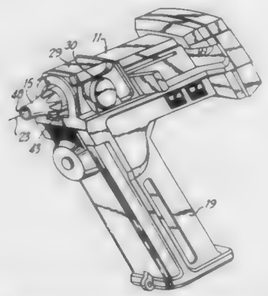
impedance voltages equals or exceeds a corresponding first or second threshold level.

4,993,424

INFRARED MEDICAL THERMOMETER

Edward D. Suszynski, Vista; Ian F. Ayton, Palos Verdes Estates; James P. Stewart, Escondido; Marco A. Schilling, Lakeside, and Thomas K. Gregory, Carlsbad, all of Calif., assignors to Diatek, Incorporated, San Diego, Calif.

Filed Dec. 4, 1989, Ser. No. 445,438
Int. Cl.[5] A61B *5/00*; G01K *1/08*
U.S. Cl. 128—736 32 Claims



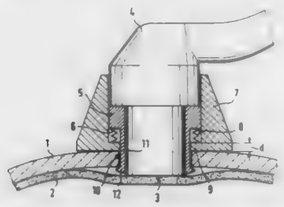
1. Infrared medical thermometer comprising:
a housing adapted to be held in a user's hand;
an elongated probe adapted to be inserted into a patient's ear canal to receive infrared radiation and provide a signal indicating the patient's body temperature;
extension/retraction means for selectively extending the elongated probe to an operative position outside the housing when a patient's temperature is to be measured and for selectively retracting the elongated probe to an inoperative position fully within the housing when the measurement has been completed; and
probe cover means for positioning a protective cover in alignment with the elongated probe while the probe is retracted within the housing such that, when the extension/retraction mean selectively extends the probe to its operative position, the protective cover is automatically placed over the probe.

4,993,425

ADAPTER ASSEMBLY FOR USE WITH A CRANIAL BIOSENSOR

Harald Kronberg, Staufen, Fed. Rep. of Germany, assignor to Hellige GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 27, 1989, Ser. No. 441,211
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1988, 88100072
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—748 4 Claims



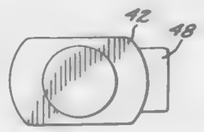
1. An adapter assembly for accurately positioning a removable biosensor in a circular hole bored through the skull, said adapter assembly comprising a tubular element having a radially outwardly extending peripheral flange and a plurality of downwardly depending spring-like legs, said legs formed as outwardly extending cams whereby when the body of the biosensor is slidably inserted in the tubular element the spring-like legs are urged into contact with the skull bone defined by the hole therein and the outwardly extending cams engage the periphery of the skull bone proximate the Dura, a sleeve element having an axial bore therethrough sized to slidably engage the flange of the tubular element and having an inwardly extending peripheral flange bearing on the lower portion of the tubular element and defining an annular space between said inwardly extending peripheral flange and the outwardly extending peripheral flange of the tubular element, and a spring element disposed in said annular space whereby when the tubular element is inserted into the sleeve element and the biosensor is inserted therein, the cams of the spring-like legs are assured of adequate anchorage to the skull bone.

4,993,426

BLOOD COLLECTOR CYLINDER WITH NEEDLE EJECTOR

Treesa A. Spencer, 21882 Winnebago, El Toro, Calif. 92630

Division of Ser. No. 222,151, Jul. 21, 1988, Pat. No. 4,907,600, which is a continuation-in-part of Ser. No. 43,884, Apr. 29, 1987, abandoned. This application Nov. 2, 1989, Ser. No. 430,669
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—763 16 Claims



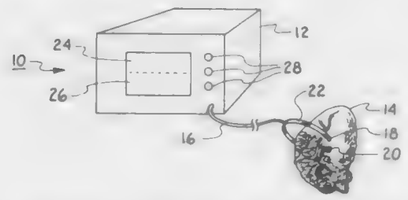
1. A blood specimen collecting system comprising in combination:
a hollow cylinder having an end wall and an apertured sleeve in the end wall adapted to receive a removably mounted needle assembly;
a blood sample collector tube adapted to fit at least partially within the hollow interior of the cylinder, the collector tube being sealed at one of its ends by a septum pierceable with a needle;
a needle assembly having an intermediate portion which is dimensioned to fit and be mounted in the apertured sleeve of the hollow cylinder, a first hollow needle portion extending axially outwardly from the hollow cylinder, and a second hollow needle portion extending axially inwardly into the interior of the cylinder, the first and second hollow needle portions being in fluid communication with one another, the first hollow needle portion being adapted to pierce a person's veins, and the second hollow needle portion being adapted to pierce the septum; and
means mounted to the cylinder and pivotable against the needle assembly, for ejecting the needle assembly from its position mounted in the aperture, the means for ejecting being capable of demounting the needle assembly from the cylinder without need for human hands to touch the needle assembly, the means for ejecting including an opening through which the needle assembly passes, whereby the pivoting of the means for ejecting against the needle assembly dislodges the needle assembly from the apertured sleeve and allows the needle assembly to fall freely through the opening so as to be completely separable from the cylinder and from the means for ejecting.

4,993,427

HEART CONTRACTION MONITOR

Howard S. Barr, Escondido; Joe E. Deavenport, San Diego; Robert J. Schuessler, Del Mar, and Thomas A. Steinke, San Diego, all of Calif., assignors to Sonotek Corporation, San Diego, Calif.

Filed Nov. 9, 1989, Ser. No. 434,136
Int. Cl.[5] A61B *5/10*
U.S. Cl. 128—774 23 Claims



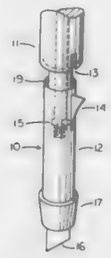
1. An apparatus for dynamically determining the dimension of a muscle which comprises:
means for transmitting a sonic or ultrasonic pulse into said muscle through a first surface of said muscle at a first time;
means for receiving and signalling the emergence of said pulse from a second surface of said muscle opposite said first surface of said muscle at a second time;
means for determining the difference between said first time and said second time to generate a pulse transmit time;
processing means for filtering said pulse transit time and ignoring said pulse transit time when said pulse transit time is not within a predetermined range; and
means for converting said pulse transit time to a distance signal for display and storage.

4,993,428

METHOD OF AND MEANS FOR IMPLANTING A PRESSURE AND FORCE SENSING APPARATUS

Steven W. Arms, Burlington, Vt., assignor to MicroStrain Company, Burlington, Vt.

Filed Feb. 12, 1990, Ser. No. 478,426
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—774 6 Claims



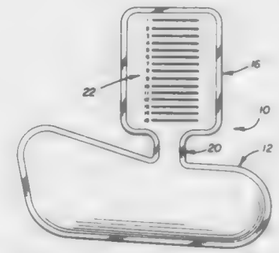
1. An implantable pressure and force sensing apparatus, for measuring the mechanical behavior of the soft tissue of the body, comprising:
a main guide cannulae;
said main guide cannulae having an alignment slot positioned at the lower end of said main guide cannulae;
said main guide cannulae further having a direction indicator at the upper end of said cannulae;
said main guide cannulae further having an inner ledge at its lower end for providing buttressing means;
retractable centerline cutting and positioning means;
inner tubular means comprising means that fit over said retractable centerline cutting and positioning means;
said tubular means having at least one sensing means attached thereto;
said tubular means further having an alignment projection means located at the upper end of said inner tubular means for being positioned within said alignment slot of said main guide cannulae;
said upper end of said tubular means being in replaceable contact with said buttressing means of said main guide cannulae; and
said tubular means further having an enlarged tapered section at the end opposite said upper end.

4,993,429

ORTHOTIC FITTING SYSTEM

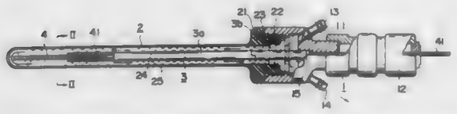
Martin S. Krinsky, 610 Craig Ave., Campbell, Calif. 95008

Filed Jun. 9, 1989, Ser. No. 364,466
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—779 12 Claims



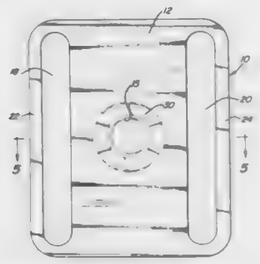
10. A method of measuring a patient's body part for fitting an orthotic device thereto using an apparatus which includes an envelope formed of opposing sheets of flexible material, including (A) an interior chamber within said sheets, said envelope having dimensions substantially equal to dimensions of said orthotic device, (B) a diverticulum having an interior chamber in flow communication with said interior chamber of said envelope, (C) a predetermined total quantity of fluid within said envelope and diverticulum, which fluid may flow between said interior chambers thereof, and (D) indicia means, affixed to said diverticulum, for measuring a quantity of said fluid which is within one of said envelope and said diverticulum, said indicia means measures a quantity of said fluid within said diverticulum, to indicate a remaining quantity of said fluid which is within said envelope by the relationship of FE=FT−FD wherein FT is the predetermined total quantity of said fluid, FD is the quantity of fluid in said diverticulum as measured by said indicia means, and FE is the remaining quantity of fluid in said envelope, said method comprising the steps of:
enclosing within said envelope an excess amount of said fluid relative to an amount needed to properly fit said envelope to said body part;
positioning said envelope into contact with said body part, with force sufficient to form at least one of said flexible sheets to contours of said body part, said fluid flowing within said envelope generally away from said at least one sheet in response to localized pressure thereon;
pressing said at least one sheet against said body part until said fluid flows from said envelope into said diverticulum in an amount sufficient to properly fit said envelope to said body part;
measuring said amount of fluid FD;
determining, according to said measuring step, how much fluid FE remains in said envelope;
placing into said orthotic device an amount of fluid substantially equal to said determined amount of fluid FE, to achieve a fit of said orthotic device to said body part substantially equivalent to the proper fit achieved by said pressing step.

4,993,430
ELECTRODE DEVICE FOR HIGH FREQUENCY THERMOTHERAPY APPARATUS
Jun Shimoyama, Kyoto, and Akitoshi Miki, Toyonaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Continuation of Ser. No. 141,398, Jan. 6, 1988, abandoned. This application Aug. 25, 1989, Ser. No. 398,496
Claims priority, application Japan, Jan. 6, 1987, 62-401
Int. Cl.[5] A61N 5/00
U.S. Cl. 128—784 2 Claims



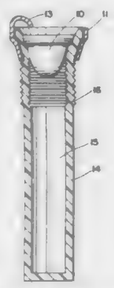
1. An electrode device for high frequency thermotherapy apparatus, comprising;
(a) a base member having a cooling liquid charge port and a cooling liquid discharge port;
(b) a cavity-inserted cylindrical body removably fixed to said base member under liquid-tight conditions;
(c) a separator fixed to said base member and arranged in said cavity-inserted cylindrical body along the longitudinal direction thereof, partitioning a space within said cavity-inserted cylindrical body into a first and a second space except for an end space thereof, said first space communicating with said charge port and said second space communicating with said discharge port, said separator comprising a flat liquid passage partition plate having a width substantially equal to an inner diameter of said cavity-inserted cylindrical body coupled to a flat liquid charge/discharge partition plate fixed to said base member having a width substantially equal to an inner diameter of said base member;
(d) an electrode arranged at one of said separator extending into said end space; and
(e) a circulation passage for a cooling liquid being formed extending from said first space via said end space to said second space.

4,993,431
PROPHYLACTIC DEVICE AND METHOD OF MANUFACTURE
Alla V. K. Reddy, 1042 Jade Dr., Hanna, Wyo. 82327
Continuation of Ser. No. 293,993, Jan. 6, 1989, abandoned. This application Aug. 22, 1990, Ser. No. 571,323
Int. Cl.[5] A61F 6/02, 6/06
U.S. Cl. 128—830 6 Claims



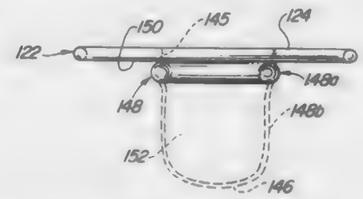
1. An anatomically configured unisex prophylactic device formed of elastic impermeable material for preventing the exchange of bodily fluids between either a male or female user and partner of the user comprising:
a flat planar rectangular shield portion having spaced parallel side edges, spaced parallel end edges and a major dimension and a minor dimension; said major dimension having a length which covers a female user's perineum from the pubic region to anal region and a length which covers a male user's perineum from the user's crotch to the coccyx region of a male user;
a pouch connected to said planar portion and extendable therefrom and adapted to be inserted into a bodily cavity of either a male or female user when said planar portion is disposed to cover either a female user's perineum from the pubic region to the anal region or to cover a male user's perineum from the user's crotch to the coccyx region;
a rectangular outer segment located in surrounding relationship to said flat planar portion and having upper and lower segments formed integrally of said spaced parallel end edges of said flat planar rectangular shield portion; said rectangular outer segment further including two spaced band segments located in spaced parallelism with said side edges and extending parallel thereto through a distance equal to that of said major dimension;
said band segments and said side edges forming narrow elongated leg openings having a length equal to said major dimension and an unstretched width that is less than one inch;
said band segments being stretchable with respect to said side edges of said shield portion to be disposed on the thighs of either a male or female user for locating said pouch in alignment with either a vaginal opening of a female user or an anal opening of a male user.

4,993,432
APPLICATOR FOR CERVICAL CAPS
Jack W. Shields, 1950 Las Tunas Rd., Santa Barbara, Calif. 93103, and Richard P. Jobe, 26965 Orchard Hill La., Los Altos Hills, Calif. 94022
Filed Mar. 28, 1989, Ser. No. 329,937
Int. Cl.[5] A61F 6/06
U.S. Cl. 128—838 4 Claims



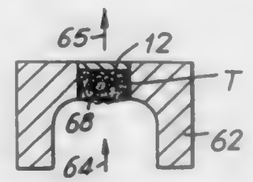
1. An adjustable cervical cap applicator device for use with a cervical cap positioning said cervical cap over the cervix uteri, said cervical cap having an outer wall, at least a portion of which outer wall is substantially convex, said adjustable applicator comprising:
(a) an applicator tip portion, said tip portion being substantially annular and concave on its inner surface to permit a mating engagement with the outer surface of said cervical cap; and
(b) an applicator handle portion, said handle portion housing a cavity therewithin and having an applicator end, said applicator end of said handle portion affixed to and terminating in said applicator tip portion, and a closed end;
(c) means for regulating the air pressure within said cavity when said cervical cap is matingly positioned within said applicator tip thereby loosely sealing said cavity, and
(d) a malleable member positioned within said handle said malleable member permitting inclusive subtantially permanent adjustment of the angle between the axis of said applicator tip and the axis of said handle.

4,993,433
PROPHYLACTIC DEVICE
Alla V. K. Reddy, 1042 Jade Dr., Hanna, Wyo. 82327
Continuation of Ser. No. 205,933, Jun. 13, 1988, Pat. No. 4,834,113, and a continuation-in-part of Ser. No. 84,622, Aug. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 7,104, Jan. 27, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 343,497
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] A61F 5/44
U.S. Cl. 128—842 5 Claims



1. An anatomically configured hermaphroditic prophylactic device adapted to be worn by either a male or a female person for insertion into a body cavity of such persons to prevent the transmission of disease and bodily fluids du ring sexual intercourse, said device comprising:
shield means for connection to either a female user or a male user to cover limited portions of the perineum regions or either user in the vicinity of either an anal canal or a vaginal canal;
said shield means including a flat shield portion having opposite ends and a central region of a width to span the perineum of either a male or female user and said flat shield portion having a preselected length bounded by said opposite ends to form a spaced shielding of either a male or a female user at only a portion of the perineum of the user which is susceptible to exposure to bodily fluids during intercourse with the user;
said flat shield portion having a length which will cover the outer body surfaces of the perineum region of a female from the upper pubic region to a point closely adjacent the anal canal and to cover the outer body surfaces of the perineum region of a male from the coccyx region to a point adjacent the male genitals and wherein said flat shield portion further includes a width that increases on either end of the central region to the opposite ends of said flat shield portion;
an extensible rolled ring on said flat shield portion defining a pouch having an entrance formed integrally with said central region of said flat shield portion and said pouch including a retracted position in which said rolled ring is located against said flat shield portion;
said pouch including a piloting position in which said rolled ring is partially deployed to form a single walled piloting segment for partially locating said rolled ring in a body cavity of either a male or a female; and
said pouch including an extended position in which said rolled ring is fully unrolled for shielding the internal walls of a body cavity of either a female or a male user thereof;
said rolled ring including an end closure wall located in substantially the plane of said flat shield portion when in said retracted position and further including telescoped segments in said rolled ring located in close juxtaposed position with the flat shield portion when is said retracted position;
said flat shield portion adapted to be connected to strap means for disposing the flat shield portion in overlying relationship with the perineum regions of either a female user or a male user and to space the end closure of said rolled ring in alignment with the entrance to either an anal canal or a vaginal canal prior to intercourse;
said pouch having a diameter greater than that of an erected penis and having a length longer than an erected penis when in said extended position and being extendable from said flat shield portion by placing a member against said end closure from the exterior surface of said flat shield portion and inserting it through said flat shield portion and partially into an aligned body cavity while simultaneously unrolling said outer layer of said rolled ring to form said single walled piloting segment for a piloted entry of said rolled ring into the bodily cavity when said pouch is in its piloting position;
said rolled ring being movable to cause said pouch to be moved into said extended position by further insertion of the member into the aligned body cavity which further insertion causes the remainder of said rolled ring to unroll to loosely cover the remainder of said rolled ring to unroll to loosely cover the internal walls of the body cavity while remaining loosely draped on the outer surface of the member; and
said pouch remaining positioned in said extended position within the body cavity by the strap means for positioning said flat shield portion in a position to cover the perineum region surrounding either an anal or vaginal cavity.

4,993,434
CIGARETTE RODS WITH LIQUID FLAVOR CENTERS
Lewis A. Hawe, and Jose G. Nepomuceno, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Jun. 29, 1989, Ser. No. 374,007
Int. Cl.[5] A24C 5/14
U.S. Cl. 131—79 23 Claims



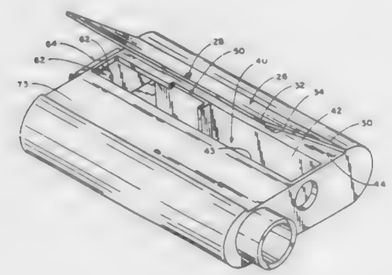
1. A method for forming cigarette rods having liquid strands comprising the steps of:
depositing tobacco onto a belt advancing in a predetermined direction;
extruding a liquid strand onto the deposited tobacco, said liquid strand having a cross-sectional area and a viscosity sufficient to prevent said liquid strand from soaking through the deposited tobacco; and
depositing additional tobacco onto said belt so that said liquid strand is completely surrounded by tobacco, forming the cigarette rod.

4,993,435
SMOKING ACCESSORY
Steven McCann, 543 E. 1800 N, N. Logan, Utah 84321
Filed Jan. 16, 1990, Ser. No. 465,339
Int. Cl.[5] A24F 13/02, 13/08, 13/22, 19/00
U.S. Cl. 131—330 3 Claims

1. A smoking accessory comprising:
(A) a smoke-impermeable hollow case having a front end wall and a rear end wall, a top and a bottom, and first and second side walls;
(B) an access door hingeably connected to said case top for providing access to the interior of said hollow case when said door is open;
(C) a lighted cigarette containing compartment in said case and which includes

(1) a first interior wall extending inside said case from said case rear end wall to said case front end wall, said first interior wall being spaced from said first side wall,
(2) a second interior wall extending inside said case from said case rear end wall to said case front end wall and being spaced from said first interior wall and from said case second side wall,
(3) an ash opening defined through said first interior wall,
(4) a sliding door portion on said first interior wall which slides from a closed position covering said ash opening to an open position uncovering said ash opening,
(5) a one-way valve in said case rear end wall for conducting ambient air into said lighted cigarette containing compartment but preventing air from passing out of said cigarette compartment via said one-way valve,
(6) a cigarette access opening defined through said case front end wall through which a cigarette foot end extends for access to a smoker, and
(7) a cigarette support tube mounted on said case front wall adjacent to said cigarette access opening;

(D) an ash compartment defined between said first interior wall and said case first side wall, said ash compartment including a top wall located to be adjacent to said case access door when said case access door is closed, said ash compartment extending from said case front end wall to said case rear end wall and being opened and closed by said sliding door;



(E) a filter compartment defined between said second interior wall and said case second side wall and extending from said case front end wall to said case rear end wall, said filter compartment including
(1) a top wall hingeably connected to said second interior wall to be adjacent to said case access door when said access door is closed,
(2) an exit opening defined in said case rear end wall to permit filtered gas in said filter compartment to escape from said case,
(3) a mouthpiece mounted on said case front end wall and a one-way valve mounted on said front end wall in covering relation to said mouthpiece for conducting air into said filter compartment via said mouthpiece but preventing air from passing out of said filter compartment via said mouthpiece,
(4) a passage in said second interior wall for conducting smoke from said cigarette containing compartment into said filter compartment, and
(5) a one-way valve mounted on said second interior wall in covering relation to the passage in said second interior wall to permit smoke to flow into said filter compartment from said cigarette containing compartment but to prevent smoke from passing from said filter compartment to said cigarette containing compartment via said passage; and

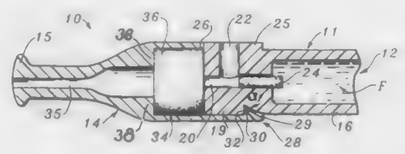
(F) filter media located in said filter compartment.

4,993,436

ASPIRATING AND VOLATILIZING LIQUID DISPENSER

Walter L. Bloom, Jr., 1281 Beech Haven Rd., Atlanta, Ga. 30324

Filed Dec. 21, 1989, Ser. No. 454,275
Int. Cl.[5] A24F *47/00*
U.S. Cl. 131—335 14 Claims



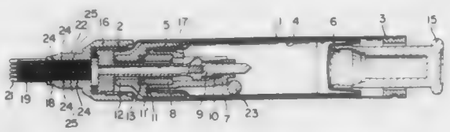
1. A dispenser adapted to deliver a liquid orally to a user and to volatilize same comprising:
a container defining an enclosed liquid reservoir therein to contain the liquid to be dispensed;
a mouthpiece operatively associated with said container and defining a bit thereon adapted to be grasped in the user's mouth, said bit defining a drawing passage therethrough so that the user can suck fluids therethrough by inhaling;
said container and said mouthpiece defining an enclosed volatilizing chamber and a vent passage from said volatilizing chamber to the ambient air;
a fluid barrier of limited permeability connecting said liquid reservoir with said volatilizing chamber so that said vent passage communicates with said volatilizing chamber in parallel with said liquid barrier; and,
an open pore material within said volatilizing chamber located so that air sucked into said drawing passage from said vent passage must pass through said open pore material and so that some of the liquid sucked from said liquid reservoir will be retained in said open pore material to be volatilized before passage into the user's mouth through said drawing passage,
whereby the user can inhale the volatilized liquid from said open pore material by sucking on the bit with the vent passage open to the ambient air and can aspirate the liquid directly into the user's mouth while replenishing the liquid in said open pore material by selectively closing said vent passage and sucking on the drawing passage to impose a sufficient pressure differential across said liquid barrier to cause liquid to be aspirated from said liquid reservoir until the pressure across said liquid barrier equalizes.

4,993,437

HAIR COSMETICS COATING TOOL

Masaru Kimura, Shinmachi, and Kiyokazu Sakurai, Kamiizumimura, both of Japan, assignors to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 364,544, Jun. 7, 1989, abandoned, which is a continuation of Ser. No. 135,411, Dec. 21, 1987, abandoned. This application Mar. 19, 1990, Ser. No. 496,152
Claims priority, application Japan, Dec. 9, 1986, 61-189637
Int. Cl.[5] A45D *24/22, 24/16*
U.S. Cl. 132—112 4 Claims



1. A hair cosmetics coating tool which comprises:
(a) a main cylindrical body;
(b) a cylindrical reservoir member for storing liquid hair cosmetic material and slidably mounted in said main body;

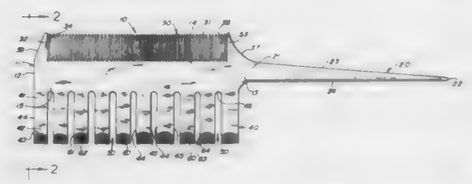
(c) an applicator head attached to said main body and having a plurality of brush tufts extending forwardly from said head and a plurality of comb teeth in a comb body also extending forwardly from said head adjacent to one side of said brush tufts for a distance beyond said brush tufts, each of said brush tufts being mounted in a bristle root hole in said applicator head;
(d) a supply means communicating from said reservoir member to said bristle root holes of said brush tufts to supply hair cosmetic liquid directly to said brush tufts;
(e) a valve device to control said supply mean having a knocking member mounted at the rear end of said main body;
(f) said applicator head having a plurality of axially extending liquid passages at least on a side of said brush tufts opposite said one side and transverse liquid passages on a forward face thereof extending between said axially extending liquid passages and said brush tufts, between said axially extending passages, and between said brush tufts to equalize flow of liquid to said tufts in said applicator head to ensure an adequate supply of liquid to said brush tufts;
whereby as the knocking member is depressed, the valve device is opened an liquid hair cosmetic is forced to flow to said brush tufts for application to hair of a user.

4,993,438

HAIR WEAVING COMB AND METHOD FOR USE

Marjorie A. Hunt, 6120 Nicollet Ave. South, Minneapolis, Minn. 55419

Filed Mar. 31, 1989, Ser. No. 331,346
Int. Cl.[5] A45D *24/04*
U.S. Cl. 132—139 25 Claims



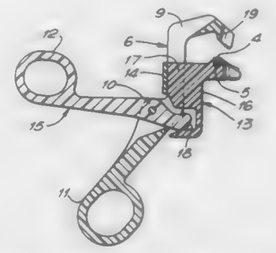
1. A hair weaving comb for rapidly separating hair for highlighting and the like comprising:
a handle;
a set of comb-like teeth integrally connected to the handle, each of the teeth being of equal length, equal width, and spaced equidistance from each other; and
a set of spaced apart legs connected to and extending from the handle, each of the legs including a distal end portion, each of the distal end portions including at least two projections and a concave edge formed between and partially by the projections, each of the concave edges having a depth less than the width of its respective distal end portion, the teeth and legs being disposed substantially in a first plane with the teeth extending away from the legs, the legs forming hair receiving spaced between each other for receiving hair, the distal end portions creating hair sub-sections when the comb is inserted into a section of hair, the distal end portions displacing alternate hair sub-sections away from other alternate hair sub-sections when the comb is further inserted into the section of hair, the other alternate hair sub-sections being received by the hair receiving spaces whereby hair is separated for highlighting and the like.

4,993,439

CURLING DEVICE

Leslie O. Davies, No. 2 Croft House, Priory Court, Chirbury, Montgomery, Powys, United Kingdom, assignor to Leslie Owen Davies and Sepralash Limited, Santa Fe, both of, N. Mex.

Filed May 17, 1990, Ser. No. 525,348
Claims priority, application United Kingdom, Jul. 18, 1989, 8916374.5
Int. Cl.[5] A45D *2/48*
U.S. Cl. 132—217 14 Claims



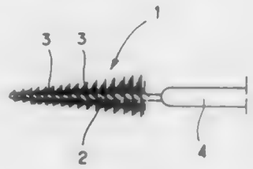
1. A device for curling eyelashes comprising:
a first arcuate curling element having end regions and a middle region;
a second arcuate curling element having end regions and a middle region and adapted to co-operate with said first arcuate member to curl eyelashes;
a first support member for supporting said first arcuate element at said middle region of said first arcuate element and having a portion providing guiding means;
a second support member supporting said second arcuate element at said middle region of said second arcuate element and slidably engaging said guide means for enabling sliding relative motion between said support members in the sense to move said first and second arcuate elements towards and away from one another; and
a third member pivotally mounted to one of said support members and engagable with the other of said support members to urge the arcuate elements relatively towards one another.

4,993,440

BRUSH FOR THE APPLICATION OF COSMETIC PRODUCTS, MASCARA IN PARTICULAR

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 125,096, Nov. 25, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 386,037
Claims priority, application France, Nov. 28, 1986, 86 16625
Int. Cl.[5] A45D *40/26*
U.S. Cl. 132—218 8 Claims



1. A brush for the application of a cosmetic product which is contained in a device including a wiping system, in particular, for the application of mascara to the eyelashes or of a dye to the hair, said brush having a central elongate core, around which are carried bristles disposed to extend substantially radially from said core and being regularly distributed, at least some of said bristles having at least one portion on its surface

formed as a capillary channel which extends substantially from the base of the bristle as far as the tip of the bristle, each capillary channel having a generally V or U shaped form in cross-section, the sides of the U or V which constitute the shape of one capillary channel soming, in cross-section slightly nearer to each other near their free ends before again diverging in the zone where the capillary channel opens out at the surface of the bristle, each bristle being inscribed as a whole in a cylinder with a diameter between about 0.06 and 0.25 mm, a capillary channel having a depth between about 0.01 and 0.06 mm and a greater width of between about 0.01 and 0.06 mm,

whereby, after the brush is wiped by the wiping system of the device there is an even distribution of the cosmetic product over the entire length of each of said bristles.

4,993,441

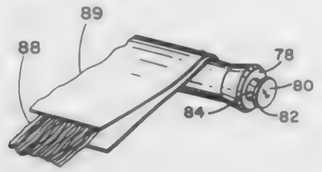
PERMANENT WAVE ROD

Luther B. Hanson, Box 162A Rte. #2, Waseca, Minn. 56093

Filed Jun. 6, 1988, Ser. No. 202,266

Int. Cl.[5] A45D *2/12*

U.S. Cl. 132—226 **16 Claims**



1. A disposable permanent wave device, comprising:

(a) an elongated imperforate generally cylindrically shaped member having end portions with a middle portion disposed therebetween and being formed of a relatively readily wettable expanded polystyrene and being constructed and arranged to receive and have rolled thereon a section of hair around its cylindrical body and to hold the same securely while the permanent wave solution is applied; and

(b) a section of end paper folded over the ends of the section of hair and wrapped around said cylindrically shaped member, thereby adhering said end paper to said cylindrically shaped member when wetted and rolled thereabout.

4,993,442

METHODS FOR REMOVING OBSTRUCTIONS FROM CONDUITS USING SULFURIC ACID ADDUCTS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 50,530, May 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 675,774, Nov. 28, 1984, Pat. No. 4,673,522, and a continuation-in-part of Ser. No. 771,259, Aug. 30, 1985, Pat. No. 4,722,986, and a continuation-in-part of Ser. No. 453,496, Dec. 27, 1982, which is a continuation-in-part of Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925. This application Oct. 3, 1989, Ser. No. 416,824

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.[5] B08B *3/08;* **C11D** *7/08, 7/32;* **C23G** *3/04*

U.S. Cl. 134—22.14 **16 Claims**

1. A method for removing a cellulose- and/or carbonic-containing deposit o obstruction from the interior of a conduit, which comprises contacting said deposit or obstruction with a composition comprising the mono- and/or diadduct of sulfuric acid and a chalcogen-containing compound having the empirical formula $R_1—C_X—R_2$, wherein X is 0 or S, each of R_1 and R_2 is independently selected from the group consisting of hydrogen, NR_3R_4 and NR_5, with at least one of R_1 and R_2 being other than hydrogen, each of R_3 and R_4 is independently selected from the group consisting of hydrogen and monovalent organic radicals, and R_5 is a divalent organic radical, the equivalent molar ratio of said chalcogen-containing compound to sulfuric acid being at least about 1.

4,993,443

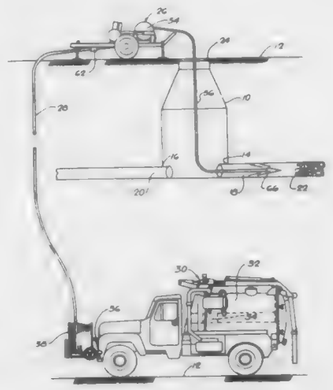
SEWER PIPE CLEANING ACCESSORY

Phillip S. Buchert, Crystal Lake, Ill., assignor to City of Crystal Lake, Crystal Lake, Ill.

Filed Mar. 29, 1984, Ser. No. 594,560

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—167 C **4 Claims**



1. Apparatus for cleaning a sewer comprising a source of water pressure of sufficient quantity and under sufficient pressure to clean a sewer, and a movable vehicle disposed at a distance from the water source having a frame, a pair of parallel wheels mounted on the frame for rotation with respect thereto for supporting the frame, a water inlet mounted on the frame, said inlet being adapted to be connected to the source of water under pressure, a reel mounted on the frame for rotation with respect to the frame having a water connector, piping means connected between the water inlet and the connector including a first valve, a first hose having a central channel for transporting water under pressure having one end connected to the water connector of the reel and an opposite end, said reel being of sufficient size to contain the entire first hose in a coiled configuration, a nozzle mounted on the opposite end of the first hose, said nozzle having apertures directed back toward the hose, whereby a flow of water through the first hose and nozzle will be directed back by the nozzle to propel the first hose forward and unwind additional first hose from the reel, an air compressor mounted on the frame, an air motor mounted on the frame, means including a second valve connecting the air motor to the compressor, and a third valve connected between the compressor and the connector of the piping means, and a second hose connected at one end to the water inlet of the vehicle and connected at the other end to the source of water, said second hose being flexible and extending between the water source and the vehicle.

4,993,444

DISHWASHER

Tateo Toriyama; Masayoshi Okabe, and Katsura Ikedo, all of Ota, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,212

Claims priority, application Japan, Feb. 16, 1988, 63-033254

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—181 **9 Claims**

1. A dishwasher comprising:

a wash tank, wherein said wash tank is formed of a bottom wall, and side walls;

a cage removably installed in said wash tank for accommodating dishes;

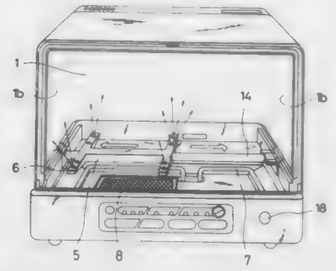
an "H" shaped nozzle body for delivering wash water to the interior of said wash tank;

said nozzle body including a rectangular central part having side walls, end walls at both ends and a cavity formed therein, and wings extending laterally from each of the opposing ends of the central part, said wings including spray apertures and a hollow water passage connecting the wings to the central part whereby said spray apertures are in communication with the cavity of said nozzle body;

drive means for applying a linear back and forth motion to said nozzle body in the wash tank;

wash water supply means for supplying the wash water to said nozzle body;

a water conduit extending horizontally in said wash tank from one of said side walls to an opposing side wall;



said end walls of the central part including an aperture for water tight fitting with said water conduit so that said water conduit extends through the apertures in the end walls of the central part and through the cavity;

said nozzle body being movable along the water conduit for said back and forth movement;

said water conduit having a plurality of water delivery apertures disposed at about the center of the water conduit in a lengthwise direction thereof so that the water delivery apertures are kept inside the cavity of the central part wherever the central part is situated along the water conduit; and

means for supplying wash water into the conduit so that the wash water entering the water conduit is passed through the water delivery aperture into the cavity in the central part, through the passage in the wings, and sprayed through the spray apertures.

4,993,445

GARDEN UMBRELLA WITH SOLID WOODEN POLE DESIGNED TO OPERATE WITH HAND CRANK AND PULLEY SYSTEM

Emanuel Dubinsky, N.Y.

Filed Aug. 16, 1990, Ser. No. 568,065

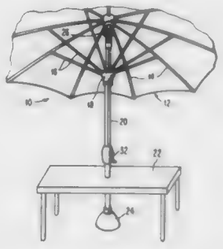
Int. Cl.[5] A45B *11/00*

U.S. Cl. 135—20 M **8 Claims**

1. In an umbrella having an umbrella pole made of a solid rigid material, an umbrella cover, frame support ribs to support said umbrella cover and a rib-holder adapted for slidable movement along said umbrella pole, the improvement of which comprises:

a pulley wheel mounted in said umbrella pole below its top portion, a pulley cord having one end fixedly attached to said umbrella rib-holder, said pulley cord extending operatively around said pulley wheel and downward to a lower part of said umbrella pole, a hand crank attached near said lower part of said umbrella and connected to the other end of said pulley cord whereby said hand crank will raise or lower said rib-holder and umbrella cover through said pulley cord and pulley wheel;

said umbrella pole including a narrow groove formed along the side of said pole and extending longitudinally from the top portion of said pole near said pulley wheel down to the lower part of said pole near said hand crank, said groove having a width sufficient to contain said pulley



cord therein and permit said pulley cord to move longitudinally therein, and cord retainer means extending along the open side of said groove adjacent the side of said pole, said cord retainer providing a closure for said groove to retain said cord in said groove and comprising a wall section for said pole for closing off said open side of said groove.

4,993,446

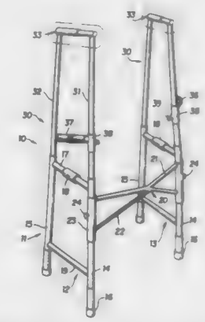
COMBINATION WALKER AND CRUTCH

Glen A. Yarbrough, 705 Louise St., Clarksville, Ark. 72830

Filed Oct. 16, 1989, Ser. No. 421,804

Int. Cl.[5] A61H *3/00*

U.S. Cl. 135—67 **10 Claims**



1. An invalid support apparatus comprising a walker base, said walker base including a pair of side frames having front and rear leg posts, reinforcing frame means for connecting said front leg posts of each of said side frames together in spaced relationship with respect to another, each of said front and rear leg posts having upper and lower ends, a first horizontal reinforcing member extending between said front and rear leg posts of each of said side frames adjacent the upper ends thereof, a crutch member selectively mounted to each of said side frames, each crutch member having front and rear posts, said front posts being vertically adjustably mounted to each of said front leg posts of said side frames, each of said rear posts of said crutch members being vertically adjustably mounted to said rear leg posts of said side frames whereby said crutch members may be vertically adjustable relative to said walker base, said front and rear posts of said crutch members having upper ends, and underarm support means being mounted to said upper ends of front and rear post means.

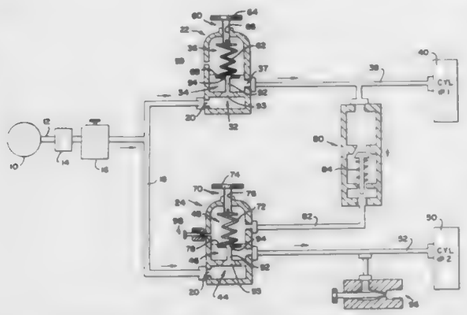
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4,993,447

PRESSURE-REGULATING METHOD AND APPARATUS

Arthur Camire, Calumet City, Ill., assignor to D&K Custom Machine Design, Inc., Elk Grove, Ill.

Filed Oct. 13, 1989, Ser. No. 421,238
Int. Cl.[5] G05D *11/03*
U.S. Cl. 137—9 4 Claims



1. A method of regulating fluid pressure from a source to a plurality of pressure-operated devices including at least two pressure-regulating devices, each having an inlet connected to said source and an outlet connected to a pressure-operated device with a regulating section between said inlet and said outlet controlling the pressure of fluid between said inlet and said outlet, the steps of adjusting said regulating section of a first of said pressure-regulating devices to produce a predetermined pressure at said outlet and diverting the pressurized fluid from the outlet to the regulating section of a second pressure-regulating device, and applying an independent regulating pressure to said second pressure-regulating section so that the outlet pressure of said second regulating device can be independently varied and the outlet pressures of the two pressure-regulating devices can be varied by adjusting the regulating section of the first pressure-regulating device, including the further step of introducing a controlled pressure drop between the outlet of said first pressure-regulating device and the regulating section of said second pressure-regulating device.

4,993,448

CRUDE OIL EMULSIONS CONTAINING A COMPATIBLE FLUOROCHEMICAL SURFACTANT

Athanassios Karydas, Brooklyn, and Juliana Rodgers, Yonkers, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 51,096, May 15, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 314,616
Int. Cl.[5] F17D *1/17*
U.S. Cl. 137—13 13 Claims

1. A crude oil in water emulsion, which is stable to both breakdown and phase inversion up to at least about 50° C., said emulsion containing an effective, compatible, emulsion stabilizing amount of a fluorochemical surfactant of the formula

$$(R_f)_n A_m Q \qquad (I)$$

wherein

R_f is an inert, stable, oleophobic and hydrophobic fluoroaliphatic group having up to about 20 carbon atoms;
n is an integer from 1 to 3;
A is a direct bond or an organic linking group and is covalently bonded to both R_f and Q;
Q is an anionic, nonionic or amphoteric group; and
m is an integer from 1 to 3;

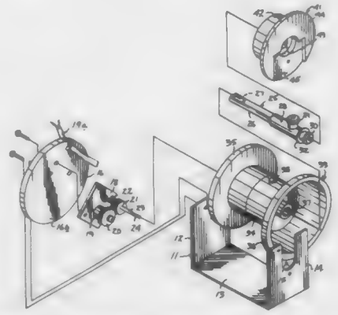
wherein the amount of weight of said fluorochemical surfactant present in said emulsion being between about 0.001 and 1% by weight of said emulsion, in the presence or absence of up to about 2% by weight of a crude oil emulsion promoting hydrocarbon surfactant, with the proviso that at least about 0.005% by weight total fluorochemical and hydrocarbon surfactant is present, based upon the weight of emulsion, and wherein said emulsion contains about 15 to about 90 percent by weight water, based upon the weight of emulsion, such that the viscosity of the emulsion is less than about 50% of the viscosity of said crude oil, and wherein said emulsion spontaneously breaks down into an aqueous and crude oil phase at a temperature between about 55° and 75° C.

4,993,449

HOSE REEL APPARATUS

Larry L. Stutzman, 7181 Hites Cove Rd., and James R. Owings, 2842 Highway 49 S., both of Mariposa, Calif. 95338

Filed Jun. 21, 1990, Ser. No. 541,322
Int. Cl.[5] B65H *75/46*
U.S. Cl. 137—355.26 5 Claims



1. A hose reel apparatus comprising,

a support base, the support base including a first vertical flange spaced from and parallel a second vertical flange, the second vertical flange including a flange recess directed downwardly from an upper edge of the second vertical flange,

and

a support drum rotatably mounted on the support base, the support drum including a central cylindrical support housing defined by a first diameter and a rear drum disk spaced from and parallel a forward drum disk, the rear and forward drum disks defined by a second diameter,

and

the rear and forward drum disks coaxially mounted at opposed terminal ends of the central cylindrical support housing,

and

the rear drum disk including a rear cylindrical cavity, and the forward drum disk including a forward cylindrical cavity,

and

a drum support tube coaxially directed through the central cylindrical support housing and extending interiorly of the forward cylindrical cavity,

and

an elongate axially aligned spindle rotatably mounted within the support tube and extending exteriorly of the tube through the forward cylindrical cavity,

and

a forward mounting disk mounted within the forward cylindrical cavity, with a forward terminal end of the spindle directed through the forward mounting disk,

and

a rear mounting disk including a drive means mounted thereto, with the drive means arranged for selective rotation of the spindle, with the drive means mounted within the rear cylindrical cavity,

and

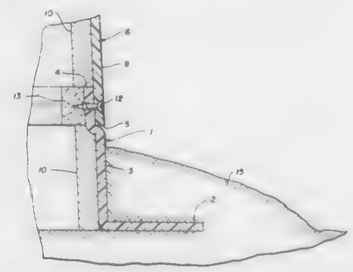
the rear mounting disk and the forward mounting disk respectively mounted to the first support flange and the second support flange.

4,993,450

COVER FOR OUTSIDE PIPE ASSEMBLY

James W. Dunn, P.O. Box 704, Laurel Hill, Fla. 32567

Filed Jan. 26, 1990, Ser. No. 470,585
Int. Cl.[5] F16L *35/00*
U.S. Cl. 137—382 9 Claims



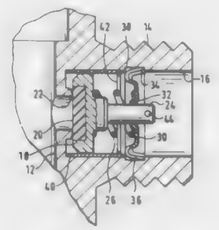
1. A cover for an outside pipe assembly comprising a base portion, an outwardly extending peripheral flange provided on the lower end of said base portion, said base portion having walls extending upwardly from said flange to an open end portion, a peripheral shoulder provided on the walls of said base in proximity to the open end portion thereof, a cover portion having a top wall, and side and end walls depending from said top wall, the lower edges of said side and end walls being seated on the peripheral shoulder on said base portion, fastening means securing the cover portion to the base portion, and means securing the base portion to the ground, said base portion and cover portion enclosing an outside pipe assembly, whereby the pipe assembly is protected from damage due to vandalism.

4,993,451

VALVE FOR GAS CYLINDERS

Paul Kremer, Walferdange, Fed. Rep. of Germany, assignor to Ceodeuz S.A., Lintgen, Luxembourg

Filed Dec. 21, 1989, Ser. No. 454,376
Claims priority, application Luxembourg, Dec. 23, 1988, 87411
Int. Cl.[5] F16K *15/02*
U.S. Cl. 137—454.2 9 Claims



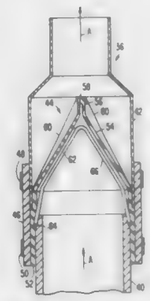
1. Valve for gas cylinders which is intended to contain a given residual pressure in the cylinder and is mounted in a cylindrical bore (16) of a connection piece (14) designed to be connected either to a circuit for using the gas, or to a circuit for filling or rinsing the cylinder, the said valve comprising a closing member which is urged in the direction of its closure onto a seat (22) under the action of a spring (26) and counter to the action of the pressure of the gas in the cylinder, characterized in that the closing is axially displaceable inside a bush (40) which is removably engaged in the said bore (16), and in that the said spring (26) rests on an element designed to be secured either to the connection piece (14) so as to keep the valve in the operative position, or to the said bush (40) so as to permit the axial disengagement of the valve together with the bush (40) and the said element.

4,993,452

LOW PRESSURE CHECK VALVE

Walter J. Hough, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 22, 1989, Ser. No. 455,260
Int. Cl.[5] F16K *15/16*
U.S. Cl. 137—515.7 23 Claims



1. In an exhaust gas aftertreatment system having an air supply system comprising

an air feeding means for selectively creating a flow of air;

a flow passage for directing the flow of air including at least two coaxial tubular members;

a valve element having a circular base portion surrounding and supported by one of said coaxial tubular members, a flexing portion extending from said circular base portion and converging to form a tip, and a diametrical slit formed in said tip;

a sealing means surrounding said flow passage for sealing a joint formed between said coaxial tubular members; and

a support means extending into said valve element to a position adjacent said tip for supporting said flexing portion;

wherein said valve element permits the flow of air from said air feeding means in one direction and prevents the flow of exhaust gas in an opposite direction and said support means prevents said valve element from collapsing when said air feeding means is inoperable.

4,993,453

VALVE AND ARRANGEMENT FOR FIRE SUPPRESSION WATER SPRINKLER SYSTEM

George J. McHugh, Broomall, Pa., assignor to AGF Manufacturing, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 138,436, Dec. 28, 1987, Pat. No. 4,852,610, which is a continuation-in-part of Ser. No. 881,270, Jul. 2, 1986, Pat. No. 4,741,361, which is a continuation-in-part of Ser. No. 874,653, Jun. 16, 1986, abandoned. This application Mar. 8, 1989, Ser. No. 320,716
Int. Cl.[5] G01M *19/10;* F16K *5/10*
U.S. Cl. 137—559 34 Claims

25. An arrangement for testing and draining a fire suppression water sprinkler system, comprising:

conduit means for supplying water to a plurality of sprinklers;

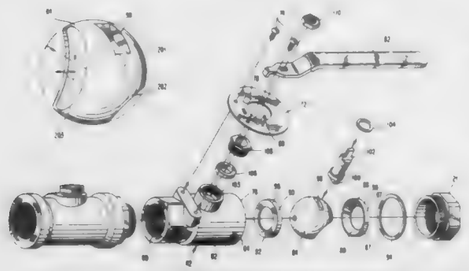
means for sensing a flow of water in said conduit means;

valve means provided downstream of said means for sensing and in communication with said conduit means, said valve comprising:

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a housing defining an interior chamber having an inlet and an outlet;

a thinly walled valve member disposed within said housing, said valve member having at least one aperture, said at least one aperture defining first, second, and third openings arranged about an outer periphery of said valve member and controlling a fluid flow between said inlet and outlet, said valve member being selectively positionable within said interior chamber in either one of a first, a second, and a third position, the first position preventing fluid flow from the inlet to the outlet, the second position



allowing a restricted fluid flow from the inlet to the outlet through the first and third openings and preventing a fluid flow through the second opening, the third position allowing an unrestricted fluid flow from the inlet to the outlet through the first and second openings and preventing a fluid flow through the third opening;

seat means for selectively sealingly receiving a surface of the valve member, said seat means being disposed adjacent said outlet; and

moving means for selectively moving said valve member amongst said first, second and third positions.

4,993,454

PIPING BRANCH STRUCTURE

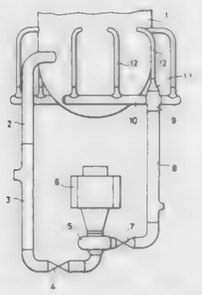
Yasuhiro Masuhara, Hitachi; Osamu Yokomizo, Ibaraki; Koichi Kotani; Shinichi Kashiwai, both of Hitachi, and Iwao Yokoyama, Kitaibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 678,594, Dec. 5, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 925,907

Claims priority, application Japan, Dec. 16, 1983, 58-236296

Int. Cl.[5] G21D *1/00*

U.S. Cl. 137—561 A **6 Claims**



1. A reactor recirculation system piping branch structure comprising a cross branch pipe distributing an inflowing water to three pipes in three directions, a first and second of said three pipes comprising bent header pipes each having a ring-shape disposed in opposition to each other and respectively disposed at a right angle to the inflowing water, and a third of the three pipes faces a direction of flow of the inflowing water, a fluid inlet of said third pipe of the three pipes protrudes into said cross branch pipe and has a substantially constant diameter over an entire length thereof, and a length of a fluid inlet of said protruding pipe is set such that an upstream end thereof passes an extension line of an inner plane on a downstream side of fluid outlets of said first and second pipes, whereby the flow of water surrounding said third pipe protruding into said cross-branch pipe is maintained in a single non-vortex flow state and pressure losses in each direction of flow are maintained at a constant level.

4,993,455

RECEIVER DRYER HEADER PORTION FOR AN AUTOMOBILE AIR CONDITIONING APPARATUS

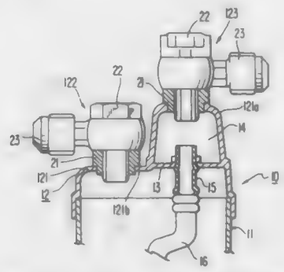
Masahiro Yanagisawa, Gunma, Japan, assignor to Sandeu Corporation, Gunma, Japan

Filed Mar. 3, 1986, Ser. No. 835,247

Claims priority, application Japan, Mar. 2, 1985, 60-29168[U]

Int. Cl.[5] E03B *11/00*

U.S. Cl. 137—592 **9 Claims**



1. In a receiver dryer for a refrigeration circuit including a cylindrical body with an upper opening and a header portion disposed on the upper opening of said cylindrical body, said header portion being provided with a fluid inlet port member and a fluid outlet port member to communicate with the refrigeration circuit, the improvement comprising:

said header portion having a cover plate, said cover plate being a step-like structure with a lower flat surface portion and an upper flat surface portion, said fluid inlet port member being rotatably disposed on one of said flat surface portions and said fluid outlet port member being rotatably disposed on the other of said flat surface portions, one of said fluid inlet port or fluid outlet port being rotatable without interfering with the other said port or other elements of the receiver dryer.

4,993,456

PINCH VALVE ASSEMBLY

Akos Sule, 4 Gates Ave., Roseland, N.J. 07068

Continuation-in-part of Ser. No. 822,899, Jan. 27, 1986, abandoned, and a continuation-in-part of Ser. No. 695,395, Jan. 28, 1985, abandoned, which is a division of Ser. No. 354,053, Mar. 2, 1982, Pat. No. 4,496,133. This application Jul. 17, 1989, Ser. No. 381,043

Int. Cl.[5] F16K *11/00*

U.S. Cl. 137—595 **14 Claims**

10. A pinch valve assembly comprising a valve body,

a solenoid housing mounted on said valve body,

a solenoid coil mounted in said solenoid housing with said solenoid coil having a central bore,

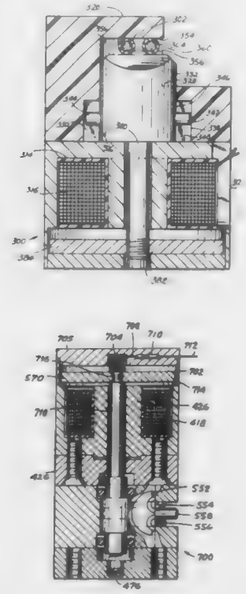
shaft means disposed in said central bore with said shaft means having an upper end and a lower end,

a plunger member connected to said upper end of said shaft means,

armature means connected to said lower end of said shaft means,

guide means disposed on said valve body and disposed to guide said plunger member relative to said valve body,

resilient tubing means disposed between said plunger and said valve body, with said armature capable of an upper position, when said solenoid coil is electrically energized, in which said armature raises said shaft means and said plunger member thereby forcing said plunger member against said tubing means and said tubing means against said valve body, causing said tubing means to collapse and



preventing flow through said tubing means until said solenoid coil is de-energized, whereupon said armature falls to a lower position causing said shaft and said plunger member to move away from said tubing means, thereby permitting flow through said tubing means, with said guide means comprising a pair of pin members projecting from said plunger member, with said valve body further including a slot portion and with said pin members substantially aligned and projecting into said slot portion.

4,993,457

HOUSING ARRANGEMENT FOR A FLUID PUMP AND TANK

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Jul. 18, 1990, Ser. No. 554,707

Int. Cl.[5] A01G *25/09*

U.S. Cl. 137—899 **7 Claims**

1. A housing arrangement for a fluid pump and tank, comprising:

a housing; a fluid pump mounted within the housing;

a tank for containing a fluid; the tank having a vertically oriented rib;

the housing having an entry port through which the tank for fluid may be inserted within the housing; the housing having a vertically oriented recess for receiving the tank rib when the tank is inserted into the housing;

flow means within the housing for placing the pump and the tank in flow communication with each other; and the recess being positioned in the housing such that when the tank rib is received the recess the tank is aligned with the flow means.

4,993,458

INTERMITTENT WHIP ROLL BRAKING DEVICE

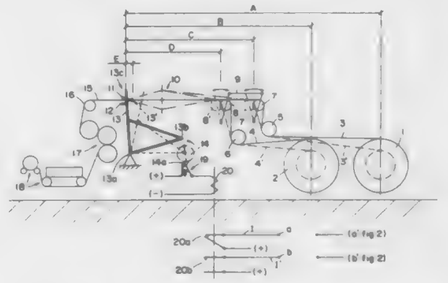
Göran Norlin, Almhult, Sweden, assignor to Almhults Bruk AB, Almhult, Sweden

Filed Jun. 28, 1989, Ser. No. 372,418

Claims priority, application Sweden, Jun. 28, 1988, 8802404

Int. Cl.[5] D03D *49/04*

U.S. Cl. 159—114 **15 Claims**



1. A braking device for use in a weaving machine which operates with at least one warp thread track leading from warp thread magazines towards a shuttle race plate at which a fell of a cloth is established and weft threads are drawn in with a reed during ongoing weaving, said device including;

means for producing a momentary friction or increase in friction between the warp thread and a rotatable member for changing the direction of the warp thread track which is arranged in the warp thread track between the magazine and the fell of the cloth in order to effect, during the interaction between the reed and the weft thread a reduction in the flexibility of the warp thread at the fell of the cloth;

said means including controllable brake members which, in response to control signals, interact with said member for changing the direction of the warp thread track, such that the friction or the increase in friction is present when the brake members are activated, causing the warp thread to run with friction over the braked member for changing the direction, wherein said direction changing member is held by said brake member to be stationary or to be rotated at a reduced speed, and the friction or the increase in friction is not present when the brake members are deactivated, since the warp thread causes such a rotation of the member for the changing direction that none or only slight friction occurs between the warp thread and the direction-changing member.

4,993,459

SUPPLYING AND GUIDING WEFT THREAD ON WEAVING MACHINES

Henry Shaw, Vleteren; Dirk Lewyllie, Wervik, and José Vangheluwe, Ieper, all of Belgium, assignors to Picanol N.V., Belgium

Filed Oct. 3, 1989, Ser. No. 416,480

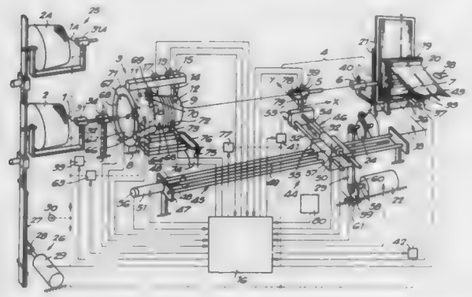
Claims priority, application Belgium, Oct. 3, 1988, 8801129

Int. Cl.[5] D03D *47/30*

U.S. Cl. 139—452 **22 Claims**

1. A device for automatically supplying and guiding weft thread from a thread preparation mechanism to near a point from which a weft thread is inserted into a shed of a weaving machine, comprising means including a movable guide element for guiding a weft thread along a path from the thread preparation mechanism to near the point from which the weft thread is inserted into the shed during the normal weaving process

and for supplying a new weft thread for insertion into the shed when said guide element is moved between at least a first position adjacent said thread preparation mechanism and a second position near to the point at an entrance to the shed



from which the weft threads are inserted into the shed; means for moving said guide element between said first position and said second position; and control means for controlling said moving means.

4,993,460

SIGHT GLASS INCORPORATED INTO FUEL DISPENSING NOZZLE

Thomas L. Robinson, Robertsville; Thomas O. Mitchell, Maryland Heights, and Fink, Sr. Arthur C., Lonedell, all of Mo., assignors to Husky Corporation, Pacific, Mo.

Filed Mar. 22, 1990, Ser. No. 497,588
Int. Cl.[5] B65B *1/30;* G01F *15/00*
U.S. Cl. 141—94 10 Claims



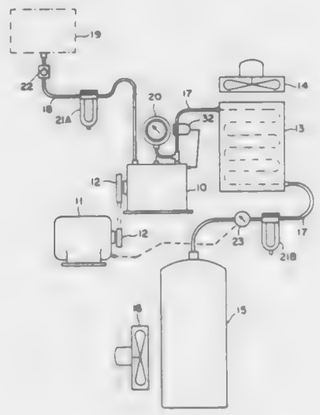
1. In a fluid dispensing nozzle for attachment to a flow line and for application and delivering a quantity of fluid through a flow channel in the nozzle and to a reserve for usage, said nozzle being of the type incorporating a nozzle body attaching a spout, and with the body incorporating a poppet valve manipulated by handle for delivery of fluid under pressure to said reserve, the improvement comprising, said nozzle body having a cavity with an exterior opening therein and communicating with the nozzle flow channel for use in the disposition of a poppet valve therein, said cavity having a cap attaching upon the opening and providing for its closure and retention of the poppet valve therein, a sight glass provided within the cap for furnishing viewing into the poppet cavity, and fluid activated means provided within the cavity and motivated by the passing fluid to provide observance for detecting the passage of fluid through said nozzle during its dispensing.

4,993,461

CHLOROFLUOROCARBON RECOVERY DEVICE

Makoto Yamane, Yamaguchi, Japan, assignor to Taisei Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 275,426, Nov. 23, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 437,829
Claims priority, application Japan, Feb. 4, 1988, 63-14375
Int. Cl.[5] F25B *45/00*
U.S. Cl. 141—231 7 Claims



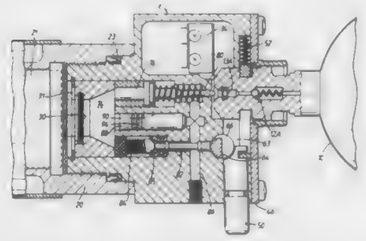
1. A-hand-pushed mobile chlorofluorocarbon gas recovery device adapted for recovering and recycling chlorofluorocarbon gas from a refrigeration apparatus, said device comprising:
a frame;
a pushing handle provided on said frame;
wheels provided on said frame;
a suction input means for being coupled to said refrigeration apparatus;
an accumulator provided on said frame and having an input and an output and having its input coupled to said suction input means;
a compressor provided on said frame and having a drive unit and an input and an output with the input thereof being coupled to the output of said accumulator;
a condenser having an oil lubrication input port provided on said frame and having a cooling fan and an input and an output with the input thereof being coupled to the output of said compressor;
a first oil separator provided between said output of said compressor and said input of said condenser, said first oil separator for separating oil from said gas and for supplying said separated oil to said oil lubrication input port of said compressor;
a thermal-switch means coupled to said drive unit for sensing a temperature of the output from said condenser and for turning off said drive unit when said temperature exceeds a predetermined temperature;
a second oil separator provided on said frame and having an input and an output and having its input coupled to said output of said condenser;
a gas recovery container provided on said frame and coupled to the output of said second oil separator; and
a cooling fan provided on said frame adjacent said recovery container for cooling said recovery container and accelerating liquification of said chlorofluorocarbon gas.

4,993,462

FLUID FLOW CONTROL ARRANGEMENT

Michael D. Oxley, Slough, and Peter N. Wiseman, Maidenhead, both of United Kingdom, assignors to Graviner Limited, Derby, England

Filed Jun. 23, 1989, Ser. No. 370,637
Claims priority, application United Kingdom, Jun. 25, 1988, 8815165
Int. Cl.[5] B01J *7/00*
U.S. Cl. 141—346 28 Claims



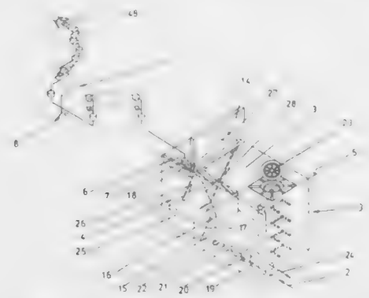
28. A gas flow control arrangement in combination with an electrically ignitable pyrotechnic gas generating source and for controlling the flow of gas under pressure from the gas source into the gas reservoir which has a valved inlet portion with an outer surface and including an inlet passage with said valve therein and which is to be charged with the said gas,
the gas flow control arrangement comprising
receiving means for receiving the inlet portion of the gas reservoir,
purging means for passing gas over the outer surface of the inlet portion of the gas reservoir for purging purposes, and
control means responsive to the flow of gas under pressure from the gas source to cause the gas to pass sealingly into the interior of the inlet portion of the gas reservoir and to open the valve therein whereby the gas passes into and charges the reservoir.

4,993,463

SINKABLE FUELLING SYSTEM

Wolfgang von Meyerinck, Daubringer Strasse 43, D-6304 Lollar, and Dietz von Meyerinck, Arnsburger Strasse 14, D-6302 Lich 2, both of Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 386,576
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1989, 8904997[U]
Int. Cl.[5] B65B *3/04;* B67D *5/70*
U.S. Cl. 141—387 11 Claims



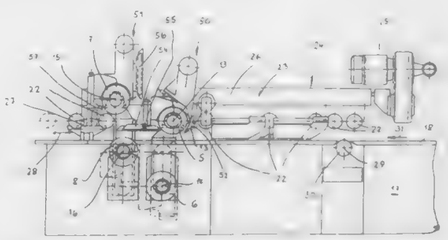
1. In a fuelling system comprising a fuelling arm composed of several pipe elements connected with one another each through a joint having one degree of freedom, and which is connected at one end to a supply line, said supply line being arranged inside a vertically opening enclosed space, said fuelling system further including lifting and lowering means for lifting and lowering said fuelling arm to and below ground level, the improvement wherein said lifting and lowering means includes a plate liftable by said lifting and lowering means to a position flush with respect to the ground, on which plate is supported a first joint pivotal about a vertical axis and at least first, second and third elongated pipe elements, said first pipe element having a first horizontally extending extension and first and second ends, said first end being bent at 90° and coupled in said first joint so that said first pipe can swing about said vertical axis of said first joint, said second end being bent at 90° in a direction opposite said first end and lying in the same plane as said first end, said second pipe element having a second horizontally extending extension and third and fourth ends, said third end and said fourth end of said second pipe element both being bent at 90° and in the same horizontal direction, said third pipe element having a third horizontally extending extension and fifth and sixth ends, first and second pipe sections each having a right angle section thereon, a second joint for coupling said second end to one end of said first pipe section, a third joint for coupling said third end to the other end of said first pip section, a fourth joint for coupling said fourth end to one end of said second pipe section and a fifth joint for coupling said other end of said second pipe section to said fifth end of said third pipe element, a sixth joint for coupling said sixth end on said third pipe element to an end of said fuelling arm opposite an outlet end thereof, said second, fifth and sixth joints being pivotal joints, each allowing pivotal movement of the connected pipes about a vertical axis parallel to said vertical axis of said first joint, a guide rod connected to and extending between said first and second pipe sections so that a parallelogram is defined by said first and second pipe sections, said second pipe element and said guide rod, a ground engaging support wheel and support means therefor, said support means being mounted on said at least one of said connected pipe elements radially spaced from said first joint to support and space said first, second and third pipe elements from the ground, said first, second and third pipe elements being pivotal with respect to one another about said vertical axes of said second, fifth and sixth joints so as to be movable to a collapsed position wherein all of said several pipe elements are oriented directly above said plate, one of the dimensions of said plate equalling at least the length of the longest of said first, second and third pipe elements.

4,993,464

WOODWORKING MACHINE, ESPECIALLY GROOVING MACHINE

Heiner Englert, Lauda-Konigshofen, Fed. Rep. of Germany, assignor to Michael Weinig Aktiengesellschaft, Tauberbischofsheim, Fed. Rep. of Germany

Filed Oct. 6, 1989, Ser. No. 418,017
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1988, 8812624[U]
Int. Cl.[5] B27C *5/00*
U.S. Cl. 144—136 R 15 Claims



1. In a woodworking machine, including spindles that carry working tools, particularly cutter heads, and also including at

least one feed unit via which pieces of wood that are to be worked are transported through said machine in a direction of transport, the improvement comprising:

at least one carrier means that is shiftable transverse to said direction of transport of pieces of wood through said machine and that carries two of said working tools, and

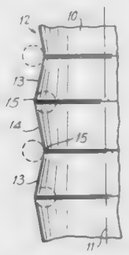
means with which said two working tools are made selectively shiftable via said carrier means into an operating position and a rest position, one of said working tools always being in the operating position when the other of said tools is in the rest position and vice versa so that operation of the woodworking machine occurs without having to shut down employment of one of the working tools and without having to interrupt passage of pieces of wood through the machine since the one working tool in the rest position can be replaced or reconditioned while the working tool in the operating position continues in use and down times are reduced as required only for adjustment of the carrier means.

4,993,465

ROUTER TOOL FOR AND METHOD OF PRODUCING WORKPIECES WITH ALTERNATING CONTOUR MATING SURFACES

Lawrence M. Cotton, and Gary R. Compton, both of New Bern, N.C., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,745
Int. Cl.[5] B27M *1/00*
U.S. Cl. 144—371 12 Claims



1. A router tool for producing workpieces having alternating contour mating surfaces, comprising a rotation-symmetrical working portion having an axis and an outer contour; and means for preventing edge chipping of the workpieces having alternating contour mating surfaces, said means including an axial cross-section of said working portion with said outer contour formed so that it includes a plurality of straight lines arranged in a consecutive order and each extending in a direction substantially along said axis.

4,993,466

RADIAL TIRE FOR HEAVY DUTY VEHICLES HAVING A GROOVED BUFFER PLANE OUTWARD OF EACH TREAD EDGE

Kiyoshi Ochiai, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

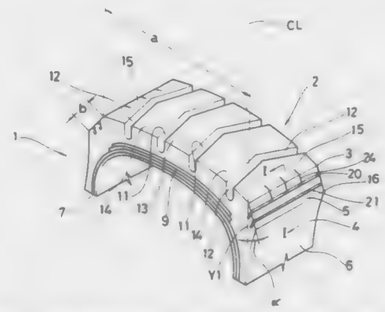
Filed Dec. 5, 1988, Ser. No. 279,708
Claims priority, application Japan, Dec. 9, 1987, 62-312682
Int. Cl.[5] B60C *11/01*
U.S. Cl. 152—209 R 3 Claims

1. A heavy duty radial tire having

a tread surface defining a ground contacting area between the axially outer edges thereof and provided with at least one longitudinal groove extending in the circumferential direction of the tire, and

a buffer plane portion extending radially inwardly and axially outwardly from each of said axial outer edges of said tread surfaces so as to be formed substantially in part of a right cone having an axis placed on the tire axis, defined as a rotational center of the tire,

said buffer plane portion having an outer surface extending along a plane inclined at an angle in the range of 25 to 70 degrees with respect to a tire equatorial plane, with a total length (b) along said outer surface of the buffer plane portion being at least 0.05 to less than 0.15 times a total



axial length (a) between said axial outer edges of the tread surface, and

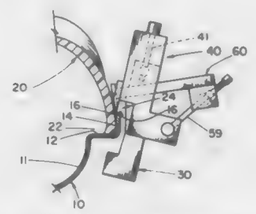
said buffer plane portion being provided with at least one buffer groove extending substantially continuously in the circumferential direction of the tire with a depth (c) being in the range of 0.25 to 0.8 times groove depth (d) of said longitudinal groove.

4,993,467

TIRE BEAD TOOL

Raymond Stavinoha, 9005 FM 361, Richmond, Tex. 77469

Continuation of Ser. No. 432,180, Nov. 6, 1989, abandoned. This application Dec. 18, 1989, Ser. No. 451,865
Int. Cl.[5] B60C *25/06*
U.S. Cl. 157—1.17 8 Claims



1. A tire bead breaker tool for separating a tire member from a tire rim comprising:

an elongated main body member having spaced apart side wall sections, a forward wall section and an upper closure wall section, all connected together in an integral structure,

a pair of spaced apart, elongated wedge members attached to said forward wall section, said wedge members having forward and rearward surfaces with the apex portions of said wedge members facing downward with respect to said upper closure wall section, and with the forward face of said wedge members facing toward a tire member, said wedge members being spaced outwardly from said body member sufficiently to accommodate a tire rim profile when said wedge members are disposed between a tire wall and a tire rim,

an elongated jaw member having spaced apart side wall sections arranged to be movably disposed between said side wall sections of said main body member, said side wall sections of said jaw member being attached to one another at a lower end and having forward faces shaped to define upwardly facing jaw surfaces for engaging a tire rim surface when said wedge members are disposed in a first position between a tire wall and a tire rim, said side wall sections of said jaw member having vertical forward faces spaced inwardly relative to said jaw surfaces for accommodating a tire rim profile when said wedge members are disposed in said first position between a tire wall and a tire rim,

first actuating means for moving said facing jaw surfaces toward and away from said wedge members,

a bead breaker member having an elongated wedge element arranged transversely to an elongated bar element and attached thereto, said wedge element having a wedge shaped section facing downward toward said jaw surfaces, said bar element being disposed between said side wall sections of said jaw member,

said forward wall section having a downwardly facing abutment surface located intermediate of the length of said wedge members so that said wedge shaped section can have its forward face aligned with the forward face of said wedge members and said bar member can be in engagement with said abutment surface in an initial operating location for said body and said bead breaker members, and

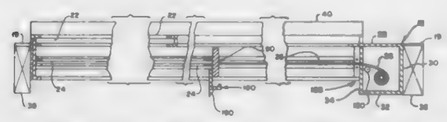
second actuating means for initially pivoting said wedge shaped section relative to said wedge members about said abutment surface to a second location to separate a tire bead from a tire rim when said jaw member and said main body member are in said first position and for moving said wedge shaped section from said second location in a direction away from said wedge members to move a tire bead from engagement with a tire rim.

4,993,468

WINDOW WITH AUTOMATIC SCREEN

William A. Hackman, 561 So. 8th St., Grover City, Calif. 93433-2631, and Leonard A. Miller, 260 Miles St., Santa Maria, Calif. 93454

Filed Jul. 28, 1989, Ser. No. 386,423
Int. Cl.[5] E06B *9/08*
U.S. Cl. 160—27 7 Claims



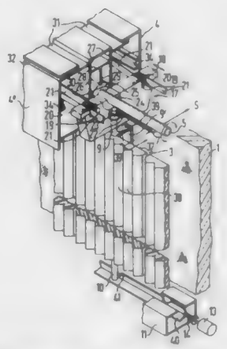
1. A window ad self-screening system comprising an outer supporting frame, at least one window slidably retained within said frame and movable from one end of said frame toward the opposite end thereof between a first closed position and a second open position, a window screen mounted on means for retaining said screen in a wound condition and for allowing said screen to be unwound therefrom and taken up thereby, said screen being positioned on said system adjacent the end corresponding to the first closed position of said window said screen having a first end attached to said window so that said first end will move together with said window and a second end attached to said retaining means, said screen further including top and bottom side edges, said retaining means including first sealing means for sealing about said screen as said screen moves with said window, and second sealing means secured along said side edges, said frame further including means defining elongated channels for supporting said at least one window and for slidably receiving said second sealing means so that as said window moves between said first and second positions the screen will follow that movement and simultaneously establish a seal about the marginal edges of said screen.

4,993,469

DEVICE FOR PROTECTION FROM THE SUN

Julius Moench, Wendelstein, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,679
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1988, 8805107[U]
Int. Cl.[5] E06B *9/36*
U.S. Cl. 160—168.1 25 Claims



1. A vertical Venetian blind, comprising a plurality of blocking means for blocking solar rays; supporting means for supporting each of said blocking means in a generally vertical orientation; moving means for moving said blocking means along said supporting means between a closed position and an open position; rotating means for rotating each of said blocking means about a generally vertical axis of rotation associated therewith; and coupling means for coupling and uncoupling adjacent pairs of said blocking means in response to the movement of said blocking means along said supporting means, said coupling means including a plurality of spacer bars, each spacer bar being pivotally attached to one blocking means of a corresponding one of said adjacent pairs of said blocking means and being pivotal between a first position in which it is disengaged from the other blocking means of said corresponding one of said adjacent pairs of blocking means and a second position in which it is engaged with said other blocking means to thereby maintain a predetermined spacing between said one blocking means and said other blocking means, all of said spacer bars being in their second position when said blocking means are in their closed position, whereby said blocking means are spaced apart at predetermined intervals along said supporting means when they are in their closed position.

4,993,470

LATCH FOR POWERED DOOR ASSEMBLY

Jan Ballyns, Pickering; John C. Martin, and Paul H. Martin, both of Toronto, all of Canada, assignors to Diesel Equipment Limited, Toronto, Canada

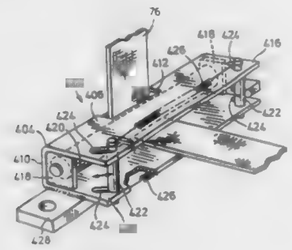
Division of Ser. No. 92,571, Sep. 2, 1987, Pat. No. 4,860,813.
This application Jul. 11, 1989, Ser. No. 378,160
Int. Cl.[5] E05B *11/00*
U.S. Cl. 160—193 9 Claims

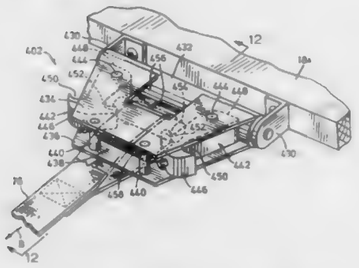
8. A latch for a powered door assembly of the type which has a winch for pulling the door to a closed position comprising;

(a) a latch socket housing having a socket formed therein, said socket having a front end and a back end, a pair of latch pins slidably mounted in said housing, one on either side of said socket for movement along inclined planes which converge toward the front end of the socket between a first position which is located toward the front end of the socket and a second position located toward the

back end of the socket, said first position being one in which the retainer members are arranged more closely adjacent one another than they are when in the second position, first biasing means for biasing said retainer members toward said first position, and guide means located in said socket between the latch pins and the back end of the socket,

(b) a latch plug having a proximal end and a distal end, attachment means at the proximal end for attaching the latch plug to a movable door, said distal end being proportioned to fit within said socket and having side edges which converge in a direction from the proximal end to the distal end, said side edges being arranged and proportioned to deflect said latch pins away from one another to admit the plug member to the socket, latch lever means pivotally mounted on the latch plug, one at either side of the latch plug, each latch lever having an outer end projecting from its pivotal connection toward the distal end of the plug and an inner end projecting toward the proximal end of the plug, the outer end of each lever being adapted to interlock with a locking pin when located inwardly thereof in said socket, said lever members being





capable of pivoting between a retracted position in which they are located sufficiently close to one another to permit the outer ends thereof to enter the socket to be located inwardly of the latch pins and an extended position in which the outer ends of the lever engage and interlock with the latch pins to retain the plug in the socket, second biasing means engaging said latch levers and urging them toward said retracted position,

(c) locking means slidably mounted in said latch plug for movement toward and away from the distal end of the plug between a locking position and a release position, said locking means cooperating with said latch levers to move the latch levers from their retracted position to their extended position in response to movement of the locking means from its released position to its locking position, and

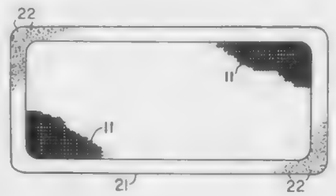
(d) flexible door pulling means having a first end connected to said locking means, said flexible door pulling means extending into said socket to engage said guide means and having a second end connectable to a winch of the powered door assembly, such that when the winch is operated to wind in the flexible door pulling member, the pulling load applied thereto will force the locking means to slide to its locking position causing the locking levers to be located in their extended position and will draw the latch plug into the latch socket to cause the outer ends of the latch levers to deflect the latch pins away from one another to permit the outer ends of the latch levers to be located inwardly of the latch pins, said second biasing means being effective to urge the latching pins inwardly to their inner position when the outer ends of the lever arms are located inwardly of the latching pins, said second biasing means being operable when the pulling load is released to cause the outer ends of the lever arms to pivot to their retracted position so as to move away from their interlocking position with respect to the latching pins to permit withdrawal of the latch plug from the latch socket.

4,993,471

SELF-MOUNTING VEHICLE SCREEN

Sandra L. Golden, 8218 Brackridge Blvd. South, Jacksonville, Fla. 32216

Continuation of Ser. No. 341,904, Apr. 24, 1989, abandoned.
This application Mar. 20, 1990, Ser. No. 501,315
Int. Cl.[5] B60J *3/00*
U.S. Cl. 160—370.2 **1 Claim**



1. A method of temporarily attaching a screen over a vehicle opening surrounded by a napped or looped fabric roof liner material, consisting of the following steps:

(A) providing a multi-apertured sheet of material having a perimeter slightly greater than the perimeter of said vehicle opening, the sheet having a plurality of resilient, hook-like projections around its periphery, the projections being capable of entanglement directly with the fabric roof liner material to form a temporary attachment;

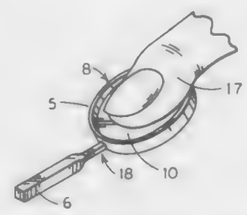
(B) pressing the projections directly against the fabric roof liner material to form the temporary attachment.

4,993,472

METHOD OF MAKING FINGERPRINT JEWELRY

Kirk L. Culver, 831 Wayne Ave., New Smyrna, Fla. 32168

Filed Jun. 18, 1990, Ser. No. 539,171
Int. Cl.[5] B22D *7/02, 9/04*
U.S. Cl. 164—35 **2 Claims**



1. A method of obtaining a digit print impression for making jewelry to be worn as a memento and for identification purposes comprising:

providing a thin sheet of wax

cutting said selectively shaped and sized piece of wax from a thin sheet of wax;

enclosing said piece of wax in an impression plate

using a source of heat to melt the top surface of said piece of wax in said impression plate until said piece of wax becomes soft;

placing and pressing a digit down on said wax piece in said impression plate to form a digit imprint;

allowing the wax to cool until said digit imprint is firm; and

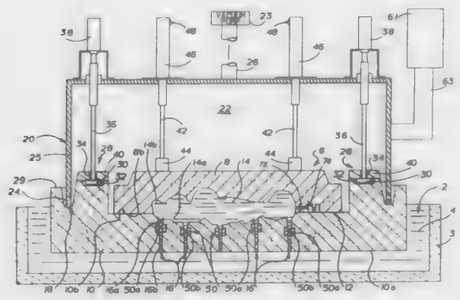
utilizing said digit imprinted piece of wax in said impression plate to cast a metal piece having a portion corresponding to said digit imprint.

4,993,473

DIFFERENTIAL PRESSURE, COUNTERGRAVITY CASTING USING MOLD INGATE CHILLS

Thomas P. Newcomb, Defiance, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 30, 1990, Ser. No. 559,319
Int. Cl.[5] B22D *15/00, 18/06*
U.S. Cl. 164—63 **15 Claims**



1. Apparatus for the differential pressure, countergravity casting of molten metal, comprising:

(a) a mold having a mold cavity and an ingate for engaging an underlying source of the molten metal to communicate the mold cavity with said source,

(b) means for applying a sufficient differential pressure between the mold cavity and the source while the ingate engages the source to urge the molten metal upwardly through the ingate into the mold cavity to fill said mold cavity with the molten metal, and

(c) a heat conductive chill member disposed in said ingate to accelerate solidification of a plug of the metal in the ingate in the vicinity of said chill member after the mold cavity is filled and before the ingate disengages the source for preventing run-out of the molten metal from the mold cavity upon subsequent disengagement of said ingate and said source, whereby accelerated solidification of said plug allows early disengagement of said ingate and said source after the mold cavity is filled.

11. A method of differential pressure, countergravity casting of molten metal, comprising:

(a) forming a mold having a mold cavity, an ingate for engaging a source of the molten metal to communicate the mold cavity with said source, and a heat conductive chill member in communication with the ingate,

(b) relatively moving the mold and the source to engage the ingate and the source,

(c) applying a sufficient differential pressure between the mold cavity and the source while the ingate and the source are engaged to urge the molten metal upwardly through the ingate into the mold cavity to fill said mold cavity with said molten metal,

(d) extracting sufficient heat from the molten metal in the ingate via the chill member after the mold cavity is filled to accelerate solidification of a plug of the metal in the ingate in the vicinity of said chill member while the ingate and the source remain engaged for preventing run-out of the molten metal from the mold cavity upon subsequent disengagement of said ingate and said pool, and

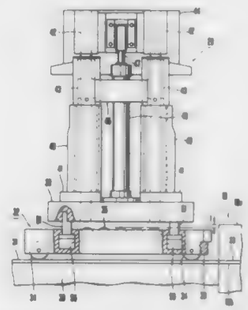
(e) disengaging the ingate and the source after formation of said plug in said ingate.

4,993,474

DIE CASTING APPARATUS

Masashi Uchida, Ube, Japan, assignor to Ube Industries, Ltd., Ube, Japan

Filed Oct. 28, 1988, Ser. No. 265,371
Claims priority, application Japan, Nov. 10, 1987, 62-170658; Nov. 11, 1987, 62-283122
Int. Cl.[5] B22D *5/02*
U.S. Cl. 164—326 **10 Claims**



1. A multi station die casting apparatus (1) of the type including

a mold clamping unit (10);

at least one mold opening/closing unit (29);

at least one mold means including a stationary mold (48) and a movable mold (49) disposed in a respective opening/-closing unit; and

at least one carrier (32) supporting and movable with a respective mold opening/closing unit back and forth between a predetermined position inside of, and a standby position outside of, said mold clamping unit; wherein at least one of said stations includes

a stationary board (16) having a high portion (16*a*) disposed at said predetermined position; and

a pair of tracks (31) straddling said high portion, for guiding said at least one carrier between said standby position and said predetermined position; and wherein each said carrier (32) includes

lower means (34) for moving freely on said tracks,

upper means (35) for on-loading said mold opening/closing unit, and

lift means (50,51) for

raising said opening/closing unit to an elevation higher than said high portion above said carrier when in said standby position,

holding said opening/closing unit at said elevation while being moved by said carrier along said tracks into said predetermined position, and

lowering said opening/closing unit onto said high portion in said predetermined position.

4,993,475

DIE FOR GOLF CLUB HEAD

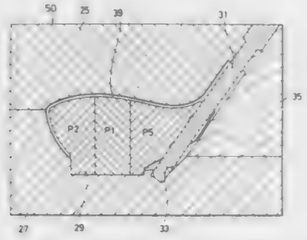
Magoichi Yamada, Tokyo, Japan, assignor to Daiwa Golf Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,457
Claims priority, application Japan, Feb. 28, 1989, 1-47643
Int. Cl.[5] B22D *17/26, 33/04*
U.S. Cl. 164—340 **2 Claims**

1. A golf club head die comprising a die divided into at least two pieces to form a hollow head body provided with an

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opening in the sole, insert core placed at a position in said die to make a hollow part of said head body, and a shaft hole pin



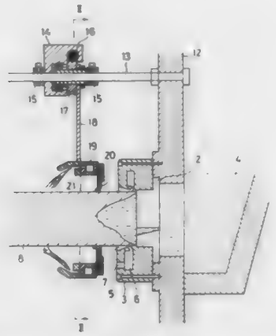
which pierces through at least said insert core and is inserted into a positioning hole formed in one of said divided dies.

4,993,476

SECONDARY COOLING DEVICE FOR A HORIZONTAL CONTINUOUS CASTING APPARATUS

Yoshitaka Nagai, Asahi; Makoto Arase, and Norio Ohatake, both of Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 492,883
Claims priority, application Japan, Mar. 17, 1989, 1-29710[U]
Int. Cl.[5] B22D *11/124*
U.S. Cl. 164—440 1 Claim



1. A secondary cooling device in a horizontal continuous casting apparatus, comprising

(1) support rod horizontally disposed before a tundish and above a cooling mold,

(2) a holder slidably mounted on said support rod means and incorporating a worm and a pair of worm gears so designed as to engage with each other,

(3) an arm extending downwardly from the end of each of said worm gears,

(4) half-annular shaped cooling water pipes secured onto the lower ends of said respective arms, said half-annular shaped cooling water pipes being so designed as to form an annular shape when brought together,

(5) half-annular shaped wipers secured to said respective cooling water pipes on the side facing said tundish, said wipers being positioned concentrically with respect to the resulting ingot and having a inner diameter smaller than the diameter of said resulting ingot, and

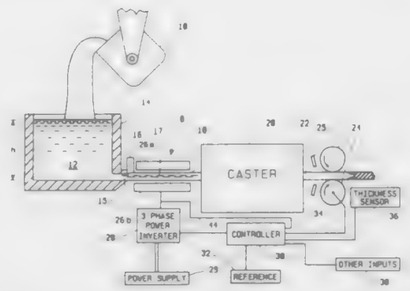
(6) cooling water nozzles secured to said cooling water pipes on the side away from said tundish.

4,993,477

MOLTEN METAL FEED SYSTEM CONTROLLED WITH A TRAVELING MAGNETIC FIELD

Walter F. Praeg, Palos Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1989, Ser. No. 318,875
Int. Cl.[5] B22D *11/10, 11/16*
U.S. Cl. 164—453 8 Claims



1. A continuous metal casting system for the production of thin metal sheets in near net shape having a reservoir for the storage of molten metal to be cast, a caster in which the metal can be continuously cast, a duct connecting the reservoir and the caster, and means to control transients in the flow of molten metal from the reservoir to the caster, including:

a linear induction motor surrounding the duct coupled with controlling means responsive to a plurality of reference inputs and capable of producing a traveling magnetic wave whereby transients in the flow of a molten metal in the duct can be regulated, in which said controlling means is responsive to a plurality of reference inputs including the speed, dimension, surface quality, or temperature of the metal being cast, and in which said controlling means includes:

a low frequency feedback loop, and

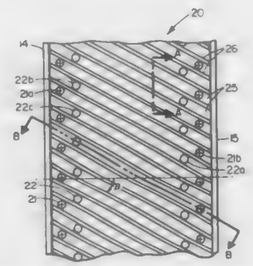
a high frequency feedback loop.

4,993,478

UNIFORMLY-COOLED CASTING WHEEL

Paul E. George, II, Dublin, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Mar. 16, 1990, Ser. No. 494,648
Int. Cl.[5] B22D *11/06, 11/124*
U.S. Cl. 164—479 23 Claims



1. A uniformly-cooled substrate for casting uniform metal products directly from a metal melt comprising

a cylindrical, casting drum having an outer cylindrical, heat-conductive casting surface and a plurality of coolant channels below and in heat transfer relationship with the casting surface and being substantially parallel to each other at an angle between about 15° and 75° to the drum axis, and

means for circulating a coolant liquid through the coolant channels.

20. A process for casting uniform metal products directly from a metal melt by extracting a molten metal layer from an open tundish on an outer cylindrical casting surface of a cylindrical substrate and solidifying the molten metal layer to a solid strip wherein the improvement comprises

circulating a coolant liquid through a plurality of adjacent coolant channels extending under the casting surface substantially parallel to each other at an angle of between abut 15° and 75° to the drum axis.

4,993,479

HEAT EXCHANGERS

Jiri Jekerle, Baunatal/Altenritte, Fed. Rep. of Germany, assignor to Schmidt'sche Heissdampf GmbH, Kassel-Bettenhausen, Fed. Rep. of Germany

Continuation of Ser. No. 269,797, Nov. 10, 1988, abandoned. This application Jul. 31, 1990, Ser. No. 586,171
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1987, 3738727
Int. Cl.[5] F28F *27/00*
U.S. Cl. 165—1 12 Claims

1. A heat exchanger comprising:

first conduit means for defining a path for the flow of a heated fluid, said first conduit means having a linear section with an axis;

second conduit means, said second conduit means defining a flow path which is at least in part linear, said linear part of said second conduit means defined flow path being arranged coaxially with the linear section of the flow path of said first conduit means, said second conduit means linear path part being positioned to the exterior of said first conduit means linear section whereby said second conduit means linear flow path part is generally of annular cross-section;

means for selecting the heat exchange characteristics of said first conduit means linear section, said heat exchange characteristic selecting means comprising an elongated fluid impervious solid body which extends a substantial distance into said first conduit means linear section, said body being positioned so as to be coaxial with said first conduit means linear section, said body cooperating with said first conduit means to define an annular flow path having a cross-sectional area which is less than the cross-sectional area of said first conduit means linear section, said annular flow path extending along at least a first part of said first conduit means linear section whereby the velocity of fluid flowing said first part will be greater than that in the remaining part of said first conduit means linear section; and

means for supporting said elongate body in said first conduit means, said supporting means permitting removal and replacement of said elongated body; whereby

said body can be positioned axially relative to said first conduit means to vary the length of said annular flow path.

11. A method for the adjustment of the exit temperature of a heated gas flowing through a coaxial tube heat exchanger, the heat exchanger having inner and outer tubes, comprising the steps of:

inserting a streamlined, fluid impervious flow intercepting body a substantial distance into the heat exchanger inner tube through which the heated gas passes to reduce the cross-sectional area of a portion of the inner tube and thereby increase the velocity of flow in the said reduced cross-sectional area portion of the inner tube whereby the heat exchanger is divided into sections having different heat exchange characteristics; and

positioning the flow intercepting body as a function of gas exit temperature, said positioning varying the effective lengths of the different sections having different heat exchange characteristics.

4,993,480

TEMPERATURE CONTROLLING MEANS FOR A THERMOSTAT FOR USE IN MEASURING VISCOSITY

Osamu Suzuki, Kumagaya; Syousuke Ishiwata, Yorimachi; Mitsuroh Hayashi, and Hideaki Oshima, both of Kumagaya, all of Japan, assignors to Chichibu Cement Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 305,299, Feb. 1, 1989, abandoned. This application Nov. 17, 1989, Ser. No. 440,402
Int. Cl.[5] F25B *29/00*
U.S. Cl. 165—2 26 Claims

1. Temperature controlling means for controlling the temperature of a fluid sample immersed in a liquid bath, comprising:

first means for detecting the temperature of the fluid sample and producing a first output signal corresponding thereto;

a first controller for receiving the first output signal and an input command corresponding to a desired set point of temperature of the fluid sample, determining a set point of temperature of the liquid bath according to one of first and second operation formulas expressed as a function of the difference between the desired set point temperature of the fluid sample and its detected temperature and producing one of first and second controlled signals corresponding to the respective liquid bath set point temperatures determined by carrying out the first operation formula and the second operation formula;

second means for checking the difference between the set point temperature of the fluid sample and its detected temperature and whether or not the absolute value of the difference exceeds a predetermined value of temperature and performing the first operation formula when the absolute value exceeds the predetermined value and performing the second operation formula when the absolute value is at most equal to the predetermined value;

third means for limiting either of the levels of the first and second controlled signals relative to the level of the input command corresponding to the fluid sample set point temperature, the fourth means being operative to determine a temperature error by subtracting the fluid sample set point temperature from the determined set point temperature of the liquid bath, to check the temperature error and whether or not the absolute value of the temperature error exceeds a given value of temperature and to set the new value of the liquid bath set point temperature equal to the sum of the fluid sample set point temperature and the given value when the temperature error exceeds the given value and equal to the value of the fluid sample set point temperature minus the given value when the temperature error is less than the negative quantity of the given value;

fourth means for detecting the temperature of the liquid bath and producing a second output signal corresponding thereto;

heating and cooling means for heating and cooling the liquid bath; and

a second controller for receiving the second output signal and one of the first and second controlled signals the levels of which have been limited by the third means, forming an actuating signal corresponding to the difference in level between the received one of the first and second controlled signals and the second output signal and subsequently inputting to the heating and cooling means a PID controlled signal formed on the basis of the actuating signal, the heating and cooling means being operative to heat and cool the liquid bath according to the PID controlled signal inputted thereto

4,993,481

THERMAL STORAGE UNIT

Masayuki Kamimoto; Yoshiyuki Abe; Yoshio Takahashi; Ryuji Sakamoto; Kotaro Tanaka; Akira Negishi, all of Tsukuba; Hidetoshi Yamauchi, Ogaki; Kiyotaka Tsukada, Ogaki, and Yoshimi Ohashi, Ogaki, all of Japan, assignors to The Agency of Industrial Science and Technology, Tokyo and Ibiden Co., Ltd., Ogaki, both of, Japan

Filed Sep. 26, 1989, Ser. No. 412,837
Claims priority, application Japan, Oct. 3, 1988, 63-247385
Int. Cl.[5] F28D *20/00*
U.S. Cl. 165—10 **19 Claims**

1. A thermal storage unit, comprising:
a vessel having an opening communicating with the outside for receiving a fluid;
a thermal storage body arranged within said vessel;
said thermal storage body comprising:
a porous ceramic molded body member having opposite ends;
said porous ceramic molded body m ember having hollow portions and having a thermal storage material received in said hollow portions thereof; and
sealing means at both opposite ends of said hollow portions of said porous ceramic molded body member for sealing said thermal storage material in said hollow portions of said porous ceramic molded body member; and
means in said vessel for defining a flow path for said received fluid such that said received fluid flows through said porous ceramic molded body member and through said thermal storage material sealed therein.

4,993,482

COILED SPRING HEAT TRANSFER ELEMENT

Thomas P. Dolbear; Richard D. Nelson; David A. Gibson, all of Austin, Tex., and Omkarnath R. Gupta, Fremont, Calif., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jan. 9, 1990, Ser. No. 462,688
Int. Cl.[5] F28F *7/00;* **H02B** *1/56;* **H05K** *7/20*
U.S. Cl. 165—80.2 **23 Claims**

16. A heat transfer element thermally connecting a heat source and a heat sink comprising:
a flexible canted coil spring containing a plurality of canted coils laid on its side between and in heat exchange contact with said heat source and said heat sink,
wherein said canted coils provide two heat conduction paths at said contacts,
wherein said canted spring engages in sliding contact with at least one surface and provides a wiping action to clean said at least one surface, and
said at least one surface is prepared to lower the coefficient of friction on said at least one surface.

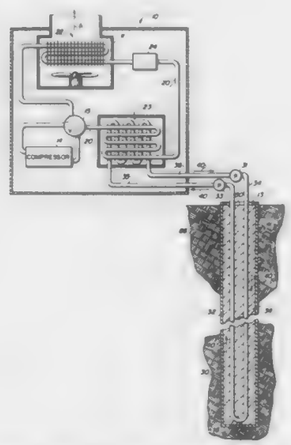
4,993,483

GEOTHERMAL HEAT TRANSFER SYSTEM

Charles Harris, 5314 W. Luke, Glendale, Ariz. 85301

Filed Jan. 22, 1990, Ser. No. 468,166
Int. Cl.[5] F25B *27/00;* **F24J** *3/08*
U.S. Cl. 165—45 **2 Claims**

2. In a system for conditioning a primary fluid by the transfer of heat between the fluid and the earth, said system including
a reservoir of said primary fluid,
a heat sink in heat exchange relationship with the earth,
a fluid circulating system for circulating a heat exchange fluid past said reservoir in heat exchange relationship with said primary fluid and circulating said heat exchange fluid through said heat sink,
the improvement in said system wherein said heat sink comprises
(a) an elongate imperforate container of slurry extending into the earth, said slurry including
(i) a liquid antifreeze solution, and
(ii) a plurality of particles shaped and dimensioned such that said particles move over one another and permit said container to contract without said particles interlocking and packing; and,
(b) a first line extending into said container and through said slurry and spaced away from said inner wall of said container, said line having a first end and a second end;
(c) a second line extending into said container and through said slurry and spaced away from said inner wall of said container, said second line having a first end and a second end;
(d) means connecting said first end of said first line and said second end of said second line to said fluid circulating



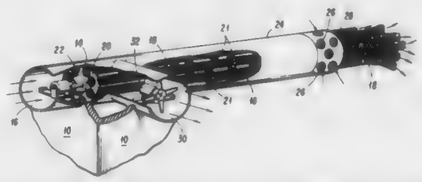
system such that said heat exchange fluid circulates in a closed circuit past said reservoir
(i) through one of the pair comprising
said first line, and
said second line,
(ii) through the other of said pair comprising
said first line, and
said second line, and
(iii) back past said reservoir; and,
(e) means connecting said first and second lines such that said heat exchange fluid flows between said first and second lines without intermixing with said slurry.

4,993,484

AIR TO AIR HEAT EXCHANGER

Jack E. Neuzil, Johnson County, Iowa, assignor to Kirkwood Community College Facilities Foundation, Cedar Rapids, Iowa

Filed Jan. 17, 1989, Ser. No. 297,109
Int. Cl.[5] F24H *3/02;* **F24F** *7/10*
U.S. Cl. 165—54 **1 Claim**



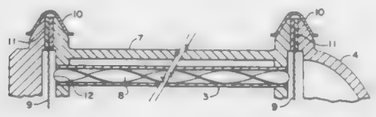
1. An air-to-air heat exchanger for exhausting air from inside of an enclosure and replacing the exhausted air with air from outside the enclosure, said heat exchanger comprising an outer duct, a plurality of inner ducts positioned inside of the outer duct, the inner ducts each being smaller than the outer duct and spaced-apart from each other and from the outer duct, means to maintain the position of the inner ducts spaced relative to the outer duct along substantially the entire length of the outer duct, the cross-sectional area of the space between the outer duct and the inner ducts being approximately the same as the cross-sectional area of the inner duct so that approximately the same volume of air can flow through the inner ducts as the air flowing in the space between the inner ducts and outer duct, the inner ducts having an outer surface that is corrugated to increase substantially the surface area of the inner ducts, means for moving air from outside the enclosure area through only the inner ducts and discharging it inside of the enclosure, the discharge ends of the inner ducts extending beyond the outer duct and being adapted to be located at different selected positions inside of the enclosure, and means for moving air from inside the enclosure only through the space between the inner ducts and the outer duct and discharging the air outside of the enclosure.

4,993,485

EASILY DISASSEMBLED HEAT EXCHANGER OF HIGH EFFICIENCY

Jeremy W. Gorman, 1095 Middlebury Rd., Middlebury, Conn. 06762

Filed Sep. 18, 1989, Ser. No. 408,663
Int. Cl.[5] F28F *13/02*
U.S. Cl. 165—85 **17 Claims**



1. A heat exchanger comprising:
an outer envelope having an inlet and an outlet for passage of an associated first heat exchange fluid therethrough;
a first tube mounted within the envelope for external contact by the first heat exchange fluid, and adapted for passage of a second heat exchange fluid therethrough in physical isolation from the first heat exchange fluid,
a generally helical blade disposed within the first tube for free rotation and free axial movement, said helical blade having a laterally centered bearing portion on at least one end thereof. said helical member having a diameter relative that of the first tube, such as to cause said helical blade to pass in closely spaced relation to the inside surface of said first tube during rotation; and
a bearing member disposed adjacent at least one end of the helical blade which comprises a porous member disposed in substantially aligned relationship with said helical blade and means for directing the second heat exchange fluid, said bearing member being disposed in said means for directing and extending across substantially the entire extent thereof whereby the second heat exchange fluid passes through said bearing member.

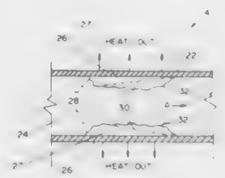
4,993,486

HEAT TRANSFER LOOP WITH COLD TRAP

Joseph R. Wetch, San Jose, Calif., assignor to Space Power, Inc., San Jose, Calif.

Filed Dec. 5, 1989, Ser. No. 446,463
Int. Cl.[5] F28D *15/00*
U.S. Cl. 165—104.13 **6 Claims**

1. In a heat transfer system which uses a liquid as the heat transfer medium and includes a heat source interconnected to a heat sink and an expansion chamber, with the liquid moved within the heat transfer system by a pumping means, the improvement comprising:
a liquid heat transfer medium which is moved through the entire system which comprises a combination of at least two immiscible liquids with distinctly different freezing-melting temperatures, so that a first liquid will freeze before the others, and a second liquid will remain liquid under all conditions of anticipated use of the heat transfer system; and
a heat sink of sufficient volume and cross section so that all



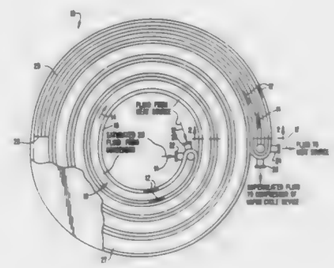
frozen material resulting from freezing of the liquids can be accommodated on the inside surface of the heat sink while maintaining flow through paths for the remaining liquid with the flow through paths located adjacent to all existing frozen material, so that the surfaces of the frozen material are in intimate contact with the remaining liquid and no portion of the heat sink is blocked by frozen material.

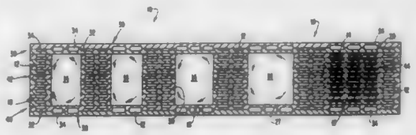
4,993,487

SPIRAL HEAT EXCHANGER

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 29, 1989, Ser. No. 330,071
Int. Cl.[5] F28D *9/04*
U.S. Cl. 165—164 **41 Claims**





1. A laminated spiral heat exchanger comprising:
a heat conductive top laminate;
a heat conductive bottom laminate;
at least one spiral heat conductive laminate, the laminates being joined together to form a heat exchanger core;
at least one spiral laminate with at least a portion of a first spiral channel being defined by a space extending through a thickness of the spiral laminate between adjacent turns of at least one spiral laminate and the top laminate and the bottom laminate;
a first fluid port coupled to the first spiral channel at a first

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radius with respect to a center point of the spiral heat exchanger;

a second fluid port coupled to the first spiral channel at a second radius with respect to the center point of the spiral heat exchanger which is greater than the first radius; and

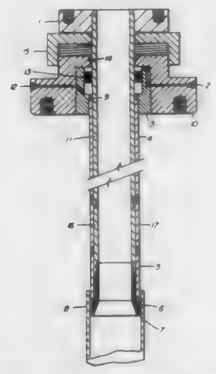
wherein the laminates are planar and stacked parallel to each other.

4,993,488

WELL CASING PACKERS

Roderick D. McLeod, 5104-125 Street, Edmonton, Alberta, Canada (T6H 3V5)

Filed Nov. 1, 1989, Ser. No. 430,012
Claims priority, application Canada, Nov. 2, 1988, 581963
Int. Cl.[5] E21B *33/03*
U.S. Cl. 166—72 2 Claims



1. A short-coupled, well casing packer comprising:

(a) a body adapted for external mounting on a well casing head, tubing spool or the like;

(b) concentrically arranged inner and outer mandrels supported in said body, each outer mandrel being adapted to be restrained to the casing head and said inner mandrel being axially moveable within said outer mandrel, the upper end of said inner mandrel extending upwardly and outwardly of said body and having a connecting flange;

(c) high pressure seal means on the lower end of said outer mandrel for circumferentially sealing the lower end of said outer mandrel against the inner wall of said casing;

(d) seal expanding means on the lower end of said inner mandrel for circumferentially engaging and radially expanding said seal means;

(e) hydraulic pressure responsive piston means in said body and secured to said inner mandrel for linearly moving said inner mandrel upwardly or downwardly with respect to said outer mandrel; and

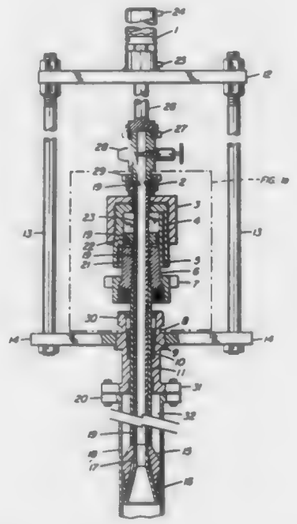
(f) means engaging the upper end of said inner mandrel for locking said inner mandrel in position relative to said outer mandrel, comprising a lock nut having a peripheral rim portion threadably engaging the outside of said body and a planar collar portion, normal to said rim portion, and being disposed intermediate the upper end of said body and the under-surface of said connecting flange; whereby, when said inner mandrel is moved upwardly by said piston means, the distance of said movement will be indicated by the commensurate space between the lower surface of said connecting flange and the upper surface of said planar collar portion.

4,993,489

WELLHEAD ISOLATION TOOL

Roderick D. McLeod, 5104-125 St., Edmonton, Alberta, Canada (T6H 3V5)

Filed Oct. 25, 1989, Ser. No. 426,235
Claims priority, application Canada, Oct. 28, 1988, 581611
Int. Cl.[5] E21B *23/06, 33/02*
U.S. Cl. 166—72 8 Claims



1. A wellhead isolation tool having a mandrel assembly for insertion into and sealing off a wellhead casing, said tool comprising:

(a) means for detachably mounting said tool on said wellhead casing;

(b) rigidly spaced, parallel upper and lower plate members, said lower plate member being secured to said mounting means;

(c) said mandrel assembly including concentrically arranged inner and outer mandrels having their upper, driven ends located intermediate said plate members and their lower, operative ends extending below said detachable mounting means of said tool for insertion into said casing;

(d) said outer mandrel having a sealing nipple including a deformable element on the lower end thereof and said inner mandrel having a nipple expander on the lower end thereof, said nipple expander being concentrically located with respect to and inwardly of said sealing nipple and deformable element on the end of said outer mandrel;

(e) means mounted on said upper plate member and connected to the driven end of said mandrel assembly for raising or lowering the operative ends thereof in said wellhead casing;

(f) an actuating cylinder concentrically mounted about the upper, driven ends of said mandrels, means secured to said inner mandrel adjacent the upper end thereof and operating in said actuating cylinder for effecting movement of said inner mandrel with respect to said outer mandrel and when raising said inner mandrel causing said nipple expander on its lower end to effect outward, radial pressure against said deformable seal and the casing wall; and

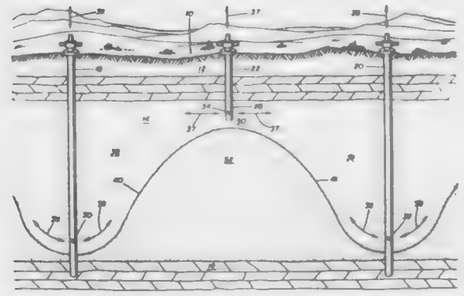
(g) means on said actuating cylinder for locking the inner mandrel in position relative to the outer mandrel.

4,993,490

OVERBURN PROCESS FOR RECOVERY OF HEAVY HITUMENS

David J. Stephens, London, England, and Roland P. Leaute, Calgary, Canada, assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 3, 1989, Ser. No. 416,554
Claims priority, application Canada, Oct. 11, 1988, 579473
Int. Cl.[5] E21B *43/24, 43/243*
U.S. Cl. 166—261 11 Claims



10. A method for the production of bitumens from a subterranean reservoir which is penetrated by a plurality of spaced-apart injection-production wells, the method comprising the steps of:

cyclically injecting steam into and recovering bitumens from the reservoir through a first injection-production well and a second injection-production well so as to form a zone of increased effective permeability in the reservoir about each of the first and second injection-production wells, each zone of increased effective permeability having a lower boundary in the reservoir with a substantially positive gradient outwardly from its respective injection-production well, the zones of increased effective permeability intersecting so as to form an area of communication between each other in the upper portion of the reservoir above a cold hump laterally intermediate the first and second injection-production wells;

drilling an injection well in the reservoir, the injection well being in fluid communication with the area of communication between the zones of increased effective permeability proximate the uppermost portion of the cold hump;

initiating in-situ combustion in the area of communication between the zones of increased effective permeability proximate the injection well;

injecting oxygen-containing fluid into the area of communication between the zones of increased effective permeability through the injection well so as to expand the in-situ combustion outwardly from the injection well, whereby the heat and combustion pressure of the in-situ combustion and gravity cause bitumens from the zones of increased permeability and the cold hump to flow downwardly along the lower boundaries of the zones of increased effective permeability towards the injection-production wells; and

recovering the bitumens from the zones of increased permeability and the cold hump through each of the injection-production wells.

4,993,491

FRACTURE STIMULATION OF COAL DEGASIFICATION WELLS

Ian D. Palmer, Tulsa; David C. Gardner, Broken Arrow; Ralph W. Veatch, Tulsa, all of Okla., and G. Michael Kutas, Farmington, N. Mex., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 24, 1989, Ser. No. 342,407
Int. Cl.[5] E21B *43/267*
U.S. Cl. 166—280 11 Claims

1. A method of placing a conductive proppant pack while hydraulically fracturing a subterranean coal formation penetrated by a coal degasification well, said method comprising the steps of:

continuously injecting a pad fluid through the well and into contact with said coal formation at a flow rate and pressure at least sufficient to fracture said coal formation and thereafter injecting a proppant-laden fracturing fluid into the fractured coal formation for a time sufficient to emplace a conductive proppant pack in said fracture coal formation that is in fluid communication with the wellbore;

said proppant-laden fracturing fluid having a graduated schedule of (i) increasing proppant mesh size, ranging from about 40/70 mesh to about 12/20 mesh, and (ii) increasing proppant concentration in the fracturing fluid.

4,993,492

METHOD OF INSERTING WIRELINE EQUIPMENT INTO A SUBSEA WELL

John F. Cressey, Southwell, England, and Ian J. Hardy, Banchory, Scotland, assignors to The British Petroleum Company, p.l.c.c, London, England

Continuation of Ser. No. 262,132, Oct. 25, 1988, abandoned, which is a continuation of Ser. No. 792,711, Oct. 30, 1985, abandoned. This application Jun. 1, 1990, Ser. No. 532,106
Claims priority, application United Kingdom, Nov. 13, 1984, 28633
Int. Cl.[5] E21B *33/076*
U.S. Cl. 166—339 1 Claim



1. A method for inserting wireline equipment into a subsea oil well utilizing a subsea wireline lubricator comprising in sequence a stuffing box for axial marine entry of a wireline tool, at least one blow-out preventer, a riser, a foot valve and a connector for connection to a subsea well head assembly, said method comprising the steps of (a) connecting the subsea wireline lubricator to the wellhead, (b) closing the foot valve, (c) opening the stuffing box, (d) opening the blow-out preventer, (e) inserting the equipment through the stuffing box and the blow-out preventer into the riser directly from the sea in the wet, (f) closing the stuffing box, (g) pressure testing, (h) opening the foot valve and (i) lowering the equipment through the foot valve and into the well.

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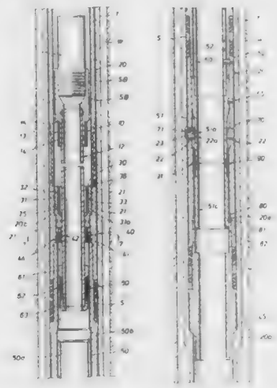
RETRIEVABLE LANDING METHOD AND ASSEMBLY FOR A WELL BORE

Ronald D. Arnold, Missouri City, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Continuation of Ser. No. 911,861, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 729,733, May 2, 1985, abandoned. This application Apr. 30, 1987, Ser. No. 44,423

Int. Cl.[5] E21B *23/00*

U.S. Cl. 166—382 45 Claims



17. A retrievable landing assembly for supporting on a well string to actuate a setting sleeve and position a retrievable receptacle in a tubular member provided with a latching groove for receiving therein latch members supported on the retrievable receptacle including:

tool means;

first means for connecting said tool means with the retrievable receptacle;

second means operable by manipulation of the well string to disconnect said tool means from said first means for longitudinal movement relative to the retrievable receptacle to move the setting sleeve and urge the latch members into the latching groove; and

additional means engaged with the retrievable receptacle to prevent withdrawal of said tool means from the retrievable receptacle while accommodating relative longitudinal movement therebetween.

25. A method of actuating a setting sleeve to position a retrievable receptacle with seal means and a landing shoulder in a tubular member provided with a landing seat and a latching groove for receiving therein latch members supported on the retrievable receptacle to secure the retrievable receptacle to the tubular member comprising the steps of:

releasably connecting the retrievable receptacle with tool means on a well string for lowering and positioning the retrievable receptacle landing shoulder on the tubular member landing seat;

manipulating the well string and tool means to disconnect the tool means from the retrievable receptacle for relative longitudinal movement therebetween whereby the tool means moves the setting sleeve to urge the latching members into the latching groove to sealably secure the retrievable receptacle with the tubular member; and

maintaining the tool means coupled to the receptacle to prevent withdrawal of the tool means from the retrievable receptacle while positioning the retrievable receptacle in the tubular member.

37. A setting tool for use in a well bore with a well tool requiring a longitudinal motion for operation including,

a tubular member, adapted for coupling to a tubing string,

first outer releasable interconnecting nut means for threadably interconnecting said tubular member to a well tool, said first releasable interconnecting nut means being slidably but non-rotatively mounted on said tubular member for permitting relative longitudinal motion between said tubular member and said first interconnecting nut means and for permitting corotation of said tubular member and said first nut means for releasing said first nut means from a well tool,

second outer releasable interconnecting nut means for threadably interconnecting said tubular member to a well tool, said second releasable interconnecting nut means being arranged for non-rotative releasable interconnection to a well tool for permitting said tubular member to be releasable from interconnection with said second interconnecting nut means upon rotation of said tubular member relative to a well tool,

said tubular member being arranged so that said tubular member has means providing a downwardly facing surface which is engagable with an upwardly facing surface on a well tool so that upon release of the threaded interconnection of said second interconnecting nut means relative to said tubular member, said tubular member can engage an upwardly facing surface on a well tool.

4,993,494

HORSESHOE

Arne Tuunanen, Sallerupsvägen 6, S-212 Malmo, Sweden

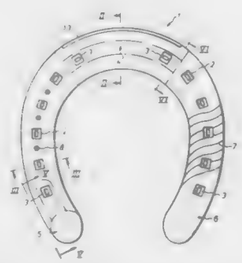
PCT No. PCT/SE87/00197, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO87/06097, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 16, 1987, Ser. No. 263,777

Claims priority, application Sweden, Apr. 18, 1986, 8601777-9

Int. Cl.[5] A01L *5/00*

U.S. Cl. 168—4 12 Claims



1. A horseshoe (1) conformed substantially to the U-shaped sole of the hoof and having a reinforcing insert (16) of a flexible material and a portion (17) which encloses said insert (16) and is made of an elastic friction material, wherein said insert (16) is narrower than the width of the U-shaped sole such that thrust, shock and shear loads are elastically absorbed by the portion (17) enclosing said insert, characterised in that said insert comprises at least one channel (30) which extends in the longitudinal direction of the insert and in which a separate element of a curable composite material is positioned, said composite material being caused to cure in situ only after said insert has been given its final shape.

4,993,495

APPARATUS FOR APPLYING FIREFIGHTING CHEMICALS

Peter P. Burchert, Kamloops, Canada, assignor to Chemonics Industries, Inc., Phoenix, Ariz.

Filed Aug. 18, 1989, Ser. No. 395,601

Claims priority, application Canada, Aug. 25, 1988, 575734

Int. Cl.[5] A62C *5/02*

U.S. Cl. 169—14 1 Claim

1. In apparatus for fighting wild fires, including a water supply tank,

a pump for delivering water under pressure from said water supply tank,

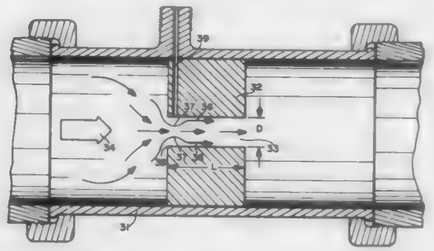
a fire-fighting liquid concentrate supply tank,

means for mixing said concentrate with said water,

nozzle means for applying said mixture to vegetation, and

conduit means connecting said water supply tank, said concentrate supply tank, said pump and said nozzle,

the improved system comprising inductor/mixing means in said conduit downstream of said pump, including:



(a) a hollow barrel portion;

(b) a short pipe orifice positioned in said barrel, said short pipe orifice having a length and a constant inner diameter, the length thereof being at least 2.5 times the inner diameter thereof; and

(c) means defining a concentrate liquid port in said barrel for inducting said liquid at the vena contracta of pumped water flowing therethrough.

4,993,496

QUICK RELEASE VALVE FOR SPRINKLER HEAD

Armin Riedle, Rathinges; Horst Zientek, Kaarst; Nikolaus Grainer, Odenthal-Blecher, and Heinz Heider, Cologne, all of Fed. Rep. of Germany, assignors to Total Walther Feuerschutz GmbH, Cologne, Fed. Rep. of Germany

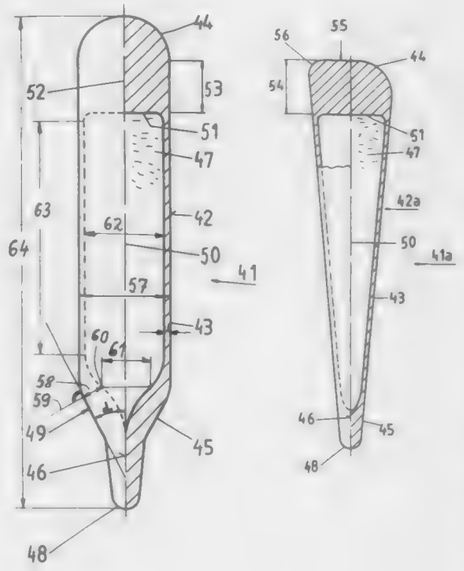
Continuation of Ser. No. 206,029, Jun. 13, 1988, Pat. No. 4,898,246. This application Jan. 8, 1990, Ser. No. 463,156

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722233; Jul. 22, 1987, 3724215; Aug. 6, 1987, 3726120

Int. Cl.[5] A62C *37/14, 37/10, 37/11*

U.S. Cl. 169—38 10 Claims

10. A release member for thermal and/or electrical release of a fire protection plant, in particular a sprinkler plant, wherein the release member is made of glass, is elongated along a longitudinal axis, has an inside and an outside, and is filled with a liquid for bursting of the release member, and wherein the release member (41) comprises a cylindrical center part with thin wall thickness, which cylindrical center part is closed at an upper end by way of an outwardly rounded first glass plug (44), and which cylindrical center part is furnished at a lower end with a second glass plug (45) with a fill-in opening (46) which second glass plug narrows in an axial direction, which lower second plug with fill-in opening is melted after the filling-in of the bursting fluid (47) in the lower end (48), wherein the release member (41) is furnished out of a prefabricated cylindrical glass tube (42) with a cylindrical outer face and overlength shoulders (49), which glass tube (42) is dimensioned such that, in each case, at the two ends of the glass tube (42), the glass plugs (44, 45) are melted inwardly from the shoulders, and wherein the cylindrical outer face is thereby retained over the full length of the release member (41), and wherein the second plug (45) is funnel-shaped and the shoulder at the outside of the second plug is a transition shoulder (49), which forms a shoulder angle alpha relative to the longitudinal axis (50) of from about 30 to 40 degrees, and wherein the first plug (44) is furnished with an internal, substantially planar floor section (51).



4,993,497

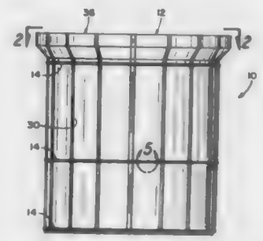
DELUGE FUNNEL TANK JACKET

Oscar R. Majors, Rte. 1, P.O. Box 61, Porter, Okla. 74454

Filed Apr. 6, 1990, Ser. No. 506,265

Int. Cl.[5] A62C *3/12*

U.S. Cl. 169—66 15 Claims



1. A water collecting and distributing protective jacket in combination with a storage tank, comprising:

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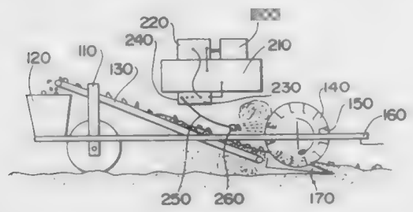
a plurality of channel members substantially surrounding the storage tank,
each channel member having means for receiving and and loosely holding in position an edge portion of a jacket plate component at a distance from the tank to create a void between the jacket and the storage tank,
each channel member having a plurality of side openings to permit water to flow from a channel member into the void,
a funnel positioned on top of the water jacket forming an enclosure for collecting water and having means for permitting communication of water flow from the enclosure of the funnel into the void,
the funnel having a horizontal sectional demension at least equal to a horizontal sectional dimension of the storage tank, and
a horizontally disposed channel member near the lowest portion of the jacket in communication with the void, the horizontally disposed channel member having a plurality of relief ports to permit water flowing through the void to exit the jacket.

4,993,498

APPARATUS FOR CLEANING SANDY OR PEBBLE-COVERED SITES

Jean-Marie Fresnel, Le Tiocan, les Hautes de Thoiry, F-01630 Saint-Genis-Pouilly, France

Filed May 16, 1988, Ser. No. 194,163
Int. Cl.[5] A01D *13/00*
U.S. Cl. 171—25 **15 Claims**



1. An apparatus for cleaning soil containing at least one member selected from the group consisting of sand and pebbles, said apparatus comprising:
(a) means for removing a layer of top soil comprising particles from a group consisting of sand, pebbles and a mixture of said and pebbles to a predetermined depth from an area of land;
(b) means for projecting said particles in a cloud; and
(c) means for applying a fluid comprising an electrolysate of sea water having a chlorine equivalent value within a range of 200 to 2000 mg/l to said particles in said cloud, operably positioned with respect to said means for projecting said particles, so as to envelope said particles with said fluid before depositing said particles on land.

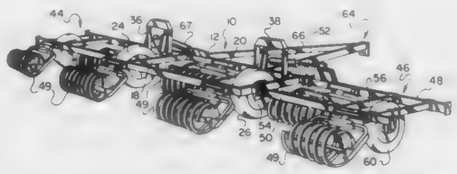
4,993,499

WING PACKER

Gerard F. Bourgault, and Richard P. Coquet, both of St. Brieux, Canada, assignors to F. P. Bourgault Industries Air Seeder Division Ltd., St. Brieux, Canada

Filed Sep. 26, 1989, Ser. No. 413,102
Claims priority, application Canada, Sep. 1, 1989, 610168
Int. Cl.[5] A01B *35/16, 73/04*
U.S. Cl. 172—294 **7 Claims**

1. A packer adapted for towing across the ground behind a power source or in tandem behind another wheeled implement such an air seeder, comprising:
(a) a middle frame section;
(b) hitch means affixed to said packer for attachment to a vehicle;
(c) a plurality of ground-engaging wheels rotatable affixed to said middle frame section;
(d) two wing frame sections pivotally attached to said middle frame section and extending laterally therefrom and adapted for pivoting downwards when in the working position to remain a predetermined height over uneven ground;
(e) at least one ground-engaging roller pivotally attached by a roller pivot to each of said middle frame section and said wing frame sections about a first axis substantially parallel to the ground when in the working position and perpendicular to the forward direction to permit each said roller to move up and down, and about a second axis perpendicular to said first axis and oblique to the ground by attachment to a pivot member connected to said roller pivot to permit each said roller to pivot from side to side, whereby without pivoting about an additional, vertical axis the roller follows the contour of the ground and when encountering objects such as rocks will pivot upwardly and obliquely thereby avoiding damage to the roller and frame sections;



(f) said ground-engaging rollers being staggered in overlapping relationship wherein said middle frame section and said wing sections comprise forward members and rearward members both on which are mounted rollers thereby completely packing the land over which the packer traverses;
(g) a ground-engaging wheel rotatably affixed to each of said wing frame sections;
(h) means for pivotally lifting said middle frame section from a working position in which said roller attached to said middle frame section is in contact with the ground to a transport position in which said roller is out of contact with the ground;
(i) means for pivotally lifting said wing frame sections from a working position in which said rollers and wheels attached thereto are in contact with the ground to a transport position in which said rollers and wheels are set out of contact with the ground; and
(j) said wing frames being adapted for substantially vertical orientation when in the transport position, whereby it is not necessary to move the packer implement rearwardly in order to move the implement from the transport to the operating position or vice versa.

4,993,500

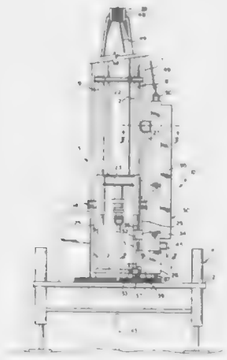
AUTOMATIC DRIVE HAMMER SYSTEM AND METHOD FOR USE THEREOF

R. Richard Greene, Indianapolis, and Rick Sams, Greenfield, both of Ind., assignors to Mobile Drilling Company, Inc., Indianapolis, Ind.

Filed Mar. 27, 1989, Ser. No. 329,346
Int. Cl.[5] E21B *49/02*
U.S. Cl. 173—1 **39 Claims**

1. A method for driving a drill rod into the earth, comprising the steps of:
providing an automatic drive hammer system mounted for operation from an earth drilling rig having a drill rod feed mechanism support structure, said system including:
a support bucket pivotally mounted to the support structure for movement between an on-hole position and an off-hole position,

an automatic drive hammer apparatus having a housing, an anvil and a hammer, the anvil adapted for connection to a drill rod, the hammer adapted for reciprocal sliding movement within said housing to cyclically strike the anvil and drive the drill rod into the earth,
a winch assembly disposed for operation from high atop the support structure, said winch assembly including a cable having a distal end constantly connected to said drive hammer apparatus, and
wherein the drive hammer system has a storage position wherein said drive hammer apparatus sits within said bucket and said bucket is in the off-hole position, a loading/unloading position wherein said drive hammer





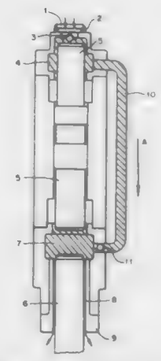
apparatus sits within said bucket and said bucket is in the on-hole position, and an operating position wherein said drive hammer apparatus is suspended by said winch assembly in the on-hole position out of said bucket and said bucket is in the off-hole position;
pivoting said bucket whereupon the drive hammer system is put in the loading/unloading position from the storage position;
operating in one manner said winch assembly whereby said drive hammer apparatus is lifted out of said bucket;
pivoting said bucket to the off-hole position with said drive hammer apparatus staying in the on-hole position and whereupon the drive hammer system is put in the operating position;
operating in another manner said winch assembly whereby said drive hammer apparatus is lowered to a predetermined height above the drill rod and the anvil is connected to the drill rod; and,
operating said drive hammer apparatus to cyclically drop said hammer onto the anvil.

4,993,501

HYDRAULIC HAMMER IN PARTICULAR FOR USE IN DUSTY AND/OR CORROSIVE ENVIRONMENTS

Gianfranco Zanaini, Limena, Italy, assignor to TECHMO Car S.p.A, Limena Po, Italy

Filed Apr. 28, 1989, Ser. No. 345,090
Claims priority, application Italy, Jun. 14, 1988, 20959 A/88
Int. Cl.[5] B23B *45/16*
U.S. Cl. 173—76 **2 Claims**



1. A hydraulic hammer for use in dusty and/or corrosive environments having a hydraulically actuated beating mass reciprocally movable in a cylinder to strike against a tool, comprising:
said cylinder having a longitudinal axis, along which said beating mass is reciprocally movable;
an intake duct for conveying air from the external environment into a top chamber defined by the rear face of said beating mass, the inner surface of the cylinder and the upper base of said cylinder, during the sinking stroke of said beating mass as a result of the downwards movement thereof;
said top chamber being located along said longitudinal axis;
a filter arranged in said intake duct for removing abrasive agents contained in the intake air;
a one-way valve arranged in said intake duct for permitting the filtered air to enter said top chamber;
a connection duct for conveying the filtered air contained in said top chamber into a bottom chamber defined by the front face of said beating mass, the inner surface of the cylinder and the rear face of the tool, during the rising stroke of said beating mass as a result of the upwards movement thereof;
said connection duct being parallel to said longitudinal axis;
said bottom chamber being located along said longitudinal axis;
a one-way valve in said connection duct for permitting the filtered air to flow from said top chamber into said bottom chamber;
a guide bushing for said tool and located beneath said bottom chamber;
and an exhaust chamber formed by the clearance between the tool and the guide bushing for said tool;
whereby an over pressure is generated inside said bottom chamber both during said rising stroke and said sinking

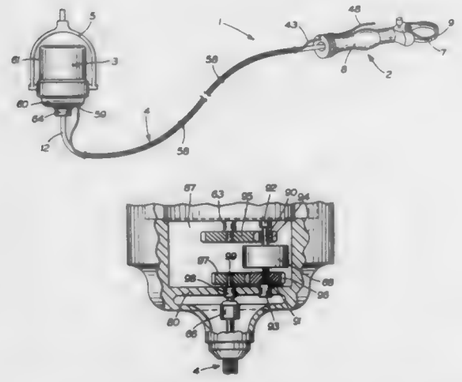
stroke of said beating mass, so as to permanently cause a filtered air stream to flow from said bottom chamber to the external environment through the exhaust chamber.

4,993,502

PNEUMATIC CONTROL SYSTEM FOR MEAT TRIMMING KNIFE

Timothy J. McCullough, Vermilion, Ohio, assignor to Food Industry Equipment International, Inc., Lorain, Ohio

Division of Ser. No. 102,322, Sep. 29, 1987, Pat. No. 4,850,111.
This application Jun. 15, 1989, Ser. No. 367,195
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] A22C *17/00*
U.S. Cl. 173—163 **7 Claims**



1. A control system for an electrically driven meat trimming knife of the type having a handpiece with an annular cutting blade rotatably mounted on the front end of the handpiece and driven by a flexible drive cable extending into the handpiece, said cable being driven by an electric motor located remote from the said handpiece, said control system including:

(a) gear means for operatively connecting an input end of the flexible drive cable to an output shaft of the electric motor for increasing the rotational speed of the drive cable greater than the rotational speed of the output shaft of the motor; and

(b) clutch located at the electric motor for operatively connecting the output shaft of said motor to the input end of the drive cable through the gear means.

4,993,503

HORIZONTAL BORING APPARATUS AND METHOD

Edward E. Fischer, Acton; Thomas H. Mann, Littleton, and Allan T. Fisk, Needham, all of Mass., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Mar. 27, 1990, Ser. No. 499,782
Int. Cl.[5] E21B *7/08, 7/18, 47/09, 47/12*
U.S. Cl. 175—62 **26 Claims**

1. Dual mode boring apparatus for forming a generally horizontal underground passage for a utility conduit or the like comprising

a tool head having elongated body structure that defines a tool axis and structure defining a cutting face at one end of said elongated body structure,

cutting bit structure fixed to and projecting forwardly from said cutting face, said cutting bit structure including pilot structure defining a pilot axis offset from said tool axis,

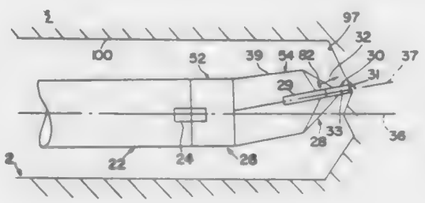
structure defining a cutting fluid orifice in said cutting face adjacent said cutting bit structure for directing a high velocity jet of cutting fluid forwardly of said cutting face, and

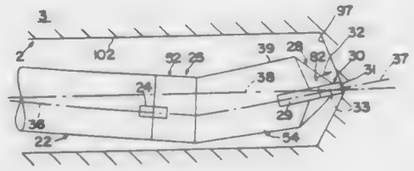
coupling structure for attaching said elongated body structure to a drill string such that said cutting tool face is offset from said drill string axis,

said boring apparatus being adapted to be advanced and concurrently driven in rotation to move said cutting face in an orbital path about said tool axis in boring action in relatively soft underground strata and to move said cutting face in a rotary path about said pilot structure in rotary boring action in underground strata that is harder than said relatively soft underground strata to bore an underground passage, and to be advanced without rotation to produce a change in direction of said underground passage in the direction of offset of said pilot structure from said tool axis.

20. A method for forming a generally horizontal underground passage for a utility conduit or the like comprising the steps of

providing a tool head that has elongated body structure and a cutting face at one end of said elongated body structure, cutting bit structure fixed to and projecting forwardly





from said cutting face, and structure defining a cutting fluid orifice in said cutting face adjacent said cutting bit structure,

attaching said elongated body structure to a drill string such that said cutting tool face is offset from the axis of said drill string,

concurrently rotating and advancing said tool head along an underground path to move said cutting bit structure in orbital boring action about said drill string axis while concurrently directing a high velocity jet of cutting fluid from said orifice defining structure at an angle to said drill string axis in the same direction as said cutting tool face is offset from said drill string axis to bore a substantially straight underground passage, and

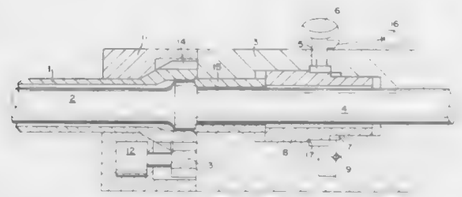
advancing said tool head along an underground path without rotation while concurrently directing said high velocity jet of cutting fluid from said orifice defining structure at an angle to said drill string axis in the same direction as said cutting tool face is offset from said drill string axis to produce a change in direction of said underground passage in the direction of said high velocity jet of cutting fluid.

4,993,504

DEVICE FOR EFFICIENT ENERGY TRANSFER AND DAMPING OF IMPACT DRILLING MACHINES

Jörgen A. R. Rodert, Saltsjö-Boo, and Kurt H. Andersson, Tyresö, both of Sweden, assignors to Atlas Copco MCT AB, Nacka, Sweden

Filed Feb. 8, 1990, Ser. No. 476,985
Claims priority, application Sweden, Feb. 21, 1989, 8900571
Int. Cl.[5] E21B *1/02, 6/00*
U.S. Cl. 175—135 **2 Claims**



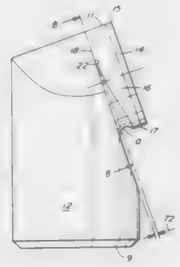
1. A device in impact machines for drilling by means of a drill string, said device comprising a set of tubes (1) for transferring rotation to a drill bit and a set of separate rods (2) arranged centrally in the set of tubes for transferring impact energy from a hammer piston (4) movable to and fro in a machine housing (3) to said drill bit, characterized in that said device comprises a first chamber (5) and a second chamber (7) defined within said machine housing (3), a piston movable within said machine housing (3), said piston having a surface in fluid communication with said first chamber (5) such that liquid pressure within said first chamber determines a forwardly directed force transferred by said piston, and an accumulator (6) coupled in fluid communication to said first chamber, said piston being movable into said second chamber in closely fitting relationship therein to entrap a liquid volume for damping a recoil from said set of rods causing said piston to move in a rearwardly direction.

4,993,505

DIAMOND INSERT GRINDING PROCESS

Scott Packer, Provo, and Mike Lockwood, Heber City, both of Utah, assignors to Smith International, Inc., Houston, Tex.

Filed Dec. 18, 1989, Ser. No. 452,148
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—329 **8 Claims**



1. A diamond insert grinding process to remove stress riser cracks or notches formed in a critical area of a tungsten carbide insert body, said cracks being caused by leaching of cobalt from the carbide during a process of brazing a polycrystalline diamond disc having a tungsten carbide substrate sintered thereto to the insert body comprising the step of;

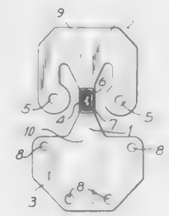
removing selectively, material from the intersection of the braze and the tungsten carbide base of said polycrystalline diamond disc and said tungsten carbide body below the depth of the cracks in the tungsten carbide body thereby relieving the stress riser in said critical area of the body.

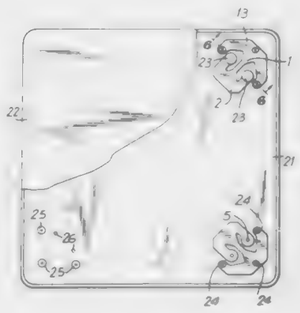
4,993,506

MASS-PRODUCED FLAT ONE-PIECE LOAD CELL AND SCALES INCORPORATING IT

Shlomo Angel, 205 West 15th St., New York, N.Y. 10011

Filed Dec. 21, 1989, Ser. No. 448,672
Int. Cl.[5] G01G *3/14, 3/08;* G01L *1/22*
U.S. Cl. 177—211 **5 Claims**





1. A low-profile load cell designed for mass production and comprising

a. a one-piece, flat, mechanically-deformable metal part, stamped from a single piece of thin stock material, comprising

(1) a flat flexure beam on which strain sensors are bonded,

(2) a flat U-shaped loading element attached at its inner mid-section to one end of the flexure beam, with the leading edges of the U-shaped element reaching beyond the mid-point of the flexure beam, the U-shaped element being loadable at two points opposite each other across the mid-point of the flexure beam; and

(3) a flat mounting element, wider than the flexure beam, attached at its mid-section to the other end of the flexure beam, the mounting element being fastenable to a plurality of flat protrusions on a rigid surface;

so that the flexure beam bends under a load as a double cantilever beam into a symmetrical S-shape, producing stresses of equal and opposite sign at points equi-distant from its mid-point along its main axis; and

b. at least one pair of strain sensors mounted on at least one of the flat surfaces of the flexure beam, with their centers substantially along its main axis and substantially equidistant from its mid-point, each pair of sensors forming half a Wheatstone bridge and producing signals of nominally equal and opposite values when the load cell is under load.

4,993,507

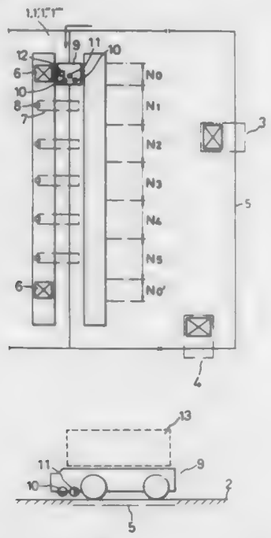
METHOD OF CONTROLLING OPERATION OF AUTOMATED GUIDED VEHICLE

Akira Ohkura, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 192,720, May 11, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 439,010

Int. Cl.[5] B62D *1/26;* **G06F** *15/50*

U.S. Cl. 180—168 **1 Claim**



1. A method of controlling the operation of an automated guided vehicle A.G.V. to carry workpieces along production lines to a plurality of successive work stations at a speed corresponding to a predetermined distinctive workpiece conveyor speed for the respective production line in a manufacturing area of a plant, comprising the steps of:

defining a boundary of the manufacturing area with a transportation line having a work load entrance station and a work load exit station;

providing a plurality of parallel spaced production lines, within the defined boundary;

providing a plurality of successively disposed work stations along each production line;

connecting the transportation line and each production line by a guide wire provided in the manufacturing area floor;

propelling the A.G.V. at a transportation line speed by detecting a magnetic field generated continuously from the transportation line to each of the production lines and from each production line to the transportation line;

generating a speed command signal adjacent the entrance and exit ends of each production line for controlling the A.G.V. entering and exiting a respective production line;

storing on the A.G.V. speed data corresponding to a predetermined distinct workpiece conveyor speed for each production line; each distinct workpiece conveyor speed being continuous and each being less than the transportation line speed through the work stations of each production line; each distinct workpiece conveyor speed being the desired speed for performing manufacturing operations at the work stations along each corresponding production line;

detecting on the A.G.V. the generated speed command signals of the corresponding entrance and exit end of the respective production line;

decreasing the speed of the A.G.V. from the transportation line speed to the respective stored speed for the corresponding production line until the speed of the A.G.V. is equal to the distinct workpiece conveyor speed in response to the generated speed command signal at the entrance end of a respective production line;

propelling the A.G.V. at the corresponding stored distinct workpiece conveyor speed along the production line continuously; and

increasing the speed of the A.G.V. to the speed of the transportation line speed in response to the generated speed command signal at the exit end of the corresponding production line.

4,993,508

REAR WHEEL SUPPORTING DEVICE FOR A MOTORCYCLE

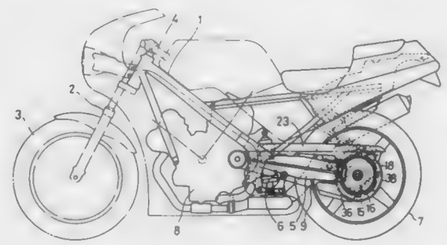
Kouichi Nozoe, Saitama, and Tetsuya Kudo, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,115, Jan. 5, 1988, abandoned. This application Sep. 7, 1989, Ser. No. 404,054

Claims priority, application Japan, Jan. 27, 1987, 62-17019; Jan. 27, 1987, 62-10469[U]

Int. Cl.[5] B62D *61/02;* **B62K** *11/00*

U.S. Cl. 180—219 **12 Claims**



1. A rear wheel supporting device for a motorcycle having a body, comprising:

a swing arm having one end connected for pivotal movement to said motorcycle body and an axle-supporting portion at the other end thereof;

an axle positioned in said axle-supporting portion;

a rear wheel mounted on said axle on one side of said axle-supporting portion;

a sprocket for driving said wheel mounted on the other side of said axle-supporting portion; and

partition means positioned between said rear wheel and said sprocket, said partition means being carried by said swing arm and having edge means disposed in substantially contiguous relation therewith to positively laterally separate said sprocket from said rear wheel.

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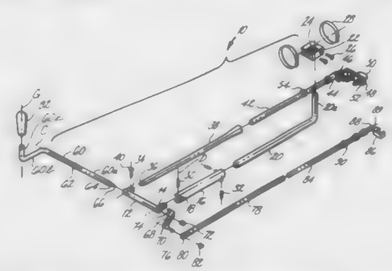
VEHICLE HAND CONTROL DEVICE

Keith Howell, R.R. #6, Fredericton, New Brunswick, Canada E3B 4X7

Filed Feb. 2, 1990, Ser. No. 474,521

Int. Cl.[5] B60K *26/00*

U.S. Cl. 180—333 **5 Claims**



1. A vehicle hand control device operable to control an accelerator pedal of an automotive vehicle, comprising:

an elongated support means for stationary connection to a steering column of the vehicle;

said support means having a first end pivotally connected to a first end of a control arm tube whereby said control arm tube is held for pivoting only about its said first end;

said control arm tube also having a second end and formed of an elongated tubular member which extends from said pivotal connection from said first end of said support means;

a control arm having a first end and a second end and a mid portion and formed of a slender, elongated shaft having a handle extending from said first end, said handle positionable adjacent a steering wheel of the steering column;

said control arm connected and supported along its length between said second end and said mid portion coaxially within said control arm tube for rotation only;

a control arm lever having first and second ends and connected at said first end to, and radially extending from, said control arm second end;

an elongated accelerator pedal connecting means operably connectable at each end between said control arm lever second end and the accelerator pedal, respectively, for controlling the accelerator pedal in response to rotational movement of said control arm coaxially within said control arm tube by corresponding manual rotational movement of said handle.

4,993,510

MOBILE SPEAKER FIXING DEVICE

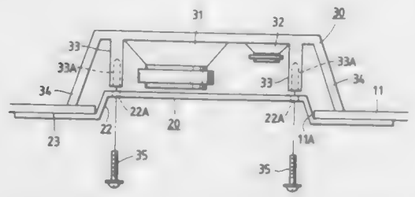
Toshifumi Kato, Yamagata, and Yoshihiro Hirano, Tokyo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 7, 1990, Ser. No. 476,221

Claims priority, application Japan, Apr. 22, 1989, 1-48166[U]

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—141 **7 Claims**



1. A speaker fixing device for fixing a speaker with respect to a mount opening in a rear parcel tray of a vehicle, said device comprising:

speaker grille means for protecting a speaker and having screw seat means projected toward said mounted opening for receiving fixing screws, and further having skirt means for contacting a surface of said rear parcel tray at a predetermined distance spaced from said mount opening;

holder means having a fitting projection portion for fitting in said mount opening, flange means projecting from said fitting projection portion to be substantially wider than said mount opening so that said flange means can abut and support a lower surface of said rear parcel tray, and fixing screw-mounting means for allowing fixing of fixing screws through said holder means and into said screw seat means;

wherein said holder means can be fixed to said speaker grille means such that said rear parcel tray is clamped between, and supported by said skirt means and said flange means.

4,993,511

SPEAKER

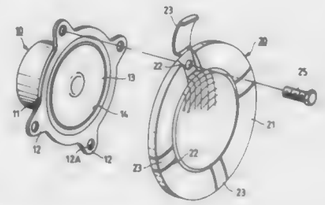
Takayuki Hiraki; Hideaki Kurata; Tetsuya Kamata, and Eiji Shintani, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,660

Claims priority, application Japan, Apr. 10, 1989, 1-41798[U]

Int. Cl.[5] H04R *1/02*

U.S. Cl. 181—150 **9 Claims**



1. A speaker comprising:

a speaker unit;

a speaker frame for holding said speaker unit, said speaker frame having a plurality of holes for receiving respective bolts; and

a grille unit for covering a front surface of said speaker frame, said grille unit having a plurality of holes which correspond to the holes of said speaker frame so that said grille unit and said speaker frame can be bolted together by inserting the bolts through the holes of said speaker frame and said grille unit, said grille unit further having a plurality of cover means each disposed adjacent a different one of the grille unit holes, each of said cover means movable between a first position for allowing one of said bolts to be inserted through the adjacent hole, and a second position for covering a head portion of the inserted bolt.

4,993,512

EXHAUST DUCT PART IN PARTICULAR FOR AN INTERNAL COMBUSTION ENGINE

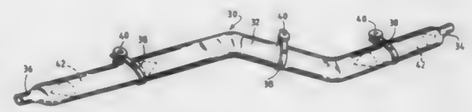
Henri Lescher, St Germain en Laye, France, assignor to Glaenzer Spicer, Poissy, France

Filed Sep. 9, 1988, Ser. No. 242,413

Claims priority, application France, Sep. 9, 1987, 87 12525

Int. Cl.[5] F01N *1/24, 7/08*

U.S. Cl. 181—227 **44 Claims**



1. In a part of an elongated exhaust duct for outflow of a fluid, particularly for outflow of exhaust gases from an engine, said exhaust duct part comprising a continuous elongated external casing having a constant cross section throughout substantially an entire length thereof, and at least one acoustic attenuation unit positioned within said external casing at a location such that a fluid transfer section of said external casing that leads to said acoustic attenuation unit is of a length sufficient to enable said fluid transfer section to participate in providing acoustic attenuation for said exhaust duct part, said acoustic attenuation unit comprising an elongated internal casing adapted to include sound deadening material and having an outer surface that defines with an inner surface of said external casing at least one longitudinal channel defining therein a space for the passage of the fluid, the improvement wherein:

said internal casing has a transverse cross-sectional configuration that is of substantially constant area throughout substantially an entire length of said internal casing;

said at least one longitudinal channel is defined by at least a portion of said internal casing being in contact with said inner surface of said external casing; and

said portion of said internal casing, which is in contact with said inner surface of said external casing, comprising at least one zone of said internal casing deformed radially outwardly along substantially said entire length of said internal casing and defining a radially outwardly projecting space within said internal casing so as to create an increased surface contact area between said acoustic attenuation unit and said space defined within said at least one longitudinal channel, said outwardly projecting space being adapted to include the sound deadening material.

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MUFFLER

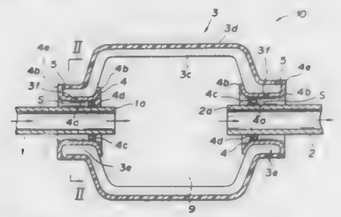
Takeshi Inoue; Hiroshi Funabashi, both of Saitama, and Yukihiro Nakagawa, Aichi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Nakagawa Sangyo Co., Ltd., Aichi, both of, Japan

Filed Jan. 27, 1989, Ser. No. 302,531

Claims priority, application Japan, Jan. 29, 1988, 63-11070[U]; Jan. 29, 1988, 63-11071[U]

Int. Cl.[5] F01N *1/24, 7/14, 7/18*

U.S. Cl. 181—282 **12 Claims**



1. A muffler comprising:

an outer box forming an exhaust gas expansion chamber;

an exhaust pipe connected at one end of said exhaust pipe to said outer box for feeding exhaust gas into said box;

a discharge pipe connected at one end of said discharge pipe to said outer box for discharging expanded exhaust from said box; and

a connecting member of a noncircular cross section having means for radiating heat and fixed to said one end of at least one of said exhaust pipe and said discharge pipe, where said one end of said at least one of said exhaust pipe and said discharge pipe is connected to said outer box, said connecting member being interposed between said one end and said outer box, said outer box having a hardened, tight resin outer layer and a porous inner heat insulation layer.

4,993,514

LADDER LEVELLING DEVICE

William H. Ferguson, 18 Graham Crescent, Bainfield Estate, Cardross, Dunbartonshire, Great Britain G82 5Jh

PCT No. PCT/GB88/00493, § 371 Date Nov. 27, 1989, § 102(e) Date Nov. 27, 1989, PCT Pub. No. WO88/10354, PCT Pub. Date Dec. 29, 1988

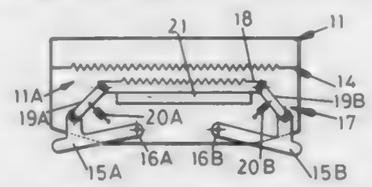
PCT Filed Jun. 24, 1988, Ser. No. 435,475

Claims priority, application United Kingdom, Jun. 24, 1987, 8714831

Int. Cl.[5] E06C *7/44*

U.S. Cl. 182—200 **6 Claims**

1. A ladder levelling device is characterised by the combination of a carrier structure capable of attachment to a ladder and adapted releasably to receive the feet of the ladder in a sliding fit at spaced apart stations on the structure, said structure incorporating fixedly mounted first interconnect means extending substantially linearly between said stations, first and second adjustably mounted ground-engaging means and articulated linkage means connected to the first and second ground-engaging means and including second linearly extending interconnect means for releasably interconnecting with said first interconnect means, said second interconnect means extending parallel to said first interconnect means, each of said interconnect means comprising interconnect elements capable of connecting the second interconnect means to the first interconnect



means at a selected one of a plurality of locations along the length of the first interconnect means, wherein the linkage means is resiliently biassed against said interconnection being effected in the absence of ladder weight being applied to said carrier structure whereby to permit by selective interconnection of the first and second interconnect means verticality of a ladder when the ground-engaging means are supported by an inclined surface, with rigidity between the ground-engaging means and the carrier structure provided by said interconnection of the first and second interconnect means.

4,993,515

POLE CLIMBER ASSEMBLY

Bruce G. Green, and Richard G. Green, both of 9604 111th Ave., SE., Kirland, Wash. 98033

Filed Mar. 24, 1989, Ser. No. 328,290

Int. Cl.[5] A63B *27/02*

U.S. Cl. 182—221 **12 Claims**



1. A pole climber assembly to facilitate the climbing of vertical poles and trees comprising:

a hook comprising a calf section to be secured about a person's calf and a stirrup section integrally connected to said calf section and at substantially a right angle to said calf section, said stirrup section to hold the person's foot in place within said hook;

a gaff extending outwardly from said hook for engaging and gripping a climb surface;

strap means for strapping the person's foot into said stirrup section and for strapping the person's calf to said calf section;

a non skid pad to protect said hook from structural damage during use resulting from contact with objects external to the pole, said skid pad comprising a horizontal section;

said calf section comprises an interior surface abutting the calf of the person and an exterior surface opposite of said interior surface facing away from the person;

said stirrup section comprises an interior surface abutting the foot of the person and an exterior surface opposite of said interior surface facing away from the person, said horizontal section of said skid pad rigidly attached to said exterior surface of said stirrup section, said skid pad acting as a buffer between said hook and any horizontal surface which may wear against said pole climber assembly;

wherein, said hook is made entirely of a composite material, said composite material including insulation means for insulating the person's calf and foot from any electrical shock resulting from contact of said hook, gaff, or strap means with an electrical source.

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SEALED AND PRESSURE BALANCED OIL LUBRICATING SYSTEM

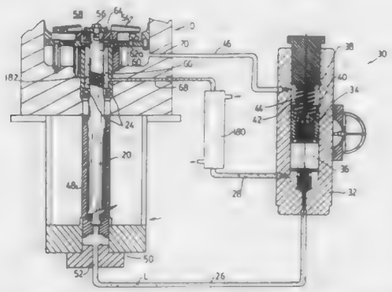
Patrick M. Taiani, Bedford, Canada, assignor to Nova Scotia Research Foundation Corporation, Dartmouth, Canada

Filed Apr. 24, 1990, Ser. No. 513,935

Claims priority, application Canada, Apr. 28, 1989, 598202

Int. Cl.[5] F01M *1/20*

U.S. Cl. 184—6.4 **11 Claims**



1. A balanced lubricating system for lubricating bearings associated with rotating equipment exposed to high pressure gases to offset any leakage of such gases into the lubricant comprising:

(a) high pressure housing means closed at each end thereof;

(b) conduit means leading from one end of said housing means to the bearings to be lubricated;

(c) reciprocable piston means slidably and sealingly contained within said housing means intermediate the ends thereof, said piston means serving to divide said housing means into a lubricant chamber and a gas chamber;

(d) spring biased relief valve means within said piston means, the opening direction of said relief valve means relative to said piston means being towards said lubricant chamber;

(e) relief valve actuation means within said gas chamber;

(f) spring biasing means within said gas chamber for applying a preload on said piston means in the direction of said lubricant chamber; and

(g) passage means connecting said gas chamber to an area within said equipment which, during operation thereof, will be exposed to high pressure gases;

whereby (i) as said equipment operates pressured gas from said area will be communicated via said passage means to said gas chamber to bias said piston means against lubricant in said lubricant chamber so as to transmit lubricant therefrom to said bearings via said conduit means; and (ii) when said equipment ceases to rotate and said area and gas chamber are returned to atmospheric pressure any pressurized gas which has leaked into said lubricant will migrate to said lubricant chamber and move said piston means towards said gas chamber due to the pressure differential thereacross, such movement bringing said relief valve means into engagement with said actuation means to open said relief valve means and thereby permit the pressurized gas in said lubricant to escape to said gas chamber through said piston means and hence escape to atmosphere.

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OIL-FILL OPENING FOR INTRODUCING LUBRICATING OIL INTO AN INTERNAL COMBUSTION ENGINE

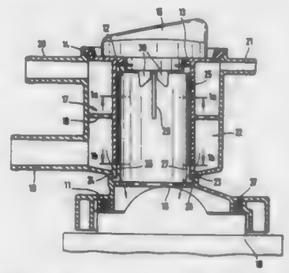
Rudolf Leipelt, Marbach, and Karl-Heinz Messner, Benningen, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Apr. 30, 1990, Ser. No. 516,747

Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914759

Int. Cl.[5] F16N *21/00*

U.S. Cl. 184—105.1 **8 Claims**



1. An oil-fill opening for introducing lubricating oil into a crankcase of an internal combustion engine, comprising a tubular member defining an oil-fill opening (12); a cap (15) with retaining means for opening and closing said oil-fill opening; an oil separator (22) arranged adjacent said oil-fill opening through which blow-by gases from the crankcase of said engine are conducted to an engine intake manifold or to the clean-air side of an engine air filter; at least one return port (23, 24) communicating between said oil separator (22) and said oil-fill opening (12) for returning lubricating oil collected in said oil separator; a shutter (25) comprising a rotary slide valve within said oil-fill opening (12) for opening and closing said return port; and means for connecting said shutter to said cap (15) such that when said oil-fill opening is closed by said cap (15), said shutter is actuated to open said return port (23, 24), and when said oil-fill opening is opened by means of said cap, said shutter is actuated to close said return port (23, 24).

4,993,518

METHOD AND APPARATUS FOR THE GROUP CONTROL OF ELEVATORS WITH DOUBLE CARS

Johannes van Straaten, Kriens, and Miroslav Kostka, Ballwil, both of Switzerland, assignors to Inventio AG, Switzerland

Filed Oct. 26, 1989, Ser. No. 427,743

Claims priority, application Switzerland, Oct. 28, 1988, 04032/88

Int. Cl.[5] B66B *1/18*

U.S. Cl. 187—127 **12 Claims**

1. A method for the group control of elevators with double cars in which, for the determination of an optimally applicable elevator for the serving of a floor call at a floor in a scanner position α, the operating costs defined as loss of time of all passengers involved in serving a call is the criterion of decision, and for which these operating costs are calculated and

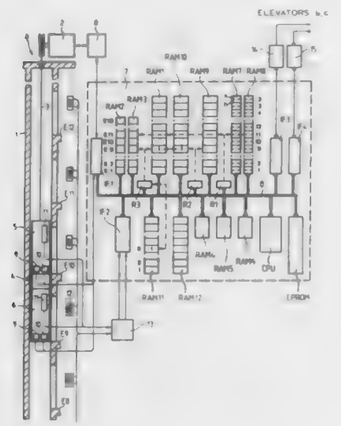
stored separately for each elevator within the framework of a cost calculating cycle KBZ for every scanner position α, whether a floor call exists or not, and subsequently are compared for all elevators together within the framework of a cost comparison cycle KVZ, wherein the elevator with the lowest operating costs for the respective scanner position α is assigned by a control apparatus as the favored for serving an eventual floor call and where also the assignment of a certain individual car of the corresponding double car is provided for the scanner position α to be served, characterized by the following steps:

(a) For the characterization of the applicability of a double car with respect to the serving of a floor call in a scanner position α, the following are defined for the double car as total operating costs $K_g(\alpha)$:

$$K_g(\alpha)=G\cdot K_{Ig}(\alpha)+K_{Ag}(\alpha)$$

(b) For the serving of a scanner position α by a double car, certain standard call serving positions are established by the position of the individual cars depending on the call serving directions the serving position $\alpha,\alpha+1$ for the downward call serving direction, as well as the serving position $\alpha,\alpha-1$ for the upward call serving direction and the standardized total operating costs $K_{gs}(\alpha)$ defined as follows:

$$K_{gs}(\alpha)=G\cdot[S\cdot[K_{IA}(\alpha)+K_{IH}(\alpha\pm1)]]+[K_{AA}(\alpha)+K_{AH}\cdot(\alpha\pm1)]$$



(c) For every double car, the standardized total operating costs $K_{gs}(\alpha)$ are calculated within the framework of its cost calculating cycle (KBZ) in every scanner position α according to step b by means of a cost calculating algorithm (KBA) and subsequently stored in a first total cost [memory, wherein the internal operating costs $K_{IA}(\alpha)$ and $K_{IH}(\alpha\pm1)$ as well as the external operating costs $K_{AA}(\alpha)$ and $K_{AH}(\alpha\pm1)$ are calculated separately and are also stored separately in corresponding partial cost memories respectively;

(d) For every double car, the individual car optimal for serving is determined within the framework of its cost calculating cycle (KBZ) and marked in an individual car/call assignment memory, wherein immediately after the cost calculating algorithm (KBA), that call serving position $(\alpha,\alpha+1)$ or $(\alpha,\alpha-1)$ is found by means of a car assignment algorithm which is an optimum in the sense of a hierarchically sequenced chain of criteria for the respective scanner position α;

(e) The total servicing costs $K_g(\alpha)$, designate modified total servicing costs $K_{gm}(\alpha)$, are determined for every double car within the framework of its cost calculating cycle KBZ in every scanner position α for the optimal serving positions α, $\alpha+1/\alpha,\alpha-1$ according to step d and stored in a second total cost memory, wherein the standardized total operating costs $K_{gs}(\alpha)$ are modified immediately after the car assignment algorithm (DZA) by means of a cost modification algorithm (KMA), depending on whether the car assignment according to step d agrees with the standardized call serving position or not; and

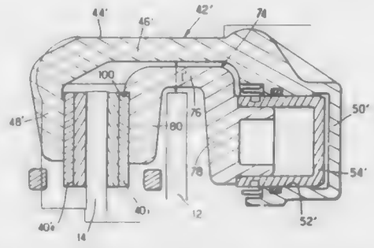
(f) The modified total operating costs $K_{gm}(\alpha)$ of all elevators are compared, within the framework of the cost comparison cycle (KVZ) including all elevators of the elevator group, in a comparator circuit for every scanner position α, and the double car with the lowest modified total operating costs $K_{gm}(\alpha)$ marked as "favored" for the serving of an eventual floor call at the scanner position and, if necessary, the car is immediately assigned.

4,993,519

BRAKE WITH TWO DISCS OF FIXED SPACING

Alain Thioux, Bry sur Marne, France, assignor to Bendix France, Drancy, France

Filed Oct. 17, 1989, Ser. No. 422,855
Claims priority, application France, Oct. 28, 1988, 88 14120
Int. Cl.[5] F16D *55/10*
U.S. Cl. 188—71.3 **10 Claims**



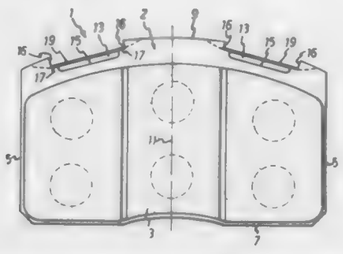
1. A disc brake for a motor vehicle, comprising a pair of rotary discs, respectively an inner and an outer, fastened one to the other and with a fixed spacing, two pairs of friction elements, an outer pair and an inner pair respectively intended for coming into frictional engagement with opposite faces of the two discs, outer and the inner respectively, and support and control members intended for laying the friction elements of the two pairs against their respective discs and for absorbing the resulting braking torque, the brake comprising a supporting yoke extending both inside of the inner disc, in a gap between the two discs, and outside of the outer disc, a first clamping caliper, called an inner caliper, interacting with the inner pair of friction elements, and a second clamping caliper, called an outer caliper, interacting with the outer pair of friction elements, the two calipers being mounted slidably in the supporting yoke, the inner caliper comprising a body in the form of an upturned U, a base of which straddles the inner disc and has an outer wing descending into the gap between the two discs and coming into contact with an external friction element of the pair of inner friction elements, and an inner wing descending on the inner side of the inner disc, forming a cylinder, receiving a piston in contact with an internal friction element of the pair of inner friction elements, and the outer caliper comprising a body in the form of an upturned U, a base of which straddles the two discs and has an outer wing descending outside of the outer disc and coming into contact with an outer friction element of the pair of external friction elements, and an inner wing descending inside of the inner disc, forming a cylinder receiving a piston, and the caliper having a spacer in the form of an upturned U, a base of which straddles the inner disc in a radial gap separating the periphery of the inner disc and the base of the caliper and having an inner wing descending on the inner side of the inner disc in order to come into contact with the piston, and an outer wing descending in the gap between the two discs in order to come into contact with the internal friction element of the pair of outer friction elements.

4,993,520

FRICTION PAD ASSEMBLIES

Christopher H. Goddard, Usk, and Richard E. Thompson, Monmouth, both of Great Britain, assignors to Lucas Industries public limited company, Birmingham, England

Filed Apr. 26, 1989, Ser. No. 343,213
Claims priority, application United Kingdom, Apr. 27, 1988, 8809966
Int. Cl.[5] F16D *65/40*
U.S. Cl. 188—73.38 **8 Claims**



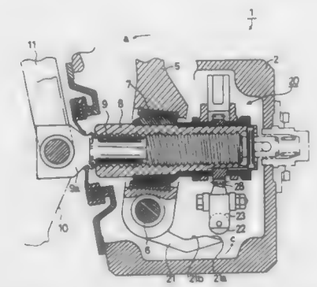
1. A friction pad assembly comprising a planar backing plate having a rear face and a front face to which a pad of friction material is secured, said backing plate having between said faces a pair of side edges, an inner edge and a radially outer edge defining the swept profile of said backing plate, said assembly being symmetrical with respect to a center line thereof, a pair of recesses in said radially outer edge of said backing plate, each being located symmetrically about said center line, each recess having a base, and a resilient spring located across each recess in the plane of said backing plate, said springs being at all times within the radially outer edge of said backing plate as well as being within the swept profile thereof, each recess having support means for end regions of each spring, said support means being constructed and arranged to support a spring above said base, each spring being deflectable towards said base and below said support means.

4,993,521

TREAD BRAKE UNIT

Yoshio Asano; Takeshi Kishimoto, and Mitugu Tunazawa, all of Kobe, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Aug. 17, 1989, Ser. No. 395,376
Claims priority, application Japan, Aug. 26, 1988, 63-112622[U]
Int. Cl.[5] F16D *65/56*
U.S. Cl. 188—203 **7 Claims**



1. A tread brake unit for a railway vehicle comprising:

(a) a cylinder;

(b) a piston operable in said cylinder between a brake release position and a brake application position;

(c) a brake shoe engageable with the tread of a wheel of said vehicle;

(d) a main lever connected to said piston at one end and pivotally connected at the other end to a first fulcrum pin;

(e) push rod means for transmitting movement of said piston to said brake shoe with mechanical advantage via said main lever; and

(f) compensating means for maintaining the stroke of said piston between said brake release and application positions constant comprising:

(i) said push rod means including:

(a) a sheath rod connected to said main lever at a location intermediate said one end and said other end of said main lever and having a threaded bore; and

(b) a push rod having screw-threaded engagement with said sheath rod via said threaded bore and being connected to said brake shoe, said brake shoe connection locking said push rod against rotation;

(ii) a toothed ratchet wheel fixed on the periphery of said sheath rod;

(iii) a lever arm projecting from said other end of said main lever so as to be rotatable therewith and having an operating surface;

(iv) a pawl engageable with said ratchet wheel teeth when the stroke of said piston exceeds a predetermined amount;

(v) spring means in which a source of energy is stored during said movement of said piston toward said brake application position for causing said pawl to effect rotation of said sheath rod in a direction to extend said push rod relative thereto during subsequent movement of said piston toward said brake release position;

(vi) means including a roller engageable with said operating surface of said lever arm for progressively increasing the stress of said spring means during said movement of said piston toward said application position to provide said source of stored energy; and

(vii) said operating surface of said lever arm having a backside sloped portion and a frontside sloped portion intersecting at an apex, said backside sloped portion traversing said roller in response to rotation of said main lever during said stroke of said piston toward said brake application position, the profile of said backside sloped portion being such as to effect said progressive increase of said stress of said spring means, said apex of said operating surface defining the limit of said backside sloped portion to thereby prevent said stress of said spring means from exceeding a maximum amount, said frontside sloped portion of said operating surface traversing said roller during said stroke of said piston toward said brake application position, the profile of said frontside sloped portion being such as to maintain said stress of said spring means at said maximum amount.

4,993,522

HYDRAULICALLY BLOCKABLE GAS SPRING

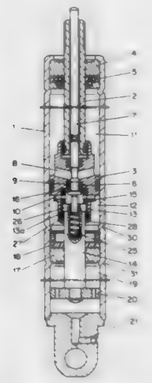
Udo Wagner, Dachsenhausen, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Jan. 23, 1990, Ser. No. 468,710
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902882
Int. Cl.[5] F16F *9/06, 9/46*
U.S. Cl. 188—269 **14 Claims**

1. A hydraulically blockable gas spring comprising a cylinder member (1) having an axis, a hydraulic fluid chamber (11,12) being confined within said cylinder member (1), said hydraulic fluid chamber (11,12) having a first end and a second end axially opposite each other, an axially extending first piston rod section (2) being sealingly guided through said first end

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of said hydraulic fluid chamber (11,12), said first piston rod section (2) being connected with a piston member (3) within said hydraulic fluid chamber (11,12), said first piston rod section (2) and said piston member (3) providing a piston rod-piston unit (2,3,14) axially movable with respect to said cylinder member (1), said piston member (3) defining two hydraulic fluid compartments (11,12) within said hydraulic fluid chamber (11,12), said hydraulic fluid compartments (11,12) being interconnectable by hydraulic fluid passage means (8,10), a valve unit (6) being allocated to said hydraulic fluid passage means (8,10) for selectively opening and closing said hydraulic fluid passage means (8,10), said valve unit (6) being actuatable by



external actuating means (7) from outside said hydraulic fluid chamber (11,12), said piston rod-piston unit (2,3,14) being subject to the biasing action of a volume of pressurized gas, said volume of pressurized gas being confined within a gas chamber (19) adjacent said second end of said hydraulic fluid chamber (11,12), said gas chamber (19) being separated from said hydraulic fluid chamber (11,12) by a separating wall (17),

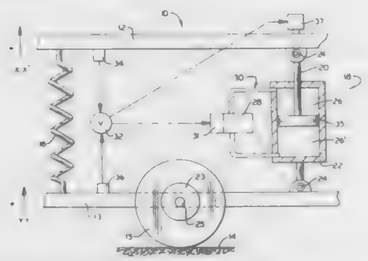
said separating wall (17) being axially fixed with respect to said cylinder member (1), said piston rod-piston unit (2,3,14) being provided with a second piston rod section (14) sealingly guided through said separating wall (17), said second piston rod section (14) being exposed to the pressure of pressurized gas within said gas chamber (19).

4,993,523

FLUID CIRCUIT FOR SEMIACTIVE DAMPER MEANS

Leonard J. Schwemmer, and Robert H. Marjoram, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Feb. 10, 1989, Ser. No. 310,062
Int. Cl.[5] F15F *9/34*
U.S. Cl. 188—299 11 Claims



1. Semiactive damper means, comprising:

an extendable and contractible hydraulic damper assembly having relatively movable piston and cylinder members defining first and second variable volume chambers containing hydraulic fluid, extension and contraction of said assembly causing a fluid pressure differential between said chambers;

fluid circuit means within said piston member, said fluid circuit means having a first operating condition, and a second operating condition, and interconnecting said chambers;

said fluid circuit means when in said first condition thereof permitting relatively free flow of said fluid from said first of said chambers to said second of said chambers during extension of said damper assembly, and permitting only relatively restricted flow of said fluid from said second of said chambers to said first of said chambers during contraction of said damper assembly;

said circuit means when in said second condition thereof permitting relatively free flow of said fluid from said second of said chambers to said first of said chambers during contraction of said damper assembly, and permitting only relatively restricted flow of said fluid from said first of said chambers to said second of said chambers during extension of said damper assembly;

said circuit means including a control valve member movable in translation between first and second mutually spaced valve seats, said circuit means being in said first condition thereof when said control valve is in engagement with said first of said valve seats and said circuit means being in said second condition thereof when said valve is in engagement with said second of said valve seats;

said control valve member being subjected during extension and contraction of said damper assembly to fluid pressure forces created by said fluid pressure differential, said fluid pressure forces urging said control valve member toward said first of said valve seats during contraction of said assembly and toward said second of said valve seats during extension of said assembly; and

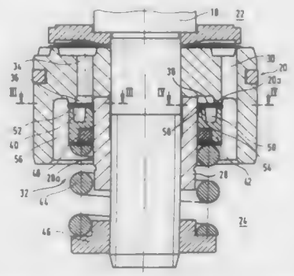
extrinsically powered valve drive means for imparting to said control valve member driving forces that are sufficient to move said control valve from one to the other of said valve seats when said fluid pressure forces are no greater than a preselected magnitude reached during operation of said damper assembly, and that are insufficient to move said control valve from one to the other of said valve seats when said fluid pressure forces are greater than said preselected magnitude.

4,993,524

DAMPING VALVE UNIT FOR A HYDRAULIC OSCILLATION DAMPER

Manfred Grundei, Niederwerrn, and Hans Reimer, Waigolshausen, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 22, 1989, Ser. No. 441,364
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1988, 3840302
Int. Cl.[5] F16F *9/348*
U.S. Cl. 188—322.22 8 Claims



1. A damping valve unit for a hydraulic oscillation damper,

said damping valve unit (32) comprising a basic constructional assembly (18,20,28), said basic constructional assembly (18,20,28) having an axis, a radially outer cylindrical face (28*a*) and an axially directed annular valve face (20*a*), said axially directed annular valve face (20*a*) surrounding said radially outer cylindrical face (28*a*) and being radially spaced from said radially outer cylindrical face (28*a*),

said damping valve unit (32) further comprising a first substantially planar valve disc (38) axially movable along said radially outer cylindrical face (28*a*) and having a radially inner circumferential edge (38*b*) adjacent said radially outer cylindrical face (28*a*), a radially outer circumferential edge (38*a*), a first side face (38*c*) engageable with said axially directed annular valve face (20*a*), and a second side face (38*d*) axially remote from said first side face (38*c*),

said damping valve unit (32) further comprising a second substantially planar valve disc (40), said second substantially planar valve disc (40) being axially movable along said radially outer cylindrical face (28*a*) and having a radially inner circumferential edge (40*b*) adjacent said radially outer cylindrical face (28*a*), a radially outer circumferential edge (40*a*), a first side face (40*c*) adjacent said second side face (38*d*) of said first valve disc (38) and a second side face (40*d*) axially remote from said first valve disc (38),

said damping valve unit (32) further comprising an annular valve member (42) axially slidable along said radially outer cylindrical face (28*a*), said annular valve member (42) having axially directed contact face means (52,54) engageable with said second side face (40*d*) of said second valve disc (40) and being axially biased towards said second side face (40*d*) of said second valve disc (40), such as to urge said second valve disc (40) towards said first valve disc (38) and said first valve disc (38) towards said axially directed annular valve face (20*a*),

a liquid distribution space means (36) being provided adjacent said first side face (38*c*) of said first valve disc (38) and radially inwards of said axially directed annular valve face (20*a*), said liquid distribution space means (36) being in liquid connection with a first working chamber (22) of said hydraulic oscillation damper, a liquid collection space means (56) being provided adjacent the radially outer edges (38*a*,40*a*) of said first and second valve disc (38,40), said liquid collection space means (56) being in liquid flow connection with a second working chamber (24) of said hydraulic oscillation damper, said first valve disc (38) being liftable from said axially directed annular valve face (20*a*) in response to a predetermined pressure difference between a higher liquid pressure within said first working chamber (22) and a lower liquid pressure within said second working chamber (24), such as to open a liquid flow passage between said first working chamber (22) and said second working chamber (24), a preliminary restricted liquid flow passage (60) existing between said liquid distribution space means (36) and said liquid collection space means (56) below said predetermined pressure difference, said preliminary liquid flow passage (60) extending in series across the radially inner circumferential edge (38*b*) of said first valve disc (38), through radially inner edge recesses (40*f*) of said radially inner circumferential edge (40*b*) of said second valve disc (40) and through radially outer edge recesses (40*h*) of said radially outer circumferential edge (40*a*) of said second valve disc (40),

said contact face means (52,54) of said annular valve member (42) comprising a radially inner annular axially directed contact face (54) engageable with said second side face (40*d*) of said second valve disc (40) adjacent the radially inner circumferential edge (40*b*) thereof and a radially outer annular axially directed contact face (52) engageable with said second side face (40*d*) of said second valve disc adjacent the radially outer circumferential edge (40*a*) thereof, an annular recess (50) being provided within said annular valve member (42) radially between said radially inner annular axially directed contact face (54) and said radially outer annular axially directed contact face (52),

said radially inner edge recesses (40*f*) of said radially inner circumferential edge (40*b*) of said second valve disc (40) extending radially outwards beyond said radially inner annular axially directed contact face, such as to open into said annular recess (50) of said annular valve member (42), said radially outer edge recesses (40*h*) of said radially outer circumferential edge (40*a*) of said second valve disc (40) extending radially inwards beyond said radially outer annular axially directed contact face (52) of said annular valve member (42), such as to open into said annular recess (50) of said annular valve member (42),

said radially inner edge recesses (40*f*) of said radially inner circumferential edge (40*b*) of said second valve disc (40) defining a first liquid flow resistance of said preliminary restricted liquid flow passage (60) between said distribution space means (36) and said annular recess (36), said radially outer edge recesses (40*h*) of said radially outer circumferential edge (40*a*) of said second valve disc (40) defining a second liquid flow resistance of said preliminary liquid flow passage (60) between said annular recess (50) and said collection space means (56), said first liquid flow resistance being larger than said second liquid flow resistance,

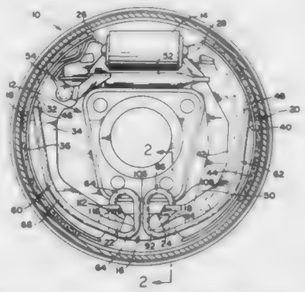
said radially inner edge recesses (40*f*) of said radially inner circumferential edge (40*b*) of said second valve disc (40) being circumferentially spaced from the radially outer edge recesses (40*h*) of said radially outer circumferential edge (40*a*) of said second valve disc (40), such as to establish circumferentially extending flow paths within said annular recess (50) between circumferentially subsequent radially inner and radially outer edge recesses (40*f*,40*h*).

4,993,525

DRUM BRAKE SHOE HOLD-DOWN AND RETRACTION SPRINGS AND ANCHOR POST THEREFOR

Robert W. Hyde, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1989, Ser. No. 411,448
Int. Cl.[5] F16D *51/26*
U.S. Cl. 188—328 3 Claims



1. For use in a drum brake assembly which has a brake shoe mounted on a backing plate for movement into braking relation with a brake drum when the drum brake assembly is actuated and for retracting movement to a released position when the drum brake assembly is released, and a brake shoe anchor mounted on the backing plate, the anchor having means for attachment of a brake shoe retraction and hold-down spring thereto:

a brake shoe retraction and hold-down spring having one end being adapted to be attached to said anchor and another end adapted to be attached to the brake shoe for exerting separate brake shoe retraction and hold-down forces thereon,

said spring being further having one part thereof adapted to having a torsional spring force stored therein and another

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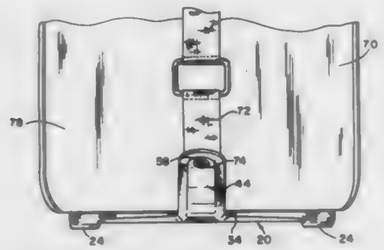
part thereof adapted to having a cantilever spring force stored therein when said spring is installed in the brake shoe assembly, said torsional spring force being the brake shoe hold-down force exerted on the brake shoe and said cantilever spring force being the brake shoe retraction force exerted on the brake shoe.

4,993,526

LUGGAGE-PROTECTIVE PAD INCLUDING INTEGRAL FEET AND BUMPER

David C. Morrison, Gallatin, Tenn., assignor to Lenox Incorporated, Lawreneeville, N.J.

Filed Dec. 15, 1988, Ser. No. 284,995
Int. Cl.[5] A45L *13/36*
U.S. Cl. 190—125 **14 Claims**



1. An article of luggage, comprising:

a base and sidewalls attached to the base, the base and sidewalls defining a receptacle with an inside and an outside, the sidewalls being disposed at an angle relative to the base, at least one of the base and the sidewalls being formed of a flexible material such that the article of luggage is subject to deformation by bending the sidewalls relative to the base;

a foot section having at least one pair of feet, the foot section being attached to the base, the feet being spaced apart and defining protrusions spacing the article of luggage from an underlying surface when the article of luggage is placed thereon;

a spacer section extending between the feet, the spacer section being connected to the feet; and,

a sidewall guard section connected to one of the sidewalls, and also connected to at least one of the feet and the spacer section, the feet, the spacer section and the sidewall guard section being integrally connected together by resilient wear resistant molded material which retains a predetermined shape, the molded material bridging across the spacer section and the feet and the sidewall guard section, to define a one-piece protective pad having a thickness sufficient to space adjacent portions of the article of luggage from a surface against which the article of luggage can be rested, said deformation of the sidewalls relative to the base being limited substantially exclusively by the protective pad;

whereby the article of luggage is resiliently protected at the base and the sidewalls.

4,993,527

METHOD OF DETERMINING AND CONTROLLING THE LOCK-UP OF A TORQUE CONVERTER IN AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

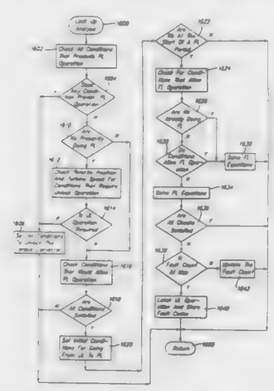
Howard L. Benford, Bloomfield Hills, and Francis M. Fodale, Southfield, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 188,603, Apr. 29, 1988, abandoned.
This application Jan. 23, 1990, Ser. No. 470,439
Int. Cl.[5] F16H *61/14, 45/02*
U.S. Cl. 192—0.076 **4 Claims**

1. In a vehicle having an engine and a throttle means and a transmission system, the transmission system including a transmission having an input member, an output member, a torque converter assembly for transmitting torque between the engine and the input member of the transmission, the torque converter assembly having a turbine connected to said input member, a gear assembly for changing the ratio of torque between the input member and output member, a frictional unit for coupling the turbine of the torque converter to the engine, a slave valve receiving fluid flow from a fluid source for directing fluid flow to the torque converter assembly and frictional unit and at least one solenoid-actuated valve being movable in response to the presence or absence of electrical power for directing fluid flow from the fluid source to the slave valve, the transmission system including a plurality of input sensors for providing signals indicative of measurement data for predetermined conditions including engine speed and turbine speed and a controller having memory for processing and storing the signas and predetermined valves and providing output signals, a method of controlling the difference between the rotational speed of the output member of the engine and the rotational speed of the torque converter turbine by varying the engagement force of the frictional unit, said method comprising the steps of:

checking a plurality of first predetermined conditions by the input sensors to determine whether the torque converter turbine can be partially frictionally coupled to the engine;

determining whether any of the checked plurality of first



predetermined conditions indicate that the torque converter turbine should not be partially frictionally coupled to the engine by comparing them to stored values for the first predetermined conditions in memory;

setting a plurality of second predetermined conditions to uncouple the torque converter turbine from the engine if any first predetermined condition indicate that the torque converter turbine should not be partially frictionally coupled to the engine;

setting predetermined initial conditions to control a duty cycle (DC) of the solenoid-actuated valve which allows and prevents fluid flow to the slave valve to allow or prevent fluid flow to a frictional unit which frictionally couples the torque converter turbine to the engine;

determining whether the method is at the start of a duty cycle (DC) period of the solenoid-actuated value for partially coupling the torque converter to the engine;

checking a plurality of third predetermined conditions by the input sensors that would allow the torque converter turbine to be fully frictionally coupled to the engine to eliminate the difference between speeds if the method is at the start of a duty cycle period of the solenoid-actuated valve for controlling the slave valve;

determining whether the checked plurality of third predetermined conditions allow the torque converter turbine to be fully frictionally coupled;

solving a first set of predetermined equations for the duty cycle (DC) of the solenoid-actuated valve for full frictional coupling of the torque converter turbine if determined that the torque converter turbine is allowed to be fully frictionally coupled;

solving a second set of predetermined equations for the duty cycle (DC) of the solenoid-actuated valve for partially frictionally coupling of the torque converter turbine if determined that the torque converter turbine is not allowed to be fully frictionally coupled; and

wherein said step of solving a second set of predetermined equations is in accordance with the equations:

$$DC = DC(i-1) + delta\ DC$$

$$delta\ DC = C\ delta\ DC(i-1) + K(Ea - A)$$

where

C=predetermined value for a lead/lag constant;

K=predetermined value for a gain constant;

E_a=anticipated slip error based on previous slip errors;

A=predetermined value for an anticipated error modification term; and

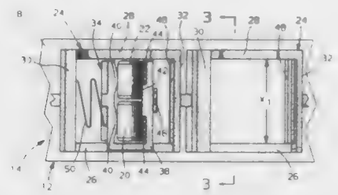
duty cycling the solenoid-actuated valve based on the valve for solved duty cycle.

4,993,528

MULTIPLE ROW ROLLER CLUTCH WITH ROLLER CONTROL CARS

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 4, 1990, Ser. No. 519,524
Int. Cl.[5] F16D *15/00, 41/06*
U.S. Cl. 192—45 **2 Claims**



1. An overrunning clutch of the type that is adapted to be installed between a cam race having a series of sloped cam ramps and a cylindrical pathway of a coaxial pathway race, said clutch comprising,

a series of pairs of cylindrical rollers, each pair respective to a cam ramp, one of which has a smaller diameter so as to advance ahead of the larger roller when each roller is maintained in a ready position in contact with both said pathway and its respective cam ramp during clutch operation,

a cage adapted to be non-turnably fixed to said cam race when said clutch is installed, said cage having a series of generally rectangular pockets, each of which is substantially square to said clutch axis and aligned with a respective cam ramp,

a series of generally rectangular roller control cars, each of which contains a pair of rollers and is in turn slidably contained within a respective cage pocket, each of said control cars also having a pair of rocker pads formed on its interior engageable with a respective roller near the center thereof, said control car further having enough interior clearance from said rollers and enough exterior clearance from said cage pocket to allow said rollers to pivot about said rocker pads as each roller attains its particular ready position, and,

a series of energizing springs, each compressed between a respective control car and cage pocket so as to continually urge said control car toward said rollers' ready positions and thereby maintain said rocker pads in continual contact with said rollers,

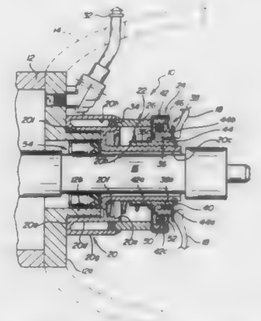
whereby, each roller is urged toward ready position by a share of the force of one of said springs during clutch operation.

4,993,529

CONCENTRICALLY MOUNTED HYDRAULIC CLUTCH ACTUATOR

Keith V. Leigh-Monstevens, Troy; David L. Wrobleski, Fraser, and Paul M. Regula, Sterling Heights, all of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation-in-part of Ser. No. 153,512, Feb. 18, 1988, which is a continuation of Ser. No. 921,762, Oct. 22, 1986, abandoned.
This application Jun. 15, 1988, Ser. No. 207,653
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] F16D *25/08, 23/14*
U.S. Cl. 192—85 CA **14 Claims**



1. A hydraulic actuator for use with a clutch housing and a transmission input shaft mounted for rotation within the clutch housing, said actuator including:

(A) a housing structure adapted to be positioned within the clutch housing concentrically around the transmission input shaft and defining a rearward mounting section, an annular quill shaft extending forwardly with respect to said rearward mounting section in concentrically surrounding relation to the input shaft, and annular inner and outer piston wall sections extending forwardly with respect to said mounting section and defining an annular piston bore between the inner annular surface of said outer piston wall section and the outer annular surface of said inner piston wall section having an open forward end, said inner piston wall section having an inner annular surface having a diameter greater than the diameter of the outer annular surface of said quill shaft by a predetermined radial distance;

(B) an annular piston having its rear end positioned in said piston bore and extending at its forward end out of said piston bore; and

(C) a bearing assembly including a bearing carrier slidably mounted on said quill shaft, said bearing carrier having a radial thickness at its rear end less than said predetermined radial distance so that said carrier may assume an axially overlapping relation to said annular piston.

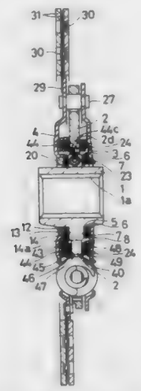
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4,993,530

CLUTCH DISK ASSEMBLY WITH CONTINUOUSLY VARIABLE HYSTERESIS

Naoyuki Maki, Hazu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 250,747, Sep. 29, 1988, Pat. No. 4,903,813. This application Sep. 28, 1989, Ser. No. 413,742
Claims priority, application Japan, Sep. 29, 1988, 63-244761
Int. Cl.[5] F16D *3/14*
U.S. Cl. 192—106.2 **8 Claims**



1. A clutch disk assembly comprising:
a hub member having means for connection with an output shaft for rotation about an axis;
a disk member coaxially and rotatably mounted to said hub member and connected to an input shaft;
a hysteresis mechanism operably connected between said hub member and said disk member for establishing a hysteresis torque therebetween, said hysteresis mechanism including a plate member, a spring member and a friction lining member, said plate member provided with a recess of constant axial length in which said spring member is positioned so as to be normally out of contact with said plate member, said plate member connected to said hub member;
first and second projections formed on said plate member and said spring member, respectively, and being engageable during a range of relative angular displacement between said plate member and said spring member for generating a continuously variable hysteresis torque; and
connecting means connecting said plate member to said disk member in a manner preventing relative radial movement therebetween.

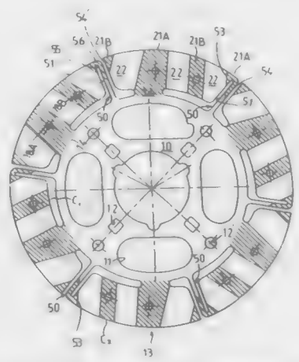
4,993,531

FRICTION PAD CARRIER DISC, IN PARTICULAR FOR AN AUTOMOTIVE VEHICLE CLUTCH

Giso Villata, Buttigliera D'Asti, Italy, assignor to Valeo, Paris, France

Filed Nov. 28, 1989, Ser. No. 442,310
Claims priority, application France, Nov. 29, 1988, 88 15562
Int. Cl.[5] F16D *13/60*
U.S. Cl. 192—107 C **7 Claims**

1. A friction pad carrier disc for a disc-type clutch for automotive vehicles, comprising a circumferentially generally continuous central portion, a peripheral portion comprising a series of radial blades surrounding the central portion, and a plurality of radial blade feet each joining a respective said blade individually to said central portion with the blade being cantilevered from its blade foot to define two circumferentially extending blade portions of unequal length extending on opposite sides of the blade foot, each blade having a plurality of transverse shoulders defining thereon a plurality of pad carrying zones alternating with junction zones, the carrying zones being generally parallel to the mean plane of said central portion and the junction zones being generally offset obliquely with respect to said plane, with an endmost said shoulder of each blade intersecting the longer one of its said blade portions,



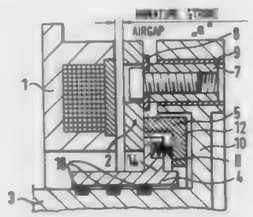
wherein, for an outer circumference of the blades corresponding to a given diameter, a terminal zone of each said longer blade portion is intersected by said endmost shoulder of the blade, the disc further comprising a plurality of reinforcing feet, each joining a respective said terminal zone to said central portion.

4,993,532

AUTOMATIC READJUSTING ASSEMBLY FOR AN ELECTROMAGNETIC CLUTCH OR BRAKE APPARATUS

Harald Weiss, Kaufbeuren; Winfried Höfler, Krumbach; Karl Schilling, Auerberg, and Günter Klinger, Oberostendorf, all of Fed. Rep. of Germany, assignors to Chr. Mayr. GmbH & Co. KG, Mauerstetten, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 450,839
Claims priority, application European Pat. Off., Dec. 14, 1988, 88120922
Int. Cl.[5] F16D *13/75, 27/14, 65/54*
U.S. Cl. 192—111 A **11 Claims**



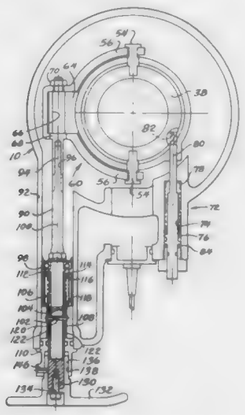
1. An apparatus for adjusting an air gap in at least one of a clutch and a brake mechanism, comprising:
a rotatable shaft;
a contact plate for axial movement relative to said shaft;
means for mounting said contact plate to said shaft such that said contact plate is axially movable in the axial direction of and relative to said shaft yet substantially rotationally rigid with respect to said shaft;
contact means for attracting said contact plate and contacting said contact plate in a first position thereof for providing at least one of a braking and a clutching action with said shaft;
adjustment means, having a biasing means for biasing said contact plate toward a second position away from said contact means, for automatically compensating for wear between said contact means and said contact plate in order to maintain a constant air gap between said contact plate and said contact means when said contact plate is in said second position away from said contact means, said adjustment means including an adjustment member in frictional engagement with said shaft;
wherein said means for mounting said contact plate to said shaft comprises a radial flange connected to said shaft and a plurality of bolt assemblies connected to said contact plate and axially slidably yet substantially rotationally rigidly mounted to said radial flange.

4,993,533

MANUAL CONNECT-DISCONNECT OPERATOR

Neil L. Brown, Stillman Valley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 10, 1989, Ser. No. 418,494
Int. Cl.[5] F16D *23/12, 11/10*
U.S. Cl. 192—114 R **14 Claims**



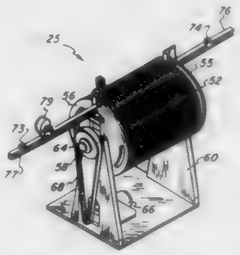
7. A manual connect-disconnect operator for a power transmission path comprising:
a coupling member;
a translatable carrier journalling said coupling member for rotation about an axis and mounting said coupling member for axial movement along said axis between connect and disconnect positions;
a lever mounted on a pivot and connected to said carrier for translating the carrier to move the coupling member upon pivotal movement thereof;
a support shaft mounted for movement along its axis and including an operating section; and
a reciprocating motion to rotary motion converting mechanism interconnecting said support shaft and said lever;
whereby when said support shaft is moved along its axis by said operating section, said lever will pivot to move said carrier between said positions.

4,993,534

METHOD AND APPARATUS FOR RELIABLE INTEGRATED CIRCUIT PACKAGE CONSTRUCTION

Anthony L. Adams, Wylie, and John G. Stewart, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 85,296, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 755,233, Jul. 15, 1985, abandoned. This application Nov. 2, 1988, Ser. No. 267,743
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—347.3 **22 Claims**



1. Apparatus for conveying and staring integrated circuit devices, comprising:
a first work station for producing a stream of devices, and a second work station for receiving the stream of devices;
a drum buffer, axially in-line with said first and second work stations, for conveying the stream of devices between said first and second work stations and for storing and outputting individual devices on a substantially last-in first-out basis, said drum buffer having a plurality of device conveying and storing channels, having device conveying means integrally formed with said channels for driving the devices along said channels, formed axially along the length of said drum, wherein the channels include means for retaining the devices within the channels, and wherein each channel can store more than one of the individual devices;
means for sensing the presence of devices at the input of said drum from said first work station;
means for determining whether space is available in said drum to receive the devices;
means for rotatably indexing said drum if no space is determined to be available to provide available space to receive the sensed devices;
an input escapement for allowing the sensed devices to be conducted into said drum;
and means for transferring the sensed devices into said drum.

4,993,535

BIDIRECTIONAL TRAVELLING DEVICE FOR THE SIDE-SORTING OF ARTICLES IN FLEXIBLE PATH TRANSPORTING SYSTEMS

Mario Scata, Teramo, Italy, assignor to Meccanizzazione Postale E Automazione SpA, Piane di Sant'Atto, Italy

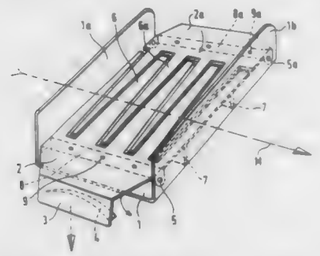
Filed Dec. 11, 1989, Ser. No. 448,273
Claims priority, application Italy, Dec. 22, 1988, 22322 B/88
Int. Cl.[5] B65G *47/46*
U.S. Cl. 198—365 **4 Claims**

1. A bidirectional travelling device for the side-sorting of articles in a flexible path transporting system, comprising:
at least one support fastened to a guided tow element of the system, each support being made of a channel iron having two side boards, the channel iron being disposed transversely with respect to the flexible path;
a swiveling member disposed on each support, on which the article to be sorted is loaded, the swiveling member comprising two complementary, fork-shaped elements facing and interpenetrating one another and pivoting on the side boards, whereby the elements are in a horizontal, stable

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equilibrium position due to gravity to define a plane supporting the article; and

means for actuating and resetting the swiveling member, for rotating and raising the respective fork-shaped elements, causing downward discharge of the article transverse to the flexible path transporting system, the fork-shaped element thereafter returning to the equilibrium position due to gravity, whereby the swiveling member is reset.



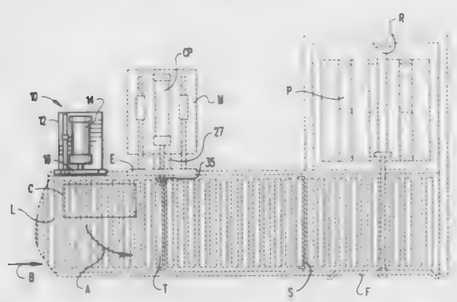
2. The bidirectional traveling device of claim 1, wherein each of the fork-shaped elements have bent ends which oppose one another and the means for actuating and resetting the swiveling member comprising two actuators provided at discharge points located on the flexible path transporting system and two cam elements, respectively fastened at the bent ends of the fork-shaped elements, the actuators, when activated, engage the respective cams and thereby rotate the fork-shaped elements and side-sort the article.

4,993,536

CASE TURNING ASSIST ATTACHMENT FOR A PALLETIZING MACHINE

Michael J. Bell, 5028 Royalton Center Rd., Gasport, N.Y. 14067

Filed Dec. 12, 1989, Ser. No. 448,975
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—374 **1 Claim**



1. In a palletizing machine having a linear live roller conveyor for conveying cases, a case turner including a double acting air piston cylinder assembly, an air supply including a first and second conduits connected to opposite ends of said double acting air piston cylinder assembly, an electrical valve for alternatively connecting said air supply to said first conduit to actuate said case turner and to said second conduit to deactuate said case turner, the improvement comprising:

a case turning assist attachment disposed upstream said live roller conveyer from said case turner, said case turning assist attachment including a push member operably connected to an actuating piston cylinder assembly and an actuating switch for activating said actuating piston cylinder assembly, said push member and actuating switch disposed at spaced locations along said live roller conveyer whereby contact of a forward end of a case with said actuating switch causes said push member to engage a rearward end of the case;

said actuating switch including an air valve and an abutment member for actuating said air valve upon contact with a case; and

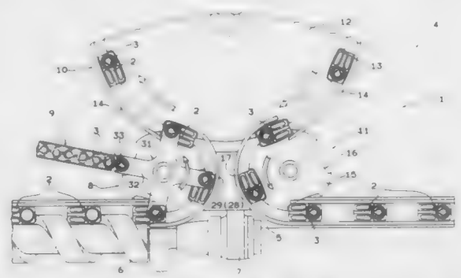
said air valve connected in said first conduit to said air supply between said electrical valve and said double acting air piston cylinder assembly, such that air is only supplied to said air valve when said case turner is actuated.

4,993,537

APPARATUS FOR CORRECTLY POSITIONING DISPENSERS TO BE APPLIED TO CONTAINERS

Ivo Bianchini; Carlo Corniani, both of Marmirolo, and Claudio Sogliani, Cerese Di Virgilio, all of Italy, assignors to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed May 17, 1990, Ser. No. 524,535
Claims priority, application Italy, May 25, 1989, 3487 A/89
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—395 **8 Claims**



1. Apparatus for correctly positioning dispensers to be applied to containers which comprises first feeder means for containers intended to receive respective dispensers, first conveyor means adapted to receive said containers from said first feeder means, second conveyor means adapted to receive said dispensers in succession, second feeder means adapted to feed said dispensers in succession to said second conveyor means, and third conveyor means for receiving said containers and said dispensers respectively from said first conveyor means and said second conveyor means, wherein said second conveyor means comprise a conveyor provided with a plurality of housings adapted to receive respective dispensers and to support them rotatably about their respective axes, there being provided a fixed abutment element arranged adjacent to said conveyor and adapted to interfere with at least part of the peripheral surface of said dispensers to cause a rotation of said dispensers about their respective axes during their movement by virture of said conveyor, means for sensing the position assumed by a given portion of each of said dispensers during its rotation about it own axis, and retention means supported by said conveyor for locking each of said dispensers within the related housing upon said sensing means detecting the attainment of a given position by said given portion of each of said dispensers.

4,993,538

APPARATUS FOR CLEANING OVERHEAD CONVEYOR TROLLEYS

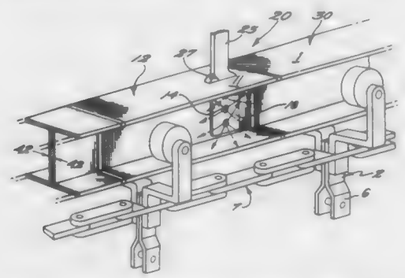
Fritz Norbury, 1344 Country Squire Dr., Columbia, S.C. 29212

Filed Feb. 20, 1990, Ser. No. 481,598
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—495 **12 Claims**

1. An apparatus for cleaning a trolley wheel of a trolley of an overhead conveyor system, wherein said apparatus effects

cleaning without disruption of the operation of the overhead conveyor system in an essentially continuous manner, wherein said apparatus effects cleaning to a level of sufficiency, thoroughness and safety as to be utilizable in animal butchering operations, and wherein said apparatus effects cleaning with minimal requirements for in service maintenance, said apparatus comprising:

an I beam shaped girder consisting of a vertical structural component, an upper horizontal structural component and a lower horizontal structural component, wherein the girder has overall vertical and horizontal proportions comparable in size and form to the guide rail and when adopted to the overhead conveyor tracks coextensive with the guide rail, wherein the girder has a nozzle mounted essentially in a plane defined by a lateral face of the vertical structural component between the upper horizontal structural component and the lower horizontal structural component such that a pressurized fluid emanating from the nozzle sprays through a spatial region that will impact an area on a trolley wheel passing by the nozzle; wherein the girder has a network of fluid communicating channels, which are within the structural components of the girder, where said network of fluid communicating channels supplies a pressurized fluid to the nozzle, where the network generally consists of a main channel originating on the topside of the upper horizontal structural component and passes downward through the vertical structural component into a cavity where a lateral wall of the cavity is essentially in the plane defined by the lateral face of the vertical structural component between the upper horizontal structural component and the lower horizontal structural component, wherein said cavity forms the distribution channel which supplies the nozzle, where the fluid communicating channels are supplied externally with a fluid which has been pressurized to a level such that, upon impacting the trolley wheel, the fluid has excellent cleaning properties.



4,993,539

SCREW FEEDING DEVICES

Edward C. Duce, West Yorkshire, England, assignor to Stockrail International Limited, West Yorkshire, England

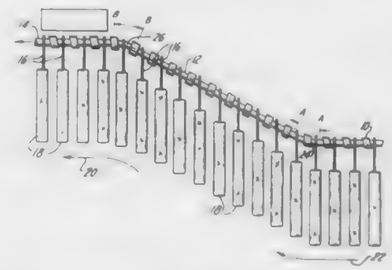
Filed Sep. 18, 1989, Ser. No. 389,229
Claims priority, application United Kingdom, Oct. 20, 1988, 8824562
Int. Cl.[5] B65G *33/26*
U.S. Cl. 198—659 **6 Claims**

1. A feed screw device for transporting articles, said device comprising:

(a) a hollow rod of a rigid plastic material, said rod including an outer periphery;

(b) a raised helical land along the outer periphery of the hollow rod;

(c) a helical groove which is defined between the land and from which articles may be suspended; and



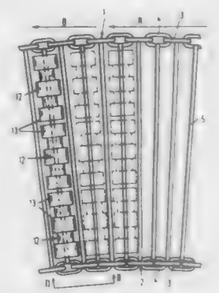
(d) a continuous helical slot which opens into the bore of the rod and imparts to said rod a degree of resilience sufficient for it to form a curve of a required shape.

4,993,540

LOW BACK PRESSURE CONVEYOR

Pieter van Capelleveen, Driebergen-Rijsenburg, Netherlands, assignor to Gebr. Van Capelleveen B.V., Utrecht, Netherlands

Continuation of Ser. No. 263,986, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 28,860, Mar. 23, 1987, abandoned. This application Dec. 21, 1989, Ser. No. 455,905
Claims priority, application Netherlands, Mar. 21, 1986, 8600734
Int. Cl.[5] B65G *17/00*
U.S. Cl. 198—779 **5 Claims**

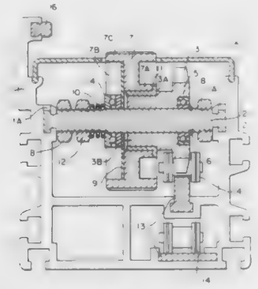


1. A low back pressure chain conveyor comprising: two endless side chains each constructed of a series of interengaging links, longitudinally adjacent links in each side chain lying in planes which are substantially perpendicular to each other, said links allowing a temporary shortening of one side chain relative to the other side chain by temporarily sliding one into another in series along the respective side chain for traversing lateral bends;

through bars extending transversely between the chains, each said through bar having opposite ends connected to corresponding links of respective ones of said side chains; and

a plurality of rollers mounted on each of alternate ones of said through bars for free rotation relative to the respective bar and, on each bar, relative to one another, so that as the conveyor executes a lateral bend having an inside and an outside, at least one said roller on each bar and located nearer said outside of said lateral bend can rotate faster than at least one other said roller on each bar and located nearer said inside of said lateral bend.

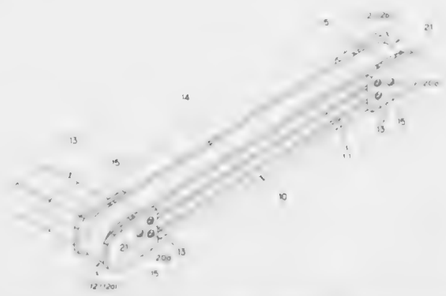
4,993,541
TRIPLE CONVEYOR
Jae Y. Roh, 493 Shinpwong-Dong, Saha-Ku, Pusan, Rep. of Korea
Filed May 16, 1989, Ser. No. 352,255
Int. Cl.[5] B65G *13/07*
U.S. Cl. 198—781 3 Claims



1. A triple conveyor comprising:
a housing member,
a main shaft member mounted in said housing member,
a chain gear extending from a chain shaft, said chain shaft being coaxially mounted on said main shaft member, said chain shaft being provided with a raised bushing,
a roller member coaxially mounted on said chain shaft through an inter-position of said raised bushing, said roller member combining three roller members,
a plate washer coaxially mounted on said main shaft member and extending along a lateral side of said coaxial roller member,
bearing housing coaxially mounted on said main shaft member adjacent said plate washer, said bearing housing containing bearings disposed therein for slidably attaching to said plate washer inserted into a hollow portion of said roller member,
spring means coaxially mounted on said main shaft adjacent said bearing housing,
a plurality of pallets supported by said three roller members, said pallets carrying a product thereon to be transported along said conveyor,
an adjusting nut mounted on said main shaft for adjusting the resiliency of said spring means, and
a fixing nut mounted to said main shaft member next to said adjusting nut, whereby, when a chain connected to the chain gear moves forward along a guide rail by a driving force from a motor, the chain gear and the roller member rotate simultaneously and the pallet carrying a product thereon is moved forward in the downstream direction of a conveyor line so that the conveyor can transport the product quickly and accurately, and reduce ncise and vibration of the conveyor since the roller member is slidably attached to the chain shaft through said raised bushing and said bearing housing slidably confronts the plate washer.

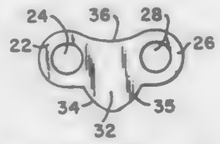
4,993,542
BELT CONVEYOR
Ryouichi Nomura, Toyama, Japan, assignor to NIC Autotec Company, Limited, Toyama, Japan
Filed Mar. 30, 1990, Ser. No. 501,855
Int. Cl.[5] B65G *23/44*
U.S. Cl. 198—816 11 Claims

1. A belt conveyor, comprising:
an elongated main frame having a pair of longitudinal end surfaces, and upper and lower surfaces, each of said upper and lower surfaces being provided with a pair of slots extending longitudinally at least near each of said longitudinal ends;
a housing provided at each longitudinal end of said main frame;
a pulley received in each of said housings so as to be rotatable about an axial line substantially perpendicular to a longitudinal line of said main frame;
an endless belt passed around said pulleys and extending along said upper and lower surfaces of said main frame; and



a motor coupled with one of said pulleys to move said endless belt along said upper and lower surfaces of said main frame and around said pulleys;
each of said housings consisting of a pair of housing blocks each having means for rotatably supporting said pulleys and a pair of L-shaped pawls which are adapted to be received by said slots.

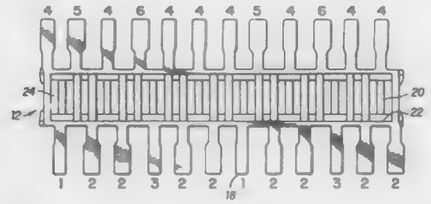
4,993,543
LINK CHAIN BELT
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Continuation of Ser. No. 228,154, Jan. 23, 1981, abandoned, Continuation of Ser. No. 13,165, Feb. 21, 1979, abandoned, Continuation-in-part of Ser. No. 801,904, May 31, 1977, abandoned. This application Apr. 14, 1983, Ser. No. 483,210
Int. Cl.[5] B65G *23/06*
U.S. Cl. 198—834 31 Claims



1. A linked belt and sprocket assembly comprising:
a plurality of identical linked modules, each having a plurality of links of the same length and width and sufficiently rigid to resist bending in the plane of an associated sprocket wheel, each module having a first plurality of link ends of substantially identical width, and a second plurality of link ends of substantially identical width, each link end circumscribing a pivotal hole, said holes of said first plurality being arranged coaxially along a first pivotal axis, said holes of said second plurality being arranged coaxially along a second pivotal axis parallel to said first axis;
said link ends having no driving engagement with an associated sprocket wheel;
each of said modules having at least one driving tooth integral with and protruding therefrom substantially normal to the pitch line between said pivotal axes and intermediate the latter;
said tooth having a pair of working surfaces, each of the working surfaces having a shape in the range between and including that of a cylindrical segment and a chord of said segment;

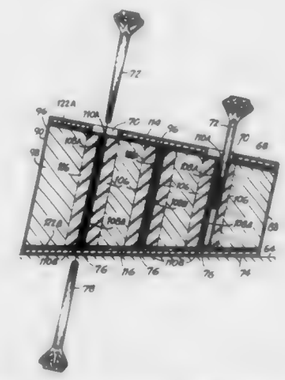
the axis of each working surface being parallel with the pivotal axes of the link and positioned intermediate the pivotal axes or coincident with the pivotal axis furthest from that surface;
the pair of working surfaces being part of a pair of intersecting loci;
the shape of each of the working surfaces being such that the tangent angle of each such surface is not more than 90°;
one of said pluralities of link ends of each said module being engaged between one of said pluralities of link ends of an adjacent module except for the individual link ends positioned at the extreme sides of said belt;
means extending through said holes pivotally connecting said modules at engaged link ends;
a toothed sprocket wheel having recesses between adjacent teeth thereof, each of said recesses including a pair of facing surfaces of shape corresponding to the pair of working surfaces of said driving tooth; and
only the teeth of said connected links being in driving engagement with the recesses of said sprocket wheel, the engaged linked belt and sprocket wheel exhibiting minimal scrubbing action and chordal action.

4,993,544
PLASTIC MODULAR CONVEYOR BELTS AND MODULES THEREFOR
Peter K. Bailey, Easton, and Michael L. Spangler, Cambridge, both of Md., assignors to Cambridge Wire Cloth Company, Cambridge, Md.
Continuation of Ser. No. 296,792, Jan. 13, 1989, Pat. No. 4,893,710. This application Sep. 26, 1989, Ser. No. 412,451
The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.
Int. Cl.[5] B65G *23/06*
U.S. Cl. 198—834 1 Claim



1. A conveyor belt module for the interior of a conveyor belt constructed of a plurality of modules having interfitting link ends connected by pivot rods, the module having a plurality of spaced link ends on both sides thereof; intermediate members connecting the link ends, transverse members connecting the intermediate members, wherein the transverse members and some of the intermediate members form sprocket holes to allow the belt to be driven by a sprocket wheel, wherein some of the link ends are of unequal width so as to provide at least a plurality of narrow link ends and at least a plurality of wide link ends on each side thereof, arranged to allow said conveyor belt module to be assembled with other modules of the belt in a brick-laying pattern while preventing assemblage of the conveyor belt with an interior module of the belt in an orientation reversed from that of other interior modules in the belt, each link end being connected to an intermediate member by a shank portion that is narrower than its corresponding link end and a plurality of the narrow link ends being offset of their respective shank portions in a direction toward intermediate members adjacent the offset link ends.

4,993,545
UNITARY ANGLED RING DISPLAY SYSTEM
Robert J. Feiler, c/o Morel Jewel Displays, Inc., 517 W. 29th St., New York, N.Y. 10001
Continuation-in-part of Ser. No. 241,890, Sep. 8, 1988, Pat. No. 4,917,235, which is a continuation-in-part of Ser. No. 231,359, Aug. 12, 1988, Pat. No. 4,913,289. This application Sep. 27, 1989, Ser. No. 413,092
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] B65D *6/04*
U.S. Cl. 206—6.1 30 Claims



1. A display system for showing rings on a generally horizontal shelf surface of a showcase, including, in combination,
a support structure,
said support structure including a first flat surface having a first plurality of ring slots for mounting a first plurality of the rings and a second flat surface having a second plurality of ring slots for mounting a second plurality of the rings,
said support structure being movable between first and second display positions, said first display position being when said first flat surface is oriented facing upward for viewing and said second flat surface is oriented facing downward, and said second display position being when said second flat surface is oriented facing upward for viewing and said first flat surface is oriented facing downward,
wherein in said first display position said second flat surface is positioned on the generally horizontal shelf surface and said first flat surface is aligned with a first flat plane which defines a first angle with the generally horizontal shelf surface,
and wherein in said second display position said first flat surface is positioned on the generally horizontal shelf surface and said second flat surface is aligned with a second flat plane which defines a second angle with the generally horizontal shelf surface.

4,993,546
SELF DRAINING SOAP DISH
Stanley R. Southard, 5244 Brynwood Dr., Columbus, Ohio 43110
Filed Mar. 26, 1990, Ser. No. 500,536
Int. Cl.[5] A47K *5/02*
U.S. Cl. 206—77.1 1 Claim

1. A self draining soap dish comprising,
a floor web, the floor web including a planar rear wall mounted orthogonally and upwardly relative to rear edge of the floor web, and
the dish further including a right and left side wall wherein the right and left side walls are arranged parallel to one

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another and orthogonally mounted to the rear wall at rear terminal ends of each respective side wall, and

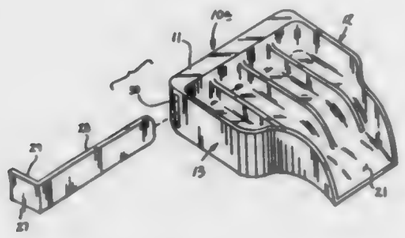
the right and left side walls including respective right and left forward ends wherein the right and left forwards ends extend beyond the floor web, and

wherein the right and left side walls are of a generally "S" shaped configuration and the floor web includes a planar bottom surface underlying an inclined top surface, the inclined top surface angulated downwardly towards the right and left forward ends of the respective right and left side walls, and

wherein the right and left side walls define a trough extending beyond and below the planar bottom surface of the floor web, and

wherein the trough includes a planar trough floor wherein the planar trough floor defines an obtuse included angle between the planar trough floor and the planar bottom surface of the floor web, and

wherein the right side wall includes a right planar rear portion and the left side wall includes a left planar rear portion wherein the right and left rear portions are arranged parallel to one another and are coextensive with the floor web, and the left and right side walls further including a respective right and left concave medial portion wherein the concave medial portions are spaced interiorly of the respective right and left side walls, and the concave right



and left medial portions extend forwardly and downwardly relative to the floor web including right and left forward portions, the right and left forward portions include the planar trough floor fixedly mounted therebetween, and

wherein the inclined top surface of the floor web includes a series of ribs, the ribs arranged parallel to one another and spaced apart a predetermined spacing, and

wherein the trough floor extends forwardly and below the planar bottom surface of the floor web terminating in a trough forward edge, the trough forward edge arranged parallel to and below the planar rear wall, and

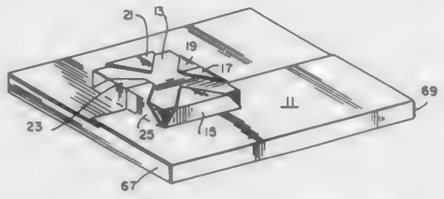
wherein the planar rear wall includes an elongate sleeve longitudinally arranged and positioned within the planar rear wall, the sleeve defined by a predetermined length, and further including a cleaning tool, the cleaning tool including a first rigid leg wherein the first rigid leg is defined by a width substantially equal to the predetermined spacing and is defined by a length equal to the predetermined length of the sleeve, and the cleaning tool includes a second leg defining a handle orthogonally mounted to an upper terminal end of the first leg, and the sleeve receives the first leg complimentarily therewithin and selectively permits removal of the cleaning tool to permit directing of a lower terminal end of the first leg between the ribs to permit cleaning therebetween.

4,993,547

STACKABLE PIGGY-BACK CARTON FOR BASKETBALL BACKBOARD AND RIM

James Pallasch, Wheaton, and Robert Floresch, Sycamore, both of Ill., assignors to Porter Athletic Equipment Company, Schiller Park, Ill.

Filed Dec. 5, 1989, Ser. No. 446,448
Int. Cl.[5] B65D 85/20
U.S. Cl. 206—315.1 25 Claims



1. A packaging carton blank for a basketball backboard and rim comprising:

a flat rectangular shaped carton blank having two parallel long sides and two parallel short sides large enough to be completely folded about the basketball backboard;

two substantially Y-shaped score lines, having a base portion starting at a pair of parallel sides and extending inwardly of the blank and a V portion whose open ends face each other across the blank and are each spaced equidistant one from the other two parallel sides of the blank;

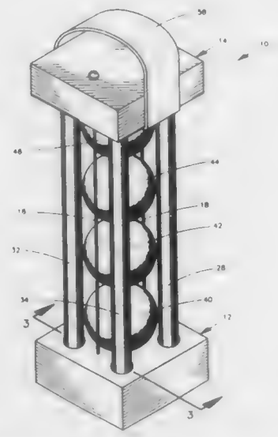
wherein said Y-shaped scores provide tab means which can be folded 90° outwardly from a plane of the blank to provide for at least one of length and width securement of a basketball rim package on the blank.

4,993,548

CARRYING CASE

Vernon L. Peterson, P.O. Box 1096, Bismarck, N. Dak. 58502

Filed Jun. 8, 1990, Ser. No. 535,748
Int. Cl.[5] B65D 61/00
U.S. Cl. 206—315.1 5 Claims



1. In combination,

a base member having an upper surface and a lower surface, said base member having a centrally-disposed cavity formed therein extending downwardly thereinto for partially receiving the underside of a ball,

said base member having at least four spaced-apart stake openings formed therein extending downwardly thereinto from the upper surface thereof,

a plurality of elongated stakes having upper and lower ends, the lower end of each of said stakes being received by one of said stake openings,

a top member positioned above said base member and having an upper surface and a lower surface, said lower surface of said top member having a plurality of spaced-apart stake openings formed therein which receive the upper ends of said stakes,

a lower ball member positioned in the cavity on said base member between said stakes,

a plurality of vertically disposed balls positioned on said lower ball member between said stakes with said stakes maintaining said vertically disposed condition of said balls,

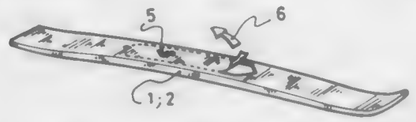
and a plurality of elongated elastic members secured to and extending between said base member and said top member for normally urging said base member and said top member towards one another to maintain said stakes in engagement with said stake openings in said base and top members.

4,993,549

PACKAGING AND PROCESS OF PACKAGING A SKI

Jean-Luc Diard, Annecy, and Yves Gagneux, Annecy le Vieux, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Nov. 28, 1988, Ser. No. 276,459
Claims priority, application France, Dec. 4, 1987, 87 17255
Int. Cl.[5] B65D 75/58
U.S. Cl. 206—315.1 14 Claims



1. A packaged ski comprising:

(a) a ski having at least one area at which at least one binding element is adapted to be affixed; and

(b) an envelope of thermo-shrinkable material surrounding said ski, said envelope having at least one zone which corresponds to said at least one area of said ski at which said at least one binding element is adapted to be affixed, wherein said at least one zone is defined by at least one tear line.

14. A packaging for a ski, comprising

(a) a closed envelope, made of thermo-shrunk plastic material protecting and surrounding the ski, and wherein said envelope comprises at least one zone defined by a tear line corresponding to the location for the mounting of bindings upon the ski;

(b) a protective plate extending beyond at least one of said at least one zone, positioned between the ski and said envelope, and wherein said protective plate comprises indicators corresponding to locations where holes for the mounting of the bindings are to be formed.

4,993,550

PACKING SMALL MESH PIECES

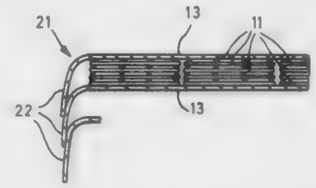
Frank B. Mercer, Blackburn; Brian Orr, Preston, and Keith F. Martin, Blackburn, all of Great Britain, assignors to Nelton Limited, Blackburn, Great Britain

Filed Feb. 1, 1989, Ser. No. 304,614
Claims priority, application United Kingdom, Nov. 3, 1988, 8825773
Int. Cl.[5] B65D 85/46
U.S. Cl. 206—321 5 Claims

1. A package of multiplicity of small, light weight mesh pieces having high flexural recovery, which are to be used for strengthening a matrix, the package comprising:

a length of flexible wrapping material which is wide enough to receive a number of the mesh pieces distributed across its width, the wrapping material being rolled up in a generally spiral configuration; and

successive, substantially flat, substantially uncreased mesh pieces retained between successive turns of the wrapping material and distributed both across the width of the



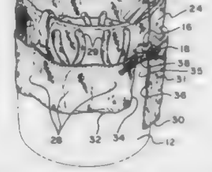
wrapping material and longitudinally of the wrapping material, substantially each mesh piece longitudinally overlapping another mesh piece and being longitudinally overlapped by a further mesh piece, the edge portions of the wrapping material extending beyond those pieces which are nearest the edges, and the edge portions of substantially every turn of the wrapping material being bent towards the axis of the package and providing retention of the mesh pieces along the edges of the package.

4,993,551

TOOL HOLDER FOR BUCKET

Brian K. Lindsay, Box 267K, Braddock Ave., Hammonton, N.J. 08037

Filed Aug. 18, 1989, Ser. No. 395,815
Int. Cl.[5] B65D 85/20, 30/22
U.S. Cl. 206—373 24 Claims



1. A tool holder device to interfit over a bucket comprising an upper rim, an inside surface, an outside surface, a top opening and a carrying handle extending across the top opening and attaching at two areas on the outside surface of the bucket, the device to drape downwardly over the upper rim and conform to the surfaces of the inside of the bucket and of the outside of the bucket, the device comprising:

(a) a tubular panel of drapable sheet material comprising:

(i) a circumference of the tubular panel proximate the circumference of the bucket,

(ii) a length of the tubular panel,

(iii) a first end edge and a second end edge, both of the tubular panel, and

(iv) a first face of the tubular panel,

(b) first pockets on the panel comprising:

(i) a first flexible sheet panel section positioned with one edge aligned with the first end edge and overlapping a portion of the first face, and

(ii) a plurality of first stitching means each comprising a

lengthwise line of attachment between the first section and the panel to form a plurality of first pockets opening toward the second end edge along a line around the circumference of the panel,

(c) opening means comprising at least two openings cut through the panel of sufficient size and shape to allow the second end edge of the panel to drape downwardly on the outside surface of the bucket around the two areas of attachment of the handle, and

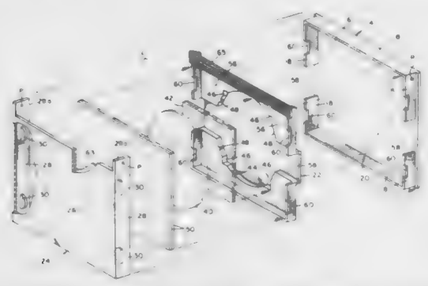
(d) tie means attached on opposite sides of the each of the two openings to pull the openings together under the areas of attachment of the handle on the outside surface of the bucket.

4,993,552

PACKAGING DEVICE

Marc Bugbey, 345 Chester St. #1, Glendale, Calif. 91203, and Michelle Agul, 106 N. Meridith Ave. #4, Pasadena, Calif. 91105

Filed Apr. 12, 1990, Ser. No. 507,984
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—444 **10 Claims**



1. A packaging device for packaging magnetic and optical disks of specific sizes comprising:

(a) a housing having interconnected bottom and sidewalls defining a chamber;

(b) closure means operably associated with said housing for closing said chamber;

(c) a disk supporting insert closely receivable within said chamber, said insert comprising:

(i) a first disk receiving compartment having first and second portions, said first portion being adapted to closely receive at least one 3½ inch, generally rectangularly shaped computer diskette envelope, said second portion being superimposed over said first portion and being adapted to closely receive an optical disk; and

(ii) a second disk receiving compartment superimposed over said first disk receiving compartment for closely receiving two 5¼ inch, generally rectangularly shaped computer diskette envelopes.

8. A packaging device for packaging two 3½ inch and two 5¼ inch computer diskette envelopes comprising:

(a) a clear plastic housing having integrally formed bottom and sidewalls defining a chamber;

(b) a plastic closure member hingeably interconnected to said housing for closing said chamber;

(c) a disk supporting insert closely receivable within said chamber, said insert comprising:

(i) a first disk receiving compartment having first and second portions, said first portion having a plurality of upstanding sidewalls defining four square corners, said sidewalls being spaced apart approximately 3¾ inches, said second portion being superimposed over said first portion being generally circular in plan; and

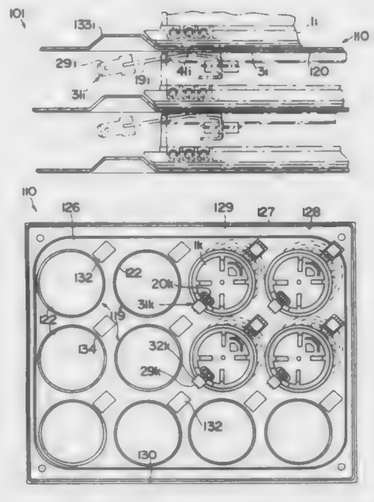
(ii) a second disk receiving compartment superimposed over said first disk receiving compartment for receiving two 5¼ inch generally square computer diskette envelopes.

4,993,553

ELECTRIC HOTPLATE STACKING AID

Robert Kicherer; Felix Schreider, and Stefan Reif, all of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 303,318
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803806; Dec. 2, 1988, 3840734
Int. Cl.[5] B65D *21/00*
U.S. Cl. 206—499 **16 Claims**



1. A stacking aid for hotplates having a hotplate body with a cooking face and a plugging piece for connection to connecting members of an electrical supply line, the stacking aid being adapted for receiving a plurality of hotplates in a multilayer stack, said stacking aid comprising:

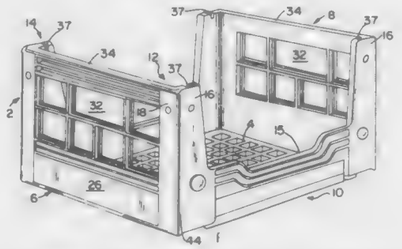
pallet plates containing receptacles for receiving said plugging pieces of each single hotplate, the receptacles being laterally outside of said each single hotplate in said plurality of hotplates.

4,993,554

NESTABLE BEVERAGE CASE

Thomas Box, Tinton Falls, N.J., assignor to Spectrum International, Inc., Tinton Falls, N.J.

Filed Oct. 14, 1987, Ser. No. 108,147
Int. Cl.[5] B65D *21/04*
U.S. Cl. 206—507 **9 Claims**



1. A rectangular beverage case that can be stacked or nested comprised of

(a) two lateral sides extending the full height of the beverage case;

(b) two longitudinal sides having center panel sections that extend upwardly from the bottom of the beverage case in height less than one-half the height of the lateral sides, said center panel section of both longitudinal sides having a length greater than the length of the lateral sides and an intermediate recess, the upper edge of which extends below the upper edge of the remaining portion of the center panel of the longitudinal sides;

(c) vertical reinforcing members at each corner of the beverage case; and

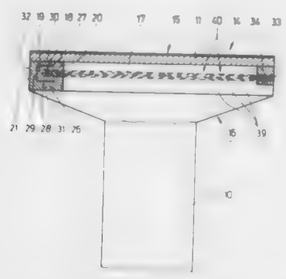
(d) a surface at the bottom of the beverage case to support beverage containers.

4,993,555

PACK, COMPOSITE SHEET FOR PRODUCING A PACK, APPARATUS FOR PRODUCING THE COMPOSITE SHEET, AND PROCESS FOR PRODUCING VACUUM PACKS

Gerhard Hemm, Delmenhorst, Fed. Rep. of Germany, assignor to Jacobs Suchard AG, Zurich, Switzerland

Filed Aug. 10, 1989, Ser. No. 392,025
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3829042
Int. Cl.[5] B65D *3/26*
U.S. Cl. 206—605 **15 Claims**



1. Pack consisting of a tube of multilayer composite sheet having at least one sealable (thermoplastic) external layer, for pourable products, particularly (ground) roasted coffee, formed into a (cuboidal) coffee block which is stable in respect of shape, whereby a sealable tear-open strip is provided, extending at least in a partial region of the pack and up to or into the region of a grip tab, characterized in that the tear-open strip (**17**) is sealed via spot seals (**39**) with breaks (**40**) in the sealing—viewed in the longitudinal direction of the tear-open strip—to the pack-composite sheet (**32**).

4,993,556

TURNING DEVICE FOR SHEET-LIKE ITEMS AND PROCESS FOR ITS OPERATION

Andr',acu/e/ Gerlier, Sciez, France, assignor to Landis & Gyr Betriebs AG, Zug, Switzerland

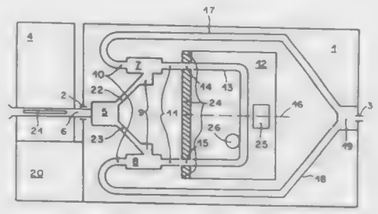
Filed Nov. 30, 1989, Ser. No. 443,927
Claims priority, application Switzerland, Jan. 9, 1989, 00057/89
Int. Cl.[5] B07C *5/00*; B65H *29/00*
U.S. Cl. 209—534 **16 Claims**

1. A turning device with a conveying mechanism for orienting sheet-like items into a predetermined position, comprising

a service station rotatable about an axis of rotation into first and second rest positions, said first and second rest positions being separated by 180° of arc, said service station including a conveying path having first and second openings, drive means for driving said items along said conveying path, and at least one sensing means for sensing the presence of said items upon said conveying path,

a conveyor belt and a switching station along said conveyor belt, said conveyor belt receiving said items from an inlet and delivering them to said switching station, said conveyor belt further including first and second branches extending from said switching station, said switching station delivering said items to said first and second branches,

first and second bifurcations connected to and receiving said items from said first and second branches of said conveyor belt respectively, said first and second bifurcations terminating at positions located opposite said first and second openings of said conveying path, said first and second bifurcations delivering said items to said service station through said first and second openings for reorientation, and receiving said items from said service station through said first and second openings after said items have been reoriented by said service station,



a conveying system comprising first and second arms, a combining inlet, and an output, said first and second arms receiving said items from said first and second bifurcations after they have been reoriented and delivering said items to said output via said combining inlet,

control means for controlling the direction of movement of said items along said conveying path of said service station, and

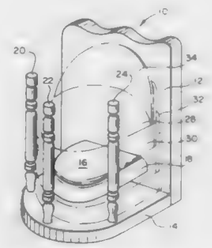
signal circuit means connecting said switching station, said belt conveyor, said service station, said sensing means, said drive means, and said conveying system to said control means.

4,993,557

CAP STORING DEVICE

Bert Davis, Rte. 2, Box 700, Centreville, Ala. 35402

Filed Aug. 7, 1990, Ser. No. 563,642
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—30 **8 Claims**



1. A cap storage device adapted for storing a plurality of headpieces of the type having a crown with an extended visor comprising:

a. a horizontal base defining rear and front portions;

b. an upstanding back secured at its lower extremity to said base rear portion and extending vertically thereof, and

c. a curvate lower shelf supported at one end upon said back and superposed with respect to said horizontal base, such that the crown of a cap may fit thereover with the cap visor extending vertically in parallel with said back.

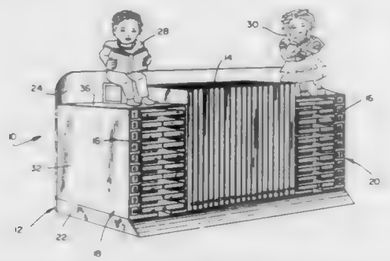
VOL 1123 ISS 3 FEB 19 1991 UMI

4,993,558

BOOK AND TRANSCRIPTION FILE

Daniel C. Assael, c/o Assael Creative, Inc., 63 Downing St., New York, N.Y. 10014

Filed Jun. 28, 1989, Ser. No. 372,637
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—40 10 Claims



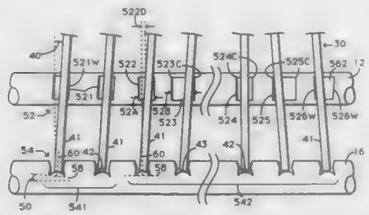
1. A book and companion audio transcription file system, the system comprising a plurality of books and a like plurality of audio transcriptions, means for supporting the plurality of books in a row and book end means for abutting a book at one end of the row, the book end means including rack means for storing the plurality of audio transcriptions, the audio transcriptions being coordinated with the books, the rack means including means forming a plurality of compartments, each compartment being dimensioned to receive an audio transcription.

4,993,559

WAFER CARRIER

Mario E. Cota, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1989, Ser. No. 386,665
Int. Cl.[5] A47G 19/08
U.S. Cl. 211—41 17 Claims



1. A wafer carrier having a plurality of slots for receiving and supporting a plurality of wafers at a predetermined angle with respect to the vertical, comprising:

side slots for engaging portions of principal faces of the wafers near lateral edges of the wafers; and

bottom slots for supporting bottom edges of the wafers, wherein bottoms of the bottom slots are convex upward when viewed in a direction parallel to a principal face of a wafer and tangential to the edge of the wafer where it resides in a slot.

4,993,560

CARD HOLDER

Sidney Jaffe, 5200 Irvine Blvd., #199, Irvine, Calif. 92720

Filed Jun. 26, 1989, Ser. No. 371,627
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—45 2 Claims

1. A card holder comprising a flexible member having a plurality of slots formed therein, a plurality of shaped members adjacent corresponding ones of said slots forming support walls to secure cards inserted between said shaped members and said adjacent slots; means provided at the top portion of said holder to enable said holder to be suspended from a support surface; a base member, separate from said flexible member, having a slot formed therein; and means at the bottom portion of said card holder adapted for insertion into the slot formed in said base member to enable the card holder to be self supporting.

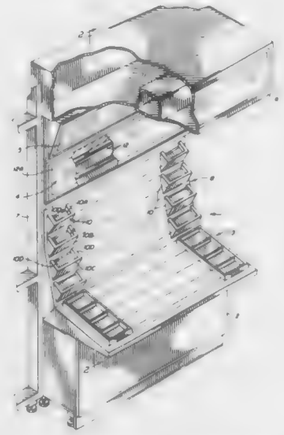


4,993,561

MERCHANDISING SYSTEM

Randall W. Stultz, Phoenix, Ariz., assignor to Design Sciences International, Inc., Phoenix, Ariz.

Filed Dec. 22, 1988, Ser. No. 290,303
Int. Cl.[5] B42F 00/00
U.S. Cl. 211—55 26 Claims



3. A feature rack comprising in combination:

(a) a vertical panel having a vertical front surface;

(b) an array of pockets disposed on the front surface, each pocket including a pocket recess formed by a bottom surface, first and second sides, and a front lip;

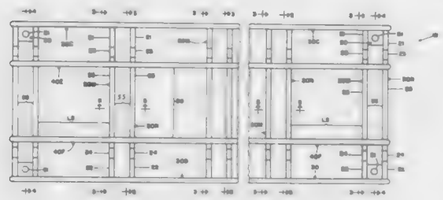
(c) a plurality of display accessories supported by various pocket recesses, respectively, wherein one of the display accessories is a product/graphic support element that includes a flat first panel that rests on and is inclined at the same angle as the bottom surface of a first pocket recess, a vertical second panel in front of the first pocket recess, and a contoured web connected to a front edge of the flat first panel and a top edge of the vertical second panel, the web abutting the front lip to retain the product/graphics support element in the pocket recess.

4,993,562

WALL-MOUNTABLE GRID-SUPPORT FOR GARMENT BRACKETS

Joel H. Alperson, 3306 S. 157th St., Omaha, Nebr. 68130

Filed Dec. 14, 1989, Ser. No. 450,451
Int. Cl.[5] A47F 5/08
U.S. Cl. 211—87 4 Claims



1. Wall-mountable grid-support for alternatively supporting hook-type and slat-type garment brackets, and comprising:

(A) a plurality of parallel, directionally transversely extending, and respectively uniplanar spacer members, each having a regular cross-sectional shape and size therealong, and each comprising:

(Ai) a pair of colinear terminal-lengths including a first-length and a second-length whereby said terminal-lengths for said spacer members plurality lie along a first-plane and there adapted to abut a planar upright wall environment,

(Aii) a linearly extending medial-length that is substantially parallel to said colinear terminal-lengths whereby the medial-lengths for said spacer members plurality lie along a second-plane that is parallel to and directionally laterally offset from said first plane, and

(Aiii) said spacer members being arranged in a plurality of proximal pairs wherein a finite small-spacing exists therebetween and a finite large-spacing exists between consecutive proximal pairs;

(B) a plurality of parallel, directionally longitudinally extending linear bridger members, each said bridger member being attached to a plurality of spacer member medial-lengths to thereby establish a third-plane that is parallel to and directionally laterally offset a finite small-gap from said second-plane, and the distance between consecutive bridger members being manyfold greater than the said finite small-spacing; and

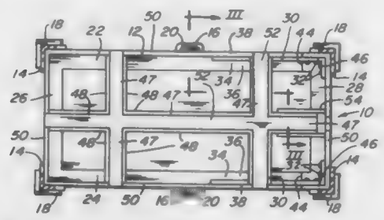
(C) along said first-plane and at a said proximal pair of spacer members, wall attachment means for attaching said grid-support article to an upright wall environment.

4,993,563

STACKING AND BUNDLING APPARATUS

Ambrose Bolling, 2808 Weir Ave., Weirton, W. Va. 26062

Filed Dec. 5, 1989, Ser. No. 446,122
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—175 7 Claims



1. A stacking apparatus comprising:

a base assembly including a first pair of laterally spaced, longitudinally extending portions and a second pair of longitudinally spaced portions extending between and connected to said first pair of portions to form a generally polygonal frame enclosing an area;

elongated means extending within said area between at least one said pair of portions and supported thereby;

said elongated means being cooperable with said pairs of portions to provide support within said area for articles stacked upon said base assembly;

said elongated means including an upwardly open channel extending substantially continuously throughout the length of said elongated means, said channel being open ended for access thereto from locations laterally outward of said at least one pair of portions;

a plurality of uprights adapted to be carried by said polygonal frame at selected locations spaced about the periphery thereof;

said polygonal frame including retention means adjacent said selected locations for selectively retaining and supporting said uprights in an upstanding orientation with respect thereto; and

means permitting the said portions of at least one of said pairs of portions to be selectively moveable with respect to each other for adjustment of the spacing therebetween to thereby adjust the size of said area while maintaining support of said elongated means; and

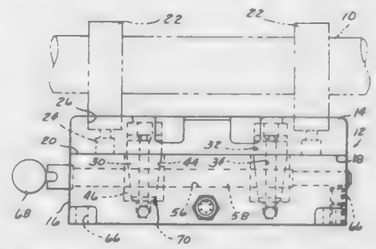
said at least one said pair of portions including interengaged guide means which are relatively moveable in telescoping relationship to guide the said portions of said at least one said pair of portions throughout selective movement thereof with respect to each other.

4,993,564

QUICK DISCONNECT TOOLING MOUNT

John A. Blatt, 47 Willison, Grosse Pointe Shores, Mich. 48236

Filed May 17, 1989, Ser. No. 353,395
Int. Cl.[5] B66C 23/70
U.S. Cl. 212—177 22 Claims



1. A quick disconnect tooling mount comprising:

a first and a second coupling member having respective end faces adapted to be seated in face-to-face engagement;

a first and a second guide rod fixedly mounted in said first coupling member and projecting in an outwardly extending relationship from said end face of said first coupling member;

means defining a first and a second guide rod receiving bore, extending into said second coupling member from said end face of said member, adapted to slidably receive said first and said second guide rod respectfully, said first and said second guide rod and said first and second receiving bore cooperating to guide said coupling members to and from a coupled position;

means defining a locking member mounting bore, extending through said second coupling member along an axis normal to, and offset from said first and said second guide rod receiving bore, said locking member mounting bore intersecting at least one of said first and said second guide rod receiving bore;

a rotary locking member mounted within said locking member mounting bore for rotation therein; and

locking means, disposed on said rotary locking member, for engagement with at least one of said first and said second guide rod when said coupling members are in a coupled position, to retain said members in said coupled position.

4,993,565

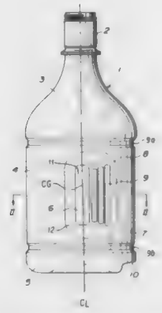
BIAXIAL-ORIENTATION BLOW-MOLDED BOTTLE-SHAPED CONTAINER HAVING OPPOSED RECESSES AND GROOVES FOR STABLE GRIPPING AND ANTI-BUCKLING STIFFNESS

Akiho Ota, and Hiroichi Ishii, both of Koto, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 851,450, Apr. 14, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 112,070

Int. Cl.[5] B65D *23/10*

U.S. Cl. 215—1 C **2 Claims**



2. A blow-molded bottle-shaped container of biaxially oriented thermoplastic synthetic resin comprising:

a cylindrical container body defining a longitudinal center line and having a shoulder and neck portion at an upper end thereof and a bottom portion at a lower end thereof;

a pair of recesses depressed inwardly on opposite sides of a rear half portion of the cylindrical container body substantially at a central height position of the cylindrical container body to form a grip to be grasped by one hand, said recesses including tapered parts disposed oppositely with respect to the longitudinal center line and having inclined surfaces substantially inclined in a direction from the rear half portion of said container body towards center thereof, said recesses having a nadir area aligned with an area including a point defining the center of gravity of said container; and

a pair of parallel upper and lower circumferential reinforcing rib grooves located entirely in the grip between upper and lower limits of the recesses, and extending between the tapered part of one recess and the tapered part of the opposite recess without extending into the recesses.

4,993,566

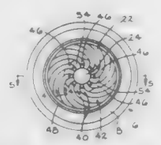
SPIRAL CONTAINER BASE STRUCTURE FOR HOT FILL PET CONTAINER

Theodore F. Eberle, Saline, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Dec. 19, 1989, Ser. No. 452,638

Int. Cl.[5] B65D *1/02, 1/42, 23/00*

U.S. Cl. 215—1 C **4 Claims**



1. A PET container formed by blow molding and adapted to be filled with liquid at a temperature elevated above room temperature, said container comprising an upper portion defining a sealable closure, a sidewall portion, and

a base structure closing the bottom of the container and formed integral with said sidewall portion, said base structure having a peripheral support ring at the lower end of said sidewall portion that is substantially concentric with said sidewall portion, a dome formed integral with said peripheral ring and extending upwardly into said container and terminating in a central disk portion that is also substantially concentric with said sidewall portion, said dome including an annular wall extending between said disk portion and said peripheral ring, at least a portion of said annular wall being subject to deformation by virtue of the presence therein of unrelaxed retractive stresses resulting from blow molding and the heating effect of filling said container with liquid at an elevated temperature, said annular wall being shaped to resist said stresses by the provision of a transversely spaced plurality of rib members therein spanning and extending across said annular wall, each said rib member having upright reinforcing walls with connecting portions therebetween and extend in a direction radiating substantially outwardly and downwardly along an involute path from said disk portion increasing in distance therefrom and being of substantially spiral shape to thereby reinforce the ability of said annular wall to resist deformation during the filling of said container with a liquid at said elevated temperature.

4,993,567

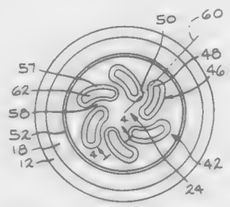
INVOLUTE EMBOSSMENT BASE STRUCTURE FOR HOT FILL PET CONTAINER

Theodore F. Eberle, Jr., Saline, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Mar. 12, 1990, Ser. No. 492,073

Int. Cl.[5] B65D *1/02, 1/42, 23/00*

U.S. Cl. 215—1 C **4 Claims**



1. A PET container formed by blow molding and adapted to be filled with liquid at a temperature elevated above room temperature, said container comprising an upper portion defining a sealable closure, a sidewall portion, and

a base structure closing the bottom of the container and formed integral with said sidewall portion, said base structure including a peripheral support ring, a dome, and a central disk, said support ring being formed with the lower end of said sidewall portion and being substantially concentric with said sidewall portion, said dome being formed integral with said support ring and extending upwardly into said container until terminating in said central disk, said disk also being substantially concentric with said sidewall portion, said dome including an annular wall extending between said disk and said support ring, a transition portion of said annular wall having present therein unrelaxed retractive stresses resulting from blow molding, said transition portion being subject to deformation by virtue of said unrelaxed retractive stresses and the heating effect of filling said container with liquid at an elevated temperature, said transition portion further being shaped to resist said stresses by the provision of a plurality of spaced involute embossments extending thereacross, each said embossment extending interiorly of said container and having substantially upright reinforcing walls with connecting portions therebetween, said embossments also extending in a direction radiating substantially outwardly and downwardly along said dome in three dimensional involute paths of substantially spiral shape from said disk to thereby reinforce the ability of said transition region to resist said deformation.

4,993,568

NIPPLE FOR NURSING BOTTLES

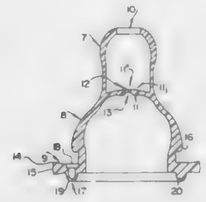
Yasuo Morifuji, and Yoshifumi Takao, both of Osaka, Japan, assignors to JEX Co., Ltd., Osaka, Japan

Filed Sep. 26, 1989, Ser. No. 412,363

Claims priority, application Japan, Dec. 15, 1988, 63-318188

Int. Cl.[5] A61J *11/00, 11/02*

U.S. Cl. 215—11.1 **7 Claims**



1. A nipple for nursing bottles, comprising:

a nipple body having a pair of openings provided at front and bottom ends thereof and including an inverted funnel-shaped intermediate portion;

an annular flange provided at the bottom end of said nipple body, said annular flange extending outwardly along a direction at a right angle with respect to a longitudinal axis of said nipple body and having an annular rib at a bottom surface thereof;

at least one air valve provided at said annular flange, said air valve having a recessed portion extending from said annular flange into said annular rib and a slit provided at said annular rib for communicating an inside of said nipple to an outside thereof;

a partition diaphragm provided inside of said nipple body and disposed in a region remote from said front and bottom ends of the nipple body in a vicinity of a boundary between said front end and said inverted funnel-shaped intermediate portion and at a position where pressure is exerted by an infant during feeding; and

a cut in said partition diaphragm forming a milk sucking passage therein, said cut being normally closed, and wherein said partition diaphragm has a spherical recess at said milk sucking passage,

wherein said cut is opened and closed in response to said pressure exerted by an infant during feeding, and

wherein the partition diaphragm is upwardly arcuate, and a central portion of said upwardly arcuate partition diaphragm comprises a thickened portion, the lower side of said thickened portion being formed with said spherical recess defining a thin diaphragm portion above said spherical recess, said cut being formed in a central region of said thin diaphragm portion.

4,993,569

PIERCING CLOSURE

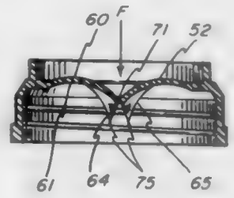
Thomas W. Osip, Worthington, Ohio; Jerold W. Montgomery, Libertyville, Ill., and Paul A. Pezzoli, Worthington, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Aug. 3, 1989, Ser. No. 388,887

Int. Cl.[5] B65D *41/00*

U.S. Cl. 215—226 **20 Claims**

1. A closure for a membrane sealed container, said closure comprising, a generally cylindrical side wall, said side wall having threads along the inner surface thereof for threadedly engaging the neck of said container, and a top, said top having an upper surface, said upper surface having a protective rim extending upwardly therefrom, said top also having a dome assembly, said protective rim extending above said dome assembly, said dome assembly including a dome, said dome having top and bottom surfaces, said bottom surface having (at least downwardly projecting plow member) projecting therefrom a plow assembly, said plow assembly having cooperating plow members, said dome having a center rib extending across said dome, said center rib passing between said cooperating plow members.



4,993,570

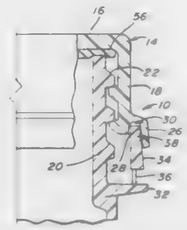
TAMPER INDICATING CONTAINER-CLOSURE PACKAGE

Randall K. Julian, Evansville, Ind., and J. Wayne Halfacre, Iuka, Ill., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Nov. 13, 1989, Ser. No. 435,617

Int. Cl.[5] B65D *41/34*

U.S. Cl. 215—252 **19 Claims**



1. A tamper indicating container-closure package comprising, in combination:

a container having a neck with means for attaching a closure thereto;

an outwardly extending flange on said neck below said closure attachment means;

a tamper indicating band circumposing said neck and attached to said flange by a plurality of circumferentially spaced frangible webs;

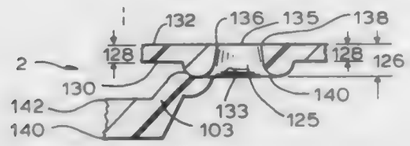
a plurality of circumferentially spaced ratchet teeth on the free end of said band;

a closure cap having a top and a skirt depending from said top with attachment means complementary to said container attaching means; and

a circumferential array of ratchet teeth at the lower end of said cap skirt;

whereby when said cap is affixed to said container neck by said attachment means, at least one of said teeth on said band will engage a ratchet tooth on said cap to prevent removal of said cap from said container neck without fracture of said frangible webs thereby indicating tampering or initial opening of said cap on said container neck.

4,993,571
TAMPER-EVIDENT CAP
Vincent N. Conti, Hempstead, N.Y., assignor to American Safety Closure Corp., Farmingdale, N.Y.
Filed Sep. 14, 1989, Ser. No. 407,398
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 6 Claims



1. An improved plastic tamper-evident cap molded on an internal mold member and adapted for use with a container having a threaded neck portion and a radially outwardly extending shoulder disposed below the threaded neck portion and facing axially away therefrom, the cap having a top wall, a depending skirt with internal threading for engagement with the threaded neck portion of the container and a continuous annular lower surface and a tamper-evident ring having an upper annular surface spaced a predetermined distance from and juxtaposed to said continuous annular lower surface of said skirt and connected to the lower end of the skirt by frangible means and having radially inwardly extending locking means adapted to like over the shoulder of the container; the improvement comprising:

said frangible means comprising a plurality of trapezoidal frangible members each having circumferentially spaced side edges defining a narrow top and wide base, said side edges at said top adjoining the skirt of the cap at sharp corners;

the side edges at said wide base of each of said frangible members adjoining said tamper-evident ring at curved corners;

the upper surface of said ring comprising a substantially continuous annulus interrupted by recesses, said side edges at said base of each of said frangible members being disposed within one of said recesses;

said frangible member having a height and being flexible therealong;

the height of the frangible member exceeding a distance between an upper surface of said tamper-evident ring and said lower continuous annular surface of the depending skirt, so that upon partial flexure of said frangible member when said locking means is forced over the container shoulder, the upper surface of said tamper evident ring sits under compression against said lower continuous annular surface of said skirt.

4,993,572
PRESSURE VENTING CLOSURE
Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Sep. 1, 1989, Ser. No. 401,999
Int. Cl.[5] B65D *51/16*
U.S. Cl. 215—260 9 Claims

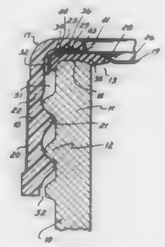
1. A composite closure for a container,

said closure comprising an annular shell having a top opening and a skirt with threaded means for securing the closure onto a container, and an overhanging top lip which surrounds said top opening,

an insert disk contained in said shell beneath said top lip, said disk including a gasket for engaging and sealing the rim of a container,

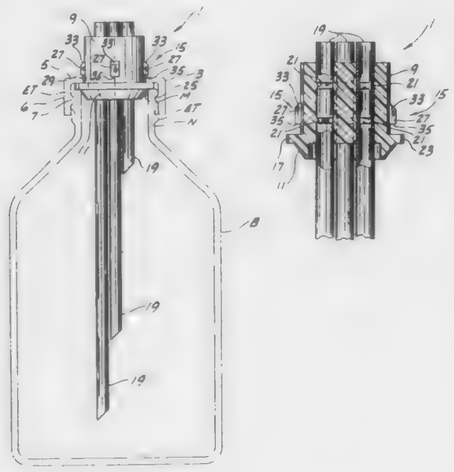
said top lip having on an undersurface thereof at least one recessed area which does not bear on said disk,

said top lip also having at least one bearing area for bearing downwardly on said disk, said bearing area having a circumferential dimension which is a small fraction of the circumference of said lip, said bearing area bearing on said disk directly above the rim of said container,



said recessed area being sized to permit gas pressure in a container, in excess of a predetermined limit, to deflect said disk upwardly toward said recessed area and away from the rim of said container sufficiently to release excess gas pressure past said rim.

4,993,573
BOTTLE CLOSURE
Iris Freidel, Creve Coeur, Mo., and Lev Leytes, Palo Alto, Calif., assignors to Kinetek Systems, Inc., St. Louis, Mo.
Filed Aug. 14, 1989, Ser. No. 393,576
Int. Cl.[5] B65D *51/16*
U.S. Cl. 215—309 14 Claims



1. A bottle closure for sealingly closing a bottle while providing for delivery of fluid to and/or from the interior of the bottle, the bottle being of the type having a neck and a mouth at the top of the neck, the bottle closure comprising a generally cylindric stopper having sealing means generally at one end of the stopper for insertion into the bottle through the mouth for sealing the bottle and a plurality of passageways extending generally axially through the stopper, each passageway having tube sealing means therein for slidingly but sealingly engaging a tube received therethrough for delivery of fluid via the tube to and/or from the interior of the bottle, said tube sealing means being adapted to form an aseptic seal with the tube engaged thereby, said tube sealing means comprising a plurality of ring-like strictures in each passageway, the strictures being axially spaced relative to each other in each passageway.

4,993,574
CARGO CONTAINER WITH IMPROVED PANELS
Edgar King, 206, 1363 Clyde Ave., West Vancouver B.C., Canada (V7T 2W9), and Peter Watson, 6430 Larch Street, Vancouver B.C., Canada V6M 4E9
Filed May 21, 1990, Ser. No. 525,689
Int. Cl.[5] B65D *6/28*
U.S. Cl. 220—1.5 20 Claims



1. A cargo container, comprising:

(a) a plurality of elongated frame members each having an outer surface and an interior region opposite said outer surface, two elongated channels opening to said interior region on either side edge of said frame member and an elongated recess adjacent to and parallel with each of the channels;

(b) a plurality of coupling members removably engagable with ends of said frame members;

(c) a plurality of panels;

(d) panel edging affixed around a periphery of each of said panels, said edging having a projecting portion removably insertable into the channels in coupled ones of said frame members and an elongated recess around the perimeter thereof such that, when said edging is engaged with corresponding channels in said frame members, the edging recess in combination with corresponding recesses of said frame members form an elongated slot around the perimeter of said edging;

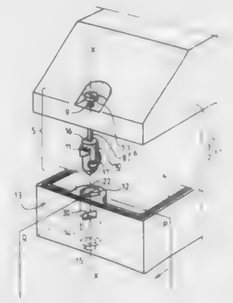
(e) an inclined wall portion coupling said projecting portion to a panel receiving portion of said edging such that an associated panel attached to said edging panel receiving portion is substantially flush with the outer surface of said frame members; and

(f) a resilient strip insertable into each of said slots for removably affixing each of said panels to said frame members such that edges of said panels may reversibly move slightly against only the compression resistance of a corresponding resilient strip in response to loads applied to said panels from within the container.

4,993,575
QUICK CLOSURE BOX
Fabrice Maes, Ermont, France, assignor to Telemecanique, France
Filed Jun. 12, 1990, Ser. No. 536,915
Claims priority, application France, Jun. 13, 1989, 89 07771
Int. Cl.[5] H02G *3/00*
U.S. Cl. 220—3.8 5 Claims

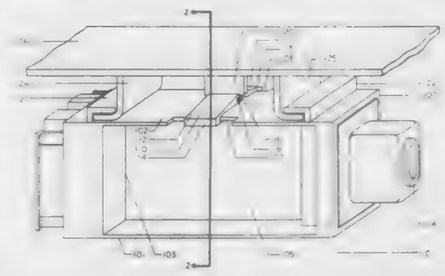
1. Quick closure box comprising a molded material base and a lid fixed thereon by means of screws each passing through an opening in this lid and having a threaded end with a small diameter and small pitch which is engaged in a tapped hole belonging to a coaxial cylindrical extension having externally a large pitch thread of a diameter greater than the preceding one, this second thread being in its turn engaged in a second fixed tapped hole which is disposed in the base in the vicinity of a wall thereof,

wherein said second tapping is formed by a reduced number



of angular fractions -α- of fixed longitudinally superimposed threads rooted in a smooth cylindrical hole, helical surfaces opposite these fractions being placed in alignment with a transversely opening wall opening and so that these helical surfaces receive a longitudinal support of the corresponding threads of the extension, whereas the external edge of these threads bears transversely on the cylindrical surface of the hole in a region opposite said angular fractions.

4,993,576
MOUNTING ASSEMBLY
Norman R. Byrne, 2736 Honey Creek, N.E., Ada, Mich. 49301
Filed May 1, 1990, Ser. No. 517,372
Int. Cl.[5] H02G *3/08*
U.S. Cl. 220—3.9 15 Claims



1. A mounting arrangement for mounting a housing having an outer wall on a structural support member, said arrangement comprising:

first and second spaced-apart support brackets on said structural support member;

first and second spaced-apart attachment lugs on said outer wall of said housing for slidably engaging said first and said second support brackets, respectively;

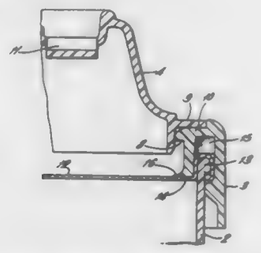
retaining means on said supporting member;

latch means comprising a pair of opposing interlocking movable latch members hingedly attached to said outer wall of said housing and defining therebetween a channel for engaging said retaining means; and

each of said interlocking latch members is operable to disengage both of said latch members from said retaining means

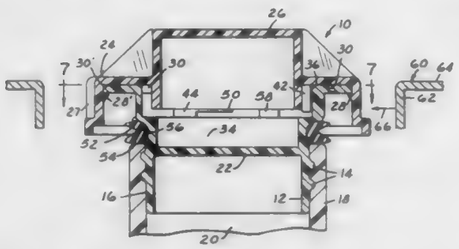
in response to an external force on either of said latch members, whereby said retaining means is disengaged from said latch means by operation of either of said latch members to allow sliding movement of said housing in opposite directions on said support brackets.

4,993,577
CONTAINERS
Christopher J. Griffin, Ealing; David W. Helps, London, and Gerard M. O'Brien, South Oxhey, England, assignors to General Foods Limited, Banbury, England
Filed Oct. 24, 1989, Ser. No. 426,369
Claims priority, application United Kingdom, Nov. 24, 1988, 8827502
Int. Cl.[5] B65D 51/22
U.S. Cl. 220—258 11 Claims



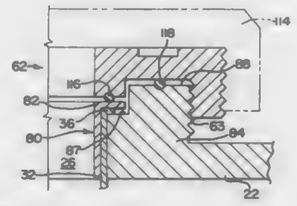
1. A microwave container comprising:
(a) a foodstuff containing receptacle having a projecting rim;
(b) a metal lid for said receptacle to hermetically seal said receptacle on said projecting rim; and
(c) a collar having an annular configuration and adapted to locate over said rim of said receptacle when said hermetically sealed metal lid is removed therefrom, said collar being provided with a means whereby, in use, any edge of said metal lid remaining after removal is shielded from microwave radiation.

4,993,578
LATERAL IMPACT REACTIVE FUEL TANK CAP
Keith A. Kerby, Clarkston, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed May 21, 1990, Ser. No. 526,279
Int. Cl.[5] B65D 41/34
U.S. Cl. 220—258 6 Claims



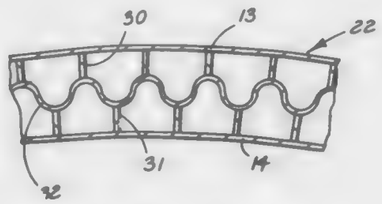
1. For a vehicle fuel tank having an inletting device, an improved impact reactive cap to cover the inlet, comprising: a cap having a main body portion adapted to be removably installed in the inletting device; a gripping portion of the cap located outwardly from the inletting device to permit application of installation and removal forces on the body portion relative to the inletting device; interconnecting structure attaching the body portion to the gripping portion including thin posts sufficiently strong to transmit the installation and removal forces, the posts extending axially between the body portion and the gripping portion whereby axially directed impact forces on the gripping portion severs the posts and thus separates the gripping portion from the body portion and whereby laterally directed forces o the gripping portion exerts a bending action on the posts to sever the posts and thus separate the portions, leaving the body portion within the inletting device.

4,993,579
BLADDER TYPE CONTAINER FOR TOXIC MATERIALS
Dennis M. Burchett, Greeley, Colo., assignor to Platte Chemical Co., Freemont, Nebr.
Filed Mar. 26, 1990, Ser. No. 499,180
Int. Cl.[5] B65D 85/00
U.S. Cl. 220—403 40 Claims



1. A container comprising:
a substantially rigid enclosure that defines a central cavity and a set of openings including at least a first opening extending between the central cavity and a region exterior of the enclosure, said central cavity communicating with the region exterior of the enclosure only via the set of openings;
a bladder disposed in the central cavity and having a neck releasably secured to the enclosure at the first opening, said bladder receiving a material to be stored and discharging same only via the neck; and
a tether releasably secured between the bladder and the enclosure at a point spaced from the first opening, said tether positioned to prevent the bladder from moving toward the first opening and obstructing flow through the neck;
said bladder configured and adapted to be inserted into and removed from the central cavity via an opening included in the set of openings, without disassembly of the enclosure.

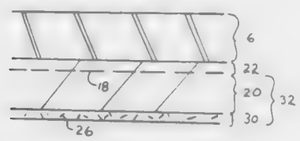
4,993,580
INSULATED BEVERAGE CONTAINER
Glen R. Smith, 800 E. Aloha St., Seattle, Wash. 98102
Filed Apr. 16, 1990, Ser. No. 509,714
Int. Cl.[5] B65D 5/56, 25/18
U.S. Cl. 220—443 1 Claim



1. An insulated beverage container comprising,
a tubular interior wall defined about an elongate axis, and
a tubular exterior wall, the tubular exterior wall coaxially arranged relative to the elongate axis in a surrounding relationship relative to the interior wall and coextensively

formed therewith, and a floor mounted to lowermost ends of the interior and exterior walls orthogonally arranged to the elongate axis defined by the interior and exterior walls, the interior wall spaced from the exterior wall by a predetermined spacing, and
corrugating means adhesively mounted within the predetermined spacing for effecting insulation and cushioning of the exterior wall relative to the interior wall, and
the corrugating means includes a series of equally spaced planar ribs, the planar ribs circumferentially spaced relative to one another within the predetermined spacing and wherein the ribs are radially aligned relative to the elongate axis of the interior and exterior walls, and
wherein the ribs include first ribs, the first ribs defined by a first length equal to one-third of the predetermined spacing, the first ribs integrally mounted to the exterior wall within the predetermined spacing and spaced apart a first spacing, and second ribs defined by a second length equal to one-third of the predetermined spacing and integrally mounted to the interior wall within the predetermined spacing wherein the second ribs and the first ribs are radially aligned relative to the elongate axis, and the second ribs are offset relative to the first ribs to bisect the first spacing between the first ribs, and the corrugating means includes a sinusoidal corrugating medium medially mounted within the predetermined spacing between the interior wall and the exterior wall wherein the corrugating medium is defined by a sinusoidal amplitude equal to one-third of the predetermined spacing between the interior and exterior walls and includes sinusoidal peaks fixedly secured to the first ribs and sinusoidal valleys fixedly secured to the second ribs.

4,993,581
DUAL WALL TANK
A. Ross Mitchell, c/o Madison Chemical Industries Inc., 490 McGeachie Dr., Milton, Ontario, Canada L9T 3Y5
Filed May 2, 1989, Ser. No. 347,163
Int. Cl.[5] B65D 90/04
U.S. Cl. 220—453 16 Claims



1. In a method of making a dual wall container for storing fluids by: producing inner wall means for storing said fluid; positioning fabric means exteriorally against said inner wall means; applying liquid resin means exteriorally to said fabric means so as to penetrate partially into said fabric means when said fabric means is positioned exteriorally against said inner wall means and, upon curing, form outer wall means for containing leakage of said fluid through said inner wall means, with an intermediate layer of fabric means permeable to leakage of said fluid through said inner wall means.

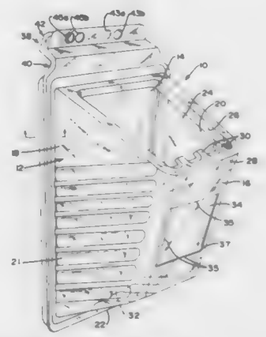
4,993,582
GUSSETED DOUBLE-WALLED BOX FORMED OF DRAPED AND BLOW MOLDED PARISON
George F. Arp, Rochester, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.
Division of Ser. No. 289,318, Dec. 23, 1988, Pat. No. 4,898,707.
This application Nov. 15, 1989, Ser. No. 437,450
Int. Cl.[5] B65D 1/40
U.S. Cl. 220—469 6 Claims

1. A double-walled box having a generally rectangular bottom region with a long axis substantially longer than a short axis, said box being formed of a single resin parison that is draped and blow molded, and said box comprising:
a. resin material of a wall of said box in said bottom region of said box being formed into a leading pinch-off region extending centrally along the length of said long axis of said rectangular bottom region;



b. said resin material being folded into an opposed pair of pleats extending inward from opposite ends of said pinch-off region; and
c. gussets unfolded from said pleats to extend toward corner regions of said bottom region, said gussets appearing on an interwall surface of said box wall forming said leading pinch-off region at said bottom region of said box.

4,993,583
DISPLAY CONTAINER
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Orangeburg, N.Y.
Filed Apr. 14, 1989, Ser. No. 338,982
Int. Cl.[5] B65D 25/24; G09F 3/18; A47F 3/101
U.S. Cl. 220—482 14 Claims



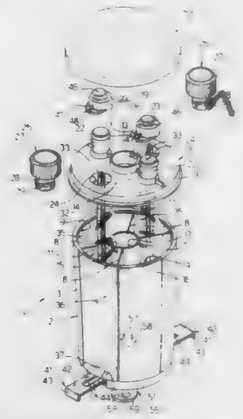
1. A display container comprising:
a receptacle housing defining an enclosure therein, said receptacle housing including at least a frontwall, a backwall, and a bottom wall, said receptacle housing including an upper opening through which articles can be deposited into and removed from said enclosure; said bottom wall having a downwardly extending incline from said front wall toward said backwall;
a reinforcing means in surrounding relation to at least a portion of the upper opening; and
securing means, connected with said receptacle housing, for securing said receptacle housing an a vertical wall.

4,993,584

FOOD CONTAINER

Giuseppe Macario, Grugliasco, Italy, assignor to GI & GI. S.r.l., Turin, Italy

Filed May 9, 1989, Ser. No. 349,426
Claims priority, application Italy, May 10, 1988, 5313088[U]
Int. Cl.[5] A47G *19/12*
U.S. Cl. 220—523 20 Claims



1. A food container comprising:
a body (2), a top and a bottom wall (4);
said body being formed with a plurality of compartments, including a first liquid food compartment (9) having a liquid dispensing outlet (22) formed in said top, and a second substantially solid granulated food compartment (11) for holding solid granulated foodstuff, with a solid dispensing outlet (37) formed in said bottom wall;
wherein said solid dispensing outlet (37) is formed in said bottom wall (4);
wherein said solid dispensing outlet comprises number of first through holes formed in said bottom wall (4); wherein said container includes rails (38) and a panel (41) designed to slide in contact with said bottom wall (4) and along said rails (38), and said panel having a first position, in which the panel closes off said first through holes (37) and a second position, in which the panel permits downward withdrawal of said granulated foodstuff through said first through holes (37).

4,993,585

ENCAPSULATED CASE EDGING

William McMahon, 10610 Lakeside Dr. N. #G, Garden Grove, Calif. 92640

Continuation-in-part of Ser. No. 296,014, Jan. 12, 1989, abandoned. This application Jul. 26, 1990, Ser. No. 557,726
Int. Cl.[5] B65D *1/48, 6/34*
U.S. Cl. 220—643 15 Claims



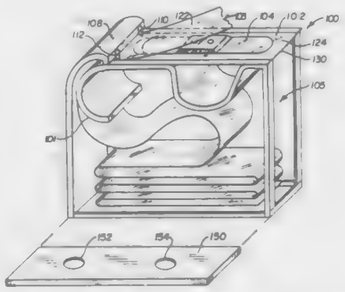
1. A thermoplastic case with a bottom and lid for carrying and storing articles comprising:
(a) an interlocking bottom peripheral edging with an inside surface and an outside surface having a downwardly projecting finger-like lobe on the outside surface,
(b) a vacuum formed case bottom intimately embracing the outside surface of the bottom edging with the downwardly projecting lobe completely enveloped, creating an integral structural bond therebetween,
(c) an interlocking lid peripheral edging with an inside surface and an outside surface having an upwardly projecting finger-like lobe on the outside surface with the lid edging interfacingly engaging the bottom edging, and
(d) a vacuum formed case lid intimately embracing the outside surface of the lid edging with the upwardly projecting lobe completely enveloped, creating an integral structural bond therebetween allowing both edgings to attached to the case without the use of structural fasteners.

4,993,586

ADHESIVE BANDAGE DISPENSING DEVICE AND ASSOCIATED METHOD

Orrin E. Taulbee, deceased, late of Blacksburg, Va. (by Laura J. Harper, executor); Gregor M. Taulbee, executor, Columbus, Ohio, and Frank R. Walters, Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Jun. 21, 1989, Ser. No. 369,457
Int. Cl.[5] G07F *11/66;* B65D *85/672*
U.S. Cl. 221—25 18 Claims



1. An adhesive bandage dispensing device comprising:
means for holding a strip of adhesive bandages, said strip having a first layer of material secured to a second layer of material with at least one adhesive bandage disposed therebetween; and
means for slicing said first and second layer of material along the length of said strip, said slicing means being connected to said holding means, whereby said strip may be removed from said holding means and pulled through said slicing means so as to enable one hand access to said adhesive bandage.

4,993,587

CARD DISPENSING APPARATUS FOR CARD VENDING MACHINE

Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1989, Ser. No. 343,898
Claims priority, application Japan, May 9, 1988, 63-60147[U]
Int. Cl.[5] B65H *3/06, 3/52*
U.S. Cl. 221—21 4 Claims

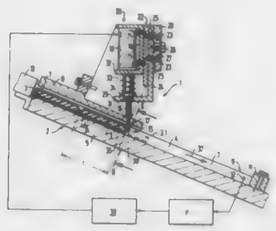
4. A card dispensing apparatus for card vending machines comprising a vertical store room defined between two parallelly spaced side plates for holding a stack of cards; a draw roller means including a draw roller mounted under said stack for drawing out a card from the bottom of the stack; a delivery roller means including a delivery roller mounted for rotation either in one direction for delivering said drawn card towards an outlet or in a reverse direction for delivering a card back to said stack; a card antidoubling roller means including an antidoubling roller mounted above said delivery roller on a reversible roller shaft rotatable in an opposite direction relative to the rotational direction of said delivery roller; a reversible motor means mounted for selectably rotating said delivery and antidoubling rollers in reverse directions; an overload signal sensing means operative to generate an overload signal to reverse said motor means when a plurality of cards are inserted between said delivery and antidoubling rollers; and free rotation means operatively interconnected between said reversible roller shaft and said antidoubling roller to permit continued limited rotation in said opposite direction upon reverse rotation of said motor means in response to said overload signal so that said plurality of cards are returning to an aligned position at the bottom of said stack of cards.

4,993,588

APPARATUS FOR SEPARATING OBJECTS OF THE SAME KIND, IN PARTICULAR ELECTRONIC COMPONENTS SUCH AS INTEGRATED CIRCUITS

Hans-Heinrich Willberg, Altofing/Bad Feilnbach; Ekkehard Ueberreiter, Raubling, and Thomas Ulrich, Stephanskirchen, all of Fed. Rep. of Germany, assignors to Multitest, Elektronische Systeme GmbH, Rosenheim-Aisingerwies, Fed. Rep. of Germany

Filed Jun. 13, 1989, Ser. No. 365,761
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820540
Int. Cl.[5] B65G *47/08, 47/88*
U.S. Cl. 221—13 12 Claims



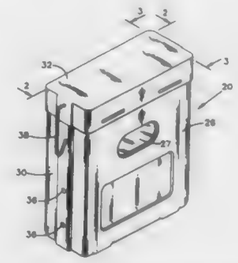
1. Apparatus for separating objects of the same kind, in particular electronic components, such as integrated circuits, which are delivered in succession in a sloping delivery passage, said apparatus having a stop member arranged in the region of the delivery passage displaceable substantially transverse to the direction of delivery so as to respectively retain a leading one of the objects, and having a control circuit which cylically controls the displacing movement of the stop member, in the region of the delivery passage downstream of the stop member in the delivery direction, there is arranged a sensor which responds to the arrival of a released object and which is connected to the control circuit, said control circuit being arranged so that selectively the cycle frequency and the ratio of the pressure applying and lifting off periods of the stop member are changed depending on the frequency of arrival and in the removal of the released objects at the sensor, said control circuit regulating the cycle frequency of the stop member so that the stop member contacts each object at least twice.

4,993,589

DISPOSABLE ARTICLE DISPENSER

David T. McLaughlin, 279 Highgate Ave., Worthington, Ohio 43085

Continuation-in-part of Ser. No. 214,060, Jun. 30, 1988, Pat. No. 4,844,293. This application Jun. 14, 1989, Ser. No. 365,835
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—33 5 Claims



1. A dispensing apparatus for disposable articles comprising, in combination:
(a) a generally rectangular, rigid enclosure having at least two spaced, parallel extending wall means, a top opening and a window in one of said wall means, said top opening and said window providing interior access to said enclosure;
(b) a packet having a pair of spaced parallel extending faces yieldably connected to one another, said faces having a planar configuration generally fully encompassing the planar area of an article to be dispensed disposed in an unfolded, planar disposition, one of said faces having an opening aligned with the window of said wall means of said enclosure;
(c) a plurality of articles mounted in said packet between said faces in a stacked, parallel extending relationship with one another and parallel to said faces of said packet in an unfolded, planar relationship;
(d) and means mounted in said enclosure for biasing said faces of said packet and the stack of articles toward said window in said wall means to urge the outermost article in said stack closely adjacent to said window.

4,993,590

SHEET DISPENSER

David C. Windorski, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 26, 1989, Ser. No. 358,395
Int. Cl.[5] B65H *1/04, 1/00*
U.S. Cl. 221—46 14 Claims

1. A dispenser for dispensing flexible sheets from a stack of the sheets disposed one on top of another, each sheet having a band of pressure sensitive adhesive coated on one surface adjacent one edge thereof and being free of adhesive coating along a portion adjacent an opposite edge thereof, and the sheets being stacked with the adhesive coating on each successive sheet disposed along alternate opposite sides of the stack and releasably adhering the sheets together to maintain the sheets in the stack, said dispenser comprising:
walls having surfaces defining a cavity adapted to receive the stack, said surfaces including
opposed end surfaces having parallel upper ends adapted to

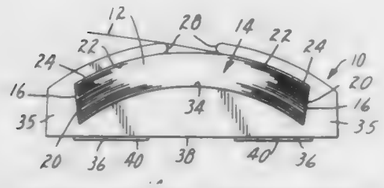
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be engaged by the opposite sides of the stack with the top sheets in the stack parallel to an adjacent said upper ends,

friction surface portions extending generally toward each other from said upper ends, and having spaced distal ends,

opposed outlet surfaces at said distal ends defining an opening through said walls between the distal ends of said friction surface portions,

said opposed end surfaces being spaced apart a distance less than the distance between the opposite sides of the stack to arc the stack positioned with its sides against the end surfaces and to position the uppermost sheets of the stack along the friction surface portions with the adhesive free portion of the uppermost sheet in the stack projecting through the opening so that by grasping that end portion the uppermost sheet on the stack can be manually pulled through the opening and will carry with it the adhesive free end portion of the sheet beneath it in the stack to which the uppermost sheet is adhered by the adhesive coating, placing that adhesive free end portion in a position where it also may be grasped and pulled to withdraw the next sheet from the stack,



said opposed end surfaces diverging slightly from each other toward the upper ends of said end surfaces to cause movement of the end portions of the stack along said end surfaces toward said upper ends in response to forces applied to the stack to sequentially remove sheets from the stack through said opening; and

said friction surface portions being shaped to provide means for affording sliding movement of the adhesively joined end portions of the uppermost sheet and the sheet beneath it between the stack and the adjacent friction surface portion, and for making frictional engagement with the adhesive coated end portion of the sheet beneath the uppermost sheet that is sufficient to restrict the movement of the sheet beneath the uppermost sheet between the rest of the stack and the adjacent friction surface portion in response to a force required to peal the uppermost sheet from the sheet beneath it after the uppermost sheet is withdrawn from the dispenser.

4,993,591

AUTOMATIC VENDING MACHINE

Hans Schock, Mintraching, Fed. Rep. of Germany, assignor to Händler GmbH und Co KG Metall- und Maschinenbau, Neutraubling, Fed. Rep. of Germany

Filed Nov. 29, 1989, Ser. No. 443,574

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719595

Int. Cl.[5] G07F *11/48, 11/62*

U.S. Cl. 221—91 **7 Claims**

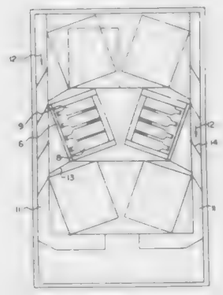
1. Automatic vending machine, comprising:

(a) a drop and delivery shaft defining a drop direction therein for product packages;

(b) a fixation frame communicating with said drop and delivery shaft for receiving a box having compartments defining product positions for product packages and having an open top being inclined relative to said drop direction for discharging into said drop and delivery shaft;

(c) a belt being attached to said fixation frame and covering said open top of the box, said belt having an opening formed therein with a contour dimensioned to permit precisely one predetermined group of adjacent product packages in the box to pass through said opening;

(d) said fixation frame, sand belt and the open top of the box being outwardly pivotable together out of said drop direction in said drop and delivery shaft; and



(e) means for displacing said opening from one product position in the box to another by incrementally moving said belt.

4,993,592

METHOD FOR USE OF CONTAINER HAVING LID ACTIVATED AND METHODS THEREFOR

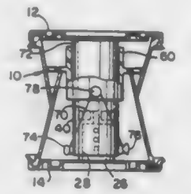
Allen C. Brader, 2160 Overhill Rd., Allentown, Pa. 18103

Division of Ser. No. 383,162, Jul. 20, 1989, Pat. No. 4,905,825.

This application Nov. 30, 1989, Ser. No. 443,928

Int. Cl.[5] B67B *7/00*

U.S. Cl. 222—1 **7 Claims**



1. A method for storing and mixing a fluid and a mixable composition, dispensing a resultant fluid which is a result of mixing said fluid and said mixable composition, and returning a spent fluid for storage, comprising the steps of:

providing a movable member within cup-like container isolating said mixable composition;

containing said fluid about a portion of said movable member which isolates said mixable composition;

opening the container and displacing the movable member upwardly to concurrently mix the fluid and the mixable composition;

accessing the resultant fluid by a user;

returning the spent fluid to the container and closing the container.

4,993,593

APPARATUS AND METHODS FOR DISPENSING A FLOWABLE MEDIUM

Ralph Fabiano, 161 Edgar St., Weehawken, N.J. 07087, and Fortunato Colacino, 29 Crystal St., North Arlington, N.J. 07031

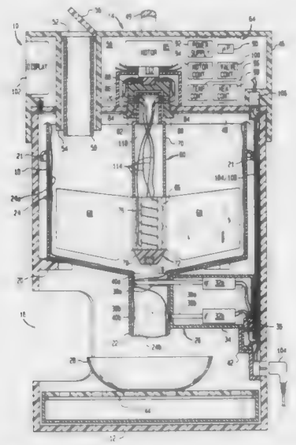
Filed Jul. 21, 1989, Ser. No. 384,285

Int. Cl.[5] B67D *5/62*

U.S. Cl. 222—1 **50 Claims**

1. A method for dispensing a flowable medium, such as a

liquid, a semi-liquid, or a liquid containing particulate matter, in preselected quantities and at preselected temperatures, using an apparatus which includes storing means for storing a flowable medium to be dispensed, dispensing means for dispensing the flowable medium from said storing means, and agitating means for agitating the flowable medium in said storing means to thereby enhance the dispensing of the flowable medium



from said storing means, said agitating means including heating means for heating said agitating means and hence the flowable medium in said storing means and sensing means for sensing the temperature of the flowable medium in said storing means, said method comprising the step of detecting large instantaneous fluctuations in temperatures sensed by said sensing means to thereby provide an indication of the level of the flowable medium in said storing means.

4,993,594

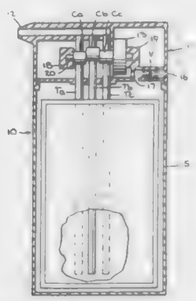
MULTI-CONSTITUENT MIXING AND METERING DISPENSER

Piper Becker, 23 E. Beardsley Ave. (1st Floor), Brant Beach, N.J. 08008, and Charles Mitchell, 9 Fourth St., Barnegat, N.J. 08005

Filed Sep. 27, 1989, Ser. No. 413,234

Int. Cl.[5] B67D *5/22*

U.S. Cl. 222—48 **13 Claims**



1. A manually-operable, multi-constituent mixing and metering dispenser adapted to yield a composition whose intermixed constituents are in relative proportions that are settable by the user, said dispenser comprising:

(a) a supply section including a plurality of compressible pouches, each being provided with a dip tube and being filled with one of the constituents in which the dip tube is immersed, said pouches being encased in a flexible squeeze container which when squeezed applies pressure to the pouches concurrently to extrude the constituents through the tubes; and

(b) a metering and mixing output section secured to the container, said output section including a mixing chamber into which is fed the constituents extruded through the dip tubes, the intermixed constituents being discharged from an outlet, and a metering mechanism disposed in advance of the mixing chamber and operated manually by a control element to pinch said dip tubes and thereby differentially restrict the flow therethrough to adjust the relative proportions of the constituents fed into the mixing chamber throughout a broad ratio range to produce a composition whose effective strength or other characteristic can be set by the user from a predetermined minimum to maximum value.

4,993,595

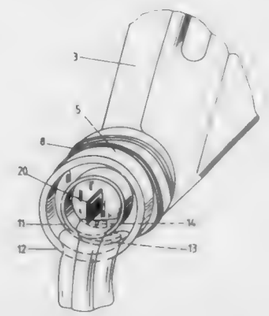
CONTAINER FOR MULTICOMPONENT PRODUCTS

Horst Bertram; Bernhard Bongers, both of Duesseldorf; Herbert Buecheler, Erkrath, and Peter Kittscher, Kaarst, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed May 18, 1989, Ser. No. 353,566

Int. Cl.[5] B65D *1/04*

U.S. Cl. 222—129 **9 Claims**



1. A multicomponent product container comprising two separate component compartments covered by a common pouring cap, individual pouring openings for the first and second components, respectively, offset from one another relative to the longitudinal axis of said container, and opening in the plane of an outer surface provided in said cap, wherein said pouring openings are each juxtaposed in the pouring direction necessary for downward gravity flow of said first and second components to an individual pouring edge, respectively, which edges both rise beyond the outer surface of said cap, are wider than the associated pouring opening in the lateral or peripheral direction, and are shaped for providing in the tilted position of said container necessary for pouring via gravity said first and second components from said pouring openings a sink formed in the region of the associated pouring opening.

4,993,596

MIXING AND DISPENSING GUN WITH IMPROVED REMOVAL NOZZLE

Daniel P. Brown, West Haven, Ill., assignor to Insta-Foam Products Inc., Joliet, Ill.

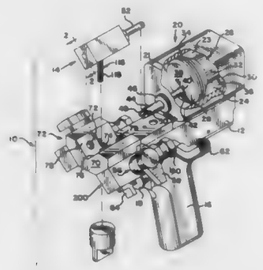
Filed May 10, 1985, Ser. No. 732,614

Int. Cl.[5] B05B *1/00*

U.S. Cl. 222—145 **8 Claims**

1. A hand held gun for discharging a mixture of two chemi-

cally reactive components, said gun being adapted to direct said components to an impingement mixing chamber in which said components are mixed immediately prior to discharge, and wherein said components are substantially simultaneously admitted to said chamber under the control of a single valve assembly, said gun comprising, in combination, a gun body including a handle, a trigger, an air cylinder and a reciprocable piston disposed therein, means defining an air circuit for operating said piston, means for connecting said piston to a product discharge valve, said gun further including a removable product mixing and discharge valve assembly and a valve carrier assembly, said discharge valve assembly including a housing, product component inlet passages, a valve body, a cylindrical



sidewall defining a central passage through said body, and a reciprocable valve stem movable through said central passage, seal means for preventing flow of product between said cylindrical sidewall and said valve stem, means on said valve stem for cooperation with said piston connection means to facilitate removable connection therewith, said carrier and said discharge valve housing having planar, mutually cooperating side wall surfaces arranged in a V-shaped cross section, and cooperating means on said carrier and said valve housing for positively aligning said carrier and valve housing in a desired directional relation and manually operable clamping means for urging said valve assembly and said carrier toward the apex of said V-shaped carrier section and into snug sealing engagement with each other.

4,993,597

AUTOMATIC BEVERAGE DISPENSER COMPRISING ELECTROMAGNETICALLY OPERATED MIXING MEANS

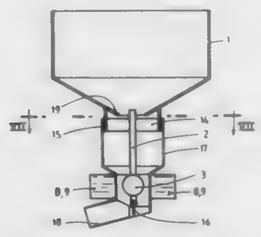
Lucas Evers, Tk Nieuwegein, and Willem Van Reeuwijk, Jh Sliedrecht, both of Netherlands, assignors to Koninklijke Olland Industrie En Handelmij B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 173,192, Mar. 24, 1988, abandoned. This application Sep. 26, 1989, Ser. No. 412,611

Claims priority, application Netherlands, Mar. 31, 1987, 8700760

Int. Cl.[5] B67D *5/60*

U.S. Cl. 222—145 **6 Claims**



1. Apparatus for mixing a liquid composition comprising a beaker having an inlet for liquid and an inlet for material to be mixed with the liquid, said beaker having an outlet at its lower end, a housing depending vertically from said beaker below said outlet to receive the material and liquid and having a discharge opening at its lower end, a stirrer freely located in said depending housing having its central axis coincident with the vertical axis of said housing and being vertically removable from said housing free of any other part of said apparatus, permanent magnet means embedded within said stirrer, and an electromagnet surrounding said housing to provide a magnetic force field in the plane of said permanent magnet means to cause said stirrer to alternate rotatively about said central axis to mix said liquid and material.

4,993,598

PUMP STERILIZATION PROCESS AND PUMPING SYSTEM SUITABLE FOR APPLYING THE PROCESS

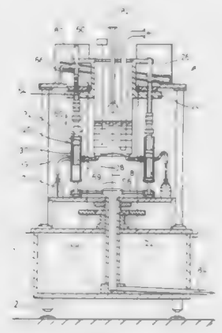
Horst Groninger, Crailsheim, Fed. Rep. of Germany, assignor to Groninger & Co. GmbH, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 351,420

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816935

Int. Cl.[5] B67D *5/52;* **B65B** *43/50*

U.S. Cl. 222—148 **6 Claims**



3. A pumping system for liquid or pasty pharmaceuticals, cosmetics, foodstuffs or similar products comprising at least one pump with a ceramic piston disposed with a ceramic cylinder and means for longitudinally sliding the piston in a generally vertical direction within the cylinder and for rotating the piston around a longitudinal axis thereof, the piston containing a recess therein adjacent a circular cylinder wall and extending to a working face of the piston, said recess communicating with a suction connection in the cylinder wall during a suction stroke of the piston and with a pressure connection in the circular cylinder wall during a pressure stroke of the piston, the cylinder including a closable aperture disposed in a bottom of the cylinder.

4,993,599

STATIC PRESSURE WHIPPING DISPENSER OF WHIPPED PRODUCTS AND PROCESS OF OPERATION

Frederick P. Gruenewald, 11 Fox Rd., Waltham, Mass. 02154

Continuation of Ser. No. 295,810, Jan. 11, 1989, abandoned. This application Jun. 6, 1990, Ser. No. 534,378

Int. Cl.[5] B65D *83/14*

U.S. Cl. 222—190 **10 Claims**

1. A static whipping device for intermixing of whippable, edible liquid food product and a propellant gas under pressure comprising:

a pressure container having a top and a bottom;

passageway means for introducing a propellant gas into the pressure container and for passing a mixture of whippable, edible liquid food products and a propellant gas from the

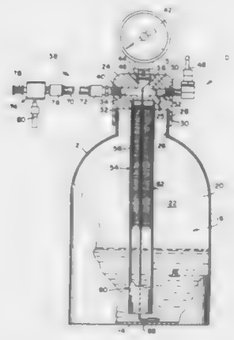
container, said passageway means being adjacent the top of said container;

a static means disposed inside said container for intermixing the whippable, edible liquid food products and the propellant gas comprising:

an elongated tubular member having one end connected to said passageway means and the other end being open and extending to a point adjacent the bottom of said container;

an internal mixer means disposed within said tubular member adjacent the top of said container and extending a predetermined length toward the other end of said tube;

an aperture disposed in said tubular member adjacent said internal mixer means for introducing a limited amount of propellant gas into said internal mixer means within said



tubular member from said container, said aperture being disposed in the upper portion of the elongated tubular member and in communication with the propellant, whereby when dispensing, the pressurized whippable, edible liquid is caused to flow through the tubular member and the internal mixer means and past the aperture where it is intermixed with a flow of said propellant gas through said aperture to thereby agitate and intermix with said whippable, edible liquid, said agitation and intermixing continuing through said tubular member to produce an intimate mixture of gas and whippable, edible liquid; and

means for dispensing whipped, edible food products disposed outside of said container and in fluid flow communication with said passageway means and said static means.

4,993,600

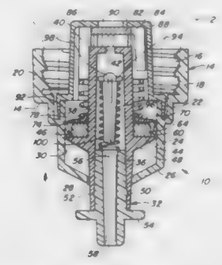
LIQUID DISPENSER PUMP

Council A. Tucker, Mebane, N.C., and Jimmie L. Whittington, Diamond Bar, Calif., assignors to James River Corporation, Oakland, Calif.

Filed Oct. 10, 1989, Ser. No. 419,334

Int. Cl.[5] B65D *88/54*

U.S. Cl. 222—321 **6 Claims**



1. A liquid dispenser pump adapted for attachment to a container and for delivering liquid from the interior of said container, said pump comprising, in combination:

cap means for attaching said pump to said container, said cap means including a peripheral wall at least partially defining a pump housing interior in fluid-flow communication with the container interior when said cap means is attached to said container, said cap means defining an aperture leading to said pump housing interior;

piston means projecting through said aperture into said pump housing interior and displaceable between a first position and a second position, said piston means defining a passageway extending therethrough between a piston inlet opening located within said pump housing interior and a piston outlet opening located exteriorly thereof;

seal means disposed about said piston means and including a resilient seal wall, said seal means being movable with said piston means and slidable along said peripheral wall when said piston means moves between said first and second positions, said seal means comprising a cup seal including a seal body in substantially fluid-tight communication with said piston means and disposed between said piston means and said resilient seal wall, said resilient seal wall including a distal end spaced from said seal body and having an outer surface in engagement with said peripheral wall;

reinforcement means for urging said resilient seal wall into substantially fluid-tight engagement with said peripheral wall, said reinforcement means comprising a reinforcement member in engagement with said seal wall distal end and resisting displacement of said seal wall distal end away from said peripheral wall, and said reinforcement member comprising an apertured core element disposed about said piston means in at least partial registry with said seal body and a plurality of discrete contact fingers radiating outwardly from said core element and having free ends in engagement with said seal wall distal end at spaced locations thereon; and

valve means operatively associated with said piston means and responsive to movement of said piston means to dispense liquid through said passageway and out said outlet opening when said piston means moves from said first position to said second position.

4,993,601

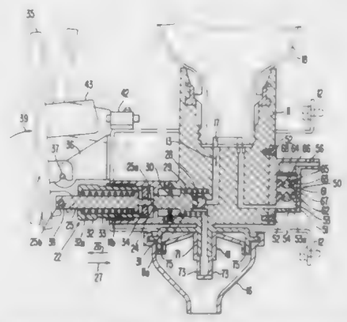
DISPENSING UNIT COMPRISING A GAS PATH IN WHICH A BEVERAGE IS EFFECTIVELY PREVENTED FROM A COUNTERFLOW THEREOF

Shunichi Nakayama, Takasaki, and Yasushi Takayanagi, Akabori, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Nov. 13, 1989, Ser. No. 434,784

Int. Cl.[5] B67D *5/56*

U.S. Cl. 222—394 **7 Claims**



1. In a dispensing unit for dispensing a syrup contained in a bottle having an outlet portion defining a bottle opening, in-

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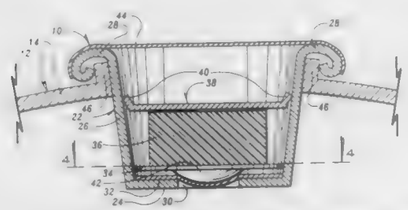
cluding a unit body having an upper surface and a side surface adjacent to said upper surface, said upper surface being for receiving said outlet portion, said unit body defining a gas path which extends between said upper and said side surfaces for supplying gas into said bottle through said bottle opening to exclude said syrup from said bottle with pressure raised in said bottle, said dispensing unit further comprising valve means coupled to said gas path for controlling a flow of said syrup in said gas path, the improvement wherein said gas path extends along a substantial U-shape, said valve means comprising a plurality of check valves placed in said gas path in series, each of said check valves being for preventing a counterflow of said syrup in said gas path.

4,993,602

PRESSURE RELIEF DEVICE FOR A PRESSURIZED CONTAINER

Donald P. Casey, Indian Shores, Fla., assignor to PRD, Inc., Clearwater, Fla.

Filed Jun. 7, 1989, Ser. No. 362,769
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—396 **14 Claims**



1. A pressure relief device for a normally vertical pressurized container having a top wall, a bottom wall, an interconnecting vertical sidewall, and valve means mounted on the container for selectively dispensing the contents of the container, the device comprising:

a base member mounted in one wall of the container apart from the valve means, and having a hole therein to provide communication between the interior of the container and the atmosphere;

sealing means in said base member positioned over said hole;

a compressible elastomeric element in said base member positioned over said sealing means; and

retention means for retaining said sealing means and elastomeric element in said base member whereby the sealing means is normally in sealing engagement with said hole in said base member so as to prevent communication between the interior of the container and the atmosphere, and whereby the elastomeric means compresses to allow the sealing means to yield from said hole upon the rise of pressure in the container to a predetermined cracking pressure and thereby provide communication between the interior of the container and the atmosphere for releasing pressure from the container,

said sealing means including a sealing membrane adjacent said bottom lower portion of said base member,

a sealing washer positioned over said sealing membrane, said sealing washer having opposite upper and lower surfaces, and a central convex dome on said lower surface for seating said sealing washer over said hole,

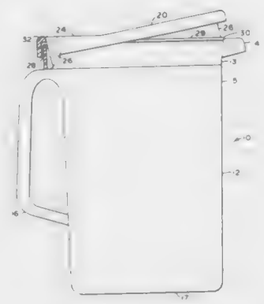
said lower surface normally maintaining said sealing member in sealing engagement with said bottom wall portion of said base member, with said dome deforming said sealing membrane into said hole in said base member.

4,993,603

FOOD STORAGE CONTAINER

Marlan H. Polhemus, Chicago, Ill., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 12, 1990, Ser. No. 464,516
Int. Cl.[5] B65D *43/02, 43/06*
U.S. Cl. 222—472 **20 Claims**



1. An easy-opening, substantially liquid-tight food storage container having pour-accommodating means, comprising:

(a) a container body having substantially upright walls, said walls having an upper rim portion and a bottom portion, said upper rim portion having an inner surface and an outer surface; and

(b) a removable lid, said lid comprising:

(i) a cover section having an upper surface and a lower surface;

(ii) a plug section integral to said lower surface of said cover section, said plug section having an outer peripheral surface adapted to substantially conform to the inner surface of said upper rim portion of said container body walls for providing a close conforming fit when said lid is installed on said container body; and

(iii) a lip integral to said cover section, said lip spaced apart from said outer peripheral surface of said plug section, wherein said lip combines with said lower surface of said cover section and said outer peripheral surface of said plug section to form a track, said track having a pair of rocker points located at a distance from a centerline of said lid;

whereby said rocker points are effective to release said lid from a closed position when a downward force is exerted upon the upper surface of said cover section of said lid.

4,993,604

LOW-COST POST-MIX BEVERAGE DISPENSER AND SYRUP SUPPLY SYSTEM THEREFOR

Loraine E. Gaunt, Marietta; Samuel C. Crosby, Decatur; William J. Saunders, Stone Mountain, and Robert D. Bruffey, Jr., Lilburn, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 775,833, Sep. 13, 1985, Pat. No. 4,635,824.
This application Aug. 28, 1986, Ser. No. 901,146
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—481.5 **10 Claims**

1. An apparatus for dispensing liquids with a controlled rate of flow comprising:

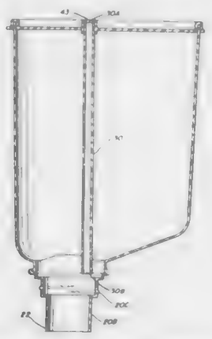
a container with an open top end, a bottom end with a discharge opening therein and sidewalls connecting said top and bottom ends, said container having a rim for defining said open top end;

a flow rate control tube having a top open end adjacent the open top end of said container and an open bottom end disposed at a predetermined distance directly above said discharge opening, said tube establishing atmospheric pressure at said open bottom end thereof;

a removable lid of thin, flexible plastic having sealing means for forming an hermetic seal between the lid and said rim defining said open top end, said lid being removable for refilling purposes;

means, provided in said removable lid, for supporting said flow rate control tube within said container, wherein said means for supporting includes a socket integrally formed with said removable lid, for receiving and supporting the top open end of said flow rate control tube, said socket having an aperture therein for communication with the atmosphere and said top open end of said tube; and

a normally-closed, spring-biased valve in said discharge opening having actuator means for opening said valve when an external force is applied thereto.

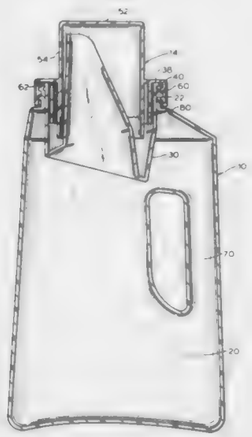


4,993,605

CLOSURE ASSEMBLY WITH POURING SPOUT AND MEASURING CUP

Salvatore N. Del'Re, Marlboro, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Nov. 16, 1988, Ser. No. 272,154
Int. Cl.[5] B65D *47/40*
U.S. Cl. 222—545 **11 Claims**



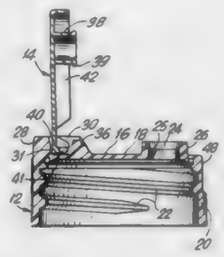
1. A closure assembly for a container having a neck comprising a pouring spout having a tapered body receivable within said neck, first means on said tapered body for resiliently engaging said neck and forming a seal therewith when press-fitted into said neck, the upper edge of said neck being beveled, said tapered body having an outwardly extending peripheral lip having a continuous protrusion thereon and closure means for engaging the peripheral lip of said pouring spout and urging said peripheral lip and continuous protrusion into sealing engagement with said closure means, said peripheral lip being resilient whereby it can move downwardly upon contact by said closure means into the beveled region of said neck to assure said sealing engagement.

4,993,606

DISPENSING CLOSURE

Robert J. Bolen, Jr., 10 Gwynn Ct., Closter, N.J. 07624, and Thomas R. Bolen, 64 Wheeler Ave., Westwood, N.J. 07675

Continuation of Ser. No. 214,676, Jul. 1, 1988, abandoned. This application Mar. 15, 1990, Ser. No. 493,828
Int. Cl.[5] B65D *47/08*
U.S. Cl. 222—546 **39 Claims**



1. In a dispensing closure for a container, the closure comprising (A) a generally circular base having an upper surface with a front section, a dispensing orifice in the front section of the upper surface and an annular skirt depending downwardly from the upper surface and adapted to engage and secure the base to the container, and (B) a separate lid adapted to be pivotally assembled to the base and having a plug on its underside for sealing the dispensing orifice, the improvement which comprises: an elevated rear land disposed above and extending across the upper surface of the base opposite the dispensing orifice and joined tot he front section of the base by an abutting wall transecting the upper surface of the base, a pivot recess defining an opening in the surface of the elevated rear land and disposed within the elevated rear land which is adapted to pivotally receive the lid, and said lid having a generally circular front section and a rearwardly extending, downwardly depending pivot post adapted to frictionally engage the pivot recess in the elevated rear land.

4,993,607

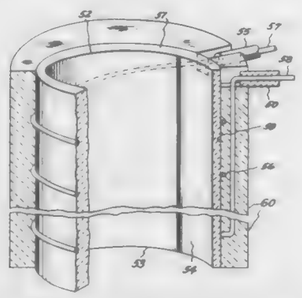
TRANSFER TUBE WITH INSITU HEATER

Milivoj K. Brun, Ballston Lake; Marcus P. Borom, Schenectady; Steven A. Miller, Amsterdam; Lawrence E. Szala, and Paul S. Svec, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 377,387, Jul. 10, 1989. This application Apr. 23, 1990, Ser. No. 513,124
Int. Cl.[5] B22D *35/06*
U.S. Cl. 222—590 **19 Claims**

1. A process for producing an integral transfer tube useful for transfer of molten metal comprised of a high density hollow tube, a continuous elongated heating element and a polycrystalline shell with a maximum density of about 80% of theoretical, said heating element being comprised of a heating wound portion and two end portions wherein the wound portion is in direct contact with the outer surface wall of said high density tube and wherein at least a sufficient amount of said end portions are exposed for electrical attachment, said shell surrounding said wound portion of said heating element and the outer surface wall of said high density tube leaving no

significant portion thereof exposed, which comprises providing a high density polycrystalline hollow tube having a density of at least about 90% of its theoretical density and being comprised of ceramic oxide, providing a continuous elongated heating element comprised of a metal or metal alloy having a melting point higher than 700° C. and at least 200° C. higher than the temperature of use of said transfer tube, forming a structure comprised of said high density tube and said heating element wherein said wound portion of said heating element is in direct contact with said wall of said high density tube and said end portions extend therefrom sufficiently to expose a sufficient amount thereof from said transfer tube for electrical attachment, providing particulate ceramic oxide material which sinters to form said shell, providing a mold having a closed end portion and an open end portion and an inner wall sufficient to enable formation of said shell of said transfer tube,



disposing said structure in said mold to form between the outer surface wall area of said structure and said inner wall of said mold a space for receiving said shell-forming particulate material, depositing said shell-forming particulate material in said space between said structure and inner wall of said mold to form a body of freely deposited particulate material, said shell-forming particulate material being deposited in an amount sufficient to form said shell, heating the resulting assembly to a temperature at which said shell-forming material sinters to produce said transfer tube, said sintering being carried out in an atmosphere or a partial vacuum which has no significant deleterious effect on said assembly, said mold having no significant deleterious effect on said transfer tube, said wound portion of said heating element being electrically characterized as having an electrical resistance and a surface area sufficient to preheat and maintain said high density tube at a temperature within 300° C. of its temperature of use.

4,993,608

POURING TUBE FOR THE INTRODUCTION OF METALLIC MELT INTO A STRIP-CASTING MOLD

Hans-Otto Thörner, Meerbusch, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 3, 1989, Ser. No. 333,244

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811751

Int. Cl.[5] B22D *41/50*

U.S. Cl. 222—607 **13 Claims**

1. Apparatus for providing metallic melt from a melt source to maintain a predetermined melt level in a strip casting mold which processes a continuous stream of melt in a strip-casting direction into a cast strip, said mold having a funnel-shaped pouring area formed of an opposing pair of broad side walls, at least a portion of said broad side walls tapering towards each other in a downstream direction and an opposing pair of narrow side walls, said mold further having a strip casting area located downstream of said pouring area, said apparatus comprising:

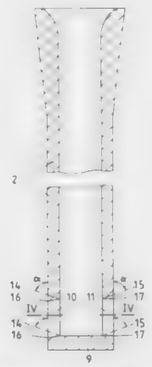
tubular pouring means for conveying said melt stream to said mold pouring area, said pouring means having:

a first axial end connected to said melt source;

a second, closed axial end positioned below said predetermined melt level;

an oval cross section with a wall having sections of a first curvature and sections of a second curvature greater than said first curvature; and

opposing symmetrical groups of discharge ports located adjacent to said second axial end and extending through said wall sections with said second curvature, each of said groups of discharge ports including a central dis-



charge port circumferentially flanked by a pair of side discharge ports, said pouring means being oriented in said pouring area so that said groups of discharge ports face said opposing narrow mold side walls whereby said groups of discharge ports split said melt stream into a plurality of separate melt substreams which flow away from said puring means with kinetic energy towards said narrow mold side walls and said energy of each of said plurality of melt substreams is dissipated within said pouring area before said each substream impinges against any of said mold side walls.

4,993,609

WHEEL ENCLOSURE

Ronald T. Flint, Irvine, Calif., assignor to B/T Western Corporation, Newport Beach, Calif.

Filed Jan. 30, 1989, Ser. No. 303,839

Int. Cl.[5] B62D *43/02*

U.S. Cl. 224—42.2 **17 Claims**



17. An enclosure for encapsulating a wheel, wherein said wheel includes a tire and wheel rim, comprising:

said enclosure having a cylindrical shape with a straight, cylindrical side wall and circular end closures whose inner diameter and height are greater than said wheel to form a cavity within which said wheel may be placed;

said enclosure separated in said side wall along a planar, elliptical parting line to form front and rear container halves;

said elliptical parting line in said rear container half forming a mounting shelf in the lower most cylindrical side wall upon which said wheel may rest and a wheel accessible opening in the uppermost cylindrical side wall for easy removal of said wheel;

said front and rear container halves have tapered edges within said cylindrical wall at said parting line to ensure an interfitting of said halves to form said enclosure;

said halves securely held together by a latching mechanism which utilizes two latch arms on opposite sides of one of said container halves and two keepers on opposite sides of the other container half;

said rear container half of said enclosure includes a frustum constructed in the center of said circular end closure thereof;

said lower most cylindrical side wall having a section removed from draining moisture from said enclosure;

said wheel adapted to be secured to said frustum cone through a series of apertures in said cone which enable the alignment of said wheel;

said enclosure adapted to be mounted by use of said cone; and

said apertures in said frustum cone oriented to ensure said wheel rests upon said lowermost cylindrical side wall.

4,993,610

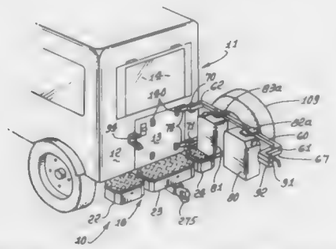
PROTECTIVE BOX BUMPER AND ASSOCIATED MOVABLE FRAME, ON VEHICLE

Edward V. Abretske; Joseph M. Abretske, and Anthony I. Abretske, all of West Covina, Calif., assignors to Canyon City 4×4, Azusa, Calif.

Filed Feb. 12, 1990, Ser. No. 478,620

Int. Cl.[5] B62D *43/02;* **B60R** *11/06*

U.S. Cl. 224—42.004 **12 Claims**



1. Heavy duty protective apparatus mounted at the rear of a vehicle, comprising

(a) metal container means and extending laterally of a vehicle to serve as a bumper, the container means forming interior space to receive and transport equipment such as tools and the like, the interior space opening downwardly sufficiently to be washed out by draining water downwardly,

(b) and a protective frame unit extending laterally of the vehicle rear, above the container means, and forming protected space between the frame unit and vehicle rear to receive other equipment,

(c) the frame unit mounted to the vehicle to be guided for rearward movement away from the vehicle rear to provide access to the vehicle rear,

(d) the vehicle having hinge structure for a vehicle body rear door that is accessible when the frame unit is moved rearwardly away from the vehicle rear, the frame unit mounted on said hinge structure to be swung away from the vehicle body rear door.

4,993,611

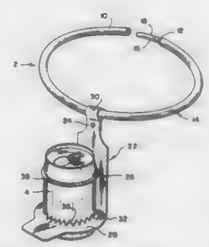
BEVERAGE CONTAINER SUPPORT

Rocco Longo, 485 Garfield Ave., Carnegie, Pa. 15106

Filed Oct. 28, 1988, Ser. No. 264,473

Int. Cl.[5] A45F *4/00*

U.S. Cl. 224—148 **8 Claims**



1. An apparatus for supporting a beverage container on the person of a user in order that the user may imbibe the beverage, comprising:

a. a primary support member which may be supported on the person of the user, said primary support member comprising an arcuate portion;

b. a flexible container support member comprising:

(1) a first leg attached at one end thereof to said arcuate portion for rotation around and movement along said arcuate portion; and

(2) a second leg attached to the other end of said first leg for movement relative thereto between one position which is substantially parallel to said first leg and another position which is substantially perpendicular to said first leg, said second leg including means for holding said container; and

c. means for stabilizing said container, said means for stabilizing being attached to said first leg.

4,993,612

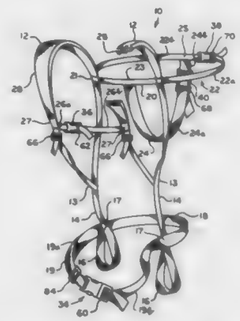
PORTABLE BACK CARRIER FOR CARRYING A PERSON

Robert J. Quimby, Sr., and Michael S. Quimby, both of 1351 Todd Farm, Apt. 202, Elgin, Ill. 60123

Filed Oct. 13, 1989, Ser. No. 420,924

Int. Cl.[5] A61G *1/00*

U.S. Cl. 224—160 **17 Claims**

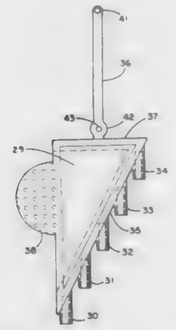


1. A portable back carrier for carrying a person, comprising flexible generally nonextendable strap means formed to the combination of a pair of shoulder loops adapted to fit over the shoulders of the carrying person, a pair of load links respectively connected one each off of the shoulder loops, and a pair of foot loops respectively connected one each off of the load links; the strap means being proportioned to locate the load

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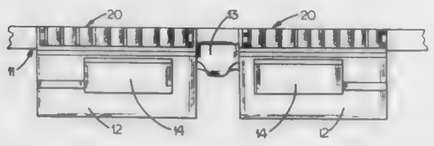
link connections off of the shoulder loops in the region generally underlying the carrying person's armpits and shoulders and the load links and foot loops depending therebelow and being along the sides of the carrying person, whereby a carried person can fit his/her feet into the foot loops and be supported thereby by standing adjacent the back of the carrying person while facing in the same direction as the carrying person, and the flexible shoulder loops generally assuming teardrop shapes around the shoulders to the load link connections; and strap means connected between the shoulder loops adjacent the back of the carrying person for providing upper body support of the carried person.

4,993,613
GOLF TEE HOLDER
James D. Frisbie, 8450 Dygert, Alto, Mich. 49302
Filed Jun. 12, 1989, Ser. No. 364,642
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—251 **1 Claim**



1. A golf tee holder, comprising:
a right-triangular body portion having a short side and a long side;
means for suspending said body portion from a support;
said suspending means attached to said short side of said body portion at a central portion on said short side, thereby positioning said short side horizontally;
said long side having a top at its intersection with said short side;
a plurality of separately depending tubular receptacles sized to frictionally hold a golf tee;
said receptacles being molded integrally on said long side of said body portion, a first of said receptacles being positioned at said top of said long side, with each subsequently positioned receptacle spaced along said long side and extending downwardly beyond the previously-positioned receptacle.

4,993,614
POCKET MEMBER FOR TOOL BELT
William F. Bonofiglo, 2033 Coronado SE., Grand Rapids, Mich. 49506
Filed Jan. 16, 1990, Ser. No. 465,347
Int. Cl.[5] A45F *5/02*
U.S. Cl. 224—253 **7 Claims**



1. A belt type tool holder of the type to be worn around the waist of the user, said tool holder having a belt to be worn around the user's waist; a tool caddy, said caddy having a backing member of approximately the width of the belt and a length of less than one half of the length of the belt, said backing member having a back face which faces the belt; a web formed into a plurality of closely spaced loops and means securing said web to said backing member at both web ends and between each pair of adjacent loops, said web being of an elastic material whereby each loop can be individually stretched to tension it when a tool is inserted partially through the loop, means for detachably securing said backing member to said belt whereby the tool caddy and the tools it is supporting can be removed together by detachment of the backing member from the belt.

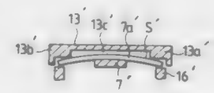
4,993,615
ANCHORAGE DEVICE
Jan-Ivar Arvidsson, Hillerstorp, Sweden, assignor to Industri AB Thule, Hillerstorp, Sweden
Filed Apr. 29, 1988, Ser. No. 188,218
Int. Cl.[5] B60R *9/00, 9/04*
U.S. Cl. 224—309 **20 Claims**

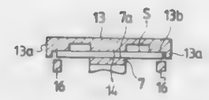


4. An anchorage device for a load carrier to be mounted on a vehicle roof, comprising:
load bearing means extending over the vehicle roof for carrying a load;
foot means provided at opposite end portions of the load bearing means for fastening the load bearing means to the vehicle;
two plate-like support members pivotally connected to each foot means, said support members having vehicle abutting support surfaces at their lower edges;
anchorage means provided on each foot means for retaining the foot means on the vehicle; and
means for operating the anchorage device, said operating means including a lever connected to said plate-like support members for concurrently pivoting said support members about respective axes so as to pivot the anchorage means into and out of a locking position, said operating means including a resilient member that is compressed when said anchorage device is in the locking position so that suitable tensioning is obtained.

4,993,616
ELECTRIC STAPLER CARTRIDGE
Toru Yoshie; Yuji Sakurazawa, and Mitsuteru Kurosawa, all of Tokyo, Japan, assignors to Max Co., Ltd., Nihonbashi, Japan
Filed Oct. 24, 1989, Ser. No. 425,691
Claims priority, application Japan, Oct. 25, 1988, 63-138693[U]; Apr. 4, 1989, 64-39801[U]
Int. Cl.[5] B27F *7/21*
U.S. Cl. 227—120 **6 Claims**

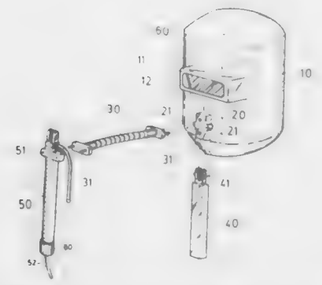
1. A staple sheet cartridge for dispensing staple sheets of predetermined thickness, adapted for use with a staple' machine, having means on the staple machine for positioning said staple cartridge on the staple machine and a conveying means located at a predetermined position, comprising:
a staple sheet accommodating section comprising,
a front wall wherein a staple sheet let-off opening is formed in the lower portion of said front wall so as to allow the staple sheets to exit from said accommodating section,
two side walls having staple sheet supporting members extending along the lower edges of said side walls and at right angles to said walls so as to hold the staple sheets from exiting the open bottom of said accommodating section and,
a rear wall,





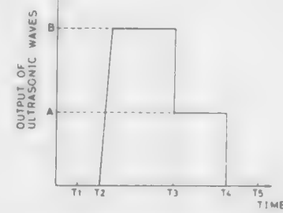
a guide member extending froward from the lower end of the outer surface of said front wall with a top portion covering the top of the staple sheet while in conveyance and guide surfaces for guiding the sides of the staple sheet along a staple sheet conveying means, and
a retaining protrusion formed on a lower surface of said top portion of said guide member between said guide surfaces and directly opposite the predetermined position of the conveying means, in such a manner that when said cartridge is mounted on the staple machine the distance between the upper surface of the conveying means and the bottom of said retaining protrusion is less than, or equal to, said predetermined thickness.

4,993,617
STRUCTURE OF HEAD SHIELD FOR WELDING PLIERS
Chin-Pou Yang, Changhua Hsien, Taiwan, assignor to Liso, Su-Land, Taipei, Taiwan
Filed Nov. 13, 1989, Ser. No. 436,012
Int. Cl.[5] B23K *9/32*
U.S. Cl. 228—57 **5 Claims**



1. A welding apparatus; comprising a protective portable head shield having an upper end and a lower end; a viewing window located in an upper portion of the shield;
an elongated flexible articulated tube; a first mechanical connection between one end of said articulated tube and said shield at a point on the shield located below the viewing window; a welding rod pliers having a pair of jaws adapted to grip a welding rod, and an elongated handle having means for thereon operating the jaws;
an electric cable extending through the cable to the jaws for supplying current to a welding rod while it is in the grip of the jaws; and a second mechanical connection between the handle and the other end of the flexible articulated tube; said articulated tube extending angularly away from the handle, such that the person operating the apparatus can look through the viewing window and observe the welding rod while holding the pliers to perform a welding operation; said head shield being supported entirely by the articulated tube and the pliers; said articulated tube being transversely bendable in a range of different directions for changing the sight line from the viewing window to the tip of the welding rod.

4,993,618
WIRE BONDING METHOD
Kenji Toyozawa, Nara, and Takamichi Maeda, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 27, 1989, Ser. No. 386,519
Claims priority, application Japan, Aug. 5, 1988, 63-196375
Int. Cl.[5] B23K *20/10*
U.S. Cl. 228—102 **11 Claims**



1. A wire bonding method for connecting a pad of a semiconductor chip and an inner lead with a bonding wire, comprising the steps of:
pressing a ball formed on an end of the bonding wire to the pad; and
applying ultrasonic waves to the ball to bond the ball to the pad by:
(A) commencing said applying of ultrasonic waves to the ball at a first amplitude comprising a maximum amplitude at which the ultrasonic waves are applied to the ball in said wire bonding method;
(B) reducing the amplitude at which the ultrasonic waves are applied to the ball from said first amplitude to a second amplitude, wherein said second amplitude is in the range of 1/6 to ½ of said first amplitude; and
(C) further reducing the amplitude at which the ultrasonic waves are applied to the ball from said second amplitude to substantially zero amplitude in a single stepwise reduction so as to thereby discontinue said applying of ultrasonic waves to the ball.

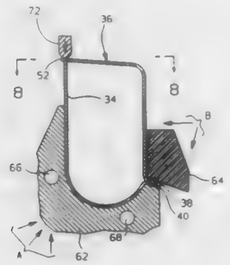
VOL 1123 ISS 3 FE 19 1991 UMI

4,993,619

JOINT AND METHOD FOR SINGLE SIDE WELDING AND SELF-FIXTURING OF CLOSED STEEL SECTIONS

Alfred L. Krease, Jr., Romeo, and Gregory L. Nagel, Berkley, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 386,669, Jul. 31, 1989, abandoned. This application Aug. 20, 1990, Ser. No. 569,486
Int. Cl.[5] B23K *33/00*
U.S. Cl. 228—135 4 Claims



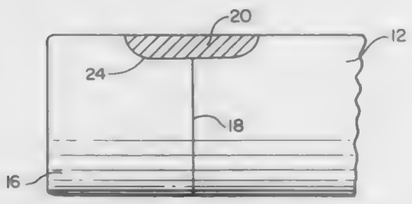
1. A method of joining together two sheet metal panels to form a closed box-section structure, comprising:
stamping each of the two panels to provide a flange along one edge of each panel and a toothed edge of alternating notches and tabs along the other edge of each panel,
assembling the two panels in box-section forming relationship with the flanges of the two panels abutting one another and the toothed edges abutting one another with the tabs of the one panel interdigitating with the tabs of the other panel,
clamping the two panels to retain the interdigitating relation of the tabs and to retain the flanges in abutting relationship,
and welding the panels together at the interdigitating tabs and at the flanges to form a closed box-section structure.

4,993,620

SOLDER-ELECTROFORMED JOINT FOR PARTICLE BEAM DRIFT TUBES

Michael G. Kornely, Jr., Centerport; Robert G. Micich, Bethpage, and Douglas S. Holmes, Shirley, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 3, 1990, Ser. No. 518,441
Int. Cl.[5] B23K *31/02, 101/36*
U.S. Cl. 228—169 8 Claims



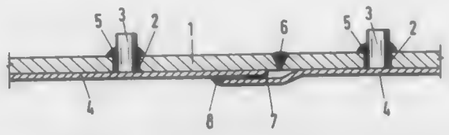
1. A method for sealing an interface existing between two abutting members comprising the steps:
machining a recess in each member, the recess extending outwardly of its interface surface;
positioning the members together wherein the recesses of the members mate to form a single continuous recess across the interface;
soldering the interface surfaces of the members with low melting temperature solder; and
electrodepositing metal into the continuous recess thereby electroforming a strap around the interface which metallurgically bonds with both members to seal the interface.

4,993,621

METHOD OF PROTECTING CORROSION-SUSCEPTIBLE WALLS AGAINST CORROSION

Hermann Koy, Alzenau-Albstadt, and Rainer Reuffurth, Offenbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,381
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840842
Int. Cl.[5] B23K *31/02, 101/18*
U.S. Cl. 228—173.6 13 Claims



1. A method of protecting a steel wall against corrosion which comprises the steps of:
(a) providing a corrosion-susceptible steel wall to be protected against corrosion with a plurality of bores with predetermined distances apart;
(b) applying a plurality of corrosion-resistant steel sheets against a surface of said corrosion-susceptible steel wall on a side thereof facing a space receiving a corrosive medium and overlapping said sheets at respective edges;
(c) inserting respective studs into each of said bores from an opposite side of said corrosion-susceptible steel wall into contact with said sheets so that said studs project away from said sheets beyond said opposite side of said wall and have free ends remote from said sheets;
(d) stud-welding each of said studs to said sheets;
(e) securing each of said studs gas tightly to said wall at said opposite side; and
(f) welding the overlapping sheets together and said respective edges.

4,993,622

SEMICONDUCTOR INTEGRATED CIRCUIT CHIP INTERCONNECTIONS AND METHODS

Richard M. Brook, Sherman, and Thomas H. Ramsey, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 43,290, Apr. 28, 1987, abandoned. This application Feb. 9, 1988, Ser. No. 157,090
Int. Cl.[5] B23K *20/22, 101/40*; H01L *21/603*
U.S. Cl. 228—179 47 Claims

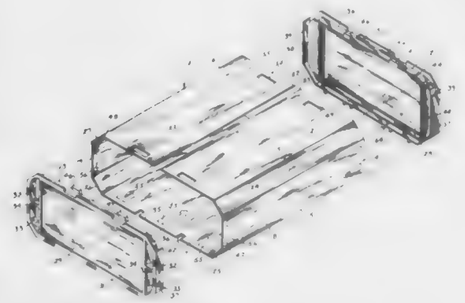
1. An electrical connection of a wire to a bonding pad, comprising:
(a) a semiconductor chip having a copper doped aluminum bonding pad thereon; and
(b) a copper doped gold wire bonded to said bonding pad wherein said wire has from more than 100 to about 10,000 parts per million copper and the remainder substantially all gold.

4,993,623

PRODUCE CONTAINER OR THE LIKE

Peter C. Kelly, Neenah; Donald E. McGillan, Milwaukee; Russell L. Johnson, Weyauwega; Edward M. Kaucic, Watertown, and Richard R. Masten, Jr., Neenah, all of Wis., assignors to Menasha Corporation, Neenah, Wis.

Filed Sep. 21, 1989, Ser. No. 410,438
Int. Cl.[5] B65D *6/00*
U.S. Cl. 229—23 R 21 Claims



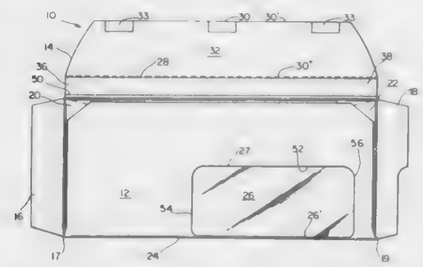
1. A container comprising:
a body having two parallel cap engaging edges and two parallel free edges at right angles to said engaging edges, said body provided with at least two fold lines parallel to said free edges, said body being foldable along said fold lines to form an open ended container wherein said cap engaging edges lie in parallel planes which are perpendicular to said fold lines; and
two end caps engageable with said folded body so as to close open ends of said open ended container and said cap engaging edges of said body being mechanically engaged with said end caps by releasable locking means operatively associated with cap engaging edge portions and said end caps to maintain edges of said body in contact with said end caps so as to impart a high degree of stiffness to said container when assembled, said releasable locking means including locking strips that abut against both a catch tooth and an opposing wall.

4,993,624

TWO-WAY BAR CODE WINDOW ENVELOPE

John H. Schlich, Louisville, Ky., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Apr. 26, 1990, Ser. No. 514,953
Int. Cl.[5] B65D *27/04, 27/06*
U.S. Cl. 229—71 8 Claims



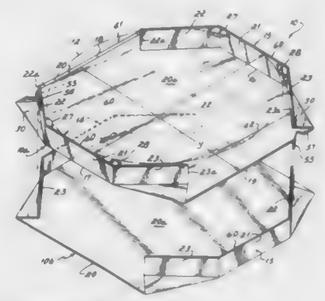
1. A barcode-visible window envelope including a substantially rectangular front panel having a top edge, first and second side edges and a bottom edge, a substantially rectangular window in said panel, said window including a window bottom edge partly coextensive with said front panel lower edge, and
further including a facing identification mark printed on said front panel.

4,993,625

TRAY

Ralph E. Stease, and Kevin A. Gorsuch, both of Cincinnati, Ohio, assignors to Honeymoon Paper Products, Ohio

Filed Apr. 4, 1990, Ser. No. 504,615
Int. Cl.[5] B65D *5/20*
U.S. Cl. 229—109 32 Claims



1. A tray comprising
a floor,
a pair of opposed side walls each being oriented at a generally right angle relative to said floor, each of said side walls being foldably connected along a base edge to said floor,
a corner wall foldably connected to each end edge of each side wall, each corner wall being oriented at a generally right angle relative to said floor, each corner wall also being oriented at an angle relative to its connected side wall,
a set up panel foldably connected to a bottom edge of each corner wall, said set up panel also being foldably connected to said floor, said set up panel overlying said floor panel in flush relation when its associated corner panel is oriented at a generally right angle relative to said floor, and
a fastener system that directly connects each set up panel with said floor, said fastener system functioning to retain said side walls and said corner walls in generally right angular position relative to said floor, thereby forming a tray with opposed side and corner wall pairs that cooperate to retain a product therebetween on said floor even when said tray is somewhat tipped relative to horizontal.

4,993,626

SECURITY MAILBOX

Gerald W. Berry, Rural Rte. 1, Box 125, Maynard, Iowa 50655

Filed May 29, 1990, Ser. No. 530,902
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—17 5 Claims

1. A mail comprising:
a mail housing means;
a moveable shelf inside the housing means dividing the housing means into upper and lower compartments, the shelf being moveable between a substantially horizontal mail rest position and a downwardly angled mail drop position;
a connection means between the shelf and housing means for providing pivotal movement of the shelf about a generally horizontal axis between the mail rest and mail drop position, and allowing slideable movement along the horizontal axis;
a mail a signal arm operatively connected to the shelf outside

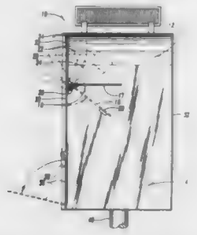
VOL 1123 ISS 3 FE 19 1991 UMI

the housing, movement of the arm causing responsive movement of the shelf;

the connected combination of the arm and shelf having a center of gravity urging the shelf to pivot from the mail rest to the mail drop position;

a first stop member on the housing corresponding to the mail rest position for the shelf;

a second stop member inside the housing corresponding with the mail drop position for the shelf;



the first stop member impeding pivotable movement of the arm and holding the shelf in the mail rest position when the arm is positioned substantially adjacent to the housing;

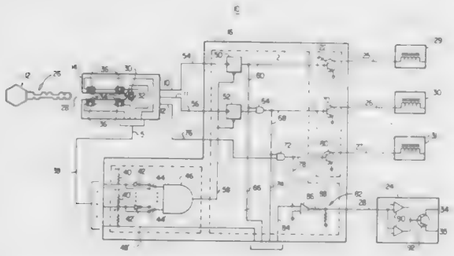
the seconded stop member impeding pivotable movement of the shelf and holding the shelf in the mail drop position when the arm is slideable moved to a position farther away from the housing so that the arm can pivot past the first stop member.

4,993,627

ELECTRONICALLY CONTROLLED LOCKING MECHANISM

Michael D. Phelan, 100 Eagle Nest, Irving, Tex. 75063, and Keith N. St. John, 2006 Sunset Ct. N., League City, Tex. 77573

Filed May 2, 1989, Ser. No. 346,399
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—382 14 Claims



1. An electrical security system comprising:

a multiple-position code receiver switch means including means for receiving an operating code and a code sensing means for outputting electrical signals indicative of a received code;

a first decision making means connected to the code sensing means for comparing the received code to a preset code and outputting a control signal indicative of a matching code to a first action means;

a first action means connected to the switch positions of the multiple position code receiver switch means for storing information as to positions thereof contacted, and to the first decision making means for receiving a control signal, and a second decision means connected to the first action means for determining responsive to receipt of a control signal by the first action means the sequential positioning of the multiple position switch through its positions and outputting a control signal indicative thereof; and

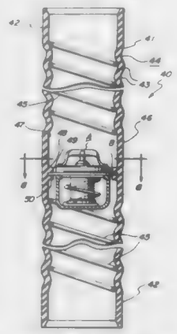
a second action means connected to the second decision making means and responsive to a control signal thereof for generating power at a working level for an electrically operated device.

4,993,628

RADIATOR HOSE WITH INTERNALLY MOUNTED THERMOSTAT

William J. Reynolds, 1410 E. 6th St., #33, Corona, Calif. 91719

Filed Apr. 30, 1990, Ser. No. 516,164
Int. Cl.[5] F01P *7/16*
U.S. Cl. 236—34.5 5 Claims



1. A temperature responsive fluid control apparatus for use with thermostatic valves of the type having a substantially cylindrical non-concave body portion and a thin radially outwardly projecting annular flange section of generally uniform thickness, said flange being longitudinally positioned between opposite transverse ends of said thermostatic valve, and said flange being of larger diameter than said body portion of said thermostatic valve, said apparatus affording means for replacing a thermostatic valve of said type normally retained between bolted-together mating metal engine fittings by the same type of thermostatic valve subsequently replaceable without the requirement for removing and installing bolts into said matching metal engine fittings, said apparatus comprising:

(a) an elongated flexible tube made of resilient material and having a generally circular cross-sectional shape, and

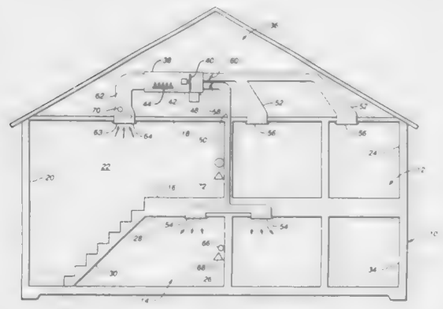
(b) means for retaining said thermostatic valve in a fixed longitudinal position within said tube, said means comprising an annular shoulder flange which projects radially inwards from and is integral with the inner wall of said tube, said shoulder flange having an inner cylindrical wall with a circular opening of larger diameter than the diameter of said body portion of said thermostatic valve and of smaller diameter than the outer diameter of said annular flange of said thermostatic valve, said shoulder flange further having a thin, annular groove extending radially outward from the inner cylindrical wall of said shoulder flange for receiving said annular flange of said thermostatic valve, whereby said body of said thermostatic valve may be inserted axially through said opening of said annular shoulder flange to seat said annular flange of said valve on said annular shoulder flange.

4,993,629

SYSTEM FOR MODIFYING TEMPERATURES OF MULTI-STORY BUILDING INTERIORS

Calvin R. Wylie, Fair Oaks, Calif., assignor to Beutler Heating and Air Conditioning, Inc., Sacramento, Calif.

Continuation-in-part of Ser. No. 345,728, May 1, 1989, Pat. No. 4,915,294. This application Mar. 5, 1990, Ser. No. 487,790
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—11 11 Claims



1. Apparatus for use in a building having upper and lower levels, each level including a floor, a ceiling, and walls between the floor and ceiling defining an interior, said apparatus adapted to modify the temperatures of said interiors and comprising, in combination:

air delivery means;

heat generating means;

first duct means providing air flow communication between said air delivery means and said upper and lower levels;

second duct means providing air flow communication between said upper level interior and said air delivery means;

first temperature sensing means for sensing the temperature of said lower level interior;

second temperature sensing means for sensing the temperature of said upper level interior; and

control means operatively associated with said air delivery means and said heat generating means for actuating said air delivery means to deliver air from said upper level interior to said lower level interior through said first and second duct means when a temperature differential of a first predetermined magnitude is sensed by said first and second sensing means and for actuating said heat generating means to heat the air delivered by said air delivery means to said lower level interior when a temperature differential of a second predetermined magnitude less than said first predetermined magnitude is sensed by said first and second sensing means.

4,993,630

SYSTEM FOR TEMPERING SPACES OF A BUILDING

Wolfgang Reichel, Iserlohn, and Hans H. Timmer, Erkrath, both of Fed. Rep. of Germany, assignors to Ingenieurbüro Timmer GmbH, Haan, Fed. Rep. of Germany

Filed Oct. 16, 1989, Ser. No. 422,096
Claims priority, application European Pat. Off., Mar. 9, 1989, 89104188.1
Int. Cl.[5] F24F *7/00*
U.S. Cl. 237—49 19 Claims

1. System for tempering spaces of a building with ceiling or wall constructions of metal or nonmetallic parts which are fastened to supporting or nonsupporting wall or ceiling of the spaces, in which through a heat transport medium conducted through the ceiling or wall construction the parts of the construction facing the interior space of the building are tempered, said system comprising:

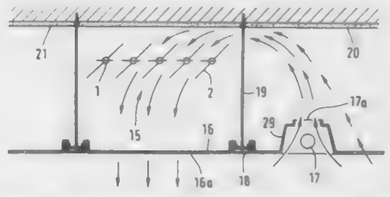
at least one pipeline (1) conducting the heat transport medium;

several heat transfer profiles (2) being arranged on said pipeline (1);

said heat transfer profiles (2) having a substantially rectangular, plate-form construction;

said heat transfer profiles (2) being spaced from one another or lying immediately one after another;

said heat transfer profiles (2) being joined to said pipeline (1) in a heat-conducting arrangement by clamping or metallically or in a one-piece construction with said pipeline (1);



an effective radiation and convection heat transfer surface of said heat transfer profiles (2) being greater than that of the wall or ceiling surface covered by the system;

said heat transfer profiles (2) being arranged as registers (15) over a suspended ceiling (16, 22) and below the ceiling or wall constructions; and

said suspended ceiling (16, 22) having air passages (16a) therethrough;

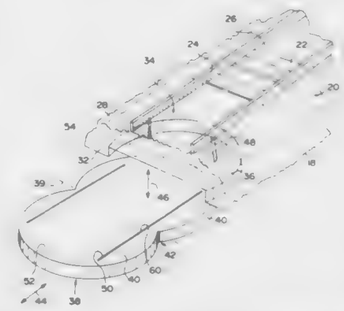
whereby the basic heat transfer of the system is effected by convection caused by said heat transfer surface of said heat transfer profiles (2) being greater than that of the wall or ceiling surface covered by the system.

4,993,631

MODEL TRAIN TRACK FOR ELECTRICAL MODEL TRAINS

Jörg Niehoff, Wissmannstr. 59, D-2870 Delmenhorst, Fed. Rep. of Germany

PCT No. PCT/DE87/00584, § 371 Date Jul. 13, 1989, § 102(e) Date Jul. 13, 1989, PCT Pub. No. WO88/04192, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 9, 1987, Ser. No. 372,345
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642350
Int. Cl.[5] A63H *19/30*
U.S. Cl. 238—10 B 13 Claims



1. A model train track for electrical model trains, comprising:

an oblong track body with a trapezoidal section and a ballast structure, at least two metal rails being fastened on railroad ties on a top of the track body, the track body having a bottom side serving as a support, and two end-facing

connection zones for electrical and mechanical connections, each of said two connection zones having a recess open toward the bottom side and toward a connection plane and a separate connecting member symmetrical to the connection plane, each said connection zone having only one recess, the recesses for said two connection zones being open only toward the bottom side and only toward the connection plane, said recess having undercuts that taper the recess toward the bottom side and toward the connection plane, the connecting member having two heads of identical shape, and said heads being insertable into the recess of the connection zone in an interlocking manner, the connecting member having contact surfaces that are electrically connectable to one another, and contact zones corresponding to the said contact surfaces being provided on the bottom side of the recesses of the track body, at least two of the said contact zones being electrically connected to the at least two rails.

4,993,632

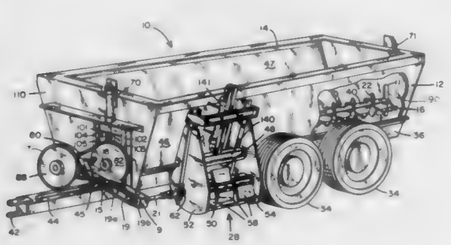
MANURE SPREADERS

Mervin G. Martin, Myerstown, Pa., assignor to Hedlund Manufacturing Co., Inc., Boyceville, Wis.

Continuation-in-part of Ser. No. 170,034, Jul. 10, 1980, abandoned, and a continuation-in-part of Ser. No. 172,976, Jul. 28, 1980, Pat. No. 4,362,272. This application Oct. 9, 1981, Ser. No. 310,046

Int. Cl.[5] A01C *23/00*

U.S. Cl. 239—7 **20 Claims**



1. An apparatus for transporting manure containing chunks of manure that may form a manure bridge over a conveying mechanism comprising a container for holding material, said apparatus including a conveying mechanism for moving manure along said conveying mechanism in said container to an area to be discharged, said apparatus including means to bite into and pull manure from the manure bridge over said conveying mechanism so that the manure in the manure bridge can be discharged from said apparatus.

4,993,633

HIGH VOLUME LOW PRESSURE AIR SPRAY GUN

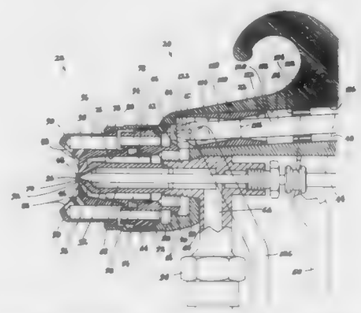
Robert R. Mellette, Jamestown, Colo., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Continuation of Ser. No. 306,517, Feb. 3, 1989, abandoned. This application May 22, 1990, Ser. No. 529,498

Int. Cl.[5] B05B *1/02, 1/30*

U.S. Cl. 239—8 **69 Claims**

1. A method of spraying liquid coating material, comprising the steps of providing liquid coating material to a fluid orifice in a spray head; supplying air to the spray head; delivering air supplied to the spray head to an atomizing air orifice in the spray head to atomize the coating material into a spray and to side port air orifices in the spray head for impingement against and to shape the spray; adjusting the volume flow rate of air delivered to the side port orifices to vary the shape of the spray; and, in response to and concurrently with performance of said adjusting step, adjustably controlling the volume flow rate of air supplied to the spray head in accordance with the volume flow rate of air delivered to the side port orifices for



maintaining substantially constant the volume flow rate and pressure of air delivered to the atomizing air orifice.

4,993,634

PROGRAMMABLE CHEMICAL APPLICATION SYSTEM

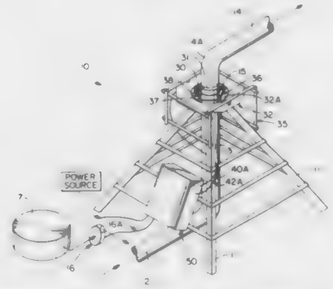
Clifford C. Hach, and Keith M. Gawlik, both of Loveland, Colo., assignors to Hach Company, Loveland, Colo.

Continuation-in-part of Ser. No. 227,707, Aug. 3, 1988, Pat. No. 4,878,614. This application Oct. 24, 1989, Ser. No. 426,055

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] A01C *23/04;* **A01G** *25/09*

U.S. Cl. 239—10 **19 Claims**



1. In combination with a center pivot irrigation system having a vertical water feed pipe, a horizontal sprinkler boom operably coupled to the upper end of said feed pipe by means of a rotatable connector, and an agricultural chemical supply means connected to said water feed pipe, wherein the improvement comprises:

(a) rotation sensor means operably connected to said rotatable connector and being adapted to determine the degree of rotation of said horizontal boom relative to said vertical feed pipe; and

(b) first and second control means operably connected to said rotation sensor means and being adapted to control the amount of said agricultural chemical supplied to said feed pipe in response to rotation of said horizontal boom relative to said vertical feed pipe.

4,993,635

PORTABLE SNOW MAKING TOWER

Herman K. Dupre, Seven Springs, Champion, Pa. 15622

Filed Nov. 20, 1989, Ser. No. 438,616

Int. Cl.[5] F25C *3/04*

U.S. Cl. 239—14.2 **14 Claims**

1. A portable snow making tower comprising an elongated water conduit having first discharge nozzle means provided adjacent the upper end thereof, water supply line attachment means at the lower end of said water conduit for supplying water therein under pressure, an air conduit extending substantially coextensive with and secured with said water conduit and having an air discharge orifice adjacent the upper end of said air conduit and said orifice positioned to discharge air therefrom under pressure which is directed into the water discharged from said nozzle means to form a plume of atomized water for making snow, air supply attachment means at the bottom of said air conduit for supplying air therein under pressure, said water conduit positioned at an incline and supported intermediate its upper and lower ends by two legs pivotally attached thereto at their upper ends and spread at



their bottom ends thereby forming a tripod configuration including said water supply conduit which may be collapsed by pivoting said legs inwardly toward said water conduit, stop means limiting further pivotal travel of said legs away from said water conduit beyond an outer predetermined limit to stablilize said tripod configuration, skid means on the bottom of said legs permitting said legs to slide along a surface, tow attachment means at the bottom end of said water conduit for towing the snow-making tower on said skid means, said stop means comprising three horizontal cross-braces respectively connected between said legs and between said legs said water conduit, said braces each being readily detachable at one end and pivoted at the other end to permit folding of the tripod configuration.

4,993,636

HIGH PRESSURE FUEL INJECTION DEVICE FOR ENGINE

Jun Taue, and Takeo Yoshida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

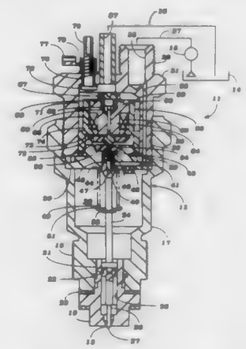
Filed Mar. 3, 1989, Ser. No. 318,674

Claims priority, application Japan, Mar. 4, 1988, 63-50955; Mar. 4, 1988, 63-50958

Int. Cl.[5] H01F *7/08;* **F02M** *47/06*

U.S. Cl. 239—88 **10 Claims**

1. An accumulator type of injection nozzle comprised of an accumulator chamber to be supplied with high pressure fuel, a nozzle port leading from said accumulator chamber, an injector valve movable between a closed position and an opened position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injector valve for retaining said injector valve in its closed position when said control chamber is pressurized and for movement of said injector valve to its opened position when pressure is relieved in said control chamber, and relief valve means moveable between a closed position for maintaining pressure in said control chamber and an opened position for relieving said control chamber for effecting fuel discharge through said nozzle port, the improvement comprising said nozzle comprising an outer housing defining cavity, an electromagnet within said cavity for moving said relief valve to one of said positions when said electromagnet is energized, said electromagnet being comprised of an armature surrounded by a winding, a yoke surrounding said winding and having an intermediate portion in proximity to one end of said winding and extending inwardly toward said armature for forming a flux path between said intermediate portion and said armature



through said relief valve when said winding is energized, said yoke having a first portion spaced inwardly from said outer housing within said cavity and extending around said winding and a mounting portion having an outer surface fixed relative to said outer housing and extending from one end of said winding and around said relief valve, said mounting portion being connected to said intermediate portion by a connection having means for reducing flux leakage from said intermediate portion to said outer housing.

4,993,637

FUEL INJECTOR

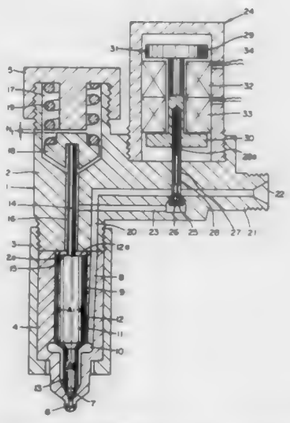
Hiroshi Kanesaka, Kawasaki, Japan, assignor to Usui Kokusai Sangyo Kaisha, Ltd., Japan

Filed Sep. 18, 1989, Ser. No. 409,017

Claims priority, application Japan, Sep. 21, 1988, 63-234732

Int. Cl.[5] F02M *41/16*

U.S. Cl. 239—96 **3 Claims**



1. A fuel injector comprising:

a valve housing having a sliding bore formed therein, a working chamber defined in the valve housing adjacent the sliding bore, a portion of the working chamber defin-

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ing a valve seat, injection ports extending from the valve housing and communicating with the working chamber, a portion of the sliding bore remote from the working chamber defining a fuel accumulator, a fuel passage defined in the valve housing for delivering fuel to the working chamber, a communicating passage formed in the valve housing and extending from a location along the fuel passage and into communication with the accumulator for diverting fuel from the fuel passage to the accumulator, portions of the communicating passage adjacent said fuel passage defining a valve seat of the communicating passage;

a needle valve having a first portion disposed in the sliding bore and extending between the accumulator and the working chamber and a second portion extending from the first portion into the working chamber, said second portion being configured to selectively sealingly engage the valve seat of the working chamber, said needle valve being configured such that fuel in the working chamber urges the needle valve toward the accumulator and away from the valve seat of the working chamber, and such that fuel in the accumulator urges the needle valve toward the valve seat of the working chamber;

biasing means communicating with the needle valve for urging the needle valve toward the valve seat of the working chamber;

a regulator valve in the valve housing and moveable from a first position for sealingly engaging against the valve seat of the communicating passage to a second position spaced from the valve seat of the communicating passage;

first and second armatures connected to the regulator valve;

first and second electromagnetic actuators in proximity to the respective first and second armatures, said first and second electromagnetic actuators being selectively and alternately operable such that said first electromagnetic actuator is operable to move the first armature and the regulator valve in a first direction for sealingly engaging the valve seat of the communicating passage and such that the second electromagnetic actuator is operable to move the second armature and the regulator valve in the second direction and away from the valve seat of the communicating passage;

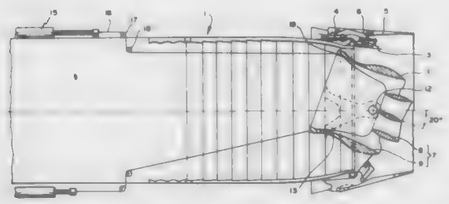
whereby the first and second electromagnetic actuators are alternately operable for selectively diverting fuel from the fuel passage to the accumulator for controlling fuel pressure in the accumulator and the working chamber.

4,993,638

THRUST VECTORING NOZZLE ASSEMBLY

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Mateurs d'Aviation "S.N.E.C.M.A." , Paris, France

Filed Mar. 1, 1990, Ser. No. 486,851
Claims priority, application France, Mar. 1, 1989, 89 02640
Int. Cl.[5] F02K *1/52, 1/46, 1/78*
U.S. Cl. 239—265.35 **10 Claims**



1. A thrust vectoring exhaust nozzle assembly for a turbojet engine with an exhaust duct generally concentric about a longitudinal axis and having at least one set of pivoting flaps arranged in a generally annular array about a downstream end of the duct to vary the cross-section of the nozzle, comprising:

(a) a first, inner vectoring member having a generally annular configuration about a thrust axis;

(b) a second, outer vectoring member having a generally annular configuration;

(c) support means connecting the inner and outer vectoring members together such that they are radially spaced apart and generally concentric about the thrust axis;

(d) attaching means to pivotally attach the outer vectoring member to the exhaust duct adjacent its downstream end such that at least a portion of the outer vectoring member extends into the interior of the exhaust duct and such that the inner and outer vectoring members may pivot about a pivot axis extending generally perpendicular to the longitudinal axis; and,

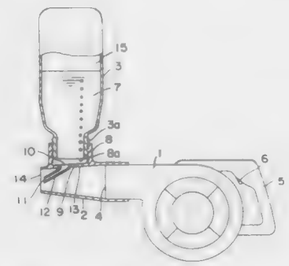
(e) control means operatively associated with one of the inner and outer vectoring members to pivot the vectoring members about the pivot axis such that exhaust gases passing through the vectoring members may be deflected at an angle to the longitudinal axis of the exhaust duct.

4,993,639

MIST SPRAYER

Mitsuo Hata, 524 Nishihirajima, Okayama-shi, Okayama-ken, Japan

Filed Oct. 4, 1989, Ser. No. 417,243
Int. Cl.[5] B05B *7/24*
U.S. Cl. 239—289 **12 Claims**



1. A mist sprayer and a means for blowing air characterized in that:

(a) a vessel attachment section is formed in a cylindrical mist spray head connected to a blast opening of an air blower, so that said attachment section is perpendicular to the axis of said head; (b) a long, slender vessel which accommodates a mist liquid is attached to said vessel attachment section so that said vessel can be freely attached or removed, said vessel being provided above said axis; (c) a spray tube is provided so that it extends from said vessel attachment section through a partition wall which separates the interior of said mist spray head from said vessel attachment section and to the vicinity of a spray opening which is locate at the tip of said mist spray head; and (d) a hole formed in said partition wall which allows the passage of air; whereby said mist sprayer may be used as a means for blowing air by rotating said vessel about said axis of said head to a position wherein said vessel is below said axis.

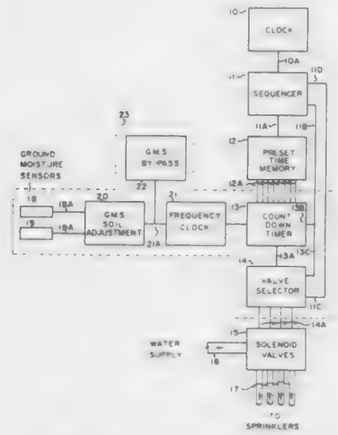
4,993,640

FLUID CONTROL SYSTEM

Mark R. Baugh, 5587 S. 3275 W., Salt Lake City, Utah 84118

Filed Jun. 12, 1989, Ser. No. 364,864
Int. Cl.[5] A01G *25/16*
U.S. Cl. 239—64 **2 Claims**

1. In combination, a water delivery system having a series of branches, first means for controlling said water delivery system to sequence the operation of said branches and to time the operating times of said branches, and second means coupled to said first means, and including a pair of mutually spaced probes, for modifying and locking in, prior to water delivery startups, any preset water delivery timing, thereby so modifying water delivery. by increasing and decreasing the same, in accordance with ambient soil conditions.

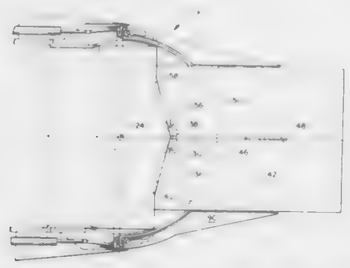


4,993,641

GAS TURBINE SPHERICAL EXHAUST NOZZLE

Debora F. Kehret, Jupiter, and Edward B. Thayer, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1989, Ser. No. 427,054
Int. Cl.[5] F02K *1/12*
U.S. Cl. 239—127.3 **7 Claims**



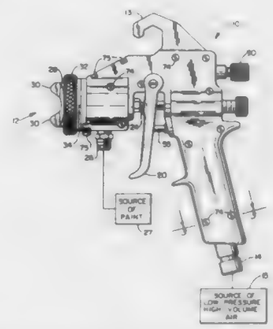
4. A spherical exhaust nozzle for a gas turbine engine, said engine including an afterburner liner terminating in a fixed collar having a spherical external surface and a rearwardly facing opening for the discharge of exhaust gases, upper and lower converging flaps for varying the area of said opening, said flaps being mounted on a gimbal ring and having a common horizontal axis of rotation, said gimbal ring surrounding said fixed collar and having a vertical axis of rotation with respect to said fixed collar, actuating means for rotating said converging flaps about their horizontal axis, said actuating means being connected at one end to gimbal ring structure and at the opposite end to the external surface of said converging flaps and means for cooling said convergent flaps including torus means surrounding said fixed collar and adjacent said gimbal ring, means for providing cooling air to said torus means, means for ducting said cooling air through said torus to the horizontal rotational axis of said upper and lower converging flaps, hub means for each of said upper and lower converging flaps on said horizontal axis of rotation, means for the flow of cooling air therethrough, and means for conducting cooling air through said converging flaps and discharging it therefrom.

4,993,642

PAINT SPRAY GUN

John W. Hufgard, Novelty, Ohio, assignor to AccuSpray, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 297,128, Jan. 17, 1989, Pat. No. 4,915,303, which is a continuation-in-part of Ser. No. 101,563, Sep. 28, 1987, Pat. No. 4,905,905. This application Dec. 26, 1989, Ser. No. 456,552
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] B05B *1/28*
U.S. Cl. 239—300 **16 Claims**



1. A spray gun for use with air atomizable liquids comprising;

means forming an air chamber in said gun having an outlet end;

a liquid nozzle valve having a conical taper penetrating said air chamber and extending to and coaxially aligned with a central circular aperture in the outlet end of said air chamber;

means for delivering a liquid to said central aperture for atomization by air exiting said air chamber through said central aperture;

at least two pattern adjusting nozzles disposed adjacent to the central aperture of said air chamber;

means for conducting air to said chamber and separate means for conducting air to said nozzles;

trigger means for activating means to allow the flow of air to said nozzles and for activating means to allow the flow of liquid to said nozzle valve,

the outlet end of said air chamber having a converging down stream frusto-conical shape which terminates at said central aperture, and

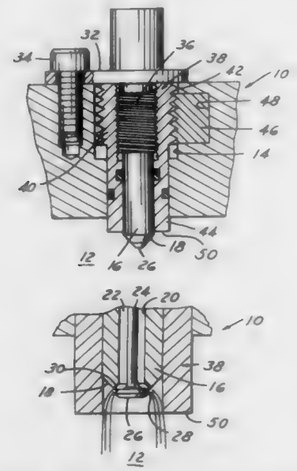
said gun being formed as parts bolted together, said parts having internal passages extending from the nozzles to the means to allow flow of air to said nozzles, said passages of each of said parts being mirror images of said passages of the other part, said means to allow the flow of air to said nozzles being the only source of air to said passages.

4,993,643

FUEL INJECTOR WITH VARIABLE FUEL SPRAY SHAPE OR PATTERN

Michael M. Schechter, Southfield, and Michael B. Levin, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,462
Int. Cl.[5] B05B 1/26; F02M 61/08
U.S. Cl. 239—499 5 Claims



1. An engine type fuel injector with variable fuel spray pattern comprising in combination, an injector having an outer stationary tubular-like body containing fuel and chamfered at one end and slidably receiving therein a nozzle type valve having a conical-like tip seated against and closing the one end of the body, the tip being movable to an unseated position to open the one end of the body for the flow of fuel outwardly therebetween, the shape of the tip and chamfered end deflecting the fuel essentially diagonally outwardly therefrom in a spray pattern, and a spray pattern control sleeve axially movably mounted on the body and movable with respect thereto and to the tip to variable positions into the path of the fuel spray for interacting with and deflecting the path of the fuel spray and thereby changing the shape of the spray, with said injector further comprising rack and pinion means for moving said sleeve.

4,993,644

DEVICE FOR APPLYING WATER-BORNE PAINT BY MEANS OF HIGH-SPEED ROTARY ATOMIZERS OF OTHER APPLICATION SYSTEMS VIA DIRECT CHARGING OR CONTACT CHARGING

Horst Klemm, Munster, Fed. Rep. of Germany, assignor to BASF Lacke & Farben Aktiengesellschaft, Münster, Fed. Rep. of Germany

PCT No. PCT/EP87/00803, § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO88/04957, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 19, 1987, Ser. No. 378,213
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644536
Int. Cl.[5] B05B 5/16
U.S. Cl. 239—690 4 Claims

1. A device for applying water-borne paint by means of high-speed rotary atomizers and direct charging or contact charging, comprising:

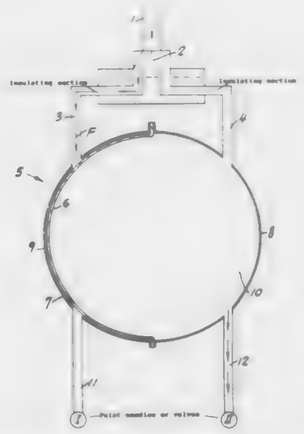
a grounded ring main system for supplying the paint to said high-speed rotary atomizers;

a paint storage vessel inserted between the ring main system and said high-speed rotary atomizers;

a pair of distribution lines adjoining the paint storage vessel, and

a change-over mechanism which provides an insulation section between the ring main system and the two adjoining distribution lines;

said ring main system leading, upstream of the paint storage vessel, into said change-over mechanism, and



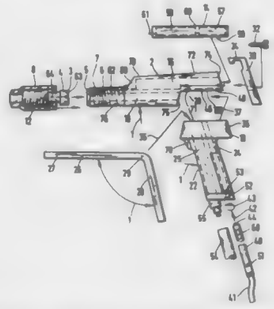
said paint storage vessel being subdivided in its interior by a flexible insulation, the area of which corresponds to the inner periphery of one half of the paint storage vessel, the flexible insulation dividing the paint storage vessel into two mutually insulated parts, and the two resulting interior spaces of the paint storage vessel adjoining booth lines connected to a spray system.

4,993,645

SPRAY COATING DEVICE FOR ELECTROSTATIC SPRAY COATING

Karl Buschor, St. Gallen, Switzerland, assignor to Ransburg-Gema AG, Gallen, Switzerland

Filed Jan. 25, 1990, Ser. No. 470,869
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1989, 3904438
Int. Cl.[5] B05B 5/00
U.S. Cl. 239—708 12 Claims



1. Spray coating apparatus for electrostatic spray coating of articles with coating material,

with a gun barrel (2),

with a spray nozzle (4) attached to the front end of the gun barrel,

with a straight-line first channel (10) which extends axially to the spray nozzle through the gun barrel (2) and communicates with the spray nozzle (4),

with a straight-line second channel (16) which extends through the gun barrel (2) from its rear end toward its front end, essentially parallel to the first channel (10),

with a voltage generator (14) which is exchangeably inserted in the second channel (16), from the rear, and which consists at least of a transformer (57) located near the rear barrel end (74) and of a more forwardly situated voltage multiplier cascade (59), and features on the secondary side an electrical contact (61) by way of which it is electrically connected through an electrical conductor (62) with an electrode (64) serving to electrostatically charge the coating material,

with a carrier (18) which detachably is fastened on the gun barrel (2),

with a third channel (24), extending through the carrier (18), through which an electrical connector (40) of an electrical voltage supply cable (41) can be passed in order to detachably connect it electrically with the primary side electrical connectors (46, 50) of the voltage generator (14),

wherein the rear end (74, 75) of the gun barrel (2) is in its length so graduated that its rear end features at the bottom a recess (20),

in that the first channel (10) is located in the lower barrel part (76) of the gun barrel (2), which due to the recess is shorter than the remaining upper barrel part (78) of the gun barrel (2),

in that the second channel (16) with the voltage generator (14) is located in the upper barrel part (78), which equal to the length of the recess (20) protrudes rearwardly beyond the lower part (76),

in that the transformer (57) and the voltage multiplier cascade (59) of the voltage generator (14) are cast in a common plastic body which as a module is exchangeably arranged in the second channel (16),

in that the voltage generator (14) extends within the second channel (16) with at least one-half the length of the transformer (57) rearwardly beyond the first channel (10),

in that the second channel (16) is sealed liquid-tight at both of its ends (90, 92 at the rear end, end faces 3, 5 on the front end) so that no liquid can proceed to the voltage generator (14) in this second channel (16),

in that a part (36) of the carrier (18) is fitted in the recess (20) at the bottom of the gun barrel (2), in that the third channel (24) extending through the carrier (18) and serving to accommodate the electrical connector (40) is straight, in that the connecting elements (46, 50) for the electrical connection of the primary side of the voltage generator (14) are relative to the inner end of the third channel (24) so arranged that they will automatically make contact with the electrical contacts (44) of the electrical connector (40) that are provided on the end of the connector (40), away from the voltage supply cable (41), as the connector (40) is passed from outside through the third channel (24), for which purpose the connector (40) is designed rod-shaped and stiff.

4,993,646

POWDERY, GRANULAR AND CONGLOMERATE MATERIAL TREATING APPARATUS

Akira Narukawa, Yokkaichi, Japan, assignor to NGK Insulators, Ltd., Aichi, Japan

Division of Ser. No. 235,560, Aug. 24, 1988, Pat. No. 4,919,342.
This application Sep. 29, 1989, Ser. No. 414,479
Int. Cl.[5] B02C 25/00
U.S. Cl. 241—37.5 4 Claims

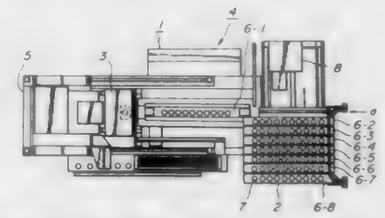
1. A crushing system having a crushing vessel transferring unit comprising:

a manual crusher for crushing a sample in a crushing vessel;

a working table for introducing the sample into the crushing vessel and removing a crushed sample from the crushing vessel;

a crushing vessel cleaning unit for cleaning the crushing vessel from which the crushed sample has been removed;

a crushing vessel stocker for storing cleaned crushing vessels; and



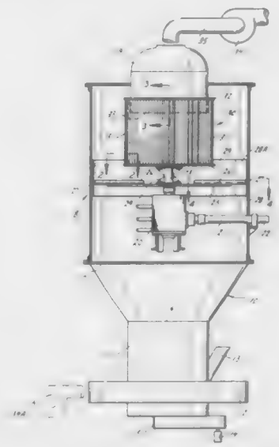
a crushing vessel transferring unit for transferring the crushing vessels between the manual crusher, the working table, the crushing vessel cleaning unit and the crushing vessel stocker.

4,993,647

TWO STAGE SEPARATOR APPARATUS

Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Filed Mar. 26, 1990, Ser. No. 498,619
Int. Cl.[5] B02C 23/32
U.S. Cl. 241—52 10 Claims



1. In apparatus for processing the output material from a power operated grinder so as to obtain a desired substantially uniform fineness size particle output, the improvement of a ground material separating device associated with the output of the power operated grinder comprising:

(a) a chamber having an inlet connected to the grinder to receive the output of ground material therefrom, and having an outlet;

(b) a power operated drive shaft in said chamber;

(c) a bladed rotor connected to said drive shaft and rotatable in an orbit within said chamber to effect one stage separation of the ground material wherein oversize particles are centrifuged in said chamber to the outside and gravity returned to said grinder for further reduction;

(d) a rotor cage connected to said drive shaft and positioned adjacent said chamber outlet to effect another stage separation of the ground material, said rotor cage having

means for allowing a predetermined size of ground material particles to pass to said chamber outlet; and

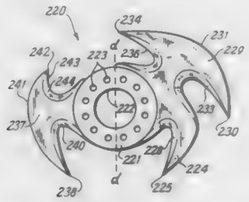
(e) power operated air moving means connected to the apparatus for establishing a flow of air through said chamber inlet to propel the ground material particles responsive to the air velocity through said chamber outlet.

4,993,648

KNIFE ASSEMBLY

Per C. Torp, Sondervang 3, DK-9640, Farso, Denmark

Filed May 22, 1989, Ser. No. 354,798
Int. Cl.[5] B02C *18/20*
U.S. Cl. 241—100 **16 Claims**



1. A knife assembly for a shredder, comprising:

(a) a mounting means;

(b) a first knife secured at its proximal end to said mounting means and extending radially outwardly therefrom to form a first distal point, said first knife defining a first cutting surface between said first distal point and said mounting means;

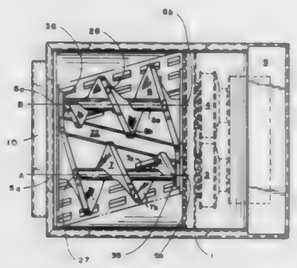
(c) a second knife secured at its proximal end to said mounting means, said second knife also being joined at its proximal end to said proximal end of said first knife and extending radially outwardly from said mounting means to form a second distal point, and defining a second cutting surface extending in the same cutting direction as said first cutting surface between said second distal point and said first knife; said second knife extending radially outwardly from said mounting means to form a third distal point and defining a third cutting surface between said third distal point and said mounting means, whereby said second distal point extends in the opposite circumferential direction from said third distal point.

4,993,649

DUAL AUGER SHREDDER

Larry E. Koenig, c/o Komar Industries, Inc., 4425 Marketing Pl., Groveport, Ohio 43125

Filed Apr. 28, 1988, Ser. No. 187,229
Int. Cl.[5] B02C *19/22*
U.S. Cl. 241—224 **7 Claims**



1. A shredder for shredding large articles comprising:

a frame defining a shredding chamber having opposing first and second walls;

first and second auger screws mounted substantially parallel to each other within said chamber, each of said screws having a substantially cylindrical shaft and a flight extending radially therefrom tapering in diameter from one end thereof to an opposite end thereof, each of said flights including a plurality of teeth extending radially outwardly from a periphery thereof and being spaced along a length thereof;

said screws being positioned within said chamber such that said screws extend axially from said first wall to said second wall such that a large diameter end of said first auger screw and a small diameter end of said second auger screw are adjacent to said first wall, and a small diameter end of said first auger screw and a large diameter end of said auger screw are adjacent to said second wall, such that said flight of said first auger screw tapers from said first wall towards said second wall, and said flight of said second auger screw tapers from said second wall towards said first wall;

hopper means positioned above said screws for receiving material to be shredded in said chamber;

discharge opening means formed in said frame below said screws for discharging shredded materials from said chamber; and

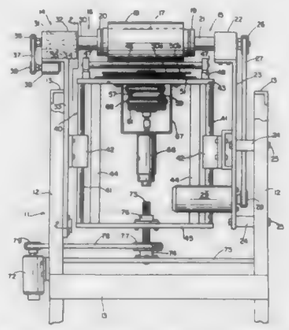
means for counter rotating said screws relative to each other such that material entering said chamber through said hopper is grabbed by said teeth and said flights, pulled downwardly between said screws, and is simultaneously compressed and shredded by interaction of said flights of said screws.

4,993,650

HIGH SPEED PRECISION YARN WINDING SYSTEM

Larry C. Nickell, Lewisburg, W. Va., assignor to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Continuation-in-part of Ser. No. 270,813, Nov. 7, 1988, abandoned. This application Nov. 7, 1989, Ser. No. 432,663
Int. Cl.[5] B65H *54/02, 54/28*
U.S. Cl. 242—180 R **49 Claims**



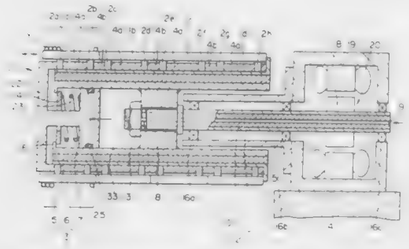
1. In a high-speed precision winder for winding a running yarn onto a tube to form a cross wound yarn package, including spindle means for rotating the tube about a spindle axis, yarn traversing means for guiding running yarn received along an infeed path back and forth across a traverse zone adjacent said tube to form the cross wound package, a bail roll disposed in rolling contact with the peripheral surface of the yarn package being wound, and tensioner means for controlling tension of the infeed yarn approaching said traversing means; the improvement comprising a control system for continuously regulating operation of the winder during formation of the package comprising first, second and third separate variable speed drive motors and respective associated motor control circuits forming a spindle drive, a traversing means drive, and a down pressure drive, the three drive motors and associated motor control circuits providing three independent motor systems which are separately controllable, means coupling the first drive motor with the spindle for rotating the package tube about the spindle axis to wind the yarn thereon, means connecting the second drive motor with the traversing means for variably driving the traversing means in accordance with the speed of the second drive motor, said down pressure drive including down pressure adjusting means for continuously regulating the relative positions of said bail roll and said spindle axis with respect to each other, and means coupling said third drive motor with said adjusting means for regulating the relative positions of said bail roll and spindle axis.

4,993,651

YARN WINDING APPARATUS

Michio Ohno; Katsumi Hasegawa, and Hiromitsu Kanamori, all of Kusatsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,279
Claims priority, application Japan, Oct. 7, 1988, 63-254634
Int. Cl.[5] B65H *54/547*
U.S. Cl. 242—46.2 **20 Claims**



1. A yarn winding apparatus comprising:

(a) a spindle comprising a cylindrical body, bobbins being detachably mounted on an external peripheral surface thereof, and a driving shaft connected to the cylindrical body;

(b) bobbin fitting and detaching means provided on the cylindrical body;

(c) driving means for rotatably driving the spindle; and

(d) at least a portion of at least one of said cylindrical body and said driving shaft further comprising a composite layer made of reinforcing fibers and a matrix component and a supporting member made of metal connected to said composite layer.

4,993,652

CONTINUOUS WINDER FOR WEB MATERIALS

Robert F. Moeller, Baldwinsville, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Nov. 6, 1989, Ser. No. 432,109
Int. Cl.[5] B65H *19/20, 54/71*
U.S. Cl. 242—56 A **12 Claims**

7. Apparatus for continuously winding web material into rolls on successive cores while maintaining said web under substantially constant tension during transfer from a full roll to a new core, and while preventing fold-back of the leading end of said web on each new core, comprising:

(a) a base structure including a pair of spaced opposed end stands,

(b) two turret arms mounted in each of said end stands for rotation with respect to each other on a common axis and each including means for rotatably supporting a new core,

(c) means coupling said turret arms in opposed pairs,

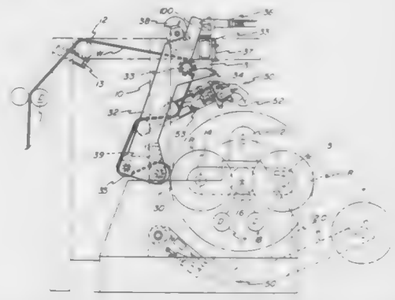
(d) means for selectively indexing each of said pairs of turret arms about said common axis,

(e) a rider roll mounted for movement along a predetermined path toward and away from said common axis of said turret arms,

(f) means establishing a roll changing zone defined by predetermined angularly spaced positions of said pairs of turret arms on opposite sides of said rider roll path wherein the web is severed from a full roll carried by one of said pairs of turret arms and transferred to a new core carried by the other said pair of turret arms,

(g) means for guiding the web between said rider roll and said common axis,

(h) yieldable means arranged to bias said rider roll toward said common axis and thereby to press the web against a winding roll or a new core supported within said zone by one of said pairs of turret arms,



(i) said indexing means cooperating with said yieldable means to move both of said pairs of turret arms simultaneously in the same direction and thereby to move a full roll supported by one of said pairs of turret arms out of engagement with said rider roll and concurrently to move a new core supported by the other said pair of turret arms into engagement with said rider roll with the web therebetween while maintaining both of said pairs of turret arms within said zone, and

(j) means for severing the web material at a position within said zone between said full roll and said new core to effect a roll change.

4,993,653

APPARATUS FOR ROTATABLY SUPPORTING A HOLLOW, SUBSTANTIALLY CYLINDRICAL WINDING CORE, AND WINDING CORE FOR SUPPORTING A COIL OF FLEXIBLE, SUBSTANTIALLY FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS

Hans Frei, Oetwil am See, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 3, 1989, Ser. No. 306,092
Claims priority, application Switzerland, Feb. 5, 1988, [illegible]
Int. Cl.[5] B65H *16/02, 75/02*
U.S. Cl. 242—59 **25 Claims**

1. An apparatus for rotatably supporting a hollow, substantially cylindrical winding core for rotation about a longitudinal axis thereof and for carrying on an external side thereof a coil formed of flexible, substantially flat products, especially printed products, comprising:

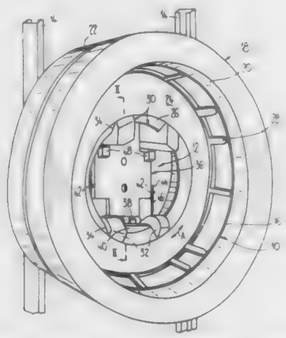
a support arrangement having an axis of rotation and said support arrangement being rotatably supported for rotation about said axis of rotation;

said axis of rotation substantially coinciding with said longitudinal axis of said winding core releasably clamped to said support arrangement;

said support arrangement comprising at least one support element, at least one pressing element, and a holding element rotatable about said axis of rotation;

said at least on support element being structured such that the winding core can be brought to bear thereupon and said at least one support element being fixedly mounted at said holding element;

said at least one pressing element having an idle position and an operative position and said at least one pressing element in said operative position being situated substantially diametrically opposite said at least one support element;
said at least one pressing element being structured for being brought from said idle position into said operative position for pressing said winding core against said at least one support element;
pivotably supporting means for pivotably supporting said at least one pressing element at said holding element for pivotal movement about a pivot axis defined by said pivotably supporting means;
said pivot axis extending in a direction substantially perpendicular to said axis of rotation of said support arrangement;



said at least one support element together with said at least one pressing element forming a clamping arrangement;
said clamping arrangement releasably clamping said winding core to said support arrangement;
drive means for pivoting said at least one pressing element selectively between said idle position and said operative position;
said drive means comprising a lever pivotably supported at said holding element;
said lever having a resting position and a working position;
said lever being selectively pivotable between said resting position and said working position;
said lever having a free end; and
said at least one pressing element in said operative position being supported at said free end of said lever when in said working position.

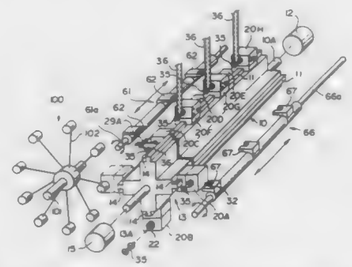
4,993,654

METHOD OF WINDING FILM ON A SPOOL AND LOADING THE SPOOL WITH THE FILM INTO A MAGAZINE, AND A SYSTEM FOR CARRYING OUT THE METHOD

Chiaki Suzuki, and Shigehisa Shimizu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 351,236, May 15, 1989, Pat. No. 4,947,536.
This application Nov. 27, 1989, Ser. No. 441,576
Claims priority, application Japan, May 13, 1988, 63-116404
Int. Cl.[5] B65H *18/10*
U.S. Cl. 242—67.10 R **2 Claims**

1. A film winding pallet comprising
a spool holding shaft which holds a spool and rotates the spool about its longitudinal axis under a force transmitted thereto from outside the film winding pallet,
a film pinch means which opens and closes under a force transmitted thereto from outside the film winding pallet and pinches a leader portion of a roll film wound around the spool when said film pinch means closes,
a brake means which brakes and releases the spool holding shaft, and
an engagement means for holding said film winding pallet on an external guide member, and which is adapted to be slidably engaged with said external guide member along



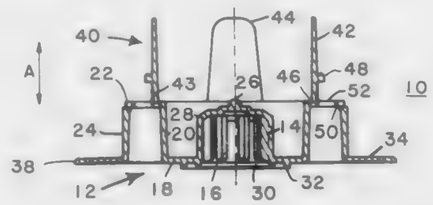
said external guide member in a direction parallel to the spool holding shaft.

4,993,655

ONE-PIECE TAPE REEL

Anthony L. Gelardi, Cape Porpoise; Craig Lovecky, Old Orchard Beach, both of Me.; Alan Lowery, Canton, Mass., and Robert Barstow, Alfred, Me., assignors to Shape Inc., Biddeford, Me.

Filed Nov. 28, 1989, Ser. No. 442,167
Int. Cl.[5] B65H *75/18*
U.S. Cl. 242—71.8 **23 Claims**



1. A plastic molded tape reel, comprising:
(a) a cylindrical hub having a smooth, continuous, outer diameter surface, a first, lower end and a second, upper end;
(b) first means for retaining wound tape formed at the first, lower end; and
(c) second means for retaining the wound tape formed at the second, upper end, which means includes a plurality of planar ears molded in a first position parallel to a central axis of the cylindrical hub, and movable into a second assembled position perpendicular to the central axis of the hub.

4,993,656

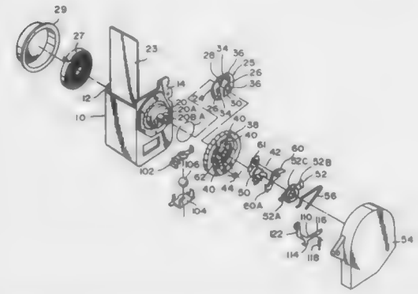
WEBBING RETRACTOR

Hiroshi Tsuge; Yasutaka Watanabe; Fuminori Teraoka, and Shinji Mori, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Sep. 29, 1989, Ser. No. 414,512
Claims priority, application Japan, Oct. 7, 1988, 63-131713[U]
Int. Cl.[5] B60R *22/38, 22/40*
U.S. Cl. 242—107.4 A **20 Claims**

1. A webbing retractor for taking up a webbing worn by a seat occupant of a vehicle, comprising:
a take-up shaft by which said webbing is retained and which is urged in a direction in which said webbing is taken up;
a lock wheel axially supported by said take-up shaft and adapted to be rotatable relative to said take-up shaft;

lock means which is interposed between said take-up shaft and said lock wheel and which operates so as to prevent said take-up shaft from rotating in a direction in which said webbing is drawn out;
a pawl which is engaged with said lock wheel at the time of sudden deceleration of said vehicle and causes said lock wheel and said take-up shaft to rotate relative to each other so as to operate said lock means;
a rotating member adapted to rotate integrally with said take-up shaft;
a displacing member, which is supported by said rotating member, is moved to a first position by the rotation of said take-up shaft in said taking-up direction, is engaged with



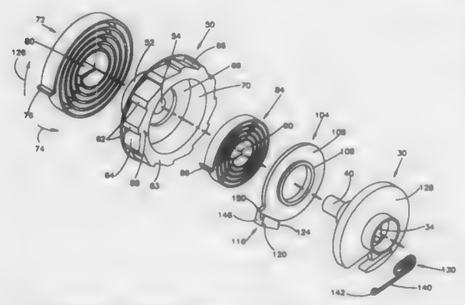
said lock wheel so as to prevent the rotation of said lock wheel relative to said take-up shaft, is moved to a second position by the rotation of said take-up shaft in said drawing-out direction and is disengaged from said lock wheel so as to permit said relative rotation of said lock wheel;
a lever, which is swingable between a third position, in which the engagement of said pawl with said lock wheel is prevented, and a fourth position, in which the engagement of said pawl with said lock wheel is permitted; and
lever swinging means which causes said lever to be located in said third position when said take-up shaft rotates in said taking-up direction and causes said lever to be located in said fourth position when said take-up shaft rotates in said drawing-out direction.

4,993,657

DUAL SPRING RETRACTOR

Louis R. Brown, Oxford, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Oct. 3, 1989, Ser. No. 416,533
Int. Cl.[5] A67B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107 **14 Claims**



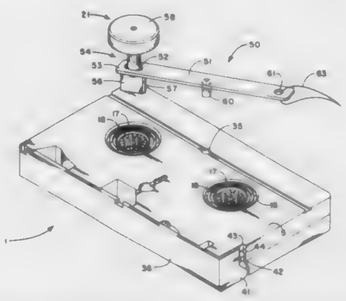
1. A seat belt retractor comprising:
a frame;
a spool on which seat belt webbing is wound and which is rotatable in said frame in belt withdrawal and belt retraction directions;
a ratchet rotatable relative to said spool;
first and second springs biasing said spool in the belt retraction direction, said first spring acting between said ratchet and said frame, said second spring acting between said ratchet and said spool;
a pawl having a first position blocking rotation of said ratchet in the belt retraction direction and a second position in which said pawl does not block rotation of said ratchet in the belt retraction direction;
means biasing said pawl toward its first position;
a cam rotatable relative to said spool and said pawl, said cam having a surface portion for moving said pawl from its first position to its second position upon rotation of said cam relative to said pawl; and
a cam driver rotatable with said spool and engageable with said cam to rotate said cam relative to said pawl to effect movement of said pawl from its first position to its second position;
said cam and pawl cooperating to block rotation of said cam in the belt retraction direction by said cam driver when said pawl is in said second position;
said cam driver including a deflectable part which engages said cam when said cam is blocked from rotation in the belt retraction direction and said cam driver is rotating in the belt retraction direction, which deflectable part deflects and rotates past said cam in the belt retraction direction.

4,993,658

VIDEO TAPE CASSETTE WINDING DEVICE

Sandra T. Lantrip; Judy A. Anselmo, and George A. Thibodaux, all of P.O. Box 135, Ethel, La. 70730

Filed Nov. 13, 1989, Ser. No. 435,338
Int. Cl.[5] G11B *15/32*
U.S. Cl. 242—179 **9 Claims**



1. A device for hand winding video tape on a video tape cassette having exposed tape reel winding gears located on one side of the cassette the free rotation of which is controlled by a release switch operative access thereto being through a recess located on the same side of the cassette as the winding gears, which comprises:
(a) an elongated member having at one end an opening extending through the member,
(b) an assembly extending through the opening which comprises:
(i) an axle shaft extending through the opening,
(ii) a cog fixedly attached to one end of the axle shaft and shaped to operatively engage one of the winding gears,
(iii) a handle fixedly attached to the other end of the axle shaft for rotating the axle shaft and the cog, and
(c) a means fixedly attached to and extending outward from the member at a position to operatively engage the release switch when the cog has operatively engaged one of the winding gears.

4,993,659

TAPE TWINE DETECTING DEVICE

Kazuki Takai, and Eiji Ishikura, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

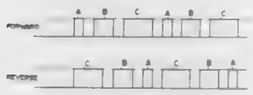
Filed May 16, 1989, Ser. No. 352,388

Claims priority, application Japan, May 24, 1988, 63-126169; Jun. 3, 1988, 63-136850

Int. Cl.[5] B65H *26/00*; G11B *15/32*; G01D *5/34*; H03M *1/22*

U.S. Cl. 242—186 13 Claims





4. An apparatus comprising: a rotatably supported reel base; signal generating means for generating a signal which includes three successive pulses of different widths, said pulses occurring in respective first and second sequences when said reel base is respectively rotating in a first direction and in a second direction opposite said first direction; and direction detecting means responsive to said signal for determining the direction of rotation of said reel base; wherein said direction detecting means includes means for producing a windup indicating signal in response to detection of rotation of said reel base in said second direction; wherein said signal generating means cyclically repeats said first sequence when said reel base is rotating in said first direction and cyclically repeats said second sequence when said reel base is rotating in said second direction; and wherein said direction detecting means includes pulse width comparison means for identifying one of said pulses of said signal having a width corresponding to a reference width, and includes comparator means for comparing the widths of two pulses of said signal respectively received immediately before and immediately after said pulse having said reference width and for producing a comparison output signal representing the result of said comparison and thus the direction of rotation of said reel base.

4,993,660

REEL DRIVE DEVICE

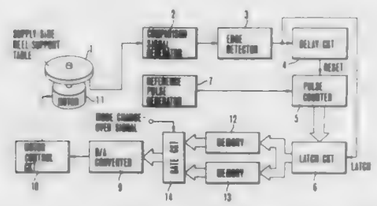
Isao Harigaya, and Koichi Miyoshi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 250,970, Sep. 23, 1988, abandoned, which is a continuation of Ser. No. 857,236, Apr. 29, 1986, abandoned. This application Jul. 14, 1989, Ser. No. 380,688

Claims priority, application Japan, May 31, 1985, 60-119437; May 31, 1985, 60-119438

Int. Cl.[5] G11B *15/43, 15/46*

U.S. Cl. 242—186 9 Claims



1. A drive for running a tape-shaped medium convoluted around two reels with selection between a plurality of running modes of different running speeds of said tape-shaped medium, comprising:

(a) rotation drive means for rotating at least one of said two reels;

(b) data generating means for detecting a rotation period of said one of said two reels to generate address data corresponding to the rotation period thus detected;

(c) first memory means corresponding to a first running mode in which said tape-shaped medium is driven at a first running speed, said first memory means being arranged to store rotation torque control data of said rotation driving means corresponding to said first running mode in an address corresponding to the address data generated by said address data generating means;

(d) second memory means corresponding to a second running mode in which said tape-shaped medium is driven at a second running speed which is different from said first running speed, said second memory means being arranged to store rotation torque control data of said rotation drive means corresponding to said second running mode in an address corresponding to the address data generated by said address data generating means;

(e) read means which receives the address data generated by said address data generating means and reads out said rotation torque control data stored in the addresses corresponding to the received address data among said rotation torque control data stored in said first memory means and said second memory means, respectively;

(f) selective output means for selectively outputting the two kinds of said rotation torque control data read out from said first memory means and said second memory means by said read means, depending upon an instruction for the first running mode or the second running mode; and

(g) torque control means for controlling a torque of said rotation drive means, depending upon said rotation torque control data outputted from said selective output means.

4,993,661

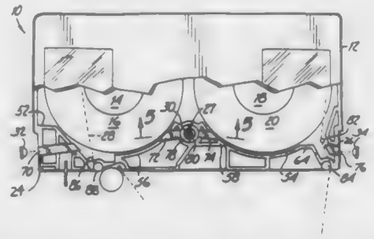
TAPE CASSETTE WITH TAPE LEADER DETECTION IMPROVEMENTS

Dale T. Tollefson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 12, 1989, Ser. No. 351,412

Int. Cl.[5] G11B *23/06*

U.S. Cl. 242—188 32 Claims



1. A tape cassette for use with a tape leader detector which includes a light source and at least one light detector, comprising:

a first hub;

a second hub;

a tape, connected to the first and second hubs, which has at least one transparent leader portion and travels along a tape path when moving between the first and second hubs;

a light transmissive cassette cover supporting the first and second hubs;

a source receiving aperture in the cassette cover for receiving the light source;

a window in the cassette cover;

a light path between the source receiving aperture and the window, the light path intersecting the tape path, for allowing light emitted from the light source and passing through the leader portion of the tape to reach the light detector; and

light pipes coupled to the cassette cover, with at least one light pipe adjacent the source receiving aperture and at least one other light pipe adjacent the window, and with each light pipe having an interior channel therethrough which is aligned to define a portion of the light path.

4,993,662

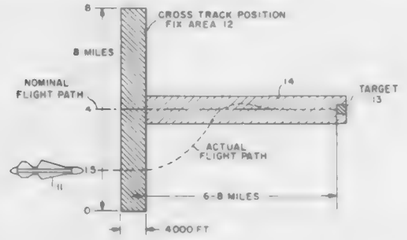
APPARATUS FOR GUIDING A MISSILE

Daniel C. Barnes; Wendell J. Bridges, and Jon R. Carr, all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 7, 1970, Ser. No. 56,014

Int. Cl.[5] F41G *7/00*

U.S. Cl. 244—3.17 4 Claims



1. A device for guiding a pilotless aircraft to a previously selected target comprising,

a rotatable drum,

a film strip attached to said drum having a first negative portion of a photographic representation of a first rectangular area of ground having its longitudinal axis normal to the nominal flight path for said pilotless aircraft, said first area of ground being a known distance from said target to be used for establishing a position fix for a pilotless aircraft with respect to a nominal flight path for said pilotless aircraft, and said film strip having a second negative portion of a photographic representation of a second rectangular area of ground having its longitudinal axis parallel with the nominal flight path for said pilotless aircraft, said second area of ground extending from said first area of ground to a previously selected target to be used for guiding a pilotless aircraft on he terminal portion of flight to a previously selected target,

a lens system for superimposing a live view of the ground below said pilotless aircraft onto said film strip for correlating said live view of the ground below with the first area of ground depicted on said first negative portion of said film strip, and

a Pechan prism spaced between said lens system and said film strip for rotating the image from said lens system when said live view of the ground below is to be correlated with the photographic representation on said second negative portion of said film strip.

4,993,663

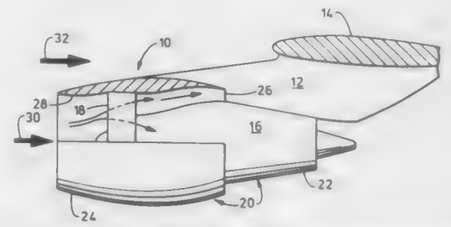
HYBRID LAMINAR FLOW NACELLE

Daniel J. Lahti; David E. Yates, both of Cincinnati; Parmanand Mungur, West Chester, and Norbert O. Stockman, Batavia, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 1, 1989, Ser. No. 359,556

Int. Cl.[5] B64D *33/02*

U.S. Cl. 244—53 B 22 Claims



9. A hybrid laminar flow nacelle for housing an engine of an aircraft, comprising:

(a) an outer annular cowl having a leading lip and radially spaced and axially extending annular outer and inner forward surface portions which merge at said leading lip; and

(b) a suction bleed system including a plurality of air suction elements defined in said outer and inner forward surface portions axially downstream from said leading lip in a direction of airflow, suction generating means, and means interconnecting said air suction elements and suction generating means in flow communication;

(c) said outer forward surface portion of said cowl having a geometry shape tailored to produce a substantially uniform pressure in a boundary layer airflow along said surface;

(d) said suction generating means being operable for applying air suction selectively to said air suction elements to cause bleed of portions of said boundary layer airflow through said air suction elements at said outer surface of said cowl for augmenting reduced friction drag laminar flow over said cowl at cruise operation of the aircraft and to cause bleed of portions of said boundary layer airflow through said air suction elements at said inner surface of said cowl for preventing separation over said inner surface of said cowl at off-cruise operation of the aircraft.

4,993,664

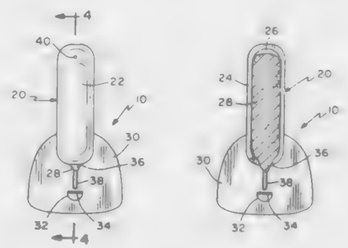
EQUILIBRIUM BALLAST APPARATUS FOR LIGHTER-THAN-AIR BALLOONS AND METHOD FOR USING SAME

Howard A. Kneeland, 15 Farver La., Silver Bay, Minn. 55614

Filed Apr. 24, 1989, Ser. No. 342,164

Int. Cl.[5] B64B *1/70*

U.S. Cl. 244—94 12 Claims



1. A ballast apparatus for a lighter-than-air balloon including

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a balloon body filled with a buoyant gas and a neck portion, said balloon body having a predetermined weight, said buoyant gas producing a lifting force greater than said weight of said balloon body such that said balloon has a positive buoyancy in ambient air, said ballast apparatus comprising:

a body defining a cavity and an evaporation aperture communicating with said cavity;

a wicking material contained within said cavity which absorbs a liquid having a weight, the wicking material having an area exposed to the ambient air; and

a securing means for attaching said body to the neck of the balloon,

whereby the wicking material is impregnated with the liquid, and the liquid evaporates from the wicking material through the evaporation aperture and the weight of the liquid in the wicking material decreases at a rate which corresponds substantially to the decrease in buoyancy of the balloon over time, thereby maintaining the balloon in an aerostatic condition for an extended period of time.

4,993,665

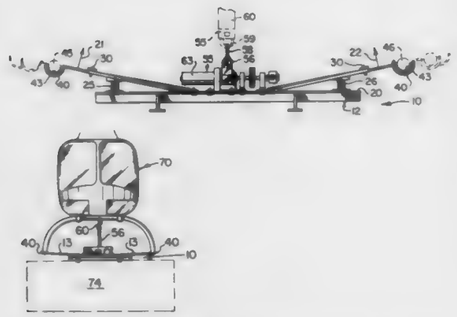
DEVICE FOR ATTACHMENT TO A HELICOPTER

Fred Sparling, 122 Waterford Bridge Road, St. John's, Newfoundland, Canada A1E 1C9

Filed Feb. 17, 1989, Ser. No. 312,051

Int. Cl.[5] B64D *9/00*

U.S. Cl. 244—118.1 **17 Claims**



1. A load frame adapted for external attachment to a helicopter by its cargo hook, comprising a base means, a plurality of arms radiating from said base means and adapted to releasably engage predetermined parts on said helicopter, a strap-like member for engaging said cargo hook and winch means on said base means adapted, in operation, to winch-in said strap-like member and move said load frame into stable flight position beneath said helicopter with said arms firmly engaging said predetermined parts.

4,993,666

PIVOTABLE SEAT, ESPECIALLY FOR A FLIGHT ATTENDANT

Faruk Baymak, Hamburg; Klaus Lasch, Stade; Helmut Stueben, Gruenendeich, and Hanno Zestermann, Hamburg, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, Fed. Rep. of Germany

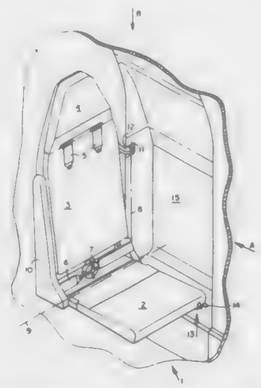
PCT No. PCT/DE87/00424, § 371 Date Jun. 30, 1988, § 102(e) Date Jun. 30, 1988, PCT Pub. No. WO88/01967, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 19, 1987, Ser. No. 214,722

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631726; Sep. 23, 1986, 3632288

Int. Cl.[5] B64D *11/06*

U.S. Cl. 244—122 R **5 Claims**



1. A tiltable seat structure, especially for a flight attendant in an aircraft, comprising a seat section with a one-piece seat plate and a backrest section with a one-piece backrest carrier plate, first hinging means for journalling said seat section to said backrest section, first spring means urging said seat section up against said backrest section, second hinging means for journalling said backrest section and said seat section to a structural member of said aircraft, second spring means for automatically biasing said backrest section with said seat section into a storage position in a recess in said structural member when said seat section is in an upright position, first locking means (13, 14; 41) secured to said seat section for locking said seat section in a use-position, second locking means (22*a*) secured to said backrest section for locking said backrest section and said seat section in said storage position, a tapered pin (22) secured in a fixed location to said aircraft structure in a position for cooperating with said first locking means to hold said seat section in its use position and for further cooperating with said second locking means (22*a*) to hold said backrest section and said seat section in said stored position in said recess, whereby said tapered pin (22) holds said seat in said use-position and in said storage position.

4,993,667

METHOD FOR MAKING A PARACHUTE

Jarmo I. Uotila, Klaneettitie 12 F 71, SF-00420 Helsinki, Finland

Filed Feb. 19, 1986, Ser. No. 831,010

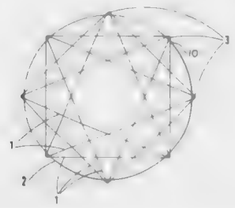
Claims priority, application Finland, Feb. 20, 1985, 850686

Int. Cl.[5] B64D *17/02*

U.S. Cl. 244—142 **20 Claims**

1. A method of manufacturing at least part of a parachute having a canopy with an outer peripheral skirt and a plurality of spaced apart attachment points on the skirt, comprising selecting one of the attachment points as a starting point, winding a single continuous fiber from the starting point to another attachment point to form a first reinforcing strand of fiber, winding the continuous fiber from said other attachment point to a further attachment point to form a second reinforcement strand of fiber, continuing the winding of the continuous fiber from attachment point to attachment point until all attachment points have at least one strand of fiber extending therefrom so as to form a reinforcement net between the attachment points, and connecting a canopy to the reinforcement net.

14. A parachute comprising a canopy having an outer peripheral skirt and a plurality of spaced apart attachment points on said skirt, a single continuous fiber wound from one attachment point which is selected as a starting point, to another attachment point to form a first reinforcing strand, the continuous fiber extending from the other attachment point to a still further attachment point to form a second reinforcing strand and further to all attachment points so that each attachment point has at least one strand extending therefrom forming a reinforcement net between said attachment points, said canopy being connected to said reinforcement net.



4,993,668

MOUNTING STRUCTURE FOR CAR-MOUNT DEVICES

Shigeaki Inamura, Kobe, Japan, assignor to Fujitsu Ten Limited, Kyogo, Japan

Division of Ser. No. 200,123, May 27, 1988. This application Jan. 18, 1990, Ser. No. 467,518

Claims priority, application Japan, May 29, 1987, 62-85403; May 29, 1987, 62-85404

Int. Cl.[5] G12B *9/00*

U.S. Cl. 248—27.3 **6 Claims**

1. A structure for mounting in and dismounting from an instrument panel of an automotive vehicle a car-mounted device, such as a radio or a tape player, having a main body and a front panel extending from the main body with the width of the front panel being less than the width of the main body to define a step therebetween at each side thereof, said structure comprising:

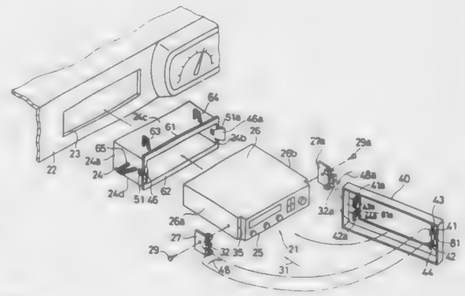
a mounting tube to be inserted forwardly through a mounting hole in the instrument panel and retained therein, such that the car-mounted device can be inserted in an insertion direction forwardly into said mounting tube, said mounting tube having opposite side walls having therein respective detent holes;

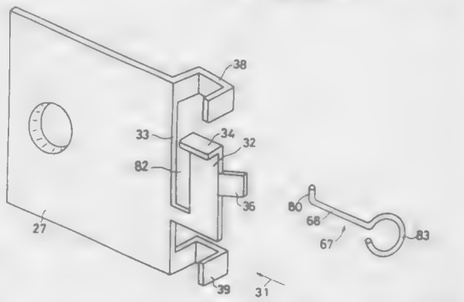
a pair of mounting members to be attached to respective opposite sides of the main body of the car-mounted device;

each said mounting member having integral therewith at a position of juncture an elastic member extending in a direction generally along the height dimension of said mounting tube, said elastic member being spaced from said mounting member by a slot, said elastic member being urged outwardly by the elastic force thereof to a normal position and being deflectable therefrom against said elastic force thereof about said position of juncture in a plane perpendicular to said insertion direction, said elastic member having an outwardly directed detent pawl and said elastic member having extending inwardly therefrom a guide tab;

when said mounting members are mounted with the car-mounted device in said mounting tube, said elastic members being deflected about said respective positions of juncture in respective said planes in the area of the respective step between the main body and the front panel of the car-mounted device, and said detent pawls extending into respective said detent holes; and

a dismounting tool for removing each said detent pawl from the respective said detent hole, said tool including a longitudinal shaft having a substantially L-shaped end capable of being inserted into contact with each said guide tab to deflect the respective said elastic member from said normal position to remove said detent pawl from said detent hole, and wherein by turning said tool about the axis of said shaft said L-shaped end is insertable into said slot to hook said elastic member, whereby pulling of said tool enables removal of said mounting member and the car-mounted device from said mounting tube.





4,993,669

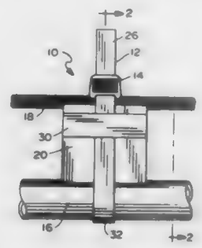
BUNDLE TIE

Edward Dyer, Germantown, Wis., assignor to Tyton Corporation, Milwaukee, Wis.

Filed Jan. 4, 1990, Ser. No. 461,026

Int. Cl.[5] B65D *63/00;* **B21F** *9/02*

U.S. Cl. 248—61 **21 Claims**



1. A tie head for use with an elongate plastic tie strap to form a bundle tie, said tie head comprising:

a tie head housing including a pair of spaced-apart slots

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extending therein forming a pair of strap-receiving passageways, each passageway having an entrance opening, at least one of said passageways having an exit opening, said housing further including a pawl-receiving channel extending intermediate the passageways, said channel having at least one channel opening disposed substantially normal to said entrance openings, said channel having an intermediate portion intersecting each said passageway;

a pawl member mounted in said channel including an elongate base portion and a pair of arm portions extending outwardly from opposed sides of the base, each arm having a free end with a blade section, each of said free ends extending from the channel into one of said passageways; and

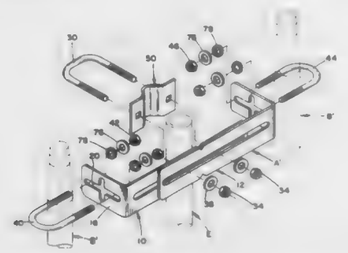
mounting means for retaining the pawl in position in the housing, whereby a tie strap inserted through the entrance openings into each passageway is retained by the tie head against withdrawal by gripping engagement of the strap between the blade sections and surfaces of said passageways.

4,993,670

UNIVERSAL BRACKET ASSEMBLY

Robert D. Tessar, Independence, Ohio, assignor to Perfection Corporation, Madison, Ohio

Filed Aug. 15, 1984, Ser. No. 640,963
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—68.1 **15 Claims**



10. A universal bracket assembly for gas risers, comprising:

a first L-shaped member having a main body portion and a flange extending from one end of said main body portion;

a second L-shaped member having a main body portion and a flange extending from one end of said main body portion, said two members being secured to each other at least along one of said main body portions and flanges;

a first aperture provided in each of said flange portions through which a first fastener can extend;

a second aperture provided in each of said main body portions through which a second fastener can extend; and,

wherein said two L-shaped members are positioned in a nesting configuration with both their main body portions and their flanges abutting each other.

4,993,671

PAINT BRUSH HOLDER

Ray M. Ste. Marie, 16532 Stent Rd., Jamestown, Calif. 95327

Filed Sep. 18, 1989, Ser. No. 408,605
Int. Cl.[5] A46B *17/00*
U.S. Cl. 248—113 **9 Claims**

1. A paint brush holder attachable to a container having an opening with an annular lip, comprising:

a brush-supporting bed having an inner end and an outer end;

first and second side portions connected to said bed and extending upwardly form the bed;

a brush handle-gripping spring clamp adjacent said outer end including first and second leaf spring tines for longitudinally engaging a paint brush handle wherein each one of said tines is a longitudinal extension of a separate one of said side portions, said tines extending longitudinally from said side portions, free of connection to said bed, wherein said tines are flexibly moved apart by placement of said paint brush handle therebetween and are biased by spring energy against said handle to prevent movement of said paint brush toward said inner end; and



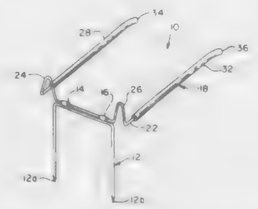
a snap-lock attachment adjacent said inner end including first and second downwardly extending arcuate flanges defining an arcuate groove therebetween for engaging said annular lip.

4,993,672

SAFETY RETAINER FOR MODEL AIRPLANES

Fred G. Hosage, 174 Tree Rd., Centereach, N.Y. 11720

Filed Feb. 20, 1990, Ser. No. 481,269
Int. Cl.[5] A45F *3/44*
U.S. Cl. 248—156 **10 Claims**



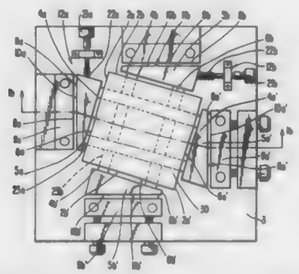
1. Model airplane restraining apparatus comprising support means for insertion into the ground until the top of said support means is substantially at ground level, hinge means rigidly mounted on the top of said support means, restraining means mounted on said hinge means for rotation, said restraining means comprising an element engaged with said hinge means, a pair of spaced, extended parallel arms perpendicular to said element, and leg means making an angle with said arms sufficiently in excess of 90 degrees so that when said leg means is substantially horizontal and in contact with ground surface said restraining member will tend to rotate under the influence of gravity, said angle being sufficiently close to 90 degrees so that when said leg means is in contact with ground said parallel arms are sufficiently upright to block forward movement of said airplane, whereby said plane may be withdrawn from contact with said restraining member using one hand permitting said restraining member to drop to the ground and out of the way of said airplane.

4,993,673

MECHANISM FOR MOVING A TABLE IN ORTHOGONAL DIRECTIONS

Kazuya Hirose, Tokyo, Japan, assignor to Hihaisuto Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 326,032
Claims priority, application Japan, Mar. 22, 1988, 63-67558
Int. Cl.[5] G05G *11/00*
U.S. Cl. 248—178 **6 Claims**



1. A mechanism for moving a table means horizontally in orthogonal directions, comprising:

two mutually orthogonal pairs of table carried parallel guide faces adapted to be mounted on the table means;

a support base;

two pairs of guide members each pair having two parallel guide faces in horizontally spaced opposed relation to corresponding table carried guide faces, the parallel guide faces on one pair of guide members being orthogonal to the parallel guide faces on the other pair of guide members, said guide members each being movably mounted on said support base for movement in a direction for moving parallel guide faces of the respective pairs of guide member guide faces in a horizontal direction perpendicular to the length of the guide member guide faces;

two pairs of parallel straight motion guide bearing mechanisms mounted between horizontally spaced opposed pairs of guide faces for movably supporting the table means on said guide members for movement along the parallel guide faces of said guide members and supporting the weight of the table means; and

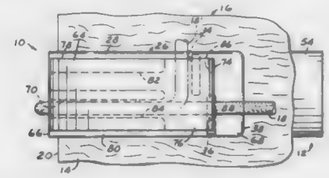
drive means engaged with at least one guide member of each pair of guide members for moving the one guide member in a direction to move the guide face thereof in said perpendicular direction.

4,993,674

CLIP STRUCTURE FOR MOUNTING VEHICLE TELEPHONE MICROPHONE

James E. Van Hout, Auburn Hills, and David R. Baehr, Detroit, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 18, 1990, Ser. No. 525,005
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—229 **6 Claims**



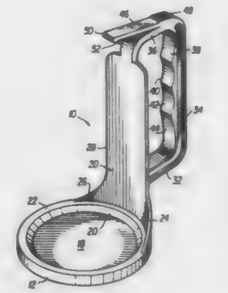
1. A clip structure for securing the microphone of a vehicle telephone in a position beneath the forward marginal edge portion of a vehicle headliner with the microphone cable extending around the forward edge of the vehicle headliner into the space between the vehicle headliner and the vehicle roof structure, the clip structure comprising a first clip portion including an upper arm and a lower arm connected together by a flexible web to define a generally U-shaped structure receivable on the forward marginal edge portion of a vehicle headliner with said upper arm lying over the forward marginal edge portion of the vehicle headliner and said lower arm lying under the forward marginal edge portion of the vehicle headliner and with both arms pressing against the vehicle headliner, a second clip portion depending from said lower arm for receiving and engaging the microphone of a vehicle telephone, a microphone cable guide wall positioned above said upper arm is spaced apart relationship thereto and extending substantially parallel thereto, a rib is provided between the cable guide wall and upper arm extending longitudinally thereof, and microphone cable retaining structure depending from at least one side edge of the microphone cable guide wall towards said upper arm and terminating short thereof, said microphone cable retaining structure permitting a length of microphone cable to be squeezed thereby into the space between the microphone cable guide wall and upper arm with the rib and microphone cable retaining structure thereafter preventing escape of the microphone cable.

4,993,675

CAN CADDY

Joe Walker, 209 S. Gardenia, Toppenish, Wash. 98948

Filed Nov. 17, 1989, Ser. No. 438,613
Int. Cl.[5] B65D *25/00*
U.S. Cl. 248—311.2 **[illegible] Claims**



1. A single-piece holder for releasably retaining a beverage can or the like comprising:

a can bottom support means;

a partially circular wall extending upwards form the periphery of the can bottom support means;

a handle extending radially outward from the wall; and

a can retaining clip extending radially inward from the top of the handle, said clip comprising:

a resilient element diverging from the top portion of the handle, and extending radially inwardly a sufficient distance to overlie the top bead of a beverage can; and

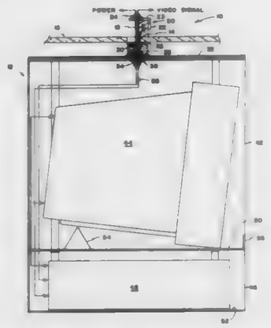
a curved detent extending downwardly from the inner end of the clip, the radius of the curve of the radially outward side of the detent being of approximately the same radius as the inner side of the top bead of a beverage can, the radially outward side of the detent being so located as to contact said inner side of the top bead.

4,993,676

APPARATUS FOR SUPPORTING A TELEVISION SET FROM A CEILING

William E. Fitts, and Christina L. Fitts, both of 375 Chicken Creek Rd., Pulaski, Tenn. 38478

Filed Jan. 16, 1990, Ser. No. 465,918
Int. Cl.[5] A47B 97/00
U.S. Cl. 248—317 9 Claims



1. Apparatus for mounting a television set or the like from a ceiling that includes spaced-apart joists having a rectangular cross section with a ceiling panel secured to the underside of said joists which comprises:

an L-shaped bracket member having a top leg and a side leg;

a hollow shaft securable to the top leg in perpendicular relation thereto, said legs and said shaft forming a U-shaped hook adapted to come into flush contact with top and side surfaces of a said joist;

a bottom portion of said shaft being adapted to extend downward through a hole in said ceiling;

a cabinet for supporting a television set or the like coupled to said bottom portion of said shaft; and

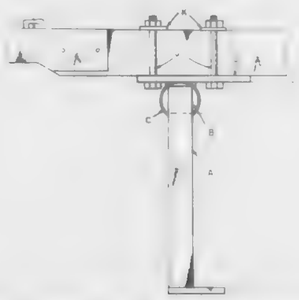
means securing said cabinet to said shaft.

4,993,677

CLAMP-ON SUPPORT LEG FOR TRAILER TONGUES

Gary W. Patterson, Belle Vue Trl. Ct. #3, P.O. Box 2533, Polson, Mont. 59860

Continuation-in-part of Ser. No. 103,342, Oct. 1, 1987, abandoned. This application Jun. 13, 1990, Ser. No. 537,436
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—351 5 Claims



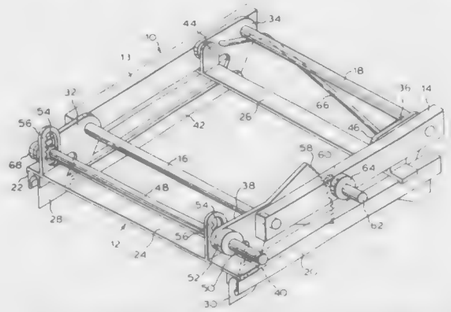
1. A support leg for trailer tongues or the like which comprises an L-shaped ground support leg having a horizontal portion of square cross-section; leg-mounting means adapted to be attached to a device to be supported, said leg-mounting means having a hollow cylindrical interior capped at one end and open at the other end with a circular cross section of sufficient diameter to telescopically and rotatively receive said horizontal leg portion, said hollow cylindrical interior terminating at its closed end in an internal leg-locking cavity of square cross-section, said horizontal leg portion being adapted to be inserted through the open end of said leg-mounting member and to extend through said hollow cylindrical interior into said leg-locking internal cavity, and said internal cavity being adapted to telescopically receive said horizontal leg portion and restrain said horizontal leg portion against rotative movement, whereby said horizontal leg portion may be withdrawn from said internal leg-locking cavity and rotated in said hollow cylindrical interior from a retracted to an extended position and vice versa and then telescopically inserted back into said internal cavity for locking engagement in the new position; said leg-mounting means being so constructed that said hollow cylindrical interior, including said internal leg-locking cavity at the closed end thereof, is exposed to ambient surroundings only through its open end; tension means located within said leg horizontal member and extending therein to within said internal leg-locking cavity and fastened at its ends inside said leg horizontal portion and said leg-locking cavity to resist telescoping disengagement of said leg horizontal portion from said internal leg-locking cavity; and means associated with said leg and said leg-mounting means to effect a closure between them at the open end of said hollow cylindrical interior when said leg is telescopically engaged in said internal leg-locking cavity.

4,993,678

SEAT POSITIONING MECHANISM

Robert L. Easter, Kingswood, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1989, Ser. No. 422,870
Claims priority, application United Kingdom, Oct. 27, 1988, [illegible]
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—371 12 Claims



1. A seat positioning mechanism for a motor vehicle having a floor and slides mounted on the floor for carrying a seat of the type having a seat cushion, the mechanism being of the type which allows adjustment of both the seat height and the seat tilt with respect to the vehicle floor, the mechanism comprising punctuation

a first frame to be attached to the underside of the seat cushion;

a second frame to be mounted on the seat slides for fore and aft movement thereon;

a first adjustment device for operating the seat height adjustment;

a second adjustment device for operating the seat tilt adjustment;

an axle mounted on said second frame, said second adjustment device being rotatively operable to produce vertical movement of said axle relative to said second frame;

a control link pivotally mounted to said first frame and to said axle, said first adjustment device being operable upon pivotal movement to alter the angle said control link makes to said first frame; and

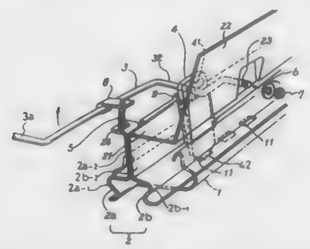
a system of pivoted links interconnecting said two frames and said axle.

4,993,679

LOCKING DEVICE FOR SLIDE RAIL IN VEHICLE SEAT

Muneharu Urai, and Shigeru Kasai, both of Akishima, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,632
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—429 9 Claims



1. A locking device for a slide rail in a vehicle seat, in which said slide rail is two in number, forming a pair of spaced-apart slide rails in said seat, each of said slide rails including an upper rail and a lower rail, said upper rail being slidably fitted in said lower rail and being further formed by two half rail members,

a pair of stoppers which are each slidably inserted in a through-bore defined between said two half rail members respectively of said two upper rails, such that said stoppers are free to be moved vertically therein;

a plurality of holes which are formed in each of said lower rails, into which holes said stoppers are to be engaged;

a rod member extending between said pair of stoppers, said rod member having an integral crank part on which is operatively connected said pair of stoppers;

means for providing an operation lever, said means being integrally defined on said rod member; and

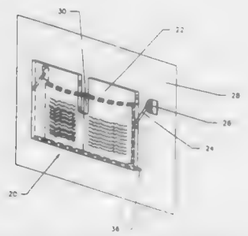
wherein a tension spring is extended between said lever rod and one of said two half rail members so as to bias said means for providing an operation lever in a direction towards said two half rail members, thereby normally urging said stoppers into engagement with said holes of said lower rails.

4,993,680

EASY VIEWING AND SPACE SAVING DOCUMENT HOLDER

Randall S. Gemmen, and Marian G. Armour-Gemmen, both of 51 Murdell La., Apt. 2, Livermore, Calif. 94550

Filed Jan. 9, 1990, Ser. No. 462,710
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—444.1 10 Claims



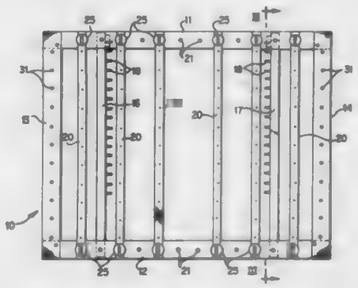
1. A book or document holder for mounting on a vertical flat surface comprising a single transparent rigid sheet, a single elongated ledge, two tie-bars, and two mounting brackets, said transparent rigid sheet having said elongated ledge attached parallel to the lower edge thereof and extending inward toward said vertical flat surface from said transparent rigid sheet, so as to be disposed therebetween, said tie-bars being attached along opposed edges of said transparent rigid sheet with means for rotating said tie-bars about a horizontal axis, said mounting brackets joined to another end thereof of said tie-bars with means for rotating said tie-bars about a horizontal axis parallel to first said horizontal axis, and with means for attaching said mounting brackets to said vertical flat surface, wherein said inwardly extended elongated ledge permits said book or document to be forcibly maintained between said transparent rigid sheet and said vertical flat surface solely due to the weight of said book on said elongated ledge thereby forcing said transparent rigid sheet downward and toward said vertical flat surface whenever said book or document is appropriately placed between said vertical flat surface and said transparent rigid sheet.

4,993,681

EASEL ASSEMBLY

Michael T. Ambrose, 8 Dunmore Terrace, Auchenflower, Queensland 4220, Australia, and Steven M. Rigter, Miami, Australia, assignors to Michael T. Ambrose, Auchenflower, Australia

Filed Sep. 21, 1989, Ser. No. 411,361
Int. Cl.[5] A47G 1/24
U.S. Cl. 248—455 14 Claims



1. An easel assembly including

a frame having opposed frame members located in one plane,

at least one wall support member releasably secured to the frame and located in a plane inclined relative to the one plane,

at least one strut attached to said frame members, said strut having registry means in the form of a series of spaced apertures,

at least one work piece support having complementary registry means in the form of a plurality of apertures for receiving pins whereby the work piece support can be located in a desired orientation and position over and relative to the strut, and

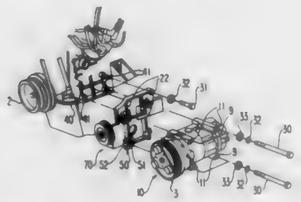
at least one planar stencil carrier having registry apertures complementary to the apertures in the strut and in the work piece support, thereby enabling the carrier to be mounted relative thereto to overlie the work piece support to enable artwork to be applied to the work piece.

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4,993,682
VIBRATION ABSORBING MOUNTING MECHANISM FOR AN AUTOMOTIVE AIR CONDITIONING COMPRESSOR

Soichiro Imai, Maebashi, and Seiji Shimazaki, Isesaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Apr. 28, 1989, Ser. No. 344,665
Claims priority, application Japan, Apr. 28, 1988, 63-58357[U]
Int. Cl.[5] F16M *1/00*
U.S. Cl. 248—638 22 Claims



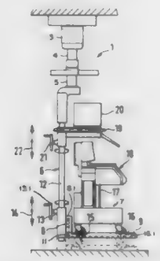
1. A mounting mechanism for coupling a compressor to an automobile engine including a mounting bracket, at least one flange projecting from an outer peripheral surface of the compressor and fastening means for fastening each flange to the mounting bracket, the improvement comprising:

said mounting bracket including vibration absorbing coupling means for coupling said fastening means to the mounting bracket and absorbing axial and radial vibration generated by the compressor, said vibration absorbing coupling means comprising at least one vibration absorbing unit comprising vibration absorbing material and having its longitudinal axis in substantially parallel alignment with the longitudinal axis of the compressor, while being in substantially perpendicular alignment with the center line of the fastening means.

4,993,683
OVERHEAD SUPPORT FOR MEDICAL APPLIANCES

Friedhelm Kreuzer, Puchheim, Fed. Rep. of Germany, assignor to F. M. K. Kreuzer GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,858
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 8716928[U]
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—639 1 Claim

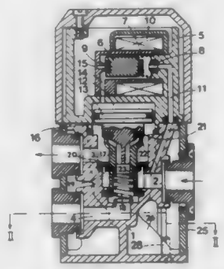


1. An overhead support for carrying medical appliances, comprising an extension arm, a column with supply lines passed therethrough, appliance receiving means being provided at the bottom end of said column and being formed to grab a medical appliance supported on a carriage from below said carriage, means for lifting said carriage off the floor and for adjusting the level of said appliance receiving means to receive said medical appliance, said appliance receiving means comprises two rails and means for adjusting the distance between said two rails, and a hinge provided at the column end for folding said rails up around said hinge.

4,993,684
VALVE FOR FLUID

Raphaël Prina, Perly, Switzerland, assignor to Honeywell Lucifer S.A., Carouge, Switzerland

Filed Jul. 13, 1989, Ser. No. 384,776
Claims priority, application European Pat. Off., Sep. 14, 1988, [redacted]
Int. Cl.[5] F16K *27/02*
U.S. Cl. 251—367 5 Claims

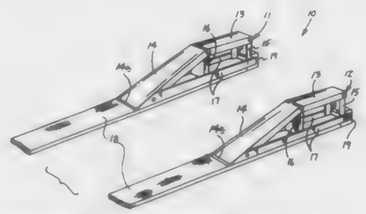


1. Valve for fluid, comprising a body, at least one inlet passage for fluid and one outlet passage for fluid, a closure member between the inlet and outlet passages and a casing surrounding the body and having openings located in registry with said passages, characterized in that the casing is of tubular shape of uniform cross-sectional configuration apart from said openings, this casing having connectors in said openings, and screws detachably interconnecting said connectors and said casing.

4,993,685
AUTOMOTIVE RAMP APPARATUS

Danny E. Sparling, 2401 Grandview #32, Casper, Wyo. 82601

Filed May 29, 1990, Ser. No. 529,531
Int. Cl.[5] B66F *19/00*; E02C *3/00*
U.S. Cl. 254—88 3 Claims



1. An automotive ramp apparatus comprising,

a horizontal platform member, the horizontal platform member including a rear terminal end and a forward terminal end, and

a ramp member, the ramp member fixedly mounted to the platform member at the forward terminal end defining an intersection with the ramp member longitudinally aligned to the platform member and directed downwardly therefrom wherein the ramp member includes a ramp member forward terminal edge disposed generally orthogonally to the ramp member spaced below the platform member, and

a rear vertical support orthogonally mounted underlying the platform member at the rear terminal end, and

a forward vertical support orthogonally mounted to the platform member at the intersection, the rear and forward vertical supports including spaced parallel side rails to secure the rear and forward vertical supports together, the side rails arranged parallel relative to one another, and

the rear vertical support, the forward vertical support, and the side rails defining a framework underlying the platform member, and

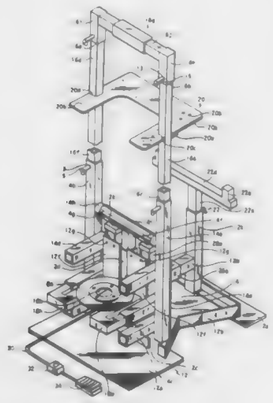
an elongate longitudinally aligned flexible web mounted to the framework, the flexible web extending longitudinally of and forwardly of the ramp member forward terminal edge underlying the ramp member forward terminal edge to frictionally accommodate an automotive wheel mounted thereon to align and secure the ramp member to the automotive wheel, and

the flexible web includes a rear terminal edge, the rear terminal edge mounted to a "C" shaped mounting block, the "C" shaped mounting block including a bottom horizontal plate, a top horizontal plate overlying and parallel to the bottom horizontal plate, and a rear vertical plate mounted orthogonally between the top and bottom horizontal plates, and an engagement flange integrally and downwardly mounted to a forward elongate edge of the top horizontal plate, the rear vertical support including a slot, and the engagement flange directed through the slot to secure the flexible web to the framework.

4,993,686
TRANSMISSION WORK STATION

Eusebio M. Diaz, 6450 Balboa Blvd., Van Nuys, Calif. 91406

Filed Nov. 21, 1988, Ser. No. 274,307
Int. Cl.[5] B66F *3/00*
U.S. Cl. 254—133 R 12 Claims



1. A transmission work station comprising:

(a) a base assembly comprising:

(1) a base plate having a front and back section,

(2) a center post sleeve attached to the front section of said base plate,

(3) a lower vertical support sleeve attached to the back section of said base plate,

(4) a longitudinal support attached between the back of said center post sleeve and front of lower vertical support sleeve,

(b) a lower pivoting assembly pivotally mounted on the base comprising:

(1) a right vertical sleeve having a right support sleeve rigidly attached normal to a lower-half inside-surface of said right vertical sleeve,

(2) a left vertical sleeve having a left support sleeve rigidly attached normal to a lower-half inside surface of said left vertical sleeve,

(3) a combination support sleeve attachment and roller plate rigidly attached to back surface of each said right and left vertical sleeves,

(4) a center post sized to slideably fit into said center post sleeve and having rigidly and centrally attached to its upper end a pivot shaft sleeve,

(5) a pivot shaft slideably inserted into said pivot shaft sleeve and having the ends of said pivot shaft rigidly attached to upper-half inside-surfaces of said right and left vertical sleeves such that said right and left vertical sleeves are free to pivot about said pivot shaft sleeve,

(6) means to lock said pivot shaft at any of a plurality of angles,

(c) an upper pivoting assembly pivotally mounted relative to said base comprising:

(1) a right pivotal member having an upper end and a lower end that is sized to be slideably inserted into and held within said right vertical sleeve,

(2) a left pivotal member having an upper end and a lower end that is sized to be slideably inserted into and held within said left vertical sleeve,

(3) a handle having on each end a vertical portion respectively inserted over the right and left pivotal members,

(d) a tail housing support assembly comprising:

(1) a trail housing plate having a centrally located shaft insertion bore therethrough,

(2) means to releasably attach said plate to said right and left support sleeves,

(e) a bell-housing mounting and utility plate assembly comprising:

(1) a mounting and utility plate having a set of transmission mounting bores therethrough that are specifically spaced to allow a variety of transmission bell housings to be attached,

(2) means to attach said mounting and utility plate to said right and left pivotal member,

(f) a rear transmission cradle assembly mounted on a rear portion of said base comprising:

(1) a vertical support member having an upper end and a lower end that is sized to slideably fit into said lower vertical support sleeve,

(2) means to adjust and hold said vertical support member within said lower vertical support sleeve,

(3) a horizontal member rigidly and centrally attached to the upper end of said vertical support member configured to support said upper pivoting assembly when the combination of said upper and lower pivoting assemblies are pivoted about said pivot shaft to recline in a horizontal or angled position,

(g) a lift roller assembly comprising:

(1) an upwardly angled member having a forward end and a downwardly extending channel sized to slideably fit into and be held within said longitudinal support,

(2) a T-section member centrally and rigidly attached to the forward end of said upwardly extending member,

(3) a roller attached to ends of said T-section member where said roller has means so that the roller abuts a roller plate on said lower pivoting assembly,

(h) a pivot shaft sleeve lift assembly mounted on said base comprising:

(1) a lift having a cradle that is sized to encompass the diameter of said pivot shaft sleeve, and

(2) means to operate said lift,

whereby said roller plate slides along said rollers as said lift assembly lifts said upper and lower pivoting assemblies.

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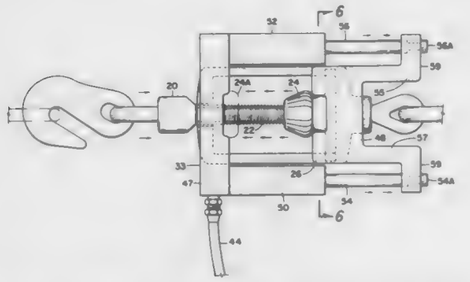
HYDRAULIC LOAD BINDER

Edward J. Crook, Tulsa, and C. Ronald Garrett, Ramona, both of Okla., assignors to The Crosby Group, Tulsa, Okla.

Continuation of Ser. No. 820,716, Jan. 17, 1986, abandoned. This application Jul. 16, 1987, Ser. No. 75,198

Int. Cl.[5] B25B *28/00*

U.S. Cl. 254—228 3 Claims



1. A tensioning device for applying tension to a chain having a first end and a second end which comprises:
- a link member having a first side, a second side, a first end and a second end with a hole in said first end;
- a threaded rod slidably extending through said hole;
- a cross-link member secured to said threaded rod and mounted for movement between said ends;
- a securing nut threadedly mounted on said threaded rod between said first end and said first cross-link member;
- means to connect said threaded rod to an elongated member;
- a hydraulic motor means for insertion within the link member between its sides and between said first end of said link member and said cross-link member for forcing said cross-link member away from said first end of said link member.

4,993,688

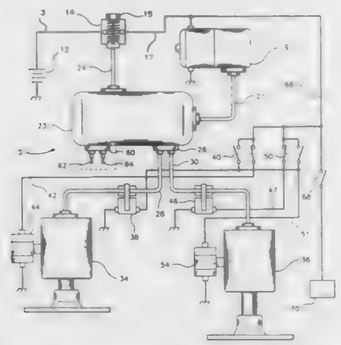
BUILT-IN POWER JACK

Thomas L. Mueller, and Pamela A. Mueller, both of P.O. Box 69, Germantown, Ill. 62245

Filed Oct. 10, 1989, Ser. No. 419,505

Int. Cl.[5] B66F *3/24*

U.S. Cl. 254—423 1 Claim



1. An automobile pneumatic jack system comprising:
- a front suspension pneumatic jack and means for mounting it centrally to the front suspension of an automobile between its front wheels;
- a rear suspension pneumatic jack and means for mounting it centrally to the rear suspension of an automobile between its rear wheels;
- a compressed air reservoir tank;
- a first air hose line connected between said air reservoir tank and said front suspension pneumatic jack;
- a second air hose line connected between said air reservoir tank and said rear suspension pneumatic jack;
- a first solenoid valve means for extending said front suspension pneumatic jack to the ground and a second solenoid valve means for retracting said front suspension pneumatic jack;
- a front jack control assembly for operating said first and second solenoid valve means;
- a third solenoid valve means for extending said rear suspension pneumatic jack to the ground and a fourth solenoid valve means for retracting said rear suspension pneumatic jack;
- a rear jack control assembly for operating said third and fourth solenoid valve means; and
- means for maintaining a ready supply of compressed air in said reservoir tank.
- comprising an electric air compressor pump connected to said air reservoir tank by a high pressure line, said pump being electrically connected to the battery of an automobile;
- an auxiliary air regulator connected to said air reservoir tank, said air regulator having air outlet connectors for a pneumatic lug wrench and a tire inflation hose; and
- an adjustable automatic air regulator switch in the electrical circuit between said battery and said compressor pump;
- a third air hose line connected between said auxiliary air regulator and a brake master cylinder to provide pressure to the brake master cylinder to releasingly lock the brakes in a brake-on position; and
- a brake switching means in a brake electrical circuit of the automobile to actuate the brake master cylinder.

4,993,689

CONVERTOR FOR CONTINUOUSLY MELTING SCRAP WITH TAPPING MEANS

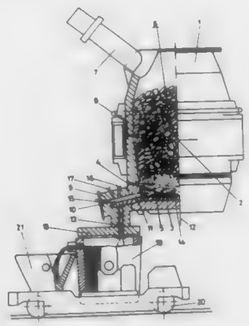
Ludwig von Bogdandy, Linz; Gerhard Mitter, Traun; Otto Köller, and Luzian Pochmarski, both of Leoben, all of Austria, assignors to Voest Alpine Stahl Donawitz Gesellschaft m.b.H., Leoben-Donawitz, Austria

Division of Ser. No. 278,543, Dec. 1, 1988, Pat. No. 4,895,594. This application Oct. 30, 1989, Ser. No. 428,774

Claims priority, application Austria, Dec. 17, 1987, 3341/87

Int. Cl.[5] F27B *14/18*

U.S. Cl. 266—79 6 Claims



1. Apparatus for continuously forming a melt of scrap and/or pig iron and for discharging the melt into a mobile ladle, said apparatus comprising:
- A converter having a bottom, radical taphole and an interior;
- a plurality of burners (4), extending in essentially radial direction relative to said converter and arranged on the converter (1) within a first plane having an orientation parallel to said bottom of the converter and being located in proximity to said bottom (3) of the converter, for directing flames into the interior of the converter for sub-stoichiometric heating there;
- a plurality of air nozzles arranged within a further plane located above the first plane for supplying secondary air for completing combustion; and
- tapping means (9) for discharging the melt from said converter into the mobile ladle (19), said tapping means being connected to the bottom of the converter via said radial taphole within the converter.

4,993,690

ELECTROSLAG REMELTING PLANT INCLUDING AN INGOT MOLD AND A HOOD

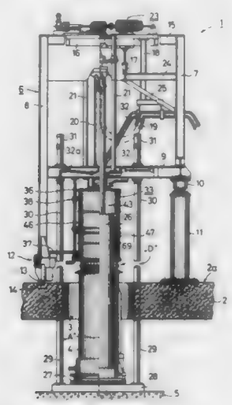
Otto Stenzel, Grundau; Wolfram Diemar, Clausthal; Heiko Spengemann, Langenselbold; Heinz Kohnert, Erlensee; Leo Emiljanow, Maintal, and Helmut Gröf, Bruchköbel, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Aug. 9, 1989, Ser. No. 391,182

Claims priority, application Fed. Rep. of Germany, Jan. 1, 1989, 3901297

Int. Cl.[5] C21B *7/22*; C22B *4/00*; H05B *3/60*

U.S. Cl. 266—158 14 Claims



1. An electroslag remelt plant comprising
an ingot mold for forming a block from remolten material of at least one consumable electrode,
an electrode rod driven parallel to its axis for the advance of an consumable electrode mounted coaxially thereto,
a hood disposed above the ingot mold and comprising two segments which are movable transversely to the axis of the rod, said segments being closable to form a first sealing joint about the ingot mold and a second sealing joint about the electrode rod, said hood having an interior of such cross-section and height that the consumable electrode is, in its most elevated position, below the second sealing joint.

4,993,691

OXYGEN INJECTION LANCE

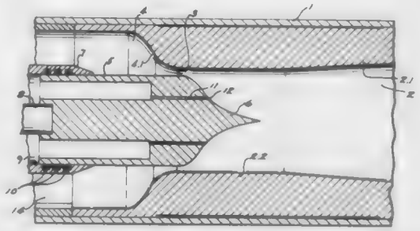
Robert Mousel, Dudelange; Carlo Lax, Bertrange; Francois Knaff, Niederkorn; Henri Klein, Bergem; Romain Henrion, Esch/Alzette; Carlo Heintz, Luxembourg; Michel Decker, Soleuvre, and Andre Bock, Luxembourg, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Aug. 17, 1989, Ser. No. 395,104

Claims priority, application Luxembourg, Sep. 28, 1988, 87353

Int. Cl.[5] C21C *5/32*

U.S. Cl. 266—225 16 Claims



1. A gas injection lance for use in metal refining, comprising:
- a tube extending along a central axis and having an inner diameter profile wherein the inner diameter of the tube varies with axial distance along the axis;
- a throttle body member slidably received within the tube and movable along the axis, said throttle member comprising;
- a substantially cylindrical throttle body, and
- a throttle nose extending axially from the throttle body, said throttle nose having a profiled surface wherein curves defined by intersection of a plane axially aligned with and passing through the central axis are compound curves having a circular part and a parabolic part and exhibit a central inflection point.

4,993,692

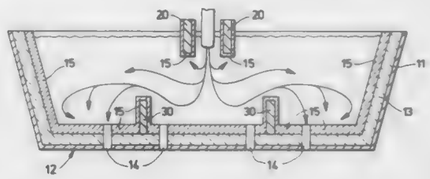
UNITARY TUNDISH LININGS WITH FLOW-CONTROL DEVICES

William K. Brown, 323 Ridge Point Cir., Apt. A34, Bridgeville, Pa. 15017, and Thomas W. Lewis, 964 Cork Dr., Bethel Park, Pa. 15102

Filed Jul. 10, 1989, Ser. No. 377,176

Int. Cl.[5] C21B *7/14*

U.S. Cl. 266—229 6 Claims



1. A tundish consisting essentially of a rigid metallic outer casing, at least one layer of permanent heat insulating material adjacent said casing, and a unitary, integrally formed inner expendable lining and at least one expendable liquid metal flow control device of a hydrocarbon-free refractory composition said unitarily formed expendable lining and control device being structured so as to be removable from the tundish at the same time and, said composition being chemically compatible with the molten metal to be placed in the tundish.

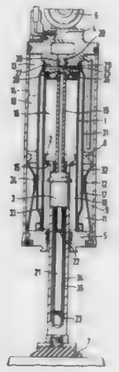
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4,993,693

SELF-PUMPING HYDROPNEUMATIC SHOCK ABSORBING LEG WITH INTERNAL LEVEL REGULATION

Karl-Heinz Löhr; Ewald Kohberg, both of Eitorf; Norbert Sommer, Königswinter, and Hubert Beck, Eitorf, all of Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,004
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816102
Int. Cl.[5] B60G *17/00*; F16F *9/34*
U.S. Cl. 267—64.17 19 Claims



1. A self-pumping hydropneumatic shock absorber with leveling regulation for connection between relatively moveable first and second elements of a suspension of a vehicle, said shock absorber comprising:

an elongated working cylinder having a first end and a second end;

said second end of said working cylinder having a piston rod hole therethrough;

a piston mounted on a piston rod;

said piston being disposed for movement within said working cylinder with said piston rod extending through said piston rod hole in said second end;

said first end of said working cylinder for being connected to said first element;

said piston rod for being connected to said second element;

said working cylinder including a supply of oil for damping movement of said piston within said working cylinder during relative movement of said first and said second elements;

said piston being disposable within said working cylinder to define a first working chamber at said first end of said working cylinder and a second working chamber at said second end of said working cylinder;

said piston being disposed for said movement in a first direction toward said first end of said working cylinder and in a second direction toward said second end of said working cylinder;

said piston having at least one piston check valve means for controlling the supply of oil from said first working chamber to said second working chamber;

said at least one piston check valve means for allowing said oil to flow in one direction from said first working chamber to said second working chamber;

means for generating a self-pumping action to provide internal leveling regulation regardless of the direction of movement of said piston in response to relative movement between said first and second elements when connected to the suspension of a vehicle;

first passage means for connecting said first working chamber and said second working chamber;

adjustable valve means positioned in said first passage means for controlling the flow of oil between said first and second working chambers, said adjustable valve means movable to a preselected position in said first passage means to direct a flow of oil to said first working chamber for selected damping movement of said piston; and

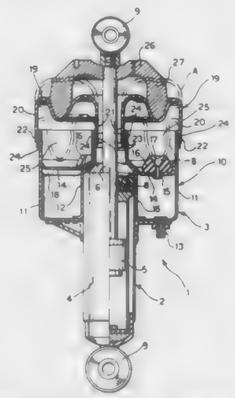
at least one check valve means positioned in said first passage means for allowing flow of at least some of said oil from said second working chamber through said first passage means into said first working chamber.

4,993,694

SUSPENSION DEVICE FOR VEHICLES, COMPRISING A TELESCOPIC SHOCK-ABSORBER AND AN AIR SPRING

Romolo Gandiglio, Cambiano, and Maurizio Urbinati, Bruino, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Oct. 4, 1989, Ser. No. 417,610
Claims priority, application Italy, Oct. 4, 1988, 67892 A/88
Int. Cl.[5] F16F *9/04*
U.S. Cl. 67—64.240 2 Claims



1. A suspension device for vehicles, comprising a telescopic shock-absorber constituted by a cylinder with a piston which is slidable therein and is fixed to a rod that projects sealingly from the cylinder and an air spring arranged externally of the shock-absorber and coaxially therewith, the spring comprising a casing which is at least partially flexible and defines a pneumatic chamber having an annular cross-section, at least in the region of the seal between the rod and the cylinder,

wherein the casing of the air spring comprises:

a rigid axial portion which is fixed to one of the cylinder and the rod of the shock-absorber and is open at one end, the rigid portion having an annular inner wall and an annular outer wall which are coaxial with each other,

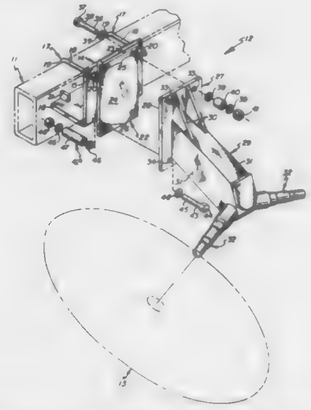
a flexible axial portion which is fitted to the open end of the rigid-walled portion and on the top of which bears an annular thrust member carried by the other of the rod and the cylinder respectively, the flexible portion having an annular conformation with outer and inner peripheral edges fixed sealingly to the annular outer wall and the annular inner wall of the rigid portion, respectively.

4,993,695

FLEXIBLE STRUT ASSEMBLY

Howard W. Taylor, 308 Fifth Ave., Armstrong, Iowa 50514; Warren L. Stinar, 314 N. 18th St., Estherville, Iowa 51334, and Kenneth L. McConnell, 701 Second St., Armstrong, Iowa 50514

Filed Feb. 9, 1990, Ser. No. 477,560
Int. Cl.[5] F16F *1/16*; A01B *35/28*
U.S. Cl. 267—70 6 Claims



1. A flexible strut device for supporting the lifter wheels of a sugar beet harvester having a transversely extending horizontal tool bar, comprising:

a mounting bracket for attachment to the transversely extending horizontal support bar of the sugar beet harvester, a vertically disposed fixed fulcrum plate secured to said mounting bracket and having a substantially flat rearwardly facing fulcrum surface,

an elongate flexible strut extending in a fore and aft direction, a pair of stub shafts secured to said flexible strut and extending outwardly therefrom for journaling thereon a pair of lifter wheels,

a vertically disposed movable fulcrum plate secured to the front end of said flexible strut and having a substantially flat forwardly facing surface, and

means yieldably connecting the fixed and movable fulcrum plates together so that the respective flat fulcrum surfaces thereof are urged into engaging relation with each other when the flexible strut assembly and lifter wheels are in a normal operating position, said yieldable connecting means permitting said movable fulcrum plate to yieldably tilt about its upper edge portion said fixed fulcrum plate when the rear end of said flexible strut is urged upwardly.

4,993,696

MOVABLE STAGE MECHANISM

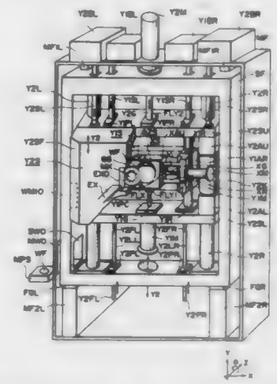
Motomu Furukawa, Kawasaki; Makoto Higomura; Masaru Ohtsuka, both of Yokohama; Hironori Yamamoto, Chigasaki; Shinkichi Ohkawa, Tsuchiura; Koichi Matsushita, Chiba; Yasuo Kawai, Shizuoka; Takao Kariya, Hino; Haruyuki Kusunoki, Abiko, and Toshihiko Yamaura, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,566
Claims priority, application Japan, Dec. 1, 1986, 61-284287; Dec. 2, 1986, 61-287069; Dec. 2, 1986, 61-287070; Jan. 8, 1987, 62-1099
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—73 21 Claims

1. A stage device for moving a stage substantially in a direction of gravity, said device comprising:

a guide mechanism for guiding the stage substantially in the direction of gravity;

a driving mechanism for moving the stage substantially in the direction of gravity; and



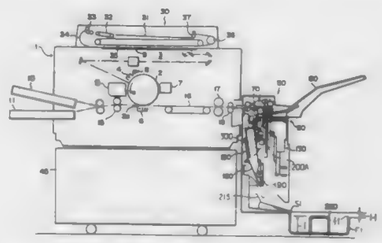
a balancing mechanism for effecting gravity compensation of the stage with respect to movement of the stage, said balancing mechanism including a belt having an end fixed to the stage and a constant-tension spring mechanism for acting on said belt.

4,993,697

COPY SHEET STACK APPARATUS

Hiroki Yamashita; Toshio Matsui; Keichi Kinoshita; Kazuhito Ozawa; Wataru Kurahashi, and Katsuya Yasuda, all of Osaka, Japan, assignors to Minolta Camera Kaisha, Osaka, Japan

Filed Feb. 16, 1989, Ser. No. 311,060
Claims priority, application Japan, Feb. 18, 1988, 63-35896; Feb. 18, 1988, 63-35898; Apr. 22, 1988, 63-99542
Int. Cl.[5] B42B *1/02*
U.S. Cl. 270—53 12 Claims



1. A copy sheet stack apparatus for stacking copy sheets discharged from an image-forming device and binding them, comprising:

first accommodating means for accommodating copy sheets discharged from the image-forming device,

binding means for binding the copy sheets accommodated in said first accommodating means,

second accommodating means disposed below said first accommodating means to accommodate a bundle of the copy sheets bound by said binding means,

fall means for making the bundle of the copy sheets bound by said binding means fall from said first accommodating means into said second accommodating means by its own weight, and

guide means disposed between said first accommodating means and said second accommodating means to guide the bundle of the copy sh ~s falling from said first accommo-

dating means to said second accommodating means, said guide means including curl means for curling each bundle of said copy sheets such that each bundle has a generally arcuate cross-section in a plane which is perpendicular to a bundle discharging direction so as to make each bundle thereof rigid in the bundle discharging direction during discharge of the bundle into said second accommodating means.

4,993,698

FILM MAGAZINE

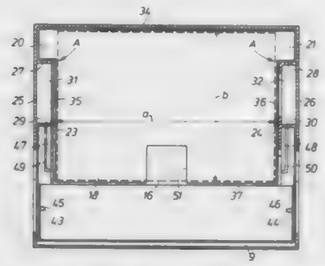
Edward Buelens, Kontich; Danny Van Geyte, Wilrijk, both of Belgium, and Hubert Hackenberg, Holzkirchen, Fed. Rep. of Germany, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 19, 1989, Ser. No. 452,306

Claims priority, application European Pat. Off., Dec. 20, 1988, 88202971.3

Int. Cl.[5] B65H *1/00*

U.S. Cl. 271—145 15 Claims



1. In a light-tight magazine (10) for a stack of alternatively piled image light-sensitive recording sheets (16) and spacing foils (17), and having an openable end thru which the recording sheet can be dispensed one by one, the end portions of the spacing foils remote from said openable end being held with respect to the magazine to prevent said foils from being dispensed simultaneously with an image recording sheet, and the end portions of the spacing foils adjacent said openable end each having a cut-away portion (51) to allow a feeding means to have access to the uppermost image recording sheet of the stack for the dispensing of such image recording sheet to a subsequent position, in combination, the improvement wherein said remote end portions of the spacing foils (17) are provided with ear portions (20, 21) protruding laterally beyond the side edges of the stacked image recording sheets, and said magazine has opposite lateral walls (23, 24) with interior abutment means (27, 28) for engaging said ear portions to retain said foils within the magazine while said recording sheets are dispensed.

4,993,699

REVERSIBLE AUTO DOCUMENT FEEDER

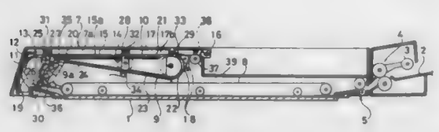
Masanobu Takahashi, Suita, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 13, 1988, Ser. No. 243,578

Claims priority, application Japan, Sep. 19, 1987, 62-235777

Int. Cl.[5] B65H *29/20*

U.S. Cl. 271—186 2 Claims



1. An improved reversible auto document feeder removably mountable on a conventional image forming apparatus of the single side type which produces an automatic document feeder ADF signal which is useable to provide single side copying only using a conventional document feeder, the improved reversible auto document feeder being operable to use said ADF signal and enable said improved reversible auto document feeder to effect double sided copying, said improved reversible auto document feeder comprising a document feed mechanism having a first single side copying mode which includes feeding the document to a document placing position on said image forming apparatus and then discharging the document, said document feed mechanism receiving said ADF signal from said image forming apparatus to effect operation of said document feed mechanism according to said first single side copying mode, said document feed mechanism having a second double sided copying mode which includes feeding a document to said document placing position on said image forming apparatus, reversing the document, feeding the reversed document to said document placing position again, and discharging the document; and a change switch means provided on the improved reversible auto document feeder operable to selectively change operation of said document feed mechanism between said first and second copying modes, said change switch means comprising control means receiving said ADF signal from said conventional image forming apparatus and providing a reverse automatic document feed RADF signal for effecting operation of said document feed mechanism according to said second copying mode to thereby effect double sided copying.

4,993,700

FACING MECHANISM FOR SHEET FEEDER

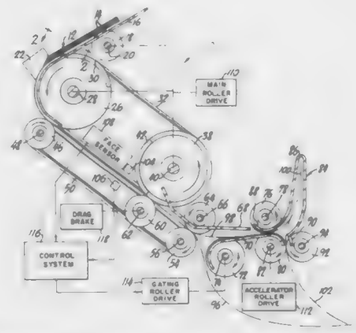
Theodore Winkler, Levittown, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Continuation of Ser. No. 271,915, Nov. 15, 1988, abandoned.

This application Feb. 22, 1990, Ser. No. 483,989

Int. Cl.[5] B65H *29/00*

U.S. Cl. 271—186 5 Claims



1. Apparatus for feeding currency notes having different indicia on the opposite faces thereof from an input stack to an output path in predetermined spaced relationship including in combination means for feeding notes in spaced relationship from said input stack at a first speed, means for examining the indicia on one face of each note fed by said feeding means, means forming a first path leading directly to said output path, means forming a note-inverting path leading to said output path, said note-inverting path having a length which is greater than the length of said first path, means responsive to said indicia-examining means for selectively directing notes from said feeding means to said first path or to said inverting path so that all notes from said feeding means are delivered to said output path with the same face up, means for moving notes directed to said inverting path and means for continuously driving said note moving means to move all diverted notes through said inverting path at a second speed greater than said first speed, the product of said first path length and said first speed being substantially equal to the product of the inverting path length and the second speed so that every inverted sheet arrives at said output path at the same time it would have had it moved along said first path at said first speed.

4,993,701

RECEIVING TRAY FOR SHEET FORM MATERIAL

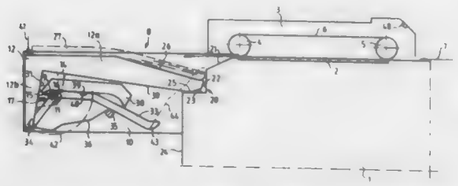
Willem A. Tooserams, Reuver, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Jun. 19, 1989, Ser. No. 367,974

Claims priority, application Netherlands, Jun. 24, 1988, 8801610

Int. Cl.[5] B65H *31/20*

U.S. Cl. 271—207 5 Claims



1. A receiving tray for material in sheet form, comprising a support rotatable about a pivot axis and having two support surfaces on opposing sides of said support facing away from each other, each of said support surfaces being spaced apart from said pivot axis at a different distance, said support being operable in each of two positions, a first position in which one of the support surfaces can receive material in sheet form, and a second position in which the other support surface can receive material in sheet form.

4,993,702

APPARATUS FOR VARIABLY ACCELERATING A DRIVE MEMBER

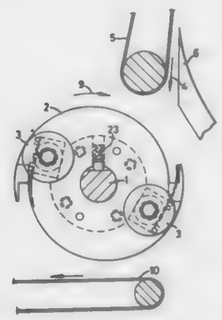
John C. Jackson, Preston, United Kingdom, assignor to Rockwell Graphic Systems Limited, Lancashire, United Kingdom

Continuation of Ser. No. 81,865, Aug. 5, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,629

Claims priority, application United Kingdom, Aug. 11, 1986, 8619504

Int. Cl.[5] B65H *5/34*

U.S. Cl. 271—270 6 Claims



1. An apparatus for processing sheets which includes a device for receiving sheets moving at a first velocity and for delivering them to a conveying mechanism operating at a substantially different velocity, said device including a rotatable drive member for accelerating or decelerating such sheets in order to present them to said conveying mechanism at a compatible velocity, the drive member being operated by apparatus comprising a planetary gear system having a sun gear with planet gear arranged to orbit therearound in use, said planet gear and sun gear each having an axis, a rotation element having an end located off axis relative to the axis of said planet gear but being rotatably driven by the planet gear orbiting, and said drive member being linked for rotation by a movement of said rotation element, wherein the movement of the drive member follows a predefined velocity and acceleration profile which repeats itself periodically, said device including a further drive member rotatably mounted on the axis of said sun gear, the further drive member being linked for rotation by one or more further rotation elements, each mounted to a respective further planet gear arranged to orbit around the sun gear, the further rotation element each having an end located off axis relative to their respective further planet gears to provide rotational movement in counterpoint to a movement from the rotation element.

4,993,703

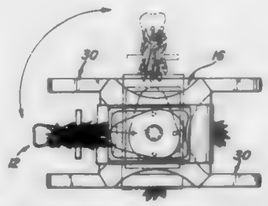
CONVERTIBLE ROCKING TOY

Michael Sears, Millington, Mich., assignor to William H. Sears and David G. Sears, both of Burton, Mich.

Filed Sep. 5, 1989, Ser. No. 402,230

Int. Cl.[5] A63G *17/00*

U.S. Cl. 272—52 11 Claims



1. A convertible riding figure cradle toy comprised of:

a riding figure having an elongated body portion adapted to receive a figure astride said body portion;

an intermediate platform having said riding figure fixed above the upper surface thereof;

a rocker assembly having parallel curved rockers enabling a lengthwise rocking action;

convertible mounting means adjustably mounting said platform and riding figure atop said rocking assembly in either of two orientations, a first orientation with said body portion extending parallel to said rockers for conventional riding rocking movement thereof, and a second orientation with said body portion extending transversely thereto;

said body portion being formed with a cradle cavity extending transversely to said rockers with said platform in said second orientation;

saddle closure means removably covering said cradle cavity whereby enabling use of said toy as a riding figure or cradle.

4,993,704

SKI SLALOM EXERCISER

Kazimierz Laczynski, 127 Spyglass Hill Road, Concord, Ontario, L4K 2K6, Canada

Filed Apr. 7, 1988, Ser. No. 178,435

Claims priority, application Canada, Apr. 10, 1987, 527458

Int. Cl.[5] A63B *69/18*

U.S. Cl. 272—97 6 Claims

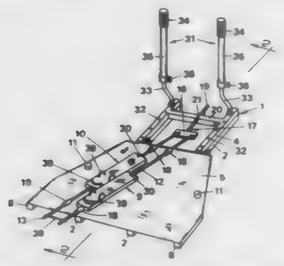
1. A ski slalom exerciser comprising

a base disposed on a floor,

a horizontal platform having a low friction top surface, mounted upon a rear portion of said base,

a pair of sliders having low friction bottoms disposed on said platform for sliding movement thereon,

a pair of adjacent elongated guides positioned and extending above said platform having forward ends pivotally secured to bracket means displaced forwardly in a variable distance from said platform; middle portions of said guides extending into center openings of said sliders slidably engaging thereof to guide said movement; and a stretch-



able tether removably coupling rear portion of said guides for maintaining and slides in close proximity,

a pair of stretchable straps each with one end removably attached proximate the forward portions of said sliders, and the other ends of said straps embracing the knees of a user,

a pair of upright poles with variable length mounted proximate the forward portion of said base in variable distance from said platform.

4,993,705

ATHLETIC DEVICE

Gerhard-Hugo Tölle, D - 4938 Schieder-Schwalenberg 2, Fed. Rep. of Germany

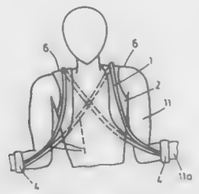
PCT No. PCT/EP88/00191, § 371 Date Nov. 16, 1988, § 102(e) Date Nov. 16, 1988, PCT Pub. No. WO88/06908, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 11, 1988, Ser. No. 272,696

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708567

Int. Cl.[5] A63B *21/02*

U.S. Cl. 272—139 **17 Claims**



2. An athletic device for training the muscles of the upper body, in particular the arm muscles, in the course of running and walking, comprising a vest to be worn by a user, an elastically expandable flat rectangular cross sectioned strap removably disposed fastened in place across a back part of the vest and having at its ends two cuff means for connection to the arms or wrists of the user, wherein the expandable strap is in the form of two crossing straps which are fastened with their ends on the two cuff means.

4,993,706

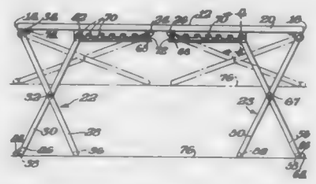
EXERCISE BENCH

William T. Wilkinson, Seaford, Del., assignor to Super Step, Inc., Seaford, Del.

Filed Dec. 13, 1989, Ser. No. 450,172

Int. Cl.[5] A63B *1/00;* **A47B** *3/02*

U.S. Cl. 272—144 **10 Claims**



1. An exercise bench comprising an elongated horizontal platform having a pair of opposite end portions and an intermediate pair of opposite side portions, each of said end portions joining a respective side portion at a corner of said platform, said platform being mounted on a plurality of support units comprising a pair of support units at each of said end portions, two sets of parallel racks having a series of cutouts and suspendedly mounted from said platform in a horizontal position, each of said support units comprising a pair of inner legs and a pair of outer legs pivotally connected together, the upper end of each of said outer legs being pivotally and fixedly connected to said platform, the upper end of each of said inner legs being adjustably engaged to one of said rack in such a manner that the distance between the ends of said legs may be varied to vary the overall height of said support unit to thereby provide a means for adjusting the degree of elevation and angular orientation of said platform whereby said platform may be used for a climbing exercise program to permit the user to step up on to and to step down from said platform, a bridging member connecting said upper ends of each pair of said inner legs of said support units, and said bridging member engaging a corresponding pair of said racks.

4,993,707

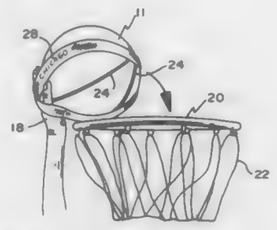
BASKETBALL ACCESSORY

Shadrach A. Schwartz, 9501 Cove Ave., Pensacola, Fla. 32514

Filed Mar. 28, 1990, Ser. No. 501,782

Int. Cl.[5] A63B *69/00*

U.S. Cl. 273—1.5 **11 Claims**



1. A basketball accessory comprising:

a first strap of predetermined width having its ends overlapped and secured together;

a second strap equal dimensioned to the first strap;

said first and second straps attached to each other at their crossing point such that the overlapped sections are diagrametically opposite each other; and

said straps forming a harness to tightly fit the circumference of a basketball.

4,993,708

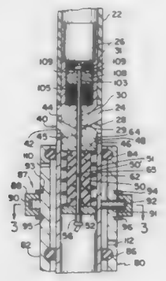
BATTING TEE

William Prosser, 1966 Mears Pkwy., Margate, Fla. 33063 and Preston Douglas, 8400 SW. 20th St., North Lauderdale, Fla. 33068

Continuation of Ser. No. 935,730, Nov. 28, 1986, abandoned. This application Mar. 7, 1989, Ser. No. 320,913

Int. Cl.[5] A63B *69/00*

U.S. Cl. 273—26 R **11 Claims**



1. A batting tee, comprising:

a base member comprised of a ground engaging member adjustably supporting an intermediate member, said intermediate member having an upper end and a lower end;

a ball support return means connected to an upper end of said intermediate member;

a ball support member releasably connected to said ball support return means;

a flexible cable means releasably connecting said ball support member to said ball support return means;

said ball support member having a normally vertical at rest orientation;

wherein said ball support return means is comprised of a resilient shock absorbing member for dissipating movement of said cable means,

wherein when a bat strikes and tips over said ball support member, restoring forces within said ball support return means urge said ball support member to return to its vertical, at rest position.

4,993,709

BALL GAME APPARATUS

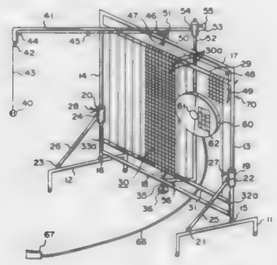
Yasuhiro Tominaga, Tokyo, Japan, assignor to Pan Pacific Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 252,103, Oct. 3, 1988, abandoned. This application Jan. 10, 1989, Ser. No. 296,369

Claims priority, application Japan, Oct. 5, 1987, 62-250896

Int. Cl.[5] A63B *67/10, 61/00*

U.S. Cl. 273—29 A **22 Claims**



1. A ball game apparatus comprising support means having a net suspending horizontal frame, a net which includes strings directed in the vertical direction and an upper end of the net is fixed to said horizontal frame, a movable frame mounted to a lower end of said net, guide means, mounted on said support means, for vertically movably supporting both ends of said movable frame, a net fixing frame arranged below said net, a bolt one end of which is threadably engaged at substantially the center of said movable frame and the other end of which is pivotally engaged with said net fixing frame, a rotary handle fixed to said bolt, elastic cord means one end of which is locked on said support means, a ball coupled to the other end of said elastic cord means, and target means, mounted on said support means at a position behind said net and having a sensing range in a predetermined zone in front of said net, for outputting a hit signal when said ball flying toward said net falls within the sensing range and a corresponding ball speed signal representing a ball speed, said target means being provided with a display unit for displaying the number of hits, and individual ball speeds, and total points as a product of the number of hits and an average value of the ball speeds.

4,993,710

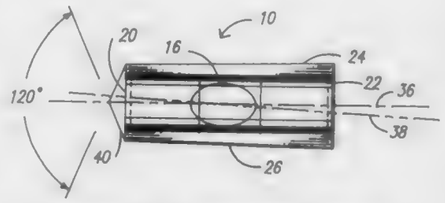
SKEWED BUBBLE TUBE FOR GOLF CLUB LIE INDICATOR

Perry C. Marshall, 103 Granada Ct. North, Plant City, Fla. 33567

Filed Jun. 14, 1980, Ser. No. 538,299

Int. Cl.[5] A63B *69/36, 57/00*

U.S. Cl. 273—32 H **11 Claims**



1. A lie indicator for a golf clubhead, comprising:

a linear-in-configuration bubble tube;

said bubble tube having a first longitudinal axis of symmetry;

a linear-in-configuration base member for holding said bubble tube;

attachment means for releasably securing said base member to a clubhead face;

said base member having a second longitudinal axis of symmetry; and

said first and second longitudinal axes of symmetry being disposed at a predetermined angle with respect to one another so that the bubble in said tube may be centered with the lie of the club being incorrect at the golf ball address position but becomes correct at the moment of ball impact due to the downward displacement of the toe of the head as the club head impacts the ball.

4,993,711

TENNIS RACKET WITH VIBRATION-DAMPING STRINGING

Dominique Deville, Saint Etieane de Crossey, and Gilles Du Gardin, Voiron, both of France, assignors to Societe Skis Rossignol S.A., Voiron, France

Continuation of Ser. No. 34,886, Apr. 6, 1987, Pat. No. 4,909,511. This application Jan. 26, 1990, Ser. No. 470,936

Claims priority, application France, Apr. 8, 1986, 86 05479

Int. Cl.[5] A63B *49/14*

U.S. Cl. 273—73 D **9 Claims**

1. A racket for a racket sport, the racket comprising:

a frame having a frame head and a handle affixed to the head, the head being formed with an externally open groove and

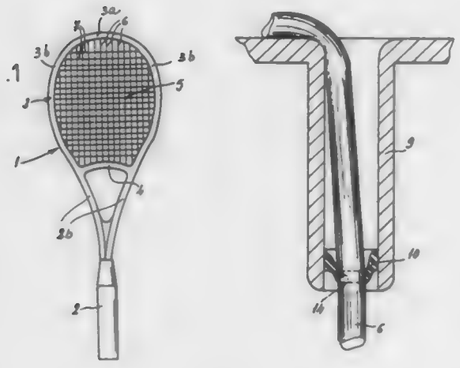
having a crown, a bottom spaced toward the handle from the crown, and a pair of spaced sides extending between the bottom and the crown, said frame being formed with stringing holes;

a rigid liner defining respective passages aligned with at least some of said holes;

stringing including

longitudinal strings passing through said holes in said frame between said crown and said bottom and

transverse strings passing through said holes in said frame between the sides of said head,



the strings passing through said some of said holes being bent around and in contact with said liner at a base of said groove; and

a respective pliable membrane received in each of the holes traversed by a string bent around and in contact with said liner at said base of said groove and having an inner periphery hugging the string and in contact on at least two opposite sides of the string for damping vibration in said head.

4,993,712

APPARATUS MOUNTED ON A TENNIS RACKET AND USED TO RETRIEVE A TENNIS BALL

Kenneth J. Urwin, 123 Potrero La., Star Rte., Santa Barbara, Calif. 93105

Filed Oct. 26, 1989, Ser. No. 426,856

Int. Cl.[5] A63B *49/00*

U.S. Cl. 273—73 R **14 Claims**

1. An apparatus mounted on a tennis racket and used to retrieve a tennis ball having fibers on its surface, comprising:

a. an arcuate shaped gripping member further comprising,

(i) a generally arcuate frame having a concave interior surface configured to be similar in shape to the arc on the spherical surface of a tennis ball,

(ii) the arcuate frame including a central base member, a first arm extending from one side of the central base and a second arm extend from the opposite side of the central base,

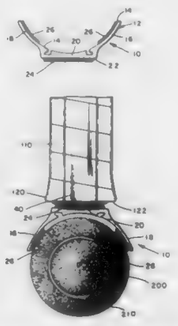
(iii) ball gripping means made of hook type VELCRO ® fasteners affixed to the concave interior surface at the locations of the first arm and the second arm and extending generally perpendicular to the concave interior surface of the first arm and generally perpendicular to the concave interior surface of the second arm so as to also extend generally perpendicular to the surface of the tennis ball when the tennis ball is placed in the arcuate frame so that the hook type VELCRO ® fasteners will firmly grasp with fibers on the surface of a tennis ball,

(iv) the hook type VELCRO ® fasteners on the concave interior surface of the first arm being oppositely disposed to the corresponding hook type VELCRO ® fasteners on the concave interior surface of the second arm so as to provide a coordinated effect in securely gripping the fibers of the tennis ball;

(v) the central base having an exterior surface to which is attached VELCRO ® gripping means;

b. the tennis racket having a head including a frame member having an exterior surface to which is attached a first VELCRO ® gripping means for removably retaining said arcuate shaped gripping member;

c. the tennis racket having a handle including a butt end having a lower surface to which is attached a second



VELCRO ® gripping means for removably retaining said arcuate shaped gripping member;

d. said hook type VELCRO ® fasteners of the ball gripping means configured to grasp the fibers on a surface of a tennis ball when the arcuate shaped gripping member is pushed onto a tennis ball; and

e. said first VELCRO ® gripping means and said second VELCRO ® gripping means each matched to the VELCRO ® gripping means on the exterior surface of the central base of said arcuate shaped gripping member so as to removably grasp the VELCRO ® gripping means on the exterior surface of the central base when the two VELCRO ® gripping means are brought together;

f. whereby a user can removably place the arcuate shaped gripping member onto the tennis racket at the location of said first VELCRO ® gripping means or said second VELCRO ® gripping means and use the tennis racket as an extension to push the arcuate shaped gripping member onto a tennis ball where it will be gripped by said hook VELCRO ® fasteners.

4,993,713

GAME MACHINE

Masamichi Harada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Feb. 3, 1989, Ser. No. 307,130

Claims priority, application Japan, Feb. 3, 1988, 63-22993

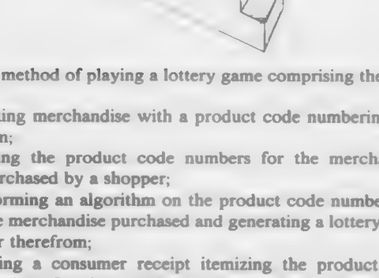
Int. Cl.[5] A63B *71/00;* **A63F** *1/00;* **G07F** *17/32*

U.S. Cl. 273—138 A **9 Claims**

9. A game machine having a microprocessor unit for controlling a game process and means for generating a hit request which effects hit game processing, wherein a number of coins are inserted at the beginning of a game, the award for a hit game depends on the number of inserted coins, and when a game results in a lost game in spite of a hit request being generated, said hit request is carried over for the following game, said game machine further comprising:

a coin counter for supplying a count representative of the number of inserted coins;

means for counting the number of said hit requests; and



judging means for comparing the count of said coin counter with the count of said hit request counting means and for effecting hit game processing only when the count of said coin counter bears a predetermined relationship to the count of said hit request counting means.

4,993,714

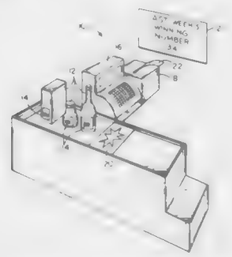
POINT OF SALE LOTTERY SYSTEM

Cecelia K. Golightly, 360 S. Lexington Pkwy., Apt. 302, St. Paul, Minn. 55105

Filed Mar. 27, 1990, Ser. No. 500,073

Int. Cl.[5] A63F *9/00*

U.S. Cl. 273—138 A **10 Claims**



1. A method of playing a lottery game comprising the steps of:

marking merchandise with a product code numbering system;

tallying the product code numbers for the merchandise purchased by a shopper;

performing an algorithm on the product code numbers for the merchandise purchased and generating a lottery number therefrom;

printing a consumer receipt itemizing the product code numbers for the merchandise purchased and listing the generated lottery number thereon; and

selecting a winning lottery number from among the generated numbers.

4,993,715

APPARATUS FOR PLAYING A GAME OF SKILL

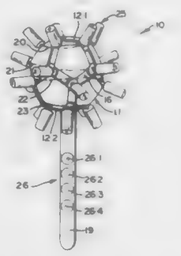
Terence M. Brooking, 15 Singleton Rd., Flynnlands 4052, Durban, South Africa

Filed Jul. 17, 1989, Ser. No. 380,975

Claims priority, application South Africa, Jul. 15, 1988, 88/5107

Int. Cl.[5] A63F *9/08*

U.S. Cl. 273—153 S **12 Claims**



1. Apparatus for playing a game comprising a three-dimensional body in the form of a ball presenting a three-dimensional playing surface, the said playing surface being divided into twelve pentagonal regions separated by grooves, the said regions comprising a top region, a bottom region diametrically opposed to the top region, an upper row of five regions and a lower row of five regions, a first ring of five playing positions being defined by the grooves at the corners of the top pentagonal region between the said top pentagonal region and the said upper row of five regions, a second row of five playing positions being defined by the grooves at the corners of the bottom pentagonal region between the said bottom pentagonal region and the said lower row of five regions, a third ring of five playing positions being defined by the grooves at the corners between the upper and lower rows of regions but towards the first ring of playing positions and a fourth ring of five playing positions being defined by the grooves at the corners between the upper and lower row of regions, but towards the second ring of playing positions, one additional playing position being provided within a selected pentagonal region, a groove within this region leading from the said additional playing position to a groove extending between two of the playing positions at the corners of the said selected pentagonal region; and

twenty playing pieces slidably located within the grooves of the body, the playing pieces being movable relative to one another between the playing positions, by virtue of the provision of the said additional playing position, between a starting configuration and a predetermined eventual configuration with respect to one another.

4,993,716

GOLF STANCE ALIGNMENT DEVICE

Malcolm C. Waller, 4247 Shallowford Rd., Chattanooga, Tenn. 37411

Filed Apr. 20, 1990, Ser. No. 512,210

Int. Cl.[5] A73B *69/36*

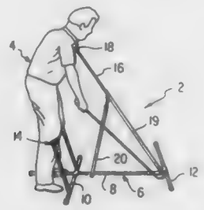
U.S. Cl. 273—183 B **14 Claims**

1. A golf stance alignment device for checking the stance, of a golfer holding a golf club standing in aligned position for hitting a golf ball, said device comprising a framework which connects the following parts:

adjustable means for supporting shoulders of a golfer holding a golf club standing in aligned position for hitting a golf ball;

adjustable means for supporting knees of said golfer holding

a golf club standing in aligned position for hitting the golf ball; and



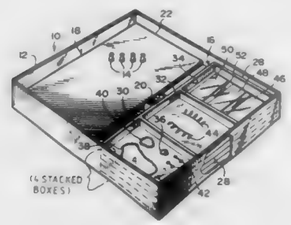
adjustable means for aligning the position of the golf club according to the club used when said golfer is standing in said aligned position.

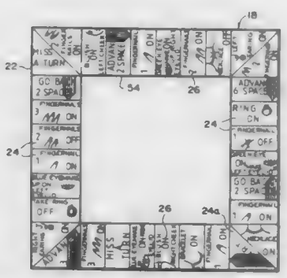
4,993,717

YOUNG GIRLS BOARD GAME

Holly Fiske, 12 E. Garfield St., Apt. 2-B, Bay Shore, N.Y. 11706

Filed Jun. 6, 1990, Ser. No. 533,754
Int. Cl.[5] A63B *3/00*
U.S. Cl. 273—243 7 Claims





1. A young girls board game comprising:

(a) a plurality of playing pieces, each representing one young girl player;

(b) a plurality of make-up kits having a plurality of items therein, said items adapted to be worn on each player's body;

(c) a game board having a continuous path around its perimeter divided into consecutive spaces, in which one of the spaces is a start position for said playing pieces while the other spaces bear instructions in which most of the instructions indicate what items from their said make-up kit each player must wear on their body and what items each player remove from their body when their playing piece lands thereon during the play of the game; and

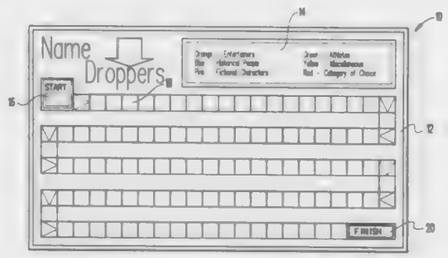
(d) means for producing random numeric designations representing travel movements for each said playing piece along the continuous path of the spaces, so that when each said playing piece lands on one space the instructions will be followed, until the first young girl player wears all of the items from her said make-up kit will become the winner.

4,993,718

METHOD OF PLAYING A BOARD GAME

Rita M. Dandridge, and Steven E. Dandridge, both of 1114 S. Broom St., Wilmington, Del. 19805

Filed Nov. 15, 1989, Ser. No. 436,696
Int. Cl.[5] A63F *3/00, 9/18*
U.S. Cl. 273—249 2 Claims



1. A method of playing a game, comprising the steps of:

providing:

a game board, a movement path formed by a plurality of discreet spaces and including start and finish spaces defined on said game board;

a plurality of game markers for movement along said path;

a sequentially numbered die;

a multi-colored die having differently colored faces;

a plurality of cards, each of said cards having a front face bearing indicia designating a famous individual in each of a plurality of different categories, said categories color coded in correspondence with said multi-colored die, and each of said cards having a rear face bearing indicia designating a description clue corresponding to each of said individuals;

timing means for controlling length of each turn of play;

determining a seating and play order among a group of players by rolling said numbered die;

assigning a different one of said game markers to each player;

an initial player rolling said multi-colored die to determine a category, said initial player selecting a category of choice upon rolling a predetermined one of said colors;

starting said timing means;

said initial player drawing one of said cards and giving verbal clues to an adjacent player describing the famous individual in the selected category;

said initial player continue to draw cards and describe individuals in the indicated category upon correct identification of an individual by the adjacent player:

said initial player stopping play upon expiration of a predetermined time interval indicated by said timing means;

said initial player replacing any unidentified cards without revealing the individual upon expiration of said time interval;

said initial player and said adjacent player moving their game markers along said game board movement path corresponding to the number of correctly identified individuals;

and

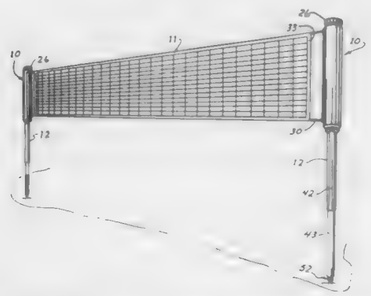
continuing play in the above manner in sequential fashion among said group of players until one of said game markers reaches said finish space.

4,993,719

PORTABLE SELF-CONTAINED VOLLEYBALL NET

Tirso R. Hernandez, 630 E. Ogden St., Milwaukee, Wis. 53202

Filed Jul. 25, 1990, Ser. No. 558,162
Int. Cl.[5] A63B *61/00*
U.S. Cl. 273—411 11 Claims



1. A portable net and net support apparatus for volleyball and the like comprising:

a pair of hollow tubular housings;

a multi-section telescoping post assembly disposed in a stored position within each tubular housing and extensible from the stored position through an open end of the housing to a deployed position;

said post assembly including an upper post section journaled for rotation and secured against relative axial movement within said housing on a common longitudinal axis;

an intermediate post section disposed within and extensible from said upper section on said common axis;

a lower post section disposed within and extensible from said intermediate section on said common axis;

locking means on the adjoining ends of each of the post sections in the deployed position for releasably securing the post assembly against relative movement along said common axis;

a longitudinal slot in said tubular housing, said slot extending substantially the full length thereof and disposed parallel to said common axis;

a net attached at one end to and at least partially rolled around the outer surface of said upper post section in each tubular housing in a net storing position;

said net extending through the slot in each of said housings such that said net is unrolled from said upper post section and fed through said slots as said housings are moved relatively away from one another to a net deploying position;

net rolling means attached to said upper post section on the opposite end and externally of said housing for manually rolling the net from said net deploying position to said net storing position;

a threaded anchor spike journaled for rotation on said common axis in and extending axially from the free end of said lower post section; and,

means for rotating said anchor spike relative said housing and post assembly.

4,993,720

SELF-SEALING MECHANICAL SEAL GLAND FOR PUMPS AND OTHER MACHINERY

Alfredo A. Ciotola, 1060 Revere Ave., Bronx, N.Y. 10465

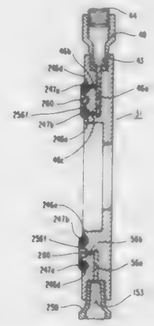
Filed Aug. 15, 1988, Ser. No. 232,438
Int. Cl.[5] F16J *15/02, 15/14*
U.S. Cl. 277—27 7 Claims

1. A cylindrical gland constructed to be used in coaxial relation to a rotatable shaft of a pump shaft assembly having a fixed pump housing;

said gland comprising means for securing a substantially flat surface of said gland in face-to-face relation against a fixed mating surface of said pump housing;

said gland including three annular grooves engraved on said substantially flat surface in concentric and coaxial relation with the principal axis of said gland, there being two outer grooves and a central groove between the two outer grooves, each groove having an annular bottom within the gland spaced from and facing the fixed mating surface;

means comprising an O-ring of elastomeric material dimensioned to seat securely in each of said outer grooves, each O-ring having an inner surface facing the respective bottom of the groove in which the respective O-ring is inserted and having an outer surface facing the fixed mating surface;



means for interposing a viscous liquid into said outer grooves between the inner surface of said O-ring and the bottom of said groove so that a portion of the outer surface of said O-ring is compressed against the fixed mating surface of said pump housing; and

means constructed for supplying a desired quantity of a fibrous compound to the central groove, being separate from the means for interposing a viscous liquid, the fibrous compound being in sealing contact between the gland surface and the fixed mating surface of the pump housing.

4,993,721

SEAL EQUIPMENT FOR ROTARY SHAFT MOVABLE IN THE AXIAL DIRECTION

Teiji Uezono, Tokyo, Japan, assignor to Tanken Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 320,951
Claims priority, application Japan, Apr. 8, 1988, 63-86754
Int. Cl.[5] F16J *15/34, 15/38*
U.S. Cl. 277—30 7 Claims

1. A seal structure for sealing a rotary shaft which is movable in the axial direction and extends from a casing and comprising in combination, said rotary shaft and said casing about said shaft, said casing having an upper end and a lower end;

a cylindrical pipe having an upper end and a lower end provided between said casing and said rotary shaft, movable in the axial direction in axial synchronism with said rotary shaft;

a rotary seal component mounted around said rotary shaft and movable in the axial direction in axial synchronism with said rotary shaft and said cylindrical pipe, said rotary seal component providing a seal between said rotary shaft and said cylindrical pipe;

an upper first seal affixed to said casing at said upper end thereof and movable in the axial direction with respect to said cylindrical pipe, for sealing off a space between said casing and said cylindrical pipe at said upper end of said casing;

a lower first seal secured on said cylindrical pipe at said lower end thereof and movable in the axial direction with respect to said casing, for sealing off said space between

VOL 1123 ISS 3 FE 19 1991 UMI

said cylindrical pipe and said casing at said lower end of said cylindrical pipe;

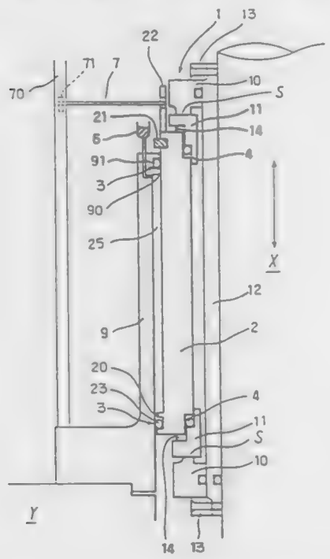
the volume of said space between said pipe and said casing being variable as a result of the movement of said rotary shaft in the axial direction.

3. A seal structure for sealing a rotary shaft which is movable in the axial direction and extends from a casing and comprising in combination, said rotary shaft and said casing about said shaft, said casing having an upper end and a lower end;

a plurality of telescoping cylindrical pipes each having an upper end and a lower end, said pipes axially oriented with said upper end and said lower end of said casing and provided between said casing and said rotary shaft, and movable in the axial direction and each of them having respectively different diameters;

the innermost cylindrical pipe being movable in axial synchronism with the rotary shaft;

a rotary seal component mounted around said rotary shaft and movable in the axial direction in axial synchronism with said rotary shaft and said innermost cylindrical pipe, said rotary seal component providing a seal between said rotary shaft and said innermost cylindrical pipe;



an upper first seal affixed to said casing at one end thereof and permitting relative movement of the outermost cylindrical pipe in the axial direction with respect to said casing, for sealing off a space between said casing and said outermost cylindrical pipe at said upper end of said casing;

a lower first seal affixed to said outermost cylindrical pipe at said lower end thereof and movable in the axial direction with respect to said casing, for sealing off the space between said outermost cylindrical pipe and said casing at said lower end of said outermost cylindrical pipe;

additional pairs of seals for sealing off spaces between pairs of adjacent pipes of and said cylindrical pipes, each said pair comprising an upper first seal affixed to one cylindrical pipe at its first end and movable with respect to the adjacent cylindrical pipe and a lower first seal affixed to the adjacent cylindrical pipe at its lower end and movable with respect to said one cylindrical pipe;

the volume of said spaces between said pipes and said casing being variable as a result of the movement of said rotary shaft in the axial direction.

4,993,722

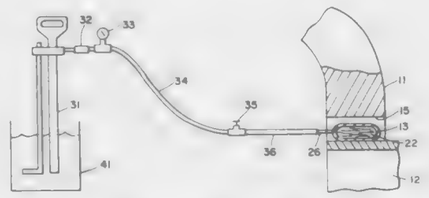
APPARATUS AND METHOD FOR IMPROVED PIPE TO MANHOLE SEALING

William P. Gundy, Milford, N.H., assignor to NPC, Inc., Milford, N.H.

Continuation-in-part of Ser. No. 281,096, Dec. 7, 1988. This application Sep. 21, 1989, Ser. No. 410,585

Int. Cl.[5] F16J *15/46*

U.S. Cl. 277—34.3 27 Claims



1. A seal for sealably and flexibly joining together a pipe member and an enclosed body formed with a porthole that is defined by a circular edge, said seal comprising:

a double-walled elastic sleeve for circumscribing the periphery of the pipe member to form a continuous cavity within said sleeve,

dry, liquid-activated coagulation means disposed within said cavity for forming, with the addition of a low-viscosity, substantially incompressible liquid, an amorphous, cellular, gelatinous mass that fills said cavity to support said sleeve in an expanded, sealing configuration thereby to permit limited motion between the pipe member and the supporting structure while maintaining the seal therebetween, and

means for directing the liquid into said sleeve under pressure thereby to expand the walls of said sleeve into sealing relationships with the pipe and with the supporting structure adjacent the porthole.

4,993,723

ELBOW GASKET HAVING MIDDLE AND SIDE SUPPORT SEALING BEADS

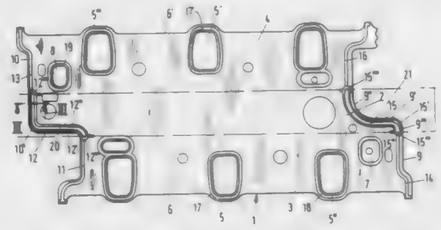
Michael Sroka, Thalfingen; Peter Grosch, Finningen, and Ingo Kremer, Senden, all of Fed. Rep. of Germany, assignors to Reinz-Dichtungs- Gesellschaft mit beschrankter/Haftung, Neu-Ulm, Fed. Rep. of Germany

Filed Jan. 13, 1989, Ser. No. 297,794

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1988, 8800475

Int. Cl.[5] F16J *15/06, 15/10*

U.S. Cl. 277—180 4 Claims



1. A gasket comprising a plate of thin base material, said plate having a substantially rectangular-shaped middle segment and opposite side parts each on an opposing side of the middle segment along a length thereof and oriented offset at an angle to the middle segment, first and second sealing bead means of elastomeric material arranged upon said base material and extending on said middle segment from one side part to the other, said first and second sealing bead means being spaced apart so that a sealed region is defined therebetween on said middle segment, each bead means comprising a middle sealing strip and two lateral side support sealing strips adjoining said middle sealing strip and having a substantially smaller height than said middle sealing strip, said two lateral side support sealing strips being interconnected at the ends of each sealing bead means on said side parts by rounded-off sections of elastomeric material so that said middle sealing bead is enclosed about its entire perimeter.

4,993,724

WALL FEEDTHROUGH FITTING

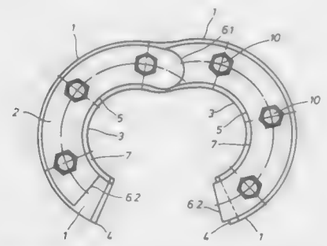
Werner Hauff, Ballmertshofen, Fed. Rep. of Germany, assignor to Plastoform GmbH & Co. KG, Vlotho, Fed. Rep. of Germany

Filed Aug. 18, 1989, Ser. No. 395,729

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 3828693

Int. Cl.[5] F16J *9/16, 15/02*

U.S. Cl. 277—199 7 Claims



1. A feedthrough fitting for sealing around at least one conduit extending longitudinally through a cutout in a wall at a transverse spacing from an inner surface of the cutout, the fitting comprising:

an elastomeric and annular one-piece seal having

a pair of longitudinally oppositely directed faces,

an outer surface corresponding generally to the inner surface,

at least one longitudinally throughgoing passage extending between the faces and to the conduit, and

at least one lateral split extending completely longitudinally between the faces and completely laterally from the passage to the outer surface, whereby the seal can be spread at the split to fit around the conduit with elastic deformation of the seal to a lateral side generally opposite the split;

a respective end plate covering generally all of each of the faces and formed of a plurality of separate section together forming a hole corresponding to and longitudinally aligned with the passage, the sections of each plate being formed to the lateral side of the passage generally opposite the split with interfitting substantially part-circular edges that interfit angularly without longitudinally overlapping, the sections meeting laterally at opposite edges to the opposite lateral side of the passage that angularly confront each other without longitudinally overlapping; and

means including fasteners engaging longitudinally through the two plates and seal for longitudinally compressing the seal and forcing the outer surface against the inner surface, whereby the fitting can be opened at the split with the plates and fasteners in place by elastic deformation of the seal at the interfitting surfaces and pivoting of the sections of the plates of each plurality of plates relative to each other at the part-circular edges.

4,993,725

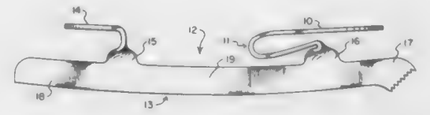
UNITARY SKATE ASSEMBLY HAVING VERTICAL SPRING MEANS

Frank S. Barnes, and Norman W. Baer, both of Boulder, Colo., assignors to University of Colorado Foundation, Inc., Boulder, Colo.

Filed Apr. 11, 1990, Ser. No. 508,329

Int. Cl.[5] A63C *1/24*

U.S. Cl. 280—11.14 34 Claims



1. A blade/boot plate assembly arranged for attachment to a skate boot, comprising a unitary metal member having;

an elongated generally horizontal blade occupying a first plane,

at least one boot plate means having a first generally horizontal portion thereof located above said blade and occupying a second plane that extends normal to said first plane, and said boot plate means including a second generally horizontal portion thereof that is located generally below said first portion and is connected to said first portion through a U-shaped bend that extends generally parallel to said second plane and normal to said first plane, and

a vertically twisted metal portion connecting said second portion of said boot plate means to said blade.

4,993,726

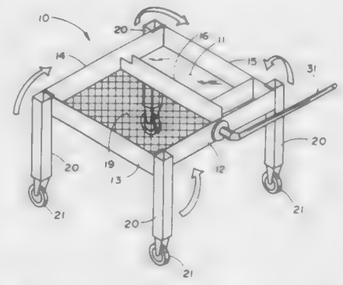
MOBILE WORK STATION FOR PAINTER

Kevin H. Schumacher, 3811 Canterbury Rd., Apt. 1009, Baltimore, Md. 21218; Robert J. Martin, and Edward L. Martin, both of Hampstead, Md., assignors to Kevin H. Schumacher, Baltimore, Md.

Filed Jun. 26, 1989, Ser. No. 371,032

Int. Cl.[5] B62B *3/00*

U.S. Cl. 280—38 9 Claims



1. A mobile work station for a painter using a roller applicator and a paint pan or the like wherein the work station is relatively lightweight and has a collapsed position to facilitate transport and storage, and an erected position such that the work station is at a convenient height to reduce bending and stretching by the painter, the work station comprising, in combination:

an open recessed tray having a planar bottom wall, the tray having a length, a front wall and an opposite back wall,

a plurality of legs, each leg having a first end and a second end, the first end being pivotally mounted on the tray and being capable of being pivoted substantially 270° between a stored position in which the leg is received within the

recessed tray and an extended position in which the leg depends downwardly to support the tray;

means for securing each leg in both the stored position and the extended position;

casters carried by the second end of each leg, thereby facilitating the movement of the work station on the job;

at least one divider in the tray forming a first compartment and a second compartment therein, said divider extending between the front wall and the back wall and having a cut-out portion adjacent each of said front and back walls for receiving at least two of the legs in the stored position thereof, the first compartment being sized to snugly receive the paint pan to be used with the roller applicator, the paint pan being disposed along the length of the tray between the front wall and the back wall, the second compartment being used for storage of paint cans, tools, paint brushes and the like; and

a rigid handle connected to the tray and disposed centrally on the front wall of the work station where the painter normally works, the rigid handle facilitating both pushing and pulling of the work station by the painter, whereby the work station may be easily and frequently moved without spilling the paint.

4,993,727

COLLAPSIBLE HAND TRUCK

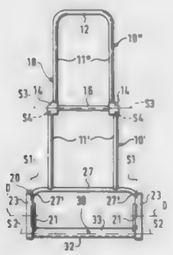
Manfred vom Braucke, Bielefeld, and Hans vom Braucke, Vlotho, both of Fed. Rep. of Germany, assignors to Bielefelder Kuchenmaschinen-und Transportgerate-Fabrik, Bielefeld, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 379,971

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 8809506[U]

Int. Cl.[5] B62B *1/04*

U.S. Cl. 280—40 **19 Claims**



1. A hand truck comprising:

a frame including

a lower frame part, and

an upper frame part having a handle and being collapsible toward said lower frame part,

a pair of wheel braces pivotably mounted to a bottom portion of said lower frame part for pivotal movement about respective axes between folded and unfolded positions, free ends of said wheel braces carrying ground support wheels, and

a carrier member pivotably mounted to said bottom portion of said lower frame part for pivotal movement between folded and unfolded positions, about an axis extending substantially perpendicular to said axes,

said wheels including elastomeric tires frictionally engaging portions of said carrier member when said wheel braces and said carrier member are in their folded positions, in order to resist unfolding of said wheel braces.

4,993,728

TWO-WHEELED VEHICLE OF THE SULKY TYPE

Michel Loporcaro, 5, avenue Janvier Passero, 06210 Mandelieu, and Jean-Eric Thorn, 249, avenue des Soles, 06250 Mougins, both of France, assignors to Michel Loporcaro, Mandelieu and Pierre Preville, Cannes la Bocca, both of, France

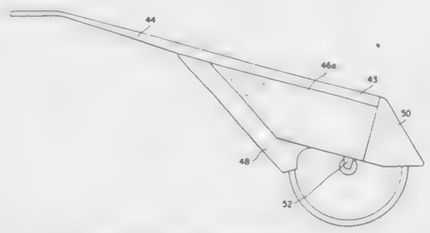
PCT No. PCT/FR87/00379, § 371 Date Jul. 22, 1988, § 102(e) Date Jul. 22, 1988, PCT Pub. No. WO88/02328, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 5, 1987, Ser. No. 218,124

Claims priority, application France, Oct. 3, 1986, 86 13821

Int. Cl.[5] B62C *1/00*

U.S. Cl. 280—63 **5 Claims**



1. A two-wheeled vehicle comprising

a transverse platform, made of composite material, said platform having upper and lower surfaces, and two extensions directed toward a front end of the vehicle, each of said extensions forming at least a portion of a shaft for pulling the vehicle, and

two forks for supporting respective wheels of the vehicle, wherein each fork is made of a composite material, and comprises two spaced lateral panels, interconnected by at least two transverse spacer elements, each of said panels being approximately trapezoidal in shape and having a horizontal upper edge which is fastened to the lower surface of the transverse platform, wherein said spacer elements are rectangular and located forward of said wheel, a first of said spacer elements being located along a front side of the lateral panels, and a second of said spacer elements being inclined rearwardly upward from its lower edge, which is fastened to the first spacer element, to its upper side, which is fastened to the lower surface of a respective forward extension of the transverse panel.

4,993,729

VEHICLE SUSPENSION

John S. Payne, Liberty, N.C., assignor to Volvo GM Heavy Truck Corporation, Greensboro, N.C.

Filed Sep. 14, 1989, Ser. No. 407,420

Int. Cl.[5] B60G *5/00*

U.S. Cl. 280—81.1 **31 Claims**

1. In an over the highway truck or tractor vehicle having tandem rear axles one of which is a driven axle and the other is a tag axle the improvement comprising:

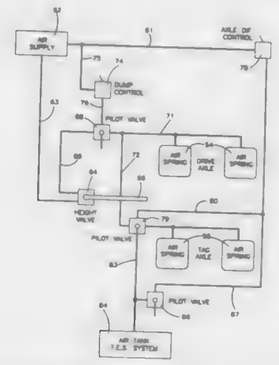
a. at least one driven axle fluid spring and at least one tag axle fluid spring, the springs respectively being interposed between the driven and tag axles and a vehicle frame;

b. a supply of fluid under pressure;

c. conduits connecting the supply to the springs;

d. pressure control means connected to at least one of the conduits for normally maintaining a predetermined pressure ratio between the pressure in the at least one driven axle spring and the at least one tag axle spring; and,

e. an operator actuatable traction enhancement control for selectively altering said predetermined ratio to provide a relative increase of the pressure in the at least one driven axle spring relative to the pressure in the at least one tag axle spring.



4,993,730

REAR-STEERING CONTROL DEVICE FOR AUTOMOTIVE VEHICLE WITH FOUR-WHEEL STEERING

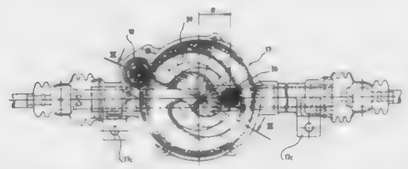
Lucien Galtier, Morsang sur Orge; Michel Langlois, Montigny le Bretonneux, and André Barthelemy, Saint-Remy-les-Chevreuse, all of France, assignors to Automobiles Peugeout, Paris and Automobiles Citroen, Neuilly sur Seine, both of, France

Filed Feb. 5, 1990, Ser. No. 475,317

Claims priority, application France, Feb. 2, 1989, 89 01632

Int. Cl.[5] B62D *7/15*

U.S. Cl. 280—91 **18 Claims**



1. A rear steering control device in particular for an automotive vehicle with four-wheel steering the rear wheels of which are connected to steering drag rods operating the pivoting of the rear wheels and of the kind comprising a transmission shaft mounted in longitudinal relation to the vehicle so as to be pivotable about its axis in response to an action of locking the front wheels of the vehicle and a rear steering mechanism mechanically connected to the rear end of the transmission shaft through the medium of a drive shaft and to the rear steering drag rods for operating the locking of the rear wheels in accordance with the lock of the front wheels, said mechanism comprising as being movable with respect to one another under the action of the drive shaft, a member comprising a cam-like groove the profile of which defines the law for locking the rear wheels in accordance with the lock of the front wheels and a roller portion engaging the groove and carried by a rigid finger extending transversely of the direction of displacement of the rear steering drag rods, wherein the improvement consists in that the finger carrying the roller portion is secured to a hub rigidly connected in coaxial relationship to both adjacent ends of both rear steering drag rods, respectively, and the drive shaft is coupled to the member comprising the cam-like groove in particular by a gear transmission for rotating it about a stationary axis of rotation during the locking of the front wheels so that the cam-like groove causes the rear steering drag rods to be displaced in parallel relation to the member carrying the cam-like groove through the medium of the roller supporting finger hub unit portion.

4,993,731

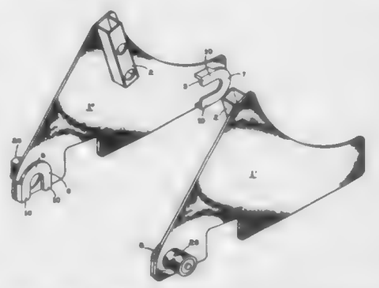
MOTORCYCLE QUICK RELEASE SISSY BAR BRACKET

Wyatt S. Fuller, 6289 NW. 62nd Ter., Parkland, Fla. 33067

Filed Sep. 19, 1989, Ser. No. 409,599

Int. Cl.[5] B62J *1/28*

U.S. Cl. 280—202 **6 Claims**



1. A quick release sissy bar bracket for a motorcycle having a rear fender bar rigidly attached to the motorcycle on each side of a rear fender, comprising: a sissy bar bracket plate releasably attachable to each fender bar; forward coupling means rigidly attached to said rear fender bar and forward receiving means rigidly attached to said bracket plate for releasably receiving said forward coupling means; rear coupling means rigidly attached to said rear fender bar spaced apart from said forward coupling means, and rear receiving means rigidly attached to said bracket plate for releasably receiving said rear coupling means; at least one of said forward and rear coupling means being a shoulder bolt having an extended head; each of said receiving means including a U-shaped holding member spaced apart from said bracket plate, forming a receiving space between said U-shaped member and said bracket plate for receiving the extended head of said shoulder bolt; and each of said U-shaped members having a pair of parallel legs, said pairs of legs being perpendicular to each other.

4,993,732

DETACHABLE MANUAL PROPULSION SYSTEM

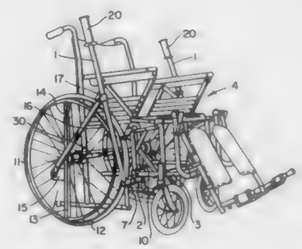
Helmut M. R. Wedemeyer, Salmon Arm, Canada

Filed May 4, 1989, Ser. No. 347,457

Claims priority, application Canada, Aug. 22, 1988, 575348; Nov. 15, 1988, 583156

Int. Cl.[5] B62M *1/16*

U.S. Cl. 280—250.1 **57 Claims**



1. A manually operable propulsion unit for detachable attachment to a conventional wheelchair having a frame with a front and a rear, and having two large wheels with hubs, in

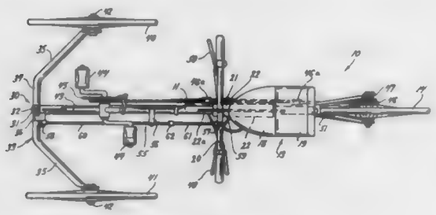
which each wheel of the wheelchair is arranged to be driven by a circular hand rail housing a center point fixedly attached to, concentric with and laterally spaced outside the wheel, said propulsion unit comprising base member means adapted to be detachably attached transversely to the frame of said wheelchair, a pair of hand levers pivotably mounted to said base member means about a horizontal axis of said base member means at either side of the wheelchair, a pair of rigid support members, each rigid support member being adapted to be detachably attached to one of said hand rails within the periphery thereof, mounting means on each said rigid support member and a pair of rigid linkages, each pivotably mounted on one end of said mounting means at a point off-center from the center of said hand rail and to an intermediate point on said hand lever whereby back and forwards motion in a vertical plane of each of said hand levers drives its associated wheel of the wheelchair via its attached hand rail.

4,993,733

THREE WHEELED RECUMBENT CYCLE

Keith Ellers, 138 Crest Haven, Belleville, Ill. 62221

Filed Feb. 21, 1989, Ser. No. 312,909
Int. Cl.[5] B62K *5/04*
U.S. Cl. 280—261 **5 Claims**



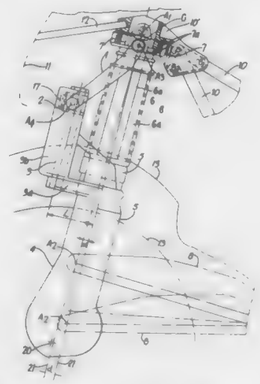
1. A recumbent vehicle comprising
a. a main longitudinal frame,
b. a seat assembly positioned on the frame,
c. a rear drive wheel mounted on the rear end of said frame,
d. a front steering mechanism mounted on the front end of said frame comprising,
   1. a front axle having a lower center axle member to provide room for the rider's feet to pedal the vehicle and rearwardly and upwardly inclined end members.
   2. a steering post, being forwardly inclined and having a connection to the frame said center axle member being pivotally mounted to said steering post below the connection of said steering post to the frame, whereby the entire axle pivots about the steering post when the vehicle is turned,
   3. a pair of front wheels journaled on the ends of said axle end members,
   4. a pivotable steering bar mounted on the frame, and
   5. a steering push rod directly connecting the center axle member and the steering bar and supported by the main frame to pivot the axle member when the steering bar is turned,
   6. said front steering mechanism providing the vehicle anti-rollover stability when the steering bar is turned thereby pivoting the entire axle about the steering post thus increasing the distance between where the outer wheel touches the ground and the center line of the vehicle and decreasing the distance between the vehicle center line and where the inner wheel touches the ground during a turn, and
e. drive means mounted on the main frame including a pedal means engagible by the feet of the driver and drive chains connected between the pedal means and the rear drive wheel.

4,993,734

COUPLING DEVICE BETWEEN A STEERABLE WHEEL AND A STEERING CONTROL MEMBER

Daniel Trema, Bezons, France, assignor to Elf France, Courbevoie, France

Filed Mar. 2, 1989, Ser. No. 317,924
Claims priority, application France, Mar. 14, 1988, 88 03281
Int. Cl.[5] B62K *25/08*
U.S. Cl. 280—276 **10 Claims**



1. A coupling device between a steerable wheel of a vehicle having a chassis and a steering control member of said vehicle, the steerable wheel being carried by a single arm connected to a suspension arm rotatably mounted at one of its ends on a transverse axis of the chassis of the vehicle, and at its other end, pivotally mounted on the single arm for defining an axis of rotation of the single arm and the steerable wheel and a suspension and shock absorbing unit with a movable rod being interposed between an upper end of the single arm and the chassis of the vehicle, wherein the single arm comprises a guiding rod directed eccentrically upwards and rigidly fixed upon the single arm and wherein the guiding rod cooperates with a slide bar ring which is pivotally connected with a first end of at least one link and a second opposite end of said at least one link being pivotally connected to a steering ring connected to the steering control member.

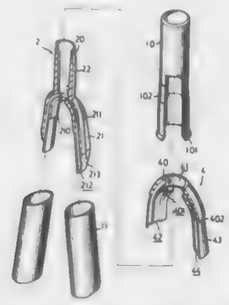
4,993,735

FRAME FORK FOR A BICYCLE

Ruo Chen, No. 34, Chia Hou Rd., Wai Pu Hsiang, Taichung Hsien, Taiwan

Filed Jan. 23, 1990, Ser. No. 468,899
Int. Cl.[5] B62K *21/04*
U.S. Cl. 280—280 **7 Claims**

1. A frame fork for a bicycle comprising a main tube having an open lower end, an annular flange being formed on a bottom of said open lower end; two support tubes, each having an open upper end; a fork head including a bracing tube and two legs integrally formed together; a sleeve including a sleeve body and two limbs integrally formed together; a center hole being formed in said sleeve body; said bracing tube passing through said center hole of said sleeve body and said open lower end of said main tube; said sleeve body embracing said lower end of said main tube; and each said leg of said fork head



and a respective limb of said sleeve being force fitted into each open upper end of said support tube.

4,993,736

WHEELCHAIR APPARATUS

David E. T. Garman, and Richard M. Rimington, both of Powys, Wales, assignors to Mangar Aids Limited, Powys, Wales

Filed Sep. 22, 1989, Ser. No. 411,395
Claims priority, application United Kingdom, Sep. 29, 1988, 8822894; Jan. 19, 1989, 8901157
Int. Cl.[5] B60N *2/16*
U.S. Cl. 280—304.1 **11 Claims**

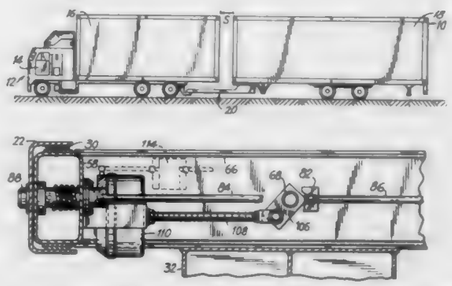
1. A wheelchair assembly comprising:
(a) four manually separable units including a chassis having wheels, a lifting device releasably mounted on said chassis, seat means releasably mounted on said lifting device, and a power unit removably stowed on said chassis, wherein the power unit is separable from the lifting device,
(b) said lifting device including a base releasably securable to said chassis by a manually actuable locking mechanism, and a platform supported above said base by internally stabilized lifting means disposed between the platform and the base for raising and lowering the platform relative to the base,
(c) the seating means including a carrier frame releasably secured by manually actuable retaining means to said platform,
(d) the power unit and lifting device are operatively connected by manually detachable connecting means, and
(e) said manually actuable locking mechanism, said manually actuable retaining means and said manually detachable connecting means are manually actuable to enable each of the lifting device and power units to be lifted from the assembly and to be reconnected together by the manually detachable connecting means for use as a bath lift apparatus without the chassis and seating means.

4,993,737

LOAD-BEARING MULTI-POSITION DRAWBAR ARRANGEMENT AND SUSPENSION SYSTEM

Albert Torcomian, Havertown, Pa., assignor to Magna Van Systems, Inc., Norristown, Pa.

Filed Jul. 25, 1989, Ser. No. 385,251
Int. Cl.[5] B60D *1/42;* **B62D** *53/08*
U.S. Cl. 280—407 **30 Claims**



1. A load-bearing, multi-position, drawbar arrangement for adjustably, interconnectably positioning apart from each other, at any selected one of a plurality of spacings, leading and trailing wheeled cargo units of a vehicle, as considered along the direction of vehicle advancement, said arrangement comprising:
(a) track means stationarily mounted on one of the cargo units, and having a plurality of apertures spaced apart of one another along a longitudinal direction parallel to the direction of vehicle advancement;
(b) actuatable locking means mounted on the other of the cargo units for joint movement therewith along the longitudinal direction relative to the track means, and operative for releasably locking the cargo units together at said selected spacing, said locking means including at least one locking pin displaceable into and out of a selected one of the apertures that corresponds to said selected spacing;
(c) actuating means for displacing said at least one locking pin between a locked state in which said at least one locking pin is displaced into said selected aperture to lock the cargo units apart at said selected spacing, and an unlocked state in which said at least one locking pin is displaced out of said selected aperture to unlock the cargo units and enable the cargo units to be moved to another selected one of the spacings.
(d) a carriage mounted upon said track means for slidable movement therealong, said locking means being mounted on said carriage; and
wherein said actuating means comprises power-assist means and said actuating means comprises a shaft journaled on the carriage for turning movement about the longitudinal direction; a pair of elongated arms extending in opposite transverse directions, each arm having one end connected to the shaft, and another end connected to a respective pin; a crank link fixedly mounted on the shaft and extending outwardly thereof to an offset end such that, in a locked position, said shaft, said elongated arms, said locking pins, and said apertures are substantially at the same height and are traversed by a common horizontal plane; an electrically-powered pneumatic device operatively connected to the offset end and operative, when electrical power is supplied to the pneumatic device from a remote activator, to turn the crank link and, in turn, the shaft

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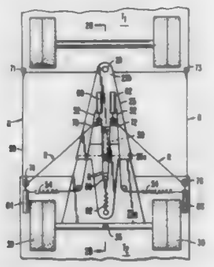
through an angular distance sufficient to pull the arms in opposite directions and, in turn, to pull the pins out of the aligned apertures to the unlocked state.

4,993,738

ANTIJACKKNIFE DEVICE FOR TOWED TRAILER

Henry E. Bennett, 710 Oak Ave., Davis, Calif. 95616

Filed Jan. 31, 1990, Ser. No. 473,002
Int. Cl.[5] B60D *1/30*
U.S. Cl. 280—432 **9 Claims**



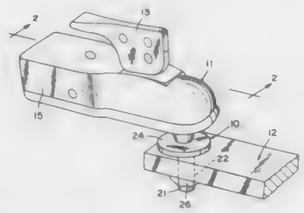
1. In combination a towing tractor;
a first towing trailer pivotally attached to said towing tractor for being serially towed first in order behind said towing tractor;
a second towed trailer, said second towed trailer having a fixed rear wheel set and a forward pivoting steering wheel set, said second towed trailer for being serially towed second in order behind said towing tractor from said first towing trailer;
a towing point affixed to a rear of said towing trailer;
a tongue attached to said second towed trailer, said tongue attached to said steering wheel set of said towed trailer for permitting said towed trailer to be towed and for effecting steering of said steering wheel set about said pivot point of said towed trailer, said tongue fastened at the forward portion thereof to said towing point on said towing trailer for enabling said towed trailer to follow and steer in the track of said towing trailer, the improvement of an antijackknifing device acting between said towed trailer and said towing trailer comprising:
running rigging for reeving between a first fixed point and a second fixed point, said rigging reeved through a reeving path;
first and second spaced apart points on said towing trailer for fixedly attaching respective first and second ends of running rigging to said towed trailer, said first point being spaced apart from said towing point for attachment of said tongue and said second point being spaced apart form said first point and said towing point;
a reeving path including first, second and third reeving points;
said first reeving point affixed to a leading edge of said towed trailer at a point spaced from the tongue of said towed trailer;
said second reeving point attached to the tongue of said towed trailer, said second reeving point intermediately located on said tongue between the towing point of said tongue to said towed trailer and the pivot point of said wheel set on said towed trailer;
said third reeving point attached to the leading edge of said towed trailer separate from said first reeving point;
said running rigging being disposed under tension along said reeving path;
first brake means acting on at least one of said reeving points on the leading edge of said towed trailer for applying a braking force to said running rigging;
second brake means acting on said tongue for applying a braking force on said running rigging to said tongue on said towed trailer;
brake actuating means mounted between said said towing and towed trailers for applying said brakes responsive to compression forces exerted on said tongue; and,
means for locking said brakes on said running rigging responsive to said brake actuating means whereby said running rigging rigidly acts under tension in combination with said tongue during application of said brake to inhibit relative jackknifing action between said towed and towing trailers.

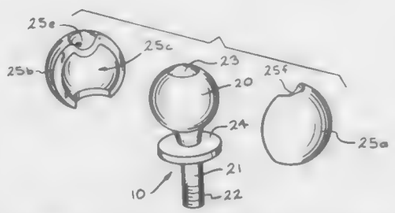
4,993,739

HITCH BALL

Rex D. Putnam, P.O. Box 39, 211 Industrial Ave., Bronson, Mich. 49028

Filed Aug. 11, 1989, Ser. No. 392,832
Int. Cl.[5] B60D *1/06*
U.S. Cl. 280—511 **17 Claims**





1. An improved ball for a tow bar assembly mounted on a vehicle which comprises:
(a) a spherical ball with a shank extending from an axis of the ball for mounting on a tongue of the tow bar assembly; and
(b) opposed hemispherical half shells mounted on and mating with the ball so as to encase the ball, means on the shell to hold the half-shells on the ball wherein the shells can move around the axis of the ball and wherein the shells provide an enlarged standard diameter for the spherical ball which fits into a trailer hitch assembly and wherein the shells are secured in place on the ball by the hitch assembly.

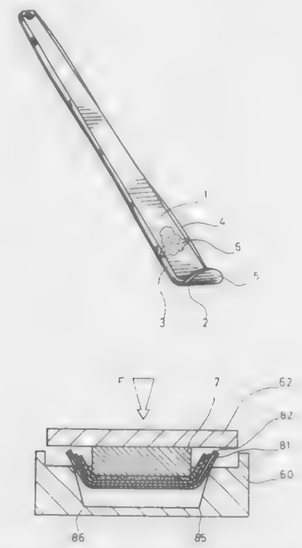
4,993,740

PROCESS FOR FORMING A SKI, AND A SKI FORMED ACCORDING TO THE PROCESS

Gilles Recher, and Maurice Legrand, both of Annecy, France, assignors to Salomon S.A., Annecy Cedex, France

Filed Mar. 29, 1989, Ser. No. 330,280
Claims priority, application France, Mar. 29, 1988, 88 04481
Int. Cl.[5] A63C *5/04, 5/12*
U.S. Cl. 280—610 **11 Claims**

1. A ski comprising: an outer appearance layer comprising a sheet of thermodeformable material which is heat deformable during a molding process, said sheet of thermodeformable material forming said appearance layer being composed of at least one outer layer of a substantially transparent plastic material, having a melting point and a heating softening temperature, and an inner layer made from substantially opaque plastic material, having a melting point and a heat softening temperature, said inner layer containing coloring agents defining a



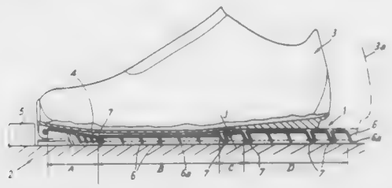
decoration which is visible from the exterior through said outer layer, said plastic materials forming said sheet of thermodeformable material are such that the melting point and the heat softening temperature of the material forming said outer layer is less than the melting point and the heat softening temperature of the material forming said inner layer.

4,993,741

LATERAL GUIDANCE DEVICE FOR A CROSS-COUNTRY SKI

Marc Provence, Thorens Les Glieres, and Gerard Graillat, Annecy, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Nov. 13, 1989, Ser. No. 434,990
Claims priority, application France, Nov. 14, 1988, 88 14773
Int. Cl.[5] A63C *9/20*
U.S. Cl. 280—615 **31 Claims**



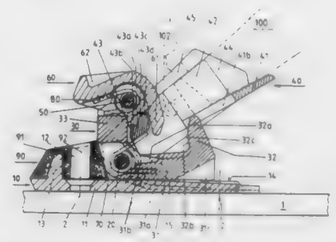
1. A device for lateral guidance of a ski shoe or boot which is affixed at its front end to a cross-country ski having an upper surface has been inserted whereby a heel of the ski shoe or boot is free to move in at least a vertical direction, said device comprising a section member adapted to be mounted on the ski, said section member including a longitudinal guidance rib adapted to cooperate with a longitudinal groove with a complementary shape provided in a sole of the shoe or boot, to laterally guide the shoe or boot while it is lowered towards the ski, the longitudinal guidance rib including a central part and two lateral support parts extending therefrom, said lateral support parts engaging the upper surface of the ski, the lower surface of said central part being raised with respect to the lower surface of said two lateral support parts to provide a free space between the lower surface of the central part and the upper surface of the ski to permit the flow of any water within said section member, wherein said guidance rib comprises hollow portions, said guidance rib including two lateral walls, said guidance rib including cross pieces for rigidification extending between said two lateral walls of said guidance rib, the lower edges of said cross pieces being slightly raised with respect to the lower surfaces of said two lateral support parts.

4,993,742

SKI BINDING FOR A CROSS-COUNTRY OR TOURING SKI

Heinz Wittmann, Vienna; Roland Erdei, Pottendorf, and Klaus Holzl, Vienna, all of Austria, assignors to TMC Corporation, Baar/Zug, Switzerland

PCT No. PCT/EP86/00659, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO87/03211, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 15, 1986, Ser. No. 254,942
Claims priority, application Austria, Nov. 22, 1985, 3423/85; Dec. 5, 1985, 3528/85; Oct. 9, 1986, 2681/86
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—615 **14 Claims**



1. A ski binding for attachment to a ski and for retaining a ski boot having a hook element extending therefrom, the ski binding comprising:
a support structure for disposition on the upper surface of a ski;
a horizontal transverse pin attached to said support structure and extending transverse to the upper surface of the ski;
a pivoting part having a first end, a second end, and a mid-portion disposed between said first and second ends, said first end including a pivot pin disposed thereon, said second end having at least one locking pin extending therefrom, and said mid-portion being pivotably connected to said horizontal transverse pin;
an elastic element disposed on said support structure for contacting said pivoting part to resist pivotal movement of said pivoting part about said transverse pin;
a boot retaining shell pivotably mounted about said transverse pin for movement between an opened position and a closed position and having a recess disposed therein, said locking pin for projecting through both said recess and the hook element of a ski boot when said retaining shell is in said closed position, and for releasing the hook element of the ski boot when said retaining shell is in said opened position;
a spring biasingly disposed between said pivoting part and said retaining shell for urging said retaining shell to said opened position; and
a spring plunger pivotably mounted about said pivot pin of said pivoting part for locking said retaining shell in said closed position.

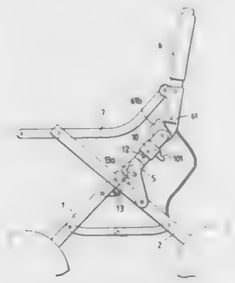
VOL 1123 ISS 3 FE 19 1991 UMI

4,993,743

FOLDING AND LOCK MECHANISM FOR PUSHCART

Takehiko Takahashi; Hideo Saito; Takashi Watanabe, and Tomihiro Kaneko, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,734
Claims priority, application Japan, Jul. 8, 1988, 63-90032[U]
Int. Cl.[5] B62B 7/08
U.S. Cl. 280—642 8 Claims



1. A folding and lock mechanism for a pushcart of the type having front and rear legs and a handle grip, all constituting part of a frame of said pushcart, comprising:

a bracket pivotally mounted at a first end on a rear face of one of said rear legs at a point thereon intermediate opposite ends of said rear leg such that said bracket is pivotally moveable between a generally upstanding position and a lower position;

a retainer plate formed on a lower end of said handle grip, said retainer plate having a bifurcated end of a generally L-shape or inverted Y-shape defined by a pair of engaging arms, said retainer plate being pivotally connected to a second end of said bracket at that portion of said retainer plate where said pair of engaging arms merge together; and

a tubular stopper fitted on the second end portion of said bracket and being slidingly movable along said bracket, said stopper fitting on and retaining either of said pair of engaging arms which is selectively fitted in said second end of said bracket.

4,993,744

VEHICULAR ANTI-ROLL SYSTEM FOR STABILIZING THE ORIENTATION OF A VEHICLE BODY

Shuji Hiromoto; Masatoshi Narioka, and Osamu Nakayama, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Aug. 14, 1989, Ser. No. 393,885
Claims priority, application Japan, Aug. 25, 1988, 63-211387; Aug. 25, 1988, 63-211388; Aug. 25, 1988, 63-211389
Int. Cl.[5] B60G 9/00, 17/00
U.S. Cl. 280—707 11 Claims

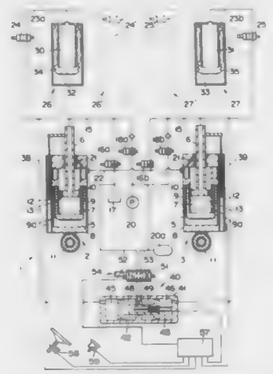
1. An anti-roll system for stabilizing the orientation of the body of a vehicle while the vehicle is turning, comprising:

a pair of hydropneumatic suspension assemblies each including a cylinder and a rod inserted therein, each said suspension assembly having an oil chamber containing oil and a gas chamber charged with compressed gas and having a nonlinear spring characteristic such that the spring constant of the suspension assembly increases as the suspension assembly deflects in the direction moving the rod into the cylinder;

an anti-roll cylinder connected to the paired suspension assemblies and adapted to discharge some of the oil from the inside suspension assembly to supply oil to the outside suspension assembly so that the heights of the two suspension assemblies are equal as the vehicle turns;

accumulating means connected to each said suspension assembly and having a gas chamber defined therein, said gas chamber containing a compressed gas; and

spring constant switching means disposed between the suspension assemblies and the accumulating means corresponding thereto, each of said switching means being



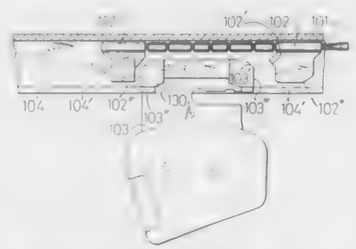
adapted to operate such that the outside suspension is caused to communicate with the accumulating means, thereby causing the gas chamber of the outside suspension and the gas chamber of the accumulating means to cooperate with each other, as the vehicle turns.

4,993,745

SILENT, RATTLE-FREE PASSIVE SEAT BELT SYSTEM

Katsuyasu Ono, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Japan

Division of Ser. No. 278,012, Nov. 30, 1988, Pat. No. 4,889,363.
This application Sep. 12, 1989, Ser. No. 406,249
Claims priority, application Japan, Dec. 2, 1987, 62-184072[U]; Dec. 28, 1987, 62-332927
Int. Cl.[5] B60R 22/06
U.S. Cl. 280—804 4 Claims



1. A passive seat belt system comprising:

a guide rail;

a slider movable along a longitudinal direction of the guide rail;

a webbing fastened to the slider, said slider being slidingly guided on a guide portion of the guide rail located on a side of a portion of the slider at which the webbing is fastened to the slider, whereby the webbing can provide selectively both an occupant restraining state and an occupant non-restraining state;

a drive member movable along the longitudinal direction of the guide rail for driving the slider, said drive member being located in the guide rail on a side of the slider away from the webbing-fastened portion of the slider; and

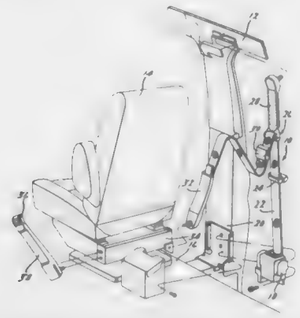
cam means provided between the drive member and the slider for producing a component force directed at an angle toward the guide rail when the drive member moves in said longitudinal direction such that the slider is moved toward the guide portion, said cam means being provided on at least one of the drive member and the slider and defining a straight cam surface which is tilted at an acute angle with respect to the moving direction of the slider.

4,993,746

LOCKING FRICTIONAL D-RING

James E. Hagelthorn, Farmington, assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 5, 1989, Ser. No. 402,325
Int. Cl.[5] B60R 22/36
U.S. Cl. 280—806 11 Claims



1. In an occupant restraint system for an automotive vehicle having a seat belt operatively carried with a retractor assembly to permit protracting movement to the seat belt toward an occupant of the vehicle for restraining the occupant and retracting movement toward the retractor for storage, a guide ring for controlling the direction of protracting and retracting movement of the seat belt comprising:

a support member mounted on the body of the automotive vehicle remote from the retractor assembly;

a substantially cylindrical roller rotatably mounted on the support member and having radially outer surfaces guidingly receiving only one side of the seat belt;

a first coating layer having a high coefficient of sliding friction fixedly secured to the roller outer surfaces; and

means earned within the roller responsive to the imposition of a predetermined force on the seat belt to substantially prevent rotation of the roller with respect to the support member, thereby effecting frictional resistance between the roller coating layer and the one side of the seat belt to prevent further protracting movement of the seat belt.

4,993,747

ELECTRO-RHEOLOGICAL BELT LOAD ANCHORAGE MECHANISM

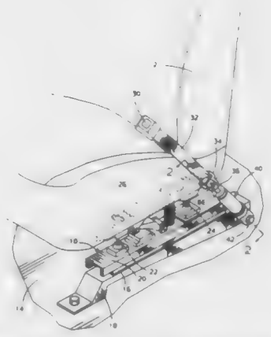
Hans J. Borlinghaus, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 12, 1990, Ser. No. 495,007
Int. Cl.[5] B60R 22/36
U.S. Cl. 280—806 3 Claims

1. In a motor vehicle having a seat mounted on the floor by a seat adjuster and a seat belt for restraining an occupant in the seat, the improvement comprising:

means mounting the seat belt on the seat for movement with the seat upon adjusting movement of the seat,

and an extensible cylinder extending between the means mounting the seat belt and the vehicle floor for transmitting loads imposed on the seat belt to the vehicle floor, said extensible cylinder including a piston movable within a cylinder to permit extension of the extensible cylinder during adjusting movement of the seat and having electro-rheological fluid filling the cylinder, said electro-rheological fluid having a solid state when a voltage is applied thereto to lock the position of the piston within the cylinder and against extension to transmit the occupant restraining load to the vehicle floor and a fluid state in the absence of voltage applied thereto so that the piston may



move freely through the electro-rheological fluid to extend and retract the extensible cylinder, and circuit means effective to apply voltage to the electro-rheological fluid when the seat adjuster is not being adjusted and to interrupt the application of voltage when the seat is being adjusted.

4,993,748

DEVICE FOR THE VERTICALLY DISPLACEABLE RECEPTION OF THE UPPER BELT ARTICULATION OR BELT DEFLECTION POINT

Arno Jambor, Vaihingen/Enz; Erich Glauner, Böblingen; Karl-Heinz Nägele, Gärtringen; Wolfgang Fussnegger, Horb, and Werner Heiss, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Mar. 21, 1990, Ser. No. 496,922
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3909360
Int. Cl.[5] B60R 22/02
U.S. Cl. 280—808 6 Claims

1. A device for a vertically displacable positioning of an upper belt articulation or belt deflection point for a safety belt system which restrains a seated occupant in a two-door motor vehicle without a middle column comprising:

a carrier having upper and lower ends and a belt articulation or belt deflection fitting positioned at the upper end thereof;

carrier transfer means for transferring the carrier between a rest position and at least one upper position of use;

an arm coupled at one end to the transfer means;

a pivot bearing permitting the arm to pivot at the lower end thereof;

a guide track provided at least one outer surface of the carrier aligned in a transverse direction of the vehicle, the guide track having a substantially straight guide track portion and a spaced and parallel guide track portion which is spaced from and in parallel with the substantially straight guide track portion; and

a guide pin which engages the guide track and is positioned at a fixed location so that the belt articulation or belt deflection fitting of the carrier is moved a predetermined amount towards a center of the vehicle and the seated occupant during transfer of the carrier from the rest position to the at least one upper position of use.

6. A device for a vertically displacable positioning of an upper belt articulation or belt deflection point for a safety belt system which restrains a seated occupant in a two-door motor vehicle without a middle column comprising:

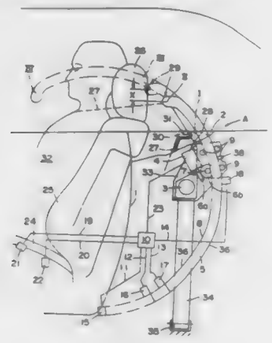
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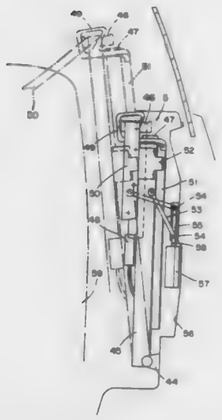
a carrier having a pivot part and a telescopic part extendable from the pivot part, the telescopic part having a belt deflection point positioned at an upper end thereof;

telescopic part transfer means for transferring the telescopic part of the carrier between a rest position and at least one upper position of use;

a pivot bearing attached to the vehicle body and about which the pivot part of the carrier pivots;

a lever arrangement for supporting the pivot part and having one end attached to the pivot part of the carrier and an other end located at the vehicle body;





lever drive means for moving the lever arrangement between extended and retracted positions; and

guide track means for receiving the end of the lever arrangement located at the vehicle body so that the pivot part of the carrier is pivoted towards a center of the vehicle and the seated occupant as the lever arrangement is moved to the extended position by the lever drive means during transfer of the telescopic part of the carrier to the at least one upper position of use.

4,993,749

MEMORANDUM BOOK AND SHEETS THEREOF

Victor F. Volk, 646 Snug Harbor Dr., Boynton Beach, Fla. 33435

Filed Jun. 21, 1990, Ser. No. 541,385
Int. Cl.[5] B42D *1/00*
U.S. Cl. 281—38 20 Claims

1. A memorandum book comprising a plurality of inscribable sheets,

(A) each of said sheets comprising:

(1) upper and lower horizontal strips and an outer vertical edge strip integral therewith, said strips forming a supporting frame, and

(2) a plurality of detachable rectangular areas, each of said areas extending inwardly from said edge strip, and



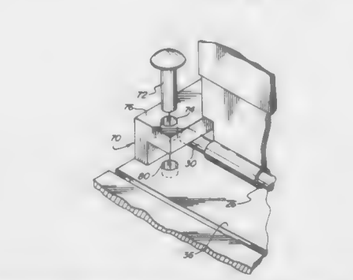
(B) means for binding said sheets together along an edge thereof opposite said vertical edge strip.

4,993,750

PAGE HOLDER FOR PHOTO ALBUM

Thomas Hoffmeister, Sunapee, N.H., and Sheldon Holson, Norwalk, Conn., assignors to The Holson Company, Forestdale, R.I.

Filed Apr. 10, 1990, Ser. No. 507,377
Int. Cl.[5] B42D *17/00*
U.S. Cl. 281—48 10 Claims



1. A photo album page holder for use on the inner surface of the spine of a photo album to hold removable photo frame pages having wire rods that serve as page hinges with rod ends for mounting to the spine, comprising:

elongate hinge retainers mounted at upper and lower ends of the spine;

said hinge retainers having end walls extending laterally across the spine and pier segments located at lateral ends of the end walls and further having bridge segments that are affixed to upper ends of the end walls and the pier segments and extend coextensively therewith across the spine; the width of the bridge segments being selected so that the bridge segments extend inwardly from the end walls towards each other so as to form holding spaces bounded by the bridge segments, the inner surface of the spine and the end walls; said spaces being sized to freely receive and retain rod ends of photo frame pages without bending thereof; with at least one of said retainers being provided with an opening that extends parallel with the length of the spine for a distance that is sufficient to move a wire rod into and out of the holding spaces substantially without bending thereof; and

a movable closure element mounted for lateral slidable motion to the bridge segment having the opening so that in one lateral position the element covers the opening to inhibit escape of a photo frame page wire rod from the holding spaces while in another lateral position of the element it uncovers the opening to enable insertion of a said photo frame page wire rod.

4,993,751

RECORD BOOK

Bruce A. Sawyer, 7100 Foothill Ranch Rd., Santa Rosa, Calif. 95404

Filed Oct. 18, 1989, Ser. No. 423,952
Int. Cl.[5] B41L *1/20*
U.S. Cl. 282—8 R 10 Claims



1. A record book comprising:

a book member including at least one record page portion;

said record page portion bearing adhesive means for attachment of an original document, said adhesive means comprising an adhesive strip covered with a removable liner; and

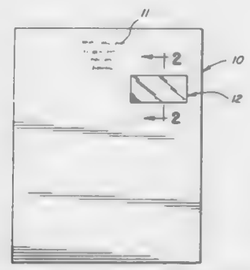
said record page portion further including imaging means for producing a visible copy of an impression placed on said original document.

4,993,752

METHOD OF PRODUCING CORRESPONDENCE

Joseph J. Juszak, Crystal Lake, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Dec. 18, 1989, Ser. No. 451,779
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—67 2 Claims



1. A method of producing correspondence comprising the steps of:

(1) providing a sheet of rectangular stationery having a label position adjacent the upper right portion thereof, a layer of release material on said portion and a generally rectangular transparent label constructed of ink receiving film mounted on said layer and equipped with a pressure sensitive adhesive on the face thereof contacting said release material,

(2) typing correspondence information on the stationery and, at the same time, typing the address of the intended recipient on said label,

(3) providing an envelope having an unaddressed face,

(4) removing said typed label from said stationery and applying it to said unaddressed envelope face,

(5) folding said stationery, and

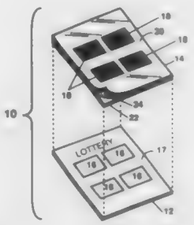
(6) inserting the folded stationery into an envelope.

4,993,753

SELF-ASSEMBLED PERSONALIZED HIDDEN MESSAGE DEVICE

Bruce W. Weeks, 27 Twombley Ave., North Billerica, Mass. 01862

Filed Jul. 28, 1989, Ser. No. 387,061
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—102 9 Claims



1. A self-assembled multi-part personalized hidden message device, comprising:

a base substrate including at least one blank message area on which a message may be written;

a transparent cover sheet, having front and back surfaces, for covering said message area;

means for adhering said cover sheet to said base substrate; and

a plurality of separate, spaced, areas of removable, opaque coating on said cover sheet for obscuring said message area when said cover sheet is adhered to said substrate, said opaque material capable of being rubbed off of said cover sheet without disrupting the cover sheet for selectively revealing the message in the message area.

4,993,754

LIQUID LEVEL COPLANAR TRANSMITTER ADAPTER

James E. Templin, Jr., Burnsville, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 29, 1989, Ser. No. 415,089
Int. Cl.[5] F16L *23/00*
U.S. Cl. 285—189 10 Claims

1. An adapter for coupling first and second isolators of a pressure transmitter to a fluid at a first pressure and a liquid presenting a hydrostatic pressure to a flanged opening, comprising:

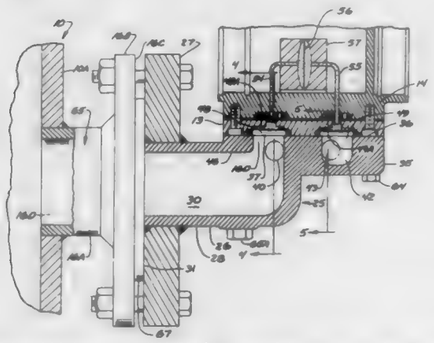
a flange having a central port receiving the liquid from a front flange face of the flange mating with the flanged opening, the flange having an opposite back side;

coupling means disposed on the back side for coupling the first and second isolators to the first and hydrostatic pressures, respectively, the coupling means having a surface surrounding first and second spaced apart coplanar pressure outlets opening to the first and second isolators, respectively;

the adapter including a first passageway coupling the first

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pressure to the first outlet, and a second passageway isolated from the first passageway, the second passageway coupling the hydrostatic pressure from the central port to the second outlet; and



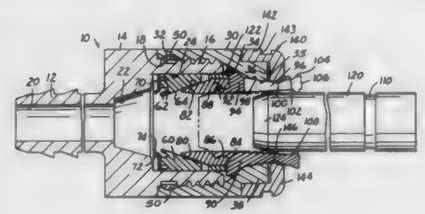
the surface being arranged to placed the central port closer to the second outlet than the first outlet so that, when the flanged opening tilts, elevation changes between the central port and the second isolator are reduced.

4,993,755

QUICK CONNECT FITTING

Robert L. Johnston, Greenville, Ohio, assignor to Master Industries, Inc., Ansonia, Ohio

Filed Sep. 22, 1989, Ser. No. 410,918
Int. Cl.[5] F16L *37/18*
U.S. Cl. 285—315 **6 Claims**



1. A quick connect fitting assembly into which a tube can be pushed and locked and sealed comprising:

(a) main fitting body having a utility hose connection means at one end and an open-ended cylindrical recess at the other end,

(b) a sleeve piston in said recess having sealing means thereon designed to have a sealing relation with said recess and an internal sealing relation with an inserted tube, said piston having an internal conical recess facing the open end of said cylindrical recess,

(c) a locking sleeve in said recess in axial alignment with said piston and having an external conical portion arranged and disposed to penetrate into said internal conical recess of said piston, said external conical portion having an inner sealing surface thereon, said external conical portion of said locking sleeve in assembly forcing said sleeve piston outwardly against the wall of said cylindrical recess and said inner sealing surface being forced inwardly into sealing relation with the exterior wall of said tube when said external conical portion of said locking sleeve is moved into the internal conical recess of said piston,

(d) retainer means engageable with said main fitting body having an internal surface engageable with said locking sleeve wherein said retainer means can force said locking sleeve into said piston,

(e) said locking sleeve having rearwardly extending circumferentially-spaced flexible fingers to engage the exterior of an inserted tube, and

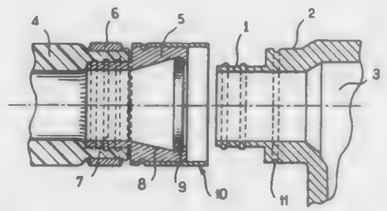
(f) a cap lock axially movable relative to said flexible fingers of said locking sleeve to a first position where said flexible fingers may expand radially by the introduction of the tube to allow tube insertion and movable to a second position to move said fingers radially into engagement with the inserted tube.

4,993,756

CONNECTING DEVICE

Jean-Pierre Bechu, Courbevoie, France, assignor to Caoutchouc Manufacture et Plastiques S.A., Versailles, France

Filed Nov. 16, 1989, Ser. No. 438,086
Claims priority, application France, Nov. 17, 1988, 88 14946
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—319 **16 Claims**



1. A connecting device for sealing in flow of fluid therethrough, said connecting device comprising;

a male coupling having an external surface;

a female coupling having an internal surface;

said male coupling and said female coupling being configured for being coaxially disposed with said male coupling at an initial position relative to said female coupling;

said male coupling also being configured for being at least partially inserted in a sealed position relative within said female coupling by axial movement in a first direction from said initial position;

resilient O-ring means;

said resilient O-ring means being configured for being disposed at a first position between said external surface of said male coupling and said internal surface of said female coupling when said male coupling is at said initial position;

said O-ring means further being configured for being disposed at a second position between said external surface of said male coupling and said internal surface of said female coupling when said male coupling is at said sealed position;

said resilient O-ring means also being configured for encircling said male coupling in both said first and said second positions;

said O-ring means at said second position being resiliently compressed between said external surface of said male coupling and said internal surface of said female coupling when said male coupling is at said sealed position to provide sealing to substantially prevent loss of the fluid by fluid flow between said external surface of said male coupling and said internal surface of said female coupling;

said O-ring means being configured for being rolled over on itself between said first position and said second position by said axial movement, in said first direction of said male coupling into said female coupling, by providing rolling friction between said O-ring means and, each of, said external surface of said male coupling and said internal surface of said female coupling and without relative sliding movement between said O-ring means and said external surface and without relative sliding movement between said O-ring means and said internal surface;

wherein at least one of said external surface of said male coupling and said internal surface of said female coupling has a substantially conical surface portion that defines a conically shaped portion;

wherein said conically shaped portion of said at least one of said external surface of said male coupling and said internal surface of said female coupling converges toward the other of said external surface of said male coupling and said internal surface of said female coupling during said axial movement;

wherein in the converging of said conically shaped portion toward the other surface is for applying an increasing contact force on said O-ring means when said O-ring means moves from said first position to said second position;

said converging of said conically shaped portion toward the other surface being for decreasing the distance between the surfaces adjacent said O-ring means during said axial movement in said first direction;

said converging of said conically shaped portion toward the other surface is for applying an increasing contact force on said O-ring means, said contact force for causing said O-ring means to stop at said second position when said axial movement is completed;

wherein the separation between said first position and said second position is equal to the distance said O-ring means moves when it completes at least one complete integral rollover turn on itself;

said converging of said conically shaped portion toward the other surface and the uncompressed diameter of said O-ring means being configured such that said O-ring means is in a substantially internally relaxed stress orientation, which stress results from said O-ring rolling over on itself, when at said first position and said second position;

said converging of said conically shaped portion toward the other surface and said uncompressed diameter of said O-ring means being configured such that said O-ring means is out of said relaxed orientation when out of either of said first position and said second position and has not rolled over an integral number of rollover turns on itself;

said converging of said conically shaped portion toward the other surface and said distance said O-ring means moves from said first position to said second position being configured such that said O-ring means completes at least one complete rollover turn on itself when moved from said first position to said second position; and

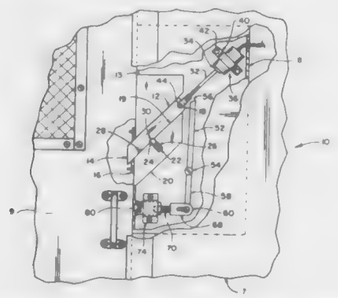
said converging of said conically shaped portion toward the other surface and said uncompressed diameter of said O-ring means being configured such that said O-ring means has internal stresses that are substantially smaller when said O-ring means is in said relaxed orientation than when said O-ring means is out of said relaxed orientation.

4,993,757

ELECTROMECHANICAL LOCKING DEVICE

Robert D. Corzine, 710 5th St., Esther, Mo. 63601

Filed Oct. 13, 1989, Ser. No. 407,277
Int. Cl.[5] E05B *55/00*; E05C *1/08*
U.S. Cl. 292—144 **23 Claims**



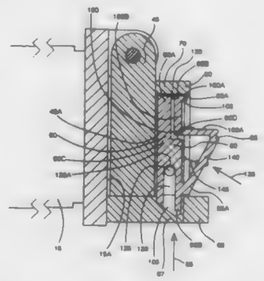
1. A solenoid-operated door locking device having a first portion for mounting on a door jamb and a cooperating portion for mounting adjacent to the edge of a door comprising a door bolt keeper, and a door bolt assembly having a door bolt cooperatively engageable with the keeper to lock the door, said bolt assembly having a bolt positioned therein for movement between an extended locked position and a retracted unlocked position, a solenoid including a solenoid coil and an armature, the armature being operatively connected to the bolt and in substantially linear alignment therewith for moving the bolt from its extended position to a retracted position when the solenoid is energized, a latch trigger assembly extendable into the space between the door and the door jamb, and a lever assembly having one lever end operatively connected to the latch trigger assembly and a second lever end extending to adjacent the bolt, said lever assembly being movable when the latch trigger assembly is depressed when the door moves to its closed position, wherein the lever assembly, when so moved, applies force against the bolt in a direction to move the bolt toward its extended locked position, and means for retaining the bolt in the retracted unlocked position until said bolt is moved toward the extended locked position by the lever assembly.

4,993,758

LATCHING APPARATUS FOR A DOOR AND OTHER MEMBERS

Richard W. Schmutzler, Walton, N.Y., assignor to Databook, Inc., Ithaca, N.Y.

Filed May 22, 1989, Ser. No. 354,793
Int. Cl.[5] E05C *1/08*
U.S. Cl. 292—152 **4 Claims**



1. A housing closure apparatus comprising:

a housing including an opening;

a door including first and second opposed surfaces, the door being swingably mounted on said housing such that said first surface covers said opening when said door is closed, said door exposing said opening when said door is swung open;

a latch guide structure situated on the second surface of said door, said latch guide structure including a channel therein;

a latch receiving member situated on said housing at a location adjacent said latch guide structure when said door is in the closed position;

a slidable latch situated within said channel, said latch including locking means for lockably engaging said latch guide structure in a first locked position when said latch is urged to extend into said latch receiving member;

said latch guide structure including first and second substantially L shaped guide rails, said first and second guide rails each including leg and foot portions, said first and second guide rails being situated on said door in substantially parallel relationship with the foot portion of said first and second guide rails facing each other such that said channel is formed between said first and second guide rails, said first and second guide rails including a common end at

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which the foot portions of said first and second guide rails are joined together by a cross member therebetween, said channel including an open portion between said cross member and said door;

said latch including a main body portion having a bolt portion at one end thereof, said main body portion being oriented within in said channel such that said bolt portion faces and is engagable with said latch receiving member when said door is closed;

said locking means including a flexible portion having first and second ends,

the first end of said flexible portion being attached to said main body portion and being situated within said channel, the second end of said flexible portion being situated adjacent said cross member and engagable with said cross member,

said flexible portion including a ramp portion between the first and second ends of said flexible portion, said ramp portion extending from within said channel to without said channel so as to be accessible by a user,

said second end of said flexible member being engagable with said cross member in said first locked position when a user urges said ramp portion to cause said bolt portion to extend into said latch receiving member.

4,993,759

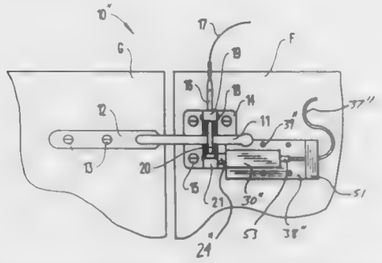
GATE LATCH

Peter C. Thomas, 6750 Riverside Blvd., Sacramento, Calif. 95816

Continuation-in-part of Ser. No. 308,672, Feb. 10, 1989, Pat. No. 4,938,508. This application May 21, 1990, Ser. No. 525,699

Int. Cl.[5] E05C *3/06*

U.S. Cl. 292—235 **5 Claims**



1. A safety latch attachment for use with a gate mounted for pivotal movement relative to a stationary fence, a latch bar secured to one of said gate or said fence, a latch frame mounting plate secured to the other of said gate or said fence, a latch frame secured to said latch frame mounting plate, a latch member pivotally mounted on said latch frame for movement between latched and unlatched positions, said latch member engaging said latch bar in said latched position, said safety latch attachment including:

an adapter plate having a planar bottom surface;

a rectangular notched out portion formed in said bottom surface of said adaptor plate dimensioned to receive a portion of said latch frame mounting plate;

means for securing said adaptor plate adjacent said latch frame mounting plate in partial overlying relation therewith;

an aperture formed through said latch frame;

a hollow guide cylinder having first and second open ends and formed on an upper surface of said adapter plate in coaxial alignment with said aperture;

a plunger received for reciprocal movement in said first end of said guide cylinder, said plunger dimensioned for insertion through said aperture;

a coil spring received in said guide cylinder, said spring in contact with said plunger, biasing said plunger through said aperture;

stationary cable guide means formed on said adapter plate, adjacent said second end of said guide cylinder;

a passage formed through said cable guide means in axial alignment with said guide cylinder; and

a cable extending through said passage and said spring and having an end secured to said plunger, whereby said plunger may be moved out of said aperture bY tensioning said cable.

4,993,760

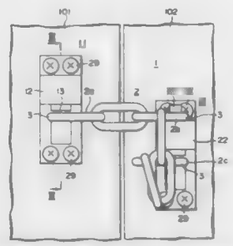
DOOR CHAIN-LOCKING DEVICE

Motohiro Gotanda, 1802-10, Nakabiyo, Abiko-shi, Chiba-ken, Japan

Filed Feb. 26, 1990, Ser. No. 485,201

Int. Cl.[5] E05C *19/08*

U.S. Cl. 292—264 **13 Claims**



1. A door chain-locking device comprising a chain, a door-frame locking means locking one end of said chain, a door-side locking unit mounted on a door and comprising a mounting case slidably supporting a bolt for sliding movement between a lowered lock position and a raised unlock position, said bolt having a lower portion which is operable to lock an end link of said chain when said bolt is in said lowered lock position and which is operable to release said end link when said bolt is in said raised unlock position, said bolt having an upper portion which is freely exposed when said bolt is in said lowered lock position to receive an intermediate link of said chain to thereby provide a temporary foreahortened chain portion extending between said bolt and said door-frame locking means to preclude any partial opening of said door, said door being partially openable as determined by the length of said chain when said intermediate link has been removed from said upper portion of said bolt and said end link is engaged by said bolt with said bolt being in its lowered lock position.

4,993,761

POSITIVE LOCK FOR SLIDING CLOSURE

John E. Paskert, 2582-F Arlington Mill Dr., Arlington, Va. 22206

Filed Jun. 4, 1990, Ser. No. 532,650

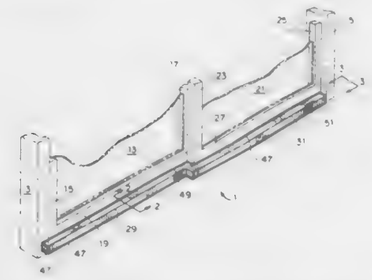
Int. Cl.[5] E05C *19/18*

U.S. Cl. 292—288 **20 Claims**

1. A removable elongated positive lock for use with a sliding closure unit having fixed vertical framing structures and a sill mounting a fixed door and a sliding door movable to open and closed positions, each of said fixed and sliding doors having oppositely disposed vertical end frame members and a horizontal bottom frame member, said elongated positive lock comprising:

first element means for engaging one of said fixed vertical framing structures and one of said vertical end frame members of said sliding door to effect positive lock of said sliding door in its closed position,

second element means for engaging the other of said fixed vertical framing structures, and



said first element means and said second element means being of integral, one-piece construction for rigidity.

4,993,762

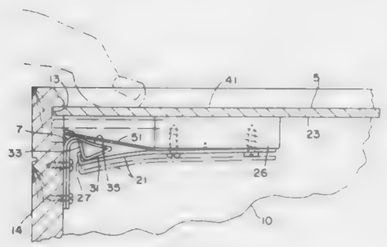
LATCH ASSEMBLY AND CONCEALED OPENING

Leonard P. Rogers, and Will McKay, both of Florence, S.C., assignors to RAM Enterprises, Inc., Florence, S.C.

Filed Oct. 31, 1989, Ser. No. 429,321

Int. Cl.[5] E05C *19/06*

U.S. Cl. 292—303 **5 Claims**



1. A locking container comprising:

three generally upright walls forming a portion of a parallelogram each said wall having an innersurface and an outersurface;

each innersurface having a slot therein with each slot contiguous with a slot of an adjoining wall;

a fourth generally upright wall closing said parallelogram and terminating below said slots;

a top closure slidably received within said slots of said three upright walls, said top closure having an outer uppersurface and a lower innersurface;

a spring latch on said lower innersurface of said top closure said spring latch extending toward the upright wall opposite said fourth wall with a downward incline, said spring latch terminating in a vertical section having a reverse bend therein to form a sliding surface;

an angular catch on said wall opposite said fourth wall having a downwardly inclined surface for receipt of said sliding surface and a bend therein to form an upwardly inclined surface inclined upwardly toward said wall opposite said fourth wall;

whereby upon sliding said top closure through said slots towards said wall opposite said fourth wall said sliding surface of said spring latch engages said downwardly inclined surface of said angular catch and slides therein until intersecting said upwardly inclined surface where said vertical section of said spring latch mates with said downwardly inclined surface and upwardly inclined surface to retain said top closure against further movement.

4,993,763

DOOR INSIDE HANDLE DEVICE

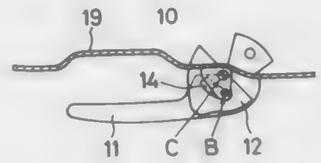
Tetsuroo Tanimoto, Kariya; Yukio Isomura, Chiryu, and Noboru Kanou, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 21, 1989, Ser. No. 410,064

Claims priority, application Japan, Sep. 23, 1988, 63-239240

Int. Cl.[5] E05B *1/00*

U.S. Cl. 292—336.3 **4 Claims**



1. A door handle device comprising:

a base plate, a first hinge pin; a second hinge pin;

an opening handle rotatably mounted on the base plate to pivot around the first hinge pin, the handle having an inner surface to which force is applicable in a first direction to pivot it away from the base plate;

a locking knob rotatably mounted on the base plate adjacent the handle to pivot around the second hinge pin which is offset from the first hinge pin in a direction at least partially opposed to the first direction, said locking knob having an operating portion at a first distance from the first hinge pin and at a second distance from the second hinge pin, said second distance being greater than said first distance,

in which:

the operating handle has an outside surface displaced from the inside surface in the first direction;

the locking knob has a farthest surface in the first direction, said farthest surface being substantially flush with said outside surface; and

the locking knob has an arcuate-shaped slot through which the first hinge pin passes, said slot permitting rotational motion of the locking knob as it pivots about the second hinge pin.

4,993,764

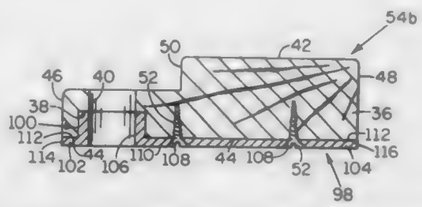
DOOR JAMB SECURITY APPARATUS

Rodney K. Barker, HC52 Box 2394-A, Bulverde, Tex. 78163

Continuation-in-part of Ser. No. 93,306, Sep. 3, 1987, Pat. No. 4,862,658. This application Feb. 28, 1989, Ser. No. 317,019

Int. Cl.[5] E05C *21/02;* **E06B** *1/18*

U.S. Cl. 292—340 **2 Claims**



1. A lock side of a door jamb, said lock side comprising a jamb member and a lock side member in mating engagement, said jamb member comprising a plate portion and a protruding portion, said plate portion being connected to an inside surface of said lock side member substantially flush therewith so tha. said lock side member is intermediate to said jamb member and a door opening defined by said door jamb and said protruding portion being received within a groove in said lock side mem-

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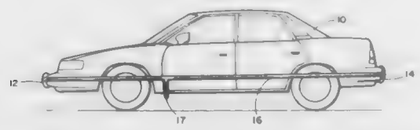
ber, whereby said protruding portion protrudes inward from said plate portion into said groove in said lock side member toward said door opening, said protruding portion having a bottom and a pair of sidewalls which are substantially perpendicular to said plate portion and said bottom, said bottom having a first passage therethrough and said lock side member having a second passage through a bottom of said groove, said protruding portion bottom being substantially flush with said bottom of said groove, said groove bottom being intermediate to said protruding portion bottom and said door opening, said first and second passages being substantially aligned and being adapted to receive a lock throw therein substantially perpendicular to said plate portion.

4,993,765

MOTOR VEHICLE BODY PROTECTOR

Timothy Ryan, P.O. Box 690957, Tulsa, Okla. 74169-0957

Continuation-in-part of Ser. No. 204,229, Aug. 25, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 433,200
Int. Cl.[5] B60R *19/38, 19/42*
U.S. Cl. 293—127 **1 Claim**



1. A vehicle body protector comprising a rear attachment means including a rear tubular attachment rod having first and second ends, means securing said rear tubular attachment rod to the rear of the vehicle, a first L-shaped tubular section having a first end which is secured in the first end of said rear tubular attachment rod and a secnd end which extends forward from the rear of said vehicle alongside of said vehicle and is spaced from the side of said vehicle, a first straight tubular section having first and second ends, wherein the first end thereof fits around the second end of said first L-shaped tubular section, a second straight tubular section having first and second ends, wherein the first end thereof fits within the second end of said first straight tubular section, a third straight tubular section bolted under the vehicle, a second L-shaped tubular section having first and second ends wherein the first end thereof fits within the outer end of said third straight tubular section, and the second end thereof which extends upwardly alongisde of said vehicle and is spaced from the side of said vehicle, a third L-shaped tubular section having a first end which fits around the second end of said second L-shaped tubular section and a second end of which fits around the second end of said second straight tubular section, a front attachment means comprising a front tubular attachment rod, means securing said front tubular attachment rod to the front of said vehicle, a fourth L-shaped tubular section having a first end which fits inside an end of said front tubular attachment rod and a second end which extends rearward from the front of said vehicle on the same side as said first L-shaped means, a fourth straight tubular means having a first end which fits around the second end of said fourth L-shaped section, and a fifth straight tubular means having a first end which fits around the second end of the fourth straight tubular means and a second end which is secured to an upper portion of the second L-shaped section.

4,993,766

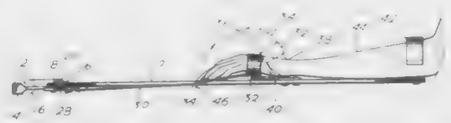
MECHANICAL GRIPPING AID FOR HANDICAPPED PERSONS

John W. Sutherland, 3071 Cascade Ct., Camino, Calif. 95709

Filed Jan. 16, 1990, Ser. No. 465,936
Int. Cl.[5] B25J *1/04*
U.S. Cl. 294—19.1 **1 Claim**

1. A manually operated mechanical device for aiding a handicapped person in reaching and picking up objects, said device adapted to one-handed usage being operable by a person through movement of the person's wrist and arm; said device comprising:

an elongated narrow bar, said bar having a first end and an oppositely disposed second end, said first end affixed with a moveable gripping means having means to releasably tighten onto an object, a U-shaped hand loop with one of its legs affixed to a hinge means, the hinge means pivoted to said bar about an axis which is transverse to said bar with said hand loop generally centered over said bar, said hand loop further positioned between said first end and said second end of said bar, linkage means connected to and between said gripping means and said hand loop, said linkage means providing means for actuating movement in



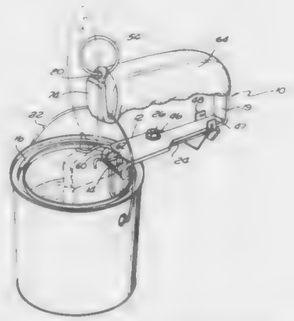
said gripping means by way of pivotal movement in said hand loop away from said bar and toward said second end of said bar, said hand loop sized to fit snugly around a person's hand with said hand loop adapted to fit over the person's hand between the wrist and the fingers, an arm attachment means affixed to said second end of said bar, said arm attachment means sized for removable attachment to a forearm portion of a person's arm; said hand loop and said arm attachment means placed in relative positioning to each other and said bar to allow positioning of said hand loop over a person's hand simultaneous with attachment of said arm attachment means attached to the person'forearm with the attachment of said device positioning the person's wrist and forearm in parallel alignment with and against said narrow bar.

4,993,767

DETACHABLE HANDLE FOR CONTAINERS

Chin H. Song, 814 S. Hobart Ave., Apt. 201, Los Angeles, Calif. 90005

Filed Feb. 9, 1990, Ser. No. 478,285
Int. Cl.[5] B65D *25/28*
U.S. Cl. 294—31.1 **10 Claims**



1. A detachable handle for a receptacle having an open top, a bail, a lateral cylindrical wall and a rim extending inwardly from the lateral wall, the handle comprising:

a base plate having a first end, a second end and a lower surface;

a first hook connected to the first end of the base plate, the first hook being formed to curve around the inside of the receptacle rim to maintain the base plate in a substantially perpendicular position relative to the longitudinal axis of the receptacle;

a gripping member having a first end and a second end;

a second hook attached to the first end of the gripping member and formed to project substantially perpendicular with respect to the longitudinal axis of the gripping member, the second hook being adapted to receive the receptacle bail such that the bail is positioned substantially above the receptacle rim;

a connecting member connecting the second end of the gripping member to the second end of the base plate so that the gripping member and the base plate are co-planar; and

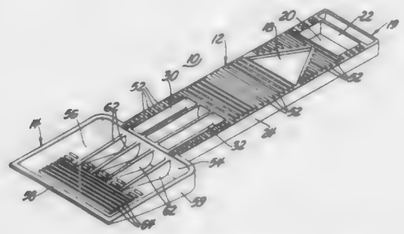
a cam latch pivotally mounted on the lower surface of the base plate and having a first end adapted to rotate into engagement with the outside of the cylindrical wall and to squeeze the wall and rim between the first hook and the cam latch first end.

4,993,768

COMBINED SHOVEL AND UTILITY DEVICE

James Ewen, Tucson, Ariz., assignor to Ronald C. Lamparter, Grosse Pointe Shores, Mich.

Filed Oct. 6, 1989, Ser. No. 418,243
Int. Cl.[5] A01B *1/20;* **E01H** *5/02*
U.S. Cl. 294—51 **4 Claims**



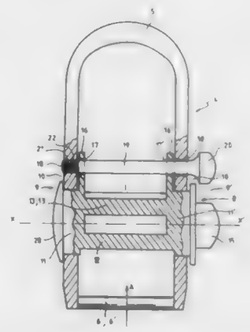
1. A combined shovel and utility device comprising an elongated rectilinear body (12) having a length greater than its width, a shovel scoop (14) integrally formed at one end of said body, the width of said body being approximately one-half the width of said scoop, said body having a generally planar top wall (16), the shovel scoop extending transversely beyond said body and having a bottom wall (56) projecting longitudinally beyond said body, the bottom wall having a rear wall portion (54) projecting upwardly and terminating at said top wall (16), the bottom wall inclining upwardly from said rear wall portion (54) and terminating in a forward edge (58) longitudinally aligned with and extending transversely beyond said top wall (16), an integral wall (59) extending around and projecting upwardly from the periphery of the bottom wall (56) and having an upper edge (60) generally coplanar with said top wall (16), said top wall (16) including a transverse opening (20) forming a handle (19) at the end of the body remote from the shovel scoop, a pair of laterally spaced recesses (30, 32) formed by body walls (34, 40) and (36, 42) and a longitudinally extending upwardly opening U-shape section (38) of said body (12) transversely spacing said recesses, said U-shape section having one end terminating proximate the rear wall portion (54) of the shovel scoop.

4,993,769

SLING STRAP

Jean-Philippe G. C. Chapalain, Les Naïades 306 Parvis de la Préfecture, 95000 Cergy Prefecture, France

Filed May 8, 1989, Ser. No. 345,488
Int. Cl.[5] B66C *1/12;* **A44B** *11/12;* **F16G** *11/00*
U.S. Cl. 294—74 **15 Claims**



1. A sling strap for lifting a load comprising:

a flat strap having at least one end;

a shackle assembled to the strap end and having a loop for use in connecting the strap to the load; and

means for receiving and securing the strap end to the shackle, said securing means comprising:

a rotatable assembly for receiving the strap end, said assembly having an axis of rotation, a pair of spaced-apart carrying pins offset from the axis of rotation and defining between them a guiding passageway, a receiving pin mounted on said rotatable assembly so that the axis of rotation lies between the carrying pins and the receiving pin and the receiving pin, the axis of rotation and the guiding passageway being aligned, whereby the strap end may be passed through the guiding passageway, wrapped around the receiving pin and then doubled-back through the guiding passageway prior to the rotatable assembly being rotated to wrap the doubled-back strap end around the carrying pins; and

means for clamping the rotatable assembly to the shackle to prevent further rotation after the doubled-back strap end is wrapped around the carrying pins to a predetermined degree, said clamping means comprising a series of holes on a portion of the rotatable assembly and a series of holes on the shackle, and a locking pin having threads at one end and where some of the holes in the shackle are threaded, whereby when appropriate holes on the rotatable assembly and on the shackle are in alignment, the locking pin may be passed there-through and the threaded end of the locking pin may be threaded into mating threads in the shackle to effect locking of the rotatable assembly against further rotation and clamping of the strap end in the receiving and securing means.

4,993,770

CARRYING DEVICE FOR ATHLETIC WEIGHTS

Philip J. Groves, Woodland Hills, Calif., assignor to Weider Health & Fitness, Woodland Hills, Calif.

Continuation of Ser. No. 300,967, Jan. 23, 1989, abandoned. This application Jan. 22, 1990, Ser. No. 544,050
Int. Cl.[5] B65D *85/02*
U.S. Cl. 294—158 **1 Claim**

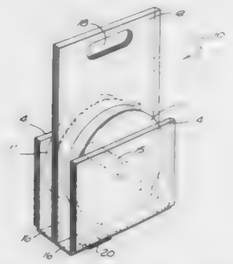
1. A device for carrying athletic weights, said weights having a center hole disposed therethrough, comprising:

an upwardly extending center panel;

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a handle disposed within said center panel;

first and second side panels disposed on opposite sides of said center panel and being substantially parallel thereto, said side panels being held a predetermined distance away from said center panel by first and second bottom panels, wherein said first and second side panels, said first and second bottom panels, and said center panel are manufactured from a single piece of material, said material being folded such that said center panel, and each of said side and bottom panels form a U-shaped cavity for receiving said weights;



a support rod disposed through holes located in said center and said side panels wherein said support rod has a cross-sectional size able to pass through said center hole and wherein a longitudinal axis of said support rod is oriented substantially parallel to said bottom panel such that said weights may be supported on said support rod; and

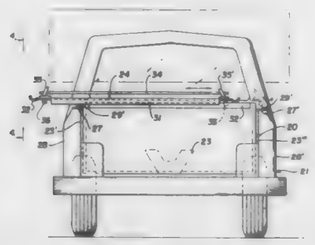
a tab extension coupled to each of said side panels and a slot in each of said bottom panels, said tabs engaging with said slots to retain said material when it is folded.

4,993,771

TRUCK TRUNK DEVICE

Sidney D. Ingerson, P.O. Box 248, Kenmare, N. Dak. 58746, and Jerol H. Staael, Stanley, N. Dak. 58784

Filed May 30, 1989, Ser. No. 359,092
Int. Cl.[5] B60R 9/00
U.S. Cl. 296—37.6 2 Claims



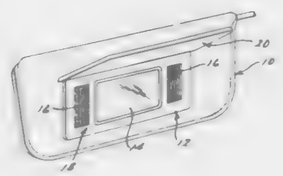
1. A trunk for mounting to the back of a pickup truck wherein said truck has a base with left and right side panels, said trunk comprising a base with front and rear side walls and left and right side walls, said trunk having projecting flange means along the left and right side walls of the trunk for mounting the trunk to the side panels of the truck, said trunk having a single horizontal sliding cover panel extending across substantially the entire top of the trunk, horizontal guideway means along the front and rear walls of the trunk, said cover and said guideway means being above the tops of the side panels of the truck for guiding the cover along a horizontal path over the tops of either the left side walls of the trunk and over the tops of either the left or right side panels of the truck, elongated handle means extending horizontally along the top of said cover from the left side wall of the trunk to the right side wall of the trunk, latch means adjacent said handle means and connected to said elongated hand means to releaseably latch said cover to said side of the trunk in response to movement of the handle means.

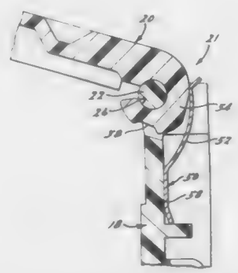
4,993,772

SPRING-LOADED, DUAL-ACTION HINGE ASSEMBLY FOR VEHICLE ACCESSORIES

Grace M. Charen, Oxford, Mich., assignor to Irvin Automotive Products, Inc., Auburn Hills, Mich.

Filed Feb. 20, 1990, Ser. No. 482,271
Int. Cl.[5] B60J 3/00
U.S. Cl. 296—97.1 42 Claims





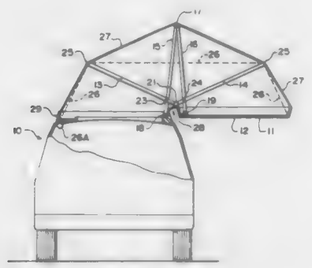
1. A spring-loaded hinge assembly for interconnecting a first member with a second member, said hinge assembly comprising: pivot means pivotally interconnecting said first and second members with one another for relative rotational movement about a generally longitudinally-extending axis; a first cam member protruding in a generally lateral direction from one of said first and second members, said first cam member having a first dwell portion thereon; first resilient biasing means on the other of said first and second members, said first resilient biasing means being resiliently deflectably engageable by said first cam member for exerting a first resilient biasing force on said first cam member, said first resilient biasing means tending to releasably maintain said first and second members in a first predetermined relative rotational orientation when engaged by said first dwell portion of said first cam member; a second cam member protruding in a generally lateral direction from said one of said first and second members, said second cam member having a second dwell portion thereon; and second resilient biasing means on said other of said first and second members, said second resilient biasing means being resiliently deflectably engageable by said second cam member for exerting a second resilient biasing force on said second cam member, said second resilient biasing means tending to releasably maintain said first and second members in a second predetermined relative rotational orientation when engaged by said second dwell portion of said second cam member, said first and second cam members and said first and second resilient biasing means being on the same hinge assembly with said first and second predetermined relative rotational orientations being distinct from one another.

4,993,773

VEHICLE WITH PIVOTAL COVER PANEL

Jack Lange, Winnipeg, Canada, assignor to Expandable Van Tops Ltd., Winnipeg, Canada

Continuation of Ser. No. 207,489, Jun. 16, 1988, abandoned.
This application Nov. 24, 1989, Ser. No. 440,486
Int. Cl.[5] B60P 3/32
U.S. Cl. 296—160 13 Claims



7. A camper vehicle comprising a body having sides, an end and a roof structure and having an opening in the roof structure, a cover panel having a closed position in which it extends across the roof structure covering the opening, pivot mounting means mounting the cover panel for pivotal movement relative to the roof structure from said closed position covering the opening to an open position in which the cover panel is inverted and extends outwardly to one side of the roof structure, and an enclosure member including a flexible cover fabric secured by lower edges thereof to the vehicle and to the cover panel and support means for the cover fabric such that the cover fabric extends in an arch construction over the opening and the panel to allow access to the upper surface of the panel in the open position thereof from the opening, said pivot mounting means including a first and a second support structure spaced apart along one side of the panel, each of said support structures comprising a first lever having one end pivotally connected to said panel, a second lever having one end pivotally connected to said roof structure, pivot coupling means connecting said first and second levers for pivotal movement relative to one another about an axis spaced from said roof structure and said cover panel, means interconnecting said first and second levers at a point along the length of each of the first and second levers which is intermediate said one end of each of said first and second levers and said pivot coupling means and means for communicating force from said panel to said interconnecting means to cause said first and second levers to be forced apart.

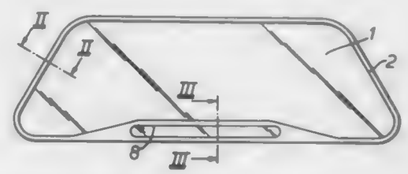
4,993,774

EDGE-ENCAPSULATED GLAZING MODULE

Geoffrey Greenhalgh; Peter Morris; John N. Bearon, all of Lancashire, England, and Guenter Armbruster, Krefeld, Fed. Rep. of Germany, assignors to Pilkington plc, St. Helens, England and Flachglas Aktiengesellschaft, Fuerth/Bay, Fed. Rep. of Germany

Division of Ser. No. 64,056, Jun. 19, 1987, Pat. No. 4,854,636.
This application Aug. 7, 1989, Ser. No. 389,917
Claims priority, application United Kingdom, Jun. 26, 1986, 8615677
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] B60J 1/00
U.S. Cl. 296—201 13 Claims

1. An edge-encapsulated glazing module for a vehicle, comprising an encapsulation molded-in-place around an edge of a glazing material, the molded-in-place encapsulation being molded with a portion disposed to an exterior side of the module wherein said portion defines means to provide an auxiliary function other than the fitting of the module to a vehicle body.

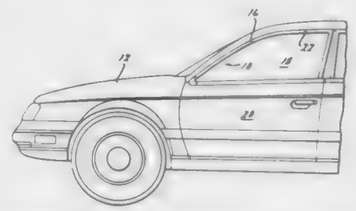


4,993,775

MODULAR WINDOW FRAME SYSTEM FOR AUTOMOTIVE VEHICLES

James F. Keys, Port Clinton, Ohio, assignor to The Standard Products Co., Cleveland, Ohio

Filed Aug. 19, 1988, Ser. No. 234,176
Int. Cl.[5] B60J 10/00, 10/06, 10/08
U.S. Cl. 296—201 14 Claims



1. A one-piece window frame and glass run channel system adapted to be secured to a door of an automotive vehicle comprising:

an elongated core having two end portions, each of said end portions adapted to be secured to an interior of the door to provide a core on the door and said core being generally "U"-shaped in crosssection with first and second legs joined by a web, one of said legs and said web having a cavity therein;

an elastomeric cover permanently bonded to and surrounding said core, said elastomeric cover having a glass run channel adapted to slidably receive edge portions of a windowpane; and

an elongated structural pillar extending into at least one cavity of said end portions of said elongated core to provide rigidity to said elongated core.

4,993,776

VEHICLE SEAT

Giovanni Acuto, Orbassano, and Giuseppe Rovero, Turino, both of Italy, assignors to Fiat Auto S.p.A., Turino, Italy

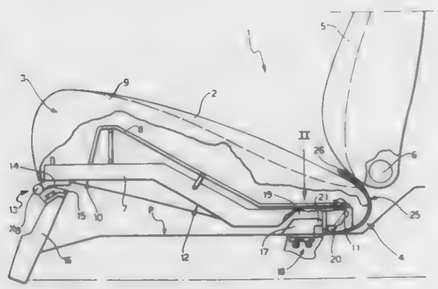
Filed Dec. 19, 1989, Ser. No. 452,484
Claims priority, application Italy, Dec. 21, 1988, 68135 A/88
Int. Cl.[5] B60N 1/10
U.S. Cl. 297—216 6 Claims

1. A vehicle seat comprising a squab having a front end portion and a rear end portion,

pivot means having a hinge axis pivotally mounting the front end portion of the squab on a floor of a vehicle passenger compartment,

normally-disengaged coupling means mounted on the floor of the passenger compartment and the squab and adapted to be brought into a coupling position as a result of a deformation of the squab in a forward direction from said rear end portion to said front end portion,

normally engaged coupling means mounted on the floor of the passenger compartment and the squab and



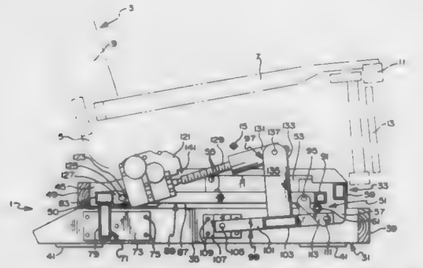
operating means connected to said normally engaged coupling means for selectively moving said normally engaged coupling out of engagement in order to enable the forward tilting of the squab about said hinge axis.

4,993,777

RECLINER CHAIR LIFT BASE ASSEMBLY

Larry P. LaPointe, Temperance, Mich., assignor to La-Z-Boy Chair Company, Monroe, Mich.

Continuation of Ser. No. 196,750, May 20, 1988, abandoned.
This application Oct. 18, 1989, Ser. No. 425,384
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—325 **23 Claims**



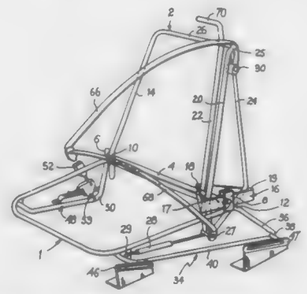
1. A lift base assembly for use with upholstered recliner chairs and the like to provide means for elevating and tilting the chair, said assembly comprising a stationary rectangular lower frame adapted to rest on a floor, a movable rectangular upper frame, said upper frame providing means on which a chair may be mounted, a lift bar member pivoted at one end to a central portion of the lower frame and extending longitudinally forwardly from said pivot, the other and front end of said lift bar member being pivoted to the front end of the upper frame, an electric motor having a rotary screw shaft, said motor being pivoted to a rear portion of said lower frame for arcuate motion of said screw shaft in a vertical plane, a pivot bracket on said lift bar and extending upwardly within the confines of the upper frame when the lift assembly is in lowered position, a screw shaft nut pivoted to an upper portion of said pivot bracket on a pivot axis parallel to and located between the pivot axes of the lift bar pivots to the lower frame and the upper frame, said screw shaft extending through and having a threaded connection with said nut whereby rotation of the screw shaft produces longitudinal movement of the nut along the length of the screw shaft and pivoting of the lift bar, longitudinal movement of the nut toward the rear producing elevation of the upper frame and longitudinal movement of the nut toward the front producing lowering of the upper frame, and tilt means connected to the upper frame producing pivoting of the upper frame about the pivot axis of the lift bar pivot to the upper frame when the upper frame is elevated or lowered.

4,993,778

REINFORCED FRAMEWORK FOR A VEHICLE SEAT

Pierre Colin, Mandeure, and Francois Fourrey, Montbeliard, both of France, assignors to ECIA - Equipements et Composants Pour l'Industrie Automobile, Audincourt, France

Filed Oct. 2, 1989, Ser. No. 416,095
Claims priority, application France, Oct. 3, 1988, 88 12904
Int. Cl.[5] A47C *7/02*
U.S. Cl. 297—452 **12 Claims**



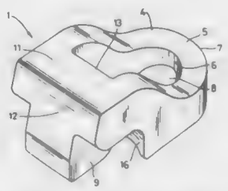
1. A vehicle seat framework comprising:
a cushion frame;
a backrest frame having sides which extend upward relative to said cushion frame, and an upper bar which interconnect the upwardly extended sides;
a triangular bracket; and
a pivot shaft, extending through said triangular bracket, and interconnecting said cushion frame with lower portions of the sides of said backrest frame;
one of the sides of said backrest frame comprising first, second and third tubes, an upper end portion of each of said tubes being connected to the upper bar of said backrest frame, a lower portion of each of said tubes being fixed to a respective corner of said triangular bracket, each of said tubes being bent at said triangular bracket so as to form bent end portions which extend below said triangular bracket, and ends of the bent end portions of said tubes being interconnected to each other.

4,993,779

ELEMENT TO FORM A RACK FOR A MINING MACHINE HAULAGE SYSTEM

Richard Cocksedge, Doncaster, England, assignor to Pitcraft Summit Limited, Nr. Barnsley, United Kingdom

Filed Mar. 29, 1990, Ser. No. 502,128
Claims priority, application United Kingdom, Jan. 10, 1990, 9000552
Int. Cl.[5] F21C *29/04;* F16G *13/14*
U.S. Cl. 299—43 **5 Claims**



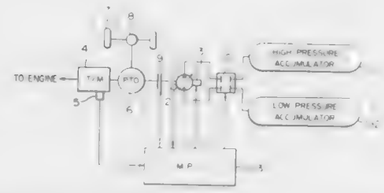
1. An element, adapted to be inter-engaged end-to-end with a plurality of similar, adjacent elements to form a rack for a mining machine haulage system, each element comprising, at one end, a looped end portion including inner and outer arcuate bearing surfaces, said inner bearing surface defining one end of an upwardly open, elongate aperture, a downwardly projecting tooth spaced from said inner bearing surface and adapted to fill partly said aperture of the next adjacent inter-engaged element with the non-filled part of said aperture remaining open, a correspondingly arcuate and convex bearing surface provided on said tooth for abutment against said inner arcuate bearing surface of said adjacent element, a transversely extending bridge provided at the other end of said element, transversely extending and upwardly converging, planar drive faces provided on said bridge for engagement, in use, from above by a tooth of a driven haulage system of an associated mining machine, dependent upon the direction of haulage, and an arcuately concave bearing surface also provided at each lateral side of said element, for abutting engagement with two laterally spaced contact areas of said outer arcuate bearing surface of said looped end portion of said next adjacent element.

4,993,780

REGENERATIVE BRAKING SYSTEM FOR CAR

Koji Tanaka, and Takashi Shima, both of Tokyo, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 424,552
Claims priority, application Japan, Oct. 24, 1988, 63-267966
Int. Cl.[5] B60T *13/74, 1/10*
U.S. Cl. 303—3 **8 Claims**



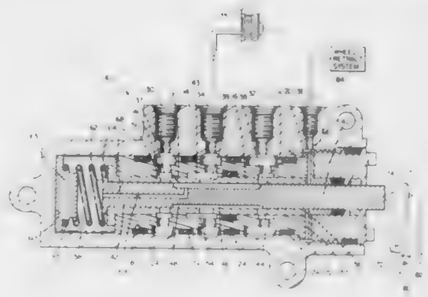
1. A regenerative braking system for a car comprising:
a hydraulic circuit formed of:
a high pressure accumulator;
a pump/motor having a displacement angle;
a circuit shut-off valve coupled to said pump/motor and said high pressure accumulator; and
a low pressure accumulator coupled to said circuit shut-off valve;
means for determining whether said hydraulic circuit is in operation;
means for sensing the displacement angle of said pump/motor;
a displacement angle controlling electromagnetic proportional control valve, coupled to said pump/motor, for controlling the displacement capacity of said pump/motor; and
control means for providing said displacement angle controlling electromagnetic proportional control valve a maximum permissible current and a minimum operating current when said hydraulic circuit is not in operation, said control means studying a maximum and a minimum displacement controlling current of said pump/motor on the basis of a variation of the sensed displacement angle when the maximum permissible current and the minimum operating current are respectively decreased and increased in a stepwise manner, thereby determining a displacement controlling current per a unit capacity for said displacement angle controlling electromagnetic proportional control valve.

4,993,781

ANTIJAM BRAKE-METERING VALVE AND METHOD FOR ITS USE

Gary M. Lindahl, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 21, 1989, Ser. No. 410,317
Int. Cl.[5] B60T *15/04;* B64C *25/22;* F15B *13/14*
U.S. Cl. 303—117 **9 Claims**



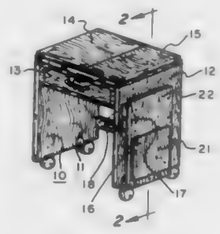
1. A brake-metering valve for use in an aircraft to control fluid pressure and flow from a pressurized fluid supply to a wheel brake on a retractable landing gear, said valve comprising:
a housing connected to the fluid supply and the wheel brake;
a slider slidably received within the housing, the slider including a plurality of sets of transverse fluid communication ports therethrough; and
an elongated port control member slidably received within the slider, the port control member including an external annular chamber which permits fluid communication between the sets of transverse ports in the slider when the slider and the port control member are suitably aligned and further including a feedback passageway between the external annular chamber and an interior end of the port control member,
the slider and the interior end of the elongated port control member forming a feedback chamber within the housing, whereby a feedback force is generated on the port control member, the feedback force being increased if the slider should jam against the elongated port control member.

4,993,782

SWIVEL SEWING MACHINE CABINET

Kenneth J. Williams, Sutton, W. Va., assignor to IMC Corporation of America, Sutton, W. Va.

Filed Jun. 2, 1989, Ser. No. 360,301
Int. Cl.[5] A47B *81/00*
U.S. Cl. 312—21 **3 Claims**



1. In sewing machine apparatus employing a standard cabinet having opposed side panels for storing a freearm sewing machine beneath folded cabinet leaves while in stored position and in elevated position when the cabinet leaves are unfolded,

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the improvements providing for dual machine usage in alternate straight or L configurations when in erected position and compact storage when in folded position comprising:

a swivel panel secured to one side panel and adapted for swivel motion between a first position parallel to the side panel and a second position perpendicular to the side panel;

a work table secured at one end to the swivel panel and adapted for motion between a folded position inclined downwardly and parallel to the swivel panel and in upright position when perpendicular to the swivel panel; and

support means for maintaining the work table in upright position whereby, in the upright position, the work table may be swiveled between straight and L configurations and folded into a compact stored position when in folded position.

4,993,783

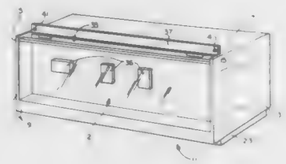
MERCHANDISE DISPLAY UNIT

Bruce Omholt, 1034 Holly, Robert Park, Calif. 94928

Filed Dec. 1, 1989, Ser. No. 434,722

Int. Cl.[5] A47F *3/14*

U.S. Cl. 312—119 **7 Claims**



1. A merchandise display unit comprising

an enclosure having a generally defined front wall area and a front display opening in said enclosure front wall area,

partitioning wall means including a substantially vertical and removable display wall, said partitioning wall means being positioned internally of said enclosure relatively close behind said front display opening so as to divide said enclosure into a relatively shallow front display area and a relatively deep, rear accessible, rear storage area, the front of said vertical display wall having merchandise attachment means for removable attaching merchandise thereon for displaying said merchandise behind said front display opening, and

a display area access opening in said enclosure to permit access to and removal of the display wall portion of said partitioning display wall means.

4,993,784

LOCKING DEVICE

Merrill A. Dana, Millbury; August M. Boucher, Leominster, both of Mass., and Wayne Crepeo, Troy, N.H., assignors to Engineered Security Products Corporation, Leominster, Mass.

Filed Dec. 7, 1988, Ser. No. 281,106

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] E05C *7/06*

U.S. Cl. 312—221 **23 Claims**

1. A locking device, comprising:

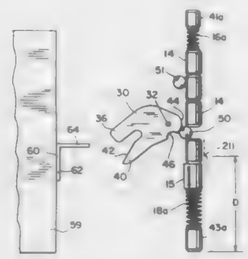
a plurality of small, discrete elements;

means for confining said elements in a string;

primary and secondary biasing means at opposite ends of said string for biasing said elements into a contiguous series with each adjacent pair meeting at a junction;

a plurality of actuator means each having a first unlocked state and a second locked state;

each said actuator means in its first unlocked state being poised adjacent a junction of said string and in its second, locked state being interjected into its adjacent junction for shifting the remainder of said elements against the force of said biasing means to misalign all of the remaining junctions with respect to the remaining actuators and prevent said remaining actuators from moving into said locked state;



said biasing means returning all said elements to said contiguous series when said actuator means in said locked state is returned to said unlocked state; and

means for realigning a junction with each of said actuator means to allow any of said actuator means to be moved to said locked state.

4,993,785

WRITING SUPPORT

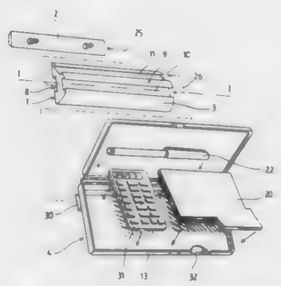
Georges Dunand, La Balme de Sillingy, France, assignor to Boitabloc, societe anonyme, Pringy, France

Filed Jan. 19, 1990, Ser. No. 467,265

Claims priority, application France, Jan. 26, 1989, 89 01314

Int. Cl.[5] A47B *67/02*

U.S. Cl. 312—245 **5 Claims**



1. A writing support intended to be removably fixed on a wall, comprising:

a profiled fixing strip, having a flat base for applying and fixing same by securing means to said wall, and comprising a longitudinal rib with dovetail cross-section for receiving and retaining an intermediate shaped adjusting piece;

a writing receptacle element having a base wall with a longitudinal rib with dovetail cross-section for fixing to an intermediate shaped adjusting piece; and

an intermediate shaped adjusting piece having, on a first face, at least a first longitudinal first face groove with a dovetail cross-section complementary to the longitudinal rib of the profiled fixing strip for fixing same to the profiled fixing strip and comprising, on a second face, at least two longitudinal grooves, each having a dovetail cross-section complementary to the rib of the writing receptacle element for receiving and retaining the writing receptacle element, which two longitudinal second face grooves are offset angularly so as to permit the intermediate shaped adjusting piece to be fixed with respect to the profiled fixing strip and to the writing receptacle element in at least two separate orientations defining two relative slants of the writing receptacle element with respect to the flat fixing strip base.

4,993,786

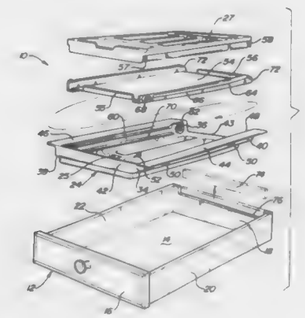
METHOD AND APPARATUS FOR RETROFITTING A DRAWER WITH A MULTIPLE LEVEL STORAGE TRAY

John P. De Giulio, 5915 Da Costa, Dearborn Heights, Mich. 48127

Filed Apr. 28, 1989, Ser. No. 344,813

Int. Cl.[5] A47B *88/22*

U.S. Cl. 312—298 **14 Claims**



1. A storage apparatus for a drawer, the drawer having a bottom, a front wall, a rear wall and two side walls, said rear wall having an opening in an upper portion thereof, said storage apparatus comprising:

a base tray having means for fixedly securing said base tray to the drawer, said base tray having a rear wall with an opening therein and in cooperative alignment with the opening in the rear wall of said drawer, said base tray also having a compartmentalized storage section, a vertically extending front lip means for abutting the drawer front wall and a pair of right and left trimmable flange means for extending from the compartmentalized storage section to the drawer side to enable the base tray to be adapted to fit within side walls of drawers of various widths;

an upper tray disposed above said base tray;

guide means interconnecting said upper tray to said base tray for guiding limited relative horizontal movement therebetween enabling said upper tray to move from a closed position disposed above said base tray to an open position wherein said upper tray is cantilevered rearwardly and extending horizontally through both the opening in the drawer rear wall and the opening in said base tray to positions partially behind the rear wall of the drawer and the rear wall of said base tray providing access to said base tray.

4,993,787

ELECTROMAGNETIC RELAY

Takashi Tanaka, Takatsuki; Takezo Sano, Shiga, and Tsutomu Shimizu, Kusatsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 167,192, Mar. 11, 1988. This application Sep. 11, 1989, Ser. No. 405,327

Int. Cl.[5] H01H *51/22*

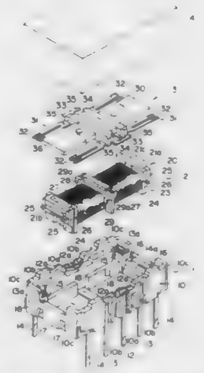
U.S. Cl. 335—78 **4 Claims**

1. An electromagnetic relay, comprising:

a base made of insulating material and including a fixed contact terminal member provided with a fixed contact and a common terminal member provided with a contact portion;

an electromagnetic block including a substantially U-shaped core formed with a pair of magnetic poles, one of said magnetic poles at each end thereof, a coil wound on a spool around the core, and a permanent magnet disposed adjacent to the center of the core between the two magnetic poles; and

an armature block provided with an armature and a movable contact and pivotally supported on the electromagnetic block at substantially the middle thereof to move the movable contact into contact with or away from the fixed contact on the basis of energization or deenergization of the electromagnetic block,



wherein said armature block further comprises a contact connection member having wing portions extending along a longitudinal side of the armature, which contact connection member is connected to the movable contact and extends from the middle portion thereof to the sideward direction, the contact connection member being fixed and electrically connected by both ends of each of said wing portions to the contact portion of the common terminal member at an end thereof.

4,993,788

HEAD-UP DISPLAY SYSTEMS

David G. Steward, Sittingbourne, England, assignor to GEC-Marconi Limited, England

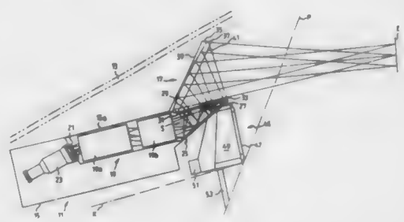
PCT No. PCT/GB89/00646, § 371 Date Feb. 9, 1990, § 102(e) Date Feb. 9, 1990, PCT Pub. No. WO89/12840, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 9, 1989, Ser. No. 460,894

Claims priority, application United Kingdom, Jun. 15, 1988, 8814177

Int. Cl.[5] G02B *27/10, 5/32*

U.S. Cl. 350—3.72 **10 Claims**



1. A head-up display system comprising: an object surface

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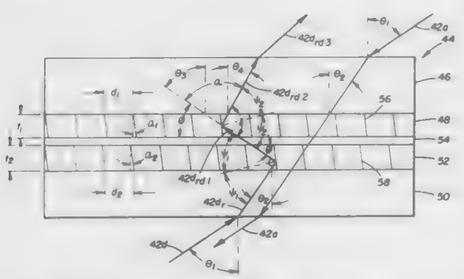
(21); a holographic combiner (17) which has been constructed using two coherent sources respectively located adjacent to entrance and exit pupils of the combiner (17) so as to deviate an axial ray coming from the object surface through an off-axis angle into an exit pupil of the system and which has a focal surface with axial coma and axial astigmatism; an optical sub-system (19) along the path of said axial ray between the object surface (21) and the combiner (17) which at least partially compensates said axial coma and said axial astigmatism; and reflector means (25) whereby rays from the object surface (21) are redirected at the exit of the optical sub-system (19) to the combiner (17) for reflection thereby to the exit pupil; characterized in that said reflector means (25) comprises: a first reflective optical surface (27); and a second optical surface (29) possessing both light reflective and light transmissive properties; the two optical said surfaces (27, 29) defining a space (S) tapering in the direction of ray propagation from the object surface (21); and the arrangement being such that rays from the object surface (21) are first reflected at said first surface (27) to said second surface (29), are then reflected from said second surface (29) back to said first surface (27), and are then reflected again at said first surface (27) to said second surface (29), the rays consequently transmitted by said second surface (29) being incident at the combiner (17) at an angle t which the hologram of the combiner (17) is tuned for reflection.

4,993,789

DUAL WAVELENGTH POLARIZATION SELECTIVE HOLOGRAPHIC OPTICAL ELEMENT

Jonathan R. Biles, 1422 SE. Knight St., Portland, Oreg. 97202, and Ho W. Lo, Portland, Oreg., assignors to Jonathan R. Biles, Portland, Oreg.

Filed Sep. 15, 1988, Ser. No. 244,923
Int. Cl.[5] G02B *5/32, 27/28;* G11B *7/12*
U.S. Cl. 350—3.7 32 Claims



1. A holographic optical element, comprising:

first holographic means, containing a hologram comprising a plurality of fringes recorded with light of a first wavelength λ_1 and having a tilt angle α_1 with respect to a normal to said first holographic means, for transmitting a first polarized light component of light without diffraction and diffracting, by a selected angle, a second polarized light component having a second wavelength σ_2 and making an incident angle θ_1 with a normal to said first holographic means, the diffracted second polarized light component making a diffracted angle θ_2 with a normal to said first holographic means, said hologram in said first holographic means being recorded with two beams making respective angles σ_1 and σ_2 with a normal to said first holographic means, where $2\alpha_1=|\theta_2-\theta_1|=|\sigma_2-\sigma_1|$ and $\lambda_2/(\sin\theta_1+\sin\theta_2)=\lambda_1/(\sin\sigma_1+\sin\sigma_2)$; and

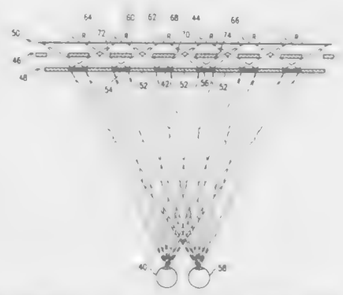
second holographic means, containing a hologram comprising a plurality of fringes recorded with light of a first wavelength λ_1 and having a tilt angle α_2 with a normal to said second holographic means, for transmitting the first polarized light component without diffraction and diffracting the second polarized light component diffracted by said first holographic means and making an incident angle θ_3 with a normal to said second holographic means by a selected angle, said hologram in said second holographic means being recorded with two beams making respective angles σ_3 and σ_4 with a normal to said second holographic means, where $2\alpha_2=|\theta_4-\theta_3|=|\sigma_4-\sigma_3|$ and $\lambda_2/(\sin\theta_3+\sin\theta_4)=\lambda_1/(\sin\sigma_3+\sin\sigma_4)$.

4,993,790

HOLOGRAPHIC LENTICULAR SCREEN STEREOSCOPIC AVOINICS DISPLAY APPARATUS

Gerald L. Vick, Mt. Vernon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1990, Ser. No. 499,241
Int. Cl.[5] G03H *1/04*
U.S. Cl. 350—3.73 15 Claims



1. The method of producing a 3-D display for use in an avionics environment comprising the steps of:

presenting a series of sets of left and right eye images on a display medium where the left and right eye images of a set are separated by at least one image of another set;

focusing light rays, occurring within a predetermined range of viewing angles that deviate from normal to a plane defined by a set of images, through a transmission medium from said left and right eye images as a set of light focusing areas; and

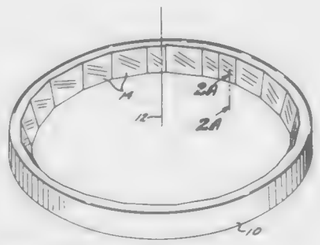
filtering light rays to prevent passage thereof, in a direction normal said transmission medium, through a given focusing area to the images of said display.

4,993,791

POWDER METAL MIRROR

Donald W. Burt, Manhattan Beach, and Gerald A. Hans, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 223,982, Jul. 25, 1988, Pat. No. 4,898,171.
This application Nov. 17, 1989, Ser. No. 438,907
Int. Cl.[5] G02B *26/08*
U.S. Cl. 350—6.8 4 Claims



1. A multi-faceted mirror comprising:

a body having a homogeneous microstructure formed of sintered, metallic powder;

said body including a plurality of separate faces, with adjacently disposed faces forming angles with one another while contacting each other along smooth, straight lines of intersection; and

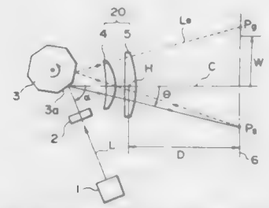
each face including an optical quality reflective surface coated with reflective material to enhance the optical finish of the surface.

4,993,792

SCANNING OPTICAL SYSTEM IN WHICH A GHOST IMAGE IS ELIMINATED

Kazuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 724,044, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 434,331, Oct. 14, 1982, abandoned. This application Jan. 30, 1986, Ser. No. 823,981
Claims priority, application Japan, Oct. 20, 1981, 56-167385
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.8 4 Claims



1. A scanning optical system for scanning a surface and for preventing formation of a ghost image on said surface within the effective scanning area that is scanned, said system comprising:

deflector means having a plurality of reflecting surfaces;

a light beam supplying optical system for forming a linear light beam image near one of said reflecting surfaces of said deflector means positioned to deflect a light beam toward the surface; and

imaging means having different powers in orthogonal directions and rendering said one reflecting surface of said deflector means and the surface to be scanned in optically conjugate relation with each other in a plane perpendicular to the deflection plane formed by the light beam image as deflected by said deflector means;

wherein the angle α which the optical axis of said imaging means forms with the optical axis of said light beam supplying optical system satisfies:

$$|\alpha| < (4\pi/N) - (W/D); \text{ and}$$
$$|\alpha| < \pi/2$$

where N is the number of reflecting surfaces of said deflector means, W is one half of the width of the effective scanning area, and D is the spacing between the principal point of said imaging means, which is adjacent to the surface to be scanned, and the surface to be scanned.

4,993,793

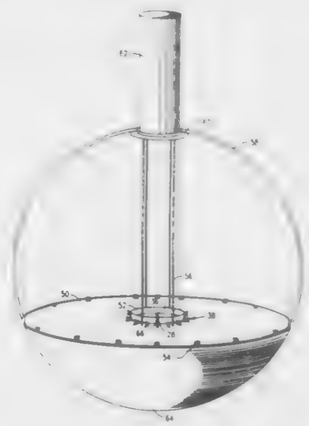
MACHINE FOR SPLITTING AND CONTROLLING A LIGHT BEAM

Michael B. Fowers, 26943 Lakewood Way, Hayward, Calif. 94541

Filed May 15, 1989, Ser. No. 351,802
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.9 11 Claims

1. A system having a machine for producing and controlling multiple light beams from a single light beam comprising:

a motor for producing rotational motion; a reflecting surface; coupling means to transfer rotational motion of said motor to said reflecting surface; at least one source of light radiation; directing means for directing light from said at least one source of light radiation upon said reflecting surface, said reflecting surface causing light from said source to be displaced outwardly and rotated over 360 degrees repeatedly; a late containing at least two openings



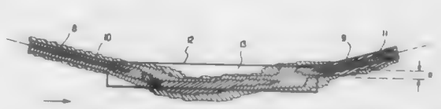
disposed so as to intercept said displaced and rotated light as said reflecting surface rotates and allow said displaced and rotated light to pass only through said openings; a base plate upon which elements which comprise said machine for producing multiple beams of light from a single beam may be mounted in a rigid manner; and means for attaching said machine elements to said base plate.

4,993,794

INTEGRATED OPTIC WAVEGUIDE WITH BEND

Terence P. Young, Chelmsford; Stuart N. Radcliffe, Shenfield, and Edwin F. W. Leach, Chelmsford, all of United Kingdom, assignors to GEC-Marconi Limited, Stanmore, United Kingdom

Filed Aug. 18, 1989, Ser. No. 395,456
Int. Cl.[5] G02B *6/10*
U.S. Cl. 350—96.12 14 Claims



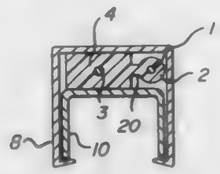
13. An integrated optic device comprising an optical waveguide having a bend, said optical waveguide including a waveguide section at said bend having a first center line, and a waveguide portion having a second center line inclined at an angle with respect to said first center line, said first center line being offset from said second center line, said waveguide section being capable of supporting more than one waveguide mode at the operating frequency, the amount of power transmitted in each mode of the waveguide section being substantially equal.

4,993,795

OPTICAL TELEPHONE WIRE

Masahiko Okura, 12-7, 4-chome, Shiroganedai, Minatoku, Tokyo, Japan

Filed Nov. 6, 1989, Ser. No. 432,161
Int. Cl.[5] G02B 6/44
U.S. Cl. 350—96.23 3 Claims



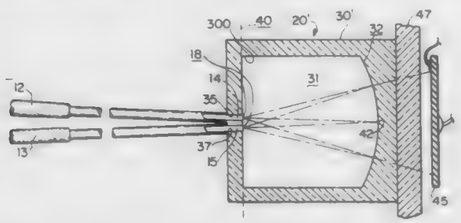
1. An optical wire consisting of a single optical conductor (1), a single messenger cable (3), a circular covering (2) for said single optical conductor, and a rectangular covering (4) for said messenger cable; wherein said circular covering has a diameter which is smaller than the smallest sides of said rectangular covering; and wherein said circular covering and said rectangular covering are integrally juxtaposed along their longitudinal axes with one of the sides of said rectangular covering being molded integrally to said circular covering.

4,993,796

FIBER OPTICS COMMUNICATION MODULES

Narinder S. Kapany, Woodside, and Fred C. Unterleitner, Palo Alto, both of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.

Continuation of Ser. No. 425,440, Oct. 23, 1989, abandoned, which is a continuation of Ser. No. 802,066, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 462,296, Jan. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 325,256, Nov. 27, 1981, Pat. No. 4,479,697, which is a continuation-in-part of Ser. No. 66,376, Aug. 14, 1979, Pat. No. 4,329,017. This application Jun. 8, 1990, Ser. No. 535,249
Int. Cl.[5] G02B 7/26; H04J 1/00
U.S. Cl. 350—96.15 22 Claims



1. A device for coupling the output from a source of light to an end of an optical fiber comprising:

means defining a spherical reflective surface characterized by a focal plane having the property that a point source of light in said focal plane is imaged in said focal plane, said reflective surface being characterized by a coefficient of reflection sufficiently less than unity to permit a detectable fraction of light incident in said reflective surface to pass therethrough;

first position defining means for registering said source of light to a first location within said focal plane;

second position defining means for registering an end of said fiber to a second location within said focal plane and separated from said first location, said first and second locations being on opposite sides of a radial axis, being displaced equal amounts from said radial axis such that the center of curvature of said spherical reflective surface lies on the straight line between said first and second locations, whereby said second location is optically complementary to said first location so that light at said first location is imaged by said first spherical reflective surface at said second location, when positioned at said first location, is imaged on said end of said fiber at said second location; and

a photodetector on the side of said reflective surface remote from said focal plane for providing a signal representative of the intensity of said light source when said light source is positioned at said first location.

12. A device for permitting multiple optical signals of differing wavelengths to be transmitted simultaneously in a first optical path and to be transmitted separately in at least second and third optical paths comprising:

means defining a first spherical reflective surface characterized by a focal plane having the property that a point source of light in said focal plane is imaged in said focal plane;

first position defining means for registering an end of a first optical fiber to a first location within said focal plane;

second position defining means for registering an end of a second optical fiber to a second location within said focal plane and separated from said first location, said first and second locations being on opposite sides of a first radial axis and displaced equal distance from said first radial axis such that the center of curvature of said first spherical reflective surface lies on a straight line between said first and second locations, whereby said second location is optically complementary to said first location so that light at said first location is imaged by said first spherical reflective surface at said second location;

means defining a second spherical reflective surface disposed between said first spherical reflective surface and said first location, said second spherical reflective surface defining means having the properties that a point source of light within a first selected wavelength range and in said focal plane is imaged by a dichroic medium in said focal plane, and that a point source of light outside of said selected wavelength range and in said focal plane passes through said second spherical reflective surface defining means and is imaged in said focal plane by said first spherical reflective surface defining means;

third position defining means for registering an end of a third optical fiber to a third location within said focal plane and separated from said first location, said first and third locations being on opposite sides of a second radial axis and displaced equal distance from said second radial axis such that the center of curvature of said second spherical reflective surface lies in a straight line between said first and third locations, whereby said third location is optically complementary to said third location so that light at said first location is imaged by said second spherical reflective surface at said third location; and

optically transparent means disposed between said first spherical reflective surface and said second spherical reflective surface for maintaining alignment of said first reflective surface, said second reflective surface and said first, second and third locations.

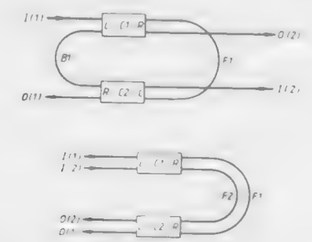
4,993,797

OPTICAL FIBRE LATTICE SIGNAL PROCESSORS

Christopher J. Groves-Kirby, Northampton, and Douglas C. J. Reid, Warwickshire, both of England, assignors to Plessey Research Caswell Limited, Ilford, England

Filed Jun. 6, 1990, Ser. No. 533,831
Claims priority, application United Kingdom, Jun. 13, 1989, 8913555
Int. Cl.[5] G02B 6/26
U.S. Cl. 350—96.15 7 Claims

1. An optical fibre lattice signal processor comprising at least a first and second optical coupling device, wherein first and second optical fibres are arranged to pass through each optical coupling device permitting optical coupling between the fibres, characterised in that the optical coupling devices are arranged in substantially parallel relationship to each other and



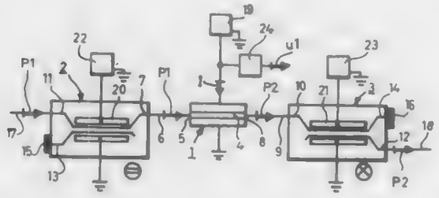
each fibre experiences substantially a 180° turn between the optical coupling devices.

4,993,798

LASER ARRANGEMENT IN OPTICAL COMMUNICATION SYSTEM

Lars H. Thylen, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 31, 1989, Ser. No. 401,172
Claims priority, application Sweden, Oct. 21, 1988, 8803780-9
Int. Cl.[5] G02B 6/26, 6/42; H01S 3/19; G02F 1/00
U.S. Cl. 350—96.15 6 Claims



1. An optical communications apparatus comprising:

first laser diode means including a coherent light source, first and second low-reflectance faces and an optical waveguide;

an optical communications channel;

a first optical reflector;

first optical coupling means for selectively intercoupling said first low-reflectance face of said laser diode means to one of said optical communications channel and said first optical reflector;

a second optical reflector; and

second optical coupling means for selectively intercoupling said second low-reflectance face of said laser diode means to one of said optical communications channel and said second optical reflector;

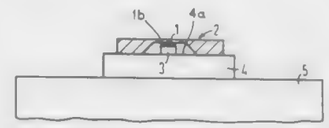
said first optical coupling means, said laser diode means, and said second optical coupling means providing for selective intercoupling of said first optical reflector and said second optical reflector.

4,993,799

ARRANGEMENT FOR ALIGNING A LENS AND OPTO-ELECTRONIC COMPONENT IN FREE BEAM TECHNOLOGY

Karl-Ulrich Stein, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1989, Ser. No. 404,639
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833096
Int. Cl.[5] G02B 6/32
U.S. Cl. 350—96.18 15 Claims



1. An optical coupling arrangement for use in free-beam technology, the optical coupling arrangement comprising:

a semiconductor wafer;

a carrier substrate having a support surface for supporting the semiconductor wafer;

a lens integrally formed within the semiconductor wafer and spaced apart from the support surface of the carrier substrate; and

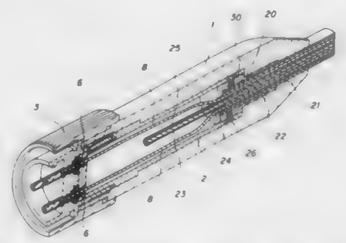
an opto-electrical component disposed on the carrier substrate between the lens and the support surface of the carrier substrate, the semiconductor wafer adapted to be freely movable about the support surface of the carrier substrate for positionally adjusting the lens with respect to the opto-electrical component before the semiconductor wafer is finally fastened in a fixed position with respect to the carrier substrate.

4,993,800

CABLE FIXING MECHANISM IN A MULTICORE TYPE OPTICAL FIBER CABLE CONNECTOR

Sueji Shibata, Tokyo, Japan, assignor to Yamaichi Electric Mgf. Co., Ltd., Tokyo, Japan

Filed May 15, 1990, Ser. No. 523,555
Int. Cl.[5] G02B 6/26
U.S. Cl. 350—96.20 1 Claim



1. A cable fixing mechanism in a multicore type optical fiber cable connector comprising:

an outer shell holding cylinder for holding an outer shell of a terminal of a multicore type optical fiber cable press fitted to an outer surface thereof;

a high tensile body press fit sleeve extending from a central portion of one end face of said outer shell holding cylinder and adapted to permit a high tensile body projecting from said terminal of said multicore type optical fiber cable to be press fitted to an inner surface thereof; and

a plurality of outlet ports formed in a periphery of said high tensile press fit sleeve at said one end face of said outer

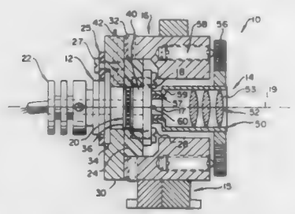
shell holding cylinder and adapted to lead out said plurality of optical fibers therethrough.

4,993,801

OPTICAL HEAD

Sanwal P. Sarraf, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1989, Ser. No. 457,594
Int. Cl.[5] G02B *6/36, 7/26*
U.S. Cl. 350—96.20 13 Claims



1. An optical head comprising:

a diode laser disposed along an optical axis of said optical head, said laser comprising a chip of semiconductor material and a barrel through which a laser beam is emitted; and

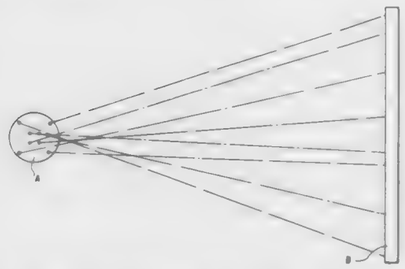
a collimating lens located along said optical axis, said lens including a lnes housing and at least one lens element in said housing, said lens housing being mounted directly on the barrel of said laser by means of a threaded connection.

4,993,802

RANDOMIZING OPTICAL CONVERTER FOR ILLUMINATION BEAM AND METHOD UTILIZING SAME

David Concannon, Farmington Hills; John Vala, Plymouth, and Clive Catchpole, Birmingham, all of Mich., assignors to Unisys Corp., Detroit, Mich.

Filed Oct. 10, 1989, Ser. No. 419,044
Int. Cl.[5] G02B *6/04;* F21V *7/04*
U.S. Cl. 350—96.24 13 Claims



1. An optical arrangement for projecting a rectangular beam from a non-rectangular source of spectral radiation onto a relatively rectangular site, this arrangement comprising:

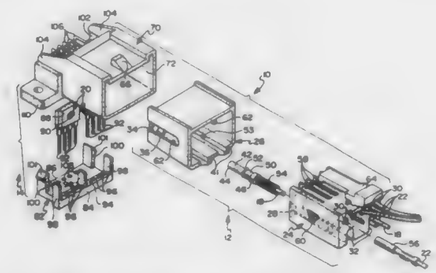
Source means projecting a prescribed non-rectangular beam of spectral radiation to a prescribed input-locus; a Bundle of prescribed optical fibers having a prescribed entry-face and emit-face, the entry face being disposed at said locus, matched to the shape of said beam at said locus; and a prescribed relatively rectangular emit-face, the entry face being disposed to receive said team of radiation at said input-locus; the exit-face being arranged and adapted to so project said rectangular beam onto said site; said fibers being so arranged between said faces as to randomize small discrete portions of said beam as received at said locus whereby to better distribute the radiation of each said portion relatively uniformly along said exit-face of the bundle.

4,993,803

ELECTRO-OPTICAL HEADER CONNECTOR

Lyle B. Suverison, Fowler; Dominic A. Messuri, Youngstown, both of Ohio, and Songchin S. Lu, Scottsdale, Ariz., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 353,684, May 18, 1989, abandoned.
This application May 7, 1990, Ser. No. 520,158
Int. Cl.[5] G02B *6/36;* H01J *5/16;* H01R *17/18*
U.S. Cl. 350—96.20 16 Claims



1. A header connector for a connection system which includes at least one fiber optic data link to an electro/optical device having a thermoplastic housing which has a fiber optic lead-in and a lead frame which is partially embedded in the thermoplastic housing so that it has a plurality of terminal blades depending from the thermoplastic housing comprising:

a connector body which has a socket for receiving a mating plug connector, a magazine chamber which is behind the socket, and a wall which is between the magazine chamber and the socket,

the wall having a window which extends through the wall to establish communication between the socket and the magazine chamber and which has a tapered sealing surface for sealingly engaging a surface of a mating connector plug, and

a clip which has a holder portion which is disposed in the magazine chamber when the clip is assembled to the connector body and a latch portion for retaining the clip in assembly with the connector body,

the holder portion having a cradle for holding the thermoplastic housing of the electro/optical device in the magazine chamber so that the fiber optic lead-in is aligned with the window,

the cradle having a floor which has slots which the terminal blades of the electro/optical device pass through for locating the terminal blades for connection to a printed circuit board, and

the latch portion having lock arms which engage the connector body so that clip is retained in assembly with the connector body with a limited movement which permits adjustment of the fiber optic lead-in with respect to the window in the transverse direction upon engagement of a fiber optic cable of a mating plug connector, and

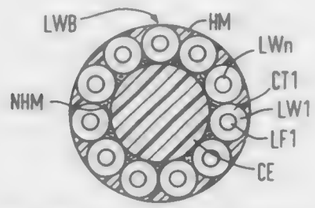
the connector body having flanges for attaching the header connector to a printed circuit board.

4,993,804

OPTICAL CABLE AND METHOD FOR MANUFACTURING THEREOF

Ernst Mayr, Starnberg, and Ulrich Oestreich, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 13, 1989, Ser. No. 434,311
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839415
Int. Cl.[5] G02B *6/44*
U.S. Cl. 350—96.23 20 Claims



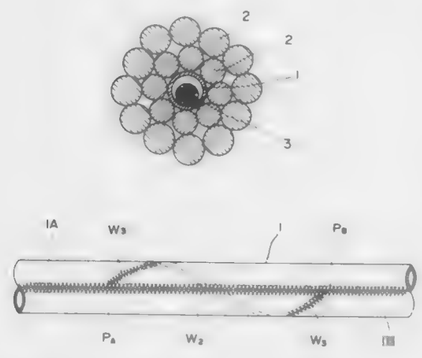
1. An optical cable having at least one bundle of a plurality of optical waveguides being arranged in a core of said cable, said plurality of optical waveguides forming outer gores and inner gores, a non-hardening filler compound being disposed in the inner gores and a hardenable compound being applied only in the outer gores of the bundle.

4,993,805

COMPOSITE OVERHEAD CABLE STRUCTURE HAVING HIGH SEAL PROPERTIES AND A PROCESS FOR PRODUCING THE SAME

Kazuya Abe, Sakura; Toshiya Shinozaki, Tokyo, and Masaru Akinaga, Funabashi, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed May 31, 1990, Ser. No. 531,369
Int. Cl.[5] G02B *6/44*
U.S. Cl. 350—96.23 6 Claims



1. A composite overhead cable structure for electric and optical transmission, comprising:

a metallic pipe having a substantially circular cross-section taken along a line perpendicular to the axis of said pipe,

at least one layer of stranded metallic elongated conductor surrounding the outer periphery of said metallic pipe in close contact with said outer periphery, and

an optical fiber cable disposed within and extending throughout the length of said metallic pipe,

said metallic pipe comprising at least two metallic pipe sections each having in its wall a longitudinal weld extending in a lengthwise direction of the pipe section, said at least two metallic pipe sections being arranged in alignment so that the longitudinal welds thereof are aligned,

the pipe sections which are disposed in adjacent relationship being connected at their respective confronting terminals having contours complementary to each other, wherein each confronting terminal comprises a complementary, terminal longitudinal portion extending, in a lengthwise direction of the pipe section, from the terminal point of said longitudinal weld of the pipe section on the side of said confronting terminal and a complementary, terminal turning portion extending between both ends of said complementary, terminal longitudinal portion of said confronting terminal so as to turn around the axis of the pipe section, so that a longitudinal through-weld extends along the entire length of said metallic pipe, said longitudinal through-weld being constituted of said longitudinal welds of the pipe sections and a connecting longitudinal weld formed by the welding of said complementary, terminal longitudinal portions of the pipe sections, and so that a connecting turning weld formed by the welding of said complementary, terminal turning portions of the pipe sections extends between first and second different points on the longitudinal through-weld of said metallic pipe so as to turn around the axis of said metallic pipe along a peripheral wall of said metallic pipe,

said first and second points being positioned at a distance which satisfies the following relationship:

$$0.15 \leqq \frac{b'}{a'} \leqq 4$$

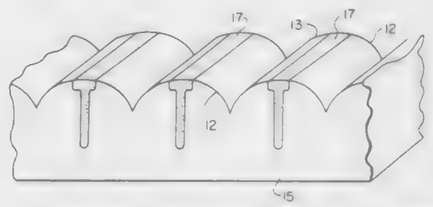
wherein a' represents the length of the circumference of the substantially circular cross-section of said metallic pipe and b' represents the distance between said first and second points on the longitudinal through-weld of said metallic pipe.

4,993,806

REAR-PROJECTION SCREEN

Johannes Clausen, Charlottenlund, and Erik Clausen, Gentofte, both of Denmark, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed May 31, 1989, Ser. No. 358,806
Claims priority, application Denmark, May 8, 1989, 2236/89
Int. Cl.[5] G03B *21/60*
U.S. Cl. 350—128 7 Claims



1. A transparent rear-projection screen having a front side and a rear side, which on its rear side is provided with a lens surface for paralleling of light coming from behind, and which on its front side facing the viewer is provided with rectilinear lenses comprising a plurality of vertical lens pairs to spread the light in a horizontal plane, wherein between the vertical lens pairs there are light absorbing grooves, which are at least partly filled with a light absorbing material, the side surfaces of each of said light absorbing groove being arranged relative to the screen such that incident light beams pass across said side surfaces without reflection.

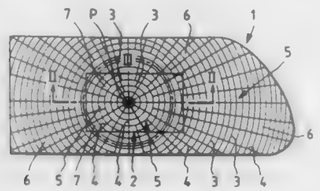
VOL 1123 ISS 3 FEB 19 1991 UMI

4,993,807

VEHICLE LAMP LENS

Koichi Sakakibara, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1989, Ser. No. 396,204
Claims priority, application Japan, Aug. 22, 1988, 63-109043[U]
Int. Cl.[5] G02B 27/00; F21V 5/02
U.S. Cl. 350—167 5 Claims



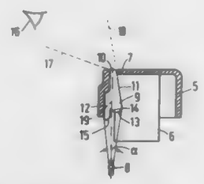
1. A vehicle lamp lens comprising: a lens body; and a plurality of arcuate step-like blocks circumferentially and radially separated from one another and arranged in a mosaic pattern, said blocks being formed on a lens surface of said lens body, and separated from one another along a plurality of concentric and radial lines, ones of said blocks in a central portion of said lens having a refractive configuration, and ones of said blocks disposed outside of said central portion having a nonrefractive linear transmitting configuration, said ones of said blocks having said linear transmitting configuration and said ones of said blocks having said refractive configuration being arranged continuously and unitarily in a concentric manner in a radial direction of said central portion.

4,993,808

DIRECTED OPTICAL SIGNALING

Herman W. T. Braakman, Bleiswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1989, Ser. No. 340,618
Claims priority, application Netherlands, May 18, 1988, 8801274
Int. Cl.[5] G02B 5/04, 17/04; H03K 17/94
U.S. Cl. 350—286 13 Claims



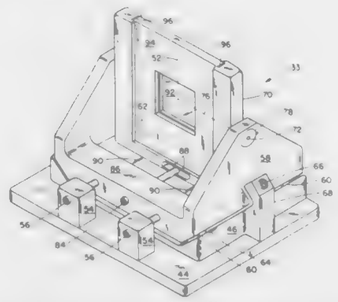
1. A keyboard comprising
(a) at least one key that includes a vertical recess,
(b) at some distance below the recess, a light source for marking a condition defined by the key, and
(c) in the recess (7), a light conducting body (9) having
(i) a top which forms an exit opening for a light beam, coming from the light source, the top being located substantially in the top face of the key (2),
(ii) a bottom directed towards the light source (8), and
(iii) at least two facets (13, 14) for allowing the light beam to emerge in a desired direction simultaneously as at least first and second substantially non-coinciding portions of the light beam (δ, β), as a result of which an angle of exit subtended by the light beam exceeds an angle of entry subtended by light coming from the light source to the light conducting body (9).

4,993,809

MOUNTING FIXTURE FOR AN OPTICAL INSTRUMENT

Kenneth G. Leib, Wantagh; Edward V. Sullivan, Huntington Station, and Ronald H. Heuer, Miller Place, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 7, 1988, Ser. No. 255,047
Int. Cl.[5] G02B 27/00, 7/02
U.S. Cl. 350—321 16 Claims



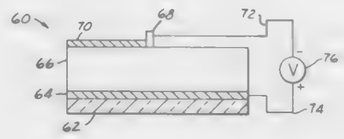
1. A mounting fixture for an optical instrument, providing for a precise mounting and positional adjustment therein of an optical element at least along two transverse x and y axes, and also rotationally along θ in roll about a z optical axis of the optical instrument, γ in pitch about the x axis, and β in yaw about the y axis, comprising:
a. a base member;
b. a track plate rotationally mounted on said base member for rotation about the y axis, and means for fixedly securing the track plate in a selected rotational position;
c. a cradle rotationally mounted on said track plate for rotation about the z optical axis, and means for fixedly securing the cradle in a selected rotational position;
d. an optical element holder rotationally mounted on said cradle for rotation about the x axis, and also for x translational movement along said x axis, means for fixedly securing the optical element holder in a selected rotational position, and means for fixedly securing the optical element holder in a selected x translational position; and
e. an optical element mounted on said optical element holder for translational movement along said y axis, and means for fixedly securing the optical element in a selected y translational position.

4,993,810

ELECTROCHROMIC DEVICES COMPRISING METAL SALTS IN AN ION CONDUCTIVE MATERIAL

Hulya Demiryont, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 14, 1989, Ser. No. 338,261
Int. Cl.[5] G02F 1/01
U.S. Cl. 350—357 17 Claims



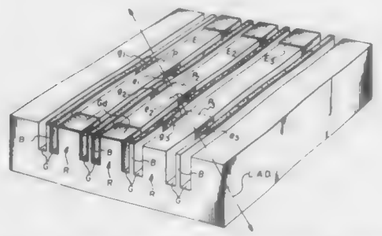
1. An electrochromic device comprising a substrate; a first electrode layer provided on said substrate; an electrochromic matrix material layer in contact with said first electrode member; and a second electrode layer in contact with said electrochromic matrix material layer, at least one of said first and second electrode members being transparent, said electrochromic matrix material layer consisting essentially of a substantially uniform mixture of: (i) a metal salt component selected from the group consisting essentially of halides, acetates, nitrates, sulfates, and phosphates of metals selected from the group consisting essentially of copper, cobalt, nickel, lead, rubidium, molybdenum and tin; (ii) an ion conductive material component selected from a group consisting essentially of solid electrolytes and gel electrolytes; and (iii) an ion conduction enhancer component selected from the group consisting essentially of lithium salts and sodium salts.

4,993,811

RIDGE ARRAY LIGHT VALVE DEVICE

Richard N. Blazey, Penfield, and Joseph Y. Kaukeinen, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1988, Ser. No. 281,420
Int. Cl.[5] G02F 1/03
U.S. Cl. 350—392 5 Claims



1. In a light valve device of the kind having an electroded, ferro electric modulator panel sandwiched between crossed polarizer elements, the improvement wherein:
(a) said panel comprises: (i) a plurality of parallel grooves that form a plurality of parallel walled ridge portions therebetween and (ii) planar address and reference electrode pairs on opposing wall surfaces of said ridge portions, the electrodes of each pair being substantially parallel and oppositely centered on a normal across the intervening ridge portion, said electrode pairs being staggered in location in the groove length direction along their respective ridge portions so as to form a linear array having a linear array direction at about 45° to the longitudinal dimensions of said ridges and grooves; and
(b) said panel is oriented between said polarizer elements so that the polarization directions of said elements are respectively parallel and perpendicular to said linear array direction.

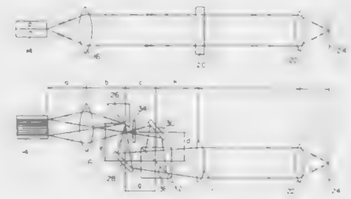
4,993,812

SEMICONDUCTOR LASER OPTICAL SYSTEM

Hiroshi Matsuoka; Hiroyuki Hiiro, and Hidetoshi Shinada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 7, 1988, Ser. No. 216,919
Claims priority, application Japan, Jul. 8, 1987, 62-170560
Int. Cl.[5] G02B 5/30, 27/28
U.S. Cl. 350—394 19 Claims

1. A semiconductor laser optical system comprising:
a semiconductor laser for oscillating a beam which has, in a far field pattern, first and second lobes in the direction aligned with a pn junction interface of said semiconductor laser;
a first lens for collimating first rays which have been oscillated by said semiconductor laser in the direction intersecting said pn junction interface and for converging at separate focal positions second rays forming said first and second lobes, respectively, which have been oscillated by said semiconductor laser in the direction aligned with said pn junction interface;
separating means for separating said second rays in such a manner that said first and second lobes formed on focal positions of said first lens are separated;
synthesizing means for synthesizing said second rays which



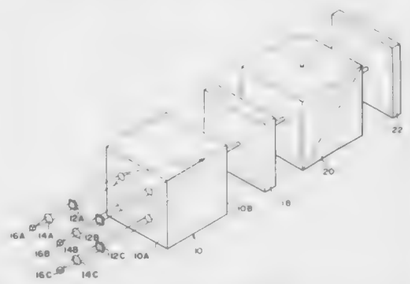
have been separated by said separating means, in such a manner that said first and second lobes are superimposed;
a second lens for collimating rays which have been synthesized by said synthesizing means and which oscillate in the direction aligned with said pn junction interface; and
a third lens for converging rays which have passed through said second lens.

4,993,813

OPTICAL AMPLIFIER

Hiroyuki Hiiro, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 21, 1989, Ser. No. 439,987
Claims priority, application Japan, Nov. 21, 1988, 63-293949
Int. Cl.[5] H01S 3/098; G02B 27/28
U.S. Cl. 350—401 16 Claims



10. An optical amplifier comprising:
a light resonator including a first reflecting mirror and a second reflecting mirror having a smaller reflectivity than that of said first reflecting mirror, said first reflecting mirror and said second reflecting mirror being arranged to oppose each other;
a plurality of amplifying means disposed between said first reflecting mirror and said second reflecting mirror and adapted to amplify light through induced emission; and
beam combining and separating means which is adapted to combine light made incident thereupon from said plurality of amplifying means and cause the light to emerge therefrom in the direction of said second reflecting mirror and is also adapted to separate the light made incident thereupon after being reflected by said second reflecting mirror and cause the light to emerge therefrom in the respective directions of said plurality of amplifying means,
whereby by repeating the combination and separation of the light by said beam combining and separating means and amplifying the light by said plurality of amplifying means, a beam of light having high energy is obtained.

4,993,814

ZOOM LENS SYSTEM

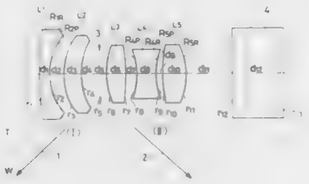
Kazuyoshi Hata, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1989, Ser. No. 298,555

Claims priority, application Japan, Jan. 18, 1988, 63-7784; Jan. 18, 1988, 63-7785; Jan. 18, 1988, 63-7786; Jan. 18, 1988, 63-7787; Jan. 18, 1988, 63-7788

Int. Cl.[5] G02B *15/00*

U.S. Cl. 350—426 **29 Claims**



1. A compact two-unit zoom lens system providing a long back focal length, comprises from object side to image side:

a front lens unit of a negative refractive power including at least two lens elements having relatively strong refractive powers facing each other to assist in correcting aberrations during zooming; and

a rear lens unit of a positive refractive power with a variable air space formed between the front and rear lens units, said rear lens unit consisting of a first biconvex lens element, a second biconcave lens element and a third biconvex lens element, wherein the variable air space between the front and rear lens units changes during a zooming operation, the refractive powers of the front and rear lens units are chosen to permit correction of field curvature, and spherical, coma, and chromatic aberrations, with only three lens elements in the rear lens unit.

4,993,815

ZOOM-LENS-BARREL ASSEMBLY

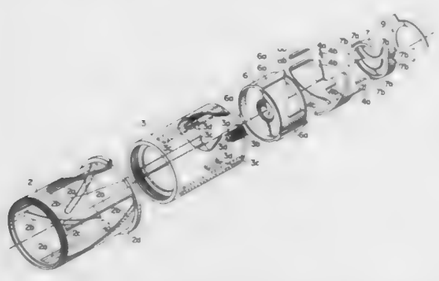
Yasuo Yamazaki, and Kazutoshi Shiratori, both of Hino, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Feb. 15, 1990, Ser. No. 480,282

Claims priority, application Japan, Feb. 21, 1989, 1-42189

Int. Cl.[5] G02B *15/00*

U.S. Cl. 350—429 **33 Claims**



1. A zoom lens-barrel assembly which performs zooming operation by moving forwardly and rearwardly a plurality of lens groups in a direction of an optical axis, comprising:

a stationary frame adapted to be mounted on a camera;

a movable frame which is moved in the direction of the optical axis relative to said stationary frame by zooming operation;

a cam frame which is cam linked with said stationary frame and may be rotated around the optical axis by being moved in the optical axis direction together with said movable frame; said cam frame having one circumferential cam at front and roar portions thereof, respectively;

first and second driven frames which are held by said movable frame so that they are movable along the optical axis and can not be rotated around the optical axis, the positions of said first and second driven frames with respect to said movable frame along the optical axis being determined by engaging with the cams at the front and rear portions of said cam frame, respectively; and

a plurality of lens groups which are respectively held by said movable frame and first and second driven frames.

4,993,816

PROJECTION LENS SYSTEM FOR USE IN PROJECTION TELEVISION

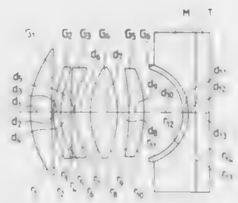
Yakayuki Yoshioka, and Kazuya Akiyama, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,975

Claims priority, application Japan, Aug. 3, 1989, 1-200273

Int. Cl.[5] G02B *13/18*

U.S. Cl. 350—432 **4 Claims**



1. A six-element projection lens system for use in a projection television which comprises, in order from the screen side, a positive first lens, a positive meniscus second lens, a negative third lens having a stronger concave surface directed toward the CRT side than on the other side, a biconvex positive fourth lens, a positive meniscus fifth lens, and a negative sixth lens having a concave surface directed toward the screen side, with each of the second and sixth lenses being a plastic lens having at least one aspheric surface, which lens system satisfies the following conditions (a)–(e):

(a) $0.5<\psi_{1,2}<1.1$

(b) $1.1<\psi_{4,5}<1.4$

(c) $0.55<|\psi_3|<0.9$, $\gamma_3<40$

(d) $0.9<|\psi_6|1.3$

(e) $0<\psi_2<0.4$

where $\psi_{1,2}$ is the composite power of the first and second lenses;

$\psi_{4,5}$ is the composite power of the fourth and fifth lenses;

ψ_3 is the power of the third lens;

ψ_6 is the power of the sixth lens;

ψ_2 is the power of the second lens (provided that the power of the overall system is assumed to be unity); and

ψ_3 is the Abbe number of the third lens.

4,993,817

ENDOSCOPE RELAY OPTICS

Jan Hoogland, 8982 N. Applegate Rd., Grants Pass, Oreg. 97527

Continuation-in-part of Ser. No. 191,926, May 9, 1988, Pat. No. 4,946,267. This application Oct. 21, 1988, Ser. No. 261,052

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] G02B *23/00, 9/36, 9/60, 9/62*

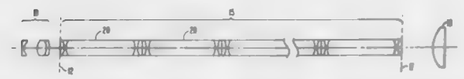
U.S. Cl. 350—465 **19 Claims**

1. A lens assembly for incorporation into an optical transfer system wherein two such assemblies define an optical transfer module for transferring an image between successive image planes, the lens assembly comprising:

a substantially symmetric rod-like central element constructed of a first material having a relatively high index of refraction and having first and second surfaces;

first and second substantially identical negative elements constructed of a second material having a relatively low index of refraction, being axially spaced apart from each other by said central element and being cemented to said central element; and

first and second substantially identical positive elements constructed of a third material having a relatively high index of refraction, being spaced apart from each other by said central element and said negative elements and being cemented to said negative elements;



the lens assembly thus being characterized by a first pair of optical surfaces at the ends thereof, a second pair of optical surfaces at the interfaces between said first positive and first negative elements and between said second positive and second negative elements, and a third pair of optical surfaces between said negative elements and said central element, at least one of said pairs of optical surfaces being aspheric to substantially correct spherical aberration;

the dispersions of said first, second, and third materials being chosen to substantially correct chromatic aberration;

the index difference contribution to the Petzval sum dominating the bending and spacing contribution to the Petzval sum contribution.

4,993,818

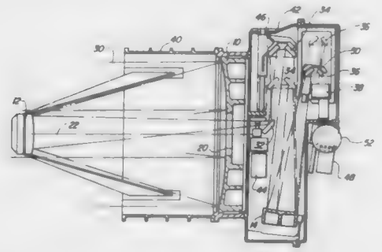
CONTINUOUS ZOOM ALL-REFLECTIVE OPTICAL SYSTEM

Lacy G. Cook, El Segundo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 17, 1988, Ser. No. 259,013

Int. Cl.[5] G02B *17/06, 23/06, 7/18, 15/00*

U.S. Cl. 350—505 **19 Claims**



1. A reflective continuous zoom optical system comprising:

a fixed position primary mirror having an opening central about a central axis;

a fixed position secondary mirror facing said primary mirror, said secondary mirror being of a smaller diameter than said primary mirror and positioned substantially symmetrically with said central axis of said primary mirror such that light from a viewed object passes around and by said secondary mirror and is reflected through said central opening in said primary mirror; and

means for reflecting said image of the object being viewed to a fixed position plane for viewing, said reflecting means positioned to receive light from said secondary mirror and movable through a plurality of positions altering focal length of the system and said primary mirror, secondary mirror and viewing plane being fixed with respect to one another.

4,993,819

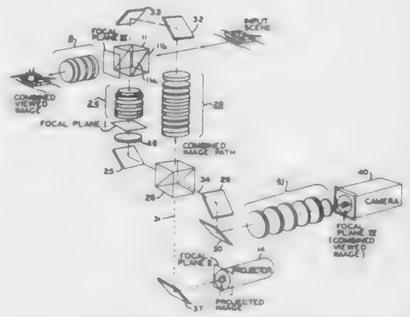
EXTERNAL GUNSIGHT EYEPIECE ATTACHMENT

Ralph E. Moorhouse, Melbourne Village, Fla., assignor to DBA Systems, Inc., Melbourne, Fla.

Filed Dec. 6, 1989, Ser. No. 446,850

Int. Cl.[5] G02B *23/02*

U.S. Cl. 350—557 **10 Claims**



1. An external gunsight viewing apparatus comprising:

a housing having first, second and third optical ports for receiving and transmitting images, said first and second optical ports being located opposite to each other along a common axis;

a coupling member for coupling said first port to said gunsight, aligning said gunsight optical axis with said common axis;

a prism disposed along said common axis, having a reflective surface, for folding the optical path of an image entering said first port along an orthogonal axis;

Erfle lens means having an axis lying along said orthogonal axis within said housing, providing an image which is viewed through said third optical port;

means including a lens disposed in said third optical port permitting viewing of said first image;

a beam combining means located along a viewing axis of said third port for combining said image with an image entering a fourth port of said housing;

a relay means for relaying said combined image; and,

mirror means for directing said relayed combined image to said prism, said prism folding said combined image optical path along said common axis to said second port.

4,993,820

OPTICAL INSTRUMENT, IN PARTICULAR BINOCULARS

Daniel Swarovski, Wattens, and Kurt Schwab, Mils, both of Austria, assignors to D. Swarovski and Company, Austria

Continuation of Ser. No. 893,158, Aug. 5, 1986, , which is a continuation of Ser. No. 467,340, Feb. 17, 1983, Pat. No. 4,626,080. This application Jul. 12, 1988, Ser. No. 218,098

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205583

Int. Cl.[5] G02B *23/02, 7/18, 23/18*

U.S. Cl. 350—569 **15 Claims**

1. An optical instrument comprising:

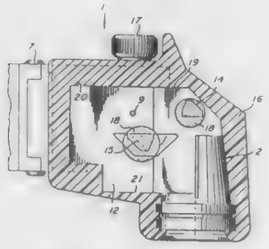
a plastic foam outer shaped member;

an objective tube within said outer shaped member, an eyepiece tube within said outer shaped member, and a prism

system within said outer shaped member providing an optical path through said optical instrument; and

positioning means for said prism system arranged between said prism system and said outer shaped member, said positioning means exhibits a minimal form and;

is adapted to receive a preformed nonintegral prism seat;



said nonintegral prism seat is arranged in said positioning means and independent from said outer shaped member said objective tube and said eyepiece tube;

wherein said positioning means and said prism seat are nonintegrally formed.

4,993,821

SELF-SUPPORTED, ADJUSTABLE, CONDENSATION-FREE SHOWER MIRROR

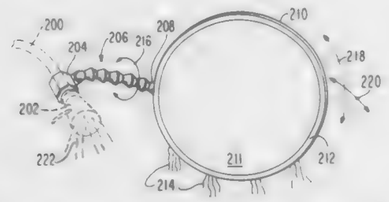
Thomas R. Christianson, Napa, Calif., assignor to Showertek, Inc., Napa, Calif.

Division of Ser. No. 311,744, Feb. 17, 1989, Pat. No. 4,904,072, which is a division of Ser. No. 128,995, Dec. 4, 1987, Pat. No. 4,836,668, which is a continuation-in-part of Ser. No. 76,494, Jul. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 899,265, Aug. 22, 1986, abandoned. This application Oct. 2, 1989, Ser. No. 416,985

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] G02B *7/18*

U.S. Cl. 350—584 **18 Claims**



1. A mirror assembly for use in a shower enclosure having a water-dispensing showerhead assembly including a showerhead and a supply pipe therefor, comprising:

a mirror having a reflecting front surface, a rear surface facing in the opposite direction from said front surface, and an edge connecting said front and rear surfaces,

a frame surrounding said edge of said mirror, said frame also extending behind and in parallel to said rear surface of said mirror so as to provide an enclosed space behind said rear surface of said mirror, said frame having an outlet so that water present in said enclosed space can flow out of said enclosed space;

an elongated flexible arm;

said arm having an elongated lumen extending therethrough,

a distal end of said arm being attached to said frame so as to support said mirror,

a proximal end of said arm, opposite said distal end thereof, having attachment means for attaching said arm to said showerhead assembly and diverting a portion of the water flowing to said showerhead through said lumen and to said enclosed space behind said mirror,

the space within said lumen communicating with said enclosed space behind said mirror such that fluid present in said lumen can flow into said enclosed space behind said mirror,

said arm comprising a plurality of individual ballandsocket friction joints which enable said arm to be flexible and bendable,

said joints being sufficiently small and numerous so that when said proximal end of said arm is attached to said showerhead assembly, and said arm extends linearly outwardly from said showerhead assembly with said frame attached to said distal end thereof such that said mirror occupies an initial position, said arm can be manually bent on its joints in any direction so that mirror can be manually moved to any position within a given range around said initial position and toward said showerhead assembly, and remains in any stable position, without changing the angular orientation of said mirror with respect to said showerhead.

4,993,822

REARVIEW MIRROR FOR A MOTOR VEHICLE

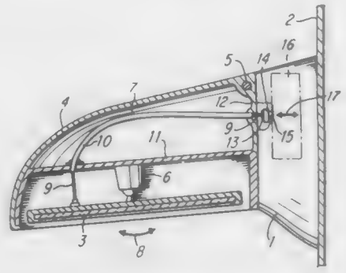
Bernhard Mittelhäuser, Am Krähenberg, 3002 Wedemark 2, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,191

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1988, 3800171

Int. Cl.[5] G02B *5/08, 7/18*

U.S. Cl. 350—604 **6 Claims**



1. In a rearview mirror, especially an external mirror, for a motor vehicle, including an approximately shelllike housing that is pivotably mounted, about an approximately vertical shaft, on a base that is secured to said vehicle, with a mirror body being accommodated in said housing in such a way that it can be adjusted in all directions, and also including adjustment means for the remote adjustment of said mirror body, with said adjustment means being embodied in the manner of Bowden cables and being adapted to be shifted in a longitudinal direction thereof, the improvement wherein:

said adjustment means are respectively provided with a first coupling half that is adapted to be connected in a pull and compression-resistant manner with a second coupling half of a shift-adjustment member that is adapted to effect shifting of said adjustment means, with said first and second coupling halves being part of a coupling connection that is selectively actuatable and releasable as a function of pivoting movement of said housing.

4,993,823

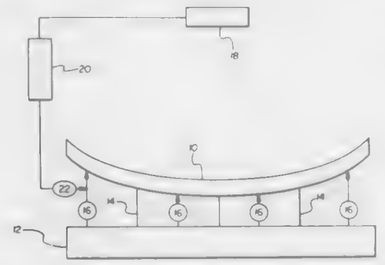
METHOD FOR CORRECTION OF DISTORTIONS OF AN IMAGING DEVICE

William E. Schaffer, Jr., Webster; Donald A. Jacques, Pittsford, and Donald E. Vandenberg, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1989, Ser. No. 374,332

Int. Cl.[5] G02B *7/18*

U.S. Cl. 350—611 **10 Claims**



1. A method for providing corrections of deviations in an optical assembly, which optical assembly comprises:

(1) an imaging device selected from the group consisting of a mirror, a lens and a diffraction grating;

(2) an auxiliary compensator device located in a common optical path with the imaging device and in a conjugate optical position to the imaging device; and

(3) at least one force actuator for acting upon at least one of the imaging device and auxiliary compensator device;

the method comprising the steps of:

a. applying a first force matrix (F_W) by way of the or each force actuator to the compensator device for introducing first deformations that act to cancel out a global imaging device Zernike aberration;

b. forming a non-singular correction matrix CM comprising at least one column vector, wherein a column vector is dedicated to the global imaging device Zernike aberration and includes at least one matrix element that carries information on undesired imaging device aberrations induced by applying the first force matrix (F_W);

c. forming a participation factor (PF) matrix by inverting the correction matrix, for eliminating the undesired aberrations; and

d. generating a product matrix (PF)·(F_W)=(F_W)', for producing a second force matrix (F_W)' for applying by way of the or each force actuator to the compensator device second deformations.

4,993,824

THERMAL MAPPING COMPENSATED MIRROR AND METHOD OF MAKING THE SAME

John Bluege, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1989, Ser. No. 451,695

Int. Cl.[5] G02B *5/10, 7/18, 5/08*

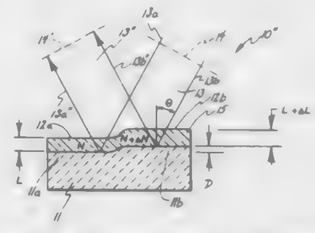
U.S. Cl. 350—641 **4 Claims**

1. A thermal distortion effect compensated mirror comprising

a mirror substrate having a reflective surface and undergoing, during the use of the mirror for reflecting a laser beam, different thermal growths at different zones thereof in proportion to temperature rises thereof as incoming laser beam regions of different intensities reach respective portions of said reflective surface that are juxtaposed with said zones, with attendant different displacements of said reflective surface portions out of their original positions, and with commensurate laser beam wavefront distortion caused by contemporaneous phase shifts between partial wavefronts of laser beam regions reflected from different ones of said reflective surface portions; and

a compensating layer of a material that is substantially transparent to the laser beam and has a refractive index with a predetermined dependence on temperature and a predetermined coefficient of thermal expansion, on said reflective surface,

said compensating layer having an original thickness that is so selected in dependence at least on said thermal expansion coefficient and on said refractive index temperature



dependence that respective times of propagation of the respective associated incoming and reflected laser beam regions through respective zones of said compensating layer that overlie said different reflective surface portions and the temperatures of which depend on the temperatures of the underlying ones of said different zones of said substrate differ from one another during the use of the mirror to such respective extents that said partial wavefront phase shifts are substantially eliminated by the time said partial wavefronts of said respective reflected laser beam regions leave said compensating layer.

4,993,825

DEVICE FOR PHOTOGRAPHING EYE MOVEMENT

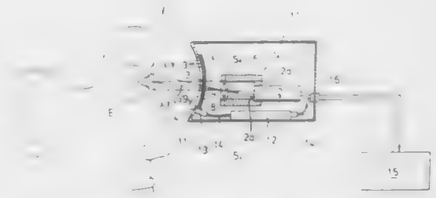
Kuniomi Abe, Kobe, and Tatsuya Kasahara, Amagasaki, both of Japan, assignors to Konan Camera Research Institute Inc., Hyogo, Japan

Filed Nov. 28, 1989, Ser. No. 442,137

Claims priority, application Japan, Nov. 29, 1988, 63-303332

Int. Cl.[5] A61B *3/14*

U.S. Cl. 351—210 **6 Claims**



1. A device for photographing eye movement comprising:

a target group consisting of a plurality of light emitting targets which are arranged vertically and horizontally from a central target positioned on the eye axis of an examinee to form a cross-shaped target, lighting of said light emitting targets of said target group being controlled by a lighting control means;

a TV camera positioned at a predetermined position being said target group such that at least a front aperture of a shooting lens of said TV camera is located at a prescribed position on a line that passes near said central target and going towards the center of said examinee's pupil; and

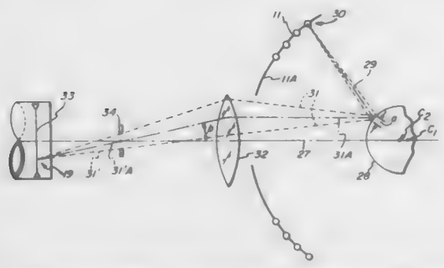
a light receiving element having a light receiving surface located on said line so that said light receiving surface is perpendicular to said eye axis and an eye image is formed on said light receiving surface.

4,993,826

TOPOGRAPHY MEASURING APPARATUS

Paul R. Yoder, Jr., Wilton, Conn., assignor to Taunton Technologies, Inc., Monroe, Conn.

Continuation-in-part of Ser. No. 125,240, Nov. 25, 1987, Pat. No. 4,902,123. This application Apr. 28, 1989, Ser. No. 344,368
Int. Cl.[5] A61B *3/10, 3/00*
U.S. Cl. 351—212 **42 Claims**



1. A contour measuring apparatus to measure the three-dimensional contour of a surface, comprising:

means to direct first light beams onto the surface being measured;

means receiving reflections of the first light beams from said surface for generating electrical output signals corresponding to electro-optically measurable optical images, each of said images corresponding to the location of said first light beams; and

means for determining the location of the center of the surface being measured with respect to an optical axis extending through the contour measuring apparatus, the location determining means comprising:

means for directing a single light beam along the optical axis of said contour measuring apparatus onto the surface being measured so as to reflect to the means for generating electrical output signals;

means for generating a pattern in said means for generating electrical output signals corresponding to the location of the optical axis through the contour measuring apparatus; and

means to compare the location of the center of the surface being measured with the location of the optical axis.

4,993,827

METHOD FOR DETECTING CATARACTOGENESIS

George B. Benedek, Belmont, and Peter C. Magnante, West Brookfield, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 91,834, Sep. 1, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,275
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—221 **4 Claims**

1. A method for in-vivo inspection of ocular tissue at a specific site comprising:

(a) providing a source of substantially monochromatic, coherent, collimated light;

(b) focusing light from the source on a first measurement location of a subject's ocular tissue wherein said first measurement location corresponds to the clearest area of the subject's ocular tissue;

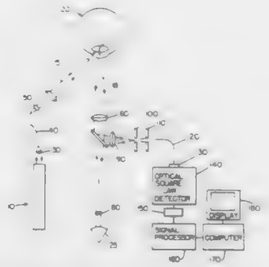
(c) collecting light scattered by the first measurement location;

(d) converting the light scattered by the first measurement location into an electrical signal representative of the intensity of the light scattered by the first measurement location ($I\rho$);

(e) storing the value of $I\rho$ for later reference;

(f) focusing light from the source on a second measurement location of a subject's ocular tissue wherein said second measurement location corresponds to the area of the subject's ocular tissue which is to be examined;

(g) collecting the light scattered by the second measurement location;



(h) converting the light scattered by the second measurement location into an electrical signal representative of the intensity of the light scattered by the second measurement location (I_{tot}); and,

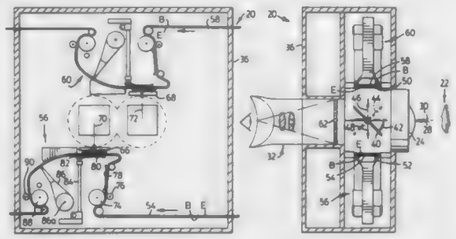
(i) comparing the value of I_{tot} to that of $I\rho$ to determine the degree of cataractogenesis at the second measurement location of the ocular tissue.

4,993,828

CAMERA AND METHOD OF PRODUCING AND DISPLAYING A 3-D MOTION PICTURE

William C. Shaw, Streetsville, and Gordon W. Harris, Oakville, both of Canada, assignors to IMAX Systems Corporation, Toronto, Canada

Filed May 11, 1989, Ser. No. 350,199
Int. Cl.[5] G03B *35/00*
U.S. Cl. 352—59 **9 Claims**



1. A camera for use in producing 3-D motion pictures, comprising:

respective left eye and right eye lenses spaced apart and defining respective substantially parallel optical axes;

in association with each said lens, a mirror positioned at a substantially 45° angle with respect to the optical axis of the lens, for reflecting an image received by the lens through substantially 90°, the two mirrors being positioned at substantially 90° with respect to one another so that images passing through the respective lenses are reflected in opposite directions to respective film exposure apertures;

means for transporting "left eye" and "right eye" films respectively past said apertures for exposure of the films, the films being disposed at said apertures in respective film planes that are substantially parallel to one another and the films being transported past said apertures with the films oriented so that, when the camera is positioned with said lenses in the same horizontal plane, an erect subject is recorded on each film as a series of images that have been turned laterally of the film as a result of being reflected in the relevant said mirror; and,

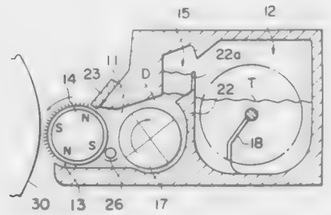
shutter means for controlling exposure of said films to a subject.

4,993,829

DEVELOPING APPARATUS FOR AN IMAGE FORMING APPARATUS

Seiko Naganuma, and Satoshi Haneda, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 23, 1989, Ser. No. 425,751
Claims priority, application Japan, Oct. 24, 1988, 63-269089; Oct. 24, 1988, 63-269090; Oct. 26, 1988, 63-271659
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 **11 Claims**



1. A developing means for a photoelectric copying apparatus wherein a developer having a volume and comprising a toner and a magnetic carrier is used, said developing means comprising:

a toner housing assembly comprising a toner housing containing said toner, and a toner conveyance means within said toner housing for conveying said toner to a developer having an upper surface housing, and

a developer housing assembly comprising

(a) said developer housing for containing said developer,

(b) a rotating developing sleeve having a plurality of magnetic poles therein for supplying said toner to a photoreceptor to develop a latent image formed thereon,

(c) a developer circulation means for mixing and circulating said toner and said magnetic carrier in said developer housing, and

(d) a passageway between said toner housing and said developer housing through which toner can be supplied to said developer housing from said toner housing, said passageway being narrower than the upper surface of said developer housing and shaped so that toner supplied from said toner housing, when the volume of developer in said developer housing is reduced, forms a distinct layer on top of said developer in said developer housing, without mixing, in an area adjacent said passageway.

4,993,830

DEPTH AND DISTANCE MEASURING SYSTEM

Harold M. Jarrett, Jr., Duluth, Ga., assignor to Systronics, Incorporated, Norcross, Ga.

Filed Dec. 18, 1989, Ser. No. 453,402
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—4 **6 Claims**

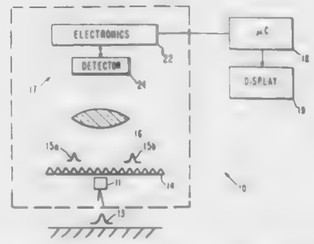
1. Apparatus for determining the relative distance to an object, comprising:

a light source for projecting light at an object whose distance is to be determined;

a lenticular prismatic screen adapted to respond to light reflected from the object and generate two distinct images thereof;

imaging means for focusing the two distinct images generated by the lenticular prismatic screen;

sensor means for detecting the images focused by the imaging means and for providing output signals indicative thereof; and



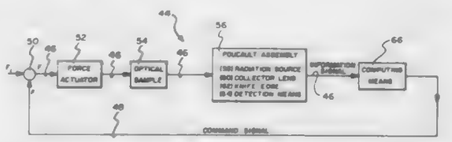
computing means for processing the output signals from the sensor means and determining the separation between the two distinct images generated by the lenticular prismatic screen in response thereto, which separation is indicative of the distance to the object.

4,993,831

CLOSED LOOP FOUCAULT KNIFE-EDGE TEST

Donald E. Vandenberg, Brockport; William D. Humbel, Rochester; Thomas W. Dey, Rochester, and John G. Pitek, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1990, Ser. No. 496,732
Int. Cl.[5] G01B *9/00*
U.S. Cl. 356—124 **4 Claims**



1. A closed loop Foucault method, which method comprises the steps of:

(1) providing an optical assembly along an open loop forward path, the optical assembly comprising:

(a) an optical sample to be tested;

(b) an input source of radiation directed along a reference axis to the optical sample;

(c) a detection means aligned on the source reference axis, for detecting the radiation imaged by the optical sample, and outputting an information signal; and

(d) a knife-edge capable of being positioned in a series of knife-edge position steps, for cutting the radiation imaged by the optical sample under test;

(2) closing a feedback loop around the optical assembly,;

(3) transmitting along the feedback loop a controlled action to the optical sample, the controlled action derived from a step comprising

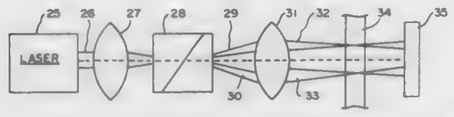
(4) processing in a computing means the information signal by quantitatively comparing the information signal to an ideal knife-edge shadow profile.

4,993,832

METHOD AND APPARATUS FOR DETECTING CONCENTRATION GRADIENTS

Janusz B. Pawliszyn, Waterloo, Canada, assignor to Anthony R. Torres, Salt Lake City, Utah

Filed Nov. 14, 1988, Ser. No. 271,008
Int. Cl.[5] G01N *21/41*
U.S. Cl. 356—128 19 Claims



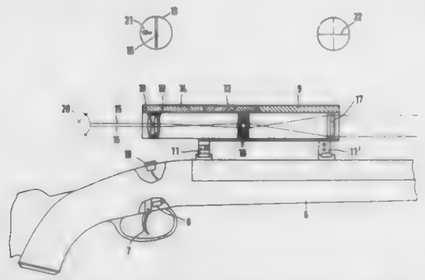
1. A detector for detecting refractive index gradients within a sample, comprising means for generating two closely spaced, parallel probe light beams; means for passing the light beams through the sample so that the light beams are separated along the direction of the expected refractive index gradient; a sensor located in the path of both of the beams after passing through the sample and adapted to measure only complementary portions of each beam when no refractive index gradient is present in the sample so that parallel movement of the beams will change equally the respective complementary portions sensed to maintain a constant output from the sensor, but movement of one beam relative to the other will produce an output proportional to the relative movement.

4,993,833

WEAPON AIMING DEVICE

Otto Lorey, Reichertshausen, and Günter Mauer, Poppenlauer, both of Fed. Rep. of Germany, assignors to Kontron Elektronik GmbH and Friedrich Wilh. Heym GmbH & Co., KG, both of, Fed. Rep. of Germany, a part interest

Filed Oct. 3, 1988, Ser. No. 252,325
Claims priority, application Switzerland, Oct. 9, 1987, 3961/87
Int. Cl.[5] G02B *27/34, 27/36*
U.S. Cl. 356—252 14 Claims



1. A device to assist a person in aiming a weapon whose target can be disposed at changing distances and whose projectile follows a curved trajectory comprising:

(a) an optical system disposed on the weapon for the person to view the target along a beam path;

(b) range finder means for calculating the distance from the weapon to the target;

(c) interchangeable storage means communicating with the range finder means for correlating the distance calculated by the range finder means with ballistic trajectory data stored in the storage means to produce a corresponding signal; and

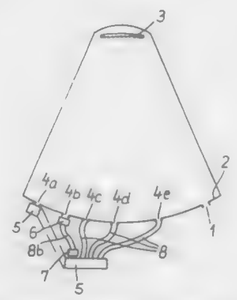
(d) indicator means communicating with the storage means and having a plurality of indicators positioned at a predetermined location so as to be reflected into the beam path, and for one preselected indicator to be actuated by the signal such that the point of aim along the beam path and the point of impact of the projectile are brought into the registration with one another, wherein a predetermined maximum firing range is stored in the storage means, and wherein the preselected indicator lights up continuously in the case of calculated ranges up to the maximum range and blinks when the maximum range is exceeded.

4,993,834

SPECTROMETER FOR THE SIMULTANEOUS MEASUREMENT OF INTENSITY IN VARIOUS SPECTRAL REGIONS

Christoph Carlhoff, Willich; Claus-Jürgen Lorenzen, Essen, and Klaus-Peter Nick, Achim, all of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 25, 1989, Ser. No. 411,820
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1988, 3833602
Int. Cl.[5] G01J *3/28, 3/18*
U.S. Cl. 356—328 11 Claims



1. In a polychromator having an entrance slit and a concave diffraction grating in a Paschen-Rung mounting on a Rowland circle, the improvement comprising:

a row of photodiodes; and

means, including image conductors coupling at least two areas on the Rowland circle and the row of photodiodes, for transmitting respective spectral regions of the at least two areas to the row of photodiodes so that the spectral intensity distribution of the at least two spectral regions is measured by the row of photodiodes, wherein each image conductor coupling an area of the Rowland circle and a photodiode is a cross section converter having on its one end a cross section equal to an acceptance cross section of the photodiode and on an opposite end a height equal to the spectral region at the area on the Rowland circle.

4,993,835

APPARATUS FOR DETECTING THREE-DIMENSIONAL CONFIGURATION OF OBJECT EMPLOYING OPTICAL CUTTING METHOD

Yasuo Inoue, and Tadashi Nishimura, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 23, 1989, Ser. No. 424,979
Claims priority, application Japan, Jun. 16, 1989, 1-152187
Int. Cl.[5] G01B *11/24;* G01N *21/86*
U.S. Cl. 356—376 6 Claims

1. An apparatus for detecting the three-dimensional configuration of an object employing an optical cutting method comprising:

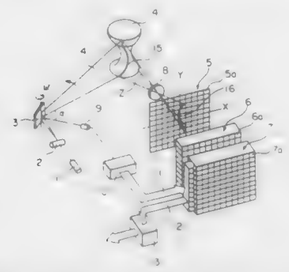
light projecting means for pulse-flashing slit-shaped light and for causing said light to scan said object at a predetermined speed;

an image sensor disposed in opposition to said object and having a plurality of pixels;

an optical system for forming on said image sensor an image of an optical cutting line formed on the surface of said object by said slit-shaped light;

difference detecting means which detects the difference between on- and off- levels of each pulse of the image of the optical cutting line that has been detected by said pixels of said image sensor;

time calculating means for calculating the time at which the image of the optical cutting line has passed each of said pixels of said image sensor, on the basis of the difference



between the levels of each of said pulses of the image of the optical cutting line that has been detected by said difference detecting means with respect to each of said pixels; and

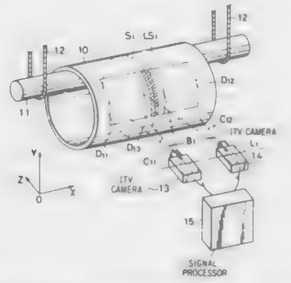
configuration calculating means for calculating the three-dimensional configuration of said object on the basis of the time of passage of the image of the optical cutting line through each of said pixels, said time having been calculated by said time calculating means, and on the basis of the scanning speed of said slit-shaped light.

4,993,836

METHOD AND APPARATUS FOR MEASURING FORM OF THREE-DIMENSIONAL OBJECTS

Nakatomo Furuhashi; Yuichi Ono, both of Tsukuba; Hiroaki Moritani, Fuchu, and Hiroshi Kobayashi, Muroran, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan and Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 17, 1989, Ser. No. 324,803
Claims priority, application Japan, Mar. 22, 1988, 63-65737
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 5 Claims



1. An object form measuring method comprising the steps of:

using at least two imaging means to obtain a picture image including a partial overlap of image areas of the respective imaging means at a surface of a measurement object having a form to be measured;

obtaining a continuous, sequential multiplicity of picture images of the measurement object from different angular positions about substantially an entire periphery of the measurement object, wherein either one of the measurement object or the imaging means is moved relative to the other to provide a partial overlap between a preceding picture image and a subsequent picture image of the measurement object;

detecting a multiplicity of local forms of the measurement object and a connective relationship between each of the multiplicity of local forms from the picture images obtained, wherein the connective relationship includes a connective position and a connective angle obtained between a local cross-sectional form segment of the measurement object generated from preceding and subsequent picture images of the measurement object; and

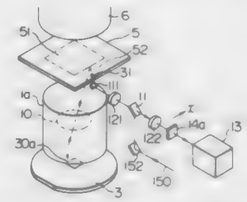
using the multiplicity of local forms and the associated connective relationships to synthesize a stereo image form of the measurement object.

4,993,837

METHOD AND APPARATUS FOR PATTERN DETECTION

Yoshitada Oshida, Fujisawa; Yasuhiro Yoshitake, Yokohama; Naoto Nakashima, Shiga, and Masataka Shiba, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,962
Claims priority, application Japan, Jan. 25, 1988, 63-12505
Int. Cl.[5] G01B *11/00;* G01N *21/86*
U.S. Cl. 356—401 35 Claims



1. A method of pattern detection comprising the steps of:

illuminating an uneven pattern to be detected formed on an object with light having a high directivity from a laser source;

forming an optical image of the pattern from light reflected from the pattern with an imaging optical element having a predetermined modulation transfer function defining a specific spatial cut-off frequency, wherein the optical image contains oscillatory noise caused by the spatial cut-off frequency of the imaging optical element;

optically reducing the oscillatory noise in the optical image; and

photoelectrically converting the optical image having reduced oscillatory noise to a pattern detection signal having a waveform which accurately represents the pattern to be detected as a result of the optical reduction of the oscillatory noise in the optical image.

4,993,838

DUST MONITOR

Stewart W. Tresouthick, Arlington Heights, and Hugh Love, Green Oaks, both of Ill., assignors to Construction Technology Laboratories, Inc., Skokie, Ill.

Filed Jun. 17, 1988, Ser. No. 208,383
Int. Cl.[5] G01N *21/59*
U.S. Cl. 356—439 18 Claims

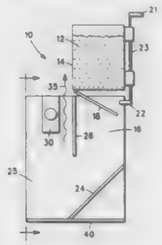
1. An apparatus for generating a dust suspension of powder material and for measuring dustiness characteristics of said powder material dust suspension, comprising:

means for supplying a material including at least said powder material;

container means for receiving said material movable from said means for supplying, said container means including an inclined ramp surface for achieving a pre-selected

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motion for said material moved from said means for supplying into said container means and said container means further including a downstream opening allowing said moving material to pass out of said container means; and



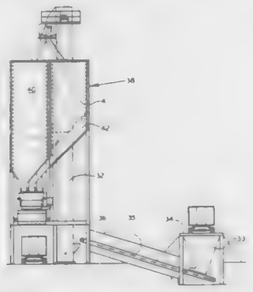
means coupled to said container means for measuring said dustiness characteristics of said powder material.

4,993,839

METHOD AND APPARATUS FOR PRODUCING ASPHALTIC MIX

J. Donald Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Mar. 20, 1989, Ser. No. 325,783
Int. Cl.[5] B01F *3/20*
U.S. Cl. 366—7 **10 Claims**



1. A method of producing asphaltic mix suitable for use in forming or resurfacing a roadway, and comprising the steps of:

heating and substantially drying a quantity of stone aggregate at a primary plant location,

mixing the heated and dried aggregate with a relatively small quantity of heated liquid asphalt at the primary plant location to form a pre-mixed hot product,

transporting the pre-mixed hot product to a satellite plant location, then

mixing the pre-mixed product while still hot with a further quantity of hot lqiuid asphalt at the satellite plant location, to form a hot asphaltic mix suitable for use in forming or resurfacing a roadway.

4,993,840

COOKING MACHINE

Yoshinari Maeda, and Tokio Akai, both of Kasai, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 142,680, Jan. 11, 1988, Pat. No. 4,913,555.
This application Nov. 14, 1989, Ser. No. 436,415
Claims priority, application Japan, Jan. 14, 1987, 62-6557; Sep. 1, 1987, 1-218594
Int. Cl.[5] B01F *7/26*
U.S. Cl. 366—205 **6 Claims**

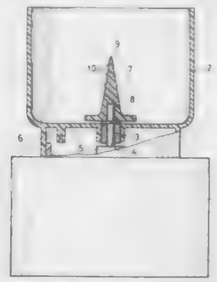
1. A method for whipping a product, comprising: providing a container, a rotatable member within the container, and an indicator rod which extends from the rotatable member to terminate at an upper end, the upper end of the indicator rod being at a predetermined level within the container;

filling the container with a product at least to the predetermined level and thereby at least to an elevation of the upper end of the indicator rod;

commencing rotation of the rotatable member to agitate and whip the product and thereby cause the upper end of the indicator rod to be uncovered by the product;

continuing rotation of the rotatable member to continue to agitate and whip the product in the container to cause a central portion of the product to rise upward along the indicator rod until the upper end of the indicator rod becomes completely covered by the product; and

observing the upper end of the indicator rod during the step of continued rotation to ascertain when a predetermined



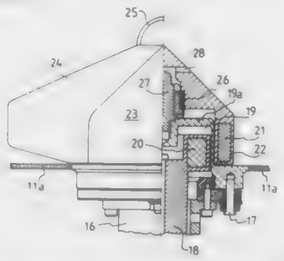
degree of whipping has taken place at which the volume of the product has increased by at least 60 percent, the upper end of the indicator rod becoming covered by the product as soon as the volume of the product has increased by at least 60 percent so as to thereby signify attainment of the predetermined degree of whipping.

4,993,841

MAGNETIC IMPELLER MEANS FOR A MIXING VESSEL

Peter Löfgren, Hovås, and Nils Arthun, Partille, both of Sweden, assignors to Steridose Systems AB, Askim, Sweden

Filed Feb. 5, 1987, Ser. No. 11,321
Int. Cl.[5] B01F *13/08*
U.S. Cl. 366—274 **5 Claims**



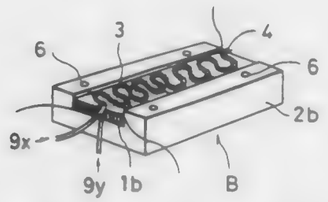
1. A mixing vessel for sterile fluids, having a closed recess forming an integral part of the bottom wall of said vessel by having a recess wall projecting internally from said bottom wall and terminating at an inner end, comprising: a rotatable drive unit mounted externally of said vessel and having magnetic means for establishing a magnetic force coupling with an impeller having a hub with inner and outer surfaces inside said vessel, said magnetic means reaching into said recess, and bearing means at the inner end of said recess supporting the hub of said impeller with a certain radial play to the wall of said recess coaxially with said magnetic coupling means in a rotatable manner through the action of said magnetic coupling, said hub being cup-shaped and having substantially radially extending borings forming passageways between inner and outer hub surfaces.

4,993,842

CALORIMETRIC DETECTION UNIT AND CALORIMETRIC MEMBER FOR CONDUCTION FLOW TYPE CALORIMETER

Satoshi Morimoto, Ushiku; Yoshio Tanaka, Tsukuba, and Shojiro Ito, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,364
Claims priority, application Japan, Jul. 15, 1988, 63-177732
Int. Cl.[5] G01K *17/06*
U.S. Cl. 374—39 **2 Claims**



1. A calorimetric detection unit for conduction flow type calorimeter, comprising:

sample pipe means;

a plurality of calorimetric detection elements each comprising two members;

said two members each comprising an inner heat sink having one set of thermopiles supported on an inner side thereof, and an outer heat sink of a shape substantially semicircular in lateral cross section and having a recess for accommodating therein said inner heat sink;

said two members being assembled into a calorimetric detection element by facing two sets of thermopiles opposite to each other across a given space and having said sample pipe means passed therethrough and enclosing two inner heat sinks by two outer heat sinks;

a plurality of insulating members each interposed a preselected distance between adjacent ones of said plurality of calorimetric detection elements for insulating and spacing adjacent calorimetric detection elements from each other such that said sample pipe means passes through each of said insulating members; and

an electric resistance heating wire wound around said sample pipe means and wherein said sample pipe means is laid in a zigzagged pattern;

whereby individual or total calories of said plurality of calorimetric detection elements are measured.

4,993,843

METHOD AND DEVICE FOR DETECTING THE TEMPERATURE TO WHICH A SOLID, A LIQUID OR A GAS MAY HAVE BEEN SUBJECTED

Joseph Toupin, Sable sur Sarthe, and Xavier Douesnel, 10-16, rue Pierre Guérin, 75016 Paris, both of France, assignors to Xavier Douesnel, France

PCT No. PCT/FR87/00162, § 371 Date Mar. 21, 1988, § 102(e) Date Mar. 21, 1988, PCT Pub. No. WO87/07373, PCT Pub. Date Dec. 3, 1987
PCT Filed May 19, 1987, Ser. No. 162,314
Claims priority, application France, May 20, 1986, 86 07590
Int. Cl.[5] G01K *11/06*
U.S. Cl. 374—160 **11 Claims**

1. A device for detecting a rise in the temperature of an object or material comprising:

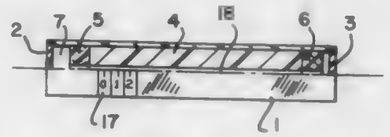
a tube that is at least partially transparent;

a movable piece mounted for movement within the tube;

means for indicating the position of the movable piece with respect to the tube;

a meltable material disposed within the tube and comprising means for immobilizing the movable piece in an initial position; and

magnetic means for selectively subjecting the movable piece to a first force urging the movable piece toward the initial position and a second force urging the movable piece toward a final position, the movable piece being so mounted that melting of the meltable material permits the movable piece to respond to the magnetic means and



move toward the final position, the magnetic means comprising at least:

a first magnetic element;

removable mounting means for removably mounting the first magnetic element on at least a first end of the tube; and

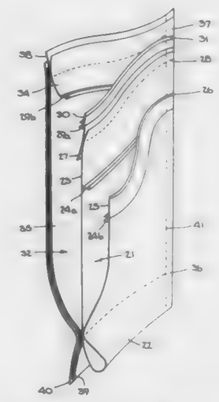
a second magnetic element disposed at a first end of the movable piece and being adapted to interact magnetically with the first magnetic element.

4,993,844

COMPARTMENTED DOUBLE ZIPPER POUCH

John P. Robinson, Clifton; William R. Stadick, North Brunswick; Thomas L. Clawges, Spotswood, and Thomas P. Minogue, Clifton, all of N.J., assignors to LPS Industries, Inc., Newark, N.J.

Filed Nov. 30, 1989, Ser. No. 443,480
Int. Cl.[5] B65D *30/22*
U.S. Cl. 383—38 **6 Claims**



1. A resealable pouch comprising first and second pockets adjacent one another and being formed with a common wall portion, each said first and second pocket having an opening for receiving selected contents, the openings being displaced relative to one another;

pressure actuated resealable fasteners disposed adjacent the openings in each of said first and second pockets; and

a first indicator disposed adjacent the opening in said first pocket and a second indicator disposed adjacent the opening in said second pocket, said first and second indicators providing an indication of the location of their associated openings.

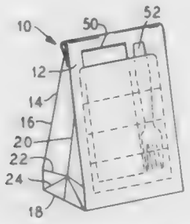
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4,993,845

COUPON POCKET BAG

Mark Faltynek, 3424 W. 82nd St., Chicago, Ill. 60652

Filed Jan. 12, 1990, Ser. No. 464,373
Int. Cl.[5] B65D *30/22*
U.S. Cl. 383—40 2 Claims



1. A paper bag for use at retail locations of the multi-ply-type with there being an inner ply and an outer ply which form a front panel, a back panel, a pair of side panels each joined to said front panel and said back panel, a bottom panel joined to each of the front, back and side panels, and an open top providing for access to the interior of the bag, and a primary compartment therein wherein:

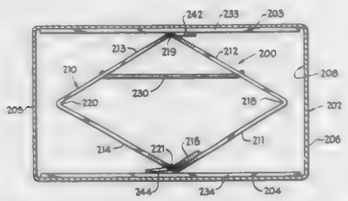
the improvement comprises only the outer ply of the front panel being die cut along the first top edge which is spaced from and substantially parallel to the open top of the bag and perforated along second, third and fourth edges and the plies glued together along peripheral sections of the front panel so as to: (a) form a secondary pocket between the inner and outer plies; (b) permit insertion of relatively bulky items into the secondary pocket through the die cut top edge; (c) separate items in the secondary pocket from items in the primary compartment; and (d) form a coupon-like section in the outer ply of the front panel and secondary pocket, which is removable therefrom along the perforations.

4,993,846

SOFT BAG AND EXPANDER

Sidney Diamond, 3800 N. Lake Shore Dr., Apt. 11-B, Chicago, Ill. 60613, and Deborah L. Diamond, Northbrook, Ill., assignors to Sidney Diamond, Niles, Ill.

Continuation-in-part of Ser. No. 383,863, Jul. 21, 1989, which is a continuation-in-part of Ser. No. 367,759, Jun. 19, 1989, Pat. No. 4,946,292. This application May 15, 1990, Ser. No. 523,734
Int. Cl.[5] A45C *7/00*
U.S. Cl. 383—127 20 Claims



1. A bag expanding device in combination with a soft bag comprising:

a pair of opposed portions partially forming the bag;

means connecting the portions and, together with the portions, defining a compartment expandable to a predetermined shape;

one or more of the means and the portions being soft and flexible so that the compartment may be readily collapsed into a substantially flattened state or expanded into a substantially stuffed state in which the portions are spaced apart from each other to substantially the full extent permitted by the predetermined shape of the expanded compartment;

the expanding device including an expandable piece having at least four sections;

each of the sections of the expandable piece being foldably attached to each of two adjacent ones of the sections for articulation relative to each other;

two or more adjacent ones of the sections forming a first set of sections;

two or more adjacent ones of the sections, not forming the first set of sections, forming a second set of sections;

the expandable piece being articulatable between an initial collapsed position in which the two or more adjacent ones of the sections forming the first set of sections are in a substantially flat coplanar position and at least partially overlap the two or more adjacent ones of the sections forming the second set of sections which are also in a substantially flat coplanar position and a fully expanded position in which sections of the first set are in a substantially parallel relation to each other and sections of the second set are in a substantially parallel relation to each other;

the expanding device further including a member attached to at least one of the sections;

the expandable piece being inserted into the compartment in the initial collapsed position between the opposed portions; and

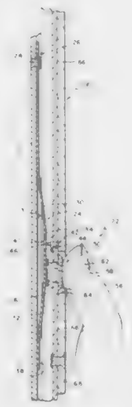
tension on the member urging each set of two or more adjacent ones of the sections from its respective, substantially flat coplanar position to an intermediate position in which the sections of each set are at an angle to each other and are restrained by the predetermined shape of the expanded compartment.

4,993,847

SLIDE RELEASE MECHANISM

James D. Hobbs, Plainfield, Ind., assignor to General Devices Co., Inc., Indianapolis, Ind.

Filed Aug. 7, 1989, Ser. No. 389,958
Int. Cl.[5] F16C *29/04;* A47B *88/00*
U.S. Cl. 384—21 26 Claims



1. A slide track assembly comprising

first and second slide tracks,

means for coupling the second slide track to the first slide track for sliding movement thereon,

means for blocking relative movement of the first and second side tracks to establish a locked connection therebetween, the blocking means including a first movable member mounted on the first slide track, and

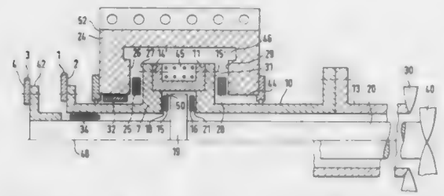
means for selectively unlocking the blocking means to bread the locked connection between the first and second slide tracks to permit relative movement therebetween, the unlocking means including a second movable member mounted on the second slide track.

4,993,848

THRUST BEARING SYSTEM FOR COUNTER-ROTATING PROPELLER SHAFTS, PARTICULARLY SHIPS PROPELLER SHAFTS

Erich John, Augsburg, and Wilhelm Schaefer, Witten, both of Fed. Rep. of Germany, assignors to Renk Tack GmbH, Fed. Rep. of Germany

Filed Jan. 25, 1990, Ser. No. 470,887
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904719
Int. Cl.[5] F16C *3/00;* B63H *23/00;* B64C *11/48;* B64D *35/06*
U.S. Cl. 384—97 4 Claims



1. A thrust bearing system for counter-rotating coaxial, inner and hollow outer shafts, comprising:

a stationary bearing housing having an axially oriented opening for passage of the inner and outer shafts therethrough, the bearing housing having in its interior first and second axially opposed, spaced apart, ring-shaped friction bearing surfaces therein;

a radially expanded, collar-like shaft section integral with the hollow outer shaft, which collar-like shaft section extends radially between the first and second friction bearing surfaces of the bearing housing;

first and second outer friction bearing surfaces on the collar-like shaft section of the hollow outer shaft, each of which is axially opposite and spaced apart from one of the first and second friction bearing surfaces of the bearing housing;

a plurality of outer friction bearing elements positioned between the first and second friction bearing surfaces of the bearing housing and the opposite first and second outer friction bearing surfaces of the collar-like shaft section of the hollow outer shaft;

the bearing housing being divided in an axial plane into at least two detachably connected parts, whereby upon the radial removal of one of the parts of the bearing housing, the collar-like shaft section of the hollow outer shaft and the outer friction bearing elements and the first and second friction bearing surfaces of the bearing housing and the opposite first and second outer friction bearing surfaces of the collar-like shaft section are made accessible;

the collar-like shaft section of the hollow outer shaft further having a groove in its inner periphery, the groove forming opposed and spaced apart first and second inner friction bearing surfaces;

a collar on the inner shaft protruding radially into the groove of the collar-like shaft section of the hollow outer shaft, the collar having first and second annular friction bearing surfaces positioned axially opposed to and spaced apart from the first and second inner friction bearing surfaces of the collar-like shaft section;

a plurality of inner friction bearing elements disposed between the first and second annular friction bearing surfaces of the collar of the inner shaft and the first and second inner friction bearing surfaces of the collar-like shaft section;

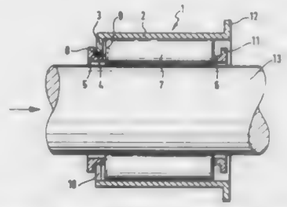
the collar-like shaft section also being divided in an axial plane into at least two detachably connected parts whereby, upon radial removal of one of the parts, the inner friction bearing elements and the first and second annular friction bearing surfaces of the collar of the inner shaft and the first and second inner friction bearing surfaces of the collar-like shaft section are made accessible.

4,993,849

RADIAL ROLLING BEARING

Norbert Radinger, Nuremberg, and Wolfgang Steinberger, Herzogenaurach, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jan. 18, 1990, Ser. No. 467,041
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 3902194
Int. Cl.[5] F16C *19/26*
U.S. Cl. 384—447 8 Claims



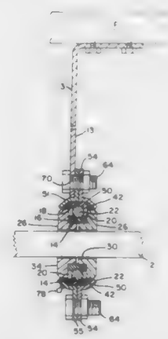
1. A radial rolling bearing with an outer race ring having at least one radial flange which engages in a peripheral groove of a cage in which rolling elements arranged in pockets are lodged, characterized in that the radial flange delimits an opening through which the cage, radially offset with regard to the bearing axis, can be inserted axially into the race ring by parallel displacement.

4,993,850

DISC HARROW SUPPORT ASSEMBLY

Clovis J. Howse, Laurel, Miss., assignor to Howse Implement Company, Inc., Laurel, Miss.

Filed Feb. 13, 1990, Ser. No. 479,537
Int. Cl.[5] F16C *33/72, 13/00*
U.S. Cl. 384—477 7 Claims



1. A device for forming a sealed-in, regreasable housing for a standard ball bearing and for mounting a square axle shaft of a disc harrow to a frame standard thereto comprising:

an annular bushing means having a central opening to receive an axle and having an annular periphery;

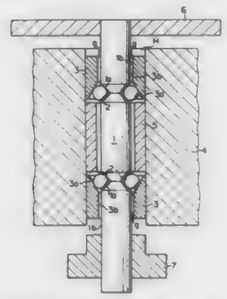
first and second spaced ridges forming said periphery and defining an annular channel therebetween;

an annular ball assembly having an inner raceway, an outer raceway, and a plurality of intermediate ball bearings

VOL 1123 ISS 3 FE 19 1991 UMI

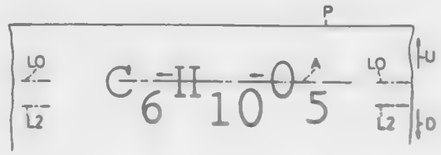
received in said channel and having an outer diameter such that an outer raceway extends at least partially beyond said periphery;
first and second edges, respectively, terminating said ridges;
a first annular groove in said first edge;
a second annular groove in said second edge;
first and second O-rings respectively located in said first and second grooves and said O-rings having a dimension so that a sealing surface extends beyond said grooves;
an annular flange means having an outer surface and an inner surface and said inner surface contacting said sealing surfaces of said O-rings and forming a housing for said ball bearing assembly;
a mounting rim extending radially outwardly from said outer surface in a plane substantially perpendicular to said axle; and
means to mount said rim to a frame standard.

4,993,851
ROTARY STRUCTURE
Tsutomu Nakanishi, Kunitachi, Japan, assignor to C.S.U. Ltd., Tokyo, Japan
Continuation of Ser. No. 7,639, Jan. 27, 1987, abandoned. This application Jun. 26, 1990, Ser. No. 544,038
Claims priority, application Japan, Jan. 29, 1986, 61-12332[U]
Int. Cl.[5] F16C *19/18*
U.S. Cl. 384—512 **14 Claims**



1. A rotary structure for a VTR or floppy disc drive comprising a cylindrical shaft having an outer surfaceprovided with a substantially annular V-shaped groove therein, a plurality of balls seated in said groove and projecting beyond an outer surface of the shaft, an outer race surrounding the outer surface and having an inner tapered surface in contact with said balls for holding said balls in said groove with a predetermined pressure, a bearing housing surrounding said shaft and having an inner peripheral surface to which said outer race is fixed, said shaft having a second annular V-shaped groove axially spaced from the first said V-shaped groove and a plurality of further balls in said second groove, a second outer race surrounding the outer surface of the shaft and having an inner tapered surface in contact with the balls in the second groove for holding said balls therein under pressure, said second race being fixed to said inner surface of said housing, said tapered surfaces being part spherical concave surfaces which widen towards one another.

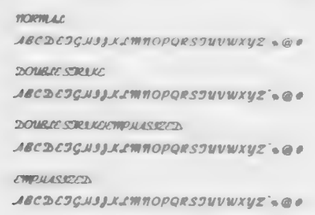
4,993,852
PRINT HEAD CONTROL FOR SUBSCRIPT AND SUPERSCRIPT CORRECTION
Naohisa Kaneko, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Continuation of Ser. No. 179,058, Apr. 8, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 442,491
Claims priority, application Japan, Apr. 9, 1987, 62-88245
Int. Cl.[5] B41J *29/36*
U.S. Cl. 400—63 **12 Claims**



1. A text processing system having erasing capabilities and for printing regular characters intermixed with subscripts and superscripts, said system comprising:
a print head for printing characters on a print sheet in response to character data;
print head driving means for reciprocating said print head along a print line on the print sheet;
line feed means for feeding the print sheet in directions perpendicular to the print line in response to shift data for printing and erasing one of a subscript or superscript;
first input means for inputting said character data;
second input means for inputting said shift data for operating said line feed means to print characters on a line shifted from a standard print line;
third input means for generating a print head reciprocating signal to energize said print head driving means;
first memory means for storing said character data and said shift data for each character to be printed;
character correction means operated in response to operation of a correction key to erase a character which has been erroneously printed;
control means responsive to said character correction means for (1) controlling said print head drive means in response to said print head reciprocating signal such that said print head is driven by said print head driving means to be reciprocally moved to any desired inputted character position on said standard print line character position by character position just along the standard print line even when said shift data has been stored in said first memory means and (2) for controlling said line feed means to respond to shift data.

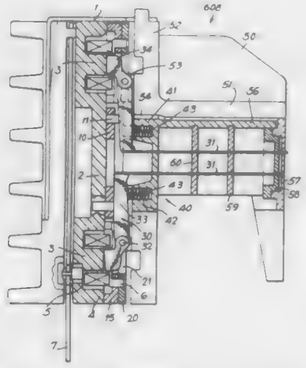
4,993,853
MATRIX CHARACTER MODIFICATION INFORMATION UNIQUE TO A GIVEN FONT
John K. Brown, III; Joseph P. Kolb; Lynn M. Olivers; Mark A. Robb, and Stephen R. Troyer, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 11, 1989, Ser. No. 392,675
Int. Cl.[5] B41J *2/485*
U.S. Cl. 400—121 **5 Claims**

1. Imaging apparatus comprising means for forming images of characters in response to a bit image pattern, means for storing bit image patterns of a font of characters, bit image processing means for modifying bit image patterns of characters by shifting original bit images and determining a bit image pattern of the combination of said original image and said shifted image for imaging by said means for forming images,



and means for storing coded information unique to said font defining said shifting for said font.

4,993,854
WIRE DOT PRINT HEAD
Takumi Sato, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Dec. 13, 1989, Ser. No. 450,094
Claims priority, application Japan, Dec. 19, 1988, 63-320221; Jan. 10, 1989, 1-3213; Feb. 1, 1989, 1-32016
Int. Cl.[5] B41J *2/27, 2/235*
U.S. Cl. 400—124 **18 Claims**



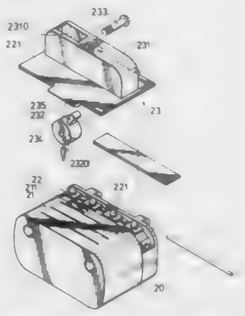
1. A wire dot printer including a wire dot print head comprising a core block having a print lever oscillation regulating projection formed at a central portion of said core block and a plurality of magnetic poles formed at regular spaced intervals about said print lever oscillation regulating projection, a plurality of print levers each having an arm member, a print wire supported at one end of said arm member and an armature formed at a second end of said arm member, a nose block having a nose for guiding said print wire and a disk member disposed opposite said core block, a disk shaped yoke, disposed on said core block, having at least one positioning slit for positioning the print lever therein and said print lever having said armature projecting from said arm member toward said core block being movably disposed between said core block and said disk member.

4,993,855
PRINTING HEAD FOR A NEEDLE PRINTER
Manfred Adamek, Kirchen-Freusburg, and Heinz-Gerhard Schock, Bad Endbach, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 14, 1989, Ser. No. 407,382
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 3832670
Int. Cl.[5] B41J *2/235*
U.S. Cl. 400—124 **13 Claims**



1. A printing head for a needle printer comprising:
a plurality of print needles a print head having a print end and a bore in communication with the end, said bore having an axis and a conical egress formed at the end of said bore and about said axis, said plurality of print needles extending through said bore and said conical egress;
a switching head including guide means for receiving and securing said plurality to print needles to the switching head said plurality of print needles extending along said axis, sandwiching head including a base member for receiving said needles therethrough and an inner conical member extending from the base member and mating with and seated in said conical egress for rotation relative to said conical egress such that the switching head is rotatable about said axis within said bore relative to said print head to thereby rotate said needle array about said axis between first and second positions.

4,993,856
PAPER CUTTING DEVICE FOR A PRINTER
Wei-Te Chung, 1212 W. McKinley Ave., #9, Sunnyvale, Calif. 94086
Filed Nov. 1, 1989, Ser. No. 430,003
Int. Cl.[5] B41J *11/68*
U.S. Cl. 400—621.1 **1 Claim**



1. A printer including a tractor unit which consists of two paper feed devices disposed on two sides of said printer, said tractor unit being capable of advancing a computer form paper on said printer, which has two weakened lines forming two paper feed strips at two sides of said paper, each of said strips having a row of paper feed holes formed therein, each of said

paper feed devices including a base with a paper running surface, an endless circulating belt mounted circulatingly on said base and having a plurality of equidistant teeth provided on an outer surface of said circulating belt, a paper feed cover having a pivot side connected pivotally to said base, said circulating belt having an inner side adjacent to said paper running surface, and an outer side adjacent to said pivot side of said paper feed cover, said paper feed cover extending over said paper running surface and said circulating belt so as to engage with upper ends of some of said teeth, each of said paper feed devices being equipped with a paper cutting device, each of said paper cutting devices including a slot formed in said paper running surface in alignment with said weakened line of said computer form paper, and a cutting blade mounted on said paper feed cover and extending into said slot of said paper running surface, characterized in that each of said paper feed covers includes a casing fixed thereon, a cylinder mounted within said casing and rotatable about a horizontal axis, a cavity formed in a circumferential surface of said cylinder, and an actuatable push lever secured to said cylinder, said cutting blades being inserted tightly into said cavity of said cylinder, said cutting blade being capable of being moved into said slot of said paper running surface or said casing of said paper feed cover by rotating said push lever, whereby, when said computer form paper is carried by said circulating belts to pass over said paper running surfaces, said cutting blades cut said paper feed strips from remaining portions of said computer form paper.

4,993,857

COSMETIC CONTAINER

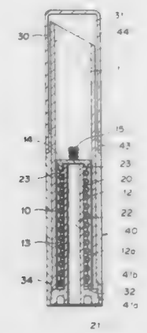
Atsushi Ohba, Tokyo, Japan, assignor to Suzuno Kasei Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 496,843

Claims priority, application Japan, Mar. 29, 1989, 1-36075[U]; Aug. 9, 1989, 1-93524[U]

Int. Cl.[5] A45D *40/06*

U.S. Cl. 401—75 24 Claims



1. A cosmetic container for a cosmetic material comprising a helical body having a top end portion on which said cosmetic material is disposed, a hollow guide cylinder means in which said helical body is disposed, said helical body comprising a plurality of helical rings separated by said helical groove, a rotary rod coaxially disposed within said helical body, said rotary rod being rotatable relative to said guide cylinder, said rotary rod having slider means engaging said helical groove such that rotation of said rotary rod effects axial displacement of said helical body relative to said rotary rod.

4,993,858

APPLICATOR DEVICE FOR COSMETIC USES

Gerhard Möck, Kirchehrenbach, Fed. Rep. of Germany, assignor to Messrs. Schwan-Stabilo Schwanhausser GmbH & Co, Nuremberg, Fed. Rep. of Germany

Filed Jul. 5, 1990, Ser. No. 548,014

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012198

Int. Cl.[5] A45D *40/00, 40/20*

U.S. Cl. 401—34 11 Claims



11. An applicator device for cosmetic use comprising: an elongate casing having a first end and a second end and including a tubular element of an axial lengthwise extent substantially of between 20 and 60 mm and an outside diameter substantially of between 3 and 8 mm, the tubular element providing a space inside same; a stick for cosmetic material of an axial lengthwise dimension substantially of between 5 and 20 mm and of a diameter substantially between 2 and 5 mm, which is axially definedly received and mechanically firmly held in the tubular element of the casing at a first end thereof and which provides an application portion projecting out of said first end of the casing; a respective abutment means in the casing at a spacing from each of the first and second ends thereof, each abutment means reducing the internal cross-section of the space in the tubular element to define the position of the stick in the casing in the axial direction thereof and each abutment means delineating a respective end portion of said space in respect of the axial extent thereof, the two end portions of said space within said tubular element being of at least substantially the same configuration, and at a spacing from each said stick abutment means in the axial direction of the casing at least one respective stick retaining means which reduces the internal cross-section of the space in the tubular element for holding the stick in the casing, the stick abutment means and the stick retaining means being integrally formed on the tubular element.

4,993,859

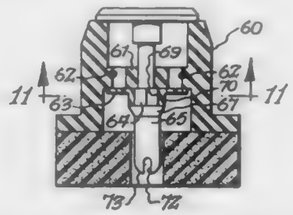
LIQUID APPLICATOR VALVE STRUCTURE

David A. Assad, West Falls; Larry R. Hironimus, Marion, and David Meyer, Kenmore, all of N.Y., assignors to Truly Magic Products, Inc., Buffalo, N.Y.

Continuation of Ser. No. 356,751, May 24, 1989, abandoned. This application Jun. 19, 1990, Ser. No. 540,455

Int. Cl.[5] A47L *13/17, 23/05*

U.S. Cl. 401—206 13 Claims



1. A liquid applicator comprising a molded valve body, a duct having first and second ends in said valve body, an internal surface in said molded valve body defining said duct, a resilient web in said duct, said resilient web extending inwardly from said internal surface and formed integrally with said molded valve body, a first aperture in said resilient web, a valve seat on said valve body at said first end of said duct, a valve member including a valve pin and a valve head on said valve pin, said valve pin being a separate member from said web, a portion of reduced diameter on said valve pin extending through said first aperture, a shoulder on said valve pin proximate said portion of reduced diameter for effectively bearing on the opposite side of said resilient web from said valve seat at the border of said first aperture for biasing said valve head onto said valve seat to prevent liquid from flowing past said valve seat into said duct, at least one permanently open second aperture in said resilient web spaced from said first aperture, a base on said valve body proximate said second end of said duct, a tip on said valve pin proximate said base, and a coating member on said base for receiving liquid from said duct when said tip of said valve pin is deflected by the application of an external force to said coating member to cause said valve head to be unseated form said seat against the bias of said resilient web.

4,993,860

APPLYING DEVICE

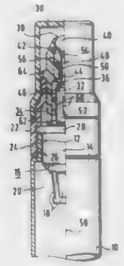
Lothar Sommer, Kurlandstrasse 24, 8500 Nuremberg, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 49,777

Claims priority, application Fed. Rep. of Germany, May 13, 1986, 3616116

Int. Cl.[5] B43K *7/10;* A45D *34/04*

U.S. Cl. 401—214 11 Claims



1. An applying device comprising a reservoir for a liquid medium, having a filling opening through which said reservoir may be filled with the liquid medium and provided with an applying element having an outlet opening connected to the interior of the reservoir through a central hollow space, a ball located in the outlet opening and moveable from a closed position wherein said ball partially extends beyond the outlet opening, and spring means within the central space of the applying element exerting a pressure to the ball urging the ball to a closed position against the outlet opening for a closure thereof and for preventing the discharge of said liquid medium, characterized in that in said central hollow space of the applying element a resilient central body functioning as said spring means is located which defines a capillary space for the liquid medium in the reservoir between the central body and the outer limit of the hollow space, said spring means being yieldable upon the application of a force to said ball for permitting said ball to move from said closed position to an open position spaced from said outlet opening for flow of liquid through said capillary space and said outlet opening for application thereof.

4,993,861

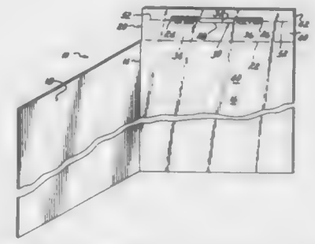
FILE FOLDER AND METHOD OF MANUFACTURE

Murray B. Blumberg, Woodmead Springs Sandton, South Africa, and William M. Hoffman, Hamilton, Ohio, assignors to Technokantoor, Ltd., Brussels, Belgium

Filed Nov. 8, 1989, Ser. No. 433,592

Int. Cl.[5] B42F *13/06, 13/08*

U.S. Cl. 402—8 8 Claims



1. In combination, a folder and a fastener for securing loose papers to the folder,

said folder having a major flap along one edge of said folder, said folder and said major flap both having an inside surface and an outside surface,

a pair of spaced, colinearly aligned, elongated minor flaps formed in one of said folder and said major flap, said minor flaps being separated by a medial portion of said one of said folder and said major flap,

said fastener comprising a central body portion and a pair of opposed, elongated prongs extending from opposite ends of the central body portion, said fastener terminating at the ends of said prongs,

said central body portion of said fastener overlying said medial portion of said one of said folder and said major flap on one surface of said one of said folder and said major flap, said prongs of said fastener overlying said minor flaps on the other surface from said one surface of said one of said folder and said major flap,

said central body portion of said fastener being sandwiched and secured between said folder and said major flap with said prongs of said fastener overlying said spaced, colinearly aligned, elongated minor flaps,

whereby said prongs may be bent upwardly from the inside surface of said folder for securement or removal of loose papers relative thereto and bent downwardly to retain papers mounted thereon.

4,993,862

CLAMP ASSEMBLY FOR SURGICAL RETRACTOR SUPPORT

Samuel Pelta, Philadelphia, Pa., assignor to Pilling Company, Fort Washington, Pa.

Filed Aug. 16, 1989, Ser. No. 394,673

Int. Cl.[5] F16B *7/04*

U.S. Cl. 403—59 13 Claims

1. A clamp assembly comprising, in combination:

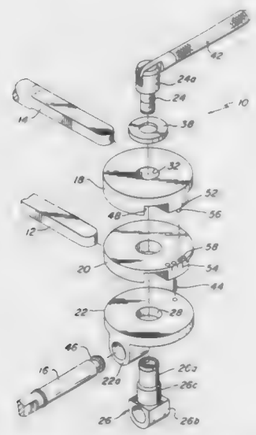
a base formed to rotate on a first axis about a first rod;

an elongate fitting slidably disposed in said base along a second axis normal to said first axis and formed to rotate with said base about the first rod;

first and second disks slidably disposed on said fitting and independently rotatable about said second axis, one side of said first disk having a channel adjacent to said fitting defining with said base opposed surfaces for clamping a second rod therebetween, and said second disk having a channel adjacent to said fitting defining with the other

VOL 1123 ISS 3 FE 19 1991 UMI

side of said first disk opposed surfaces for clamping a third rod therebetween; and



tightening means along said second axis operatively connected to said fitting and said disks for simultaneously fixing the rods relative to each other.

4,993,863

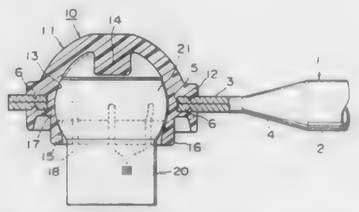
JOINT DEVICE

Yoichi Inoue, Kiryu, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Continuation of Ser. No. 188,277, Apr. 29, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 416,012

Int. Cl.[5] F16C *11/06*

U.S. Cl. 403—133 4 Claims



1. A joint device comprising a spherical shaft having a free end with a spherical portion, said spherical portion having a first spherical diameter, a spherical bearing member made of resin, spherical bearing member including a spherical bearing portion for accommodating the spherical portion of said shaft, said spherical bearing portion having one and only one spherical bearing portion opening for receiving passage of said spherical shaft, said spherical bearing portion opening having a periphery and a first inner diameter of lesser magnitude than the first spherical diameter of said spherical portion, a generally annular skirt portion formed at the periphery of said spherical bearing portion opening and being annular about a central axis and extending axially away from said spherical bearing portion opening a predetermined amount and having a free open end portion, said skirt portion having a normal unexpanded condition with a minimum inner diameter of lesser magnitude than the first inner diameter of said spherical bearing portion opening, said minimum inner diameter being located a predetermined axial distance away from the first inner diameter of said spherical bearing portion such that said minimum inner diameter limits withdrawal of said spherical portion from said spherical bearing member when said spherical portion is coupled in said spherical bearing member, a flex starting portion formed in said spherical bearing portion axially inwardly of said spherical bearing portion opening, said skirt portion having a plurality of slits formed therein and extending axially inwardly from said free open end portion to at least said flex starting portion to define segments of said skirt portion spaced by said slits, and the skirt portion at said minimum inner diameter is radially deflectable away from said central axis about said flex starting portion to expand said minimum inner diameter a predetermined amount at said segments sufficient to accommodate said spherical shaft, said spherical shaft being coupled with said spherical bearing member by insertion of the free end of said spherical shaft into the free open end portion of said skirt such that the spherical portion of said shaft engages the minimum inner diameter portion of said skirt to cause the segments of said skirt to expand at said slits and to flex about said flex starting portion such that said flexion causes said first inner diameter of said spherical bearing portion to radially expand about said flex starting portion to permit reception of said spherical bearing portion through the spherical bearing member opening such that the free end of the spherical shaft with the spherical portion is the first part of the spherical shaft to pass through the spherical bearing portion opening, and wherein said skirt portion contracts to its normal unexpanded condition after said spherical portion is coupled into said spherical bearing member, the contraction of said skirt portion after coupling of said spherical shaft with said spherical bearing member enabling the minimum inner diameter to limit withdrawal of said spherical shaft from said spherical bearing member.

4,993,864

RECONSTITUTABLE CONTROL ASSEMBLY HAVING REMOVABLE CONTROL RODS WITH DETACHABLE SPLIT UPPER END PLUGS

Robert K. Gjertsen, Columbia; Ronald P. Knott, Irmo, and James A. Sparrow, Columbia, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 284,566, Dec. 15, 1988, Pat. No. 4,888,151, which is a continuation-in-part of Ser. No. 232,970, Aug. 17, 1988, abandoned. This application Oct. 26, 1989, Ser. No. 426,939

Int. Cl.[5] B25G *3/00*; G21C *7/10*

U.S. Cl. 403—343 5 Claims



1. For use in facilitating replacement of a neutron absorber control rod on a control assembly spider structure, an end plug comprising:

(a) a pair of separate upper and lower plug portions, said upper plug portion having integral upper, middle and lower sections, said lower plug portion having integral upper, middle and lower segments;

(b) said upper section of said upper plug portion being configured for rigid attachment to a control assembly spider structure for supporting a control rod, said lower segment of said lower plug portion being configured for rigid connection to the control rod;

(c) said lower section of said upper plug portion and said middle segment of said lower plug portion being complementarily configured for rigid threaded attachment to one another, said lower section of said upper plug portion and said middle segment of said lower plug portion having respective external male threads and internal female threads thereon;

(d) said middle section of said upper plug portion and said upper segment of said lower plug portion being complementarily configured for interlocking attachment to one another so as to resist unthreaded detachment of said upper and lower plug portions from one another;

(e) said middle section of said upper plug portion having a plurality of angularly displaced flat surfaces formed on the exterior thereof at circumferentially spaced locations and said upper segment of said lower plug portion being configured as a thin-walled crimpable deformable sleeve fitted over said flat surfaces and being deformably crimped at thereagainst at angularly displaced regions of said sleeve, said thin-walled deformable sleeve being reformable upon application of a predetermined torque to the lower plug portion to rotate the same and unthread said lower and upper plug portions from one another, said crimpable sleeve of said upper segment of said lower plug portion being smaller in thickness than said internally-threaded middle segment of said lower plug portion.

4,993,865

FLYWHEEL MOUNTING DEVICE FOR INTERNAL COMBUSTION ENGINE

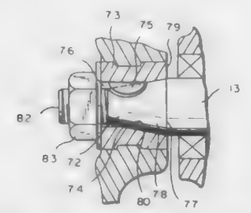
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Apr. 22, 1987, Ser. No. 41,733

Claims priority, application Japan, Apr. 23, 1986, 61-61588[U]

Int. Cl.[5] F16B *3/00*

U.S. Cl. 403—358 2 Claims



1. In a flywheel device for an internal combustion engine in which an outer peripheral surface of one end of a crank shaft of the internal combustion engine is tapered while an inner peripheral surface of a central hole of a flywheel is tapered to form a shape which fits onto said tapered surface of said crank shaft, a first keyway being formed along said tapered inner peripheral surface of said flywheel, a second keyway being formed along said tapered outer peripheral surface of said crank shaft, said crank shaft having an axis of rotation, said tapered surfaces being symmetric with respect to said axis of rotation and each said tapered surface having a respective large-diameter end and small-diameter end, and a key being fitted into said keyways to allow said flywheel to be non-rotatably mounted on said crank shaft,

an improvement characterized in that said first keyway in said flywheel extends to intersect said tapered inner peripheral surface of said flywheel, said first keyway extending along said inner peripheral surface of said flywheel from said small-diameter end thereof, and wherein said first keyway and said second keyway terminate at respective opposing intermediate portions of said tapered surfaces, respectively, such that said tapered surfaces of said crank shaft and said flywheel are closely fitted together along entire circumferential peripheries thereof extending around said axis of rotation and along a substantial length of adjoining parts of said tapered surfaces on the large-diameter ends thereof from the terminations of said key and keyways at said opposing intermediate portions;

said tapered outer peripheral surface of said crank-shaft having a largest-diameter part at said circumferential periphery at said large-diameter end thereof, said first keyway of said flywheel having a bottom is said flywheel that is parallel to and closer to said axis of rotation of said crank shaft than said largest-diameter part of said crank shaft at said large-diameter end of said tapered surface thereof to make said substantial length of said adjoining parts.

4,993,866

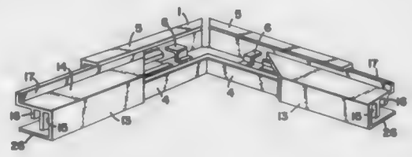
CONNECTION FITTING FOR A PICTURE FRAME CORNER

Yoshichika Sugihara, 4-12-15, Aoi, Adachiku, Tokyo, and Yasunoiri Suzuki, 1205-16, Kaburagi-cho, Sakura-shi, Chiba-ken, both of Japan

Filed Nov. 2, 1989, Ser. No. 430,813

Int. Cl.[5] F16B *12/44*

U.S. Cl. 403—402 6 Claims



1. A corner connection fitting for a frame, the frame being of the type having a front frame member and a base frame member, said corner connection fitting comprising:

a bottom part and a side part interconnected by hinge means so that said bottom part and side part are movable between a first, closed position and a second, open position, wherein said front frame member is interconnected to said side part so that rotatable movement of said side part causes movement of said front frame member;

means for biasing said bottom part and side part toward its first, closed position, wherein said biasing means includes a plate spring;

first connection means for interconnecting said corner connection fitting to said front frame member; and

second connection means for interconnecting said corner connection fitting to said base frame member.

4,993,867

RIGID CONCRETE STAMPING TOOL WITH FLAT HANDLES

Allen D. Usow, 7600 SW. 171 St., Miami, Fla. 33157

Filed Aug. 14, 1989, Ser. No. 393,663

Int. Cl.[5] E01C *23/02*

U.S. Cl. 404—89 8 Claims

1. An improved rigid concrete stamping tool, comprising in combination:

an upper support structure having an upper and a lower surface, two ends and two sides;

a lower blade assembly having an upper surface connected to the lower surface of said upper support structure;

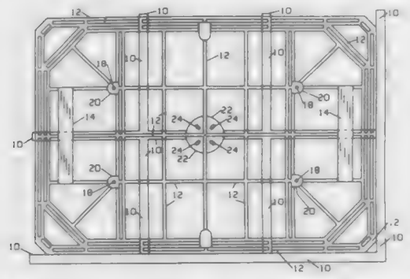
a handle coupled to said upper surface of said upper support structure, said handle being substantially flush with said upper surface of said upper support structure; and

coupling means, situated on said upper support structure, for permitting attachment of ganging planks to gang together a plurality of similar rigid concrete stamping tools in

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either a side to side configuration or an end to end configuration;

at least one ganging plank coupled to said coupling means, said ganging plank overlying said handles; whereby



said handles do not interfere with ganging planks in either said side to side or end to end configurations.

4,993,868

CONTINUOUS PREFABRICATED ROAD-MARKING TAPE WITH COMPOSITE STRUCTURE AND PASSIVE AND ACTIVE OPTICAL EFFECT COMPLETELY INDEPENDENT FROM OUTSIDE INVESTMENT AND EXTERNAL ENERGY SOURCE

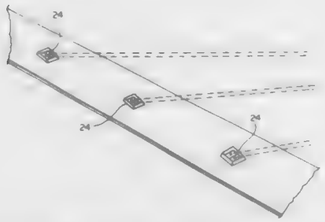
Ludwig Eigenmann, Lugano, Switzerland, assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 73,231, Jul. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 888,315, Jul. 22, 1986, abandoned. This application May 10, 1989, Ser. No. 349,625

Claims priority, application Switzerland, Jul. 23, 1985, [redacted]1197/85

Int. Cl.[5] E01F *9/06*

U.S. Cl. 404—12 **9 Claims**



1. Continuous prefabricated road-marking tape, of the type which may be firmly secured to the road surface and which is resistant to the aggression of weather and vehicular traffic said tape including:

(a) protective protrusions on the road-marking upper face;

(b) reflective elements housed within said protrusions, so that a reflective surface is exposed to the headlights of an approaching vehicle;

(c) light emitting diodes (LEDs) housed within said protrusions, and which emit light toward the approaching vehicle;

(d) an electrical circuit extending within said tape and including solar cells; said light emitting, a photocell switch and storage batteries housed within and protected by said protrusions, said diodes being controlled by said photocell switch, such that said solar cells energize said storage batteries during the day and at night said batteries energize said diodes by an energy balance assured by a light detector which activates said circuit as signalled by an approaching vehicle headlight and wherein the light detector is provided with a light focusing unit oriented so as to selectively focus the light coming from the vehicles.

4,993,869

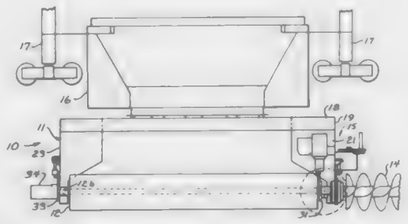
CONCRETE FINISHING MACHINE WITH VIBRATING FINISHING ROLLERS

Ewald R. Ulmer, and Murray A. Rowe, both of Canton, S. Dak., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Apr. 7, 1989, Ser. No. 334,923

Int. Cl.[5] E01C *19/38*

U.S. Cl. 404—117 **20 Claims**



1. In a concrete finishing machine including a main frame adapted for movement along a roadway or the like being surfaced, a finishing unit for finishing a concrete surface of the roadway, comprising:

a carriage supported by the main frame and adapted for movement back and forth along the main frame laterally of the roadway;

finishing roller means including at least one elongated finishing roller having first and second ends;

suspension means for rotatably mounting said finishing roller to said carriage with said finishing roller being located above the surface of the concrete being finished in engaging relationship therewith;

drive means supported on said carriage and coupled to said at least one elongated finishing roller at said first end thereof for rotating said at least one elongated finishing roller as said carriage is moved along said main frame;

vibrating means supported by said suspension means near said second end of said at least one elongated finishing roller and external thereto, said vibrating means being coupled to said at least one elongated finishing roller only at said second end thereof for vibrating said at least one elongated finishing roller, said vibrating means including first and second vibrator units, each vibrator unit including an eccentric mass adapted for rotation, said first and second vibrator units being synchronized in operation and having their respective eccentric masses rotating in opposite directions relative to one another, said suspension means including a secondary frame means extending transversely relative to the axis of said at least one finishing roller, said first and second vibrator units being carried by said secondary frame means and spaced apart laterally of one another; and

said suspension means including isolating means interposed between said vibrating means and said carriage for preventing the transmission to said carriage of vibrational forces produced by said vibrating means.

4,993,870

ANCHORING MEANS FOR BENTHIC BARRIER

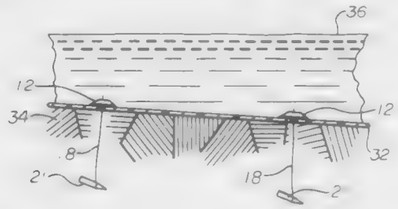
Todd J. Bridgewater, Saginaw County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 18, 1989, Ser. No. 408,845

Int. Cl.[5] E02B *3/06*

U.S. Cl. 405—21 **9 Claims**

1. A fixation device for securing articles to the earth comprising an elongated subteraneanly pivotable body portion having a bore extending at least partly through the length thereof to receive an installing rod, said pivotable body having a strap affixed centrally to one side thereof, and a benthic barrier clamping element with an aperture therethrough that is slidable on the strap, the strap being intended for passage



through a hole in a benthic barrier, the clamping element being provided with coacting means which in ratchet-like fashion allow the clamping means to slide on said strap toward but not away from said pivotable body, thereby providing means to secure a benthic barrier to the ground or a lake bottom to a desired degree of tightness.

4,993,871

OIL CATCHING BOOM

Lars Lundin, Porvoo, Finland, assignor to Oy Lars Lundin Patent Ab, Finland

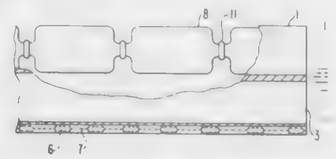
PCT No. PCT/FI88/00169, § 371 Date Jun. 7, 1990, § 102(e) Date Jun. 7, 1990, PCT Pub. No. WO89/03457, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 14, 1988, Ser. No. 469,444

Claims priority, application Finland, Oct. 14, 1987, 874526

Int. Cl.[5] E02B *15/06*

U.S. Cl. 405—68 **5 Claims**



1. An oil catching boom which comprises an upper part (**1**) in the form of a flexible hose floating on water surface and a skirt (**3**) attached under it and extending downwards over a certain distance into the water, the upper part of the boom being made up of an outer hose (**1**) of a fabric-like material and an inflatable inner hose (**8**) placed inside it, characterized in that the inner hose (**8**) is provided at certain intervals with strictures to increase its flexibility, said strictures being produced by means of flexible throttling rings (**11**) placed around the hose (**8**).

4,993,872

PRECAST CONCRETE CULVERT SYSTEM

William D. Lockwood, Dayton, Ohio, assignor to Con/Span Culvert Systems, Inc., Dayton, Ohio

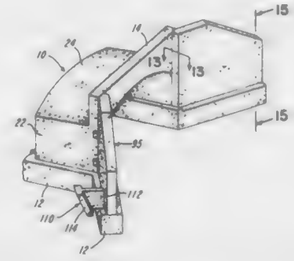
Continuation-in-part of Ser. No. 161,499, Feb. 29, 1988, Pat. No. 4,854,775, which is a continuation-in-part of Ser. No. 86,064, Aug. 17, 1987, Pat. No. 4,797,030, which is a Continuation-in-part of Ser. No. 853,206, Apr. 17, 1986, Pat. No. 4,687,371, which is a continuation of Ser. No. 566,438, Dec. 28, 1983, Pat. No. 4,595,314. This application Aug. 8, 1989, Ser. No. 390,747

The portion of the term of this patent subsequent to Jun. 17, 20003 has been disclaimed.

Int. Cl.[5] E01F *5/00*

U.S. Cl. 405—125 **22 Claims**

1. A concrete culvert assembly for installation within the ground, comprising a set of elongated footers, a plurality of precast concrete culvert sections supported by said footers in predetermined alignment, each of said culvert sections having an open bottom and including parallel spaced vertical side walls having bottom surfaces supported by said footers, a concrete top wall integrally connected to each of said side walls of each said section, said side walls of each said section having opposing inner surfaces defining a span substantially greater than the length of said side and top walls, each of said side walls of each said section having a generally uniform thickness and a substantially flat vertical outer surface, said concrete top wall of each said section having an outer surface forming a relatively sharp corner with said outer surface of



each said side wall, reinforcing members embedded in said concrete of each said section and extending generally parallel to said outer surfaces of said top and side walls, each said side wall and said top wall of each said section having inner surfaces connected by a surface cooperating with said relatively sharp corner to define a corner thickness substantially greater than the uniform thickness of said side wall, a precast concrete wing wall projecting outwardly from each said side wall of the end said culvert section and supported by a corresponding said footer, and each said precast wing wall including a rigidly connected precast wall anchor projecting laterally from said wing wall into the ground above the corresponding said footer.

4,993,873

PROCESS FOR TREATING CONTAMINATED EARTH

Kurt Tippmer, Recklinghausen, Fed. Rep. of Germany, assignor to Still Otto GmbH, Fed. Rep. of Germany

PCT No. PCT/EP87/00568, § 371 Date May 3, 1989, § 102(e) Date May 3, 1989, PCT Pub. No. WO88/02285, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 2, 1987, Ser. No. 346,993

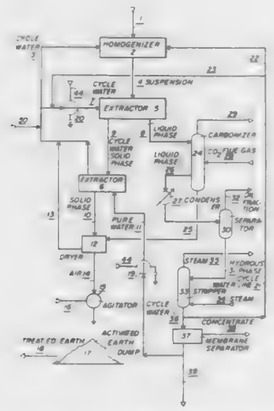
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633699

Int. Cl.[5] B09B *3/00*

U.S. Cl. 405—128 **13 Claims**

1. A process for treating contaminated earth, comprising homogenizing and comminuting the contaminated earth to form a dissolved portion, adding cycle water to the dissolved portion to form a suspension which is contaminated with anorganic and organic substances by treating it in countercurrent with said cycle water in at least one stage system at a temperature in the range of approximately from 120° to 180° C. and a pressure of from 8 to 12 bars using at least one of warm and hot water in order to form an extraction, drying the extraction, separating of dissolved substances form the cycle water, said

suspension drawn from said extractor being dried to an approximate residual humidity of 30% by weight, and separating



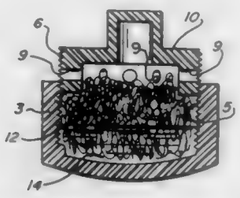
soluble substances from the cycle water by means of condensation.

4,993,874

METHOD AND APPARATUS FOR THE COLLECTION OF REDUCED GASES

Ronald W. Klusman, Evergreen, Colo., assignor to Colorado School of Mines, Golden, Colo.

Filed Jul. 14, 1989, Ser. No. 380,115
Int. Cl.[5] B01D *35/00*
U.S. Cl. 405—128 8 Claims



1. Apparatus for the integrative collection of reduced gases, including:

a container body having an opening, and including within the container, a quantity of oxidizing liquid; and wick means immersed in the liquid to absorb the oxidizing liquid and thereby increase the surface area of the liquid;

plug means sized and adapted for insertion into the opening and including means for raising and lowering the plug means within the opening between given dimensional limits;

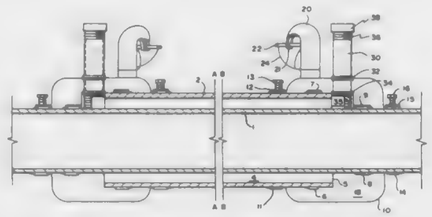
selectively open aperture means through the plug means operative as a function of the travel of the plug means between the said dimensional limits.

4,993,875

PIPE SEALING AND ANTI-CORROSION SYSTEM

James J. Nicholson, Sr., Vacaville, Calif.; Erwin P. Miller, Clyde, Ohio; Daniel P. Walsh, Vallejo, Calif.; Steve A. Bowles, San Francisco, Calif., and John V. O'Brien, Vallejo, Calif., assignors to Miller Pipeline Corp., Indianapolis, Ind.

Filed Mar. 12, 1990, Ser. No. 491,590
Int. Cl.[5] F16L *58/10*
U.S. Cl. 405—157 6 Claims



1. A sealing assembly for a pipe comprising:

a casement sleeve means having first and second ends, said casement sleeve means adapted to surround a portion of a pipe with a generally annular casement cavity therebetween;

first and second inner muff means, said first inner muff means being adapted to be secured about the outer perimeter portions of the pipe and said casement sleeve means at the first end of said casement sleeve means, said second inner muff means being adapted to be secured about outer perimeter portions of the pipe and said casement sleeve means at the second end of said casement sleeve means; and

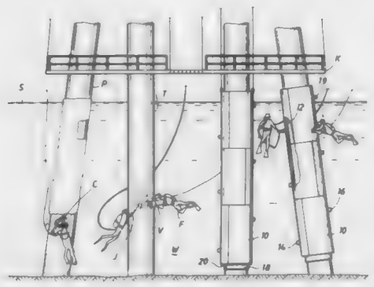
first and second outer muff means, said first outer muff means being adapted to encompass said first inner muff means and to be secured about an outer perimeter portion of the pipe and said casement sleeve means so as to form a first mold cavity, said second outer muff means being adapted to encompass said second inner muff means and to be secured about an outer perimeter portion of the pipe and said casement sleeve means so as to form a second mold cavity.

4,993,876

METHOD AND APPARATUS FOR PROTECTIVE ENCAPSULATION OF STRUCTURAL MEMBERS

Richard K. Snow, Gallatin, and Milton W. Ellisor, Jr., Houston, both of Tex., assignors to 501 Sandoz, Ltd., Switzerland

Continuation of Ser. No. 247,846, Sep. 22, 1988, abandoned, which is a division of Ser. No. 874,500, Jun. 16, 1986, Pat. No. 4,876,896. This application Jul. 3, 1989, Ser. No. 373,691
Int. Cl.[5] E02D *5/60*
U.S. Cl. 405—216 25 Claims



1. A method of forming a protective encasement about at

least a portion of a load supporting structural member which is at least partially submerged in water, comprising the steps of:

providing a jacket of reinforced resin material which is essentially chemically inert and corrosion resistant;

positioning the jacket about the portion of the structural member desired to be encapsulated while separating the jacket from the structural member a desired predetermined distance to form a continuous annular void;

preparing a first component of a epoxy grout at a location remote from the structural member;

preparing a second component of an epoxy grout at a location remote from the structural member;

pumping the first epoxy grout component through a first conduit to a location adjacent said jacket;

pumping the second epoxy grout component through a second conduit to a location adjacent said jacket;

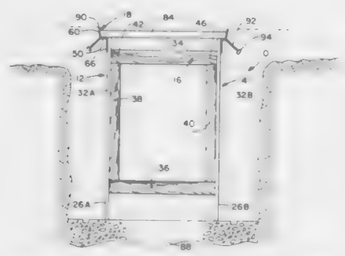
combining the first epoxy grout component with the second epoxy grout component to initiate the epoxy polymerization reaction immediately prior to injecting the combined epoxy grout into the jacket at a submerged location in the water to fill the continuous annular void.

4,993,877

METHOD AND APPARATUS FOR FORMING A TRENCH

John V. Beamer, Atlanta, Ga., assignor to Construction Casting Company, Atlanta, Ga.

Filed Oct. 2, 1987, Ser. No. 103,678
Int. Cl.[5] E02B *5/00*
U.S. Cl. 405—282 21 Claims



1. An adjustable frame for maintaining a grate in stable position relative to a second frame along a trench, comprising:

(a) a horizontal grate supporting member comprising:

1. a generally planar top surface upon which the bottom of said grate rests;
2. a bottom surface opposite said top surface;
3. a rearward edge; and
4. a forward edge opposite said rearward edge;

(b) an upper grate contacting member extending vertically upward from said top surface of said grate supporting member at said rearward edge of said grate supporting member for contacting a side of said grate; and

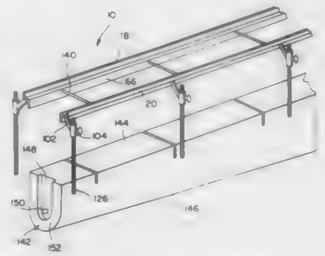
(c) a sidewall contacting surface extending vertically downward from said bottom surface of said grate supporting member at said forward edge of said grate supporting member for contacting a trench from sidewall, said sidewall contacting surface having adjustment slots through which fastening means can be place for adjusting both the vertical position and slope of the frame and selectively fastening said frame to said sidewall.

4,993,878

METHOD AND APPARATUS FOR FORMING A TRENCH

John V. Beamer, Atlanta, Ga., assignor to Construction Casting Company, Atlanta, Ga.

Continuation of Ser. No. 325,615, Mar. 17, 1989, which is a continuation-in-part of Ser. No. 103,678, Oct. 2, 1987. This application Jul. 7, 1989, Ser. No. 376,695
Int. Cl.[5] E02B *5/00*
U.S. Cl. 405—282 48 Claims



1. A device for forming a trench comprising:

(a) a pair of frame members;

(b) a connecting rod disposed between said frame members to maintain said frame members in a fixed position relative to each other;

(c) anchoring means attached to said frame members for positioning said frame members relative to the ground; and

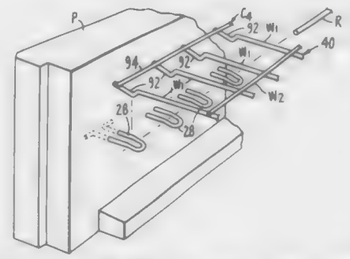
(d) a form removably held in a fixed position between said frame members and having an upper surface and a shaped lower surface, said shaped lower surface providing means for molding a moldable trench composition into the shape of the lower surface.

4,993,879

CONNECTOR FOR SECURING SOIL REINFORCING ELEMENTS TO RETAINING WALL PANELS

William K. Hilfiker, 5135 Blackberry, Eureka, Calif. 95501

Continuation-in-part of Ser. No. 320,630, Mar. 8, 1989. This application Mar. 2, 1990, Ser. No. 488,277
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—262 15 Claims



5. An improved connector for securing a wire soil reinforcing element for horizontal disposition within an earthen formation, said connector comprising:

(a) a rigid member defining an eye;

(b) a generally inflexible kinked extension formed on said wire reinforcing element and proportioned for extension through said eye from one side of the member to the other; and,

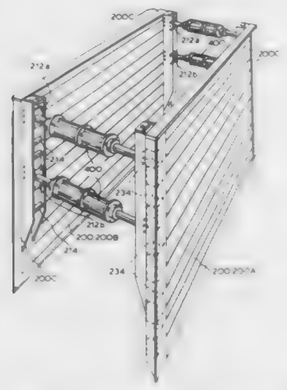
(c) a rod extensible through the extension to said other side of the member and engageable with the member when so disposed to secure the extension against removal from the eye.

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4,993,830
TRENCH-BOX PANEL

John Collins, St. Albans, England, assignor to Maybe Hire Company Limited, United Kingdom

Filed May 3, 1990, Ser. No. 518,700
Claims priority, application United Kingdom, May 3, 1989, 8910100
Int. Cl.[5] E21D 5/00
U.S. Cl. 405—283 6 Claims



1. A trench-box panel comprising an array of horizontal members, arranged one on top of another and welded together in mutually adjoining pairs, at least one element of one member of each said pair of mutually adjoining members co-operating with at least one adjoining element of the other member of the pair to define a horizontally-extending cavity which is closed by said elements except at the ends of the cavity, adjacent ends of mutually adjoining members being in mutually staggered relationship to leave spaces between the ends of alternate horizontal members at each of two vertical edges of the panel, and vertical panel-strengthening members welded to said ends of the horizontal members, at both said vertical edges of the panel, by means of welds, so as to seal the ends of said horizontally-extending cavities, some of said welds being welds in said spaces between the horizontal members on the one hand and at least one said vertical member at each said vertical edge of the panel on the other hand.

4,993,881
ARRANGEMENT FOR THE TRANSPORT OF GOODS IN BULK

Sven-Johan Person, Surbrunnsgatan 4, S-532 00 Skara, Sweden

Filed Oct. 21, 1988, Ser. No. 263,798
Claims priority, application Sweden, Mar. 4, 1987, 8700896
Int. Cl.[5] B65G 69/08
U.S. Cl. 406—88 5 Claims

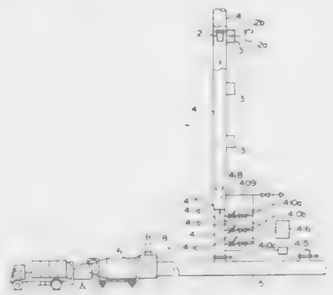


1. Arrangement for the transport of goods in bulk, such as cereal grain, by means of air flowing through a perforated base plate, comprising a base plate provided with a plurality of stamped areas defining funnel-shaped depressions disposed transversely across said base plate, some of said depressions being laterally displaced in relation to some depressions in front and behind other depressions in an unsymmetrical manner, such that they form diagonal rows with respect to the flow path of the goods along said base plate, one diagonal row defining an angle α with respect to said flow path, said angle α being considerably smaller in relation to an angle β defined by another diagonal row with respect to said flow path, wherein diagonal lines which represent the angles α and β are drawn through corresponding depressions on either side of a central line in transverse rows of depressions immediately before and after a transverse row having the depression through which the central line is drawn counted in the direction of the flow path.

4,993,882
WASTE COLLECTION METHOD

Sakae Nishizuka; Ippei Watanabe; Shozo Maruo; Yohichiro Tsutsui; Sadahito Ishikawa, all of Yokohama; Nobutaka Koibuchi, Tokyo; Teruhiko Miyauchi, Tokyo, and Koshin Kikuchi, Tokyo, all of Japan, assignors to Shimizu Construction Co., Ltd., Tokyo and Shinmeiwa Industry Co., Ltd., Nishinomiya, both of, Japan

PCT No. PCT/JP87/01014, § 371 Date Apr. 18, 1988, § 102(e) Date Apr. 18, 1988, PCT Pub. No. WO88/04639, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 22, 1987, Ser. No. 207,042
Claims priority, application Japan, Dec. 22, 1986, 61-305989; Dec. 22, 1986, 61-305990; Apr. 9, 1987, 62-87462; Jul. 8, 1987, 62-170071; Jul. 8, 1987, 62-170075
Int. Cl.[5] B65G 51/36, 51/20, 51/28, 51/18
U.S. Cl. 406—31 3 Claims

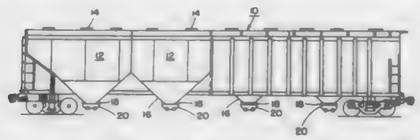


3. A method of collecting waste containers, comprising the steps of:
(a) operating one of throwing devices arranged at a plurality of floors of a building, the one throwing device having accommodated therein waste containers, and throwing the waste containers into a vertical transport pipe mounted substantially vertically to said building;
(b) decelerating the falling waste containers at a lower portion of the vertical transport pipe so as to prevent the thrown-in waste containers from being broken when the waste containers reach a shut-off valve provided at a lower end of said vertical transport pipe;
(c) detecting throwing devices having accommodated therein the waste containers, of said throwing devices;
(d) operating the throwing device at the uppermost floor, of the throwing devices detected by said detecting step (c) to throw the waste containers into the vertical transport pipe, and rendering other throwing devices inoperative;
(e) after the step (d), counting the number of the waste containers falling onto said shut-off valve to judge whether or not the waste containers are at least equal to a predetermined number;
(f) opening the shut-off valve when the waste containers are at least equal to the predetermined number in the judging step (e), to discharge the waste containers from the lower end of the vertical transport pipe;
(g) returning to said step (d) when the waste containers do not reach the predetermined number in the judging step (e); and
(h) after the discharging step (f), returning to the step (c).

4,993,883
PNEUMATIC UNLOADING APPARATUS FOR BULK MATERIALS

Robert F. Jones, Winston-Salem, N.C., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jan. 16, 1990, Ser. No. 465,300
Int. Cl.[5] B60P 1/60
U.S. Cl. 406—39 6 Claims

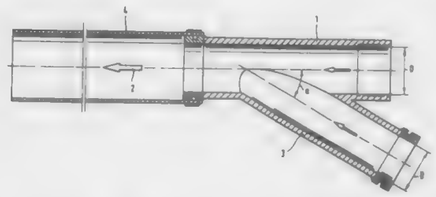


1. A pneumatic unloading apparatus for the discharge of a flowable bulk material from the bottom of a hopper; a trough-shaped housing connected to the lower end of said hopper, said housing having downwardly converging side walls and end walls, and a partition wall spaced between said end walls for separating said housing into a plurality of longitudinally spaced downwardly narrowing compartments; elongate slot-like orifices formed in the bottom of each said compartment, said orifices extending in parallel and being offset relative to each other at opposite sides of a longitudinal centerline extending through said housing, first and second parallel arranged conduits extending below said compartments on opposite sides of and coextensive with said longitudinal centerline, each said conduit having an opening means communicating with the respective orifice of the compartment on the same side of said centerline; and means for imparting a vacuum to each said conduit for aspirating bulk material from said hopper through the compartment and orifice associated therewith.

4,993,884
METHOD AND SPRAYING APPARATUS FOR APPLYING A LAYER OF AIR-SPRAYED CONCRETE

Karl-Hans Mueller, Bruchkoebel, and Walter Barthel, Langenselbold, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 181,206, Apr. 13, 1988, abandoned.
This application Feb. 12, 1990, Ser. No. 478,752
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714386
Int. Cl.[5] B65G 53/00, 53/52
U.S. Cl. 406—49 15 Claims

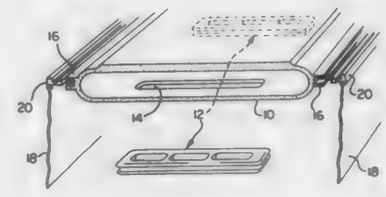


1. A method for applying a layer of air-sprayable concrete onto a surface, comprising:
providing a pumpable and sprayable mixture of air spray concrete comprising cement, aggregates, and water;
feeding a given mass flow of the mixture of air sprayable concrete so obtained through a concrete feed means to spraying means;
introducing propelling air into said concrete feed means at a feed pressure above atmospheric; and
mixing precipitated silica having an inner surface in a range between 35–700 m^2/g with said cement such that said air-spray concrete includes precipitated silica and the mixture of air-sprayable concrete and silica is sprayed with the propelling air and, while said air sprayable concrete is being sprayed by the propelling air, the mixing of the water and the precipitated silica results in the water being spontaneously drawn out from the concrete by action of attachment to the silica, and said precipitated silica and propelling air are introduced into the mass flow of said mixture of air sprayable concrete in such an amount that the applied air-sprayed concrete experience a spontaneous temperature elevation of at least 2 degrees Kelvin immediately after the application of said sprayable concert to a surface.

4,993,885
ADAPTABLE PASSAGE FOR THE TRANSPORATION OF PARTS IN AN ULTRA-CLEAN ENVIRONMENT

Jean-Pierre Lazzari, Corsac, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Jun. 5, 1989, Ser. No. 361,134
Claims priority, application France, Jun. 9, 1988, 88 07682
Int. Cl.[5] B65G 53/58
U.S. Cl. 406—89 9 Claims



1. An adaptable passage having a top wall, side walls and an open bottom, said passage comprising:
at least one longitudinal unitary pipe (10) provided with nozzles (12) issuing into the interior of the passage, said pipe constituting a substantial portion of at least one of said walls; and
at least one impermeable unitary skirt (18), said skirt constituting a substantial portion of at least one of said walls, said pipe and skirt being attachable to one another by complimentary tight fastening systems (16, 20), whereby an ultra-clean environment may be maintained in said passage by blowing ultra-clean air through said pipe.

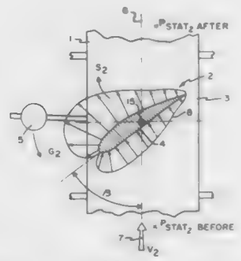
4,993,886
AIR REGULATING UNIT, PROCESS FOR REGULATING AIR FLOW, AND USE OF A LIFTING BODY IN SUCH A SYSTEM

Hans Hofstetter, Gossau, Switzerland, assignor to Buehler AG, Uzwil, Switzerland

Filed Apr. 21, 1989, Ser. No. 335,083
Claims priority, application Switzerland, Jul. 1, 1987, 02478/87
Int. Cl.[5] B65G 53/34
U.S. Cl. 406—192 6 Claims

1. An air flow regulating unit including means for continuously automatically regulating the air volume in a pneumatic conveying system, said regulating means comprising:
a rotatable throttle member mounted for movement between open and closed and to intermediate positions, said throttle member being shaped as an airfoil so as to define lifting body means responsive to lifting forces acting on it di-

rectly for moving said throttle member towards said closed position; said throttle member further including biasing means providing a continuous counterforce to said lifting forces tending to move said throttle member towards said open position as said air flow urges said throttle member towards said closed position; said throttle



member having a rounded leading end and a pointed trailing end and being positioned in its open position at an angle of at least 10 degrees relative to the direction of air flow, said throttle member moving between an angle of approximately 10 degrees in its open position to an angle of approximately 90 degrees in its closed position.

4,993,887

COMPENSATOR FOR SOLIDS CONVEYED IN A STREAM OF GAS

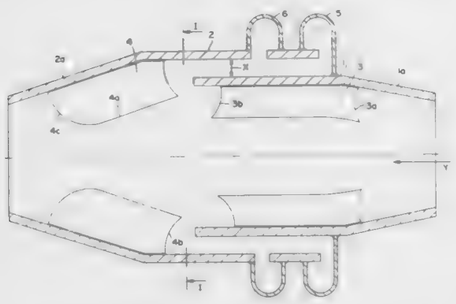
Erwin Schulze, Kirchgasse 10, D-3500 Kassel-Bettenhausen, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,397

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823046

Int. Cl.[5] B65G *53/52*

U.S. Cl. 406—193 **8 Claims**



1. A compensator for solids conveyed in a gas stream, particularly for use in a power plant, comprising:

a pair of sleeves, each of which has an inner wall, an inner end and an outer end, said inner ends of said sleeves being telescopically arranged relative to one another such that said sleeves are laterally displaceable at a radial distance to each other, one of said sleeves defining a flow inlet side of said compensator and the other of said sleeves defining a flow outlet side of said compensator; and

a plurality of fins arranged on said inner walls of said sleeves.

4,993,888

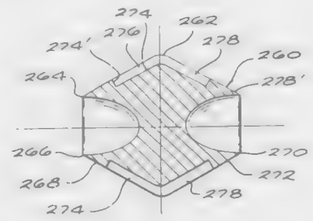
CUTTING TOOL ARRANGEMENT

Leonard A. Briese, 5039 Browndeer La., Rancho Palos Verdes, Calif. 90274

Division of Ser. No. 102,038, Sep. 29, 1987, Pat. No. 4,828,436. This application Feb. 22, 1989, Ser. No. 313,705

Int. Cl.[5] B23B *27/00*

U.S. Cl. 407—11 **1 Claim**



1. An improved cutting insert comprising, in combination:

a body member having a medial plane;

a cutting edge spaced from said medial plane;

a flank surface tapering inwardly from said medial plane to said cutting edge to provide a conical flank surface;

a mounting end spaced from said medial plane and on the opposite side thereof from said cutting edge;

a mounting surface tapering inwardly from said medial plane to said mounting end to provide a conical mounting surface;

first planar wall means defining two generally "U" shaped connecting channel means in said flank surface and said mounting surface, said planar wall means having a first end spaced intermediate said medial plane and said cutting edge and a second end spaced intermediate said medial plane and said mounting end.

4,993,889

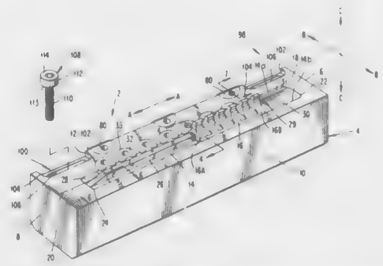
BROACHING ASSEMBLY

Walter Kelm, Mt. Clemens, Mich., assignor to Carboloy Inc., Warren, Mich.

Filed Aug. 10, 1989, Ser. No. 392,260

Int. Cl.[5] B23P *15/42*

U.S. Cl. 407—15 **13 Claims**



1. A broach assembly comprising:

(a) a holder comprising a longitudinally elongated slot for housing longitudinally spaced cutting inserts aligned in a row in the slot, the slot defined by opposing longitudinally extending first and second side walls;

(b) at least one semi-circular slot positioned along the elongated slot and having a common opening therewith in the first side wall;

(c) at least one wedge means for clamping a pair of the inserts against the second side wall, the wedge means being insertable into the semi-circular slot such that an axis of the wedge means is aligned with an axis of the semi-circular slot, the wedge means comprising a pair of longitudinally spaced apart cutting insert engaging faces and being adapted to pivot about its axis within the semi-circular slot until each cutting insert engaging face of the wedge means is in flush engagement with a corresponding face of a corresponding cutting insert; and

(d) fastener means for releasably locking the wedge means to the holder in flush engagement against the pair of cutting inserts to push the pair of inserts against the second side wall and thereby secure the pair of cutting inserts within the elongated slot of the holder.

4,993,890

MILLING CUTTER AND CARTRIDGE THEREFOR

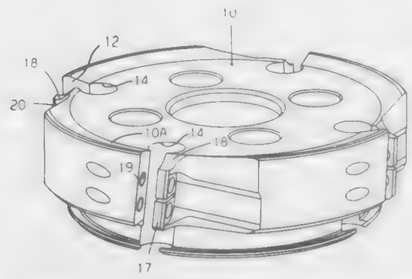
Tommy S. Tukala; Per Nilsson, and Lars-Gunnar Wallstrom, all of Sandviken, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed May 15, 1989, Ser. No. 351,486

Claims priority, application Sweden, Jun. 16, 1988, 8802256

Int. Cl.[5] B23C *5/22, 5/08*

U.S. Cl. 407—34 **13 Claims**



1. A milling cutter for chip machining of metal workpieces, comprising:

a milling cutter body defining a longitudinal axis of rotation, said body including an outer peripheral surface containing a plurality of circumferentially spaced recesses, each recess formed by circumferentially spaced front and rear walls integral with said body, said front wall being divided into separate first and second arms which are spaced in a direction parallel to said longitudinal axis,

a plurality of cutting cartridges received in respective ones of said recessed between said front and rear walls, and

first and second releasable clamp means arranged adjacent each said recess to contact respective ones of said first and second arms for separately clamping said first and second arms against said cutting cartridge.

4,993,891

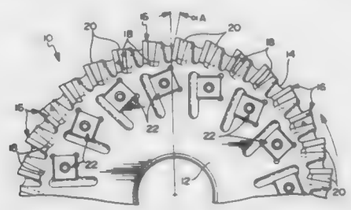
MILLING CUTTER WITH GRINDING INSERTS

Brian D. Kaminiski, Southfield; Joseph W. Matthews, Rochester Hills, and Gary L. Gaffney, Sylvan Lake, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1990, Ser. No. 481,939

Int. Cl.[5] B23C *5/06*

U.S. Cl. 407—42 **3 Claims**



1. A face milling cutter of the type that is adapted to be rotated about an axis and driven in a path generally normal to said axis across a workpiece, said milling cutter comprising,

a generally cylindrical cutter body having an outer edge and adapted to be rotated about said axis,

a plurality of cutting inserts mounted in a circular array to said cutter body outer edge, each cutting insert having at least one cutting corner presented to said workpiece surface to provide a milled surface on said workpiece, and,

a plurality of grinding inserts mounted in a circular array inboard of said cutting inserts and at a slight axial step relative to said cutting inserts, each grinding insert having a generally flat grinding surface oriented with a small positive axial rake angle and a small reversed lead angle, thereby elevating an inboard trailing portion of said grinding surface, said insert also having a positive radial rake angle large enough to present a sufficiently large working area of said grinding surface elevated trailing portion to said workpiece, but small enough to maintain said working area substantially radially inboard of said cutting insert corners,

whereby, after said workpiece surface has been initially milled by said cutting inserts, it is ground by said grinding inserts' working areas dragging across said workpiece milled surface, thereby forcing said grinding inserts into compression against said cutter body at a location substantially radially inboard of said cutter body outer edge.

4,993,892

THREAD CUTTING THROW-AWAY TIP

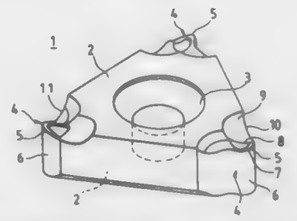
Nobuhiro Takahashi, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 22, 1989, Ser. No. 396,663

Claims priority, application Japan, Aug. 25, 1988, 63-111347[U]

Int. Cl.[5] B23P *15/28*

U.S. Cl. 407—114 **8 Claims**



1. A throw-away thread cutting insert having an upper wall and a plurality of side walls for use in a cutting tool, one of said side walls being a thread leading side wall, comprising:

a cutting tip provided at a corner portion of said insert, said cutting tip corresponding to a shape of a thread groove of a workpiece;

a trough-shaped groove formed in said upper wall of the insert, said groove being disposed adjacent to said cutting tip;

a land disposed between said cutting tip and said groove, said land substantially surrounding said groove on three sides, said groove being deeper than said land; and

a recess formed continuously with a fourth side of said groove, a bottom of said recess being positioned at the thread leading side or said cutting insert relative to a bisector of said cutting tip, said recess being provided with a side wall opening formed by chamfering a part of said upper wall and said thread leading side wall of said insert, said groove slanting inwardly downwardly toward said recess and said recess being deeper than said groove such that a cutting chip engages said groove before engaging said recess and said cutting chip is guided through said groove into said recess and out said side wall opening.

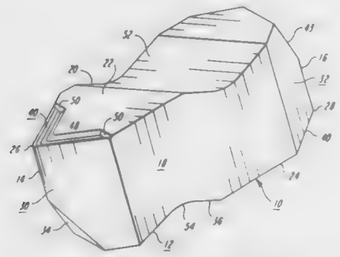
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4,993,893

CUTTING INSERT WITH CHIP CONTROL

Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Filed Jan. 8, 1990, Ser. No. 461,883
Int. Cl.[5] B23P *15/28*
U.S. Cl. 407—116 **20 Claims**



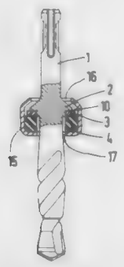
1. An improved cutting insert with chip control features comprising an insert body having sides and top and bottom walls defining therein means forming a notch and being generally perpendicular to said sides, said insert body being invertible about an axis perpendicular to said sides thereof and having end wall regions which each comprise two end walls converging toward one another as they extend from the insert's sides forming at the juncture with the respective top and bottom walls, a cutting edge, said top and bottom walls further defining therein a recess proximate each said cutting edge, each said recess having a land extending along the respective cutting edge and terminating in a descending wall which in turn terminates in a floor region which in turn terminates in an ascending wall terminating in said respective top or bottom portions of the insert body, and a pair of backramps which form a pair of walls parallel with said axis, said recess defining, when viewed in plan, a generally "V" shaped depression having the bottom of the "V" proximate the cutting edge at the juncture of said two convergent end walls and wherein the extending arms of the "V" extend from the juncture and terminate in the pair of backramps whereby in each inverted position of said insert body a respective cutting edge is presented uppermost at the same end of said insert body.

4,993,894

DRILL

Artur Fischer, Tumlingen, and Willi Haug, Freudenstadt, both of Fed. Rep. of Germany, assignors to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal/Tumlingen, Fed. Rep. of Germany

Filed Feb. 27, 1990, Ser. No. 485,439
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1989, 3906036; Mar. 4, 1989, 3907088
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—14 **8 Claims**



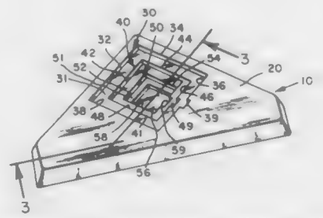
1. A drill for producing drilled holes in masonry, comprising a drill shank; and a depth stop mounted on said shank and comprising a resilient anti-vibration element; a drill bit tip having lateral cutting edges projecting laterally beyond said shank; bulge means formed on said shank between said resilient anti-vibration element and said drill tip; a collar formed on said shank above said resilient anti-vibration element; and a bearing washer arranged between said collar and said resilient, anti-vibration element, said resilient anti-vibration element being ring-shaped and abutting said bearing washer.

4,993,895

APPARATUS FOR RETAINING A TILE IN A SECURE POSITION TO PREVENT ROTATION WHILE AN OPENING IS DRILLED THROUGH THE TILE

Edward Nordstrom, 3611 Kelton Ave., Los Angeles, Calif. 90034

Filed Jan. 8, 1990, Ser. No. 462,148
Int. Cl.[5] B23B *41/00*
U.S. Cl. 408—103 **14 Claims**



1. An apparatus for retaining tiles to prevent rotation while an opening is drilled in a tile, comprising:

a. a supporting structure having an upper surface;

b. a first stepped depression extending from the interior of the upper surface of said supporting structure and having four generally perpendicular walls to form a square and an interior base surrounded by the four walls and having a generally square interior opening;

c. a second stepped depression set within the first stepped depression and being smaller than the first stepped depression, the second stepped depression having four generally perpendicular walls to form a square extending perpendicularly from the interior opening of the base of the first stepped depression and having an interior base surrounded by the four walls of the second stepped depression and having a generally square interior opening;

d. a third stepped depression set within the second stepped depression and being smaller than the second stepped depression, the third stepped depression having four generally perpendicular walls to form a square extending perpendicularly from the interior opening of the base of the second stepped depression and having an interior base surrounded by the four walls of the third stepped depression and having an interior opening;

e. the length and height of the walls of each stepped depression sized to fit a tile;

f. a stop plate set beneath the third stepped depression; and

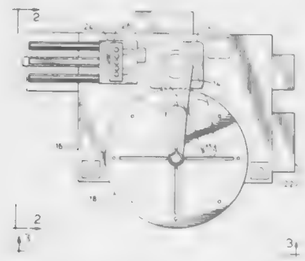
g. a gap in at least one of the four walls of each of the three stepped depression.

4,993,896

EDGE CONTOURING SYSTEM

David M. Dombrowski; William D. Rouse, both of Milford, Ohio; Robert W. Bean, Worster; Paul D. Cotnoir, North Grosvenordale, Conn.; David P. Asmus, Princeton; Andre G. Beaupre, Worster, both of Mass., and Kevin M. Conlon, Dracut, Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 13, 1988, Ser. No. 284,011
Int. Cl.[5] B23C *3/12*
U.S. Cl. 409—138 **14 Claims**



1. Apparatus for machining an edge of a workpiece, comprising:

a rotary cutting tool;

means for rotating said rotary cutting tool;

means for moving said rotary cutting tool along the edge of the workpiece;

a pilot, connected to said rotary cutting tool, for limiting the penetration of said rotary cutting tool into the edge of said workpiece;

means for permitting movement of the rotary cutting tool in a direction normal to the workpiece edge; and

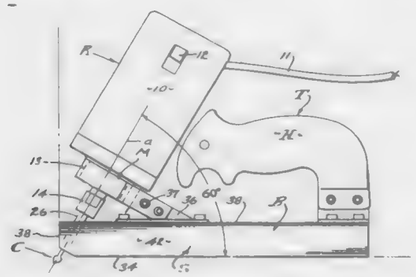
compliance means for applying a force on said rotary cutting tool to drive said cutting tool into the workpiece edge, said force being applied in said normal direction.

4,993,897

ROUTER COMBINATION FOR INSTALLING WEATHER-STRIP SEALS

Arnold J. Anderhalden, 9012 Gullo Ave., Arleta, Calif. 91332

Filed Nov. 20, 1989, Ser. No. 438,191
Int. Cl.[5] B23C *1/20*
U.S. Cl. 409—180 **12 Claims**



I. A hand tool for advancement of a router and cutter disposed on an angle bisecting a corner of a jamb face and an angularly related slamming stop to cut a continuous groove for the anchored securement of a weather-strip seal therein, and including;

an elongated V-shaped base having angularly related sides forming a vertex guidedly engageable into the corner of the jamb and angularly related slamming stop,

router means on the base and carrying the cutter on an axis disposed on said angle bisecting the angularly related sides of the V-shaped base and in alignment with said vertex and disposed on said angle bisecting the corner of the jamb and angularly related slamming stop and projecting forwardly and beyond the front end of the base at an acute angle with respect to the longitudinal disposition of said vertex,

the router cutter having a cutting stem of reduced diameter projecting from the vertex of the V-shaped base, and having a cutting head of larger diameter carried by the stem and spaced from said vertex to undercut the continuous groove,

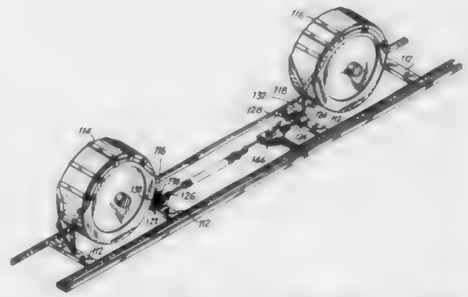
and handgrip means on the base to manipulate the hand tool for advancement of the router and cutter along said bisecting angle.

4,993,898

APPARATUS AND SYSTEM FOR TYING DOWN CARGO

John A. Klahold, Red Lion, Pa., assignor to Babcock Industries Inc., Fairfield, Conn.

Continuation-in-part of Ser. No. 36,044, Apr. 8, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,144
Int. Cl.[5] B65D *63/00;* **B61D** *3/16;* **B60P** *7/12*
U.S. Cl. 410—12 **38 Claims**



1. Apparatus for tying down wheeled vehicles to a base support which comprises:

a. means for tying down a first wheel of a vehicle to a base support;

b. means for tying down a second wheel correspondingly positioned in tandem with the first wheel;

c. means for continuously applying tension to said tie-down means of said first and second wheels; and

d. means interposed between said tensioning means and said first and second wheels for rigidly securing said tying means to said base support respectively with respect to each wheel so as to prevent relaxation of tension applied thereto.

4,993,899

APPARATUS FOR AUTOMATIC INSERTION AND ALIGNMENT OF FREIGHT UNITS

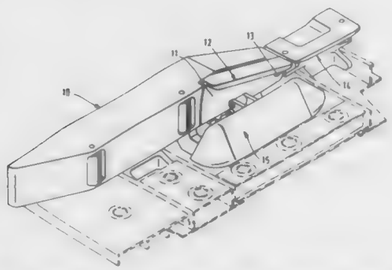
Hinrich Engel, Bremen; Hartmut Sempert, Delmenhorst, and Gerhard Palme, Ganderkesee, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Mar. 6, 1990, Ser. No. 489,454
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908257
Int. Cl.[5] B63B *25/22*
U.S. Cl. 410—69 **10 Claims**

1. Apparatus for automatic insertion and alignment of freight units, such as pallets and containers, in mobile cargo compartments with conveyor paths including storage locations for the freight units and latching elements extending from the conveyor paths, said latching elements guide and lock the freight

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units and engage with guide elements provided on said freight units, wherein said apparatus comprises a pivotal guide lever (11) including a hold-down member (12) located in the conveyor path, an adjustment lever (15) is arranged in and extends



upwardly from the bottom of the cargo container and is displaceable so that freight units can pass thereover, and said adjustable lever is connected to said guide lever for pivotally displacing said guide lever as freight units pass over said adjustable lever.

4,993,900

ANCHOR MEMBER SECURED IN PLACE BY A PERMANENTLY HARDENABLE MASS

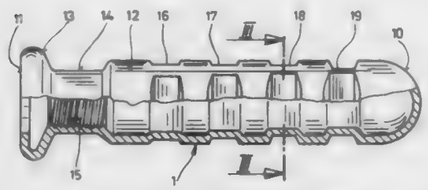
Robert Hügel, Kaufering, and Erich Leibhard, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Continuation of Ser. No. 752,916, Jul. 8, 1985, abandoned. This application Apr. 9, 1987, Ser. No. 37,139

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3425041

Int. Cl.[5] F16B *37/02*

U.S. Cl. 411—82 **5 Claims**



1. An anchor member to be fixed in a borehole by a permanently hardenable mass comprising an axially elongated sleeve-like member having a first end and a second end and a generally cylindrically shaped inside surface and outside surface, said outside surface has at least two recessed areas extending in the circumferential and axial direction and said recessed areas being spaced apart in the axial direction of said sleeve-like member by said cylindrically shaped outside surface, wherein the improvement comprises that each of said recessed areas is deformed inwardly from the generally cylindrically shaped outside surface and has a plurality of planar base surfaces extending chordally of the axis of said sleeve-like member and arranged in series one following the other in the circumferential direction with adjacent said planar base surfaces in the circumferential direction extending angularly relative to one another, said deformed recessed areas inwardly of said planar base surfaces have inner planar surfaces in the inside surface in said sleeve-like member deformed inwardly from said generally cylindrically shaped inside surface with the inner planar surfaces at said recessed areas forming at least two multi-planar sided cross-sections in the axially extending region of the recessed areas spaced axially apart by said cylindrically shaped inside surface and with each of the inner planar surfaces of said cross-sections extending generally parallel with a corresponding one of said planar base surfaces, in the axially extending region of said deformed recessed areas the inside said cross-sections of said sleeve-like member have a generally rectangular cross-section extending transversely of the axial direction of said sleeve-like member, the first end of said sleeve member is the leading end which is inserted first in to a borehole and the second end is the trailing end, the maximum depth of the deformed recessed areas inwardly from the generally cylindrically shaped outside surface of said sleeve-like member decreases in the axial direction from the first end to the second end of said sleeve-like member, and said sleeve-like member is closed at the first end thereof and is imperforate between the first and second ends for preventing the flow of the hardenable mass inside said member.

4,993,901

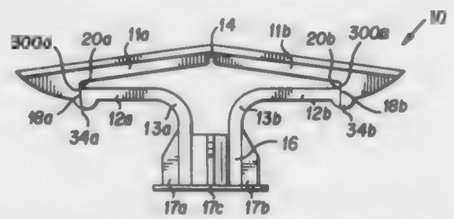
OVER-CENTER HOLLOW WALL ANCHOR WITH ENHANCED HOLDING STRENGTH

Thomas W. McSherry, Stamford, Conn., and Nathaniel H. Garfield, Harrison, N.Y., assignors to Mechanical Plastics Corp., Pleasantville, N.Y.

Filed Feb. 26, 1990, Ser. No. 484,725

Int. Cl.[5] F16B *13/04, 21/00*

U.S. Cl. 411—340 **7 Claims**



1. An over-center integrally molded plastic fastener comprised of a base element having an end integrally joined to hingeable webs, which extend outwardly away therefrom and merge with an anchoring element comprised of a pair of outstretched rear toggle arms and a pair of front toggle arms, with the rear toggle arms each being attached to a different front arm, with a solid non-hinging connection, the front arms in turn, converge toward each other, to a position overlying the base element, with the front and rear arms being adapted to be folded together to form a collapsed anchoring element of the fastener which is insertable into an opening within a substrate, wherein the front and rear arms expand, after passing through the opening, to assume an over-center anchoring position, and with the base element remaining substantially within the opening, and wherein, in the over-center anchoring position, the rear arms are adjacent a surface of the substrate and bear a substantial portion of a load placed on the anchor with the rear arms bending, under increasing load, at the periphery of the connections between the rear and front arms, characterized in that the rear arms comprise reinforcement means which retard the bending at the periphery of the connections between the rear and front arms and which reinforcement means do not necessitate a larger insertion opening.

4,993,902

PLASTIC CAPPED LOCK NUT

Keith Hellon, Libertyville, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Aug. 9, 1990, Ser. No. 564,868

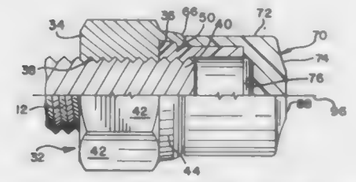
Int. Cl.[5] F16B *37/14*

U.S. Cl. 411—430 **10 Claims**

1. A plastic capped lock nut comprising:

a metal body having a threaded bore extending axially between transverse opposite end faces and including an annular wall extending outwardly of one of said end faces to define an open ended cavity for receiving a lock ring;

a lock ring of resilient material mounted in said cavity in coaxial alignment with said bore against said one end face of said body; and



an end cap formed of plastic material including an outer end wall and an annular side wall engaging said lock ring, said annular wall of said metal body having an outer end deflected against said lock ring to secure said ring in said cavity against rotation relative to said body, said end cap facing said outer end of said body and secured to an outer end portion of said lock ring.

4,993,903

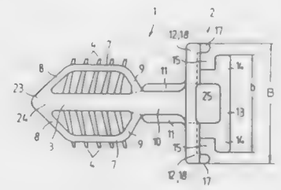
PLASTIC FASTENING ELEMENT WITH FLEXIBLE CENTERING STRAPS

Willibald Kraus, Grunstadt, Fed. Rep. of Germany, assignor to TRW United Carr GmbH & Co., Enkenbach-Alsenborn, Fed. Rep. of Germany

Filed Nov. 16, 1989, Ser. No. 437,253

Int. Cl.[5] F16B *19/00*

U.S. Cl. 411—510 **17 Claims**



1. A fastening element formed of plastic for installation into a substantially rectangular opening of a support member, said fastening element comprising: head part; a holding part having a substantially rectangular cross section joining said head part; lamella-form fingers on the longer sides of the holding part lying in groups opposite each other; stays (5) extending lengthwise of the holding part, said stays designed as resilient straps (7) having beginning zones (8) lying opposite each other on different sides of the holding part (3) and arranged diagonal to each other and merging into a push-in zone (23) having a conical configuration with oblique side surfaces (24), an intermediate body portion (10) adapted in cross section to the support opening positioned between the lamellaform fingers (4) and the head (2), the head part (2) comprising a base plate (12) adjoining the intermediate body portion (10) and a closing plate (13) arranged thereon in the form of an inverted U with laterally extending stays (14), the base plate (12) having at least one resilient zone (16) in the middle zone opposite the stays (14).

4,993,904

AUTOMATED ARCHIVING AND RETRIEVAL SYSTEM FOR COMPUTER TAPE CASSETTES

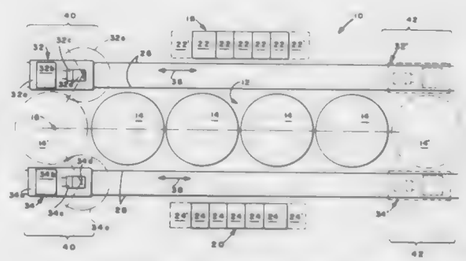
Rolf Baur, Huebach-Lautern, Fed. Rep. of Germany, assignor to Grau GmbH & Co., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 182,593, Apr. 18, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 306,182

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3832994

Int. Cl.[5] B65G *65/00*

U.S. Cl. 414—223 **5 Claims**



1. A system for storing computer tape cassettes and for transporting said cassettes between a storage location and a tape drive, said system comprising:

at least one tape storage facility for storing a number of said computer tape cassettes during periods of non-use;

first and second tape drive sections each having at least one tape drive for accepting a preselected one of said tape cassettes therein, said first tape drive section being positioned on one lateral side of said tape storage facility so as to define a first space therebetween, and said second tape drive section being positioned on another lateral side of said tape storage facility opposite to said one lateral side so as to define a second space therebetween;

first and second robot transport means respectively movable along first and second substantially horizontal paths disposed within said first and second defined spaces between said storage facility and said first and second tape drive sections, whereby selected ones of said computer tape cassettes may be retrieved from said storage facility and inserted into said tape drive of said first and second tape drive sections, and wherein

said storage facility includes a number of tape storage carousels, each said storage carousel including means for mounting said carousels for rotational movements about a substantially vertical axis, and wherein

said number of tape storage carousels are aligned along a horizontal axis substantially parallel to said first and second paths of said first and second robot transport means, respectively.

4,993,905

APPARATUS FOR DEPOSITING LONG PIECES OF MATERIAL

Tomislav Potocnjak, Lauffen, Fed. Rep. of Germany, assignor to Tepora Transportsysteme Entwicklungs GmbH, Lauffen, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 387,219

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825570

Int. Cl.[5] B65G *1/06*

U.S. Cl. 414—277 **16 Claims**

1. In an apparatus for depositing long pieces of material, such as pipes or rods, in a shelf unit that has a number or vertically spaced receiving spaces for said long pieces of material, said apparatus including a horizontally and vertically movable tray-like receptacle that has open ends and conveys said long pieces of material, with a drive mechanism being

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provided for introducing one of the ends of said receptacle into said receiving spaces, comprising the improvement wherein:

chain wheels are provided on the receptacle in the vicinity of said ends of said receptacle;

CATERPILLAR type endless treads are guided over said chain wheels;

a pusher is provided; and



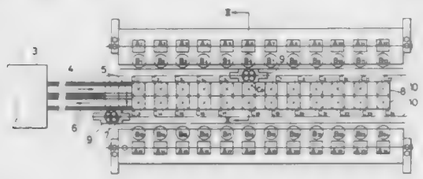
whereby rotation of the treads over the wheels causes said introduction of said end of said receptacle into one of said receiving spaces, and causes relative movement between the receptacle and the pusher when the receptacle is withdrawn from said one receiving space and thereby depositing said pieces of material into said one receiving space.

4,993,906

GREEN TIRE FEED SYSTEM BETWEEN FORMING AND VULCANIZING PROCESSES

Seiichiro Nisimura; Toshifumi Hata, and Kenji Yamashita, all of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 156,697, Feb. 17, 1988, abandoned.
This application Aug. 17, 1989, Ser. No. 396,724
Claims priority, application Japan, Feb. 27, 1987, 62-43165
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—286 5 Claims



1. A green tire feed system between forming and vulcanizing processes for feeding green tires formed by forming machine means and then placed on pallets and delivered to a plurality of vulcanizing machines comprising;

a pallet receiving station;

pallet sending means for sending said pallets from said forming machine means to said pallet receiving station and from said pallet receiving station back to said forming machine means;

a plurality of vulcanizing machines positioned in a row;

pallet loading tables disposed respectively in front of the respective vulcanizing machines in a row parallel with said row of the vulcanizing machines;

shelves disposed in opposition to said pallet loading tables in a row parallel with said row of the pallet loading tables;

a passageway formed between said row of said pallet loading tables and said row of said shelves, said pallet receiving station being positioned along said passageway at an end thereof;

a stacker crane traveling through said passageway and having means for loading and unloading said crane with pallets;

means controlling said stacker crane for direct transportation of pallets by said stacker crane between said pallet receiving station and said shelves, between said pallet receiving station and said pallet loading tables and between said shelves and said pallet loading tables; and

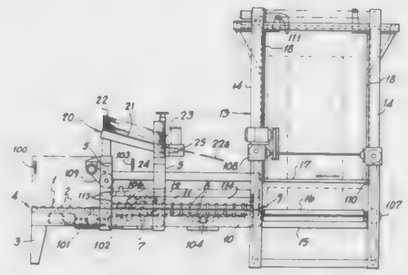
loaders disposed respectively on the respective vulcanizing machines for taking out the green tires from the pallets on said pallet loading tables and loading them into said vulcanizing machines.

4,993,907

STACKING EQUIPMENT

Alan Clark, Sutton, Great Britain, assignor to Simon Container Machinery Limited, Cheshire, United Kingdom

Filed Oct. 31, 1988, Ser. No. 264,522
Claims priority, application United Kingdom, Nov. 7, 1987, [illegible]
Int. Cl.[5] B65G *57/30*
U.S. Cl. 414—795.3 12 Claims



1. Stacking equipment comprising: a driven conveyor for receiving successive products to be assembled in pre-determined disposition into a batch thereon; a stop member to which the products are conveyed on the conveyor; at least one deflector horizontally movable transversely of the conveying direction to determine the lateral positions of individual products thereon as the batch is assembled; at least two further deflectors simultaneously horizontally movable toward and away from each other transversely of the conveying direction to centralize the transverse disposition of the assembled batch; a main support means for supporting each batch at a stacking location; a retractable push plate movable into position behind an assembled batch on said driven conveyor for transferring same longitudinally onto said main support means; retractable auxiliary support means above said main support means to which each successive batch may be transferred by raising the main support means until said successive batch is positioned immediately beneath or in contact with said auxiliary support means, temporarily retracting the auxiliary support means, further raising the main support means to its highest position, extending the auxiliary support means so as to interfinger with the main support means, and then lowering the main support means, whereby a stack of said batches is formed on the auxiliary support means; and vertically disposed structures above the auxiliary support means simultaneously movable toward and away from each other in a direction parallel to the direction of movement of said batches onto said main support means to centralize the longitudinal disposition of the assembled batches over the main support means and to determine the vertical alignment of the longitudinal sides of the stack on the auxiliary support means, so that the longitudinal centering occurs over the main support means and the transverse centering occurs over the conveyor.

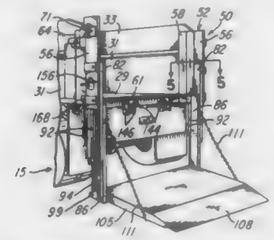
4,993,908

COMBINED TAILGATE AND LOADER ASSEMBLY FOR A DUMP TRUCK

Robert W. Park, 1289 E. David Rd., Dayton, Ohio 45429

Filed May 15, 1989, Ser. No. 352,349
Int. Cl.[5] B60P *1/46;* B62D *33/033*
U.S. Cl. 414—472 25 Claims

1. A combined tailgate and loader unit adapted for quick attachment to a dump truck having a pivotally supported body including a bed and parallel spaced side walls defining a rear opening, said unit comprising a frame including a pair of parallel spaced vertical frame members having upper end portions and lower end portions, a horizontal cross frame member rigidly connecting said lower end portions of said vertical frame members, means for removably connecting said upper end portions of said vertical frame members to the side walls of said body and for supporting said frame for pivotal movement on a horizontal axis from a first position with said cross frame member disposed generally adjacent the bed, a set of elongated extendable tracks having lower end portions and supported by said vertical frame members for longitudinal vertical movement between upper retracted positions and lower extended positions, a generally rectangular tailgate having a longitudinal



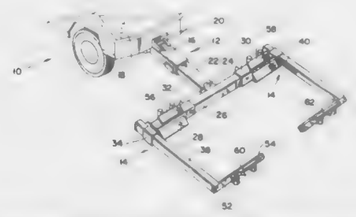
edge portion supported by said lower end portions of said tracks for pivotal movement of said tailgate between a vertical position and a horizontal position forming a platform, power operated means adjacent said vertical frame members for moving said tracks between said retracted and extended positions to move said tailgate in said horizontal position between a lower position adjacent a road surface and an elevated position generally flush with said bed, and said unit including said frame, said tracks and said tailgate being pivotal on said horizontal axis between said first position closing the opening of the body and a second angular position uncovering the opening when the body is pivoted to an inclined dumping position.

4,993,909

WHEEL RETAINER BLADES FOR WHEEL LIFT APPARATUS

Reed K. Hamman, Newbern, Tenn., assignor to Holmes International, Chattanooga, Tenn.

Filed Apr. 10, 1989, Ser. No. 335,273
Int. Cl.[5] B60P *3/12*
U.S. Cl. 414—563 8 Claims



1. Apparatus for use with wheel lift towing equipment for supporting the tires of a vehicle lifted and towed thereby, said apparatus comprising a transversely elongated tow bar adapted to be positioned beneath said vehicle, mounting means for carrying a cradle at a respective opposite end portion of said tow bar for supporting a respective tire of said vehicle, each of said cradles having front support means for supporting a front surface portion of the respective tire and rear support means for supporting a rear surface portion thereof, said rear support means including an elongated arm and a leg secured to and extending transversely to the arm, means for mounting said arm to a respective end portion of said front support means such that said leg is spaced from said front support means, at least one enlarged surface tire engaging foot, said foot comprising a plate having a first surface adapted for engaging a tire and a second surface, first connecting means fixedly secured to said second surface, at least one of said front support means and said leg having second connecting means fixedly secured thereto, said first and second connecting means being selectively cooperable for removably mounting said foot at an angular inclination extending upwardly from and forming a continuation of said one of said front support means and said leg for engaging and aiding in supporting an adjacent surface of said tire.

4,993,910

ADJUSTABLE DEVICE FOR TOWING VEHICLES WITH VERTICAL LIFT

Leonard Rigg, R.D. 1, P.O. Box 336, Snow Shoe, Pa. 16874

Filed Feb. 26, 1990, Ser. No. 484,901
Int. Cl.[5] G60P *3/06*
U.S. Cl. 414—563 9 Claims



1. Apparatus for adjustably and detachably securing a vehicle to be towed on a towing vehicle, with partial vertical lift of the towed vehicle, comprising:

a. a plurality of pivot brackets spaced for fixed and downwardly oriented attachment to the chassis of a towing vehicle, said brackets having means to facilitate the vertically pivotal mounting of a pivot axle between said pivot brackets along an axis defined by the width of the towing vehicle, and said pivot brackets having means to facilitate selective vertical adjustment of the pivot axle relative to the driving surface;

b. a pivot axle rotatably and adjustably mounted between said plurality of pivot brackets;

c. a load bar that is fixedly attached to the pivot axle in a perpendicularly central orientation along the longitudinal axis of the towing vehicle, said load bar having means for providing longitudinal adjustment with respect to a slideably fitted load bar extension;

d. a load bar extension that is slidably mounted to the load bar in a longitudinal orientation, said load bar extension having means for the longitudinal adjustment of the load bar extension with respect to the load bar, and said load bar extension having means for attachment to a coupling box at its rearwardly located end;

e. a plurality of rear load bar supports having means to facilitate the vertical adjustment of the load bar with respect to said rear load bar supports, said supports being fixedly mounted to the rearward portion of the chassis of the towing vehicle or to chassis extension means, and said rear supports being mounted so as to form an inverted cradle for the upwardly rotated load bar, and said rear load bar supports having vertical adjustment means, so as to permit the load bar to pivot upwardly into an adjustable cradle space formed by said rear load bar supports, and into a desired vertical orientation for operation of the towing vehicle;

f. a plurality of integral positive locking means located so as to prevent the undesired longitudinal movement of the load bar extension with respect to the load bar, and the undesired vertical movement of the load bar extension with respect to the rear load bar supports;

g. a first coupling means attached in an axial direction to the rearwardly extending end of the load bar extension, such that the engaging portion of said first coupling means is

oriented in an upwardly pointing direction with respect to the driving surface and the bottom of a towed vehicle; and

h. a mounting bar configured with mounting means for removable attachment to the undercarriage of a towed vehicle, said mounting bar having a downwardly oriented second coupling means for selective, detachable coupling with said first coupling means, said coupling to provide for universally pivotal movement in both horizontal and vertical planes of the mounting bar with respect to the first coupling means and load bar extension assembly;

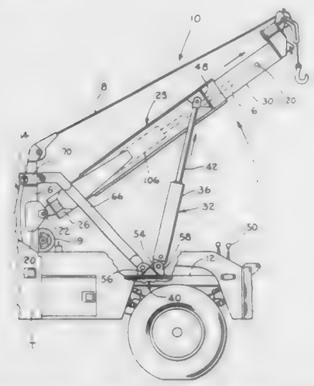
i. a plurality of safety means that are removably attached to the mounting bar, to be rearward end of the load bar extension and to the rear load bar supports, so as to prevent an undesired longitudinal dislocation of the towed vehicle from the towing vehicle, or the load bar extension from the load bar.

4,993,911

MOBILE CRANE

Robert K. Grant, Mullins, S.C., assignor to Grant Wrecker Equipment, Inc., Marion, S.C.

Filed Aug. 7, 1989, Ser. No. 390,167
Int. Cl.[5] B66C *23/74*
U.S. Cl. 414—563 **7 Claims**



1. In combination with a towing/hoisting vehicle having a flat bed upon which a winching mechanism is arranged in association with a vertical mast structure for supporting pulleys for cables utilized in hoisting and holding heavy loads, the improvement comprising:

a boom 25 having an inwardly extending member pivotally mounted at one end to the mast structure and an outwardly extending member slidably arranged within said inwardly extending member, said outwardly extending member having one or more pulleys positioned at its outer end for operative cooperation with the cables,

a fluid-operable, cylinder/piston extension ram arranged within said boom and having one end connected to the interior of said inwardly extending member and another end connected to the interior of said outwardly extending member whereby activation of said ram produces outward extension of said outwardly extending member and, therefore, said one or more pulleys relative to the mast structure,

a pair of fluid-operable, cylinder/piston elevation rams arranged generally in parallel with each having an end connected adjacent to the outer end of said inwardly extending member and another end pivotally secured to an anchor structure on the vehicle bed, said elevation rams, when activated, being adapted to pivot said boom selectively in a range of orientations between minimum and maximum angular positions, said anchor structure being arranged so that for all orientations of said boom, the longitudinal axes of said elevator rams will be at an acute angle relative to the plane of the vehicle bed extended outwardly below said outer member,

brace members connected between an upper portion of the mast structure and said anchor position, thereby being arranged to counteract some of the horizontal components of forces upon said elevator rams during lifting of loads, and

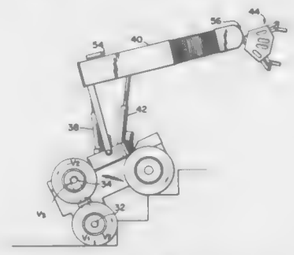
wherein said anchor structure comprises a member having first and second angled elements angularly related to each other and to the plane of the vehicle bed and wherein said brace members are connected to one of said angled elements and said elevator rams are pivotally connected to the other of said angled elements.

4,993,912

STAIR CLIMBING ROBOT

Edward G. King, Baltimore; Hilmer H. Shackelord, Jr., Finksburg, and Leo M. Kahl, Baltimore, all of Md., assignors to Chamberlain MRC, Division of Duchossois Industries, Inc., Elmhurst, Ill.

Filed Dec. 22, 1989, Ser. No. 453,315
Int. Cl.[5] B25J *5/00*
U.S. Cl. 414—729 **10 Claims**



1. A robot vehicle adapted to climb stairs and similar obstacles comprising:

an elongated chassis having a front, back, sides and top and a pair of front wheels rotatably mounted on opposite sides thereof;

a pair of beams rotatably mounted on opposite sides of said chassis each beam extending from the center toward the rear of the chassis whereby the axis of rotation of each beam is contained in a plane perpendicular to the planes containing each of said front wheels;

a first and a second pair of wheels, one rotatably mounted at each end of each beam whereby when said beams are horizontal and said six wheels rest on a horizontal surface the longitudinal axis of said chassis will be substantially horizontal;

reversible first and second front drive means coupled respectively to each of said front wheels for selectively rotating said wheels;

reversible first and second rear drive means coupled respectively for selectively rotating each pair of wheels mounted on each beam whereby each wheel in a pair is rotated in the same direction and the same rotational velocity;

reversible wheel over wheel drive means coupled to each beam for selectively causing said beams to rotate in the same direction and at the same velocity; and

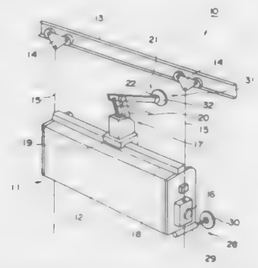
control means coupled to each of said drive means for sensing and controlling the direction of rotation and rotational velocity of each wheel and for engaging the wheel over wheel drive means to rotate said beams in one direction at a first rotational velocity and to rotate each of said pairs of wheels in an opposite direction at the same rotational velocity.

4,993,913

ROBOT FOR A WORK ON A WALL SURFACE

Shigeru Ohtsuki, Tokyo, Japan, assignor to Nihon Biso Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 378,407
Claims priority, application Japan, Jul. 15, 1988, 63-176295
Int. Cl.[5] B25T *5/04*
U.S. Cl. 414—729 **4 Claims**



1. A robot for performing work on a wall surface comprising:

(a) a main module hung by ropes and comprising means capable of moving said main module vertically and horizontally to a desired position on the wall surface;

(b) an arm module mounted on the main module and being movable with one or more degrees of freedom with respect to the wall surface, said arm module comprising a slide base extending horizontally along substantially the entire width of the main module, a slide table slidably mountable on the slide base and a parallel link type arm mounted movably on the slide table; and

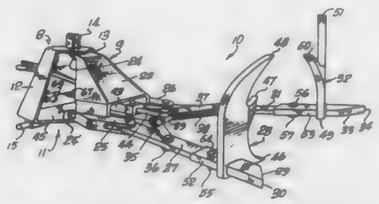
(c) a wrist module mounted on a foremost end portion of the arm module and comprising an assembly including a first rotary portion rotatable about a vertical axis of the wrist module, a second rotary portion rotatable about a horizontal axis of the wrist module, and a third rotary portion rotatable about a central axis of the wrist module, and an automatic tool changer for detachably mounting a tool thereon.

4,993,914

FALLEN TREE REMOVAL IMPLEMENT

James W. Riddle, 1103-2A Buckingham Station Dr., Midlothian, Va. 23113

Filed May 30, 1989, Ser. No. 357,893
Int. Cl.[5] B66C *3/16*
U.S. Cl. 414—738 **17 Claims**



1. A farm implement for transporting fallen trees, said implement being attachable to a tractor including a raiseable attachment means and power take off means, said implement comprising:

a frame having at least one point of attachment for attaching the frame to the raiseable attachment means of the tractor;

a first arm horizontally hinged to said frame, said first arm being movable from an open position to a closed position and said first arm having an inner hinged end and an outer terminus;

a first grabbing jaw affixed to said first arm near the terminus thereof, said first grabbing jaw including a plurality of large, vertically separated, generally inwardly directed grasping teeth;

a second arm horizontally hinged to said frame, said second arm being movable from an open position to a closed position and said second arm also having an inner hinged end and an outer terminus and said first and second arms being movable in a single plane;

a second grabbing jaw affixed to said second arm near the terminus thereof, said second grabbing jaw including a plurality of large, vertically separated, generally inwardly directed grasping teeth;

synchronizing means attached to said first arm and to said second arm to cause the first and second arms to move together and apart simultaneously; and

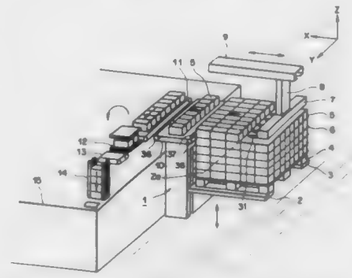
means to close and open said arms whereby said implement may be positioned about the roots of a fallen tree when the arms are apart and the arms closed to cause the first and second grabbing jaws to grasp the roots which may then be lifted and held by the jaws and moved with a minimum of damage to the soil.

4,993,915

PACKET DEPALLETIZER

Maurice Berger, Cortaillod, and Jean Cestonaro, Marin, both of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Jul. 26, 1989, Ser. No. 385,105
Claims priority, application Switzerland, Aug. 10, 1988, 3014/88
Int. Cl.[5] B65G *59/02*
U.S. Cl. 414—796.9 **9 Claims**



1. Automatic depalletizing apparatus capable of moving objects disposed on a pallet in superimposed layers separated by cardboard separators and formed of parallel and adjacent rows on a pallet and of bringing the objects one by one to an entry station of a machine, said apparatus being of the type having lift means for lifting the pallet step by step and thereby moving the layers in a vertical direction Z to a predetermined level (Z_e), transfer means movable in a horizontal direction X, a discharge conveyor likewise movable in said direction X, and distribution means for distributing the objects in the entry station, said distribution means comprising a secondary conveyor movable in said direction Y for simultaneously receiving all the objects of said one row moved by said discharge conveyor, wherein the improvement comprises:

transfer means including a transfer facility capable of moving all the objects of one row in one operation, said one row being oriented in a horizontal direction Y perpendicular to the direction of travel X of said transfer means, and of placing all the objects of said one row on said discharge conveyor after a translational movement, said transfer facility comprising a plurality of pincers oriented in direction X and aligned along direction Y and a carriage sup-

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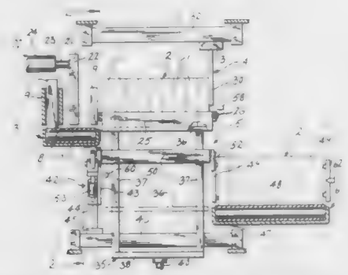
porting said transfer means, said pincers being mounted on said carriage and each being capable of grasping one of the objects of a row to be transferred for shifting it onto said discharge conveyor by movement of said carriage, said carriage including a pedestal, a truss adjustable in direction Y relative to said pedestal, a plurality of claws disposed parallel to direction X and pivoted on said truss about a single axis parallel to direction Y, and a jack-type control integral with said truss and capable of causing said claws to pivot simultaneously about said axis.

4,993,916

HIGH SPEED STACKING APPARATUS

Wolfgang C. Dorner, Oconomowoc, Wis., assignor to Dorner Mfg. Corp., Hartland, Wis.

Continuation of Ser. No. 226,461, Aug. 1, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 477,176
Int. Cl.[5] B65G *57/00*
U.S. Cl. 414—798.7 4 Claims



1. A stacking apparatus, comprising stacking means for stacking a plurality of articles in side-by-side relation at a stacking station, said stacking means comprising movable support means mounted for movement between a support position where said support means supports said stack and a release position where said support means will not interefere with downward movement of said stack, said stacking means also including movable backstop means disposed to be engaged by a lead article as the lead article is fed to said stacking station and as a stack of articles is formed against said lead article, said backstop means being movable by the stack as it is formed between a stack forming position and a second stack completed position, means for lowering the stack from the stacking station to a discharge station, discharge conveyor means located adjacent said discharge station, transfer means for transferring the stack from said discharge station to said discharge conveyor means, and a movable gate attached to and movable with said transfer means during the transfer operation and disposed generally normal to the direction of travel of said discharge conveyor means, said gate being movable from an obstructing position where said gate prevents movement of said stack on said moving discharge conveyor means to a non-obstructing position whereby the articles in the stack will be released for movement in side-by-side alignment on said discharge conveyor means.

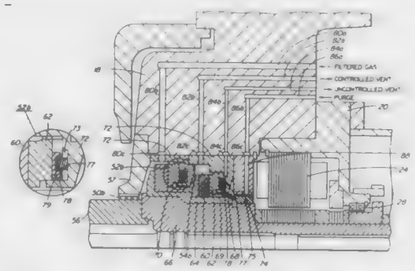
4,993,917

GAS COMPRESSOR HAVING DRY GAS SEALS

Vaclav Kulle, Blind Bay, and Robert A. Peterson, Calgary, both of Canada, assignors to NOVA Corporation of Alberta, Calgary, Canada

Filed Sep. 19, 1989, Ser. No. 410,046
Claims priority, application Canada, Sep. 30, 1988, 578979
Int. Cl.[5] F01D *3/00, 11/00*
U.S. Cl. 415—105 14 Claims

1. A rotary fluid machine having a housing, a fluid duct extending through the housing between a suction inlet and a discharge outlet, a rotor assembly rotatable in said duct to be impinged by fluid flowing through the duct from the inlet to the outlet and including a shaft rotatably supported on axially spaced bearings and at least one impeller secured to said shaft between said bearings, a pair of seal assemblies disposed at opposite ends of said duct to seal said shaft within said housing and to inhibit efflux of fluid from the duct, at least one of said seal assemblies comprising a pair of axially spaced seals each disposed between said housing and said shaft to define end



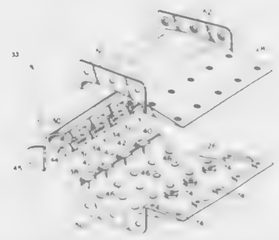
walls of a chamber formed therebetween with end wall of said chamber being subjected to fluid pressure in said duct and the other end of said chamber being subjected to a second pressure lower than the duct pressure, said seals being of different effective diameters to provide an area differential therebetween whereby a pressure in said chamber in excess of lower than the duct pressure second pressure will generate an additional axial force on said shaft.

4,993,918

REPLACEABLE FAIRING FOR A TURBINE EXHAUST CASE

Richard S. Myers, Palm Beach Gardens, and Peter T. Vercellone, Lake Worth, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 19, 1989, Ser. No. 354,060
Int. Cl.[5] F03B *3/00;* F04D *17/16*
U.S. Cl. 415—191 13 Claims



1. For a gas turbine engine having a turbine exhaust case comprising a pair of concentrically spaced rings and a plurality of radially extending struts interconnecting and supporting said rings, fairing means encapsulating at least one of said struts including a nose extending radially and coextensive with said strut and a pair of complementary axially extending halves in allochiral relationship coextensive with said strut defining with said nose an aerodynamically shaped body and connection means for removably connecting said nose to said halves at their most forward end, said nose is hyperbolic shape in cross section defining a leading edge and a relatively flat face remote from said leading edge, a plurality of narrow slots extending into wider slows radially spaced in said flat face, axially extending protrusions having a wider depending member on the forward face of said halves complementing said wider slots so that positioning said nose radially places said wider depending

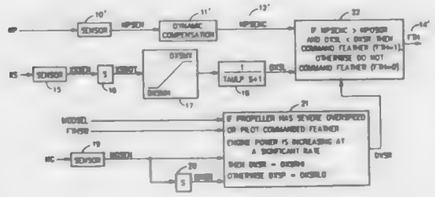
member out of register with said larger slots and said projection in register with said narrow slots whereby said nose is removable by returning said wider depending member in register with said wider slots.

4,993,919

DISCRETE (ON-OFF) FEATHER SIGNAL TO GOVERN PROPELLER OVERSPEED

Roy W. Schneider, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 11, 1989, Ser. No. 336,271
Int. Cl.[5] F01B *25/00;* B63H *3/00*
U.S. Cl. 416—35 7 Claims



1. Apparatus for governing propeller speed by feathering propeller blade pitch, comprising:

propeller speed sensor means, for providing a propeller speed signal indicative of the propeller speed;

propeller overspeed means, for comparing said propeller speed signal to a predetermined governor reference speed signal to determine an occurrence of a propeller overspeed condition;

propeller pitch sensor means, for providing a propeller pitch signal indicative of the propeller pitch;

propeller pitch rate means, for comparing the average rate of said propeller pitch signal to a predetermined reference average pitch rate signal to determine an occurrence of an average pitch rate excess condition; and

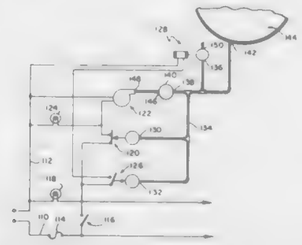
feather command means, responsive to both said propeller overspeed means and said propeller pitch rate means, for providing a feather command signal when both said propeller overspeed condition and said average pitch rate excess condition have occurred.

4,993,920

AIR MATTRESS PUMPING AND VENTING SYSTEM

Barry A. Harkleroad, 6478 W. U.S. 52, New Palestine, Ind. 46163, and Eric D. Blom, 8939 Shagbark Rd., Indianapolis, Ind. 46260

Filed Apr. 7, 1989, Ser. No. 334,462
Int. Cl.[5] F04B *49/08*
U.S. Cl. 417—44 25 Claims



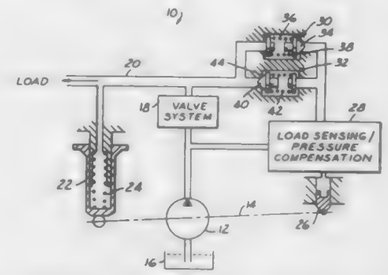
1. In combination, a first switch for operation at a first fluid pressure, the first switch having a fluid inlet, a second for operation at a second fluid pressure higher than the first, the difference between the first and second fluid pressure defining a pressure zone within which the combination does not control pressure the second switch having a fluid inlet, a source of fluid pressure, the fluid pressure source having an outlet, an electrically actuated fluid valve, the valve having a fluid inlet and a fluid outlet, means for coupling the first switch across a source of electrical power for controlling the supply of fluid under pressure from the fluid pressure source, means for coupling the second switch across the source of electrical power for controlling the fluid valve, and means for coupling the outlet of the fluid pressure source to the first switch, the second switch and the electrically actuated fluid valve.

4,993,921

POWER TRANSMISSION

Lael B. Taplin, Union Lake, and Vinod K. Nanda, Rochester, both of Mich., assignors to Vickers, Incorporated, Troy, Mich.

Filed Apr. 21, 1989, Ser. No. 341,213
Int. Cl.[5] F04B *49/00*
U.S. Cl. 417—218 12 Claims



1. A hydraulic control system that comprises a hydraulic pressure line, hydraulic fluid control means and lag network means coupling said hydraulic pressure line to said hydraulic control means, said lag network means including means for restricting flow of hydraulic fluid therethrough for delaying and damping response of said control means to fluid pressure at said line; characterized in that said flow-restricting means comprises:

check valve means including means defining a flow passage interconnecting said line and said control means, a valve element, and spring means resiliently urging said valve element to close said passage such that said flow-restricting means exhibits increasing resistance to fluid flow as fluid flow decreases between said line and said control means,

said check valve means comprising a pair of said valve elements positioned in said passage-defining means and coupled to said spring means for restricting flow in opposite directions through said passage.

4,993,922

AIR COMPRESSOR UNLOADER SYSTEM

Jerre F. Lauterbach; Nathan Ritchie, both of Columbus, and Richard F. Miller, North Vernon, all of Ind., assignors to Holset Engineering Company, Inc., Madison, Ind.

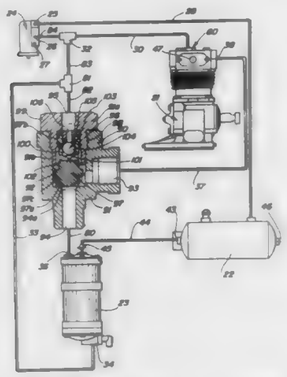
Filed Nov. 30, 1988, Ser. No. 278,179
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—279 48 Claims

1. An air compressor unloading system including:

(a) a reciprocating air compressor means having a compression chamber, an inlet to said compression chamber, and an outlet from said compression chamber;

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(b) means to block said inlet and said outlet during a compressor unloading cycle in a manner to create an air spring



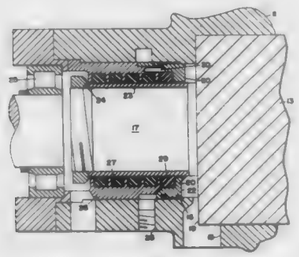
in said compression chamber, by capturing system air pressure in the cylinder bore and head assembly.

4,993,923

ROTARY COMPRESSOR WITH CAPACITY REGULATION VALVE

Guido J. E. Daeyaert, Mortsel, Belgium, assignor to Atlas Copco Aktiebolag, Stockholm, Sweden

Filed Jan. 12, 1988, Ser. No. 143,353
Claims priority, application Sweden, Jan. 20, 1987, 8700199
Int. Cl.[5] F04C *29/08*
U.S. Cl. 417—283 4 Claims



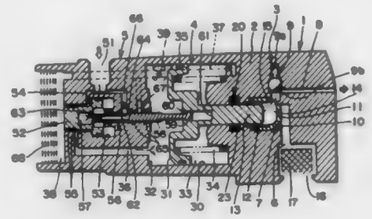
1. A rotary compressor comprising a housing (11) provided with two intersecting bores, one rotor (12, 13) journalled for rotation in each of said bores for conveying compressible fluid from an inlet opening (14) to an outlet opening (15), each rotor comprising a number of lobes and intervening grooves, characterized by a valve element (16) slideable in said housing (11) along at least one rotor shaft (17) of at least one of said rotors between a first position (18) in sealing cooperation with an end face (19) of said at least one rotor and a second position (20) creating a leakage path (21) between the outlet opening (15) and the inlet opening (14) along the outer surface of said at least one rotor, said valve element (16) comprising an annular ring guided by a pin (30) being immobile relative to the housing (11).

4,993,924

RECIPROCATING PUMP

Eiichi Mukumoto, Takarazuka, and Mitsufumi Kishimoto, Kobe, both of Japan, assignors to Konan Electric Co., Ltd., Nishinomiya, Japan

Filed Apr. 10, 1989, Ser. No. 335,913
Claims priority, application Japan, Apr. 15, 1988, 63-91778
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—402 3 Claims



1. A reciprocating pump apparatus adapted to reciprocate a piston between forward and backward ends of a stroke by alternately switching a supply and discharge of a pressurized fluid working against said piston by means of a selector valve, wherein said switching operation of said selector valve is controlled by switching pilot supply and pilot discharge flow passages by a pilot valve body which is switched by said piston at said ends of the stroke of said piston between forward movement and backward movement, and the fluid is sucked through a suction valve and discharged through a delivery valve by a plunger reciprocated by said piston, the improvement wherein

said pilot valve body has first and second means for engaging said piston for predetermined distances to and from the ends of the respective forward and backward strokes of said piston, for moving said pilot valve between a first position connecting said supply to said selector valve via said pilot supply passage to apply working pressure to said selector valve and a second position connecting said selector valve to said discharge via said pilot discharge passage to remove working pressure from said selector valve in said second position, said means for engaging comprising means for releasing said pilot valve from engagement with said piston and holding it at said each of said switching positions for a predetermined distance of movement of said piston,

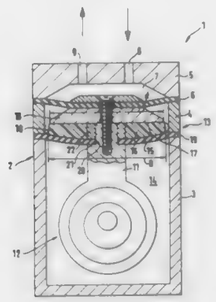
said pump apparatus further including a pump chamber connected respectively to a fluid suction passage and a fluid delivery passage, the suction valve body being adapted to move in said pump chamber and come in contact with or spaced from a valve seat to open and close the connection between the fluid suction passage and the pump chamber, and a check valve serving as a delivery valve adapted to open and close the connection between said pump chamber and the fluid delivery passage, said suction valve body comprising a cup-shaped member adapted to reciprocally guide said plunger, the plunger chamber defined between said suction valve body and the plunger and the throttling port in communication with the inlet of said delivery valve being formed in said suction valve body, and wherein a spring is provided to urge said suction valve body against the valve seat and is selected to be a weak spring necessary for reducing the cracking pressure of the suction valve to a desired level.

4,993,925

DIAPHRAGM PUMP WITH NOISE INTERCEPTING INSERT

Erich Becker, and Heinz Riedlinger, both of Bad Krozingen, Fed. Rep. of Germany, assignors to KNF Neuberger GmbH, Freiburg Munzingen, Fed. Rep. of Germany

Filed Nov. 13, 1989, Ser. No. 434,335
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838141
Int. Cl.[5] F04B *43/02*
U.S. Cl. 417—413 20 Claims



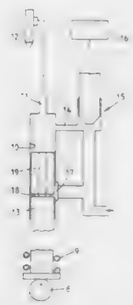
1. A diaphragm pump comprising a housing; at least one diaphragm installed in and defining with said housing a pumping chamber at one side of the diaphragm; and noise intercepting means provided in said housing at the other side of said diaphragm, said noise intercepting means including a deformable wall disposed in and connected to said housing, and elastic distancing means between said wall and said diaphragm.

4,993,926

FUEL PUMPING APPARATUS

Eric J. Cavanagh, Surbiton, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Continuation of Ser. No. 162,571, Mar. 1, 1988, abandoned. This application Jan. 31, 1990, Ser. No. 473,097
Claims priority, application United Kingdom, Mar. 11, 1987, 8705783
Int. Cl.[5] F04B *59/20*
U.S. Cl. 417—490 3 Claims



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising:

a pumping plunger reciprocable within a bore;

an outlet from one end of the bore for connection in use to an injection nozzle of an associated engine;

an engine driven cam for imparting inward movement to the pumping plunger to effect displacement of fuel from said one end of the bore;

a spill valve operable to allow fuel displaced by the pumping plunger to flow to a drain thereby to control the quantity of fuel supplied by the apparatus;

a restricted flow path from said one end of the bore and cooperating valving edges formed on the pumping plunger and the wall of the bore;

said restricted flow path having a passage in said plunger, a circumferential groove in the plunger, and restricted drillings through which the passage is in communication with said groove;

said valving edges being defined by an end wall of said groove and by an end wall of a recess in said wall of said bore;

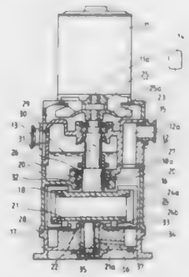
said groove being disposed with respect to said recess such that said groove is adjacent to and in communication with said recess during an initial period of the pumping plunger stroke, and is not adjacent to and is not in communication with said recess for the remainder of the pumping plunger stroke, whereby said flow path is open during a predetermined initial portion of the pumping plunger stroke during the inward movement of the pumping plunger and is closed for the remaining portion of the stroke.

4,993,927

SCROLL FLUID MACHINE WITH LUBRICATION OF OLDHAM COUPLING

Isamu Eto, and Mitsuhiro Nishida, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,350
Claims priority, application Japan, Jun. 3, 1988, 63-74440[U]; Jun. 7, 1988, 63-141065; Jul. 26, 1988, 63-187691
Int. Cl.[5] F04C *18/04, 29/02*
U.S. Cl. 418—55.3 6 Claims



1. A scroll fluid machine comprising:

a casing, having upper and lower portions, said lower portion comprising a bottom portion;

an upper scroll and a lower scroll, each of said upper and lower scrolls being provided rotatably about a respective vertical axis and being disposed within said casing, said scrolls being supported for eccentric rotation with respect to each other;

a coupling comprising a central member and a peripheral member, said central member being provided under said lower scroll at a position extended radially from said lower scroll axis and proximate to but above said casing bottom portion, and said peripheral member being provided at said upper scroll and being joined to said central member;

an oil storage recess provided within said bottom portion of said casing at a position proximate to said central member and facing said central member;

an annular wall extending up from said bottom portion of said casing and disposed inside of said casing at a position extended radially from said lower scroll axis; and

an oil sump means, having a bottom lower than said oil recess, provided at a position extended radially from said

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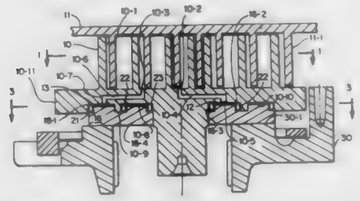
lower scroll axis that is beyond the position of said annular wall.

4,993,928

SCROLL COMPRESSOR WITH DUAL POCKET AXIAL COMPLIANCE

Howard H. Fraser, Jr., Lafayette, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 10, 1989, Ser. No. 418,604
Int. Cl.[5] F04C *18/04*
U.S. Cl. 418—55.4 **8 Claims**



1. In a scroll compressor including a crankcase and a fixed scroll means, axial compliance means comprising:

an orbiting scroll means having a plate with a wrap on a first side and annular recess means on a second side;

annular ring means having a first side coacting with said annular recess means to define a plurality of radially spaced annular pocket means and a second side adapted to coact with said crankcase;

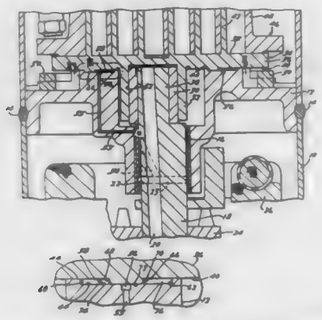
a plurality of fluid pressure supply means for supplying pressurized fluid to said pocket means at lest one of said fluid pressure supply means being from at least one trapped volume formed between sasid fixed and orbiting scroll means whereby fluid pressure supplied to said pocket means acts on said orbiting scroll means to keep said orbiting scroll means in axial engagement with said fixed scroll means and acts on said annular ring means to force said annular ring means against said crankcase and to thereby support said annular ring means and said orbiting scroll means.

4,993,929

SCROLL MACHINE WITH LUBRICATED THRUST SURFACES

Roger C. Weatherston, East Amherst, N.Y., assignor to Copeland Corporation, Sidney, Ohio

Filed Oct. 4, 1989, Ser. No. 416,981
Int. Cl.[5] F01C *1/04, 21/04;* F16C *32/06, 33/10*
U.S. Cl. 418—55.6 **20 Claims**



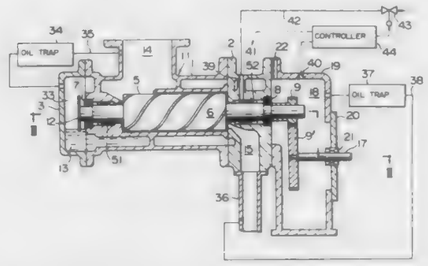
1. In a hydrostatic thrust bearing for two engaged thrust surfaces wherein one of said surfaces orbits about an axis with respect to the other of said surfaces, the improvement comprising means on said thrust surfaces defining a pumping means for elavating the pressure of the lubricating oil supplied thereto to enhance lubrication of said bearing.

4,993,930

VACUUM PUMP APPARATUS AND SHAFT SEALING DEVICE THEREFOR

Riichi Uchida, Ibaraki, and Kotaro Naya, Shimizu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,127
Claims priority, application Japan, Jul. 22, 1987, 62-181025
Int. Cl.[5] F04C *18/18, 27/00*
U.S. Cl. 418—104 **9 Claims**



1. A vacuum pump apparatus comprising:

a pair of male and female screw rotors meshing with each other;

a casing for accommodating said male and female screw rotors and including a working space, a suction port and a discharge port both communicating with said working space;

bearing portions for supporting shafts of said male and female screw rotors on suction and discharge sides thereof;

shaft seal portions respectively disposed between said working space and each of said bearing portions and adapted to seal said shafts of said male and female screw rotors on the suction and discharge sides thereof;

seal gas introducing means for introducing seal gas into said shaft seal portions; and

a controller for controlling a pressure of said seal gas introduced into said shaft seal portions in dependence upon a pressure of the seal gas introduced by said seal gas introducing means such that the pressure of the seal gas on a side of the shaft seal portion facing the working space on the discharge side is greater than a pressure on an opposite side of said shaft portion so as to provide a positive differential pressure across said shaft seal portion at said discharge side.

4,993,931

APPARATUS FOR MAKING A HOLLOW POLYETHYLENE TEREPHTHALATE BLOW MOLDED ARTICLE WITH AN INTEGRAL EXTERNAL PROJECTION SUCH AS A HANDLE

Samuel L. Belcher, Cincinnati, Ohio, assignor to Sabel Plastechs, Inc., Cincinnati, Ohio

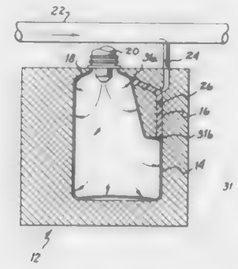
Filed Jul. 21, 1988, Ser. No. 222,186
Int. Cl.[5] B29C *49/04, 49/20*
U.S. Cl. 425—112 **8 Claims**

1. A machine for completely forming from a preform of polyethylene terephthalate and molten polyethylene terephthalate, in a single stage, a hollow blow molded article of polyethylene terephthalate having an integral injection molded polyethylene terephthalate projection bonded to and extending from an exterior wall section thereof which is free of injection molded rings encircling the article and passing through the point where the projection bonds to the exterior wall section thereof without intermediate removal of the molded article from a mold, comprising:

(a) a combination blow mold and injection mold having a hollow article-defining blow mold cavity and a projection-defining injection mold cavity which are physically separate and independent of each other except for communicating at an interface therebetween, wherein said hollow article-defining blow mold cavity has an interior wall surface which defines and corresponds to the entire desired shape of the exterior surface of the hollow article other than at said interface whereat the projection is to be bonded to said exterior wall section of said article, said blow mold being free of relatively movable injection cavity-defining parts which move within the blow mold relative to said injection mold cavity to seal said blow mold and injection mold cavities at said interface, said projection-defining injection mold cavity defines the projection extending from said exterior wall section of the article, and said interface whereat said blow mold and injection mold cavities are in communication with each other corresponding to the location on the article wall from which the projection extends;

(b) means for opening and closing said combination mold;

(c) means for inserting an unblown preform of polyethylene terephthalate into said blow mold cavity of said combination mold prior to blow molding the article therein;



(d) means for injection blow gas into the interior of the preform when said combination mold is closed to conform the preform to said blow mold cavity and produce said article;

(e) means for injection molten polyethylene terephthalate into said injection mold cavity, said means being actuated after conforming the preform to the blow mold cavity with said blow gas and prior to opening said combination mold and exhausting said blow gas and removal of said article from said combination mold, to form said integral injection molded projection bonded to said exterior wall section of the hollow blow molded article at said interface whereat said injection mold cavity communicates with said blow mold cavity; and

said machine being free of both (i) a blow mold having radially inwardly extending ridges, to form an externally grooved article, which is not in communication with an injection mold via an interface between their respective cavities, and (ii) means for transferring a previously blow molded article to the blow mold cavity of the combination mold having blow and injection mold cavities communicating at their interface.

4,993,932

CLAY DOUGH TOY EXTRUDER

Bruce M. D'Andrade, 3 Ten Eyck Rd., Whitehouse Station, N.J. 08889

Filed Mar. 21, 1990, Ser. No. 496,649
Int. Cl.[5] B29C *47/00*
U.S. Cl. 425—154 **7 Claims**

1. An extruder toy for cold molding and cold extruding of clay dough with toy molds and dies, which comprises:

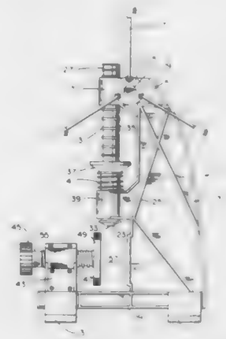
(a) a main housing having a base, an upright middle section and a top;

(b) a pinion gear rotatably located at the top of said housing;

(c) a crank wheel and handle connected to said pinion gear to enable a user to rotate said pinion gear;

(d) a ram piston with a rack gear attached thereto, said ram piston being connected to the top of said housing in a vertically movable fashion and so as to engage said rack gear and said pinion gear with one another, said ram piston further having horizontal ridges to enhance the functioning of said toy and decrease sticking of clay dough during use;

(e) a compression chamber having an open top, connected to said housing and located below said ram piston, and having a cross-sectional dimension adequate to allow ram insertion of said ram piston therein, said compression chamber having a tapered bottom with an outlet orifice substantially smaller than said compression chamber open top;



(f) clamping means connected to said housing and located below said compression chamber to hold a mold or die for receiving clay dough therefrom by ram action compression-injection; and,

(g) a safety clutch engaged with said pinion gear and said rack gear to permit slipping of said pinion gear relative to said rack gear when excessive force above a predetermined limit is applied.

4,993,933

MOLDING INSTALLATION USING DIE

Kenichiro Yoshioka; Tsuneyuki Kondo, and Hirosori Hisamitsu, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

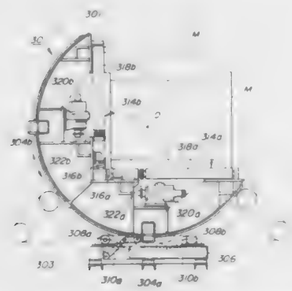
Filed Nov. 5, 1987, Ser. No. 117,160
Claims priority, application Japan, Nov. 6, 1986, 61-262716; Nov. 6, 1986, 61-262718; Nov. 6, 1986, 61-262720; Nov. 19, 1986, 61-177763; Jan. 28, 1987, 62-16272; Feb. 13, 1987, 62-29872; Apr. 27, 1987, 62-103647
Int. Cl.[5] B29C *45/04;* B65G *57/08*
U.S. Cl. 425—190 **25 Claims**

1. A molding installation comprising:

a transverse molding machine for molding with a die, said die comprising a pair of mold halves; die positioning means rotatable about a horizontal axis and capable of slidably receiving the die from the machine with die faces

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alternatively in either a vertical or horizontal plane and holding the die in such position; and a first die conveying



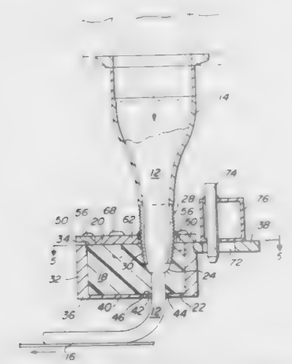
means for conveying the die along a first passage between said molding machine and said die positioning means.

4,993,934

EXTRUDATE CUTTING APPARATUS FOR CONTROLLING THE FLOW OF EXTRUDATE FROM AN ORIFICE FITTING

E. Terry Groff, Reading, Pa., assignor to Reading Pretzel Machinery Corp., Robesonia, Pa.

Filed Jun. 30, 1989, Ser. No. 374,497
Int. Cl.[5] A21C *7/06, 11/10*; B29C *47/08*
U.S. Cl. 425—238 **15 Claims**



1. An extrudate cutting apparatus for controlling the flow of extrudate from an orifice fitting, said apparatus, comprising:

a generally cylindrically shaped shaping die have an upper surface and a lower surface, said shaping die including an eccentrically positioned opening extending from said upper surface to said lower surface for releasably receiving said orifice fitting and permitting said extrudate to pass from said fitting through said opening;

a generally tubular housing rotatably receiving said shaping die therein, said housing having a first open end positioned proximate said upper shaping die surface and a second end positioned proximate said lower shaping die surface;

a nozzle knife integral with said second housing end and in facing relation with said lower shaping die surface for retaining said shaping die within said housing, said knife including an aperture for allowing extrudate from said orifice fitting to pass therethrough unimpeded when said aperture and said opening are in registry; and

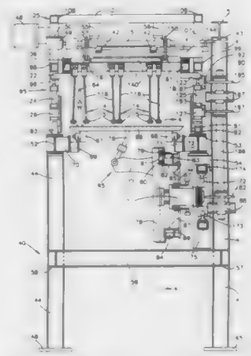
actuator means for rotating said housing with respect to said shaping die and for moving said housing between an open position wherein said opening and said aperture are in registry to allow said extrudate to pass therethrough unimpeded, and a closed position wherein said opening and said aperture are completely out of registry to prevent any of said extrudate from passing through said aperture.

4,993,935

BEAD FORMER AND LOOSENER FOR DIPPING MACHINE

Srbo M. Stevanovich, Akron, Ohio, assignor to ACC Automation, Inc., Akron, Ohio

Filed Aug. 21, 1989, Ser. No. 396,080
Int. Cl.[5] B29C *41/14*
U.S. Cl. 425—270 **16 Claims**



1. A bead forming assembly for articles on forms moving on a form carriage assembly, comprising:

a fixed frame through which the form carriage assembly moves;

means for loosening the articles from the forms, the loosening means including

a loosener frame assembly supported on the fixed frame and movable in the same direction as the forms are moving on the form carriage assembly, the loosener frame assembly being movable between a starting position and an ending position, and

a plurality of looseners supported on the loosener frame assembly, each of the looseners positioned for engaging one of the forms;

drive means for moving the loosener frame assembly from the starting position to the ending position at a speed different from a speed at which the form carriage assembly is moving to allow the looseners to move around the forms as the forms move and loosen the articles from the forms;

means for returning the loosener frame assembly from the ending position to the starting position;

a pair of roller brushes supported on the fixed frame and engaging one of the forms, one roller brush on each side of the form, the roller brushes being mounted diagonally with respect to the direction of travel of the forms on the form carriage assembly; and

means for rotating the pair of roller brushes in opposite directions as the roller brushes engage the form to produce a bead on the article.

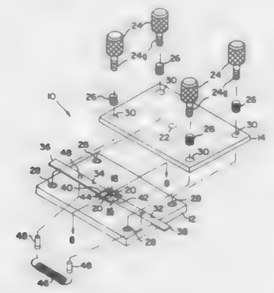
4,993,936

APPARATUS FOR COMPRESSING, DEFORMING AND DEHYDRATING EXPANSILE, HYDROGEL INTRAOCULAR LENS

Steven B. Siepser, 866 Downingtown Pike, West Chester, Pa.

Filed Apr. 17, 1989, Ser. No. 339,007
Int. Cl.[5] B29C *43/04, 43/54*
U.S. Cl. 425—408 **5 Claims**

1. An apparatus for reducing a cross sectional dimension of an expansile hydrogel intraocular lens having an optic portion with an optic axis comprising means defining a compression chamber for supporting the lens in a direction generally transversely to the optic axis and means for applying a biaxial con-



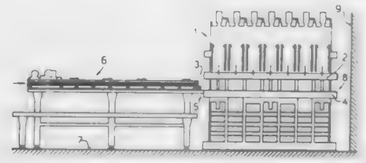
stant compressive force to the optic portion along its optic axis and an axis generally transversely to the optic axis, thereby simultaneously dehydrating the lens and reducing the cross sectional dimension of said lens to a dimension less than the maximum cross section in a hydrated state.

4,993,937

APPARATUS FOR THE FEEDING AND DISCHARGE OF A HEATING-PLATE PRESS

Claudio Ginnasi, Milan, Italy, assignor to Simpianti S.r.l., Milan, Italy

Filed May 22, 1989, Ser. No. 355,904
Claims priority, application Italy, May 24, 1988, 20723A/88
Int. Cl.[5] B29C *43/34, 43/50*
U.S. Cl. 425—444 **11 Claims**



1. A machine for treatment of substantially board-shaped workpieces, comprising a press having a treating chamber with an inlet; and apparatus for admitting untreated workpieces into and for withdrawing treated workpieces from said chamber, including a carriage which is movable into and from said chamber through said inlet and said carriage having an upper side arranged to support an untreated workpiece during movement of said carriage into said chamber and an underside provided with means for gripping a treated workpiece during movement of said carriage out of said chamber.

4,993,938

CONTINUOUSLY-VARIABLE RATE PULSE COMBUSTION APPARATUS

William H. Thrasher, North Royalton, and Gregory J. Wells, Cleveland, both of Ohio, assignors to Gas Research, Inc., Chicago, Ill.

Filed Sep. 21, 1989, Ser. No. 410,542
Int. Cl.[5] F23C *11/04*
U.S. Cl. 431—1 **8 Claims**

1. Continuously-variable rate pulse combustion apparatus comprising:

a main burner;

a primary burner operably connected to said main burner;

main fuel supply means for self-feeding a combustible gaseous mixture to said main burner;

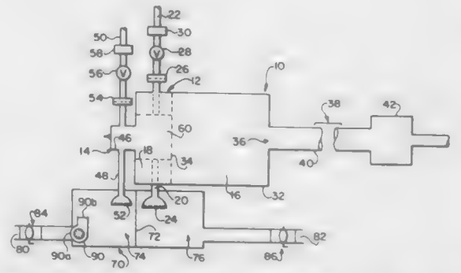
primary fuel supply means for self-feeding a combustible gaseous mixture to said primary burner;

main air supply means for providing one-way flow of air to said main burner;

primary air supply means for providing one-way flow of air to said primary burner;

combustion chamber means for pulse combustion of the combustible gaseous mixture to provide combustion gases;

exhaust means for self-exhausting the combustion gases from said combustion chamber;



inlet air decoupling means for acoustically decoupling said main and primary air supply means, said inlet air decoupling means having a primary section surrounding at least a portion of said primary air supply means and a main section surrounding at least a portion of said main air supply means;

main inlet air means for supplying combustion air to said main section of said inlet air decoupling means;

primary inlet air means for supplying combustion air to said primary section of said inlet air decoupling means; and

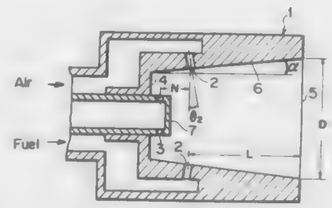
main valve means for controlling air flow into said main inlet air means.

4,993,939

BURNER WITH A CYLINDRICAL BODY

Shuzo Fukuda; Masahiro Abe, both of Yokohama; Shiro Fukunaka, Fukuyama; Michio Nakayama, Kawasaki; Koichiro Arima, Tama; Shunichi Sugiyama, and Koji Matsui, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 316,352
Claims priority, application Japan, Apr. 26, 1985, 60-88731; Aug. 29, 1985, 60-190327; Aug. 31, 1985, 60-192606; Aug. 31, 1985, 60-192607; Aug. 31, 1985, 60-192609; Aug. 31, 1985, 60-192610
Int. Cl.[5] F23D *14/22, 14/24*
U.S. Cl. 431—351 **5 Claims**



1. A burner for producing flames for reduction, comprising a tubular burner having an inner wall and an open end exit; at least one combustion air outlet disposed in a space circumferentially of the tubular burner; and at least one fuel gas outlet disposed centrally of the tubular burner, wherein said at least

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one combustion air outlet and said at least one fuel gas outlet are constructed in such a manner that

(a) said at least one combustion air outlet is formed such that an air jetting direction has an angle of not more than 60° with respect to a tangent of an inner circumference of the tubular burner, and an oblique angle of not more than 30° toward the tubular burner exit with respect to the diameter direction of the tubular burner;

(b) the combustion air outlet is positioned at an axial distance N from the fuel gas outlet in a range of N=0 to 0.1D when the fuel gas outlet is closer to the exit of the tubular burner than the combustion air outlet, and in a range of N=0 to 0.4D when the fuel gas outlet is further from the exit of the tubular burner than the combustion air outlet, wherein D is the inner diameter of the tubular burner, and N=0 when the combustion air outlet and the fuel gas outlet are at the same axial position; and

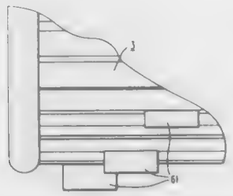
(c) a distance L from the combustion air outlet to the exit of the tubular burner is determined to be from 0.6D to 3D, wherein D is the inner diameter of the tubular burner.

4,993,940

SCRAPPER FOR AN AXIAL SEAL IN A ROTARY COMBUSTOR

Scott E. McIlvaine, Acme, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1990, Ser. No. 534,602
Int. Cl.[5] F27B *7/24*
U.S. Cl. 432—105 5 Claims



1. A scrapper for removing aluminum and other materials from axial seals in an incinerator having a rotary combustor formed from a circular array of cooling tubes spaced apart by a perforated web, wherein the axial seal includes a plurality of support bars affixed to every other tube and extending radially outward therefrom, sealing strips extending at an angle from said support bars and stationary shoes disposed adjacent a distal end of the support bars to form an axial seal as the sealing strips approach the shoes; the scrapper comprising a plurality of radial members attached to the support bars; the radial members each having a radially outer distal margin with a wedged shaped portion that increases in thickness from one end of the radial member to the other; the wedge portion extending over about one half the radial height of the radial member; a flat portion disposed radially inward of the wedge portion and a plurality of kerfs extending inwardly from the distal margin and beyond the wedged portion to form a plurality of wedge shaped fingers of increasing thickness so that as the rotary combustor turns the thickest edge of one finger makes the first contact with the aluminum and other material built up on the stationary shoe allowing each finger to scrape a discreet portion of the shoe and remove the aluminum and other material to prevent damage to the sealing strips so as to maintain an effective seal.

4,993,941

DENTAL IRRIGATING NEEDLE

Eikichi Maita, Sendai; Kohji Ikeda, Osaka, and Akira Tsuji, Kishiwada, all of Japan, assignors to Nissho Corporation and Fujisawa Pharmaceutical Co., Ltd., both of Osaka, Japan

Filed Apr. 29, 1988, Ser. No. 187,750
Claims priority, application Japan, May 7, 1987, 62-111236
Int. Cl.[5] A61G *17/02*
U.S. Cl. 433—80 4 Claims



1. A dental irrigation needle comprising:

a hub having means engageable with a syringe;

a cannula having one closed end and another end fitted to the hub, said cannula being formed of a freely bendable annealed stainless steel, whereby said cannula may be bent to a desired angle and will maintain the bent angle in the absence of a restoring force; and

at least one nozzle orifice formed in a lateral wall of said cannula adjacent said one end, whereby a fluid from a syringe may be discharged through said nozzle orifice.

4,993,942

LIME SLUDGE KILN

John W. Boyden, II, Webster, and James F. Schooling, Jr., Houston, both of Tex., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 914,482, Oct. 1, 1986, Pat. No. 4,952,147.
This application Jun. 18, 1990, Ser. No. 539,719
Int. Cl.[5] F27B *15/00*
U.S. Cl. 432—14 2 Claims

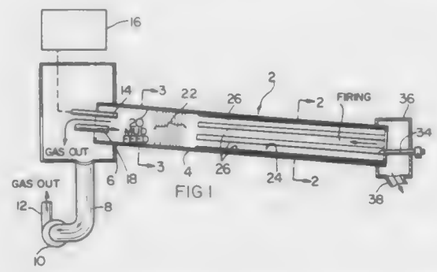


FIG 1

1. A method of calcining lime sludge in a kiln, said method comprising the steps of:

(a) providing a water-diluted supply of lime sludge;

(b) removing a portion of the alkali content of the water-diluted lime sludge by vacuum filtration;

(c) feeding the water-diluted filtered lime sludge into the kiln;

(d) feeding the lime sludge in the kiln through a chain system wherein heat is added to the lime sludge to raise the temperature thereof and wherein the lime sludge is comminuted;

(e) subsequently feeding the heated, comminuted lime sludge into a tumbling zone in the kiln wherein the lime sludge is mixed and tumbled by tumbling ribs within the kiln;

(f) maintaining the temperature of the lime sludge in the range of about 1,800° F. to about 2,000° F. while in the tumbling zone;

(g) maintaining the oxygen content in the kiln in the range of about 1% to about 2% during the calcining process; and

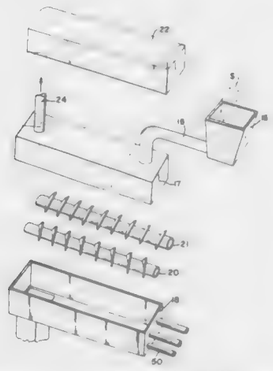
(h) discharging calcined lime from the tumbling zone and the kiln.

4,993,943

APPARATUS AND METHOD FOR THE REMOVAL OF HIGHER AND LOWER VOLATILITY ORGANIC CONTAMINANTS FROM SOIL

David P. Norris, 685 Birch Hill Dr., and William P. Norris, 147 Warren Ave., both of Bridgewater, N.J. 08807

Filed Mar. 2, 1990, Ser. No. 488,745
Int. Cl.[5] F27B *7/08*
U.S. Cl. 432—107 48 Claims



1. An apparatus for the removal of higher and lower volatility organic contaminants from media contaminated therewith comprising:

a screw conveyor having an inlet, an outlet and one or more solid core flights;

means for connecting and delivering media contaminated with higher and lower volatility organic contaminants to said screw conveyor inlet;

at least one infrared radiation source external to said screw conveyor adapted to heat said media in said screw conveyor to a temperature above which at least one of said contaminants volatilize;

venting means for venting said volatilized contaminants from said screw conveyor; and

gas delivery means connected to said screw conveyor for delivering a gas therethrough, so that said gas flows through said conveyor in a direction substantially opposite from the direction of movement of said media through said conveyor, whereby said delivered gas exits said screw conveyor by said venting means.

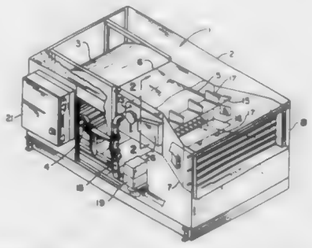
4,993,944

DIRECT GAS-FIRED BURNER ASSEMBLY

Gary J. Potter; Robert W. Reinkemeyer, both of St. Charles County, and Clifford L. Heitmann, St. Louis County, all of Mo., assignors to Cambridge Engineering, Inc., Chesterfield, Mo.

Continuation-in-part of Ser. No. 240,150, Sep. 2, 1988, Pat. No. 4,929,541. This application Feb. 16, 1990, Ser. No. 480,888
Int. Cl.[5] F24H *1/00*
U.S. Cl. 432—222 30 Claims

1. In a burner assembly for location within an air supply housing and ductwork for a heater and disposed for inducing the movement of air through a blower and into and around a burner assembly during heater operation to create a supply of heated air for a space to be warmed, said burner assembly being of the type having opposite side walls and upper and lower tiered baffles forming a combustion chamber for reception and combustion of gas delivered from a gas manifold arranged approximately at the intake end of the burner assembly, the improvement which comprises, said gas manifold having a series of gas discharge ports provided along its length, and said upper and lower tiered baffles forming said combustion chamber, and said tiered baffles having air balancing



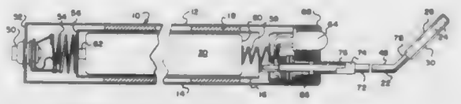
baffles connected thereon, and both said tiered and air balancing baffles having arranged openings therethrough to regulate the flow of air through the baffles and thereby control the degree of burning within the formed combustion chamber.

4,993,945

HEATED DENTAL MIRROR

Benedict B. Kimmelman, Melrose Park, Pa.; Erhart E. Demand, Boston, Mass., and Edmund Thelen, Strafford, Pa., assignors to D-O Scientific Products, Inc., Philadelphia, Pa.

Filed Aug. 1, 1989, Ser. No. 388,258
Int. Cl.[5] A61B *1/24*
U.S. Cl. 433—30 17 Claims



1. A heated dental mirror comprising

a body portion containing a low voltage battery therewithin;

a first electrical circuit in the body portion and connected to receive low voltage electrical current from the battery, the first electrical circuit comprising a first connector and first and second electrical terminals;

a reflecting portion removably connected to the body portion at the said first connector;

the reflecting portion comprising an elongate mirror support shaft having two ends, a reflecting means affixed at one end of the mirror support shaft and a second connector affixed at the other end of the mirror support shaft, the second connector being adapted to be removably connected to the first connector, the reflecting portion comprising two electrical terminals corresponding to the first and second electrical terminals of the body portion, the two electrical terminals of the reflecting portion being adapted to respectively interconnect with the first and second terminals of the body portion when the first and second connectors are interconnected to lead the low voltage electrical current from the first electrical circuit to the reflecting portion;

a second electrical circuit positioned in the reflecting portion, the second electrical circuit comprising a heater circuit constituting an electrical heating means,

the second electrical circuit being protectively sealed and connected to the two electrical terminals of the reflecting portion to energize the electrical heating means when the first and second connectors are connected, the electrical heating means heating and elevating the temperature of the reflecting means when energized; the reflecting portion being sterilizable with the second electrical circuit protected from sterilization liquids;

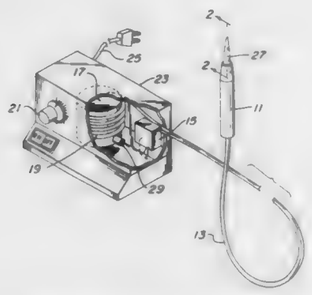
whereby a portable, low voltage, heated dental mirror can be continuously available for use.

4,993,946

THERMAL TOOTH PULP TESTER

Alan Kirsch, 1080 Squirrel Rd., Jenkintown, Pa. 19046

Filed Dec. 21, 1989, Ser. No. 454,444
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—32 **5 Claims**



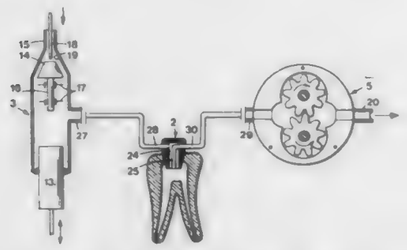
1. An intraoral thermal probe for testing the vitality of the pulp of human teeth, comprising:
a. an elongate, pencil-shaped handpiece, including a heat applicator tip at one end;
b. a pair of conduits located within and extending substantially the entire length of said handpiece forming a inlet and return means for a circulating fluid passing through and reversing its direction within the applicator tip of said handpiece;
c. a fluid reservoir containing a circulating fluid connected by tubing to said handpiece conduits for providing a source of fluid thereto;
d. pump means hydraulically connected between an outlet port of said reservoir and said tubing for creating a circulating flow of said fluid from said reservoir to said handpiece and then returning to said reservoir; and
e. a heating element in thermal communication with said fluid for increasing the temperature of said fluid and maintaining it at a pre-selected level.

4,993,947

EQUIPMENT FOR THE TREATMENT OF DENTAL ROOTS

Jean Grosrey, Arzier, Switzerland, assignor to Meditec S.A., Geneva, Switzerland

Filed Jun. 23, 1988, Ser. No. 210,400
Claims priority, application Switzerland, Jul. 16, 1987, 2707/87
Int. Cl.[5] A61G *5/02*
U.S. Cl. 433—81 **13 Claims**



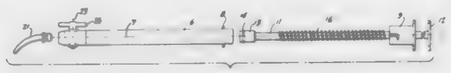
1. Equipment for the treatment of dental roots, comprising a connection piece (2), which can be fitted in a sealed manner on an opening in the pulp chamber of a tooth, said connection piece being provided with an injector (24) connected to a supply pipe (28) for conveying liquid into the tooth, and a duct (25) for discharging the liquid located inside the tooth, wherein the injector (24) and the discharge duct (25) lead into the pulp chamber when the connection piece (2) is fitted onto a tooth, the said equipment further comprising cavitation-inducing means including a gear pump (5) having an input side connected to the discharge duct (25), so as to control the mean pressure in the liquid inside the pulp chamber and inside the radicular channel of the tooth by providing continuous suction on the chamber, and said cavitationinducing means further including a piston pump (3) connected to said supply pipe and to a reservoir containing liquid to be conveyed to the injector (24), so as to perform complete filling of the tooth with said liquid and for producing alternate phases of suction and compression so as to induce a cavitation in the liquid inside the pulp chamber and inside the radicular channel(s) of the tooth, thus completely cleansing this cavity and these channels.

4,993,948

APPLICATOR FOR DENTAL MATERIAL

Frederick J. Cameron, 59 Maywood Dr., San Rafael, Calif. 94901, and Carl L. Cranke, 31403 NE. 152nd Ave., Battleground, Wash. 98604

Filed Oct. 30, 1989, Ser. No. 428,966
Int. Cl.[5] A61C *5/04*
U.S. Cl. 433—90 **5 Claims**



1. An applicator for dental material comprising:
a. a cylindrical body adapted to receive a semi-fluid charge;
b. a nozzle on one end of said cylindrical body and communicating therewith;
c. a piston plunger reciprocable in said cylindrical body for displacing said charge from said cylindrical body to flow through said nozzle;
d. a spring;
e. means for mounting said spring in said body for engagement with said piston plunger;
f. a removable cap mounted on the other end of said body and engageable with said spring for holding said spring in an initially compressed state to displace said piston plunger toward said nozzle;
g. a flow controlling valve in said body between said piston plunger and said nozzle and movable between one position allowing said flow and another position blocking said flow; and,
h. means connected to said valve and disposed outside said nozzle in position to be operated by a person holding said cylindrical body for moving said valve between said one position and said other position.

4,993,949

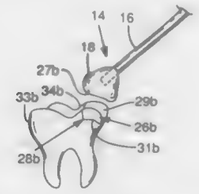
METHOD FOR HANDLING SMALL OBJECTS

Sheryl L. Hill, 14830 SW. Farmington Rd., Beaverton, Oreg. 97007

Filed Jan. 19, 1990, Ser. No. 467,644
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—141 **5 Claims**

1. A method for placing an object in a predetermined location inside a dental patient's mouth, comprising:
(a) providing an elongate handle having a straight terminal portion, said straight terminal portion being surrounded by a lump of plastically deformable nonhardening adhesive material;
(b) shaping said adhesive material to form a forward bonding surface that fits within the available surface area of said object requiring placement, while being of sufficient size to adhere to and lift said object;

(c) thereafter pressing said forward bonding surface against said object with sufficient force and for a sufficient time to attach said object thereto; and



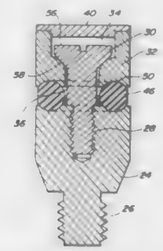
(d) manipulating said handle so as to place said object in a predetermined location inside the patient's mouth.

4,993,950

COMPLIANT KEEPER SYSTEM FOR FIXED REMOVABLE BRIDGEWORK AND MAGNETICALLY RETAINED OVERDENTURES

Merrill C. Mensor, Jr., 11670 St. Bernard, Tahoe-Donner, Truckee, Calif. 95737

Continuation of Ser. No. 209,324, Jun. 20, 1988, abandoned. This application Jul. 13, 1990, Ser. No. 554,151
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 **18 Claims**



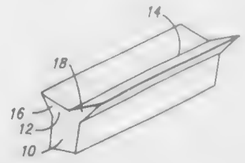
1. A dental connector adapted to be secured to an implant fixture embedded in a patient's jaw bone or tooth root, for providing support to a denture or overdenture attached to the connector, the connector comprising:
a transmucosal cuff adapted to be removably secured to the implant fixture, the cuff including a threaded portion;
a keeper member having an internal bore through which a screw extends, the screw engaging the threaded portion on the cuff to secure the cuff and the keeper member together, and cuff and keeper member having opposed annular concave grooves with the cross-sectional surfaces of said grooves following a circular arc;
a resilient O-ring disposed between the cuff and the keeper member and within the annular grooves thereof, the O-ring acting as means for absorbing forces transmitted by the keeper member to the cuff and as means for permitting limited but substantially universal motion between the keeper member and the cuff, thereby cushioning the underlying implant fixture, bone or tooth root from forces transmitted by the denture or overdenture, the surfaces of the annular grooves in the cuff and keeper member being in intimate contact with the O-ring as the keeper member is moved relatively to the cuff; and
means included in the keeper member for removably connecting an overlaying denture including a false tooth, to the keeper member.

4,993,951

CERAMIC BODY FOR A PRE-DRILLED TOOTH CAVITY

Dieter Schumacher, Bessler Strasse 5, 2370 Readsburg, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 288,092
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3743433
Int. Cl.[5] A61C *5/04*
U.S. Cl. 433—226 **7 Claims**



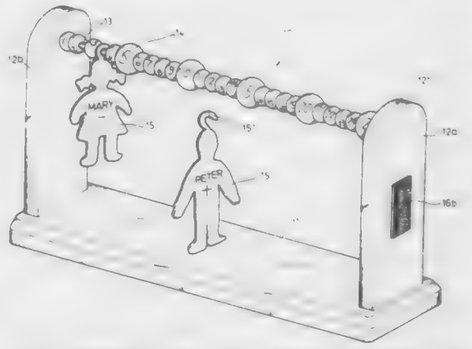
1. A ceramic body having two end walls made for filling a predrilled cavity in a decayed especially caries-ridden, tooth, comprising a roughly beam-shaped, tapered, blunt wedge-shaped, downward-pointing segment and an upward-pointing dove-tailed extension segment with an obtuse-angled notch forming a fissure in the upper surface of the body.

4,993,952

ARITHMETIC COUNTER

Cheng-Siung Yeh, Taipei, Taiwan, assignor to Lucky Star Enterprise Co., Ltd., Taipei, Taiwan

Filed Oct. 30, 1989, Ser. No. 429,070
Int. Cl.[5] G09B *1/00*
U.S. Cl. 434—191 **1 Claim**



1. An arithmetic counter, comprising: an upstanding U-shaped support structure that includes a base and two horizontally spaced vertical panels; a horizontal rod extending between said panels above said base; a plural number of annular beads slidably arranged on said rod for movement therealong; said beads having numbers thereon denoting the location of each bead in relation to the other beads; the numbers on the beads being consecutive, beginning with number 1 on the bead nearest one of said panels and increasing one integer for each succeeding bead, so that the highest number appears on the bead nearest the other panel; and at least one marker board adapted to be hung vertically from the rod in the space between any two adjacent beads; each marker board having two flat parallel major faces defining the major plane of the marker board; each board having a hook portion within its major plane for releasable engagement on the rod at any point therealong; each said marker board being adapted to serve as a visible separator between beads when selected numbers of beads are moved along the rod during the process of adding or subtracting numbers; and further comprising means for storing each

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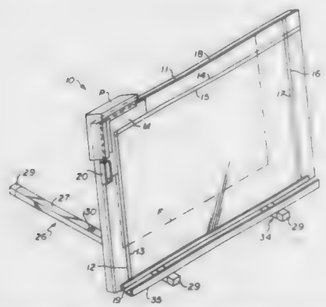
said marker board flat against a major face of one of said vertical panels; said storing means comprising a first patch of fibrous material permanently attached to a marker board, and a second patch of fibrous material permanently attached to the associated panel; one of said patches being formed of a fibrous miniature hook material, and the other patch being formed of a fibrous miniature loop material such that when the two patches are facially engaged the miniature hooks interlock with the miniature loops.

4,993,953

DISPLAY HOLDER FOR FRAME AND MAT SELECTION

Linda C. Stein, 1139 Ivy Wall Dr., Houston, Tex. 77079

Filed Oct. 23, 1989, Ser. No. 425,680
Int. Cl.[5] G09B *25/00*
U.S. Cl. 434—365 15 Claims



1. Apparatus for displaying proposed arrangements of pictures, artwork, mats, picture frames, and the like comprising;

a base support,

a square cornered generally rectangular display base of uniform cross section pivotally connected to said base support and having a series of guide lines on the front surface thereof at predetermined locations to aid in placing flat materials such as mat corner samples, artwork, posters, photographs, and the like at predetermined locations on said display base,

inclination adjustment means operatively connected between said display base and said base support for positioning said display base at selective angle relative to a vertical plane,

a square cornered generally rectangular cover/holding member formed of rigid transparent plastic material pivotally connected at its bottom end to the bottom end of said display base and sized to substantially cover the front surface of said display base with its corners aligned with the corners of said base, and

one or more clip members on said cover/holding member for releasably securing flat materials such as mat samples firmly against said cover/holding member, whereby

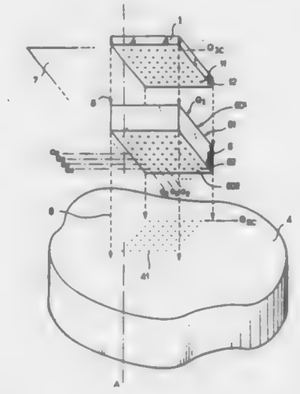
flat materials to be displayed may be placed on the front surface of said display base and said transparent cover/-holding member closed thereon and sample mat materials secured on the front surface of said cover/holding member and the assembled display pivotally raised an supported at a selective angle relative to a vertical plane and sample picture frame materials placed on the corners of said display base and cover/holding member an extension member connected with said base support and having a horizontal support member moveably positioned at selected distances in front of the bottom edge of said cover/-holding member for receiving and supporting flat and three dimensional materials in front of said cover/holding member.

4,993,954

DEVICE FOR INTERCONNECTION BETWEEN AND INTEGRATED CIRCUIT AND AN ELECTRICAL CIRCUIT

Michel Prevost, Le Plessis-Robinson, France, assignor to Thomson-CSF, Puteaux, France

Filed Jul. 6, 1989, Ser. No. 375,979
Claims priority, application France, Jul. 13, 1988, 88 09547
Int. Cl.[5] H05K *3/30*
U.S. Cl. 439—68 10 Claims



1. A device for interconnection between an integrated circuit (IC), having contact zones arranged on an active face, and an electrical circuit (EC) having a surface substantially parallel to the active face of the IC, where connection points are located, said device connecting contact zones of the IC and connection points of the EC and comprising at least one platelet of a first type, made of an electrically insulating material and having a first and a second parallel faces, said device being placed between the active face of said IC and said surface of said EC and said platelet comprising:

contact zones on said first face located in front of said IC, said contact zones being arranged in front of the contact zones of said IC;

contact zones on said second face located in front of said EC, said contact zones of said second face being arranged in front of said connection points of said EC, said contact zones of said first and second faces having a size between that of the contact zones of the IC and that of the connection points of the EC; and

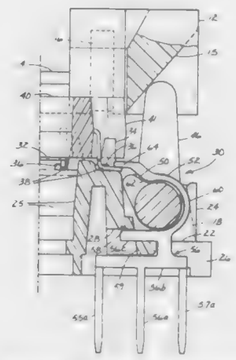
internal means for providing electrical contact between the contact zones of said first face and the contact zones of said second face, said internal means including for each contact zone of said first face a fusible electricity conducting channel without an offset and at least one fusible electricity conducting channel with an offset, said offset taking place in a pre-fixed direction parallel to said first and second faces, within a given platelet, a selected conduction route being established between each contact zone of said first face and one contact zone of said second face by burning out all the fusible channels connected to said each contact zone but one; said device further comprising assembling means for providing electrical contact between the contact zones of said IC and the contact zones of said frst face, on the one hand, and between the contact zones of said second face and the connection points of said EC on the other hand.

4,993,955

TOP-LOAD SOCKET FOR INTEGRATED CIRCUIT DEVICE

John A. Savant, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 8, 1990, Ser. No. 490,458
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—73 16 Claims



1. A socket assembly for use with an integrated circuit device having a plurality of contact points arranged along at least one side of the device, said assembly comprising:

a support frame having a generally rectangular configuration and spacer means along at least one side for receiving a plurality of contact elements,

a plurality of generally planar contact elements disposed in spaced parallel relationship along said at least one side of said frame, each contact element comprising a connecting portion for making connection with an external electronic member, anchor means for anchoring each said contact element to said frame, contacting means for making resilient pressure contact with a said integrated circuit device, and means affording movement of said contacting means from a first normal unflexed position to an open position for receiving a said integrated circuit device and to an operative position in pressure electrical contact with a said integrated circuit device,

cam means positioned along said at least one side of said frame and supported by said frame for engaging said contact elements to urge said contacting means thereof from said normal position to said open position, and

a guide member supported for movement from a first position to a second position in relationship to said frame, said guide member having cam surface means on said guide member for cooperatively engaging said cam means for moving said contact elements to said open position upon movement of said guide member from said first position to said second position and to release said contact elements upon movement thereof back toward said first position in relationship to said frame.

4,993,956

ACTIVE ELECTRICAL CONNECTOR

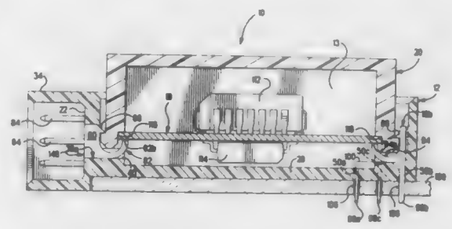
Charles S. Pickles, Hummelstown, and Mansour Zarreii, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1989, Ser. No. 430,230
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—76 2 Claims

1. An electrical connector comprising:

an insulating housing having an outwardly open cavity defined by front, rear and side walls and a floor, said cavity adapted to receive a printed circuit board therein with the plane of the board being parallel to said floor;

a plurality of conductive contact element disposed adjacent front and rear walls in said housing and having electrical engaging means extending outwardly therefrom for electrically engaging other electrical means and further having contact beams positioned in said cavity for electrically engaging respective conductive pads on opposing edges



on a printed circuit board which may be removable but placed in said cavity; and

a cover, removably placed on said housing to cover said cavity with cooperating means on said contact elements and on said cover for removably latching said cover to said housing.

4,993,957

CONTACT PIN

Katsuhide Shino, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1989, Ser. No. 394,744
Claims priority, application Japan, Aug. 17, 1988, 63-204177
Int. Cl.[5] G01R *31/02*
U.S. Cl. 439—86 5 Claims

1. In a probe-type contact pin comprising an end tip which is to be brought into contact with a terminal disposed on a circuit card. for the transmission of an electric signal through said terminal,

said, end tip consists of an elastic body which has a spherical shape and is electrically conductive.

4,993,958

HIGH DENSITY PLANAR INTERCONNECT

Douglas W. Trobough, and Mark B. Trobough, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 23, 1990, Ser. No. 527,396
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—91 22 Claims

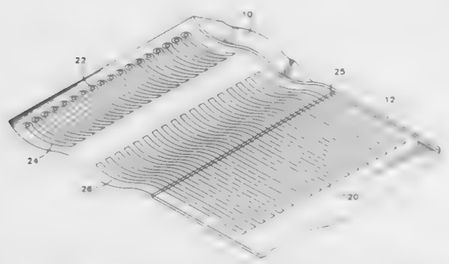
1. A connector comprising:

an elastomeric member having a lower surface and an upper surface, the lower surface having a first convex region at one end, a second convex region at the other end, and a concave region in a middle joining the first and second convex regions, and the upper surface having a convex region in the middle so that the upper surface in the convex region of the upper surface is approximately parallel to the concave region of the lower surface, the upper

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surface also having two end regions opposite the first and second convex regions;

a conductive run disposed below the lower surface of the elastomeric member; and



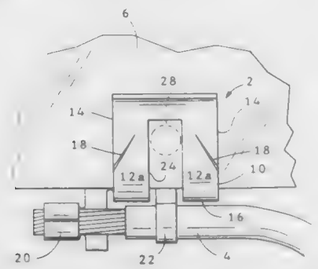
means for applying pressure downward on the upper surface of the elastomeric member to deform the elastomeric member and cause the first and second regions of the lower surface of the elastomeric member to move outwardly, thus creating a wiping contact between the conductive run and a mating surface.

4,993,959

GROUNDING CLIP

Kurt A. Randolph, Etters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 19, 1990, Ser. No. 467,817
Int. Cl.[5] H01R *4/18, 11/22*
U.S. Cl. 439—92 7 Claims



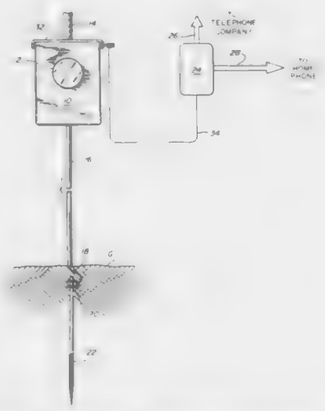
1. A grounding clip for forming an electrical interconnection between a ground wire and an electrically conductive panel, the grounding clip comprising a stamped and formed member having a U-shaped section with opposed walls extending from a bight; tines protruding inwardly from each wall for gripping the panel; a wire contact section for establishing an electrical interconnection with the ground wire, and a strain relief arm extending from one said wall on the side of the bight opposites said walls, the other said wall having a slot from which the strain relief arm is formed, and wherein the free ends of the tines are inclined relative to the walls and extend toward the bight, the tines having a greater retention force when subjected to a straight pull exerted on the U-shaped section than when subjected to a force tending to impart rotation to the U-shaped section.

4,993,960

GROUNDING SYSTEM AND CLAMP

George J. Franks, Jr., Inverness, Ill.

Continuation-in-part of Ser. No. 116,899, Nov. 3, 1987, Pat. No. 4,828,504. This application Jun. 9, 1988, Ser. No. 204,397
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—92 22 Claims



1. A system for grounding a telephone system and an electrical power system, comprising:

an electric utility box for the electrical power system;

a ground mechanism;

a first electrical conductor connecting the ground mechanism to the utility box for electrically grounding the utility box;

a clamping device connected to the utility box and having securing means for penetrating the outer surface of the utility box without penetrating the inside of the utility box; and,

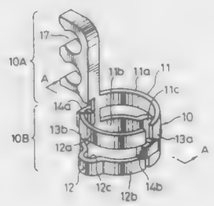
a second electrical conductor for connecting the clamping device to a ground connection for the telephone system, whereby the ground mechanism for the electrical power system serves the dual purpose of grounding the telephone system.

4,993,961

IGNITION PLUG SOCKET

Masahiro Hisatomi, Kanagawa, and Mitsuyasu Tanaka, Shizuoka, both of Japan, assignors to Nissan Motor Co., Ltd. and Yazaki Corporation, both of, Japan

Filed Mar. 1, 1990, Ser. No. 486,935
Claims priority, application Japan, Mar. 3, 1989, 64-24398[U]
Int. Cl.[5] H01R *13/72*
U.S. Cl. 439—125 8 Claims



1. An ignition plug socket and card clamp combination, comprising:

(a) a plug socket body;

(b) a high tension cord clamp member removably attached to said plug socket body, said high tension cord clamp member having:

(1) at least one cord clamp portion formed with at least one cord holding cutout portion;

(2) a two-part separable cord clamp mounting portion formed integral with said at least one cord clamp portion; and

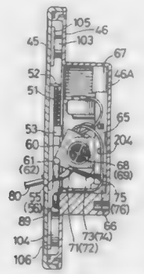
(3) locking means for locking said two-separable cord clamp mounting portion mounted on said plug socket body.

4,993,962

CLOSED TYPE CONNECTING BLOCK

Minoru Noda; Junji Nomura, and Shinji Sakamoto, all of Inazawa, Japan, assignors to Tomei Tsushin Kogyo Co., Ltd., Inazawa, Japan

Filed Aug. 13, 1990, Ser. No. 566,966
Claims priority, application Japan, Aug. 18, 1989, 1-213845; Mar. 20, 1990, 2-71432
Int. Cl.[5] H01R *13/44*
U.S. Cl. 439—136 15 Claims



1. A connecting block for electrically connecting communication equipment to communication line, of the closed type which prevents entry of moisture, salty moisture, corrosive gases and the like when said connecting block is either in use or not in use, comprising:

a housing including a housing body and a covering member sealingly engageable with said housing body, said covering member having an opening of a size to permit insertion of a plug connected to a cord from the communication equipment;

a shutter for closing and opening said opening:

a jack electrically connected to the communication line and having a plug insertion opening;

said shutter and said covering member each having a notch contoured to the outer configuration of the cord so that the cord is tightly secured between said notches when said shutter is shifted to a first position to close said opening under the condition that said plug is inserted into said plug insertion opening of said jack;

a first resilient member biasing said shutter toward the first position to close said opening;

jack support members pivotably supporting said jack;

second resilient members biasing said jack toward the first position;

first engaging members mounted on said shutter; and

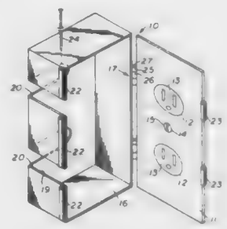
second engaging members mounted on said jack and adapted to engage said first engaging member, wherein said first engaging members are engaged with said second engaging members to pivot said jacks against the biasing force of said second resilient members so that said plug insertion opening is faced to said opening of said covering member in parallel relation when said shutter is shifted toward a second position to open said opening against the biasing force of said first resilient member, and wherein said jack is pivoted with the aid of the biasing force of said second resilient members so that said plug insertion opening of said jack is inclined toward the first position when said shutter is shifted toward the first position with the aid of the biasing force of said first resilient member.

4,993,963

PROTECTIVE COVER FOR ELECTRIC SOCKETS

William S. Pedigo, 15158 Sheffield Terrace, Channelview, Tex. 77530

Filed Nov. 9, 1989, Ser. No. 434,976
Int. Cl.[5] H01R *13/44*
U.S. Cl. 439—142 9 Claims



1. A protective cover assembly for electric sockets of the type having plug receptacles, a cover plate fitting over the receptacles, and a screw holding the cover plate thereon, comprising:

a base plate of an insulating material having openings adapted to fit said electric receptacles and an opening for receiving a mounting screw,

a mounting screw adapted to fir said mounting screw opening to secure said base plate in place of said socket cover plate,

a box-shaped cover of an insulating material having a front wall, top and bottom walls, and opposed side walls,

hinge means on one side wall of said box-shaped cover and said base plate for hingedly supporting said box-shaped cover on one side of said base plate,

said box-shaped cover being openable to permit installation and removal of electric plugs in said receptacles,

said insulated, box-shaped cover having laterally spaced apart slots extending transversly along the other side wall and approximately half way across the top wall thereof through which cords may extend from plugs secured in said electric receptacles, and

fastening means on said base plate and said box-shaped cover on the side opposite said hinge means for securing said box-shaped cover against being easily opened by a child.

4,993,964

ELECTRICAL CONNECTOR ENVIRONMENTAL SEALING PLUG

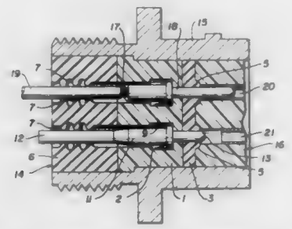
Richard O. Trummer, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 18, 1989, Ser. No. 339,693
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—272 5 Claims

1. An environmental sealing plug for an electrical connector including a connector plug portion having a shell containing a dielectric insert having pin contact receiving cavities, a rubber gasket mounted in the shell at the forward end of the insert, apertures in said gasket aligned with said insert cavities, conical projections provided on said gasket surrounding said apertures, and a rear elastomeric grommet having annular sealing ribs mounted in said shell at the opposite end of said insert, the sealing plug comprising, a dielectric plug mounted in said pin contact receiving cavity, said plug having a shank portion extending through said grommet, and a pin portion extending

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a short distance outwardly of the gasket through said apertures, to thereby maintain the rigidity of the conical projection



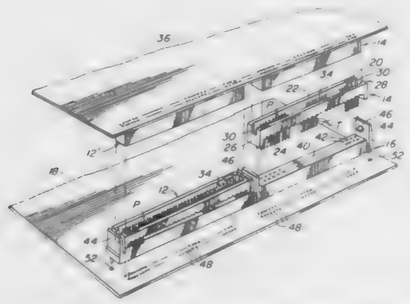
on the gasket to optimize the seal between the mated plug portion and a receptacle portion of the connector.

4,993,965

SUPPORT FOR FLOATED HEADER/CONNECTOR

Michael P. Eck, Wellsville, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 192,473, May 10, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 438,960
Int. Cl.[5] H01R *13/64*
U.S. Cl. 439—374 19 Claims



1. A system for mounting a connector or header to a circuit board substrate, comprising:

a connector body having a plurality of electrical contacts and corresponding tail portions extending therefrom, said connector body and electrical contacts connectable with a mating connector body and said tail portions mountable through holes in a circuit board substrate;

a support member adapted for mounting on a surface of said substrate, said support member having a solid base provided with a plurality of tapered through openings wider at one end than the other end and aligned with the holes of said circuit board substrate, said wider end accepting and guiding said tail portions to and through said substrate holes, the through openings each having an axial length dimension and having a minimum transverse dimension at said other end larger than the corresponding transverse dimension of the tail portion to define a clearance space sufficient to accommodate yielding of the tail portions in response to a lateral movement of said connector body relative to the substrate in response to a laterally directed force;

means for retaining the connector on said base, and

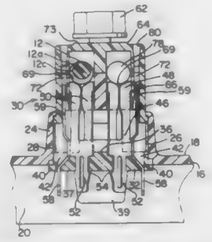
first and second walls extending from said base and spaced from opposite ends of the connector body, said body thereby being free to move both laterally and longitudinally on said base.

4,993,966

ELECTRICAL CONNECTOR BLOCK

Sidney Levy, Belle Mead, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Apr. 27, 1990, Ser. No. 515,796
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—411 14 Claims



1. An electrical connector block for electrically connecting plural pairs of conductors of a multiconductor cable to plural pairs of drop wires comprising:

an elongate terminal block housing having a planar surface and plural discrete apertures extending therethrough; and

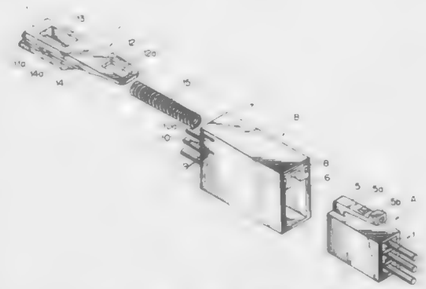
a plurality of identical electrical terminal modules, one module of said plurality insertably mounted in each aperture of said terminal block housing, each terminal module including means for electrically interconnecting one pair of said plural paris of conductors of said multiconductor cable to one pair of said plural pairs of drop wires.

4,993,967

ELECTRIC CONNECTOR WITH A DOUBLE LOCKING MECHANISM

Mitsuru Matsumoto, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 538,341
Claims priority, application Japan, Jul. 3, 1989, 1-169846
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—489 3 Claims



1. An electric connector with a double locking mechanism, comprising:

a first connector housing;

a second connector housing to be mated with the first connector housing;

primary locking means provided between said first connector housing and said second connector housing to lock said first connector housing and said second connector housing when said first connector housing and said second connector housing are fully engaged;

a locking slider mounted on said second connector housing slidably in axial directions and biased rearwardly, said locking slider being adapted to be temporarily latched to said second connector at a first position; and

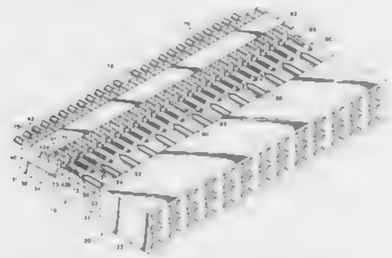
secondary locking means for locking said locking slider to said first connector housing at a second position forwardly of said first position when said first connector housing and said second connector housing are fully engaged.

4,993,968

ECONOMICAL CONNECTOR SYSTEM FOR AN ARRAY OF CONDUCTORS

Alex W. Guletsky, Tualatin, and Scott S. Corbett, III, Lake Oswego, both of Oreg., assignors to Precision Interconnect Corporation, Portland, Oreg.

Filed Mar. 2, 1989, Ser. No. 317,772
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—492 25 Claims



1. An apparatus for terminating conductors having respective elongate contact portions comprising:

(a) a connector body having spaced-apart terminals, said terminals including generally planar contact areas arranged in a common plane in separated, side-to-side relation to each other;

(b) retainer means on said connector body and separate from said terminals for accepting said conductors and for holding each conductor by separate frictional engagement in substantially parallel, separated, side-to-side relation to each other so that the side-to-side separation between respective conductors is established by said retainer means and corresponds to the side-to-side separation between respective ones of said contact areas of said spaced-apart terminals and so that said contact portions are connectible with said contact areas while said retainer means maintains said contact portions in substantially parallel relation to said common plane of said contact areas.

4,993,969

ELECTRICAL CONNECTOR ASSEMBLY

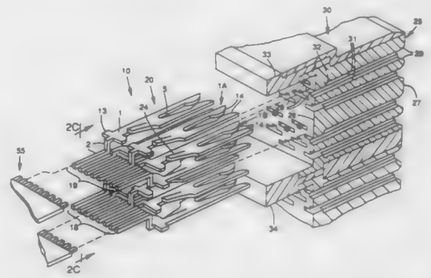
Michael K. Cabourne, Santa Ana, Calif., assignor to Precision Interconnect Corporation, Portland, Oreg.

Filed Jul. 11, 1989, Ser. No. 378,079
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—499 30 Claims

1. An electrical connector assembly including a plurality of contacts, detachably engageable with a mating multiconductor assembly, and a plurality of terminals occupying different positions in an imaginary plane defined by a first axis and a second axis mutually perpendicular to each other, said connector assembly comprising:

(a) a series of at least four of said contacts each spaced at a different distance from said second axis along a direction parallel to said first axis, at least some of said contacts being offset from each other by respective distances parallel to said second axis; and

(b) a series of at least four of said terminals, each coupled to a respective one of said contacts, having corresponding portions spaced apart at different positions in substantial alignment along an imaginary line which extends parallel



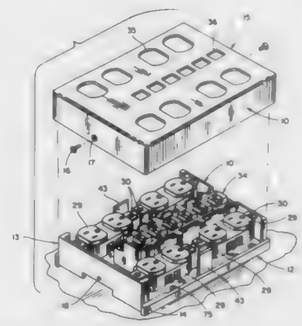
to said second axis and which substantially bisects said series of contacts.

4,993,970

MULTIPLE FUNCTION ELECTRICAL OUTLET AND ELECTRICAL DISTRIBUTION SYSTEM UTILIZING THE SAME

Gary L. Littrell, 302 Timbercrest Ct., Schaumburg, Ill. 60193

Filed Sep. 1, 1989, Ser. No. 402,488
Int. Cl.[5] H01R *13/60*
U.S. Cl. 439—535 20 Claims



1. In combination, a multiple function electrical outlet and electrical distribution device for attachment to a floor and electrical duplex receptacles and jacks, the improvement comprising a plate-like base, a plate-like floor fitting, the said plate-like fitting having pivot means pivotally connecting said plate-like floor fitting to said plate-like base, the plate-like base and the plate-like fitting being shaped in such a way that the plate-like fitting is pivotally movable into and out of nested superimposed engagement with said plate-like base, the plate-like base having an enlarged base opening for receipt of electrical circuit lines there through, the plate-like floor fitting having an elongated centrally located fitting opening vertically aligned with said base opening, the fitting opening being peripherally bounded by a U-shaped upright fitting wall dividing the plate-like floor fitting into a low tension central compartment and a peripheral high tension compartment located at the outside perimeter of the U-shaped upright fitting wall, upright receptacle support posts positioned at spaced intervals in said peripheral compartment, Chase nipples for securing said plate-like base to a floor, notch means in said floor fitting accommodating heads of said Chase nipples providing clearance for said Chase nipples thus allowing said floor fitting to lie flat-wise upon said plate-like base, said electrical duplex receptacles being attached to said receptacle support posts and being positioned in said peripheral compartment and being isolated from

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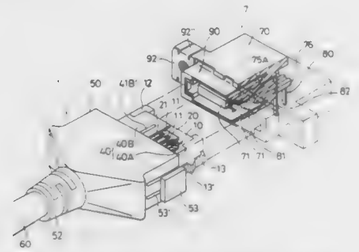
said central compartment by said U-shaped upright fitting, a jack holder plate mounted on said U-shaped upright fitting wall, means securing said jack holder plate to said U-shaped upright fitting wall, the jack holder plate having longitudinally spaced jack openings for receipt of jacks, said jacks being secured in said jack openings in said jack holder plate, and a dish-shaped floor fitting cover telescopingly mounted over said plate-like base and said plate-like floor fitting for protectively encasing and shielding the same, the dish-shaped cover having a series of cover openings aligned with said duplex receptacles and said jacks when mounted over said plate-like fitting thus exposing them exteriorally of the floor fitting cover for ready access thereto.

4,993,971

EMI RESISTANT ELECTRICAL CONNECTOR

Shuichi Matsuzaki, and Shigeru Kikuta, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 315,583, Feb. 27, 1989, abandoned. This application Apr. 2, 1990, Ser. No. 503,138
Claims priority, application Japan, Mar. 7, 1988, 63-53288
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—607 **5 Claims**



5. A thin electromagnetic interference resistant electrical connector consisting of a thin electrical plug and a thin electrical receptacle for mounting on a planar panel or printed circuit board,

said electrical plug comprising:

a low insulating housing having a pair of low side walls and a floor portion extending between said side walls to define a fitting cavity, said low side walls extending substantially up to a front end of said floor portion;

a plurality of first contact elements arranged on a surface of said floor portion such that their contact sections are exposed in said fitting cavity;

first shield plate means provided on the other surface of said floor portion extending forwardly substantially up to said front end of said floor portion for supporting said insulating housing; and

second shield plate means extending forwardly above said contact sections substantially up to said front end of said floor portion to cover said fitting cavity; and

said electrical receptacle comprising:

a substantially rectangular, low insulating housing having a pair of retention columns extending forwardly from a front end thereof and contact support plate means extending forwardly beyond said front end substantially up to front ends of said retention columns;

a plurality of second contact elements arranged on said contact support plate means such that their contact sections are exposed in said fitting cavity so that they come into contact with first contact elements when said electrical plug and receptacle are joined, and

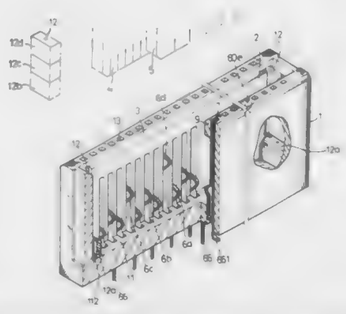
a shield means having an upper surface, low side walls, and a lower surface to define a substantially rectangular fitting section fitted over said retention columns and a first flat section extending rearwardly from said upper surface in a close relation to said contact support plate means and a second flat section extending rearwardly from said lower surface in an opposed relation to said second contact sections such that when both said electrical plug and receptacle are connected to each other, said first and second contact sections are brought into contact with each other in said fitting cavity, and said first and second shield plate means are brought into contact with said first flat section between said first flat section and said contact support plate means and said second flat section of said shield means respectively.

4,993,972

MULTI-PURPOSE PC BOARD CONNECTOR

Yu C. Lin, 2Fl., No. 12, Lane 121, Lihsing Rd., Sec. 2, Sanchung, Taiwan

Filed Feb. 7, 1990, Ser. No. 476,351
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—637 **6 Claims**



1. A multi-purpose PC board connector for use with dielectric panels wherein the panels have parallel elongated conductive strips extending therealong: said connector comprising a dielectric body having an exposed face presentable to an edge of a panel, and a panel-reception groove extending from said exposed face into the dielectric body; said groove being defined by a groove bottom wall, two longitudinal side walls extending from said bottom wall, and two transverse end walls extending from the bottom wall at opposite ends of the side walls; a plural number of parallel conductive spring elements mounted in said body so that each spring element extends within one of the groove side walls normal to the groove bottom wall; each spring element having an electrical contract portion thereof projecting beyond the plane of the groove side surface into the groove space, whereby insertion of a panel into the groove causes the conductive strips on the panel to engage the contact portions of the spring elements;

said conductive spring elements including a first group of elements having their contact portions spaced a relatively small distance from the groove bottom wall, a second group of elements having their contact portions spaced a second intermediate distance from the groove bottom wall, and a third group of elements having their contact portions spaced a third relatively great distance from the groove bottom wall; two facing guide slots (12) formed in the groove side walls in close proximity to each groove end wall, each guide slot extending from the groove bottom wall to said exposed face of the dielectric body; and at least one spacer pad adapted for removal disposition within said groove at each groove end wall; each spacer pad having two laterally projecting guide ribs extending in opposite directions for slidable accommodation in said facing guide slots, whereby when a dielectric panel is inserted into the groove a transverse edge of the panel will strike the spacer pads at opposite ends of the groove; said spacer pads including multiple sets of pads having thickness selected to vary the insertion length of the panel into the groove, such that the conductive strips on the panel

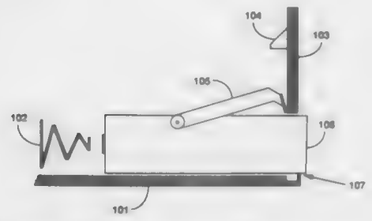
are in contact with all three groups of spring elements, or only the second and third groups of spring elements, or only the third group of spring elements.

4,993,973

BATTERY CONTACT

George J. Selinko, Lighthouse Point, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1989, Ser. No. 439,054
Int. Cl.[5] H01R *19/00*
U.S. Cl. 439—627 **12 Claims**



1. A housing for receiving an energy source having first and second ends comprising:

a chamber for receiving said energy source in a first direction;

a first contact positioned in said chamber and coupled to said housing for applying a force in a direction substantially opposite to said first direction when electrically contacting said first end of said energy source.

retaining means having a second electrical contact for contacting said second end of said energy source said retaining means being rotatably positioned in said chamber and coupled to said housing for securing said energy source in said chamber and to prevent said force from being applied to a door means, and

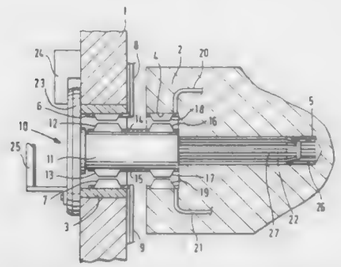
said door means for enclosing said chamber, said first contact, and said retaining means.

4,993,974

ELECTRICAL CONNECTOR ELEMENT FOR ORBITAL STATIONS

Manfred Baune, Hassendorf, Fed. Rep. of Germany, assignor to Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Apr. 30, 1990, Ser. No. 516,208
Claims priority, application Fed. Rep. of Germany, May 2, 1989, 3914511
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—628 **14 Claims**



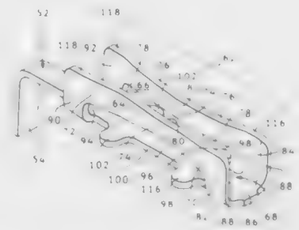
1. An interconnecting electrical system comprising a first structure having a first wiring system connected to a first set of contact elements in a first receptacle, a second structure having a second wiring system connected to a second set of contact elements in a second receptacle, a removable junction element comprising a third set of contact elements and a fourth set of contact elements each connected to one of the third set, said first, second, third and fourth contact sets being structurally arranged such that, when the junction element is placed in the first and second receptacles, the first and third sets of contact elements and the second and fourth sets of contact elements are interconnected respectively thereby interconnecting the first and second wiring systems of the first and second structures.

4,993,975

ELECTRICAL CONNECTOR AND TAPERED FIXED BEAM CONTACT THEREFOR

John C. Asick, Harrisburg; George H. Douty, Mifflintown; James S. Staron, Halifax, and Thomas J. Zola, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 7, 1989, Ser. No. 376,729
Int. Cl.[5] H01R *13/42*
U.S. Cl. 439—751 **24 Claims**



1. A receptacle contact adapted to be received in a contact receiving passage of a connector housing, comprising:

first and second base members;

a first support member, said first support member having a first end integral with the first base member and a second end formed normal thereto;

a second support member, said second support member having a first end integral with the second base member and a second end formed normal thereto;

a first tapered fixed beam, said first tapered fixed beam having a first end integral with the second end of the first support member and a second end integral with the second end of the second support member, said beam tapering to narrow from proximate the second end of each of said first and second support members to a midpoint, said beam formed inwardly toward an axis of the contact between said first and second support members; and

a central rib extending between and integral with the first and second base members, said central rib having a first pair of interference protrusions at a first location along the central rib, the first pair of interference protrusions defining a predetermined tip-to-tip distance adapted to engage side walls of a contact receiving passage upon insertion of the contact into a contact receiving passage, said central rib having a second pair of interference protrusions spaced along said central rib from said first pair of interference protrusions, said second pair of interference protrusions defining a tip-to-tip distance that is greater than the predetermined tip-to-tip distance of said first pair of interference protrusions.

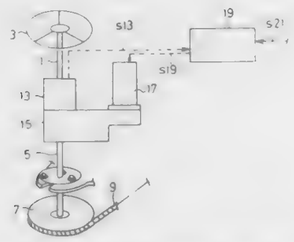
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4,993,976

STEERING SYSTEM FOR OUTBOARD MOTOR

Katsukuni Kabuto, Aichi; Fumikazu Sugimoto, Gifu; Kasataka Kase, Kawasaki, and Manabu Yamada, Gifu, all of Japan, assignors to Kayaba Industry Co. Ltd., Japan

Filed May 8, 1990, Ser. No. 520,788
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—53 4 Claims



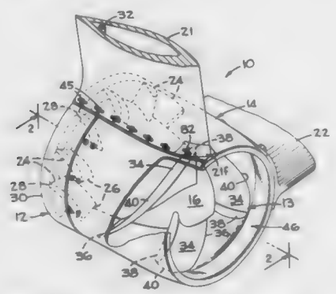
1. A steering system for an outboard motor comprising:
an input shaft;
a steering wheel mounted on said input shaft;
an output shaft;
a drum which is mounted on said output shaft and on which a cable is wound, said cable being connected at the distal end thereof to the outboard motor;
a torque sensor arranged between said input shaft and said output shaft to detect steering torque supplied through said steering wheel thereto, to thereby generate a detection signal;
an electric motor for generating an output for said output shaft;
a speed reducer for reducing the speed of said output of said electric motor to feed said output reduced to said output shaft; and
a control device for generating a control signal depending upon said detection signal generated from said torque sensor and feeding it to said electric motor to cause said output of said electric motor to correspond to said steering torque.

4,993,977

WATER JET PROPULSION MODULE

Waldo E. Rodler, Jr., San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 21, 1989, Ser. No. 369,179
Int. Cl.[5] B63H *1/16*
U.S. Cl. 440—67 20 Claims



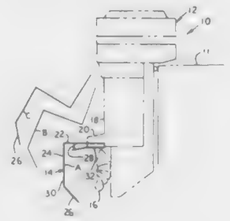
1. A water jet propulsion module comprising:
means defining an outer stator housing generated about a central axis and having an inlet end with a parabolic inner surface, an outlet end and a truncated conically shaped inner surface terminating in a conical inner stator surface at said outlet end;
means defining an impeller having a plurality of impeller blades secured to a rotatable generally parabolic impeller diffusion cone disposed within and closely adjacent to said truncated conically shaped inner surface of said stator housing;
means defining an annular inner stator wall having an outer surface closely adjacent to said generally parabolic impeller diffusion cone with said outer surface shaped as a continuation of the surface of said generally parabolic impeller diffusion cone;
means defining a plurality of spaced stator vanes secured between a portion of said outer stator wall and said inner stator wall adjacent said outlet end; and
power means secured to said inner stator wall and having a shaft operatively connected to said impeller means for driving said impeller means.

4,993,978

BOAT MOTOR REFLECTOR

John T. Johannes, 211 Meade, Erie, Pa. 16509

Filed Mar. 12, 1990, Ser. No. 491,737
Int. Cl.[5] G02B *5/12*
U.S. Cl. 440—71 4 Claims



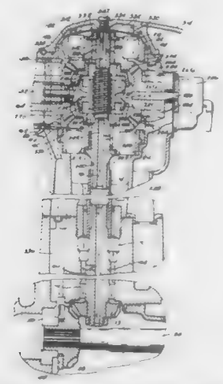
1. In combination, an outboard motor adapted to be supported on a boat to be trailered and a reflector member,
said outboard motor having a drive train housing supported on said outboard motor,
a propeller supported on said motor below said drive train housing,
an upper rearwardly extending housing member and a lower rearwardly extending housing member fixed to said drive train housing,
said reflector member comprising an upper plate part, an intermediate plate part, and a lower plate part,
said upper plate part extends generally perpendicular to said intermediate plate part and underlies said upper rearwardly extending housing member,
said upper plate part disposed between said upper rearwardly extending housing member and said lower rearwardly extending housing member,
clamping means disposed below said upper plate part urging said upper plate part into clamped relation with said upper rearwardly extending housing member whereby said reflector member is supported on said intermediate plate part in a generally vertical position and said lower plate part extends downwardly and forwardly when said outboard motor is in its normal position on said boat and whereby said lower plate part is disposed generally vertical when said outboard motor is swung rearwardly and upwardly to a position for trailering said boat.

4,993,979

MARINE PROPULSION DEVICE

Gerald F. Bland, Glenview; James c. Kantola, Waukegan; Martin J. Mondek, Wonder Lake, and Lawrence E. Zdanowicz, Waukegan, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 12, 1989, Ser. No. 351,441
Int. Cl.[5] B63H *23/04*
U.S. Cl. 440—75 25 Claims



1. A marine propulsion device comprising a gear housing adapted to be mounted on the transom of a boat, first bearing means supported by said gear housing, a first gear which is rotatably supported by said first bearing means and which is adapted to be driven by an engine, a vertical drive shaft having a lower end, second and third bearing means supported by said gear housing, second and third gears which mesh with and are driven by said first gear and which are respectively supported by said second and third bearing means for rotation relative to said vertical drive shaft, clutch means for causing selective and alternative driving engagement of said second and third gears with said vertical drive shaft, a fourth gear driven by said lower end of said vertical drive shaft, a propeller shaft which has a forward end, which is rotatably supported by said gear housing and which is adapted to have mounted thereon a propeller, a fifth gear which is drivingly mounted on said forward end of said propeller shaft; which meshes with, is driven by and is located forwardly of said fourth gear and which has thereon a centrifugal pump, and means for lubricating at least one of said first, second and third bearing means and including passage means communicating between said centrifugal pump and said one of said first, second and third bearing means.

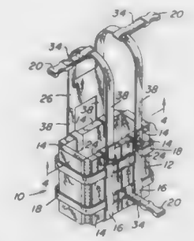
4,993,980

BUOYANT SUPPORT APPARATUS AND SYSTEM FOR USE IN EXERCISING

Thomas G. Dulin, 66 Lochatong Rd., West Trenton, N.J. 08628; Eric Bass, 10 Walton Ave., and Richard M. Babyak, 612 Shady Retreat Rd., #60, both of Doylestown, Pa. 18901

Continuation of Ser. No. 118,386, Nov. 6, 1987, Pat. No. 4,840,591. This application Mar. 1, 1989, Ser. No. 317,415
The portion of the term of this patent subsequent to Jan. 20, 2006, has been disclaimed.
Int. Cl.[5] A63B *23/00*
U.S. Cl. 441—129 7 Claims

1. A buoyant support system for use by an individual for exercising in a tank with water, said system comprising a jacket to be worn closely about the trunk of the individual entirely below said individual's armpits, a harness, a means for connecting said jacket and said harness to said tank, means for attaching said harness to said jacket, said jacket comprising a plurality of segments of buoyant material, covering means for encasing said segments of buoyant material in said jacket, and for forming flexible joints interposed between said segments with the space in between said segments being adjustable, and holding means for wrapping said jacket about the trunk of said individual so that said segments completely encircle said trunk,



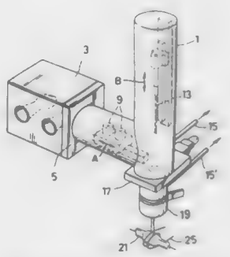
said holding means comprising at least one adjustable belt encircling said segments and interposed joints to adjust the spacing of said segments with respect to one another when said jacket is in place, whereupon said jacket is held in place by the frictional engagement of said covering means with said trunk.

4,993,981

METHOD OF MANUFACTURING VAPORIZED METAL DISCHARGE LAMP

Akira Ose; Shinya Omori, both of Yokohama, and Akihiko Tsurumaru, Tokyo, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 254,410, Oct. 6, 1988, abandoned. This application Jan. 8, 1990, Ser. No. 463,001
Claims priority, application Japan, Oct. 12, 1987, 62-256877
Int. Cl.[5] H01J *9/38*
U.S. Cl. 445—9 15 Claims



1. A method of manufacturing a vaporized metal discharge lamp, comprising:
locating a source of metal halide in a container having an opening therein;
locating a metal rod and said container with said metal halide therein in an air evacuated chamber;
moving said metal rod through said opening and at least partially into said container so that at least a tip end of said metal rod is in said container;
causing said metal halide in said container to deposit onto said tip of said metal rod in said container so as to attach a layer of metal halide onto said tip of said metal rod
then removing said tip of said metal rod from said container;
inserting at least said tip of said metal rod, with said metal halide layer attached thereto, into the inside of an air evacuated light emission envelope of said lamp, said lamp envelope being coupled to said air evacuated chamber so as to be air evacuated therewith; and then
transferring said metal halide layer from said tip of said metal rod to the inside surface of said air evacuated envelope, while at least said tip of said metal rod is in said

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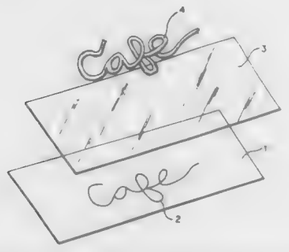
envelope, by at least heating of at least said tip of said metal rod with said layer of metal halide thereon.

4,993,982

METHOD AND APPARATUS FOR PRODUCING NEON SIGNS

John R. Knapp, Bellevue, Wash., assignor to Mid Mountain Materials, Inc., Redmond, Wash.

Continuation of Ser. No. 926,913, Mar. 11, 1986, abandoned.
This application Feb. 9, 1989, Ser. No. 309,775
Int. Cl.[5] G09F *13/26*
U.S. Cl. 445—22 8 Claims



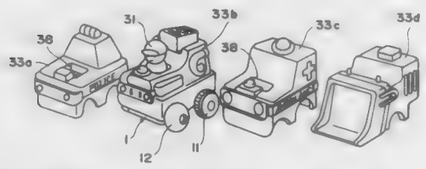
1. A method for producing neon signs comprising the steps of:
drawing the design on a sheet of material; and,
covering the material and the design drawn on the material with a sheet of translucent heat resistant material; and,
bending glass tubing to the shape of the design drawn over the sheet of translucent heat resistant material; and,
fitting the bent tubing with electrodes and a low pressure gas.

4,993,983

MOBILE TOY HAVING MULTIPLE SIREN SOUNDS AND BODY TYPES

Toshiaki Kurita, and Akihisa Hatakeyama, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 554,922
Claims priority, application Japan, Aug. 8, 1989, 1-93170[U]
Int. Cl.[5] A63H *17/00, 33/26, 5/00, 29/24*
U.S. Cl. 446—94 18 Claims



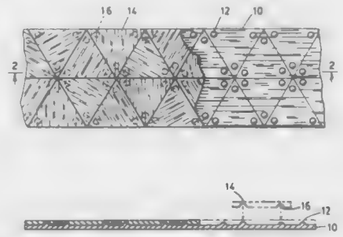
1. A mobile toy comprising:
a plurality of body shells, each being shaped to resemble a different vehicle type;
a chassis to which any one of the plurality of body shells is selectively and detachably coupled;
siren sound generating means, mounted on the chassis, for producing a plurality of siren sounds, each being selectable to correspond to a selected and coupled one of the plurality of body shells; and
a plurality of means for activating said sound generating means, each of said plurality of means activated by a different one of said body shells.

4,993,984

DISCRETIONARY MOSAIC ART KIT

Anthony G. R. Matarese, 27 Lake Home St., Rochester, N.Y. [14612]

Filed Jan. 16, 1990, Ser. No. 465,425
Int. Cl.[5] A63H *33/06;* A63F *39/00;* G09B *19/00;* E04B *5/04*
U.S. Cl. 446—118 11 Claims



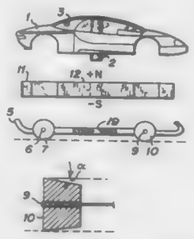
1. A discretionary mosaic art kit which consists of:
(a) a portable support board arranged so as to selectively accommodate individual pieces of design creating elements at a selected location on said board;
(b) a plurality of flat design creating elements in the form of an equilateral triangle, each adapted to be fixed to said board at a selected location so as to present a substantially flat uninterrupted surface; and
(c) connecting means located adjacent each of the three corners of said design creating elements in the form of interlocking stems or recesses which are adapted to mate with complementary recesses or stems at said selected locations on said board.

4,993,985

ANTI-COLLISION TOY VEHICLE PLAYSET

Sidney Bass, Los Angeles, and Harold E. Garner, Long Beach, both of Calif., assignors to Universal Product Innovations, Inc., Carson, Calif.

Filed Jan. 29, 1990, Ser. No. 471,438
Int. Cl.[5] A63H *33/26, 17/00*
U.S. Cl. 446—133 15 Claims



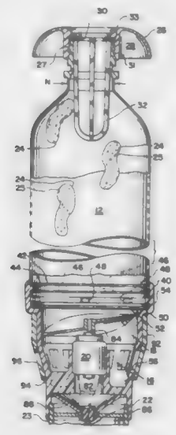
2. An improved children's toy car playset of the kind containing a plurality of wheeled toy cars for relatively free rolling movement on a roadway surface, in which one car on said roadway surface may be propelled and released to roll thereon toward at least a second car of said plurality at any angular position about a circle centered at said second car, the improvement comprising in combination therewith:
collision inhibiting means carried by each of said cars for inhibiting collisions between said one car and said second car, irrespective of the angle of approach of said one car to said second car; said collision inhibiting means comprising:
permanent magnet means located within each of said cars, each said permanent magnet means having a first pole on an upper surface and a second opposite pole on the bottom surface thereof for providing invisible magnetic field lines that extend from said first polarity pole to said second polarity pole on a lower surface thereof with said magnetic field lines extending beyond all sides of said toy car and with said field lines appearing all about the periphery of said associated car; whereby responsive to the one of said cars rolling to within a predetermined distance of said second car, the invisible magnetic field lines associated with said one of said toy cars interacts with the invisible magnetic field lines associated with said second car to create a repelling force therebetween.

4,993,986

FUZZ BLOWER POWER TUBE

Steven L. Bloomfield, 1406 Jensen Dr., Pittsburg, Calif. 94565

Filed Nov. 1, 1989, Ser. No. 430,173
Int. Cl.[5] A63H *33/00, 33/40, 29/22;* A63F *9/00*
U.S. Cl. 446—140 34 Claims



1. A fuzz blower power tube comprising:
a ventilated container having intake means for receiving fluid into said container and exhaust means for expelling fluid from said container displaced from each other and a transparent wall therebetween;
fluid disposed through said container and flowing through at least one of said intake means and exhaust means;
agitation means disposed adjacent one of said means for causing fluid flow of said fluid;
a light weight float transported from an upstream position to a downstream position by said fluid flow within said container, said float being freely movable within said container transparent wall;
said float sized to present a float cross section which is only a portion of the cross section of said container.

4,993,987

DOLL WITH PHOTO IMAGE FACE

Harold L. Hull, 401 Canyon Way, SP. 43, Sparks, Nev. 89434, and Karen K. Joslin, 23656 Via Avant, Valencia, Calif. 91355

Filed Sep. 1, 1989, Ser. No. 402,462
Int. Cl.[5] A63H *3/00*
U.S. Cl. 446—268 2 Claims

1. A method of making and using a doll having a facial image of a person related to and recognizable by a child player of the doll, the steps comprising;
a. taking a photograph of said person;
b. constructing a doll with a blank face portion made of a material impregnatable by heat cured inks in a photographic printing process;
c. printing said photograph with heat cured inks on said doll by a photographic printing process to define a doll face having the facial image of said person;
d. providing said doll having said facial image to said child player; and



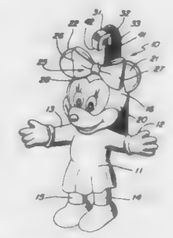
e. comparing the face of said person with said doll face to determine a match.

4,993,988

TOY FIGURE WITH CLIP-ON HAIR PIECE

Michael K. Chamberlain, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 26, 1990, Ser. No. 498,667
Int. Cl.[5] A63H *3/44*
U.S. Cl. 446—394 6 Claims



1. A toy figure comprising:
a toy figure body having arms, legs and torso;
a head defining a headpiece decoration including a bow and a first cooperating attachment portion defining a center portion thereof a resilient clip defining a locking channel sized and shaped to be snap-fitted to said first cooperating attachment portion; and
a quantity of simulated hair strands secured to said resilient clip,
said resilient clip being removably attached to and removed from said headpiece decoration by a snap-fit engagement with said first cooperating attachment portion.

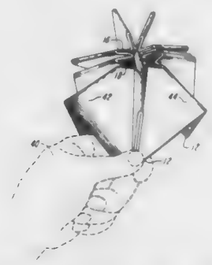
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4,993,989

FOLDING DEVICE FOR USE AS A GAME, PUZZLE, BOOK OR TOY

Joan Gidwani, 83 Thomas St., Dedham, Mass. 02026

Filed Oct. 26, 1989, Ser. No. 427,645
Int. Cl.[5] A63H *33/00, 33/38;* A63F *9/08;* E04B *1/32*
U.S. Cl. 446—487 16 Claims



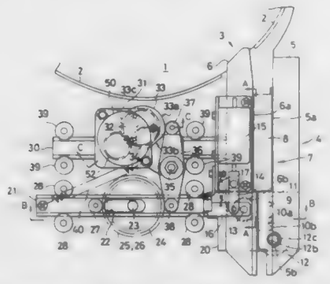
1. A folding device for use as a toy, puzzle, and game, comprising a plurality of like polygonal components with each component having a pair of symmetrically arranged, mirror-imaqe segments interconnected along a common hinge, said segments each having first and second orthogonally-related sides forming one corner, with said one side defining said hinge, a third side extending at an acute angle from said second side and at least one additional side connecting said third and first sides, and hinge means interconnecting each of said polygonal components to adjacent polygonal components along adjacent third sides.

4,993,990

UNACCEPTABLE COIN REMOVING APPARATUS FOR COIN HANDLING MACHINE

Masamichi Ozeki, Ashikaga; Katsuyuki Miyamoto, Urawa, and Shoichi Uda, Tokyo, all of Japan, assignors to Laurel Bank Machines CP., Ltd., Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,119
Claims priority, application Japan, Oct. 20, 1988, 136777; Oct. 6, 1989, 261736
Int. Cl.[5] G07D *5/02, 5/08*
U.S. Cl. 453—7 3 Claims



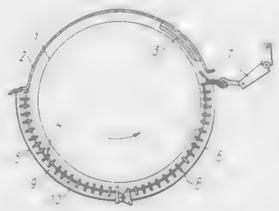
1. An unacceptable coin removing apparatus for a coin handling machine comprising a rotatable disk for receiving deposited coins, annular guide means provided on the periphery of said rotatable disk and formed with an opening, coin sorting passage means connected to said opening downstream thereof, a pair of guide plate means provided for said coin sorting passage means, a space between said pair of guide plate means being adjustable and said pair of guide plate means being capable of supporting a predetermined denomination of coins in accordance with the space therebetween, a coin collecting opening provided below said pair of guide plate means, coin transporting means provided in the coin sorting passage means for transporting coins by contacting upper faces of coins in the coin sorting passage means, drive means for driving said rotatable disk and said coin transporting means and sensor means provided downstream of said coin collecting opening in the coin sorting passage means for detecting characteristics of coins, said unacceptable coin removing apparatus comprising first stopper means provided downstream of said sensor means in the coin sorting passage means and capable of preventing coins from being further transported, second stopper means provided downstream of said first stopper means in the coin sorting passage means and capable of preventing coins from being further transported, and control means for judging based upon signals input from said sensor means whether each coin is acceptable or not, said control means being constituted so that when it judges that the coin is an unacceptable coin, it drives said first stopper means and said second stopper means so as to prevent the unacceptable coin from being further transported by the second stopper means and prevents coins following the unacceptable coin from being transported by said first stopper means, thereafter drives said drive means to enable said rotatable disk and said coin transporting means to drive so that the following coins can be returned onto the rotatable disk and, after the following coins have been returned onto the rotatable disk, sets the space between said pair of guide plate means larger than the largest diameter of coins to be handled, drives said first stopper means and said second stopper means in the reverse direction and drives said coin transporting means so as to feed said unacceptable coin toward said rotatable disk.

4,993,991

THRESHING UNIT OF AN AXIAL GRAIN COMBINE HARVESTER

Jury N. Yarmashev, I-i Krepostnoi pereulok, 34 kv. 213; Vladimir A. Zapandi, ulitsa Svobody, 24/2, kv. 37; Valentin N. Tkachev, ulitsa Svobody, 27/2, kv. I, all of Taganrog, Rostovskaya oblast, and Vladimir K. Zhurkin, p/o Lugovaya, VIK, IO, kv. 54, Moskovskaya oblast, all of U.S.S.R.

PCT No. PCT/SU87/00094, § 371 Date Apr. 10, 1989, § 102(e) Date Apr. 10, 1989, PCT Pub. No. WO89/01735, PCT Pub. Date Mar. 9, 1989
PCT Filed Aug. 25, 1987, Ser. No. 348,005
Int. Cl.[5] A01F *12/20*
U.S. Cl. 460—66 3 Claims



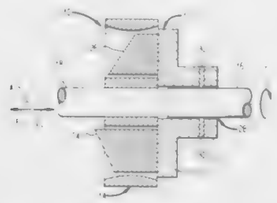
1. A threshing unit of an axial grain combine harvester comprising a rotor (1) arranged along the direction of the harvester travel and accommodated in a stationary cylindrical casing (2) whose top portion is provided with helical guide ribs (3) located on its inner surface, while the bottom portion of the cylindrical casing situated in the threshing zone is provided with a change concave (4), characterized in that the concave (4) is made up of a number of independent sections (5 and 6) arranged on both sides of the longitudinal axis of the cylinder rotor (1), the first section (5) of the concave (4) as along the direction of rotation of the cylinder rotor (1), is rigidly fixed with respect to the cylinder rotor (1), while the second concave section (6) is connected to the first section (5) by an articulated joint and has a device (7) for adjusting the threshing clearance at the outlet of the unit.

4,993,992

SINGLE STAGE ENGAGEMENT COUPLING

Jon M. Kriegel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1989, Ser. No. 453,732
Int. Cl.[5] F16C *1/26;* F16D *3/64*
U.S. Cl. 464—137 15 Claims



1. A flexible coupling for transmitting drive torque from the output shaft of a drive means to the input shaft of a drivable component of an electrostatographic copier or printer, the coupling including:

(a) a rotatable driver half assembly connectable to such output shaft of the drive means, said driver half assembly including a radially extending member having a backside and a front side, and a plurality of multi-length driver teeth attached to said front side for effecting a precisely aligned and repeatable blind mounting of the coupling halves at a single time, and in a single stage;

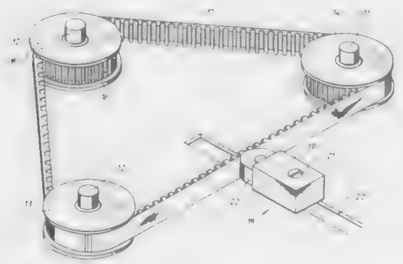
(b) a rotatable driven half assembly for achieving a full and completely aligned engagement with said driver half assembly when said driven half assembly is moved axially by a relatively small force into movement-stopping contact with said driver half assembly, said driven half assembly being connectable to the input shaft of such drivable component, and said driven half assembly including a disc member having a plurality of slot therein for receiving said plurality of driver teeth of said driver half assembly when said driver and driven halves are being closed or coupled.

4,993,993

BELT TENSIONING APPARATUS

Hugh Gill, Livingston, Scotland, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 22, 1990, Ser. No. 497,497
Claims priority, application United Kingdom, Jun. 10, 1989, 8913411
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—111 13 Claims



1. A tensioning system for a drive belt passing around at least two pulleys, comprising in combination;

a tensioning member which is mounted in a housing which is movable toward and away from said drive belt in order to deflect said drive belt;

said tensioning member being urged towards said drive belt by a spring action between said tensioning member and said housing, said spring requiring an increasing force to increase its deflection up to a predetermined limit, but which, when this limit is reached, can be deflected over a predetermined range without any further increase in the applied force;

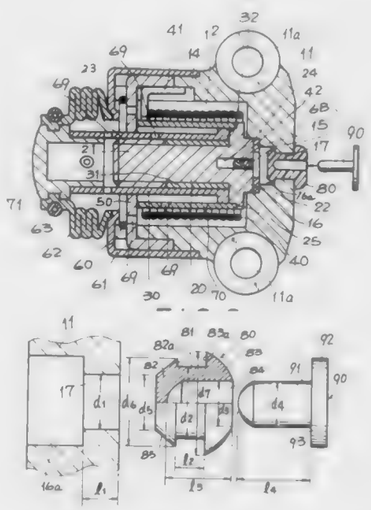
said spring adapted to increase the force applied by the member to the belt as it is moved towards the belt until the force reaches said predetermined limit, whereafter further movement over said predetermining range does not further increase said force.

4,993,994

SEALING CONSTRUCTION OF A TENSIONER

Juji Ojima, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1989, Ser. No. 448,085
Claims priority, application Japan, Dec. 30, 1988, 63-331598
Int. Cl.[5] F16H *07/08*
U.S. Cl. 474—111 1 Claim



1. In combination, a sealing construction for a tensioner, wherein the tensioner includes a rotation body energized by a spring and an urged body advanced in an axial direction by the rotation of the rotation body in a screwed state in a casing, and

a sealing member pressed into an inserting hole formed in the casing of the tensioner by using a pushing jig having a flange portion at one end of an axial portion, said sealing member of the tensioner being formed with an elastic body having

a body portion closely adhered to an inner circumferential surface of the inserting hole,

inner and outer guard portions closely adhered to an inner and an outer surface of the casing formed at opposite ends of the body portion,

a penetrated hole for receipt of the axial portion of the pushing jig for pushing of the body portion, and

a flanged end surface formed adjacent an opening portion of the penetrated hole providing a pushing force to the whole sealing member by the abutment of the flange surface of the pushing jig at a pushing time thereof since a length of the axial portion of the pushing jig is less than the length of the penetrated hole of the sealing member.

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4,993,995

TOOTHED-BELT FIXING MECHANISM

Noritaka Okazaki, Kadoma, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 10, 1989, Ser. No. 418,634
Claims priority, application Japan, Oct. 29, 1988, 63-141742; Oct. 29, 1988, 63-141743
Int. Cl.[5] F16G 1/00
U.S. Cl. 474—152 6 Claims

1. In an assembly comprising a toothed belt having first and second opposite ends, and means for fixing said opposite ends in predetermined positions, the improvement wherein said fixing means comprises a mechanism for fixing at least said first end in a manner to impart a predetermined tension to said belt, said mechanism comprising:

a non-driven toothed pulley having peripheral teeth and mounted for rotation in only a single direction about an axis;

a guide member mounted at a position spaced from said toothed pulley to define a gap between said guide member and said peripheral teeth of said toothed pulley; and

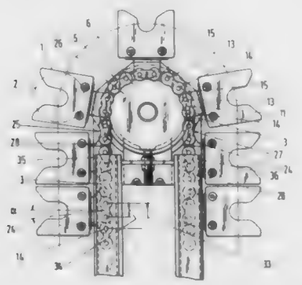
at least said first end of said belt being inserted in said gap with teeth of said belt engaging said peripheral teeth of said toothed pulley, such that said inserted end may be pulled through said gap and said toothed pulley rotates in said single direction, to thereby impart said predetermined tension to said belt, and whereby when such pulling is stopped said toothed pulley is prevented from rotating in a direction opposite to said single direction.

4,993,996

CHAIN MAGAZINE FOR SHOP MACHINES

Walter Horny, and Helmut Krug, both of Nürtingen, Fed. Rep. of Germany, assignors to Gebr. Heller Maschinenfabrik GmbH, Nürtingen, Fed. Rep. of Germany

Filed Feb. 23, 1990, Ser. No. 483,888
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905780
Int. Cl.[5] F16H 55/00
U.S. Cl. 474—155 12 Claims



1. In a chain magazine for shop machines, especially for apparatus for handling workpieces, including at least one endless rotating chain, preferably a roller chain, that is guided over sprocket wheels, with holders, for accommodating tools, workpieces, or the like, being mounted on said chain via connectors that are provided on at least two places of attachment, preferably pins, of chain links of said chain, the improvement wherein:

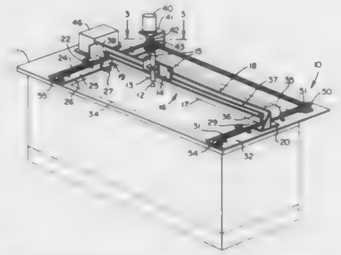
each of said connectors, in a portion thereof that is disposed beyond said sprocket wheels, is provided with at least one support part via which said connector is supported against at least an adjacent chain link of said chain.

4,993,997

LUGGED BELT DRIVEN LINEAR X-Y POSITIONER

William B. Stuhler, 1908 Edgewater, Plano, Tex. 75075

Filed Mar. 8, 1990, Ser. No. 490,347
Int. Cl.[5] F16H 1/00, 7/00
U.S. Cl. 474—165 17 Claims



1. A lugged belt driven linear positioner comprising: a transversally extended carriage structure extended from a first rail means mounted carriage member to a second rail means mounted carriage member with both movable in unison in the transversally extended carriage through a range of movement back and forth along said first and second rail means; space maintaining means holding said first and second rail means in spaced parallel relation; lugged belt drive means positioned in the positioner structure and connected to each of said first and second rail means mounted carriage members; said lugged belt drive means including four lugged pulleys rotatably mounted in pairs, a first pair at a first end of said first rail means, and a second pair at a first end of said second rail means, four gears each drive connected to one of said four lugged pulleys with the two gears with each pair of lugged pulleys in meshed engagement, a first idler pulley rotatably mounted at a second end of said second rail means and a second idler pulley rotatably mounted at a second end of said first rail means, power drive input means drive shaft connected to one of said four gears and to one of said four lugged pulleys; and a lugged belt extended from connection means fastening to said first rail means mounted carriage means to and passed over a first lugged pulley at the first end of said first rail means with belt lugs engaging and driven by the first lugged pulley, the belt then extended to and passed over a second lugged pulley with belt lugs engaging and driving lugs of said second lugged pulley rotatably mounted at a first end of said second rail means; the belt then extended to and around said first idler pulley rotatably mounted at a second end of said second rail means, extension of the belt from said first idler pulley to and over in lugged engagement with a third lugged pulley paired with said second lugged pulley, extension of the lugged belt from said third lugged pulley to and over a fourth lugged pulley in lugged engagement therewith and then down and around said second idler pulley and back to a connection means fastening to said first rail means mounted carriage means.

4,993,998

POWER TRANSMISSION BELT AND DRIVE

Hiroyuki Tanaka; Takaji Nagai; Takahide Mizuno, all of Kobe; Yasuhiro Hashimoto, Miki; Kazumi Kawai, Kobe, and Hideo Hirai, Kakogawa, all of Japan, assignors to Mitsuboshi Belting Ltd., Japan

Filed Jan. 12, 1989, Ser. No. 296,235
Claims priority, application Japan, Jan. 13, 1988, 63-6426
Int. Cl.[5] F16G 1/28
U.S. Cl. 474—205 3 Claims

1. A power transmission toothed belt comprising:

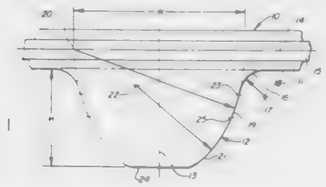
a belt body defining a longitudinal pitch line; and

a plurality of longitudinally spaced teeth projecting inwardly from said body, each tooth being symmetrical about a center axis perpendicular to said pitch line, each half of each tooth having

a concave root surface defined by an arc of a circle, the bottom of the root surface defining a belt land line,

a convex power transmission surface extending inwardly from said root surface and being defined by an arc of a circle having a radius centered on said pitch

a convex tip surface extending inwardly from said power transmitting surface and being defined by an arc of a circle having a radius centered in the tooth on the opposite side of the center axis and being smaller than said radius of the circle defining said power transmitting



surface such that a portion of the tip surface is radially inside of an extension of the arc of the power transmitting surface,

a flat distal inner end surface extending transversely to said tooth center axis,

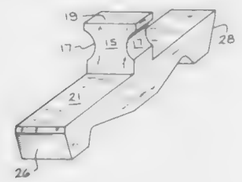
said power transmitting surface defining a junction with said root surface spaced inwardly from said belt land line approximately one-fourth the height of the tooth inwardly from said belt land line, and said power transmitting surface defining a junction with said tip surface spaced inwardly from said belt land line in the range of approximately one-half to two-thirds the height of the tooth inwardly from said belt land line.

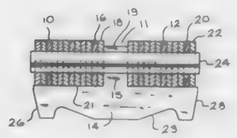
4,993,999

CHAIN-BELT

Philip J. Mott, Dryden, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Mar. 20, 1990, Ser. No. 496,461
Int. Cl.[5] F16G 1/24
U.S. Cl. 474—240 23 Claims





1. An endless power transmission chain-belt (13) especially adapted for drivingly connecting the pulleys (2, 3) of a pulley of a pulley transmission (1) comprising:

a chain (10, 12), said chain (10, 12) being an assembly of a plurality of interleaved sets of links (16, 18, 20, 22);

a pivot means (24) extending through said chain (10, 12) to lace and pivotally interconnect adjacent sets of links (16, 18, 20, 22) to provide an endless chain-belt (13), said sets of links (16, 18, 20, 22) of said chain (10, 12) being held together by said pivot means (24);

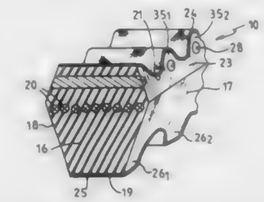
a plurality of load blocks (14) connected to said chain-belt (13), said load blocks (14) having at least one projection (15) that extends in a direction towards chain (10, 12), said projection (15) engaging adjacent pivot means (24) to secure said load blocks (14) to said chain (10, 12), said load blocks (14) extending substantially across the width of said chain (10, 12), each load block (14) having lateral edges (26, 28) shaped to frictionally engage said pulleys (2, 3) of said pulley transmission (1) said load blocks (14) being in contact with said links (16, 18, 20, 22) whereby said forces on said load blocks (14) from said pulleys (2, 3) of said pulley transmission (1) are spread across said load blocks (14) and said links (16, 18, 20, 22) of said chain (10, 12).

4,994,000

POWER TRANSMISSION BELT OF THE TRAPEZOIDAL TYPE

Jean-Michel Simon, Clamart, and Victor Zarife, St. Germain-des-Pres, both of France, assignors to Hutchinson, Paris, France

Filed Nov. 7, 1989, Ser. No. 432,689
Claims priority, application France, Nov. 7, 1988, 88 14484
Int. Cl.[5] F16G 5/06
U.S. Cl. 474—265 6 Claims



1. A power transmission belt of the trapezoidal type comprising a body made of an elastomer matrix having a layer of cord embedded therein, the cord being made of synthetic or natural textile material and serving as a traction strength member, the belt also including reinforcing members based on fibers extending substantially transversely relative to the belt, wherein said reinforcing members are rigid composite pins made of glass fibers coated in epoxy resin and they are disposed in an outside or back portion only of the belt, said portion being delimited by two side faces which are set back to avoid any contact between said reinforcing members and the cheeks of pulleys with which the belt is adapted to co-operate.

4,994,001

VALVE ACTUATOR DIFFERENTIAL WORM PLANETARY GEAR DRIVE

Ivan E. Wilkinson, Lynchburg; Charles L. Hylton, Madison Heights, and R. Gregory Pence, Forest, all of Va., assignors to Limitorque Corporation, Lynchburg, Va.

Continuation-in-part of Ser. No. 173,195, Mar. 24, 1988, Pat. No. 4,896,562. This application Aug. 7, 1989, Ser. No. 390,551
Int. Cl.[5] F16H 1/32, 37/06, 55/22
U.S. Cl. 475—4 7 Claims

1. A valve actuator for controlling valve movement, comprising:

(a) a bi-directional motor-operated drive means;

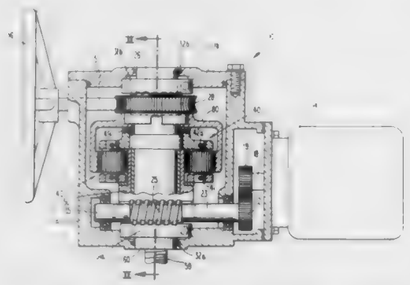
(b) a bi-directional manually-operated drive means;

(c) a first worm fixedly attached to said motor-operated drive means;

(d) a second worm fixedly attached to said manually-operated drive means.

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(e) a first worm gear operatively engaged with said first worm;
(f) a second worm gear operatively engaged with said second worm;
(g) planetary drive means operably connected to said first and second worm gears and to a rotatable sleeve member, said planetary drive means comprising:
(1) a sun gear concentrically disposed about said sleeve member;
(2) a plurality of planet gears operatively engaged with said sun gear;
(3) a ring gear concentrically disposed about said sun gear and operably engaged to said plurality of planet gears;
(h) an elongate stem disposed within said sleeve member for non-rotational axially reciprocal movement relative thereto in response to rotation of said sleeve member;
(i) wherein upon actuation of said motor-operated drive



means, said second worm and said second worm gear remain stationary, and wherein upon actuation of said manually-operated drive means, said first worm and said first worm gear remain stationary;
(j) wherein said sun, ring and planet gears are coplanar relative to one another and in adjacent parallel planes relative to said first worm and gear and to said second worm and gear;
(k) wherein said first worm and gear have a helix angle is less than the coefficient of friction between said first worm and said first worm gear;
(l) wherein said second worm and gear have a helix angle such that the tangent of said helix angle is such that the tangent of said helix angle is less than the coefficient of friction between said second worm and said second worm gear; and
(m) wherein said first and second worm gears are each disposed concentrically around said sleeve member.

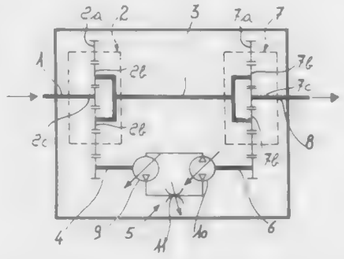
4,994,002

VARIABLE-SPEED POWER TRANSMISSION DEVICE

Gianni Valotto; Bruno Valotto, and Luciano Valotto, all of Cittadella, Italy, assignors to Tecnoquattro S.R.L., Trento, Italy

Filed Dec. 27, 1988, Ser. No. 290,595
Int. Cl.[5] F16H *47/04*
U.S. Cl. 475—72 **4 Claims**

1. A variable-speed power transmission device, comprising:
an input planetary gearing for splitting input power into two, first and second variable power fractions having different and variable speeds,
first and a second power transmission paths connected mutually in parallel and to said input planetary gearing for receiving from said input planetary gearing said first and second power fractions and generating respectively a first and a second speeds,
an output planetary gearing connected to said first and second power transmission paths for combining said first and second power fractions and generating an output rotation rate as the sum of said first and second speeds,
said first power transmission path including a first intermediate shaft extending from said input to said output planetary gearings,
said second power transmission path including a hydrostatic pump-motor assembly, a second intermediate shaft interposed between said input planetary gearing and said hydrostatic pump-motor assembly, and a third intermediate shaft interposed between said hydrostatic pump-motor assembly and said output planetary gearing,



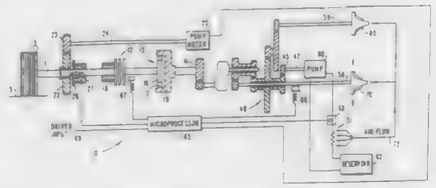
said hydrostatic pump-motor assembly including a hydraulic pump, a hydraulic motor and a controllable flow regulator interposed between said hydraulic pump and said hydraulic motor, said controllable flow regulator controlling flow of fluid in said hydrostatic pump-motor assembly and thus controlling splitting of power between first and second power transmission paths and varying said first and second speeds.

4,994,003

APPARATUS USING AERODYNAMIC ROTORS FOR EXERTING A BRAKING TORQUE UPON A ROTATING SHAFT

Thomas A. Oldfield, Columbus, Ind., assignor to Anchor Tech, Inc., St. Augustine, Fla.

Continuation-in-part of Ser. No. 58,358, Jun. 4, 1981, Pat. No. 4,827,798. This application Feb. 13, 1989, Ser. No. 310,199
Int. Cl.[5] F16H *47/04, 37/06;* **F16D** *57/02;* **B60K** *41/26*
U.S. Cl. 475—72 **9 Claims**



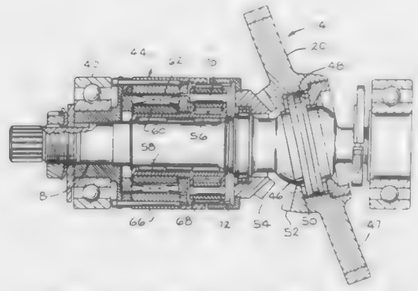
1. A device for providing a variable retarding torque upon a rotating shaft, comprising:
an aerodynamic rotor;
control means, responsive to independent pre-selected signals, for continuously varying the ratio of the speed of said aerodynamic rotor as compared to the speed of the rotating shaft; and
wherein said control means includes an operator variable torque limiting dynamic friction clutch operatively connected between said rotating shaft and said aerodynamic rotor, and operative to control said ratio during active operation of the device.

4,994,004

ELECTRIC ACTUATOR FOR SWASHPLATE

Roelf J. Meijer, and Robert P. Verbey, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Nov. 30, 1988, Ser. No. 277,773
Int. Cl.[5] F16H *35/08*
U.S. Cl. 475—149 **10 Claims**



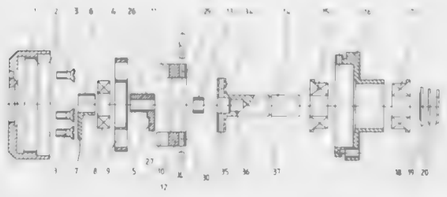
1. An actuating mechanism for a swashplate of a reciprocating thermal machine for varying the angle of inclination of said swashplate with respect to a drive shaft to thereby vary the displacement of pistons coupled to said swashplate, comprising:
a first ring gear fixed with respect to said drive shaft for rotation therewith,
at least one planet gear meshing with said first ring gear,
a second ring gear meshing with said planet gear and having a different number of teeth than said first ring gear,
coupling means for coupling said second ring gear to said swashplate whereby rotation of said second ring gear with respect to said drive shaft rotates said swashplate with respect to said drive shaft thereby changing said swashplate angle, and
electric motor means fixed with respect to said drive shaft for rotation therewith and driving said planet gears, said electric motor means causing said planet gears to rotate with respect to said drive shaft and drive said second ring gear.

4,994,005

EXCENTRIC MOTION TRANSLATING APPARATUS

Gustav Rennerfelt, Nilstorpsvägen 53, Lidingö S-181 47, Sweden

PCT No. PCT/SE88/00028, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO88/05509, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 26, 1988, Ser. No. 392,539
Claims priority, application Sweden, Jan. 26, 1987, 8700291; Nov. 16, 1987, 8704493
Int. Cl.[5] F16H *1/28*
U.S. Cl. 475—162 **8 Claims**



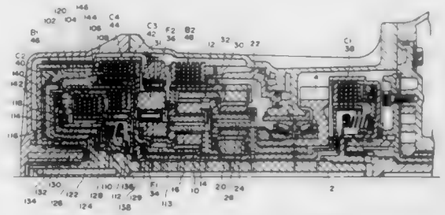
1. Motion transmitting element, a so-called driving dog or transmitter, for translating the rotation of the center of gravity of an excentrically mounted excentric gear wheel (9) to a first shaft (14) while the excentric gear wheel simultaneously executes a planetary movement about a second shaft, characterized by a rigid body (10, 25) mounted for pivoting about first pivot pins (11, 12) which are disposed substantially at right angles to said first shaft (14) said rigid body having in its symmetry plane for the first pins and first shaft axially directed, tooth-like projections (26, 27; 118, 119) which fit with negligible play into two radially counter-directed apertures (22, 23) in the excentric gear wheel (9) for allowing said projections to execute radial sliding reciprocatory motion in the apertures simultaneously as they execute a rolling movement therein, and the rigid body pivots round the first pins.

4,994,006

AUTOMATIC TRANSMISSION FOR VEHICLE HAVING STICK-FREE RADIALLY DUPLICATE CLUTCHES

Masafumi Kinoshita, Toyota; Tokuyuki Takahashi, Aichi, and Hiroshi Itoh, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 27, 1989, Ser. No. 413,488
Claims priority, application Japan, Sep. 27, 1988, 63-241780
Int. Cl.[5] F16H *57/10*
U.S. Cl. 475—286 **2 Claims**



1. An automatic transmission for a vehicle comprising an input rotational member, an output rotational member, a rotational speed change gear mechanism, clutches, and brakes, said clutches and brakes changing a route of transmittance of torque between said input rotational member and said output rotational member through said rotational speed change gear mechanism in accordance with selective engagement and disengagement thereof so as to provide a series of shift stages including a reverse stage and sequential forward speed stages of gradually rising speed, said clutches including a first clutch comprising a first rotational cylinder member serving as an input rotational member of said first clutch and having a first cylinder chamber space therein, a first rotational piston member received in said first cylinder chamber space so as to define a first pressure chamber therein and torque transmittingly engaged with said first rotational cylinder member and having a second cylinder chamber space therein, an output rotational member of said first clutch, an input friction element of said first clutch torque transmittingly carried by said first rotational cylinder member, and an output friction element of said first clutch torque transmittingly carried by said output rotational member of said first clutch, said input and output friction elements of said first clutch being torque transmittingly pressed to one another as supported between said first rotational cylinder member and said first rotational piston member when said first pressure chamber is supplied with a pressure fluid, so as to transmit torque between said input and output rotational members of said first clutch, and a second clutch comprising an input rotational member provided by a combination of said first rotational cylinder member and said first rotational piston member torque transmittingly engaged with one another, a second rotational piston member received in said second cylinder chamber space of said first rotational piston member so as to define a second pressure chamber therein, an output rotational member of said second clutch, an input friction element of said second clutch torque transmittingly carried by said first rotational piston member, and an output friction element of said second clutch torque transmittingly carried by said output rotational member of said second clutch, said input and output

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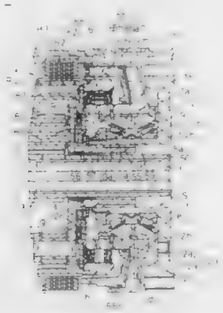
friction elements of said second clutch being torque transmittingly pressed to one another as supported between said first rotational piston member and said second rotational piston member when said second pressure chamber is supplied with a pressure fluid, so as to transmit torque between said input and output rotational members of said second clutch, wherein said second clutch is always disengaged in a shift stage adjacent to any shift stage in which said first clutch is engaged.

4,994,007

COUNTER GEAR SUPPORTING DEVICE FOR AN AUTOMATIC TRANSMISSION

Masakatsu Miura, Kariya, and Masahiko Ando, Okazaki, both of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Continuation-in-part of Ser. No. 127,358, Dec. 1, 1987, Pat. No. 4,934,215. This application Jan. 23, 1989, Ser. No. 300,529
Claims priority, application Japan, Dec. 9, 1986, 61-293663
Int. Cl.[5] F16H *3/44*
U.S. Cl. 475—346 **4 Claims**



1. A counter drive gear supporting device for an automatic transmission, said automatic transmission including a casing, a planetary gear unit situated inside the casing and having an output element, comprising,

an input shaft situated inside the casing and operationally connected to the planetary gear unit,

a support wall formed in the casing to extend radially inwardly therefrom and having an inner surface,

a sub assembly having a counter drive gear coaxially arranged with the input shaft and a bearing unit for rotationally supporting the counter drive gear,

said counter drive gear having at one side a boss section connected to the output element of the planetary gear unit and at the other side a gear section adapted to be connected to an output device of the automatic transmission,

said bearing unit rotationally supporting the boss section of the counter drive gear relative to the support wall, said bearing unit having a plurality of inner races situated over the boss section, bearing members situated outside the inner races and one outer race situated outside the bearing members, said outer race having a mating surface which fits flush with the inner surface of the support wall, a brim section formed at one side of the outer race to extend radially outwardly therefrom to engage the support wall, and an elongated section formed at the other side of the outer race, and

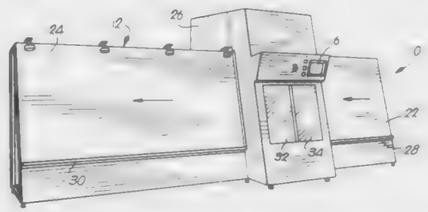
stopping means installed on the outer race away from the brim section to extend between the support wall and the outer race, said stopping means and the brim section holding the support wall therebetween so that the bearing unit is installed on the boss section under a predetermined load between the bearing members.

4,994,008

MACHINE FOR PRODUCING CONTAINER BLANKS FROM FLAT STOCK

Robert A. Haake; Steven R. Woodside, both of Kansas City, and Ronald O. Cowell, Independence, all of Mo., assignors to RSR Machine Builders, Inc., Kansas City, Mo.

Continuation of Ser. No. 359,960, Jun. 1, 1989, abandoned. This application Mar. 23, 1990, Ser. No. 497,897
Int. Cl.[5] B31B *1/16, 1/25*
U.S. Cl. 493—2 **15 Claims**



1. A machine for producing container blanks from flat stock comprising:

a frame;

assembly means coupled with said frame and controllably operable for selectively performing cutting and scoring operations on flat stock for producing a container blank therefrom; and

control means operably coupled with said assembly means for controlling the operation thereof, said control means including

information means for receiving container information comprising an operator input selection denoting a desired container,

means responsive to said container information for determining container blank information in accordance therewith including cut and score data representative of a corresponding container blank from which said desired finished container is to be formed, and

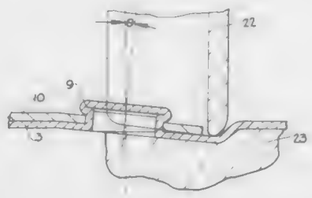
means responsive to said blank information for controlling the operation of said assembly means to cut and score the stock in accordance therewith for producing said corresponding container blank from flat stock.

4,994,009

EASY OPEN CAN END METHOD OF MANUFACTURE

Carl McEldowney, Russia, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Division of Ser. No. 307,441, Feb. 7, 1989, Pat. No. 4,930,658. This application Aug. 23, 1989, Ser. No. 397,760
Int. Cl.[5] B21D *51/44*
U.S. Cl. 493—14 **7 Claims**



1. A method for manufacturing an easy open can end, said method comprising the steps of:

(a) providing a can end blank having a substantially planar portion;

(b) forming a retained tear strip in said substantially planar portion;

(c) providing a rivet having a base connected to said can end blank, said rivet being connected in an orientation generally perpendicular to said substantially planar portion; and

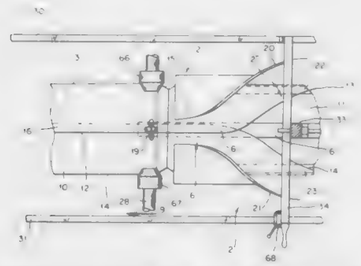
(d) modifying the orientation of said rivet with respect to said can end blank such that said rivet is disposed at a predetermined non-perpendicular angle with respect to said substantially planar portion and tilted away from a major portion of said retained tear strip.

4,994,010

METHOD AND APPARATUS FOR THE ATTACHMENT OF CLASPS TO LETTER ENVELOPES

Alfred Doderer-Winkler, Melsbach, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany

Filed Aug. 30, 1989, Ser. No. 400,380
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830084
Int. Cl.[5] B31B *1/90, 21/36*
U.S. Cl. 493—215 **25 Claims**



1. A method for attaching metal clasps to letter envelopes in combination with an envelope forming machine for manufacturing letter envelopes, said clasps having anchoring elements and being attached to the letter envelopes as the letter envelopes are moved in a direction of conveyance by the envelope forming machine during their manufacture,

said envelope forming machine having in the manufacture of the letter envelopes a means for folding the lateral flaps of the envelope blank to form the back side of the envelopes;

said method comprising: supplying said clasps in an uninterrupted succession from a supply magazine;

advancing said clasps by a feed mechanism to an embossing roller disposed in said envelope forming machine at the end of the folding operation and;

affixing said clasps by means of said embossing roller to the back sides of said envelopes; the affixing step including

securing said clasps to the flaps forming the back sides of the letter envelopes with the anchoring elements of the clasps by means of a stationary support plate;

opposing said embossing roller, said stationary opposing support plate being gripped in tube-like manner between the front and back sides of the letter envelope; the clasps being securely fastened to the back side of the letter envelope only when the contacting lateral flaps of the envelope have been brought into final position with respect to each other.

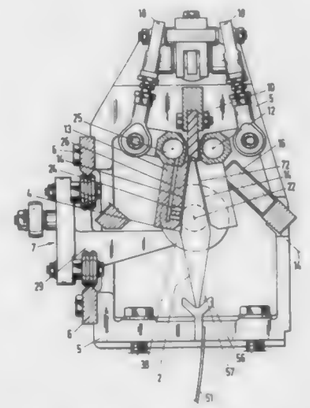
4,994,011

APPARATUS FOR FOLDING INTO AN OPEN STATE SLEEVES WHICH ARE LYING FLAT

Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tera Pak Finance & Trading S.A., Pully, Switzerland

Filed Feb. 9, 1989, Ser. No. 309,778
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804791
Int. Cl.[5] B31B *1/78, 1/80*
U.S. Cl. 493—316 **8 Claims**

1. Apparatus for opening flat folded packaging sleeves, each sleeve including a longitudinal sealing seam, and for positioning said opened sleeve in axial alignment with an elongated mandrel complementally configured to receive said sleeve, comprising in combination (1) a source of separate flat folded packaging sleeves, (2) an ejector adapted to engage one end of an opened sleeve, said ejector being spaced apart from said mandrel and being adapted for reciprocating linear movement with respect to said mandrel, (3) feeder means for grasping a flat folded sleeve and positioning it in axial alignment between the mandrel and said ejector, said feeder means comprising a distributor-rocker which is pivotable about an axis parallel



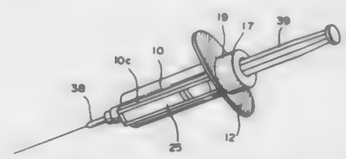
with the direction of linear movement of the ejector so as to move a sleeve through a quarter-circle from the source thereof to said axial alignment (4) a V-shaped abutment means positioned to receive a leading folded edge of a sleeve in its axially aligned position, (5) a pair of pivotable lever means positioned contiguously to said V-shaped abutment means and including elongated plane surfaces having vacuum apertures formed therein, whereby a folded sleeve in axial alignment is positioned to be opened upon pivoting and vacuum actuation of said lever means and vacuum apertures.

4,994,012

RADIATION-SHIELDED HOLDER FOR AN INJECTOR

Shozo Nakayama, Kobe; Mitsuhisa Iinuma, Nagoya, and Hiroaki Matsushima, Nishinomiya, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Takarazuka, Japan

Filed May 9, 1989, Ser. No. 349,430
Claims priority, application Japan, May 9, 1988, 63-61541[U]
Int. Cl.[5] A61B *6/00*
U.S. Cl. 600—5 **2 Claims**



1. A radiation-shielded holder for an injector, comprising:

a cylinder of radiation shielding tungsten, said cylinder being provided with a circular bore for inserting a cylindrical syringe-type body, and a protruding portion having a quadrilateral cross section which protrudes from a peripheral side of said cylinder, the protruding portion comprising a cutout extending in the lengthwise direction of said cylinder, wherein said protruding portion is a built-up portion of said radiation shielding tungsten which is

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formed on the cutout periphery of said cylinder, the body having a piston and a plunger screwed onto the piston, a space encapsulating radioactive material being defined by said body and the piston;

a transparent radiation shielding plate being fitted to the cutout, of which a peripheral lateral side is covered with the built-up portion;

a through hole being provided at one end of said cylinder;

a winged finger holding member being fixed to the other end of said cylinder, said holding member having an annular part, the cutout extending from one end of said cylinder which has said through hole to the vicinity of a portion where said member is fixed to said cylinder;

a cap having a hole for passage through of a plunger, said cap being detachably screwed onto the annular part of said holding member;

a first annular packing arranged between said cap and the annular part of said holding member and capable of contacting with the body; and

a second annular packing arranged around a periphery of the through hole on the end of said cylinder and capable of contacting with the body;

wherein when the body is inserted into the bore of said cylinder, a tip of the body projects from said through hole at said one end, while said cap is screwed onto said member which is fixed to the other end of said cylinder, whereby the body is fixedly caught between said one end and said cap.

4,994,013

PELLET FOR A RADIOACTIVE SEED

Krishnan Suthanthiran, Lorton, Va., and Raj Lakshman, Bethesda, Md., assignors to Best Industries, Inc., Springfield, Va.

Filed Jul. 28, 1988, Ser. No. 225,302
Int. Cl.[5] A61N *5/10*
U.S. Cl. 600—008 25 Claims



1. A pellet for a radioactive seed for use in radiation therapy, comprising a metallic rod substrate uniformly and completely coated with binder material having radioactive-absorbing material in the binder material wherein the radioactive-absorbing material is selected from the group consisting of carbon, activated carbon and charcoal.

4,994,014

PROCESS FOR TREATING DISEASED CELLS INCLUDING THE STEP OF RAISING THE SUBJECTS BLOOD OXYGEN LEVEL

Robert T. Gordon, 4936 W. Estes, Skokie, Ill. 60077

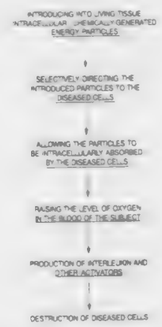
Filed Jul. 26, 1988, Ser. No. 224,144
Int. Cl.[5] A61N *2/02*
U.S. Cl. 600—13 50 Claims

1. A process for treating diseased cells in living tissue of a subject comprising the steps of:

introducing into the living tissue of the subject intracellular, chemically-generated energy particles;

allowing said introduced particles to be intracellularly absorbed by the diseased cells;

thereafter, raising the level of oxygen in the blood of the subject and thereby stimulating the intracellular production of interleukins and other activators, and thereby destroying the diseased cells; and



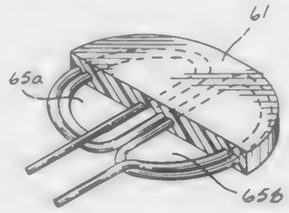
after said raising step, applying to the subject an alternating electromagnetic field tuned to a resonant frequency of the diseased cells.

4,994,015

MAGNETIC STIMULATOR COILS

John A. Cadwell, Kennewick, Wash., assignor to Cadwell Industries, Inc., Kennewick, Wash.

Continuation of Ser. No. 95,957, Sep. 14, 1987, abandoned. This application Feb. 10, 1989, Ser. No. 309,915
Int. Cl.[5] A61N *2/02*
U.S. Cl. 600—13 9 Claims



1. A magnetic stimulator coil comprising a plurality of turns of electrical conductor wound into a geometric shape, said geometric shape including a straight section wherein all of the coil windings in said straight section lie parallel to one another and are more concentrated than in other sections of said geometric shape, said coil being wound such that when power is applied to said coil, the current flow through said more concentrated windings is in the same direction whereby the intensity of the magnetic field produced by said more concentrated windings as a result of said current flow through said more concentrated windings is greater than the intensity of the magnetic field produced in said other sections of said geometric shape as a result of said current flow through said other sections of said geometric shape.

4,994,016

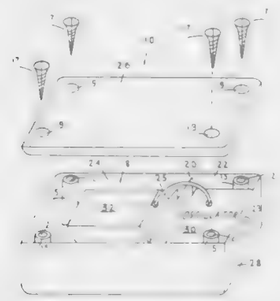
ELECTRONIC STIMULATING DEVICE

John Atwood, 916 Perrin Dr., Arabia, La. 70032

Continuation-in-part of Ser. No. 338,312, Apr. 14, 1989. This application Jul. 27, 1989, Ser. No. 385,717
Int. Cl.[5] A61N *1/00*
U.S. Cl. 600—14 8 Claims

1. An electronic stimulating device, comprising:

a relaxation oscillator circuit means for producing distorted wave shapes and a power source for said circuit; said relaxation oscillator circuit comprising a light-emitting diode connected to the power source, a unijunction transistor comprising emitter/base structure connected through emitter base 1 to a resistor and through emitter base 2 to the light-emitting diode, a variable resistor means for varying oscillator frequency connected in parallel to



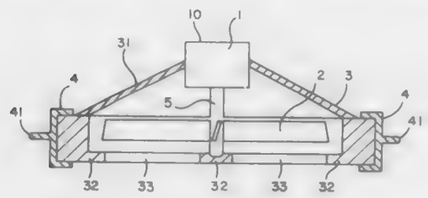
said light-emitting diode and to a capacitor, an antenna connected between said variable resistor means and the capacitor to said transistor; and a lightweight portable housing means for containing the relaxation oscillator circuit means.

4,994,017

CIRCULATION APPARATUS

Ryohei Yozu, Yokohama, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1989, Ser. No. 393,985
Claims priority, application Japan, Sep. 28, 1988, 63-242690
Int. Cl.[5] A61M *1/12*
U.S. Cl. 600—16 7 Claims



1. An apparatus for circulating fluids within a vascular system, said system having inner walls, comprising

a support frame having a cavity for directing flow axially of the frame and adapted for fixation onto an inner wall of said vascular system,

turbine blades rotatably mounted to said support frame in said cavity which are adapted for applying a driving force to the fluid such that axial fluid movement is produced, and

means for rotating said blades, said means being mounted upon said support frame and residing within the vascular system, said apparatus residing within the vascular system.

4,994,018

INTRA-AORTIC BALLOON ASSEMBLY

Lawrence Saper, New York, N.Y., assignor to Datascope Corporation, Oakland, N.J.

Filed May 31, 1989, Ser. No. 359,643
Int. Cl.[5] A61N *1/362*
U.S. Cl. 600—18 8 Claims

1. A dual tubular member intra-aortic balloon assembly for insertion into a vessel comprising:

an outer tubular member;

an inner tubular member having a distal end coaxial with the outer tubular member;

a balloon membrane having a proximal end attached to a distal end of the outer tubular member, and a distal end attached to the inner tubular member, the inner tubular member being axially rigid but bendable for at least that portion within the balloon membrane;



a flexible inner tubular member extension attached to the inner tubular member distal end and extending forwardly in an amount sufficient for guiding the intra-aortic balloon assembly through the vessel;

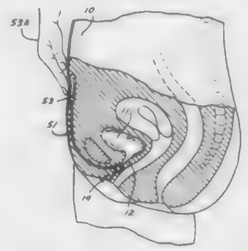
a tip disposed at said distal end of the balloon membrane, the junction of the inner tubular member and the flexible inner tubular member extension embedded therein.

4,994,019

MAGNETIC OCCLUDING DEVICE

Mario F. Fernandez, Los Olivos, Calif.; Loren R. Keldahl, Edina, Minn.; Dale C. Lindquist, Willmar, Minn., and Paul L. Miller, Minnetonka, Minn., assignors to Micro-Magnetics, Inc., Willmar, Minn.

Continuation of Ser. No. 387,398, Jul. 28, 1989, abandoned, which is a continuation of Ser. No. 149,405, Jan. 28, 1988, abandoned. This application Feb. 6, 1990, Ser. No. 474,680
Int. Cl.[5] A61F *2/02*
U.S. Cl. 600—30 12 Claims



1. A magnetic occluding device for a conduit in a body comprising:

first and second assembles, said assemblies including means for mounting the assemblies on opposite sides of a bodily conduit;

at least a first of said assemblies including magnet means having a pair of poles that are spaced apart in a reference direction passing through the poles, said magnet means being movably mounted on the first assembly for movement between first and second positions, the reference direction of the poles being substantially transverse to the conduit in one of said positions;

a second of said assemblies including means that are magnetically attracted to the poles of the magnet means in a first position of the magnet means the magnet attraction between the two assemblies is substantially reduced to permit a bodily conduit placed between the assemblies to expand, the magnet means being movable between the first and second positions in a direction parallel to a plane defined by the second assembly; and

means for actuating the magnet means between the first and second positions.

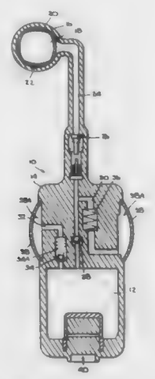
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4,994,020

IMPLANTABLE ARTIFICIAL SPHINCTER SYSTEM

Mark Polyak, Minnetonka, Minn., assignor to American Medical Systems, Inc., Minnetonka, Minn.

Filed Jul. 21, 1989, Ser. No. 383,827
Int. Cl.[5] A61F *2/02, 2/08*
U.S. Cl. 600—31 32 Claims



1. An implantable sphincter system for reversibly occluding a body passageway, which comprises

a fluid inflatable occlusion means adapted to substantially encircle a body passageway, a control assembly in fluid communication with said occlusion means, said assembly including a fluid capacitor disposed thereon for storing of fluid when said occlusion means is deflated, said capacitor being capable of distending under fluid pressure and

a pump means in fluid communication with said occlusion means for transferring fluid from said occlusion means to said capacitor to deflate said occlusion means and open said body passageway, said occlusion means and said fluid capacitor to deflate said occlusion means and open said body passageway, said occlusion means and said fluid capacitor being connected such that said occlusion means remains substantially inflated during short, significant pressure increases in said body passageway up to a predetermined limit, but wherein said occlusion means at least partially deflates on prolonged moderate pressure increases in said body passageway.

4,994,021

APPARATUS AND METHOD FOR COLLECTING AND FREEZING BLOOD PLASMA

Sidney T. Smith, Lake Forest, and Dean M. Glash, McHenry, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Nov. 15, 1988, Ser. No. 271,471
Int. Cl.[5] A61J *1/00*
U.S. Cl. 604—6 18 Claims

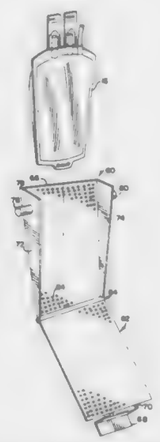
9. A method for collecting and freezing plasma comprising:

providing a container comprising a pair of substantially flat flexible opposing plastic sidewalls, which sidewalls are substantially adjacent when the container is in an unfilled condition so as to provide an empty lay-flat configuration; said sidewalls being peripherally sealed together to define an interior compartment; and means for accessing said interior compartment;

collecting a quantity of liquid plasma in said container, said liquid plasma resulting in a generally bulbous shape in the sidewalls of the container;

inserting the liquid plasma-containing container into a form that defines a V-shape about the container;

engaging the sidewalls of the plasma-containing container with the form so as to press the sidewalls into a V-shape, so that said sidewalls converge toward one end of the container; and



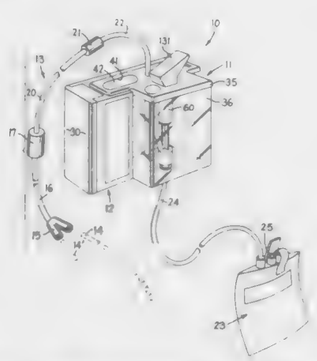
freezing the plasma-containing container while maintaining the container in said V-shaped configuration in the form, thereby forming a wedge-shaped container having a frozen, wedge-shaped plasma slug therein.

4,994,022

BLOOD CONSERVATION SYSTEM

Michael W. Steffler, Kalamazoo, and Steven J. Carusillo, Portage, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Feb. 2, 1989, Ser. No. 305,901
Int. Cl.[5] A61M *5/00, 37/00, 1/00*
U.S. Cl. 604—7 22 Claims



1. A blood conservation system capable of receiving blood and lipids from a patient, the system comprising:

a reservoir;

means for releasably connecting said reservoir to a patient for receiving body liquids including blood from the patient;

transfusion means for receiving blood from said reservoir; and

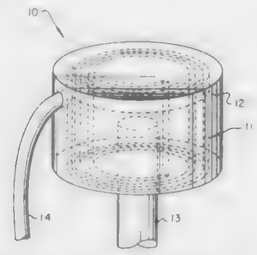
means for transferring blood from said reservoir to said transfusion means but preventing transfer of lipids from said reservoir to said transfusion means, said transfusion means comprising a standpipe located within the bottom portion of the reservoir and opening at a level spaced above the bottom of the reservoir for receiving liquid from the reservoir, and a hood loosely telescoped over the standpipe, the hood and standpipe having a respective outflow position permitting flow of liquid therebetween from the reservoir down through the standpipe while preventing a predetermined thickness top layer of liquid in the reservoir from escaping past the hood to the standpipe, such that lipids and other unwanted materials trapped in such top layer cannot enter the standpipe whereas blood underlying said top layer can enter said standpipe.

4,994,023

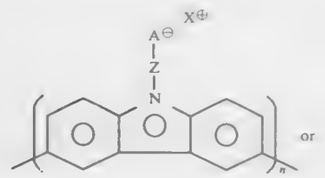
ELECTROCHEMICAL DRUG RELEASE AND ARTICLE

Stephen T. Wellinghoff, 7718 Benbcook, San Antonio, Tex. 78250, and Charles K. Baker, 902 River Stone Dr., San Antonio, Tex. 78258

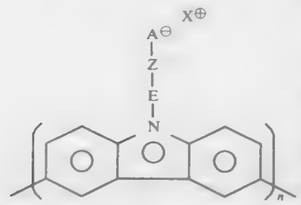
Filed Aug. 8, 1989, Ser. No. 391,282
Int. Cl.[5] A61N *1/30;* A61B *5/04*
U.S. Cl. 604—20 6 Claims



1. A drug delivery device comprising an electrically conducting self-doped carbozole polymer of the formula:



or



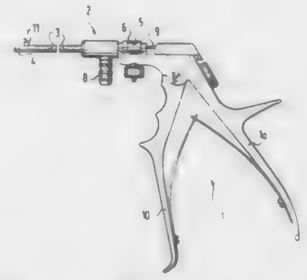
wherein A is a bifunctional molecule capable of bonding to a positively charged molecule at one end and is capable of bonding to a flexible spacer group Z at another end, Z is a flexible spacer group capable of bonding to an anionic group A at one end and is capable of bonding to either to an aromatic nitrogen or electron withdrawing or electron donating group at another end, E is a bifunctional molecule capable of bonding to nitrogen at one end and is capable of bonding to a flexible spacer group Z at another end, X is a positively charged drug molecule, and n is at least 2, in the form of a film embedded in an electrolyte, a cathode and an anode operatively associated, respectively, with said polymer film and said electrolyte, and a source of electrical power operatively associated with said cathode and anode.

4,994,024

ARTHROSCOPY HOOK-CLIPPERS

Ernst Falk, Sternenfels-Diefenbach, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jul. 19, 1989, Ser. No. 381,981
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1988, 3824910
Int. Cl.[5] A61B *17/00*
U.S. Cl. 604—22 5 Claims



1. Arthroscopy hook-clippers comprising: a hollow outer shaft having a circular cross-section, a proximal end and a distal end; a fixed jaw being formed by the distal end of said shaft; a movable hooked jaw being pivoted to said shaft at the distal end thereof; a thrust rod extending through said shaft and being axially movable for pivotally displacing said movable jaw with respect to said fixed jaw, by means of a scissors type handle for said hook-clippers; and a hollow tube forming a flushing or vacuum extraction channel extending through said outer shaft beside said thrust rod, said tube communicating with a deep inner recess in said fixed jaw and having a substantially circular cross-section excepting that the tube has a flat upper wall facing said thrust rod and said flat upper wall defining in cooperation with an upper internal wall surface of said outer shaft a guideway for said thrust rod, said thrust rod having a cross-section which is matched to a cross-section of the guideway.

4,994,025

METHOD OF DISSOLVING CHOLESTEROL-RICH CALCULI WITH SHORT CHAIN HALOGENATED ORGANIC SOLVENTS AND COSOLVENTS

Paul DeAntonio, Westminster; Kenneth G. Mayhan, Irvine, and John T. Sorensen, Costa Mesa, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Aug. 29, 1989, Ser. No. 400,212
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—28 17 Claims

1. A method for dissolving cholesterol-rich calculus comprising contacting the calculus with a fluid compound of the formula R-X, R having 2 to 4 carbon atoms with substituents consisting of hydrogen or halogen, X being halogen, and wherein if X is fluorine, at least one substituent is selected from the group consisting of hydrogen, chlorine, bromine, or iodine.

4,994,026

GRAVITY FLOW FLUID BALANCE SYSTEM

Luciano Fecondini, Bologna, Italy, assignor to W. R. Grace & Co. - Conn., Lexington, Mass.

Filed Aug. 31, 1988, Ser. No. 238,903
Int. Cl.[5] A61M *1/03*
U.S. Cl. 604—29 12 Claims

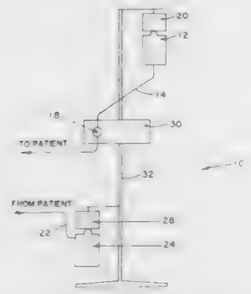
1. A system for monitoring and controlling the infusion and removal of fluids travelling by gravity to a human body comprising:

an infusate reservoir for storing a supply of infusate;

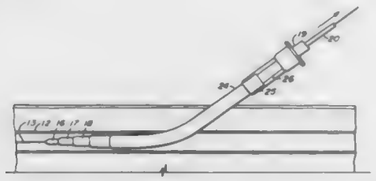
means for transporting infusate from said infusate reservoir to the human body;

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an ultrafiltrate reservoir for storing a supply of ultrafiltrate;
means for transporting a fluid from the human body to said ultrafiltrate reservoir, said means for transporting fluid including a means for filtering said fluid to obtain an ultrafiltrate;
means for monitoring said infusate transported out of said infusate reservoir and the fluid transported to said ultrafiltrate reservoir by determining weight changes of said infusate reservoir and said ultrafiltrate reservoir;
means for controlling the infusate transported out of said infusate reservoir based on a rate of weight change over time, said rate of weight change being equal to a rate of change over time in the weight of said infusate reservoir minus a rate of change over time in the weight of said ultrafiltrate reservoir.

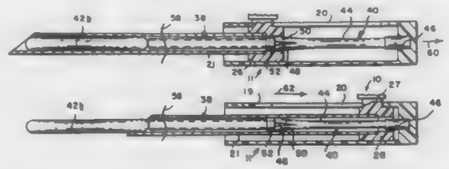


4,994,027
PERCUTANEOUS FEMORAL BYPASS SYSTEM
Edward M. Farrell, P.O. Box 539, Tyler, Tex. 75710
Division of Ser. No. 204,043, Jun. 8, 1988, Pat. No. 4,895,564.
This application Oct. 19, 1989, Ser. No. 424,174
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—53 3 Claims



1. A method for establishing a percutaneous cannula insertion, comprising the steps of:
inserting a hypodermic needle into a selected vessel;
threading a guide wire through said needle;
removing said needle from said guide wire;
sliding a dilator sleeve along said guide wire until said dilator sleeve is inserted into said vessel;
sliding a sheath along said guide wire and over said dilator sleeve;
removing said dilator sleeve from said guide wire;
compressing said sheath to prevent escape of fluid through said sheath;
inserting a cannula into said sheath, along said guide wire.

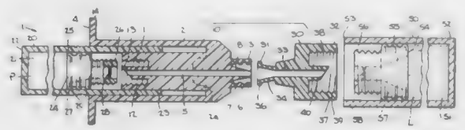
4,994,028
INJECTOR FOR INPLANTING MULTIPLE PELLET MEDICAMENTS
Robert J. Leonard, Lynnfield, Mass., and S. Mitchell Harman, Ellicot City, Md., assignors to Endocon, Inc., Walpole, Mass.
Continuation of Ser. No. 27,565, Mar. 18, 1987, Pat. No. 4,846,793. This application May 15, 1989, Ser. No. 351,951
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—60 4 Claims



1. A device for inserting and positioning a plurality of elongate implants beneath the skin, comprising:
insertion means for defining a bore, the bore being sufficiently long to contain the plurality of implants in an end-to-end relationship and including a hollow cannula having a distal end adapted for insertion beneath the skin, the cannula having a bore which forms at least a part of said insertion means bore;
an obturator having distal and proximal ends and including first and second sections which are arranged so as to allow the first section to move with respect to the second section, the direction of movement being along an obturator axis;
body means, to which is mounted the obturator first section, for positioning the obturator with respect to the insertion means bore so that the distal end of the obturator lies within the insertion means bore and so that the obturator axis is coaxial with the insertion means bore;
means for moving the insertion means and cannula with respect to the obturator between a distal position and a proximal position;
the body means further including a portion adapted to be manually held in a stationary position while the insertion means and cannula are moved between the distal and proximal positions;
the insertion means further including means for engaging the obturator second section when the insertion means is first moved from the distal position to the proximal position and for moving the obturator second section in a distal direction to an extended position as the insertion means is moved from the proximal position to the distal position; and
means, operative after the insertion means has been moved from the proximal position to the distal position, for maintaining the obturator second section in said extended position as the insertion means is moved from the distal position towards the proximal position.

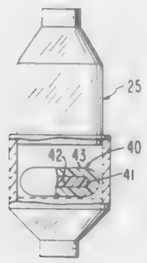
4,994,029
SYRINGE MIXER AND INJECTOR DEVICE
John Rohrbough, Walnut, Calif., assignor to David Bull Laboratories Pty. Ltd., Mulgrave, Australia
Filed Sep. 12, 1989, Ser. No. 405,989
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—88 8 Claims

1. Syringe mixer and injector device comprising
an injector and an adapter, each having an inner end and an outer end and a protected fluid pathway extending longitudinally therethrough from the inner end to the outer end thereof,
the injector inner end having a connection nozzle defining the inner terminus of the injector pathway and the adapter inner end having a counterpart connection nozzle defining the inner terminus of the adapter pathway, the nozzle and counterpart nozzle having mating lock connection formations arranged to interconnect releasably the injector and adapter to flow connect their pathways in protected fluid tight condition,
the injector and adapter each having a guideway extending from the outer end toward the inner end thereof, adapted to receive and guide for movement longitudinally relative thereto a respective medicament containing vial having an open end closed by a penetrable stopper movable longitudinally along the vial relative to its open end, and



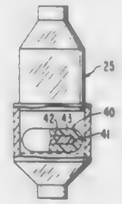
the injector and adapter each having a connecting socket defined in the outer end thereof, adapted to connect stationarily the corresponding stopper thereat, and a tubular spike defining the outer terminus of the pathway thereof and protruding into the respective socket and terminating inwardly from the respective outer end sufficiently to protect the spike from unintended human contact and arranged to penetrate the corresponding stopper to flow connect its vial with the respective pathway in protected fluid tight condition.

4,994,030
RECONSTITUTION OF HUMAN BONE AND TISSUE
Frank P. Glowczewskie, Jr., Gainesville, Ill.; David A. Present, New York, N.Y.; David W. Anderson, New York, N.Y., and Patrick A. McBrayer, Yardley, Pa., assignors to Osteotech, Inc., Shrewsbury, N.J.
Filed Jun. 28, 1988, Ser. No. 212,516
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—84 5 Claims



1. A kit for reconstituting human tissue selected from the group consisting of bone and musculoskeletal tissue, said kit comprising:
(a) a sealed vessel containing a sterile preformulated reconstitution medium for said human tissue, said sealed vessel comprising an access site into the interior of said vessel; and
(b) means for accessing the interior of said sealed vessel and for placing the interior of said vessel in open communication with the interior of a sealed vessel containing said human tissue necessitating reconstitution;
wherein said pre-formulated reconstitution medium comprises a sterile aqueous solution including, in an amount suitable to preserve sterility of said human tissue during reconstitution and subsequent implant, a preservative selected from the group consisting of gentamicin sulfate, bacitracin, polymyxin B, neomycin and cefazolin sodium; and
said means of accessing the interior of said sealed vessel comprises a hollow needle having two opposite pointed open ends and being separate from both said sealed vessel containing said reconstitution medium and said sealed vessel containing said human tissue.

4,994,031
INTRAVENOUS SYSTEM FOR DELIVERING A BENEFICIAL AGENT
Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Continuation of Ser. No. 45,358, May 4, 1987, Pat. No. 4,857,052, which is a continuation of Ser. No. 702,292, Feb. 15, 1985, Pat. No. 4,740,198, which is a division of Ser. No. 310,047, Oct. 9, 1981, Pat. No. 4,511,353, which is a continuation-in-part of Ser. No. 283,077, Jul. 13, 1981, abandoned. This application Apr. 17, 1989, Ser. No. 338,691
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[5] A61M *5/14*
U.S. Cl. 604—85 1 Claim



1. An improvement in an intravenous delivery system for administering a drug formulation, in which system the drug formulation is formed during the operation of the system, wherein the system comprises:
(a) a container comprising a pharmaceutically acceptable intravenous fluid that is a carrier for a drug;
(b) an intravenous administration set in communication with the container for permitting fluid to flow from the container through the set, the set comprising:
(1) a drip chamber; and,
(2) a drug formulation chamber in communication with the drip, chamber, such that fluid flows into the formulation chamber, which formulation chamber comprises:
(i) a hollow housing;
(ii) a fluid inlet and a fluid exit; and wherein the improvement comprises;
(iii) means in the housing for storing a drug in a solid form and for releasing the drug into fluid that flows through the housing to form a fluid drug formulation for intravenous administration at a keep-the-vein-open rate over time.

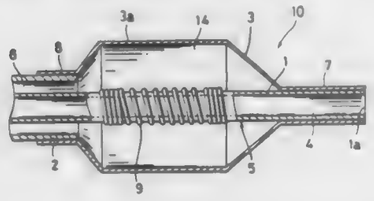
4,994,032
BALLOON CATHETER
Yoshiaki Sugiyama; Kyuta Sagae, and Susumu Tanabe, all of Fuji, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 29, 1988, Ser. No. 277,564
Claims priority, application Japan, Dec. 1, 1987, 62-303930
Int. Cl.[5] A61M *25/10*
U.S. Cl. 604—96 13 Claims

1. A balloon catheter, comprising:
a tubular body including at least one lumen;
a foldable balloon provided at a predetermined distal portion of said tubular body and surrounding the outer surface off said distal portion of said tubular body so that said balloon

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communicates with said at least one lumen of said tubular body;

a coil spring provided at a predetermined portion on the outer surface of the portion of said tubular body surrounded by said balloon, for reinforcing said tubular body,



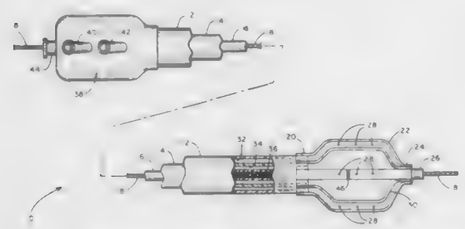
said coil spring having opposite end portions and an intermediate portion, said coil spring being wound such that the turns thereof are in intimate contact with each other at both end portions thereof and are sparse in said intermediate portion thereof.

4,994,033

INTRAVASCULAR DRUG DELIVERY DILATATION CATHETER

Rick L. Shockey, Eagan, and Robert A. Van Tassel, Excelsior, both of Minn., assignors to Schneider (USA) Inc., Minneapolis, Minn.

Filed May 25, 1989, Ser. No. 356,520
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—101 **8 Claims**



1. An intravascular material delivery dilatation catheter comprising:

first, second and third elongated, flexible, hollow, plastic tubular members of descending diameter concentrically disposed relative to one another and each having a proximal end, a distal end and defining a lumen extending between the proximal end and the distal end, the distal end of the third tubular member extending beyond the distal ends of the first and second tubular members:

inner hollow expansible sleeve means bonded at one end to the third tubular member near the distal end thereof and at the other end to the distal end of the second tubular member, the interior of the inner hollow expansible sleeve means further being in fluid communication with the portion of the lumen defined by the second tubular member outside the third tubular member;

outer hollow expansible membrane sleeve means bonded at one end near the distal end of the third tubular member and at the other end to the distal end of the first tubular member, the interior of the outer hollow sleeve means further being in fluid communication with the portion of the lumen of the first tubular member defined between the first and second tubular members, the outer hollow sleeve means including a pattern of minute openings extending radially therethrough; and

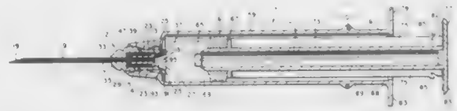
manifold means connected to the proximal ends of the first and second tubular members for introducing an inflation fluid into the lumen of the second tubular member outside the third tubular member and a liquid dispersant into the lumen of the first tubular member outside the second tubular member whereby an amount of dispersant can be caused to perfuse through the minute openings in the outer sleeve means as the inner hollow sleeve means is expanded by the inflation fluid.

4,994,034

RETRACTABLE NEEDLE HYPODERMIC SYRINGE SYSTEM

Michael J. Botich, 1307 Hanover Ct., Ventura, Calif. 93003, and Thor R. Halseth, 1223 Village Ct., Simi Valley, Calif. 93065

Filed Jul. 11, 1989, Ser. No. 378,275
Int. Cl.[5] A61M *5/24*
U.S. Cl. 604—110 **16 Claims**



1. A hypodermic syringe system, comprising:

(a) a syringe barrel;

(b) a syringe plunger including a frangible end sealing an interior cavity, said syringe plunger sized to be received within and slide through said syringe barrel;

(c) an injection needle; and

(d) a spring holding means associated with and held by said syringe barrel, for holding said injection needle and selectively retracting said injection needle into said interior cavity of said syringe plunger when said syringe plunger abuts against and moves beyond a portion of said syringe barrel, causing breakage of said frangible end, and allowing said frangible end of said syringe plunger to separate, wherein said spring holding means, comprising: a holder for holding said injection needle; and a spring means for exerting an expansive force between said holder and said spring holding means, wherein said spring holding means selectively holds said holder and said spring means therebetween while allowing said injection needle to extend through said spring holding means in an assembled condition wherein said holder has a lip, said spring holding means has extending resilient fingers with interior and inferiorly positioned hooks to retain said lip of said holder in an assembled condition wherein, said frangible end of said syringe plunger has an engaging and complementing surface which abuts up against said hooks of said extending resilient fingers, spreading said extending resilient fingers radially outwardly to release said lip against the expansive force of said spring means when said syringe plunger moves beyond said portion of said syringe barrel.

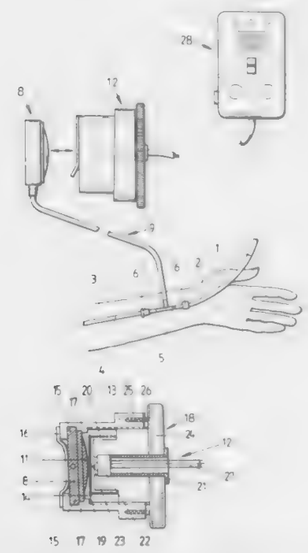
4,994,035

PRESSURE-TRANSMITTING DIAPHRAGM SYSTEM FOR INFUSIONS

Klaus Mokros, Brentanostrasse 51, D-8755 Alzenau, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 345,080
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816128
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—118 **11 Claims**

1. A pressure-transmitting diaphragm system for infusions, comprising: a source of infusion substance; a catheter; an infusion line connecting said catheter to said infusion source; a pressure transducer mounted in a pressure sensor; a closed pressure line containing air connected between said infusion line and said pressure transducer, said transducer being removably mounted in said pressure sensor; said pressure sensor having a mounting member with an opening for removably holding said transducer; spring means for securing said transducer in said opening for sterile separation between said transducer and said pressure sensor; and means connected to said



pressure sensor for generating a warning alarm signal when pressure in said pressure line exceeds a predetermined threshold, said warning alarm signal having only two states to indicate whether or not said threshold is exceeded.

4,994,036

CATHETER SET FOR SPINAL ANAESTHESIA

Juergen Biscoping, Giessen; Marie-Louise Summerer, Koerle; Heinz Wiegel, Alheim, and Hans-Hinrich Witt, Koerle, all of Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 390,608
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 8811408[U]
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—158 **11 Claims**

1. A catheter set for spinal anaesthesia, comprising:

an epidural cannula having a lumen having an inner diameter smaller than approximately 1.0 mm,

a spinal catheter having an inner diameter and being adapted for insertion into the lumen of the epidural cannula,

a spinal cannula adapted for insertion into the lumen of the epidural cannula, the spinal cannula having a front end adapted to project out of the epidural cannula when the spinal cannula is inserted into the lumen of the epidural cannula, and

a guide wire adapted for insertion into the spinal cannula, the guide wire having a diameter which is smaller than the inner diameter of the spinal catheter,

whereby the spinal cannula is removable from the lumen of the epidural cannula over the guide wire, and

whereby the spinal catheter is insertable into the lumen of the epidural cannula over the guide wire.

4,994,037

ABSORBENT STRUCTURE DESIGNED FOR ABSORBING BODY FLUIDS

Leo J. Bernardin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 9, 1990, Ser. No. 550,239
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—368 **48 Claims**



1. In a disposable absorbent garment, an absorbent structure having opposed longitudinal ends, a central crotch portion and including a body-facing sheet, a backing sheet and liquid absorbing material therebetween, said liquid absorbing material comprising:

a first layer consisting essentially of cellulosic fibers and having a density from about 0.03 to about 0.14 g/cc and underlying said facing sheet, said first layer having top and bottom surfaces;

a second layer consisting essentially of cellulosic fibers, formed substantially separately from and underlying at least a portion of said first layer, said second layer having top and bottom surfaces, a density from about 0.14 to about 0.3 g/cc, a total void volume greater than about 80%,, an average pore size distribution generally less than the average pore size distribution of said first layer and wherein there is an overlap in the pore size distributions of said first and second layers such that the smallest pores in said first layer are smaller than the largest pores in said second layer; and

front and rear fluid storage pouches comprising superabsorbent material disposed in a hydrophilic web, said pouches being located underlying said first layer and spaced from one another at said opposed longitudinal ends, respectively of said absorbent structure.

4,994,038

ABSORBENT ARTICLE

Kenneth B. Buell, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1988, Ser. No. 175,816
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—385.1 **34 Claims**

1. A disposable absorbent article, comprising:

a moisture pervious topsheet;

a moisture impervious backsheet associated with said topsheet;

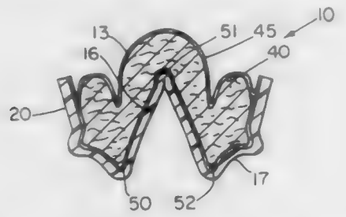
an absorbent means intermediate said topsheet and said backsheet;

a body surface associated with said topsheet; and

a moisture stable deformation element associated with said

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absorbent means, said deformation element being flexure-resistant, at least a portion of said body surface having a



convex upward configuration when said article is subjected to lateral compressive forces.

4,994,039

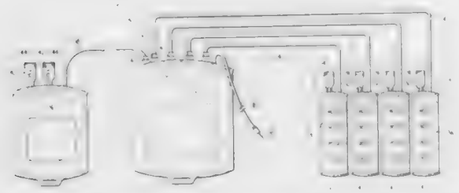
APPARATUS AND METHOD FOR PATIENTS FROM A SINGLE DONOR OR A RESTRICTED GROUP OF DONORS

Philip D. Mattson, 1776 Plantation Way, El Cajon, Calif. 92020

Continuation of Ser. No. 798,272, Nov. 15, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 13,220

Int. Cl.[5] A61B *19/00*

U.S. Cl. 604—408 **18 Claims**



1. A donor exposure limiting apparatus for providing multiple transfusions of blood to premature infants comprising:

a sterile, deformable primary reservoir having an inlet for admitting a first predetermined quantity of blood being substantially less than an adult-size donation of about 450 ml to about 550 ml from the donor into said primary reservoir;

collecting means for collecting said first predetermined quantity of blood from the donor and for conducting the blood to said inlet;

sterilely sealable outlets for releasing blood from said primary reservoir;

selectively releasable closures for preventing the release of blood from said reservoir through said outlets;

a plurality of sterile, deformable satellite administering reservoirs for receiving a second predetermined quantity of blood substantially corresponding to the infusion requirements of the premature infant from said primary reservoir and providing said second quantity to the infant, each of said satellite reservoirs having inlet means for selectively receiving said second predetermined quantity of blood from said primary reservoir, each of said satellite reservoirs having graduations thereon for visually indicating said second quantity received by said satellite reservoirs and outlet means for administering said second predetermined quantity of blood therefrom to the infant, at least one of said satellite reservoirs having top outlet means for releasing blood plasma, bottom outlet means for releasing red blood cells and a central portion between said top and bottom outlet means for containing white blood cells, whereby the blood plasma and the red blood cells are separable from the white blood cells in said at least one satellite reservoir

said primary reservoir having a capacity of about 150 ml and each of said satellite reservoirs having a capacity of about 40 ml, said first predetermined quantity being about 150 ml and said second preselected quantity being from about 10 ml to about 30 ml.

4,994,040

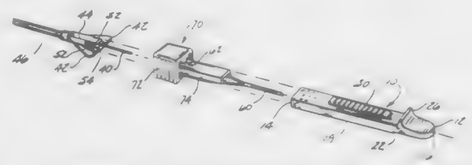
THROUGH THE NEEDLE CATHETER INSERTION DEVICE AND TECHNIQUE

Robert H. Cameron, Tampa, and Robert Doman, Lutz, both of Fla., assignors to Critikon, Inc., Tampa, Fla.

Continuation of Ser. No. 261,647, Oct. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 260,142, Oct. 20, 1988, Pat. No. 4,957,489, which is a continuation-in-part of Ser. No. 259,649, Oct. 19, 1988, Pat. No. 4,957,488. This application Jun. 5, 1990, Ser. No. 533,609

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—160 **10 Claims**



1. A through-the-needle catheter device intended for adult applications, comprising:

a housing having a distal end;

a hollow needle affixed to said housing and extending at least one-quarter inch from the distal end of said housing and terminating in a distal end;

a catheter assembly including a catheter cannula arranged to slide through said hollow needle so that the distal end of said catheter cannula extends at least one-eighth inch from the distal end of said needle; and

wherein said housing further includes means for withdrawing said hollow needle into said housing and splitting said needle, and wherein said housing further includes means for irreversibly sliding said catheter cannula through said hollow needle and out of the distal end thereof before withdrawing and splitting said needle.

4,994,041

NEEDLE AND CATHETER ASSEMBLY

Mitchell P. Dombrowski, 103 Mapleton, Gross Point Farms, Mich. 48236, and Robert A. Welch, 9573 Winterset Cir., Plymouth, Mich. 48170

Division of Ser. No. 269,784, Dec. 27, 1988, which is a continuation-in-part of Ser. No. 231,053, Aug. 11, 1988, abandoned. This application Apr. 9, 1990, Ser. No. 506,936

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—164 **4 Claims**

1. A disposable needle assembly (**10**) comprising: hub means (**16**) for connecting said assembly (**10**) to a syringe (**22**), said hub means (**16**) including a passageway (**24**) extending therethrough; a hollow needle portion (**28**) in fluid communication with said passageway (**24**) and including a distal tip (**32**); cap means (**34**) having a neutral position along said needle portion (**32**) proximate to said hub means (**16**) for exposing a length of said needle portion (**28**) and an extended position for capping said distal tip (**32**), said cap means including tether means (**50'**) for connecting said cap means (**34**) to said first hub means (**16**) and limiting the extent that said cap means (**34**) can be extended from said first hub means (**16**), and said cap means further including locking means for locking said cap means (**34**) over said distal tip (**32**) when said tether means (**50'**) is completely extended, said tether means (**50'**) including a cord (**60**) interconnecting said hub means (**16**) and said cap means (**66**), characterized by said cord (**60**) having a first end connected to said cap means (**34**), said first hub means (**16**) including a second passageway (**68**) extending therethrough, said cord (**60**) having a length thereof releasably contained within said second passageway (**68**) when said cap means (**34**) is in said neutral position and extending from said second passageway (**68**) when said cap means (**34**) is in said extended position, said cord (**60**) including stop means for limiting the amount of said cord (**60**) extending from said passageway (**68**).



4,994,042

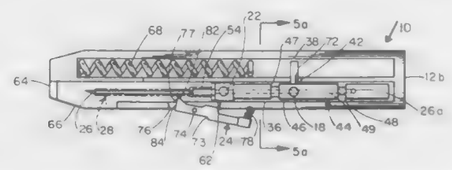
COMBINED CATHETER & NEEDLE

Dinesh L. Vadher, St. Johns Medical Arts Bldg., Rte 25A, Smithtown, N.Y. 11787

Filed Oct. 2, 1989, Ser. No. 415,876

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—165 **15 Claims**



1. A combined medical needle and catheter assembly comprising:

a. an elongated body with a proximate end and a distal end having an extended principal passageway and an extended secondary passageway parallel to and adjacent each other, said passageways being spaced from each other and communicating with each other through an extended slot;

b. plunger means within said principal passageway slidable along the length of said passageway;

c. a hollow needle extending from the proximate end of said plunger means fully contained within said principal passageway with said plunger means adjacent the distal end of said body;

d. spring means mounted within and at the proximate end of said secondary passageway;

e. compression pin means mounted on said plunger means extending through said extended slot into said secondary passageway for compressing said spring means when said plunger means is moved toward the proximate end of said body;

f. catheter means enclosing said needle with the tip of the latter extending past the proximate end of said catheter means thereby being exposed;

g. means for pushing said plunger means to the proximate end of said body, whereby said needle with catheter extend out from the proximate end of said body when said plunger means is at the proximate end of said principal passageway;

h. means for locking said plunger means in the proximate position with said needle and catheter extended; and

i. means for releasing said plunger means to permit said spring means to retract said needle back into said body after use leaving said catheter means extending out of said body.

4,994,043

TWO COMPARTMENT SYRINGE

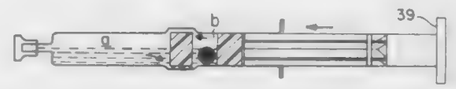
Willem M. Ysebaert, Hendriklaan, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 15, 1988, Ser. No. 207,082

Claims priority, application European Pat. Off., Jun. 16, 1987, 87.201141

Int. Cl.[5] A61M *5/00, 37/00*

U.S. Cl. 604—191 **14 Claims**



1. A two compartment syringe for containing and combining separated medication components comprising

a barrel;

a tip extending from a distal end of said barrel having a passageway therethrough connecting the interior of the barrel with the outside;

a by-pass stopper slidably positioned in fluid-tight engagement inside said barrel thus forming a first compartment between said tip and said by-pass stopper;

at least two raised peripheral portions of said barrel serving as by-passes and defining by-pass zones, said by-pass zones each being longer than the length of said by-pass stopper measured along the longitudinal axis of said barrel, said by-passes positioned so that when said by-pass stopper is moved in the direction of the tip it comes within each by-pass zone simultaneously, said by-passes being raised enough to allow fluid flow around the by-pass stopper when said by-pass stopper is positioned within the by-pass zones; and

a stopper slidably positioned in fluid-tight engagement inside said barrel and adapted to engage a plunger rod, thus forming a second compartment between said stopper and said by-pass stopper, said second compartment having means separate from said tip passageway for allowing the escape of a fluid therefrom during a lyophilization process, said means comprising a small opening in the wall of the barrel associated with the second compartment, which means can be closed by moving the stopper in the direction of the tip.

4,994,044

PROTECTED NEEDLE SYRINGE

Carmelo Lo Duca, Via Val di Sole, 11 - 20141, Milan, Italy

Filed Oct. 12, 1989, Ser. No. 420,319

Claims priority, application Italy, Oct. 18, 1988, 22345 A/88

Int. Cl.[5] A61M *5/32, 5/00*

U.S. Cl. 604—192 **9 Claims**

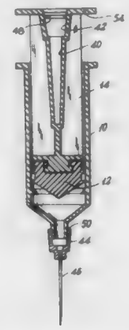
1. A syringe for medical use of the disposable type, comprising:

a needle having, at an end thereof opposite to its a tip, a collar with a frustrum of cone shaped outer surface,

a cap for protecting the needle after use, said cap having a body defining a cavity in which the needle can be completely inserted and protected, said cavity being open at one of its ends and having a seat that is substantially complementary to that the needle collar formed at said one of its ends,

wherein the cap, close to said open end, is provided with elastically deformable catching members, said catching members comprising means for engaging the collar of the needle when the needle is completely inserted in the cap

cavity, and being sufficiently rigid to prevent the needle from coming out of the cavity as a result of the catching members engaging the collar and wherein said cap has a



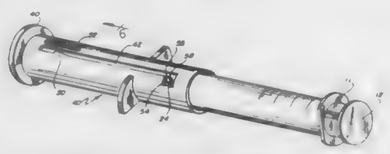
support base on a closed end thereof opposite to said open end, said support base having a width sufficient to stably support said cap in an upright position on a substantially horizontal support surface.

4,994,045

SPLIT SLEEVE SAFETY SYRINGE

Alan B. Ranford, Creve Coeur, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Apr. 20, 1990, Ser. No. 511,667
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 20 Claims



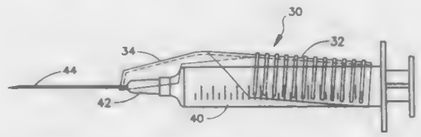
1. A medical device, comprising
a syringe means having proximal and distal ends and a generally elongate barrel section extending therebetween,
an elongate and hollow needle having a distal needle point thereon operatively connected to said distal end of said barrel section,
a locating ring operatively connected to said distal end of said barrel section and including a body section and an outwardly extending tab member extending from said body section of said locating ring,
an elongate sleeve member having circumferentially closed proximal and distal ends, said sleeve member adapted to be longitudinally movable over said barrel section and said locating ring between a retracted position wherein said needle point is exposed and an extended position wherein said sleeve member protects said needle point,
said sleeve member including an elongate slot having proximal and distal ends, said elongate slot extending between said proximal and distal ends of said sleeve member and wherein said tab member of said locating ring extends therein to slidably retain said sleeve member about said barrel section and said locating ring, and
a first perpendicular slot located near the proximal end of said elongate slot and said first perpendicular slot is adapted to receive said tab member therein and retain said sleeve member in said extended position wherein said needle point is protected when said sleeve member is rotated about said barrel section.

4,994,046

NEEDLE GUARD FOR SYRINGE

Vann T. Wesson, 4155 Caminito Cassia, San Diego, Calif. 92122; Jean P. Wesson, San Diego, and Thomas J. Ryan, Del Mar, both of Calif., assignors to Vann T. Wesson, Encinitas, Calif.

Continuation of Ser. No. 292,375, Dec. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 176,653, Apr. 1, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 455,938
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 10 Claims



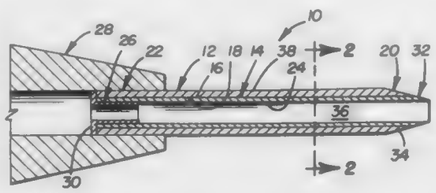
1. A guard for a syringe having an elongate cylindrical barrel, a needle, and a hub attachment section connecting a reward end of the needle to a forward end of the barrel, comprising:
elongated substantially rigid shield means for enclosing a forward tip of the needle; and
elongated body means connected directly to the shield means for surrounding the barrel and sliding longitudinally therealong from a retracted position angularly disposed relative to the barrel to an extended position substantially parallel to the barrel in which the shield means encloses the tip of the needle, the body means providing a spring force when in its retracted position that urges the shield means against the needle, said spring force being provided by over-spread of a pair of circumferential half-sections of a generally cylindrical body portion having a longitudinally extending slot, the body portion further having a longitudinally extending recess opposite the slot to facilitate spreading of the circumferential half-sections.

4,994,047

MULTI-LAYER CANNULA STRUCTURE

Jack M. Walker, Portola Valley, and Joseph R. Thomas, Fremont, both of Calif., assignors to Menlo Care, Inc., Palo Alto, Calif.

Filed May 6, 1988, Ser. No. 191,007
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—264 23 Claims



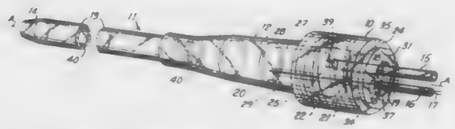
1. A swelling multilayer cannula having proximal and distal end portions and a wall defining an inner lumen, comprising:
(a) a hydrophilic layer structure having one or more hydrophilic layers having respective outer and inner surfaces and being formulated of a hydrophilic material characterized in that it increases in volume more than 1.3:1 upon contact with an aqueous medium at 37° C., said hydrophilic layer structure comprising at least ⅓rds of the cross-sectional area of said wall, said inner lumen swelling such that its cross-sectional area increases more than 20% upon contact of said hydrophilic layer structure with said aqueous medium at 37° C.; and
(b) a substantially non-hydrophilic layer structure having one or more substantially non-hydrophilic layers having respective outer and inner surfaces and being formulated of a substantially non-hydrophilic material, an outer or inner surface of each of said hydrophilic layers being bonded to a corresponding inner or outer surface of at least one of said substantially non-hydrophilic layers, said bonded hydrophilic and substantially non-hydrophilic layers being of a construction such that they remain bonded to one another following swelling of said lumen such that its cross-sectional area increases more than 20% upon contact of said hydrophilic layer structure with said aqueous medium at 37° C.

4,994,048

APPARATUS AND METHOD FOR CONNECTING A PASSAGEWAY AND OPENINGS WITH A CONNECTOR

Mark G. Metzger, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 19, 1988, Ser. No. 246,476
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—283 34 Claims



1. A connector comprising:
a body with a first end and a second end and a first part on the first end and a second part on the second end, the body having a passageway aligned along an axis of the body and passing through the first part from the first end into the body, the body having a plurality of openings in the second part each of the openings generally parallel to the axis of the body and extending through the second part from the second end to the passageway, the passageway extending from the first end to at least the second part of the body to permit communication through the body from the first end to the second end, the body at the first part being shaped and located for cooperative interengagement with a catheter adapter to permit communication of the passageway with the catheter adapter and a catheter connected thereto; and
a probe tube with a lumen therethrough, the probe tube passing through at least one of the openings and extending into a portion of the passageway providing the lumen between the first end to the second end.

4,994,049

DEVICE FOR APPLYING A SUBSTANCE TO THE SKIN

Arno W. Latzke; Ralf Latzke, and Gert Latzke, all of Mühltobel 946, CH-9429 Zelg/Wolfhalden, Switzerland

Continuation of Ser. No. 245,923, Sep. 16, 1988, Pat. No. 4,898,592, which is a continuation of Ser. No. 42,344, Apr. 24, 1987, abandoned. This application Nov. 15, 1989, Ser. No. 436,709
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628688; Aug. 30, 1986, 3629565; European Pat. Off., Feb. 18, 1987, 87102306
The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.
Int. Cl.[5] A61F *13/02*
U.S. Cl. 604—307 14 Claims

1. A device for application of a substrate to skin, comprising at least one absorptive carrier for applying a substrate to skin, and a laminate support housing the carrier comprising:
a first closed-cell polyethylene foam layer having a thickness of about 1 to 6 mm, said first foam layer including a foil-facing area and a laminate-contacting area defined on a first surface, and an opposite surface;
a second closed-cell polyethylene foam layer having a thickness of about 1 to 6 mm, said second foam layer including a laminate-contacting surface bonded to said laminate-contacting area of the first foam layer and an opposite, skin-contacting surface, wherein at least one portion of said second foam layer has been removed to define side



walls surrounding an area housing the carrier, the housing area being at least as large as the surface area of the carrier; and
a flexible heat-conductive metal foil, said metal foil including a first surface facing said foil-contacting surface of the first foam layer and an opposite surface facing said carrier.

4,994,050

FLOAT CHAMBER AND SLEEVE FOR USE IN A CHEST DRAINAGE DEVICE

Eugene E. Weilbacher, Ellisville, and F. Thane DeWeese, Ladue, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 31, 1989, Ser. No. 429,892
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—320 27 Claims

23. An improved suction control chamber for use with a drainage device having a collection chamber and a water seal chamber, wherein the improvement comprises
a liquid containing suction control chamber having a top and bottom section
a first column having top and bottom ends wherein said top end is in flow communication with the atmosphere and said bottom end is partially submerged in the liquid in the bottom section of said suction control chamber
a second column having top and bottom ends wherein said bottom end is in flow communication with the bottom end of said first column and said top end is in flow communication with a source of vacuum pressure and a collection chamber,
a float means and ballast means in flow communication with the bottom end of said first column to selectively restrict flow communication between the source of vacuum pressure and the atmosphere,
a damper chamber in the bottom of said second column and

having an opening therein adjacent to the bottom end of said first column, and

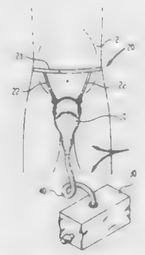
wherein said float means is movably positioned in at least a portion of the damper chamber and is normally submerged in the liquid in the bottom section of the suction control chamber.

4,994,051

EXTERNAL URINE CATHETER FOR MALES

Leopoldine Walsh, R.D. 1, Box 1-Bryan Tpk., Wallkil, N.Y. 12589

Filed Dec. 22, 1989, Ser. No. 454,933
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—349 10 Claims



1. An external urine catheter system for males adapted to fit and be worn around the waist and the lower part of the male abdomen comprising in combination;

a substantially tubular sheath for receipt of male genitalia, said sheath including an upper portion and a lower portion, said upper portion being adapted to fit at one end adjacent to the pubic area of the male user providing a scrotal support portion, said lower portion being integrally formed at the distal end of said upper portion a providing penis receptacle portion, said lower portion being formed with a smaller diameter than said upper portion that decreases from the adjoining end to its distal end, said sheath having an opening extending longitudinally throughout its body, said opening generally conforming to a shape of a male scrotum within said scrotal support portion and to the shape of a the male penis within said penis receptacle portion, said sheath including a scrotum bar extending laterally across the lower part of the end of said upper portion adjacent to the pubic area and waist belt attachment means integrally formed at the end of said scrotal support portion that is disposed adjacent to the body of the user, said scrotum bar being formed from soft rubber material,

a waist belt assembly selectively attachable to said sheath providing means to secure said sheath to the body of the user, said waist belt assembly including a waist belt having two ends, a pair of sheath straps and a pair of thigh straps, said waist belt including adjustable belt closure means, said sheath straps and said thigh straps being fixedly and respectively attached at one end to the sides of said waist belt and selectively attachable at the opposite end to said tubular sheath, said sheath straps being disposed to fit across the upper front portion of the thighs of the user, said thigh straps being disposed to fit around the back portion of the thighs of the user passing under the buttocks to the crotch of the user,

a urine collector comprising a flexible container including a urine inlet receptacle and a collector disposal port having means for selectively sealing said disposal port, and

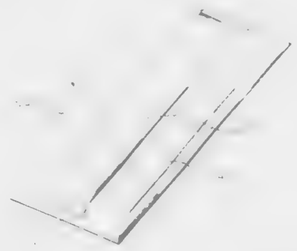
a length of hollow tubing interconnecting said sheath and said urine collector comprising a length of hollow tubing sealingly engageable with the urine inlet receptacle of said urine collector at one end and sealingly engageable with the opening of said sheath at the opposite end.

4,994,052

DIAPER

Keiko Kimura, New-Apartment-Kunitachi, Room 101 Kita 1-9-1, Kunitachi-shi, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,993
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—355 1 Claim



1. A diaper having a three-dimensional configuration, made substantially of soft, flexible liquid absorbing material, comprising:

(a) a main body formed in a substantially flat square shape having a top surface, a first side and a second side opposing each other, and a first end and a second end opposing each other;

(b) a raised part for supporting thereon buttocks of a user of said diaper, said raised part being formed on said first end integrally with said main body;

(c) an end wall formed on said second end integrally with said main body, the height of said end wall being lower than the height of said raised part; and

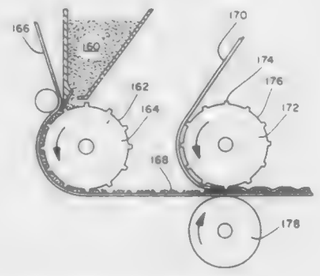
(d) a first side wall and a second side wall opposing each other, said first side wall being formed on said first side integrally with said main body and said second side wall being formed on said second side integrally with said main body so that said raised part, said end wall, said first side wall and said second side wall form a continuous four-sided wall integral with said main body, the height of each of said first and second side walls being lower than the height of said raised part and substantially equal to the height of said end wall.

4,994,053

COMPOSITE ARTICLE HAVING DISCRETE PARTICULATE AREAS FORMED THEREIN

Theodore B. Lang, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 749,158, Jun. 26, 1985, Pat. No. 4,715,915.
This application Sep. 30, 1987, Ser. No. 103,000
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—367 17 Claims



5. A composite article comprising:

(a) a liquid-impermeable web;

(b) superabsorbent deposited on said liquid-impermeable web in a plurality of discrete areas; and

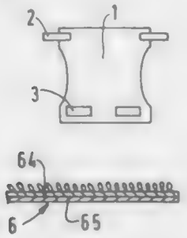
(c) a liquid permeable web positioned adjacent to said superabsorbent and being bonded to said liquid-impermeable web in distinct areas which surround said discrete areas of superabsorbent.

4,994,054

SELF-ATTACHING FASTENER PART NOTABLY FOR ALL-IN-ONE DISPOSABLE DIAPER AND PROCESS FOR MANUFACTURING IT

Raymond Pigneul, Durrenentzen; Rémy Ruppel, Horbourg, and Jean Brellmann, Colmar, all of France, assignors to Kaysersberg, SA, Kayersberg, France

PCT No. PCT/FR88/00065, § 371 Date Oct. 7, 1988, § 102(e) Date Oct. 7, 1988, PCT Pub. No. WO88/06014, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 8, 1988, Ser. No. 279,152
Claims priority, application France, Feb. 10, 1987, 87 01590
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—391 13 Claims



1. A disposable diaper comprising an external surface, an internal surface and a fastening system having a buckles part and a grip part positioned on said diaper in such a manner that when said buckles part and said grip part are interlocked, said interlocked buckles part and grip part are capable of holding said diaper in position on a user of said diaper, wherein at least said buckles part of said fastening system is affixed to said external surface of said diaper and comprises a support material having an open mesh structure and a plurality of raised buckles on a first side of said support material, a cold melt adhesive applied to a second side of said support material to affix said support material to said external surface of said diaper, and an adhesive having no tack at ambient temperature positioned on said second side of said support material between said support material and said cold melt adhesive to provide a screen between said support material and said cold melt adhesive.

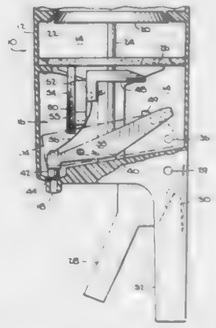
4,994,055

FLUID FLOW CONTROL APPARATUS

Douglas M. Spranger; Karl D. Kirk, III, both of New York, N.Y.; Robert Cohen, Duxbury; Preston J. Keeler, III, Westport, both of Mass., and Jeffrey A. Stein, Milford, Conn., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Mar. 29, 1989, Ser. No. 330,399
Int. Cl.[5] A61B *19/00*; B67D *5/08, 5/14*
U.S. Cl. 604—403 28 Claims

4. A reservoir outlet control device for controlling fluid outflow from a reservoir comprising a housing, adapted to contain collected fluid, having an outlet, a float being movable responsive to a level of fluid in said housing, an arm including means for sealing said outlet against fluid outflow, means cooperating with said arm for moving said arm to a position releasing said outlet seal, and means for releasably latching said float and said arm for first maintaining said released outlet seal until



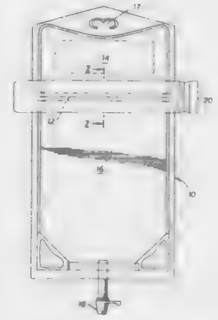
a predetermined level of fluid remains in the reservoir and thereafter for restoring said outlet seal.

4,994,056

UNIT DOSE MEDICAMENT STORING AND MIXING SYSTEM

Daniel P. Ikeda, 6436 Harmon Dr., Sacramento, Calif. 95831

Filed Nov. 9, 1989, Ser. No. 434,010
Int. Cl.[5] A61B *19/00*
U.S. Cl. 604—410 12 Claims



1. A package for separately storing and subsequently mixing two ingredients comprising:

a container formed of first and second opposed walls of flexible material and having at least one port;

a closure dividing said container to define first and second compartments within said container, the closure being formed by at least one leak-proof, resealable interior fastener disposed between a top and a bottom of said container, the interior fastener having a first mating portion and a second mating portion, the first mating portion being disposed on the inner surface of the first wall of the container, and the second mating portion being disposed on the inner surface of the second wall opposite the first mating portion; and

an external clamp to fit over the closure, said external clamp including means for forming first and second external seals between the first and second walls of the container, the first external seal being disposed on one side of the closure and the second external seal being disposed on the other side of the closure.

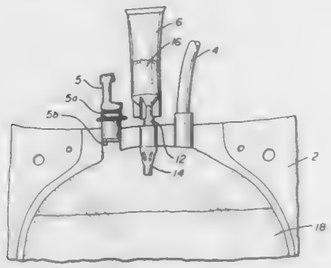
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4,994,057

STERILIZABLE SYSTEM FOR BLOOD STORAGE

Raleigh A. Carmen, Concord, and Chi-Yong Chong, San Francisco, both of Calif., assignors to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 100,647, Sep. 24, 1987, Pat. No. 4,902,287. This application Nov. 6, 1989, Ser. No. 432,431
Int. Cl.[5] A61J *1/00*
U.S. Cl. 604—416 8 Claims



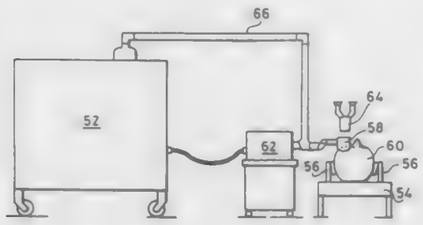
1. In a closed, heat sterilizable, blood bag system comprising at least one flexible bag adapted to receive and store a blood component, the improvement comprising a squeezable, resilient compartment extending from the bag via a conduit, the squeezable compartment being generally elongated and having two ends, including means for strengthening the compartment against deformation at one end and containing a solid material for controlling pH within the bag, the solid material being separated from the interior of the flexible bag by means of an externally manipulatable closure system located outside of the conduit which, when opened, permits the mixture of the solid pH control material with the contents of the bag, thereby assuring pH control of the bag contents over prolonged periods of time.

4,994,058

SURFACE SHAPING USING LASERS

Antony L. Raven, Hertfordshire; John Marshall, Hants, both of United Kingdom, and David F. Muller, Boston, Mass., assignors to Summit Technology, Inc., Watertown, Mass.

Filed Jan. 15, 1988, Ser. No. 124,101
Claims priority, application United Kingdom, Mar. 19, 1986, 8606821
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[5] A61N *5/06*
U.S. Cl. 606—5 29 Claims



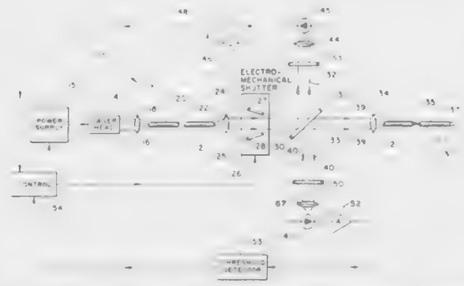
1. An erodable mask for reprofiling a surface using laser radiation, the mask comprising a material erodable by laser radiation and positionable between a source of laser radiation and the surface, the mask providing a predefined profile of resistance to the said laser radiation, such that upon irradiation of the mask a portion of the laser radiation is selectively absorbed by the mask and another portion is transmitted to the surface in accordance with the mask profile, to selectively erode the surface.

4,994,059

LASER CATHETER FEEDBACK SYSTEM

Nadhir B. Kosa; James J. Burke, and Gary L. Moore, all of Minneapolis, Minn., assignors to GV Medical, Inc., Minneapolis, Minn.

Continuation of Ser. No. 861,459, May 9, 1986, abandoned, which is a continuation of Ser. No. 679,920, Dec. 10, 1984, abandoned. This application Sep. 1, 1988, Ser. No. 239,602
Int. Cl.[5] A61N *5/06*
U.S. Cl. 606—12 4 Claims



1. In a laser enhanced transluminal angioplasty catheter system including a catheter having a proximal end and a distal end, a laser beam generator providing a source of laser beam energy, lens means for focusing the laser beam energy from the source onto an optical fiber column for providing a beam transmitting fiber column for transmission of laser beam energy along said catheter from the proximal end of the distal tip end thereof and a control means for controllably interrupting the delivery of laser beam energy to said optical fiber column being interposed along said fiber column at the proximal end of said catheter, said laser enhanced transluminal angioplasty catheter system being characterized in that:

(a) an optical fiber column extends along the length of said catheter system for transmitting said laser beam energy to the distal tip of said catheter for controllably discharging said laser beam energy from said catheter distal tip, said control means including a laser beam energy evaluation zone at the proximal end of said catheter system between said generator means and said distal tip, and means for accessing at least a portion of said laser beam energy within said beam energy evaluation zone during operation of said laser beam generator and said catheter system;

(b) said optical fiber column including means for delivering laser beam energy from said column to said laser beam evaluation zone;

(c) said control means including shutter means within said beam energy evaluation zone and having means for controllably interrupting the passage of laser beam energy through said beam energy evaluation zone and along said beam transmitting fiber column upon detection of an anomalous signal from said control means;

(d) beam splitter means disposed within said beam energy evaluation zone for diverting a portion of said laser beam energy passing through said beam energy evaluation zone for directing said diverted portion onto a first detector means, and means for simultaneously enabling the passage of the non-diverted portion of said laser beam energy through said beam splitter means and along said beam transmitting fiber column to said distal tip;

(e) optically reactive means disposed at the distal tip of said catheter along the path of the non-diverted portion of said laser beam energy and axially distally of said beam transmitting fiber column for normally receiving and normally transmitting substantially all of said non-diverted laser beam energy therethrough, and having optically reactive fluorescent responsive means incorporated therein for fluorescing to generate radiant energy at a wavelength

significantly different from that of said laser beam energy while being stimulated with said laser beam energy transmitted along said beam transmitting fiber column and received by said optically reactive means, said optically reactive means being a fluorescent lens element which emits fluorescent energy upon stimulation by laser beam energy;

(f) means for simultaneously transmitting said stimulated radiant energy from said optically reactive means as an energy source through said beam transmitting fiber column and thence onto said beam splitter means for diversion of said stimulated radiant energy onto a second detector means during the operation of said laser beam generator and with said beam transmitting fiber column simultaneously transmitting laser beam energy created by said laser beam generator to said optically reactive means;

(g) first and second signal processing means responsive to said first and second detector means respectively; and

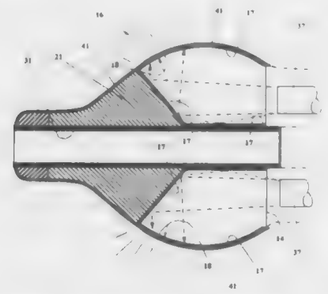
(h) said control means further including shutter control means responsive to the output of said first and second signal processing means for closing said shutter means and interrupting the passage of laser beam energy from said laser beam generator through said beam energy evaluation zone upon detection of an anomalous signal form one of said first and second detector means.

4,994,060

LASER HEATED CAUTERY CAP WITH TRANSPARENT SUBSTRATE

Dan L. Rink, Oakland; John L. Rink, San Francisco, and Garrett Lee, Piermont, all of Calif., assignors to Xintec Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 179,678, Apr. 11, 1988, Pat. No. 4,848,339, which is a continuation-in-part of Ser. No. 19,755, Feb. 27, 1987, which is a continuation-in-part of Ser. No. 650,889, Sep. 17, 1984. This application Mar. 20, 1989, Ser. No. 325,955
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—28 35 Claims



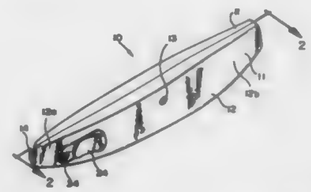
1. An improved intravascular cautery cap assembly for recanalization of a lumen, including a substrate member formed of a transparent high temperature tolerant material, said substrate member having a diameter and an outer surface which is smoothly curved along a direction axial to said substrate member, at least one optical fiber having an input end adapted to be connected to a controlled laser light source and an output end mechanically and optically coupled to said substrate member, a central bore having a surface extending axially through said substrate member and having a distal end, a counterbore extending axially into the distal end of said bore, said counterbore having a smooth, inwardly tapering surface, reflective surface coating means secured to said inwardly tapering surface to form an internally reflective surface in confronting alignment to said optical fiber output end, heat zone means at the outer surface of said substrate member and disposed to receive a primary reflection of said laser light from said internally reflective surface, said heat zone means including absorptive surface coating means which has a thermal mass for absorbing said laser light and generating thermal energy therefrom, said heat zone means being positioned on said outer surface to contact material blocking the lumen in which the substrate member is disposed.

4,994,061

HAIR GRASPING DEVICE

Bruce McPherson, Maitland, Fla., assignor to Selvac Corporation, Dresher, Pa.

Filed Mar. 6, 1989, Ser. No. 319,610
Int. Cl.[5] A61B *17/41*
U.S. Cl. 606—43 14 Claims



1. A hair grasping device for hair removal comprising:

a housing;

a first clamping member slidably disposed with respect to said housing and including a first hair engaging surface;

a second clamping member including a second hair engaging surface;

a biasing means for biasing the first clamping member toward the second clamping member and said first hair engaging surface into engagement with said second hair engaging surface for grasping and holding a hair therebetween; and

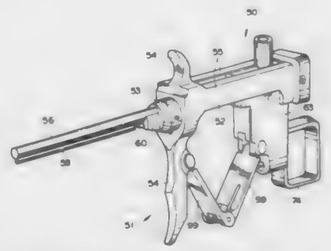
a control cap slidably disposed on the periphery of said housing, said cap including a projection extending into said housing through an aperture thereof, said projection engaging said first clamping member for movement of said first clamping member against the bias of said biasing means such that the position of said hair engaging surfaces with respect to each other is dependent upon the position of said control cap.

4,994,062

RESECTOSCOPE APPARATUS

Shinichi Nishigaki, Tokyo, and Shiro Bito, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 22, 1989, Ser. No. 355,270
Claims priority, application Japan, Sep. 16, 1988, 63-231869
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—46 8 Claims



1. A resectoscope apparatus comprising:

an elongate hollow sheath to be inserted into a body cavity;

an electrode inserted through said sheath and resecting or coagulating tissues within the body cavity by using a high frequency current;
an endoscope insertable part inserted through said sheath and having an optical system with which the body cavity interior can be observed; and
an operating part having a guide tube part through which said endoscope insertable part is inserted and a sheath connecting part connected to the base end part of said sheath and making said electrode operatable from outside the body, at least one of said guide tube part and sheath connecting part being formed of an electric insulating material for electric insulation.

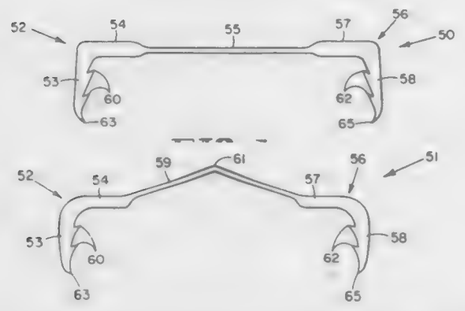
4,994,063

METHOD AND APPARATUS FOR INTEROSSEOUS BONE FIXATION

Eric T. Garner, 8805 Westbrook, Boise, Id. 83704

**Division of Ser. No. 12,838, Feb. 10, 1987, Pat. No. 4,841,960.
This application Jun. 12, 1989, Ser. No. 365,217
Int. Cl.[5] A61B *17/58***

U.S. Cl. 606—75 **3 Claims**



3. A bone staple, comprising a first foot and a first shoulder on one end thereof, said first foot being substantially perpendicular to said first shoulder, a second foot and a second shoulder on a second end thereof, said second foot being substantially perpendicular to said second shoulder, and a central web portion extending between said first end and said second end, said central web portion having a cross sectional area less than a cross sectional area of said first end or said second end and being adapted to be crimped into substantially an inverted V shape subsequent to insertion of said stable into a bone section.

4,994,064

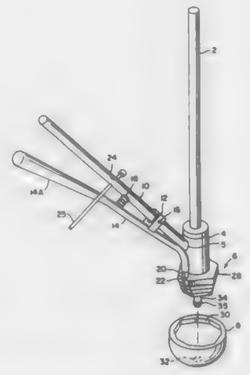
INSTRUMENT FOR ORIENTING, INSERTING AND IMPACTING AN ACETABULAR CUP PROSTHESIS

Robert I. Aboczky, 323 E. Saddle River Rd., Upper Saddle River, N.J. 07458

**Filed Dec. 21, 1989, Ser. No. 454,432
Int. Cl.[5] A61F *5/04***

U.S. Cl. 606—91 **12 Claims**

1. An instrument for orienting, inserting and impacting an acetabular cup prosthesis as part of a total hip replacement procedure, comprising:
first, second and third rods disposed in a common plane;
the first rod having a bottom with a shaped end and a slot in said end;
the second rod extending angularly from the bottom of the first rod;
the third rod displaceably coupled to the second rod and having an end receivable in the slot in the end of the first rod and shaped to match the shape thereof;
a spring captured between the second and third rods and normally biasing the third rod so that the shaped end thereof is received in the slot in the end of the first rod, whereby said first rod end is adapted for supporting an acetabular cup;
the third rod displaced against the bias of the spring, whereby the end of said third rod is displaced out of the slot to grip the acetabular cup;
a pair of holes extending through the second rod in longitudinal spaced relation, with the axis of one of said holes being in a plane angularly displaced in one direction from the common plane of the first, second and third rods and the axis of the other of said holes being in a plane angularly displaced in another direction from said common plane;



a bar extending through one of said holes in accordance with the side of a patient which is being subjected to the total hip replacement procedure;
the second rod being disposed in a plane normal to the plane in which the patient is supported and the bar being disposed normal to a line extending between the right and left anterior/superior iliac spines of the patient, whereby the gripped cup is aligned for insertion into the patient's acetabulum, and thereafter inserted therein and impacted via impaction of the first rod to seat the aligned and inserted cup; and
the third rod displaced by the bias of the spring, whereby the end of the third rod enters the slot to release the grip on the seated acetabular cup, whereupon the instrument is removeable from said cup without disturbing its seating.

4,994,065

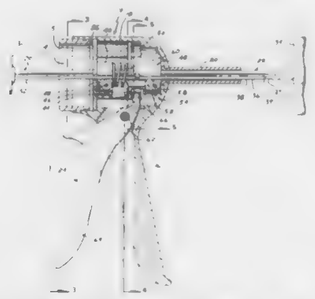
APPARATUS FOR DISPENSING LOW VISCOSITY SEMI-FLUID MATERIAL UNDER PRESSURE

Rebecca Gibbs, Carrboro, N.C.; Jan J. Krygier, St. Constant, Canada; Joseph E. Miller, deceased, late of Carrboro, N.C.; L. A. Desrochers, executor; Bryan O'Donnell, executor, both of Edmonton, Canada, and Patricia Miller, executor, Westmount, Canada, assignors to Zimmer, Inc., Warsaw, Ind., by said Rebecca Gibbs

**Filed May 18, 1990, Ser. No. 524,793
Int. Cl.[5] A61F *5/04***

U.S. Cl. 606—92 **10 Claims**

1. A feeding device for delivering a low viscosity paste material under pressure comprising a housing adapted to engage the end of a cartridge from which the low viscosity paste material can be dispensed, a plunger including a rod adapted to slide axially of the housing for engagement within the cartridge, the rod being provided with an axially extending series of notches forming teeth and the notches being discontinuous at least in a circumferential segment of the rod leaving a smooth axial rod surface segment) an annular ratchet cylinder slidable within the housing, the ratchet cylinder including a bore through which the rod is to pass, a pistol grip extending from the housing at an angle to the axis of the housing, and a lever pivotally mounted to the pistol grip with the lever extending beyond the pivot point thereof to engage the ratchet



cylinder, the ratchet cylinder including a pawl pivotally mounted therein and being spring biased to engage the series of teeth on the rod in order to advance the plunger.

4,994,066

PROSTATIC STENT

Gene A. Voss, 4227 Centergate, San Antonio, Tex. 78217

**Filed Oct. 7, 1988, Ser. No. 255,144
Int. Cl.[5] A61M *29/00***

U.S. Cl. 606—108 **10 Claims**



1. A stent for symptomatic treatment of prostatic hypertrophy comprising:
a cylindrical conduit having first and second conduit ends, an interior annular surface, and an exterior annular surface;
a conical flange radiating outwardly from said conduit's said exterior annular surface at said first conduit end; and
an externally situated, coaxial, annular flange at said second conduit end;
said stent being constructed of a medical grade plastic material suitable for surgical implantation in humans;
said stent being associated with implantation means comprising:
a first tube having a first tube insertion end and a first tube external end, a first tube annular flange being formed on said first tube at a distance from said insertion end slightly greater than the overall axial length of said stent, said first tube having an external diameter approximately equal to, but no greater than the internal diameter of said conduit, said insertion end of said first tube extending through said conduit whereby said stent annular flange at said first end of said stent is juxtaposed against said first tube annular flange and said conical flange of said stent is adjacent to said insertion end, said first tube being made of a medical grade plastic material suitably flexible for traversing the urethral path of said patient; and
a second tube extending through the interior of said first tube, said second tube having a second tube insertion end and a second tube external end, said second tube being formed from a highly flexible medical grade plastic material, said second tube insertion end of said second tube being turned back over said first tube insertion end and enveloping said stent situated thereon, the terminus of said second tube insertion end being affixed to the exterior surface of said first tube adjacent to said first tube annular flange opposite said stent by securing means, said second tube external end extending beyond said first tube external end whereby said second tube external end may be grasped and a traction force applied to retract said second tube dislodging said second tube insertion end from said securing means, said second tube being sized at said second tube insertion end whereby said conical flange is held compactly for traversing said urethral path.

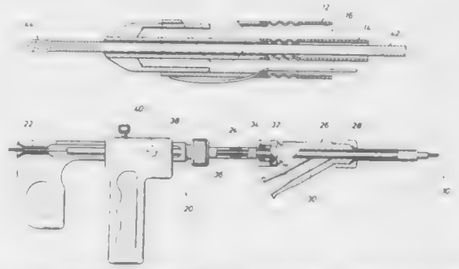
4,994,067

DISTAL ATHERECTOMY CATHETER

David P. Summers, Montgomery, Tex., assignor to American Biomed, Inc., The Woodlands, Tex.

**Filed Feb. 17, 1989, Ser. No. 312,737
Int. Cl.[5] A61M *25/00*; A61B *17/00***

U.S. Cl. 606—159 **10 Claims**



1. An atherectomy catheter for removal of occlusive material in a coronary vessel, comprising:
(a) an outer catheter tube;
(b) an inner catheter tube concentrically received within said outer catheter tube and defining an annulus therebetween;
(c) flexible drive shaft means extending through said inner catheter tube terminating in an abrasive burr for boring through an obstruction in the coronary vessel;
(d) wherein said outer catheter tube and said inner catheter tube cooperate to form a cutting assembly for excising the occlusive material in the coronary vessel;
(e) manipulator means connected to the proximal end of said outer catheter tube and said inner catheter tube for reciprocating said inner catheter tube relative to said outer catheter tube for excising the occlusive material in the coronary vessel; and
(f) vacuum means connected to said manipulator means and said outer catheter for evacuating the excised occlusive material from the coronary vessel.

4,994,068

COMBINATION STERILE PAD SUPPORT AND LANCET CONTAINING LANCET DISPOSAL ELEMENT

Douglas R. Hufnagle, Columbus, Ohio, assignor to Unidex, Inc., Columbus, Ohio

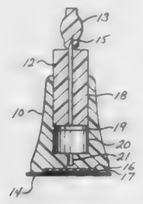
**Filed Nov. 24, 1989, Ser. No. 440,945
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[5] A61B *17/34***

U.S. Cl. 606—181 **6 Claims**

1. A combination sterile pad support and lancet comprising:
a member provided with a base and containing a hollow cylinder, one end of said cylinder being closed and terminating adjacent to said base, the opposite end of said cylinder being open and terminating in the end of said member opposite to said base,
a lancet, said cylinder being of a size and shape adapted

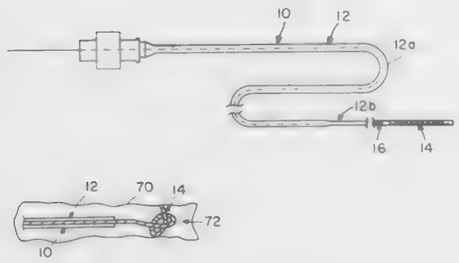
VOL 1123 ISS 3 FE 19 1991 UMI

frictionally to hold said lancet, said lancet being positioned in said cylinder,
said lancet having a sharp pointed end on one end thereof and a removable cover on said sharp pointed end,
said one end of said lancet extending out of said cylinder a distance so that said lancet may be readily pulled out of said cylinder,
said hollow cylinder containing means for gripping said lancet when said lancet is reinserted into said cylinder with said sharp pointed end extending into said cylinder,



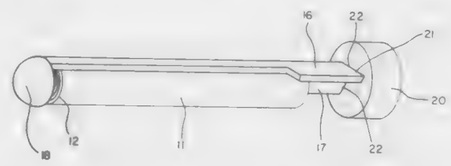
after said cover on said sharp pointed end has been removed,
said member being provided with a recess in the base of said member,
an absorbent pad in said recess containing an antiseptic fluid,
a removable cover on said base completely covering said pad and adapted to cooperate with said recess to prevent said antiseptic fluid from coming in contact with the atmosphere, said cover being separable from said pad whereby said pad will remain in said recess when said cover is removed from said base.

4,994,069
VASO-OCCLUSION COIL AND METHOD
Mark Ritchart; Mike Mariant; Ivan Sepetka, all of Santa Clara, and Erik Engelson, Portola Valley, all of Calif., assignors to Target Therapeutics, San Jose, Calif.
Filed Nov. 2, 1988, Ser. No. 265,908
Int. Cl.[5] A61B 17/12, 17/00
U.S. Cl. 606—191 25 Claims



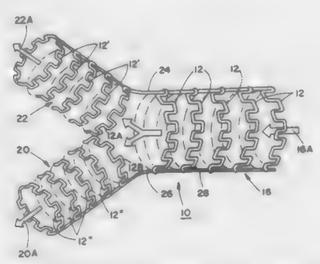
1. A flexible, vaso-occlusive wire designed for occluding a vessel having a selected cross-sectional area, when the wire is released into the vessel from a small-diameter catheter, said wire being characterized by:
(a) a relaxed condition in which the wire assumes a folded, convoluted conformation which is adapted to form a substantially space-filling body having a substantially predetermined diameter when the wire is in said released condition,
(b) a stretched condition in which the wire has a linear conformation in which the wire can be pushed through said catheter, and
(c) a memory which returns the wire from its stretched to its relaxed condition, as the wire is released from said catheter in the vessel, thereby forming a space-filling, vaso-occlusive body which is lodged in the vessel at the site of release, the size of the wire and relaxed shape of the body being such as to occlude the vessel at said site.

4,994,070
APPARATUS FOR DILATING A BODY CAVITY
Gerard A. Waters, Castletown House, Celbridge, County Kildare, Israel
Filed Apr. 11, 1989, Ser. No. 336,040
Int. Cl.[5] A61M 29/00
U.S. Cl. 606—191 7 Claims



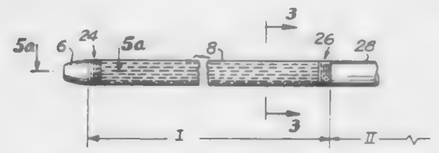
1. A vaginal speculum comprising a sheet member of inherently resilient material capable of being rolled into a normal position in which the sheet member forms a narrow generally elongate shape, the sheet member being expandable under its inherent resilience to a dilated position in which the sheet member forms a hollow generally open-ended elongate shape having a substantially continuous sidewall, said sheet member being generally rectangular and having upper and lower edges and left and right side edges, a first elongate handle member attached along the left side edge of the sheet member and a second elongate handle member attached along the right side edge of the sheet member, said first and second elongate handle members having lower ends which extend below the lower edge of the sheet member.

4,994,071
BIFURCATING STENT APPARATUS AND METHOD
David C. MacGregor, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed May 22, 1989, Ser. No. 354,799
Int. Cl.[5] A61M 29/00; A61F 2/06
U.S. Cl. 606—194 16 Claims



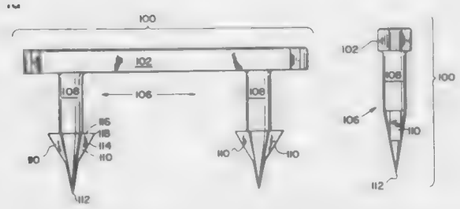
1. A bifurcating stent for placement in a subject vessel comprising:
a first generally cylindrical matrix of filament material forming a series of interconnected loops that define a first flow path for fluid flow; and a second generally cylindrical matrix of filament material forming a series of interconnected loops that define a second branching flow path; said first and second matrices connected by a flexible interconnecting member bent to define an angle between the first and the branching flow paths;
said matrices constructed from a material that allows that stent to conform to an insertion configuration and expand to an in place configuration.

4,994,072
DILATION CATHETER
Anandkumar Bhate, St. Louis, Mo., and David Catlin, Middletown, N.J., assignors to Meadox Medicals, Inc., Oakland, N.J.
Continuation-in-part of Ser. No. 239,081, Aug. 31, 1988, Pat. No. 4,896,669. This application Aug. 30, 1989, Ser. No. 400,631
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] A61M 29/00
U.S. Cl. 606—194 10 Claims



1. A dilatation catheter, comprising:
a length of a shaft of flexible material having a longitudinal axis;
an inner flexible member coaxially disposed in the shaft and having a distal portion projecting therefrom;
a balloon portion formed at the distal end of the flexible shaft, the balloon portion formed with radial crimps running length-wise about the circumference thereof and being capable of expanding to a predetermined diameter when subjected to internal pressure to provide a balloon, the balloon portion fixed to the distal end of the flexible shaft and the distal end of the inner flexible member; and
a transition portion at at least one end of the balloon portion surrounding the inner flexible member for coupling the balloon portion to one of the inner distal ends of the flexible member and tho distal portion of the flexible shaft, the transition portion being capable of longitudinal extension in response to a minor longitudinal contraction at the two ends of the balloon portion when the balloon portion is inflated.

4,994,073
SKIN FASTENER
David T. Green, Westport, Conn., assignor to United States Surgical Corp., Norwalk, Conn.
Filed Feb. 22, 1989, Ser. No. 314,368
Int. Cl.[5] A61B 17/00; F16B 15/02
U.S. Cl. 606—220 18 Claims



1. A surgical fastener for joining layers of body tissue comprising:
(a) a backspan; and
(b) at least two prongs spaced apart from the ends of said backspan extending substantially perpendicularly from said backspan in substantially parallel relationship to each other, each prong having a shaft portion with a tip portion tapering into a distal point and at least one, substantially triangular shaped barbed means for penetrating body tissue and retaining the fastener in the body tissue, said barbed means being located on the tapered tip portion of said shaft and having a distal edge spaced apart from said distal point, said barbed means further being disposed in the body tissue without passing completely therethrough for retaining the fastener in the body tissue without engaging a retainer.

4,994,074
COPOLYMERS OF EPSILON-CAPROLACTONE, GLYCOLIDE AND GLYCOLIC ACID FOR SUTURE COATINGS
Rao S. Bezwada, Whitehouse Station; Alastair W. Hunter, Bridgewater, and Shalaby W. Shalaby, Lebanon, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Feb. 1, 1990, Ser. No. 473,291
Int. Cl.[5] C08G 63/06, 63/08
U.S. Cl. 606—230 16 Claims

1. A copolymer of a predominant amount of ε-caprolactone and the balance glycolide and glycolic acid, at a concentration of glycolic acid such that the intrinsic viscosity of the copolymer in hexafluoroisopropyl alcohol is between about 0.15 to about 0.60 dl/g.

15. An absorbable multifilament suture coated with the copolymer of claim 1.

4,994,075
INFANT PACIFIER HOLDER ASSEMBLY
Jeanne M. Smith; Virginia A. Buechler, and Predrag Vukovic, all of 450 Cascade Dr., Fairfax, Calif. 94930
Filed Jul. 25, 1989, Ser. No. 385,210
Int. Cl.[5] A61J 17/00
U.S. Cl. 606—235 4 Claims



1. A holder assembly for an infant pacifier, having a ring affixed thereto, said assembly comprising;
a plastic cord member having a general sinusoidal configuration and defining at its proximate end a flexible loop portion adapted to be attached to said ring of the pacifier in such a manner that it is difficult for an infant to open said loop portion;
a distal end portion on said cord member providing a connection means and including an enlarged stub portion; and
a decorative plastic clip member attached to said connection means, said clip member having means which enable it to be clipped to the clothes of an infant so that the pacifier is retained on the infant during use, and an enlarged hole in said clip member for receiving said distal end portion and forming a releasable connection between the sinusoidal plastic cord member and the integral clip member.

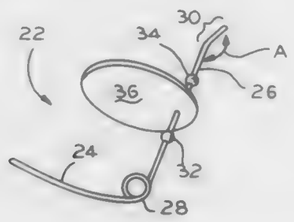
VOL 1123 ISS 3 FE 19 1991 UMI

4,994,076
INFANT NURSING DEVICE
Barron Guss, 821 Cooke St., Honolulu, Hi. 96813
Filed Oct. 25, 1989, Ser. No. 427,064
Int. Cl.[5] A61J *17/00*
U.S. Cl. 606—236 4 Claims



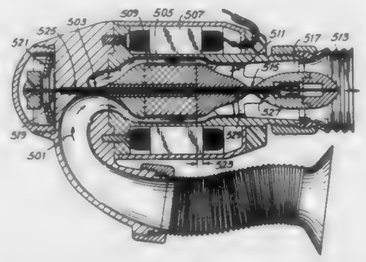
1. A device for permitting an infant to ingest by means of a nipple a liquid contained in a nursing bottle remote from the nipple, comprising a closure for the nursing bottle, the closure including means forming a conduit passing through the closure for conducting out of the bottle a liquid contained in the bottle, the closure having an obverse surface which is conical and coaxial with the conduit, the conical surface defining a mouth which is adapted to receive an outlet of a water tap, a first segment of flexible tubing having an end communicating with an end of the conduit at the interior of the closure and being of such length that another end of the first flexible tubing segment approximately reaches the bottom of the bottle, means for holding the nipple so that a fluid-tight seal is formed about a periphery of the nipple, means forming a conduit passing through the nipple holding means for communicating between the interior and the exterior of the nipple, and a second segment of flexible tubing having an end communicating with an end of the nipple holding means conduit located to be at the exterior of the nipple and having another end communicating with an end of the closure conduit at the exterior of the closure.

4,994,077
ARTIFICIAL HEART VALVE FOR IMPLANTATION IN A BLOOD VESSEL
Richard L. Dobben, 6355 N. 600 West, Michigan City, Ind. 46360
Filed Apr. 21, 1989, Ser. No. 342,225
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 27 Claims



1. An artificial heart valve comprising a wire bent into a shape which anchors said wire in a position within a blood vessel, said wire being sized and shaped for complete containment within said vessel and having at least one means for snagging the internal wall surface of said blood vessel without completely piercing it, and a flap valve attached to said wire, said flap valve being a disk which is free to open and substantially close approximately the entire surface space defined by the internal wall surface within the vessel responsive to the ebb and flow of blood caused by a pumping heart.

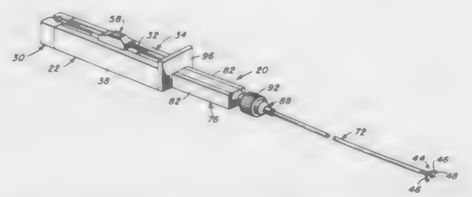
4,994,078
INTRAVENTRICULAR ARTIFICIAL HEARTS AND METHODS OF THEIR SURGICAL IMPLANTATION AND USE
Robert K. Jarvik, 124 W. 60th St., New York, N.Y. 10023
Continuation-in-part of Ser. No. 156,896, Feb. 17, 1988, abandoned. This application Feb. 16, 1989, Ser. No. 311,921
Int. Cl.[5] A61M *1/12*
U.S. Cl. 623—3 25 Claims



1. An artificial heart, heart assist, or blood pumping device adapted to propel blood therethrough by means of rotary hydrodynamic fluid pumping elements, comprising:
(a) inflow and outflow means by which to connect said device to the vascular system,
(b) blood containing housing means within which a pumping mechanism is contained,
(c) minimally-hemolytic axial flow, mixed flow, or centrifugal flow rotary pump impeller means, mechanically supported and rotated by a magnetically actuated rotor,
(d) minimally-hemolytic wear-resistant blood-immersed mechanical journal bearing means supporting said rotor for rotation in a configuration such that all of the exposed junctions of the rotating and stationary components of the pumping elements are washed by high enough blood flow to prevent thrombus accumulation sever enough to cause failure of the pump, and
(e) power means and magnetic actuator means to provide force to rotate said rotor and impeller means thereby pumping the blood,

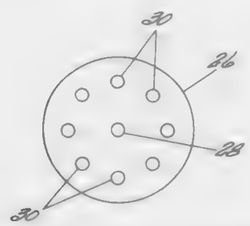
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4,994,079
GRASPING FORCEPS
Joseph Genese, Covington, and Peter Perez-Castro, Conyers, both of Ga., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed Jul. 28, 1989, Ser. No. 386,224
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—206 16 Claims



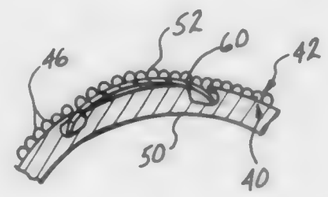
1. A forceps comprising a handle, an elongate flexible shaft extending longitudinally from said handle, said shaft including a forward distal end with multiple claws diverging forwardly and terminating in radially spaced free ends to define an open position, said claws being resiliently moveable radially inward to a closed position wherein the claws are in substantially longitudinal alignment with the shaft, a closure sleeve extending forwardly of said handle and including a distal end for moving said claws to the closed position, said closure sleeve being closely received about and longitudinally reciprocal on said shaft between a retracted position rearward of said claws allowing resilient expansion of said claws to the open position, and an extended position engaged with and inwardly biasing said claws to the closed position, a sleeve control on said handle engaged with and for reciprocation of said closure sleeve between the retracted and extended positions thereof, a protective sheath extending forwardly of said handle and directly received about and longitudinally reciprocal on said closure sleeve between a retracted position rearward of said claws and the sleeve distal end, and an extended position forward of the sleeve distal end for enclosing and forwardly projecting beyond said claws and the free ends thereof, and sheath control means on said handle engaged with and for longitudinal reciprocation of said protective sheath between the retracted and extended positions thereof, and positioning means for automatically moving said closure sleeve to the extended position thereof in response to movement of the protective sheath to its extended position, and for automatically moving said protective sheath to its retracted position in response to movement of said closure sleeve to its retracted position, whereby enclosure of said claws by said sheath occurs only in the closed position of said claws.

4,994,080
OPTICAL LENS HAVING AT LEAST ONE STENOPAEIC OPENING LOCATED IN THE CENTRAL AREA THEREOF
Dennis D. Shepard, 1414 E. Main St., Santa Maria, Calif. 93454
Filed Jul. 15, 1988, Ser. No. 220,012
Int. Cl.[5] A61F *2/14, 2/16;* G02C *7/04*
U.S. Cl. 623—5 21 Claims



1. An optical lens for an eye for use in a human or animal comprising
a clear transparent lens body having a selected diopter pwoer and formed in the central area thereof at least one stenopaeic opening which is located substantially along the central axis of the lens and which is substantially along the central axis of the lens and which is substantially perpendicular to the lens body and having a dimension "d" which is selected to be a geometrical dimension and means for defining a plurality of stenopaeic openings spaced from adn positioned around said at least one stenopaeic opening wherein each of said plurality of stenopaeic openings has a selected dimension such that an image of an outside object located on one side of a lens is projected through the lens, through the eye, generally along predetermined light transmitting paths defining the visual axis and lines parallel to the visual axis and onto substantially the same area of hte fovea centralis of the eye in a manner to obtain an optical effect by increasing the depth of focus of the eye in order to substitute for the loss of at least one of the focusing power and the accommodation of the eye.

4,994,081
METHOD FOR LOCATING ON A CORNEA AN ARTIFICIAL LENS FABRICATED FROM A COLLAGEN-HYDROGEL FOR PROMOTING EPITHELIAL CELL GROWTH
Linda Civerchia, Ft. Lauderdale, Fla., and Dennis D. Shepard, Santa Maria, Calif., assignors to CBS Lens, Santa Maria, Calif.
Continuation of Ser. No. 920,070, Oct. 16, 1986, abandoned. This application Apr. 16, 1990, Ser. No. 511,847
Int. Cl.[5] A61F *2/14, 9/00*
U.S. Cl. 623—5 10 Claims



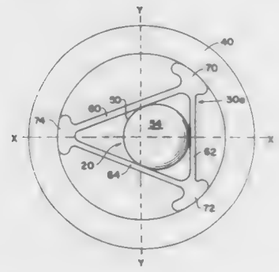
1. A method for locating on the cornea an optical lens having a preselected geometric shape and power, said optical lens comprising an optical portion having an outer edge, a posterior surface and an anterior surface, said optical lens being formed of a hydrogel polymer formed by the free radical polymerization of a hydrophilic monomer solution gelled and crosslinked to form a three dimensional polymeric meshwork for anchoring collagen; and a stock solution of collagen added to and interdisposed within said polymeric meshwork forming a collagen-hydrogel for promoting epithelial cell growth comprising the steps of:
removing from Bowman's membrane over the pupillary zone of the eye a portion of corneal epithelium on an area slightly greater than the generalized shape of said optical lens;
forming on Bowman's membrane a "v" shaped annular groove having a diameter substantially equal to the maximum geometrical dimensions of said optical lens and defining therearound a peripheral edge and medial edge and having a preselected depth which is less than the thickness of the corneal stroma;
dissecting the peripheral edge of said groove forming a wing of corneal tissue having a preselected length;
placing the posterior surface of said optical lens on the anterior surface of Bowman's membrane and positioning the outer edge of said optical lens under said corneal wing, whereby the corneal wing lies flush with and in contact with the anterior surface of said lens; and
affixing the optical lens to the Bowman's membrane over the pupillary zone of the eye to maintain the same on the cornea with the posterior surface in contact with Bowman's membrane and the corneal wing overlying the edge of said optical lens enabling corneal epithelium to touch and interact with said optical lens formed of a stock solution of collagen added to a hydrogel polymer for promoting epithelial cell growth and adherence to said optical lens and to respond to the epithelial cells growth promoting constituent in said optical lens formed of a stock solution of collagen added to a hydrogel polymer over a healing period wherein epithelial cells grow in from the edge of said optical lens and over the same enabling the epithelial cells to adhere to and implant said optical lens in the cornea under a new growth of corneal epithelium formed from several layers of epithelial cells adhering to the optical lens.

4,994,082

ACCOMMODATING INTRAOCULAR LENS

William D. Richards, Medway, and Ernesto E. Blanco, Belmont, both of Mass., assignors to Ophthalmic Ventures Limited Partnership, Norwood, Mass.

Filed Sep. 9, 1988, Ser. No. 242,962
Int. Cl.[5] A61F 2/16
U.S. Cl. 623—6 17 Claims



1. An adjustable-power intraocular lens comprising:

lens means adapted for implantation in an eye, for causing light rays entering the eye to converge at a selected focal point or plane, the location of which varies along a first axis in analog fashion between first and second locations with movement of said lens means along a selected axis between first and second positions on said selected axis wherein said selected axis extends substantially perpendicular to said first axis; and

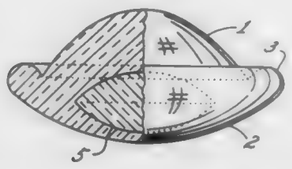
adjustment means connected to said lens means and couplable to the ciliary muscle of said eye for causing said lens means to move along said selected axis between said first and second positions in response to contraction and relaxation of said ciliary muscle.

4,994,083

SOFT INTRACAMERAL LENS

Jirí Sulc; Zuzana Krcová; Karel Smetana, and Sárka Pitrová, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 379,575, Jul. 13, 1989, Pat. No. 4,955,903, which is a division of Ser. No. 76,127, Jul. 21, 1987. This application May 21, 1990, Ser. No. 527,653
Claims priority, application Czechoslovakia, Jul. 22, 1986, 5559-86
Int. Cl.[5] A61F 2/16
U.S. Cl. 623—6 3 Claims



1. A soft intracameral lens adapted for location in the posterior chamber of an eye having an outer part which surrounds an inner part, said lens comprising a convex front supporting and centering part which, after location of the lens in the posterior chamber of the eye, protrudes anteriorally to the posterior chamber and contacts the iris such that said lens is centered in the eye, the surface of said front part being selected from the group consisting of spheroidal, paraboloidal and hyperboloidal surfaces, a rear supporting part which, after the location of said lens in the posterior chamber of the eye, is adapted for contacting a capsula or a membrane of the eye, the surface of said rear part being selected from the group consisting of spheroidal, paraboloidal and hyperboloidal surfaces, and a retaining ring located on said rear supporting part comprising an anterior surface, said anterior surface extending radially outward from said rear supporting part, wherein the outward extension of the anterior surface of said ring ranges from about 1 mm to about 3.5 mm, said lens after location in the posterior chamber of the eye being self-centering and self-supporting without the need for additional supporting or centering means, and all surface parts of the lens which contact eye tissue being formed from a soft hydrogel which will not wound the eye tissues, wherein the inner part of the lens is located such that the optical axis of the lens passes through said inner part, said inner part possessing a higher refractive index of light than the outer part.

4,994,084

RECONSTRUCTIVE SURGERY METHOD AND IMPLANT

H. George Brennan, 1137 Granville, Newport Beach, Calif. 92660

Filed Jun. 23, 1989, Ser. No. 370,453
Int. Cl.[5] A61F 2/02
U.S. Cl. 623—11 9 Claims



1. A method of altering the appearance of a person's physical features, comprising:

forming an implant of a desired shape of two or more layers of stiff, but formable thin tissue, dehydrated homograft; and

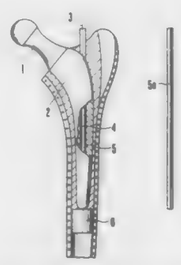
inserting said implant immediately beneath the person's dermis in a desired location.

4,994,085

ARTIFICIAL STEM UNIT FOR COXA WITH SETTING GUIDE

Kazuhiko Sawai, Nagoya; Shigeo Niwa; Tomokazu Hattori, both of Aichi; Wataru Yagi, Nagoya; Ryohei Yabuno, and Masami Ishii, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 8, 1989, Ser. No. 320,436
Claims priority, application Japan, Mar. 9, 1988, 63-55634
Int. Cl.[5] A61F 2/32
U.S. Cl. 623—23 4 Claims



1. A femoral prosthesis system comprising an elongated stem defining a central longitudinal axis configured to be inserted and cemented in an intramedullary cavity, said stem having a through bore extending and aligned along the longitudinal axis thereof, said bore having a diameter of about 1.0 to 5.0 mm, and a separate setting guide insertable within the intramedullary cavity before cementing of said stem for aligning the stem in the intramedullary cavity, said setting guide having degassing means and including a cylindrical centering rod and a plug attached to one end of the rod, said rod having an outer diameter sized to slidably fit within the through bore such that the stem is capable of sliding over said rod as the stem is inserted in the intramedullary cavity, whereby proper alignment of said stem is established before the stem is cemented in place.

4,994,086

UNIVERSAL MODULAR FRAME FOR ABOVE-KNEE ENDOSKELETAL PROSTHESIS

Dan J. Edwards, Sunland, Calif. 91040, assignor to United States Manufacturing Company, Pasadena, Calif.

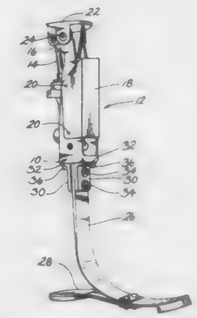
Continuation of Ser. No. 391,428, Aug. 9, 1989, abandoned. This application Jun. 4, 1990, Ser. No. 534,334
Int. Cl.[5] A61F 2/72, 2/62, 2/66
U.S. Cl. 623—26 17 Claims

1. A universal modular frame for use as a shin component in an above-knee endoskeletal prosthesis of the type which includes (a) socket means for attachment to an amputated upper leg, (b) a knee motion and gait control unit, (c) lower leg pylon means, and (d) a linkage between the modular frame and the socket means;

the modular frame comprising a rigid one-piece metal outer frame of closed configuration forming a rigid skin member and having (1) an upper connecting means extending between lateral and medial sides of the frame, the upper connecting means being adapted for connecting to said linkage for the socket means, (2) rigid lateral and medial side arms rigidly affixed to and extending downwardly from the upper connecting means, said lateral and medial side arms having recessed lightning regions therein for reducing the weight of the outer frame, and (3) a lower base extending between and rigidly affixed to the bottom portions of the lateral and medial side arms;

the outer frame forming the perimeter of an open central region for rigidly but removalby mounting the knee motion and gait control unit therein;

the lateral and medial side arms being spaced apart between the upper connecting means and the lower base to form elongated open regions therebetween at both the front and rear sides of the outer frame sufficient for the knee motion



and gait control unit for being inserted as a unit into said open central region of the frame from either the front or rear side of the frame;

the lower base having a flat bottom and a pattern of spaced-apart holes extending through the lower base and exposed to an underside of the lower base opposite from the control unit for use in receiving corresponding fastening means for rigidly but removably affixing a flat upper connecting portion of the lower leg pylon means to the bottom of the outer frame.

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4,994,087

COMPOUNDS CONTAINING SUBSTITUTED PHENYLAMINO AND PYRIDYL GROUPS AND HAIR DYEING PREPARATIONS USING THEM

Guenther Konrad, Hilden, and Edgar Lieske, Duesseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

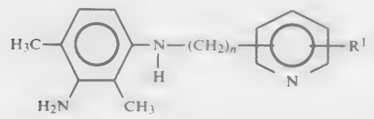
Filed Dec. 5, 1988, Ser. No. 280,109

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741236

Int. Cl.[5] **A61K** *7/13;* **C07D** *213/73, 213/38*

U.S. Cl. 8—409 **20 Claims**

1. A compound having the formula:



in which n is 0 or 1 and R^1 is hydrogen, C_1–C_4 alkyl, hydroxyalkyl, or an amino group; and the acceptable salts thereof.

4,994,088

HAIR COSMETIC COMPOUNDS

Hiroshi Ando, Funabashi, and Keiichi Akimoto, Sakura, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 91,293, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 906,376, Sep. 12, 1986, abandoned. This application Jun. 5, 1989, Ser. No. 361,335

Claims priority, application Japan, Sep. 30, 1985, 60-217514

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[5] **A61K** *7/13, 7/06*

U.S. Cl. 8—426 **9 Claims**

1. A hair cosmetic composition, consisting of:

(A) from 0.1–20 wt. % of an amphoteric polymer prepared by copolymerizing a monomer mixture of from 45–55 mole % of at least one acidic vinyl monomer or salt thereof with 55–45 mole % of a basic vinyl monomer or salt thereof having a basic nitrogen group, said amphoteric polymer being soluble in an aqueous 10 wt. % sodium chloride solution and 0.1 wt. % of said amphoteric polymer is insoluble in water at 20° C.;

(B) from 0.1–30 wt. % of a water-soluble inorganic salt;

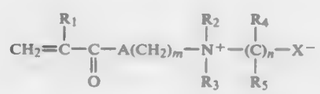
(C) from 0.1–10 wt. % of a cosmetic oil or fat;

(D) from 0.1–10 wt. % of a quaternary ammonium surface active compound; and

(E) from 30–99 wt. % of water or aqueous alcohol.

2. A hair cosmetic composition, consisting of:

(A) from 0.1–20 wt. % of an amphoteric polymer prepared by polymerizing an amphoteric monomer of the formula:



(I)

wherein R_1, R_4 and R_5 each independently is hydrogen or methyl, R_2 and R_3 each independently is methyl or ethyl, A is —O— or —NH—, X is $—CO_2$, $—SO_3$ or $—PHO_3$ and m and n independently are integers of from 1–3, said amphoteric polymer being soluble in an aqueous 10 wt. % sodium chloride solution and 0.1 wt. % of said amphoteric polymer is insoluble in water at 20° C.;

(B) from 0.1–30 wt. % of a water-soluble inorganic salt;

(C) from 0.1–10 wt. % of a cosmetic oil or fat;

(D) from 0.1–10 wt. % of a quaternary ammonium surface active compound; and

(E) from 30–99 wt. % of water or aqueous alcohol.

4,994,089

CARRIER FOR THE DYEING OF POLYESTER MATERIALS: N-ALKYLPHTHALIMIDE AND AROMATIC ESTER OR ETHER

Frank Bartkowiak; Hans Schulze, both of Cologne; Wolf-Dieter Schröer, Munich; Günther Boehmke, Leverkusen; Karlhans Jakobs, Bergisch Gladbach, and Willi Schössler, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

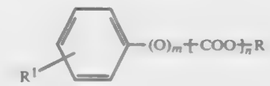
Filed Sep. 28, 1989, Ser. No. 414,051

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834737

Int. Cl.[5] **C09B** *67/38;* **D06P** *1/64, 3/54*

U.S. Cl. 8—574 **4 Claims**

1. Carrier mixture containing N-alkylphthalimides (I) and compounds of the general formula



(II)

in which

R is C_1–C_7-alkyl; phenyl, benzyl or phenylethyl, which can be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl,

R^1 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkylcarbonyloxy, hydroxyl or C_1-C_4-alkoxycarbonyl,

m is 0 or 1,

n is 0 or 1, m and n not being 0 at the same time

the carrier mixture containing components (I) and (II) in a weight ratio of 0.5–12:1.

4,994,090

PROCESS FOR CONTROLLING SULFUR-OXIDE FORMATION AND EMISSIONS WHEN BURNING A COMBUSTIBLE FUEL FORMED AS A HYDROCARBON IN WATER EMULSION

Domingo P. Rodriguez, Los Teques; Euler G. Jimenez, Caracas; Ignacio Layrisse, San Luis; Jose P. Salazar, San Antonio de Los Altos, and Hercilio Rivas, Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation of Ser. No. 300,043, Jan. 23, 1989, abandoned, which is a division of Ser. No. 14,871, Feb. 17, 1987, Pat. No. 4,834,775, which is a continuation-in-part of Ser. No. 875,450, Jun. 17, 1986, Pat. No. 4,801,304. This application Mar. 5, 1990, Ser. No. 490,531

Int. Cl.[5] **C10L** *1/32*

U.S. Cl. 44—301 **1 Claim**

1. A hydrocarbon combustible fuel comprising a hydrocarbon-in-water emulsion comprising a sulfur capturing additive, an emulsifier and a sulfur containing hydrocarbon having the following chemical and physical properties:

C wt. % of 78.2 to 85.5;

H wt. % of 9.0 to 10.8;

O wt. % of 0.2 to 1.3;

N wt. % of 0.50 to 0.70;

S wt. % of 2 to 4.5;

Ash wt. % of 0.05 to 0.33;

Vanadium, ppm of 50 to 1000;

Nickel, ppm of 20 to 500;

Iron, ppm of 5 to 60;

Sodium, pm of 30 to 200;

Gravity, ° API of 1.0 to 12.0;

Viscosity (CST),

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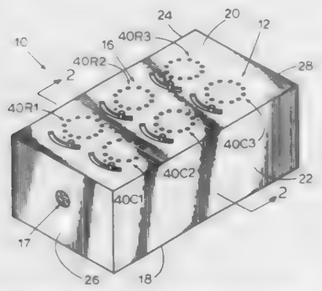
122° F. of 1,000 to 5,100,000;
210° F. of 40 to 16,000;
LHV (BTU/lb) of 15,000 to 19,000; and
Asphaltenes wt. % of 9.0 to 15.0;
said sulfur capturing additive being selected from the group consisting of Na^+, K^+, Li^+, Ca^{++}, Ba^{++}, Mg^{++}, Fe^{+++} and mixtures thereof, said hydrocarbon in water emulsion having a water content of from about 5 to 40 volume percent, an oil droplet size of from about 10 to 60 μm and a molar ratio amount of sulfur capturing additive to sulfur in the hydrocarbon of greater than or equal to 0.100 in order to reduce the amount of sulfur emissions produced during subsequent combustion of said hydrocarbon in water emulsion by at least 90% so as to obtain SO_2 emissions upon combustion of less than or equal to 1.50 lb/MMBTU.

4,994,091

CAMPFIRE PRODUCING ELEMENT

Gary J. Dougherty, and Randall W. Seaman, both of P.O. Box 756, Deer Park, Wash. 99006

Filed Jan. 5, 1990, Ser. No. 461,303
Int. Cl.[5] C10L *11/06*
U.S. Cl. 44—532 **10 Claims**



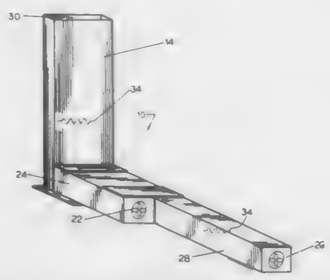
1. A campfire producing element comprising:
(A) a hollow combustible housing having ends sides a top and a bottom, a length dimension as measured between said ends, a width dimension as measured between said sides and a thickness dimension as measured between said top and said bottom;
(B) a plurality of layers of combustible materials in said housing which include
(1) a bottom layer which includes artificial log type materials and which extends from said housing bottom towards said housing top for just under one-half the thickness dimension,
(2) an intermediate layer which includes saw dust and which extends from said bottom layer towards said housing top, and
(3) a top layer which includes shredded newspaper and which extends from said intermediate layer to said housing top and has a dimension as measured between said intermediate layer and said top of just under one-half the thickness dimension; and
(C) an air flow system which includes
(1) a plurality of air inlet hole systems defined through said housing top, each inlet hole system including a plurality of angularly spaced apart holes defined in a circular pattern,
(2) two side air conduits each being U-shaped and each having two entrance sections each being in fluid communication with one of said hole systems and extending along said housing thickness dimension and having a horizontal section fluidically connecting said entrance sections together and extending along said housing length dimension,
(3) a mid air conduit which is U-shaped and has two entrance sections each being in fluid communication with a hole system and extending along the thickness dimension of the housing toward the housing bottom, and a horizontal section which connects the mid air conduit entrance sections together and which extends along the housing width dimension,
(4) each air conduit having a multiplicity of air perforations defined therethrough, and
(5) plurality of a damper units mounted on said housing top and having one unit associated with each air flow conduit entrance section, each damper unit including
(a) a pivot pin mounted on said housing top to depend into the housing interior,
(b) an arcuate slot defined through said housing top and positioned so that said pivot pin is located between said arcuate slot and the hole system associated therewith
(c) a pivot arm connected to said pivot pin,
(d) a handle on one end of said pivot arm and extending through said slot,
(e) a butterfly-type valve element mounted on another end of said pivot arm for movement therewith as said handle is moved in said slot, and
(f) slot means defined through each air flow conduit entrance section to accommodate said butterfly valve-type element.

4,994,092

HELIUM SMOKE GENERATOR

Thor I. Eklund, Haddonfield; James E. Demaree, Northfield, and William E. Neese, Absecon, all of N.J., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Jun. 27, 1989, Ser. No. 371,883
Int. Cl.[5] C10L *5/00*
U.S. Cl. 44—629 **12 Claims**



7. The method of simulating the products of combustion from a fire at any desired temperature which comprises generating simulated smoke at a low temperature and adding thereto a component that is lighter than air.

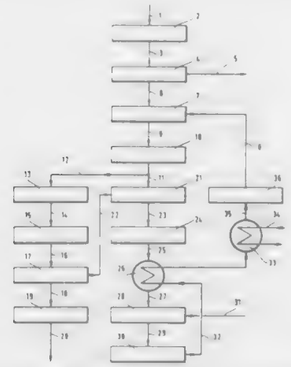
4,994,093

METHOD OF PRODUCING METHANOL SYNTHESIS GAS

Rolf Wetzel, Heiligenhaus, and Bernhard Firnhaber, Essen, both of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 550,133
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1989, 3922612
Int. Cl.[5] C10J *3/08;* **C10K** *1/02, 1/04;* **C01B** *3/14*
U.S. Cl. 48—197 R **11 Claims**

11. A method of producing a synthesis gas with a ratio of carbon monoxide to hydrogen defined for a desired synthesis reaction, by gasifying of fine-grained to dust-like fuels at temperatures above a slag melting point, comprising the steps of producing a partial oxidation crude gas in a gasifier; indirectly cooling the produced partial oxidation crude gas in a waste heat boiler after the gasifier with steam generation; further cooling the partial oxidation gas after the waste boiler by adding a converted circulating gas; subjecting the thusly produced gas mixture of the partial oxidation gas with the converted circulating gas to a dry dedusting; separating the dedusted gas mixture into a product gas partial stream and a circulating gas partial stream; subjecting the product gas partial stream to a further cooling, a subsequent gas washing for removing residual dust and impurities, a final cooling for water condensation, and a desulfurization and CO_2 removal, and then



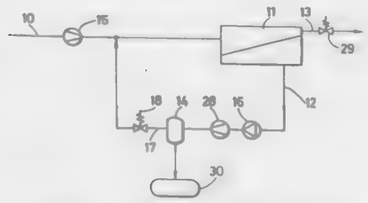
recovering the desulfurized product gas, saturating the circulating gas partial stream with use of a condensate from the final cooling of the product gas partial stream and washing at a dew point of the gas; subjecting the thusly purified circulating gas partial stream, for adjusting a molar ratio of carbon monoxide to hydrogen to a CO-conversion in the presence of a sulfur resistant catalyst; and cooling the converted circulating gas close to its water steam dew point for further cooling of the partial oxidation crude gas after the waste heat boiler by recycling the converted circulation gas for adding to the partial oxidation crude gas.

4,994,094

METHOD OF REMOVING ORGANIC COMPOUNDS FROM AIR/PERMANENT GAS MIXTURES

Dieter Behling, Hamburg; Karl Hattenbach; Klaus Ohlrogge, both of Geesthacht; Klaus-Victor Peinemann, Reinbek, and Jan Wind, Barsbüttel, all of Fed. Rep. of Germany, assignors to GKSS Forschungszentrum Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 316,054
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806107
Int. Cl.[5] B01D *53/22, 71/64*
U.S. Cl. 55—16 **18 Claims**



1. In a method of removing organic compounds from a primary air/permanent gas mixture, including conveying said air/permanent gas mixture which is initially untreated medium, to a first gas separation membrane means and dividing said mixture into a filtrate gas stream that is concentrated with organic compounds and a retained gas stream that is depleted of organic compounds, with said concentrated filtrate gas stream being conveyed to a recovery device for the recovery of said organic compounds therefrom, and with a gas stream exiting said recovery device, the improvement in combination therewith comprising the steps of:
effecting said recovery of said organic compounds from said concentrated filtrate gas stream in said recovery device by at least one recovery step undertaken selectively and preferably by condensing under pressure and optionally by removal of heat therefrom or by sorption;
then first raising the pressure of said primary air/permanent gas mixture directly prior to entry thereof into said first gas separation membrane means;
thereafter reducing the pressure of said concentrated filtrate gas stream after exit thereof from said first gas separation membrane means;
then discharging said depleted gas stream from said first gas separation membrane means into the atmosphere; and
finally returning said gas stream that exits from said recovery device, at least in part, to at least some portion of said primary air/permanent gas mixture at a point subsequent to said pressure increase thereof.

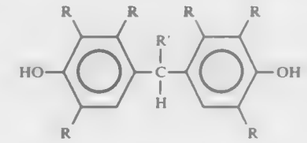
4,994,095

SEMIPERMEABLE MEMBRANES BASED ON SPECIFIC 4,4'-(1H-ALKYLIDENE)BIS[2,3,6-TRIALKYLPHENOL]-TYPE POLYESTERS

James H. Kawakami, Piscataway; Natarajan Muruganandam, Somerville, and George L. Brode, Bridgewater, all of N.J., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 358,631, May 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 289,668, Dec. 27, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 443,208
Int. Cl.[5] B01D *71/48*
U.S. Cl. 55—16 **29 Claims**

13. A process for separating a component from an O_2/N, CO_2/CH_4 or He/CH_4 gas mixture containing said component which comprises contacting said gas mixture with one side of a gas separation membrane comprising a thin layer consisting predominantly of a polyester or copolyester derived from the reaction of a 4,4'-(1H-alkylidene) bis[2,3,6-trialkylphenol] of the general formula:



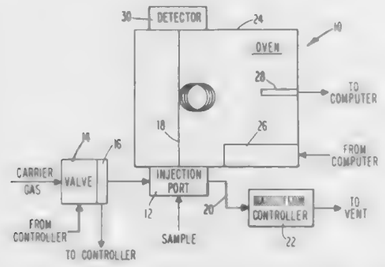
wherein R is an alkyl group having from 1 to about 3 carbon atoms and R' is an alkyl group having from 1 to about 4 carbon atoms, and an aromatic dicarboxylic acid or derivative thereof; said membrane having a combination of high selectivity and high permeation rate values, while maintaining a pressure differential across the two sides of the membrane and removing the permeated component from the other side of the membrane.

4,994,096

GAS CHROMATOGRAPH HAVING INTEGRATED PRESSURE PROGRAMMER

Kenneth J. Klein, Wilmington, Del.; R. John Phillips, Swarthmore, Pa.; Lesley M. Freed, Wilmington, Del., and Michael Thompson, Coatesville, Pa., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed May 9, 1989, Ser. No. 349,740
Int. Cl.[5] B01D *15/08*
U.S. Cl. 55—20 **25 Claims**



1. A method for performing a chromatographic separation of a given compound wherein said compound is injected into a pressurized carrier gas and passed through a column and wherein a portion of said column subjected to a temperature profile, comprising the steps of:

generating a temperature information signal representative of the temperature to which said column is subjected;

determining the pressure of said carrier gas and generating a pressure information signal representative of said pressure;

storing system information, mass flow information, and carrier gas viscosity information;

retrieving said system information, said mass flow information and said viscosity information and calculating a carrier gas pressure in relation to said system information, said mass flow information and said viscosity information;

generating a control signal in relation to the calculated carrier gas pressure and said pressure information signal; and

controlling the pressure of said carrier gas in response to said control signal, so that as the temperature to which said column is subjected changes with time, the desired mass flow of carrier gas at a corresponding time is maintained by controlling the pressure of said carrier gas.

4,994,097

ROTATIONAL PARTICLE SEPARATOR

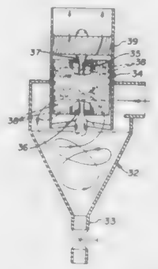
Jozef J. H. Brouwers, Enschede, Netherlands, assignor to B. B. Romico B.V. I.O., Burg, Netherlands

Filed Sep. 27, 1989, Ser. No. 414,749
Claims priority, application Netherlands, Mar. 25, 1987, 8700691
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—317 **16 Claims**

1. A rotational particle separator for separating particulate material having cross-sectional dimensions from about 0.1 micron to about 5 microns from a gas, said separator comprising:

a housing having a gas inlet, a gas outlet and an outlet for separated particulate material;

a centrifuge rotatably mounted in said housing along a rotation axis extending through said housing, said centrifuge including a plurality of radially-spaced individual separation channels which extend parallel to each other and parallel to said rotation axis, each of said separation channels having a cross-section along substantially the entire length thereof which extends azimuthally about said rotation axis by less than 360° to prevent azimuthal flows greater than 360° about said rotation axis in any of said individual separation channels; and



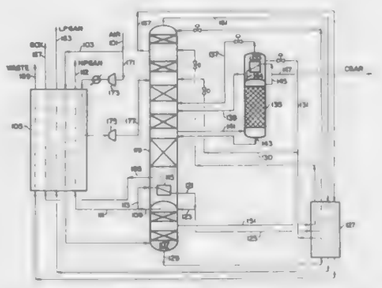
means for rotating said centrifuge within said housing about said rotation axis.

4,994,098

PRODUCTION OF OXYGEN-LEAN ARGON FROM AIR

Rakesh Agrawal, Allentown, and Donald W. Woodward, New Tripoli, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 2, 1990, Ser. No. 474,431
Int. Cl.[5] F25J *3/04*
U.S. Cl. 62—22 **3 Claims**



1. In a process for the separation of air by cryogenic distillation to produce a crude argon product, wherein the separation is carried out in a multiple distillation column system containing a high pressure column, a low pressure column and an argon sidearm column; wherein a crude argon product is produced at the top of the argon sidearm column; wherein at least a portion of crude liquid oxygen produced at the bottom of the high pressure column is fed to a reboiler/condenser located at the top of the argon sidearm column to provide refrigeration for condensing at least a portion of the crude argon thereby providing reflux for the argon sidearm column; wherein a gaseous argon-oxygen containing side stream is removed from an intermediate location of the low pressure column and fed to the bottom of the argon sidearm column for rectification; and wherein the argon sidearm column a liquid phase and a vapor phase are intimately contacted to effectuate mass transfer to and from the liquid and vapor phases; the improvement for the production of low oxygen content argon having an oxygen content of less than or equal to 0.5 mol % directly from the argon side arm column while maximizing argon recovery comprises:

(a) using an argon sidearm column having an effective number of theoretical stages required to produce a particular crude argon product purity without sacrificing argon recovery;

(b) feeding crude liquid oxygen from the bottom of the high pressure column to the reboiler/condenser located in the top of the argon side arm column at a rate in the range from about 1.04 to about 1.36 times the theoretical minimum flow of crude liquid oxygen necessary to completely vaporize that minimum flow of crude liquid oxygen to its dew point; and

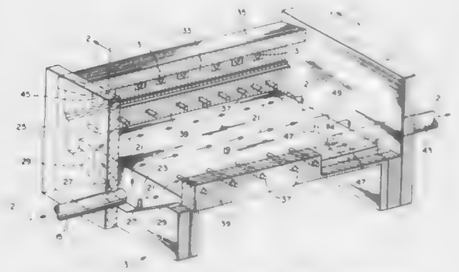
(c) operating the argon sidearm column so as to achieve a pressure at the top of the argon side arm column such that the flow of crude liquid oxygen to the reboiler/condenser located in the top of the side arm column falls within the range from about 1.04 to about 1.36 times the theoretical minimum flow of crude liquid oxygen necessary to completely vaporize that minimum flow of crude liquid oxygen to its dew point.

4,994,099

METHOD FOR FINING MOLTEN GLASS

George B. Boettner, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 339,605, Apr. 17, 1989, Pat. No. 4,906,272. This application Jan. 19, 1990, Ser. No. 467,251
Int. Cl.[5] C03B *5/225, 5/23*
U.S. Cl. 65—136 **6 Claims**



1. A method for processing molten glass comprising:

(a) introducing molten glass into a chamber;

(b) removing bubbles from the molten glass by:

(i) flowing the molten glass through the chamber in a substantially horizontal direction without developing substantial internal convective flows within the flowing glass; and

(ii) heating the molten glass as it flows in the substantially horizontal direction;

(c) cooling the molten glass while flowing the molten glass in a substantially vertical direction without mechanical agitation; and

(d) removing the cooled molten glass from the chamber.

4,994,100

HOMOGENEOUS GRANULAR NITROGEN FERTILIZER

Allen R. Sutton, Corydon, Ky.; Charles W. Weston, Prarieville, La., and Richard L. Balser, Tulsa, Okla., assignors to Freeport McMoRan Resource Partners, New Orleans, La.

Filed Dec. 29, 1988, Ser. No. 292,004
Int. Cl.[5] C05C *9/00*
U.S. Cl. 71—30 **26 Claims**

1. A homogeneous granulated fertilizer composition comprising as components about 90% to about 98% by weight urea, about 0.4% to 1.0% by weight ammonium thiosulfate and about 1.4% to about 3.0% by weight dicyandiamide, the foregoing components being in a homogeneous blend by said components being formed into granules from a melt of said urea component.

4,994,101

SYSTEMIC HERBICIDES AND METHODS OF USE

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 771,259, Aug. 30, 1985, Pat. No. 4,722,986, and a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, abandoned, and a continuation-in-part of Ser. No. 453,496, Dec. 27, 1982, Pat. No. 4,910,179. This application Nov. 3, 1987, Ser. No. 116,472
Int. Cl.[5] A01N *59/02*
U.S. Cl. 71—83 **15 Claims**

1. A herbicidal composition comprising a systemic herbicide stable in said composition and the monoadduct of urea and sulfuric acid.

4,994,102

HERBICIDAL COMPOSITION

Ryo Yoshido, Misawa; Yoshihiro Mano, Toyonaka, and Hideyuki Shibata, Takarazuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jul. 3, 1989, Ser. No. 374,867
Claims priority, application Japan, Jul. 8, 1988, 63-171346
Int. Cl.[5] A01N *57/04, 43/38*
U.S. Cl. 71—86 **5 Claims**

1. A herbicidal composition which comprises as the active ingredients (1) 2-{7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin -6-yl}-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione and (b) N-(phosphonomethyl)-glycine or its salt, and an inert carrier or diluent, wherein the weight proportion of the components (a) and (b) is from 1:1 to 1:70.

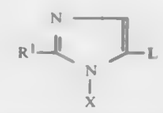
4,994,103

1,5-SUBSTITUTED 1H-IMIDAZOLES

Marcel F. L. De Bruyn, Hoogstraten; Guy R. E. Van Lommen, Berlaar, both of Belgium, and William R. Lutz, Riehen, Switzerland, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium and Ciba-Geigy, Basel, Switzerland

Division of Ser. No. 173,511, Mar. 25, 1988, Pat. No. 4,878,940. This application Oct. 12, 1989, Ser. No. 420,248
Claims priority, application United Kingdom, Apr. 2, 1987, 87/07856; Dec. 22, 1987, 87/29798
Int. Cl.[5] A01N *43/50;* **C07D** *233/84, 401/06, 409/04*
U.S. Cl. 71—92 **14 Claims**

1. A compound of the formula:



or a stereochemically isomeric form thereof, or a salt thereof, wherein:

R^1 represents hydrogen or mercapto;

L represents:

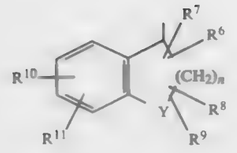
(ix) —C(=G)—R wherein G represents O or NR^5 wherein R^5 represents hydrogen, C_{1-5}alkyl, or hydroxy, and R represents hydrogen, C_{1-7}alkyl, or fluoroC_{1-5}alkyl; or

(xi) —CH(R^3)—Z^1—R^4 wherein R^3 represents hydrogen, C_{1-5}alkyl, or fluoroC_{1-5}alkyl, R^4 represents hydrogen or C_{1-5}alkyl, Z^1 represents O, S, or NR^4, and R^4 represents hydrogen or C_{1-5}alkyl, and

X represents:

(o) a Group of the Formula:

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wherein Y represents —CH_2—O— or —CH_2—S—, n represents zero or one, R^6, R^7, R^8, and R^9 independently represent hydrogen or C_{1-5}alkyl, and R^{10} and R^{11} independently represent hydrogen or halo;

(p) a group of the Formula:

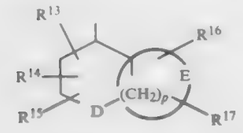
(b)



wherein A represents C_{1-7}alkyl, phenyl, or pyridinyl, said phenyl and pyridinyl being optionally substituted with C_{1-5}alkyl, methoxy, or halo, and B represents pyridinyl, phenyl, or phenyl substituted with C_{1-5}alkyl, methoxy, or halo; or

(q) a group of the Formula:

(c)



wherein D represents CH_2, O, or S, p represents 0 or 1, R^{13}, R^{14}, and R^{15} represent hydrogen or C_{1-5}alkyl, E represents C_{3-4}alkanediyl, and R^{16} and R^{17} represent hydrogen or C_{1-5}alkyl.

7. A method of controlling weeds by applying thereto or to the locus thereof of a herbicidally effective amount of a compound of Formula (I) as described in claim 1.

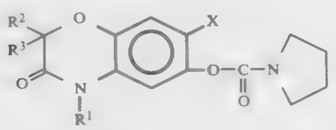
4,994,104

TETRAHYDROPHTHALIMIDE CARBAMATE HERBICIDAL COMPOSITIONS

Jun H. Chang, Princeton Junction, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 19, 1988, Ser. No. 286,434
Int. Cl.[5] A01N *43/40*
U.S. Cl. 71—94 **6 Claims**

1. Compound of the formula



in which R^1 is H, alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, haloalkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, cycloalkyl, aralkyl, alkylthioalkyl, hydroxy, alkoxy, cyanoalkyl or alkylcarbonylalkyl;

R^2 and R^3 are independently H or alkyl;

X is H, Cl or F; and

in which any alkyl, alkenyl, alkynyl or alkylene moiety of R^1, R^2 or R^3 have less than 6 carbon atoms.

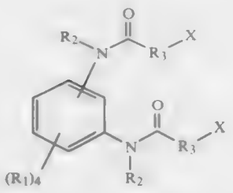
4,994,105

N,N'-BIS(ALKOXYALKYL)-N,N'-(2-HALOACETYL)-PHENYLENEDIAMINES

William. F. Burgoyne, Jr., Emmaus, Pa., and Dale D. Dixon, Venice, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 12, 1989, Ser. No. 364,933
Int. Cl.[5] A01N *31/18;* **C07C** *307/56*
U.S. Cl. 71—118 **22 Claims**

1. A compound having the formula:

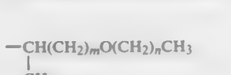


wherein:

each R_1 is independently selected from H, a straight chain or branched C_1–C_{10} alkyl, C_1–C_8 alkoxy, C_2–C_{10} alkenyl or C_3–C_7 cycloalkenyl group;

each R_2 is independently selected from

—$CH_2(CH_2)_mO(CH_2)_nCH_3$ and

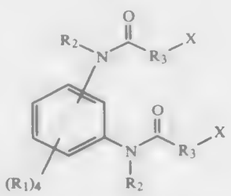


wherein m and n are independently selected integers from 0 to 4, inclusive;

each R_3 is independently selected from a straight chain or branched C_1–C_{10} alkylene; and

X is independently selected from Cl, Br and I.

12. A method for controlling weeds and grasses in an agricultural crop which comprises applying to the agricultural crop an effective amount of a compound having the formula:

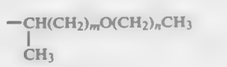


wherein:

each R_1 is independently selected from H, a straight chain or branched C_1–C_{10} alkyl, C_1–C_8 alkoxy, C_2–C_{10} alkenyl or C_3–C_7 cycloalkenyl group;

each R_2 is independently selected from

—$CH_2(CH_2)_mO(CH_2)_nCH_3$ and



wherein m and n are independently selected integers from 0 to 4, inclusive;

each R_3 is independently selected from a straight chain or branched C_1–C_{10} alkylene; and

X is independently selected from Cl, Br and I.

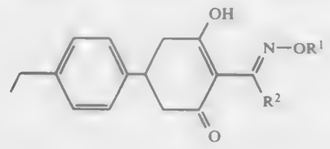
4,994,106

CYCLOHEXENONE COMPOUNDS, THEIR PREPARATION AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Dieter Kolassa, Ludwigshafen; Juergen Kast, Boehl-Iggelheim; Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Norbert Meyer, Ladenburg; Karl-Otto Westphalen, Spever, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,063
Int. Cl.[5] A01N *33/24*
U.S. Cl. 71—121 **9 Claims**

1. A cyclohexenone compound of the formula I



where the substituents have the following meanings:

R^1 is C_3–C_4-alkenyl, or C_2–C_4-haloalkenyl, and

R^2 is C_1–C_4-alkyl,

and their agriculturally acceptable salts.

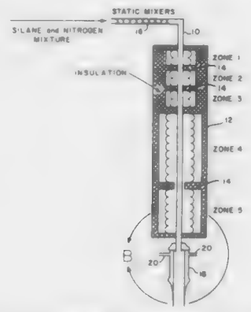
3. A process for combating the growth of unwanted plants, wherein the unwanted plants and/or their habitat are treated with a herbicidally effective amount of a cyclohexenone derivative of the formula I as set forth in claim 1.

4,994,107

AEROSOL REACTOR PRODUCTION OF UNIFORM SUBMICRON POWDERS

Richard C. Flagan, and Jin J. Wu, both of Pasadena, Calif., assignors to California Institute of Technology, Los Angeles, Calif.

Continuation of Ser. No. 883,573, Jul. 9, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 248,486
Int. Cl.[5] C01B *33/02;* **C22C** *1/04;* **B05D** *7/00*
U.S. Cl. 75—367 **11 Claims**



1. A method of producing submicron nonagglomerated particles of material in a single-stage flow reactor from a reactant or mixture of reactants containing a material out of which said particles are to be produced, said single-stage flow reactor defining a flow path, comprising the steps of:

introducing a reactant or mixture of reactants at one end of said single-stage flow reactor;

increasing the temperature along an initial section of said flow path of said single-stage flow reactor to initiate reaction at a rate to homogeneously generate seed particles in an initial section of said single-stage flow reactor;

accelerating the reaction by increasing the temperature along said flow path of said single-stage flow reactor without mixing additional reactants with said seed particles in said flow path, thereby promoting growth of particles by chemical vapor deposition while minimizing agglomerate formation; and

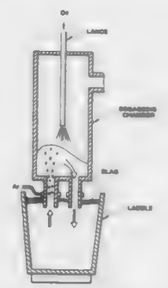
maintaining a concentration of particles in said single-stage flow reactor such that coagulation is inhibited within the residence time of said particles in said single-stage flow reactor, wherein the maximum temperature along the flow path of said single-stage flow reactor and a flow rate through said single-stage flow reactor along said flow path are controlled to bring the reaction to completion in the residence time of said submicron nonagglomerated particles.

4,994,108

PROCESS FOR PRODUCING HIGH CLEANNESS EXTRA LOW CARBON STEEL

Kazuhisa Hamagami, and Masayuki Onishi, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 18, 1989, Ser. No. 381,593
Claims priority, application Japan, Jul. 18, 1988, 63-177028
Int. Cl.[5] C21C *7/00*
U.S. Cl. 75—508 **7 Claims**



1. A process for producing high cleaness extra low carbon steel, comprising the steps of:

preparing low carbon, non-deoxidized molten steel in a refining furnace;

adding deoxidizing agent to the molten steel tapped from said furnace to a laddle for adjusting iron concentration of iron oxide in slag at less than or equal to 5%;

performing vacuum degassing process by means of a vacuum degassing apparatus with blowing oxygen to the molten steel bath for decarbonizing to lower carbon content less than or equal to 0.006%.

4,994,109

METHOD FOR PRODUCING PERMANENT MAGNET ALLOY PARTICLES FOR USE IN PRODUCING BONDED PERMANENT MAGNETS

Carol J. Willman, Bethel Park; Edward J. Dulis, Pittsburgh, and Francis S. Snyder, Coraopolis, all of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed May 5, 1989, Ser. No. 347,660
Int. Cl.[5] H01F *1/053, 1/06*
U.S. Cl. 75—338 **9 Claims**

1. A method for producing permanent magnet alloy particles suitable for use in producing bonded permanent magnets, said method comprising, producing a melt of a permanent magnet alloy comprising at least one rare earth element, at least one transition element and boron, inert gas atomizing said melt to form spherical particles of a particle size larger than 325 mesh and heat treating said particles at a temperature of 475 to 700 degrees C in a nonoxidizing atmosphere for a time at said temperature to increase the intrinsic coercivity of said particles to at least 10,000 Oe without sintering said particles to substan-

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tially full density and thereafter separating said particles to produce a discrete particle mass.

4,994,110

DYES CONTAINING LITHIUM FOR INK-JET PRINTING INKS

John L. Stoffel; Ronald A. Askeland, both of San Diego, and William D. Kappele, San Marcos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 223,322, Jul. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 11,186, Jul. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,664, Aug. 27, 1986, abandoned. This application Dec. 22, 1989, Ser. No. 455,465

The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 20 Claims

1. A thermal ink-jet composition suitable for use in ink-jet printers comprising:

(a) a vehicle comprising about 5 to 10% at least one member selected from the group consisting of glycols ethers and the balance water; and

(b) a dye having at least one negatively charged functional group per molecule, present in an amount up to about 0.1 Molar of the vehicle composition, said dye having a plurality of anionic sites, originally associated with undesirable cations, substantially all of said cations being replaced with lithium cations, said ink containing less than about 500 ppm of said undesirable cations.

4,994,111

INK-JET INK CONTAINING LITHIUM SALT OF COPPER COMPLEX MONOAZO DYE

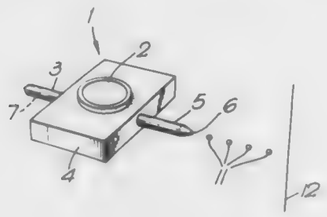
Arthur Quayle, Bury, and Cecil V. Stead, Manchester, both of England, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 46,200, May 5, 1987, Pat. No. 4,931,550. This application Nov. 30, 1989, Ser. No. 443,394

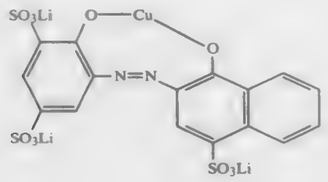
Claims priority, application United Kingdom, May 13, 1986, 8611637; Jul. 16, 1986, 8617372

Int. Cl.[5] C09D *11/02, 11/16;* C09B *45/08, 45/18*

U.S. Cl. 106—22 6 Claims



1. An ink comprising the dye of the formula:



4,994,112

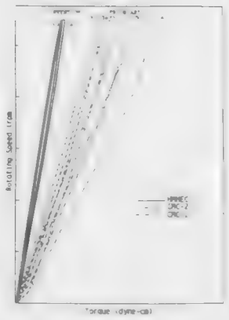
HYDROPHOBICALLY MODIFIED CELLULOSIC THICKENERS FOR PAPER COATING

Thomas G. Majewicz, Kennett Square, Pa., and Teng-Shau Young, Wilmington, Del., assignors to Aqualon Company, Wilmington, Del.

Filed Oct. 30, 1989, Ser. No. 429,195

Int. Cl.[5] C08L *1/04*

U.S. Cl. 106—169 11 Claims



1. An aqueous paper coating composition containing a polysaccharide thickener, characterized in that the thickener is a water soluble hydrophobically modified alkylcellulose, alkylhydroxyalkylcellulose or hydroxyalkylcellulose.

4,994,113

MIXTURE FOR THE PREPARATION OF BUILDING MATERIALS

John G. Helmstetter, Brick, N.J., assignor to Core-Guard Industries, Inc., Lavalette, N.J.

Filed Feb. 6, 1990, Ser. No. 480,488

Int. Cl.[5] C04B *12/04, 16/02, 18/24*

U.S. Cl. 106—618 3 Claims

1. A mixture suitable for use in the manufacture of building materials comprising, based on 100 total parts by weight of the mixture, an admixture of 80 to 40 parts by weight of waste material consisting essentially of cellulosic waste and 20 to 60 parts by weight of an equal mixture of the following two parts solution:

Part A, the first part comprising a mixture of three liquid silicates of varying viscosities with the following composition:

(a) 50% by weight of a solution of about 8.9% Na_2O and about 28.7% SiO_2 and having a specific gravity of between 35°–40° Baume;

(b) 25% by weight of a solution of about 11.0% Na_2O and about 31.7% SiO_2 and having a specific gravity of between 40°–50° Baume; and

(c) 25% by weight of a solution of about 8.3% K_2O and about 20.8% SiO_2 and having a specific gravity of between 65°–85° Baume;

and Part B, the second part comprising an aqueous mixture of equal amounts of acetic acid, borax, kaolin, zinc oxide and sodium bicarbonate.

4,994,114

METHOD FOR SELECTING A POZZOLAN INTENDED TO BE INCORPORATED INTO A COMPOSITE MATERIAL COMPRISING CEMENT AND GLASS

Jacques Thiery, Villers-Les-Nancy, and Pascal Soukatchoff, Lay Saint Christophe, both of France, assignors to Vetrotex Saint-Gobain, Chamberry, France

Filed Jul. 6, 1989, Ser. No. 376,477

Claims priority, application France, Jul. 13, 1988, 88 09567

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[5] C04B *14/44*

U.S. Cl. 106—713 35 Claims

1. In a method for making a composite material comprising cement, the improvement which comprises adding to the cement a pozzolan which exhibits a capacity for fixing lime during the 90° C. Chapelle test greater than 700 mg of CaO per gram of pozzolan, a capacity for fixing lime during the 50° C. Chapelle test greater than 200 mg of CaO per gram of pozzolan, and a ratio of the quantity of lime absorbed per gram of pozzolan during the 50°C. Chapelle test to the specific surface area of the pozzolan which is greater than about 10 mg of CaO per square meter of pozzolan.

4,994,115

PROCESS FOR PRODUCING A HIGH TOTAL DIETARY CORN FIBER

J. E. Todd Gienfeldt, La Grange; Robert J. Repta, Orland Park, and Irving F. Deaton, Wheaton, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 23, 1988, Ser. No. 211,188

Int. Cl.[5] A23L *1/10;* C08R *30/02*

U.S. Cl. 127—67 5 Claims

1. A continuous process for producing a corn fiber product having a high dietary fiber content which comprises:

(a) diluting crude fiber obtained from the corn wet-milling process with water to give an aqueous slurry of crude corn fiber with a solids concentration of from about 2% to about 5% by weight;

(b) passing said aqueous slurry of crude corn fiber through a hydroclone with the operating pressure of said hydroclone adjusted so that from about 65% to about 75% of the volume of the aqueous slurry entering the hydroclone exits in the overflow stream from the hydroclone;

(c) passing said overflow stream from the hydroclone into a centrifugal paddle screen having screen openings of from about 2 mm to about 4 mm, and clearance between the screen and the paddles from about 6 mm to about 15 mm; and

(d) washing the solid separated by the centrifugal paddle screen to give a corn fiber fraction of high dietary fiber content.

4,994,116

WHEEL DEVICE FOR REMOVING FLUID FROM A FLUID CARRYING CHAIN

Thomas W. Donaldson, Balboa, Calif.

Filed May 28, 1985, Ser. No. 738,439

Int. Cl.[5] E02B *15/04*

U.S. Cl. 134—15 7 Claims

1. A device for removing fluid from a fluid carrying chain comprising:

a first rotatable wheel member having a circumferential face, pockets in said edge face configured to the shape of link members of the fluid carrying chain,

a second rotatable wheel member having the circumferential face geometry of said first rotatable wheel member, positioned so that the faces of said wheel members are abutting and so that said pockets line up to form enclosed chambers for said link members.

4,994,117

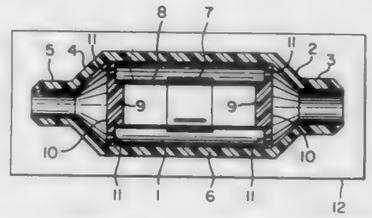
QUANTITATIVE CARBON DIOXIDE DETECTOR

Carl G. Febder, 147 Bradford Ct., Mount Laurel, N.J. 08054

Continuation-in-part of Ser. No. 136,600, Dec. 22, 1987, which is a continuation of Ser. No. 896,360, Aug. 13, 1986, Pat. No. 4,728,499. This application Mar. 31, 1988, Ser. No. 175,881

Int. Cl.[5] G01N *31/22;* A61M *16/00*

U.S. Cl. 436—133 35 Claims



1. A detector for the quantitative determination of the concentration of carbon dioxide contained in a gas sample, the detector comprising a plurality of indicator elements supported by at least one support component, each of said indicator elements producing a distinguishable signal within a rapid response time, each such signal corresponding to a predetermined different concentration of carbon dioxide in the gas sample, said indicator elements being arranged in a sequence wherein each signal of each of said indicator elements corresponds in turn to a progressively different concentration of carbon dioxide from that to which the signal of each preceding indicator element corresponds, said sequence of components thereby providing a progressive quantitative determination of carbon dioxide in the gas sample.

33. A method for the quantitative determination of the concentration of carbon dioxide in a gas which comprises bringing said gas into contact with a surface of at least one component in a detector said at least one component having a carrier defining said surface to be exposed to said gas, said surface being impregnated with a plurality of chromogenic indicating elements of a predetermined sensitivity which produce a series of rapid visual color changes corresponding to varying concentrations of carbon dioxide, said indicating elements being arranged on said surface in a sequence wherein said predetermined sensitivity of each of said indicating elements in the sequence differs progressively by an increment which gives a color change different from that of each preceding indicating element, and comparing said series of rapid visual color changes or said different color changes with the colors in a precalibrated color comparison chart, thereby obtaining a progressive quantitative determination of the concentration or change in concentration of carbon dioxide in the gas.

4,994,118

PROCESS FOR THE PRODUCTION OF HOT ROLLED STEEL OR HEAVY PLATES

Hans Pircher, Mülheim; Rudolf Kawalla, Oberhausen; Jürgen Mahn, Krefeld; Gerd Sussek, Mülheim; Walter Wilms, Duisburg, and Waldemar Wolpert, Dinslaken, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Jul. 27, 1989, Ser. No. 386,550

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825634

Int. Cl.[5] C21D *8/04*

U.S. Cl. 148—2 19 Claims

1. In the production of hot rolled strip or heavy plates from stainless and heat resistant steels or from forgeable nickel-based alloys with a final thickness in the range of 5 to 60 mm by the production of a slab from monobloc casting or by continuous casting and heating of the slab at a temperature above 1100° C., followed by the hot rolling of the slab and accelerated cooling

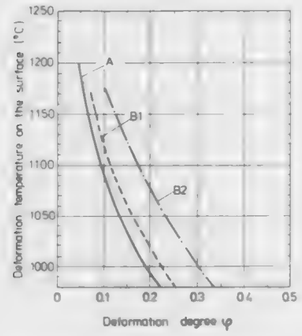
VOL 1123 ISS 3 FE 19 1991 UMI

of the product rolled to the end thickness, the improvement which comprises

(a) first rolling the heated slab

(aa) to a maximum of 1/6 of its initial thickness by deformation passes in which the degree of deformation per pass in the thickness direction is greater that the degrees of deformation shown by curve A in FIG. 1, in dependence on the surface temperature of the product,

(ab) then without interruptions finish rolling the heated slab to the end thickness by deformation passes in which the degree of deformation per pass in the thickness direction is greater than the degrees of deformation shown by curve



B1 or curve B2 in FIG. 1, in dependence on the surface temperature of the product and the pause between two adjacent passes as parameters, while the surface temperature of the finished rolled product

is not less than 1030° C., if the product contains up to 1.0% molybdenum and

is not less than 1050° C., if the product contains more than 1.0% molybdenum and

(b) at the latest 100 seconds following finish rolling, cooling the product at an accelerated rate with a speed in the core of more than 3 K/sec, to a temperature which is equal to or lower than 650° C.

4,994,119

WATER SOLUBLE SOLDERING FLUX

Barbara L. Gutierrez, Austin, and Janet Sickler, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1990, Ser. No. 521,775
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 14 Claims

1. A water soluble soldering flux adapted for use in assembling chips to integrated circuit boards where the stand-off height of the chips to the boards is on the order of about 0.002 inches to 0.004 inches, the flux comprising:

from about 4 to about 40% by weight of a tacky, non-toxic water soluble polymer as a carrier, the non-toxic water soluble polymer comprising a naturally occuring resin:

from about 2 to about 8% by weight of an organic activator;

the remainder being water; and

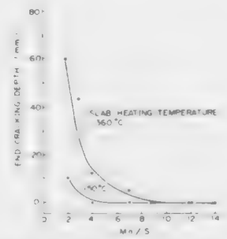
wherein the flux is characterized by the absence of halogen and rosin components and is completely soluble in water, allowing it to be cleaned from the integrated circuit board without the use of organic solvents.

4,994,120

PROCESS FOR PRODUCTION OF GRAIN ORIENTED ELECTRICAL STEEL SHEET HAVING HIGH FLUX DENSITY

Nobuyuki Takahashi; Yozo Suga; Katsuro Kuroki, and Satoshi Arai, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 274,432
Claims priority, application Japan, Nov. 20, 1987, 62-291975; May 7, 1988, 63-109880; May 11, 1988, 63-112551
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—111 12 Claims



1. A process for the preparation of a grain-oriented electrical steel sheet having a high flux density, which comprises heating a slab at a slab-heating temperature of lower than 1200° C., said slab comprising 1.5 to 4.8% by weight of Si, 0.012 to 0.050% by weight of Al, 0.0010 to 0.120% by weight of N, 0.0005 to 0.0080% by weight of B, up to 0.012% by weight of at least one member selected from S and Se, and Mn in an amount of up to 0.45% by weight, which satisfies the requirement of $Mn/(S+Se) \geqq 4.0$ (weight ratio), with the balance comprising Fe and unavoidable impurities, hot-rolling the slab, performing cold rolling once or at least twice with intermediate annealing to obtain a final thickness, performing decarburization annealing in a wet hydrogen atmosphere, coating an annealing separator on the steel sheet surface, performing finish annealing for secondary recrystallization and purification of the steel, and performing a nitriding treatment of the steel sheet during the period of from the point of termination of final cold rolling to the point of initiation of secondary recrystallization at the finish annealing step.

4,994,121

METAL COATING PRETREATING AGENT

Tamotsu Sobata; Masaaki Takimoto, both of Osaka, and Yuichi Yoshida, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 103,013, Sep. 30, 1987, Pat. No. 4,853,285, which is a division of Ser. No. 869,857, May 28, 1986, Pat. No. 4,719,038, which is a continuation-in-part of Ser. No. 687,004, Dec. 27, 1984, abandoned. This application Mar. 31, 1989, Ser. No. 331,383
Claims priority, application Japan, Dec. 27, 1983, 58-248312; Dec. 29, 1983, 58-245747; Dec. 29, 1983, 58-245748; Jan. 21, 1984, 59-008678; Mar. 2, 1984, 59-040874; Mar. 29, 1984, 59-062555; Mar. 29, 1984, 59-062556
Int. Cl.[5] C23C *22/24*
U.S. Cl. 148—251 5 Claims

1. A metal coating pre-treating agent comprising at least one hexa-valent chromium containing chromium compound having a solubility of 10^{-5} to 20 and binder which is compatible with the chromium compound, the content of said chromium compound being 10^{-1} to 100 g/l as metallic chromium and the content of said binder being 10^{-2} to 500 g/l as solid content.

4,994,122

CORROSION RESISTANT, MAGNETIC ALLOY ARTICLE

Terry A. DeBold, Wyomissing; Theodore Kosa, Reading, and Millard S. Masteller, Fleetwood, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Jul. 13, 1989, Ser. No. 379,486
Int. Cl.[5] C22C *38/18*
U.S. Cl. 148—306 7 Claims

1. A corrosion resistant, magnetic article formed of an alloy consisting essentially of, in weight percent, about

Carbon	0.025 max.
Manganese	0.2–0.5
Silicon	0.5 max.
Sulfur	0–0.5
Chromium	2–10
Molybdenum	1.0 max.
Nitrogen	0.025 max.

and the balance essentially iron, said article having been annealed at a temperature below the ferrite-to-austenite transition temperature of said alloy for at least about 4 hours and further characterized by having a saturation induction of at least about 17.5 kG and a coercive force of not more than about 4 Oe.

4,994,123

POLYMERIC INTERMOLECULAR EMULSION EXPLOSIVE

Michael A. Patrick, Shalimar, Fla., and Sara J. Massey, Miamisburg, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 29, 1990, Ser. No. 529,413
Int. Cl.[5] C06B *45/00*
U.S. Cl. 149—2 9 Claims

1. An emulsion explosive composition consisting of a dispersed phase and a continuous phase, wherein the dispersed phase consists essentially of at least one oxidizing compound and at least one fuel compound, and wherein the continuous phase consists essentially of a polyacrylate resin.

4,994,124

SENSITIZED EXPLOSIVE

Anh D. Nguyen, Brossard, Canada, assignor to ICI Canada Inc., North York, Canada

Filed May 15, 1990, Ser. No. 523,563
Int. Cl.[5] C06G *45/00*
U.S. Cl. 149—21 14 Claims

1. A sensitized, water resistant, particulate explosive composition comprising a crystallized oxidizer salt, and a sensitizing amount of a chemical sensitizer, wherein said crystallized oxidizer salt comprises 5 to 30% water by weight of the weight of the total composition.

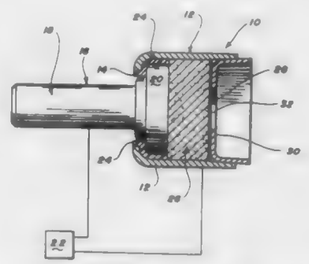
4,994,125

ELECTRIC PRIMER WITH INTRINSIC CONDUCTIVE MIX

George C. Mei, Creve Coeur, Mo., assignor to Olin Corporation, Stamford, Conn.

Filed May 8, 1989, Ser. No. 348,440
Int. Cl.[5] C06B *43/00*
U.S. Cl. 149—22 17 Claims

1. An electric primer comprising an intrinsically conductive pyrotechnic mixture consisting essentially of 15% to 50% dry weight of a finely divided metal powder fuel, 75% to 40% dry



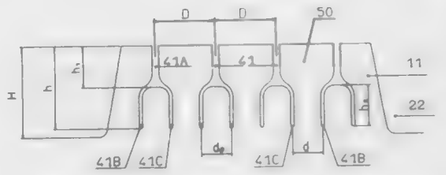
weight of an alkaline oxidizer, and 2% to 15% of a sensitizing fuel.

4,994,126

TREAD FOR PNEUMATIC TIRE INTENDED FOR WINTER DRIVING

Alain Lagnier, Romagnat, France, assignor to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand, France

Filed Dec. 12, 1989, Ser. No. 449,579
Claims priority, application France, Jan. 10, 1989, 89 00302
Int. Cl.[5] B60C *11/12*
U.S. Cl. 152—209 R 8 Claims



1. A tread for a tire with radial carcass reinforcements surmounted by a tread reinforcement, more particularly intended for travel on wet, snow-covered or icy ground, formed at least of elements in relief separated by grooves and provided with incisions, having on the surface of the tread, a contour of a width (e) of between 0.4 and 1.6 mm, characterized by the fact that cut elements in relief (**11, 13**) are provided at least with some incisions (**41, 42, 43**) having in cross-section an outline formed of a first linear part (**41A**) of width (e) extending radially inwardly from the tread surface a depth (h_1) of between 35% and 55% of the total depth (h) of the outline, this first part (**41A**) opening into at least two branches or segments (**41B, 41C**) of a width (e/2) half that of the first linear part extending radially inward over the remaining depth ($h-h_1$) of the outline, the length (l, l') of an incision (**41, 42, 43**) on the surface of the tread **1** remaining constant as a function of the depth (h) of the outline, the number of incisions on the element in relief (**11, 13**) being multiplied by a factor at least equal to 1.5, in order to determine the minimum number of branches or segments leading from the depth (h_1) to the final depth of the outline (h).

4,994,127

METHOD FOR REPAIRING HOSIERY

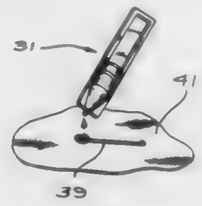
Sherry K. Sallenbach, 3359 Marigold Cir., Costa Mesa, Calif. 92626

Filed Dec. 28, 1989, Ser. No. 458,560
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—64 19 Claims

1. A method for mending hosiery comprising the steps of: putting the hosiery on;

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detecting an imperfection such as a run, snag, hole or the like in the hosiery;
opening a one-shot application container having a biocompatible adhesive therein;



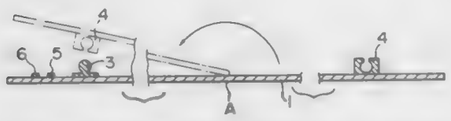
applying said biocompatible adhesive to the imperfection while the hosiery is being worn;
permitting the adhesive to dry to form a permanent repair for the hosiery; and
repeatedly reusing the repaired hosiery.

4,994,128

METHOD FOR MANUFACTURING FILM ROLLS

Isao Toshima, Kawasaki, Japan, assignor to Asahi Chemical Polyflex, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00751, § 371 Date Mar. 22, 1989, § 102(e) Date Mar. 22, 1989, PCT Pub. No. WO89/00967, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 27, 1988, Ser. No. 360,927
Claims priority, application Japan, Jul. 28, 1987, 62-186611
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—66 **2 Claims**



1. A method for manufacturing film rolls, comprising the steps of: feeding a continuous strip of film along a path, melt-bonding resin-made male and female fastener claws to one surface of said film adjacent opposite edges of said film strip at fixed distances from said edges and, thereafter, without folding or wrinkling said film, winding said film on a winding core having an axial center while moving said core in an axial first direction a pre-set distance from said axial center and then in a second axial opposite direction a pre-set opposite distance from said axial center and obliquely winding said film strip on said winding core, with said male and female claws, respectively, on said film wound obliquely and off set on said male and female claws, respectively, on the immediately preceding wound film, said oblique winding direction of said film strip and said claws progressing on said winding core in a direction opposite to the direction of movement of said core and being reversed each time said core movement reaches a pre-set distance and is reversed, thus winding said claws, adjacent said opposite edges of said film strip being wound in a serpentine manner.

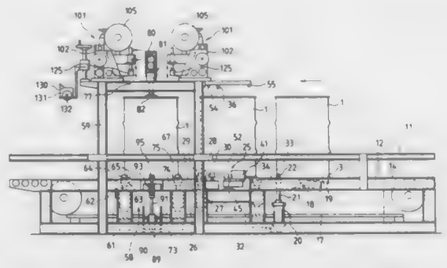
4,994,129

METHOD AND APPARATUS FOR TEMPORARILY COVERING OPENINGS OF CONTAINERS

Keisuke Nakagaki, Toukai, Japan, assignor to Nittetsu Steel Drum Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,902
Int. Cl.[5] B32B *31/12*
U.S. Cl. 156—69 **23 Claims**

1. A method of temporarily covering an opening of a container to prevent the entry of foreign matter during a process in which a plurality of containers are handled, comprising the steps of:
preparing a temporary cover, having a sticky surface on one side thereof, that is large enough to cover the opening of the container;
automatically feeding the container in such a manner that the opening of the container is positioned at a temporary covering point;



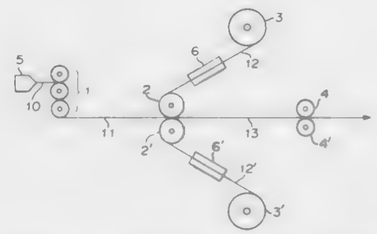
automatically feeding the temporary cover to a position near the opening of the container with the sticky surface thereof oriented to face the opening of the container; and
automatically lightly pressing the temporary cover against the end of the opening so that the temporary cover sticks thereto.

4,994,130

METHOD FOR PRODUCING A COMPOSITE LAMINATE

Kunihiko Ichikawa, Machida; Kiyoshi Mishima, Ageo; Kunio Tsukagoshi, Hamura; Isao Hayatsu, Mizuho, and Toshiharu Yamazaki, Ome, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Aug. 17, 1989, Ser. No. 394,814
Claims priority, application Japan, Aug. 30, 1988, 63-215953; Aug. 30, 1988, 63-215954
Int. Cl.[5] B65D *37/00*
U.S. Cl. 156—164 **6 Claims**



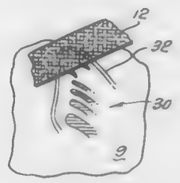
1. A method for continuously producing a composite laminate comprising a thermoplastic synthetic resin sheet and an aluminum sheet laminated on each side of the resin sheet, wherein
(1) as the thermoplastic resin sheet, a solid sheet 1–10 mm thick is used,
(2) as the aluminum sheet, an aluminum sheet 0.01–0.5 mm thick having a thermoplastic adhesive layer provided on its surface is used,
(3) two such aluminum sheets with the respective adhesive layers facing to each other, with the thermoplastic synthetic resin sheet interposed therebetween, are fed to hot press bonding rollers, and
(4) when they are fed to the hot press bonding rollers, (a) a tension of at least 2 kg/mm^2 is exerted to each aluminum sheet, and (b) the thermoplastic adhesive layer provided on the surface of each aluminum sheet is maintained to be in a molten state.

4,994,131

PROCESS OF PREPARING DECORATIVE MATERIAL UTILIZING TRANSFER PRINT FOILS

Homer L. Edwards, 1131 South Gladys Ave., San Gabriel, Calif. 91776

Continuation of Ser. No. 290,866, Dec. 28, 1988, abandoned, which is a continuation of Ser. No. 668,316, Nov. 5, 1984, abandoned. This application Jun. 29, 1990, Ser. No. 546,678
Int. Cl.[5] B44C *1/165*; B32B *31/00*
U.S. Cl. 156—233 **1 Claim**



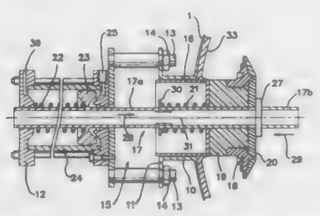
1. A process for decorating a surface with a metallic foil, said process comprising:
applying a liquid adhesive of the type which dries to a delayed tack adhesive directly on a surface to be decorated;
drying said liquid adhesive to an extent sufficient to provide a tacky surface in a predetermined shape;
providing transfer print foils having a metallic layer side;
placing the metallic side of a transfer print foil of a first color over said tacky surface and tapping lightly the foil to transfer a portion of the foil to the tacky surface;
pressing the metallic side of a transfer print foil of a second color against the tacky surface, said metallic side of said transfer print foil of a second color being larger than said tacky surface and the transferred portion of the first color foil; and
removing the transfer print foil of a second color from contact with the tacky surface thereby transferring only a portion of the foil of the second color to that portion of the tacky surface not covered by the foil of the first color and providing an iridescent foil portion in the shape of said tacky surface on the surface.

4,994,132

METHOD AND APPARATUS FOR ATTACHING AN INSERT IN A HOLLOW BODY

Michel Liekens, Geel, Belgium; Edward T. LeBreton, Mentor, and Arthur M. Kepler, Mantua, both of Ohio, assignors to Essef Corporation, Chardon, Ohio

PCT No. PCT/US89/01941, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO89/10827, PCT Pub. Date Nov. 16, 1989
PCT Filed May 4, 1989, Ser. No. 460,850
Claims priority, application Belgium, May 6, 1988, 8800508
Int. Cl.[5] B29C *33/14, 41/04, 41/30*
U.S. Cl. 156—245 **24 Claims**



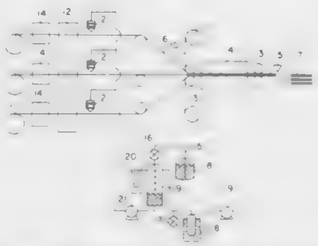
1. A method of mounting an insert having a thermoplastic mounting portion at an opening in a body primarily molded of thermoplastic material comprising the steps of providing a mold having a mold opening for forming said body opening and for providing communication with a mold cavity provided by an inner mold wall for shaping said body, said mold cavity containing a charge of thermoplastic material for molding said body, heat said charge of thermoplastic material, distributing molten thermoplastic material over said mold wall, supporting said insert within said cavity in a first position of a predetermined distance from said mold opening and said mold wall, moving said mold to distribute said charge and form said body, moving said insert to a second position with said thermoplastic mounting portion thereof in contact with the molten thermoplastic material while it is sufficiently hot and soft to fuse with the mounting portion of the insert, and cooling and hardening said thermoplastic material and removing the body and mounted insert from the mold.

4,994,133

CONTINUOUS PROCESS FOR PRODUCING REINFORCED RESIN LAMINATES

Masayuki Oizumi; Masakazu Uekira, both of Kobe; Masana Goto, Miki; Ichiro Azumi, Ohtsu; Shoji Uozumi; Masaharu Abe, both of Kobe; Yasuo Fushiki, Takatsuki; Minoru Isshiki, Kobe, and Kunio Kawasaki, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 555,836, Nov. 28, 1983, Pat. No. 4,571,279, which is a division of Ser. No. 384,438, Jun. 2, 1982, Pat. No. 4,451,317, which is a division of Ser. No. 223,402, Jan. 8, 1981, Pat. No. 4,372,800. This application May 23, 1985, Ser. No. 737,134
Claims priority, application Japan, Jan. 8, 1980, 55-1020
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—270 **6 Claims**



1. In a continuous process for producing a metal clad reinforced resin laminate comprising the steps of (a) impregnating a fibrous cellulosic substrate with a liquid unsaturated polyester resin which is free of volatile solvent and is capable of curing without generating liquid and gaseous by-products; (b) laminating a plurality of the resin-impregnated substrates into a unitary member; (c) sandwiching the laminate between a pair of covering sheets, at least one of which is a cladding metal foil capable of permanently bonding to the resin-impregnated substrates after the laminate is cured; and (d) curing the laminate while supporting it between the pair of covering sheets without applying any appreciable pressure thereto; the improvement comprising:
(e) impregnating the substrate in step (a) to a final resin content of 10–90% by weight, based on the total weight of the resin-impregnated substrate;
(f) partially curing the sandwiched laminate in step (d) at an elevated temperature until the metal foil is firmly bonded in position and the entire structure is sufficiently hard and self-supporting to be cut into lengths with a guillotine cutter or movable slicer;
(g) cutting a continuous length of the partially cured laminate into a predetermined length;
(h) fully curing the cut length of said laminate at an elevated

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temperature to decrease warp and residual strain in the laminate; and

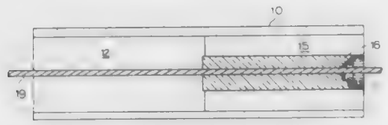
(i) mechanically correcting any distortion in the configuration of the fully cured laminate by geometrically modifying the warp in two directions which are perpendicular to each other to form a finished product which is substantially flat, free of residual strain or internal stress, and resistant to changes in physical and electrical properties upon exposure to elevated temperatures.

4,994,134

METHOD OF MAKING A FERRULE HAVING ENHANCED CONCENTRICITY

Dennis M. Knecht, and Joel C. Rosson, both of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Feb. 12, 1990, Ser. No. 478,847
Int. Cl.[5] B29C *65/78;* G02B *6/36*
U.S. Cl. 156—294 **14 Claims**



1. A method of making a ferrule comprising:

(a) providing a tubular fixture;

(b) inserting a ferrule fixture into a portion of said tubular fixture, said ferrule fixture having a continuous channel and recess therein, said continuous channel having a concentricity that varies no more than two microns;

(c) inserting a first ferrule tubular member into another portion of said tubular fixture;

(d) inserting a second ferrule tubular member into said first ferrule tubular member and into said recess of said ferrule fixture;

(e) inserting an alignment member, having a length greater than said second ferrule and a diameter that matches the internal diameter of said second ferrule tubular member and said continuous channel of said ferrule fixture within one micron, into said continuous channel of said ferrule fixture and into said second ferrule tubular member;

(f) bonding said first ferrule tubular member to said second ferrule tubular member to form a composite; and,

(g) removing said composite from said tubular fixture.

4,994,135

DEVICE FOR ROTATION OF THE PEDESTALS SUPPORTING BOTTLES, OR CONTAINERS IN GENERAL, IN ROTARY LABELING MACHINES

Ireneo Orlandi, San Giorgio di Mantova, Italy, assignor to Alfa Costruzioni Meccaniche S.P.A., Mantova, Italy

Filed Jun. 2, 1989, Ser. No. 360,821
Claims priority, application Italy, Jun. 3, 1988, 40088 A/88
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—362 **3 Claims**

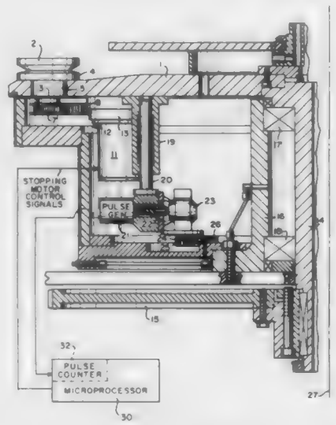
1. A device in a rotary type labeling machine having a fixed frame, said device being for rotation of pedestals for supporting containers to be labeled, comprising:

a rotatable carrousel platform, the periphery of said platform including a plurality of pedestals, each pedestal being rotatable on a respective pedestal shaft about a respective vertical axis;

a plurality of stepping motors, each stepping motor being connected to each said respective pedestal shaft for rotating the respective pedestal;

a pulse generator, connected to said platform to output pulses in response to platform rotation;

a microprocessor for receiving and counting said pulses emitted by said pulse generator, said microprocessor serving to establish in terms of total pulses the angular position of said pedestals in relation to the axis of rotation of the carrousel and controlling rotation of said stepping motors,



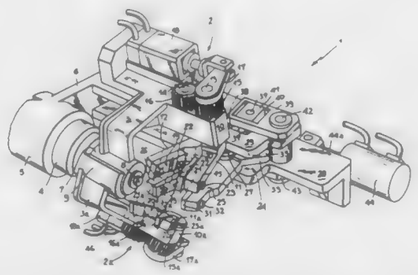
respectively, to rotate said pedestals about said pedestal axes response to with said counted pulses.

4,994,136

DEVICE FOR SPLICING THE ENDS OF ELASTOMERIC FILLERS APPLIED ON BEAD CORES OF PNEUMATIC TIRES

Augusto Pizzorno, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Italy

Filed May 1, 1989, Ser. No. 345,299
Claims priority, application Italy, May 18, 1988, 20621 A/88
Int. Cl.[5] B29C *65/70;* B29D *30/18*
U.S. Cl. 156—502 **7 Claims**



1. Device for splicing the ends of an elastomeric filler applied on bead cores of pneumatic tires, said filler having a triangular cross-section and two opposed ends, the base of said triangular cross-section extending along a radial outer chafer of a bead core and having said ends mutually facing and diverging according to a substantially "V" configuration, one with respect to the other upon moving radially away from the peripheral chafer of the bead core,

said device comprising two primary pliers systems, each one gripping one of the opposed ends of the filler through at least two facing gripping elements placed on opposite sides of the filler and moveable one with respect to the other from an open position, in which they are laterally separated from the filler to a closed position in which they work against the opposite sides of the filler to exert opposed thrust forces, said primary pliers system being angularly moveable around an axis of rotation near the point in which the "V" configuration of the filler ends converges,

said pliers being moveable from a rest position in which they are mutually separated to permit the locking of the filler ends between said gripping elements to a splicing position in which they approach each other to splice said ends when said ends are held by the gripping elements in said closed position, said primary pliers systems being mounted so that upon translating from the rest position to the splicing position, they rotate one with respect to the other according to an angulation greater than the angle formed by the "V" configuration of the filler ends when the pliers systems are in the rest position, the gripping elements of each pliers system having respective contacting surfaces with respective offset portions which are offset with respect to offset portions of the contacting surfaces of the other primary pliers system and are positioned for acting on a radial outer zone of the filler to mutually place side by side in overlapping relationship the ends of the filler in said radial outer zone said device comprising also at least an ancillary pliers system arranged between said primary pliers systems and provided with respective gripping elements positioned side by side with respect to the opposite sides of the filler and mounted to compress the ends of the filler gripped by the action of the primary pliers systems.

4,994,137

BAG MAKING MACHINE SEALER SLITTER APPARATUS

Takeo Yanai, Tokeo, Japan, assignor to Nippon Flute Co., Ltd., Saitama, Japan

Filed Jul. 14, 1989, Ser. No. 380,105
Claims priority, application Japan, Jul. 14, 1989, 63-175547
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—515 **6 Claims**



1. A sealer slitter apparatus for a bag making machine operable to produce thermoplastic resin film bags, said sealer slitter apparatus comprising:

sealing means for applying heat to and transversely sealing together two opposing layers of a tubular web of thermoplastic resin film, said sealing means including,

at least one stationary lower seal bar positioned beneath and extending transversely across an intended path of travel of a tubular web of thermoplastic resin film, said at least one stationary lower seal bar comprising a U-shaped seal bar,

at least one upper seal bar positioned above, mutually opposed to and in vertical alignment with said stationary lower seal bar, wherein a tubular web of thermoplastic resin film may be operably fed between said upper and said lower seal bars,

a seal bar reciprocating mechanism operable to impart selective vertical motion to said upper seal bar toward and away from said stationary lower seal bar and operably provide contact with a tubular web of thermoplastic resin film between said upper and said lower seal bars,

means for heating said lower and said upper seal bars to thereby induce a sealing weld bead to be formed transversely across a tubular web of thermoplastic resin film when said upper seal bar is lowered onto said lower seal bar with a tubular web of thermoplastic resin film therebetween, and

said stationary lower seal bar and said upper seal bar being coated with a covering on the surfaces which operably contact a tubular web of thermoplastic resin film to minimize adherence of a thermoplastic resin film to said seal bars; and

slitting means operably connected to said sealing means and being positioned adjacent to but spaced from said sealing means, said slitting means including,

a cutting edge for transversely severing a tubular web of thermoplastic resin film adjacent to and substantially parallel with a weld bead, thereby dividing a tubular web of thermoplastic resin film into two portions and forming a bag of a predetermined length with a transverse seal at one end, said cutting edge being vertically recessed above said upper seal bar when said upper seal bar is withdrawn from said lower seal bar so that radiant heat emanating from said cutting edge does not increase the operating temperature of said upper seal bar, thereby adversely affecting the integrity of the transverse weld beads induced by said sealing means,

a cutting edge reciprocating mechanism operably connected to said cutting edge to impart selective vertical motion to said cutting edge toward and away from said stationary lower seal bar and allowing said cutting edge to contact and transversely sever a tubular web of thermoplastic resin film while said sealing means induces a weld bead to the tubular web of thermoplastic resin film,

cutting edge heating means connected to said cutting edge for heating said cutting means, and

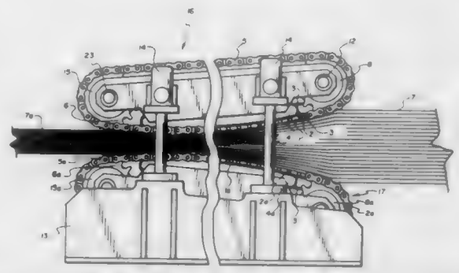
said cutting edge heating means providing heat input to said cutting edge such that the operating temperature of said cutting means is greater than the operating temperature of said sealing means and any carbon residue adhering to said cutting edge is removed by combustion.

4,994,138

PRESS FOR WOOD COMPOSITES

Peter J. Priboda, Burnaby, Canada, assignor to Compax Engineering & Development Ltd., Burnaby, Canada

Filed Jan. 31, 1989, Ser. No. 304,163
Int. Cl.[5] B30B *5/00*
U.S. Cl. 156—580 **12 Claims**



1. An apparatus for continuously pressing an uncompressed assembly of wood elements into a compressed wood assembly comprising:

(a) upper and lower frame means, the upper frame means supporting an upper press platen and the lower frame means supporting a lower press platen, the upper and lower press platens facing each other and having their entire facing surfaces formed into respective curved shapes of constant radius, the facing surfaces defining a converging inlet opening, and a diverging outlet opening, the inlet opening being adapted to receive the uncom-

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pressed assembly of wood elements and the diverging outlet opening being adapted to provide an outfeed for the compressed wood assembly;

(b) upper and lower converging endless track means, the upper endless track means adapted to travel along and conform to the curved surface of the upper press platen and the lower endless track means adapted to travel along and conform to the curved surface of the lower press platen;

(c) upper and lower antifriction means, the upper antifriction means located between the curved surface of the upper press platen and the upper track means and the lower antifriction means located between the curved surface of the lower press platen and the lower track means; and

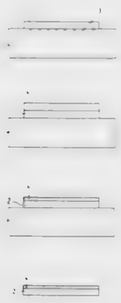
(d) power means for moving the upper and lower track means in a common direction between the upper and lower press platens.

4,994,139

METHOD OF MANUFACTURING A LIGHT-CONDUCTING DEVICE

Udo K. P. Biermann; Gijsbertus A. C. M. Spierings; Franciscus J. H. M. van der Kruis, and Jan Haisma, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 394,686, Aug. 16, 1989, abandoned.
This application Apr. 3, 1990, Ser. No. 504,727
Claims priority, application Netherlands, Aug. 16, 1988, 8802028
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—630 11 Claims



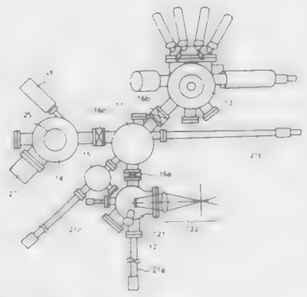
1. A method of manufacturing a device, in which a layer of a light-conducting material is applied to a plane surface of a disc-shaped carrier body, which comprises providing a carrier body having substantially completely smooth and plane main surfaces which are substantially completely parallel to each other, contacting a plane main surface of a disc-shaped body which is composed of the light-conducting material with a main surface of the carrier body to form a permanent bond, grinding the light-conductor body mechanically to a thickness which exceeds the desired ultimate layer thickness by at least 50 μm subjecting said body to alternate tribiochemical and mechanical polishing treatments until a layer thickness is obtained which exceeds the desired ultimate layer thickness by approximately 10 μm, and polishing the body tribiochemically until the desired layer thickness of said light-conductor is obtained.

4,994,140

METHOD CAPABLE OF FORMING A FINE PATTERN WITHOUT CRYSTAL DEFECTS

Akita Kenzo, Kanagawa; Mototaka Taneya, Nara; Yoshimasa Sugimoto, and Hiroshi Hidaka, both of Ibaraki, all of Japan, assignors to Optoelectronics Technology Research Corporation, Tokyo, Japan

Filed Jan. 10, 1990, Ser. No. 463,205
Claims priority, application Japan, Jan. 10, 1989, 1-2143; Apr. 28, 1989, 1-107865; Jun. 27, 1989, 1-62683; Dec. 25, 1989, 1-332640
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 16 Claims



1. A method of processing a wafer which is composed of a compound semiconductor and which has a wafer surface, said method comprising the steps of:

forming a specific layer on said wafer surface; and

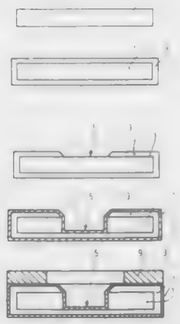
selectively etching said specific layer by introducing an electron beam and a specific gas onto said specific layer to form a predetermined pattern on said wafer surface.

4,994,141

METHOD OF MANUFACTURING A MASK SUPPORT OF SIC FOR RADIATION LITHOGRAPHY MASKS

Margret Harms, Hamburg; Holger Luthje, Halstenbek, and Bernd Matthiesen, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1989, Ser. No. 446,519
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841352
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C23F *1/02*; C03C *15/00*
U.S. Cl. 156—643 27 Claims



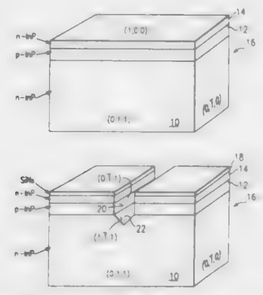
1. A method of manufacturing a mask support (diaphragm) of SiC for radiation lithography masks, in which a SiC layer is deposited at least on one of the two major surfaces of a substrate in the form of a silicon single crystal wafer and the silicon single crystal wafer is removed, except an edge region, by means of a selective etching step, characterized in that the mask support is annealed before or after the selective etching step in an oxidizing atmosphere at a temperature in the range of 200° to 1350° C. for a duration of 2 to 10 h.

4,994,142

ELIMINATING UNDERCUTTING OF MASK MATERIAL WHEN ETCHING SEMICONDUCTOR TOPOGRAPHY BY NATIVE OXIDE REMOVAL

Ami Appelbaum, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 22, 1988, Ser. No. 247,839
Int. Cl.[5] H01L *21/308*; C25F *3/12*
U.S. Cl. 156—647 9 Claims



1. A method of etching a channel of substantially constant width in a surface of a body of semiconductor material initially covered with a native oxide, comprising the steps of:

stripping native oxide from the surface of the body of semiconductor material to be etched at essentially room temperature while the body is in an oxygen containing environment;

removing substantially all oxygen from the environment adjacent the body before subjecting the body to temperatures which will cause the addition of a further oxide layer;

covering the stripped area with a pattern configured etch mask; and

etching a channel in said surface of the semiconductor material in accordance with the configuration of the mask using HCl acid to form grooves having sides of a substantially constant width.

4,994,143

METHOD FOR MANUFACTURING A BURIED HETEROSTRUCTURE LASER DIODE

Sang B. Kim, Daejon, Rep. of Korea, assignor to Electronics and Telecommunications Research Institute, Daejeon and Korea Telecommunication Authority, Seoul, both of, Rep. of Korea

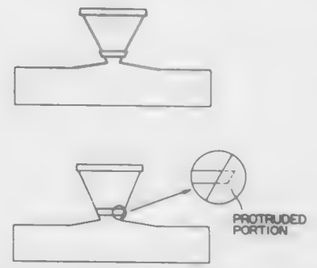
Filed Apr. 2, 1990, Ser. No. 503,222
Claims priority, application Rep. of Korea, Apr. 6, 1989, 4512
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—649 8 Claims

1. A method for manufacturing a buried heterostructure laser diode including a reverse mesa structure of an active layer (7) and a clad layer (4) formed on a substrate, current blocking layers (3) and (6) and an insulation layer (2) formed on the side of the mesa structure and an electrode (1) formed on the top of the mesa structure and an insulation layer, comprising:

a first step of forming a SiO_2 stripe mask (8) on the clad layer (4) after the first liquid-phase epitaxial growth of the active layer (7) and clad layer (4) on the substrate:

a second step of etching them under the SiO_2 stripe mask (8) using an echant for form reverse mesa structure;

a third step of selectively etching the clad layer (4) using an etchant of hydrochloric acid family to protrude the active layer (7); and



a fourth step of naturally melting back the protruded portion of the active layer (7) during the second epitaxial growth for growing the current blocking layers.

4,994,144

METHOD FOR INCREASING THE BULK OF CREPED TISSUE

Michael J. Smith, Neenah, and Fung-Jou Chen, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 13, 1989, Ser. No. 435,646
Int. Cl.[5] D21H *25/00*
U.S. Cl. 162—111 16 Claims

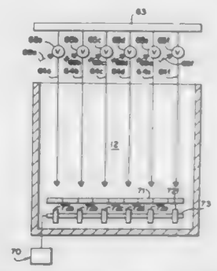
1. A method of making a tissue product comprising contacting a dried creped tissue web with steam while the web is under tension in the machine direction, wherein the bulk of the web is increased.

4,994,145

PROCESS FOR PRODUCING A CONSTANT DISTRIBUTION OF A SELECTED PROPERTY ACROSS THE WIDTH OF PULP MAT ON A PULP WASHING SURFACE

George W. Seymour, 2841 Parkwood Dr., Brunswick, Ga. 31520

Filed Mar. 2, 1989, Ser. No. 318,118
Int. Cl.[5] D21C *9/00, 9/06*
U.S. Cl. 162—49 23 Claims



1. In a pulp washing process where a cellulosic pulp slurry stream and a dilution liquid are continuously introduced into a headbox from which an admixture of these overflows into a vat to form a level of admixture comprising pulp and liquid in said vat wherein a mat comprising pulp and liquid continuously forms on a washing surface which is moved at a surface speed and wherein wash liquid is directed at said mat on said washing surface and vacuum filtering is carried out to produce a product stream of washed pulp and liquid at a downstream location on said surface and a filtrate which is divided so that part of it is recirculated to provide said dilution liquid and where there is obtained a substantially constant percentage of pulp in said

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admixture and a substantially constant average weight of liquid in the pulp mat per unit area of the washing surface despite change of production rate, the improvement comprising controlling the weight per unit area of liquid alone or liquid and pulp combined in said mat across its width to obtain a substantially constant distribution of a selected property in the pulp mat across its width by steps comprising:

(a) determining said property in a plurality of selected locations across the width of said mat and also the average value of said property across the width of said mat, and

(b) controlling a plurality of dilution liquid inputs into said headbox, each of said dilution liquid inputs being positioned to discharge at a location corresponding to a different one of said plurality of selected locations and each of said dilution liquid inputs being controlled in response to said determining to produce a substantially constant distribution of said property across the width of said mat.

4,994,146

CREPING ADHESIVE UTILIZING POLYMER-POLYMER COMPLEX FORMATION

Dave A. Soerens, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 28, 1988, Ser. No. 263,926
Int. Cl.[5] D21H 25/04
U.S. Cl. 162—112 20 Claims

1. In a method for making creped tissue wherein a tissue web is adhered to a creping cylinder and dislodged therefrom with a doctor blade, the improvement comprising adhering the web to the creping cylinder with an adhesive complex wherein a first water-soluble component of the adhesive complex is applied to the surface of the creping cylinder and a second water-soluble component of the adhesive complex is applied to the surface of the web such that the adhesive complex is formed when the web is brought into contact with the creping cylinder, said first component comprising a polyacid selected from the group consisting of polyacrylic acid, polymethacrylic acid, ethylene maleic acid copolymer, ethylene acrylic acid copolymer, ethylene methacrylic acid copolymer, styrene maleic acid copolymer, and mixtures thereof and said second component being selected from the group consisting of a polyether, a polyamide, and mixtures thereof.

4,994,147

PHOTOGRAPHIC REFLECTION PRINT MATERIAL WITH IMPROVED KEEPING PROPERTIES

Francis J. Foley, Spencerport; Alberto M. Martinez, and William A. Mruk, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 488,544, Mar. 5, 1990, abandoned. This application Jul. 25, 1990, Ser. No. 560,498
Int. Cl.[5] D21H 19/10
U.S. Cl. 162—137 13 Claims

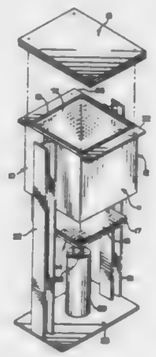
1. In the method of making a photographic paper support including the steps of internally sizing the aqueous pulp paper furnish with an acid sizing agent, forming the paper from the furnish, drying the paper and coating the paper on each surface with a polyolefin resin the improvement which comprises externally sizing the paper prior to application of the polyolefin coating with an aqueous alkaline medium to achieve a water extractable pH of the paper of from 6 to 9.5.

4,994,148

PULP PRESS MOLDING METHOD FOR MAKING PRODUCTS FROM PAPER PULP FROM RECYCLED PAPER

Stanley J. Shetka, 10247 40th St. West, Box 44D, Webster, Minn. 55088

Filed Mar. 14, 1989, Ser. No. 324,263
Int. Cl.[5] D21J 3/00
U.S. Cl. 162—227 10 Claims



1. A method for making a product from recycled paper comprising the steps of:

providing a quantity of paper to be recycled;

mixing the paper with sufficient water to form a viscous pulp;

beating said pulp to a desired consistency for a given texture of the product to be made;

providing a pulp press having a molding chamber defined on all sides by sidewalls each of which is comprised of a rigid screen through which water can pass and a rigid impermeable plate outboard from said screen, said rigid impermeable plate having channels formed therein facing said screen through which channels water can flow, one of said sidewalls being movable into said molding chamber to serve as a piston, and means to move said movable sidewall;

pouring said beaten pulp into said molding chamber;

closing said chamber;

operating said press by moving said movable sidewall into said chamber to compress said beaten pulp to a desired pressure and pulp density, whereby water and air are forced out of said pulp through said screens and into said rigid plate channels to drain; and

drying the compressed pulp to thereby yield a pulp paper product.

4,994,149

DILUENT SUBSTITUTION APPARATUS

Jeffery E. Scott; David W. McDougall, and Ronald G. Holcek, all of Calgary, Canada, assignors to Delta Projects Inc., Calgary, Canada

Division of Ser. No. 59,697, Jun. 9, 1987, Pat. No. 4,882,041. This application Nov. 3, 1989, Ser. No. 431,408
Int. Cl.[5] B01D 1/00
U.S. Cl. 196—104 5 Claims

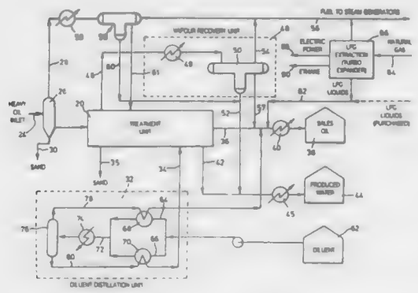
1. An apparatus for producing sales oil from a heavy oil stream, comprising:

a treatment unit for receiving said stream and removing light components including methane and carbon dioxide and reducing the vapour pressure of the stream;

first diluent supply means for adding a hydrocarbon diluent stream to said heavy oil stream in the treatment unit;

means for injecting into said heavy oil stream downstream of the treatment unit, a liquified petroleum gas (LPG) diluent stream for lowering the viscosity of the heavy oil production stream and forming a sales oil stream;

a diluent distillation unit upstream of said treatment unit and including: means for heating the hydrocarbon diluent to vapourize at least some of the light components in the diluent that would vapourize during said treatment; and



means for separating the diluent into a liquid stream and a vapour stream;

first conduit means for delivering said liquid stream to the treatment unit to provide said first diluent addition; and,

second conduit means for introducing the vapour stream not the heavy oil stream downstream of the treatment unit.

4,994,150

PROCESS FOR THE PURIFICATION OF ESTERS OF MERCAPTO ACIDS

James E. Shaw, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 24, 1989, Ser. No. 397,935
Int. Cl.[5] B01D 3/34; C07C 32/04
U.S. Cl. 203—14 13 Claims

1. A process for the recovery of esters of mercapto acids from a first mixture containing an ester of mercapto acid and water comprising the following steps:

(a) mixing said first mixture with an effective amount of cycloalkane, arene, and an aqueous inorganic salt to form a second mixture;

(b) allowing said second mixture to separate into an organic phase and an aqueous phase, retaining the organic phase; and

(c) distilling said organic phase in a suitable manner to recover said ester.

4,994,151

SEPARATION OF 4-METHYL-2-PENTANONE FROM FORMIC ACID BY EXTRACTIVE DISTILLATION WITH DIMETHYLAMIDES

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715, and George Bentu, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Jul. 14, 1989, Ser. No. 380,018
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[5] B01D 3/40; C07C 45/83, 53/02
U.S. Cl. 203—51 2 Claims

1. A method for recovering 4-methyl-2-pentanone from mixtures of 4-methyl-2-pentanone and formic acid which comprises distilling a mixture of 4-methyl-2-pentanone and formic acid in a rectification column in the presence of about one part of an extractive agent per part of 4-methyl-2-pentanone-formic acid mixture, recovering 4-methyl-2-pentanone as overhead product and obtaining the extractive agent and the formic acid from the stillpot, wherein said extractive agent comprises dimethylacetamide and at least one material selected from the group consisting of cinnamic acid m-nitrobenzoic acid, 3,4,5-trimethoxy benzoic acid, undecanoic acid, diisobutyl ketone, acetophenone, adiponitrile, anisole, methyl isoamyl ketone, ethylene glycol diacetate, diethylene glycol dibenzoate, 2-heptanone, ethyl salicylate, ethyl butyl ketone, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, dipropylene glycol dibenzoate ethyl phenyl acetate and 2-hydroxyacetophenone.

4,994,152

REMOVAL OF SMALL AMOUNTS OF A MEDIUM-BOILING FRACTION FROM A LIQUID MIXTURE BY DISTILLATION

Gerd Kaibel, Lampertheim; Karl Schloemer, Ludwigshafen, and Hans-Horst Mayer, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 27, 1989, Ser. No. 457,943
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902006
Int. Cl.[5] B01D 3/00
U.S. Cl. 203—75 10 Claims

1. A process for removing a medium-boiling fraction from a liquid feed mixture consisting essentially of the steps: distilling the liquid feed mixture containing 40 to 65% by weight of cyclohexanone as a low-boiling fraction, methylcyclohexanone as the medium-boiling fraction and from 30 to 60% by weight of cyclohexanol and from 1 to 10% by weight of higher-boiling by-products as a high-boiling fraction; using a distillation column (main column) consisting of a rectifying part and a stripping part, the rectifying part connected by a liquid-phase line so as to pass liquid from said part to the upper end of a second distillation column (side column), and the stripping part connected by a vapor-phase line so as to pass vapor from said part to the lower end of the side column; removing the medium-boiling fraction in vapor or liquid form from the middle section of the side column; removing a cyclohexanone fraction containing from 0.0001 to 0.02% by weight of methylcyclohexanone at the top of the main column; removing a cyclohexanol fraction containing from 0.002 to 0.4% by weight of methylcyclohexanone at the bottom of the main column; and removing a medium-boiling fraction containing from 1 to 25% by weight of methylcyclohexanone at the withdrawal point of the side column; wherein the concentration of the medium-boiling fraction in said liquid feed mixture is less than 2% and the amount of vapor which is passed into the lower end of the side column from the stripping part of the main column is 1–20% based on the amount of vapor in the main column at the point of withdrawal from the stripping part.

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4,994,153

PROCESS FOR PREPARING NONCONDUCTIVE SUBSTRATES

Anthony M. Piano, New Haven, Conn., and Randolfo Galvez, North Bergen, N.J., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 28, 1990, Ser. No. 545,224
Int. Cl.[5] C25D *5/02, 5/54*
U.S. Cl. 204—15 12 Claims

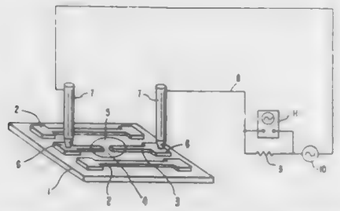
1. A process for treating the tooling holes or slots formed in a nonconductive material which has been coated with a carbon black dispersion and electroplated, which comprises removing said carbon black with an aqueous solution containing:
(a) an alkanolamine;
(b) an anionic surfactant which is the neutralized addition product of malelic and/or fumaric acid and a poly(oxylated) alcohol;
(c) a nonionic surfactant which is an aliphatic mono and/or diphosphate ester ; and
(d) an alkali or alkaline earth metal hydroxide.

4,994,154

HIGH FREQUENCY ELECTROCHEMICAL REPAIR OF OPEN CIRCUITS

Chengjun J. Chen, Yorktown Heights, and Robert J. von Gutfeld, New York, both of N.Y., assignors to Internatinal Business Machines Corporation, Armonk, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,636
Int. Cl.[5] C25D *5/02, 7/12*
U.S. Cl. 204—16 22 Claims



1. A method for repairing an open in an electronic circuit disposed on a substrate comprising the following steps:
contacting the open circuit disposed on said substrate with a first plating solution containing metal ions which are electrochemically compatible with the metal comprising the circuit, passing an alternating current having a frequency of between about 0.04 kHz and 5000 kHz through said open circuit, said solution acting to complete the current path;
continuing to pass said current for sufficient time to obtain localized Joule heating in said solution, a portion of said Joule heat being transferred to said circuit by thermal conduction from said solution resulting in an initial metallic growth forming across said open in said circuit, continuing said growth until the infinite resistance of the open reaches a finite value, said current having an amplitude sufficient to initiate said metallic growth without deleteriously affecting said metal growth during formation,
thereafter contacting the treated site containing the metallic growth with a second plating solution and applying a current having a frequency of about 60 Hz or more for such time as is required for the resistance per unit length of the metal formed in the gap to become comparable to the resistance per unit length for the rest of the circuit.

4,994,155

HIGH SPEED TIN, LEAD OR TIN/LEAD ALLOY ELECTROPLATING

Michael P. Toben, Smithtown; Neil D. Brown, Baldwin; David J. Esterl, Valley Stream, and Robert A. Schetty, Miller Place, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 282,851, Dec. 9, 1988, Pat. No. 4,880,507, which is a continuation-in-part of Ser. No. 130,759, Dec. 10, 1987, abandoned. This application Sep. 20, 1989, Ser. No. 409,914
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] C25D *3/32, 3/36, 3/60*
U.S. Cl. 204—28 18 Claims

1. A method for high speed electroplating of tin, lead or tin/lead alloys which comprises:
utilizing high speed electroplating equipment comprising an electroplating cell; an overflow reservoir adjacent said cell; means for returning solution from said reservoir to said electroplating cell; means for directing a substrate to be plated from an entry point at one end of said cell to an exit at a second end of said cell; and
introducing an electrolyte comprising a basis solution of an alkyl sulfonic acid; at least one of a solution soluble tin compound or a solution soluble lead compound; and a surfactant of an organic compound having at least one hydroxyl group and 20 carbon atoms or less condensed with an alkylene oxide compound, or solution soluble derivatives thereof, said surfactant enabling the electrolyte to be substantially non-foaming, clear, free from turbidity, and stable under high speed electroplating conditions so as to provide smooth electrodeposits having good solderability, said organic compound including one of an aliphatic hydrocarbon of between one and seven carbon atoms; an aromatic compound; or an alkylated aromatic compound having six carbon atoms or less in the alkyl moeity; into said equipment in a manner such that the electrolyte substantially fills said cell, continuously overflows into said reservoir, and is continuously returned to said cell, so as to provide vigorous agitation and circulation of said electrolyte within said cell; and
continuously electroplating substrates with a tin, lead or tin-lead alloy at a sufficient current density and at a sufficient temperature for high speed electroplating as said substrates pass through said electroplating solution within said cell.

4,994,156

ELECTRICALLY CONDUCTIVE OIL-IN-WATER MICROEMULSIONS BASED ON PERFLUORINATED COMPOUNDS AND USED AS A CATHOLYTE IN ELECTROCHEMICAL PROCESSES

Alba Chittofrati, Milan; Angelo Tentorio, Novara, and Mario Visca, Alessandria, all of Italy, assignors to Ausimont, S.R.L., Milan, Italy

Filed Jun. 19, 1989, Ser. No. 367,859
Claims priority, application Italy, Jun. 17, 1988, 21005 A/88
Int. Cl.[5] C25B *1/00*
U.S. Cl. 204—98 12 Claims

1. An electrochemical process comprising reducing oxygen at a cathode using microemulsions of oil-in-water as a catholyte, said microemulsions having an electric conductance by ionic transfer of at least 1 millisiemens cm^{-1} and the microemulsion of the oil-in-the-water type having a conductance of at least 1 millisiemens cm^{-1} consisting essentially of a liquid, limpid or opalescent, macroscopically single-phase matter obtained by mixing:
(a) an aqueous liquid;
(b) a fluorinated organic compound selected from the group of perfluorocarbons and the group of perfluoropolyether-structured fluids having perfluoroalkyl or functional end groups, with carboxylic, alcoholic, polyoxyalkylene-OH, ester, or amide functionality;

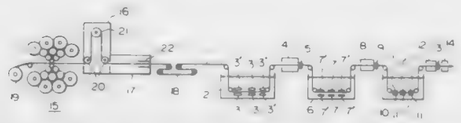
(c) a fluorinated surfactant, and
(d) a hydrogenated alcohol C_1–C_{12}.

4,994,157

METHOD AND APPARATUS FOR DESCALING STAINLESS STEEL

Masahiko Itoh, Hitachiota; Heihatiro Midorikawa, Hitachi; Masakiyo Izumiya, Mito, and Teruo Yamaguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1989, Ser. No. 426,761
Claims priority, application Japan, Oct. 29, 1988, 63-271960
Int. Cl.[5] C25F *1/06;* C25D *17/00*
U.S. Cl. 204—145 R 16 Claims



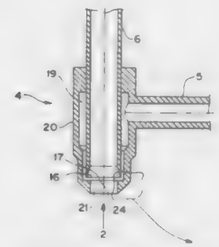
1. A method of descaling stainless steel, comprising the steps of: anode-electrolyzing stainless steel in an aqueous neutral salt solution; anode-electrolyzing said stainless steel in an aqueous alkaline solution; and cathode-electrolyzing said stainless steel, which had been treated in said former two steps, in an aqueous nitric acid solution.

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METHOD FOR ANALYZING A GAS MIXTURE

Jorma Kiimalainen, and Risto J. A. Heike, both of Tampere, Finland, assignors to Oy Tampella AB, Finland

Continuation-in-part of Ser. No. 859,823, May 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 668,963, Nov. 7, 1984, Pat. No. 4,586,390, and a continuation-in-part of Ser. No. 669,007, Nov. 7, 1984, abandoned. This application May 20, 1988, Ser. No. 196,548
Claims priority, application Finland, Nov. 17, 1983, 834,209; Nov. 17, 1983, 834,210
Int. Cl.[5] G01N *27/333*
U.S. Cl. 204—153.1 13 Claims



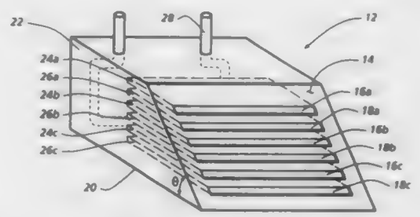
1. A method for analyzing a gas mixture which contains a finely divided solid which comprises,
separating a predetermined quantity of said gas mixture from said gas mixture by introducing said predetermined quantity of said gas mixture into a first open end of a sample-taking conduit,
concurrently introducing a predetermined quantity of liquid in which said finely divided solid is dissolvable substantially at said first open end of said sample-taking conduit with said predetermined quantity of said gas mixture to form a mixture of said predetermined quantity of said gas mixture and said predetermined quantity of said liquid in which at least a portion of said finely divided solids become dissolved into said liquid and at least a portion of the dissolvable components of said gas mixture become absorbed into said liquid, said liquid being concurrently introduced into said sample-taking conduit in such a manner that plugs of said liquid are formed between which space is left for the gas,
passing said predetermined quantity of said gas mixture and said predetermined quantity of liquid through said sample-taking conduit for a time sufficient to enable substantially complete absorption of the absorbable components of said predetermined quantity of said gas mixture into said predetermined quantity of liquid,
the flowing predetermined quantity of liquid rinsing the walls of said conduit and preventing deposits of said finely divided solids on said conduit walls,
and withdrawing said predetermined quantity of liquid from a second open end of said sample-taking conduit and passing said predetermined quantity of liquid to an analysis zone to determine the absorbed constituent concentration of said predetermined quantity of liquid.

4,994,159

METHOD AND APPARATUS FOR MEASURING CORROSION BENEATH THIN FILMS

Vinod S. Agarwala, Warminster, and Paul J. Kennedy, Bensalem, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1990, Ser. No. 468,560
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—153.1 25 Claims



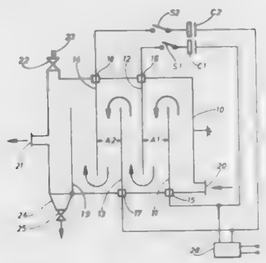
1. Apparatus for monitoring the corrosion beneath a thin film of lubricant exposed to a humid environment having a known dew point temperature comprising:
a matrix of insulating material having an essentially flat sensitive bevelled face oriented at an angle with the horizontal ranging from 10 to 80 degrees, on which the thin film of lubricant is to be disposed;
a plurality of electrically isolated surface areas of anodic material disposed on the sensitive face;
a plurality of electrically isolated surface areas of cathodic material disposed on the sensitive face in alternating relationship with the anodic surface areas;
a first conducting means connected to each of the anodic surface areas;
a second conducting means connected to each of the cathodic surface areas; and
means electrically connected to said first and said second conducting means for measuring the current generated therebetween, the current being the corrosion current generated at the sensitive face beneath the thin film of lubricant.

4,994,160

ELECTRIC-IMPULSE METHOD FOR TREATING SUBSTANCES AND DEVICE FOR CARRYING OUT THE METHOD

Heinz Doevenspeck, Sigurdstr. 1, D-4950 Minden, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 677,040
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344668; Apr. 11, 1984, 3413583
Int. Cl.[5] H05F *3/00*
U.S. Cl. 204—165 12 Claims



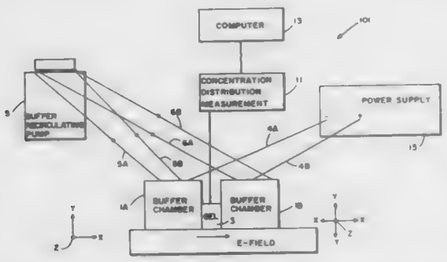
1. Electric-impulse method for treating substances, particularly for obtaining individual phases from dispersed systems, for destroying bacteria or for growing molecular chains or organic and inorganic substances, in which the substances are exposed in an electrolyte several times successively in time to impulse-like electric and/or electro-magnetic fields wherein the energy density of the successive groups of electric impulses varies.

4,994,161

APPARATUS AND METHOD FOR MACROMOLECULAR CHARGE DETERMINATION

Thomas M. Laue, Durham, N.H.; David A. Yphantis, Mansfield Center, Conn., and Andrea L. Hazard, Rochester, N.Y., assignors to University of New Hampshire, Durham, N.H.

Filed Feb. 2, 1989, Ser. No. 305,107
Int. Cl.[5] G01N *27/26, 27/28*
U.S. Cl. 204—180.1 18 Claims



1. A method of direct determination of charge on a macromolecule in solution, that comprises:

providing two buffer chambers;

establishing a volume between the two buffer chambers, which volume contains and confines the macromolecule in a solution that includes the buffer that establishes and controls the proton concentration or pH of the solution and that further includes a gelling agent, the macromolecule being confined to the volume, there being electrical continuity between the buffer in the volume and the buffer in the two buffer chambers and flow of all small molecules between the two buffer chambers through said volume;

providing external flow of buffer between the two buffer chambers to maintain constant ionic concentrations of buffer in the two buffer chambers as well as constancy and equality of liquid level in the two buffer chambers, there being no electric current between said chambers through said external flow of buffer;

establishing an electric field in a direction across said volume to establish an electrophoretic force on each macromolecule to cause said each macromolecule to migrate within said volume, diffusive force in said volume tending to counteract said electrophoretic force, the electrophoretic force and the diffusive force being opposite to one another;

after an appropriate time lapse determining the concentration distribution in the direction of the electric field; and

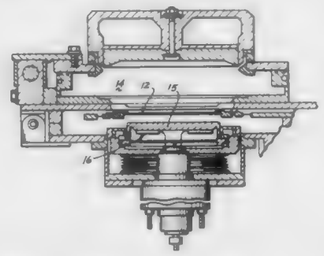
relating said concentration distribution to the charge.

4,994,162

PLANARIZATION METHOD

Karl J. Armstrong, Congers; Arnold J. Aronson, Pomona, and Jon A. Roberts, Suffern, all of N.Y., assignors to Materials Research Corporation, Orangeburg, N.Y.

Filed Sep. 29, 1989, Ser. No. 415,083
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.15 19 Claims



1. A method of planarizing a feature of a wafer with an aluminum or an aluminum alloy material comprising the steps of:

(a) depositing said material onto said wafer at a first deposition rate for a first time interval;

(b) depositing said material onto said wafer at a second deposition rate that is less than said first deposition rate while simultaneously applying heat to said wafer during a second time interval; and

(c) depositing said material onto said wafer at a higher deposition rate than said second deposition rate while continuing to apply heat to said wafer during a third time interval, thereby to planarize said feature.

4,994,163

ROTATABLE WASTEWATER METAL-RECLAIMATION DEVICE

Sheng R. Lin, No. 111, Sec. 3, Hsi Men Rd., Tainan, Taiwan

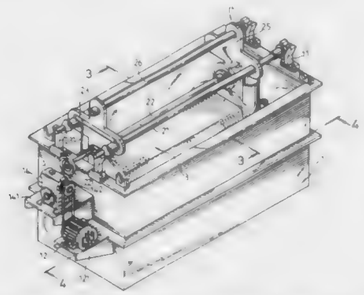
Filed May 10, 1990, Ser. No. 521,520
Int. Cl.[5] C02F *1/46*
U.S. Cl. 204—213 2 Claims

1. A rotatable wastewater metal reclaimation device comprising the combination of: a containment vessel (1) for containment of wastewater with ionic metal wastes therein, a fixed frame assembly (2), an electrolytic rotor assembly (3), a rotatable cylindrical anode (4), a wastewater inlet (5), and a D.C. voltage source (7);

said containment vessel (1) being substantially rectangular (1) and open at an upper end thereof, said containment vessel (1) having two platforms (121 and 141) extending from an outer surface of a side wall thereof on which an electric motor (12) and a variable velocity machine (14) are respectively fixed, said electric motor (12) being mechanically linked to said variable velocity machine (14) via a drive belt (13), said variable velocity machine (14) having a driving gear (142) proximate to said side wall of said containment vessel (1);

said fixed frame assembly (2) comprising two substantially cross-shaped plates (25) which are connected by a handling bar (26) at respective upper ends thereof and two support rods (21) at respective horizontal ends thereof, said handling bar (26) and said support rods (21) being parallel to each other, two conduction pieces (23) being attached to corresponding ends of said support rods (21) proximate to an outer surface of said cross-shaped plate (25), each said conduction piece (23) having a respective conduction wire (231) fixed thereto which is connected to a respective end of said cylindrical anode so that flow of electrical charge is facilitated therebetween, a rotor shaft (22) rotatably fixed to said cross-shaped plate (25) slightly below said horizontal portions thereof, one distal end of said rotor shaft (22) having an intermediate gear (221) thereon which engages with and is driven by said driving gear (142);

said electrolytic rotor assembly (3) comprising two large



rotor gears (31), a plurality of cathode rods (33), inner and outer hexagonal mixing surfaces (36 and 34), and a cylindrical anode (4) with multiplicity of openings (41) thereon for allowing said wastewater to flow therethrough; said cylindrical anode (4) being rotatably supported by said cross-shaped plate (25) at a lower end thereof, said cylindrical anode (4) rotatably supporting said rotor gears (31) so that said rotor gears (31) engage with and are rotatably driven by said shaft gears (24), said inner and outer hexagonal mixing surfaces (36 and 34) each having a respective multiplicity of openings (362 and 342) thereon, respective ends of each of said plurality of cathode rods (33) being fixed on said rotor gears (31), said cathode rods (33) being parallel with each other and being evenly spaced concentric with said cylindrical anode, said rotor gears (31) being driven to rotate by respective said shaft gears (24);

said D.C. voltage source (7) causing current to flow from said cylindrical anode (4) to said cathode rods (33) so that an activation potential in ionic metal wastes in said wastewater is lowered by causing deposits to form on said cathode rods 33.

4,994,164

METAL ION IMPLANTATION APPARATUS

Henri Bernardet, Saint Michel sur Orge, and Chantal Thiebaut, Villiers sur Marne, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 224,967, Jul. 27, 1988, abandoned. This application Dec. 11, 1989, Ser. No. 453,032
Claims priority, application France, Aug. 5, 1987, 87 11130
Int. Cl.[5] C23C *14/48*
U.S. Cl. 204—298.41 23 Claims

1. A metal ion implantation apparatus comprising:

(a) an implantation chamber,

(b) first means for producing a vacuum within said chamber,

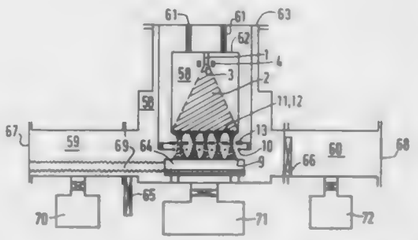
(c) at least one vacuum arc ion source within said chamber, said vacuum arc ion source including

(i) at least one cathode for emitting a plasma,

(ii) at least one anode and ignition electrode for controlling said plasma,

(iii) at least one focussing electrode and at least one extraction electrode combined for focussing and extracting ions from said plasma,

(iv) at least one acceleration electrode for accelerating said ions at an acceleration voltage,



(d) at least one target plate disposed in said chamber and receiving said ions, and

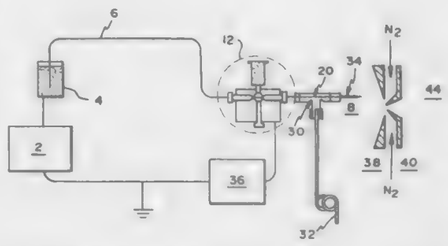
(e) lock means disposed in said chamber for introducing said target plate into said vacuum arc ion source and for supporting said target plate within said vacuum arc ion source, said lock means being an enclosed part of said implantation chamber at opposing sides of said vacuum arc ion source.

4,994,165

LIQUID JUNCTION COUPLING FOR CAPILLARY ZONE ELECTROPHORESIS/ION SPRAY SPECTROMETRY

Edgar D. Lee, Olathe, Kans.; Thomas R. Covey, Ithaca, N.Y., and John D. Henion, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Feb. 16, 1989, Ser. No. 311,500
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—299R 19 Claims



1. A liquid junction interface for coupling a zone electrophoresis separation column with an ion spray chamber/mass spectrometer system wherein said junction comprises a means for adding make-up buffer in an amount which increases the flow rate of the zone electrophoresis column eluent passing to an ion/spray mass spectrometer detector system to make said flow rate compatible with said ion spray/spectrometer in on-line separation/detection of analyte compositions and mixtures; wherein said junction comprises a zone communicating with:

(1) the exit end of the electrophoresis column;

(2) a conduit having a first end proximate to (1) but separated

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therefrom to form a gap and a second end communicating with the ion spray mass spectrometer system;

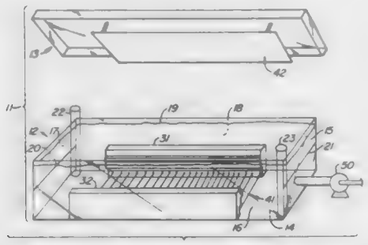
(3) a reservoir adapted to contain buffer and to supply said buffer to said zone and to surround (1) and the first end of conduit (2) including the said gap separating (1) and said first end of conduit (2).

4,994,166

SINGLE APPARATUS FOR SLAB GEL ELECTROPHORESIS AND BLOTTING

George G. Fernwood, Larkspur; Efrem G. Hernandez, San Rafael, and Frank R. Witney, Novato, all of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Aug. 22, 1989, Ser. No. 397,065
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—299 R 19 Claims



1. Apparatus for both electrophoretic separation and blotting, comprising:

a liquid receptacle defined by a floor and raised sides;

first and second electrode wires defined as separation electrodes, affixed to the interior of said liquid receptacle along opposing raised sides thereof, at a preselected height above said floor;

a first parallel array of electrode wires defined as lower blotting electrodes, affixed to the interior of said liquid receptacle along said floor;

a second parallel array of electrode wires defined as upper blotting electrodes, and means for suspending said upper blotting electrodes inside said liquid receptacle above said lower blotting electrodes;

switching means for switching between (a) electrical isolation of said lower blotting electrodes from one another and said upper blotting electrodes from one another and (b) maintenance of said lower blotting electrodes at equal potentials with each other and said upper blotting electrodes at equal potentials with each other;

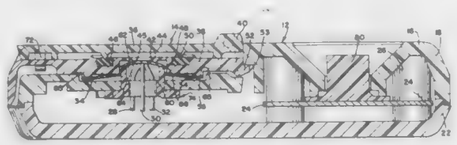
a flat porous plate of electrically insulating hydrophilic material sized to fit inside said liquid receptacle, and means for supporting said flat porous plate in said liquid receptacle above said lower blotting electrodes such that the upper surface of said flat porous plate is about 0.05 cm to about 1.0 cm below said preselected height while forming no barrier to electric current flow between said first parallel array of electrode wires and said first and second separation electrodes.

4,994,167

BIOLOGICAL FLUID MEASURING DEVICE

Mark G. Shults, Madison; Christopher C. Capelli, Kenosha, and Stuart J. Updike, Madison, all of Wis., assignors to Markwell Medical Institute, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 852,343, Apr. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 774,330, Sep. 10, 1985, abandoned. This application Jul. 7, 1988, Ser. No. 216,683
Int. Cl.[5] G01N *27/404*
U.S. Cl. 204—403 72 Claims



1. A biological fluid measuring device comprising:

(a) a main housing including electronic circuit means associated with at least two electrodes;

(b) a disposable cartridge having a homogeneous, monolithic membrane and being removably mounted on the housing with the membrane operably associated with the electrodes, the cartridge including means for protecting the membrane when not in use and means for maintaining the membrane in operative association with the electrodes at the electrode-membrane interface by osmotic pressure during storage and use, the maintaining means including an osmotic agent which does not permeate the membrane; and

(c) means for supporting the electrodes so that the supporting means, the electrodes, the maintaining means and the membrane are in operative contact to provide an electrode assembly.

4,994,168

LUBE OIL PRODUCT STRIPPING

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 21, 1988, Ser. No. 260,637
Int. Cl.[5] C10G *71/00*
U.S. Cl. 208—19 19 Claims

11. A process for the preparation of lubricating base stock oil of improved viscosity index from waxy crude oil, comprising:

(a) distilling said waxy crude oil to provide a raw lube oil stock with a boiling range between about 400° to 1065° F.;

(b) solvent extracting the raw lube oil stock to produce a raffinate of reduced aromatic hydrocarbon content;

(c) catalytically dewaxing the raffinate under dewaxing conditions in contact with a dewaxing catalyst comprising an aluminosilicate zeolite having a silica/alumina ratio of at least about 12 and a Constraint Index of about 1 to 12, to convert wax contained in the raffinate to hydrocarbons boiling below the lube boiling range;

(d) hydrotreating the dewaxed raffinate in contact with a hydrotreating catalyst and hydrogen;

(e) separating the hydrotreated, dewaxed raffinate to form a naphtha fraction and a heavier fraction;

(f) passing the heavier fraction to a vacuum steam stripping vessel and stripping it to form a lube fraction and kerosene fraction containing a heavy kerosene component and a light kerosene component;

(g) steam stripping the kerosene fraction in a fractionator under a higher pressure than the stripping step to form a light kerosene fraction and a heavy kerosene fraction;

(h) returning at least some of the heavy kerosene fraction to the vacuum steam stripping vessel whereby a portion of the returned heavy kerosene fraction is incorporated into the lube fraction withdrawn from the vacuum steam stripping vessel.

4,994,169

OIL RECOVERY PROCESS AND APPARATUS FOR OIL REFINERY WASTE

Rino L. Godino, Livingston, and John D. Elliott, Jr., Randolph, both of N.J., assignors to Foster Wheeler USA Corporation, Clinton, N.J.

Filed Nov. 23, 1988, Ser. No. 275,259
Int. Cl.[5] C01B *55/00*
U.S. Cl. 208—50 23 Claims



1. A process for recovery of oil from oily waste having high water content, a heavy hydrocarbon portion and inert solids, comprising:

mixing the waste with fluidizing oil to form a mixture;

evaporating the water from the mixture to dewater the mixture; and

feeding the dewatered mixture to a delayed coking process, including directing the dewatered mixture into a coke drum containing conventional coke feedstock and subjecting the dewatered mixture in the coke drum to coking conditions,

whereby the heavy hydrocarbon portion changes to coke and light hydrocarbon material, the inert solids become trapped in the coke, and the fluidizing oil vaporizes.

4,994,170

MULTI-STAGE WAX HYDROCRACKINIG

John J. Lipinski, Sewell, N.J.; James R. Nye, Elkton, Md., and Milos Soudek, Houston, Tex., assignors to Coastal Eagle Point Oil Company, Houston, Tex.

Filed Dec. 8, 1988, Ser. No. 282,172
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] C10G *65/10*
U.S. Cl. 208—59 17 Claims

1. In a process for the shape selective catalytic dewaxing of a wax containing feed selected from the group consisting of at least one of atmospheric gas oil and vacuum gas oil by passing the feed with about 1000 to 5000 standard cubic feet per barrel of hydrogen over a dewaxing catalyst comprising a shape selective zeolite to produce a dewaxed product and wherein the hydrogen is added to retard catalyst aging, the improvement comprising conducting the dewaxing reaction in at least two stages, with a first stage containing at least 20 wt. % of the dewaxing catalyst and in at least one second stage containing at least 20 wt. % of the dewaxing catalyst and adding at least a portion of the hydrogen downstream of the first stage reactor wherein the total hydrogen to the second stage is greater than the total hydrogen to the first stage.

4,994,171

PROCESS FOR THE MANUFACTURE—GAS OILS

Henricus J. A. Van Helden; Niels Fabricius, and Woutherus M. M. Dekkers, all of The Hague, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Continuation of Ser. No. 123,513, Nov. 20, 1987, abandoned. This application Jun. 9, 1989, Ser. No. 364,492
Claims priority, application United Kingdom, Dec. 10, 1986, 8629477
Int. Cl.[5] C10G *35/06*
U.S. Cl. 208—67 27 Claims

1. A process for the manufacture of kerosene and/or gas oil, comprising the steps of:

producing a hydrocarbon feedstock to contain flashed distillate via a catalytic residue conversion process;

catalytically treating the hydrocarbon feedstock in the presence of hydrogen at elevated temperature and pressure; and

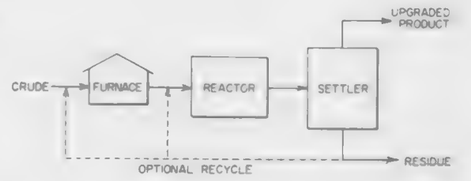
subjecting the material obtained to a distillation treatment.

4,994,172

PIPELINEABLE SYNCRUDE (SYNTHETIC CRUDE) FROM HEAVY OIL

John S. Buchanan, Hamilton Square; Lillian A. Rankel, Princeton, both of N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 30, 1989, Ser. No. 375,068
Int. Cl.[5] C10G *9/00*
U.S. Cl. 208—106 9 Claims



1. In an integrated process for producing a pipelineable and substantially upgraded syncrude from a heavy crude oil characterized by an API gravity of less than 20 wherein 10 to 30 wt% of said crude oil is burned to provide thermal energy to produce said heavy crude oil, the improvement characterized by;

(a) thermally treating in a reactor in the absence of added hydrogen gas at least the 650° F.+ fraction of the heavy crude oil under conditions of outlet temperature, time and reactor outlet pressure such that said oil is subjected to an equivalent residence time (at 800° F.) of 2000 to about 20,000 ERT seconds whereby forming a separable liquid/-liquid mixture of thermal syncrude and asphalt phases, said asphalt phase being characterized by a higher specific gravity than said syncrude phase, and wherein said thermal treatment severity is sufficient to form a liquid asphalt phase equal to 10 to 40 weight percent of said heavy crude oil;

(b) maintaining said mixture of thermal syncrude and asphalt phases in a settler under conditions effective to induce liquid/liquid separation solely by gravity of said syncrude phase and said asphalt phase, said conditions including a temperature of 150 to about 950 F. and a time of 0.05 to about 1.0 hours; and,

(c) recovering said syncrude phase; and,

(d) recovering and burning said asphalt phase whereby providing thermal energy to produce said heavy crude oil.

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4,994,173

METHOD OF ADDING ZSM-5 CONTAINING CATALYST TO FLUID BED CATALYTIC CRACKING UNITS

Conroy D. Anderson, Wenonah; Chou: Tai-Sheng, Sewell, both of N.J.; William E. Cormier, Jr., Ellicott City, Md.; Francis G. Dwyer, West Chester, Pa.; Frederick J. Krambeck, Cherry Hill, N.J.; Gary M. Pasquale, Lansdale, Pa.; Paul H. Schipper, Wilmington, Del., and William A. Stover, Hampstead, N.C., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 187,099, Jun. 28, 1988, Pat. No. 4,927,526, which is a continuation-in-part of Ser. No. 627,991, Jul. 7, 1984, abandoned, and a continuation-in-part of Ser. No. 628,062, Jul. 8, 1984, abandoned, and a continuation-in-part of Ser. No. 675,375, Nov. 27, 1984, abandoned, and a continuation-in-part of Ser. No. 629,922, Jul. 11, 1984, abandoned. This application Jan. 25, 1990, Ser. No. 470,025

Int. Cl.[5] C10G *11/18*

U.S. Cl. 208—152 **4 Claims**

1. A method of adding ZSM-5 catalyst to a fluid catlytic cracking (FCC) unit containing an inventory of equilibrium catalyst comprising:

(a) adding ZSM-5 catalyst to said equilibrium catalyst inventory, wherein the wt % ZSM-5, on a pure ZSM-5 basis, added to the catalyst inventory is equal to 1 to 6 wt % of the equilibrium catalyst and sufficient to increase the research octane number of the FCC gasoline product from 0.5 to 3.0 octane numbers, and wherein said ZSM-5 enhancement effect is attained within a 24-hour period;

(b) adding thereafter, on a daily basis for at least a one-week period, additional ZSM-5 catalyst in gradually reducing increments catalyst sufficient to maintain the desired increase in product octane number, whereby an FCC gasoline fraction with increased product octane is produced as a product of the process.

4,994,174

PROCESS AND SYSTEM FOR LOW-TEMPERATURE CARBONIZATION OF OIL SHALE, OIL SANDS OR SIMILAR OIL-BEARING SOLIDS

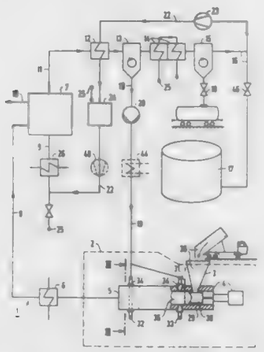
Konrad Künstle, Röttenbach; Gerd Brunner, Roth; Jürgen Hoffmann, Nürnberg, and Till Dehrmann, Forchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 19, 1989, Ser. No. 453,820

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3843063

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—417 **22 Claims**



1. Process for low-temperature carbonization of oil shale, oil sands and similar oil-bearing solids, which comprises:

(1) low-temperature carbonizing oil-bearing solids in a high-pressure fluidized bed reactor in the presence of a substance selected from the group consisting of hydrogen and steam at temperatures substantially between 400° and 600° C. for producing low-temperature carbonization gas;

(2) condensing the low-temperature carbonization gas in at least two stages for producing relatively higher boiling and relatively lower boiling oil fractions;

(3) peripherally mashing the oil-bearing solids with the higher boiling oil fraction of the low-temperature carbonization gas, before introducing the oil-bearing solids into the high-pressure fluidized bed reactor; and

(4) returning the oil-bearing solids mashed with the higher boiling oil fraction to the high-pressure fluidized bed reactor.

4,994,175

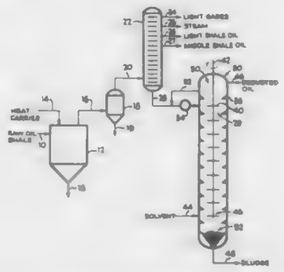
SYNCRUDE DEDUSTING EXTRACTION

Jay T. Hargreaves, Elburn, and James L. Taylor, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 14, 1988, Ser. No. 284,181

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—424 **44 Claims**



1. A method for dedusting synthetic oil, said method comprising the steps of:

(a) substantially dissolving a feed comprising a dust-laden synthetic oil selected from the group consisting of shale oil, tar sands oil and tar sands bitumen in a non-polar solvent comprising at least one alkane containing from 4 to 7 carbon atoms and forming aggregates comprising dust material; and

(b) gravitationally separating the dissolved dust-laden synthetic oil into a substantially dedusted stream and a dust-enriched stream comprising aggregates formed in step (a), said aggregates providing acceptable settling and sludge compression rates;

said dissolution and gravitational separation steps being conducted at a temperature and pressure greater than about 150° F. and about ambient pressure and less than about the critical point temperature and pressure of said solvent.

4,994,176

GRAVITY CONCENTRATOR HAVING SECONDARY WASH OF HEAVY FRACTION

Alexandr I. Yakunin, ulitsa Anosova, 47, kv. 20; Boris V. Pilat, I mikroraion, 21a, kv. 63, and Edil K. Galimzhanov, ulitsa Dekarta, 37, kv. 46, all of, Alma-Ata, U.S.S.R.

Filed Apr. 19, 1989, Ser. No. 340,896

Claims priority, application U.S.S.R., Apr. 21, 1988, 4430896

Int. Cl.[5] B03B *5/66*

U.S. Cl. 209—157 **8 Claims**

1. A concentrator comprising:

An inclined elongated hollow casing for receiving a material to be handled having a longitudinal axis and comprising an interior space and a bottom region;

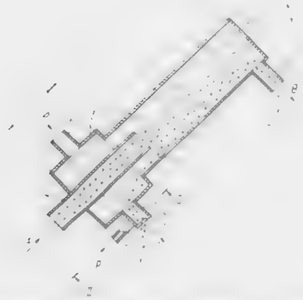
at least a first pipe and a second pipe for supplying a separating fluid to the casing;

a pipe for supplying the material to be handled into said casing;

a pipe having a distal end zone for discharging a heavy fraction of the material to be handled from the casing;

a pipe for discharging the light fraction of the material to be handled from the casing;

a discharge chamber having an interior space in flow communication with the interior space of the casing in said bottom region thereof and being coaxial with the longitudinal axis of the casing, said chamber adapted to create a gradient of velocities between the flows of the separating fluid and the material to be handled in said chamber and in said casing and in the presence of a surplus of the separating fluid to thereby enhance the washing of the heavy fraction of the material to be handled;



said discharge chamber having said pipe for supplying the material to be handled extending coaxially with the longitudinal axis of the casing, and said pipe for discharging the heavy fraction and the first pipe for supplying the separating fluid;

said second pipe for supplying the separating fluid connected to said pipe for discharging the heavy fraction of the material to be handled in said distal end zone of said pipe for discharging the heavy fraction, said second pipe adapted to wash the heavy fraction in a confined space to increase the degree of concentration of the particles of the heavy fraction of the material to be handled.

4,994,177

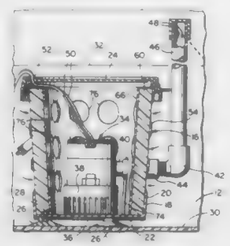
BAIT WELL WATER SPRAY AERATOR WITH VAST FILTERING CAPACITY

Earl M. Bogar, Jr., 6 Broad Oaks La., Houston, Tex. 77056

Filed Jul. 14, 1989, Ser. No. 379,620

Int. Cl.[5] A01K *63/02*

U.S. Cl. 210—167 **15 Claims**



1. A water aerator for a water containing reservoir, said aerator including a hollow open top container for disposition within a reservoir at least partially filled with water, said container including exterior wall means having a plurality of inlet openings formed therethrough for admitting water from said reservoir into said container and of a first total predetermined effective water flow cross-sectional area, a unitary electric drive motor and water pump assembly freely removably received within said container and including restricted cross sectional area water inlet means and a water outlet, said water inlet means having a second total predetermined effective water flow cross-sectional area, said first cross-sectional area being at least several times as great as said second cross-sectional area, said container exterior wall means including water filtering media removably supported therefrom and operatively associated therewith for filtering water passing through said inlet openings from said reservoir exteriorly of said container into the latter, said filtering media being supported from said exterior wall means for removal of said filtering media from said container independent of removal of said unitary electric drive motor and water pump assembly from said container, said unitary electric drive motor and water pump assembly being entirely received within said container in freely spaced relation relative to said exterior wall means and said water filtering media, said water outlet having the inlet end portion of discharge conduit means operatively associated therewith for receiving water from said water outlet and said discharge conduit means including an outlet end portion disposed exteriorly of said container and at an elevation higher than said inlet openings equipped with water spray discharge means for spray discharge of water therefrom onto the surface of the water in said reservoir exteriorly of said container.

4,994,178

HEAVIER-THAN-WATER POOL CLEANING DEVICE

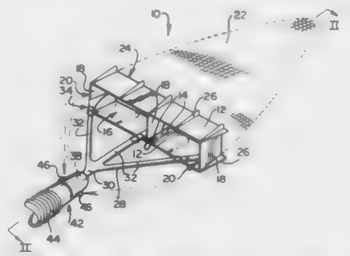
David A. Brooks, Roodepoort, South Africa, assignor to Oakleigh Limited, Guernsey, Channel Islands

Filed Feb. 22, 1989, Ser. No. 314,410

Claims priority, application South Africa, Feb. 18, 1988, 88/1142

Int. Cl.[5] B01D *21/04*

U.S. Cl. 210—169 **21 Claims**



1. A heavier-than-water cleaning device for connection to a flexible hose to be drawn in submerged condition through the water in a swimming pool, said cleaning device comprising:

a draw element having a leading end for connection to the flexible hose and a relatively wide trailing end;

a wing assembly including a pair of elongated, wing-like members, bridge members supporting the wing-like members in spaced, generally parallel condition, said wing-like members having leading edges adjacent said trailing end of said draw element, and means for securing a debris collecting bag with an open mouth to said wing-like members with the mouth opening forwardly between said wing-like members to collect debris;

hinge means connecting said trailing end of said draw element to said wing assembly adjacent said leading edges to permit downward tilting of the leading edges of the wing-like members relative to the draw element and the bag;

said wing assembly and said draw member having a center of gravity that is positioned closer to said leading edges than to the trailing edges of said wing-like members to cause the wing assembly to tilt said leading edges downwardly when sinking in the water, whereby the assembly will automatically assume an inclined condition and also will

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develop a downward hydrodynamic force when the device is drawn through the water;

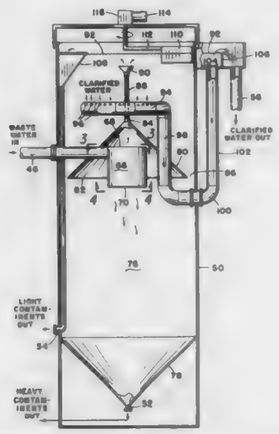
and longitudinally spaced triangular fins projecting outwardly from each of said wing-like members on opposite sides of the wing assembly and forming skids for engaging the floor of the pool, said fins having outer edges that are inclined away from the wing-like elements from the leading edges toward the trailing edges thereof to maintain the inclined condition of the wing assembly while the fins are in engagement with the floor of the pool.

4,994,179

APPARATUS AND PROCESS TO SEPARATE AND REMOVE EXTRANEOUS MATTER FROM A LIQUID STREAM

Kathy L. Keeter, 6016 E. 55th St., Tulsa, Okla. 74135, and Thomas L. Keeter, Tulsa, Okla., assignors to Kathy L. Keeter, Tulsa, Okla.

Filed Oct. 23, 1989, Ser. No. 425,761
Int. Cl.[5] C02F *9/00*
U.S. Cl. 210—195.1 26 Claims



1. A separator for removing floatable and non-floatable scum and sludge-like contaminents from fluent material comprising,

a vessel;

an influent conduit to said vessel;

means to maintain said vessel substantially filled with said fluent material to a given normal level therein;

a hydrocyclone cylinder centrally positioned with said vessel, outward to inward spiral passageway means within said cylinder, means to tangentially connect said influent conduit with said outward part of said spiral passageway, said cylinder having a top cover and a bottom cover, a central opening in said top cover and a central opening in said bottom cover;

conduit means to receive and remove substantially clarified effluent material from said vessel, said conduit means to receive and remove said effluent being positioned in the lower portion of said vessel;

means below said conduit means to remove said non-floatable contaminents from said vessel;

means above said conduit means to upwardly spray a recycled and aerated portion of said clarified effluent;

a receiving chamber in said vessel and an outlet conduit therefrom for removing said floatable contaminents, said receiving chamber open at its top, said top of said receiving chamber positioned adjacent said normal level of said fluent material, an upwardly sloped ramp, the bottom edge of which extends below said normal level to a forward edge of the top of said receiving chamber, and a downwardly sloped ramp means from the rearward top edge of said receiving chamber;

a skimmer blade having forward side and a trailing side, a float pivotally attached to said trailing side;

a skimmer arm rotatable about a central axis, means to pivotally attach said skimmer blade to said skimmer arm; and

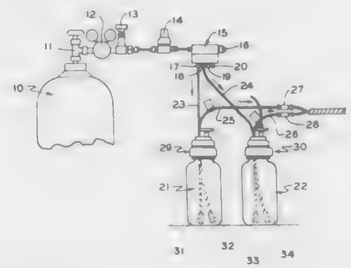
means to rotate said arm.

4,994,180

SOLVENT HANDLING SYSTEM

Carl W. Sims, St. Paul, and Louis R. Hudoba, Fridley, both of Minn., assignors to Systec, Inc., Minneapolis, Minn.

Filed Feb. 1, 1990, Ser. No. 473,840
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 10 Claims



1. A solvent handling system for use with a liquid chromatograph comprising:

a source of pressurized gas;

means for regulating the pressures of the gas delivered from said source;

a plurality of sealable, pressurizable solvent vessels, each of said solvent vessels having a sealing means, a gas inlet port, vent port and an outlet port;

manifold means for simultaneously communicating said pressurized gas from said source to each of said solvent vessels, said manifold means having an inlet passage in communication with said source of said pressurized gas, a plurality of outlet passages each in corresponding communication with a gas inlet port of one of said solvent vessels, and a common chamber connecting said inlet and said plurality of outlets;

hollow inlet conduit means connecting the gas inlet port of each said solvent vessels with a corresponding outlet passage in said manifold, said hollow conduit means being of a length sufficient to extend a distance beneath the surface of the operable solvent level associated with each said solvent vessel;

hollow outlet conduit means to convey solvent from each of said solvent vessels to a point of use for said solvent;

check valve means between said common chamber and each said solvent vessel for preventing flow from each of said solvent vessels into said manifold; and

backflow prevention means associated with each solvent vessel for preventing backflow of solvent from that vessel through the corresponding hollow inlet conduit means when gas is not being delivered from the source.

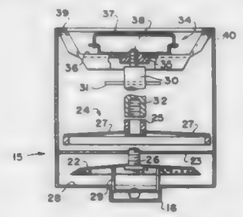
4,994,181

FRYER OIL FILTERING SYSTEM WITH CLAMPING FRAME AND THRUST APPLYING MEANS

Alfred E. Mullaney, Jr., Baltimore, Md., assignor to Vulcan-Hart Corporation, Louisville, Ky.

Filed Sep. 5, 1989, Ser. No. 402,330
Int. Cl.[5] B01D *35/30*
U.S. Cl. 210—232 4 Claims

1. An oil filtering system for a vessel in which a filtering sheet separates the vessel between an upper used-oil receiving portion and a bottom area including a collecting sump which receives filtered oil by flow through the sheet, said sheet having an outer peripheral edge area, a clamping frame adapted to engage the sheet inwardly of the outer peripheral edge area of the sheet and to apply pressure on the edge area against the vessel bottom, abutment means contacting and extending inwardly of the upper edge of the vessel, and thrust applying



means for applying downward thrust between the abutment means and the clamping frame to seal the bottom area from the receiving portion, said thrust applying means comprising a bracket, a rotatable handle and a nut threaded onto a vertical post connected to the clamping frame, whereby rotation of the handle on a vertical axis raises the bracket into engagement with the abutment means and applies downward thrust to the clamping frame such that the sole passage of oil to the sump is through said sheet.

4,994,182

APPARATUS FOR THE THICKENING BY FLOATATION OF SLURRIES PRODUCED DURING THE TREATMENT OF WATERS

Jean-Jacques Noiron, Franconville, and Gérard Rondeau, Bougival, both of France, assignors to Degremont, Rueil Malmaison, France

Filed Jun. 7, 1989, Ser. No. 362,656
Claims priority, application France, Jun. 30, 1988, 88 08852
Int. Cl.[5] B01D *21/06*
U.S. Cl. 210—241 10 Claims



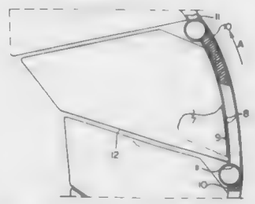
1. An apparatus for thickening by flotation sludge contained in a liquid produced during residual water treatment, which comprises: a basin in a circular form into which are introduced the sludge to be thickened and pressurized water for floating the sludge, the basin having a scraping system, including arms and a centrally located driving member for moving said arms in a rotating motion, said arms being attached to this central apparatus, and having means for isolating the external environment from atmosphere of the apparatus, said means consisting of a cover supported by the arms of the scraping system, means for sealing the center of the basin including a bell dipping into the basin and surrounding said driving member, and means for sealing the periphery of the basin.

4,994,183

ROTATING FILTER WITH OUTER FILTRATE CONDUITS

Bjarne Nilsson, Lanterngatan 9, S-462 00, Vänersborg, Sweden

PCT No. PCT/SE88/00349, § 371 Date Feb. 24, 1989, § 102(e) Date Feb. 24, 1989, PCT Pub. No. WO88/10144, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 22, 1988, Ser. No. 319,235
Claims priority, application Sweden, Jun. 24, 1987, 8702620
Int. Cl.[5] B01D *33/26*
U.S. Cl. 210—247 7 Claims



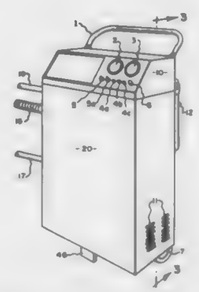
1. A disk filter including a plurality of rotatable, axially spaced annular filter disks (3) adapted to be partially immersed in a fluid to be filtered, each of said filter disks comprising a plurality of filter sections (4) carried by an annular disk holder (1) having an inner periphery mounting said filter sections, and each filter section including spaced filtering means (7), wherein said annular disk holder includes an annular channel having a radially inwardly directed opening (9), each of said filter sections being mounted to said annular disk holder such that spaces between said filtering means are in fluid communication with said channel through said opening (9), said channel being in fluid communication from above with an axially directed filtrate discharge conduit (2) in rotational positions of said filter disk when said filter section rised above a surface of said fluid upon rotation of said filter disk.

4,994,184

ULTRAFILTRATION DEVICE AND PROCESS

William H. Thalmann, E. Amherst, and Thomas W. Siegler, Kenmore, both of N.Y., assignors to Infinitex, Clarence, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,030
Int. Cl.[5] B01D *61/18*
U.S. Cl. 210—251 9 Claims



1. The combination comprising an ultrafiltration assembly and an improved fluid pick-up assembly comprising, a hollow, upwardly or downwardly slidably tubular gate, disposed over a hollow tube having fluid inlet voids therein for fluid flow from a reservoir to said hollow tube, said hollow gate being comprised of a material of a density sufficiently less than about the density of a fluid in said reservoir, to cause said gate to slide upwardly or downwardly over said inlet voids in response to a fluid level within said reservoir.

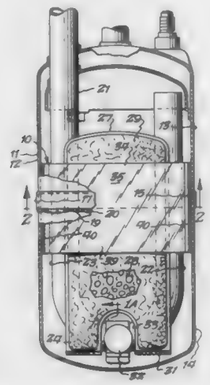
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4,994,185

COMBINED HEAT SHIELDING AND BONDING DEVICE FOR ADSORBENT PACKET IN REFRIGERANT RECEIVER

John S. Cullen, Buffalo, and Samuel A. Incorvia, Tonawanda, both of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Mar. 23, 1989, Ser. No. 328,108
Int. Cl.[5] B01D *15/00, 53/04*
U.S. Cl. 210—282 **16 Claims**



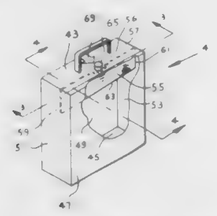
1. In a refrigerant receiver having a housing with a weld thereon and internal conduit structure within said housing and an adsorbent packet within said housing comprising a combined heat shielding and bonding device for shielding said adsorbent packet from heat experienced during fabrication of said weld and for bonding said adsorbent packet to said internal conduit structure comprising sheet metal means having first and second surfaces on opposite sides thereof, said sheet metal means being positioned in a direct line between said adsorbent packet and said weld and having a sufficient expanse to conduct sufficient heat away from said adsorbent packet during fabrication of said weld to prevent damage to said adsorbent packet from said heat, and securing means for securing said sheet metal means to both said adsorbent packet and said integral conduit structure.

4,994,186

CONTAINER FOR SEPARATING LIQUIDS

Bobby J. Hays, 3201½ Cooper Ct., Glenwood Springs, Colo. 81601-4811

Filed Aug. 10, 1988, Ser. No. 230,841
Int. Cl.[5] B01D *23/00*
U.S. Cl. 210—464 **4 Claims**



1. Container for holding a liquid combination of a liquid contaminant component, and a major liquid component that is immiscible with said contaminant component and less dense than said contaminant component, and for separating said liquid components, said container comprising:

(a) top wall, bottom and at least one vertically extending side wall;

(b) downwardly extending internal divider wall having a top edge that forms a liquid impervious joint with said top wall, and having first and second side edges that form liquid impervious joints with said at least one side wall, and a bottom edge that lies at a predetermined distance below said container top wall; and said top wall having an opening for passing liquids located adjacent the upper edge of said divider wall on one side of said divider wall, and the other side of said divider wall and adjacent portions of said container top and side wall defining a trapping chamber for said contaminant liquid component, and wherein said container has

a generally rectangular front wall and opposed back wall, and generally rectangular first and second spaced-apart side walls, and wherein

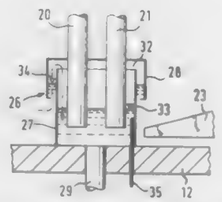
said divider wall is generally parallel to said container front wall.

4,994,187

APPARATUS FOR REMOVING SEWAGE SLUDGE FROM THE BOTTOM OR THE SURFACE IN A SETTLING BASIN

Bernd Glaser, Hamburg, and Uwe Kloth, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Richard Totzke Maschinen-und Apparatebaue GMBH, Neumunster, Fed. Rep. of Germany

Filed Aug. 16, 1989, Ser. No. 394,489
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827914; Oct. 13, 1988, 3834891; Nov. 3, 1988, 3837284
Int. Cl.[5] B01D *21/24*
U.S. Cl. 210—519 **13 Claims**



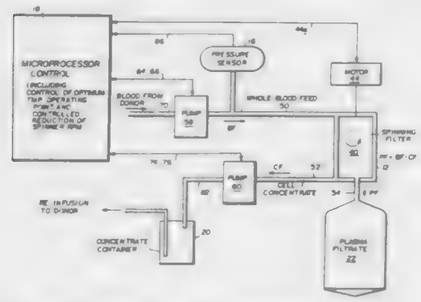
1. An apparatus for removing sewage sludge deposited on the bottom in a circular settling basin, comprising a support structure rotatable about a central vertical axis and rotatably driven by driving means, a sludge removing line extending below the settling basin and introduced into said settling basin in the central area thereof, said sludge line removing said sludge outside of said settling basin, and removing means attached to said support structure, said removing means feeding said sewage sludge into the entrance end of said sludge line, said removing means including at least one pipe or the like attached to said support structure so that it rotates together with said support structure, said pipe being connected to said sludge line below the liquid level within said basin through a rotary connection means allowing a relative rotating movement, said rotary connection means including a pot open from above and centrally located in the basin, one end of said pipe extending into said pot, a lid having a downwardly depending margin being located above said pot, said pipe end being extended through the upper portion of said lid and sealingly and fixedly attached thereto, said lid being substantially without engagement with said pot, and an air cushion being provided in the space between said lid and said pot.

4,994,188

ADAPTIVE FILTRATE FLOW CONTROL SYSTEM USING CONTROLLED REDUCTION IN FILTER EFFICIENCY

Paul R. Prince, Fountain Valley, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Feb. 5, 1988, Ser. No. 152,523
Int. Cl.[5] B01D *61/22*
U.S. Cl. 210—636 **21 Claims**



13. A fluid filtering method comprising:

passing input fluid through a rotating fluid filter having controllable rate of rotation, separating a filtrate flow from said input fluid flow via said filter and providing a concentrate output fluid flow; and

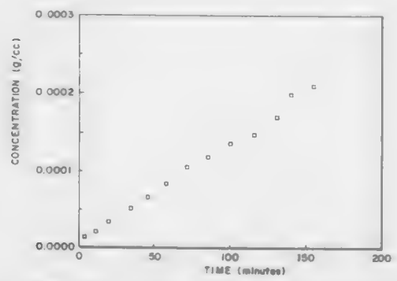
controllably decreasing the rotational rate of the filter sufficiently to prevent excessive concentration of the concentrate output.

4,994,189

SEPARATION DEVICE UTILIZING OSCILLATORY LIQUID MEMBRANE

David T. Leighton, 60049 Cedar Rd., Mishawaka, Ind. 46544, and Mark J. McCready, 54155 E. Lake Dr., South Bend, Ind. 46635

Filed Sep. 30, 1988, Ser. No. 252,575
Int. Cl.[5] B01D *61/38*
U.S. Cl. 210—637 **12 Claims**



12. A method for separation of a selected solute species from other solute species comprising the steps of:

forming a supported liquid membrane in fluid contact with and separating a first fluid and a second fluid, said supported liquid membrane comprising a porous support and a liquid substantially immiscible with said first and second fluids;

establishing a concentration gradient for the solute species between the first fluid and the second fluid;

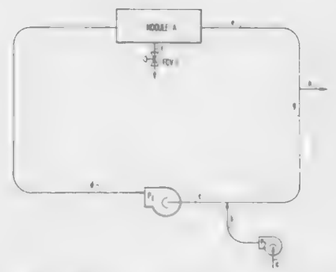
inducing a liquid oscillation in the supported liquid membrane, said oscillation frequency being selected to enhance the rate of transport of the selected molecular species through the supported liquid membrane and into the second fluid relative to the rate of transport of the solute species in the first fluid.

4,994,190

SERIAL CROSSFLOW FILTRATION ASSEMBLY

Stephen A. Uban, Stillwater, Minn., assignor to CPC Engineering Corporation, Sturbridge, Mass.

Filed Jan. 30, 1990, Ser. No. 478,149
Int. Cl.[5] B01D *61/14, 61/18*
U.S. Cl. 210—650 **16 Claims**



1. A crossflow filtration assembly, comprising:

a plurality of crossflow filtration means for separating an influent solution into a first effluent solution including a first plurality of particulate components having a given physical size and a second effluent solution including a second plurality of particulate components having a physical size smaller than said first particulate components, each of the crossflow filtration means including an inlet, a first outlet discharging said first effluent solution, and a second outlet discharging said second effluent solution, the plurality of crossflow filtration means connected in a series configuration wherein each inlet is connected to the preceding first outlet;

means for continuously introducing additional influent solution into the series-connected crossflow filtration means at each said inlet to mix with the first effluent solution discharged from the preceding first outlet and dilute a concentration of said first plurality of particulate components in said first effluent solution; and

means for continuously circulating the mixed influent solution and diluted first effluent solution through the series-connected crossflow filtration means.

16. A method of filtering an influent solution into a first effluent solution including a first plurality of particulate components having a given physical size and a second effluent solution including a second plurality of particulate components having a physical size smaller than the first particulate components, comprising the steps of:

flowing the influent solution into the inlets of a plurality of series-connected crossflow filtration modules;

flowing the first effluent solution along the surface of a filtration membrane in each crossflow filtration module;

flowing the second effluent solution through the filtration membrane in each crossflow filtration module;

flowing the first effluent solution out of a first outlet in each crossflow filtration module, mixing and diluting said first effluent solution with additional influent solution, and flowing the mixed additional influent solution and diluted first effluent solution into the inlet of a succeeding series-connected crossflow filtration module; and

discharging the second effluent solution from a second outlet in each crossflow filtration module.

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4,994,191

REMOVAL OF HEAVY METALS, ESPECIALLY LEAD, FROM AQUEOUS SYSTEMS CONTAINING COMPETING IONS UTILIZING WIDE-PORED MOLECULAR SIEVES OF THE ETS-10 TYPE

Steven M. Kuznicki, and Kathleen A. Thrush, both of Easton, Pa., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 416,613, Oct. 10, 1989, abandoned. This application May 25, 1990, Ser. No. 529,087
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—688 10 Claims

1. A process for the removal of heavy metals from aqueous solutions thereof containing one or more of said heavy metals as well as competing ions including calcium and/or magnesium which comprises contacting said aqueous solution with a crystalline molecular sieve having the X-ray diffraction pattern of either ETS-10 or ETAS-10, until such heavy metals are substantially removed from said aqueous solution.

4,994,192

AMINE POLYMERS AS COAGULATOR ACCELERATORS IN BLOOD PHASE SEPARATION

Alan F. Corin; Richard L. Columbus, and Deborah P. Freyler, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,835
Int. Cl.[5] B01D *21/26*
U.S. Cl. 210—782 10 Claims

1. Apparatus for separating and maintaining separated in a centrifuge, red cells from other constituents of whole blood, comprising

a compartment constructed to receive whole blood for phase separation,

and within said compartment, an effective amount of a coagulator accelerator agent for preventing said red cells from becoming resuspended when the compartment's contents are agitated, said agent

having properties enabling lysing-free coagulation of blood cells and being effective when consisting essentially of a positively charged polymer, at neutral pH, that is either a polymerized amino acid having a weight average molecular weight of between about 35 k Daltons and about 500 k Daltons, determined by the LALLS light scattering technique, or a vinyl addition amine polymer having a PVP-eq. Mw of between about 40 PVP-eq. k Daltons and 6000 PVP-eq. k Daltons wherein the amine is a primary, secondary, tertiary or quaternary amine pendant from the polymer backbone and having a structure that is effective to coagulate without causing lysing of red blood cells.

4,994,193

LIQUID FABRIC SOFTENER

Errol H. Wahl, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 284,960, Dec. 15, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 404,991
Int. Cl.[5] D06M *13/46*
U.S. Cl. 252—8.8 14 Claims

1. A fabric softening composition in the form of an aqueous dispersion comprising from about 3% to about 35% by weight of fabric softener and from about 1 ppm to about 1,000 ppm of a colorant system which comprises dye selected from the group consisting of C.I. Acid Blue #254; Direct Blue #199; C.I. Reactive Red #147; and mixtures thereof, said dye being predominately outside of the dispersed softener phase of the composition and the electrolyte level is less than about 2,500 ppm.

4,994,194

ALTERING HIGH TEMPERATURE SUBTERRANEAN FORMATION PERMEABILITY

Ahmad Moradi-Araghi, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 329,862, Mar. 29, 1989, Pat. No. 4,934,456. This application Apr. 30, 1990, Ser. No. 516,197
Int. Cl.[5] C09K *7/00*
U.S. Cl. 252—8.551 14 Claims

1. A delayed acrylamide containing polymer crosslinker having stability in an aqueous solution at high temperatures comprised of the combination of an aldehyde and a salicylic acid derivative selected from salicylamide and acetylsalicylic acid.

4,994,195

INHIBITOR TREATMENT PROGRAM FOR CHLORINE DIOXIDE CORROSION

James G. Edmondson, 305 Prince of Wales, Conroe, Tex. 77304, and E. Paul Holder, 7630 Woodhollow #137, Austin, Tex. 78731

Filed Jun. 21, 1989, Ser. No. 369,162
Int. Cl.[5] C23F *11/10*
U.S. Cl. 252—8.555 5 Claims

1. A composition for treating oilfield waterflood systems to inhibit chlorine dioxide corrosion comprising a non-nitrogen containing phosphonate, a copolymer consisting of repeat units of acrylic acid/allyl hydroxy propyl sulfonate ether and a permanganate having a weight ratio of about 1 to 2 to 1.25, respectively.

4,994,196

TWO-CYCLE ENGINE OIL COMPOSITION

Mineo Kagaya, Fujisawa, and Mitsuaki Ishimaru, Yokohama, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1989, Ser. No. 421,286
Claims priority, application Japan, Oct. 20, 1988, 63-262835
Int. Cl.[5] C10M *141/02*
U.S. Cl. 252—32.5 6 Claims

1. A two cycle engine oil composition comprising:

(I) 100 parts by weight of a base oil composed of (A) 20 to 80% by weight of a copolymer of an α-olefin with an ester of a dicarboxylic acid, said copolymer having a kinematic viscosity of 20 to 50 cSt at 100° C., and (B) 80 to 20% by weight of an ester of pentaerythritol and a fatty acid, said ester having a kinematic viscosity of 4 to 20 cSt at 100° C., and

(II) 0.4 to 6 parts by weight of calcium phenate mixed in the base oil.

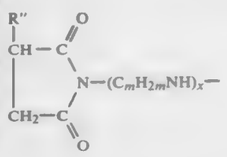
4,994,197

TRIAZOLE COMPOSITIONS AS FUEL AND LUBE ADDITIVES

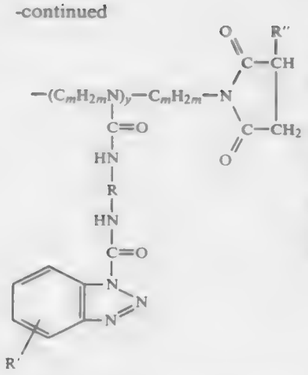
David A. Blain, Mount Laurel, and Angeline B. Cardis, Florence, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1989, Ser. No. 452,073
Int. Cl.[5] C10M *133/44, 135/58;* C10L *1/22*
U.S. Cl. 252—51.5 A 24 Claims

1. A fluid lubricant additive composition containing a compound of the following structure:



-continued



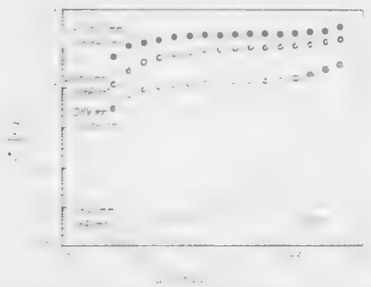
wherein m, x and y are integers x is 0 to 9, y is at least 1 and x+y is from 1 to 10, m is from 2 to 12; and where R is alkylene, arylene, arylalkylene or alkylarylene; R′ is H or C_1 to C_{12} alkyl, aryl, arylalkyl or alkylaryl; and R″ is an alkenyl group containing from 8 to about 10,000 carbon atoms.

4,994,198

ELECTRORHEOLOGICAL FLUIDS BASED ON SILICONE IONOMER PARTICLES

Kyuha Chung, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 29, 1990, Ser. No. 471,587
Int. Cl.[5] H01B *3/20;* C09K *3/00*
U.S. Cl. 252—78.3 17 Claims



1. In an electrorheological fluid comprising a dispersion of a plurality of solid particles in an electrically non-conducting liquid, the improvement comprising using as said solid particles a silicone ionomer reaction product of

(I) an amine functional diorganopolysiloxane having a degree of polymerization of less than about 10,000 wherein at least about 3 mole percent of the silicon atoms have attached thereto, through silicon-carbon bonds, an amine functional organic group bearing at least one -NHR″ group, in which R″ is selected from the group consisting of hydrogen and an alkyl radical having 1 to 6 carbon atoms; and

(II) an acid, the quantity of said acid being at least sufficient to impart a solid character to said silicone ionomer at 25° C.

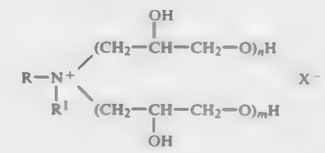
4,994,199

ANTIMICROBIAL COMPOSITION CONTAINING QUATERNARY ALIPHATIC AMINE POLYGLYCIDOL ADDUCTS

Michael Scardera, Hamden, and Frank R. Grosser, Bethany, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 16, 1990, Ser. No. 509,912
Int. Cl.[5] A61K *31/14;* C07C *215/40;* C11D *3/48, 1/62*
U.S. Cl. 252—106 16 Claims

1. A cleaning composition which comprises an aqueous liquid containing a surfactant and an antimicrobial effective concentration of a quarternary aliphatic amine polyglycidol adduct represented by the formula:



wherein R is an alkyl group having from about 8 to about 18 carbon atoms, and mixtures thereof, R^1 is selected from the group consisting of benzyl or an alkyl group having from 1 to about 12 carbon atoms, X is Cl, Br, or I, and n and m are from 1 to about 6, wherein the molar ration of amine glycidol compound to surfactant is from about 10:1 to about 1:10.

4,994,200

PREPARATIONS AND PROCESSES FOR CLEANING AND DISINFECTING ENDOSCOPES

Karlheinz Disch, Haan; Klaus Hachmann, Hilden, and Klaus Bansemir, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 121,492, Nov. 17, 1987, Pat. No. 4,784,790. This application Jul. 26, 1988, Ser. No. 224,506
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1986, 3639322
Int. Cl.[5] C11D *3/48*
U.S. Cl. 252—106 12 Claims

1. An aqueous detergent concentrate comprising: from about 5 to about 10% by weight of at least one low-foam nonionic surfactant which is a polyethylene glycol ether corresponding to the following formula

$$R^1—O—(CH_2CH_2O)_n—R^2 \quad (I)$$

in which

R^1 in a straight-chain or branched-chain C_8–C_{18} alkyl or alkenyl radical,

R^2 is a straight-chain or branched-chain C_4–C_8 alkyl radical and

n is a number of from 7 to 12,

from about 7.7 to about 77 AU/l of at least one proteolytic enzyme,

from about 1 to about 5% by weight of at least one complexing agent,

from about 10 to about 50% by weight of at least one enzyme stabilizer,

from about 1 to about 5% by weight of at least one blending aid, and

from about 0.05 to about 0.5% by weight of at least one preservative; and

wherein the pH value of the concentrate is in the range of pH 4–6.

4,994,201

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE, METHANOL AND CYCLOPENTANE

Leonard M. Stachura, Hamburg; Peter B. Logsdon, Tonawanda; Ellen L. Swan, Ransomville, and Rajat S. Basu, Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 25, 1989, Ser. No. 412,080

Int. Cl.[5] C11D *7/30, 7/50*

U.S. Cl. 252—171 **21 Claims**

1. Azeotrope-like compositions consisting essentially of from about 23 to about 93.7 weight percent 1,1-dichloro-1-fluoroethane, from about 5 to about 70 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2-dichloro-1,2,2-trifluoroethane and a mixture of 1,1-dichloro-2,2,2-trifluoroethane and 1,2-dichloro-1,2,2-trifluoroethane, from about 0.3 to about 3 weight percent cyclopentane and from about 1 to about 4 weight percent methanol which boil at about 29.8° C. at 760 mm Hg.

4,994,202

AZEOTROPIC COMPOSITIONS OF PERFLUORO-1,2-DIMETHYLCYCLOBUTANE WITH 1,1-DICHLORO-1-FLUOROETHANE OR DICHLOROTRIFLUOROETHANE

Abid N. Merchant, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1990, Ser. No. 491,579

Int. Cl.[5] C11D *7/30, 7/50;* **C23G** *5/028;* **C09K** *5/04*

U.S. Cl. 252—172 **16 Claims**

1. An azeotropic composition, consisting essentially of about 50 to 60 weight percent perfluoro-1,2-dimethylcyclobutane and about 40–50 weight percent 1,1-dichloro-1-fluoroethane wherein the composition boils at about 26.7° C. when the pressure is adjusted to substantially atmospheric pressure.

2. An azeotropic composition, consisting essentially of about 23 to 33 weight percent perfluoro-1,2-dimethylcyclobutane and from about 67 to 77 weight percent dichlorotrifluoroethane wherein said dichlorotrifluoroethane is 1,1-dichloro-2,2,2,-trifluoroethane or 1,1-dichloro-2,2,2-trifluomethane which contains 1,2-dichloro-1,2,2-trifluoroethane in an amount up to 5 percent, and wherein the composition boils at about 27.0° C. when the pressure is adjusted to substantially atmospheric pressure.

4,994,203

COMPOSITE MATERIAL WITH LUBRICATING PROPERTIES, PROCESS FOR THEIR MANUFACTURE AND ANTIEROSIVE COMPONENTS FOR A BARREL WEAPON SYSTEM WHICH CONSISTS OF THESE MATERIALS

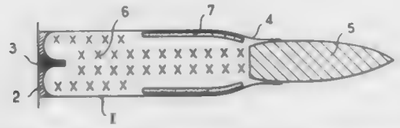
Alain Lefumeux, Orsay, and Serge Raynal, Dravell, both of France, assignors to Societe Nationale Des Poudres Et Explosifs, Paris Cedex, France

Filed Dec. 5, 1988, Ser. No. 280,126

Claims priority, application France, Dec. 18, 1987, 87 17670

Int. Cl.[5] C10M *107/50*

U.S. Cl. 252—12.2 **10 Claims**



1. A process for the manufacture of a composite material with lubricating properties consisting of a solid polymeric matrix containing throughout its mass, a uniform dispersion of liquid silicone oil droplets with lubricating properties, which consists essentially of preparing, in a first step, an emulsion of said liquid silicone oil with lubricating properties in a liquid phase of a monomer wherein said monomer is styrene or methylmethacrylate and said matrix contains polystyrene or polymethyl methacrylate, said liquid silicone oil being insoluble in said monomer, in the presence of a surface-active agent and in a second step polymerizing said emulsion wherein said surface-active agent is a block copolymer containing two-block or three-block repeat units, one repeat unit being compatible with said liquid oil and the other repeat unit being compatible with said monomer, said surface-active agent having a number-average molecular mass of between 500 and 500,000 and isolating said composite material of particle size between 5 and 45 microns.

4,994,204

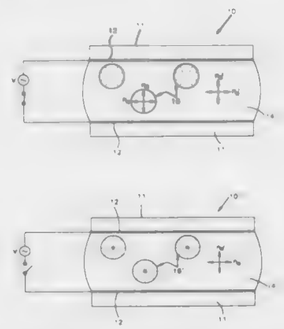
LIGHT MODULATING MATERIALS COMPRISING A LIQUID CRYSTAL PHASE DISPERSED IN A BIREFRINGENT POLYMERIC PHASE

Joseph W. Doane, Kent, and John L. West, Munroe Falls, both of Ohio, assignors to Kent State University, Kent, Ohio

Continuation-in-part of Ser. No. 267,232, Nov. 4, 1988, which is a continuation-in-part of Ser. No. 180,215, Apr. 11, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 324,051

Int. Cl.[5] C09K *19/52*

U.S. Cl. 252—299.01 **17 Claims**



1. A light modulating liquid crystal material comprising a liquid crystal phase interspersed with a birefringent, light transmissive polymer, the effective indices of refraction of the liquid crystal phase and the polymer being matched for all directions of incident light so that the material is transparent and haze-free in one of a field-ON state or a field-OFF state, and the effective indices of refraction are mismatched for all directions of incident light so that the material is opaque in the other of the field-ON state or field-OFF state.

4,994,205

COMPOSITION CONTAINING A HAFNIA PHOSPHOR OF ENHANCED LUMINESCENCE

Philip S. Bryan, Webster; Patrick M. Lambert, Rochester; Christine M. Towers, Rochester, and Gregory S. Jarrold, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 305,222, Feb. 3, 1989. This application Jun. 29, 1990, Ser. No. 546,207

Int. Cl.[5] C09K *11/67*

U.S. Cl. 252—301.4 F **14 Claims**

1. A composition containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation which is comprised of monoclinic crystals of a hafnium dioxide phosphor host consisting essentially of oxygen and elements satisfying the relationship

$$Hf_{1-z}Zr_zM_y$$

wherein

M represents at least one alkali metal;

y is in the range of from 6×10^{-4} to 1.0; and

z is in the range of from 4×10^{-4} to 0.3. said phosphor exhibiting a higher luminescence intensity when excited by X-radiation as compared to the phosphor as described above absent M.

12. A composition containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation which is comprised of monoclinic crystals of a hafnium dioxide phosphor host consisting essentially of oxygen and elements satisfying the relationship

$$Hf_{1-z}Zr_zM_yTi_x$$

wherein

M represents alkali metal ions;

x is in the range of from 3×10^{-4} to 0.5;

y is in the range of from 6×10^{-4} to 0.2; and

z is in the range of from 4×10^{-4} to 0.3.

4,994,206

PROCESS FOR THE PRODUCTION OF A NEUTRON ABSORBING PELLET, THE PELLET OBTAINED AND THE USE THEREOF

Jean Boutin, Saint Martin d'Heres; Airy-Pierre Lamaze, Grenoble, both of France, and Gunnar Vesterlund, Västerås, Sweden, assignors to Compagnie Europeenne du Zirconium Cezus, Courbevoie, France and Asea Brown Boveri, Västerås, Sweden

Filed Sep. 14, 1989, Ser. No. 407,284

Claims priority, application France, Sep. 15, 1988, 88 12550

Int. Cl.[5] C04B *35/68*

U.S. Cl. 252—478 **19 Claims**

1. Process for the production of a neutron absorbing pellet for use in a nuclear control device, comprising the steps of:

(a) forming a compactable product consisting essentially of, by weight,

about 40–100% of a component containing about 20–100% of electrolytic crystals or chips of Hf and the remainder B_4C; and

about 0–60% of other metallic elements melting at above 400° C.;

said compactable product containing at least about 20% by weight electrolytic Hf crystals;

(b) mixing and compressing said compactable product in a mold in at least one filling and compressing operation, to obtain a pellet with an apparent density greater than 80% of its average density in the solid state;

(c) optionally, sintering said pellet;

(d) removing said pellet from the mold; and

(e) optionally grinding the removed pellet.

4,994,207

THERMOPLASTIC FILM DIE ATTACH ADHESIVES

Robert Edelman, Staten Island, N.Y., and Victor D. Papanu, Flemington, N.J., assignors to National Starch and Chemcial Investment Holding Corporation, Wilmington, Del.

Filed Mar. 9, 1989, Ser. No. 321,472

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—514 **10 Claims**

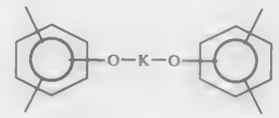
1. Electrically conductive adhesive film comprising a mixture of:

(A) a normally solid thermoplastic polyimide polymeric binder having a weight average molecular weight of about 100,000 to about 150,000 synthesized from:

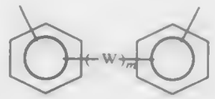
(1) a dianhydride having the structure:



wherein A is a tetravalent residue of benzene, benzophenone, or an aromatic dietherdianhydride having the formula:



where K is a substituted or unsubstituted group of the formula:

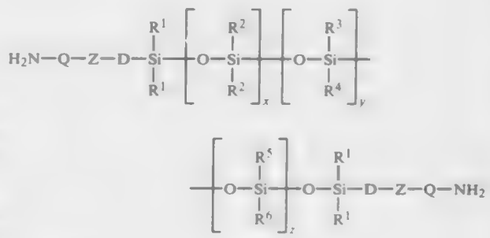


where W is —O—, —S—, —SO_2, linear or branched alkylene or alkenylene having 1 to 8 carbons or —(R)C(-L)—where R and L can be the same or different lower alkyls having 1 to 8 carbons or aryl groups having 6 to 24 carbon atoms and m is 0 or 1;

(2) a meta disubstituted benzene diamine having the structure:

wherein Y is a divalent unsubstituted meta-phenylene radical or a meta-phenylene radical substutited with at least one lower alkyl group containing 1 to about 8 carbon atoms and T is selected from the group consisting of —O—, —S—, —SO—, —SO_2—, —CO— and lower alkylene having 1 to about 8 carbon atoms; and

(3) a polysiloxanediamine having the structure:



wherein

Q is arylene,

Z is a divalent oxygen, sulfide, sulfone, sulfoxide or carboxylic ester or amide group,

D is a hydrocarbylene group,

R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different alkyls having 1 to 8 carbons, and

x, y and z are integers having values of 0 to 100; and

(B) sufficient flake to provide a conducting medium, with the proviso that about 20 to about 50 mole percent of the total diamine content is a diamine having the structure of (2)

4,994,208

PHOTOCHROMIC POLYMERIC ARTICLE

Douglas S. McBain, Norton, and John C. Crano, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 18, 1989, Ser. No. 339,850

Int. Cl.[5] G02B *5/23;* **C08J** *55/00;* **C08F** *12/28;* **G03C** *1/727*

U.S. Cl. 252—586 **26 Claims**

1. In a photochromic article comprising the polymerizate of a polyol(allyl carbonate) composition and a photochromic amount of organic photochromic substance, the improvement wherein the polyol(allyl carbonate) composition comprises a homogeneous copolymerizable mixture of:

(a) from about 55 to about 90 weight percent of polyol(allyl carbonate),

(b) from about 10 to about 40 weight percent of aliphatic polyurethan having ethylenic unsaturation at its terminal ends, and

(c) from about 1 to about 4 weight percent of a difunctional monomer selected from the group consisting of allyl methacrylate and allyl acrylate.

4,994,209

NONLINEAR OPTICAL MATERIAL

Masaki Okazaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

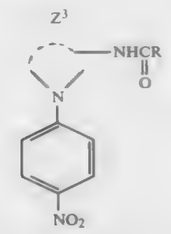
Filed Aug. 22, 1988, Ser. No. 235,405

Claims priority, application Japan, Aug. 21, 1987, 62-207842

Int. Cl.[5] F21V *9/04;* **G02B** *6/10*

U.S. Cl. 252—587 **5 Claims**

1. An organic nonlinear optical material which is an optically transparent solid solution comprising (a) an organic compound component exhibiting nonlinear optical response represented by formula (II):



(II)

wherein Z^3 represents an atomic group, which together with the adjacent nitrogen atom, forms a pyrrole, imidazole, pyrazole, triazole or tetrazole ring which ring may be substituted by one or more substituents selected from the group consisting of an alkyl group, a halogen atom, an alkoxy group and an acylamino group having the formula



wherein R and R' each represent a branched chain alkyl group having at least 3 carbon atoms or an alkyl group substituted with a substituted or unsubstituted phenyloxy group, and (b) a polymer component selected from the group consisting of polymethacrylate, polyacrylate, polyacrylamide, epoxy polymers, polystyrene and polycarbonate.

4,994,210

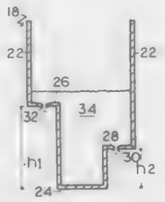
HIGH EFFICIENCY DISTRIBUTOR FOR GAS-LIQUID CONTACT COLUMN AND METHOD OF PREPARATION AND USE

Bernardo Y. Lucero, Hudson, and Gregory A. Carle, Akron, both of Ohio, assignors to Koch Engineering Company, Inc., Wichita, Kans.

Filed Mar. 1, 1990, Ser. No. 487,191

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—97 **28 Claims**



1. A high efficiency trough distributor for use in a gas-liquid contact column to distribute a downwardly flowing liquid generally uniformly across a cross sectional area of the contact column and to permit the passage of an upwardly flowing gas, which trough distributor comprises:

generally upright side walls to define a trough to contain liquid to be distributed, the trough having an upper section and a lower sump section with a bottom surface, the trough having first and second stair steps therein the stair steps are at different height levels from the bottom surface of the sump section, the stair steps having a plurality of holes therein to permit the downward flow of liquid from the trough, the number, position and size of said holes selected to control the turndown of the gas-liquid column.

4,994,211

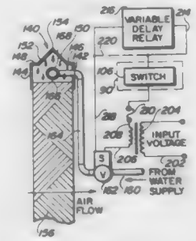
WATER DISTRIBUTION APPARATUS FOR EVAPORATIVE COOLING SYSTEM

Joe W. Fuller, 6921 W. Fullam, Peoria, Ariz. 85345

Filed Sep. 5, 1989, Ser. No. 402,474

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—97 **18 Claims**



1. Water distribution apparatus for an evaporative cooling system having an evaporative cooling medium and a water supply system for providing a flow of water to the medium, comprising, in combination:

frame means for supporting the evaporative cooling medium and for receiving water draining from the medium;

trough means for receiving water drained from the medium from the frame means; and

control means responsive to the water in the trough means for controlling the flow of water in the water supply system to the medium, including

a float responsive to the amount of water in the trough means,

a solenoid controlled valve for controlling the flow of water,

a switch responsive to the float for controlling the solenoid controlled valve, and

a variable delay relay in series with the switch for providing a variable, predetermined time delay after the switch has responded to the float for providing a flow of water to the evaporative cooling medium.

4,994,212

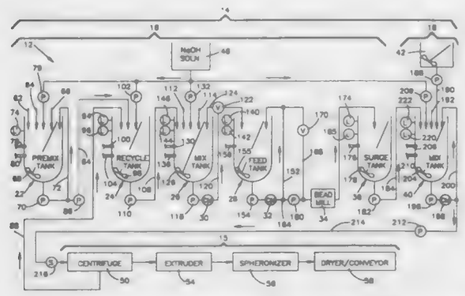
PROCESS FOR MANUFACTURING A GAS GENERATING MATERIAL

Thomas H. Vos, Rochester; James M. Kumkoski, Utica, both of Mich.; Leo S. Knowlden, Gilbert, Ariz., and George W. Goetz, Rochester Hills, Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed May 24, 1990, Ser. No. 528,144

Int. Cl.[5] C06B *21/00*

U.S. Cl. 264—3.3 **43 Claims**



1. A process for manufacturing a gas generating material comprising the steps of:

preparing a wet mixture of a metal azide and a metal oxide without prior mixing of the metal azide and metal oxide in dry form;

processing the wet mixture to form granules of gas generating material;

drying the granules of gas generating material; and

maintaining the mixture in a wet state throughout said processing prior to said step of drying the granules.

4,994,213

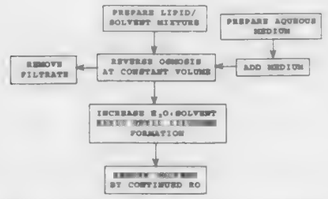
METHOD OF PREPARING LIPID STRUCTURES

David F. Aitcheson, San Jose, and Renee A. Tenzel, Mountain View, both of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Filed May 17, 1988, Ser. No. 194,838

Int. Cl.[5] A61K *9/133, 9/127;* **B01J** *13/12*

U.S. Cl. 264—4.6 **11 Claims**



1. A method of forming a suspension of liposomes having uniform sizes in the size range less than about 300 nm, comprising

forming a mixture of vesicle-forming lipids in a single-phase solvent system comprising a water-miscible lipid solvent, and water, at a water/solvent ratio at which vesicular and amorphous lipid structures, visible by light microscopy, are formed,

removing solvent and water from the mixture by reverse osmosis, and

as solvent and water are removed, adding aqueous medium to the mixture, until the mixture reaches a water:solvent ration at which liposome formation occurs.

4,994,214

PROCESS FOR CONTROLLING THE CURL OF PHOTOGRAPHIC FILM

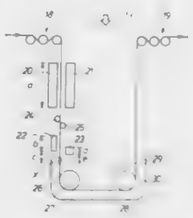
Marc P. Stevens, Belsele, and Gery Vancoppenolle, Weerde, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jun. 29, 1989, Ser. No. 372,843

Claims priority, application European Pat. Off., Jul. 5, 1988, 88201401.2

Int. Cl.[5] B29C *35/10, 55/12, 71/02*

U.S. Cl. 264—25 **13 Claims**



1. A process for making biaxially oriented photographic polyethylene terephthalate film having a controlled amount of longitudinal curl, comprising extruding molten polyethylene terephthalate polymer through a flat die onto a cooling drum, to quench the same into film form, imparting to the quenched film a given degree of permanent curl by subjecting the same to molecular orientation by stretching longitudinally and transversely while heating the film to a temperature above its Tg, the heating of the film during the longitudinal stretching occurring asymmetrically from one film face to the other thereby to establish a temperature gradient across the thickness of the film sufficient to impart to the film the given degree of curl, then heat-setting the asymmetrically heat-stretched film, winding the heat-set film into a stock roll of film, and finally subjecting the film roll to a heat treatment by heating it for a time of about 0.1 to about 1500 hours at a temperature ranging from about 30° C. up to its Tg and at an ambient relative humidity less than 100% and sufficient to thereby at least substantially maintain the degree of curl previously imparted to the film.

4,994,215

METHOD OF FABRICATING COMPLEX MICROCIRCUIT BOARDS, SUBSTRATES AND MICROCIRCUITS AND THE SUBSTRATES AND MICROCIRCUITS

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology Corp., San Diego, Calif.

Division of Ser. No. 784,454, Oct. 4, 1985, abandoned, which is a division of Ser. No. 665,507, Oct. 30, 1984, Pat. No. 4,562,092, abandoned, which is a continuation of Ser. No. 445,017, Nov. 29, 1982, which is a continuation-in-part of Ser. No. 174,929, Aug. 4, 1980, Pat. No. 4,374,929. This application Jul. 5, 1988, Ser. No. 214,796

Int. Cl.[5] C04B *38/06*

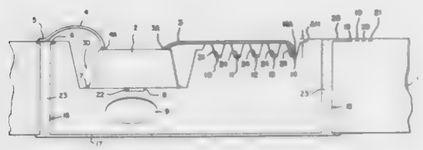
U.S. Cl. 264—27 **7 Claims**

1. A method of making a substrate comprising the steps of:

(a) providing a homogeneous composition of sinterable particulate material and binder,

(b) providing a mold including therein an insert of electrically conductive removable material in a predetermined pattern extending to an interior surface of said mold,

(c) molding said composition in said mold to the shape of said mold and around said insert,
(d) passing an electrical current through said insert to heat said insert to melt only the binder portion immediately adjacent said insert,



(e) removing said insert from said shape to form a continuous aperture in said shape having substantially the geometry of said insert,
(f) removing at least a portion of said binder from said shape, and
(g) sintering said shape after said binder removal.

4,994,216

PROCESS OF MAKING CARBON-BONDED REFRACTORY SHAPED ARTICLES

Ulrich Hintzen, Taunusstein-Watzhahn; Heinz Schermer, Eltville, and Ernst Luhrsen, Bad Schwalbach, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 20, 1988, Ser. No. 260,517
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736680
Int. Cl.[5] C01B *31/02*
U.S. Cl. 264—29.2 **11 Claims**

1. A process of making a carbon-bonded refractory shaped article which comprises:
providing a mixture containing (a) refractory material, (b) binder resin, (c) a carbonaceous substance selected from the group consisting of pitch, tar and a mixture thereof, and (d) 1 to 10 weight % of hollow fibers based on the weight of said carbonaceous substance;
molding said mixture into a shaped article;
hardening the shaped article at temperatures up to 250° C.;
tempering the hardened shaped article at temperatures up to 1000° C.; and
firing the heat-tempered shaped article at temperatures up to 1600° C.

4,994,217

LOW ODOR POLYPHENYLENE ETHER/POLYSTYRENE PROCESS

John P. Banevicius, Slingerlands, N.Y.; William M. Bunting, New Haven, Conn.; Alexandros Hasson, Delmar, N.Y.; Susan J. Hathaway, Albany, N.Y.; William E. Pecak, Cohoes, N.Y., and John P. Skilbeck, Delmar, N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 29, 1988, Ser. No. 291,563
Int. Cl.[5] B29C *49/76*
U.S. Cl. 264—45.9 **22 Claims**



1. A process for the production of a polyphenylene ether/polystyrene resin composition of low odor, the process comprising
(i) blending
(a) a solution comprising polyphenylene ether resin and a normally liquid aromatic hydrocarbon solvent, said solution having a by-product 2,4,6-trimethylanisole content of less than 1000 parts per million by weight based on said resin and sources of odoriferous amine content and
(b) a solution comprising a polystyrene resin or a rubber modified polystyrene resin and a normally liquid aromatic hydrocarbon solvent;
(ii) partially devolatilizing said blended solutions (a) and (b) by passing them through at least one zone of heat exchange whereby at least 25 percent of volatiles are evaporated and separated; and
(iii) feeding the partially devolatilized blended resin composition to at least one stripping zone to complete the devolatilization thereof and to reduce the odoriferous amine content.

4,994,218

METHOD OF PRODUCING GELLED GREEN COMPACT FOR THIN SINTERED BODY

Junichi Tokumoto; Minato Ando, and Takashi Katoh, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 28, 1989, Ser. No. 373,055
Claims priority, application Japan, Jun. 30, 1988, 63-163400
Int. Cl.[5] C04B *35/10*
U.S. Cl. 264—56 **16 Claims**

1. A method for producing a gelled green compact for a thin sintered body, comprising the steps of:
(a) adding an acid to a solution of metal alkoxide to produce a sol which has a pH of from approximately 2 to approximately 3;
(b) adding an acid to said sol to lower the pH of said sol;
(c) adding an alkali to said sol to increase the pH of said sol to within a range from approximately 1.5 to approximately 3;
(d) drying said sol; and
(e) molding said sol into the gelled green compact.

4,994,219

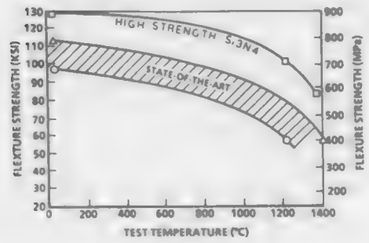
METHOD FOR FORMING A HIGH STRENGTH SILICON NITRIDE

Hun C. Yeh, Rancho Palos Verdes, Calif., assignor to Allied-Signal Inc., Morris Township, N.J.

Division of Ser. No. 165,659, Mar. 8, 1988, Pat. No. 4,870,036.
This application Jun. 19, 1989, Ser. No. 367,824
Int. Cl.[5] C04B *35/58*
U.S. Cl. 264—62 **7 Claims**

1. A method of densifying a silicon nitride green body from a mixture of by weight, 0.7–8.6% strontium carbonate, 1.8–12.0% yttrium oxide and the balance silicon nitride, said method comprising the steps of:
encapsulating said green body under vacuum;

decomposing said strontium carbonate to strontium oxide and carbon dioxide; and



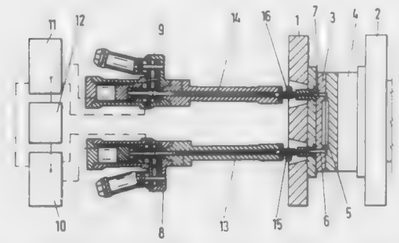
hot isostatically pressing the green body to form a densified article.

4,994,220

PROCESS FOR INJECTION MOLDING OF INJECTION MOLDED PARTS OF PLASTICIZED LIQUID CRYSTAL POLYMER MATERIAL

Lothar Gutjahr, Malterdingen, and Wolfgang Nesch, Lahr-Sulz, both of Fed. Rep. of Germany, assignors to Kloeckner Ferromatik des GmbH, Malterdingen, Fed. Rep. of Germany

Continuation of Ser. No. 329,838, Mar. 28, 1989, abandoned.
This application Sep. 28, 1990, Ser. No. 590,528
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3810954
Int. Cl.[5] B29C *45/00*
U.S. Cl. 264—69 **6 Claims**



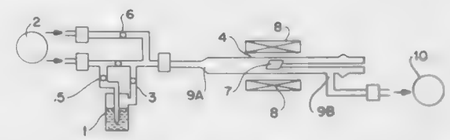
1. A process for injection molding of injected molded parts of plasticized liquid crystal polymers, comprising the steps of:
associating a separate plastification and injection device with each of at least two spaced apart infeed gates of a closed injection mold defining a mold cavity containing a set quantity of plasticized material when full;
injecting a subquantity of the plasticized material into the mold cavity via one of the infeed gates by the associated plastification and injection device so that a portion of this injected plasticized material flows via the other feed gate in the direction of the other plastification and injection device;
injecting another subquantity of the plasticized material into the mold cavity via the other infeed gate by the other plastification and injection device so that a portion of this injected plasticized material flows via the one infeed gate in the direction of the associated plastification and injection device; and
alternately repeating said injecting steps to fill the mold cavity, whereby the molecular structure of the plasticized material is oriented to increase the strength of the resulting mold parts.

4,994,221

METHOD FOR THE PRODUCTION OF A CARBON ELECTRODE

Hideaki Tanaka, Tenri, and Nobuhiro Yanagisawa, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1989, Ser. No. 360,307
Claims priority, application Japan, Jun. 3, 1988, 63-138155
Int. Cl.[5] B29C *43/18;* **B23B** *31/20;* **C01B** *31/00*
U.S. Cl. 264—81 **11 Claims**



1. A method for producing a carbon electrode comprising the steps of:
directly depositing a carbon material on an electroconductive electrode substrate by chemical vapor deposition using a starting material selected from the group consisting of hydrocarbons, hydrocarbon derivatives and mixtures thereof;
subjecting said substrate having said carbon material directly deposited thereon to an electrochemical treatment so that said carbon material is doped with a charge carrier material capable of being reversely intercalated therein and deintercalated therefrom;
compressing said substrate after said electrochemical treatment is subjected thereto; and
producing a thin plate-shaped carbon electrode having a high density.

4,994,222

PROCESS FOR PRODUCING VULCANIZED RUBBER-SYNTHETIC RESIN COMPOSITE STRUCTURE

Shingo Iizumi, Yokohama, and Kazuya Takano, Kamakura, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,033
Claims priority, application Japan, Jun. 27, 1988, 63-158271; Mar. 27, 1989, 1-74572
Int. Cl.[5] B29C *45/14*
U.S. Cl. 264—135 **7 Claims**



1. A process for producing a vulcanized rubber synthetic resin composite structure, comprising,
chlorinating a surface of a vulcanized rubber molding which comes into contact with a synthetic resin to be integrally formed together,
forming a layer of a curable adhesive on the chlorinated surface of the vulcanized rubber molding, said curable adhesive comprising a resol-type phenolic resin formed of a cocondensation product of formaldehyde and a phenol-resorcinol mixture, and aldehyde-modified polyvinyl alcohol, said phenol-resorcinol mixture containing phenol and resorcinol at a molar ration from 75 phenol and 25 resorcinol to 95 phenol and 5 resorcinol, said aldehyde-modified polyvinyl alcohol being selected from the group consisting of polyvinyl formal resin, polyvinyl acetal resin and polyvinyl butyral resin, said resol-type phenolic resin and aldehyde-modified polyvinyl alcohol being mixed in a ratio from 75 resol-type phenolic resin and 25 aldehyde-

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modified polyvinyl alcohol to 99 resol-type phenolic resin and 1 aldehyde-modified polyvinyl alcohol by weight,
disposing the vulcanized rubber molding with the curable adhesive layer in a mold,
injecting into the mold a molten synthetic resin over the curable adhesive layer to form the composite structure, and
demolding the composite structure after setting the injected resin.

4,994,223

EXTRUDER SCREW AND METHOD FOR THE EXTRUSION OF THERMALLY SENSITIVE THERMOPLASTIC MATERIALS

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Filed Jun. 16, 1989, Ser. No. 367,031
Int. Cl.[5] B29C *47/00, 47/60, 47/64*
U.S. Cl. 264—211.21 **14 Claims**



1. In an extruder screw, for extrusion of thermoplastic materials, of a single screw flight metering type having an initial, feed zone in which the screw flight has a constant depth d_f, a distal metering zone in which the screw flight has a constant depth d_m that is less than that of said feed zone, and a transition zone, interconnecting said feed zone with said metering zone and in which the screw flight progressively decreases in depth from that in said feed zone to that in said metering zone, an L/D ratio of a total length, L, of said zones to an outer diameter, D, of said screw is in the range of 20–30:1, the improvement for extrusion of thermally sensitive plastics comprising the screw having a compression ratio d_f:d_m of approximately 2:1, a length of the feed zone being form 27–33% of the total length L, a length of the transition zone being from 23–35% of said total length L, and a length of said metering zone being 45–48% of said total length L, and the lead and pitch being constant throughout the total length of said zones.

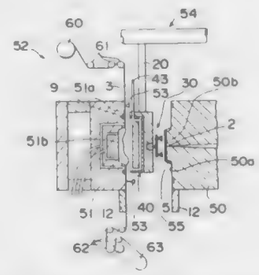
10. A method for extrusion of a rigid, thermally sensitive plastic material materials, comprising the steps of:
(a) providing a screw extruder with an extruder screw of the single screw flight type having an initial feed zone in which the screw flight has a constant depth d_f, a distal metering zone in which the screw flight has a constant depth d_m that is less than that of said feed zone, and a transition zone, interconnecting said feed zone with said metering zone and in which the screw flight progressively decreases in depth from that in said feed zone to that in said metering zone, an L/D ratio of a total length, L, of said zones to an outer diameter, D, of said screw is in a range of 20–30:1;
(b) feeding a rigid thermally sensitive plastic material to said feed zone;
(c) compacting and working said material in said feed zone and delivering it to said transition zone;
(d) plasticizing and compressing said material in the transition zone and passing the material to the metering zone at a compression ratio d_f:d_m of approximately 2:1;
(e) mixing and pumping said material in the metering zone; and
(f) extruding said material from the extruder;
wherein the compacting and working of the material is performed in said feed zone along 27–33% of the total length L; wherein the plasticizing and compressing of the material is performed in said transition zone along 23–35% of said total length L; wherein said mixing and pumping in the metering zone is performed along 45–48% of the total length L; and wherein the material is fed along the screw by the flight at a constant lead and pitch.

4,994,224

INJECTION MOLDING DEVICE AND METHOD FOR MANUFACTURING A FOIL DECORATED MOLDING

Hisayuki Itoh, Nagaokakyo; Yuzou Nakamura, Mukou; Noriaki Higuchi, Ibaraki, and Seiichi Yamasaki, Kyoto, all of Japan, assignors to Nissha Printing Co., Ltd., Kyoto, Japan

PCT No. PCT/JP88/00734, § 371 Date Mar. 16, 1989, § 102(e) Date Mar. 16, 1989, PCT Pub. No. WO89/00912, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 21, 1988, Ser. No. 362,467
Claims priority, application Japan, Jul. 23, 1987, 62-183889
Int. Cl.[5] B29C *45/16, 45/17*
U.S. Cl. 264—247 **17 Claims**



1. An injection molding apparatus for manufacturing a foil decorated molding, comprising:
a first mold half, said first mold half having a first surface defining a portion of a mold cavity and an injection port opening onto said first surface;
a second mold half, said second mold half having a second surface defining a portion of said mold cavity. said second mold half being disposed so as to confront said first mold half;
transfer foil transport means for transporting a transfer foil, said transfer foil comprising a transfer layer on a substrate film, said transfer layer comprising a plurality of transfers, and said transport means transporting said transfer foil across said second mold half one pitch of said transfer foil at a time;
clamping means for clamping said transfer foil onto said second surface of said second mold half; and
heating and removing means, movable between a first position between said first half mold and said second half mold when said first and second half molds are separated and a second position removed from between said first and second half molds, for heating the transfer foil at said second mold half in said first position and for removing a molding from said first half mold and moving the molding to said second position, said heating and removing means comprising a heating device and a molding removal device.

14. An injection molding method for manufacturing a foil decorated molding, comprising:
providing a first mold half, said first mold half having a first surface defining a portion of a mold cavity and an injection port opening onto said first surface, and a second mold half, said second mold half having a second surface defining a portion of said mold cavity, said second mold half being disposed so as to confront said first mold half;
transporting an elongated transfer foil, the transfer foil comprising a transfer layer on a substrate film, and the transfer layer comprising a plurality of transfers, into a position adjacent said second surface in a space between said first mold half and said second mold half one pitch of the transfer foil when said mold halves are separated;
moving a said heating and removing means, said heating and removing means comprising a heating device and a removing device, into the space between said mold halves;
heating the transfer foil positioned at said position adjacent said second surface with said heating device of said heating and removing means;
moving said heating and removing means from the space between said mold halves;
moving said mold halves together to form a mold having a mold cavity therein;
injection molten resin into said mold cavity of said mold to form a molded product;
opening said mold by separating said mold halves after the resin has cooled;
removing the substrate film from the molded product, the molded product being temporarily attached to said first surface of said first mold half, leaving a transfer of said transfer layer on the molded product to obtain a foil decorated molding;
moving said heating and removing means into the space between said mold halves;
holding the foil decorated molding with said removing device of said heating and removing means;
moving said heating and removing means from the space between said mold halves to remove the foil decorated molding from between said mold halves; and
removing the foil decorated molding from said removing device of said heating and removing means;
wherein the steps of holding the foil decorated molding with said removing device and moving said heating and removing means to remove the foil decorated molding are executed simultaneously with the steps of heating the transfer foil and moving said heating and removing means from the space between said mold halves being carried out for a next foil decorated molding to be molded.

4,994,225

PRODUCTION OF PASSIVE RESTRAINT DEVICE

Delbert A. Davis, Mishawaka, Ind., assignor to Uniroyal Plastics Company, Inc., Mishawaka, Ind.

Filed Jun. 28, 1988, Ser. No. 212,550
Int. Cl.[5] B60R *21/16;* **B29C** *41/02*
U.S. Cl. 264—257 **21 Claims**

1. A method for manufacturing an inflatable confinement for use in protecting an occupant of a vehicle during a collision, which method comprises:
providing a mold having an exterior surface forming a desired shape;
conforming a stretchable knitted fabric to said exterior surface of said mold, by applying said fabric over said exterior surface of an at least partially deflated inflatable mold and inflating said mold to a predetermined size, thus stretching said fabric to take on said shape of said exterior surface of said mold;
subsequently applying an elastomer coating to said fabric; and
curing said elastomer coating at a sufficient temperature and for a sufficient time to provide a cured elastomer-coated fabric having a shape identical to said shape of said mold;
wherein said heating step relaxes and heat sets said fabric so as to permit subsequent stretching of said elastomer-coated fabric.

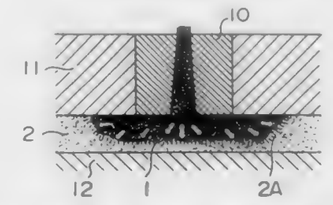
4,994,226

METHOD OF PRODUCING SYNTHETIC RESIN MADE ARTICLES HAVING POROUS ELASTIC MEMBER

Kazuhiko Nakagawa, Aichi; Yuji Wakayama, Nagoya; Shuji Nakata, Obu, and Tadashi Shimizu, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd. and Shimizu Industry Company, Ltd., both of Kariya, Japan

Continuation of Ser. No. 123,522, Nov. 20, 1987, abandoned. This application Aug. 23, 1989, Ser. No. 397,336
Claims priority, application Japan, Nov. 22, 1986, 61-279245
Int. Cl.[5] B29C *45/14, 45/16*
U.S. Cl. 264—261 **8 Claims**

1. A method of producing a synthetic resin made article having a porous elastic member by injection molding, comprising the steps of:
placing a porous elastic member in position against an inner wall surface of one of opposing segments of an injection mold splittable into two or more segments;
closing said injection mold and compressing said porous elastic member by clamping pressure;
injection under pressure a molten synthetic molding resin into the injection mold between an inner wall surface of one of the opposing segments and a surface of said porous



elastic member and, thereby, forcing synthetic molding resin between the surface of said porous elastic member and the inner wall surface of another opposing segment of the injection mold; and
applying a dwell pressure of a preset level of 300 to 500 kg/cm^2 for a prescribed period of time to the synthetic molding resin injected into said mold, wherein the injection pressure is applied to the injected resin continuously and is increased in at least two steps from a lower level of pressure of 30 kg/cm^2 to a higher level of pressure of 250 kg/cm^2.

4,994,227

METHOD FOR THE PREPARATION OF SUSTAINED RELEASED BOLUS FORMULATION

Joseph C. Dietz, Feasterville, Pa., and Richard B. Toothill, Warren, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 12,262, Feb. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 837,636, Mar. 10, 1986, abandoned. This application Feb. 3, 1989, Ser. No. 306,971
Int. Cl.[5] B29C *45/00, 45/72;* **A01N** *25/34*
U.S. Cl. 264—328.16 **5 Claims**

1. An injection molding method for the preparation of sustained release bolus formulations comprising the steps of (a) feeding a dry blend or pelletized dry blend consisting of 1% to 20% on a weight basis of active ingredient; 1.0% to 40% on a weight basis of wax or a mixture of waxes; 0% to 23% on a weight basis of fat; and 20% to 85% of a high-density, pharmacologically and pharmaceutically acceptable filler into a screw at a temperature below about 60° C., gradually heating the blend to a temperature above its softening point and forcing the softened blend into a mold, (b) cooling the mold to solidify the bolus and (c) removing the molded bolus from the mold.

4,994,228

METHOD FOR RELEASING MOLDED SYNTHETIC RESIN PRODUCTS FROM A MOLD

Seiichi Watanabe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1990, Ser. No. 479,819
Claims priority, application Japan, Feb. 16, 1989, 1-36929
Int. Cl.[5] B29C *45/43*
U.S. Cl. 264—335 **17 Claims**

1. A method for releasing a molded synthetic resin product from a mold wherein a gas is fed through a gas passageway to a position between a molded synthetic resin product, which has been molded in a mold with an injection molding process, and a molding surface of the mold in order to release the molded synthetic resin product from the mold,

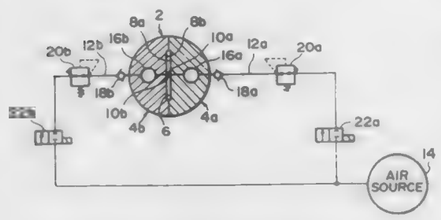
the method for releasing a molded synthetic resin product from a mold comprising the steps of:

(i) providing a gas accumulation space in which a predetermined amount of said gas is to accumulate and which communicates with said gas passageway,

(ii) feeding said gas into said gas passageway and said gas accumulation space until the pressure of said gas in said gas passageway and said gas accumulation space reaches a predetermined value after a cavity of said mold has been filled with a synthetic resin but before said mold is opened,

(iii) after the pressure of said gas in said gas passageway and said gas accumulation space has reached the predetermined value and before the mold has opened, closing said gas passageway at a position upstream from where said gas passageway communicates with said gas accumulation space, and

(iv) when mold clamping force is released in the course of opening said mold, causing said gas, which has accumulated in said gas accumulation space and the parts of said gas passageway downstream from said position at which said gas passageway has been closed, to be jetted to a position between said molded synthetic resin product and said molding surface of said mold in order to release said molded synthetic resin product from said mold.



4,994,229

FORMING THERMOPLASTIC WEB MATERIALS

Anthony E. Flecknoe-Brown, Abbottsford, Australia, assignor to Hitek Limited, Victoria, Australia

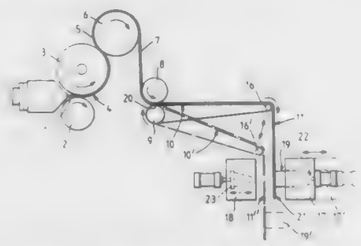
PCT No. PCT/AU88/00072, § 371 Date Jan. 17, 1989, § 102(e) Date Jan. 17, 1989, PCT Pub. No. WO88/06965, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 17, 1988, Ser. No. 283,279

Claims priority, application Australia, Mar. 17, 1987, PI0888/87

Int. Cl.[5] B29C *51/42*

U.S. Cl. 264—522 16 Claims



1. A method of thermoforming hollow objects including: extruding a web of thermoplastic material directly into a set of temperature controlled tempering rolls, cooling upper and lower surface layers of the web by passage through said tempering rolls which maintaining the interior of the web in molten condition between said surface layers, feeding the partially cooled web onto a conveyor, and conveying the web to the entry of a thermoformer, characterized in that the web is allowed to remain on the conveyor over such a length of the conveyor and for such a time until the surface layer of the web which is in contact with the conveyor has been reheated by the molten interior of the web to a thermoformable temperature below the temperature at which the web will stick to the conveyor.

4,994,230

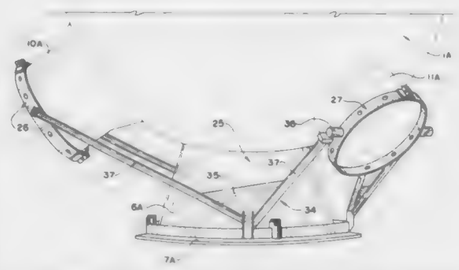
TEMPLATE METHOD FOR REPLACING A VESSEL IN A PIPE SYSTEM

Martin D. Cepkauskas, Eastham, Mass., assignor to MK Ferguson Company, Cleveland, Ohio

Filed Sep. 19, 1989, Ser. No. 409,247

Int. Cl.[5] G21C *21/00*

U.S. Cl. 376—260 8 Claims



1. A method of replacing an old vessel having at least one pipe connected thereto with a new vessel connected to the same pipe comprising the steps of:

providing a template having vessel registry means, at least one pipe connection measurement means and a framework interconnecting the same;

assembling the template on the old vessel and at least one pipe by positioning the vessel registry means in centered relationship on the old vessel at a specified location and by positioning the pipe connection measurement means in centered relationship substantially around the pipe connection to the old vessel;

utilizing the framework to rigidly interconnect the vessel registry means to the pipe measurement means in their respectively centered positions;

measuring the position of the vessel and pipe connection relative to the centered vessel registry means and pipe connection measurement means, respectively;

removing the template from the old vessel and pipe;

assembling the template on the new vessel by positioning the vessel registry means on the new vessel at the specified location in a centered location and by positioning the pipe connection measurement means adjacent to the intended point of pipe connection to the new vessel;

comparing the measurements of the relative position of the pipe connection to the pipe connection measurement means as previously measured to the position of the intended connection of the pipe to the pipe connection measurement means on the new vessel to determine if acceptable alignment will exist therebetween;

reworking the position of the intended connection on the new vessel, if necessary, to obtain proper alignment;

disconnecting the pipe at its connection to the old vessel to permit the old vessel to be removed; and

placing the new vessel in position to permit the pipe to be reconnected to the new vessel at its point of connection.

4,994,231

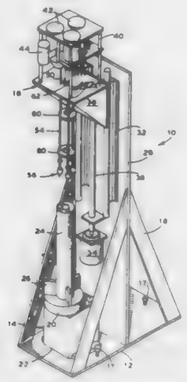
APPARATUS FOR BLENDING CONSTITUENTS OF VARYING DENSITIES

Thomas A. Artman, Lynchburg; Carroll E. Allcock, Rustburg; Garry L. Garner, Forest; Gary L. Jones, Lynchburg, all of Va.; William R. Larsen, Sterling, Ill., and Steven N. Zartman, Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 22, 1990, Ser. No. 497,173

Int. Cl.[5] G21C *19/00*

U.S. Cl. 376—261 12 Claims



1. A blending system for homogeneously loading constituents of varying densities into a cylinder comprising:

(a) a vertically elongated cylinder having a top opening;

(b) a turntable supporting said cylinder and configured to rotate said cylinder about its vertical axis;

(c) a plurality of hoppers supported about said top opening, each said hopper configured to store a uniform diameter constituent therein;

(d) a transfer conduit secured to each said hopper and extending to said cylinder for separately transferring each said stored constituent to said cylinder, a lower portion of each said transfer conduit being configured to fit through said top opening and extend into said cylinder;

(e) nozzle means secured to said transfer conduit for independently controlling the flow of each said constituent through its respective said transfer conduit and into said cylinder;

(f) raising/lowering means for varying the elevation of at least the said lower portion of said transfer conduit with respect to said cylinder;

(g) alignment means for vertically aligning said cylinder with respect to the said lower portion of said transfer conduit; and,

(h) operating means for rotating said cylinder about its said vertical axis and for simultaneously raising the said lower portion of said transfer conduit while also homogeneously discharging constituents from said hoppers through said transfer conduit and into said cylinder.

4,994,232

METHOD OF INSPECTING THE QUALITY OF NUCLEAR FUEL ROD ENDS

Raymond W. Brashier, Columbia, S.C., and Edward D. Pfau, Bostic, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 359,000, May 30, 1989, Pat. No. 4,957,691.

This application May 18, 1990, Ser. No. 525,421

Int. Cl.[5] G21C *17/06*

U.S. Cl. 376—261 8 Claims

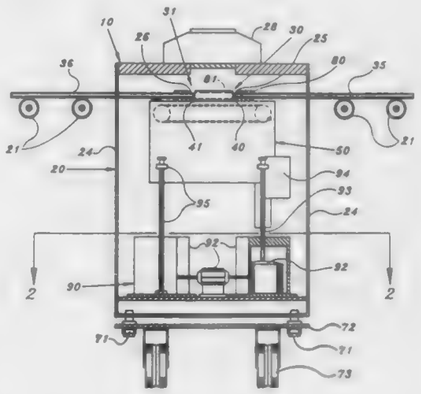
1. A method for inspecting the quality of both ends of nuclear fuel rods and which includes

a housing including a pair of longitudinally separated slots for receiving X-rays downwardly therethrough from an external source and so as to define first and second longitudinally spaced apart operating positions,

means for serially guiding nuclear fuel rods longitudinally through said housing and to a first rod position wherein the forward ends of the rods are aligned below said first operating position and to a second rod position wherein the rear ends of the rods are aligned below said second operating position,

belt conveyor assembly means for serially advancing X-ray film cartridges longitudinally through said housing and below said rods, and so that each cartridge may be selectively aligned below said first and second operating positions, said belt conveyor assembly means comprising at least one endless conveyor belt, at least three longitudinally spaced apart cleats mounted on said conveyor belt and so as to define first and second film cartridge receptacles between respective pairs of cleats, drive means for selectively advancing said conveyor belt in opposite directions, and table mean for selectively lifting the film cartridges from said conveyor belt, and so that the conveyor belt may be advanced while the film cartridges are held stationary, said method comprising the steps of

longitudinally advancing a first fuel rod to said first rod position,



placing a first film cartridge in said first receptacle and advancing said conveyor belt so that said first film receptacle and first film cartridge are aligned with said first operating position,

exposing said first film cartridge to X-rays at said first operating position so as to image the forward end of said first fuel rod,

transferring said first film cartridge from said first receptacle to said second receptacle by lifting the table means to lift the first film cartridge from said conveyor belt, advancing the conveyor belt in a reverse direction, and then lowering the table means to lower the first film cartridge back onto said conveyor belt at said second receptacle,

advancing the conveyor belt forwardly so that said second receptacle and first film cartridge are aligned below said second operating position,

longitudinally advancing the fuel rod to said second rod position,

exposing the first film cartridge to X-rays at said second operating position so as to image the rear end of the first fuel rod, and then

forwardly advancing the conveyor belt so as to permit removal of said first film cartridge from said housing.

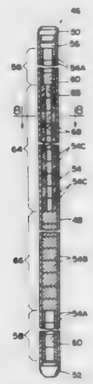
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4,994,233

FUEL ROD WITH AXIAL REGIONS OF ANNULAR AND STANDARD FUEL PELLETS

Thomas R. Freeman, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1989, Ser. No. 302,500
Int. Cl.[5] G21C *3/30*
U.S. Cl. 376—428 12 Claims



1. A fuel rod for use in a nuclear reactor fuel assembly, said fuel rod comprising:

(a) an elongated hollow cladding tube;

(b) a pair of end plugs connected to and sealing said cladding tube at opposite ends of thereof; and

(c) an axial stack of fuel pellets contained in and extending between said end plugs at said opposite ends of said tube, all of said fuel pellets contained in said tube being composed of fissile material being enriched above the level of natural enrichment;

(e) said fuel pellets in said stack thereof being provided in an arrangement of axial regions, said arrangement of axial regions including a pair of first axial regions defined respectively at said opposite ends of said pellet stack adjacent to said respective end plugs, said pellets in said first axial regions being identical in number and having annular configurations with an annulus of a first void size, said arrangement of axial regions also including another axial region defined between said first axial regions, some of said pellets in said another axial region having solid configurations.

4,994,234

CONTROLLING COOLANT FLOW TO NUCLEAR FUEL ASSEMBLIES

Olov Nylund, Västerås, Sweden, assignor to ABB Atom AB, Västerås, Sweden

Filed Mar. 22, 1989, Ser. No. 327,247
Claims priority, application Sweden, Mar. 28, 1988, 8801141
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—445 8 Claims

1. In a fuel assembly of a nuclear reactor which includes a plurality of fuel rods and means to flow coolant past the fuel rods, there is provided a device for control of the coolant flow to the fuel rods, which fuel assembly comprises a top-tie plate, a bottom-tie plate and members connecting these plates to form a framework for the fuel rods and elongated elements directly or indirectly carried by the top-tie plate and/or the bottom-tie plate and selected from the group consisting of fuel rods and control rod guide tubes, said top-tie plate and said bottom-tie plate each being provided with a plurality of openings for coolant flow to the fuel rods, which device is characterized in that the said elongated elements exhibit an irradiation growth in their longitudinal direction that deviates from that of the said framework members, said elongated elements being provided with throttling bodies which cooperate with the openings in at least one of the top-tie plate and the bottom-tie plate, whereby, during nuclear irradiation, the elongated elements



will be expanded to a greater extent than said framework members and the position of at least some of the throttling bodies will be changed in relation to the openings hence influencing the coolant flow past the fuel rods.

4,994,235

WEAR-RESISTANCE ALUMINUM BRONZE ALLOY

Takehiro Shirosaki, Fujisawa; Takashi Kikkawa, Isehara, and Hirotaka Toshima, Yamato, all of Japan, assignors to Oiles Corporation, Tokyo, Japan

Filed Nov. 3, 1989, Ser. No. 431,562
Claims priority, application Japan, Nov. 4, 1988, 63-280199
Int. Cl.[5] C22C *9/06*
U.S. Cl. 420—495 5 Claims

1. A wear-resistance aluminum bronze alloy consisting essentially of 7 to 15 wt % of Al, 0.1 to 10 wt % of Cr and the balance copper, and showing a specific depth of wear of not more than 25×10^{-6} mm/m.

4,994,236

METHOD OF MAKING HIGH MELTING POINT ALLOYS

John R. Mihalisin, N. Caldwell, and Michelle K. Tripucka, Mountain Lakes, both of N.J., assignors to Howmet Corporation, Greenwich, Conn.

Continuation of Ser. No. 82,579, Aug. 7, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 311,412
Int. Cl.[5] C22C *1/00*
U.S. Cl. 420—590 12 Claims

1. A method of making a high melting point alloy having an overall desired composition, said high melting point alloy being comprised of a combination of a base element selected from the iron group of the Periodic Table and a plurality of metallic elements other than said base element, said method comprising the steps of:

providing at least one first initial alloy, said first initial alloy consisting essentially of said base element and at least one of said metallic elements, said metallic elements other than said base element in said first initial alloys being relatively non-reactive with oxygen and nitrogen in the molten state;

providing at least one second initial alloy, said second initial alloy consisting essentially of said base element and at least one of said metallic elements, said metallic elements in said second initial alloys being relatively reactive with oxygen and nitrogen in the molten state;

selecting amounts of said first and second initial alloys that will yield said overall desired composition of said high melting point alloy upon melting;

melting said selected amounts of said first and second initial alloys to form a molten mixture having said overall desired composition; and

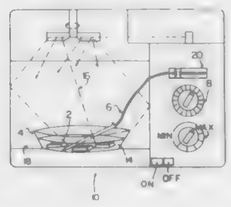
solidifying said mixture.

4,994,237

MICROWAVE PRESERVATION OF BIOPROSTHESES

Gary R. Login; Robert G. Johnson, both of Brookline, and Ann M. Dvorak, Newton Center, all of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Continuation-in-part of Ser. No. 104,631, Oct. 2, 1987, abandoned. This application Nov. 13, 1989, Ser. No. 435,332
Int. Cl.[5] A61L *2/12;* A01N *1/02*
U.S. Cl. 422—21 14 Claims



1. A method to preserve and sterilize bioprostheses comprising the following steps:

immersing a specimen of biologic tissue in a preserving solution at room temperature (20° C.) selected from a member of the group consisting of:

(a) 0.9% sodium chloride;

(b) 0.87% sodium chloride, 0.12% sodium phosphate dibasic, and 0.015% sodium phosphate monobasic, pH 7.3–7.6 (PBS);

(c) 20 mM Tris(hydroxymethyl)aminomethane and 0.9% sodium chloride, pH 7.3–7.6 (TRIS);

(d) 25 mM N-2-hydroxyethylpiperazine-N[1]-2-ethanesulfonic acid, pH 7.3–7.6 (HEPES);

(e) 0.001–0.1% glutaraldehyde in a solution selected from a member of the group consisting of (1) 0.9% sodium chloride, (2) PBS, (3) HEPES, and (4) TRIS;

(f) a calcium chelating agent in a solution selected from a member of the group consisting of (1) 0.9% sodium chloride, (2) PBS, (3) HEPES, and (4) TRIS; and

(g) a calcium chelating agent and 0.001–0.1% glutaraldehyde in a solution selected from a member of the group consisting of (1) 0.9% sodium chloride, (2) PBS, (3) HEPES, and (4) TRIS;

exposing the immersed specimen to microwave irradiation until the final temperature of the solution is between 35° and 50° C.; and,

storing the irradiated specimen in a cold sterile osmotically balanced solution selected from the group consisting of (1) 0.9% sodium chloride, (2) PBS, (3) HEPES, and (4) TRIS.

4,994,238

CONSTANT VOLUME CHEMICAL ANALYSIS TEST DEVICE

George M. Daffern, 1672 Wright Ave., Sunnyvale, Calif. 94087, and Tracy N. Thompson, 814 Moreno Ave., Palo Alto, Calif. 94303

Filed Jun. 9, 1988, Ser. No. 205,230
Int. Cl.[5] G01N *31/22*
U.S. Cl. 422—56 5 Claims

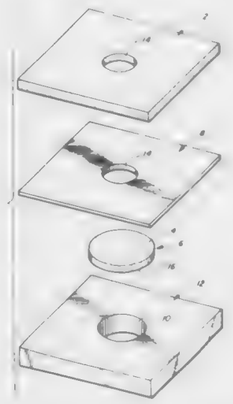
1. A multilayer testing device comprising, in sequential contact,

(a) an absorbent layer;

(b) a waterproof barrier layer; and

(c) a quickly absorbent reagent matrix layer having a determinate volume, and containing therein at least one reagent which produces a detectable species in the presence of an analyte;

wherein the absorbent and barrier layers each include an aperture functionally aligned for application of a test sample



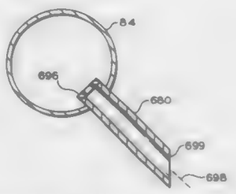
through the absorbent and barrier layers and onto a surface of the reagent layer and the reagent layer comprises an asymmetrically porous membrane having progressively finer filtration with increased distance from the barrier layer.

4,994,239

CATALYST REGENERATION

Frank W. Skraba, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 3, 1984, Ser. No. 576,821
Int. Cl.[5] B01J *8/18*
U.S. Cl. 422—144 15 Claims



1. In a regenerator for a catalytic cracking unit, said regenerator comprising

(a) a regeneration vessel having a longitudinal axis;

(b) a means for introducing coked cracking catalyst into the regeneration vessel;

(c) a means for withdrawing regenerated cracking catalyst from the regeneration vessel, and

(d) at least one oxidant gas distributor positioned in a lower portion of the regeneration vessel, said oxidant gas distributor being formed from at least one generally horizontally positioned pipe defined by a sidewall and having a longitudinal axis with nozzles opening through the sidewall for the introduction of oxidant gas into the regeneration vessel;

the nozzle improvement comprising at least one beveled-tip nozzle opening through the sidewall of the generally horizontally positioned pipe positioned normally to the sidewall of the generally horizontal pipe and downwardly at an angle of between about 10° and about 80° from the vertical, said at least one nozzle having an inlet end and a discharge end with the discharge end being beveled in a plane forming an angle in the range of from about 10° to

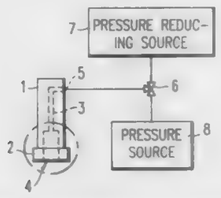
about 80° with respect to the longitudinal axis of the nozzle.

4,994,240

SUCTION HEAD AND CARRYING REACTION CUPS USED IN BIOCHEMICAL REACTION ANALYZING APPARATUS

Hidechika Hayashi, Yokohama, Japan, assignor to Tosoh Corporation, Shinnanyo, Japan

Continuation of Ser. No. 146,827, Jan. 11, 1988, abandoned. This application Apr. 6, 1990, Ser. No. 506,536
Claims priority, application Japan, Jun. 10, 1986, 61-134446
Int. Cl.[5] G01N *35/00*
U.S. Cl. 422—63 **4 Claims**



1. A biochemical reaction analyzing apparatus comprising a reaction cup, a suction head for carrying said reaction cup, means for reducing the pressure in said suction head, and means for increasing the pressure in said suction head; wherein said cup has a hollowed portion providing a reaction cell for biochemical reactions and a top face covered and sealed with a sheet, said suction head being engagable with the sealed top face of the cup, said suction head further comprising: an annular elastic suction pad at its lower end which engages with the top face of the cup to engage with the periphery of the top face of the cup, and a head body provided with an air suction and discharge opening formed inside said suction pad, said head body defining a cylindrical cavity at its lower end and an air passage at its upper end, said cylindrical cavity having a diameter which is substantially equal to a diameter of said opening, said air passage having a diameter which is smaller than the diameters of said cylindrical cavity and said opening, said cylindrical cavity extending up from said opening in a vertical direction and having a length in the vertical direction sufficient to permit a stream of discharged air from said air passage to be guided downward onto the reaction cup through an entire cross-sectional area of said opening;

wherein the length of said cylindrical cavity is equal to or greater than half the diameter of the air suction and discharge opening.

4,994,241

CATALYST RECOVERY THROUGH AND PROCESS FOR UNLOADING MULTI-TUBE REACTORS WITH MAXIMUM DUST CONTAINMENT

Paul C. Sapoff, Louisville, Ky., assignor to Catalyst Technology, Inc., Buckner, Ky.

Continuation of Ser. No. 772,139, Sep. 3, 1985, abandoned, which is a division of Ser. No. 514,287, Jul. 15, 1983, Pat. No. 4,820,496. This application Nov. 1, 1989, Ser. No. 430,128
Int. Cl.[5] B08B *9/06;* **B65G** *65/40*
U.S. Cl. 422—219 **9 Claims**

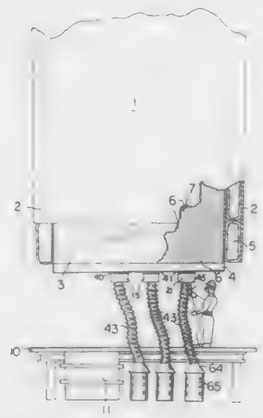
1. A method of removing fused catalyst from a reactor having a plurality of vertical tubes for containing the catalyst comprising:

securing a receiving means on a tube sheet which is in contact with said vertical tubes at an end of the vertical tubes, said receiving means including guide tubes extending therein through which pass dislodging means;

dislodging fused catalyst from the tubes;

collecting dislodged catalyst in said receiving means;

capturing substantially all catalyst dust formed by the dislodging step in the receiving means, said capturing step including positioning ends of the guide tubes extending into said receiving means adjacent openings in the vertical tubes; and



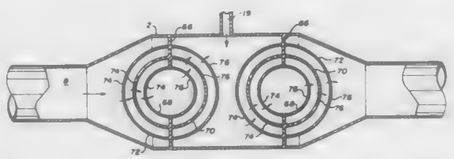
conveying the dislodged catalyst and catalyst dust from the receiving means.

4,994,242

JET IMPINGEMENT REACTOR

John M. Rae, Vancouver, and Edward G. Hauptmann, West Vancouver, both of Canada, assignors to Noram Engineering and Constructors Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 232,339, Aug. 15, 1988, abandoned. This application Sep. 12, 1989, Ser. No. 405,930
Int. Cl.[5] B01F *5/02*
U.S. Cl. 422—224 **9 Claims**



1. Apparatus to allow reactions in the liquid phase and comprising:

a vessel having a longitudinal axis;

a baffle in the vessel comprising a plurality of spheres of different diameters, arranged one within the other, each sphere being formed with a plurality of first openings defining inlets and a plurality of second openings defining outlets, each first and second opening allowing liquid to pass therethrough as a jet and neighboring openings being spaced apart so as to allow impingement of the jets.

4,994,243

CYANIDE REGENERATION PROCESS

Adrian J. Goldstone, Waihi Beach, New Zealand, and Terry I. Mudder, Duvall, Wash., assignors to Cyprus Minerals Company, Englewood, Colo.

Filed Oct. 21, 1988, Ser. No. 261,386
Int. Cl.[5] C22B *11/08;* **C01C** *3/08*
U.S. Cl. 423—29 **27 Claims**

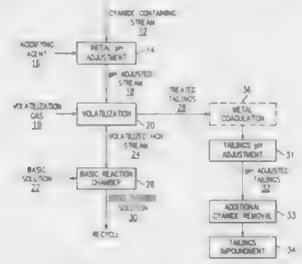
1. A process for regenerating cyanide from a cyanide-containing solution comprising:

(a) adjusting the pH of the cyanide-containing solution to a pH in the range from pH 7 to about pH 9.5,

(b) volatilizing HCN in the pH adjusted solution, and

(c) contacting the volatilized HCN with a basic material.

10. A process for regenerating cyanide from the tailings slurry resulting from a mineral recovery process employing cyanide leach solution, said regeneration process comprising:



(a) adjusting the pH of the tailing slurry to a pH in the range from pH 7 to about pH 9.5,

(b) volatilizing HCN in the pH adjusted slurry, and

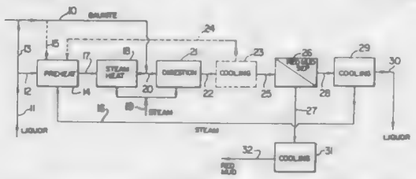
(c) contacting the volatilized HCN with a basic material.

4,994,244

PROCESS FOR PRODUCING ALUMINA FROM BAUXITE

George D. Fulford, Kingston, Canada; David R. Chinloy, Ewarton, Jamaica; Pierre G. Cousineau, Chicoutimi, and Stephen Ostap, Bath, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Jan. 10, 1990, Ser. No. 462,777
Claims priority, application Canada, Jan. 31, 1989, 589,667
Int. Cl.[5] C01F *7/06*
U.S. Cl. 423—121 **14 Claims**



1. In a Bayer process for producing alumina from bauxite which comprises (a) pressure digesting bauxite slurry in caustic soda solution to dissolve aluminum hydroxides in the bauxite as sodium aluminate while leaving most of the remaining constituents of the bauxite in solid form as red mud, (b) separating the red mud from the digested slurry to obtain a caustic-aluminate pregnant liquor, (c) precipitating alumina hydrate from the pregnant liquor and (d) calcining the alumina hydrate to obtain the alumina,

the improvement which comprises carrying out the separation, (b), of the red mud from the digested slurry at a temperature above the atmospheric boiling temperature of the liquor phase of the slurry and a pressure above atmospheric pressure and the separation being selected from (1) settling in the presence of a synthetic flocculant, (2) filtering and (3) centrifuging.

4,994,245

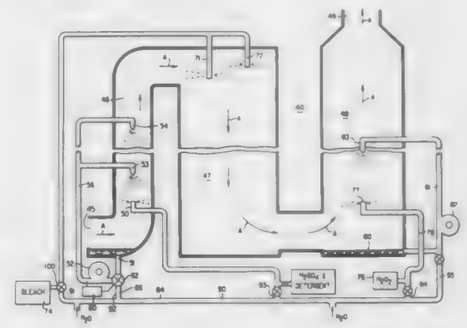
METHODS FOR REMOVING ODORS FROM PROCESS AIRSTREAMS

Charles M. Murray, Silver Spring; Joel L. Thompson, College Park, and Lawrence H. Hentz, Jr., Hampstead, all of Md., assignors to Washington Suburban Sanitary Commission, Hyattsville, Md.

Filed Aug. 25, 1989, Ser. No. 398,389
Int. Cl.[5] B01J *10/00*
U.S. Cl. 423—238 **17 Claims**

1. A method of scrubbing a stream of exhaust air, wherein the stream includes undesirable odor-causing compounds including ammonia, sulfides, and malodorous organic compounds, the method comprising the steps of:

(a) treating the airstream with a surfactant-containing acid solution in order to neutralize ammonia in the airstream while removing malodorous organic compounds therefrom;



(b) treating the neutralized airstream with a liquid bleach to remove sulfides therefrom; and

(c) treating the airstream with hydrogen peroxide to remove chlorine introduced therein by the bleach solution and to maintain the oxidation reaction so as to substantially remove any remaining odor-causing constituents from the airstream.

4,994,246

METHOD FOR REMOVING SULFUR OXIDES FROM COMBUSTING GASES IN WET, CALCIUM-BASED FLUE GAS DESULFURIZATION PROCESSES

Robert E. Moser, Palo Alto, Calif., and Frank Meserole, Austin, Tex., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 6, 1988, Ser. No. 280,752
Int. Cl.[5] C01B *17/00;* **B01J** *8/00*
U.S. Cl. 423—242 **8 Claims**

1. A method for reducing accumulation of solid sulfate-containing deposits in apparatus for storing, transporting or utilizing wet lime or limestone for combustion gas desulfurization, comprising the step of contacting said combustion gas in a reaction zone in the presence of said wet lime or limestone with thiosulfate and an organic polyacid chelating agent, said thiosulfate and chelating agent being present in sufficient concentrations to diminish the amount of sulfate formed as the result of oxidation of sulfite to sulfate.

4,994,247

PREPARATION OF CATALYST FOR OXIDATION OF CARBON MONOXIDE

Patricia A. Tooley, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1989, Ser. No. 404,726
Int. Cl.[5] B01D *53/36;* **B01J** *21/06, 23/46, 23/89*
U.S. Cl. 423—247 **33 Claims**

1. A process for preparing a composition of matter, being effective as catalyst for the reaction of CO with O_2 to CO_2 at about 20°-30° C., comprising iridium metal, iron oxide and titania, said process comprising the steps of

(a) impregnating a titania-containing support material with at least one iron compound and at least one iridium carbonyl compound;

(b) substantially drying the material obtained in step (a); and

(c) treating the substantially dried material obtained in step (b) with a reducing gas under such conditions as to acti-

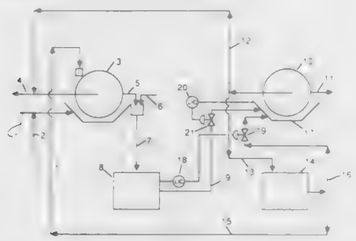
vate said substantially dried material and to obtain said composition of matter.

4,994,248

P_2O_5 RECOVERY AND PHOSPHORIC ACID PURIFICATION

S. W. Slater, Lake City, Fla.; S. R. Hylkema, Tonawanda, N.Y., and L. J. Klein, Corpus Christi, Tex., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,519
Int. Cl.[5] C01B *25/16*; C02F *1/00*
U.S. Cl. 423—320 16 Claims



1. In a wet process for making phosphoric acid wherein a slurry of calcium sulfate containing dissolved phosphoric acid and less than 2% by weight free sulfate ion is passed through a tank to a filter, the improvement which comprises monitoring the liquid level in said filter and the residence time of said slurry in said tank and recycling a portion of the filtrate from said filter back to said filter, sufficient to maintain

(1) a minimum residence time of said slurry in said tank; and

(2) the liquid level in said filter.

4,994,249

ZEOLITE ZK-5

Johannes P. Verduijn, Spijkenisse, Netherlands, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 20, 1988, Ser. No. 183,801
Claims priority, application United Kingdom, Apr. 22, 1987, #709507
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—328 4 Claims

1. A method of preparing zeolite ZK-5 by synthesis from a reaction mixture containing strontium, said method comprising:

(a) providing an alkaline reaction mixture comprising water, a source of a metal M, a source of silicon, a source of aluminium, and a source of strontium, said reaction mixture having a composition defined by the following molar ratios (expressed as oxides):

$(M_{2/n}O + SrO)/SiO_2$	0.16–0.30
$H_2O/(M_{2/n}O + SrO)$	25–120
SiO_2/Al_2O_3	8–12
SrO/SiO_2	0.001–0.03

wherein M is a cation of valence n;

(b) heating said reaction mixture to a temperature of from at least 75° C.; and

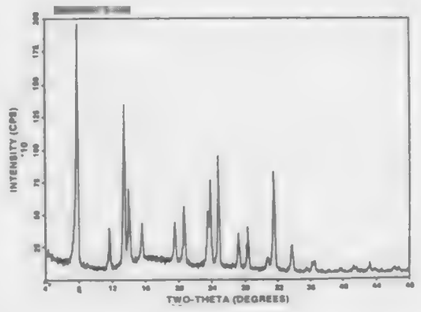
(c) recovering said zeolite ZK-5.

4,994,250

PROCESS FOR SYNTHESIZING A MOLECULAR SIEVE HAVING THE OFFRETITE STRUCTURE AND CONTAINING ALUMINUM AND GALLIUM

Mario L. Occelli, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 29, 1989, Ser. No. 414,471
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—328 37 Claims



1. A process for synthesizing a crystalline, gallioaluminosilicate molecular sieve having the offretite structure which comprises:

(a) mixing a substantially gallia-free aluminosilicate hydrogel having the following oxide mole ratios of components .

SiO_2/Al_2O_3=8 to 15

$(M_2O+N_2O)/Al_2O_3$=1 to 10

H_2O/Al_2O_3=80 to 1000

Q_2O/Al_2O_3=0.1 to 10

with a galliosilicate solution substantially free of alumina and dispersed particles, said solution having the following oxide mole ratios of components

SiO_2/Ga_2O_3=5 to 30

(M_2O of N_2O)/Ga_2O_3=6 to 20

H_2O/Ga_2O_3=200 to 800

to form a mixture of said hydrogel and said solution, wherein M is an alkali metal, N is an alkali metal other than M, Q is a cation derived from an offretite selective templating agent and said mixing is carried out by adding said galliosilicate solution to said aluminosilicate hydrogel; and

(b) crystallizing said mixture to form a gallioaluminosilicate molecular sieve having the offretite structure.

4,994,251

METHOD FOR PRODUCING ZEOLITES

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 169,005, Jul. 15, 1980, Pat. No. 4,341,748, which is a division of Ser. No. 23,117, Mar. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 841,622, Oct. 13, 1977, Pat. No. 4,175,114, which is a continuation-in-part of Ser. No. 650,481, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 424,481, Dec. 13, 1973, abandoned. This application Nov. 3, 1981, Ser. No. 317,735
The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—328 10 Claims

1. A synthetic crystalline zeolitic molecular sieve having a chemical composition expressed in terms of moles of oxides of

$0.9\pm0.3\ M_{2/n}O$: Al_2O_3: 30–350 SiO_2: 0–40 H_2O

wherein M represents a metallic cation and n represents the valence of M, and having an X-ray powder diffraction pattern having at least the d-spacings set forth in Table I of patent 3,702,886, said zeolitic molecular sieve after being calcined in air at a temperature of 600° C. having an infra-red spectrum exhibiting substantially no absorption within the range of 3600–3100 cm^{-1}, said zeolitic molecular sieve in the uncalcined state being substantially free of organic nitrogen components.

4,994,252

REMOVAL OF POTASSIUM CHLORIDE FROM SOLVENTS

Karl L. Krumel, Midland, Mich.; Charles A. Wilson, Pittsburg, Calif., and Thad S. Hormel, Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Feb. 9, 1990, Ser. No. 478,127
Int. Cl.[5] C01D *3/14*; C07C *51/44*
U.S. Cl. 423—499 8 Claims

1. A process for removing particles of potassium chloride from a mixture thereof with a polar, aprotic solvent which comprises the consecutive steps of:

(a) combining the mixture with water in an amount between about 60 percent of the weight of the solvent present and the amount necessary to dissolve all of the potassium chloride present,

(b) removing essentially all of the added water by distillation or evaporation, so that the potassium chloride is present in the form of crystals large enough to be separated, and

(c) separating the potassium chloride by filtration, centrifugation, or sedimentation.

4,994,253

PROCESS FOR THE PRODUCTION OF LARGE BOEHMITE PARTICLES

Neil Brown, Bonn, Fed. Rep. of Germany, assignor to Vereinigte Aluminium-Werke AG, Fed. Rep. of Germany

Continuation of Ser. No. 17,281, Feb. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 847,634, Apr. 3, 1986, Pat. No. 4,668,486, and a continuation-in-part of Ser. No. 17,308, Feb. 20, 1987, abandoned. This application Aug. 30, 1988, Ser. No. 240,406
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[5] C01F *7/00*
U.S. Cl. 423—111 22 Claims

1. A process for the production of alpha-alumina monohydrate aggregates comprising the steps of:

contacting a caustic aluminate-containing liquor held under a pressure of between about 20 bar and about 150 bar O_2, at a temperature of between about 120° C. and 300° C. and in the presence of an amount of cooper ions from about 1 to about 50 mg/l with an oxygen-containing gas to adjust the molar ratio of Na_2O_{free} to Al_2O_3 of the oxidized liquor to <1;

cooling said oxidized liquor without any agitation to induce nucleation of alpha-alumina monohydrate particles having



a particle size between about 20 and about 200 microns and containing between about 0.001% and 0.1% copper; and

recovering said alpha-alumina monohydrate particles in aggregate particle form.

4,994,254

ALUMINOGALLOSILICATES OF THE MFI TYPE

Isao Suzuki, and Kazuo Hirabayashi, both of Yokohama, Japan, assignors to Research Association For Utilization Of Light Oil, Japan

Division of Ser. No. 163,188, Feb. 25, 1988, Pat. No. 4,861,934, which is a continuation-in-part of Ser. No. 1,370, Jan. 8, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 322,988
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—328 2 Claims

1. A crystalline aluminogallosilicate having the skeleton comprised of SiO_4, AlO_4 and GaO_4 tetrahedra, having an MFI structure and having the following formula:

$$aM_{2/n}O.bAl_2O_3.Ga_2O_3.cSiO_2.dH_2O$$

wherein M is a metal selected from an alkali metal, an alkaline earth metal and a mixture thereof, n is the valence of said metal, a is a positive number of $(b+1)\pm3.0$, b is between 1 and 6, c is between 80 and 490, d is between 1 and 200, $c/(b+1)$ is between 45 and 65, and c/b is between 46.7–140.

4,994,255

OXIDATION OF FERROUS CHLORIDE DIRECTLY TO CHLORINE IN A FLUID BED REACTOR

Charles K. Hsu, Millersville, Md., assignor to SCM Chemicals, Inc., Baltimore, Md.

Continuation of Ser. No. 141,951, Jan. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 888,693, Jul. 24, 1986, abandoned. This application Apr. 28, 1989, Ser. No. 344,699
Int. Cl.[5] C01B *7/03*
U.S. Cl. 423—500 8 Claims

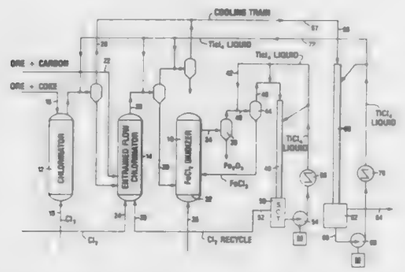
1. A single stage process for recovering elemental chlorine from ferrous chloride which comprises:

(a) introducing a product containing ferrous chloride and less than twelve percent carbon by weight into a reactor containing a fluidized bed of solid inert particulate material which is substantially inert to chlorine and which is composed of particles having a particle size range of from about −100 mesh to about +250 mesh;

(b) oxidizing the ferrous chloride in the product to elemental chlorine and ferric oxide in the presence of the fluidized inert particulate material with an oxygen containing gas at a temperature below the melting point of ferrous chloride and above about 500° C., so that at least some of the ferric

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oxide formed adheres to some of the inert particulate material;



(c) removing a portion of the inert particulate material with the adhered ferric oxide and supplying fresh inert particulate material to the reactor; and

(d) isolating the elemental chlorine.

4,994,256

RECOVERY OF CHLORINE FROM HYDROGEN CHLORIDE BY CARRIER CATALYST PROCESS

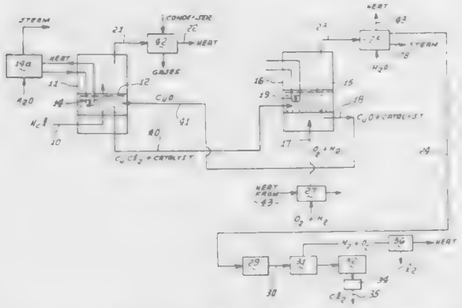
Ronald G. Minet, South Pasadena; Theodore T. Tsotsis, Huntington Beach, and Sidney W. Benson, Brentwood, all of Calif., assignors to Medalert, Inc., South Pasadena, Calif.

Continuation-in-part of Ser. No. 359,630, May 31, 1989, Pat. No. 4,959,202. This application May 14, 1990, Ser. No. 522,640

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] **C01B** *7/04;* **C01G** *1/02, 1/06*

U.S. Cl. 423—502 **16 Claims**



1. In a process of recovering chlorine from a stream of hydrogen chloride, the steps that include:

(a) providing a first fluidized bed of a carrier catalyst cupric oxide in a first reaction zone within a first reactor,

(b) supplying hydrogen chloride in a first stream to said zone for fluidizing said first bed and for exothermic reaction with cupric oxide in said bed to produce cupric chloride, water and heat, removing cupric chloride from said zone in a second stream, and removing water from said zone and removing heat from said zone,

(c) feeding said second stream to a second reaction zone within a second reactor, and providing a second fluidized bed of cupric chloride in said second reaction zone, and

(d) supplying oxygen in a third stream to said second zone for fluidizing said second bed and for endothermic reaction with cupric chloride in said second bed at elevated temperatures between 300° and 360° C. to produce cupric oxide and chlorine, removing chlorine from said second zone in a fourth stream, and removing cupric oxide from said second bed for reuse as a catalyst to produce cupric chloride, by direct recycling to the first fluidized bed of said cupric oxide removed from the second fluidized bed,

(e) and including recycling said cupric oxide from said second bed to said first bed, and supplying heat to said second bed.

4,994,257

METHOD FOR PURIFYING HIGH-TEMPERATURE REDUCING GAS

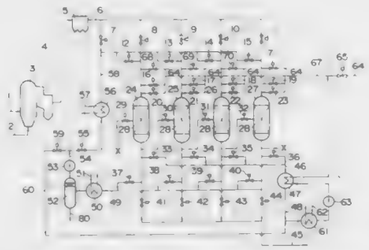
Mitsugi Suehiro, Tokyo; Toshikuni Sera; Kenji Inoue, both of Hiroshima, and Akira Shimada, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1987, Ser. No. 41,868

Claims priority, application Japan, Apr. 24, 1986, 61-93275; Mar. 13, 1987, 62-56776

Int. Cl.[5] **B01D** *53/04;* **C01B** *17/06*

U.S. Cl. 423—577 **2 Claims**



1. In a method for purifying a reducing gas containing sulfur compounds by continuously repeating the steps of reducing a regenerated absorbent with said reducing gas until concentrations of the reducing gases being treated have become uniform on the upstream and downstream sides of said absorbent, and removing sulfur compounds contained in said reducing gas by said absorbent, the improvement which comprises using at least three reactors filled with said absorbent to carry out, in this order, the steps of reduction of the absorbent, absorption of the sulfur compounds from the reducing gas, reduction of SO_2 in an SO_2-containing gas and regeneration of the absorbent, and wherein a gas from the regeneration step is circulated to the SO_2 reduction step to convert SO_2 therein to sulfur and recovering said sulfur as liquid sulfur, and dividing the gas from the SO_2 reduction step which contains residual unconverted SO_2 into two portions and feeding one portion to the absorbent reduction step and feeding the remaining portion to the absorbent regeneration step.

4,994,258

GAMMA EMITTING, CCK-A ANTAGONISTS FOR PANCREATIC IMAGING

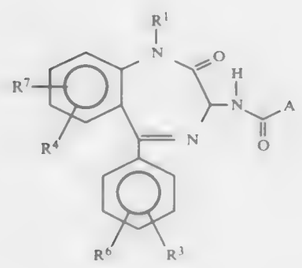
H. Donald Burns, Harleysville; Nancy J. Brenner, Macungie; Raymond E. Gibson, Holland, and Howard F. Solomon, New Hope, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 5, 1990, Ser. No. 488,192

Int. Cl.[5] **A61K** *49/02;* **C07D** *243/24*

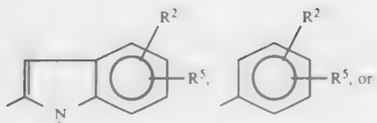
U.S. Cl. 424—1.1 **14 Claims**

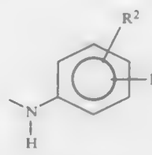
1. A compound of Formula I:



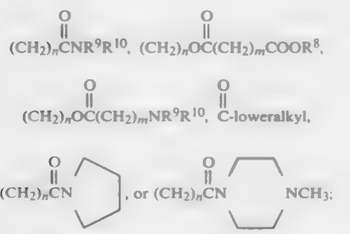
wherein:

A is





R^1 is H, C_1-C_6 linear or branched alkyl, $(CH_2)_nCOOR^8$, $(CH_2)_nOH$, $(CH_2)_nCN$, $(CH_2)_nNR^9R^{10}$,



R^2 is H, —OH, —NO_2, F, Cl, SO_3H, loweralkyl, loweralkoxy, $(CH_2)_pCOOR^8$ or $(CH_2)_pNR^9R^{10}$;

R^3 is H, —OH, —NO_2, CF_3, F, Cl, loweralkyl, or loweralkoxy;

R^4 is H, —OH, —NO_2, CF_3, CN, F, Cl, loweralkyl, loweralkoxy, $(CH_2)_pCOOR^8$ or $(CH_2)_pNR^9R^{10}$;

R^5, R^6 and R^7 are, independently, H or a radionuclide selected from the group consisting of ^{122}I, ^{123}I, ^{125}I, ^{131}I, ^{75}Br, ^{77}Br, ^{82}Br, ^{211}At, with the proviso that at least one of R^5, R^6 and R^7 is not H;

R^8 is H or loweralkyl;

R^9 and R^{10} are, independently, H or loweralkyl;

n is 1–4;

m is 1–2;

p is 0–4;

or pharmaceutically acceptable salt thereof.

4,994,259

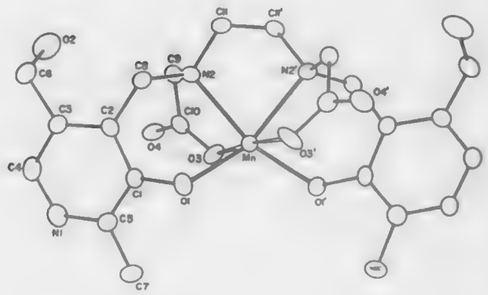
IMPROVEMENT IN THE METHOD OF NMR IMAGING EMPLOYING A MANGANESE II CHELATES OF N,N'-BIS[PYRIDOXAL-ALKYLENE (OR CYCLOALKYLENE) (OR ARYLENE)]-N,N'-DIACETIC ACID DERIVATIVES

Scott M. Rocklage, Saratoga, and Steven C. Quay, Los Altos Hills, both of Calif., assignors to Salutar, Inc., Sunnyvale, Calif.

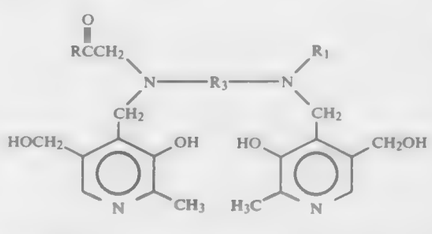
Division of Ser. No. 47,584, May 8, 1987, Pat. No. 4,935,518. This application Jul. 14, 1989, Ser. No. 380,185

Int. Cl.[5] **A61K** *49/00, 31/44;* **G01N** *33/15*

U.S. Cl. 424—9 **12 Claims**



1. An improvement in the method of performing NMR imaging with a patient comprising administering to the patient an effective amount of a manganese(II) chelate of the contrast agent of the formula:



(I)

wherein

R is hydroxy, alkoxy having from 1 to 18 carbons, amino or alkylamido having from 1 to 18 carbons;

R_1 is hydrogen or

R_2 is hydroxy, alkoxy having from 1 to 18 carbons, amino or alkylamido having from 1 to 18 carbons; and

R_3 is alkylene having from 1 to 8 carbons, 1,2-cycloalkylene having from 5 to 8 carbons, or 1,2-arylene having from 6 to 10 carbons, and

the pharmaceutically acceptable water-soluble salts thereof; and thereafter subjecting the patient to NMR imaging.

4,994,260
PHARMACEUTICAL MIXTURE
Anders G. V. Källstrand, Dalby; Kjell J. Mattson, Södertälje, and Rolf I. Sjöqvist, Gnesta, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden
Continuation of Ser. No. 500,618, Jun. 3, 1983, abandoned, and a continuation-in-part of Ser. No. 668,168, Nov. 11, 1984, Pat. No. 4,656,027, which is a continuation-in-part of Ser. No. 383,148, May 25, 1982, abandoned. This application Dec. 30, 1985, Ser. No. 815,125
Claims priority, application Sweden, Jun. 24, 1982, 8203953
Int. Cl.[5] A61K *9/36, 9/62*
U.S. Cl. 424—10 7 Claims

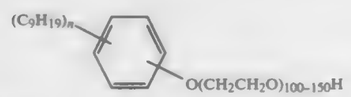
1. A ready-to-use pharmaceutical preparation for controlled release of a pharmaceutically active substance which masks bad taste and increases stability of the pharmaceutically active substance prepared by mixing in an aqueous carrier a pharmaceutically active substance encapsulated in a coating and 60 to 99% by weight of a release controlling substance selected from the group consisting of polysaccharides, oligosaccharides, disaccharides, monosaccharides, polyhydroxy alcohols and mixtures thereof.

4,994,261
PESTICIDE COMPOSITIONS AND METHOD
Herbert B. Scher, Moraga; Marius Rodson, El Cerrito, and Ronald L. Morgan, Daly City, all of Calif., assignors to ICI Americas Inc., Wilmington, Del.
Continuation of Ser. No. 846,183, Mar. 31, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,193
Int. Cl.[5] A01N *57/18*
U.S. Cl. 424—10 12 Claims

1. A granular organophosphorus pesticide composition that has been safened for handling comprising:

(a) from about 1 to about 45 percent by weight of a biologically effective amount of a dermally toxic organophosphorus pesticide compound;

(b) from about 0.1 to about 10 percent by weight of a nonionic surfactant of the formula



wherein n is 1 or 2; and

(c) from about 50 to about 98 percent by weight of a dry inert diluent carrier.

4,994,262
ORAL COMPOSITIONS
Duane L. Charbonneau, Middletown; Mark D. Evans; Lincoln D. Germain, both of Cincinnati, and Martin S. Robin, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 258,257, Oct. 14, 1988, abandoned. This application May 25, 1989, Ser. No. 356,962
Int. Cl.[5] A61K *9/18*
U.S. Cl. 424—52 15 Claims

1. An oral mouthwash or toothpaste composition comprising:

(a) from about 0.02% to about 1.5% of a cationic antimicrobial;

(b) from about 0.01% to about 3% of a benzoate salt;

(c) from about 0.01% to about 5% of a phthalate salt; and

(d) a mouthwash or toothpaste carrier.

4,994,263
MEDICINAL COMBINATION USED IN PHOTOCHEMOTHERAPY
Gerard Lang, Saint Gratien; Andre Deflandre, Orray la Ville, and Irena Beck, Villepinte, all of France, assignors to L'Oreal, Paris, France
Continuation of Ser. No. 625,391, Jun. 28, 1984, abandoned. This application Apr. 30, 1990, Ser. No. 517,520
Claims priority, application Luxembourg, Jun. 27, 1984, 85438
Int. Cl.[5] A61K *7/40, 7/42, 7/44*
U.S. Cl. 424—59 11 Claims

1. A combination for the photochemotherapy treatment of psoriasis, chronic dermatoses, herpes, vitiligo and alopecia, comprising:

a first composition containing a therapeutically effective amount of at least one furocoumarin which is activated by UV-A radiation, wherein said effective amount of said furocoumarin is effective for the treatment of diseases selected from the group consisting of psoriasis, chronic dermatoses, herpes, vitiligo and alopecia and said activated furocoumarin and said UV-A radiation cause phototoxic side effects; and

a second composition containing an effective amount of a benzylidene-camphor or a derivative thereof, wherein said effective amount of said benzylidene-camphor reduces said phototoxic side effects,

wherein said second composition is applied topically to an area of skin of a patient prior to exposure of said area to said UV-A radiation but after said first composition is administered to the patient.

4,994,264
PRESS MOLDED COSMETIC COMPOSITION WITH PAY OFF
Debra Verdon, Leonardo, N.J., and Ivonne Brown, Roosevelt, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Dec. 15, 1989, Ser. No. 451,204
Int. Cl.[5] A61K *7/02, 7/021, 7/035*
U.S. Cl. 424—63 12 Claims

1. A press molded cosmetic composition having good pay-off characteristics and formed from a paste comprising, in weight %,

about 5 to 60% of water,

about 0.1 to 1.0% of one or more hydrocolloid gums,

about 0.01 to 20% of one or more polar solvents other than water,

about 0.2 to 5.0% of one or more wetting agents,

about 0.1 to 10% of one or more powdered lubricants, and

about 10 to 90% of one or more binders.

4,994,265
SHAVING COMPOSITION
Blanca A. White, Athens, Ga., assignor to Aloe Scientific Labs, Chicago, Ill.
Continuation-in-part of Ser. No. 773,432, Sep. 6, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 40,431
Int. Cl.[5] A61K *7/150, 7/450*
U.S. Cl. 424—73 14 Claims

1. A non-aqueous composition for use in shaving comprising at least about 10% by weight of an aloe vera extract or gel, from 0 to about 2% of a cosmetically acceptable a polyhydroxy or other gelling agent, from about 0.5 to about 2% by weight of a cosmetically acceptable neutralizing agent, from about 5 to about 20% by weight of a cosmetically acceptable film forming agent comprising polymers selected from the group of polyquaternium-11, polyvinyl pyrrolidone and polyquaternium-10, from about 1 to 20% by weight of a cosmetically acceptable lubricity agent selected from the group of hydroxyamide salts of acetic and lactic acids, and from 0.2 to 1% of a cosmetically acceptable preservative, said composition being in the form of a gel.

4,994,266
PERFUMERY COMPOSITIONS
Brian L. Wells, Essex, England, assignor to Bush Boake Allen Limited, London, England
Filed Jul. 7, 1989, Ser. No. 376,825
Claims priority, application United Kingdom, Jul. 7, 1988, 8816209.4
Int. Cl.[5] A61L *11/00*
U.S. Cl. 424—76.7 6 Claims

1. A solid toilet rinse block which comprises:

from 0.1 to 15 percent by weight of a fragrance alcohol in the form of a metal complex from which the fragrance alcohol is released upon contact of the complex with water;

from 10 to 65 percent by weight of a surfactant selected from the group consisting of anionic surfactants, non-ionic surfactants and mixtures thereof;

from 2 to 10 percent by weight of a substantially water-insoluble polymeric binder; and

5 to 45 percent by weight of a filler selected from the group consisting of water soluble and water-insoluble materials;

said block being substantially free of water and containing at least 2 percent by weight but below 30 percent by weight of water insoluble ingredients;

whereby when the block is positioned in the bowl of a water-flushing toilet, controlled small amounts of the solid block are dissolved away at each flush, with the result that the metal complex content of the block is exposed gradually to water.

4,994,267
TRANSDERMAL ACRYLIC MULTIPOLYMER DRUG DELIVERY SYSTEM
Steven Sablotsky, Miami, Fla., assignor to Noven Pharmaceuticals, Inc., Miami, Fla.
Continuation-in-part of Ser. No. 164,482, Mar. 4, 1988, Pat. No. 4,814,168. This application Jan. 11, 1989, Ser. No. 295,847
Int. Cl.[5] A61K *31/74*
U.S. Cl. 424—78 14 Claims

1. An adhesive dermal composition comprising a drug, a multipolymer containing vinyl acetate/ethylene polymer and an acrylic polymer, a natural or synthetic rubber, and a tackifying agent in which the ratio by weight of the multipolymer to the rubber is about 1:10 to about 30:1 and the ratio by weight of the vinyl acetate/ethylene polymer to the acrylic polymer is about 20:1 to about 1:20.

4,994,268
PHEROMONE FORMULATION FOR ATTRACTING SPRUCE BEETLES
Helmut Wieser; Elisabeth A. Dixon, both of Calgary; Herbert F. Cerezke, Edmonton, and Alan A. MacKenzie, Calgary, all of Canada, assignors to University of Calgary, Calgary, Canada
Filed Nov. 10, 1988, Ser. No. 269,426
Int. Cl.[5] A01N *25/00*
U.S. Cl. 424—84 10 Claims

1. A method of trapping and tree baiting spruce beetles by applying a chemical composition comprising 1-methyl-2-cyclohexenol in a concentration which is effective to attract said beetles and a spruce beetle attracting enhancing amount of at least one of frontalin and tree-produced semiochemicals to a region frequented by spruce beetles.

4,994,269
TOPICAL USE OF ANTIBODIES FOR PREVENTION OR TREATMENT OF PSEUDOMONAS INFECTIONS
Michael S. Collins, Pinole, and Nirmal S. Mehton, Richmond, both of Calif., assignors to Miles Inc., Elkhart, Ind.
Filed Mar. 17, 1989, Ser. No. 325,329
Int. Cl.[5] A61K *39/00, 39/104*
U.S. Cl. 424—85.8 13 Claims

1. A method of preventing infection of *Pseudomonas aeruginosa* bacteria in a mammal, the method of comprising the topical application of antibodies capable of binding to an antigen of the Pseudomonas aeruginosa bacteria prior to exposure to the bacteria by the mammal, the antibodies being of the IgM or IgG type and the amount of antibodies being sufficient to provide prophylactic protection against the bacteria.

4,994,270
A54145 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION
LaVerne D. Boeck, Indianapolis; David S. Fukuda, Brownsburg; Jon S. Mynderse, Indianapolis; Marvin M. Hoehn, Indianapolis; Ralph E. Kastner, Indianapolis, and Harold R. Papiska, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Apr. 11, 1988, Ser. No. 179,773
Int. Cl.[5] A61K *35/74;* C07K *7/54*
U.S. Cl. 424—118 25 Claims

9. Antibiotic A54145 comprising A54145A and A54145B$_1$, which is produced by submerged aerobic fermentation of a *Streptomyces fradiae* strain selected from NRRL 18158, NRRL 18159 and NRRL 18160 or an A54145-producing mutant thereof.

10. A feed composition for improving growth performance in animals comprising animal feed and an effective amount of antibiotic A54145 of claim 9.

4,994,271
BMY-40800 ANTITUMOR ANTIBIOTICS
Kin S. Lam, Cheshire; Jacqueline Mattei, East Haven; John E. Leet; James A. Matson, both of Cheshire, all of Conn.; Koji Tomita, Tokyo, Japan, and Murray A. Kaplan, Syracuse, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Filed Feb. 16, 1988, Ser. No. 155,778
Int. Cl.[5] C12P *1/06;* H61K *35/74*
U.S. Cl. 424—120 4 Claims

1. The compound BMY-40800 having the following characteristics:

(a) a white crystalline solid containing the elements carbon, hydrogen, oxygen, and nitrogen in approximately the following percentages: C, 58.16; H, 6.94; N, 12.84; and 0 (by difference), 22.26;

(b) an infrared absorption spectrum (KBr) substantially as shown in FIG. 1;

(c) a molecular formula of $C_{72}H_{104}N_{14}O_{20}$;

(d) a 360 MHz proton magnetic resonance spectrum in $CDCl_3$ substantially as shown in FIG. 2;

(e) a 90.5 MHz ^{13}C magnetic resonance spectrum in $CDCl_3$ substantially as shown in FIG. 3;

(f) exhibits an ultraviolet absorption maximum and absorptivity when dissolved in methanol at a concentration of 0.01538 g/l of 286 nm (a=0.2891);

(g) an apparent molecular weight by FAB mass spectrometry of about 1484;

(h) exhibits in silica gel thin layer chromatography an Rf value of 0.35 with the solvent system chloroform methanol (95:5 v/v);

(i) exhibits a high performance liquid chromatography retention time of 15 minutes and a capacity factor K'=8.9 with a C_{18} reversed phase silica gel column and the solvent system acetonitrile : tetrahydrofuran : water (4:1:5 v/v); and

(i) is effective in inhibiting the growth of P388 leukemia in mice.

4,994,272

PROCESS AND APPARATUS FOR FREEING BITTER LUPIN SEED OF BITTER SUBSTANCES THEREIN

Peter Hussmann, Florence, Italy, assignor to Inter-Mittex AG, Switzerland

Continuation of Ser. No. 840,050, Mar. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 482,335, Apr. 4, 1983, Pat. No. 4,576,820. This application Jul. 12, 1989, Ser. No. 403,012

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219245

Int. Cl.[5] A01W *65/00;* A01N *17/08*

U.S. Cl. 424—195.1 18 Claims

1. A dry composition comprising a material which contains bitter substances extractable from bitter lupin seed, said material being a product of a process comprising the steps of:

(a) providing a series of separate extract solutions, each solution of said series having a differing concentration of said bitter substances, said series having at least a highest-, a second highest-, and a lowest-concentration extract solution;

(b) providing a filter medium comprised of a layer of particulate material comprised of bitter lupin seed, which filter medium is contacted by said highest-concentration extract solution in said series;

(c) sequentially contacting said layer with each extract solution of the remaining extract solutions in said series, respectively, in a predetermined order of decreasing concentration of said bitter substances;

(d) after step (c), contacting said layer with pure water;

(e) removing said highest-concentration extract solution from said series, so that said second highest-concentration extract becomes the highest-concentration extract solution in said series;

(f) repeating steps (b) through (e) at least once; and then

(g) drying at least one extarct solution from said series at a temperature such that a dry powder is provided which promotes plant growth, wherein (i) said particulate material is comprised of bitter lupin seed which is reduced to a particle size in the range of about 1 to about 50 microns, (ii) said layer of said particulate material is between about 5 and about 50 mm in thickness, (iii) said highest-concentration extract solution contains a percentage of dry mass between about 10 and 30%, and (iv) said steps (b), (c) and (d) are carried out at a temperature of about 30° C. or less.

4,994,273

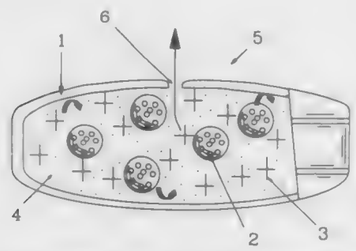
SOLUBILITY MODULATED DRUG DELIVERY DEVICE

Gaylen M. Zentner, Lawrence, and Gregory A. McClelland, Lenexa, both of Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 115,487, Nov. 2, 1987, abandoned. This application Jul. 20, 1989, Ser. No. 384,116

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—422 18 Claims



1. A drug delivery device for the controlled release of a therapeutically active ingredient into an environment of use which comprises:

(A) a core composition comprising

(a) a plurality of controlled release solubility modulating units consisting of solubility modulating agents each of which is either a surfactant or complexing agent, said surfactant being either (i) surrounded by a water insoluble microporous membrane containing at least one pore forming additive dispersed throughout said microporous membrane or (ii) dispersed in a matrix substrate and wherein said complexing agent is selected from the group consisting of: cyclodextrins, polyethylene glycols, polyvinylpyrridone, sodium, carboxymethylcellulose, salicylic acid, sodium salicylate, mandelic acid, sodium mandelate, caffeine, puric acid, quinhydrone, hydroquinone, tetracycline derivatives, 2-hydroxynicotinic acid, 3-hydroxy-3-phenyl propionic acid, phthalic acid, 3-4-dihydroxy cinnamic acid and the corresponding sodium salt; and,

(b) a diffusible water soluble therapeutically active ingredient and

(B) a water insoluble wall surrounding said core composition and prepared from a semi-permeable material substantially impermeable to core composition and permeable to the passage of an external fluid in the environment of use, with said wall having a means for release of the therapeutic agent through the water insoluble wall.

4,994,274

INTRAOCULAR PRESSURE REDUCING 11,15-DIACYL PROSTAGLANDINS AND METHOD OF USING

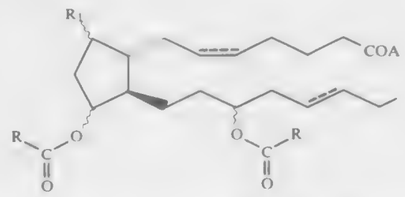
Ming F. Chan, Santa Ana, and David F. Woodward, El Toro, both of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Jul. 27, 1989, Ser. No. 385,645

Int. Cl.[5] A61K *31/22, 31/215, 31/19*

U.S. Cl. 424—427 49 Claims

1. A method of treating ocular hypertension which comprises applying to the eye in an ophthalmically acceptable excipient an amount sufficient to treat ocular hypertension of the compound:



where dashed bonds represent a double bond which can be in the cis or trans configuration, or a single bond; R_1 is —OH or =O; A is —OH, or a pharmaceutically acceptable salt thereof or $—OR_1$ where R_1 is lower alkyl; the two R groups are independently an acyclic hydrocarbon, saturated or unsaturated, having from 1 to 20 carbon atoms, or $—(CH_2)_nR_2$ where n is 0–10 and R_2 is an aliphatic ring or an aromatic ring.

4,994,275

VETERINARY DEVICES

William T. R. Grimshaw, and Andrew J. Weatherley, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

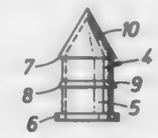
Filed Jun. 26, 1989, Ser. No. 371,479

Claims priority, application United Kingdom, Jul. 5, 1988, 8815968

Int. Cl.[5] A23K *1/18*

U.S. Cl. 424—438 6 Claims

1. A device for oral administration of a medicament to a ruminant animal comprising a trilaminate sheet, said sheet including a core sheet coated on the upper and lower surfaces, but not the edges, with an inert plastic barrier layer, said trilaminate sheet provided with holes and impregnated with the medicament and said sheet capable of slow release of the medicament within the rumen, the sheet being rolled or folded into a tube configuration and constrained in that configuration by an adhesive regenerated cellulose film, characterized in that the ends of the tube formed by the sheet are provided with



closing means comprising physiologically acceptable plastic plugs, said closing means allowing said unrolling or unfolding of the sheet in the rumen and said closing means keeping the tube ends closed during administration of the device to the animal and passage thereof into the rumen.

4,994,276

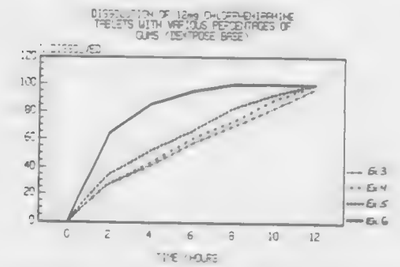
DIRECTLY COMPRESSIBLE SUSTAINED RELEASE EXCIPIENT

Anand R. Baichwal, Poughkeepsie, N.Y., and John N. Staniforth, Bath, England, assignors to Edward Mendell Co., Inc., Patterson, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,368

Int. Cl.[5] A61K *9/16*

U.S. Cl. 424—440 18 Claims



1. A free-flowing, directly compressible slow release granulation for use as a pharmaceutical excipient, comprising

from about 20 to about 60 percent by weight of a hydrophilic material comprising a heteropolysaccharide and a polysaccharide gum capable of cross-linking said heteropolysaccharide in the presence of aqueous solutions, and

from about 40 to about 80 percent by weight of an inert pharmaceutical filler selected from the group consisting of a monosaccharide, a disaccharide, a polyhydric alcohol, and mixtures thereof, the ratio of said inert pharmaceutical filler to said hydrophilic material being from about 4:1 to about 0.67:1.

4,994,277

USE OF XANTHAN GUM FOR PREVENTING ADHESIONS

Paul A. Higham, Ringwood, N.J., and Jessica D. Posey-Dowty, Kingsport, Tenn., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Oct. 31, 1989, Ser. No. 429,891

Int. Cl.[5] A61K *9/08, 9/70, 31/715*

U.S. Cl. 424—443 4 Claims

1. A method of preventing adhesions between vital, tissues comprising the step of placing a viscoelastic gel comprising 1–3 weight percent biodegradable xanthan gum in an aqueous solution, between the tissues.

4,994,278

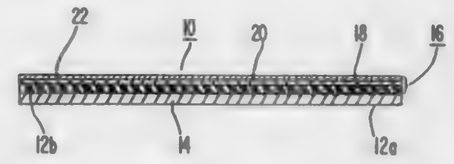
BREATHABLE BACKING

Steven Sablotsky, Miami, and Cheryl M. Gentile, Plantation, both of Fla., assignors to Noven Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 164,482, Mar. 4, 1988, Pat. No. 4,814,168. This application Jan. 11, 1989, Ser. No. 295,788

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—449 8 Claims



1. A composition, which comprises:

a pharmacologically active agent in a transdermal carrier having two surfaces, one surface being adapted for application to the skin and a second surface opposed thereto;

a backing of at least a first layer of a plastic film for said second surface of the carrier, having a thickness from about 0.2 to 3 mils, and having a water vapor transmission rate at 1 mil thickness in excess of about 2 grams per 100 square inches per 24 hours, at 40° C. and 90% relative humidity and an oxygen transmission rate at 1 mil thickness equal to or less than 0.1 cubic centimeters per 100 square inches measured over 24 hours at 1 atmosphere of pressure, at 20° C. and 65% relative humidity, said backing having a first side facing the second surface of the transdermal carrier and a second side opposite thereto.

4,994,279

MULTI-LAYER GRANULE

Shigeru Aoki, Gifu; Keizo Uesugi, Aichi; Shigeru Sakashita; Masayoshi Kasai, both of Gifu, and Masanori Kayano, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 302,646

Claims priority, application Japan, Feb. 3, 1988, 63-23215

Int. Cl.[5] A61K *9/50*

U.S. Cl. 424—494 9 Claims

1. A multi-layered granule comprising an inner slow-release layer containing a pharmacologically effective ingredient and adapted to release said pharmacologically effective ingredient at a first rate; an outer fast-release layer containing a pharmacologically effective ingredient and adapted to release said pharmacologically effective ingredient at a second rate which is greater than said first rate; and an intermediate layer provided between and in contact with said slow-release layer and said fast-release layer, said intermediate layer comprising a hardened oil and a cellulose selected from the group consisting of hydroxypropyl cellulose and methyl cellulose.

4,994,280

IODOPHOR COMPOSITION FOR AQUACULTURE

Lyle J. Kochinsky, 310 SE. 3rd Terr., Dania, Fla. 33004

Filed Jun. 20, 1989, Ser. No. 372,659

Int. Cl.[5] A61K *33/36*

U.S. Cl. 424—672 5 Claims

1. A stable biocidal iodophor liquid solution composition comprising:

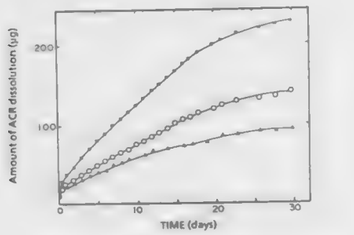
(a) a first iodophor formed from iodomethane and a soluble quaternary ammonium cationic surfactant mixed in a ratio of one part surfactant to about two parts of iodomethane;

(b) a second iodophor formed by heating elemental iodine with a surfactant selected from the group consisting of a

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sulfonate of substantially olefinic fatty acid and alkyl phenoxyl polyether alcohol in a ratio of one part of iodine to between three and eight parts of surfactant;
(c) ethylene glycol alkyl ether;
(d) water;
(e) phosphoric acid sufficient to reduce the pH to below 1.6 and in which there is between 1 and 5 parts by weight of said first iodophor; between 20 and 70 parts by weight of said second iodophor; and between 10 and 25 parts by weight of said ethylene glycol alkyl ether;
wherein said composition, when greatly diluted releases iodine slowly to kill lower life forms including virus, fungi, bacteria and unicellular pathogens while remaining non-toxic to multicellular higher life forms including vetebrates.

4,994,281
POLYLACTIC ACID MICROSPHERES AND PROCESS FOR PRODUCING THE SAME
Shozo Muranishi; Yoshito Ikada; Hiroshi Yoshikawa, and Shokyu Gen, all of Kyoto, Japan, assignors to Sanraku Incorporated, Tokyo and Biomaterials Universe Incorporated, Kyoto, both of, Japan
Filed Nov. 10, 1987, Ser. No. 119,361
Claims priority, application Japan, Nov. 12, 1986, 61-267507
Int. Cl.[5] H61K *9/16*
U.S. Cl. 424—497 5 Claims



Concentration of ACR in polylactic acid: (A) 3%, (O) 5%, (■) 10%

1. A method of enhancing phagocytosis during the controlled sustained release of a physiologically-active substance in a pharmaceutical preparation comprising administering to a host an effective amount of a pharmaceutical preparation comprising spherical microspheres of polylactic acid, said microspheres having entrapped therein said physiologically-active substance, and utilizing said microspheres in a form having an average particle diameter of 1 to 2 μm to enhance phagocytosis as said physiologically-active substance is being released from said microspheres in a sustained manner over time.

4,994,282
SOLID ANIMAL FEED SUPPLEMENT AND METHOD FOR ITS PRODUCTION
Alex E. Miller, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Division of Ser. No. 828,149, Feb. 7, 1986, Pat. No. 4,798,727. This application Oct. 3, 1988, Ser. No. 252,665
Int. Cl.[5] **A23K** *1/00*
U.S. Cl. 426—74 29 Claims

1. A solution comprising:
(a) sugar from a sugar source;
(b) dissolved phosphate ions present in a concentration of at least about 1 weight percent expressed as phosphorous;
(c) dissolved calcium ions; and
(d) dissolved magnesium ions, wherein the weight ratio of the dissolved calcium ions to the dissolved magnesium ions in the solution is about 1.5 to about 3, and the solution is capable of solidifying into a solid acidic feed block supplement.

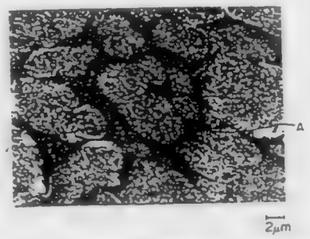
4,994,283
IRON-CALCIUM MINERAL SUPPLEMENTS WITH ENHANCED BIOAVAILABILITY
Haile Mehansho, Fairfield, and Kenneth T. Smith, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 69,359, Jul. 2, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,700
Int. Cl.[5] A23L *1/304*
U.S. Cl. 426—74 6 Claims

1. A composition of matter for conjointly administering iron and calcium to a human or lower animal comprising, a nutritionally supplemental amount of, a mixture of: (i) iron II or iron III mineral source; (ii) a calcium mineral source; (iii) citrate, tartrate, or a combination thereof; (iv) ascorbate; and (v) fructose; wherein said composition has: a fructose to calcium weight ratio of between about 20 and about 160; an ascorbate to iron weight ratio of between about 10 and about 50; and a tartrate to iron weight ratio of between about 200 and about 4,000, or a citrate to iron weight ratio of between about 200 and about 2,000 or a (citrate plus tartrate) weight ratio of from about 200 to about 4,000 wherein the citrate to iron weight ratio is less than about 2,000.

4,994,284
ANIMAL FEED SUPPLEMENT SUSPENSION
Alex E. Miller, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Continuation of Ser. No. 879,595, Jun. 27, 1986, Pat. No. 4,888,185. This application Dec. 7, 1989, Ser. No. 447,542
The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.
Int. Cl.[5] **A23K** *1/00*
U.S. Cl. 426—74 20 Claims

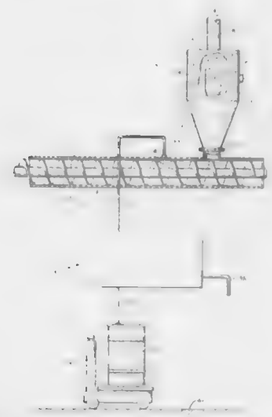
1. An alkaline aqueous suspension for use as an animal feed supplement, the suspension comprising water, calcium phosphate, a nutritious by-product liquor, limestone, a sufficient amount of sodium carbonate to enable the suspension to have a pH greater than 9 and a sufficient amount of a suspending agent to stabilize the suspension, the suspension being capable of remaining fluid upon standing for at least 17 days.

4,994,285
EDIBLE BODY AND PROCESS FOR PREPARATION THEREOF
Jinpei Hisano; Akihiro Goto, both of Ibaraki, and Kunihiko Okajima, Takatsuki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
PCT No. PCT/JP86/00535, § 371 Date Aug. 8, 1988, § 102(e) Date Aug. 8, 1988, PCT Pub. No. WO88/02991, PCT Pub. Date May 5, 1988
PCT Filed Oct. 22, 1986, Ser. No. 243,306
Int. Cl.[5] **A23J** *3/26;* **A23L** *1/534*
U.S. Cl. 426—104 19 Claims



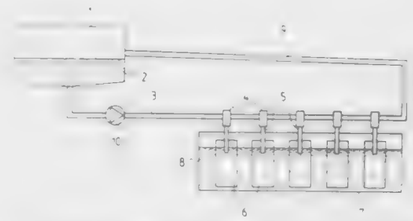
1. An edible body consisting essentially of a structural body comprising a cellulose having a crystal form of cellulose II, which is regenerated from an aqueous solution of an alkali metal hydroxide, and at least one guest component selected from the group consisting of a polypeptide and an edible polysaccharide;
said polypeptide being selected from the group consisting of soybean protein, casein, albumin, globulin and gelatin, their sodium, potassium and calcium salts, and their hydrolyzed products, and said edible polysaccharide being selected from the group consisting of gum arabic, arabinogalactan, alginic acid, gum ghatti, carrageenin, karaya gum, xanthane gum, guar gum, devil's-tongue powder, tamarind gum, tala gum, tragacanth gum, furcellaran, pullulane, pectin, chitin, locust bean gum, xylan, mannan and starches, and sodium, potassium and calcium salts thereof;
wherein the structural body is in the form of islands-in-the-sea and the cellulose II or a homogeneous mixture of the cellulose II and the polysaccharide is present as the sea component or a continuous phase in an amount of at least 10% based on the structural body.

4,994,286
GRAIN CONDITIONING METHOD
David G. Greer, Anoka, Minn., assignor to AgriChem, Inc., Anoka, Minn.
Continuation-in-part of Ser. No. 191,378, May 9, 1988, Pat. No. 4,898,092. This application Jan. 5, 1990, Ser. No. 461,339
Int. Cl.[5] **G01N** *33/00*
U.S. Cl. 426—231 10 Claims



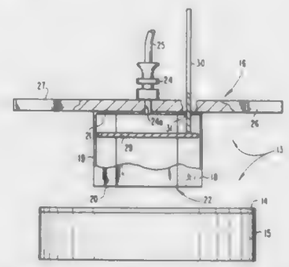
1. A method of conditioning a type of seed grain to stimulate early germination through regulated application of liquid in order to increase the moisture content of the seed grain to an approximate target moisture content, comprising the steps of:
providing a storage container mounted on a frame for holding a supply of seed grain at a first location on the frame prepatory to liquid addition;
continuously moving seed grain from the first location along a path toward a second location on the frame;
providing a moisture sensor on the frame specifically calibrated to measure moisture content of the type of seed grain to be conditioned;
substantially continuously measuring the moisture content of a sample of passing grain with the moisture sensor at a first station on the path of movement of the passing seed grain;
applying liquid comprised as a mixture of water and a surfactant type solution to the passing seed grain at a second station on the path of movement of passing grain downstream from the first station; and
regulating the application rate of liquid to the grain at the second station according to the moisture content of the grain measured at the first station.

4,994,287
METHOD AND APPARATUS FOR FILLING CURD INTO CHEESE MOULDS
Karl-Gustav Granberg, Paippinen, and Lauri Kostiainen, Helsinki, both of Finland, assignors to Hackman-MKT Oy, Helsinki, Finland
Filed Nov. 27, 1989, Ser. No. 441,583
Claims priority, application Finland, Nov. 28, 1988, 885077
Int. Cl.[5] **A23P** *1/00;* **G01N** *33/00*
U.S. Cl. 426—231 7 Claims



1. A method for filling curd (1) into cheese moulds (6), in which method the curd in whey (2) is routed from a cheese vat (1) into a piping manifold (3, 5, 9), which divides the curd into moulds placed in a whey drainage vat (7) for the separation of whey (8), comprising dividing the curd in whey (2) in the piping network from a main flow exiting from the cheese vat (1) into side flows; discharging said side flows into the individual cheese moulds (6); causing the flow exiting the cheese vat to be greater in volume than the total of side flows entering the moulds; and recirculating the excess curd in whey back to the cheese vat.

4,994,288
METHOD FOR MAKING A COMPOSITE CHEESE PRODUCT
Robert C. Graham, III, and Ziba F. Graham, Jr., both of Washington, Ind., assignors to Graham Cheese Corporation, Elnora, Ind.
Filed Jul. 18, 1989, Ser. No. 381,535
Int. Cl.[5] **A23C** *19/00*
U.S. Cl. 426—249 4 Claims



1. A method for making a composite cheese product having an outer form having a first color and an inner plug extending continuously through the outer form defined by a cheese product having a second, variegated color, comprising the steps of:
(1) cutting a first colored cheese product to a desired thickness so as to create a preform having the exterior contour of said outer form;
(2) inserting a plug cutter having the shape of said inner plug into said preform;
(3) withdrawing said plug cutter along with a correspondingly shaped plug from said preform disposed therein;
(4) removing said plug from said plug cutter;
(5) repeating steps (1) through (4) on a second colored

cheese product, thereby creating a second, similarly shaped outer form and plug of variegated color; and

(6) interchanging said plugs and reinserting the interchanged plugs into said preforms of variegated color.

4,994,289

AGING OF ALCOHOLIC BEVERAGES

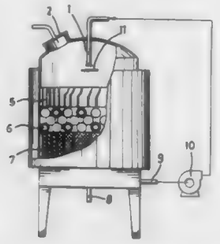
Qi-Hai Yu, 301, 3rd Building, Gangzhongcun, Hefei Iron and Steel Company, Hefei, Anhui Province, China

Continuation-in-part of Ser. No. 238,798, Aug. 30, 1988, abandoned. This application Oct. 18, 1989, Ser. No. 423,179

Claims priority, application China, Aug. 31, 1987, 87105894.4

Int. Cl.[5] C12H *1/22*

U.S. Cl. 426—330.4 16 Claims



1. The method of aging an alcoholic beverage which comprises confining the beverage in a containment vessel having solid interior wall portions of inorganic material exposed to the beverage, such vessel including internal interfacing elements separate from such wall portions and having solid surfaces of inorganic material exposed to the beverage for increasing the surface area of the solid-beverage interface in the containment vessel, without exposing the alcoholic beverage to organic material.

4,994,290

CLARIFICATION METHOD FOR GRAPE MUST, AND THE MUST THUS OBTAINED

Michel Delon, Bordeaux, and René Wajsfelner, Fresnes, both of France, assignors to Degremont, Rueil Malmaison and Chateau Leoville Las Cases, Pauillac, both of, France

Filed Aug. 24, 1989, Ser. No. 398,061

Claims priority, application France, Aug. 30, 1988, 88 11366

Int. Cl.[5] A23L *2/04*

U.S. Cl. 426—330.5 14 Claims

1. A method for clarification and concentration of grape must comprising the steps of drawing must from a source, separating solid and liquid phases of the must, clarifying said liquid phase of said must by flotation, and concentrating said clarified liquid phase of said must by reverse osmosis, whereby there is provided concentrated must.

4,994,291

METHOD FOR THE ULTRAPASTEURIZATION OF LIQUID WHOLE EGG

Kenneth R. Swartzel; Hershell R. Ball, Jr., and Mohammad-Hossein Hamid-Samimi, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation of Ser. No. 311,594, Feb. 16, 1989, which is a continuation of Ser. No. 904,744, Sep. 8, 1986, Pat. No. 4,808,425. This application Jun. 11, 1990, Ser. No. 535,718

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] A23L *3/00*

U.S. Cl. 426—399 21 Claims

1. A method of ultrapasteurizing liquid whole egg, comprising passing the liquid whole egg as a continuous stream through a pasteurizing apparatus, during which the liquid whole egg is heated to a predetermined real temperature, by contacting said liquid whole egg to a heated surface wherein the total thermal treatment received by the liquid whole egg is described by an equivalent temperature and an equivalent time defining a point above the 5% SPL (BATCH) line of FIG. 3, but insufficient to cause coagulation of the liquid whole egg.

4,994,292

PROCESS FOR THE REMOVAL OF ISO-VALERIC ACID FROM VINEGAR

Isao Ito, Kashihara; Kazuo Uenakai, Osaka; Hiroki Matsuda, Nara; Masahiro Mizukami, Yamatokoriyama, and Shinji Tanijiri, Osaka, all of Japan, assignors to Tamanoi Vinegar Co., Ltd., Osaka, Japan

Filed Oct. 6, 1989, Ser. No. 418,302

Int. Cl.[5] C12H *1/04*

U.S. Cl. 426—422 2 Claims

1. A process for the purification of vinegar which comprises contacting vinegar containing iso-valeric acid with a porous, non-ionic cross-linked polystyrene adsorbent to selectively removed iso-valeric acid from the vinegar.

4,994,293

METHOD FOR ROLLING CROISSANT DOUGH PIECES

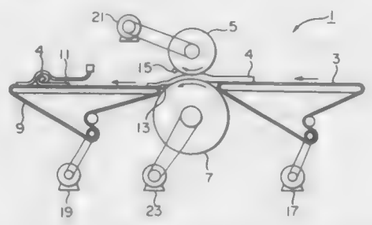
Torahiko Hayashi, Nozawa, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Division of Ser. No. 64,070, Jun. 18, 1987, Pat. No. 4,905,583. This application Nov. 17, 1989, Ser. No. 439,115

Claims priority, application Japan, Jun. 18, 1986, 61-142508; Jul. 15, 1986, 61-165766

Int. Cl.[5] A21D *6/00*

U.S. Cl. 426—501 2 Claims



1. A method for rolling a croissant dough piece comprising the steps of

(a) feeding a triangular dough piece, with the base of the triangle of the dough piece as the leading end and positioned perpendicular to the feeding direction, between a pair of vertically spaced apart rollers while the surface of one of said pair of rollers is maintained to be adhesive to the dough piece,

(b) transferring said dough piece from between said pair of rollers to an endless belt device positioned downstream of said pair of rollers through a transfer roller positioned between said pair of rollers and said endless belt device rotating in the same direction of the movement of the dough piece and faster in its peripheral speed than the peripheral speed of said pair of rollers, and

(c) rolling up said dough piece by a rolling up device positioned on said endless belt device.

4,994,294

TEMPERATURE CONTROLLED FOOD PROCESSING APPARATUS AND METHOD

Bruce Gould, 1516 Sunny Crest Dr., Fullerton, Calif. 92635

Filed Sep. 22, 1989, Ser. No. 410,993

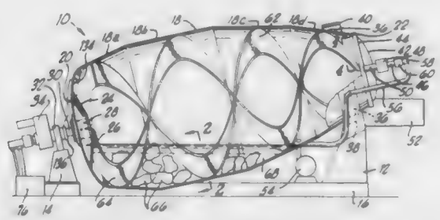
Int. Cl.[5] A23P *1/00;* A22C *5/00*

U.S. Cl. 426—519 7 Claims

2. A method for processing a multiplicity of integral food pieces comprising:

feeding the food pieces into a rotatable container structure having an interior with a fin structure exhibiting a predetermined surface area mounted therein to effect movement of food pieces at least in part along an axis of rotation of the container structure when the container structure is rotated about the axis of rotation;

rotating the container structure about the axis of rotation such that said rotation causes the fin structure to draw the



food pieces into contact with each other and to move the food pieces in substantially continuous fashion throughout the interior of the container structure; and

introducing a temperature-controlling fluid into contact with at least the fin structure to effect heat transfer between the fin structure surface area and the food pieces without direct contact between the food pieces and said temperature-controlling fluid, thereby controlling the temperature of the food processing operation.

4,994,295

CONTROLLED SURFACE BUBBLING FABRICATED SNACK PRODUCTS

David Holm; Veldon M. Hix, both of Idaho Falls, Id., and Miles J. Willard, 299 N. Lloyd Cir., Idaho Falls, Id. 83402, assignors to Miles J. Willard, Idaho Falls, Id.

Continuation of Ser. No. 144,880, Jan. 15, 1988, Pat. No. 4,931,303. This application Aug. 4, 1989, Ser. No. 390,368

Int. Cl.[5] A23B *4/03;* A21D *10/00*

U.S. Cl. 426—549 11 Claims

1. A dough preform comprising:

a. sheeted dough having a thickness from about 0.5–1.5 mm and a total moisture content of at least 30%;

b. said sheeted dough having an inner dough portion; and

c. said sheeted dough having upper and lower dough surface portions surrounding the inner dough portion, said upper and lower dough surface portions having moisture evaporated therefrom resulting in a moisture content substantially lower than the moisture content of the inner dough portion, said upper and lower dough portions having been case hardened by selective removal of moisture therefrom whereby the dough preform when fried produces a chip product having a controlled, predetermined level of surface bubbling.

4,994,296

DEHYDRATED DAIRY PRODUCT AND PROCESS FOR MAKING

Marta Kiniczky, Budapest, and dr Gyongyver Vasarhelyi, Szeutendre, both of Hungary, assignors to Gyogynoveny Kutato Intezet K.V., Budakalasz, Hungary

Filed Jun. 2, 1989, Ser. No. 353,679

Claims priority, application Austria, Sep. 2, 1988, 92240/87; PCT Int'l Appl., Sep. 2, 1988, PCT/HU88/00058

Int. Cl.[5] A23B *4/027;* A23C *3/08*

U.S. Cl. 426—580 13 Claims

1. a preserved alimentary preparation, which comprises a substantially dehydrated mixture of a dairy product with a preservingly effective amount of an alimentarily acceptable, colloidal silica.

4,994,297

METHOD OF USING FAST PYROLYSIS LIQUIDS AS LIQUID SMOKE

Gary Underwood, Manitowoc, Wis., and Robert G. Graham, Nepean, Canada, assignors to Ensyn Engineering Associates, Inc., Ontario, Canada

Division of Ser. No. 119,673, Nov. 12, 1987, Pat. No. 4,876,108. This application May 26, 1989, Ser. No. 358,650

Int. Cl.[5] A23L *1/221*

U.S. Cl. 426—650 14 Claims

1. An aqueous wood smoke solution produced by a process consisting essentially of:

(1) heating wood or cellulose in the absence of oxygen to about 400° C. to 650° C. within 1.0 second;

(2) maintaining said wood or cellulose together with the pyrolysis products produced from said wood or cellulose at about 400° C. to 650° C. for between 0.03 and 2.0 seconds;

(3) reducing the temperature of said pyrolysis products to below 350° C. within 0.6 seconds to give a liquid extract of said pyrolysis products;

(4) separating and collecting said liquid extract; and

(5) diluting said liquid extract with water to achieve a partial phase separation and to obtain an aqueous wood smoke flavored solution having a benzo(a)pyrene concentration of less than 1.0 ppb, a ratio of browning index to phenol concentration greater than 8.9 to 1 and a ratio of hydroxyacetaldehyde to acetol greater than 5.5 to 1.

4,994,298

METHOD OF MAKING A BIOCOMPATIBLE PROSTHESIS

Hirotsugu K. Yasuda, Newburg, Mo., assignor to Biogold Inc., Wilmington, Del.

Continuation of Ser. No. 203,116, Jun. 7, 1988, abandoned. This application Apr. 18, 1990, Ser. No. 512,543

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—41 16 Claims

1. A method of making a biocompatible hollow artifact having perforated walls from a substrate of electro-conductive material which has a surface exposed to a biological environment including living animal tissue or blood, to impart to said material biocompatibility at the site of exposure, comprising:

subjecting said exposed surface of the substrate of said electro-conductive material to exposure to a plasma gas discharge in a plasma zone containing a plasma polymerizable monomeric gas to form a thin flexible coating on said substrate, said exposure being performed for a predetermined period of time and during relative movement between said plasma zone and said substrate, said substrate traveling in and out of the plasma zone under plasma polymerization without disturbing plasma generation.

4,994,299

SUBSTANTIALLY ODOR FREE, UV CURABLE ORGANOPOLYSILOXANE RELEASE COATING COMPOSITIONS AND COATING METHOD

Judith Stein, Schenectady, N.Y., and Tracey M. Leonard, Essex Junction, Vt., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1989, Ser. No. 369,900

Int. Cl.[5] C08G *77/06;* B08D *3/06*

U.S. Cl. 427—54.1 9 Claims

1. A substantially odor-free, UV curable organopolysiloxane controlled release coating composition comprising,

(A) an epoxyhaloarylalkylsiloxane having from about 20 to about 100 condensed siloxy units, where the epoxyhaloarylalkylsiloxane is a member selected from the class consisting of,

(i) an epoxyhaloarylalkylsiloxane consisting of about 76 to about 94 mole % of diorganosiloxy units of the formula,

$(R)_2SiO$,

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from about 5 to about 12 mole % of epoxyorganosiloxy units of the formula,

RR^1SiO,

from about 1 to about 12 mole % of haloarylalkylsiloxy units of the formula,

RR^2SiO,

and the sum of the condensed siloxy units in the epoxyarylalkylsiloxane is 100 mole %, and

(ii) a blend of (i) and epoxysiloxane consisting of about 88 to about 95 mole % of the diorganosiloxy units of (i) and from about 5 to about 12 mole % of the epoxyorganosiloxy units of (i), and the epoxysiloxane of (ii) is utilized in the blend in an amount which is sufficient to maintain about 76 to about 94 mole % of the diorganosiloxy units, about 5 to about 12 mole % of the epoxyorganosiloxy units and from about 1 to about 12 mole % of the haloarylalkylsiloxy units and,

(B) from 0.1% to 1.5% by weight based on the weight of the UV curable organopolysiloxane coating composition of a polyaryloniumhexafluorometalloid salt selected from the class consisting of diaryliodonium salts and triarylsulfonium salts,

where R is a member selected from the same or different $C_{(1-13)}$ monovalent hydrocarbon radicals and $C_{(1-13)}$ monovalent hydrocarbon radicals substituted with radicals inert during condensation, R^1 is a monovalent epoxy functional organic radical and R^2 is a monovalent haloarylalkyl radical.

4,994,300

METHOD OF MAKING A COVER TAPE FOR SEALING CHIP-HOLDING PARTS OF CARRIER TAPE

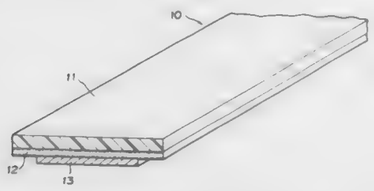
Kazumi Itou; Kazuyoshi Ebe, and Toshio Minagawa, all of Saitama, Japan, assignors to Lintec Corporation, Tokyo, Japan

Division of Ser. No. 224,016, Jul. 25, 1988. This application Dec. 7, 1989, Ser. No. 447,440

Claims priority, application Japan, Jul. 24, 1987, 62-184985; Jul. 24, 1987, 62-184986

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—54.1 **7 Claims**



1. A process for the preparation of a cover tape for sealing chips in chip-holding parts of a carrier tape having said parts provided intermittently and longitudinally of said carrier tape, which process comprises: forming an adhesive layer on only one surface of a base tape; and pattern-printing a non-adhesive layer containing oxidation-curable ink on said adhesive layer centrally along the longitudinal direction of said base tape so that said non-adhesive layer has a width greater than that of the chips and less than that of said adhesive layer.

4,994,301

ACVD (CHEMICAL VAPOR DEPOSITION) METHOD FOR SELECTIVELY DEPOSITING METAL ON A SUBSTRATE

Yoshiro Kusumoto; Kazuo Takakuwa; Tetsuya Ikuta; Akitoshi Suzuki, and Izumi Nakayama, all of Kanagawa, Japan, assignors to Nihon Sinku Gijutsu Kabusiki Kaisha, Kanagawa, Japan

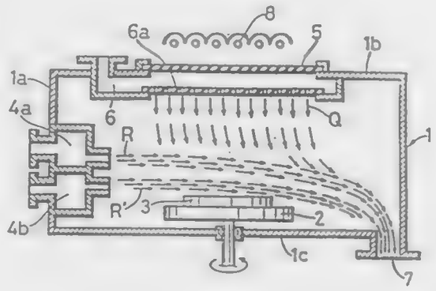
Filed Jun. 30, 1987, Ser. No. 68,644

Claims priority, application Japan, Jun. 30, 1986, 61-152921; Jul. 18, 1986, 61-170335; Jul. 19, 1986, 61-170280

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] B05D *3/06, 5/12;* **C23C** *16/00*

U.S. Cl. 427—56.1 **24 Claims**



1. A CVD (Chemical Vapor Deposition) method for selectively depositing metal on a substrate comprising the steps of:

(A) holding a wafer on a wafer holder in a reaction chamber to be put under a reduced pressure; at least one via hole or contact hole being made in an insulating film formed on a substrate of said wafer and a first metallic film being formed in said via hole or contact hole; and

(B) introducing a gas containing a metallic element and a reduction gas into said reaction chamber under the reduced pressure and directing light of a heating lamp onto said wafer so that some temperature difference is made between said insulating film and said first metallic film, utilizing some difference of absorption ratios of infrared components of said light among said insulating film, said substrate, and said first metallic film such that a chemical reaction is effected only on said first metallic film whereby a second metallic film of said metallic element is formed only on said first metallic film and said insulating film and said substrate are unaffected by said introduced gas containing said metallic element and said reduction gas.

16. A CVD method for selectively depositing metal on a substrate comprising the steps of:

(A) holding a wafer on a wafer holder in a reaction chamber to be put under a reduced pressure, at least one via hole or contact hole being made in an insulating film formed on a substrate of said wafer and a first metallic film being formed in said via hole or contact hole; and

(B) introducing a gas containing a metallic element and a reduction gas in flat or sheet form substantially parallel to the surface of said wafer into said reaction chamber under the reduced pressure, introducing an inert gas or a second gas containing mainly inert gas towards the surface of said wafer and heating said wafer whereby a second metallic film of said metal element is formed on said first metallic film.

4,994,302

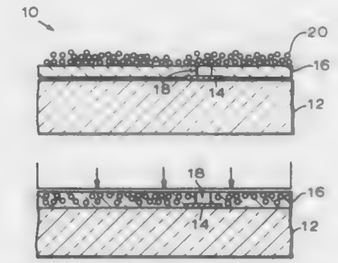
METHOD OF MANUFACTURING THICK-FILM DEVICES

David Kellerman, Littleton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 27, 1989, Ser. No. 372,059

Int. Cl.[5] B05D *5/12;* **C04B** *33/34*

U.S. Cl. 427—96 **14 Claims**



1. A method of fabricating a multilayer ceramic device comprising the steps of:

A. providing a ceramic substrate;

B. applying a metal layer to the substrate;

C. separately applying to the ceramic substrate over the metal layer (i) a green ceramic tape and (ii) a layer of hollow microspheres; and

D. firing the resultant structure.

4,994,303

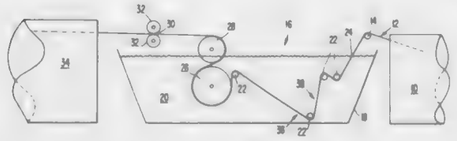
FIBER IMPREGNATION PROCESS

Richard W. Calkins, Palmyra, N.Y., assignor to Garlock, Inc., Palmyra, N.Y.

Filed Mar. 21, 1988, Ser. No. 171,116

Int. Cl.[5] B05D *1/18, 3/02, 3/12*

U.S. Cl. 427—173 **14 Claims**



1. A process for producing a fibrous non-asbestos packing material capable of withstanding high concentrations of caustic chemicals including the steps of

a. providing a supply of noncaustic resistant yarn in the form of a single continuous strand, said strand being formed of a plurality of fiber bodies;

b. placing said yarn strand under tension;

c. subjecting said tensioned yarn strand to a plurality of spaced spreader means, thereby gradually changing the configuration of said yarn strand from a substantially round bundle to a substantially flat linear array of spaced fiber bodies;

d. simultaneously with step c directing said tensioned and spread yarn fiber bodies through a highly alkaline colloidal solution of an inherently caustic resistant material so that each said fiber body is completely contacted and wet by said solution;

e. subjecting said tensioned wet fiber array to pressure and heat to remove the excess solution and dry said fiber array; and

f. relaxing the tension on said fiber array and condensing said fiber array to the configuration of said yarn strand of step a.

4,994,304

METHOD OF HARDENING

Joseph S. Yudelson, and Joseph A. Verdone, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 7, 1990, Ser. No. 476,230

Int. Cl.[5] H01F *10/02*

U.S. Cl. 427—127 **4 Claims**

1. A method of increasing the hardness of polyurethane medium containing a polyisocyanate by pacing said polyurethane medium in an atmosphere comprising an aldehyde and an acid.

4,994,305

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM

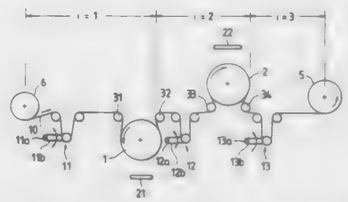
Fusao Yamanaka; makoto Nagao, and Kazuhiko Morita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Mar. 3, 1989, Ser. No. 318,408

Claims priority, application Japan, Mar. 4, 1988, 63-49810

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—132 **4 Claims**



1. A method for producing a magnetic recording medium in which a flexible nonmagnetic support is moved continuously while being kept in contact with a plurality of spaced cylindrical cans to form thin films of metal on said support successively at portions were said support is in contact with said cylindrical cans, wherein the improvement comprises: adjusting the tension of said support with respect to the Young's modulus of said support in each of a plurality n of support conveyance sections which are defined by said spaced apart cylindrical cans, to satisfy the relations:

$$5.0\times10^{-4}<T_i/Y_i<3.0\times10^{-3} \quad (1)$$

$$-7.0\times10^{-4}<\Delta(T_i/Y_i)<7.0\times10^{-4} \quad (2)$$

in which $\Delta(T_i/Y_i)=T_i/Y_i-T_{i-1}/Y_{i-1}$, T_i is the tension per unit of cross-sectional area of a one of said support conveyance sections in a sequential position i among said n support conveyance sections in a forward direction of support conveyance, and Y_i is the Young's modulus of said one of said support conveyance sections in said sequential position i on which T_i acts, where $i=1, 2, \ldots n$.

4,994,306

METHOD FOR APPLYING PLURAL LIQUIDS TO CONTINUOUSLY MOVING NONMAGNETIC CARRIER

Shinsuke Takahashi; Norio Shibata, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Shigara, Japan

Filed Mar. 12, 1990, Ser. No. 492,011

Claims priority, application Japan, Mar. 13, 1989, 1-60394

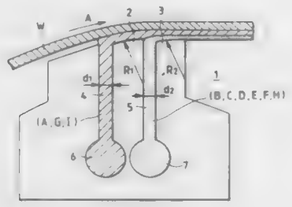
Int. Cl.[5] H01F *10/02;* **B05D** *5/12*

U.S. Cl. 427—131 **2 Claims**

1. In a method in which a plurality of liquids containing organic solvents are simultaneously applied to a continuously moving nonmagnetic carrier by a common application head of the extrusion type having a plurality of extrusion slots and liquid pockets communicating with said slots, one of said liq-

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uids containing a magnetic liquid and being a non-Newtonian fluid, whereby mutually stacked layers are made of said liquids on said carrier to manufacture a magnetic recording medium,



the improvement wherein a difference between the viscosities of said liquids when said liquids pass through said slots of said head for application to said carrier to form at least mutually adjacent ones of said layers is set at 50 cp or less.

4,994,307

PERMANENT FOGGING SYSTEM FOR GAS MAINS

Andrew Price, Southampton, and Terrence R. Baldwin, Romsey, both of England, assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Jun. 26, 1989, Ser. No. 370,976
Int. Cl.[5] B05D *1/02*
U.S. Cl. 427—236 10 Claims

1. A method of sealing leaks in a gas main or pipeline which comprises spraying or applying in the form of a fog or mist to said gas main or said pipeline, a permanent fogging or misting composition comprising up to about 50% by weight of a free radical polymerizable acrylic or substituted acrylic monomer of the formula:



$$(CH_2{=}C(R)-COO)_m R_n^1$$

where R is H or CH_3, R^1 is a mono- or polyvalent organic group, m is an integer of 1 or more depending on the nature of the R^1 group and n is an integer of 1 or more, a carrier which is compatible and non-reactive with the free radical monomer, is capable of swelling yarn or seals in other type joints and has a viscosity which permits the composition to be applied as a fog or mist, and an effective amount of a free radical initiator.

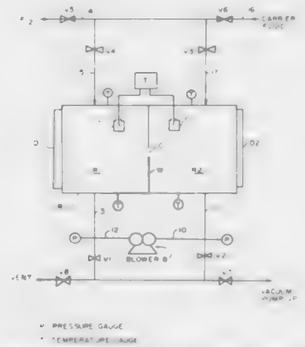
4,994,308

DIRECT FLUORINATION OF POLYMERIC MATERIALS BY USING DIOXIFLUORINE FLUID (MIXTURE OF CO_2 AND F_2)

Gregorio Tarancon, Woodbridge, N.J., assignor to Tarancon Corporation, Lake City, Ga.

Filed May 31, 1988, Ser. No. 200,353
Int. Cl.[5] C23C *18/20, 16/00*
U.S. Cl. 427—255.1 5 Claims

1. In a gas-phase process for treating solid polymeric materials with elemental fluorine to cause a chemical reaction between the fluorine and polymeric material, wherein the polymeric material is placed in a sealed reaction chamber, and wherein fluorine is supplied to the reaction chamber, and wherein a carrier fluid is supplied to the reaction chamber, either separately or as recombined mixture with fluorine, and wherein a reaction is allowed to take place in the reaction chamber to fluorinate said polymeric materials with said mixture of fluorine and carrier fluid, the improvement comprising the step of supplying gaseous carbon dioxide to said reaction chamber as said carrier fluid so that a gaseous mixture of carbon dioxide and fluorine treats the polymeric materials, with the percentage of fluorine to carbon dioxide by volume in the



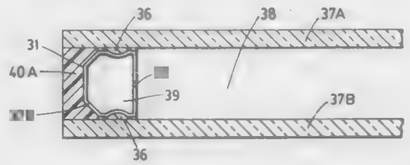
reaction chamber being in the range of from 2% to 20% for the reaction.

4,994,309

INSULATING MULTIPLE LAYER SEALED UNITS AND INSULATING

Gerhard Reichert, and Michael Glover, both of Ottawa, Canada, assignors to Lauren Manufacturing Company, New Philadelphia, Ohio

Continuation of Ser. No. 132,557, Dec. 14, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 386,026
Int. Cl.[5] E06B *3/24*
U.S. Cl. 428—34 12 Claims



1. An insulating spacer for interposition between at least first and second glazing layers of a multiple-pane sealed unit, which spacer is of a high draw ratio oriented thermoplastic polymeric material which is more highly molecularly oriented in the direction of the length thereof and which is free of reinforcing fibers, said material having a lower thermal conductivity in the direction between said first and second glazing layers than a material which does not have such a high draw ratio, being sufficiently highly drawn for having a coefficient of thermal expansion in the direction of the length of said spacer which substantially matches the thermal coefficient of expansion of said glazing layers, having dead-bend properties, having stiffness and rigidity sufficient to make a frame around the sealed unit self supporting, having ultra-violet resistance, and having moisture vapor and gas permeability less than said material which does not have such a high draw ratio.

9. A multilayered glazing unit comprising an insulating spacer interpositioned between at least first and second glazing layers, which spacer is of a high draw ratio oriented thermoplastic polymeric material which is more highly molecularly oriented in the direction of the length thereof and which is free of reinforcing fibers, said material having a lower thermal conductivity in the direction between said first and second glazing layers than a material which does not have such a high draw ratio, being sufficiently highly drawn for having a coefficient of the thermal expansion in the direction of the length of said spacer which substantially matches the thermal coefficient of expansion of said glazing layers, having dead-bend properties, having stiffness and rigidity sufficient to making a frame around the sealed unit self supporting, having ultra-violet resistance, and having moisture vapor and gas permeability less than said material which does not have such a high draw ratio.

4,994,310

FLEXIBLE PACKING LAMINATE IN THE FORM OF SHEETS OR OF A WEB, A METHOD FOR THE MANUFACTURE OF THE LAMINATE AND PACKING CONTAINERS MANUFACTURED FROM THE LAMINATE

Peter Friak, Malmö , and Lars Löfgren, Staffanstorp, both of Sweden, assignors to Roby Teknik Aktiebolag, Lund, Sweden

Filed Nov. 30, 1988, Ser. No. 277,809
Claims priority, application Sweden, Dec. 1, 1987, 8704789
Int. Cl.[5] B65D *1/00;* B32B *15/08*
U.S. Cl. 428—34.2 9 Claims



1. A packing laminate for packing containers comprising,
a rigid and foldable carrier layer,
a gas-tight metal foil layer disposed on one side of said carrier layer, and
an ethylvinyl alcohol layer produced through extrusion disposed between said carrier layer and said metal foil layer, said ethylvinyl alcohol layer attached directly to the metal foil.

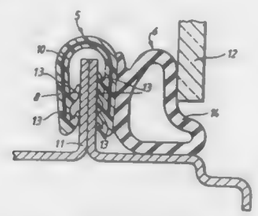
2. A packing container manufactured from a packing laminate according to claim 1.

4,994,311

TRIMMING SEALING AND FINISHING STRIPS

Bernd Junker, Viersen, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Jul. 17, 1989, Ser. No. 380,869
Claims priority, application United Kingdom, Jul. 18, 1988, [illegible]
Int. Cl.[5] E06B *7/16*
U.S. Cl. 428—122 6 Claims



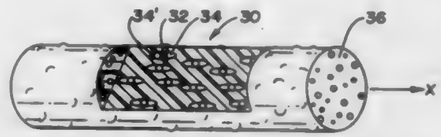
1. A strip having a surface of plastics or rubber material carrying further material applied to the surface by sintering, the sintered material being selected from one of the group consisting of a powdery thermoplast, a semi-cross-linked powdery product, and a cross-linked powdery elastomer.

4,994,312

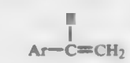
SHAPED ARTICLES FROM ORIENTABLE POLYMERS AND POLYMER MICROBEADS

Larry K. Maier; Elizabeth K. Priebe, both of Rochester; Jong S. Lee, Pittsford; Paul E. Woodgate, Spencerport, all of N.Y., and Glen C. Smith, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1989, Ser. No. 457,894
Int. Cl.[5] B32B *3/26, 5/16;* D02G *3/00*
U.S. Cl. 428—36.5 17 Claims

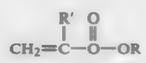


1. A shaped article selected from the group comprising films, sheets, bottles, tubes, fibers and rods wherein said article comprises a continuous oriented polymer phase selected from the group comprising polyesters and polypropylene having dispersed therein microbeads of a cross-linked polymer coated with a slop agent and which are at least partially bordered by void space, said microbeads being present in an amount of about 5–50% by weight based on the weight of said oriented polymer, said void space occupying about 2–60% by volume of said shaped article wherein said cross-linked polymer comprises polymerizable organic material which is a member selected from the group consisting of an alkenyl aromatic compound having the general formula



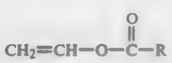
$$Ar{-}C(R){=}CH_2$$

wherein Ar represents an aromatic hydrocarbon radical, or an aromatic halohydracarbon radical of the benzene series and R is hydrogen or the methyl radical; acrylate-type monomers include monomers of the formula



$$CH_2{=}C(R')-C(=O)-O-OR$$

wherein R is selected from the group consisting of hydrogen and an alkyl radical containing from about 1 to 12 carbon atoms and R' is selected from he group consisting of hydrogen and methyl; copolymers of vinyl chloride and vinylidene chloride, acrylonitrile and vinyl chloride, vinyl bromide, vinyl esters having the formula



$$CH_2{=}CH-O-C(=O)-R$$

wherein R is an alkyl radical containing from 2 to 18 carbon atoms; acrylic acid, methacrylic acid, itaconic acid, citraconic acid, maleic acid, fumaric acid, oleic acid, vinylbenzoic acid; the synthetic polyester resins which are prepared by reacting terephthalic acid and dialkyl terephthalics or ester-forming derivatives thereof, with a glycol of the series $HO(CH_2)_nOH$, wherein n is a whole number within the range of 2–10 and having reactive olefinic linkages within the polymer molecule, the hereinabove described polyesters which include copolymerized therein up to 20 percent by weight of a second acid or ester thereof having reactive olefinic unsaturation and mixtures thereof, and a cross-linking agent selected from the group consisting of divinylbenzene, diethylene glycol dimethacrylate, oiallyl fumarate, diallyl phthalate and mixtures thereof.

4,994,313

PARISON AND BLOW-MOLDED CONTAINER AND PROCESSES FOR PRODUCTION THEREOF

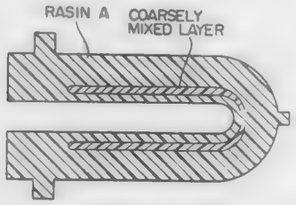
Senzo Shimizu, Odawara; Yoshiaki Momose, Hadano; Yozo Yoshida, and Takao Ohta, both of Hiratsuka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 150,372, Jan. 29, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 394,292

Claims priority, application Japan, Feb. 6, 1987, 62-24768; Nov. 27, 1987, 62-297759

Int. Cl.[5] B65D *1/00*

U.S. Cl. 428—36.7 16 Claims



1. A parison, as a precursor of a container, formed by using an injection-molding machine, comprising

an open end part of a mouth portion composed of a thermoplastic resin (resin A), and

parts other than the open end part of the mouth portion comprising an inside surface layer and an outside surface layer which are composed of the resin A, and an interlayer located between the inside surface layer and the outside surface layer, said interlayer being composed of the resin A and another thermoplastic resin having superior gas-barrier properties (resin B) with respect to resin A,

said interlayer having a multi-layered structure comprising thin layers of the resin A and thin layers of the resin B laminated alternately in the radial direction of the parison wherein part of said thin layers of the resin A and part of said thin layers of the resin B are discontinues in the circumferential direction and/or the axial direction of the parison, and being formed by injecting the resin A and the resin B through a static mixing-stirring device, which is provided in a nozzle portion of an injection cylinder, or in a mold, or in a resin flow passage between the nozzle portion of the injection cylinder and the mold, so that flows of the resin A and the resin B are divided in a plurality of thin layers of the resin A and thin layers of the resin B parallel to the flowing direction thereof.

4,994,314

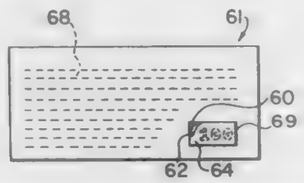
COLOR CHANGE DEVICES INCORPORATING THIN ANODIC FILMS

Aron M. Rosenfeld, and Paul Smits, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Feb. 3, 1989, Ser. No. 306,766

Int. Cl.[5] C25D *11/04*; B65D *85/00*

U.S. Cl. 428—36.92 37 Claims



1. A container comprising an opening and an element closing said opening, said container incorporating a color change device which comprises:

a layer of a metal capable of generating a color by a light interference and absorption phenomenon when directly and intimately contacted with an optically thin film of light-transmitting material; and

an optically thin film of light-transmitting material comprising anodic aluminum oxide directly and intimately contacting said metal capable of generating a color;

said optically thin film being detachable from said layer of metal capable of generating a color in areas of said device where a color change is desired; said color change device being visible from outside said container and being operatively associated with said element in such a way that removal or penetration of said element causes detachment of said thin film from said layer of metal capable of generating a color, at least in limited areas of said device, thus causing said color change device to undergo a visible color change.

4,994,315

PREFABRICATED PANE OR WINDSHIELD FOR A VEHICLE

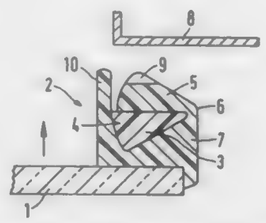
Herbert Schreiber, Wollerau, and Wolfgang Sauer, Buttikon, both of Switzerland, assignors to Gurit-Essex AG, Switzerland

Filed Jul. 7, 1989, Ser. No. 377,233

Claims priority, application Switzerland, Jul. 15, 1988, 2720/88

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—76 57 Claims



1. A prefabricated pane or windshield for a vehicle adapted to be directly mounted into a frame, a flange or the like of the vehicle, the pane or windshield comprising:

a first profiled bead of adhesive material applied to the inner surface of the pane or windshield along its edges which is elastically but not plastically deformable;

a second bead of adhesive material applied to said first profiled bead of adhesive material, said second bead of adhesive material consisting of a material which is chemically compatible with said first profiled bead of adhesive material and being plastically deformable or, if appropriate, activatable;

said first profiled bead of adhesive material comprising a hollow chamber which is essentially closed and said second bead of adhesive material being located in the interior of said hollow chamber; and

means movable into said hollow chamber upon insertion of the pane or windshield into said frame, flange or the like for squeezing said second bead of adhesive material contained in said hollow chamber at least partially out of said hollow chamber.

4,994,316

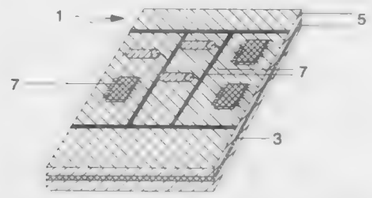
CIRCUIT BOARDS

James M. Browne, Pleasant Hill, and James J. Jarvis, Martinez, both of Calif., assignors to The Dexter Corporation, Pittsburg, Calif.

Filed Jul. 18, 1989, Ser. No. 381,753

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—209 4 Claims



1. An article of manufacture comprising a circuit board construction which comprises a composite of a electronic circuit provided on a dielectric article in which the dielectric article contains a multilayer laminate structure provided with one or more uniform layers of a syntactic film having a thickness ranging from about 0.007 to about 0.125 inch.

4,994,317

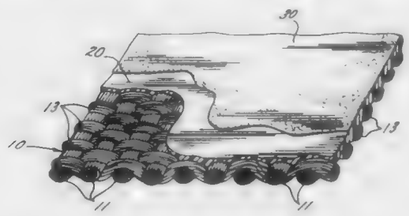
FLAME DURABLE FIRE BARRIER FABRIC

Jeffrey S. Dugan, Charlotte, N.C.; Thomas W. Tolbert, Fort Mill, and James E. Hendrix, Spartanburg, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Dec. 21, 1988, Ser. No. 287,385

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—246 25 Claims



1. A fire-resistant fabric suitable for use as a flame barrier comprising a flame durable textile fabric substrate, a flexible silicone polymer layer which stays intact and maintains its integrity on exposure to a flame and which is carried by the surface of the textile fabric substrate, and a reflective flame durable paint coating carried by said silicone polymer layer.

4,994,318

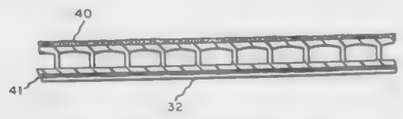
THERMOPLASTIC SUBSTRATES HAVING IMPROVED WATER SPREADING CHARACTERISTICS

Gautam A. Patel, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 17, 1989, Ser. No. 297,276

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—331 12 Claims



1. A substantially transparent thermoplastic substrate exhibiting improved water wetting and water spreading characteristics resulting from the treatment of the thermoplastic substrate by coating with a solvent blend composition having from 1% to 10% by weight of solids, allowing the treated substrate to air dry followed by heat drying the substrate at a temperature in the range of 90° C. to 130° C., where the solids in the solvent blend composition consists essentially of by weight from 3 to 50 parts of polymethylmethacrylate, per 100 parts of a colloidal inorganic oxide.

4,994,319

MEMBER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Kazuo Nojima, and Yasuo Hirano, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,868

Claims priority, application Japan, May 30, 1987, 62-1334438; Nov. 9, 1987, 62-283855

Int. Cl.[5] B32B *27/08*; G036 *13/06*

U.S. Cl. 428—335 4 Claims



1. A member for developing electrostatic latent images to visible images, comprising a support, a first coating layer comprising an elastic material formed on said support, and a second coating layer comprising an electroconductive material and a flexible resin having an elongation ration of 10% to 500% formed on said first coating layer, said flexible resin being a resin prepared by cross-linking a fluorine-containing copolymer comprising a fluoro-olefin and a hydroxyl-group containing vinyl ether through a polyfunctional isocyanante, wherein said first and second coating layers have a volume resistivity of 10^6 to 10^{11} Ω-cm, and wherein said elastic material of said first coating layer comprises as a base material a material selected from the group consisting of nitrile rubber, epichlorohydrin rubber, urethane resin, silicone resin, and mixtures thereof.

4,994,320

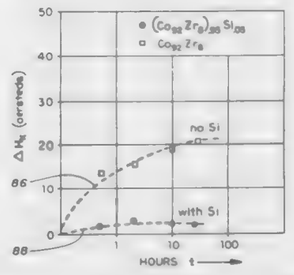
THIN MAGNETIC FILM HAVING LONG TERM STABILIZED UNIAXIAL ANISOTROPY

Tomasz M. Jagielinski, Encinitas, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1988, Ser. No. 203,953

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—336 5 Claims



5. In a magnetoresistive head utilizing soft adjacent layer biasing, the improvement comprising:

a. an amorphous magnetic film having an atomic percentage of Co between 75–95%, and atomic percentage of Si greater than 0.5% and less than 5%, and an atomic percentage of one of the elements Zr, Nb, Mo, Ta, Ru, Rh,

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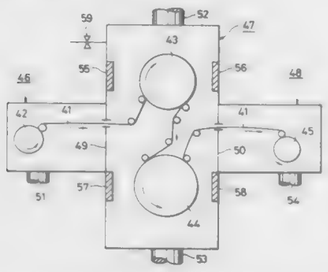
Pd, Hf, Ti, W, Re, Os, Ir, equal to 100% minus the sum of the atomic percentage of Co and the atomic percentage of Si,
b. said film having a thickness of 200 to 1000 angstroms,
c. a cladding layer of SiO2 sputter deposited to said film, and
d. said film having a uniaxial anisotropy field of a magnitude substantially constant at temperatures below the crystallization temperature of said film.

4,994,321

PERPENDICULAR MAGNETIC RECORDING MEDIUM AND THE METHOD FOR PREPARING THE SAME

Makoto Nagao; Kunihiko Sano; Fusao Yamanaka, and Akira Nahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 7,163, Jan. 27, 1987, abandoned. This application Apr. 5, 1990, Ser. No. 506,493
Claims priority, application Japan, Jan. 24, 1986, 61-12100; Jan. 24, 1986, 61-12101
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—336 **2 Claims**



1. In a perpendicular magnetic recording disk comprising a non-magnetic base having on at least one surface thereof, a magnetic layer having perpendicular anisotropy and an overlying protective layer; the improvement wherein the surface of said magnetic layer is plasma treated; and wherein the perpendicular magnetic layer has a thickness in a range of from 0.03 to 5 μm and is comprised of an alloy mainly composed of Co-Cr and wherein the protective layer is made of carbon and said layer is formed by a sputtering method and has a thickness of from 0.002 μm to 0.1 μm.

4,994,322

PRESSURE-SENSITIVE ADHESIVE COMPRISING HOLLOW TACKY MICROSPHERES AND MACROMONOMER-CONTAINING BINDER COPOLYMER

Joaquin Delgado; Roger W. Leinen, and Spencer F. Silver, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Sep. 18, 1989, Ser. No. 407,092
Int. Cl.[5] C08J *9/236, 9/32*
U.S. Cl. 428—343 **16 Claims**

1. A repositionable pressure-sensitive adhesive comprising from about 70% to about 99% of:
(a) hollow, polymeric, acrylate, inherently tacky, infusible, solvent-insoluble, solvent-dispersible, elastomeric microspheres comprising at least one alkyl acrylate or alkyl methacrylate ester, a majority of the microspheres having one or more interior voids having a diameter of at least about 10% of the diameter of the microsphere; and
(b) correspondingly, from about 30% to about 1% of a binder copolymer comprising an elastomeric polymeric backbone having pendant therefrom polymeric moieties, said backbone containing repeating A and C monomers and from about 1% to about 20% B monomers, wherein
A is a monomeric acrylic or methacrylic acid ester of a non-tertiary alcohol, said alcohol having from 1 to 14 carbon atoms, with the average number of carbon atoms being about 4–12, said A monomer comprising from about 50% to about 98% of said monomers;
B is a polar monomer copolymerizable with said monomeric acrylic acid ester;
C is a monomer having the general formula $X-(Y)_n-Z$, wherein X is a vinyl group copolymerizable with said A and B monomers,
Y is a divalent linking group, where n is zero or 1, and
Z is a monovalent polymeric moiety having a T_g greater than 20° C., and a molecular weight in the range of about 2,000 to about 30,000, and being essentially unreactive under copolymerization conditions, C comprising
from about 1% to about 30% of said monomers, wherein said binder copolymer has a shear storage modulus of at least about 1×10^5 Pascals at 3 Hz, and 22° C.

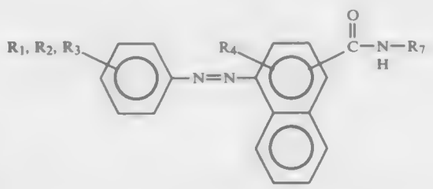
4,994,323

COLORED ARAMID FIBERS

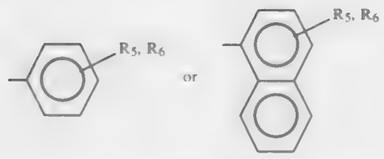
Kiu-Seung Lee, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1988, Ser. No. 226,645
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—372 **13 Claims**

1. Colored, high strength, high modulus p-aramid fibers characterized in that they exhibit a filament tenacity of at least 18 gpd and a filament initial modulus of at least 400 gpd and contain 0.01 to 6% by weight of a completely organic pigment selected from the group consisting of (1) monoazo and disazo pigments having the structure



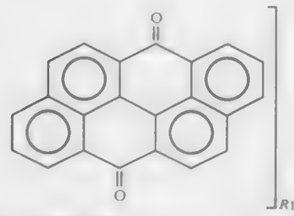
wherein R_1, R_2 and R_3 are chloro, nitro, methyl, methoxy, or hydrogen, R_4 is hydroxy, and R_7 is



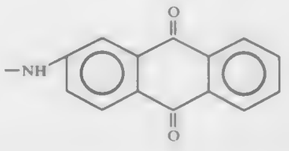
wherein R_5 and R_6 are hydrogen, methyl, or chloro, (2) anthanthrone pigments having the structure



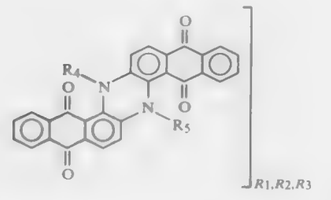
wherein R_1, R_2, and R_3 are —H, —Cl, —Br, —OHC_2, —OC_2H_5,



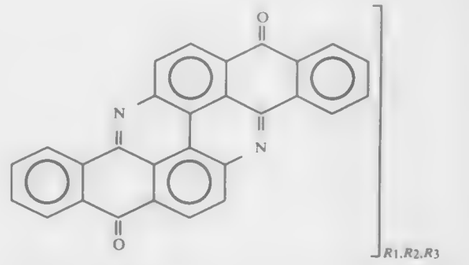
wherein R_1, R_2 and R_3 are —H, —Cl, or —Br, (3) indanthrone pigments having the structure



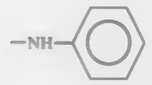
or a fused aromatic group, (6) flavanthrone pigments having the structure



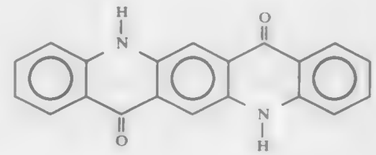
wherein R_1, R_2 and R_3 are —H, —OH, —Cl, —Br, —NH_2,



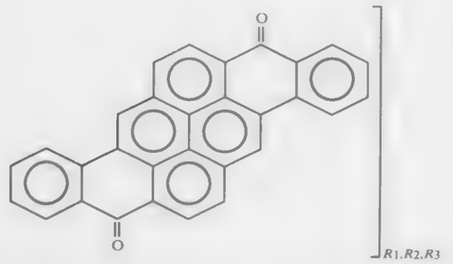
wherein R_1, R_2 and R_3 are —H, —Cl, —Br, —OH, an aromatic group or a fused aromatic group, (7) quinacridone pigments having the structure



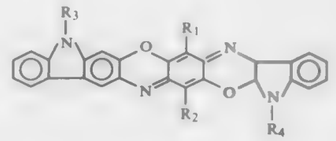
or fused aromatic groups, R_4 and R_5 are —H, —CH_3, or —C_2H_5, (4) pyranthrone pigments having the structure



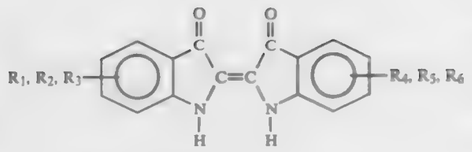
(8) dioxazine pigments having the structure



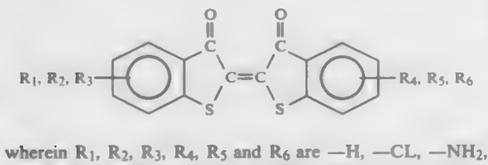
wherein R_1, R_2 and R_3 are —H, —Cl, or —Br, (5) vilanthrone pigments having the structure



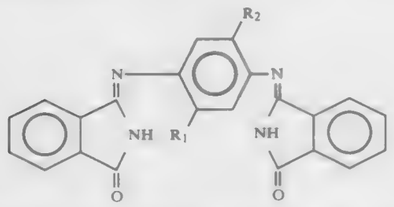
wherein R_1 and R_2 are —H or —Cl and R_3 and R_4 are —CH_3 or —C_2H_5 (9) indigoid and thioindigoid pigments having the structures



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are —H, —Cl, —Br, —CH_3 or —NH_2 and



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are —H, —CL, —NH_2, —OC_2H_5, —SC_2H_5, —CH_3, —OCH_3, phenyl or fused aromatic groups, respectively, and (10) isoindolinone pigments having the structure



distributed throughout the fibers, said pigments being particles or agglomerates with a diameter of 0.01 to 0.50 microns.

4,994,324

HOT-FILL POLYETHYLENE BAGS

Ajit K. Bose, Lawrenceville, N.J., and Kurt F. Strater, Barnesville, Ga., assignors to Union Camp Corporation, Wayne, N.J.

Filed Jan. 19, 1989, Ser. No. 299,861

Int. Cl.[5] B32B *7/12, 15/04, 27/08;* **C08L** *23/00*

U.S. Cl. 428—349 **12 Claims**



1. A sealable transparent film structure for hot-fill having one or more layers, at least one layer comprising a blend of

(a) from about 20 to 50 parts by weight of a terpolymer of ethylene, propylene, and butene-1 or hexene-1, or from about 20 to 50 parts by weight of propylene modified rubber;

(b) from about 25 to 75 parts by weight of polypropylene; and

(c) from about 25 to 75 parts by weight of Hmw-HDPE.

4,994,325

STICK OF SMALL DIAMETER

Tsutomu Moteki; Kazuo Aoki, and Kazuhiro Kimura, all of Chibaken, Japan, assignors to Chisso Corporation, Japan

Filed Apr. 28, 1988, Ser. No. 187,236

Claims priority, application Japan, May 11, 1987, 62-113942

Int. Cl.[5] A61M *35/00;* **D02G** *3/00*

U.S. Cl. 428—364 **5 Claims**

1. A stick of small diameter which comprises a polypropylene resin stick extruded and stretched to a length of at least 5 times its original length, said polypropylene resin having a crystallinity of 0.945 or more and a melt flow rate (x) of 0.2 to 20 g/10 minutes and satisfying the relationship between melt flow rate and Q value expressed by the formula of $y \geqq 2x+8$ wherein y represents Q value.

4,994,326

SOLDER POWDERS COATED WITH FLUORINE COMPOUNDS, AND SOLDER PASTES

Takashi Shimmura, Iruma; Yoshihiro Miyano, Sayama; Nobuo Tajima, Kawagoe, and Makoto Inoue, Tokyo, all of Japan, assignors to Tamura Kaken Co., Ltd., Japan

Filed Oct. 27, 1988, Ser. No. 263,551

Claims priority, application Japan, Oct. 27, 1987, 62-269279

Int. Cl.[5] C08K *9/06*

U.S. Cl. 428—405 **5 Claims**

1. A coated solder powder wherein solder powdered granules are coated with a coating agent comprising a fluorine compound insoluble or hardly soluble in a vehicle used for solder paste so as to substantially prevent oxidation of the granules, said fluorine compound being selected from a group consisting of fluorinated silicone oils, fluorinated hydrocarbon base high-molecular compounds fluorosilicone resins and any mixtures thereof.

4,994,327

COATED ARTICLE WITH METALLIC FINISH

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kogaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 204,848, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 18,744, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 618,744, Jun. 11, 1984, abandoned, which is a continuation of Ser. No. 384,345, Jun. 2, 1982, abandoned. This application Apr. 25, 1990, Ser. No. 515,775

Claims priority, application Japan, Jun. 19, 1981, 56-95672

Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—447 **13 Claims**

1. A coated article with metallic finish which comprises a base layer of a paint containing metallic powder applied to a substrate and a topcoat applied to said base layer, said topcoat being formed by applying and curing a coating material consisting essentially of a silyl group-containing vinyl polymer or copolymer having the main chain composed substantially of a vinyl polymer and at least one silicon atom connected to a hydrolyzable group at the terminal or side chain per molecule.

4,994,328

WATERPROOFING MEMBRANE

Joseph A. Cogliano, Pasadena, Md., assignor to W. R. Grace & Co. - Conn., New York, N.Y.

Filed Aug. 10, 1989, Ser. No. 391,755

Int. Cl.[5] B32B *11/04;* **E04C** *3/20*

U.S. Cl. 428—489 **10 Claims**

1. A waterproof coating product for application to concrete comprising a bituminous sheet having at least on major surface and a tack-free, water-insoluble polymer selected from polyvinyl alcohol and alpha-beta ethylenically unsaturated carboxylic acid polymer coating, said polymer coating contained on one major surface of the bituminous sheet and forming a free surface of the coating product and being capable of adhering to freshly poured concrete compositions and to the cured concrete substructure formed thereform.

4,994,329

ARTICLE HAVING NICKEL PLATED FILM COMPRISING A VARYING CONTENT OF PHOSPHORUS

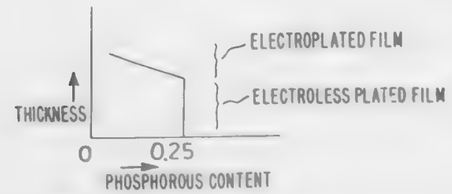
Taketoshi Kaimasu, and Takayoshi Tsuzuki, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1989, Ser. No. 436,647

Claims priority, application Japan, Nov. 15, 1988, 63-288480; Nov. 24, 1988, 63-296586

Int. Cl.[5] C25D *3/56, 5/14, 5/12;* **B32B** *15/01*

U.S. Cl. 428—678 **3 Claims**



1. A nickel plated film comprising:

a first plated film formed on a substance to be plated and having a phosphorus content of from 0.20 to 1.25 in atomic ratio of phosphorus with respect to nickel taken as one (1); and

a second plated film formed on said first plated film and having a phosphorus content less than that of said first plated film, wherein said second plated film comprises portions having phosphorus contents continuously varying from the highest value at the boundary between said first plated film and said second plated film to the lowest value at the surface of said second plated film.

4,994,330

MAGNETOOPTIC RECORDING MEDIUM CONTAINING A MULTILAYER PROTECTION FILM WITH AT LEAST ONE TRANSITION ZONE BETWEEN THE PROTECTION LAYERS

Helmut Steininger, Worms, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 193,678, May 13, 1988, abandoned. This application Mar. 13, 1990, Ser. No. 492,211

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716736

Int. Cl.[5] G11B *11/00*

U.S. Cl. 428—336 **14 Claims**

1. A sheet-like, multilayer, magneto-optical recording material which has a base which is transparent to light, a thermally alterable recording layer of an amorphous lanthanide transition metal alloy and, on the side of the recording layer remote from the base, a multistream anticorrosion layer which

(a) is from 30 to 150 nm thick and

(b) consists of two or more components which

(c) are present in four or more separate strata, each consisting of one of the components,

(d) one or more of the components being selected from the group consisting of the elements boron, aluminum silicon, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten,

(e) one or more of the other components being selected from the group consisting of the carbides, nitrides and oxides of these elements (d),

(f) directly adjacent strata always consisting of components which differ from one another and having at least one transition zone interposed between at least two strata, wherein the composition of one stratum changes gradually into the composition(s) of the adjacent stratum of the adjacent strata, the theoretical boundary between the said strata having a transition zone interposed between them being defined as the plane in which the carbon, nitrogen or oxygen content of a carbide, nitride or oxide stratum just reaches 50% of the relevant stoichiometric value, the thickness of one of the said strata being defined as the distance extending from one theoretical boundary to the next, and the thickness of a transition zone being defined as the distance extending from the plane in which the carbon, nitrogen or oxygen content of a carbide, nitride or oxygen stratum just reaches 90% of the relevant stoichiometric value, to the plane in which this relevant value is just 10%.

4,994,331

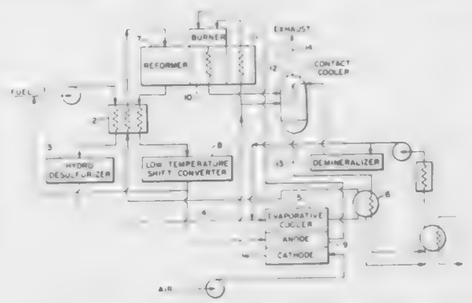
FUEL CELL EVAPORATIVE COOLING USING FUEL AS A CARRIER GAS

Ronald Cohen, West Hartford, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Aug. 28, 1989, Ser. No. 399,680

Int. Cl.[5] H01M *8/06*

U.S. Cl. 429—17 **11 Claims**



7. In a method of operating a fuel cell system, said system having a fuel stream, water, fuel, air, carbon monoxide, carbon dioxide, a hydro desulfurizer, a reformer, a low temperature shift converter, an evaporative cooler, means for heating, a contact cooler, a condenser, an exhaust, a fuel cell, said fuel cell having an anode chamber and a cathode chamber, which comprises:

a. preheating stream;

b. desulfurizing the fuel stream;

c. spraying water into the fuel stream to form mist;

d. evaporating the water into the fuel stream using an evaporative cooler, wherein the stream becomes a fuel/steam stream;

e. using a condenser to condense excess steam out of the fuel/steam stream;

f. pre-heating the fuel/steam stream;

g. using a reformer to produce hydrogen, wherein the fuel/-steam stream is introduced to the reformer where the fuel and steam react such that hydrogen, carbon monoxide, carbon dioxide are among the products;

h. using a low temperature shift converter to react the steam and the carbon monoxide, wherein hydrogen and carbon dioxide are among the products;

i. introducing the fuel stream to the anode chamber of the fuel cell as air is simultaneously introduced to the cathode chamber, wherein the reaction which occurs depletes the fuel/steam of hydrogen;

j. burning the remaining hydrogen, carbon monoxide, and fuel out of the fuel/steam stream, wherein the fuel/steam stream becomes essentially steam and carbon dioxide.

k. using a contact cooler to condense the steam out of the

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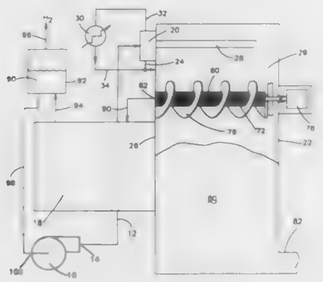
fuel/steam stream, wherein the water is recycled and the carbon dioxide is released through an exhaust.

4,994,332

METAL HYDROXIDE CRYSTALLIZER AND FILTER

Richard J. Coin, Mentor; Carl W. Brown, Jr., Painesville, and Jay M. Noscal, Jefferson, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Jul. 11, 1989, Ser. No. 378,554
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—27 30 Claims



1. A closed-loop filter system for continuously removing a metal hydroxide precipitate from an alkali-metal hydroxide solution comprising:

a filter tank including an inlet and an outlet;

a filter at said outlet having a filter surface and a plurality of small diameter openings in said surface, said filter surface being disposed within said filter tank,

means for introducing said alkali metal hydroxide solution into said tank at said tank inlet and for impacting said alkali metal hydroxide solution containing metal hydroxide precipitate onto said filter surface, metal hydroxide precipitate agglomerating on said surface, said filter surface openings having an average diameter effective for said agglomerating;

means for continuously said agglomerated precipitate from said filter surface, and;

means for separating said agglomerated precipitate from said alkali metal hydroxide solution, the agglomerated precipitate having a particle weight to surface area ratio effective for said separation, wherein said separation is by settling of said precipitate in said tank and wherein said filter system is constructed and arranged to allow particles of said agglomerated precipitate to settle in said solution at a rate in the range of about 2,000 to about 200,000 millimeters per hour.

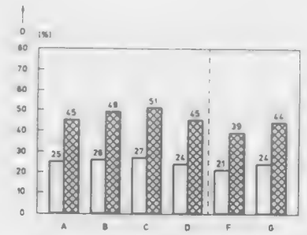
4,994,333

GALVANIC PRIMARY CELL

Horst-Udo Jose, and Gerd Jung, both of Ellwangen, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 15, 1989, Ser. No. 437,019
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1989, 3902650
Int. Cl.[5] H07M *6/06*
U.S. Cl. 429—190 6 Claims

1. A galvanic primary cell comprising a depolarizing cathode, an acidic gel electrolyte and a zinc anode of refined zinc including metal additives for suppressing zinc corrosion and for improving mechanical tensile strength comprising at least one metal selected from the group consisting of indium and



bismuth and at least one metal selected from the group consisting of magnesium and lithium.

4,994,334

SEALED ALKALINE STORAGE BATTERY AND METHOD OF PRODUCING NEGATIVE ELECTRODE THEREOF

Munehisa Ikoma, Katano; Yasuko Ito, Kyoto; Kohji Yuasa, Moriguchi; Isao Matsumoto, Osaka, and Takashi Hino, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1989, Ser. No. 356,247
Claims priority, application Japan, Feb. 28, 1989, 1-47637
Int. Cl.[5] H01M *10/52*
U.S. Cl. 429—206 21 Claims



1. A sealed alkaline storage battery comprising: a positive electrode including a metal oxide as a main constitutent material thereof; a negative electrode including, as a main constituent material thereof, a hydrogen absorbing alloy capable of absorbing/desorbing hydrogen acting as an active material and a supporter for supporting said alloy; an alkaline electrolyte; and a separator; said supporter being a three-dimensional porous body and having a hydrophobic property together with electrical conductivity.

4,994,335

MICROPOROUS FILM, BATTERY SEPARATOR EMPLOYING THE SAME, AND METHOD OF PRODUCING THEM

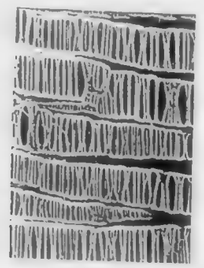
Eiichi Kamsei, Osaka; Hidetomo Ashitaka, and Toru Takahashi, both of Ichihara, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Sep. 8, 1989, Ser. No. 404,382
Claims priority, application Japan, Sep. 10, 1988, 63-226882; Sep. 26, 1988, 63-240441
Int. Cl.[5] H01M *2/16*
U.S. Cl. 429—254 3 Claims

1. A microporous film having a multiplicity of fine throughpores obtained by stretching a polyolefin film, comprising:

groups of unstretched planar flat portions which run at approximately constant intervals in the direction perpendicular to the direction in which the film is stretched and which are formed approximately parallel to a cross section perpendicular to the direction in which said film is stretched; and

groups of relatively slender fibrils which run in the gap between adjacent planar flat portions at approximately constant intervals and approximately in parallel with the direction in which said film is stretched,



both groups being combined to define a multiplicity of fine pores each of which has an approximately uniform configuration, wherein combinations of said fine pores form through-pores which extend from one surface of the film to another surface of the film in an approximately rectilinear path.

4,994,336

METHOD FOR MANUFACTURING A CONTROL PLATE FOR A LITHOGRAPHIC DEVICE

Wolfgang Benecke; Uwe Schnakenberg, both of Berlin, and Burkhard Lischke, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 17, 1989, Ser. No. 353,063
Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818535
Int. Cl.[5] G03F *1/16*
U.S. Cl. 430—5 6 Claims

1. A method for manufacturing a control plate for a lithographic apparatus, whereby the control plate charged with a plurality of particle probes (14, 14') has a semiconductor substrate (1) having an opening (10) for the passage of the particle probes (14, 14') and has a plurality of deflection elements (9, 9') for individually deflecting the particle probes (14, 14'), comprising the steps of:

providing on a front side of the semiconductor substrate (1) a first dielectric layer (2) and providing on a back side of the semiconductor substrate (1) a second dielectric layer (3); depositing a metallic layer (4) on the first dielectric layer (2);

structuring the second dielectric layer (3) according to the geometry of the opening (10) to be produced in the semiconductor substrate (1);

lithographically transferring the geometry and arrangement of the deflection elements (9, 9') to be produced onto a photoresist layer (8) applied on the metallic layer (4), whereby the thickness of the photoresist layer (8) exceeds the height of the deflection elements (9, 9'); voltaically filling up the depressions generated in the photoresist layer (8) to the desired height of the deflection elements (9, 9'); removing the photoresist layer (8);

producing the opening (10) by etching the back side of the semiconductor substrate (1); and removing the metallic layer (4) and the first dielectric layer (2) in the region of the opening (10).

4,994,337

PHOTOSENSITIVE MEMBER HAVING AN OVERCOAT LAYER

Kenji Masaki; Izumi Osawa, and Isao Doi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 16, 1988, Ser. No. 206,705
Claims priority, application Japan, Jun. 17, 1987, 62-150897; Jun. 17, 1987, 62-150896; Jun. 17, 1987, 62-150897; Jun. 17, 1987, 62-150898; Jun. 17, 1987, 62-150899
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—67 11 Claims

1. A photosensitive member comprising:

an electrically conductive substrate;

a photoconductive layer for retaining and transporting charges, said photoconductive layer comprising a selenium-arsenic alloy layer or comprising a selenium layer and selenium-tellurium layer formed in this order; and

an overcoat layer formed on said photoconductive layer and comprising amorphous carbon containing hydrogen, said overcoat layer containing halogen atoms and at least one element selected from the group consisting of chalcogen, oxygen, nitrogen and elements in Group III and IV of the periodic table.

4,994,338

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE LAYER CONTAINING AZO PIGMENT WITH COUPLER RESIDUE HAVING PHENOLIC HYDROXYL GROUP

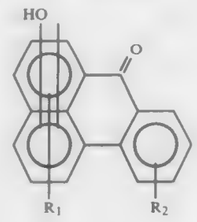
Hideyuki Takai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,643
Claims priority, application Japan, May 23, 1988, 63-123844
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—76 12 Claims

1. An electrophotographic photosensitive material comprising a photosensitive layer which is formed on a conductive substrate and which contains an azo pigment expressed by Formula (1) described below, wherein at least one of Cp in said Formula (1) is a coupler residue expressed by Formula (2) described below:

$$Ar—N=N—Cp)_n \quad (1)$$

wherein Ar is an aromatic hydrocarbon or aromatic heterocyclic group, Cp is a coupler reside having a phenolic hydroxyl group, and n is an integer of 1, 2,3 or 4



(2)

wherein R_1 and R_2 are each a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, a halomethyl group, a cyano group or a nitro group.

VOL 1123 ISS 3 FE 19 1991 UMI

4,994,339

ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING TITANYL PHTHALOCYANINE

Akira Kinoshita; Kazumasa Watanable; Naohiro Hirose; Akihiko Itami, and Kiyoshi Sawada, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 5, 1990, Ser. No. 461,257
Claims priority, application Japan, Jan. 9, 1989, 1-3407
Int. Cl.[5] G03G *5/06, 5/14*
U.S. Cl. 430—78 19 Claims

1. An electrophotographic photoreceptor comprising:
a support;
an intermediate layer on said support or an electroconductive layer, said intermediate layer comprising an ethylene copolymer resin or a polyamide resin; and
a light-sensitive layer on said intermediate layer, said light-sensitive layer comprising titanyl phthalocyanine in a crystalline state, wherein said titanyl phthalocyanine has a maximum intensity peak of the Bragg angle 2 θ at 25.2°±0.2° and crystal planes corresponding to diffraction lines at 9.6°±0.2°, 11.7°±0.2° and 24.1°±0.2° in a diffraction spectrum obtained with X-rays of Cu KÅ at a wavelength of 1.541 Å, and said titanyl phthalocyanine has a maximum absorption in the range of 780–860 nm in a near infrared absorption spectrum.

4,994,340

MAGNETIC TONER

Hiroshi Yamazaki; Yoko Yamamoto, and Hirohiko Seki, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 18, 1989, Ser. No. 409,039
Claims priority, application Japan, Sep. 22, 1988, 63-239178
Int. Cl.[5] G03G *9/083, 9/00, 5/00, 9/107*
U.S. Cl. 430—106.6 10 Claims

1. A magnetic toner comprising a binder resin, a magnetic powder, and a polyolefin, wherein said magnetic toner has a Wadel's globularity of 0.4 to 0.8, and the surface of the toner contains 10–40% by weight of polyolefin as measured by ESCA.

4,994,341

ORGANOMETALLIC COMPOUNDS AS MOTTLE PREVENTION ADDITIVES IN LIQUID ELECTROSTATIC DEVELOPERS

Paul C. Adair, Downingtown; Lalit M. Bhalla, West Chester, and Ronald L. Mueller, Exton, all of Pa., assignors to DXI-maging, Lionville, Pa.

Filed Dec. 20, 1989, Ser. No. 453,835
Int. Cl.[5] G03G *9/12*
U.S. Cl. 430—115 47 Claims

1. An electrostatic liquid developer consisting essentially of
(A) a nonpolar liquid having a Kauri butanol value of less than 30, present in 85 to 99.9% by weight, based on the total weight of liquid developer,
(B) particles having an average by area particle size of less than 30 μm of a thermoplastic resin having free carboxyl groups,
(C) a nonpolar liquid soluble charge director compound selected from the group consisting of oil-soluble petroleum sulfonate and anionic glycerides present in an amount of 0.25 to 1500 mg/g developer solids, and
(D) at least one organometallic compound selected from the group consisting of

$M^{+n}(R^-)_n$,

$M^{+n}(CO_2R'^-)_n$

and

$M^{+n}(OR''^-)_n$

where R, R', and R'', which can be the same or different, are moieties of a linear hydrocarbon of 1 to 30 carbon atoms, a branched chain hydrocarbon of 1 to 30 carbon atoms, or a linear or branched chain, substituted hydrocarbon of 1 to 30 carbon atoms, M is a metal, and n is at least 2 and is equal to the valency of the metal present in 0.01 to 0.15 part by weight metal based on the total weight of liquid developer, the total weight of developer solids being 0.1 to 15% by weight.

4,994,342

ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR AND A METHOD OF DEVELOPING THE SAME

Takao Nakayama; Chikashi Ohishi; Chiaki Kawamoto; Hidefumi Sera, and Sho Nakao, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1989, Ser. No. 374,816
Claims priority, application Japan, Jul. 1, 1988, 63-162630; Sep. 14, 1988, 63-228379
Int. Cl.[5] G03G *13/26*
U.S. Cl. 430—49 20 Claims

1. An electrophotographic lithographic printing plate precursor comprising an electrically conductive base coated, on one side thereof, with an undercoated layer and a photoconductive layer containing zinc oxide as a predominant component in order and, on the opposite side thereof, with a back layer, said undercoated layer having a surface resistivity of 1×10^8 to $1\times10^{14}\Omega$ and said back layer having a surface resistivity of at most $1\times10^{10}\Omega$.

4,994,343

OPTICAL INFORMATION RECORDING MEDIUM

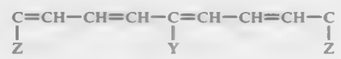
Yoshio Inagaki, Minami-Ashigara; Masao Yabe, Fujinomiya, and Keiichi Adachi, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1988, Ser. No. 202,587
Claims priority, application Japan, Jun. 9, 1987, 62-143468
Int. Cl.[5] G03C *1/72;* G11B *7/24*
U.S. Cl. 430—270 19 Claims

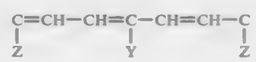
1. An optical information recording medium which comprises a support having provided thereon at least one layer on which information can be recorded and/or read out with a laser beam, wherein the recording layer contains at least one of the compounds represented by formula (I):

$$\phi^{\oplus}-L=\Psi\ (X^{1\ominus})_{1/l}$$

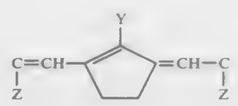
wherein ϕ and Ψ each represents a heterocylic residue having at least one nitrogen atom, wherein the heterocyclic residue having at least one nitrogen atom is selected from the group consisting of a 3H-indole ring, a thiazole ring, an oxazole ring, an imidazole ring and a quinoline ring, and these groups may each form a condensed ring with a benzene ring or a naphthalene ring, or may each have at least one substituent, L is a group represented by one of formulas (LI) to (LIX):



(LI)

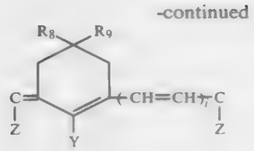


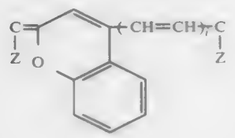
(LII)

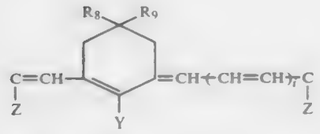


(LIII)

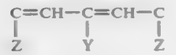
-continued







(LIV)



(LV)



(LVI)

(LVII)



(LVIII)

(LIX)

wherein i represents 0 or 1,
Z represents a hydrogen atom or a divalent group for forming a ring with connection to ϕ or Ψ, provided that at least one of Z is the divalent group,
Y represents a hydrogen atom or a monovalent group,
R^8 and R^9 each represents a hydrogen atom or a lower alkyl group,
the divalent group represented by Z is an ethylene group, a propylene group or a butylene group, and these groups may have substituent(s),
at least one of ϕ and Ψ, and the divalent group represented by Z combine to form a ring,
$X^{1\ominus}$ represents a l-valent negative ion provided that $X^{1\ominus}$ may bind to ϕ, L or Ψ as a substituent,
and l represents 1, 2 or 3.

4,994,344

SHEETLIKE LIGHT-SENSITIVE RECORDING

Karl-Rudolf Kurtz, Heidelberg; Horst Koch, Gruenstadt; Thomas Telser, Schriesheim, and Manfred Zuerger, Sinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,547
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803457
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—273 29 Claims

1. A light-sensitive recording element I useful for preparing photopolymer flexographic relief printing plates, the said light-sensitive recording element I comprising at least one photopolymerizable recording layer (A) having a thickness of from about 0.7 to about 6.5 mm and consisting essentially of
(a_1) from 20 to 99.499% by weight of at least one polymeric binder from the group consisting of random ethylene-propylene-alkadiene terpolymers having an ethylene content of from 50 to 80% by weight and a double bond content of from 2 to 20 olefinic double bonds per 1,000 carbon atoms,
(a_2) from 0.001 to 10% by weight of at least one photopolymeriztion initiator,
(a_3) from 0.5 to 50% by weight of at least one monomer which is compatible with said binder (a_1) and has at least one photopolymerizable olefinic double bond, and
(a_4) from 0.001 to 2% by weight of at least one inhibitor of thermally initiated polymerization and from 0.0001 to 5% by weight of at least one antioxidant as assistants, and a light-transmitting, smooth or matted, nontacky top layer (c) which soluble or swellable in the developers for the said photopolymerizable recording layer (A) and comprises a polymer which is tear resistant.

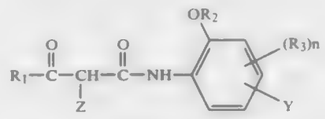
4,994,345

IMAGE FORMING METHOD FOR FORMING A MULTICOLOR IMAGE FROM A HALF-TONE DOT EXPOSURE

Tomomi Yoshizawa; Keiji Ogi, and Nariko Kimura, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

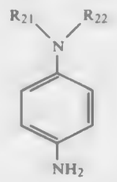
Filed Jun. 5, 1989, Ser. No. 361,264
Claims priority, application Japan, Jun. 13, 1988, 63-146096
Int. Cl.[5] G03C *7/00, 7/10, 7/30*
U.S. Cl. 430—264 7 Claims

1. An image forming method comprising
a step for exposing a silver halide color photographic light-sensitive material which comprises at east three silver halide emulsion layers being different from each other in spectral sensitivity thereof, and at least one of said silver halide emulsion layers contains an yellow coupler represented by the following Formula I, to light through black and-white halftone dot images, and
a step for developing said silver halide color photographic light-sensitive material, after said exposing step, with a color developer containing a color developing agent represented by the following Formula V;



(I)

wherein R_1 represents an alkyl group or a cycloalkyl group; R_2 represents an alkyl group, a cycloalkyl group, an acyl group or an aryl group; R_3 represents a group substitutable with a benzene ring; n is an integer of zero or 1; Y represents a mono-valent ballast group and Z represents a hydrogen atom or a group capable of being split off upon coupling reaction,



(IV)

wherein R_{21} and R_{22} represent each an alkyl group provided that R_{21} and R_{22} may be the same or different from each other, and R_{21} and R_{22} may be bound together to complete a ring.

4,994,346

NEGATIVE PHOTORESIST BASED ON POLYPHENOLS AND SELECTED EPOXY OR VINYL ETHER COMPOUNDS

Kurt Meier, Binningen; Martin Roth, Giffers; Adrian Schulthess, Tentlingen, and Heinz Wolleb, Ependes, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,846

Claims priority, application Switzerland, Jul. 28, 1987, 2871/87; Feb. 16, 1988, 546/88

Int. Cl.[5] G03C *1/68, 1/71, 1/727*

U.S. Cl. 430—280 17 Claims

1. A composition comprising

(a1) at least one solid, film-forming polyphenol which is soluble or at least swellable in aqueous alkaline media,

(b1) at least one polyfunctional epoxy resin, one polyfunctional vinyl ether compound or at least one polyfunctional epoxy resin and one polyfunctional vinyl ether compound, each of which can be dissolved, in the uncured state, in an aqueous alkaline solution with salt formation,

(c1) at least one cationic photoinitiator for component (b1).

14. A process for producing relief structures comprising the following steps:

(a) coating a substrate with a radiation-sensitive composition according to claim 1,

(b) exposure of the coated substrate with a pre-determined pattern of actinic radiation,

(c) development with an aqueous alkaline solution.

4,994,347

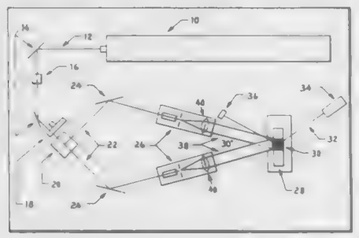
STORAGE STABLE PHOTOPOLYMERIZABLE COMPOSITION AND ELEMENT FOR REFRACTIVE INDEX IMAGING

William K. Smothers, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 144,281, Jan. 15, 1988, abandoned. This application Dec. 23, 1988, Ser. No. 288,916

Int. Cl.[5] G03C *7/028*

U.S. Cl. 430—282 32 Claims



1. A substantially solid, storage stable, photopolymerizable composition suited for forming a refractive-index image upon exposure to actinic radiation as the sole processing step, said composition consisting essentially of:

(a) approximately 25 to 95% of a solvent soluble, thermoplastic, polymeric binder;

(b) approximately 5 to 40% of N-vinyl carbazole; and

(c) approximately 0.1 to 10% of a hexaarylbiimidazole photoinitiator system having a hydrogen donor component, wherein the hydrogen donor component is a mercapto compound having a pK_{HNP} greater than 8.0, as measured in methanol with a glass electrode calibrated with aqueous buffer.

4,994,348

LIGHT-SENSITIVE RECORDING MATERIALS FOR PRODUCING MAR-RESISTANT INTAGLIO PRINTING PLATES

Eleonore Raabe, Ludwigshafen, and Erich Beck, Harthausen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

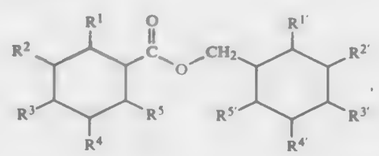
Filed Feb. 24, 1989, Ser. No. 315,119

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806270

Int. Cl.[5] G03F *7/028, 7/033, 7/037*

U.S. Cl. 430—287 7 Claims

1. A light-sensitive recording material for the production of intaglio printing plates, comprising on a dimensionally stable base material a layer (L) from 30 to 500 μm thick of a photopolymerizable and/or photocrosslinkable material which is soluble or dispersible in a developer liquid and which, on exposure to actinic light, is rendered insoluble or no longer dispersible in this developer liquid and which, at least in a surface zone of from 1 to 50 μm of the surface of the layer (L) which forms the later surface of the printing plate, contains finely divided abrasive particles in such an amount that they account for from 2 to 50 % by weight of the photopolymerizable and/or photocrosslinkable material containing these particles, the average particle size of the abrasive particles being within the range from 0.1 to 6 μm, not more than 5 % of the abrasive particles having longitudinal dimensions greater than 10 μm and the abrasive particles having a hardness of >4.0 on the Mohs hardness scale, the surface of the layer (L) which forms the later surface of the printing plate having a peak-to-valley height of <2 um and the constituents of the photopolymerizable and/or photocrosslinkable material of the layer (L) being chosen in such a way that this layer has after exposure, development and drying a hardness, measured under load, of not less than 10 N/mm^2 at least in the layer thickness range containing the ink-receiving recesses, wherein the photocrosslinkable and/or photopolymerizable material contains one or more cyclohexane derivatives of the formula (I)



(I)

where one or more of the radicals R^1 to R^5 and $R^{1'}$ to $R^{5'}$ but no more than two of the radicals R^1 to R^5 and no more than two of the radicals $R^{1'}$ to $R^{5'}$ are each a group —O—C(=O)—CR^6=CH_2 where R^6 is H or CH_3, one or more of the radicals R^1 to R^5 and $R^{1'}$ to $R^{5'}$ but no more than two of the radicals R^1 to R^5 and no more than two of the radicals $R^{1'}$ to $R^{5'}$ are each OH and the remaining radicals R^1 to R^5 and $R^{1'}$ to $R^{5'}$ are each H or CH_3.

7. The recording material of claim 1, wherein the photopolymerizable of photocrosslinkable material used is a mixture of a compound of the formula (I) with a partially hydrolyzed polyvinyl acetate whose hydroxyl groups have been partly esterified with acrylic acid or methacrylic acid.

4,994,349

PRINTED WIRING BOARD FABRICATION METHOD

Brent J. Blumenstock, Trenton, N.J., and Jose A. Ors, New Hope, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1988, Ser. No. 211,808

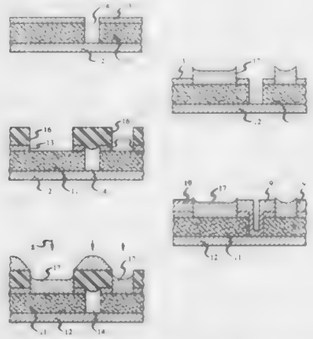
Int. Cl.[5] G03F *7/00*

U.S. Cl. 430—314 11 Claims

1. A circuit forming process comprising the steps of covering a substrate with a plating mask; selectively removing parts of the plating mask; exposing the substrate to a plating bath;

and selectively plating a metal over those portions of the substrate from which the plating mask has been removed, CHARACTERIZED IN THAT:

the substrate comprises an insulative substrate having a surface covered with a thin metal film; the metal film is covered with a first mask layer which is selectively removed to expose portions of the metal film; the exposed portions of the metal film are removed to expose portions of the insulative substrate; the exposed portions of the



insulative substrate are covered with a plating mask layer which abuts against the first mask layer; and the first mask layer is removed, whereby the remaining plating mask layer defines the plating mask.

2. The process of claim 1 FURTHER CHARACTERIZED IN THAT:

the first mask layer is a photosensitive layer, and selective removal of the first mask layer comprises the steps of selectively exposing it to actinic radiation and developing it.

4,994,350

METHOD FOR FORMING A COLOR PROOF HAVING A SPECIFIED TOE GRADATION

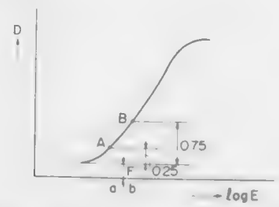
Takahiro Ogawa, and Shun Takada, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 402,840

Claims priority, application Japan, Sep. 7, 1988, 63-224013

Int. Cl.[5] G03C *7/00, 7/10*

U.S. Cl. 430—358 7 Claims



1. An image forming method for making a color proof comprising

a step for exposing a silver halide color photographic light-sensitive material, comprising a support having thereon photographic component layers including a yellow image-forming blue-sensitive silver halide emulsion layer, a magenta image forming green-sensitive silver halide emulsion layer and a cyan image-forming red-sensitive silver halide emulsion layer, to light through a transparent black-and-white halftone image and

a step for processing said exposed silver halide color photographic light-sensitive material to form a color image,

wherein said photographic component layers contain a yellow water-soluble dye, a magenta water-soluble dye and a cyan water soluble dyes and reflective densities of said silver halide color photographic material measured with light of 450 nm, 550 nm and 700 nm are each not less than 0.8 before the processing, and

toe portion gradations of characteristic curves of yellow, magenta and cyan images formed in said silver halide color photographic light-sensitive material by said processing are each not less than 1.7, and said toe portion gradations of said yellow, magenta and cyan image have the following relation:

$$|1-\gamma_A'/\gamma_A| \leq 0.05$$

wherein γ_a' is toe portion gradation of one of the three images, and γ_A is toe portion gradation of another one of said three images.

4,994,351

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yoshihiro Haga; Katuya Yabuuchi, and Yasumasa Numata, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 128,999, Dec. 4, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 366,217

Claims priority, application Japan, Dec. 17, 1986, 61-303554

Int. Cl.[5] G03C *5/50, 7/38, 7/392*

U.S. Cl. 430—379 11 Claims

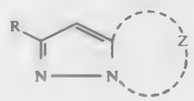
1. A method for processing a silver halide photographic material comprising:

1. treating silver halide photographic material with a black and white developer;

2. fogging said silver halide photographic material;

3. processing said silver halide photographic material with a color developer having a pH of at least 11, wherein said color developer contains a color developing agent; and

4. desilvering said silver halide photographic material, wherein said silver halide photographic material comprises a coupler represented by Formula (M-I)

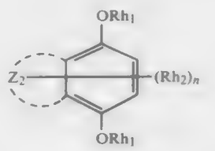


Formula (M-I)

wherein R is hydrogen or a substituent, and Z signifies the group of non-metallic atoms necessary for forming a nitrogenous heterocyclic ring, provided that the ring formed by Z has a substituent represented by the formula

$$-R_{12}-SO_2-R_{13} \quad \text{(M-X)}$$

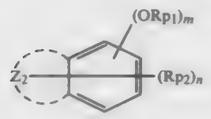
where R_{12} is an alkylene group; and R_{13} is an alkyl group, a cycloalkyl group or an aryl group; R is a hydrogen atom or a substituent; and a compound that reacts with an oxidized product of said color developing agent and which substantially lacks the ability to impart an image density represented by the following formulae (H), (P), (S), (C-1), (C-8) or (C-9):



(H)

where Rh_1 is a hydrogen atom, an aliphatic group or an acyl group; Rh_2 is a monovalent group; n is an integer of 0–6, provided that when n is 2 or more, Rh_2 may be the same or different; and Z_2 signifies an atomic group capable of

completing a benzene ring or an atomic group capable of forming a naphthalene ring together with the benzene ring;



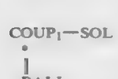
(P)

where Rp_1 and Rp_2 have the same meaning as Rh_1 and Rh_2; m is 2 or 3; when m=2, the two —ORp_1 are on an ortho or meta position, and m=3, the three —ORp_1 are bonded to mutually adjacent sites, provided that in each case —ORp_1 may be the same or different; n is an integer of 0–6, provided that when n is 2 or more, Rp_2 may be the same or different;



(S)

where A is —CO— or —SO_2—; Rs_1 and Rs_2 each represents an alkyl group, an aryl group, a heterocyclic group or an amino group; Z_3 is a hydrogen atom or an alkali decomposable precursor group; Rs_3 is a substituent; Q has the same meaning as Z_2, l is 1 or 2, provided that when l=2, —NH—A—Rs_2 may be the same or different; m is 0 or 1 and n is an integer of 0–6, provided that when n is 2 or more, Rs_3 may be the same or different; and at least one of —NH—A—Rs_2)$_l$ and —OZ_3)$_m$ is bonded in the position ortho or para to —$NHSO_2Rs_1$;



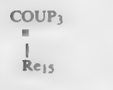
(C-1)

where $COUP_1$ signifies a coupler nucleus having a coupling site (marked with the asterisk); BALL is a stabilizing group that is bonded to the coupling site of $COUP_1$ and which can be eliminated from $COUP_1$ by reaction with the oxidized product of a color developing agent, this stabilizing group having a sufficient size and shape to render the compound of Formula (C-1) non-diffusible; and SOL is a solubilizing group that is bonded to the non-coupling site of $COUP_1$ and which imparts mobility to the product formed as a result of coupling between $COUP_1$ and the oxidized product of a color developing agent;



(C-8)

where $COUP_2$ has the same meaning as $COUP_1$; and Re_{14} is a group that is bonded to the coupling site of $COUP_2$ and which is not capable of being eliminated upon reaction between the compound of formula (C-8) and the oxidation product of a color developing agent; and



(C-9)

where $COUP_3$ represents a coupler nucleus that yields a substantially colorless product upon coupling reaction with the oxidized product of a color developing agent; and Re_{15} represents a group that is bonded to the coupling site of $COUP_3$ and which is capable of being eliminated from $COUP_3$ upon coupling reaction with the oxidized product of a color developing agent.

4,994,352

DYE-ENHANCED DEPOSITION OF ELEMENTAL METALS AND METALLOIDS ON SUBSTRATES

Andrew J. G. Strandjord; Michael S. Paquette; Syamalarao Evani; Ronald L. Yates, and Mark D. Newsham, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 276,005, Nov. 25, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 471,583

Int. Cl.[5] **G03C** *1/492, 1/00;* **B32B** *3/02*

U.S. Cl. 430—495 **11 Claims**

1. An article comprising a solid substrate having adhered to at least one surface thereof an active layer comprising a thermally decomposable metallo-organic decomposition material in active association with a photosensitive dye, said thermally decomposable metallo-organic decomposition material characterized in that when subjected to sufficient energy within the range of about 0.05 to about 100 nanojoules per square micron causes the metal ion at the location of the applied energy to be reduced to a form which is optically detectable on the surface of the substrate.

4,994,353

SILVER HALIDE PHOTOGRAPHIC MATERIAL HAVING POLYESTER SUPPORT WITH SUBBING LAYER

Akira Hatakeyama; Takashi Naoi, both of Kanagawa, and Sumio Nishikawa, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

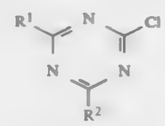
Filed Jun. 15, 1990, Ser. No. 538,452

Claims priority, application Japan, Jun. 15, 1989, 1-152931; Sep. 18, 1989, 1-240965

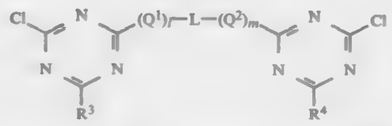
Int. Cl.[5] **G03C** *1/00*

U.S. Cl. 430—496 **20 Claims**

1. A silver halide photographic material comprising a polyester support having a hydrophilic colloidal layer containing a polymer latex on at least one side thereof, wherein said polyester support has a subbing layer having a thickness of 0.3 μm or more and containing a vinylidene chloride copolymer composed of at least (1) from 70 to 99.9% by weight of a vinylidene chloride monomer and (2) from 0.1 to 5% by weight of a vinyl monomer having at least one carboxyl group, said subbing layer further containing a compound represented by formula (I) or (II):



(I)



(II)

wherein R^1, R^2, R^3, and R^4 each represents a chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group, an alkylthio group, —OM, wherein M represents a monovalent metal atom, —NR′R″, or —NHCOR‴, wherein R′, R″, and R‴ each represents a hydrogen atom, an alkyl group, or an aryl group; Q^1 and Q^2 each represents —O—, —S—, or —NH—; L represents a divalent linking group selected from an alkylene group, an arylene group, and a combination thereof; and l and m each represents 0 or 1.

4,994,354

OPTICAL RECORDING MEDIA

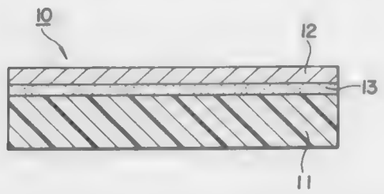
Hisaharu Toibana; Mitsuyuki Kuroiwa; Takeshi Minoda, and Akira Todo, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 427,509

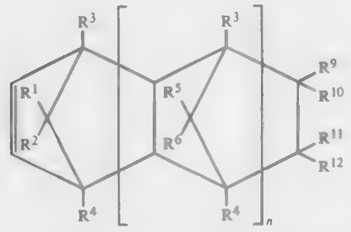
Claims priority, application Japan, Nov. 1, 1988, 63-276739; Nov. 28, 1988, 63-300357

Int. Cl.[5] **G03C** *1/00, 1/492, 11/00;* **B32B** *3/02*

U.S. Cl. 430—495 **26 Claims**



1. An optical recording medium comprising a substrate and a recording layer formed thereon, in which the recording layer is irradiated with beam of energy to form thereon pits corresponding to given pieces of information and thereby record the pieces of information, said recording layer being a thin film consisting essentially of Te and additionally containing Cr, C and H and said substrate comprising a cycloolefin random copolymer composed of a ethylene unit and a cycloolefin unit derived from the following general formula [I]



[I]

wherein n is 0 or a positive integer, R^1 to R^{12} are the same or difference, and represent each hydrogen atom, a halogen atom or a hydrocarbon group, provided that R^9 to R^{12}, when taken together, may form a mono-or poly-cyclic hydrocarbon ring which may optionally have double bond or bonds, or R^9 and R^{10} or R^{11} and R^{12}, when taken together, may form an alkylidene group.

4,994,355

RADIOGRAPHIC ELEMENTS WITH SELECTED CONTRAST RELATIONSHIPS

Robert E. Dickerson, Rochester, and Phillip C. Bunch, Brighton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

and a continuation-in-part of Ser. No. 385,128, Jul. 26, 1989, which is a continuation of Ser. No. 314,339, Feb. 23, 1989, abandoned. This application Mar. 29, 1990, Ser. No. 502,220

Int. Cl.[5] **G03C** *1/08*

U.S. Cl. 430—509 **14 Claims**

1. A radiographic element comprised of

a transparent film support,

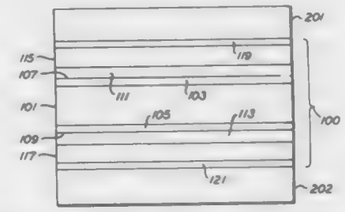
first and second silver halide emulsion layer units coated on opposite sides of the film support, and

means for reducing to less than 10 percent crossover of electromagnetic radiation of wavelengths longer than 300 nm capable of forming a latent image in the silver halide emulsion layer units, said crossover reducing means being decolorized in less than 90 seconds during processing of said emulsion layer units,

characterized in that

the first silver halide emulsion layer unit exhibits an average contrast of less than 2.0, based on density measurements at 0.25 and 2.0 above minimum density and

the second silver halide emulsion layer unit exhibits an average contrast of at least 2.5, based on density measurements at 0.25 and 2.0 above minimum density,



the contrast of the first silver halide emulsion layer unit being determined with the first silver halide emulsion unit replacing the second silver halide emulsion unit to provide an arrangement with the first silver halide emulsion unit present on both sides of the transparent support and

the contrast of the second silver halide emulsion layer unit being determined with the second silver halide emulsion unit replacing the first silver halide emulsion unit to provide an arrangement with the second silver halide emulsion layer unit present on both sides of the transparent support.

4,994,356

SOLID PARTICLE DISPERSIONS OF FILTER DYES FOR PHOTOGRAPHIC ELEMENTS

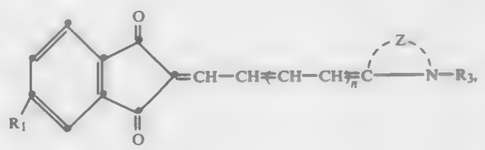
Donald R. Diehl, and Glenn M. Brown, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1990, Ser. No. 504,469

Int. Cl.[5] **G03C** *1/06*

U.S. Cl. 430—522 **13 Claims**

1. A photographic element comprising a support having thereon a radiation-sensitive layer and a hydrophilic layer, which is the same as or different from the radiation-sensitive layer, comprising a hydrophilic binder and a filter dye having the formula:



wherein

n is 0 or 1,

R_1 is CO_2H or $NHSO_2R_2$ where R_2 is substituted or unsubstituted alkyl or substituted or unsubstituted aryl,

R_3 is substituted or unsubstituted alkyl or substituted or unsubstituted aryl, and

Z represents the atoms necessary to complete a substituted or unsubstituted heterocyclic nucleus.

VOL 1123 ISS 3 FE 19 1991 UMI

4,994,357

PROCESS FOR PRODUCING PHOTOGRAPHIC SUPPORT

Akira Uno, Kashiwa, and Touru Noda, Matsudo, both of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 360,069
Claims priority, application Japan, Jun. 1, 1988, 63-135016
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—536 7 Claims

1. A process for producing a photographic support which comprises

coating one side of a base sheet with a molten polyolefin resin,

coating another side of the base sheet with a molten polyolefin resin, and

passing the resulting resin coated base sheet between a cooling roll and a back-up roll under a linear pressure of 30 to 200 kg/cm,

a front side of the base sheet on which a photographic emulsion layer is to be formed being coated with at least one polyolefin resin layer, and an outermost polyolefin resin layer having a center line average surface roughness Ra of 1.0 μm or less.

4,994,358

DIRECT POSITIVE COLOR LIGHT-SENSITIVE MATERIAL

Naoyasu Deguchi, and Shigeo Hirano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 15, 1988, Ser. No. 232,825
Claims priority, application Japan, Aug. 14, 1987, 62-201936
Int. Cl.[5] G03C *1/485, 1/46, 7/18*
U.S. Cl. 430—547 19 Claims

1. A direct positive color light-sensitive material, which comprises a support having thereon at least one internal latent image-forming silver halide emulsion layer containing non-prefogged silver halide grains and which contains at least one color image-forming coupler capable of producing or releasing a non-diffusible or diffusible dye upon oxidative coupling with a color-developing agent, with at least one layer different from said internal latent image-forming silver halide emulsion layer containing a surface latent image-forming, negative-working silver halide emulsion and with at least one of said negative-working silver halide emulsion layer and an interlayer adjacent thereto containing at least one compound capable of releasing a fogging agent, a fogging agent precursor, a development promoter or a development promoter precursor in proportion to the amount of developed silver of said negative-working silver halide emulsion upon development processing using an aromatic primary amine developing agent.

4,994,359

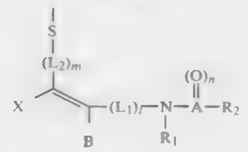
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masakazu Morigaki, and Kiyoshi Nakazyo, both of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 31, 1989, Ser. No. 386,717
Claims priority, application Japan, Aug. 2, 1988, 63-192958
Int. Cl.[5] G03C *7/26, 1/38*
U.S. Cl. 430—551 23 Claims

1. A silver halide color photographic light-sensitive material having a support and at least one silver halide light-sensitive emulsion layer coated thereon, wherein said photographic light-sensitive material comprises (i) at least one 5-pyrazolone magenta coupler possessing an elimination group represented by general formula (I) in coupling positions, and (ii) at least one compound represented by general formula (A):

Formula (I)



(I)

wherein

L_1 and L_2 each represents a methylene group or an ethylene group;

l and m each represents 0 or 1;

R_1 represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group or a heterocyclic group;

R^2 represents a group linked to A by a carbon atom, an oxygen atom, a nitrogen atom or a sulfur atom;

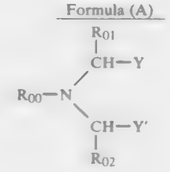
A represents a carbon atom or a sulfur atom; n represents 1 when A is a carbon atom, and 1 or 2 when A s a sulfur atom;

B represents a carbon atom, an oxygen atom, a nitrogen atom or a sulfur atom;

X represents an atomic group necessary for forming a ring;

R_1 and R_2 may be mutually bonded and form a ring; and when B is a carbon atom or a nitrogen atom, B and R_2 may be mutually bonded and form a ring;

Formula (A)



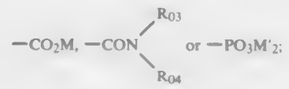
(A)

wherein

R_{00} represents an organic radical; and

R_{01} and R_{02} may be the same or different and each represent a hydrogen atom or an alkyl group;

Y and Y′ may be the same or different and each represents



M represents a hydrogen atom, a sodium atom, a potassium atom, an ammonium ion, a quaternary amine, a protonated amine compound, an alkyl group, an aryl group or a heterocyclic group; M′ represents a hydrogen atom, a sodium atom, a potassium atom, an ammonium ion, a quaternary amine or a protonated amine compound;

R_{03} and R_{04} may be the same or different and each represents a hydrogen atom or an alkyl, an aryl, an acyl, a sulfonyl group or a heterocyclic group; and

R_{03} and R_{04} may be mutually bonded and form a 5–7 membered ring.

4,994,360

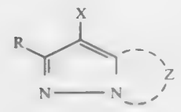
SILVER HALIDE PHOTOGRAPHIC SENSITIVE MATERIAL

Shinji Yoshimoto; Satoshi Nakagawa; Yutaka Kaneko, and Shuichi Sugita, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 395,296, Aug. 17, 1989, abandoned, which is a continuation of Ser. No. 262,191, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 946,508, Dec. 24, 1986, abandoned. This application Aug. 3, 1990, Ser. No. 563,810
Claims priority, application Japan, Dec. 28, 1985, 60-297512
Int. Cl.[5] G03C *7/38, 7/392*
U.S. Cl. 430—551 8 Claims

1. A silver halide photographic light-sensitive material comprising a pyrrazolotriazole coupler represented by Formula [I]:

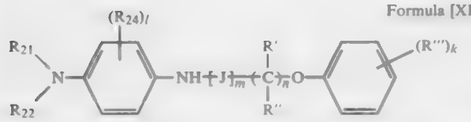
Formula [I]



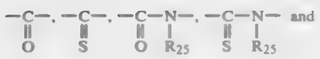
wherein Z represents a group of non-metallic atoms necessary to form a nitrogen-containing heterocyclic ring; X represents a hydrogen atom or a substituent capable of splitting off upon reaction with an oxidation product of a color developing agent; R represents a hydrogen atom or a substituent;

and a stabilizer represented by Formula [XIII]:

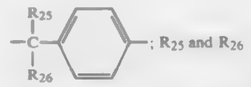
Formula [XIII]



wherein R′ and R″ independently represent a hydrogen atom and an alkyl group, R_{21}, and R_{22} and R‴ independently represent a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an aryl group, and a heterocyclic group, provided that R_{21} and R_{22} may be combined with each other to form a 5- or 6-membered ring; R_{24} represents a substituent, provided that R_{24} may be combined with R_{21}, R_{22} and a nitrogen atom adjacent to R_{21} and R_{22} to form a 5- or 6-membered ring; J represents one selected from the group consisting of:



and



; R_{25} and R_{26}

represent independently a hydrogen atom and an alkyl group; l represents an integer of 0 to 4, provided that the R_{24}'s may be the same or different when l is two or more; m is 0 or 1; n represents an integer of 1 to 3; and k represents an integer of 0 to 5.

4,994,361

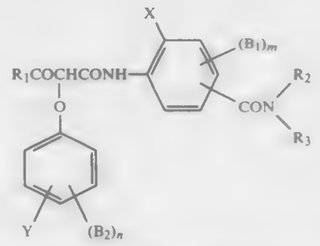
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Atsushi Tomotake; Shuji Kida; Mayumi Tomotake, and Fumio Ishii, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 441,302
Claims priority, application Japan, Nov. 29, 1988, 63-302628
Int. Cl.[5] G03C *7/36*
U.S. Cl. 430—557 9 Claims

1. A silver halide color photographic light-sensitive material comprising a silver halide emulsion layer containing a coupler represented by the following Formula I:

(I)



wherein R_1 is a substituted or unsubstituted aryl group; R_2 and R_3 are each a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group; X is a chlorine atom; Y, B_1 and B_2 are each a substituent, provided that Y or B_2 is bonded to the aryloxy group at the m- or p- position with respect to the oxygen atom; and m and n are each an integer of 0 to 3.

4,994,362

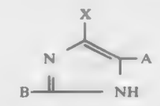
HIGH SILVER HALIDE CHLORIDE CONTENT COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS INCLUDING CYAN COUPLERS AND NITROGEN-CONTAINING HETEROCYCLIC MERCAPTO COMPOUNDS

Mitsuhiro Okumura, Hino, and Shun Takada, Odawara, both of Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,385
Claims priority, application Japan, Dec. 15, 1987, 62-316995
Int. Cl.[5] G03C *1/34, 7/38*
U.S. Cl. 430—558 30 Claims

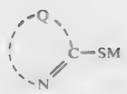
1. A silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer, wherein said silver halide emulsion layer contains silver halide grains having a silver chloride content of not less than 90 mol %, a cyan coupler of Formula C-1

Formula C-1



wherein A and B each represent an organic group combined with the imidazole ring through a carbon atoms, nitrogen atom, oxygen atom or a sulfur atom thereof, at least one of A and B being aryl; and X represents a hydrogen atom or a group capable of being split off upon reaction with the oxidized product of a color developing agent, and a nitrogen containing mercapto compound of Formula S;

Formula S



wherein Q represents a five- or six-member heterocyclic ring which may be condensed with a benzene ring, and M is a hydrogen atom or a cation.

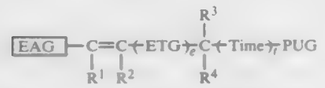
4,994,363

SILVER HALIDE LIGHT-SENSITIVE MATERIAL CONTAINING A COMPOUND RELEASING A PHOTOGRAPHICALLY USEFUL GROUP

Keizo Koya; Koki Nakamura; Hiroyuki Watanabe, and Yasuhiro Yoshioka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1988, Ser. No. 286,562
Claims priority, application Japan, Dec. 17, 1987, 62-319989
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—564 **2 Claims**

1. A silver halide light-sensitive material, comprising a compound represented by the general formula (I):



(I)

wherein EAG represents an aromatic group which receives electrons from a reducing substance; R^1 represents a group represented by $—Y^1—Y^2—R^6$ in which Y^1 and Y^2 each represents a hetero atom or a hetero atomic group and Y^1 *and* Y^2 may be the same or different and R^6 represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group; R^2 represents an acyl group, a carbamoyl group, an alkoxycarbonyl group, a cyano group, a sulfonyl group or a nitro group, with the proviso that R^1 and R^2 may be in the position of cis or trans to each other; R^3 and R^4 each represents a hydrogen atom or a hydrocarbon group; ETG represents a group capable of transferring electrons; e represents an integer of 0 or 1; Time represents a group which undergoes reaction triggered by the cleavage from the carbon carrying R^3 and R^4 to release PUG; t represents an integer 0 or 1; and PUG represents a photographically useful group.

4,994,364

DIRECT POSITIVE IMAGE FORMING METHOD

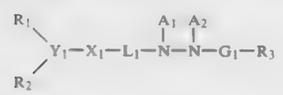
Noriyuki Inoue, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 15, 1989, Ser. No. 394,386
Claims priority, application Japan, Aug. 16, 1988, 63-202746
Int. Cl.[5] G03C *5/50*
U.S. Cl. 430—598 **53 Claims**

1. A method for forming a direct positive image in an imagewise exposed direct positive photographic light-sensitive material which comprises a support having thereon at least one layer containing internal latent image type silver halide grains not having been previously fogged comprising:

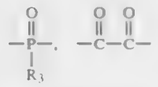
conducting a fogging treatment of the grains in the presence of a compound represented by the following general formula (I),

and after the fogging treatment or during the fogging treatment subjecting the material to development processing:



(I)

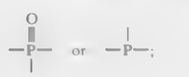
wherein A_1 and A_2 both represent a hydrogen atom or one of A_1 and A_2 represents a hydrogen atom and the other represents a sulfonyl group or an acyl group; G_1 represents a carbonyl group, a sulfonyl group, a sulfoxy group,



or an iminomethylene group; L_1 represents a divalent linkage group; X_1 represents —O— or



(wherein R_4 represents a hydrogen atom, an alkyl group or an aryl group); Y_1 represents



R_1 and R_2 each represents an aliphatic group, an aromatic group, a hetero-cyclic group, $—OR_5$ or $—NR_5R_6$ (wherein R_5 represents an aliphatic group, an aromatic group or a heterocyclic group; and R_6 represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group); and R_3 represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aralkyl group, an aryloxy group or an amino group.

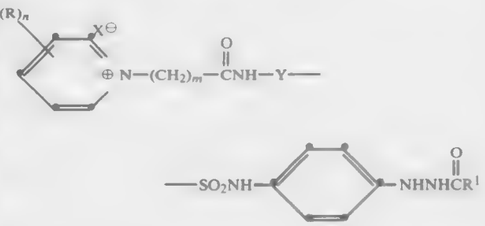
4,994,365

HIGH CONTRAST PHOTOGRAPHIC ELEMENT INCLUDING AN ARYL SULFONAMIDOPHENYL HYDRAZIDE CONTAINING AN ALKYL PYRIDINIUM GROUP

Jerome J. Looker, and Donald L. Kerr, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1990, Ser. No. 528,628
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—598 **11 Claims**

1. A silver halide photographic element adapted to form a high contrast image upon development with an aqueous alkaline developing solution, said element including at least one layer comprising, as a nucleating agent, an aryl sulfonamidophenyl hydrazide of the formula:



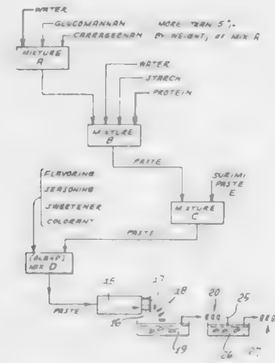
where each R is an alkyl group, n is 1 to 3, X is an anion, m is 1 to 6, Y is a divalent aromatic radical, and R^1 is hydrogen or a blocking group.

4,994,366

SHRIMP ANALOG FORMING PROCESS

Ming C. Wu, Irvine, Calif., assignor to JAC Creative Foods, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 187,548, Apr. 28, 1988, abandoned. This application Nov. 7, 1989, Ser. No. 432,483
Int. Cl.[5] A23L *1/325, 1/33*
U.S. Cl. 426—574 **13 Claims**



1. In the preparation of a shrimp-like product, the steps comprising:

(a) providing a minced fishmeat surimi paste,

(b) providing an aqueous mixture B in paste form which contains both glucomannan and carrageenan, protein and starch, said mixture B being formed by first forming a mixture A of water, glucomannan and carrageenan, wherein the glucomannan and the carrageenan constitute at least 5%, by weight, of the mixture A, and allowing said mixture A to hydrate to form a paste, and then adding and mixing H_2O, starch and protein to the hydrated mixture A to form said mixture B which is in thick paste form,

(c) forming a mixture C which contains said minced fishmeat paste and said aqueous mixture B,

(d) extruding said mixture C to form an extrudate, and cutting said extrudate to form pieces of a length between ½ inch and 1½ inches,

(e) contacting said pieces with hot water in a bath at between 50° and 100° C. for a time between 1 and 30 minutes, to cook the pieces,

(f) and then contacting said cooked pieces with cold water in a bath at between about 34° F. and 40° F., wherein the pieces are therein cooled to between about 70° and 80° F., and then removing the cooled pieces from the cold bath in gelled condition to form gelled product pieces.

4,994,367

EXTENDED SHELF LIFE PLATELET PREPARATIONS AND PROCESS FOR PREPARING THE SAME

Arthur P. Bode, Greenville, N.C.; William A. L. Heaton, Norfolk; Stein Holme, Virginia Beach, both of Va., and David T. Miller, Parkland, Fla., assignors to East Carolina University, Greenville, N.C.

Filed Oct. 7, 1988, Ser. No. 255,621
Int. Cl.[5] A01N *1/02*
U.S. Cl. 435—2 **11 Claims**

1. A blood platelet preparation, comprising:

blood platelets;

an adenylate cyclase stimulator in an amount effective to increase the production of adenosine 3', 5'cyclic phosphate (cAMP) in said blood platelets;

a phosphodiesterase inhibitor in an amount effective to reduce the degradation of cAMP in said blood platelets;

a thrombin inhibitor in an amount effective to reduce the stimulation of said blood platelets by thrombin; and

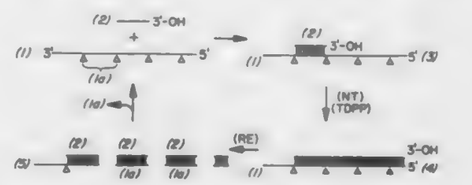
a plasmin inhibitor in an amount effective to reduce the degradation of cell surface proteins on said blood platelets.

4,994,368

AMPLIFICATION METHOD FOR POLYNUCLEOTIDE ASSAYS

Thomas C. Goodman, Mountain View; Martin Becker, Palo Alto; Edwin F. Ullman, Atherton, and Samuel Rose, Mountain View, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 23, 1987, Ser. No. 76,807
Int. Cl.[5] C12Q *1/68;* **C12P** *19/34;* **G01N** *33/566, 33/48*
U.S. Cl. 435—6 **68 Claims**



1. A method of producing multiple copies of a primary polynucleotide sequence located at the 3' terminus of a polynucleotide, which comprises:

(a) forming in the presence of nucleoside triphosphates and template-dependent polynucleotide polymerase an extension of a primary polynucleotide sequence hybridized with a template sequence of a single stranded pattern polynucleotide comprising two or more identical template sequences each containing one or more site specific cleavage sequences,

(b) cleaving into fragments said extension at cleavable polynucleotide sequences in the presence of means for specifically cleaving said cleavable polynucleotide sequences when said extension is hybridized with said site specific cleavage sequences,

(c) dissociating said fragments, said fragments comprising a primary polynucleotide sequence,

(d) hybridizing said fragments with said single stranded pattern polynucleotide, and

repeating steps (a)–(d) above wherein steps (a)–(d) are conducted simultaneously or wholly or partially sequentially.

4,994,369

T-CELL ACTIVATION RELATED GENE

Alan M. Krensky, Stanford; Mark Davis, Mountain View; Thomas Schall, Palo Alto, all of Calif., and Jan Jongstra, Toronto, Canada, assignors to The Board of Trustees of the Leland Stanford Jr. Univ., Stanford, Calif.

Filed Dec. 15, 1987, Ser. No. 132,926
Int. Cl.[5] C12Q *1/68, 1/00*
U.S. Cl. 435—6 **1 Claim**

1. A method for determining whether a T-cell is stimulated or unstimulated comprising:

determining the level of transcription or translation of messenger RNA encoding the peptide 519, wherein an increase in the level of transcription or translation of messenger RNA encoding peptide 519 compared to the level of transcription or translation of messenger RNA encoding peptide 519 in an unstimulated T-cell indicates a stimulated T-cell.

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4,994,370

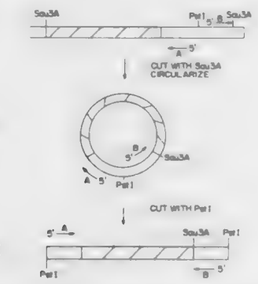
DNA AMPLIFICATION TECHNIQUE

Jonathan Silver, and Vijaya R. Keerikatte, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 3, 1989, Ser. No. 292,814

Int. Cl.[5] **C12Q** *1/68;* **C12P** *19/34;* **C12N** *9/22;* **G01N** *33/566*

U.S. Cl. 435—6 **16 Claims**



1. A method of amplifying double-stranded DNA sequences extending to one or both sides of a single region of known sequence, comprising the steps of:

(a) cutting double-stranded DNA into fragments with a least one restriction enzyme, wherein at least one restriction fragment comprises a region of known sequence and a flanking DNA sequence to be amplified;

(b) circularizing said at least one fragment obtained in step (a) with a DNA ligase;

(c) hybridizing said circularized fragment with two oligonucleotide primers complementary to opposite strands of said region of known sequence, wherein said primers are oriented with their 5' ends toward one another; and

(d) performing a polymerase chain reaction, wherein 5' to 3' primer extension proceeds from each oligonucleotide primer around the circularized fragment.

4,994,371

DNA PREPARATION OF CHRISTMAS FACTOR AND USE OF DNA SEQUENCES

Earl W. Davie, 9010 N.E. 22nd Pl., Bellevue, Wash. 98004, and Kotoku Kurachi, 4022 N.E. 104 Ave., Seattle, Wash. 98125

Continuation of Ser. No. 94,031, Aug. 28, 1987, abandoned, which is a continuation of Ser. No. 888,041, Jul. 18, 1986, abandoned, which is a continuation of Ser. No. 735,702, May 16, 1985, abandoned, which is a continuation of Ser. No. 437,009, Oct. 28, 1982, abandoned. This application May 19, 1989, Ser. No. 355,900

Int. Cl.[5] **C12Q** *1/68;* **C12N** *15/12*

U.S. Cl. 435—6 **23 Claims**

1. An isolated DNA sequence consisting essentially of a sequence encoding human factor IX.

4,994,372

DNA SEQUENCING

Stanley Tabor, Cambridge, and Charles C. Richardson, Chestnut Hill, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 3,227, Jan. 14, 1987. This application Dec. 6, 1988, Ser. No. 280,489

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

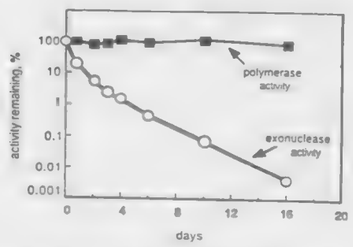
Int. Cl.[5] **C12Q** *1/68*

U.S. Cl. 435—6 **44 Claims**

1. A method for determining the nucleotide base sequence of a DNA molecule, comprising:

providing said DNA molecule annealed with a primer molecule able to hybridize to said DNA molecule;

incubating the annealed molecules in a vessel containing four different deoxynucleoside triphosphates, a processive DNA polymerase, wherein said polymerase is able to remain bound for at least 500 bases to said DNA molecule in an environmental condition used in the extension reaction of a DNA sequencing reaction, said polymerase having less than 500 units of exonuclease activity per mg of said polymerase, and one of four DNA synthesis terminating agents which terminate DNA synthesis at a specific nucleotide base, wherein each said agent terminates DNA synthesis at a different nucleotide base, and



separating the DNA products of the incubating reaction according to their size, whereby at least a part of the nucleotide base sequence of said DNA molecule can be determined.

4,994,373

METHOD AND STRUCTURES EMPLOYING CHEMICALLY-LABELLED POLYNUCLEOTIDE PROBES

Jannis G. Stavrianopoulos, New York; Dollie Kirtikar, Elmhurst; Kenneth H. Johnston, and Barbara E. Thalenfeld, both of New York, all of N.Y., assignors to Enzo Biochem, Inc., New York, N.Y.

Continuation of Ser. No. 732,374, May 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 461,469, Jan. 21, 1983, abandoned. This application Jul. 20, 1989, Ser. No. 385,956

Int. Cl.[5] **C12Q** *1/68;* **C07H** *21/00;* **G01N** *33/533*

U.S. Cl. 435—6 **27 Claims**

1. A method for detecting a polynucleotide sequence which comprises:

fixing said polynucleotide sequence to a solid support which comprises or is contained within a transparent or translucent, non-porous system, such that a single-strand of the polynucleotide is capable of hybridizing to complementary nucleic acid sequences;

forming an entity comprising said polynucleotide sequence hybridized to a polynucleotide or oligonucleotide probe, said probe having attached thereto a chemical label further comprising a signalling moiety capable of generating a soluble signal; and

generating and detecting said soluble signal.

4,994,374

DIAGNOSTIC METHOD OF CIRRHOSIS AND HEPATIC CANCER

Atsushi Nishikawa; Naoyuki Taniguchi, both of Osaka, and Isamu Takagahara, Hyogo, all of Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00898, § 371 Date May 1, 1989, § 102(e) Date May 1, 1989, PCT Pub. No. WO89/02474, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 6, 1988, Ser. No. 362,414

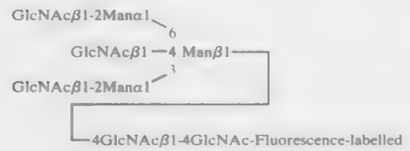
Claims priority, application Japan, Sep. 7, 1987, 62-221992

Int. Cl.[5] **C12Q** *1/48;* **A61K** *37/52, 35/16*

U.S. Cl. 435—15 **1 Claim**

1. A method for diagnosing hepatocirrhosis or hepatic cancer which comprises the following steps:

(a) adding fluorescence-labelled GnGn sugar chain and UDP-GlcNAc to a serum sample to react with UDP-N-acetylglucosamine:glycoprotein N-acetylclucosaminyltransferase III (Gn-T-III) in said serum sample to produce the following compound:



(b) subjecting the resulting reaction solution containing said compound to high-performance liquid chromatography; and

(c) examining the increase in degree of Gn-T-III activity.

4,994,375

STABLE HUMAN SERUM BASED CONTROL AND/OR CALIBRANT

Alan Posner, Davie, and Pedro Romero, Miami, both of Fla., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jul. 11, 1988, Ser. No. 217,243

Int. Cl.[5] **C12Q** *1/32, 1/50*

U.S. Cl. 435—17 **5 Claims**

1. A stable reconstituted human serum based control for the assay total LD and CK and their isoenzymes, which comprises a mixture of:

(a) fresh human serum in sufficient quantity to obtain a final total protein concentration from about 6.5 to 7.5 g/dl;

(b) from about 525 to 695 U/L of total CK, said CK being comprised of about 70 to 80% CK-MM isoenzyme, about 15 to 25% CK-MB isoenzyme and about 2 to 10% CK-BB isoenzyme;

(c) from about 300–400 U/L of LD, said LD being comprised of 37 to 47% LD1 isoenzyme, 23 to 37% LD2 isoenzyme, 7 to 19% LD3 isoenzyme, 2 to 8% LD4 isoenzyme, and 3 to 11% LD5 isoenzyme; and

(d) an effective amount of sodium citrate to stabilize the said enzymes;

(e) said control having no added thiol compounds other than the amount normally used to purify CK isoenzymes, said thiol compound concentration being less than 3×10^{-2}M and said purified CK being added to the control to meet the parameters specified in (1)(b).

4,994,376

DETECTION OF BACTEROIDES GINGIVALIS

Joseph J. Zambon, Williamsville, and Robert J. Gence, Buffalo, both of N.Y., assignors to The Research Foundation of State University of NY, Albany, N.Y.

Filed May 27, 1987, Ser. No. 54,617

Int. Cl.[5] **C12Q** *1/37, 1/02, 1/04;* **C12N** *9/99*

U.S. Cl. 435—24 **5 Claims**

1. A method for the detection of *B. gingivalis* in a biological sample which comprises the steps of:

(a) mixing said sample with N-CBz-glycyl-glycyl-L-arginine-β-naphthylamide or a derivative thereof,

(b) adding a dimethyl sulfoxide serum aminopeptidase inhibitor, and

(c) detecting the amount of *B. gingivalis* N-CBz-Gly-Gly-Arg peptidase in said sample.

4,994,377

METHOD FOR ASSAYING 1,5-ANHYDROGLUCITOL AND KIT THEREFOR

Tsuneo Nakamura, Saitama; Hiroshi Akanuma, Kanagawa; Masahiko Yabuuchi, Saitama; Kazuo Kato, Saitama, and Minoru Masuda, Saitama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,508

Claims priority, application Japan, Sep. 22, 1986, 61-222003

Int. Cl.[5] **C12Q** *1/26, 1/28;* **G01N** *1/00*

U.S. Cl. 435—25 **10 Claims**

6. A process for determining 1,5-anhydroglucitol, which comprises selectively removing sugars from a specimen containing 1,5-anhydroglucitol adding pyranose oxidase or L-sorbose oxidase to said sample in the presence of oxygen; detecting the amount of hydrogen peroxide formed as a result of enzymatic oxidation of 1,5-anhydroglucitol; anddetermining of 1,5-anhydroglucitol; and determining 1,5-anhydroglucitol from the amount of hydrogen peroxide thus formed.

4,994,378

METHOD FOR REDUCING BLOOD CARBON DIOXIDE BACKGROUND IN BACTERIAL MEDIA BY THE ADDITION OF MICELLES OF SAPONIN AND A PHOSPHOLIPID

Dolores M. Berger, Baltimore; Paul E. Goldenbaum, Towson, and Gregory Tice, Lutherville, all of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 8, 1989, Ser. No. 404,475

Int. Cl.[5] **C12Q** *1/02*

U.S. Cl. 435—29 **23 Claims**

1. A growth medium for detecting biological activity in blood which comprises a carbon source which can be metabolized by a microorganism to produce carbon dioxide, an effective amount of a lysing agent and a phospholipid, wherein said lysing agent and phospholipid are formed in mixed micelles.

4,994,379

MODIFIED SIGNAL PEPTIDES

Shing Chang, Hercules, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 583,472, Mar. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 473,820, Mar. 9, 1983, Pat. No. 4,711,844. This application Aug. 22, 1989, Ser. No. 407,701

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[5] **C12P** *21/00;* **C12N** *15/00, 7/00;* **C07H** *15/12*

U.S. Cl. 435—69.1 **13 Claims**

1. A DNA sequence encoding a modified exo-signal peptide, said modified exo-signal peptide corresponding to a wild-type signal peptide which a) is capable of forming membrane bound lipoproteins and b) includes a facilitating region within the carboxy-terminal region thereof, wherein said wild-type signal peptide is a bacterial signal peptide selected from the group

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consisting of B licheniformis penicillinase signal sequence, E. coli lipoprotein signal sequence. Bacillus cereus penicillinase III signal sequence, and S. aureus penicillinase signal sequence said facilitating region comprising a tetrapeptide, selected from the group consisting of leu-ala-gly-cys and leu-ser-ala-cys, said facilitating region having a single cysteine, the presence of which is necessary for the formation of membrane bound lipoprotein, wherein the modification to said exo-signal peptide comprises another amino acid X in place in said cysteine of the facilitating region, said amino acid X not forming a membrane bound lipoprotein but forming substantially more exoprotein than said wild-type signal peptide sequence.

4,994,380

PROCESS FOR EXPRESSING GENES BY BACILLUS BREVIS

Shigezo Udaka; Norihiro Tsukagoshi, and Hideo Yamagata, all of Nagoya, Japan, assignors to Shigezo Udaka, Nagoya, Japan

Filed Nov. 7, 1986, Ser. No. 928,125

Claims priority, application Japan, Nov. 7, 1985, 60-248036; Mar. 6, 1986, 61-47273

Int. Cl.[5] C12N *15/00, 1/20;* C12P *21/00*

U.S. Cl. 435—69.1 9 Claims

1. A process for expressing genes by *Bacillus brevis* which comprises transducing into a cell of *Bacillus brevis* a replicable plasmid comprising:

(1) a nucleotide sequence (a), which is selected from the group consisting of: GCAACT, TTCACG, and TATACT;

(2) a nucleotide sequence (b) located downstream of the nucleotide sequence (a), which is selected from the group consisting of TTTAAT, TACACT, and AAAGCG ;

(3) a nucleotide sequence (c) located downstream of the nucleotide sequence (b) and acting as a binding site to ribosome in the cell of *Bacillus brevis*;

(4) a nucleotide sequence (d) located downstream of the nucleotide sequence (c) and acting as a translation initiation codon in the cell of *Bacillus brevis*; and

(5) a gene ligated in an open reading frame downstream from the nucleotide sequence (d).

4,994,381

N-[[6-METHOXY-5-(TRIFLUOROMETHYL)-1-NAPHTHALENYL]-THIOXOMETHYL]-N-METHYLGLYCINE S-OXIDE AND THE AMIDE THEREOF

Eckhardt S. Ferdinandi, Princeton; Michael S. Malamas, Plainsboro; Kazimir Sestanj, Monmouth Junction, and Surendra N. Sehgal, Princeton, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 113,691, Oct. 28, 1987, Pat. No. 4,853,484, which is a division of Ser. No. 934,760, Nov. 25, 1986, Pat. No. 4,734,435. This application Mar. 20, 1989, Ser. No. 325,605

Int. Cl.[5] C12P *13/04, 11/00, 13/02*

U.S. Cl. 435—106 1 Claim

1. A process for preparing the compound N-[[6-methoxy-5-(trifluoromethyl)-1-naphthalenyl]thioxomethyl]-N-methylglycine S-oxide, which comprises fermentation of *Streptomyces griseus* ATCC 12475 in the presence of N-[[6-methoxy-5-(trifluoromethyl)-1-naphthalenyl]thioxomethyl]-N-methylglycine and isolation of said S-oxide compound.

4,994,382

PROCESS FOR PRODUCTION OF PYRROLO-QUINOLINE QUINONE

Minoru Ameyama, and Osao Adachi, both of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 73,046, May 29, 1985, abandoned. This application May 26, 1989, Ser. No. 357,668

Claims priority, application Japan, May 29, 1984, 59-107406

Int. Cl.[5] C12N *1/20;* C12P *17/18, 17/16;* C12R *1/38*

U.S. Cl. 435—119 2 Claims

1. A process for producing pyrrolo-quinoline quinone, comprising culturing a bacterium Pseudomonas N1-1 (FERM BP-775) in a culture medium containing methanol at a concentration of from 0.5% to 5.0% by weight under conditions in which said bacterium can grow to produce said pyrrolo-quinoline quinone in the cultured medium, and recovering at least about 26.1 ug/ml of the pyrrolo-quinoline quinone from the cultured medium.

4,994,383

METHOD FOR PRODUCING TRICHOTHECENES AND RELATED MATERIALS

Marian N. Beremand, and Patricia J. Black, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 173,910, Mar. 28, 1988, Pat. No. 4,880,747. This application Aug. 29, 1989, Ser. No. 400,306

Int. Cl.[5] C12R *1/77;* C12P *5/00*

U.S. Cl. 435—166 2 Claims

1. A biologically pure culture of *Fusarium* mutant strain NRRL 18340 or subcultures thereof, said strain having the property of accumulating trichodiene.

4,994,384

MULTIPLYING BOVINE EMBRYOS

Randall S. Prather; Frank Barnes, both of Madison, Wis.; James Robl, Belchertown, Mass.; Neal L. First, Madison, Wis., and Vincent F. Simmon, Potomac, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 948,269, Dec. 31, 1986, abandoned. This application Oct. 27, 1987, Ser. No. 113,791

Int. Cl.[5] C12N *15/00*

U.S. Cl. 435—172.2 23 Claims

1. A method for transplanting a nucleus from a two to thirty-two cell donor bovine embryo to a recipient oocyte comprising the steps of:

(a) isolating a membrane-bounded nucleus from a cell of the donor embryo;

(b) removing the nuclear chromosomal material from the recipient oocyte (to prepare an enucleated recipient oocyte);

(c) placing the donor membrane-bounded nucleus with its membrane adjacent to that of the enucleated recipient oocyte; and

(d) electrically fusing the membranes of the membrane-bounded nucleus and the enucleated recipient oocyte together to form an embryonic single cell with a nucleus from the donor embryo.

4,994,385

HETEROBIFUNCTIONAL COUPLING AGENTS

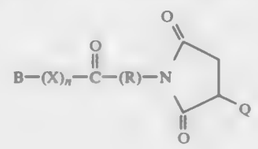
Christopher Bieniarz, Highland Park; Christopher J. Welch, Urbana, and Grady Barnes, Lindenhurst, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 114,930, Oct. 30, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 246,971

Int. Cl.[5] C12N *11/14;* C07K *17/06*

U.S. Cl. 435—177 16 Claims

1. A conjugate for use in a diagnostic assay, comprising:



wherein B is an enzyme label, an antibody, or an antibody fragment;

Q is an antibody or an antibody fragment when B is an enzyme label, or an enzyme label when B is an antibod or antibody fragment;

X is an amino acid having from three to ten carbon atoms in a straight chain;

R is cycloalkyl or alkyl-cycloalkyl; and

n is from three to ten.

4,994,386

PRODUCTION OF HBLV VIRUS IN THE HSB-2 CELL LINE

Chia-ling Hung, Darnestown, Md., assignor to Pharmacia Diagnostics, Inc., Fairfield, N.J.

Filed Jul. 13, 1987, Ser. No. 72,354

Int. Cl.[5] C12N *7/00, 7/02, 5/00, 5/02*

U.S. Cl. 435—235.1 7 Claims

1. A method of producing HBLV comprising culturing HBLV in HSB-2 cells having the identifying characteristics of ATCC No. CRL 9481.

4,994,387

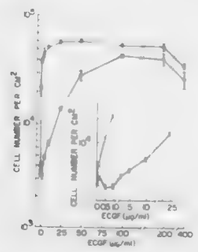
PROCESS AND MEDIUM FOR CLONING AND LONG-TERM SERIAL CULTIVATION OF HUMAN ENDOTHELIAL CELLS

Elliot M. Levine, Cherry Hill, N.J.; Sandor S. Shapiro, and Bruce E. Jarrell, both of Philadelphia, Pa., assignors to The Wistar Institute and The Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 99,241, Sep. 21, 1987, abandoned, which is a continuation of Ser. No. 848,913, Apr. 7, 1986, abandoned, and Ser. No. 848,917, Apr. 7, 1986, abandoned, which is a continuation of Ser. No. 550,306, Nov. 10, 1983, abandoned, said Ser. No. 848,913, is a continuation of Ser. No. 550,305, Nov. 10, 1983, abandoned. This application Jun. 17, 1988, Ser. No. 210,218

Int. Cl.[5] A01N *1/02;* C12N *5/00, 1/00*

U.S. Cl. 435—240.2 7 Claims



1. A culture medium for enhancing proliferation and increasing the lifespan of human endothelial cell cultures which comprises a cell growth medium, and effective amounts of endothelial cell growth factor (ECGF) and a material selected from the group consisting of heparin, dextran sulfate, and mixtures thereof to increase the population doublings of human umbilical vein endothelial cells (HUVE cells) to at least about 42 prior to senescence and to reduce the doubling time of said HUVE cells so as not to exceed about 21 hours.

4,994,388

COLLAGEN-COATED POLYSTYRENE MICROCARRIER BEADS

William J. Hillegas; James Varani, and David L. Helmreich, all of Ann Arbor,, Mich., assignors to Solohill Engineering, Inc. and The University of Michigan, both of Ann Arbor,, Mich.

Filed Apr. 15, 1988, Ser. No. 181,853

Int. Cl.[5] C12N *5/00*

U.S. Cl. 435—240.243 14 Claims

1. A carrier arrangement for immobilizing anchorage-dependent cells, the arrangement comprising an autoclavable microsupport element having a core portion formed of a non-porous polystyrene having a density of approximately between 1.01 g/cc and less than 1.05 g/cc and a softening temperature of greater than 75° C., and a smooth surface layer portion formed of cross-linked collagen.

4,994,389

PROMOTER-PROBE PLASMID FOR ANALYSIS OF TRANSCRIPTIONAL REGULATION

Jerald S. Feitelson, Englewood, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 10, 1987, Ser. No. 24,291

Int. Cl.[5] C12N *1/20, 15/00*

U.S. Cl. 435—252.35 2 Claims

1. The recombinant plasmid pCLL34.

4,994,390

ENZYME BLEND CONTAINING CELLULASE TO CONTROL INDUSTRIAL SLIME

Christopher L. Wintr, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 322,469, Mar. 12, 1989, Pat. No. 4,936,994. This application Dec. 21, 1989, Ser. No. 454,599

Int. Cl.[5] C12N *11/18*

U.S. Cl. 435—262 2 Claims

1. An enzyme blend effective in removal of microbial biofilm from slime covered surfaces and in wastewater treatment which consists of 2 parts cellulase, 1 part alpha-amylase and 1 part protease.

4,994,391

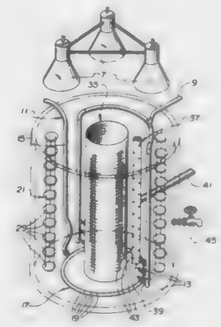
BACTERIA CULTURING SYSTEM

Craig O. Hoffmann, 10364 Newport Dr., Eden Prairie, Minn. 55347

Filed Jun. 28, 1989, Ser. No. 372,674

Int. Cl.[5] C12M *3/02*

U.S. Cl. 435—286 21 Claims



1. A bacteria culturing system for waste water treatment, comprising:

(a) a primary culturing basin including:

(i) a light source;

(ii) water input means;

(iii) removable nutrient input means vertically disposed therein;

(iv) an effluent collector comprising a vertical collection pipe having vertically disposed holes therein; and

(v) effluent collector discharge means connected to said effluent collector which is in fluid communication therewith; and

(b) an acclimator basin including:

(i) a light source;

(ii) input means from the primary culturing basin;

(iii) input means from the waste water to be treated;

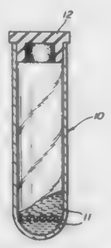
VOL 1123 ISS 3 FE 19 1991 UMI

(iv) high surface area bacteria culturing means; and
(v) output means to the waste water to be treated.

4,994,392
DEVICE FOR HEATING BREWING MASH
Walter Welledits, and Albert Welledits, both of Vienna, Austria, assignors to O. Salm & Co. GmbH, Vienna, Austria
Filed Nov. 10, 1988, Ser. No. 269,441
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738185
Int. Cl.[5] C12M *1/38*
U.S. Cl. 435—790 11 Claims

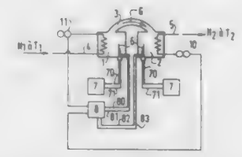
1. A device for heating brewing mash, which comprises:
a heat source;
a heat exchanger that is in direct heat exchange contact with said source wherein said heat exchanger has mash flowing through it and has at least one evenly coiled tube for flow of said brewing mash in a single spiral direction and wherein said coil tube has a smooth surface on an inner side thereof;
a control device for controlling the flow rate of the brewing mash through said at least one tube depending upon temperature change per unit of time;
an intermediate container; and
a fuel feed line having a valve and a computing unit for controlling, depending on a temperature measurement of the temperature of brewing mash in said intermediate container and before entry into said intermediate container, said valve in said fuel feed line.

4,994,393
BLOOD PARTITIONING COMPOSITION
Shrikant P. Pradhan, Parsippany, N.J.; Sheshadri Narayanan, New York, N.Y., and Fu-chung Lin, Wayne, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Feb. 22, 1989, Ser. No. 314,540
Int. Cl.[5] G01N *1/18, 33/49*
U.S. Cl. 436—8 8 Claims



8. A blood collection assembly characterized by
(a) an evacuated tube;
(b) said evacuated tube having a closed end and an open end;
(c) an elastomer stopper for closing said open end and maintaining the vacuum in said evacuated tube; and
(d) a blood partitioning composition in said evacuated tube, said composition comprising
(1) a dual resin component including poly-alpha-pinene of lower density combined with a chlorinated octadecene of higher density;
(2) a radiation stabilizer;
(3) a network stabilizer;
(4) a thixotropic agent; and
(5) a pigment.

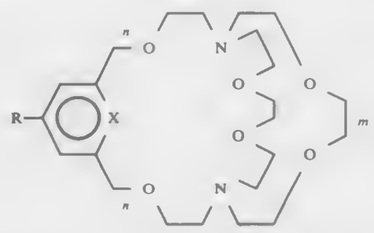
4,994,394
METHOD OF USING A THERMAL SHOCK PROBE, A THERMAL SHOCK PROBE USABLE IN THE METHOD AND APPLICATION OF THIS METHOD
Jean-Luc Oms, Villelongue Dels Monts; Jacques Prosdocimi, Canottes, and Maurice Comtat, Toulouse, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France
Filed Sep. 2, 1988, Ser. No. 239,664
Claims priority, application France, Sep. 7, 1987, 87 12390
Int. Cl.[5] G01N *35/08*
U.S. Cl. 436—55 11 Claims



1. Method of using a thermal shock probe, formed of a thermocouple associated with a heating element, characterized in that the probe is used for monitoring, in a solid-gas reactor (1,2), the chemical reaction between a porous mixture and a gas by applying a heat flux variation and processing the response of the thermocouple.

4,994,395
CHROMOGFNIC CRYPTAND REAGENTS AND METHODS FOR DETERMINING CATION CONCENTRATIONS IN TEST SAMPLES CONTAINING INTERFERING CATIONS
Eddy Chapoteau, Brooklyn; Bronislaw P. Czech, Peekskill; Carl R. Gebauer, Crompond; Koon-Wah Leong, Ossining, and Anand Kumar, Southfields, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Apr. 15, 1987, Ser. No. 38,741
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] G01N *33/20, 31/20, 33/50;* C07D *498/02*
U.S. Cl. 436—79 54 Claims

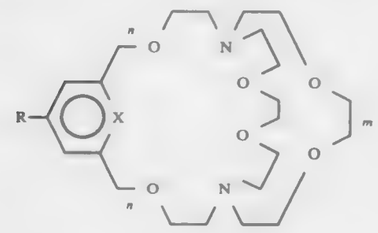
1. A reagent for determining the concentration of potassium cations in a sample containing potassium and interfering sodium cations, the reagent consisting essentially of:
(a) at least one chromogenic crptand compound having the formula



where n and m=0 or 1, X=N or COH, and R=p-nitrophenylazo, 3-phenylisothiazolyl-5-azo, isothiazolyl-5-azo, thiazolyl-5-azo, 2,4,6-trinitrophenylazo, p-nitrostyryl, p-benzoquinonemonoimino, and bis-(p-dimethylaminophenyl)hydroxymethyl, and
(b) at least one sodium mask which reacts selectively with the interfering sodium cations.

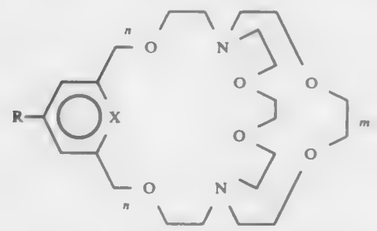
16. A reagent for determining the concentration of sodium cations present in a sample containing sodium and interfering potassium cations, the reagent consisting essentially of:

(a) at least one chromogenic cryptand compound having the formula



where n and m=0 or 1, X=N or COH, and R=p-nitrophenylazo, 3-phenylisothiazolyl-5-azo, isothiazolyl-5-azo, thiazolyl-5-azo, 2,4,6-trinitrophenylazo, p-nitrostyryl, p-benzoquinonemonoimino, and bis-(p-dimethylaminophenyl)hydroxymethyl, and
(b) at least one potassium mask which reacts selectively with the interfering potassium cations.

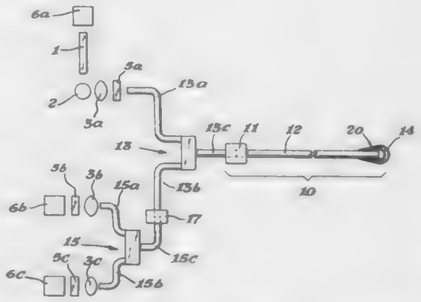
23. A method for determining the concentration of potassium cations present in a sample containing potassium and interfering sodium cations, comprising the steps of:
(a) preparing a reagent mixture consisting essentially of:
(i) at least one chromogenic cryptand compound having the formula



where n and m=0 or 1, X=N or COH, and R=p-nitrophenylazo, 3-phenylisothiazolyl-5-azo, isothiazolyl-5-azo, thiazolyl-5-azo, 2,4,6-trinitrophenylazo, p-nitrostyryl, p-benzoquinonemonoimino, and bis-(p dimethylaminophenyl)hydroxymethyl, and bis-(p-dimethylaminophenyl)hydroxymethyl, and
(ii) at least one potassium mask which reacts selectively with the interfering potassium cations;
(b) combining said reagent with said sample;
(c) measuring the absorbance of the resulting solution; and
(d) comparing the absorbance so measured with the absorbance of standard compositions containing known concentrations of sodium cations.

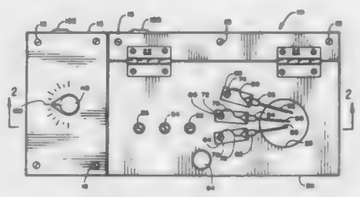
4,994,396
METHOD FOR MEASURING THE CONCENTRATION OR PARTIAL PRESSURE OF OXYGEN
Steven M. Lefkowitz; Steven P. Webb, and Michael S. Paquette, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 14, 1987, Ser. No. 133,594
Int. Cl.[5] G01N *21/64*
U.S. Cl. 436—136 21 Claims

1. A method for determining the concentration or the partial pressure of oxygen in media, comprising:
(A) inserting a sensor into the media, wherein the sensor comprises:
(a) means for transmitting and collecting light to and from a light modifying medium; and
(b) a light modifying medium comprising a luminescent dye dispersed in or upon a matrix and the dye is accessible to oxygen;
wherein said luminescent dye contains a hexanuclear core of molybdenum, tungsten or mixtures thereof having 14 coordination sites, wherein each coordination site is occupied by a ligand;



(B) transmitting and collecting light to and from said light modifying medium;
(C) measuring the intensity of luminescence collected from the light modifying medium and relating the measured intensity to a known standard to determine the concentration or partial pressure of oxygen present in the media.

4,994,397
ELECTROSTATIC METHOD AND APPARATUS FOR ANALYZING LIQUID SAMPLES
Hayes L. Pagel, 1466 Avocado Rd., Oceanside, Calif. 92054
Filed May 30, 1989, Ser. No. 357,790
Int. Cl.[5] G01N *27/00*
U.S. Cl. 436—149 19 Claims



11. A method for determining electrical characteristics of a liquid sample which comprises the steps of:
providing a quantity of a liquid;
bringing into contact with said liquid first, second and third spaced electrodes;
directing electrical signals from a speaker output connection of an audio amplifier through an electromagnetic speaker magnet to the first electrode;
directing signals from said speaker output connection directly to the second electrode;
directing output signals from said variable oscillator means to an auxiliary input connection of said amplifier; and
observing characteristics of the signal from the amplifier speaker output connection;
whereby said signals from said amplifier speaker output connection have characteristics unique to the sample in contact with said electrodes.

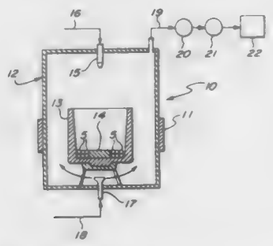
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4,994,398

ASSISTANT COMBUSTION AGENT FOR USE IN HIGH-FREQUENCY COMBUSTION FURNACE

Takeshi Yamada; Mitsuhiko Chishiro, and Katsuya Tsuji, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 18, 1988, Ser. No. 157,853
Claims priority, application Japan, Feb. 20, 1987, 62-24436
Int. Cl.[5] G01N *31/10, 31/12*
U.S. Cl. 436—166 **7 Claims**



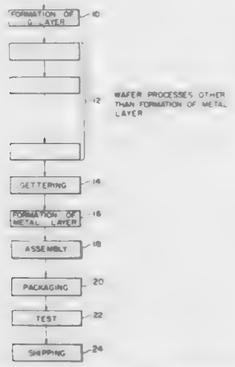
1. An assistant combustion agent for use in a high-frequency combustion furnace, comprising:
tungsten powder; and
tin powder mixed with the tungsten powder at an appointed ratio to provide a resulting mixture that is molded in an appointed form to provide a homogeneous structure of a mixed blend of tungsten and tin powder.

4,994,399

METHOD OF GETTERING HEAVY-METAL IMPURITIES FROM SILICON SUBSTRATES BY LASER-ASSISTED INTRINSIC GETTERING

Masaki Aoki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 16, 1990, Ser. No. 524,034
Claims priority, application Japan, May 16, 1989, 1-122453
Int. Cl.[5] H01L *21/322*
U.S. Cl. 437—11 **7 Claims**



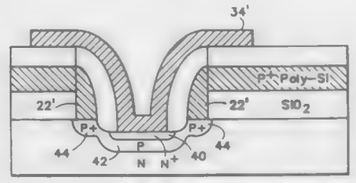
1. A method of gettering heavy metal impurities combined with acceptor impurities in a silicon substrate, said method comprising the steps of:
(a) forming an intrinsic gettering layer covered with a surface denuded zone by subjecting said substrate to heat treatments, the intrinsic gettering layer having a large density of crystal microdefects compared to the density of crystal microdefects in the denuded zone;
(b) subjecting the substrate surface on which elements are to be formed to most of the required process steps other than formation of a metal layer; and
(c) after said step (b), heating said substrate to a predetermined temperature and simultaneously irradiating said substrate with light rays, said predetermined temperature being selected to be lower than the precipitation temperature of said heavy metal impurities and enough for the heavy metal impurities to diffuse into said intrinsic gettering layer the energy level of said light being selected to be sufficient to dissociate the heavy metal impurities from the acceptor impurities.

4,994,400

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE USING A TRI-LAYER STRUCTURE AND CONDUCTIVE SIDEWALLS

Tadanori Yamaguchi, Hillsboro, Oreg.; Yeou-Chong S. Yu, San Jose, Calif.; Carol A. Hacherl, Beaverton, and Evan E. Patton, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 27, 1989, Ser. No. 302,519
Int. Cl.[5] H01L *21/00, 21/02, 21/265*
U.S. Cl. 437—31 **25 Claims**



1. A method of making an intermediate structure in the manufacture of a semiconductor device, comprising:
(a) providing a body of semiconductor material having a composite layer over a main surface thereof, the composite layer comprising at least a first layer of dielectric material, a layer of conductive material, and a second layer of dielectric material with the layer of conductive material being between the first and second layers of dielectric material, the composite layer having an opening therein through which an area of the main surface of said body is exposed;
(b) forming a conductive sidewall along one side of the opening, the conductive sidewall being spaced from an opposite side of the opening and being in conductive contact with both said body and said layer of conductive material;
(c) forming a dielectric sidewall over the conductive sidewall while leaving a portion of said body exposed; and
(d) introducing a dopant into the body through said portion of said body.

4,994,401

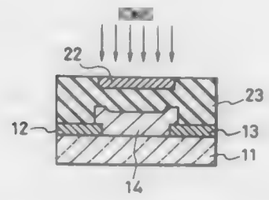
METHOD OF MAKING A THIN FILM TRANSISTOR

Yasuhiro Ukai, Kobe, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Division of Ser. No. 140,688, Jan. 4, 1988, Pat. No. 4,943,838.
This application Mar. 26, 1990, Ser. No. 498,641
Claims priority, application Japan, Jan. 16, 1987, 62-7657
Int. Cl.[5] H01L *29/78*
U.S. Cl. 437—40 **8 Claims**

1. A method for the manufacture of a thin film transistor comprising the steps of:
forming spaced source and drain electrodes on an insulating substrate;
forming a semiconductor layer on the insulating substrate between the source and drain electrodes;
forming an insulating organic molecular film all over the source and drain electrodes and the semiconductor layer; and

selectively implanting ions into a region of the top surface of the insulating organic molecular film remote from the semiconductor layer, whereby chains of molecules in said



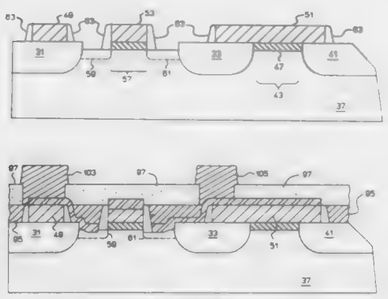
surface region of the insulating organic molecular film are cut to form free carbon, providing a conductive gate electrode in said top surface.

4,994,402

METHOD OF FABRICATING A COPLANAR, SELF-ALIGNED CONTACT STRUCTURE IN A SEMICONDUCTOR DEVICE

Kuang-Yi Chiu, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 67,509, Jun. 26, 1987. This application Aug. 30, 1989, Ser. No. 400,609
Int. Cl.[5] H01L *21/283, 21/285, 21/76*
U.S. Cl. 437—41 **13 Claims**



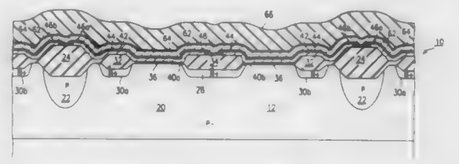
1. A method of forming a coplanar self-aligned contact structure in a semiconductor device, the method comprising:
forming first and second field oxide regions in a planar surface of a substrate, the regions being separated from each other by an island region of the substrate;
forming a gate oxide layer in the planar surface of the island region;
forming three coplanar polysilicon pads, a first such pad overlying the first field oxide region, a second such pad overlying the second field oxide region and a third such pad overlying the gate oxide layer to define a gate region;
forming in the island region a source diffusion region between the gate region and the first field oxide region and a drain diffusion region between the gate region and the second field oxide region;
coating the pads and the substrate with a refractive metal;
coating the metal with a reactive layer;
forming first and second conductors from the metal and the reactive layer, the first and second conductors being in electrical contact with the source and drain regions, respectively, and extending therefrom to and over the first and second pads; and
establishing electrical contacts with the portions of the conductors which cover the pads.

4,994,403

METHOD OF MAKING AN ELECTRICALLY PROGRAMMABLE, ELECTRICALLY ERASABLE MEMORY ARRAY CELL

Manzur Gill, Rosharon, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1989, Ser. No. 457,990
Int. Cl.[5] H01L *29/788*
U.S. Cl. 437—43 **4 Claims**



1. A method for fabricating at least first and second electrically erasable and programmable memory cells at a face of a semiconductor layer having a first conductivity type, comprising the steps of:
selectively doping the semiconductor layer with a dopant of a second conductivity type opposite the first conductivity type to create a drain region of the first cell, a shared source region spaced from the drain region of the first cell by a channel region of the first cell, and a drain region of the second cell spaced from the source region by a channel region of the second cell;
differentially growing an insulator layer over the face to create thick insulator regions over the source and drain regions, and a relatively thin insulator layer in between the source region and the drain regions;
selectively removing the thin insulator layer to expose first and second window areas on the source region adjacent the channel regions of the respective first and second cells;
forming a first conductive layer over the face;
selectively etching the first conductive layer to define first and second floating gate conductors, each formed over a respective thin window insulator and the channel adjacent the respective thin window insulator; and
forming a control gate conductor insulatively adjacent the floating gate conductors.

4,994,404

METHOD FOR FORMING A LIGHTLY-DOPED DRAIN (LDD) STRUCTURE IN A SEMICONDUCTOR DEVICE

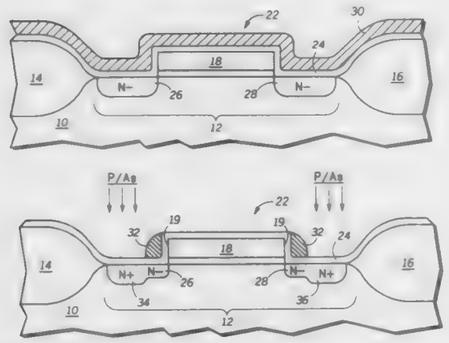
David Y. Sheng; Yasunobu Koss, both of Austin; Andrew J. Urquhart, Pflugerville, and Mark J. Cullen, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1989, Ser. No. 399,670
Int. Cl.[5] H01L *21/312, 21/265*
U.S. Cl. 437—44 **2 Claims**

1. A method for forming a lightly-doped drain in a semiconductor device comprising the steps of:
providing a semiconductor substrate of a first conductivity type and having an active region intermediate to a first and a second isolation region;
forming a thin dielectric layer overlying said active region;
forming a transistor gate in a central portion of said active region overlying said dielectric layer, said gate having horizontal surface and bounded by a vertical surface;
forming an oxidation layer to overlie said active region and said transistor gate;
forming a lightly-doped impurity region of a second conductivity type in said active region using said gate and said first and second isolation regions as a doping mask;
depositing by plasma enhanced chemical vapor deposition a conformal layer of amorphous carbon to overlie said substrate;
anisotropically etching said conformal layer of amorphous

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carbon by oxygen plasma reactive ion etching to remove said layer from said horizontal surface and leave a portion of said amorphous carbon covering said vertical surface to form a sidewall spacer;



forming a highly doped impurity region of a second conductivity type in said active region using said sidewall spacer and said first and second active regions as a doping mask; and

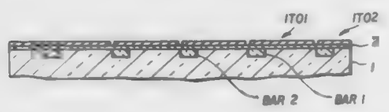
removing said sidewall spacer.

4,994,405

AREA IMAGE SENSOR WITH TRANSPARENT ELECTRODES

Krishnakumar M. Jayakar, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1989, Ser. No. 439,314
Int. Cl.[5] H01L *21/28, 29/78*
U.S. Cl. 437—53 **1 Claim**



1. A method of making a two phase image sensor having transparent electrodes comprising the steps of:

(a) sequentially forming on a substrate a gate oxide layer, a transparent conductor layer, a first polysilicon layer, a nitride layer, a second oxide layer, and then forming a first mask on the second oxide layer;

(b) selectively etching the first oxide and nitride layers to form first windows and then depositing a second photoresist mask in these windows to provide first openings and implanting dopant into the substrate through said first openings;

(c) removing the photoresist mask, selectively removing the second oxide layer leaving nitride layer strips, growing a third oxide layer on the exposed poly layer, and then removing the nitride strips;

(d) etching the portion of the first polysilicon layer exposed after the nitride strips were removed to form second windows and providing a third maks in said second windows leaving second openings and implanting dopant into the substrate through said second openings;

(e) removing the third mask and growing more oxide on the remaining second oxide layer and on the exposed first polysilicon layer surfaces, depositing a second polysilicon layer and then a planarizing layer;

(f) etching back the planarizing layer to expose the second polysilicon layer directly over the first polysilicon layer;

(g) selectively etching the exposed second polysilicon layer to expose the third oxide layer;

(h) selectively etching the third oxide layer and the planarizing layer leaving first polysilicon layer and second polysilicon layer portions on the transparent conductor;

(i) etching the exposed transparent conductor between the first polysilicon layer and second polysilicon layer portions to make transparent electrodes; and

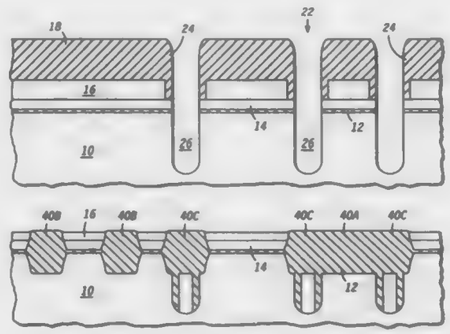
(j) etching the first polysilicon layer and second polysilicon layer selectively to expose two sets of transparent electrodes.

4,994,406

METHOD OF FABRICATING SEMICONDUCTOR DEVICES HAVING DEEP AND SHALLOW ISOLATION STRUCTURES

Barbara Vasquez, Chandler, and Peter J. Zoebel, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 3, 1989, Ser. No. 431,420
Int. Cl.[5] H01L *21/467*
U.S. Cl. 437—67 **16 Claims**



1. A method of fabricating a semiconductor structure comprising the steps of:

providing a semiconductor substrate;

forming a thermal oxide layer on said substrate;

forming a polycrystalline semiconductor layer on said thermal oxide layer;

forming a first dielectric layer on said polycrystalline semiconductor layer;

forming a first mask on said first dielectric layer and using said first mask to form at least one opening in said first dielectric layer, said at least one opening extending to said polycrystalline semiconductor layer;

forming dielectric spacers in said at least one opening;

forming a trench in said substrate beneath said at least one opening, said dielectric spacers creating a self-aligned reduction in the width of said trench;

forming a dielectric trench liner in said trench and in said at least one opening;

filling said trench with polycrystalline semiconductor material; and

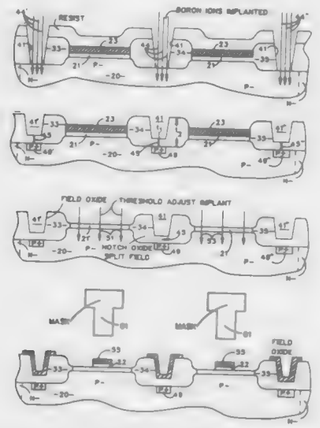
forming a shallow dielectric isolation element on said filled trench.

4,994,407

RADIATION HARDENED FIELD OXIDES FOR NMOS AND CMOS-BULK AND PROCESS FOR FORMING

Frank Z. Custode, Norco, and John G. Poksheva, Whittier, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 20, 1988, Ser. No. 247,053
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—70 **7 Claims**



1. A process for hardening an NMOS device having a P doped silicon substrate or a P well serving as the substrate, comprising the following steps:

masking a region on the substrate where the device will be formed;

oxidizing the unmasked P doped substrate to form field oxide in and above the silicon substrate and surrounding the region;

establishing a peripheral notch in the field oxide about the region which exposes the substrate within the notch;

implanting the so-exposed substrate with boron to create a degenerately doped region in the exposed substrate;

growing a thin oxide to partially fill the notch and cover the exposed substrate to form a thin oxide region within the notch surrounding the region for the device to enhance the field oxide isolation in a radiation harsh environment whereby when radiation breaks down the thick field oxide, said degenerately doped region maintains high voltage threshold in the thin oxide region to maintain radiation hardness; and,

unmasking said region and forming said device in said region and further comprising depositing and delineating interconnect conductors over the field oxide on the unnotched portions thereof and on the thin oxide.

4,994,408

EPITAXIAL FILM GROWTH USING LOW PRESSURE MOCVD

Eric S. Johnson, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Feb. 6, 1989, Ser. No. 306,600
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—133 **10 Claims**

1. A method for growing high quality epitaxial films using low pressure metalorganic chemical vapor deposition comprising the steps of:

providing a gallium arsenide substrate that is misoriented from the {100} plane one of 3.0 to 8.5 degrees towards the {111}A plane, 4.5 to 12.5 degrees toward the {111}B plane and at least 4.0 degrees generally towards the {110} plane;

placing said substrate into an MOCVD reactor, said reactor having a temperature in the range of 650 to 750 degrees centigrade and a total pressure of less than 0.2 atmospheres; and

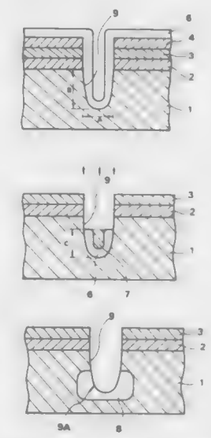
growing an aluminum gallium arsenide epitaxial film on said substrate.

4,994,409

METHOD FOR MANUFACTURING A TRENCH CAPACITOR USING A PHOTORESIST ETCH BACK PROCESS

Yong H. Yoon, and Cheol K. Bok, both of Seoul, Rep. of Korea, assignors to Hyundai Electronics Industries Co. Ltd., Kyungki, Rep. of Korea

Filed Jul. 18, 1989, Ser. No. 381,288
Claims priority, application Rep. of Korea, Jul. 22, 1988, 88-9191
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—164 **7 Claims**



1. A method for manufacturing a trench capacitor using a photoresist etch back process comprising:

providing a silicon wafer;

sequentially depositing an oxide layer, a nitride layer and an oxide layer as a mask layer on the Si wafer and coating the mask layer with a photoresist layer, and

forming a first mask pattern by removing a portion of the photoresist layer;

forming a second mask pattern by removing the exposed mask layer along the photoresist pattern, and removing the photoresist completely;

forming a trench in the Si wafer along the second mask pattern;

depositing a thin doped oxide layer having a constant thickness outside and inside the trench,

entirely coating the doped oxide layer with a photoresist, thereby filling the trench with photoresist, then planarizing the top surface of the photoresist;

baking the resulting photoresist coated Si wafer, and selectively etching back the photoresist deposited outside and inside the trench;

selectively etching the doped oxide layer to the photoresist remaining in the trench, together with the oxide layer; and

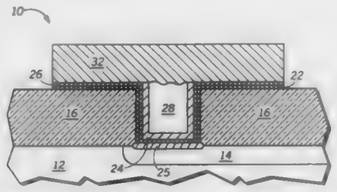
completely removing the photoresist remaining inside the trench, and thermal processing the doped oxide inside the trench, thereby forming a selective doping region along the wall of the trench in the Si wafer.

4,994,410

METHOD FOR DEVICE METALLIZATION BY FORMING A CONTACT PLUG AND INTERCONNECT USING A SILICIDE/NITRIDE PROCESS

Shih W. Sun, and Jen-Jiang Lee, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 177,747, Apr. 4, 1988, Pat. No. 4,926,237.
This application Feb. 16, 1990, Ser. No. 481,137
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—192 **4 Claims**



1. A method for fabricating a semiconductor device, comprising the steps of:
providing a silicon substrate;
forming a device region at the surface of said substrate;
forming an insulating layer overlying said surface;
forming an opening through said insulating layer to expose a portion of said device region;
sequentially sputter depositing a layer of titanium overlying said insulating layer and extending into said opening to contact said portion of said device region in an inert and a layer of tungsten to overlie and contact said layer of titanium in a sputtering apparatus, wherein said sequential sputtering is performed without exposing the sputtered layers to room ambient;
heating in a nitrogen containing ambient and diffusing nitrogen atoms through said sputtered tungsten layer to form titanium silicide at the silicon-titanium interface and titanium nitride at the titanium-tungsten interface;
chemical vapor depositing tungsten overlying said layer of sputtered tungsten to a thickness sufficient to substantially fill said opening;
etching back said chemical vapor deposited tungsten to remove substantially all of same overlying said insulator, to expose portions of said layer of titanium, and to leave said chemical vapor deposited tungsten substantially filling said opening;
applying a layer comprising aluminum to contact said chemical vapor deposited tungsten remaining in said openings; and
selectively patterning said layer comprising aluminum and any titanium remaining thereunder.

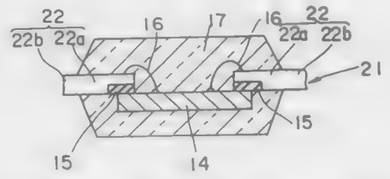
4,994,411

PROCESS OF PRODUCING SEMICONDUCTOR DEVICE

Takahiro Naito, Kodaira; Gen Murakami, Machida; Hiromichi Suzuki, Tokorozawa; Hajime Sato, Kodaira; Wahei Kitamura, Kodaira, and Masachika Masuda, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,385
Claims priority, application Japan, Mar. 10, 1988, 63-57902; Mar. 11, 1988, 63-57520
Int. Cl.[5] H01L *21/02*
U.S. Cl. 437—209 **15 Claims**

1. A process of producing a semiconductor device comprising the steps of:
providing a lead frame having inner leads spaced from each other and connected together by a connecting portion;
bonding a layer of an insulating material to said connecting portion and to surrounding portions of the inner leads;
removing said connecting portion and a portion of the layer of insulating material simultaneously to form end portions of the inner leads which are separated from each other and retained in a spaced arrangement by a remaining portion of said layer of insulating material;
joining a semiconductor chip having bonding pads to the end portions of said inner leads;
connecting the bonding pads on said semiconductor chip and said inner leads by means of wires; and



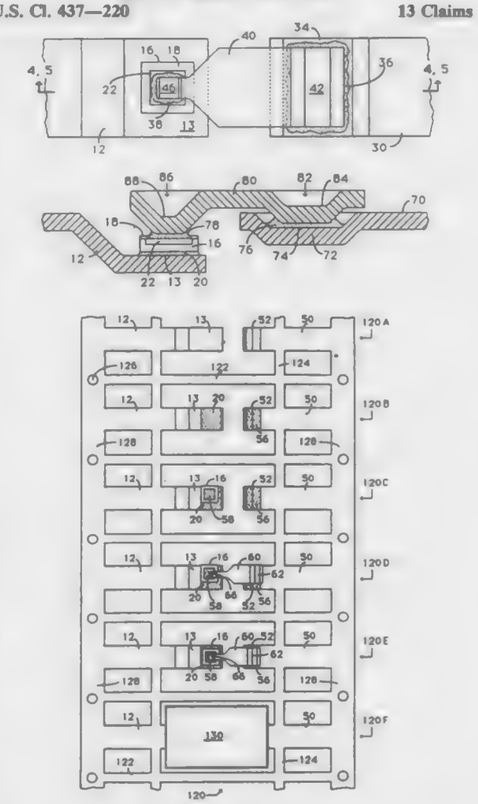
encapsulating said semiconductor chip, the remaining portion of the layer of insulating material, said inner leads and said wires within a resin material;
wherein a peripheral portion of one face of said semiconductor chip partially overlaps faces of said end portions.

4,994,412

SELF-CENTERING ELECTRODE FOR POWER DEVICES

Martin Kalfus, Scottsdale, and Robert A. Gooch, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Feb. 9, 1990, Ser. No. 477,397
Int. Cl.[5] H01L *23/48, 29/44*
U.S. Cl. 437—220 **13 Claims**



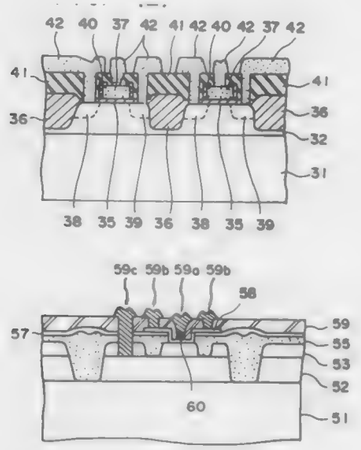
1. A method for forming a device having an electronic element therein, comprising:
supplying a support member for receiving the electronic element and a lead member having a first alignment means for receiving a connection clip having a mating second alignment means therein for mutually aligning the lead member and the connection clip;
supplying the connection clip with the second alignment means for mating with the first alignment means and having a first attachment means for coupling to the electronic element;
providing a first bonding material between the support member and the electronic element providing a second bonding material between the mating first and second alignment means, and providing a third bonding material between the attachment means and the electronic element;
temporarily floating the connection clip on the second and third bonding material; and
thereafter solidifying the second and third bonding material.

4,994,413

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A SILICON CARBIDE LAYER

Takashi Eshita, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 12, 1989, Ser. No. 420,465
Claims priority, application Japan, Oct. 12, 1988, 63-254898
Int. Cl.[5] H01L *21/465*
U.S. Cl. 437—244 **12 Claims**



1. A method of forming a semiconductor device on a silicon carbide layer, comprising the steps of:
defining at least one device region and associated device isolation regions in the silicon carbide layer;
selectively introducing an impurity into the device isolation regions of the silicon carbide layer at a concentration level sufficient to impart an enhanced rate of oxidation characteristic to said defined, device isolation regions, relatively to the rate of oxidation characteristic of the remainder of the silicon carbide layer including each said associated device region;
oxidizing the silicon carbide layer by annealing in an oxidizing atmosphere and thereby forming an oxide layer on the silicon carbide layer, the oxide layer so formed in the device isolation regions being substantially thicker than that in each said associated device region and extending to a sufficient depth in the silicon carbide layer thereby to afford electrical isolation of a device to be formed in the associated device region; and
forming a semiconductor device in the device region.

4,994,414

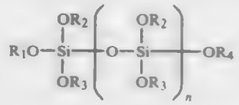
METHOD OF PRODUCING BIOACTIVE CERAMICS CONTAINING APATITE CRYSTAL

Nobuyuki Yamamoto, Tokyo; Tsuyoshi Goto, Kanagawa, and Yasunobu Horiguchi, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 99,784, Sep. 22, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 221,527
Claims priority, application Japan, Sep. 24, 1986, 61-225179; Sep. 24, 1986, 61-225180
Int. Cl.[5] C03C *3/097;* **C03G** *3/078*
U.S. Cl. 501—12 **11 Claims**

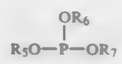
1. A method of producing a bioactive ceramics containing apatite crystal, which comprises the steps of
(i) reacting components (A), (B) and (C) in the presence of water at pH of not higher than 8 so as to prepare a gel comprising 20 to 70 mol % of component (A) as SiO_2, 1 to 50 mol % of component (B) as P_2O_5 and 20 to 70 mol % of component (C); wherein (A) is at least one of the types of silicic acid ester represented by a general formula (I):

(I)

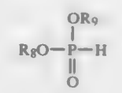


wherein each of R_1 to R_4 is hydrogen or a radical represented by $C_xH_{2x+1}(OC_2H_4)_y$— (x: 1 to 5; y: 0 to 10); R_1 to R_4 are not all hydrogen; (and n: 0 to 20);
(B) is at least one of a phosphorus compound exclusive of phosphoric acid represented by general formulae (II), (III) or (IV):

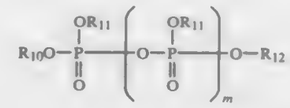
(II)



(III)



(IV)



wherein each of R_5 to R_{12} is hydrogen, an alkyl group, a phenyl radical with 1 to 5 carbon atoms, or an aralkyl group with 7 to 10 carbon atoms; in which at least one of R_{10} to R_{12} is hydrogen; and m: 0 to 10, and
(C) is at least one water soluble calcium salt; and
(ii) sintering the resulting gel to obtain the bioactive ceramics containing not less than 5 wt % of apatite and not more than 2 wt % of Na compound as Na_2O.

4,994,415

SiO_2-AL_2O_3-BAO GLASS SUBSTRATES WITH IMPROVED CHEMICAL RESISTANCE FOR USE IN DISPLAY PANELS AND OTHERS HAVING THIN FILMS

Katsuhiko Imai, Shiga, and Shigeru Yamamoto, Kyoto, both of Japan, assignors to Nippon Electric Glass Company, Limited, Shiga, Japan

Continuation of Ser. No. 92,132, Sep. 2, 1987, abandoned. This application May 25, 1989, Ser. No. 357,657
Claims priority, application Japan, Sep. 17, 1986, 61-218743
Int. Cl.[5] C03C *8/00*
U.S. Cl. 501—66 **1 Claim**

1. A substrate for use in an electronic display device, a solar

cell and/or other devices having a thin film formed on the substrate, said thin film forming an electric circuit by photo-etching treatment, wherein said substrate is comprised of a glass essentially free from alkali metal oxide, lead oxide and magnesium oxide, the glass having a high chemical resistance and consisting essentially of 55–58% SiO_2, 8–13% Al_2O_3, 4–10% B_2O_3, 4–7% CaO, 11–20% BaO, 0–5% SrO and 0.5–7% ZnO, all by weight.

4,994,416

CERAMIC COMPOSITES REINFORCED WITH MODIFIED SILICON CARBIDE WHISKERS AND METHOD FOR MODIFYING THE WHISKERS

Terry N. Tiegs, Lenoir City, and Terrence B. Lindemer, Oak Ridge, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Division of Ser. No. 152,276, Feb. 4, 1988, Pat. No. 4,916,092. This application Dec. 1, 1989, Ser. No. 444,479

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—88 **32 Claims**

23. A method for fabricating a ceramic composite formed of a ceramic matrix material having homogeneously dispersed therein elongated monocrystalline silicon carbide whiskers, said whiskers being retained in said matrix material with an insufficient bond at a matrix-whisker interface to promote debonding along said whisker-matrix interface when a crack propagating into said ceramic composite contacts said whiskers thereby providing bridging and deflection of said crack by said whiskers when said ceramic composite is subjected to sufficient stress to effect propagation of said crack therein comprising the steps of:

(a) modifying the exposed surface portions and near surface regions of the silicon carbide whiskers to inhibit bonding of the whiskers to the ceramic matrix material by subjecting the whiskers to an atmosphere provided by one or of a combination of atmospheres formed by;

(i) an atmosphere at a pressure less than atmospheric pressure,

(ii) an atmosphere of an inert gas selected from the group consisting of argon, helium, neon and mixtures thereof, or

(iii) an atmosphere of a gas reactive with metals or compounds on the surface and near surface regions of the whisker;

(b) heating the whiskers while subjected to said one or a combination of said atmospheres to a temperature in the range of about 800° to 1850° C.;

(c) maintaining said whiskers at said temperature in said one or a combination of said atmospheres for a duration sufficient to effect a reduction in nonsilicon carbide materials on said exposed surface or near surface regions of said whiskers which contribute to the formation of a chemical bond of the whiskers to the ceramic matrix at the interface thereof;

(d) forming a homogeneous mixture of a ceramic matrix powder and the silicon carbide whiskers modified as set forth in (a), (b) and (c);

(e) pressing said homogeneous mixture at a pressure in the range of 28 to 70 MPa while heating said homogeneous mixture to a temperature in the range of 1600 to 1900° C. to provide a ceramic composite exhibiting improved fracture toughness and flexural strength.

4,994,417

SINTERED SILICON CARBIDE ARTICLES

Koichi Yamada; Masahide Mouri, both of Niihama, and Yoshisaburo Nomura, Uma, all of Japan, assignors to Sumitomo Aluminum Smelting Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 247,066, Sep. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 716,152, Mar. 26, 1985, abandoned. This application Feb. 7, 1990, Ser. No. 476,139

Claims priority, application Japan, Mar. 26, 1984, 59-57584

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—90 **1 Claim**

1. A sintered silicon carbide article having a sintered density of at least 95% of the theoretical density and a mechanical flexural strength of about 50 kg/mm^2 or higher, said sintered silicon carbide article being produced according to a process comprising the steps of adding a tar pitch in such an amount to provide about 4.2 to about 6 parts by weight of carbon after being carbonized and a boron compound in such an amount as to correspond to a content of 0.05–0.13 parts by weight of boron as densification aids to 100 parts by weight of a finely divided α-type silicon carbide powder and mixing and shaping the resulting mixture, and then sintering the shaped article in an inert atmosphere at a temperature of from about 2050° to about 2300° C.

4,994,418

CERAMIC COMPACT AND A PROCESS FOR THE PRODUCTION OF THE SAME

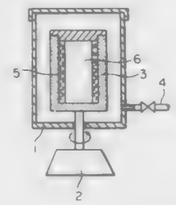
Akira Yamakawa; Yoshihiko Doi, and Masaya Miyake, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 262,099, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 20,733, Mar. 10, 1987, abandoned. This application Dec. 18, 1989, Ser. No. 453,158

Claims priority, application Japan, Mar. 17, 1986, 61-57059; Mar. 17, 1986, 61-57060; Mar. 31, 1986, 61-71317

Int. Cl.[5] C04B *35/02*

U.S. Cl. 501—95 **4 Claims**



1. A sintered ceramic compact comprising a matrix of silicon nitride and ceramic fibers which fibers are present in an amount of 0.1 to 45% by volume based on the volume of the ceramic compact uniformly dispersed therein and orientated in a direction by a centrifugal force, said matrix and fibers being closely bonded by sintering to form a fiber-reinforced compact sintered body of silicon nitride, wherein the ceramic fibers are selected from the group consisting of fibers of alumina, silicon nitride, silicon carbide, carbon, potassium titanate and zirconium oxide and mixtures thereof.

4,994,419

LOW TEMPERATURE SYNTHESIS OF HIGH PURITY MONOCLINIC CELSIAN USING TOPAZ

Inna G. Talmy, Silver Spring, Md., and Deborah A. Haught, Sterling, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1990, Ser. No. 580,012

Int. Cl.[5] C04B *35/18*

U.S. Cl. 501—125 **5 Claims**

1. A process for preparing monoclinic $BaO{\cdot}Al_2O_3{\cdot}2SiO_2$ comprising the following steps in order

(1) forming an intimate reaction mixture of powders of topaz and $BaCO_3$ wherein the molar ratio of topaz to $BaCO_3$ is from 2:1 to 4:1; and

(2) heating the reaction mixture to initiate a celsian formation reaction, in an atmosphere of gases generated by the celsian formation reaction, at a temperature in the range of from 900° C. to less than 1590° C. until the monoclinic celsian is produced.

4,994,420

METHOD FOR FORMING CERAMIC MATERIALS, INCLUDING SUPERCONDUCTORS

Ronald H. Baney; Debora F. Bergstrom, both of Midland, and Bruce H. Justice, Dearborn, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 12, 1989, Ser. No. 420,172

Int. Cl.[5] H01B *12/00*

U.S. Cl. 501—126 **34 Claims**

23. A method for forming high temperature superconductors of the general formula $Ln_1Ba_2Cu_3O_{(7-d)}$, Ln (7-d), where Ln is selected from the group consisting of yttrium (Y), lanthanum (La), neodymium (Nd), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), and lutetium (Lu), and d is less than .5, said method comprising: forming a solution by dissolving compatible, pyrolyzable compounds of Ln, Ba and Cu in at least one organic solvent in a molar ratio of approximately 1:2:3, at least one of said pyrolyzable compounds being an iodide salt of one of said metals;

evaporating said solvent to form a residue of said pyrolyzable compounds;

pyrolyzing said residue in an oxygen containing environment to convert them to oxides.

4,994,421

ELECTRO-OPTICAL POLYCRYSTALLINE BARIUM LANTHANUM TITANIUM NIOBATE

Arun K. Mehrotra, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 2, 1988, Ser. No. 278,994

Int. Cl.[5] C04B *35/46, 35/50*

U.S. Cl. 501—139 **19 Claims**

1. A transparent electro-optic article comprised of a barium lanthanum titanium niobate wherein substantially all grains are of a grain size between about 2 and about 20 microns, said article has a pore volume of less than about 1 percent, and said article has a grain size of between about 2 and about 20 microns.

7. A method of forming transparent electro-optical barium lanthanum titanium niobate comprising

providing particles of barium carbonate, lanthanum oxide, titanium oxide, and niobium oxide,

calcining said particles,

sintering the calcined particles at a temperature of between about 1200° C. and 1300° C., and a vacuum of between about 10^{-3} and 10^{-4} torr while under pressure to form a sintered mass,

cooling said sintered mass,

slicing said mass to form wafers,

heating said wafers in an oxidizing atmosphere.

4,994,422

MICROSPHERES COATED WITH CATALYST AND METHODS OF PRODUCING SAME

Stuart O. Goldman, Scottsdale, Ariz., assignor to Fuel Conservation Corporation, Ridgewood, N.J.

Filed Feb. 20, 1990, Ser. No. 482,170

Int. Cl.[5] B01J *37/34*

U.S. Cl. 502—5 **20 Claims**

1. A method of producing a catalytically-coated microsphere for use in facilitating the efficiency of hydrocarbon fuel combustion while reducing the quantity of environmental pollutants resulting therefrom, said method comprising the steps of: passing light fuel oil through an electrostatically charged misting means into a refrigerated area to form a plurality of frozen oil pellets having an electrostatic charge; drawing said electrostatically charged pellets upwardly in response to an attracting electrostatic force through a plasma field of a catalyst selected from the group consisting of lithium, sodium, potassium, aluminum, iron, gallium, indium, germanium, tin, antimony, scandium, titanium, vanadium, chromium, platinum, palladium, calcium, manganese, yitrium and zirconium or alloys and mixtures thereof to deposit sufficient catalyst on said pellets to form a coated microsphere having sufficient mass to overcome said upwardly attractive electrostatic force and respond to gravitational force thereupon; allowing said coated microsphere to descend back through said plasma field and obtain an additional deposit of catalyst thereupon; and collecting said coated microspheres for subsequent introduction with a hydrocarbon fuel into a hydrocarbon combustion chamber.

4,994,423

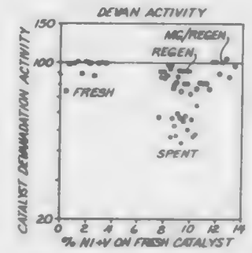
PROCESS FOR REGENERATING SPENT HEAVY HYDROCARBON HYDROPROCESSING CATALYST

Frederick T. Clark, Wheaton, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Amoco Corporation, Chicago, Ill.

Filed May 25, 1990, Ser. No. 529,192

Int. Cl.[5] B01J *23/94, 38/64;* **C10G** *45/08*

U.S. Cl. 502—25 **11 Claims**



1. A process for regenerating a metals contaminated spent hydrocarbon hydroprocessing catalyst with a total contaminent metals build-up of greater than 4 wt% nickel plus vanadium, based on the total weight of fresh catalyst, comprising the steps:

(a) partially decoking said catalyst in an initial coke-burning step wherein said catalyst is contacted with an oxygen-containing gas at a temperature ranging from about 400° F. to about 700° F.;

(b) impregnating said partially decoked catalyst with a Group IIA metal-containing impregnation solution such that the impregnated partially decoked catalyst contains from about 0.1 to about 20.0 wt. % of said Group IIA metal calculated as the oxide and based on the fresh weight of said spent catalyst; and

(c) decoking said impregnated catalyst in a final coke-burning step wherein said impregnated catalyst is contacted with an oxygen-containing gas at a temperature of about 600° F. to about 1400° F.

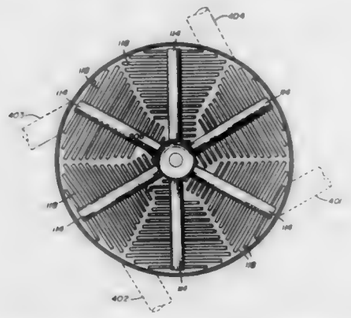
VOL 1123 ISS 3 FE 19 1991 UMI

4,994,424

CATALYTIC CRACKING PROCESS WITH IMPROVED FLOW IN SWIRL REGENERATOR

Tiberiu M. Leib, Voorhees, and Ajit V. Sapre, W. Berlin, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 6, 1989, Ser. No. 431,949
Int. Cl.[5] B01J *38/36, 29/38;* C01G *11/18;* C01B *21/20*
U.S. Cl. 502—41 12 Claims



1. A process for the fluidized catalytic cracking (FCC) of a hydrocarbon by contact of a crackable hydrocarbon with a source of regenerated FCC catalyst in a cracking reactor to produce catalytically cracked products and coked FCC catalyst which is regenerated in a swirl regenerator which maintains a catalyst inventory of at least 100 tons of catalyst as a dense phase, bubbling fluidized bed of catalyst having a depth of at least 8 feet within a regenerator vessel having sides and a diameter of at least 10 feet, and wherein said bubbling dense phase bed moves in a swirling direction within said regenerator due to tangential additional of coked cracking catalyst via at least two symmetrically placed coked catalyst inlets on the sides of said regenerator having an inlet diameter of at least 1 foot, said inlets tangentially discharging said coked catalyst into said catalyst bed in the same radial direction and said coked catalyst is regenerated in said dense bed by contact with an upflowing supply of oxygen or an oxygen containing gas to produce regenerated catalyst which is withdrawn from said catalyst bed via a catalyst outlet which is radially displaced from said catalyst inlets.

4,994,425

CATALYST BASE

Andrew P. Chapple, Wrexham, Wales, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 79,082, Jul. 29, 1987, Pat. No. 4,849,394. This application Mar. 13, 1989, Ser. No. 322,569
Claims priority, application United Kingdom, Aug. 6, 1986, 8619151
Int. Cl.[5] B01J *21/14, 21/16, 29/04*
U.S. Cl. 502—64 4 Claims

4. A process for preparing a catalyst, wherein a silica/-magnesia catalyst cogel is first prepared according to the following steps:

(i) intimately mixing a liquid magnesia source at a pH below 10 and liquid silica source in proportions providing a magnesia content in the range 5% to 50% by weight based on the total of silica and magnesia in a liquor with a pH from 9.0 to 10, and

(ii) maintaining the resultant liquor at a pH 9.0 to 10 until no free magnesia is detected in the solid phase by IR spectroscopy, and magnesium ions are not detected in the liquid phase, thereby obtaining a said silica/magnesia catalyst cogel in which essentially all of the magnesia is chemically incorporated within the cogel, and the thus prepared cogel is then intimately mixed with a zeolite and, optionally, alumina and, optionally, a clay and the resultant mixture dried to provide a petroleum cracking catalyst with the composition

40 to 90% by weight silica/magnesia base,
5 to 40% by weight zeolite,
0 to 40% by weight alumina, and
0 to 50% by weight clay.

4,994,426

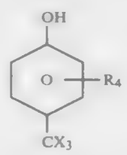
CATALYST AND PROCESS FOR POLYMERIZATION OF NORBORNENE DERIVATIVES

Willem Sjardijn, and Wilhelmina J. M. van der Linden-Lemmers, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 28, 1989, Ser. No. 413,799
Claims priority, application United Kingdom, Sep. 29, 1988, [illegible]11
Int. Cl.[5] C08F *4/22*
U.S. Cl. 502—158 7 Claims

1. A catalyst system for the polymerization of norbornene derivatives which is the product of combining components comprising:

(a) a tungsten component which is the product of contacting a tungsten halide with a para-trihalomethylphenol which can be described by the formula



in which each X is halide and each R is selected independently from hydrogen, alkyl and halide, and

(b) a compound of the general formula



in which R^1, R^2 and R^3 are independently selected from hydrogen and $C_{1\text{-}20}$ hydrocarbyl, and no more than one of R^1, R^2 and R^3 is hydrogen.

4,994,427

SUPPORTED AQUEOUS PHASE ORGANOMETALLIC CATALYST USEFUL FOR HYDROFORMYLATION AND OTHER REACTIONS, AND A METHOD FOR ITS PREPARATION

Mark E. Davis; Juan P. Arhancet, and Brian E. Hanson, all of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Nov. 28, 1988, Ser. No. 276,825
Int. Cl.[5] B01J *31/22*
U.S. Cl. 502—166 24 Claims

1. A catalyst comprising a porous solid having immobilized on the external and pore surfaces thereof an aqueous solution of one or more organometallic complexes of rhodium.

4,994,428

METHOD FOR PREPARING A PROMOTED IRON CATALYST AND CATALYST PREPARED BY THE METHOD FOR CONVERSION OF SYNTHESIS GAS TO LIQUID HYDROCARBONS

Weldon K. Bell, Pennington, and Werner O. Haag, Lawrenceville, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,796
Int. Cl.[5] B01J *23/78*
U.S. Cl. 502—330 19 Claims

1. In a method for preparing a catalytically active Fischer Tropsch promoted iron catalyst, which method comprises activating an inactive catalyst precursor comprising an iron oxide and a promoting amount of potassium, said iron oxide being selected from the group consisting of precipitated iron oxide, fused magnetite, and iron oxide impregnated on a carrier, said activation being effected by contact of said inactive catalyst precursor with gaseous hydrogen, carbon monoxide, or a mixture thereof at elevated temperature, the improvement which comprises:

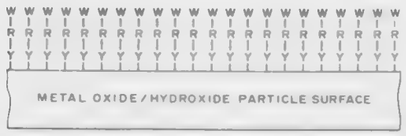
contacting said catalyst precursor with water vapor during or after said activation step, said contacting with water vapor being conducted under a combination of conditions including a temperature of about 160° C. to about 350° C., a water vapor partial pressure of about 1 (one) to 500 psig, and for about 0.5 to 100 hours, said combination being effective to increase the selectivity of the activated catalyst for forming liquid hydrocarbons whereby forming selectivated activated catalyst.

4,994,429

ACTIVE MATERIAL USEFUL AS ADSORBENT COMPRISING METAL OXIDE/HYDROXIDE PARTICLES REACTED WITH PHOSPHORUS-CONTAINING ORGANIC ACID GROUP OF ORGANIC COMPOUND HAVING UNREACTED ACID GROUP

Larry F. Wieserman; Karl Wefers, both of Apollo; Kathryn Cross, Murrysville, and Edward S. Martin, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 23,423, Mar. 9, 1987, Pat. No. 4,788,176, which is a continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,242
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] B01J *20/22, 20/06;* B01D *15/08;* B32B *9/00*
U.S. Cl. 502—401 20 Claims



1. An active material comprising a metal oxide/hydroxide particle having a surface and having reactive sites thereon, said reactive sites having bonded thereto a substantially monomolecular layer of organic acid molecules, said organic acid molecules comprising unreacted acid groups and acid groups selected from phosphonic and phosphinic acid bonded to reactive sites on said metal oxide/hydroxide surface.

4,994,430

METHOD OF PREPARING A PLATE-LIKE SUPPORT BEARING CATALYTICALLY ACTIVE COMPOUNDS

Michael Kotter, Bruchsal, and Friedrich Weyland, Leimen-St. Ilgen, both of Fed. Rep. of Germany, assignors to Kraftanlagen Aktiengesellschaft, Fed. Rep. of Germany

PCT No. PCT/EP89/00586, § 371 Date Jan. 18, 1990, § 102(e) Date Jan. 18, 1990, PCT Pub. No. WO90/00089, PCT Pub. Date Jan. 11, 1990
PCT Filed May 26, 1989, Ser. No. 457,816
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821920
Int. Cl.[5] B01J *32/00, 35/02*
U.S. Cl. 502—439 12 Claims

1. Method of preparing a plate-like support bearing catalytically active compounds, with degreasing or etching of an embossed, solid-surfaced or grid-like metal base structure, followed by application of a vitreous enamel coating, characterized in that a vitreous enamel which forms a low-porosity bottom layer and a rough top layer of high resistance to acid is applied to the metal base structure and is fired onto its surface as the vitreous enamel ground, and furthermore that the base structure coated with the vitreous enamel ground is wetted after the firing with a catalyst slip liquefying under the influence of shear forces and composed of a powder of catalytically acting compounds, a binding agent and water, by immersion into an agitated catalyst slip bath, and the wetted base structure is removed from the bath again while maintaining the movement of the slip bath, and then delivered to a drying process.

4,994,431

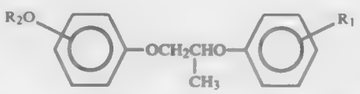
HEAT-SENSITIVE RECORDING MATERIAL

Ken Iwakura; Naoto Yanagihara; Masato Satomura, and Takayuki Hayashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 1, 1989, Ser. No. 401,899
Claims priority, application Japan, Sep. 2, 1989, 63-220190; Sep. 6, 1989, 63-22651
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—208 7 Claims

1. A heat-sensitive recording material comprising a support having provided thereon a heat-sensitive color forming layer containing a colorless or slightly colored electron donating dye precursor and an electron accepting compound capable of forming color by the reaction with said electron donating dye precursor,

wherein the said heat-sensitive color forming layer contains a 1-alkoxyphenoxy-2-aryloxypropane compound represented by formula (I):


(I)

wherein R_1 represents a hydrogen atom, an alkyl group, an alkoxyl group or a halogen atom; and R_2 represents an alkyl group.

4,994,432

HIGH TEMPERATURE SUPERCONDUCTOR SYSTEM AND PROCESSES FOR MAKING SAME

Allen M. Hermann, and Zhengzhi Sheng, both of Fayettefille, Ark., assignors to University of Arkansas, Fayetteville, Ark.

Filed Jan. 15, 1988, Ser. No. 144,114
Int. Cl.[5] C01F *11/02;* C01G *3/02, 15/00;* H01L *39/12*
U.S. Cl. 505—1 7 Claims

1. A superconductor having the following approximate nominal stoichiometry:

$TlBa_aCu_bO_c$

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wherein:
a has a value that is equal to or greater than 0.2 and less than 5;
b has a value that is greater than 0.5 and less than 15; and
c has a value that is greater than a+b and less than 2+a+b.

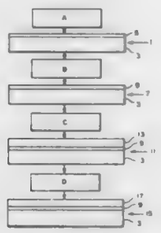
4,994,433
PREPARATION OF THIN FILM SUPERCONDUCTING OXIDES

Yet-Ming Chiang, Ashland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed May 22, 1987, Ser. No. 53,058
Int. Cl.[5] H01L *39/12;* B05D *5/12, 3/02*
U.S. Cl. 505—1 40 Claims

1. A method of preparing a copper oxide based superconducting film comprising the steps of:
making an organic liquid solution of the cation constituents of the oxide film by chelating a precursor solution containing said cation constituents with an organic acid and adding a polymerizing alcohol;
forming the solution into a liquid film;
drying and heating the liquid film solution to obtain a solid organic polymer or resin; and
firing the polymer to obtain the copper oxide based superconducting oxide.

4,994,434
METHOD OF FORMING A BARRIER LAYER ARRANGEMENT FOR CONDUCTIVE LAYERS ON SILICON SUBSTRATES

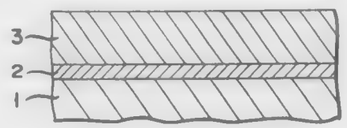
Liang-Sun Hung, and John A. Agostinelli, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 153,699, Feb. 8, 1988, Pat. No. 4,908,348.
This application Mar. 21, 1989, Ser. No. 326,813
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 8 Claims



1. A process of producing on a silicon substrate a barrier layer triad interposed between the conductive layer and the silicon substrate comprising
forming a silica layer of at least 2000 Å in thickness on the silicon substrate,
depositing on the silica at least one Group 4 heavy metal to form a layer having a thickness in the range of from 1500 to 3000 Å, and
heating the layers in the absence of a reactive atmosphere sufficiently to permit oxygen migration from the silica layer,
thereby forming a barrier layer triad consisting of a first triad layer located adjacent the silicon substrate consisting essentially of silica, a third triad layer remote from the silicon substrate consisting essentially of at least one Group 4 heavy metal oxide, and a second triad layer interposed between the first and third triad layers consisting essentially of at least one Group 4 heavy metal silicide.

4,994,435
LAMINATED LAYERS OF A SUBSTRATE, NOBLE METAL, AND INTERLAYER UNDERNEATH AN OXIDE SUPERCONDUCTOR

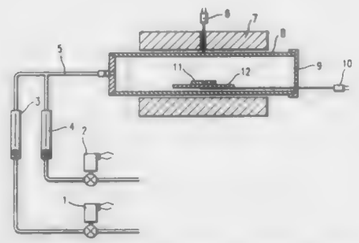
Shoji Shiga; Masanori Ozaki, both of Utsunomiya; Ton-Chi Chang, Yokohama; Nakahiro Harada, Yokohama, and Masanao Mimura, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Oct. 11, 1988, Ser. No. 256,763
Claims priority, application Japan, Oct. 16, 1987, 62-260864; Oct. 23, 1987, 62-267853; Oct. 28, 1987, 62-272736
Int. Cl.[5] H01L *39/14*
U.S. Cl. 505—001 22 Claims



1. An oxide superconductor shaped body comprising:
a substrate consisting of a polycrystalline metal or ceramic having a thermal expansion coefficient of 5×10^{-6}/° C. to 15×10^{-6}/° C.;
a noble metal layer directly on and in surface contact with said substrate,
an interlayer of an inorganic material directly on and in surface contact with said noble metal layer consisting essentially of a material having a free energy ($\Delta G°$)equal to or lower than that of BaO and selected from the group consisting of cubic, hexagonal, tetragonal, and rhombic materials; and
an oxide superconductive layer directly on and in surface contact with said interlayer.

4,994,436
PROCESS FOR SAFELY DESTROYING ORGANIC BINDERS IN CERAMIC COMPONENTS DURING THE FIRING PROCESS

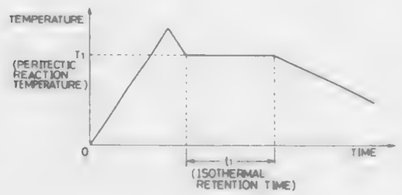
F. W. Giacobbe, Naperville, Ill., assignor to American Air Liquide, New York, N.Y.
Filed Mar. 10, 1989, Ser. No. 321,833
Int. Cl.[5] C04B *35/64;* H01C *39/12*
U.S. Cl. 505—1 10 Claims



1. A process for firing a ceramic structure containing an organic component, comprising passing an inert gas containing a mild oxidizing agent which is either (ia) up to 50% by volume of water vapor or carbon dioxide, or (ib) up to 10% by volume of nitrous oxide or oxygen over a ceramic component containing an organic component, at a temperature sufficiently high to cause the firing of said ceramic structure and either the decomposition or the burning of the organic component, said mild oxidizing agent being present in an amount effective to effectuate said decomposition or burning.

4,994,437
METHOD OF MANUFACTURING OXIDE SUPERCONDUCTING FILMS BY PERITECTIC REACTION

Yasuko Torii; Yasuo Namikawa, and Masami Tatsumi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Nov. 28, 1988, Ser. No. 276,725
Claims priority, application Japan, Nov. 26, 1987, 62-301073; Jan. 30, 1988, 63-19763; Feb. 15, 1988, 63-30916; Feb. 18, 1988, 63-34032
Int. Cl.[5] B05D *5/12, 1/18*
U.S. Cl. 505—1 12 Claims



1. A method of manufacturing an oxide superconductor comprising the steps of:
(a) dispersing a powder of a raw material for an oxide superconductor comprising $MBa_2Cu_3O_{7-\delta}$, wherein M represents at least a single element selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu, in a dispersion medium to form a dispersion;
(b) then applying the dispersion onto a substrate;
(c) then heating the dispersion under an oxygen atmosphere to a temperature from 0° to 100° C. higher than the peritectic reaction temperature of said dispersion to form a molten solution, wherein said peritectic reaction temperature is within a range ±30° C. of a rise temperature of a differential thermal peak of said powder;
(d) then cooling said molten solution to said peritectic temperature;
(e) then maintaining said molten solution at said peritectic temperature for about 1 to 20 hours; and
(f) then cooling said molten solution at a rate of not more than 300° C./hour to room temperature.

4,994,438
HEAT TREATMENT OF LYOPHILIZED PLASMA FRACTIONS

Alan Rubinstein, 803 N. Bedford Dr., Beverly Hills, Calif. 90210
Continuation of Ser. No. 625,007, Jun. 26, 1984, abandoned, which is a continuation of Ser. No. 499,489, May 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 377,863, May 13, 1982, Pat. No. 4,456,590, which is a continuation-in-part of Ser. No. 317,513, Nov. 1, 1981, abandoned, which is a continuation of Ser. No. 205,913, Nov. 12, 1980, abandoned. This application Dec. 23, 1988, Ser. No. 289,236
Int. Cl.[5] A61K *37/00*
U.S. Cl. 514—2 1 Claim

1. A composition intended for therapeutic administration to hemophiliacs, said composition comprising a human Factor VIII concentrate which has been heated in the lyophilized state to a predetermined temperature of at least 60° C. for at least 10 hours with a clotting activity recovery of at least about 90% as compared with the activity of the human Factor VIII concentrate prior to heating.

4,994,439
TRANSMEMBRANE FORMULATIONS FOR DRUG ADMINISTRATION

John P. Longenecker, Mountain View; Richard Ennis, Fremont; Patricia A. Baldwin, Hayward, and William A. Lee, Los Altos, all of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.
Filed Jan. 19, 1989, Ser. No. 299,881
Int. Cl.[5] A61K *9/08, 9/10, 9/12, 37/02*
U.S. Cl. 514—3 23 Claims

1. An aqueous composition for transmucosal membrane administration of a drug which composition comprises an aqueous physiologically compatible buffer which contains:
(a) an amount of drug effective to affect the condition to which it is directed,
(b) at least one nonionic detergent of the formula $RO(CHR'CH_2O)_nR$, wherein R' is H or methyl, n is an integer of 1–150; and one R is H and the other R is an organic residue selected from saturated or unsaturated acyclic or cyclic radicals of 6–40 C; and
(c) at least one bile salt or fusidate or derivative thereof; wherein
(i) the weight ratio of detergent of (b) to the bile salt-/fusidate/derivative of (c) is 1:10–10:1, and
(ii) the concentration of detergent of (b) plus bile salt-/fusidate/derivative of (c) is higher than the critical micellar concentration (CMC) of the mixture of these components, and wherein
(iii) the detergent of (b) and bile salt/fusidate/derivative of (c) are present in the composition as mixed micelles.

4,994,440
METHOD FOR THE TREATMENT OF RENAL CELL CARCINOMA

Patrick J. Creaven, 29 Woodhaven Rd., Amherst, N.Y. 14226
Filed Feb. 13, 1989, Ser. No. 310,256
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—8 5 Claims

1. A method for the treatment of renal cell carcinoma comprising administering to a warm blooded mammal in need thereof a therapeutically effective amount of N-acetyl-muramyl-L-alanyl-D-isoglutaminyl-L-alanine-2-(1,2-di-palmitoyl-sn-glycero-3-hydroxyphosphoryloxy)ethylamide monosodium salt.

4,994,441
DENTAL ANTI-PLAQUE AND ANTI-CARIES AGENT

Jean-Richard Neeser, Lausanne, Switzerland, assignor to Nestec S.A., Vevey, Switzerland
Filed Feb. 8, 1988, Ser. No. 154,077
Claims priority, application Switzerland, Feb. 26, 1987, 732/87
Int. Cl.[5] A61K *37/02, 7/16, 9/20, 9/68*
U.S. Cl. 514—8 6 Claims

1. A composition in a form for treating and inhibiting formation of dental plaque and caries in a buccal cavity comprising a carrier selected from a group of carriers consisting of a chewing gum, a lozenge for sucking, a mouthwash, a tooth powder and a toothpaste containing an active principle which is obtained from material of lactic origin selected from a group consisting of kappa-caseino-glycopeptides and desialylated derivatives thereof and which is in an amount effective for treating bacteria and for inhibiting adhesion of bacteria in the buccal cavity which are responsible for formation of dental plaque and caries in the buccal cavity.

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4,994,442

METHOD FOR STIMULATION OR REPAIR AND REGENERATION OF INTESTINAL GUT CELLS IN INFANTS AND ENHANCING THE IMMUNE RESPONSE OF T-CELLS

Angel H. Gil; Daniel V. Morales, and Eduardo R. Valverde, all of Granada, Spain, assignors to Union Industrial Y Agro-Ganadera, S.A. (UNIASA), Granada, Spain

Division of Ser. No. 55,858, Jun. 1, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,596
Claims priority, application Spain, May 29, 1987, 8701601
Int. Cl.[5] A61K *31/70*; A23C *9/00*
U.S. Cl. 514—45 16 Claims

1. A method for the stimulation or repair and regeneration of intestinal gut cells in infants which comprises administering to an infant in need of such stimulation an amount effective for said stimulation of an infant formula free of cow's milk, said infant formula comprising a therapeutically effective amount of carbohydrates, a source of amino acids, vegetable oils, minerals, vitamins, and at least one member selected from the group consisting of uridine, uridine phosphate and mixtures thereof; guanosine, guanosine phosphate and mixtures thereof; adenosine, adenosine phosphate and mixtures thereof; cytidine, cytidine phosphate and mixtures thereof and inosine, inosine phosphate and mixtures thereof.

4,994,443

INHIBITION OF ANGIOGENESIS

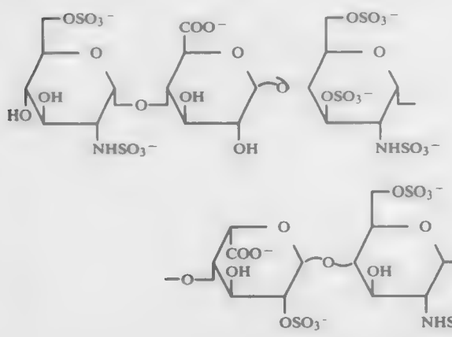
Moses J. Folkman, Brookline; Stephanie Taylor, Boston, and Robert S. Langer, Somerville, all of Mass., assignors to The Children's Medical Center Corporation, Boston, Mass.

Division of Ser. No. 80,255, Jul. 27, 1987, abandoned, which is a continuation of Ser. No. 844,221, Mar. 24, 1986, abandoned, which is a continuation of Ser. No. 641,305, Aug. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 559,175, Dec. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 451,431, Dec. 20, 1982, abandoned. This application Oct. 13, 1988, Ser. No. 257,409
Int. Cl.[5] A61K *31/725, 31/56*
U.S. Cl. 514—56 15 Claims

1. A composition for treating mammals for stopping growth, bringing about regression, or preventing metastasis of solid tumors in mammals by oral, or parenteral administration in which the active agents consist essentially of effective proportions for said treating of (1) a member selected from the group consisting of a

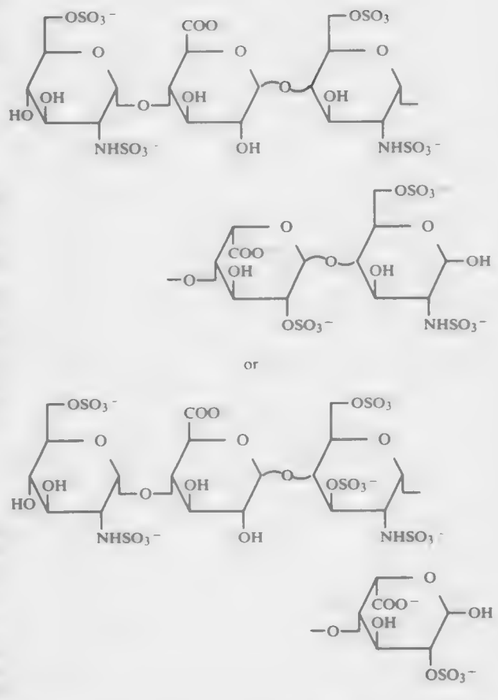
said composition including a non-toxic physiologically acceptable carrier adapted for oral or parenteral administration,

said composition exhibiting an avascular zone when implanted in an immature chick chorioallantoic membrane. heparin fragment which is either a hexasaccharide or larger oligosaccharide and an analogous compound having of the structures



-continued

or



and (2) a member selected from the group consisting of steroids having a 17α- and 21-hydroxy groups, 3- and 20-one groups, and in the 16-position hydrogen, hydroxy, or a methyl group, and a non-toxic physiologically acceptable carboxylate, or acetal, or ketal, or phosphate thereof.

4,994,444

MACROMOLECULES FOR SEALING CAPILLARY ENDOTHELIAL JUNCTIONS

Bashir A. Zikria, Norwood, N.J., assignor to The Trustees of Columbia in the City of New York, New York, N.Y.

Filed Jul. 31, 1987, Ser. No. 80,403
Int. Cl.[5] A61K *31/00*
U.S. Cl. 514—60 12 Claims

1. A method of treating a human subject suffering from trauma to prevent leakage of serum albumin from capillary endothelial junctions during a period of increased capillary permeability which comprises administering to the human subject an effective capillary sealing amount of a macromolecule which is biodegradable, non-toxic, globular in shape, and has a molecular weight within the range above 100,000 daltons to about 1,000,000 daltons in a pharmaceutically acceptable carrier.

7. A method of claim 1, wherein the macromolecule comprises a dextran.

4,994,445

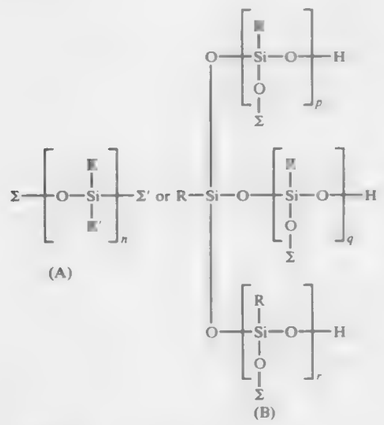
SUBSTANCES WITH THERAPEUTIC APPLICATIONS COMPRISING ORGANO-SILICON COMPOUNDS

Loic Le Ribault, 23 chemin des Dames, 33260 La Teste Du Buch, and René Nardou, 32 Allée Emile Péreire, 33120 Arcachon, both of France, assignors to Loic Le Ribault, La Teste de Buch; Rene Nardou, Arcachon and Michel Bonnaval-Lamothe, Cadillac-sur-Garonne, all of, France

Continuation of Ser. No. 212,094, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 699,257, Feb. 7, 1985, abandoned. This application Mar. 22, 1990, Ser. No. 498,444
Claims priority, application France, Feb. 8, 1984, 84 02120
Int. Cl.[5] A61K *33/00, 31/695*; C07F *7/18*
U.S. Cl. 514—63 19 Claims

1. A composition for the treatment of cardiovascular diseases and having therapeutic value, comprising in aqueous solution:

(1) at least one organo-silicon compound having either of the following formulae:



(A)

(B)

in which:

n is an integer between 1 and 1000;

p, q, and r are integers between 0 and 1000;

R and R', independently of one another, represent saturated or unsaturated linear, branched or cyclic groups which may include hetero-linear, aromatic, heteroaromatic, arylaliphatic or heteroarylaliphatic groups, with R further representing OH, OR, or $OSiR_3$, where R is as described above;

being R, H, or SiR_3 where R is as defined above;

being R where R is as defined above; and

(2) at least one metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, germanium, chromium, rhodium, gold, iridium, platinum, osmium, rare earths, and uranyl derivatives;

said organo-silicon compound being present in said composition in an amount between about 10^{-5} to 10^{-1} gram-atom of silicon per liter and the weight/volume ratio of (2):(1) is between about 10^{-10} to 10^{-5} gram-atom of metal per liter of solution.

4,994,446

DRUG SYSTEM

Mordechai Sokolovsky, Tel Aviv, and Yoel Kloog, Herzelia, both of Israel, assignors to Ramot - University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Filed Jan. 3, 1989, Ser. No. 293,136
Int. Cl.[5] A61K *31/66, 31/441*
U.S. Cl. 514—75 3 Claims

1. A pharmaceutical composition for the treatment of epilepsy, for use as anticonvulsant and for the prevention of damage caused by strokes in mammals, including humans, which comprises in combination from 15 mg to 500 mg phencyclidine and from 350 mg to 1000 mg of D (−) 2-amino-5-phosphovaleric acid (AP-5).

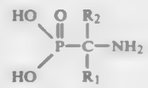
4,994,447

METHOD FOR CONTROLLING PHYTOPATHOGENIC FUNGI USING BRANCHED AMINOALKANEPHOSPHONIC ACIDS

David G. Cameron, Stockholm, Sweden; Harry R. Hudson, London, England; Inger Lagerlund, Bromma, Sweden, and Max Pianka, Wembley Park, England, assignors to KenoGard AB, Sweden

Division of Ser. No. 207,921, Jun. 10, 1988, Pat. No. 4,888,330, which is a continuation of Ser. No. 851,211, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 695,227, Jan. 28, 1985, abandoned. This application Jun. 29, 1989, Ser. No. 373,002
Claims priority, application Sweden, Jan. 30, 1984, 8400458
Int. Cl.[5] A01N *57/00, 57/26*
U.S. Cl. 514—114 24 Claims

1. A method for controlling phytopathogenic fungi which method comprises applying to infected or infectable seed or foliage a fungicidally effective amount of an aminoalkanephosphonic acid of the formula



wherein R_1 is an alkyl group having 1 to 12 carbon atoms and R_2 is hydrogen or an alkyl group having 1 to 12 carbon atoms, or fungicidially effective salts or acid addition salts of the aminoalkanephosphonic acids.

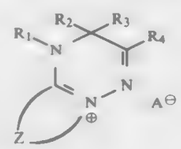
4,994,448

CONDENSED QUINOLINIUM AND ISOQUINOLINIUM DERIVATIVES

András Messmer; György Hajós; Zsuzsa Juhász née Riedl; Pál Benkö; László Pallos; Lujza Petöcz; Enikö Szirt née Kiszelly; Gábor Gigler; István Gyertyán, and Mária Hegedüs, all of Budapest, Hungary, assignors to Egis Gyogyszergyar, Budapest, Hungary

Filed Sep. 30, 1988, Ser. No. 251,445
Claims priority, application Hungary, Oct. 2, 1987, 4436/87
Int. Cl.[5] A61K *31/535*; C07D *413/04, 417/04, 253/08*
U.S. Cl. 514—227.5 3 Claims

1. A method of providing local anesthesia which comprises administering to a patient in need thereof an anesthetic-effective amount of a compound of the formula:



wherein:

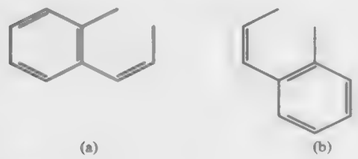
R_1 is C_{1-4} alkyl or C_{1-4} alkyl substituted by phenyl or naphthyl;

R_2 is hydroxy; or R_1 and R_2 together from a valency bond;

R_3 is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, phenyl, amino, alkylthio or a group of the formula $—NR_7R_8$ in which R_7 and R_8 may be the same or different and stand for hydrogen, C_{1-4} alkyl, phenyl-C_{1-4} alkyl, hydroxy-C_{1-4} alkyl or di-(C_{1-4} alkyl)-amino-C_{1-4} alkyl or together with the nitrogen atom they are attached to form a 6-membered heterocyclic ring

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which may optionally contain a further nitrogen, oxygen or sulfur atom in the 4 position; or
R_2 and R_3 together form an oxo (=O) or thioxo (=S) group;
R_4 represents hydrogen, C_{1-4} alkyl or phenyl which may optionally bear one or two halogen or nitro substituent(s);
Z is a group of the formula (a) or (b)



(a) (b)

and

A^- represents an anion.

4,994,449

METHOD FOR INCREASING BONE DENSITY IN HUMANS

Walter G. Leonard, Melrose, Mass., assignor to Modulus III, Inc., Redding, Conn.

Continuation of Ser. No. 179,963, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 764,945, Aug. 12, 1985, Pat. No. 4,736,849, which is a continuation-in-part of Ser. No. 563,148, Dec. 19, 1983, Pat. No. 4,534,468. This application Nov. 27, 1989, Ser. No. 443,089
Int. Cl.[5] A61K *31/56, 33/10*
U.S. Cl. 514—171 **26 Claims**

1. A method of increasing the bone density in a post-menopausal woman as well as retarding the effects of osteoporosis and treating the symptoms of menopause regardless of the age of the post-menopausal woman at the time the method is initiated, comprising the steps of
(1) compliantly ingesting an effective daily dose amount of estrogen hormone for each of calendar days 1 through 25 of each calendar month:
(2) compliantly ingesting an effective daily does amount of progesterone hormone for each of calendar days 16 through 25 of each calendar month;
(3) compliantly ingesting an effective daily dose amount of non-dietary calcium for at least calendar days 26 through the remaining days of the calendar month; said effective daily does amount of calcium being independent of consumption of dietary calcium at any intake level; and
(4) repeating the regimen of steps 1 through 3 for each consecutive calendar month thereafter.

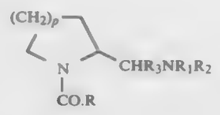
4,994,450

AZACYCLIC COMPOUNDS AND THEIR USE AS ANALGESIC AGENTS

Vittorio Vecchietti, Milan, and Antonio Giordani, Pavia, both of Italy, assignors to Dr. Lo. Zambeletti S.p.A., Italy

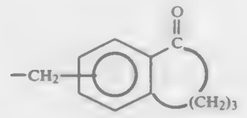
Filed Feb. 10, 1989, Ser. No. 309,687
Claims priority, application United Kingdom, Feb. 12, 1988, 8803259
Int. Cl.[5] C07D *419/06, 419/10;* **A61K** *31/40, 31/445*
U.S. Cl. 514—183 **19 Claims**

7. A pharmaceutical composition useful for the treatment of pain in mammals which comprises an analgesically effective amount of a compound of the formula



I

in which:
R_1 and R_2 are independently hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of 4 to 12 carbon atoms, or together form a branched or linear polymethylene of 2–8 carbon atoms or alkenylene of 2–6 carbon atoms wherein one $—CH_2—$ moiety thereof may be replaced by oxygen or sulphur, provided that R_1 and R_2 are not simultaneously hydrogen;
R_3 is hydrogen, alkyl of 1 to 6 carbon atoms, or phenyl;
p is 1, 2, 3, or 4 and
R is a group of the formula



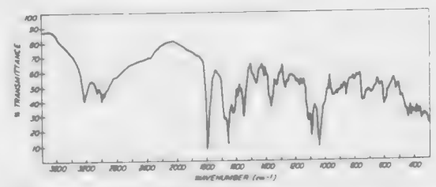
in which the $—CH_2—$ is in the meta- or para-position with respect to —C— and one or more of the ring ($—CH_2$) groups is unsubstituted or substituted by alkyl of 1 to 6 carbon atoms, in combination with a pharmaceutically acceptable carrier.

4,994,451

CEPHALOSPORIN SALTS AND INJECTABLE COMPOSITIONS

Murray A. Kaplan, Syracuse, N.Y.; Thomas W. Hudyma, Durham, Conn.; Robert A. Lipper, Manlius, N.Y.; Kun M. Shih, East Syracuse, and Susan D. Boettger, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 144,899, Jan. 19, 1988, Pat. No. 4,910,301, which is a continuation-in-part of Ser. No. 901,088, Aug. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 762,235, Aug. 5, 1985, abandoned. This application Dec. 11, 1989, Ser. No. 448,482
Int. Cl.[5] A61K *31/545*
U.S. Cl. 514—202 **4 Claims**



1. Temperature stable crystalline salts of 7-[α-(2-aminothiazol-4-yl)-α-(Z)-methoxyiminoacetamido]-3-[(1-methyl-1-pyrrolidinio)methyl]-3-cephem-4-carboxylate selected from the group consisting of the sulfuric, di-nitric, mono-hydrochloric, and di-hydrochloric acid addition salts, and orthophosphoric acid addition salts containing 1.5–2 molar equivalents of H_3PO_4, or solvates thereof in physical admixture with a pharmaceutical acceptable non-toxic organic or inorganic base selected from the group consisting of sodium salts with weak non-toxic anions, N-methylglucamine, lysine and arginine in proportions to provide a pH of about 3.5 to about 7 on dilution of the admixture with water to injectable concentration.

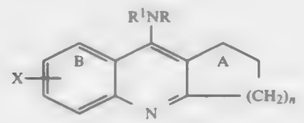
4,994,452

HEXAHYDRO-1H-QUINO[4,3,2-EF][1,4]BENZOXAZEPINES AND RELATED COMPOUNDS

Gregory M. Shutske, Somerset; Kevin J. Kapples, Little York, both of N.J., and John D. Tomer, IV, Perkasie, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Nov. 28, 1989, Ser. No. 443,288
Int. Cl.[5] A61K *31/55;* **C07D** *513/06, 498/06*
U.S. Cl. 514—211 **55 Claims**

1. A compound of the formula



wherein R^1 is H, loweralkyl, or benzyl; R is a group of the formula



wherein Y is H, H or O, R^2 is H, loweralkyl, or phenyl, and Z is O or S; wherein Z of the group of the formula



is bound to either the A- or B-position of the heteroaromatic nucleus; X is H, halogen, loweralkoxy, loweralkyl, or trifluoromethyl; and n is 1, 2, or 3; the pharmaceutically acceptable salts thereof; and the optical isomers thereof.

43. A method of relieving memory dysfunction in mammals comprising administering to a mammal memory dysfunction relief, a memory dysfunction relieving effective amount of a compound of claim 1.

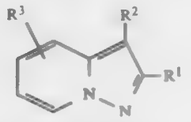
4,994,453

PYRAZOLOPYRIDINE COMPOUND AND PROCESSES FOR PREPARATION THEREOF

Youichi Shiokawa, Ibaraki; Atsushi Akahane, Hyogo; Hirohito Katayama, Nishinomiya, and Takafumi Mitsunaga, Ashiya, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 202,526, Jun. 6, 1988, Pat. No. 4,925,849. This application Sep. 15, 1989, Ser. No. 407,747
Claims priority, application United Kingdom, Jun. 15, 1987, 8713908; Aug. 20, 1987, 8719724; Dec. 31, 1987, 8730330
Int. Cl.[5] A61K *31/435*
U.S. Cl. 514—212 **1 Claim**

1. A method for the treatment of obesity, bronchial asthma, sudden infant death syndrome, immunosuppression or diabetes, which comprises administering an effective amount of a compounds of the formula:



wherein R^1 is lower alkyl, phenyl which may have 1 to 3 substituents selected from the group consisting of halogen, lower alkoxy, nitro, amino and protected amino, or pyridyl,
R^2 is a group of the formula:

$—A—R^6$

wherein R^6 is a group of the formula:

$—COR_N$

wherein
R_N is piperidino which may have 1 to 4 substituents selected from the group consisting of lower alkyl, hydroxy(lower-)alkyl, lower alkoxy(lower)alkyl, lower alkanoyloxy(lower)alkyl, lower alkoxycarbonyl and carboxy; pyrrolidin-1-yl which may be substituted by lower alkoxy(lower)alkyl; perhydroazepin-1-yl; piperazin-1-yl which may be substituted by lower alkyl; morpholino; 7-azabicyclo[2.2.1]heptan-7-yl; or 3-azabicyclo[3.3.3]nonan-3-yl,
A is lower alkyl, lower alkenyl or lower alkynyl, each of which may be substituted by halogen, and
R^3 is hydrogen, lower alkyl, lower alkoxy or halogen, or a pharmaceutically acceptable salt thereof, to a human being or animal.

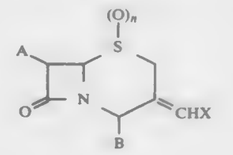
4,994,454

CEPHAM DERIVATIVES

Jan Verweij, Leiden; Jan J. DeKoning, Rijswijk, and Hendrik A. Witkamp, Pijnacker, all of Netherlands, assignors to Gist-Brocades N.V., Netherlands

Division of Ser. No. 337,525, Feb. 15, 1989. This application Dec. 27, 1989, Ser. No. 457,253
Claims priority, application European Pat. Off., Jul. 13, 1987, 87201325.0
Int. Cl.[5] C07D *501/18;* **A61K** *31/545*
U.S. Cl. 540—215 **3 Claims**

1. A 3-halomethylene cepham compound of the formula



I

wherein,
A is an amino group or a protected amino group,
B is a carboxy group or a protected carboxy group, or a salt thereof
X is halogen, and
n is 0, 1 or 2.

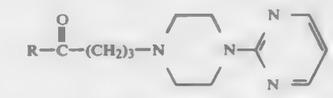
4,994,455

ANTI-ANXIETY AGENTS

Williard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US87/02855, § 371 Date Apr. 21, 1990, § 102(e) Date Apr. 21, 1990
PCT Filed Oct. 26, 1987, Ser. No. 477,835
Int. Cl.[5] C07D *401/14, 403/14, 405/14;* **A61K** *31/505*
U.S. Cl. 514—216 **13 Claims**

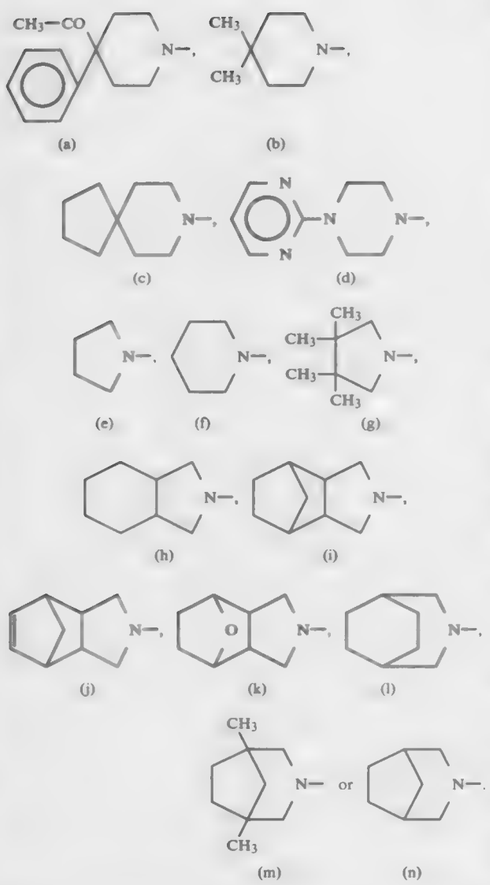
1. A compound having the formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein R is group:

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6. A method of treating anxiety in a human suffering therefrom which comprises administering to said human an anti-anxiety treating amount of a compound according to claim 1.

4,994,456

PYRIDINECARBOXYLIC ACID AMIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAME

Katsutoshi Miura; Hiroyasu Koyama; Toshiji Sugai; Hiroaki Yamada; Einosuke Sakurai, all of Saitama, and Masato Horigome, Tokyo, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

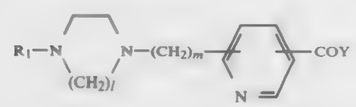
Filed Feb. 22, 1990, Ser. No. 483,532

Claims priority, application Japan, Mar. 1, 1989, 1-46648; Feb. 8, 1990, 2-27202

Int. Cl.[5] **C07D** *401/04, 401/06, 401/14;* **A61K** *31/495*

U.S. Cl. 514—218 **8 Claims**

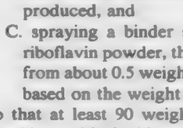
1. A compound of formula (I)



(I)

wherein R_1 is hydrogen; C_1–C_6 alkyl; C_3–C_6 cycloalkyl or diphenylmethyl;

Y is $—NH(CH_2)_n—R_2$ or



R_2 is OH or $—ONO_2$;

l is 2 or 3; m is 0 or 1; and n is 2 to 8; and physiologically acceptable acid addition salts thereof, provided that —COY is in the 3- position of the pyridine ring.

4,994,457

ANTIINFLAMMATORY COMPOSITIONS AND METHODS

Thomas C. Crawford, Ledyard; David L. Larson, East Lyme, and Joseph G. Lombardino, Niantic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 19, 1987, Ser. No. 66,352

Int. Cl.[5] **A61K** *31/54, 49/00*

U.S. Cl. 514—226.5 **26 Claims**

1. An improved antiinflammatory composition which comprises:

(a) an antiinflammatory amount of piroxicam or a pharmaceutically acceptable salt thereof; and

(b) a gastric antiirritation and ulcer-inhibiting amount of 5'-guanylic acid or a pharmaceutically acceptable salt thereof.

4,994,458

PROCESS FOR ROTARY FLUID BED GRANULATION OF RIBOFLAVIN

Terence K. Kilbride, Jr., Bloomfield Hills, Mich., assignor to BASF Corporation, Parsippany, N.J.

Filed Apr. 30, 1990, Ser. No. 516,398

Int. Cl.[5] **A61K** *31/525, 9/16*

U.S. Cl. 514—251 **20 Claims**

1. A process for making a riboflavin granulate, the process comprising the steps of:

A. placing riboflavin powder into a product bowl of a rotary fluid bed granulator, wherein the amount of riboflavin added to the product bowl is calculated to produce a granulated product comprising riboflavin in an amount from about 75 to about 99.5 weight percent, dry basis;

B. fluidizing the powder with fluidizing air which has been forced upward around the periphery of a rotor disc within the granulator, while simultaneously rotating the rotor disc, whereby a fluidized cloud of the riboflavin powder is produced, and

C. spraying a binder solution into the fluidized cloud of riboflavin powder, the binder being added in an amount of from about 0.5 weight percent to about 25 weight percent, based on the weight of the resulting granulate, dry basis; so that at least 90 weight percent of the riboflavin powder combines with the binder to form granules.

4,994,459

ARYLOXYPROPANE SUBSTITUTED PIPERAZINE DERIVATIVES WITH ANTIARRHYTHMIC AND ANTIFIBRILLATORY ACTIVITY

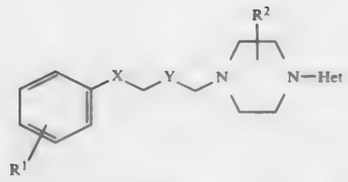
John A. Butera, Kendall Park, and Jehan F. Bagli, Princeton, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 11, 1989, Ser. No. 449,273

Int. Cl.[5] **A61K** *31/495;* **C07D** *403/04*

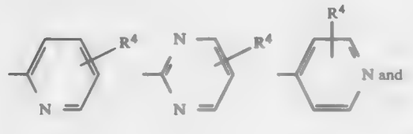
U.S. Cl. 514—252 **9 Claims**

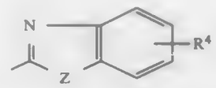
1. The compounds of formula (I)



(I)

wherein R^1 is alkylsulfonamido of 1 to 6 carbons, arylsulfonamido of 6 to 10 carbons, perfluoroalkylsulfonamido of 1 to 6 carbon atoms, alkylsulfone or alkylsulfoxide of 1 to 6 carbon atoms, NO_2, CN, or 1-imidazolyl; R^2 is hydrogen or straight or branched alkyl chain of 1 to 6 carbon atoms; X is O, S, or NR^3 wherein R^3 is H or a straight or branched alkyl chain of 1 to 6 carbon atoms; Y is CH_2 or CHOH; Het is selected from the group consisting of





wherein R^4 is H, $—NHSO_2$ (C_1 to C_6 alkyl) or NO_2 and Z is O, S, NR^5 wherein R^5 is H or alkyl of 1 to 6 carbon atoms and the pharmaceutically acceptable salts thereof.

9. A method of treating arrhythmia which comprises administering an effective amount of a compound of the formula (I) of claim 1 or its pharmaceutically acceptable acid addition salt.

4,994,460

AGENTS FOR TREATMENT OF BRAIN ISCHEMIA

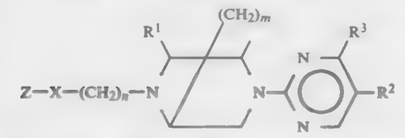
Pierre Dextraze, Quebec, Canada, and Joseph P. Yevich, Southington, Conn., assignors to Bristol-Myers Squibb Co., New York, N.Y.

Continuation-in-part of Ser. No. 360,657, Jun. 1, 1989, abandoned. This application Mar. 30, 1990, Ser. No. 503,197

Int. Cl.[5] **A61K** *31/495;* **C07D** *403/04*

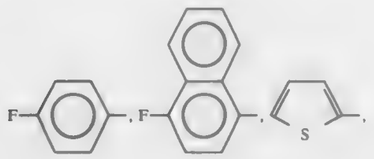
U.S. Cl. 514—252 **40 Claims**

1. A compound of Formula I' and its pharmaceutically



I

acceptable acid addition salts and/or solvates thereof wherein Z is a member selected from the group consisting of

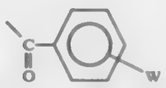


naphthalenyl, anthracenyl, fluorenyl, phenanthrenyl, and C_{5-6} cycloalkyl;

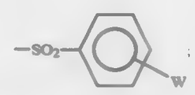
X is a member selected from the group consisting of —O—, —S—, $—SO_2—$, —CO—,



wherein R^4 is hydrogen, or C_{1-6} alkyl and R^7 is hydrogen, C_{1-6} alkyl, C_{2-7} alkanoyl, or



wherein W is hydrogen, halogen or alkoxy, and —CH-R^5— wherein R^5 is hydrogen, CN, N_3 or NHR^6 with R^6 being R^7 or



or Z and X taken together can be



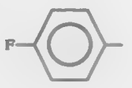
R^1 is hydrogen or C_{1-4} alkyl;

R^2 is halogen;

R^3 is hydrogen, C_{1-4} alkoxy or C_{1-4} alkylthio;

n is 1–3; and

m is 0 or 1; with the proviso that Z cannot be



when X is



or —CO—, while R^3 is either hydrogen or C_{1-4} alkoxy, or while m is 0.

39. The method for protecting brain cells from ischemia comprising systemic administration to a mammal suffering from ischemia or being susceptible to ischemia, of an effective ischemia-protective dose of a compound of claim 1.

VOL 1123 ISS 3 FE 19 1991 UMI

4,994,461

1,4-DIHYDROPYRIDINE ENANTIOMERS

Wolf-Rüdiger Ulrich, Constance, Fed. Rep. of Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

PCT No. PCT/EP88/00239, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/07525, PCT Pub. Date Oct. 6, 1988

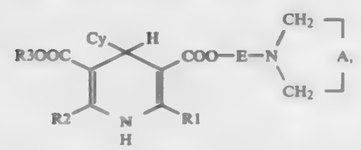
PCT Filed Mar. 24, 1988, Ser. No. 401,453

Claims priority, application Switzerland, Mar. 27, 1987, 01190/87; Mar. 27, 1987, 01184/87

Int. Cl.[5] A61K *31/495, 31/44;* **C07D** *401/12*

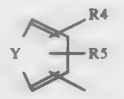
U.S. Cl. 514—252 **22 Claims**

1. A pure dihydropyridine enantiomer of formula I

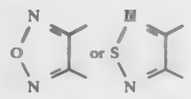


(I)

wherein Cy represents a cyclic radical of the formula



in which Y denotes oxygen (O), sulphur (S), vinylene (—CH=CH—), azomethine (—CH=N—) or a group of the formula



R1 and R2 are identical or different and denote hydrogen, 1–6C-alkyl or 3–7C-alkoxyalkyl,

R3 denotes 1–6C-alkyl or 3–7C-alkoxyalkyl,

R4 and R5 are identical or different and denote hydrogen, hydroxyl, halogen, nitro, cyano, trifluoromethyl, 1–4C-alkyl, 1–4C-alkoxy, completely or partially fluorine-substituted 1–4C-alkoxy, 1–4C-alkoxycarbonyl or 2–5C-acyl or together denote methylenedioxy, or denote amino or mono- or di-1–4C-alkylamino,

E denotes straight-chain or branched 2–5C-alkylene which may be substituted by 1–4C-alkoxy or aryl,

A denotes —CH_2—C(R6)R7—CH_2— or —CH_2-NR8—CH_2—,

R6 denotes hydrogen (H) or aryl and

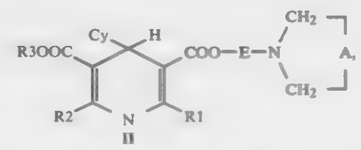
R7 denotes aryl or arylcarbonyl

R8 denotes aryl, aryl-1–4-C-alkyl, aryl-2–4C-alkenyl, aryl-2–4C-alkynyl, diaryl-1–4C-alkyl, heteroaryl, heteroaryl-1–4C-alkyl, heteroaryl-aryl-1–4C-alkyl, diheteroaryl-1–4C-alkyl, arylcarbonyl, heteroarylcarbonyl, arylsulphonyl, aryll–4C-alkylcarbonyl or aryl-2–4C-alkenylcarbonyl, aryl representing a ring of the formula



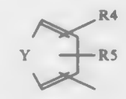
wherein R9 and R10 are identical or different and have the meaning of hydrogen (H), 1–4C-alkyl, 1–4C-alkoxy, halogen, hydroxyl or trifluoromethyl, and heteroaryl represents a 5-membered or 6-membered heterocyclic radical having one heteroatom or two identical or different heteroatoms from the group consisting of oxygen (O), sulphur (S) or nitrogen (N), which is unsaturated or partially or completely saturated and which may carry one or two substituents from the group consisting of 1–4C-alkyl, 1–4C-alkoxy, halogen, trifluoromethyl or cyano, and the salts of these compounds, except for the (S)-enantiomer of the compound in which Cy has the meaning of 3-nitrophenyl, R1, R2 and R3 denote methyl, E denotes propylene, A represents CH_2—C(R6)R7—CH_2 and R6 and R7 denote phenyl.

6. A process for the preparation of pure enantiomeric compounds of the formula I

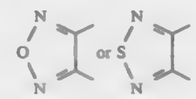


(I)

wherein Cy represents a cyclic radical of the formula



in which Y denotes oxygen (O), sulphur (S), vinylene (—CH=CH—), azomethine (—CH=N—) or a group of the formula



R1 and R2 are identical or different and denote hydrogen, 1–6C-alkyl or 3–7C-alkoxyalkyl,

R3 denotes 1–6C-alkyl or 3–7C-alkoxyalkyl,

R4 and R5 are identical or different and denote hydrogen, hydroxyl, halogen, nitro, cyano, trifluoromethyl, 1–4C-alkyl, 1–4C-alkoxy, completely or partially fluorine-substituted 1–4C-alkoxy, 1–4C-alkoxycarbonyl or 2–5C-acyl or together denote methylenedioxy, or denote amino or mono- or di-1–4C-alkylamino,

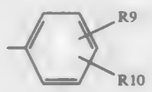
E denotes straight-chain or branched 2–5C-alkylene which may be substituted by 1–4C-alkoxy or aryl,

A denotes —CH_2—C(R6)R7—CH_2— or —CH_2—NR-8—CH_2—,

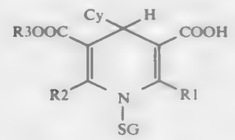
R6 denotes hydrogen (H) or aryl and

R7 denotes aryl or arylcarbonyl,

R8 denotes aryl, aryl-1–4C-alkyl, aryl-2–4C-alkenyl, aryl-2–4C-alkynyl, diaryl-1–4C-alkyl, heteroaryl, heteroaryl-1–4C-alkyl, heteroaryl-aryl-1–4C-alkyl, diheteroaryl-1–4C-alkyl, arylcarbonyl, heteroarylcarbonyl, arylsulphonyl, aryl-1–4C-alkylcarbonyl or aryl-2–4C-alkenylcarbonyl, aryl representing a ring of the formula

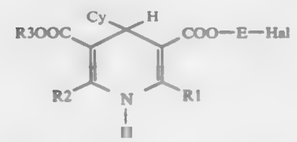


wherein R9 and R10 are identical or different and have the meaning of hydrogen (H), 1–4C-alkyl, 1–4C -alkoxy, halogen, hydroxyl or trifluoromethyl, and heteroaryl represents a 5-membered or 6-membered heterocyclic radical having one heteroatom or two identical or different heteroatoms from the group consisting of oxygen (O), sulphur (S) or nitrogen (N). which is unsaturated or partially or completely saturated and which may carry one or two substituents from the group consisting of 1–4C-alkyl, 1–4C-alkoxy, halogen, trifluoromethyl or cyano, and their salts, characterised in that pure enantiomeric N-protected dihydropyridinecarboxylic acids of the formula II



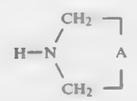
(II)

wherein R1, R2, R3 and Cy have the above-mentioned meanings and SG represents a protective group, are reacted with an omega-dihaloalkane Hal-E-Hal, wherein Hal denotes halogen and E has the above-mentioned meaning, and, after elimination of the protective group SG, the resulting haloalkyl ether III



(III)

is reacted with an amine of the formula IV or a salt thereof



(IV)

wherein A has the above-mentioned meaning, and, if desired, salts of the compound I which are obtained are then converted into the free bases or the compounds I are converted into their salts.

4,994,462

PLATELET AGGREGATION INHIBITORY AGENTS AND INTERMEDIATE THEREFOR

Andrew Lasslo, Memphis; Ronald P. Quintana, Germantown; Marion Dugdale, and Randy W. Johnson, both of Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 909,135, Sep. 18, 1986, Pat. No. 4,798,830, which is a division of Ser. No. 571,326, Jan. 6, 1987, Pat. No. 4,634,209, which is a division of Ser. No. 368,863, Apr. 15, 1982, Pat. No. 4,443,450. This application Oct. 5, 1988, Ser. No. 253,806

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.[5] A61K *31/495;* **C07D** *401/14*

U.S. Cl. 544—252 **4 Claims**

1. The compound N,N'-bis(nipecotoyl)piperazine dihydrobromide.

2. The compound N,N'-bis(1-decylnipecotoyl)piperazine dihydriodide.

4,994,463

TRICYCLIC THROMBOXANE A_2 ANTAGONISTS

Etsuo Oshima, Shizuoka; Hiroyuki Obase, Mishima; Akira Karasawa; Kazuhiro Kubo, both of Shizuoka; Ichiro Miki, Tokyo; Akio Ishii; Hidee Ishii, both of Shizuoka, and Kenji Ohmori, Mishima, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

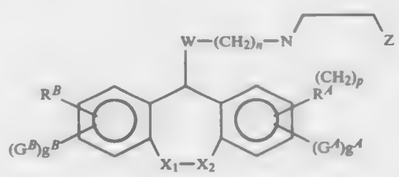
Filed Dec. 8, 1988, Ser. No. 281,545

Claims priority, application Japan, Dec. 14, 1987, 62-315769; Feb. 3, 1988, 63-23543

Int. Cl.[5] A61K *31/495;* **C07D** *405/12*

U.S. Cl. 514—253 **12 Claims**

1. A tricyclic compound represented by formula (I):



(I)

wherein

represents single or double bond;

X_1–X_2 represents —CH_2O—;

W represents —S— or =CH—;

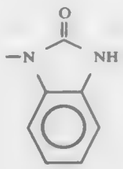
n is 1, 2, 3, or 4;

one of R^A and R^B represents hydrogen and the other represents —Y—M wherein Y represents single bond, —$CR^1R^2(CH_2)_m$—, —CR^1=CR^2—$(CH_2)_m$—, wherein each of R^1 and R^2 independently represents hydrogen or lower alkyl and m is 0, 1, 2, 3 or 4, in which the left side of each formula is bound to the mother nucleus; and M represents —$COOR^3$ wherein R^3 represents hydrogen or lower alkyl, $CONR^{3a}R^{3b}$ herein each of R^{3a} and R^{3b} independently has the same significances for R^3 as described above, or tetrazoyl;

each of G^A and G^B independently represents lower alkyl, halogen, hydroxyl, or lower alkoxyl;

each of g^a and g^b independently represents 0, 1, 2 or 3;

Z represents >N—E^1—Q, wherein E^1 represents single bond, —CO—, —COO— wherein the left side of the formula is bound to the nitrogen atom, or —SO_2—; and Q represents optionally substituted aryl, optionally substituted aralkyl, optionally substituted aralkenyl, aromatic heterocyclic group or



p is 2;

and pharmaceutically acceptable salts thereof.

12. A pharmaceutical composition comprising a pharmaceutical carrier and, as an active ingredient, an effective amount of a tricyclic compound as defined by claim 1.

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PIPERAZINYLPYRIMIDINES AS β-ADRENERGIC RECEPTOR BLOCKERS

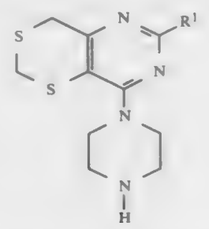
Richard L. Tolman, Warren, N.J.; John J. Baldwin, Gwynedd Valley, Pa.; Arthur F. Wagner, Princeton, N.J., and Adolph Pietruszkiewicz, North Wales, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 91,471, Aug. 31, 1987, Pat. No. 4,889,856. This application Oct. 5, 1989, Ser. No. 417,535

Int. Cl.[5] **C07D** *495/04;* **A61K** *31/505*

U.S. Cl. 514—254 **6 Claims**

1. A compound of structural formula:



or an opthalmologically acceptable salt thereof, wherein:

R^1 is

(1) hydrogen,

(2) C_{1-5}alkyl, straight or branched and either unsubstituted or substituted with

(a) cyano,

(b) phenyl-C_{1-5} alkoxy, or

(c) phenyl,

(3) phenyl, either unsubstituted or substituted with one or more of

(a) nitro

(b) halo,

(c) C_{1-3}alkyl, or

(d) C_{1-3}alkoxy,

(4) C_{3-6} cycloalkyl.

4,994,465

ANTIHYPERLIPIDEMIC AND ANTIATHEROSCLEROTIC TRISUBSTITUTED UREA COMPOUNDS

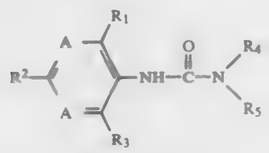
Bharat K. Trivedi, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 312,857, Feb. 17, 1989, abandoned. This application Feb. 5, 1990, Ser. No. 474,426

Int. Cl.[5] **A61K** *31/17, 31/44;* **C07C** *275/28;* **C07D** *213/75*

U.S. Cl. 514—256 **14 Claims**

1. A compound of the formula



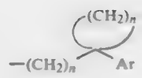
wherein

A is each independently CH or N;

R_1, R_2, and R_3 are each independently hydrogen, alkyl of one to six carbon atoms, halogen or alkoxy of one to six carbon atoms;

R_4 is alkyl of four to ten carbon atoms, cycloalkyl of three to seven carbon atoms, benzyl or benzyl substituted by alkyl of one to six carbon atoms, alkoxy of one to six carbon atoms, halogen, COOR′ where R′ is H, alkyl, $N_1'R_2'$ where R_1' and R_2' are each independently hydrogen, alkyl or cycloalkyl of three to seven carbon atoms, and

R_5 is



wherein

n is 1;

n′ is 4 or 5;

Ar is phenyl, naphthyl, pyridyl, thienyl or furanyl;

or a pharmaceutically acceptable acid addition or base salt thereof.

14. A method of treating hypercholesterolemia and atherosclerosis comprising administering to a patient an ACAT-inhibitory effective amount of a compound as claimed in claim 1 in combination with a pharmaceutically acceptable carrier.

4,994,466

METHOD OF TREATMENT FOR MULTIPLE SCLEROSIS

Fred P. Sherman, Hollywood, and Elliot Hahn, North Miami Beach, both of Fla., assignors to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

Filed Jun. 14, 1990, Ser. No. 537,589

Int. Cl.[5] **A61K** *31/44*

U.S. Cl. 514—282 **13 Claims**

1. A method of treating a patient suffering from multiple sclerosis comprising the daily administration to the patient of from about 1 to about 100 mg of a pure narcotic antagonist.

4,994,467

TREATING AUTISM AND OTHER DEVELOPMENTAL DISORDERS IN CHILDREN WITH NMDA RECEPTOR ANTAGONISTS

Andrew W. Zimmerman, 930 Emerald Ave., Ste. 815, Knoxville, Tenn. 37917

Filed May 31, 1989, Ser. No. 359,115

Int. Cl.[5] **A61K** *31/12, 31/44*

U.S. Cl. 514—284 **7 Claims**

1. A method of treating autism and other pervasive developmental disorders in children comprising the administration to said children of a therapeutically effective amount of a N-methyl-D-aspartate receptor antagonist chosen from the group consisting of ketamine, a pharmaceutically acceptable salt thereof, dextromethorphan and a pharmaceutically acceptable salt thereof.

4,994,468

IMIDAZOQUINOLONE DERIVATIVES

Fumio Suzuki, Mishima; Takeshi Kuroda; Yoshisuke Nakazato, both of Shizuoka; Kenji Ohmori, Mishima, and Haruhiko Manabe, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

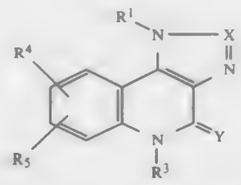
Filed Mar. 5, 1990, Ser. No. 489,025

Claims priority, application Japan, Mar. 7, 1989, 1-54148

Int. Cl.[5] **A61K** *31/47;* **C07D** *471/04*

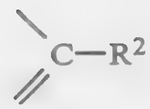
U.S. Cl. 514—293 **8 Claims**

1. An imidazoquinolone derivative represented by the formula:



wherein R^1 represents hydrogen, alkyl having 1 to 10 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, alkenyl having

2 to 6 carbon atoms, aralkyl having 7 to 15 carbon atoms, aralkenyl having 8 to 18 carbon atoms or aryl having 6 to 10 carbon atoms which is optionally substituted with 1 or 2 substituents independently selected from the group consisting of alkyl having 1 to 6 carbon atoms, trifluoromethyl, hydroxyl, alkoxyl having 1 to 6 atoms, alkylthio having 1 tp 6 carbon atoms, nitro, halogen, amino, alkylamino having 1 to 6 carbon atoms, alkanoylamino having 1 to 6 carbon atoms, alkoxycarbonyl having 2 to 7 carbon atoms, alkanoyl having 1 to 6 carbon atoms and aroyl selected from the group consisting of benzoyl, toluyl, propylbenzoyl and naphtoyl; x represents nitrogen or



where R^2 is hydrogen, hydroxyl, alkyl having 1 to 10 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, alkenyl having 2 to 6 carbon atoms, aralkyl having 7 to 15 carbon atoms, aralkenyl having 8 to 18 carbon atoms, aryl having 6 to 10 carbon atoms which is optionally substituted with 1 to 2 substituents independently selected from the same groups as previously defined as to the substituents for aryl, thiol, halogen, aromatic heterocyclic group including heterocyclic rings of 5 or 6 members selected from the group consisting of thienyl, furyl, pyrazolyl, oxazolyl, imidazolyl and pyridyl which are optionally substituted with 1 or 2 substituents independently selected from the group consisting of alkyl having 1 to 6 carbon atoms, alkoxyl having 1 to 6 carbon atoms and halogen, or $-(CH_2)_mCO_2R^6$ where R^6 is hydrogen or alkyl having 1 to 6 carbon atoms and m is an integer of 0 to 3; Y represents oxygen or sulfur;

RR^3 represents alkyl having 1 to 10 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, aklenyl having 2 to 6 carbon atoms, alkoxyalkyl where alkyl moiety has 1 to 10 carbon atoms, aralkyl having 7 to 15 carbon atoms, aralkenyl having 8 to 18 carbon atoms, $-(CH_2)_n-$Het where Het has the same meaning as defined as to the aromatic heterocyclic group, and n is an integer of 1 to 3 or $-(CH_2)_nCO_2R^{6a}$ where n has the same meaning as defined above and R^{6a} has the same meaning as defined as to R^6; each of R^4 and R^5 independently represents hydrogen, alkyl having 1 to 6 carbon atoms, trifluoromethyl, cycloalkyl having 3 to 8 carbon atoms, halogen, hydroxyl, alkoxyl having 1 to 6 carbon atoms, alkylthio having 1 to 6 carbon atoms, nitro, amino, alkylamino having 1 to 6 carbon atoms, alkanoyl having 1 to 6 carbon atoms, alkanoylamino having 1 to 6 carbon atoms, aroyl selected from the group consisting of benzoyl, toluyl, propylbenzoyl and naphtoyl or aroylamino where the aroyl moiety has the same meaning as defined as to the aroyl; or a pharmaceutically acceptable salt thereof.

4,994,469

DIACLYL-SUBSTITUTED METHYLENE-2,2,4-TRIMETHYL-1,2-DIHYDROQUINOLINES AND A PROCESS FOR THE PREPARATION THEREOF

János Szvoboda; Tamás Rozsnyai, both of Budapest; József Szente, Kiskunlacháza; László Melovits, Budapest; Imre Ötvös, Budapest; Ilona Légrádi, Budapest; László Prohászka, Budapest, and Jeno Fekete, Budapest, all of Hungary, assignors to Material Vegyipari Kisszovetkezet, Budapest, Hungary

PCT No. PCT/HU88/00026, § 371 Date Dec. 16, 1988, § 102(e) Date Dec. 16, 1988, PCT Pub. No. WO88/08420, PCT Pub. Date Nov. 3, 1988

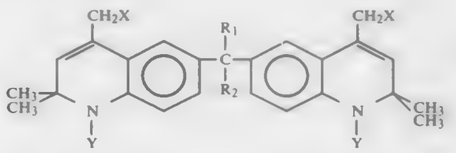
PCT Filed Apr. 22, 1987, Ser. No. 301,887

Claims priority, application Hungary, Apr. 22, 1987, 1740/87; Apr. 11, 1988, 1740/87

Int. Cl.[5] **A61K** *31/47;* **C07D** *215/06, 215/08, 215/12*

U.S. Cl. 514—314 **9 Claims**

1. A compound of the Formula (I)



or a pharmaceutically acceptable salt thereof, wherein

R_1 is C_1 to C_4 alkyl unsubstituted or substituted by hydroxyl, halogen, C_1 to C_4 alkoxy, carboxyl or C_1 to C_4 alkoxy-carbonyl;

R_2 is C_1 to C_2 alkyl unsubstituted or substituted by hydroxyl, halogen, C_1 to C_4 alkoxy, carboxyl or C_1 to C_4 alkoxy-carbonyl;

X is hydrogen or SO_3M wherein

M is hydrogen, alkali metal or alkaline earth metal ion; and

Y is hydrogen, formyl, acetyl or benzoyl.

4,994,470

BENZOPYRAN DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Michel Barreau, Montgeron; Jean-Claude Hardy, Cergy Pontoise, and Christian Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Antony, France

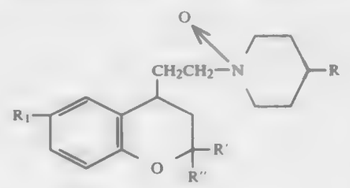
Filed Jan. 16, 1990, Ser. No. 465,448

Claims priority, application France, Jan. 20, 1989, 89 00656

Int. Cl.[5] **A61K** *31/445;* **C07D** *211/94*

U.S. Cl. 514—320 **3 Claims**

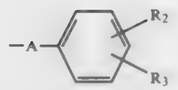
1. A benzopyran derivative, which is of the formula:



in which

R_1 denotes a hydrogen or halogen atom or a hydroxy, alkyloxy, nitro, amino, alkylsulphonamido, bis(alkylsulphonyl)amino, or alkylcarbonylamino radical,

R denotes a radical of general formula:



in which A denotes a single bond or a methylene radical and R_2 and R_3 which may be identical or different, denote a hydrogen or halogen atom or a hydroxy, alkyl, alkyloxy, nitro, amino, alkylsulphonamido, bis(alkylsulphonyl)amino, alkylcarbonylamino, sulphamoyl or cyano radical, or form together, when they are adjacent, a methylenedioxy or ethylenedioxy radical, or alternatively R denotes a 2-oxo-2H-benzimidazolyl radical,

and R′ and R″ are identical and denote hydrogen atoms or alkyl radicals, on the understanding that the alkyl and alkylcarbonyl, radicals mentioned above contain 1 to 4 carbon atoms in a straight or branched chain, its isomeric forms or the mixtures thereof.

3. A pharmaceutical composition, which comprises an antiarrhythmic or antifibrillating effective amount of a benzopyran derivative according to claim 1, in combination with a pharmaceutically acceptable adjuvant or diluent.

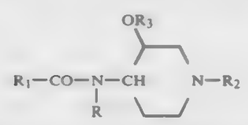
4,994,471

N-ARYL-N-(1-SUBSTITUTED-3-ALKOXY-4-PIPERIDINYL)AMIDES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUCH COMPOUNDS

Nhora L. Lalinde, West Nyack; John Moliterni, Staten Island, both of N.Y., and H. Kenneth Spencer, Chatham, N.J., assignors to BOC, Inc., New Providence, N.J.

Filed May 12, 1989, Ser. No. 351,360
Int. Cl.[5] A61K *31/445;* **C07D** *333/06*
U.S. Cl. 514—326 **21 Claims**

15. A method of producing analgesia in a mammal comprising administering to the mammal in need thereof an analgesically effective amount of a compound having the formula:



(I)

an optically active isomeric form thereof, a, cis/trans isomeric form thereof or a pharmaceutically acceptable acid addition salt thereof, wherein:

R is an aryl group selected from the group consisting of phenyl and substituted phenyl, wherein the substituents on the phenyl group are selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, and combinations thereof;

R_1 is selected from the group, consisting of lower-alkyl, lower-alkenyl, and lower-alkoxy lower-alkyl, each alkyl group having from 1 to 6 carbon atoms;

R_2 is thienyl lower-alkyl; and

R_3 is selected from the group consisting of hydrogen, lower-alkyl and lower-alkyl aryl.

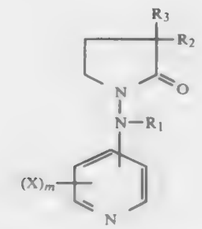
4,994,472

1-(PYRIDINYLAMINO)-2-PYRROLIDINONES AS PAIN RELIEVERS

Richard C. Effland, Bridgewater, and David G. Wettlaufer, Phillipsburg, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Filed Aug. 2, 1989, Ser. No. 388,413
Int. Cl.[5] A61K *31/44;* **C07D** *401/00, 211/00*
U.S. Cl. 514—333 **23 Claims**

1. A 1-(pyridinylamino)-2-pyrrolidinone of the formula



wherein R_1, R_2 and R_3 are independently hydrogen, loweralkyl, aryl, arylloweralkyl or heteroarylloweralkyl selected from the group consisting of pyridinylmethyl, pyridinylethyl, thienylmethyl, thienylethyl or R_2 and R_3 together form a cycloalkane ring of 4 to 6 carbons or a spiro-fused aryl or heteroaryl substituted cycloalkane; the term "heteroaryl" signifying an aromatic heterocyclic radical selected from pyridyl or thiophene; X is hydrogen, halogen, hydroxy, loweralkyl, loweralkoxy, nitro, amino or trifluoromethyl; m is an integer of 1 to 3, or the pharmaceutically acceptable acid addition salts thereof and where appropriate the geometrical, optical and stereoisomers and racemic mixtures thereof.

22. A method of alleviating pain in a mammal which comprises administering to a mammal a pain alleviating effective amount of a compound as defined in claim 1.

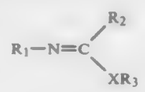
4,994,473

PYRIDYL CONTAINING INSECTICIDES

Michael D. Broadhurst, Novato, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 121,839, Nov. 17, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 263,604
Int. Cl.[5] A61K *31/44;* **C07D** *213/74*
U.S. Cl. 514—335 **45 Claims**

1. A compound having the formula

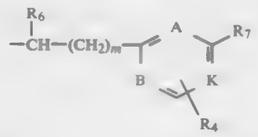


wherein

R_1 is pyridyl, optionally substituted by from 1 to 4 groups selected from halo, C_1–C_6 alkyl, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, or C_1–C_4 alkylthio, provided that R_1 is not 3-chloro-5-trifluoromethyl-pyrid-2yl;

R_2 is methyl, ethyl, n-propyl, C_3–C_7 branched alkyl, C_3–C_4 cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_1–C_6 haloalkyl, C_2–C_6 alkoxyalkyl or cyclopropyl substituted by up to four methyl groups or up to two halogens; X is oxygen, sulfur or —NH—; and

when X is oxygen, then R_3 is:



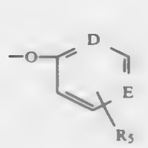
in which m is 0 or 1;

A, B and K are each carbon or nitrogen, provided that no more than one of A, B, and K is nitrogen;

R_4 is hydrogen, monohalo or dihalo;

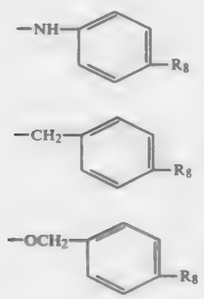
R_6 is hydrogen, methyl, fluoro or ethynyl; and

R_7 is



in which D and E are each carbon or nitrogen provided that both D and E are not nitrogen, and further provided that if A, B or K is nitrogen, then D and E are both carbon; and

R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, cyano, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, or mono- or polyhalo;



in which R_8 is hydrogen or halogen; or

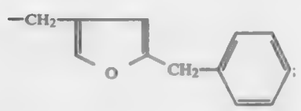
(iii) —O—CH_2—CH=CH_2



in which

(i) R_9 is 4-fluoro, 4-methoxymethyl, or 4-propargyl, and R_{10} is fluoro or

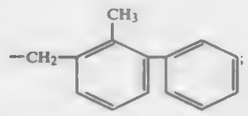
(ii) R_9 is 3- or 4-allyl, 3- or 4-propargyl, or 3- or 4-(mono- or dihalo)allyl, and R_{10} is hydrogen or fluoro;



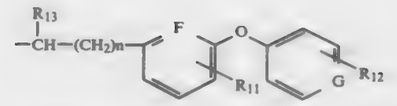
(d) 4-phenoxy-2-butyn-2-yl;

(e) 4-(benzyloxy)benzyl;

(f) 4-(4-fluorobenzyloxy)benzyl; or



and if X is sulfur or —NH—, then R_3 is



in which n is 0 or 1; F and G are independently nitrogen or carbon, provided that F and G are not both nitrogen; R_{11} is hydrogen or halo; R_{12} is hydrogen, mono- or dihalo, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, cyano, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl; and R_{13} is hydrogen or methyl; (j) pentafluorobenzyl; or (k) 2-methyl-3-phenylbenzyl.

(ii)

4,994,474

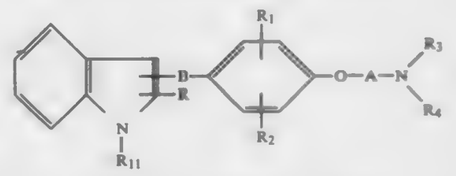
ALKYL- OR ARLY-AMINOALKOXY-BENZENE-SULFONYL INDOLES

Jean Gubin; Pierre Chatelain, both of Brussels, and Henri Inion, Wemmel, all of Belgium, assignors to Sanofi, Paris, France

Continuation-in-part of Ser. No. 82,554, Aug. 7, 1987, Pat. No. 4,957,925, which is a continuation-in-part of Ser. No. 6,233, Jan. 23, 1900, abandoned. This application Feb. 6, 1989, Ser. No. 306,499
Claims priority, application France, Feb. 14, 1986, 8602045
Int. Cl.[5] A61K *31/40, 31/45*
U.S. Cl. 514—339 **14 Claims**

1. An aminoalkoxyphenyl compound of formula:

(b)



(c)

and pharmaceutically acceptable salts, in which:

B represents a—S—,—SO— or —SO_2— group,

R_1 and R_2, which are identical or different, each denote hydrogen, a methyl or ethyl radical or a halogen atom,

A denotes a straight-or branched-alkylene radical having from 2 to 5 carbon atoms or a 2-hydroxypropylene radical in which the hydroxy is optionally substituted by a lower alkyl radical,

R_3 denotes an alkyl radical or a radical of formula:

—Alk—Ar

in which Alk denotes a single bond or a linear-or branched-alkylene radical having from 1 to 5 carbon atoms and Ar denotes a pyridyl, phenyl, 2,3-methylenedioxyphenyl or 3,4-methylenedioxyphenyl radical or a phenyl group substituted with one or more substituents, which may be identical or different, selected from halogen atoms, lower alkyl group or lower alkoxy groups,

(g)

R_{11} denotes hydrogen or a lower alkyl, phenyl, diphenylmethyl, benzyl or halogenobenzyl radical,

R_4 denotes hydrogen or a C_{1-8} alkyl radical,

R represents hydrogen, an alkyl radical, a cycloalkyl radical, a benzyl radical or a phenyl radical optionally substituted with one or more substituents, which may be identical or different, selected from halogen atoms and from lower alkyl, lower alkoxy or nitro groups.

4,994,475
METHOD FOR POTENTIATING AN IMMUNE RESPONSE WITH DERIVATIVES

Maurice W. Gittos, Plobsheim, France, assignor to National Research Development Corporation, London, England

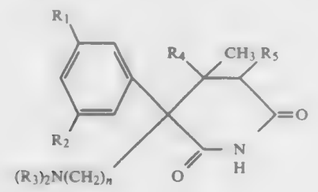
Division of Ser. No. 323,308, Mar. 14, 1989, Pat. No. 4,918,084, which is a division of Ser. No. 136,996, Dec. 23, 1987, Pat. No. 4,835,151, which is a division of Ser. No. 905,525, Sep. 18, 1986, Pat. No. 4,738,973. This application Dec. 19, 1989, Ser. No. 452,343

Claims priority, application United Kingdom, Sep. 11, 1985, 8522455; Feb. 17, 1986, 8603909; Feb. 17, 1986, 8603910

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—348 **4 Claims**

1. A method of potentiating an immunoresponse, which comprises administering to a patient suffering a bacterial or viral infection, an immunoresponse potentiating amount of a compound of Formula I



wherein:

R_1 represents methoxy, ethoxy, or hydroxy,

R_2 represents methoxy, ethoxy, hydroxy or hydrogen;

each R_3 independently represents methyl or ethyl;

R_4 represents hydrogen or methyl;

R_5 represents hydrogen or methyl; and

n represents 2 or 3,

or a pharmacologically acceptable acid addition salt thereof.

4,994,476
DIHYDROPYRIDIN-3,5-DICARBOXYLATES INCORPORATING ARYLOXYPROPANOLAMINE MOIETIES

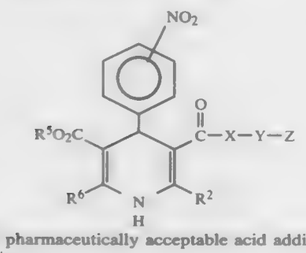
Graham S. Poindexter, Evansville, Ind., assignor to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 666,848, Oct. 31, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 779,188

Int. Cl.[5] C07D *211/86;* **A61K** *31/455*

U.S. Cl. 514—356 **34 Claims**

1. A compound of Formula XXI



XXI

or the pharmaceutically acceptable acid addition salt thereof wherein

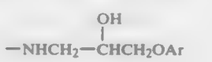
R^2 is lower (C_{1-4}) alkyl, hydroxyalkyl, alkoxyalkyl, alkylaminoalkyl, dialkylaminoalkyl, phenyl or thienyl;

R^5 and R^6 are independently selected from lower alkyl, hydroxyalkyl, alkoxyalkyl, alkylaminoalkyl, or dialkylamino-alkyl and may be the same or different;

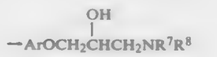
X is 0;

Y is a covalent bond or a lower alkylene chain which may be substituted with a lower alkyl group, or is an alkyleneoxyalkylene, alkyleneaminoalkylene, alkylenecarboxamido, alkylenecarboxamidoalkylene, or alkylene thioureaalkylene chain; and

Z is a beta-block moiety of Formula A or B



A



B

with Ar being naphthyl, 5,6,7,8-tetrahydronaphthyl either unsubstituted or substituted at one or more positions in the saturated ring with oxo or hydroxy groups, or phenyl either unsubstituted or optimally substituted at one or more ring positions with lower alkyl, alkoxy, alkoxyalkylene, (C_{3-6})-cycloalkyl, allyl, aminocarbonylalkylene, cyano, halogen, hydroxyl, or trifluoromethyl, or Ar can be 4-(4-morpholino)-1,2,5-thiadiazol-3-yl; and

R^7 and R^8 are independently chosen from lower alkyl and hydrogen.

4,994,477
HETEROCYCLIC RENIN INHIBITORS

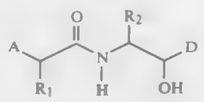
Dale J. Kempf, Lake Villa; Saul H. Rosenberg; Jacob J. Plattner, both of Libertyville; Hing L. Shan, Gurnee, and Biswanath De, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 24, 1988, Ser. No. 173,382

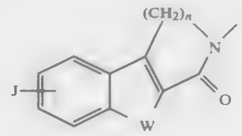
Int. Cl.[5] A61K *31/42;* **C07D** *413/02, 413/14*

U.S. Cl. 514—359 **7 Claims**

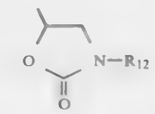
1. A compound of the formula:



wherein A is



wherein J is absent or represents one or two substituents independently selected from hydroxy, loweralkoxy, amino, loweralkylamino, diloweralkylamin loweralkyl, thioloweralkoxy and halo; W is NR_4 wherein R_4 is hydrogen, loweralkyl or aryllowerakyl wherein aryl is selected from phenyl, naphthyl, substituted phenyl and substituted naphthyl wherein the phenyl or naphthyl ring is substituted with loweralkyl, amino, (N-protected)amino, loweralkylamino, diloweralkylamino, loweralkoxy, thioloweralkoxy, hydroxy, halo, mercapto, nitro, carboxaldehyde, carboxyl, loweralkoxycarbonyl or carboxamide; n is 1; R_1 is heterocyclic substituted methyl wherein the heterocycle is a 5-membered ring containing one oxygen, sulfur or nitrogen atom; or one nitrogen and one oxygen atom; or two or three nitrogen atoms; R_2 is hydrogen, loweralkyl, C_4 to C_7 cycloalkylmethyl or benzyl; and D is



wherein R_{12} is hydrogen, loweralkyl, hydroxyloweralkyl, hydroxy, loweralkoxy, amino or loweralkylamino; or a pharmaceutically acceptable salt or ester thereof.

3. The compound (1'S,2''S,3''R,5'''S)-2-(1-(N-(1-cyclohexyl-3-hydroxy-3-(3-ethyloxazolidin-2-on-5-yl)-2-propyl)-carbamoyl-2-(4-imidazolyl)methyl)-1,2,3,4-tetrahydropyrrolo(3,4-b)-indole-3-one.

7. A method for inhibiting renin comprising administering to a host in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,994,478
OXADIAZOLE DERIVATIVE

Takashi Kishimoto; Takashi Okabe; Tomio Yamada; Michihiko Matsuda, and Yukio Kitagawa, all of Odawara, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 136,190, Dec. 21, 1987, abandoned. This application May 18, 1989, Ser. No. 357,623

Claims priority, application Japan, Dec. 27, 1986, 61-310145

Int. Cl.[5] C07D *271/06;* **A01N** *43/82*

U.S. Cl. 514—364 **12 Claims**

1. A compound selected from the group consisting of:

(1) 3-(2,6-difluorophenyl)-5-(4-isopropoxybenzyl)-1,2,4-oxadiazole;

(2) 3-(2,6-dichlorophenyl)-5-)4-isopropoxybenzyl)-1,2,4-oxadiazole;

(3) 3-(2,6-dibromophenyl)-5-(4-isopropoxybenzyl)-1,2,4-oxadiazole;

(4) 3-(2,6-dichlorophenyl)-5-(4-cyclopentyloxybenzyl)-1,2,4,-oxadiazole;

(5) 3-(2,6-dichlorophenyl)-5(4-cyclohexyloxybenzyl)-1,2,4-oxadiazole;

(6) 3-(2,6-dichlorophenyl)-5-(4-sec-butyloxybenzyl)-1,2,4-oxadiazole;

(7) 3-(2,6-dichlorophenyl)-5(4-isopropylthiobenzyl)-1,2,4-oxadiazole;

(8) 3-(2,6-dichlorophenyl)-5-(α-acetoxy-4-cyclopentyl oxybenzyl)-1,2,4-oxadiazole;

(9) 3-(2,6-dichlorophenyl)-5-(α-hydroxy-4-cyclopentyl oxybenzyl)-1,2,4-oxadiazole;

(10) 3-(2,6-dichlorophenyl)-5-(α-chloro-4-cyclopentyl oxybenzyl)-1,2,4-oxadiazole;

(11) 3-(2,6-dichlorophenyl)-5-(α-acetoxy-4-isopropoxy benzyl)-1,2,4-oxadiazole;

(12) 3-(2,6-dichlorophenyl)-5-(α-hydroxy-4-isopropoxy benzyl)-1,2,4-oxadiazole;

(13) 3-(2,6-dichlorophenyl)-5-(α-dichloro-4isopropoxy benzyl)-1,2,4-oxadiazole;

(14) 3-(2,6-dichlorophenyl)5-(4-isopropoxybenzoyl)-1,2,4-oxadiazole;

(15) 3-(2,6-dichlorophenyl)-5-(α-hydroxyimino-4-isopropoxybenzyl)-1,2,4-oxadiazole;

(16) 3-(2,6-dichlorophenyl-5[(N-methylcarbamoyloxy imino)-4isopropoxybenzyl]-1,2,4oxadiazole;

(17) 3-(2,6-dichlorophenyl)5-(α-ethoxycarbonyloxy-4-isopropoxybenzyl)-1,2,4-oxadiazole;

(18) 3-(2,6-dichlorophenyl)-5-(α-dichloroacetoxy-4-isopropoxybenzyl)-1,2,4-oxadiazole;

(19) 3-(2,6-dichlorophenyl)-5(α-amino-4-isopropoxybenzyl)-1,2,4-oxadiazole; and,

(20) 3-(4-cyclopentyloxybenzyl)-5-(2,6-dichlorophenyl)-1,2,4-oxadiazole.

4,994,479
PHENYLENE DERIVATIVES AND ANTI-ALLERGIC USE THEREOF

Toshiyasu Mase, Chiba; Kiyoshi Murase, Saitama; Hiromu Hara, Saitama, and Kenichi Tomioka, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP86/00155, § 371 Date Aug. 15, 1986, § 102(e) Date Aug. 15, 1986, PCT Pub. No. WO86/05779, PCT Pub. Date Oct. 9, 1986

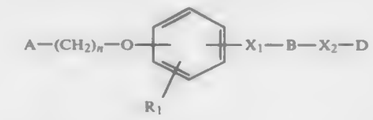
PCT Filed Mar. 31, 1986, Ser. No. 899,218

Claims priority, application Japan, Apr. 3, 1985, 60-70566; Dec. 26, 1985, 60-297096

Int. Cl.[5] C07D *257/04, 257/06;* **C07C** *101/02;* **A61K** *31/71, 31/19*

U.S. Cl. 514—381 **27 Claims**

1. A compound represented by the general formula (I) or a pharmaceutically acceptable salt thereof:



wherein symbols represent:

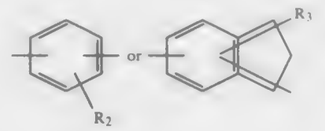
A: hydrogen atom, a phenyl group or a phenoxy group;

n: an integer of 3 to 10;

R_1: hydrogen atom or a lower alkoxy group;

X_1: a group shown by $—CH_2CH_2—$, $—CH=CH—$, $—CH_2—Y_1—$ (wherein Y_1: —O—, —S— or —NH—), $—Y_1—CH_2$, $—CO—Y_2—$ (wherein Y_2: —NH—, $—CH_2—Y_1—$ or $—Y_1—CH_2—$) or $—Y_2—CO—$;

a group represented by:



wherein:

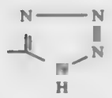
R_2: a hydrogen atom, a halogen atom, a nitro group, a hydroxy group, a lower alkoxy group, a carboxy group, a lower alkoxycarbonyl group, a lower alkyl group, a hydroxy-lower alkyl group, a lower alkoxycarbonyl-lower alkyl group, a carboxy-lower alkylthio-lower alkyl group, a lower alkoxycarbonyl-lower alkylthio-lower alkyl group, a halo-lower alkyl group, a carboxyl-lower alkoxy group, a lower alkoxycarbonyl-lower alkoxy group, a lower alkanoyl-lower alkoxy group, a lower alkoxycarbonyl-lower alkoxycarbonyl-lower alkoxy group, a lower alkanoyl group or a group represented by the formula:



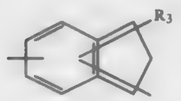
(wherein R_4 and R_5, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a carboxy-lower alkyl group, a lower alkoxycarbonyl-lower alkyl group, a lower alkanoyl group, a carboxy-lower alkanoyl group, a lower alkoxycarbonyl-lower alkanoyl group, a phenyl-lower alkoxy-carbonyllower alkanoyl group, a carbamoyl group, a lower alkoxy oxalyl group or a mono- or di-lower alkylaminocarbonyl group),

R_3: a hydrogen atom, a hydroxy group or a lower alkoxy group,

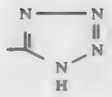
X_2: a group represented by —CH=CH— or —Y_3—Y_4— (wherein Y_3: a single bond, —O—, —S— or —NH—; Y_4: an alkylene group having 1 to 6 carbon atoms which may be intervened by a sulfur atom), and
D: a carboxy group, or a group represented by:



with the proviso that:
(a) when A is hydrogen, B is



or



(b) when D is carboxy, R_2 is a hydrogen atom, a halogen atom, a nitro group, a hydroxy group, a lower alkoxy group, a lower alkyl group, a hydroxy-lower alkyl group, a lower-alkoxy-lower alkyl group, or a halo-lower alkyl;
X_1: is —CONH—; and
X_2: is —CH=CH— or —Y_3—Y_4—, wherein Y_3 is a single bond or —O—, and Y_4 is an alkylene group having 1 to 6 carbon atoms.

10. A pharmaceutical composition useful for inhibiting the production and release of SRS-A comprised of a pharmaceutically acceptable amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

19. A method for inhibiting the production and release of SRS-A in a subject, which comprises administering to said subject an effective amount for inhibiting the production and release of SRS-A of the pharmaceutical composition of claim 10.

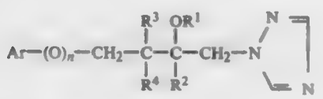
4,994,480

FUNGICIDAL SUBSTITUTED TRIAZOLYLMETHYLCARBINOLS

Karl H. Büchel, Burscheid; Graham Holmwood, Wuppertal; Gerd Hänssler, Leverkusen; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 337,201
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813253
Int. Cl.[5] C07D *249/08;* A01N *43/653*
U.S. Cl. 514—383 14 Claims

1. A substituted triazolylmethylcarbinol of the formula



(I)

in which
n stands for the numbers 0 or 1,
Ar is phenyl which is optionally substituted by one or two identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, straight-chain or branched alkyl having 1 to 4 carbon atoms, straight-chain or branched halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 halogen atoms and straight-chain or branched halogenoalkoxy having 1 to 4 carbon atoms and 1 to 9 halogen atoms,
R^1 is hydrogen, straight-chain or branched alkyl having 1 to 8 carbon atoms or is alkenyl having 2 to 4 carbon atoms,
R^2 is straight-chain or branched alkyl having 1 to 8 carbon atoms, cycloalkyl having 3 to 6 carbon atoms or is straight-chain or branched alkenyl having 2 to 6 carbon atoms,
R^3 is methyl and
R^4 is methyl or
R^3 and R^4 together are ethane-1,2-diyl,
or an addition product thereof with an acid or metal salt.

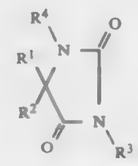
4,994,481

TREATMENT OF AIDS WITH DIPHENYLHYDANTOIN AND ITS DERIVATIVES

Pascal Zimmer, Lehrertalweg 112, and Hans A. Lehr, Werastrasse 15, both of D-7900 Ulm, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,671
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607381
Int. Cl.[5] A61K *31/415*
U.S. Cl. 514—391 4 Claims

1. Method of treating the immune disease, AIDS, which comprises administering to a patient suffering from the same, an AIDS treatment effective amount of a diphenylhydantoin of the formula:



wherein R^1 and R^2 are each hydrogen, phenyl or phenyl substituted by halogen, hydroxyl, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl, C_5–C_6 cycloalkyl or thiophene, and wherein R^3 and R^4 are each hydrogen, C_1–C_4 alkoxy, C_1–C_4 alkyl or phenyl, and pharmaceutically acceptable salts thereof.

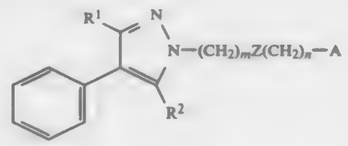
4,994,482

ARYLPYRAZOL DERIVATIVES AS ANTI-PLATELET AGENTS, COMPOSITIONS AND USE

Nicholas A. Meanwell, East Hampton, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 387,749, Jul. 31, 1989, abandoned. This application May 10, 1990, Ser. No. 523,637
Int. Cl.[5] A61K *31/415;* C07D *231/12*
U.S. Cl. 514—406 17 Claims

1. A compound of the formula



wherein
R^1 and R^2 each are independently hydrogen or phenyl, provided that R^1 and R^2 may not both be hydrogen;
m is an integer from 3 to 9;
n is an integer from 0 to 3 and the sum of m+n is an integer from 5 to 12;
Z is O, S, SO, SO_2, —CH=CH— or a direct bond;
A is



R^3 is hydrogen or C_{1-6} alkyl;
or a pharmaceutically acceptable salt or hydrate thereof.

17. The pharmaceutical composition for inhibiting blood platelet aggregation comprising a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable salt or hydrate thereof and a pharmaceutical carrier.

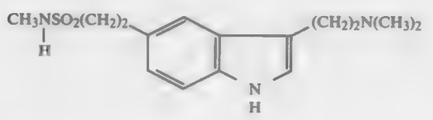
4,994,483

5-SUBSTITUTED-3-AMINOALKYL INDOLE DERIVATIVES FOR MIGRAINE

Alexander W. Oxford, Royston; Brian Evans, Buntingford; Michael D. Dowle, Ware, and Ian H. Coates, Hertford, all of England, assignors to Glaxo Group Limited, England

Continuation of Ser. No. 72,786, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 678,995, Dec. 6, 1984, abandoned. This application Nov. 30, 1989, Ser. No. 443,874
Claims priority, application United Kingdom, Dec. 6, 1983, 83 32435
Int. Cl.[5] C07D *209/16, 209/14;* A61K *31/40*
U.S. Cl. 514—415 5 Claims

1. A compound having a formula as follows:



or a physiologically acceptable salt or solvate thereof.

2. A process for the treatment of pain resulting from dilatation of the cranial vasculature which comprises administering to a patient an effective amount of a compound as claimed in claim 1 to relieve said pain.

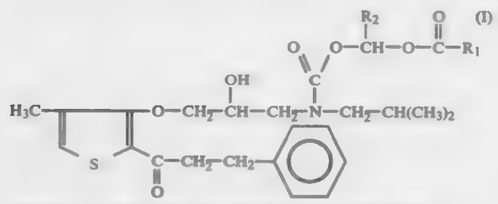
4,994,484

1-(3-(2-HYDROXY-3-ALKYLAMINOPROPOXY)-2-THIENYL)-3-PHENYL-1-PROPANONES AND PROCESS FOR THE PREPARATION OF THE SAME

Dieter Binder, Vienna, and Gerhard Greier, Linz, both of Austria, assignors to Laevosan-Gesellschaft m.b.H., Linz, Austria

Filed Jan. 24, 1990, Ser. No. 469,893
Claims priority, application Austria, Jan. 24, 1989, A130/89
Int. Cl.[5] A61K *31/38;* C07D *333/32*
U.S. Cl. 514—445 4 Claims

1. 1-(3-(2-hydroxy-3-alkylaminopropoxy)-2-thienyl)-phenyl-1-propanones represented by formula (I)



(I)

wherein R_1 and R_2 each represent a lower alkyl group.

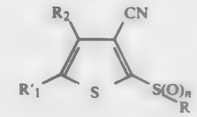
4,994,485

THIO COMPOUNDS HAVING FUNGICIDAL ACTIVITY

Hendrik Dolman, and Johannes Kuipers, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation of Ser. No. 395,220, Aug. 17, 1989, abandoned, which is a continuation of Ser. No. 175,601, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 14,596, Feb. 13, 1987, abandoned. This application Aug. 14, 1990, Ser. No. 566,868
Claims priority, application Netherlands, Feb. 19, 1986, 8600416; May 22, 1986, 8601296
Int. Cl.[5] A01N *43/06;* C07D *333/38*
U.S. Cl. 514—445 7 Claims

1. Compounds of the formula



(IV)

wherein
R_1' is a cyano group, a formyl group, an alkylcarbonyl group having 2–5 carbon atoms or a benzoyl group which may be substituted with one or more substituents selected from the group consisting of halogen, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl and C_1–C_4 haloalkoxy;
R is an alkyl group substituted or not substituted with halogen and having 1–12 carbon atoms, an alkenyl or alkynyl group having 2–4 carbon atoms, an alkadienyl group having 3 or 4 carbon atoms, or a phenyl or phenyl (C_1–C_4) alkyl group, which groups are unsubstituted or substituted with a substituent selected from halogen, nitro, cyano, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy and C_1–C_4 alkylsulphonyl;
R_2 is a hydrogen atom, a halogen atom, an amino group unsubstituted or substituted with one or two groups selected from C_1–C_4 alkyl and C_2–C_5 alkylcarbonyl, an alkyl or alkoxy group having 1–4 carbon atoms and optionally substituted with halogen or C_2–C_5 alkylcarbonyl, or a phenyl, phenoxy or phenylthio group, which groups are unsubstituted or substituted with a substituent selected from halogen, nitro, cyano, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy and C_1–C_4 alkylsulphonyl; and
n is 1 or 2.

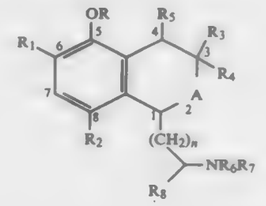
4,994,486

DOPAMINERGIC COMPOUNDS

Robert W. Schoenleber, Deerfield; John W. Kebabian, Lake Bluff; Michael P. DeNinno, Wildwood; Michael R. Michaelides, Highland Park, and Sheela A. Thomas, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 359,448, May 31, 1989, Pat. No. 4,963,568. This application Dec. 22, 1989, Ser. No. 456,011
Int. Cl.[5] A61K *31/35;* C07D *333/64, 277/22, 405/00*
U.S. Cl. 514—456 16 Claims

1. A compound having the formula:



I

VOL 1123 ISS 3 FEB 19 1991 UMI

wherein
A is O,
n is 0 or 1;
R is hydrogen, lower alkyl or a prodrug ester group;
R_1 is selected from hydrogen, halogen, lower alkyl, C_1–C_6 haloalkyl and lower alkoxy;
R_2 is selected from hydrogen, halogen, lower alkyl, and C_1–C_6 haloalkyl or, taken together with R_8 forms a saturated fused ring of from six or seven carbon atoms;
R_3 is selected from
hydrogen,
alkyl of from one to twelve carbon atoms,
alkenyl of from two to twelve carbon atoms,
alkynyl of from two to twelve carbon atoms,
cycloalkyl of from three to twelve carbon atoms,
aryl wherein aryl is selected from phenyl, 1 - or 2-naphthyl, pyridyl, pyrazinyl, thiazolyl, furyl, and thienyl, optionally substituted by hydroxy, halogen, lower alkyl or lower alkoxy,
arylalkyl wherein the aryl portion is as defined above and the alkyl portion is of from one to twelve carbon atoms or,
R_3, taken together with R_4 forms a saturated spiroalkyl group of from five to seven carbon atoms or,
R_3, taken together with R_5, forms a saturated fused cycloalkyl ring of six carbon atoms;
R_4 is hydrogen or alkyl of from one to twelve carbon atoms;
R_5 is hydrogen or alkyl of from one to twelve carbon atoms;
R_6 is selected from hydrogen,
alkyl of from one to twelve carbon atoms,
alkenyl of from one to twelve carbon atoms,
alkynyl of from two to twelve carbon atoms,
cycloalkyl of from three to twelve carbon atoms, and
aralkyl, wherein aralkyl is as defined above, or
taken together with R_7 or R_8 forms a saturated nitrogen-containing heterocycle of from five to seven ring atoms;
R_7 is hydrogen or alkyl of from one to twelve carbon atoms or, taken together with R_6 or R_8 forms a saturated nitrogen-containing heterocycle of from five to seven ring atoms;
R_8 is hydrogen or alkyl of from one to twelve carbon atoms or, taken together with R_6 or R_7, forms a saturated nitrogen-containing heterocycle of from five to seven ring atoms, or, or
a pharaceutically acceptable salt, ester, or amide thereof;
subject to the proviso that R_3 and R_4 cannot simultaneously both be hydrogen.

4,994,487

METHODS AND COMPOSITIONS FOR THE TREATMENT OF PLANTS

William A. Haglund, Burlington, Wash., assignor to Washington State University Research Foundation, Pullman, Wash.

Filed Sep. 26, 1989, Ser. No. 412,883
Int. Cl.[5] A01N *47/10*; A61K *31/27*
U.S. Cl. 514—476 12 Claims

1. A method of enhancing plant growth in a plant bed, comprising treating the soil in the plant bed with a fungicidally effective amount of metham at or after the time of planting of seed or vegetative material in the plant bed, said fungicidally effective amount being insufficient to retard growth of a plant from the seed or vegetative material.

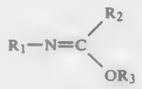
4,994,488

NOVEL IMIDATE INSECTICIDES

Michael D. Broadhurst, Novato; Karl J. Fisher, Fairfax; William G. Haag, Martinez, and Michael R. Leadbetter, El Cerrito, all of Calif., assignors to ICI Americas Inc., Wilmington, Del.

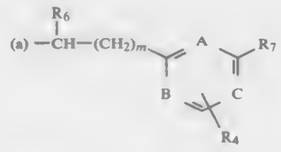
Continuation-in-part of Ser. No. 263,605, Oct. 31, 1988, which is a continuation-in-part of Ser. No. 264,746, Oct. 31, 1988, which is a continuation-in-part of Ser. No. 122,877, Nov. 17, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 343,550
Int. Cl.[5] A61K *31/21*
U.S. Cl. 514—508 26 Claims

1. A compound having the formula

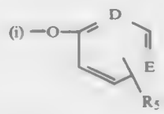


(I)

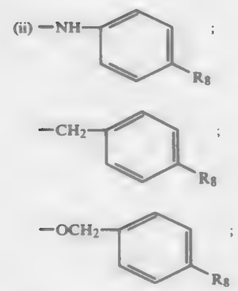
in which
R_1 is naphthyl, optionally substituted by up to 2 halogens; or phenyl, optionally substituted by one or more of: C_2–C_5 carboalkoxy, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkylsulfonyl, C_2–C_5 alkylcarbonyl, C_2–C_4 alkenyl, C_3-haloalkenoxy, C_1–C_4 haloalkylthio, C_3–C_6 cycloalkyl, phenyl, monosubstituted phenyl, pyridyloxy, C_2–C_4 alkyleneoxy, C_1–C_4 alkylenedioxy, C_1–C_3 haloalkylenedioxy, C_2–C_4 alkylene, amido, nitro, cyano, up to two C_1–C_4 alkylthio groups, up to three C_1–C_4 alkoxy groups, up to three C_1–C_4 haloalkoxy groups, up to three C_1–C_4 alkyl groups, up to three C_1–C_4 haloalkyl groups, or up to five halogens;
R_2 is cyclopropyl, optionally substituted by one or 4 methyl groups or up to 2 halogens; and
R_3 is



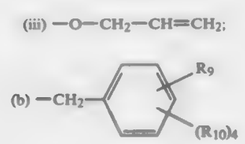
in which m is 0 or 1;
A, B and C are each carbon or nitrogen, provided that A, B and C are not all nitrogen and if two of A, B and C are nitrogen, then A and C are nitrogen;
R_4 is hydrogen, monohalo or dihalo;
R_6 is hydrogen, methyl, fluoro or ethynyl; and
R_7 is



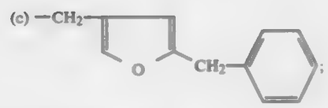
in which D and E are each carbon or nitrogen provided that both D and E are not nitrogen, and further provided that if any of A, B or C is nitrogen, then D and E are both carbon; and
R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, cyano, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, or mono- or polyhalo;



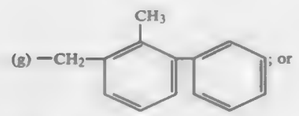
in which R_8 is hydrogen or halogen; or



in which
(i) R_9 is 4-fluoro, 4-methoxymethyl, or 4-propargyl, and R_{10} is fluoro or
(i) R_9 is 3- or 4-allyl, 3- or 4-propargyl, or 3- or 4-(mono- or dihalo)allyl, and R_{10} is hydrogen or fluoro;



(d) 4-phenoxy-2-butyn-2yl;
(e) 4-(benzyloxy)benzyl;
(f) 4-(4-fluorobenzyloxy)benzyl;



(h) 4-(4-trifluoromethyl-2-pyridyloxy)benzyl; provided that:
R_1 is not 2,3-dichlorophenyl, 2,6-difluorophenyl, 2,6-di(C_1–C_4 alkyl)phenyl, 2,4,6-tribromophenyl or 2,4,6-tri(C_1–C_4 alkoxy)phenyl.

22. A method for controlling insects comprising applying to an insect, the locus of an insect or a locus at which insecticidal control is desired, an insecticidally effective amount of a compound according to claim 1.

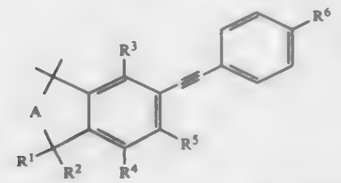
4,994,489

ESTER DERIVATIVES OF DIARYLACETYLENES, THEIR COMPOSITIONS AND THEIR USE IN ACNE TREATMENT

Hans-Heiner Wuest, Dossenheim; Fritz-Frieder Frickel, Deidesheim, and Axel Nuerrenbach, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft

Division of Ser. No. 778,256, Sep. 20, 1985, Pat. No. 4,806,558. This application Jul. 22, 1988, Ser. No. 222,901
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434946
Int. Cl.[5] C07C *69/78*; A61K *31/235*
U.S. Cl. 514—510 4 Claims

1. A diarylacetylene of the formula I



where R^1 and R^2 are each hydrogen or methyl, R^3 is hydrogen, methyl, hydroxy or C_1–C_6-alkoxy, R^4 is hydrogen, methyl or methoxy, R^5 is hydrogen, halogen, methoxy or C_1–C_4-alkyl, A is methylene or ethylene radical which is unsubstituted or substituted by C_1–C_4-alkyl or is —CH=CH—, —CHOH—CH_2—or —CO—CH_2- and R^6 is $COOC_1$—C_8-alkyl and its physiologically tolerated salts.

4. The method of treating acne in a patient suffering therefrom which comprises administering to said patient an effective amount of a compound I as defined in claim 1.

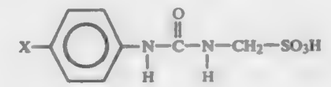
4,994,490

NOVEL N-(SULFOMETHYL)-N'-ARYLUREAS

Glenn Roy, Streamwood; Chris Culberson, Schaumburg; George Muller, Northbrook, and Srinivasan Nagarajan, Arlington Heights, all of Ill., assignors to The NutraSweet Company, Deerfield, Ill.

Filed Apr. 3, 1989, Ser. No. 331,997
Int. Cl.[5] A61K *31/275, 31/17*
U.S. Cl. 514—522 8 Claims

1. A method of inhibiting the sweet taste of a food, beverage or pharmaceutical composition having a sweet taste which comprises adding to the food, beverage or pharmaceutical composition one or more compounds of formula



wherein X represents H, CHO, CN, CO_2C_1–C_3 alkyl, COC_1–C_3 alkyl, $CONH_2$, Br, Cl, F, I or NO_2 or physiologically acceptable salts thereof in an amount effective to inhibit all or a portion of the sweet taste thereof.

4,994,491

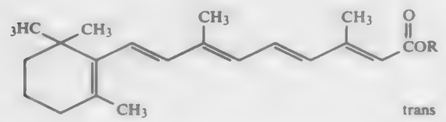
DERMAL USES OF TRANS-RETINOIDS FOR THE TREATMENT OF CANCER

William P. Purcell, and Harlie A. Parish, Jr., both of Memphis, Tenn., assignors to Molecular Design International, Memphis, Tenn.

Filed Dec. 14, 1988, Ser. No. 284,185
Int. Cl.[5] A61K *31/38, 31/40, 31/44, 31/215*
U.S. Cl. 514—529 5 Claims

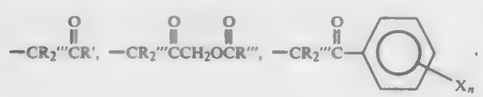
1. A method for retarding and reversing the effects of skin

cancer in a human subject requiring said treatment without the inducement of dermatitis which comprises topical application on a cancerous dermal site of said human subject a pharmaceutical composition which comprises an effective skin cancer treatment amount of a non-irritating retinoid having the formula

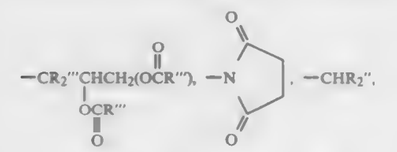


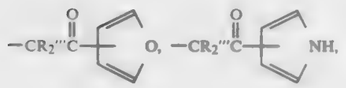
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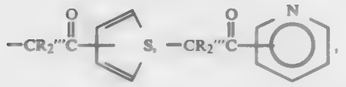
wherein R is a member of the group consisting of

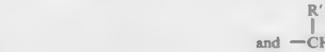






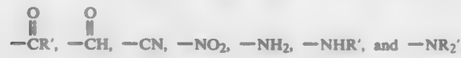




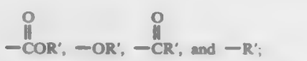


wherein X is a member of the group consisting of





wherein n is a number from 1 to 5;
wherein R′ is a member of the group consisting of H and any of the lower alkyls ranging from C_1 to C_6; wherein R″ is a member of the group consisting of



wherein each R‴ is a member of the group consisting of R′ and the hydrocarbon backbone of fatty acids; and further, where there are two or more R′, R″, or R‴ groups attached to the same carbon or nitrogen, each r′, R″, R‴ may be the same as or different from the other R′, R″, R‴ groups attached to that carbon or nitrogen;
admixed with a pharmaceutically-acceptable topical vehicle.

4,994,492

TREATMENT OF MELANOMA USING N,N-DIMETHYLGLYCINE

Roger V. Kendall, Williston, Vt.; John W. Lawson, Clemson, and Elizabeth A. Reap, Pendleton, both of S.C., assignors to Foodscience Corporation, Essex Junction, Vt.

Filed Jan. 9, 1989, Ser. No. 294,845
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—561 5 Claims

1. A method of inhibiting the metastasis of a melanoma tumor comprising administering to a patient with a melanoma tumor a metastasis-inhibiting amount of N,N-dimethylglycine or a pharmaceutically acceptable salt thereof.

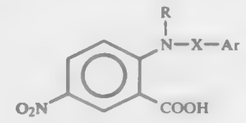
4,994,493

N-SUBSTITUTED 5-NITROANTHRANILIC ACIDS, A PROCESS FOR THEIR PREPARATION, THEIR USE, AND PHARMACEUTICAL PRODUCTS BASED ON THESE COMPOUNDS

Rainer Greger, Heitersheim; Heinrich C. Englert; Hans-Jochen Lang, both of Hofheim am Taunus, and Max Hropot, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften, Gottingen and Hoechst Aktiengesellschaft, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,318
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527409; Aug. 5, 1985, 3528048
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—567 3 Claims

1. A pharmaceutical composition for the treatment of cerebral edema which comprises an effective amount of a compound of the formula I



in which
R is hydrogen or $(C_1–C_4)$alkyl,
X is a chain $(CH_2)_n$, n being 1, 2, 3 or 4, which chain is unsubstituted or substituted by 1 to 2n $(C_1–C_2)$alkyl radicals, it being additionally possible for the chain to be substituted by a radical Ar which is as defined below, and
Ar is selected from the group consisting of phenyl, furyl, thienyl, isothiazolyl, oxazolyl, isoxazolyl, pyrazolyl, imidazolyl, thiazolyl, pyridyl, pyrazinyl. pyrimidinyl, pyridazinyl and triazinyl, said radical being unsubstituted or substituted by 1 to 3 identical or different radicals selected from the group consisting of $(C_1–C_2)$-alkyl, $(C_1–C_2)$alkoxy, F. Cl, Br, I and CF_3, or a pharmaceutically tolerated salt thereof together with a pharmaceutically acceptable carrier.

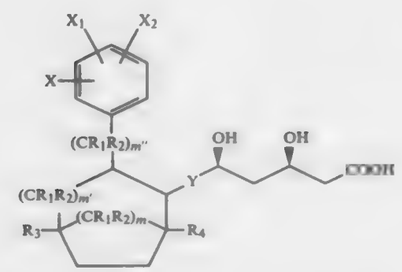
4,994,494

HMG-COA REDUCTASE INHIBITORS

John R. Regan, Princeton, N.J.; Joseph G. Bruno, Sellersville, Pa.; Kent W. Neuenschwander, Ambler, Pa., and Donald E. Kuhla, Doylestown, Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Fort Washington, Pa.

Division of Ser. No. 283,111, Dec. 12, 1988, Pat. No. 4,904,692, which is a continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Dec. 14, 1989, Ser. No. 450,493
Int. Cl.[5] A61K *31/19*; C07C *62/22, 62/32*
U.S. Cl. 514—569 19 Claims

1. Hydroxy acids and pharmaceutically acceptable salts thereof of a compound of the formula



wherein
Y is: —CH—, —CHRCHR—, —CHRCHRCHR—, or —RC=CR—;
X, X_1 and X_2 are independently: H, F, Cl, Br, OH, CF_3, alkyl, aryl, NO_2, NH(CO)R, $N(R)_2$, or $S(O)_nR$;
R, R_1, R_2, R_3 and R_4 are independently: H or lower alkyl;
m is: 1 or 2;
m′ is: 0 or 1;
m″ is: 0 or 1;
n=0, 1, 2; and
the dotted lines in the bicyclic ring represent optional double bonds.

19. A method of inhibiting cholesterol biosynthesis in a patient in need of such treatment comprising administering a pharmaceutical composition defined in claim 1.

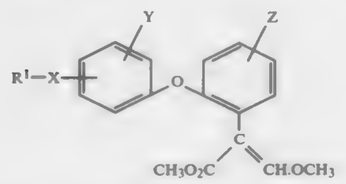
4,994,495

FUNGICIDES

John M. Clough, Buckinghamshire; Christopher R. A. Godfrey, Bracknell; Paul J. de Fraine, Wokingham; Michael G. Hutchings, Bury, and Ian Ferguson, Todmorde, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 11, 1989, Ser. No. 350,344
Claims priority, application United Kingdom, May 13, 1988, 8811435
Int. Cl.[5] A01N *17/40*; C07C *69/76*
U.S. Cl. 514—574 7 Claims

1. Fungicidal compounds of the formula (I) :



(I)

and stereoisomers thereof, wherein R^1 is optionally substituted C_{2-10} alkenyl, optionally substituted C_{5-6} cycloalkenyl, optionally substituted C_{2-10} alkynyl, or C_{1-10} alkyl substituted with —CN, —NC, —COR^2, —CO_2R^2, —NO_2 or —SCN; X is O, S(O)n or NR^2 and is attached to the 3- or the 4-position of the phenyl ring; Y and Z, which may be the same or different, are H, halogen, —CH_3, —C_2H_5 or —OCH_3; R^2 is H, C_{1-4} alkyl, C_{1-4} alkenyl, or, when R^2 is C_{1-4} alkyl in the group —COR^2 it joins with the alkyl group to which —COR^2 is attached to form a 5- or 6-membered aliphatic ring; and n is 0, 1 or 2.

4,994,496

USE OF MILK GLOBULES AS CARRIERS FOR DRUGS

Elizabeth A. Repasky, 66 Frankhauser Rd., Williamsville, N.Y. 14221, and Richard B. Bankert, 148 Capen Blvd., Amherst, N.Y. 14226

Filed Sep. 9, 1987, Ser. No. 94,515
Int. Cl.[5] A61K *9/127, 35/20*
U.S. Cl. 514—775 8 Claims

1. A therapeutic composition of matter comprising milk fat globules which are surrounded by a lipid bilayer containing proteins and glycoproteins and loaded with therapeutic agent other than milk fat.

4,994,497

METHOD OF AVOIDING OR MINIMIZING BURN DAMAGE TO THE SKIN

Orlyn G. Pepper, 355 Everett, Milan, Mich. 48160

Filed Oct. 11, 1989, Ser. No. 419,698
Int. Cl.[5] A61K *7/48, 7/50*
U.S. Cl. 514—887 9 Claims

1. A method of avoiding or minimizing inflammatory sequelae to a painful freshly burned epidermal skin site, which comprises applying to the surface of the skin site promptly before the appearance of overt inflammation, an anti-inflammatory composition in homogeneous non-alcoholic aqueous solution form consisting essentially of distilled hamamelis water, magnesium sulfate, and copper sulfate to allow for transdermal absorption of the composition at the site for a period sufficient to achieve local relief of inflammatory symptoms.

4,994,498

TANTALUM-CONTAINING CATALYST USEFUL FOR PRODUCING ALCOHOLS FROM SYNTHESIS GAS

Nancy E. Kinkade, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 2, 1990, Ser. No. 487,504
Int. Cl.[5] C07C *27/06*
U.S. Cl. 518—714 9 Claims

1. A process for producing a mixture of lower alkanols comprising reacting hydrogen and carbon monoxide in the vapor phase in the presence of a catalyst consisting essentially of a mixture of molybdenum sulfide, an alkali metal compound in an amount of at least about 0.20 mole of alkali metal per mole of molybdenum, and a tantalum compound in an amount of at least about 0.3 mole of tantalum per 100 moles of molybdenum.

4,994,499

METHOD OF ADDING FLAME RETARDANT TO VINYL AROMATIC POLYMERS MADE IN A ONE-STEP PROCESS

Fred M. Sonnenberg, Merion, and Dennis M. Hajnik, West Chester, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jul. 31, 1990, Ser. No. 560,946
Int. Cl.[5] C08J *9/18, 9/20*
U.S. Cl. 521—56 20 Claims

1. A process for preparing flame-retardant expandable thermoplastic beads with low residual vinyl aromatic monomer content comprising:
(a) polymerizing an aqueous suspension of a vinyl aromatic monomer to a percent conversion within the range of about 50 and 80 percent to form polymer beads having a density greater than about 1;
(b) impregnating the polymer beads with a blowing agent;
(c) heating the polymer beads at a temperature sufficient to polymerize the remaining vinyl aromatic monomer; and
(d) impregnating the polymer beads with a solution of the blowing agent and a flame retardant soluble in the blowing agent,
wherein said process is a one-step suspension polymerization process.

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4,994,500

ACTIVE AND ELASTIC FOAMED MATERIALS

Keiichi Yamamoto, 13-11, Nakagawa, Ikuno-Ku 5-Chome, Osaka, Japan

Filed Sep. 19, 1989, Ser. No. 409,097
Int. Cl.[5] C08J 9/00
U.S. Cl. 521—92 1 Claim

1. Active and elastic foamed materials comprising a foamed matrix of natural rubber, synthetic rubber or synthetic resin and an active substance contained therein comprising zircon or zirconium complex compound of 20–150 wt% to the foamed matrix.

4,994,501

FOAMING PUTTY PLUG REPAIR COMPOSITION AND METHOD

Garson P. Shulman, Santa Fe Springs, Calif., assignor to Thermo-Foam, Inc., Santa Fe Springs, Calif.

Division of Ser. No. 281,173, Dec. 7, 1988. This application Apr. 13, 1990, Ser. No. 509,058
Int. Cl.[5] C08J 9/02, 9/12
U.S. Cl. 521—117 17 Claims

1. Curable, foamable mass having a putty consistency suitable for blocking openings in walls, said mass comprising a polyimide resin and a low boiling alcohol blowing agent, said alcohol blowing agent being present in an amount between 28% of the weight of said mass and that sufficient to foam said mass at the curing temperature of said resin without liquefying said mass before resin cure.

4,994,502

PROCESS FOR THE PREPARATION OF INTEGRAL SKIN POLYURETHANE STEERING WHEELS

Robert A. Markoya, and Eric R. Sattler, both of Grosse Ile, Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Jul. 1, 1987, Ser. No. 68,918
Int. Cl.[5] C08L 75/14
U.S. Cl. 521—137 9 Claims

1. A urethane composition consisting essentially of the reaction product of

(a) a mixture of a graft polymer dispersion in a polyol or a polyol mixture,

(b) an organic polyisocyanate selected from the group consisting of an isocyanate prepolymer prepared by reacting 4,4′-diphenylmethane diisocyanate with a mixture of dipropylene glycol and a polyoxypropylene glycol having a molecular weight of about 420, a polymeric polymethylene polyphenylene polyisocyanate containing about 55 weight percent diphenylmethane diisocyanate, a 1:1 mixture of 2,4′- and 4,4′-diphenylmethane diisocyanate and mixtures thereof,

(c) a blowing agent,

(d) a chain extender, and

(e) a catalyst, surfactant and optionally flame retardants, fillers, and ultraviolet absorbers.

4,994,503

PARTICULATE POLYMER AND POLYMER COMPOSITIONS THEREWITH

Robert F. Harris, Midland, and Michael R. Savina, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1989, Ser. No. 406,944
Int. Cl.[5] C08G 18/14
U.S. Cl. 521—137 23 Claims

1. A stable dispersion of (b) in (a) which comprises

(a) a continuous phase: and

(b) from about 0.1 to about 50 weight percent by total weight of (a) and (b) of a discrete particulate polymer which has an average particle size of about 30 microns or less,

characterized in that (b) is a product containing a plurality of aminocarbonyl moieties or aminothiocarbonyl moieties which is the result of a reaction that comprises contacting

(c) one or more carbonyl- or thiocarbonyl-containing compounds selected from the group consisting of a urea compound, a biuret compound, a polycarboxylic acid compound or its ester or anhydride, a polycarboxylic acid chloride, a thiourea compound, a dithiobiuret compound, a polythiocarboxylic acid or its ester or anhydride, and a polythiocarboxylic acid chloride; and

(d) one or more polyamines.

4,994,504

VINYLIC MACROMERS CONTAINING PERFLUOROPOLYALKYL ETHER AND POLYALKYL ETHER SEGMENTS, POLYMERS AND OPHTHALMIC DEVICES MADE THEREFROM

Merrill Goldenberg, Teaneck, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 296,170, Jan. 11, 1989, Pat. No. 4,933,408. This application Mar. 28, 1990, Ser. No. 500,435
Int. Cl.[5] C08J 3/00
U.S. Cl. 523—106 10 Claims

1. A method of preparing a hydrogel contact lens from a macromer ... containing perfluoropolyalkylether and polyalkylether segments and ethylenically unsaturated moieties, having the formula I, more specifically as seen in formula Ia to Td,

$$E—T—L—Q—X—Z—X—Q—L—T—E \quad (Ia)$$

$$E—T—L—Q—X—Z—X—Q—L \quad (Ib)$$

$$E—T—L—Q—X—G—X—Q—L—T—E, \text{ or} \quad (Ic)$$

$$E—T—L—Q—X—G—X—Q—L \quad (Id)$$

wherein

Z is $—(C_aF_{2a}O)_b—CF_2—$, where

a is 1 to 4, b is 2 to 200;

x is a direct bond, $—CH_2—$, $—CH_2OCH_2CHOHCH_2—$, $—CH_2(OCH_2CH_2)_y—$or carbonyl where y is 1 to 10 and where in each case the carbon atom is attached to Z or G;

Q is a direct bond of —ACONH—R—NHCO— where A is oxa or imino and R is a divalent aliphatic group having from 2 to 14 carbon atoms, a divalent 5- or 6- membered cycloaliphatic group having 5 to 14 carbon atoms or an arylene group having 6 to 14 carbon atoms;

L is $—A(C_mH_{2m}O)_nC_mH_{2m}AY—$ or L_1 where Y is a direct bond or H and m is 2 to 4 or mixtures thereof and n is 5 to 100, where A is attached to Q;

T is —CONH—R_5A— or —CONH—R—NHCOOR_5A——CONH—R—NHCO—A— or —R_5A— or direct bond where the carbonyl group is attached to L. where R_5 is alkylene of hydroxy-substituted alkylene of 2 to 15 carbon atoms and R is as above;

E is $—CO—C(R_1)=CHR_2$ or —CONH-phenyl-$C(R_1)=CR_2H$ or

—CONH—$C(R_4)_2$-phenyl-$C(R_1)(R_2)$=CH

where

R_1 is hydrogen or methyl, and

R_2 is hydrogen, methyl or $—COOR_3$ where R_3 is hydrogen or alkyl of 1 to 4 carbon atoms with the proviso that, when

R_1 is methyl, R_2 is hydrogen, R_4 is hydrogen or methyl and G is $—(C_aF_{2a}O)_b—CF_2[CH_2—OCONH—R—NHCOOCH_2CF_2(OC_aF_{2a})_bl]_x$ or $—(C_aF_{2a}O)_b—CF_2[CH_2—NHCONH—R—NHCONHCH_2CF_2(OC_aF_{2a})_bl]_x$ or $—(C_aF_{2a}O)_{b—CF2}[CH_2—NHCONH—R—NHCONHCH_2CF_2(OC_aF_{2a})_bl]_x$

where

x is 1 to 3 ;

L_1 is $—A(C_mH_{2m}O)_n[C_mH_{2m}ACONH—R—NHCOA(C_mH_{2m}O)_{n1}]_zC_mH_{2m}AY$ where n_1 is 5 to 100, z is 1 to 10 and Y is a direct bond or H; by crosslinking ... in an inert solvent in a mold by free radical polymerization and equilibrating the resulting solvent swollen crosslinked contact lens in an aqueous medium.

4,994,505

BINDER COMPOSITIONS COMPRISING LOW MOLECULAR WEIGHT POLY(ORTHOMETHYLOLATED) PHENOLIC COMPOUND AND NOVOLAC RESIN

Arthur H. Gerber, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Filed Nov. 15, 1988, Ser. No. 271,447
Int. Cl.[5] B22C 1/22; C08L 61/00
U.S. Cl. 523—145 29 Claims

1. A composition of at least three different components comprising:

(a) a poly(orthomethylolated) phenolic compound, wherein the molecular weight of the poly(orthomethylolated) phenolic compound is less than about 320, and wherein the poly(orthomethylolated) phenolic compound has at least two methylol groups that are in positions ortho to a hydroxyl group of the phenolic compound;

(b) a phenol-formaldehyde novolac resin; and

(c) an alkalizing agent capable of supplying alkali ions to the composition, wherein the molar ratio of alkali, calculated as equivalents of potassium ion, to phenol group in the composition is in the range of from about 0.1:1 to about 0.7:1, and wherein the alkalizing agent is selected from the group consisting of potassium hydroxide, sodium hydroxide, calcium hydroxide, calcium oxide, lithium hydroxide, lithium oxide and a mixture thereof.

8. A composition as claimed in claim 1 further comprising an additive selected from the group consisting of graphite, silicon dioxide, clay, silanes, iron oxide, urea, aluminum powder, magnesium powder, silicon powder, and non-reactive solvents, wherein the additive is present in a total amount up to about 20% by weight based on the weight of the composition.

4,994,506

BRAKE LININGS

Octavian Anton, Brussels, Belgium; Alfred Eckert, Wachtersbach, and Armin Eckert, Waltrop, both of Fed. Rep. of Germany, assignors to Redco N.V., Fed. Rep. of Germany

Filed Aug. 31, 1989, Ser. No. 399,838
Int. Cl.[5] C08K 3/34
U.S. Cl. 523—155 5 Claims

1. Asbestos-free brake lining comprising phenolic resin, fillers, and an amount of 3 to 25% by weight of synthetic hydrated calcium silicate particles of xonotlite with a substantially spherical morphology and a mean diameter of 50 to 70 μwith an open inner structure and an outer shell with a close limited crystal structure with pore openings of up to 10^{-7} m in the outer shell.

4,994,507

CATHODIC ELECTRODEPOSITION COATINGS CONTAINING LEAD CYANAMIDE AS A SUPPLEMENTARY CATALYST

Tapan K. Debroy, Utica; Ding Y. Chung, Rochester Hills; Craig R. Deschner, Southfield, and Sloe-Heng A. Tjoe, Troy, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 20, 1990, Ser. No. 481,542
Int. Cl.[5] C08L 31/00; C25D 13/00; B01J 31/00
U.S. Cl. 523—415 12 Claims

1. In a catalyst system useful for cathodic electrocoat processes, the catalyst system being used to catalyze a curing reaction between a blocked polyisocyanate and a polymer which is an epoxy amine adduct, wherein the improvement comprises; the catalyst system is a mixture of a primary metal catalyst and lead cyanamide.

4,994,508

SPECIFIC HYDROGENATED BLOCK COPOLYMER COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Toshinori Shiraki, Yamato, and Yasuo Hattori, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 14, 1988, Ser. No. 219,236
Claims priority, application Japan, Jul. 16, 1987, 62-175859; Oct. 14, 1987, 62-257267; Oct. 15, 1987, 62-258260
Int. Cl.[5] C08K 7/06; C08L 51/04, 53/02, 95/00
U.S. Cl. 524—14 29 Claims

1. A composition comprising,

(a) 1 to 99 parts by weight of a specific hydrogenated product of a block copolymer having at least one polymer block composed mainly of a vinyl aromatic compound and at least one polymer block composed mainly of a conjugated diene compound, a modified product thereof, which comprises said specific hydrogenated product having grafted thereon 0.01 to 50 parts by weight per 100 parts by weight of the block copolymer of an α, β-unsaturated carboxylic acid or the anhydride, the esterified product, the amidated product or the imidated product thereof, or a mixture of said product and said modified product, wherein the content of the vinyl aromatic compound prior to hydrogenation is 5 to 95% by weight and the content of vinyl linkages prior to hydrogenation which originated from the conjugated diene compound is 10 to 80%, said product satisfying the following conditions;

(1) the hydrogenated ratio of the total of aliphatic double bonds which originated from the conjugated diene compound is not lower than 5% and lower than 50%, and

$[B]/[V]^{\frac{1}{3}}$=3 to 20

wherein [B] is the hydrogenated ratio of the vinyl linkage portions which originated from the conjugated diene compound, and

(b) 99 to 1 parts by weight of at least one thermoplastic substance selected from the group consisting of tackifier resins, thermoplastic resins excluding tackifier resins and bituminous materials.

4,994,509

MULTICOLORED COMPOUND FOR WALL COATING

Alain Laurent, 40, rue du Vieux Port, 69540 Irigny, France

Filed Oct. 27, 1988, Ser. No. 263,230
Claims priority, application France, Oct. 28, 1987, 87 15323
Int. Cl.[5] C08L 1/26; C08K 3/34; C09J 101/26; C04B 14/06
U.S. Cl. 524—35 7 Claims

1. An aqueous dispersion of a multicolored wall coating composition comprising colored minerals in the form of quartz granules from about 0.1 to about 2 mm in diameter having transparent or translucent fibers from about 0.1 to about 3 mm long agglomerated thereto wherein said materials are transparent or translucent after drying of said composition.

4,994,510

POLY(CARBONATE-SILOXANE) WITH REDUCED TENDENCY TO BURN

Raymond Z. Nasr, Delmar, N.Y., and Edward N. Peters, Lenox, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 5, 1990, Ser. No. 505,333
Int. Cl.[5] C08K *5/13*
U.S. Cl. 524—162 5 Claims

1. A flame resistant composition comprising:
(a) from 60% to 99.999% by weight of a poly(carbonate-siloxane); and
(b) from 0.001% to 2% by weight of an alkali metal salt of an aromatic sulfone sulfonate.

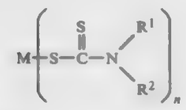
4,994,511

POLYKETONE STABILIZATION WITH DIHYDROCARBYLDITHIOCARBAMATE SALTS

Robert Q. Kluttz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 95,737, Sep. 14, 1987, abandoned. This application Oct. 30, 1989, Ser. No. 428,479
Int. Cl.[5] C08K *5/36*
U.S. Cl. 524—202 18 Claims

1. A polymeric composition comprising a linear alternating polymer of carbon monoxide and at least one olefinically unsaturated hydrocarbon containing an effective stabilizing amount of a dihydrocarbyldithiocarbamate salt sufficient to improve thermal oxidative stability of the polymer, said salt having the formula



wherein R^1, R^2, R^3, and R^4 individually represent hydrocarbyl groups having from about 1 to about 20 carbon atoms, and M is a selected from the group consisting of metals of Group IIIB through Group VA, and mixtures thereof, and n is an integer equal to at least 1.

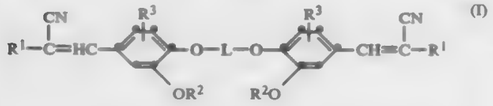
4,994,512

POLY-METHINE COMPOUNDS, CONDENSATION POLYMER HAVING A POLY-METHINE COMPOUND ADMIXED THEREIN AND SHAPED ARTICLES PRODUCED THEREFROM

Max A. Weaver; Clarence A. Coates; Wayne P. Pruett, all of Kingsport, and Samuel D. Hilbert, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1989, Ser. No. 345,277
Int. Cl.[5] C08K *5/41, 5/16;* C07C *121/72, 125/06, 147/06*
U.S. Cl. 524—209 15 Claims

1. A polymeric composition comprising a physical admixture of a polymer selected from extrusion, molding and fiber grade, thermoplastic, linear polyester and polycarbonate with about 100 to 10,000 ppm, based on the weight of the polymer, of at least one poly-methine compound having the formula:



(I)

wherein
R^1 is an unsubstituted or substituted alkoxycarbonyl, cycloalkoxycarbonyl or aryloxycarbonyl radical; an unsubstituted or substituted carbamoyl radical; or an unsubstituted or substituted alkylsulfonyl, cycloalkylsulfonyl or arylsulfonyl radical or an unsubstituted or substituted aryl radical;
R^2 is an unsubstituted or substituted alkyl, cycloalkyl or aryl radical;
R^3 is hydrogen, alkyl, —OR^2 or halogen; and
L is an organic linking group bonded by non-oxo carbon atoms to the oxygen atoms adjacent to L.

4,994,513

POLYKETONE COPOLYMER COMPOSITION COMPRISING AMIDE OR ALUMINUM COMPOUND

Johannes L. M. Syrier; Dirk A. Borger; Johan M. Beyen; Antonius A. Broekhuis, and Franciscus C. Groenland, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 296,651, Jan. 13, 1989, abandoned. This application Dec. 19, 1989, Ser. No. 452,486
Claims priority, application United Kingdom, Jan. 27, 1988, 8801756; European Pat. Off., Jan. 24, 1989, 89200149.6
Int. Cl.[5] C08J *5/21;* C08F *283/00*
U.S. Cl. 524—210 21 Claims

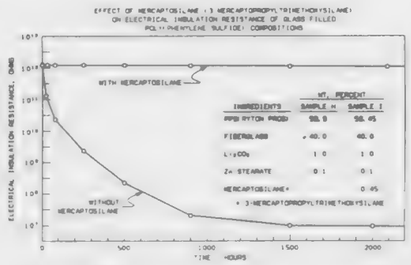
1. A composition comprising a linear alternating copolymer of carbon monoxide and an olefinically unsaturated compound and, based on the weight of copolymer, from 0.01 to 5.0 wt % of at least one additive, wherein the additive is selected from the group consisting of acid amides of monocarboxylic or polycarboxylic acids having from 5 to 30 carbon atoms and being optionally N-monosubstituted or N,N-disubstituted with C_1 to C_4 alkyl groups.

4,994,514

ENCAPSULATION OF ELECTRONIC COMPONENTS WITH POLY(ARYLENE SULFIDE) CONTAINING MERCAPTOSILANE

Jennings P. Blackwell; John E. Leland; Robert D. Still, and James S. Dix, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 399,110, Jul. 16, 1982, Pat. No. 4,782,195. This application Aug. 5, 1988, Ser. No. 229,367
Int. Cl.[5] C08K *3/36, 3/40*
U.S. Cl. 524—262 20 Claims



1. A composition for encapsulating an active electronic component comprising:
(i) about 25 to about 45 weight percent poly(arylene sulfide),
(ii) mercaptosilane,
(iii) about 5 to about 30 weight percent glass,
(iv) about 40 to about 60 weight percent silica; wherein said weight percentages are based upon total amount of (i), (ii), (iii) and (iv); and wherein the viscosity of said composition does not exceed about 800 poise as tested on a capillary rheometer at 650° F. and at a shear rate of 1000 $(sec)^{-1}$.

4,994,515

HEAT-RESISTANT RESIN COMPOSITION

Junichiro Washiyama; Chikara Aoyama, and Tetsuo Yasuda, all of Kanagawa, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,863
Claims priority, application Japan, Jun. 27, 1988, 63-158508; Jun. 27, 1988, 63-158509; Jun. 28, 1988, 63-158054
Int. Cl.[5] C08L *51/04*
U.S. Cl. 524—269 18 Claims

1. A resin composition comprising:
(A) at least one heat-resistant resin selected from group consisting of (1) a copolymer comprising a styrene compound and an α,β-unsaturated dicarboxylic acid imide compound and (2) a rubber-reinforced copolymer comprising a styrene compound and an α,β-unsaturated dicarboxylic acid imide compound,
(B) at least one thermoplastic resin selected from the group consisting of (1) a high-impact resin obtained by graft-copolymerizing (i) styrene and acrylonitrile or (ii) styrene and methyl methacrylate to (iii) a butadiene rubber, an ethylene-propylene rubber or an acrylic ester rubber, and (2) a copolymer resin comprising (i) styrene and acrylonitrile or (ii) styrene and methyl methacrylate,
(C) an antimony oxide,
(D) at least one bromine-containing reaction product selected from the group consisting of (1) compound having a molecular weight of from 1,200 to 6,000 and a bromine content of from 5.0 to 60% by weight which is obtained by reacting a bromine-containing epoxy compound and 1,3,5-tribromophenol, and (2) a compound obtained by reacting a bromine-containing epoxy compound having an epoxy equivalent of from 450 to 7,000 and a bromine content of from 5.0 to 52% by weight and an acrylonitrile-butadiene copolymer having a carboxyl group at the both terminals thereof and a molecular weight of from 1,000 to 10,000, and
(E) at least one silicon-containing compound selected from the group consisting of (1) silicone oil, (2) a ladder silicone resin, and (3) an alkoxysilane having a mercapto group, a vinyl group or a methacryloyl group,
wherein the amounts of the styrene compound and α,β-unsaturated dicarboxylic acid imide compound in said heat-resistant resin (A) are from 10 to 50% by weight based on the total amount of said heat-resistant resin (A) and thermoplastic resin (B), respectively; the ratio of the α,β-unsaturated dicarboxylic acid imide compound to the total amount of said styrene compound and α,β-unsaturated dicarboxylic acid imide compound is from 5 to 50% by weight; the total amount of a rubber reinforcement used in the rubber-reinforced copolymer of said heat-resistant resin (A) and the butadiene rubber, ethylene-propylene rubber and acrylic ester rubber used in said high-impact resin is from 5 to 35% by weight based on the total amount of said heat-resistant resin (A) and thermoplastic resin (B); the amount of said antimony oxide is from 0.5 to 10 parts by weight per 100 parts by weight of the total amount of said heat-resistant resin (A) and thermoplastic resin (B); the amount of said bromine-containing reaction product (D) is from 5.0 to 40 parts by weight per 100 parts by weight of the total amount of said heat-resistant resin (A) and thermoplastic resin (B); and the amount of said silicon-containing compound (E) is from 0.01 to 15 parts by weight per 100 parts by weight of the total amount of said heat-resistant resin (A) and thermoplastic resin (B).

4,994,516

PETROLEUM RESINS AND THEIR PRODUCTION

Quoc Lavinh, Brussels, Belgium, assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 4,298, Jan. 7, 1987, Pat. No. 4,824,921, which is a continuation of Ser. No. 623,108, Jun. 22, 1984, abandoned. This application Apr. 3, 1989, Ser. No. 332,858
Claims priority, application United Kingdom, Jun. 28, 1983, 8317510
Int. Cl.[5] C08L *91/06*
U.S. Cl. 524—275 13 Claims

1. A hot melt adhesive comprising:
(i) an ethylene vinyl acetate copolymer;
(ii) wax; and
(iii) a resin consisting essentially of a copolymer containing from 5 to 80 wt. % units derived from an olefinically unsaturated aromatic compound, from 5 to 80 wt. % units derived from C_5 olefins or diolefines or C_6 olefines or diolefines or a mixture thereof, and from 7 to 45 wt. % units derived from a terpene.

4,994,517

LOW-VISCOSITY ANTICORROSION LACQUER

Klaus-Peter Vohrer, Leiferde, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Jun. 8, 1989, Ser. No. 363,211
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820664
Int. Cl.[5] C08K *5/01, 5/05, 5/07*
U.S. Cl. 524—357 9 Claims

1. A low-viscosity anticorrosion lacquer, consisting essentially of:
(a) 2.8 to 12.5% by weight of an acetal of polyvinylalcohol with about 18% by weight of polyvinylalcohol with a molecular weight in excess of 10,000;
(b) 1 to 3% by weight of 70% solution of epichlorhydrin and diphenylolpropane based epoxy resin;
(c) 0.9 to 2.9% by weight of a nonplastified methyl esterified 50% solution of melamineformaldehyde resin;
(d) 55 to 85% by weight of a mixture of C_1 to C_6 lower alcohols;
(e) 8 to 15% by weight of an aromatics-containing hydrocarbon mixture having a boiling point of 160° C. to 185° C. and an aromatics content of about 99%; and
(f) up to 5% by weight of a phosphoric acid material selected from the group consisting of phosphoric acid, phosphoric acid ester and phosphoric acid salt derivative.

7. A method of making a low-viscosity anticorrosion lacquer, consisting essentially of:
(a) 2.8 to 12.5% by weight of an acetal of polyvinylalcohol with about 18% by weight of polyvinylalcohol with a molecular weight in excess of 10,000;
(b) 1 to 3% by weight of 70% solution of epichlorhydrin and diphenylolpropane based epoxy resin;
(c) 0.9 to 2.9% by weight of a nonplastified methyl esterified 50% solution of melamineformaldehyde resin;
(d) 55 to 85% by weight of a mixture of C_1 to C_6 lower alcohols;
(e) 8 to 15% by weight of an aromatics-containing hydrocarbon mixture having a boiling point of 160° C. to 185° C. and an aromatics content of about 99%; and
(f) up to 5% by weight of a phosphoric acid material selected from the group consisting of phosphoric acid, phosphoric acid ester and phosphoric acid salt,
which comprises the steps of:
(A) supplying an alcohol to a mixing vessel;
(B) slowly stirring the acetal of polyvinylalcohol into said alcohol with slight heating to 40° to 60° C. in said mixing vessel and thereafter cooling said acetal composition to room temperature;
(C) mixing a further alcohol with said aromatics-contain-

ing hydrocarbon mixture and adding the resulting mixture with stirring to said vessel;
(D) stirring said epoxy resin into said vessel; and
(E) stirring said nonplastified methyl esterified 50% solution of melamine formaldehyde resin into said vessel to form the lacquer.

4,994,518
THERMOTROPIC POLYMER/INORGANIC REINFORCING FILLER MOLDING COMPOSITIONS
Alain Morin, and Jean-Pierre Quentin, both of Lyon, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Jul. 13, 1989, Ser. No. 379,371
Claims priority, application France, Jul. 13, 1988, 88 09768
Int. Cl.[5] C08K *3/34, 7/00, 9/06;* C08L *67/00*
U.S. Cl. 524—449 9 Claims

1. A moldable composition of matter, which comprises (a) a thermotropic polymer, and (b) an inorganic reinforcing filler material therefor, said inorganic filler (b) comprising a crystalline inorganic filler of platelet shape having a mean diameter ranging from 0.5 to less than 20 μm and a shape factor represented by the ratio:

$$\frac{\text{mean particle diameter in } \mu m}{\text{mean particle thickness in } \mu m}$$

which ranges from 10 to 90, and said inorganic filler (b) being present in an amount, expressed in % by weight of filler in the combined polymer+filler, ranging from above 50% to 60% which is effective to provide highly satisfactory results with respect to anisotropy.

4,994,519
RUBBER-TO-METAL BINDERS FROM CHLORINATED RUBBER AND BROMINATED POLYDICHLOROBUTADIENE
Hans Scheer, Düsseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Feb. 9, 1988, Ser. No. 153,903
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704152
Int. Cl.[5] C08L *15/02;* C08K *5/33*
U.S. Cl. 524—519 8 Claims

1. A heat-stable binder for use in the vulcanization of natural or synthetic rubber mixtures onto metallic or other substrates, comprising a mixture which is free from oxidizing agents that oxidize quinone dioxime consisting essentially of
(a) from about 3 to about 90 parts by weight of chlorinated rubber,
(b) from about 5 to about 40 parts by weight of afterbrominated polydichlorobutadiene,
(c) from about 5 to about 30 parts by weight of quinone dioxime,
(d) from about 5 to about 20 parts by weight of carbon black, and
(e) from about 1 to about 25 parts by weight of ground sulfur.

4,994,520
CARBON BLACK-GRAFT POLYMER, METHOD FOR PRODUCTION THEREOF, AND USE THEREOF
Yoshikuni Mori, Settsu; Mitsuo Kushino, Minoo; Hayato Ideda, Settsu; Nobuaki Urashima, Takatsuki; Masuji Izubayashi, Nishinomiya; Shigeru Tanimori, Hirakata; Yoshihiro Arita, Takatsuki; Kiyoshi Kawamura, Mishima; Kenji Minami, Suita, and Yoshinori Sano, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
Division of Ser. No. 373,234, Jun. 29, 1989, Pat. No. 4,940,749, which is a division of Ser. No. 134,319, Dec. 16, 1987, Pat. No. 4,880,857. This application Jun. 6, 1990, Ser. No. 533,780
Claims priority, application Japan, Dec. 17, 1986, 61-298985; Apr. 24, 1987, 62-99648; May 21, 1987, 62-122476; May 29, 1987, 62-131272; Jul. 8, 1987, 62-168868; Aug. 25, 1987, 62-209303; Sep. 3, 1987, 62-219097; Sep. 22, 1987, 62-236212; Sep. 22, 1987, 62-236214; Sep. 25, 1987, 62-238621
Int. Cl.[5] C08L *41/00;* C08K *3/18*
U.S. Cl. 524—547 26 Claims

1. A toner for the development of images of electrostatic charge, which toner comprises a carbon black-graft polymer produced by causing a polymer possessing one to two reactive groups on the average selected from the class consisting of aziridine group, oxazoline group, N-hydroxyalkylamide group, epoxy group, and thioepoxy group to react with carbon black, wherein said polymer possesses a number average molecular weight in the range of 2,000 to 100,000.

4,994,521
PERSULFATE ACTIVATED AUTODEPOSITING COMPOSITION
Ronald W. Broadbent, Horsham, Pa., assignor to Amchem Corporation, Ambler, Pa.
Continuation-in-part of Ser. No. 544,450, Oct. 21, 1983, Pat. No. 4,758,621, which is a continuation of Ser. No. 327,677, Dec. 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 102,834, Dec. 12, 1979, abandoned. This application Jul. 18, 1988, Ser. No. 220,457
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.
Int. Cl.[5] C08L *9/08*
U.S. Cl. 524—575 12 Claims

1. An autodepositing coating composition having a pH of at least about 6 and comprising: (A) about 5 to about 550 g/l of dispersed resin solids; (B) about 1 to about 20 g/l of dissolved persulfate; and (C) dissolved fluoride in an amount at least sufficient to increase the rate at which the composition etches a ferriferous surface immersed therein.

4,994,522
VINYL CHLORIDE RESIN COMPOSITION
Isao Sasaki; Naoki Yamamoto, both of Hiroshima, and Akira Yanagase, Ohtake, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan
Filed Jan. 23, 1989, Ser. No. 299,433
Claims priority, application Japan, Jan. 25, 1988, 63-14290
Int. Cl.[5] C08L *51/04*
U.S. Cl. 525—63 8 Claims

1. A vinyl chloride resin composition, comprising:
(A) a vinyl chloride resin, and
(B) a compound rubber type graft copolymer wherein one or more vinyl monomers are graft-polymerized onto a compound rubber that has an average particle diameter of 0.08 to 0.6 μm and possesses such a structure that 10 to 90 wt. % of a polyorganosiloxane rubber component and 10 to 90 wt. % of a polyalkyl (meth)acrylate rubber component are entangled in an inseparable fashion, and the total amount of the polyorganosiloxane rubber component and the polyalkyl (meth)acrylate rubber component is 100 wt. %.

4,994,523
IMPACT-RESISTANT RESIN COMPOSITION
Isao Sasaki; Naoki Yamamoto, both of Hiroshima, and Akira Yanagase, Ohtake, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan
Filed Jan. 23, 1989, Ser. No. 299,677
Claims priority, application Japan, Jan. 25, 1988, 63-14289
Int. Cl.[5] C08L *51/04*
U.S. Cl. 525—63 11 Claims

1. An impact-resistant resin composition comprising:
(A) a compound rubber type graft copolymer wherein at least one vinyl monomer is graft-polymerized onto a compound rubber that has an average particle diameter of 0.08 to 0.6 μm and possesses such a structure that 10 to 90 wt. % of a polyorganosiloxane rubber component and 10 to 90 wt. % of a polyalkyl (meth)acrylate rubber component are entangled in an inseparable fashion, and the total amount of the polyorganosiloxane rubber component and the polyalkyl (meth)acrylate rubber component is 100 wt. %; and
(B) a vinyl polymer obtained by polymerizing 70 to 100 wt. % of at least one vinyl monomer selected from the group consisting of aromatic alkenyl compounds, vinyl cyanide compounds, and alkyl (meth)acrylates with 0 to 30 wt. % of another vinyl monomer.

4,994,524
RUBBER MODIFIED REACTION MOLDABLE NYLON-6 COMPOSITIONS
Kishore Udipi, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 808,781, Dec. 13, 1985, and a continuation-in-part of Ser. No. 808,792, Dec. 13, 1985. This application Jul. 27, 1988, Ser. No. 225,111
Int. Cl.[5] C08L *77/02*
U.S. Cl. 525—66 4 Claims

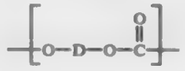
1. A process for the preparation of a dispersion in caprolactam of a core-shell polymer consisting of a crosslinked rubber core and a thermoplastic polymer shell having a glass transition temperature of at least 35° C., which comprises adding an aqueous dispersion of said core-shell polymer to an aqueous solution of caprolactam, stirring the mixture to provide a uniform dispersion, and evaporating water from the mixture to provide said dispersion.

4,994,525
FUNCTIONALIZED POLYPHENYLENE ETHERS, METHOD OF PREPARATION, AND POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS PREPARED THEREFROM
Sterling B. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 866,661, May 27, 1986, abandoned. This application Sep. 29, 1986, Ser. No. 912,705
Int. Cl.[5] C08L *71/04, 77/06*
U.S. Cl. 525—66 6 Claims

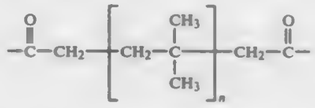
1. A resinous composition comprising at least one polyphenylene ether, at least one polyamide and any reaction products thereof, at least a portion of said polyphenylene ether comprising a functionalized polyphenylene ether prepared by reacting a polyphenylene ether with at least one of glycidyl methacrylate, glycidyl acrylate, glycidyl ethyl maleate, glycidyl ethyl fumarate and allyl glycidyl ether.

4,994,526
TELECHELIC POLYISOBUTYLENE AND BLOCK COPOLYMER DERIVATIVES
Edward N. Peters, Lenox, Mass., assignor to General Electric Company, Mt. Vernon, Ind.
Division of Ser. No. 83,120, Aug. 10, 1987, Pat. No. 4,845,158. This application Mar. 24, 1989, Ser. No. 328,267
Int. Cl.[5] C08G *64/00, 63/64, 69/44, 69/26*
U.S. Cl. 525—146 11 Claims

1. A polycarbonate-polyisobutylene block copolymer having recurring or repeating structural units of the formula:



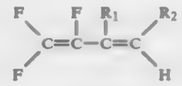
wherein D is a divalent aromatic radical of a dihydric phenol, interrupted by at least one divalent moiety of the formula:



wherein n is an integer such that the moiety has a molecular weight contribution of from 5,000 to 30,000 Daltons as determined by gel permeation chromatography.

4,994,527
HIGH TEMPERATURE, OIL-RESISTANT ELASTOMERS FROM HYDROGENATED COPOLYMERS OF 1,3-DIENES CONTAINING FLUORINE
Tonson Abraham, Elyria, and Gary R. Cornell, Parma, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Dec. 14, 1989, Ser. No. 450,950
Int. Cl.[5] C08F *8/04*
U.S. Cl. 525—326.2 26 Claims

1. A high temperature oil elastomeric composition, comprising:
a hydrogenated copolymer, said copolymer prepared by the copolymerization of a polar first monomer of



wherein R_1 and R_2 are independently fluorine, hydrogen, or a fluoro alkyl group containing from 1 to about 4 carbon atoms and containing at least three fluorine atoms;
and a second monomer wherein said second monomer is (a) a conjugated diene, a branched conjugated diene, or mixtures thereof containing from 4 to 8 carbon atoms; or (b) a monomer of the general formula $CH_2{=}CR_3X$ wherein R_3 is hydrogen or an alkyl group containing from 1 to 4 carbon atoms, and X is 2-pyridyl, 4-pyridyl, —$COOR_4$, —$CONR_5R_6$ or —$COOR_7OR_4$ wherein R_4 is an alkyl group containing from 1 to about 4 carbon atoms, —CH_2CF_3 or —$CH_2CF_2CF_2H$, R_5 and R_6 are alkyl groups containing from 1 to about 4 carbon atoms and R_7 is an alkylene group containing from 1 to about 4 carbon atoms; or mixtures of diene (a) and $CH_2{=}CR_3X$ (b), wherein the mole ratio of diene (a): $CH_2{=}CR_3X$ (b), when (b) is present, is from 1:7 to about 7:1 and wherein the mole ratio of first monomer:second monomer of from about 4:3 to about 2:3;
wherein a transition metal catalyst is complexed with a first complexing agent and the hydrogenation is conducted in the presence of said transition metal catalyst complex and

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a trialkylaluminum wherein the alkyl group contains from 1 to about 4 carbon atoms and further in the absence of boron trifluoride or boron trifluoride etherate; and further wherein said transition metal catalyst is deactivated after hydrogenation by the use of a second complexing agent, in the absence of air.

4,994,528

COMPOSITION OF AND A METHOD FOR PREPARING HIGH-TEMPERATURE OIL-RESISTANT ELASTOMERS FROM HYDROGENATED BUTADIENE-ACRYLATE COPOLYMERS

Tonson Abraham, Elyria; Philip H. Starmer, and August H. Jorgensen, both of Avon Lake, all of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

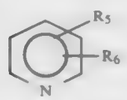
Filed Dec. 14, 1989, Ser. No. 450,947
Int. Cl.[5] C08F *8/04*
U.S. Cl. 525—338 32 Claims

1. A method of preparing an oil resistant elastomer, which comprises:

forming, by emulsion polymerization, a random copolymer having a cis-trans 1,4 microstructure from two monomeric classes wherein the first monomeric class is a conjugated diene or branched conjugated diene or mixtures thereof containing from four to eight carbon atoms and the second monomeric class is polar and is of the general formula

$$CH_2{=}CR_1CS$$

wherein R_1 is hydrogen or an alkyl group containing from 1 to about 4 carbon atoms and X is —OOR_2, —ONR_3R_4 or —OOR_7OR_2 wherein R_2 is an alkyl group containing form 1 to about 4 carbon atoms, —CH_2CF_3, or —CH_2CF_3, or —$CH_2CF_2CF_2H$, R_3 and R_4 are alkyl groups independently containing from 1 to about 4 carbon atoms and R_7 is an alkylene group containing from 1 to about 4 carbon atoms with the proviso that said second monomeric class can be replaced with up to about 20 percent by weight of the polar group having the general formula



where R_5 is an alkenyl group containing from about 2 to about 8 carbon atoms and R_6 is hydrogen, or an alkyl group containing from 1 to about 8 carbon atoms, wherein an emulsion polymerization catalyst is employed; and

complexing a transition metal catalyst with a first complexing agent to form a transition metal catalyst complex; and

hydrogenating said random copolymer in the presence of said transition metal catalyst complex and a trialkylaluminum catalyst wherein the alkyl group contains from 1 to about 4 carbon atoms and further in the absence of boron trifluoride or boron trifluoride etherate; and

deactivating said transition metal catalyst after hydrogenation by the use of a second complexing agent in the absence of air.

4,994,529

WEATHERABILITY AND ADHERENCE OF POLYPROPYLENE

Tetsuo Sekiguchi, Hasuda; Masaki Yagi, Omiya; Yutaka Nakahara, Okegawa, and Naotoshi Sonoda, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Continuation of Ser. No. 78,364, Jul. 27, 1987, abandoned. This application Dec. 6, 1989, Ser. No. 446,757
Claims priority, application Japan, Jul. 28, 1986, 61-177323
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—375 13 Claims

1. A process for improving the resistance to deterioration when exposed to weather and the adherence to other materials of polypropylene which comprises subjecting a surface of polypropylene to the action of activated oxygen gas at a temperature below about 100° C. in the presence of an N-alkyl or N-acyl 2,2,6,6-tetramethyl piperidyl compound and a phenolic antioxidant for a time sufficient to improve such weather resistance and adherence.

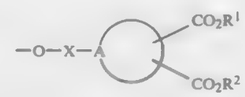
4,994,530

POLYMERIC COMPOUNDS

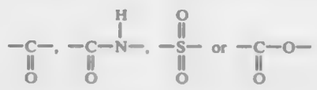
Terence Etherington, Leeds, and Victor Kolodziejczyk, Bradford, both of United Kingdom, assignors to E. I. Du Pont de Nemours and Company (Inc.), Wilmington, Del.

Filed Nov. 22, 1989, Ser. No. 440,674
Claims priority, application United Kingdom, Nov. 29, 1988, 8827611
Int. Cl.[5] C08G *85/00*; G03C *1/52*
U.S. Cl. 525—386 12 Claims

1. A bakeable Polymer comprising groups of the formula



attached to carbon atoms which are part of the backbone of a polymer containing hydroxyl and optionally epoxide groups where, X is



A is a moiety made up of sufficient carbon atoms to form a ring or fused ring system, and R^1 and R^2 are H or lower alkyl, provided that at least one of R^1 and R^2 is H, the groups containing R^1 and R^2 being oriented relative to one another on the ring system such that intramolecular anhydride formation can occur through heating.

4,994,531

FUNCTIONALIZED POLYPHENYLENE ETHERS, METHOD OF PREPARATION, AND POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS PREPARED THEREFROM

Sterling B. Brown, and Dennis J. McFay, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 912,705, Sep. 29, 1986, which is a continuation-in-part of Ser. No. 866,661, May 27, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 119,874
Int. Cl.[5] C08G *65/48*
U.S. Cl. 525—391 4 Claims

1. A functionalized polyphenylene ether which is the reaction product of a non-metalated polyphenylene ether and at least one glycidyl compound selected from the group consisting of glycidyl methacrylate, glycidyl acrylate, glycidyl ether maleate, glycidyl ethyl fumarate and allyl glycidyl ether.

4,994,532

POLYCARBONATE-SILICONE BLOCK COPOLYMER COMPOSITIONS

Christopher M. Hawkins, Evansville, and Robert R. Gallucci, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jun. 16, 1989, Ser. No. 367,417
Int. Cl.[5] C08F *283/02*
U.S. Cl. 525—464 6 Claims

1. A process of preparing a polycarbonate-silicone block copolymer, which comprises;

melt-blending together

(a) an aromatic polycarbonate resin; and

(b) a polydiorganosiloxane having at least one functional carboxylic acid group and wherein the term organo means a monovalent radical selected from the group consisting of alkyl, halogen-substituted alkyl, alkenyl, and aryl.

4,994,533

POLY(ARYL ETHER)-POLY(ARYL CARBONATE) BLOCK COPOLYMERS AND THEIR PREPARATION

Michael J. Mullins; Steven P. Crain; Edmund P. Woo; Daniel J. Murray, and Stephen E. Bales, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 186,997, Apr. 27, 1988, Pat. No. 4,880,884. This application Mar. 28, 1989, Ser. No. 329,802
Int. Cl.[5] C08G *64/42, 64/18, 64/08*
U.S. Cl. 525—469 29 Claims

1. A method for making poly(aryl ether)-poly(aryl carbonate) block copolymers comprising:

heating a copolycarbonate recurring containing units having the structure:

[—AO—CO—O—] and [—B—O—CO—O—],

wherein A is an activating aromatic radical having at least one electron-withdrawing group located in a position ortho or para to its carbonate linking group, and B is a nonactivating aromatic radical which is characterized by the absence of an electron-withdrawing group located in a position ortho or para to its carbonate linking group;

in the presence of at least on decarboxylation catalyst at an elevated temperature for a time sufficient to decarboxylate said copolymer to form a poly(aryl ether) poly(aryl carbonate) copolyer containing recurring units having the structure

$$(\text{—AO—})_k\,(\text{—B—O—CO—O—})_m$$

wherein A and B are as previously described, k represents the number of recurring poly(aryl ether) units in the poly(aryl ether) block, m represents the number of recurring poly(aryl carbonate) units in the poly(aryl carbonate) block and n represents the overall degree of polymerization

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4,994,534

PROCESS FOR PRODUCING STICKY POLYMERS

Seung J. Rhee, Belle Mead; Edgar C. Baker, Bridgewater, both of N.J.; David N. Edwards, Charleston; Kiu H. Lee, South Charleston, both of W. Va.; John H. Moorhouse, Kendall Park, N.J.; Leonard S. Scarola, Union, N.J., and Frederick J. Karol, Belle Mead, N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 28, 1989, Ser. No. 413,704
Int. Cl.[5] C08F *2/34, 210/06, 210/12*; C08K *3/04, 3/36*
U.S. Cl. 526—88 27 Claims

1. A process for producing sticky polymers at polymerization reaction temperatures in excess of the softening temperature of said sticky polymers in a fluidized bed reactor in the presence of a catalyst, which comprises conducting said polymerization reaction above the softening temperatures of said sticky polymers in the presence of about 0.3 to about 80 weight percent, based on the weight of the final product of an inert particulate material having a mean particle size of from about 0.01 to about 10 microns whereby polymer agglomeration of said sticky polymers is maintained at a size suitable for continuously producing said sticky polymers.

4,994,535

METATHESIS POLYMERIZATION CROSS-LINKED HALOGEN-CONTAINING COPOLYMER

Zen-ichiro Endo, Shigeyoshi Hara, and Hiroshi Mera, all of Iwakuni, Japan, assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 159,091, Feb. 23, 1988, abandoned. This application Jan. 10, 1990, Ser. No. 462,920
Claims priority, application Japan, Feb. 23, 1987, 62-37824; Jul. 1, 1987, 62-162235
Int. Cl.[5] C08F *26/06*
U.S. Cl. 526—259 4 Claims

1. A metathesis bulk-polymerized cross-linked halogen-containing copolymer comprising:

(a) 60–1mole % of repeating units derived from at least one metathesis polymerizable halogen-containing cycloalkene selected from the group consisting of:

(I) cycloalkenes produced by reacting halogenated ethylene with a diene according to a Diels-Alder addition reaction,

(II) cycloalkenes produced by reacting hexachlorocyclopentadiene with another unsaturated compound according to a Diels-Alder addition reaction, and

(III) cycloalkenes having at least one halogenated aromatic substituent group bonded to the cycloaklene moiety through a hetero-atom containing group, and

(b) 40–99 mole % of repeating units derived from at least one metathesis polymerizable cyclic compound which contains at least 30 mole %, based on the total moles of the metathesis polymerizable cyclic compounds, dicyclopentadiene but does not contain any halogen atom in its structure.

4,994,536

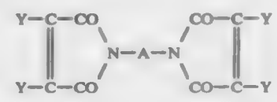
THERMALLY STABLE BISIMIDO COPOLYMERIZATES

Rene Arpin, Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 23, 1988, Ser. No. 210,508
Claims priority, application France, Jun. 23, 1987, 87 09000; Dec. 2, 1987, 87 17014
Int. Cl.[5] C08F *22/40*
U.S. Cl. 526—262 13 Claims

1. A thermally stable bisimido polymer comprising the copolymerizate of:

(a) an N,N'-bismaleimide of the formula:



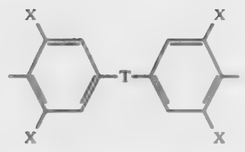
(I)

in which:

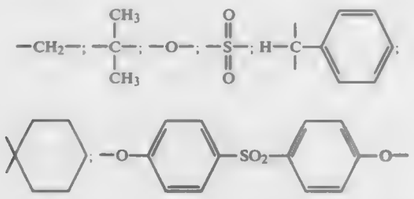
each of the symbols Y, which may be identical or different, is a hydrogen atom, a methyl radical or a chlorine atom;

the symbol A is a cyclohexylene, phenylene, 4-methyl-1,3-phenylene, 2-methyl-1,3-phenylene, 5-methyl-1,3-phenylene or 2,5-diethyl-3-methyl-1,4-phenylene radical, or a radical cf the formula:

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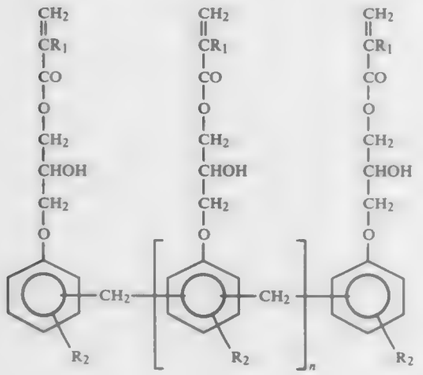
in which T is a single valence bond or one of the groups:



and each of the symbols X, which may be identical or different, is a hydrogen atom or a methyl, ethyl, propyl or isopropyl radical; with

(b) an acrylate reactant which comprises either:

(b1) a novolak epoxy (meth)acrylate corresponding to the general formula:



(II)

in which:

each of the symbols R_1 and R_2, which may be identical or different, is a hydrogen atom or a methyl radical; and

n is a positive number ranging from 0.1 to 8;

or a mixture of the aforesaid compound (b1) with not more than 30% by weight, relative to the weight of the mixture (b1)+(b2), of a compound (b2) of the general formula:

$$-(CH_2{=}CR_3{-}CO{-}O)_3{-}Z-;$$

in which:

the symbol R_3 is a hydrogen atom or a methyl radical;

the symbol Z is a trivalent linear or branched chain saturated aliphatic hydrocarbon radical containing from 1 to 20 carbon atoms, with the proviso that such radical may contain one or more oxygen bridges and one or more hydroxyl groups; in the presence of

(c) an imidazole compound and further comprising a chlorinated or brominated epoxy resin (d1) or a mixture of the resin (d1) with a non-chlorinated or non-brominated epoxy resin (d2).

4,994,537

POLYACRYLATE COPOLYMER, POLYACRYLATE DISPERSION COMPRISING THE POLYACRYLATE COPOLYMER, AND PROCESS FOR PREPARING THE SAME

Daniel H. Craig, Hockessin, Del., and Harry J. Goldy, Woodlyn, Pa. assignors to Hercules Incorporated, Wilmington, Del.

Filed Sep. 18, 1989, Ser. No. 408,821
Int. Cl.[5] C08F *18/24*
U.S. Cl. 526—273 17 Claims

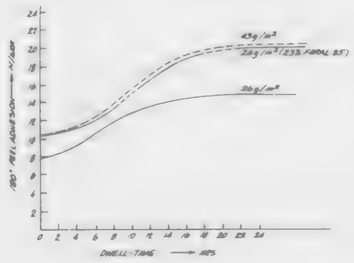
1. An acrylate copolymer comprising (a) repeating units derived from at least one monomer selected from the group consisting of acrylic and methacrylic esters and, based on the weight of the total copolymer, (b) about 0.1 to 3% of repeating units derived from at least one water-soluble monomer possessing conjugated unsaturation and (c) about 0.1 to 3% of at least one repeating unit derived from a water-soluble allyl monomer having a solubility of at least 0.5 g in 100 g of water at 20° C. selected from the group consisting of allyl alcohol; mono, di, and triallylamine and acid salts thereof; alkyl derivatives of mono, di, and triallylamines and acid salts thereof; allyl amides; allyl carbonates; allyl carbamates; mono and diallyl amine adducts of epoxides; allyl urea; and N-2-(allylcarbamato) aminoethyl imidazolidinone.

4,994,538

SILICONIZED EMULSION BASED PRESSURE-SENSITIVE ADHESIVES

Ivan S. P. Lee, Arcadia, Calif., assignor to Avery International Corporation, Pasadena, Calif.

Filed Feb. 24, 1989, Ser. No. 315,507
Int. Cl.[5] C08F *30/08*
U.S. Cl. 526—279 18 Claims



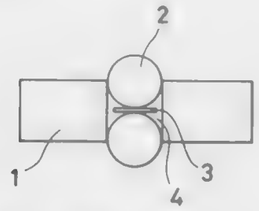
1. A pressure-sensitive adhesive tacky polymer prepared by emulsion polymerization said polymer comprising a polymerized amount of at least one reactive silicone acrylate polymer having an acrylate functionality of at least about 2, the total amount of polymerized silicone acrylate polymer present in the tacky polymer being from about 0.1 to about 1% by weight of the tacky polymer, at least one unsaturated carboxylic acid containing from 3 to about 5 carbon atoms, the polymerized carboxylic acid content of the tacky polymer being from about 3 to about 10 percent by weight of the tacky polymer, the balance of the tacky polymer comprising at least one alkyl acrylate soft monomer the total alkyl acrylate of the tacky polymer being in an amount of at least 50% by weight of the tacky polymer, said tacky polymer having a glass transition temperature of less than about −15° C.

4,994,539

METHOD FOR IMPROVING IMPULSE DESTRUCTIVE STIENGTH OF ELECTRICAL INSULATING MATERIALS

Yuichi Orikasa; Shinji Kojima; Takashi Inoue, all of Yokohama; Kaoru Yamamoto; Atsushi Sato, both of Tokyo, and Shigenobu Kawakami, Ichikawa, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Japan

Filed Oct. 1, 1985, Ser. No. 782,402
Claims priority, application Japan, Oct. 3, 1984, 59-207595; Oct. 17, 1984, 59-217924; Nov. 6, 1984, 59-233950
The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.
Int. Cl.[5] C08F *18/16*
U.S. Cl. 576—326 20 Claims



1. In a method of insulating an electrical conductor the improvement which comrpises employing, as said electrical insulating material, an ethylene copolymer prepared by subjecting, to a high pressure radical polymerization, ehtylene and an aromatic compound, at a polymerization pressure of 500 to 4,000 kg/cm^2 and a polymerization temperature of 50° to 400° C, said ethylene copolymer containing 0.005 to 1 mol % of a unit derived from said aromatic compound as a polymeric component, said aromatic compound selected from the group consisting of allyl benzene, phenylbutene, benzyl methacrylate, benzylacrylate, indene, beta-methyl styrene, phenylcyclohexene, methoxybeta-methyl styrene, chlorophenyl cyclohexene, phenylvinyl ether, allylbiphenyl, diphenylethylene, phenyl styrylethane, diphenyl methylpentene, phenylbenzyl methacrylate, phenylbenzylacrylate, isopropenyl biphenyl, vinyl naphthalene, phenylisopropenyl phenylmethane and vinylanthracene.

11. An electrical conductor insulated with a material comprising of ethylene copolymer prepared by subjecting, to a high pressure radical polymerization, ethylene and an aromatic compound, at a polymerization pressure of 500 to 4,000 kg/cm^2 and a polymerization temperature of 50° to 400° C., said ethylene copolymer containing 0.005 to 1 mol % of a unit derived from said aromatic compound as a polymeric component, said aromatic compound selected from the group consisting of allyl benzene, phenylbutene, benzyl methacrylate, benzylacrylate, indene, beta-methyl styrene, phenylcyclohexene, methoxybetamethyl styrene, chlorophenyl cyclohexene, phenylvinyl ether, allylbiphenyl, diphenylethylene, phenyl styrylethane, diphenyl methylpentene, phenylbenzyl methacrylate, phenylbenzylacrylate, isopropenyl biphenyl, vinyl naphthalene, phenylisopropenyl phenylmethane and vinylanthracene.

4,994,540

SAG RESISTANT, UNFILLED, LOW VISCOSITY URETHANE STRUCTURAL ADHESIVE

Peter W. Boerner, Massillon, Ohio; Richard W. Mitesser, and Jeffrey F. Dormish, both of Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1990, Ser. No. 464,821
Int. Cl.[5] C08G *18/32*
U.S. Cl. 528—44 6 Claims

1. A two component polyurethane adhesive comprising the reaction product of a curative and a polyisocyanate, said curative comprising a polyol and an aromatic amine terminated polyether containing two or more primary amine groups and having a molecular weight of from 250 to about 10,000, said adhesive being characterized in its improved sag resistance, its heavy body which is obtained without resort to included fillers or to prepolymerization of the components and by that the viscosity of its components is under about 15,000 cps.

4,994,541

PROCESS FOR THE PREPARATION OF POLYISOCYANATES CONTAINING URETDIONE AND ISOCYANURATE GROUPS, THE POLYISOCYANATES OBTAINED BY THIS PROCESS AND THEIR USE IN TWO-COMPONENT POLYURETHANE COATINGS

Winfried Dell; Werner Kubitza, and Dietrich Liebsch, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 22, 1989, Ser. No. 455,693
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1989, 3900053
Int. Cl.[5] C08G *18/38*
U.S. Cl. 528—51 18 Claims

1. A process for the preparation of a modified polyisocyanate containing uretdione and isocyanurate groups which comprises

(a) oligomerizing a portion of the isocyanate groups of an organic diisocyanate containing (cyclo)aliphatically-bound isocyanate groups in the presence of an organic phosphine catalyst,

(b) reacting about 0.1 to 10% of the isocyanate groups present in the starting diisocyanate with at least one alcohol to form urethane groups before and/or during the oligomerization reaction of step (a),

(c) terminating the oligomerization reaction at the desired degree of oligomerization by the addition of a catalyst poison,

(d) subsequently removing by distillation at least a portion of the excess, unreacted starting diisocyanate and

(e) heating the distillation residue obtained in step (d) to a temperature of at least 50° C. in the presence of about 100 to 10,000 ppm, based on the weight of said distillation residue, of a peroxide.

4,994,542

SURGICAL ADHESIVE

Takehisa Matsuda, Minoo; Teruo Takakura, Yokohama, and Tetsuo Itoh, Shiga, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo and Sanyo Chemical Industries, Ltd., Kyoto, both of, Japan

Filed Mar. 7, 1989, Ser. No. 320,054
Claims priority, application Japan, Mar. 7, 1988, 63-52918
Int. Cl.[5] C08G *18/38*
U.S. Cl. 528—70 20 Claims

1. A surgical adhesive, which comprises at least one NCO-terminated hydrophilic urethane prepolymer, derived from (a) an organic polyisocyanate component comprising at least one fluorine-containing polyisocyanate and (b) a polyol component comprising at least one hydrophilic polyether polyol having an oxyethylene content of at least 30%.

4,994,543

HALOGENATED POLYESTER RESIN COMPOSITION AND ELECTRIC WIRE

Toshio Nakane; Yukihiko Kageyama; Hiroaki Konuma, and Kenji Hijikata, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jul. 10, 1989, Ser. No. 377,053
Claims priority, application Japan, Aug. 31, 1988, 63-217597
Int. Cl.[5] C08G *18/42*
U.S. Cl. 528—83 12 Claims

1. A halogenated polyester resin composition characterized by comprising a flame-retardant aromatic polyester copolymer

having a halogen content of 0.5 to 30 wt. % which is produced by a polycondensation reaction of:

(A) a mainly aromatic dicarboxylic acid or an ester-forming derivative thereof,

(B) a mainly aliphatic glycol or an ester-forming derivative thereof, and

(C) a halogenated ester-forming compound and 0.1 to 10 wt. %, based on the total composition, of an isocyanate compound.

4,994,544

PRODUCTION PROCESS FOR POLYIMIDE FIBERS

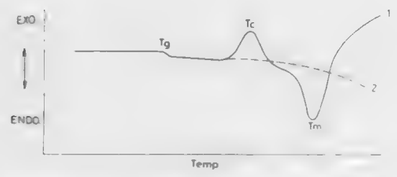
Taizo Nagahiro, Tokyo; Masahiro Ohta, Kanagawa; Shuichi Morikawa, Kanagawa; Nubohito Koga, Kanagawa, and Shoji Tamai, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 6, 1989, Ser. No. 431,779

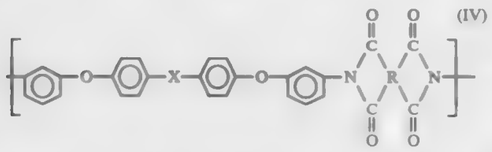
Claims priority, application Japan, Nov. 7, 1988, 63-279280; Oct. 18, 1989, 1-268985

Int. Cl.[5] C08G *8/02*

U.S. Cl. 528—125 **19 Claims**



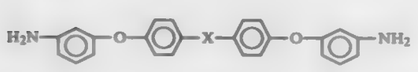
1. In a process for producing polyimide fibers having, as a basic skeletal structure, recurring units represented by the following formula (IV):



(IV)

wherein X represents a group selected from the group consisting of a direct bond, a divalent hydrocarbon group having 1–10 carbon atoms, a hexa-fluorinated isopropylidene group, a carbonyl group, a thio group and a sulfonyl group and R represents a tetravalent group selected from the group consisting of aliphatic groups having at least 2 carbon atoms, alicyclic groups, monocyclic aromatic groups, fused polycyclic aromatic groups and non-fused polycyclic groups with aromatic rings bonded together directly or via a crosslinking member, said process including thermally or chemically imidating a polyamic acid, which has been obtained by reacting a diamine and a tetracarboxylic dianhydride, into a polyimide and then spinning the polyimide or spinning the polyamic acid and then thermally or chemically imidating the thus-spun polyamic acid, the improvement wherein:

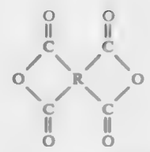
(a) the diamine comprises a diamine represented by the following formula (I):



(I)

wherein X has the same meaning as defined above;

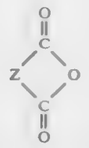
(b) the tetracarboxylic dianhydride comprises a tetracarboxylic dianhydride represented by the following formula (II):



(II)

wherein R has the same meaning as defined above;

(c) the reaction is conducted in the presence of a dicarboxylic anhydride represented by the following formula (III):



(III)

wherein Z represents a divalent group selected from the group consisting of monocyclic aromatic groups, fused polycyclic aromatic groups and non-fused polycyclic aromatic groups with aromatic rings bonded together directly via crosslinking member;

(d) said tetracarboxylic dianhydride comprises a tetracarboxylic dianhydride represented by the formula (II) and said dicarboxylic anhydride are in proportions of 0.9–1.0 mole and 0.0001–1.0 mole, respectively per mole of said diamine comprised of a diamine represented by the formula (I); and

(e) the water content of the polyimide or polyamic acid prior to spinning is less than 200 ppm.

4,994,545

POLYETHERIMIDE

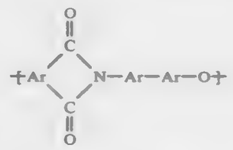
Gene C. Robinson, and G. P. Stahly, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 290,583, Dec. 27, 1988. This application Sep. 28, 1989, Ser. No. 413,960

Int. Cl.[5] C08G *73/10*

U.S. Cl. 528—170 **8 Claims**

1. A polyetherimide polymer consisting essentially of repeating units of the formula:



wherein each Ar depicted is an aromatic group having up to about 24 carbon atoms.

4,994,546

PROCESS FOR PREPARING BISPHENOL POLYARYLATES

Brian A. Stern, Evans, and Richard Layton, Augusta, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 9, 1990, Ser. No. 477,440

Int. Cl.[5] C08G *63/00, 63/02*

U.S. Cl. 528—194 **7 Claims**

1. A process for preparing polyarylates comprising the steps of (a) prepolymerizing a diester of Bisphenol-A with at least one benzene dicarboxylic acid selected from the group consisting of isophthalic acid and terephthalic acid wherein isophthalic acid constitutes at least 75 percent or no more than 25 percent of the benzene dicarboxylic acid to form a prepolymer having a melting point of at least about 200° C. and being fluid at this temperature; (b) polycondensing said prepolymer neat under agitation without agglomeration until substantially transformed into a powdery solid; maintaining said agitation to keep the powdery solid in a polydispersed nonagglomerated solid state; and continuing the polymerization below the agglomeration temperature of the polymerizing solid, until the desired molecular weight is reached.

4,994,547

LINEAR COPOLYCARBONATE FROM HYDROQUINONE-BISPHENOL CYCLIC COPOLYCARBONATE

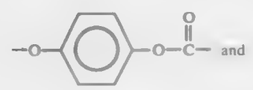
Daniel J. Brunelle, Scotia, and David K. Bonauto, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,051

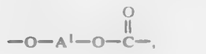
Int. Cl.[5] C08G *64/04*

U.S. Cl. 528—201 **7 Claims**

1. A linear copolycarbonate comprising structural units of the formulas

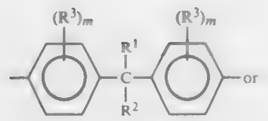


(I)

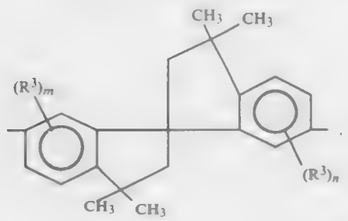


(II)

wherein A^1 is



(III)



(IV)

each of R^1 and R^2 is a c_{1-4} primary or secondary alkyl or C_{6-10} aromatic hydrocarbon radical, R^3 is C_{1-4} primary or secondary alkyl or halo, m is 0–4 and n is 0–3; at least 40% of the structural units having formula I.

4,994,548

MODIFIED BISPHENOL RESINS HAVING AT LEAST ONE ARYLCYCLO-BUTANENEALKYL MOIETY

Pui K. Wong, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 349,544, May 9, 1989, Pat. No. 4,960,956. This application Apr. 17, 1990, Ser. No. 509,839

Int. Cl.[5] C08G *65/38*

U.S. Cl. 528—219 **12 Claims**

1. A relatively insoluble, rigid polymer obtained by heating to a temperature up to about 300° C. a ring-arylcyclobutenealkylated di(hydroxyphenyl) compound having at least one arylcyclobutenealkyl substituent on at least one of the phenyl rings in which the alkyl moiety of each arylcyclobutenealkyl group is attached to a carbon atom of a six-membered aromatic ring.

4,994,549

SEGMENTED THERMOPLASTIC COPOLYESTERS ENDOWED WITH ELASTOMERIC PROPERTIES

Antonio Chiolle; Gian P. Maltoni, both of Ferrara, and Romolo Stella, St. Maria Maddalena, all of Italy, assignors to Ausimont S.R.L., Milan, Italy

Filed Jun. 30, 1989, Ser. No. 373,514

Claims priority, application Italy, Jul. 4, 1988, 21212 A/88

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **16 Claims**

1. Segmented, elastomeric thermoplastic copolyesters essentially consisting of a multiplicity of repeating long-chain ester units and short-chain ester units connected to each other head-to-tail through linkages of the ester type, said long-chain ester units being represented by the formula:



(I)

said short-chain units being represented by the formula:



(II)

wherein:

G is a divalent radical remaining after the removal of the end hydroxyl groups from a poly-(alkylene oxide)-glycol having a molecular weight not higher than about 6000;

R is a divalent radical remaining after the removal of the carboxyl groups from a dicarboxylic acid having a molecular weight lower than about 30%; and

D is a divalent radical remaining after the removal of hydroxyl groups from a diol having a molecular weight lower than about 250; characterized in that:

G is a mixture of poly-(alkylene oxide)-glycols containing at least 10% by weight of poly-(alkylene oxide)-glycols having a molecular weight lower than, or equal to, 300;

the carbon/oxygen ratio in G is within the range of from 1.8 to 4.3; and

the short-chain ester units are in an amount of about 25–80% by weight relative to the weight of the polyesters whereby improved melt flow, tearing IZOD resilience or heat resistance are obtained compared to individual glycols.

4,994,550

PROCESS FOR THE CONTINUOUS PREPARATION OF NYLON 4,6 FROM AQUEOUS SALT SOLUTION

Gunter Pipper, Bad Duerkheim, and Eckhard M. Koch, Fussgoenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 494,402

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1989, 3912770

Int. Cl.[5] C08G *69/28*

U.S. Cl. 528—335 **10 Claims**

1. A process for the continuous preparation of polytetramethylene adipamide, wherein

(a) an aqueous solution of the salt of 1,4-diaminobutane and adipic acid is heated in a vaporizing zone to a temperature of from 270° to 330° C. for a period of not more than 120 seconds under a pressure of from 1 to 10 bar with evaporation of water to form a vapor phase and molten prepolymer,

(b) the said prepolymer and vapor phase are then passed, to effect thorough mixing thereof, through a mass transfer

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zone equipped with baffles and located immediately downstream of said vaporizing zone, for a residence time of from 70 to 120 seconds at a temperature of from 270° to 330° C. and under a pressure of from 1 to 10 bar, to give molten prepolymer and a vapor phase,

(c) the said vapor phase is separated from the polymer in a separating zone and the polymer is discharged in the form of a melt capable of being granulated, with the proviso that the total residence time in stages (a), (b) and (c) is less than 5 minutes, and

(d) pyrrolidine is distilled off from the vapor phase separated in stage (c) and 1,4-diaminobutane is recycled to the vaporizing stage (a).

4,994,551

BIOABSORBABLE CO-POLYDEPSIPEPTIDE

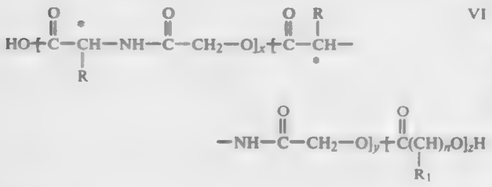
Fu-Ning Fung, and Raymond C. Glowaky, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 137,262, Dec. 23, 1987, Pat. No. 4,916,209. This application Dec. 21, 1989, Ser. No. 454,818

Int. Cl.[5] **C08G** *69/00*

U.S. Cl. 528—354 **6 Claims**

1. An optically-active, hydrolyzable, semi-crystalline depsipeptide copolymer having a number average molecular weight of from about 5,000 to 200,000 and the structural formula VI:



VI

wherein

R is C_1–C_{12} alkyl, C_1–C_6 alkoxy (C_1–C_6 alkyl), aryl, aryl(C_1–C_{12} alkyl), C_1–C_{12} alkylaryl, C_1–C_6 alkylaryl(C_1–C_6 alkyl), C_1–C_6 alkylthio (C_1–C_6 alkyl), C_1–C_6 alkylsulfinyl(C_1–C_6 alkyl), C_1–C_6 alkylsulfonyl(C_1–C_6 alkyl), cyano (C_1–C_{12} alkyl) or aminocarbonyl (C_1–C_{12} alkyl), with each aryl group having up to 10 carbons in the nuclear ring;

R_1 is hydrogen or methyl;

x,y are relative amounts of (D) and (L) optical isomers, respectively, wherein the asterisk indicates the stated optical activity,

the ratio $x/(x+y)$ is either less than about 0.45 or greater than about 0.55;

the ratio $z/(x+y+z)$ is from about 0.01 to 0.5; and n is 1 to 5,

with the proviso that when n is 5, R_1 is hydrogen.

4,994,552

HIGH CLARITY RADIATION STABLE POLYMERIC COMPOSITION AND ARTICLES THEREFROM

Joel L. Williams, Cary, and George R. Titus, Raleigh, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 362,999, Jun. 8, 1989. This application May 4, 1990, Ser. No. 519,602

Int. Cl.[5] **C08F** *6/00;* **A61M** *5/00*

U.S. Cl. 528—480 **8 Claims**

1. A flexible radiation-sterilized article comprising a composition comprising a polyolefin having a crystalline content of about 20 to 90 percent and a weight distribution wherein the ratio of the weight average molecular weight to the number average molecular weight is no greater than 6, a mobilizing amount of a liquid mobilizer compatible with said polyolefin having a density of about 0.6 to 1.9 grams per cubic centimeter, a radiation stabilizing amount of a hindered piperidine stabilizer and a clarifying amount of a dibenzylidene sorbitol alkyl thioether clarifier.

4,994,553

IMMUNOGENIC PEPTIDES OF HUMAN INTERLEUKIN-1 AND THE CORRESPONDING ANTI-PEPTIDE ANTIBODIES

John A. Schmidt, Mahwah; Joshua S. Boger, and Ellen B. K. Bayne, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 782,847, Oct. 2, 1985, Pat. No. 4,772,685. This application Jun. 17, 1988, Ser. No. 208,954

Int. Cl.[5] **C07K** *7/08, 17/00*

U.S. Cl. 530—327 **6 Claims**

1. A peptide having the amino acid sequence ALA PRO VAL ARG SER LEU ASN CYS THR LEU ARG ASP or the amide or acid addition salts thereof.

4,994,554

PROBURSIN

Tapan Audhya, Bridgewater; Gideon Goldstein, Short Hills, and George Heavner, Flemington, all of N.J., assignors to Immunobiology Research Institute, Inc., Annandale, N.J.

Continuation-in-part of Ser. No. 192,482, May 11, 1988, abandoned. This application Dec. 20, 1988, Ser. No. 287,462

Int. Cl.[5] **A61K** *37/24;* **C07K** *5/08;* **C08F** *283/00*

U.S. Cl. 530—327 **18 Claims**

1. A peptide comprising the same or substantially the same amino acid sequence of formula Phe-Phe-Trp-Lys-Thr-Lys-Pro-Arg-Lys-His-Gly-Gly-Arg-Arg, analogs thereof, and the pharmaceutically acceptable acid-addition salts thereof.

4,994,555

PROCESS FOR RECOVERY OF GLYCOPEPTIDIC ANTIBIOTICS

Giambattista Panzone, Cornaredo, and Anacleto Gianantonio, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Continuation of Ser. No. 253,936, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 36,211, Apr. 9, 1987, abandoned. This application May 21, 1990, Ser. No. 528,274

Claims priority, application United Kingdom, Apr. 11, 1986, 8608798

Int. Cl.[5] **C07K** *1/14*

U.S. Cl. 530—344 **11 Claims**

1. A process for recovering a glycopeptidic antibiotic selected from teicoplanin and antibiotic A-40926 from aqueous solutions resulting from fermentation broths directly after filtering the mycelia which comprises contacting said aqueous solution with a polyamide column chromatography resin capable of absorbing said antibiotic activity, separating the resin from the aqueous solution, washing the resin with a aqueous mixture eluent and recovering the glycopeptidic antibiotic from said eluent.

4,994,556

NOVEL LYMPHOKINE AND ITS PRODUCTION AND USES

Masakazu Mitsuhashi, and Masashi Kurimoto, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku, Okayama, Japan

Filed Sep. 8, 1986, Ser. No. 904,864

Claims priority, application Japan, Sep. 18, 1985, 60-205537

Int. Cl.[5] **C07K** *15/00;* **A61K** *39/00*

U.S. Cl. 530—351 **8 Claims**

1. A lymphokine (LK 3), which has the following physicochemical properties:

(1) Molecular weight;

15,000±2,000 daltons on electrophoresis using polyacrylamide gel

(2) Isoelectric point;

pI=4.5±0.5

(3) Electrophoretic mobility;

on Disc-PAGE, Rf=0.73±0.05

(4) uv-Absorption spectrum;

an abosorption maximum at a wave length of about 280 mm

)5) Solubility in solvents;

dissoluble in water, saline and phosphate buffer scarcely dissoluble or insoluble in ethyl ether, ethyl acetate or chloroform

(6) Coloring reaction;

protein-positive by the Lowry's method or microburette method

saccharide-positive by the phenol-sulfuric acid method or anthrone-sulfuric acid method

(7) Biological activities;

cytostatic on KB cell with or without human interferon-alpha, and extremely cytostatic on malignant tumor cells with interferon-alpha cytotoxic on L 929 cell substantially free of interleukin and interferon activities

(8) Stability in aqueous solution;

stable up to 60° C when incubated at pH 7.2 for 30 minutes

stable in the pH range of 2.0–11.0 when incubated at 4° C for 16 hours, and

(9) Stability on cryopreservation; stable at −10° C over a period of one month or longer.

4,994,557

RADIOHALOGENATED HALF-ANTIBODIES AND MALEIMIDE INTERMEDIATE THEREFOR

Amin I. Kassis, Chestnut Hill, and Leslie A. Khawli, Newton Centre, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jan. 29, 1988, Ser. No. 150,132

Int. Cl.[5] **C07D** *207/27;* **A61K** *37/00*

U.S. Cl. 530—391 **2 Claims**

1. N-(m-radiohalophenyl)maleimide.

2. Conjugate of N-(m-radiohalophenyl)maleimide with reduced antibody.

4,994,558

IMMUNOGLOBULIN CONJUGATES

Henry K. Armour, Indianapolis, Ind.; G. Davon Kennedy, Atlanta, Ga.; Gary A. Koppel, and William L. Scott, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 124,191, Nov. 23, 1987, Pat. No. 4,814,438, Continuation-in-part of Ser. No. 946,351, Dec. 24, 1986. This application Jan. 9, 1989, Ser. No. 294,338

Int. Cl.[5] **C07K** *17/06;* **A61K** *39/44, 31/70*

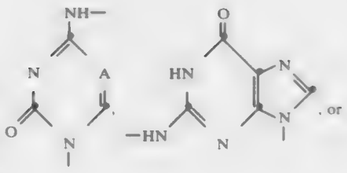
U.S. Cl. 530—391 **12 Claims**

1. A conjugate of the formula $(Q)_n$—Im where Im is an immunoglobulin or immunoglobulin fragment, n is about 1–10, and Q is an acylated difluoronucleoside of the formula

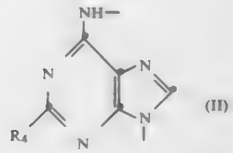


(I)

wherein the —R—NH— moiety is



or



(II)

R_1 is hydrogen, C_1–C_4 alkyl, —COR_3, or —COXCO—; R_2 is hydrogen or —COXCO—; R_4 is hydrogen, C_1–C_4 alkyl, amino, bromo, fluoro, chloro, or iodo; R_3 is hydrogen or C_1–C_4 alkyl; X is a bond, C_1–C_{10} straight chain alkylene, C_2–C_{10} branched alkylene, C_2–C_{10} alkenylene, C_3–C_{10} alkynylene, C_3–C_6 cycloalkylene, phenylene, or hydroxysubstituted C_1–C_{10} alkylene, and A is N or C–R_4, provided that one and only one of R_1 and R_2 is —COXCO—.

4,994,559

HUMAN BASIC FIBROBLAST GROWTH FACTOR

David A. Moscatelli; Daniel B. Rifkin, both of New York, N.Y., and Andreas Sommer, Boulder, Colo., assignors to Synergen, Inc., Boulder, Colo. and New York University, New York, N.Y.

Continuation of Ser. No. 163,142, Feb. 24, 1988, abandoned, which is a continuation of Ser. No. 895,829, Aug. 12, 1986, abandoned, which is a continuation of Ser. No. 809,873, Dec. 17, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 301,080

Int. Cl.[5] **C07R** *13/00*

U.S. Cl. 530—399 **1 Claim**

1. An angiogenic factor protein comprising a single-polypeptide-chain protein having at least one active site possessing mitotic and chemotactic activity and the ability to stimulate protease synthesis, wherein said protein is substantially free of the other proteins which are not angiogenic factors and said protein consists of the amino acid sequence:

G—T—M—A—A—G—S—I—T—T—L—P—A—L—P—E—

—D—G—G—S—G—A—F—P—P—G—H—F—K—D—P—K—

—R—L—Y—C—K—N—G—G—F—F—L—R—I—H—P—D—

—G—R—V—D—G—V—R—E—K—S—D—P—H—I—K—L—

—Q—L—Q—A—E—E—R—G—V—V—S—I—K—G—V—C—

—A—N—R—Y—L—A—M—K—E—D—G—R—L—L—A—S—

—K—C—V—T—D—E—C—F—F—F—E—R—L—E—S—N—

—N—Y—N—T—Y—R—S—R—K—Y—T—S—W—Y—V—A—

—L—K—R—T—G—Q—Y—K—L—G—S—K—T—G—P—G—

—Q—K—A—I—L—F—L—P—M—S—A—K—S.

VOL 1123 ISS 3 FE 19 1991 UMI

4,994,560

FUNCTIONALIZED POLYAMINE CHELANTS AND RADIOACTIVE RHODIUM COMPLEXES THEREOF FOR CONJUGATION TO ANTIBODIES

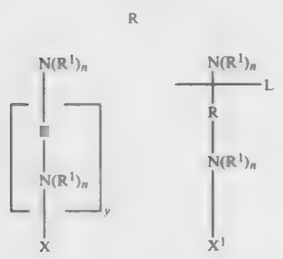
William J. Kruper, Jr., Sanford; Douglas K. Pollock, Midland; William A. Fordyce, Midland; Michael J. Fazio, Midland, and Muthiah N. Inbasekaran, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 24, 1987, Ser. No. 65,739

Int. Cl.[5] C07F *15/00*

U.S. Cl. 534—10 **16 Claims**

1. A rhodium complex which comprises rhodium, in which at least a portion of the rhodium is radioactive rhodium, complexed with a compound of the formula:



wherein:

each R independently represents a straight-chained or branched alkylene group of 2 to 10 carbon atoms inclusive, with the proviso that for any two adjacent nitrogens connected by an R group the R group must provide at least three single bonds between the nitrogens it connects;

each R^1 independently represents hydrogen or a straight-chained or branched alkylene group of 1 to 10 carbon atoms inclusive;

X an X^1 represent H, or X and X^1 taken together complete a bridging straight-chained or branched alkylene group of 2 to 10 carbon atoms inclusive or a bridging aralkylene group wherein the alkylene is a straight-chained or branched alkylene group of 2 to 10 carbon atoms inclusive, with the proviso that when X and X^1 are taken together the group it represents must provide at least three single bonds between the adjacent nitrogens it connects;

n is an integer of 0 or 1, provided that when the : group is bonded to the same nitrogen atom, n must be 0, otherwise n must be 1;

y is an integer of 1 through 3 inclusive; and

L is a linker/spacer group covalently bonded to, and replaces one hydrogen atom of, any one of the nitrogen or carbon atoms, said linker/spacer group being represented by the formula



wherein:

s represents an integer of 1;

t represents an integer of 0 through 20 inclusive;

R^2 represents an electrophilic or nucleophilic moiety which allows for covalent attachment to an antibody or nucleophilic moiety which allows for covalent attachment to an antibody or fragment thereof, or a synthetic linker which can be attached to an antibody or fragment thereof; and

Cyc represents an aromatic moiety, aliphatic heterocyclic moiety, or aromatic heterocyclic moiety, each of said moieties optionally substituted with one or more groups which do not interfere with binding to an antibody or antibody fragment.

4,994,561

PROCESS FOR THE PREPARATION OF METALLIZABLE AZO DYES CARRYING OUT COUPLING IN AN INERT GAS ATMOSPHERE IN THE PRESENCE OF AN AMMONIUM SALT

Hans P. Joswig, Grenzach-Wyhlen, and Werner Huber, Schwörstadt, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

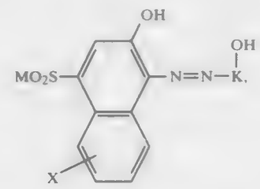
Continuation of Ser. No. 280,062, Dec. 5, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 536,054

Claims priority, application Switzerland, Dec. 7, 1987, 4757/87

Int. Cl.[5] C09B *41/00, 45/16, 45/20, 63/00*

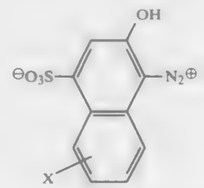
U.S. Cl. 534—582 **13 Claims**

1. A process for the preparation of an azo dye of formula



(1)

wherein K is the β-naphthol radical, X is hydrogen or nitro and M is an alkali metal ion or an ammonium ion, which process comprises coupling an aqueous solution containing 15 to 30 percent by weight of a diazo component of formula



(2)

and 6 to 20 mol % of an ammonium salt, based on the molar amount of the diazo component, at a pH in the range from 10.5 to 11.5, a temperature from 32° to 34° C. and in an inert gas atmosphere, to a coupling component of formula



(3)

in which formulae (2) and (3) above K and X are as defined for formula (1).

4,994,562

FIBER-REACTIVE FORMAZAN DYES CONTAINING α,β-DIHALOPROPIONYLAMINO, α-HALOACRYLOYLAMINO OR HALOACETILAMINE

Urs Lehmann, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

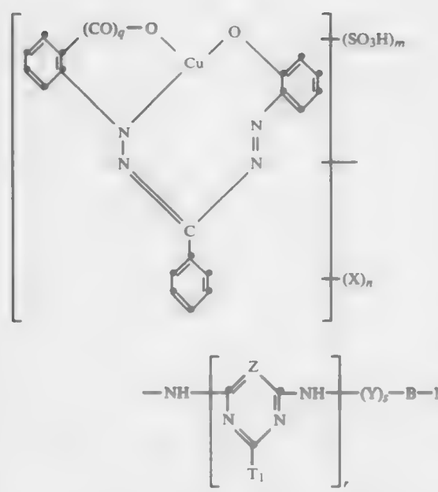
Filed Jun. 29, 1989, Ser. No. 374,320

Claims priority, application Switzerland, Jun. 29, 1988, 2473/88

Int. Cl.[5] C09B *62/018, 62/038, 62/04, 62/465;* D06P *1/38*

U.S. Cl. 534—618 **13 Claims**

1. A fiber-reactive formazan dye of the formula



(1)

where B is C_1–C_8alkylene which is unsubstituted or substituted by halogen or C_1–C_4alkoxy or B is naphthylene or phenylene each of which is unsubstituted or substituted by C_1–C_8alkyl, C_1–C_8alkoxy, C_2–C_8alkanoylamino, C_2–C_8alkoxycarbonylamino, benzoylamino, C_5–C_7cycloalkylcarbonyl, benzoyl, amino, C_1–C_8alkylamino, C_1–C_8dialkylamino, phenylamino, C_1–C_8alkoxycarbonyl, nitro, cyano, trifluoromethyl, halogen, carbamoyl, ureido, hydroxyl, carboxyl phenyl, naphthyl or phenoxy, R is α, β-dihalopropionyl, α-haloacryloyl or haloacetyl, T_1 is fluorine or chlorine, X is halogen, C_1–C_4alkyl, C_1–C_4alkoxy, cyano or nitro, Y is —CO— or —SO_2—, Z is —C—F, —C—Cl or nitrogen, m is 1 or 2, n is 0, 1 or 2, q is 0 or 1, and r and s are each either 0 or 1 but never the same as each other.

4,994,563

MONOAZO DYES CONTAINING A 3-SULFOALKANOYLAMINO OR 3-SULFOALKYLSULFONYLAMINOANILINE COUPLING COMPONENT

Harald Walter, and Rudolf Hurter, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

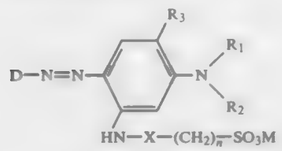
Filed Jun. 27, 1989, Ser. No. 372,402

Claims priority, application Switzerland, Jun. 29, 1988, 2471/88

Int. Cl.[5] C09B *29/033, 29/085, 29/09, 31/047, 31/14*

U.S. Cl. 534—728 **7 Claims**

1. An azo of the formula

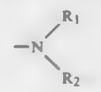


(1)

in which

D is thienyl, thiazolyl, 7-oxotetrahydrobenzo[b]thiophenyl, isothiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, benzthiazolyl, benzisothiazolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, thiophenyl, benzthiophenyl, tetrahydrobenzo[b]thiophenyl, pyridinyl, indazolyl, phenyl or naphthyl, each of which is unsubstituted or substituted by C_1–C_8alkyl, C_1–C_8alkoxy, C_2–C_8alkanoyl, C_2–C_8alkanoylamino, C_2–C_8alkoxycarbonylamino, C_5–C_7cycloalkylcarbonyl, benzoyl which is unsubstituted or substituted by C_1–C_4alkyl or halogen, amino, monoalkylamino or dialkylamino, each of which has 1 to 8 carbon atoms in the alkyl radical, phenylamino, C_1–C_8alkoxycarbonyl, C_3–C_7-cycloalkylaminosulfonyl, nitro, cyano, trifluoromethyl, halogen, sulfamoyl, sulfamoyl which is monosubstituted or disubstituted on the nitrogen atom by C_1–C_4alkyl, C_5–C_7cycloalkyl or phenyl, carbamoyl, ureido, hydroxyl, C_1–C_8alkylsulfonyl, C_1–C_8alkylaminosulfonyl, phenylsulfonyl or phenoxysulfonyl each of which is unsubstituted or substituted by C_1–C_4alkyl, halogen or sulfo, carboxyl, sulfomethyl, sulfo, sulfato, thiosulfato or C_1–C_8alkylthio, benzisothiazolyl, benzthiazolyl, benzisooxazolyl or benzoxazolyl, each of which is unsubstituted or substituted by C_1–C_4alkyl or halogen, phenylazo, naphthylazo, or phenoxy or phenylaminosulfonyl both of which are unsubstituted or substituted by C_1–C_4alkyl or halogen, or phenyl or naphthyl,

R_1 and R_2 independently of one another are each C_1–C_{10}alkyl which is unsubstituted or substituted by hydroxyl, C_1–C_4alkoxy, phenyl, sulfo, sulfato, thiosulfato, cyano or halogen, C_5–C_7cycloalkyl which is unsubstituted or substituted by halogen, C_1–C_4alkyl or C_1–C_4alkoxy, or phenyl or naphthyl which both are unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkanoylamino, benzoylamino, halogen or sulfo, or the radical



is piperazinyl, piperidinyl or morpholinyl,

R_3 is hydrogen, halogen, C_1–C_{10}alkyl which is unsubstituted or substituted by hydroxyl, C_1–C_4alkoxy, phenyl, sulfo, sulfato, thiosulfato, cyano or halogen, C_1–C_{10}alkoxy which is unsubstituted or substituted by C_1–C_4alkoxy, or phenoxy which is unsubstituted or substituted by C_1–C_4alkoxy, C_2–C_4alkanoylamino, benzoylamino, halogen or sulfo,

X is —CO—or —SO_2—,

n is the number 1,2,3,4,5 or 6 and

M is a cation.

4,994,564

AZO DYES WITH A DIAZO COMPONENT OF THE 3-AMINO THIOPHENE SERIES AND A COUPLING COMPONENT OF THE PYRIDINE, PYRIDONE OR PYRAZOLE SERIES

Karl-Heinz Etzbach, Frankenthal; Helmut Reichelt, Neustadt; Guenter Hansen; Ernst Schefczik, both of Ludwigshafen; Helmut Hagen, Frankenthal, and Gunther Lamm, Hassloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

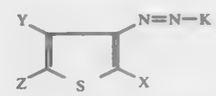
Filed Nov. 10, 1988, Ser. No. 269,646

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738374

Int. Cl.[5] C09B *29/033, 29/42;* D06P *3/26, 3/60*

U.S. Cl. 534—766 **4 Claims**

1. A thien-3-ylazo dye of the formula I



(I)

where

X is cyano, C_1–C_6-alkanoyl, substituted or unsubstituted benzoyl, substituted or unsubstituted phenyl or the radical COOR[1] or CONR[1]R[2] where R[1] and R[2] are identical or different and each is independently of each other, substi-

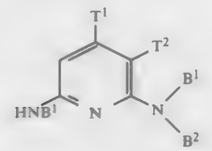
VOL 1123 ISS 3 FE 19 1991 UMI

tuted or unsubstituted C_1–C_8-alkyl, C_5–C_7-cycloalkyl, C_3–C_4-alkenyl, substituted or unsubstituted phenyl or together with the nitrogen atom linking them a member selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino and N-(C_1–C_4-alkyl)-piperazino, and R^2 may additionally be hydrogen,

Y is hydrogen, cyano, C_1–C_6-alkanoyl, substituted or unsubstituted benzoyl, substituted or unsubstituted phenyl or the radical $COOR^1$ or $CONR^1R^2$ where R^1 and R^2 are each as defined above,

Z is hydrogen, substituted or unsubstituted C_1–C_8-alkyl, substituted or unsubstituted C_1–C_6-alkylthio, substituted or unsubstituted phenyl, substituted or unsubstituted phenylthio or substituted or unsubstituted C_1–C_6-alkylsulfonyl or phenylsulfonyl and

K is a group of the formula (II)



(II)

where

B^1 and B^2 are identical or different and each is independently of the other hydrogen, unsubstituted or substituted C_1–C_{12}-alkyl, substituted or unsubstituted C_3–C_{12}-alkoxyalkoxyalkyl or C_2–C_{12}-alkoxyalkyl, C_5–C_7-cycloalkyl, substituted or unsubstituted phenyl, C_3–C_6-alkenyl, substituted or unsubstituted benzoyl, C_1–C_8-alkanoyl, C_1–C_6-alkylsulfonyl or phenylsulfonyl,

T^1 is hydrogen, C_1–C_4-alkyl or phenyl,

T^2 is hydrogen, cyano, nitro, carbemoyl, C_1–C_4-monoalkyl- or dialkyl-carbamoyl, C_1–C_8-alkanoyl, C_1–C_6-alkanoyl, C_2–C_6-alkoxycarbonyl or C_3–C_6-alkoxyalkoxyalkoxycarbonyl, and

the substituents on substituted alkyl, alkylthio, alkoxyalkyl, alkoxyalkoxyalkyl or alkylsulfonyl values of X, Y and Z are selected from the group consisting of hydroxy, C_1–C_4-alkoxy, phenoxy, C_1–C_4-alkoxycarbonyl, cyano and phenyl, the substituents on substituted benzoyl, phenyl, phenylthio and phenylsulfonyl values of X, Y, Z, B^1 and B^2 are selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, cyano, fluoro, chloro, bromo and nitro, and the substituents on substituted alkyl, alkoxyalkoxyalkyl and alkoxyalkyl values of B^1 and B^2 are phenyl, cyano, C_1–C_8-alkoxycarbonyl, phenoxycarbonyl, halogen, hydroxyl, C_1–C_8-alkanoyloxy, benzoyloxy, C_5–C_7-cycloalkoxy and phenoxy.

4,994,565

NUCLEOTIDE SEQUENCE OF GENE SPECIFICALLY EXPRESSED BY INSULINOMA

Hiroshi Okamoto, Sendai, Japan, assignor to Tohoku University, Sendai, Japan

Filed Aug. 21, 1987, Ser. No. 87,803

Claims priority, application Japan, Aug. 22, 1986, 61-195168

Int. Cl.[5] C07H *15/12, 19/06;* C12Q *1/68;* G01N *33/566*

U.S. Cl. 536—27 5 Claims

1. A DNA comprising one of the following nucleotide sequences:

ATGGCAGAAG TAGAGCAGAA GAAGAAGCGG	30
ACCTTCCGCA AGTTCACCTA CCGCGGCGTG	60
GACCTCGACC AGCTGCTGGA CATGTCCTAC	90
GAGCAGCTGA TGCAGCTGTA CAGTGCGCGC	120
CAGCGGCGGC GGCTGAACCG GGGCCTGCGG	150
CGGAAGCAGC ACTCCCTGCT GAAGCGCCTG	180
CGCAAGGCCA AGAAGGAGGC GCCGCCCATG	210
GAGAAGCCGG AAGTGGTGAA GACGCACCTG	240

-continued

CGGGACATGA TCATCCTACC CGAGATGGTG	270
GGCAGCATGG TGGGCGTCTA CAACGGCAAG	300
ACCTTCAACC AGGTGGAGAT CAAGCCCGAG	330
ATGATCGGCC ACTACCTGGG CGAGTTCTCC	360
ATCACCTACA AGCCCGTAAA GCATGGCCGG	390
CCCGGCATCG GGGCCACCCA CTCCTCCCGC	420
TTCATCCCTC TCAAG	435

which is specifically expressed in a human insulinoma;

ATGGCCGAAG TGGAGCAGAA GAAAAAGCGA	30
ACCTTCCGCA AGTTCACCTA CCGTGGCGTG	60
GACCTCGACC AGCTGCTGGA CATGTCCTAT	90
GAGCAGCTGA TGCAGTTGTA CAGCGCCCGG	120
CAGAGACGGC GCCTGAACCG AGGCCTGCGG	150
AGGAAGCAGC ACTCACTGCT CAAGCGCTTG	180
AGGAAGGCCA AGAAGGAGGC GCCACCCATG	210
GAGAAGCCGG AGGTCGTGAA GACCCACCTT	240
AGGGACATGA TCATTCTGCC CGAGATGGTC	270
GGCAGCATGG TGGGTGTGTA CAACGGCAAG	300
ACCTTCAACC AGGTGGAGAT CAAACCCGAG	330
ATGATCGGCC ACTACCTGGG CGAGTTCTCC	360
ATCACCTACA AGCCTGTGAA GCACGGCCGG	390
CCCGGCATTG GTGCCACCCA CTCCTCCCGA	420
TTTATCCCCC TCAAG	435

which is specifically expressed in rat insulinomas; and

ATGGCCGAAG TGGAGCAGAA GAAGAAGCGG	30
ACCTTCCGCA AGTTCACCTA CCGCGGCGTG	60
GACCTGGACC AGCTGCTAGA CATGTCCTAT	90
GAGCAGCTCA TGCAGCTTTA CAGCGCCAGG	120
CAGAGGCGGC GGCTGAACCG CGGCCTGCGG	150
CGGAAGCAGC ACTCGCTGCT CAAGCGCCTG	180
AGAAAGGCCA AGAAGGAGGC GCCGCCCATG	210
GAGAAGCCCG AGGTGGTGAA GACGCACCTG	240
AGGGACATGA TCATCCTGCC CGAGATGGTG	270
GGCAGCATGG TGGGCGTGTA CAACGGCAAG	300
ATGATCGGCC ACTACCTGGG CGAGTTCTCC	360
ATCACCTACA AGCCGGTGAA GCACGGCCGG	390
CCCGGCATCG GTGCTACCCA CTCCTCCCGG	420
TTCATCCCGC TCAAG	435

which is specifically expressed in a hamster insulinoma.

4,994,566

PHTHALOCYANINE CRYSTAL, PROCESS FOR MANUFACTURE THEREOF AND ITS USE FOR ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Yoshikazu Mimura, Tokyo; Keiichi Takano, deceased, late of Kanagawa (by Isao Takano, legal representative), and Tomohisa Gotou, Tokyo, all of Japan, assignors to NEC Corporation, Tokyo, Japan

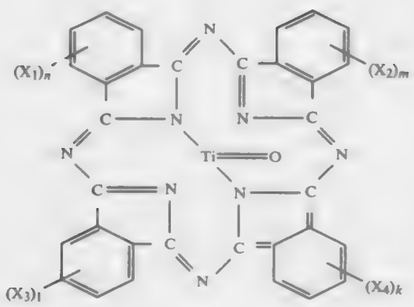
Filed Apr. 17, 1989, Ser. No. 339,442

Claims priority, application Japan, Apr. 15, 1988, 63-93051; Mar. 15, 1989, 1-64801

Int. Cl.[5] C09B *47/04*

U.S. Cl. 540—141 5 Claims

1. A phthalocyanine crystal which is represented by the general formula:



wherein X_1, X_2, X_3 and X_4 each independently represent various halogen atoms and n, m, l and k represent numerals of 0 to 4 and shows, in an infrared absorption spectrum, characteristic strong absorption peaks at 1,332±2 cm^{-1}, 1,074±2 cm^{-1}, 962±2 cm^{-1} and 783±2 cm^{-1}.

4,994,567

PROCESS FOR PREPARATION OF CEFUROXIME ESTER

Harold A. Crisp, Harrow Weald; John C. Clayton, Eastcote, Pinner; and Edward M. Wilson, St. John's Close, Penn, all of England, assignors to Glaxo Group Limited, London, England

Division of Ser. No. 938,140, Dec. 4, 1986, Pat. No. 4,820,833 which is a continuation of Ser. No. 781,505, Sept. 30, 1985, abandoned, which is a continuation of Ser. No. 711,559, Mar. 14, 1985, abandoned, which is a continuation of Ser. No. 635,797, Jul. 30, 1984, abandoned, which is a continuation of Ser. No. 518,671, Jul. 29, 1983, abandoned.

Claims priority, application United Kingdom, Jul. 30, 1982, 8222019

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] C07D *501/12*

U.S. Cl. 540—222 8 Claims

1. A process for the preparation of highly pure cefuroxime axetil in predominantly amorphous form which comprises recovering cefuroxime axetil from a solution thereof by roller drying.

4,994,568

6- AND 4-SUBSTITUTED-1-AZABICYCLO(3.2.0)HEPTAN-3,7-DIONE-2-CARBOXYLATES

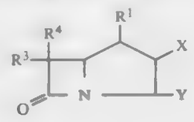
Burton G. Christensen, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 870,285, May 21, 1986, abandoned, which is a continuation of Ser. No. 395,197, Jul. 6, 1982, abandoned, which is a division of Ser. No. 245,005, Mar. 18, 1981, Pat. No. 4,350,631, which is a continuation-in-part of Ser. No. 217,931, Dec. 18, 1980, abandoned. This application Feb. 15, 1990, Ser. No. 481,715

Int. Cl.[5] C07D *487/04;* A61K *31/495*

U.S. Cl. 540—350 4 Claims

1. A compound having the structure:



wherein R^1 is β—CH_3, one of R^3 and R^4 is H and the other is; X is a leaving group; and Y is selected from (i) COOH or a pharmaceutically acceptable ester or salt thereof, (ii) $COOR^5$ where R^5 is a readily removable carboxyl covering group, (iii) COOM where M is an alkali metal and (iv) COO^-, provided that an additional compensating cation or cationic group is present.

4,994,569

5,6-DIHYDRO-4H-1,3-OXA(OR THIA)ZINE DERIVATIVES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Jean-Dominique Bourzat, Vincennes; Claude Cotrel, Paris; Claude Guyon, Saint Maur des Fosses, all of France, and Philippe Pitchen, Brentwood, Great Britain, assignors to Rhone-Poulenc Sante, Antony, France

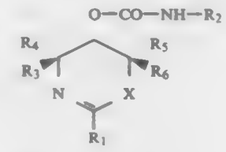
Filed Nov. 1, 1989, Ser. No. 430,127

Claims priority, application France, Nov. 3, 1988, 88 14322

Int. Cl.[5] C07D *417/00, 413/00;* A61K *31/54*

U.S. Cl. 544—55 28 Claims

1. A compound of formula:



(I)

in which

R_1 denotes 2-indolyl, 2-thienyl, 3-furyl, naphthyl, phenyl or phenyl substituted by one or two halogen atoms, or by alkoxy, alkyl, nitro, acylamino, alkylthio, acyl, trifluoromethoxy, morpholino, piperidino, amino, monoalkylamino, or dialkylamino in which the alkyl groups are identical or different, or, at the 3- and 4-positions, by methylenedioxy,

R_2 denotes phenyl or phenyl substituted by one or two halogen atoms, by one or two alkyl radicals, or by alkoxy, nitro, trifluoromethyl or hydroxy or, at the 3- and 4-positions, by methylenedioxy, and

either X denotes oxygen and

R_3 denotes phenyl and R_4, R_5 and R_6 denote hydrogen, or

R_3 and R_4 denote hydrogen, R_5 denotes hydrogen or methyl and R_6 denotes phenyl, or

one of R_3 and R_4 denotes methyl and the other hydrogen, R_5 denotes hydrogen and R_6 denotes phenyl,

or X denotes sulphur, R_3 denotes phenyl and R_4, R_5 and R_6 denote hydrogen; the aforesaid acyl, alkyl and alkoxy radicals and acyl, alkyl and alkoxy portions containing 1 to 4 carbon atoms each in a straight or branched chain, and its acid addition salts.

4,994,570

INDICATORS FOR THE DETECTION OF THIOL GROUPS

Holger Heidenreich, Cologne, and Klaus Wehling, Wuppertal, both of Fed. Rep. of Germany, assignors to Miles Inc., Elkhart, Ind.

Division of Ser. No. 481,618, Feb. 20, 1990, Pat. No. 4,962,019, which is a division of Ser. No. 432,466, Nov. 7, 1989, Pat. No. 4,931,579, which is a continuation-in-part of Ser. No. 105,565, Oct. 8, 1987, abandoned. This application May 29, 1990, Ser. No. 530,152

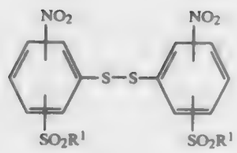
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634525

Int. Cl.[5] C07D *401/12, 403/12, 413/12, 231/06*

U.S. Cl. 544—111 1 Claim

1. The compound having the general formula

VOL 1123 ISS 3 FEB 19 1991 UMI



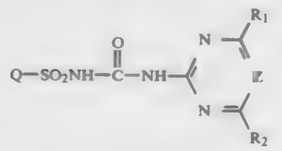
wherein
R^1 is



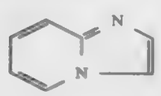
and
R^2 is C_1–C_4 alkyl substituted by —COOH or cyano,
R^3 is hydrogen or R^2; or
R^2 and R^3 together with a nitrogen atom form a pyrrolidine, pyrazoline, piperidine, piperazine or morpholine ring, unsubstituted, or substituted by C_1— to C_4—alkyl or phenyl.

4,994,571
PROCESS OF PRODUCING SULFONYLUREA DERIVATIVES
Hideki Miki, Tokyo, and Yasuo Ishida, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Aug. 26, 1988, Ser. No. 237,231
Claims priority, application Japan, Aug. 31, 1987, 62-218963
Int. Cl.[5] C07D *401/14, 403/14, 413/14, 417/14*
U.S. Cl. 544—331 **3 Claims**

1. A process for producing a compound of the formula



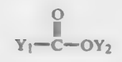
wherein Q is a condensed heterocyclic group which is formed by removing one hydrogen atom bonded to a heterocyclic ring-constituting carbon atom from a condensed heterocyclic ring of the formula



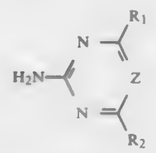
wherein the bonding of Q to SO_2 in the compounds always occurs through a heterocyclic ring-constituting carbon atom of Q,
which condensed heterocyclic group is unsubstituted or is substituted by one to three of the same or different substituents selected from the group consisting of (1) halogen, (2) straight chain, branched chain or cyclic alkyl having 1 to 6 carbon atoms, which is unsubstituted or is substituted by one to three members selected from the group consisting of (a) straight chain or branched chain alkylthio having 1 to 4 carbon atoms, (b) halogen and (c) straight chain or branched chain alkoxy having 1 to 6 carbon atoms and (3) alkoxy of 1 to 6 carbon atoms,
R_1 and R_2 each are straight chain, branched chain or cyclic alkyl having 1 to 6 carbon atoms or straight chain or branched chain alkoxy having 1 to 6 carbon atoms, and Z is CH, or a salt thereof
which comprises the 1st step of reacting a compound of the formula



wherein the symbols are as defined above, with a compound of the formula



wherein Y_1 is halogen, and Y_2 is phenyl, in the presence of an alkali metal hydroxide, alkali metal carbonate, alkali metal hydrogen carbonate, alkoxide or organic tertiary amine at a temperature of −20° to 150° C. for about 5 minutes to about one hour and the 2nd step of allowing a compound of the formula



wherein Z,R_1 and R_2 are as defined above, and an acid selected from an inorganic acid, methanesulfonic acid, ethanesulfonic acid and benzenesulfonic acid to act on the reaction mixture of the 1st step under anhydrous conditions at a temperature of about 10° to 100° C. for about 10 minutes to about 6 hours.

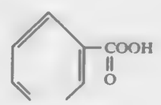
4,994,572
SYNTHESIS OF NOJIRIMYCIN DERIVATIVES
George W. J. Fleet, Oxford, United Kingdom, assignor to Monsanto Company, St. Louis, Mo.
Filed Oct. 12, 1989, Ser. No. 420,424
Int. Cl.[5] C07D *211/40*
U.S. Cl. 546—220 **1 Claim**

1. N-benzyloxycarbonyl-2,4-di-O-benzyl-1,5-dideoxy-1,5-imino-D-glucitol.

4,994,573
PYRIDINE-3-PEROXYCARBOXYLIC ACID MONOPERSULFATE
Carlo Venturello, Novara, and Claudio Cavallotti, Milan, both of Italy, assignors to Ausimont S.R.L., Milan, Italy
Filed Dec. 12, 1989, Ser. No. 448,894
Claims priority, application Italy, Dec. 13, 1988, 22923 A/88
Int. Cl.[5] C07D *213/55*
U.S. Cl. 546—318 **1 Claim**

1. Pyridine-3-peroxycarboxylic acid monopersulfate comprising the formula:

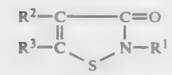
(I)



$N.H_2SO_5$

4,994,574
PREPARATION OF ISOTHIAZOLONES
George M. Lein, Jr., 80 Oxbow Cir., Chalfont, Pa. 18914
Filed Nov. 27, 1987, Ser. No. 126,051
Int. Cl.[5] C07D *275/02*
U.S. Cl. 548—213 **18 Claims**

1. A process for preparing a compound of the formula:



where R^1 is alkyl, substituted alkyl, aryl, substituted aryl, cycloalkyl, substituted cycloalkyl, or alkaryl and R^2 is H, halo or alkyl, R^3 is hydrogen or halo, which comprises treating a compound of the formula:

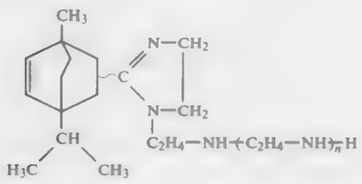
$$XOCCHR_2CH_2SSCH_2CHR_2COX$$

wherein R^2 is as defined above and X is halo, first with one equivalent of a halogenating agent, followed by the addition of a mixture of an acid scavenger and two equivalents of an amine of the formula: R^1-NH_2 wherein R^1 is as defined above and finally adding from two to six equivalents of halogenating agent.

4,994,575
DIPENTENE ACRYLIC ACID IMIDAZOLINES AND THEIR USE AS CORROSION INHIBITORS
Ewa A. Bardasz, Mentor, Ohio, assignor to Union Camp Corporation, Wayne, N.J.
Filed Oct. 30, 1989, Ser. No. 429,232
Int. Cl.[5] C07D *233/06*
U.S. Cl. 548—352 **3 Claims**

1. An imidazoline of the formula:

(I)



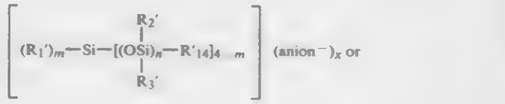
wherein n represents a whole number integer of from 1 to 6.

4,994,576
METHOD FOR REDUCING AROMATIC NITRO GROUPS
Paul R. Buckland, St. Albans, and Robert N. Gourley, Aylesbury, both of Great Britain, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 30, 1989, Ser. No. 358,048
Claims priority, application United Kingdom, Jun. 14, 1988, [redacted]14003
Int. Cl.[5] C07D *231/00*
U.S. Cl. 548—367 **6 Claims**

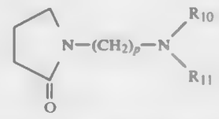
1. A method for reducing an aromatic nitro (—NO_2) group to the corresponding amine (—NH_2) group which comprises treating a benzene compound having a nitro group with iron or zinc metal and a halogen-containing aliphatic carboxylic acid, said acid being selected from trichloro-, dichloro-, or trifluoroacetic acid; said method being further characterized by making little or no anilide.

4,994,577
QUATERNIZED SILICONES
Mohamed M. Hashem, Wayne, and James H. Merrifield, Landing, both of N.J., assignors to Rhone-Poulenc Specialty Chemicals, L. P., Monmouth Jct., N.J.
Filed Sep. 5, 1989, Ser. No. 402,413
Int. Cl.[5] C07F *7/02*
U.S. Cl. 548—406 **9 Claims**

2. A quaternized silicone compound having the formulae



wherein m, n, and r are as defined above; R'_1, R'_2, R'_3, R'_4, R'_5, R'_6, R'_7, R'_8, R'_9, R'_{14} and R'_{15} correspond to R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{14} and R_{15} except that, where R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{14} or R_{15} is a radical containing a haloalkyl group, where the halogen and alkyl groups are as defined above; at least one of the halogen atoms in the haloalkyl group is replaced in the corresponding R'_1, R'_2, R'_3, R'_4, R'_5, R'_6, R'_7, R'_8, R'_9, R'_{14} and R'_{15} with the quaternized pyrrolidone radical

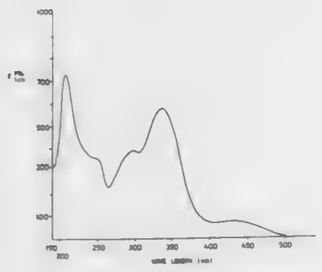


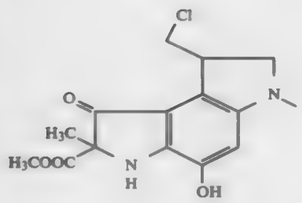
where the pyrrolidone ring is optionally substituted with carboxyl or lower alkyl and p is as defined above; R'_{10} and R'_{11} correspond to R_{10} and R_{11}; x is equal to the number of quaternized nitrogen atoms in the product molecule and the anion is a halide anion, such as Cl, Br, I or the anion salt conjugate base of a strong acid.

4,994,578
CERTAIN ANTI-TUMOR DUOCARMYCIN ANTIBIOTICS FROM STREPTOMYCES
Kazunori Ohba; Hiroomi Watabe; Mieko Nagasawa; Shiro Sakakibara; Takashi Shomura; Masaji Sezaki; Shinichi Kondo; Masao Koyama; Tadashi Nakazawa, and Haruo Yamamoto, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 276,714, Nov. 28, 1988, abandoned. This application Apr. 28, 1989, Ser. No. 344,738
Claims priority, application Japan, Nov. 27, 1987, 62-297476; Apr. 19, 1988, 63-94544; Apr. 28, 1988, 63-103782
Int. Cl.[5] C07D *487/04, 519/00;* **A61K** *31/40, 31/41*
U.S. Cl. 548—433 **1 Claim**

1. An antibiotic substance which is selected from the group consisting of
SF2582 A represented by the formula (A)

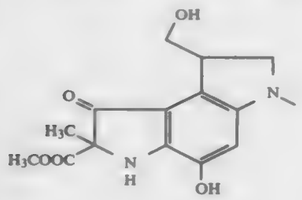
VOL 1123 ISS 3 FE 19 1991 UMI



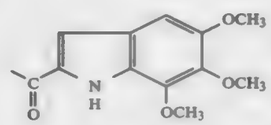


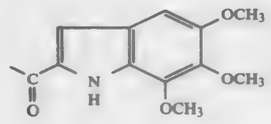
(A)

and SF2582 C represented by the formula (C)



(C)





4,994,579

AROMATIC ETHER IMIDES

Knud Reuter; Dieter Freitag, both of Krefeld; Günther Weymans, Leverkusen, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

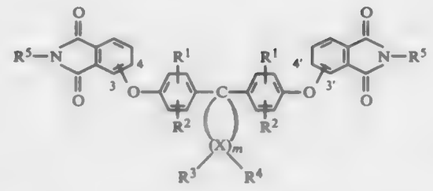
Filed Oct. 4, 1989, Ser. No. 417,216

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834560

Int. Cl.[5] C07D *403/12*

U.S. Cl. 548—461 1 Claim

1. Aromatic ether imides corresponding to the following formula



wherein

R^1 and R^2 denote, independently of one another, hydrogen, halogen, C_1–C_8-alkyl, C_5–C_6-cycloalkyl, C_6–C_{10}-aryl or C_7–C_{12}-aralkyl,

R^3 and R^4, which can be chosen individually for each X, denote, independently of one another, hydrogen or C_1–C_6-alkyl,

X stands for carbon under the condition that at least one ring carbon atom is at the same time substituted by two C_1–C_6-alkyl groups,

R^5 stands for C_1–C_4-alkyl, C_5–C_6-cycloalkyl or C_6–C_{10}-aryl, and

m stands for an integer with a value from 4 to 7.

4,994,580

PRODUCING BIS (ALICYCLIC) THIOETHERS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 917,773, Oct. 10, 1986, Pat. No. 4,798,900. This application Oct. 26, 1989, Ser. No. 426,994

Int. Cl.[5] C07D *209/48*

U.S. Cl. 548—461 2 Claims

1. A process of producing 4,4'-thiobis(N-arylphthalimide) compounds which comprises aromatizing a 4,4'-thiobis(N-aryltetrahydrophthalimide) using dimethylsulfoxide, iodine and sulfuric acid.

4,994,581

PHOSPHORIC ESTERS

Motoru Takeda; Mitsuharu Masuda, both of Wakayama; Takashi Imamura, Chiba, and Tomihiro Kurosaki, Osaka, all of Japan, assignors to Kao Corporation, Tokyo, Japan

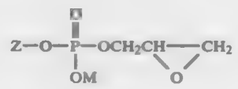
Filed Dec. 19, 1989, Ser. No. 452,419

Claims priority, application Japan, Dec. 22, 1988, 63-324650

Int. Cl.[5] C07F *9/06, 9/02*

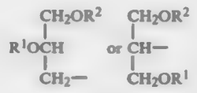
U.S. Cl. 549—219 8 Claims

1. A phosphoric ester of the formula (I):



(I)

wherein Z represents the following radicals

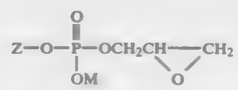


wherein R^1 and R^2 each represent a hydrogen atom, an acyl group which is residue of a linear or branched aliphatic carboxylic acid having 5 to 36 carbon atoms, a linear or branched alkyl group having 5 to 36 carbon atoms or a linear or branched alkenyl group having from 5 to 36 carbon atoms with the proviso that both R^1 and R^2 are not simultaneously hydrogen atoms; and

M represents a hydrogen atom, an alkali metal ion, and

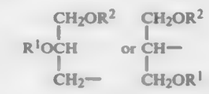
alkaline earth metal ion, ammonium, an alkylamine ion or an alkanolamine ion.

5. A phosphoric ester of the formula (II):



(II)

wherein Z represents the following radicals



wherein $R^1$and R^2 each represent a hydrogen atom, an acyl group which is residue of a linear or branched aliphatic carboxylic acid having 5 to 36 carbon atoms, a linear or branched alkyl group having 5 to 36 carbon atoms or a linear or branched alkenyl group having from 5 to 36 carbon atoms with the proviso that both R^1 and R^2 are not simultaneously hydrogen atoms; and

M represents a hydrogen atom, an alkali metal ion, an alkaline earth metal ion, ammonium, an alkylamine ion or an alkanolamine ion.

4,994,582

NOVEL ANTIBIOTIC NK130119

Takaaki Nishikiori; Masanori Yamazaki, both of Tokyo; Seiichi Saito, Kashiwa; Nobuyoshi Shimada, Tokyo; Takashi Kurokawa, Ageo; Kiyonobu Hirose, Ageo; Takumi Yamashita, and Takashi Harada, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

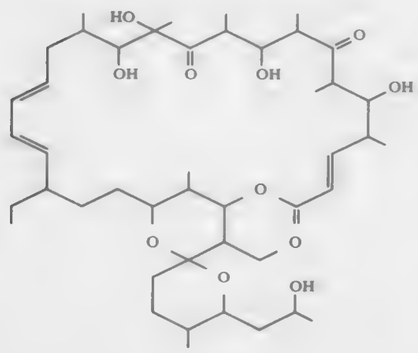
Filed Jan. 17, 1990, Ser. No. 466,589

Claims priority, application Japan, Feb. 3, 1989, 1-23697

Int. Cl.[5] C07D *313/00;* A61K *31/335*

U.S. Cl. 549—270 1 Claim

1. An antibiotic NK130119 of the formula:



4,994,583

PROCESS FOR THE PREPARATION OF EPSILON-CAPROLACTONE

Michèle Pralus, Saint Cyr Au Mont D'Or; Jean-Claude Lecoq, Chaponost, and Jean-Pierre Schirmann, Oullins, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 929,888, Nov. 13, 1986, abandoned, which is a continuation of Ser. No. 653,667, Sep. 21, 1984, abandoned, which is a continuation of Ser. No. 457,914, Jan. 14, 1983, abandoned. This application Jul. 12, 1989, Ser. No. 377,806

Claims priority, application France, Jan. 15, 1982, 8200564

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[5] C07D *313/04*

U.S. Cl. 549—272 4 Claims

1. A continuous process for manufacturing epsilon-caprolactone which comprises:

reacting a C_2–C_4 carboxylic acid with hydrogen peroxide in the presence of a boric acid catalyst and an azeotropic solvent in a first reaction vessel to form a crude percarboxylic acid solution containing a C_2–C_4 percarboxidic acid and unreacted carboxylic acid, hydrogen peroxide, catalyst and solvent, while continuously eliminating the water of reaction by azeotropic entrainment with said solvent;

directing said crude percarboxylic acid to a second reaction vessel to form a reaction mixture with cyclohexanone wherein the molar ratio of cyclohexanone to percarboxylic acid is maintained at between 0.75 and 0.9 for oxidizing cyclohexanone to epsilon-caprolactone;

directing said reaction mixture to a column for separation of a crude epsilon caprolactone solution from said crude percarboxylic acid solution;

recycling said separated crude percarboxylic acid solution to said first reaction vessel; and

recovering epsilon caprolactone by distillation under reduced pressure of said crude epsilon caprolactone solution.

4,994,584

PRECURSOR OF PROSTAGLANDIN AND PRODUCTION THEREOF

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya, and Tomio Oda, Sanda, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

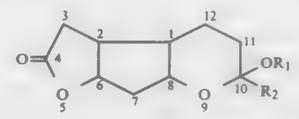
Division of Ser. No. 386,074, Jul. 28, 1989, Pat. No. 4,918,202. This application Jan. 19, 1990, Ser. No. 467,455

Claims priority, application Japan, Jul. 29, 1988, 63-191190

Int. Cl.[5] C07D *493/00, 307/77*

U.S. Cl. 549—299 6 Claims

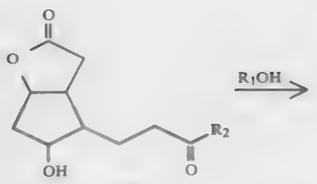
1. A process for production of 10-substituted-5,9-dioxatricyclo[6.4.0.$0^{2,6}$]dodecane-4-one represented by following formula:



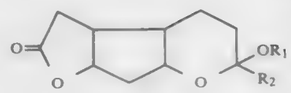
[II]

wherein R_1 is a hydrocarbon protecting group, and R_2 is a saturated or unsaturated hydrocarbon group corresponding to the w-chain of objective prostaglandin, which may contain one or more substituent(s) selected from the group consisting of a halogen atom, a hydroxyl group, a lower alkyl group, an alkoxy group and a phenoxy group, which comprises reacting a compound represented by formula:

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[I]



[II]

wherein R_1 are the same as the above, with a hydroxyl compound represented by formula: R_1OH wherein R_1 is the same as the above, under the presence of an acidic catalyst.

4,994,585

METHOD OF PREPARING (S)-γ-HYDROXYMETHYL-α,β-BUTENOLIDE

Koshi Koseki; Takashi Ebata; Hiroshi Kawakami; Hajime Matsushita, all of Yokohama; Kazuo Itoh, and Yoshitake Naoi, both of Tokyo, all of Japan, assignors to Japan Tabacco Inc. and Yuki Gosei Kogyo Co., Ltd., both of Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,509

Claims priority, application Japan, Jul. 19, 1989, 1-184817

Int. Cl.[5] C07D *307/28, 311/00*

U.S. Cl. 549—323 **5 Claims**

1. A method of preparing (S)-γ-hydroxymethyl-α,β-butenolide, comprising the step of oxidizing a levoglucosenone with a peracid in an organic solvent.

4,994,586

METHOD FOR PREPARING EPOXY COMPOUND

Nobumasa Arashiba, Yokohama; Takashi Shimizu, Osaka; Masaru Takeshita, Osaka, and Akira Otsu, Osaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Chiyoda, Japan

Filed May 25, 1989, Ser. No. 357,201

Claims priority, application Japan, May 26, 1988, 63-126912

Int. Cl.[5] C07D *301/19*

U.S. Cl. 549—529 **18 Claims**

1. A method for preparing an epoxy compound which comprises the step of reacting an olefin compound having 4 to 16 carbon atoms with an organic hydroperoxide in an inactive solvent in the presence of a molybdenum compound and at least one metal halide selected from the group consisting of halides of alkali metals and alkaline earth metals, to form said corresponding epoxy compound.

4,994,587

CATALYTIC SYSTEM FOR EPOXIDATION OF ALKENES EMPLOYING LOW SODIUM CATALYST SUPPORTS

Thomas M. Notermann, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Company, Inc., Danbury, Conn.

Continuation of Ser. No. 765,067, Aug. 12, 1985, abandoned.

This application Sep. 8, 1989, Ser. No. 404,560

Int. Cl.[5] C07D *301/10*

U.S. Cl. 549—534 **9 Claims**

1. A process for the epoxidation of alkene in the presence of an oxygen-containing gas comprising contacting said alkene and said oxygen-containing gas under epoxidation conditions in the presence of at least one efficiency-enhancing gaseous member of a redox-half reaction pair selected from the group of NO, NO_2, N_2O_3, N_2O_4, or a gas capable of forming one of the aforementioned gases under epoxidation conditions and a solid catalyst, said catalyst comprising a catalytically-effective amount of silver on a solid, alpha-alumina support and an efficiency-enhancing amount of at least one efficiency-enhancing nitrate salt of a member of a redox-half reaction pair, said support having less than about 50 ppm, by weight, of leachable sodium.

4,994,588

FLUORINE-CONTAINING CATALYTIC SYSTEM FOR EXPOXIDATION OF ALKENES

Louis A. Kapicak, Cross Lanes; Alfred W. Naumann, Charleston; Thomas M. Notermann, Charleston, and Erlind M. Thorsteinson, Charleston, all of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 765,068, Aug. 13, 1985, abandoned.

This application Aug. 31, 1989, Ser. No. 401,542

Int. Cl.[5] C07D *301/10*

U.S. Cl. 549—534 **14 Claims**

1. A process for the epoxidation of alkene in the presence of an oxygen-containing gas comprising contacting the alkene and the oxygen-containing gas under epoxidation conditions in the presence of at least one gaseous member of a redox-half reaction pair comprising NO, NO_2, N_2O_3, N_2O_4, or a gas capable of generating one of the above-mentioned gases under epoxidation conditions and a supported silver catalyst comprising a catalytically-effective amount of silver on a porous support and at least one efficiency-enhancing nitrate salt, wherein said solid support has present a performance-enhancing amount of a fluorine-containing substance.

4,994,589

CATALYTIC SYSTEM FOR EPOXIDATION OF ALKENES

Thomas M. Notermann, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 765,066, Aug. 13, 1985, abandoned.

This application Aug. 31, 1989, Ser. No. 401,541

Int. Cl.[5] C07D *301/10*

U.S. Cl. 549—534 **10 Claims**

1. A process for the epoxidation of alkene in the presence of an oxygen-containing gas comprising said alkene and the oxygen-containing gas under epoxidation conditions in the presence of at least one gaseous member of a redox-half reaction pair comprising NO, NO_2, N_2O_3, N_2O_4, or a gas capable of generating one of the above-mentioned gases under epoxidation conditions and a supported silver catalyst, said catalyst comprising a catalytically effective amount of silver on a solid, porous support having an efficiency-enhancing amount of at least one efficiency-enhancing nitrate salt, said support consisting essentially of alpha-alumina and having a surface area of at least about 0.7 m^2/g and at least 50 percent of the support particles having particle sizes of at least 0.1 micron have a platelet-type morphology.

4,994,590

RUTHENIUM-PHOSHINE COMPLEX

Hidemasa Takaya, Shiga; Kazushi Mashima, Kyoto; Hidenori Kumobayashi, and Noboru Sayo, both of Kanagawa, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Oct. 24, 1989, Ser. No. 427,209

Claims priority, application Japan, Oct. 24, 1988, 63-267946; Sep. 16, 1989, 1-242604

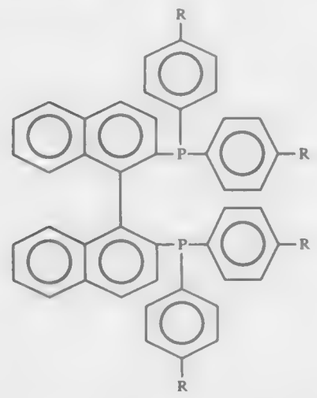
Int. Cl.[5] C07F *15/00, 9/50*

U.S. Cl. 556—21 **2 Claims**

1. A ruthenium-phosphine complex represented by formula (I)

$$[RuX_\lambda(L)_m(R\text{-}BINAP)]Y_n \quad (I)$$

wherein R-BINAP represents a tertiary phosphine represented by formula (II):



(II)

wherein R represents a hydrogen atom or a methyl group; X represents a halogen atom; L represents substituted or unsubstituted benzene or acetonitrile; Y represents a halogen atom, ClO_4, PF_6, BPh_4, wherein Ph represents a phenyl group, or BF_4; when L is substituted or unsubstituted benzene, λ represents 1, m represents 1, and n represents 1; and when L is acetonitrile, when λ is 1, then m represents 2, and n represents 1, and when λ is 0, then m represents 4, and n represents 2.

4,994,591

PLATINUM COMPLEXES DERIVED FROM B-SILYAMINES

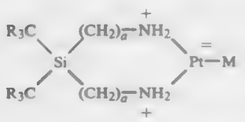
Wayne K. Anderson, Williamsville, N.Y., and Rudiger D. Haugwitz, Bethesda, Md., assignors to The Research Foundation of State University of NY, Albany, N.Y.

Filed Jun. 2, 1989, Ser. No. 360,363

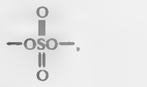
Int. Cl.[5] C07F *15/00*

U.S. Cl. 556—137 **53 Claims**

1. A cis diamino platinum compound of the formula:



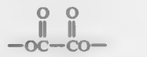
wherein Pt is platinum II or platinum IV; M is selected from Y_2, cyclic



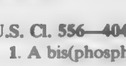
cyclic



and cyclic



when Pt is platinum II and X_4 when Pt is platinum IV; each a is independently 1 or 2; each Y is independently selected from —Cl, —Br, —I, —OH, —ONO_2, —OSO_3 and



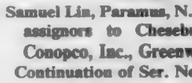
each X is independently selected from —Cl, —Br, —OH



and two equatorial X's can together further be cyclic



or cyclic



each R is independently selected from hydrogen and Z-substituted and unsubstituted alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkynyl and aryl, provided that two R's attached to the same or adjacent carbon atoms, or two R's attached through different carbon atoms to the silicon atom, can form Z substituted or unsubstituted alkyl or aryl cyclic ring; and, Z is selected from halogen, carboxylic acid, haloalkyl, alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkynyl and aryl.

4,994,592

POLYMERIZATION PROCESS

Johannes A. Van Doorn; Johannes J. M. Snel; Nicolaas Meijboom, and Richard L. Wife, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 222,993, Jul. 22, 1988, Pat. No. 4,880,900.

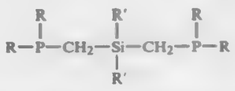
This application Jun. 12, 1989, Ser. No. 364,779

Claims priority, application Netherlands, Jul. 23, 1987, 8701741

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—404 **8 Claims**

1. A bis(phosphino)-2-silapropane compound of the formula



wherein R independently is a monovalent alkoxy-substituted aryl group of from 6 to 20 carbon atoms inclusive and R' independently is a hydrocarbyl group of up to 10 carbon atoms.

4,994,593

HYDROXYLHYDROCARBYL-MODIFIED AMINOALKYL SILICONES

Samuel Lin, Paramus, N.J., and Colleen Parriott, Monroe, N.Y., assignors to Chesebrough-Pond's USA Co. Division of Conopco, Inc., Greenwich, Conn.

Continuation of Ser. No. 276,726, Nov. 28, 1988, abandoned.

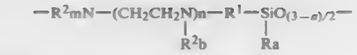
This application Dec. 6, 1989, Ser. No. 449,360

Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—424 **23 Claims**

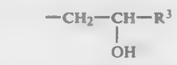
1. An organosiloxane comprised of at least one unit of formula A:

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A

wherein a is from 0 to 2, n is from 1 to 5, R is a monovalent radical, R^1 is a divalent hydrocarbon radical, R^2 is



R^3 is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals, m is 1 or 2, and b is 0 or 1.

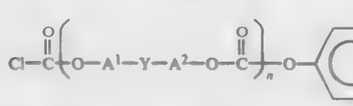
4,994,594

OLIGOMERIC CARBONATE CHAINSTOPPERS

James M. Silva, Clifton Park, N.Y., and Robert A. Pyles, Bethel Park, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,689
Int. Cl.[5] C07C *69/96*
U.S. Cl. 558—268 **3 Claims**

1. A chainstopper compound, for controlling the molecular weight of polycarbonates, having the formula



wherein each of A^1 and A^2 is a substituted or unsubstituted phenylene group, Y is a bridging group wherein one or two atoms separate A^1 from A^2, R^1 is hydrogen or a branched- or straight-chain alkyl group containing up to about 15 carbon atoms and n is an integer from 1 to about 10.

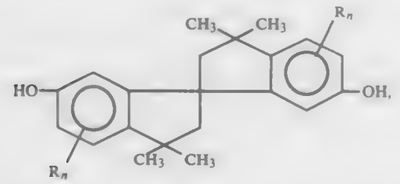
4,994,595

PREPARATION OF SPIROBIINDANE BISPHENOL BISCHLOROFORMATE COMPOSITIONS

Daniel J. Brunelle, Scotia, and Thomas G. Shannon, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1986, Ser. No. 926,685
Int. Cl.[5] C07C *68/02, 69/96*
U.S. Cl. 558—281 **11 Claims**

1. A method for preparing a composition comprising bischloroformates of spirobiindane bisphenols of the formula



wherein each R is independently C_{1-4} primary or secondary alkyl or halo and n is from 0 to 3, which comprises (A) passing phosgene into a heterogeneous mixture of said spirobiindane bisphenol, a substantially inert organic liquid and an aqueous alkali metal or alkaline earth metal base solution, said mixture being maintained at a temperature within the range of about 10°–40° C. and a pH of the aqueous phase in the range of about 8–14, until all solids have dissolved, and (B) continuing phosgene passage as the pH of the aqueous phase is decreased to a value in the range of about 2–6.

4,994,596

CYANOALKENYLATION PROCESS

Barbara C. Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 29, 1990, Ser. No. 471,614
Int. Cl.[5] C07C *253/08, 253/10*
U.S. Cl. 558—332 **8 Claims**

1. A process which comprises reacting an alkylbenzene wherein the alkyl group contains 1–6 carbon atoms with an alkali metal cyanide and an alkenoyl halide containing 1–6 carbon atoms in the presence of an effective amount of aluminum chloride for a time and at a temperature sufficient to form a 1-cyano-1-(4-alkylphenyl)alkene.

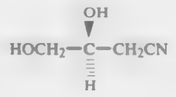
4,994,597

METHOD FOR PREPARING OPTICALLY ACTIVE 3,4-DIHYDROXY BUTYRIC ACID DERIVATIVES

Kenji Inoue, Hyogo; Mitsunori Matsumoto, Nakatsu, and Satomi Takahashi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

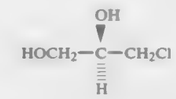
Filed Apr. 27, 1989, Ser. No. 343,565
Claims priority, application Japan, Apr. 27, 1988, 63-106856
Int. Cl.[5] C07C *253/00*
U.S. Cl. 558—342 **6 Claims**

1. A method for preparation of (S)-3,4-dihydroxy butyronitrile expressed by the structural formula (II)



(II)

characterized by reaction of (R)-3-chloro-1,2-propanediol expressed by the structural formula (I)



(I)

with a cyanating agent in the presence of a base in alcohol or a mixed solution of alcohol and water.

4,994,598

OXIDATIVE CONVERSION OF ORGANIC COMPOUNDS

James B. Kimble, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 180,873, Apr. 13, 1988, Pat. No. 4,925,997, which is a continuation-in-part of Ser. No. 947,235, Dec. 29, 1986, abandoned, Ser. No. 945,123, Dec. 22, 1986, Ser. No. 945,129, Dec. 22, 1986, and Ser. No. 938,907, Dec. 8, 1986, Pat. No. 4,774,216, which is a division of Ser. No. 742,340, Jun. 7, 1985, Pat. No. 4,658,077, and Ser. No. 938,895, Dec. 8, 1986, Pat. No. 4,775,654, which is a division of Ser. No. 713,673, Mar. 19, 1985, Pat. No. 4,658,076, and Ser. No. 891,009, Jul. 31, 1986, Pat. No. 4,895,823, which is a division of Ser. No. 713,674, Mar. 19, 1985, Pat. No. 4,672,145, Ser. No. 742,337, Jun. 7, 1985, and Ser. No. 742,335, Jun. 7, 1985. This application Feb. 22, 1990, Ser. No. 484,033
Int. Cl.[5] C07C *255/08*
U.S. Cl. 558—462 **20 Claims**

1. A method for the oxidative conversion of feed organic compounds comprising acetonitrile, comprising:

contacting said feed organic compounds and a free oxygen-containing gas with a solid contact material comprising (A) lanthanum, or, alternatively, at least two metals selected from the group consisting of Group IIA metals, Lanthanum Series metals, zinc and titanium, and (B) oxygen;

under reaction conditions wherein said acetonitrile is converted to acrylonitrile.

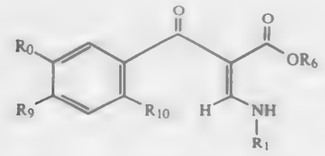
4,994,599

INTERMEDIATES FOR PRODUCING QUINOLONE-3-CARBOXYLIC ACIDS

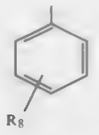
Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 123,097, Nov. 20, 1987, abandoned, which is a continuation of Ser. No. 797,057, Nov. 12, 1985, abandoned, which is a continuation of Ser. No. 514,715, Jul. 18, 1983, abandoned. This application Aug. 21, 1989, Ser. No. 397,366
Int. Cl.[5] C07C *229/00*
U.S. Cl. 560—43 **8 Claims**

1. A compound of the formula:



wherein $R_0$is halo; $R_1$is substituted phenyl of the formula



wherein R_8 represents one or two halo atoms substituted on the phenyl ring; R_6 is alkyl of 1 to 10 carbon atoms, phenyl or benzyl; R_9 is halogen; and R_{10} is a leaving group selected from halo, alkoxy, -S-alkyl, -O-tosyl and -O-mesyl.

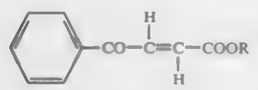
4,994,600

PROCESS FOR PREPARING TRANS-BETA-BENZOYLACRYLIC ACID ESTER

Satomi Takahashi, Kobe; Yasuyoshi Ueda, Takasago; Yoshifumi Yanagida; Namito Yoshio, both of Takasago; Takehisa Ohashi, Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi, Kagaku, Kogyo, Kabushiki, Kaisha, Osaka, Japan

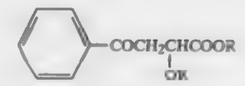
Filed Jun. 2, 1986, Ser. No. 869,782
Claims priority, application Japan, Jun. 5, 1985, 60-122301
Int. Cl.[5] C07C *67/08, 67/327, 67/333, 69/738*
U.S. Cl. 560—051 **11 Claims**

1. A process for preparing trans-β-benzoylacrylic acid ester having the general formula (I):



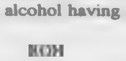
(I)

wherein R is an alkyl group or an aralkyl group, which comprises dealcoholizing β-benzoyl-α-alkoxypropionic acid ester having the general formula (II):



(II)

wherein R is as above, by removing from the reaction system an alcohol having the general formula (V):



(V)

wherein R is as above, in the presence of an acid catalyst at a temperature of from 20° to 150° C. to give trans-β-benzoylacrylic acid ester having the general formula (I).

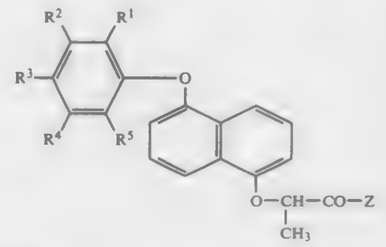
4,994,601

HERBICIDAL α-(5-ARYLOXY-NAPHTHALEN-1-YL-OXY)-PROPIONIC ACID DERIVATIVES

Michael Haug, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,817
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733067
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—56 **11 Claims**

1. An α-(5-aryloxy-naphthalen-1-yl-oxy)-propionic acid derivative of the formula



(I)

in which

R^1 stands for hydrogen, halogen, cyano or trifluoromethyl,

R^2 stands for,hydrogen or halogen,

R^3 stands for halogen, cyano, trifluoromethyl or trifluoromethoxy,

R^4 stands for hydrogen or halogen,

R^5 stands for hydrogen or halogen and

Z stands for halogen, hydroxyl, or for the —O—R^6 group, wherein

R^6 stands for an optionally halogen-substituted radical from the series comprising alkyl, alkenyl, alkinyl, alkoxyalkyl, or aralkyl.

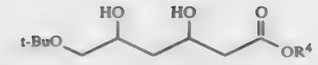
4,994,602

PROCESS FOR PREPARING OPTICALLY ACTIVE 6-T-BUTYOXY-3,5-DIHYDROXYHEXANOIC ESTERS

Nobuo Seido; Noboru Sayo, and Hidenori Kumobayashi, all of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Feb. 27, 1990, Ser. No. 485,692
Claims priority, application Japan, Feb. 27, 1989, 1-43196
Int. Cl.[5] C07C *69/66*
U.S. Cl. 560—186 **10 Claims**

1. A process for preparing an optically active 6-t-butoxy-3,5-dihydroxyhexanoic ester represented by formula (VII):



(VII)

wherein t-Bu represents a t-butyl group; and R^4 represents a lower alkyl group, comprising asymmetrically hydrogenating a 4-t-butoxyacetoacetic ester represented by formula (I):

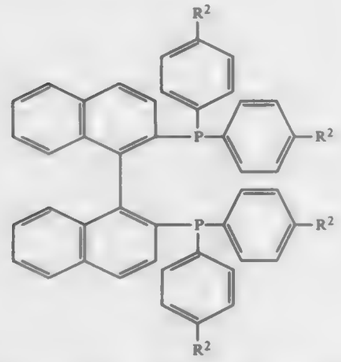


(I)

wherein t-Bu is as defined above; and R^1 represents a lower alkyl group, in the presence of a ruthenium-optically active phosphine complex represented by formula (II):

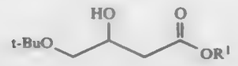
$$Ru(R^2\text{—BINAP})(O_2CR^3)_2 \quad \text{(II)}$$

wherein R^2-BINAP represents a tertiary phosphine represented by formula (III):



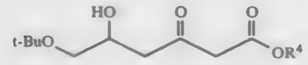
(III)

wherein R^2 represents a hydrogen atom or a methyl group; and R^3 represents a lower alkyl group or a trifluoromethyl group, to obtain an optically active 4-t-butoxy-3-hydroxybutanoic ester represented by formula (IV):



(IV)

wherein t-Bu and R^1 are as defined above, reacting the compound represented by formula (IV) with a lithium enolate of an acetic ester to obtain an optically active 6-t-butoxy-5-hydroxy-3-oxohexanoic ester represented by formula (V):



(V)

wherein t-Bu and R^4 are as defined above, and then subjecting the compound represented by formula (V) to asymmetric hydrogenation using a ruthenium-optically active phosphine complex represented by formula (VI):

$$Ru_2Cl_4(R^2\text{—BINAP})_2(NEt_3) \quad \text{(VI)}$$

wherein R^2-BINAP is as defined above; and Et represents an ethyl group, as a catalyst.

4,994,603

PREPARATION OF METHYL FORMATE

Franz-Josef Mueller, Wachenheim; Wolfgang Steiner, Friedelsheim; Karl-Heinz Roos, Mutterstadt, and Otto Kratzer, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,544
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037089
Int. Cl.[5] C07C *67/36, 69/06*
U.S. Cl. 560—232 8 Claims

1. A process for the preparation of methyl formate which comprises reacting methanol and carbon monoxide in the presence of sodium methylate at a temperature of 30° to 150° C. and a pressure of 5 to 300 bar, binding the sodium cation of said sodium methylate with a nonionic complexing agent selected from the group consisting of acyclic compounds containing a polyethylene glycol structural unit

$$-(-OCH_2-CH_2-)_{hd}\ n-O-$$

where n=2 to 12.

4,994,604

FORMATION AND RESOLUTION OF IBUPROFEN LYSINATE

Hsien-Hsin Tung, Scotch Plains; Stanley Waterson, Colonia, and Scott D. Reynolds, Plainsboro, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 10, 1990, Ser. No. 463,198
Int. Cl.[5] C07B *57/00*
U.S. Cl. 562—401 8 Claims

1. A process for the formation and resolution of (S)-ibuprofen-(S)-lysine which comprises:
(a) contacting (R)(S)-ibuprofen and (S)-lysine in an aqueous-organic solvent mixture;
(b) separating any suspended solid from the mixture;
(c) cooling the clear mixture until the mixture is supersaturated with respect to each of the (S,S) and (R,S) salts;
(d) contacting the supersaturated mixture with a slurry of (S)-ibuprofen-(S)-lysine in an aqueous-organic solvent;
(e) separating the formed crystalline (S)-ibuprofen-(S)-lysine.

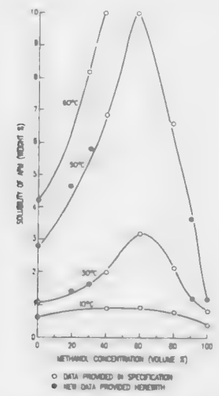
4,994,605

METHOD OF SEPARATING ALPHA-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER THROUGH CRYSTALLIZATION

Shinichi Kishimoto, Yokkaichi, and Katsumi Sugiyama, Yokosuka, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 612,000, May 18, 1984, abandoned. This application Apr. 25, 1989, Ser. No. 342,894
Claims priority, application Japan, Jun. 8, 1983, 58-102327
Int. Cl.[5] C07C *103/52*
U.S. Cl. 562—445 20 Claims

1. A method of crystallizing α-L-aspartyl-L-phenylalanine methyl ester from a solution containing the ester, comprising:
(A) adding an already formed α-L-aspartyl-L-phenylalanine methyl ester product to a mixture of water and a C_{1-2} alcohol to dissolve said product in said mixture, wherein said alcohol is present in the water/alcohol mixture in an amount of about 30 to about 80 percent by volume;
(B) crystallizing the ester by either (B1) concentrating the solution, (B2) cooling the solution to a temperature effective for crystallization, (B3) adjusting the water:alcohol ratio, or (B4) a combination thereof, to prevent formation of crystals of said esters; and
(C) separating said crystals from the solution.



4,994,606

PROCESS FOR THE PREPARATION OF 4,5-DIFLUOROANTHRANILIC ACID FROM 4,5-DIFLUOROPHTHALIC ANHYDRIDE OR 4,5-DIFLUOROPHTHALIC ACID

Lawrence B. Fertel, Buffalo, and Henry C. Lin, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 439,228, Nov. 20, 1989, Pat. No. 4,937,377. This application Jun. 4, 1990, Ser. No. 532,764
Int. Cl.[5] C07C *229/00*
U.S. Cl. 562—456 27 Claims

1. A process for the preparation of 4,5-difluoroanthranilic acid which comprises dissolving a starting material selected from the group consisting of 4,5-difluorophthalic anhydride and 4,5-difluorophthalic acid in a solvent selected from the group consisting of dimethyl acetamide, N-methyl-2-pyrrolidone and quinoline to form a solution, and heating said solution at a temperature between 175 and 215° C. to form 3,4-difluorobenzoic acid, nitrating said 3,4-difluorobenzoic acid in a mixture of nitric and sulfuric acids to form 2-nitro-4,5-difluorobenzoic acid, and reducing said 2-nitro-4,5-difluorobenzoic acid to form 4,5-difluoroanthranilic acid.

4,994,607

ASYMMETRIC CATALYTIC HYDROGENATION OF ALPHA-ARYLPROPENIC ACIDS

Albert S. C. Chan, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 22, 1989, Ser. No. 369,875
Int. Cl.[5] C07C *53/134*
U.S. Cl. 562—496 5 Claims

1. Process for preparing an α-arylpropionic acid comprising catalytically asymmetrically hydrogenating an α-arylpropenoic acid utilizing a rhodium or ruthenium coordination complex of a chiral phosphine compound at a temperature less than about 15° C., and optionally, at a pressure greater than about 75 psig H_2.

4,994,608

ADDITION OF HYDROGEN TO CARBON MONOXIDE FEED GAS IN PRODUCING ACETIC ACID BY CARBONYLATION OF METHANOL

G. Paull Torrence, Corpus Christi, Tex.; Joel D. Hendricks, Pineville, N.C., Dennis D. Dickinson, and Adolfo Aguilo, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, North Somerville, N.J.

Continuation of Ser. No. 874,734, Jun. 16, 1986, abandoned. This application Aug. 5, 1987, Ser. No. 82,945
Int. Cl.[5] C07C *51/12, 53/08*
U.S. Cl. 562—519 17 Claims

1. In a process for producing acetic acid by reacting a feed consisting essentially of methanol with carbon monoxide in a carbonylation reactor holding a liquid reaction medium containing a rhodium catalyst, the improvement which comprises:
maintaining catalyst stability and system productivity by maintaining in said reaction medium during the course of said reaction at least a finite concentration up to less than 14 wt. of water together with (a) from about 2 to 20 wt. % of lithium iodide as a catalyst stabilizer, (b) from about 5 to 20 wt. % methyl iodide, and (c) from about 0.5 to 30 wt. % methyl acetate, and (d) a partial pressure of hydrogen of at least about 4 up to about 150 psi at reaction conditions comprising 15 to 40 atmospheres total reaction pressure.

4,994,609

PRODUCTION OF CITRIC ACID

Avraham M. Baniel, Jerusalem, and David Gonen, Haifa, both of Israel, assignors to Innova S.A., Luxembourg, Luxembourg

Filed Jun. 6, 1990, Ser. No. 534,635
Int. Cl.[5] C07C *51/48, 59/265*
U.S. Cl. 562—580 3 Claims

1. A process for the recovery of citric acid from a citric acid fermentation broth comprising
(i) Subjecting said citric acid fermentation broth to evaporation to produce a concentrate with a citric acid concentration of at least 80% of the saturation value at the evaporation temperature;
(ii) subjecting such concentrate to an extraction operation with a recycled amine extractant citric acid solution in which the citric acid concentration is below the equilibrium value which corresponds to the broth concentrate at the extraction temperature, to produce a more concentrated amine extractant citric acid solution and an aqueous citric acid raffinate;
(iii) withdrawing the aqueous extraction raffinate from said extraction operation, bleeding off a small fraction thereof and recycling the balance to the said evaporation;
(iv) withdrawing the said concentrated amine extractant citric acid solution extract and back-extracting it with water to obtain an aqueous citric acid solution and a depleted amine extractant citric acid solution the concentration of which is below the equilibrium value which corresponds to the broth concentrate; and
(v) recycling said depleted amine extractant citric acid solution to the extraction operation.

4,994,610

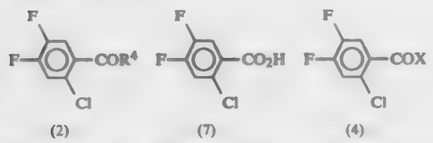
PROCESS FOR PREPARING FLUORINATED BENZOYL COMPOUNDS

Seisaku Kumai, Fujisawa; Osamu Yokokoji, Yokohama, and Akihiro Tamaoki, Ichihara, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Division of Ser. No. 229,425, Aug. 8, 1988, abandoned. This application Dec. 5, 1989, Ser. No. 446,110
Claims priority, application Japan, Aug. 14, 1987, 62-201862; Apr. 15, 1988, 63-91609
Int. Cl.[5] C07C *51/60*
U.S. Cl. 562—864 21 Claims

1. A process for preparing a 2-chloro-4,5-difluorobenzoyl halide of formula (4), which comprises:

(i) converting a fluoroinated benzoyl compound of formula (2) into 2-chloro-4,5-difluorobenzoic acid of formula (7) by haloform reaction; and
(ii) halogenating said 2-chloro-4,5-difluorobenzoic acid to obtain a 2-chloro-4,5-difluorobenzoyl halide of formula (4).
wherein formulae (2), (7) and (4) are:



(2) (7) (4)

wherein R^4 is a lower alkyl group and X is a halogen atom.

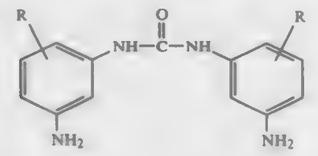
4,994,611

PROCESS FOR THE PRODUCTION OF N,N'-BIS-(3-AMINOPHENYL)-UREAS

Andreas Ruckes; Gerhard Grögler, both of Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 14, 1989, Ser. No. 436,393
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843410
Int. Cl.[5] C07C *273/18*
U.S. Cl. 564—50 **8 Claims**

1. A process for the production of an N,N'-bis-(3-aminophenyl)-urea compound corresponding to formula (I)



(I)

wherein
R represents a linear or branched C_1–C_6 alkyl group in the 2-, 4- and/or 6-position with urea in a molar ratio of greater than 2:1 in chlorobenzene as solvent to form a compound which precipitates out of chlorobenzene and recovering the precipitated compound.

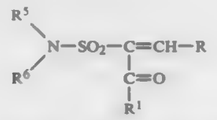
4,994,612

YLIDENE SULFONAMIDE DERIVATIVES

Roland Jaunin, Basel, and Henri Ramuz, Birsfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 871,026, Jun. 5, 1986, Pat. No. 4,847,273. This application Apr. 11, 1989, Ser. No. 336,176
Claims priority, application Switzerland, Jun. 21, 1985, 2651/85
Int. Cl.[5] C07C *311/12*
U.S. Cl. 564—88 **6 Claims**

1. A compound of the formula



II

wherein R is naphthyl or phenyl optionally monosubstituted by c_1–C_6-alkyl, halogen, trifluoromethyl or nitro or optionally disubstituted by halogen or halogen and nitro; imidazolyl; or pyridyl, R^1 is C_1–C_4-alkyl or C_3–C_6-cycloalkyl, R^5 is hydrogen, C_1–C_6-alkyl or C_3–C_6-cycloalkyl, $R^6$is C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_6-alkyl, C_1–C_6-alkoxy-C_1–C_6alkyl, C_1–C_6-alkoxy-C_1–C_6-alkoxy-C_1–C_6-alkyl, Chd 1–C_6-alkylthio-C_1–C_6-alkyl, C_1–C_6-alkoxycarbonyl-C_2–C_6-alkyl or R^5 and R^6 taken together are the group $—CH_2CH_2—0-CH_2CH_2—$or a $—(CH_2)_n—$group in which n is an integer of 2 to 7.

4,994,613

PROCESS FOR PREPARING 4-HYDROXYACETOPHENONE OXIME WITH MOTHER LIQUOR RECYCLE

Olan S. Fruchey, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 157,186, Feb. 16, 1983, abandoned. This application Jan. 29, 1990, Ser. No. 470,410
Int. Cl.[5] C07C *251/44*
U.S. Cl. 564—259 **4 Claims**

1. In the process for the production of 4-hydroxyacetophenone oxime by the conversion of 4-hydroxyacetophenone utilizing hydroxylamine, the improvement which comprises forming said 4-hydroxyacetophenone oxime and crystallizing the same from a mother liquor; washing said crystallized 4-acetophenone oxime; combining said wash water with said mother liquor; and recycling at least a portion of said combined liquor back to the reaction vessel for oxime production while maintaining the following mol ratio of reactants:
caustic:4-hydroxyacetophenone 1–4% molar excess
caustic:hydroxylamine 1–4% molar deficiency.

4,994,614

AMINE OXIDE PROCESS

Dennis P. Bauer, and Teresa K. Summerford, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 132,805, Dec. 14, 1987, abandoned. This application Dec. 28, 1987, Ser. No. 138,208
Int. Cl.[5] C07C *239/00, 259/00*
U.S. Cl. 564—300 **22 Claims**

1. A process for making a substantially nitrosamine-free tert-amine oxide, said process comprising reacting at a temperature in the range of about 30°–90° C. a tert-amine capable of forming a tert-amine oxide with at least a stoichiometric amount of about 20–70 weight percent active aqueous hydrogen peroxide in the presence of the synergistic combination of (a) an effective amount within the range of about 0.005–10 weight percent of ascorbic acid or salt thereof and (b) a promotor formed by adding about 0.05–5 weight percent, based on the weight of the initial tert-amine, of carbon dioxide to the reaction mixture.

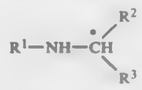
4,994,615

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE SECONDARY ARYLAMINES

Felix Spindler, Starrkirch-Wil, and Benoit Pugin, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 29, 1987, Ser. No. 79,054
Claims priority, application Switzerland, Aug. 4, 1986, 3116/86
Int. Cl.[5] C07C *57/00*
U.S. Cl. 564—304 **13 Claims**

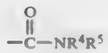
1. A process for the preparation of an optically active secondary N-arylamine of the formula I



(I)

in which R^1 is C_6–C_{12}-aryl or C_4–C_{11}-heteroaryl which has 1

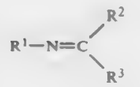
or 2 heteroatoms in the ring and is bonded via a ring C atom, it being possible for these radicals to be substituted by C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, C_1–C_{12}alkylthio, C_1–C_6-haloalkyl, halogen, —OH, —CN, C_6–C_{12}-aryl or -aryloxy or -arylthio, C_7–C_{16}-aralkyl or -aralkoxy or -aralkylthio, it being possible for the aryl radicals in turn to be substituted by C_1–C_4-alkyl, -alkoxy, -alkylthio, halogen, —OH, —CN, $—CONR^4R^5$ or $—COOR^4$, secondary amino with 2 to 24 C atoms,



or $—COOR^4$, in which R^4 and R^5 independently of one another are C_1–C_{12}-alkyl, phenyl or benzyl or R^4 and R^5 together are tetra- or pentamethylene or 3-oxapentylene; R^2 and R^3 differ from one another and are C_1–C_{12}-alkyl or cycloalkyl with 3–8 ring C atoms, which are unsubstituted or substituted by —OH, —CN, halogen, C_1–C_{12} -alkoxy, phenoxy, benzyloxy, secondary amino with 2 to 24 C atoms,



or $—COOR^4$, C_6–C_{12}-aryl or C_7–C_{16}-aralkyl which is unsubstituted or substituted in the same way as R^1, $—CONR^4R^5$ or $—COOR^4$, in which R^4 and R^5 are as defined above; or R^1 is as defined above and R^2 and R^3 together are alkylene which has 2 to 5 C atoms and is uninterrupted or interrupted by 1 or 2 —O—, —S—or $—NR^4$- and/or is unsubstituted or substituted by =0 or as described above for R^2 and R^3 alkyl, and/or is fused with benzene, furan, thiophene or pyrrole, or R^2 is as defined above, R^1 is bounded to R^3 and are alkylene which has 2 to 5 C atoms and is uninterrupted or interrupted by 1 or 2 —O—, S—or $—NR^4$ - and/or unsubstituted or substituted by —0 or as described above for alkyl R^2 and R^3, and/or is fused to benzene, furan, thiophene or pyrrole, and • is chiefly the R- or S-configuration, by asymmetrically catalyzed hydrogenation of an N-arylated prochiral ketimine



(II)

in which R^1, R^2 and R^3 are as defined above, in the presence of a complex salt of a noble metal with chiral ligands, which comprises carrying out the hydrogenation at a temperature of −20° to 80° C. under a hydrogen pressure of 10^5 Pa to 6.10^6 Pa and adding to the reaction mixture catalytic amounts of an iridium compound of the formula III or IIIa

[XIrYZ] (III)

III

[XIrY]⊕A⊖ (IIIa)

in which X is two olefin ligands or one diene ligand, Y is a chiral diphosphine, the secondary phosphine groups of which are linked by 2–4 C atoms and which, together with the Ir atom, forms a 5-, 6- or 7-ring, or Y is a chiral diphosphinite, the phosphinite groups of which are linked via 2 C atoms and which together with the Ir atom forms a 7-ring, Z is Cl, Br or I and A⊖ is the anion of an oxygen acid or complex acid.

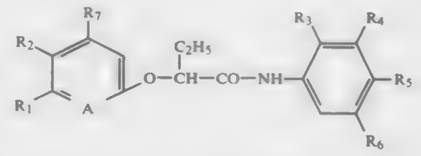
4,994,616

ANILIDE HERBICIDES

David Munro, Maidstone, United Kingdom, assignor to UBE Industries, Ltd., Yamaguchi, Japan

Filed Apr. 12, 1988, Ser. No. 180,576
Claims priority, application United Kingdom, May 1, 1987, 8710362
Int. Cl.[5] C07C *213/00, 215/00, 217/00*
U.S. Cl. 564—346 **5 Claims**

1. A compound of formula I



(I)

wherein R_1 represents a chlorine atom or a trifluoromethyl, difluoromethoxy or acetyl group;
R_2 represents a hydrogen chlorine or fluorine atom;
R_7 represents a hydrogen atom, or an alkyl or trifluoromethyl group;
R_3 represents a hydrogen, chlorine or fluorine atom;
R_4 represents a hydrogen or chlorine atom or a trifluoromethyl group;
R_5 represents a hydrogen, chlorine or fluorine atom or an alkyl group;
R_6 represents a hydrogen or fluorine atom or a trifluoromethyl, alkyl or alkoxy group; and
A represents a nitrogen atom or a —CH— group.

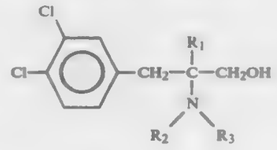
4,994,617

AMINOALCOHOLS, THEIR PREPARATION PROCESS AND THEIR APPLICATIONS, PARTICULARLY IN THERAPEUTICS

Gilbert Aubard, Palaiseau; Jacques Bure, Neuilly sur Seine; Alain P. Calvet, Versailles; Claude Gouret; Agnes G. Groubel, both of Meudon, and Jean-Louis Junien, Paris, all of France, assignors to Jouveinal S.A., Paris, France

Continuation of Ser. No. 3,276, Jan. 14, 1987, abandoned. This application Dec. 26, 1989, Ser. No. 456,743
Claims priority, application France, Jan. 30, 1986, 86 01295
Int. Cl.[5] A61K *31/135;* C07C *215/00*
U.S. Cl. 564—355 **12 Claims**

1. An aminoalcohol of the formula



(I)

wherein
R_1 is lower alkyl,
R_2 is H or lower alkyl,
R_3 is H, lower alkyl or lower alkenyl and the acid addition salt thereof.

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4,994,618

BEVANTOLOL PREPARATION

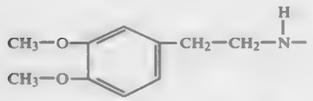
Marvin S. Hoekstra, Holland, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 610,532, May 15, 1984, abandoned. This application Sep. 9, 1988, Ser. No. 243,154

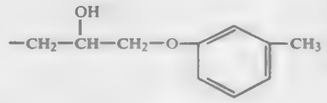
Int. Cl.[5] C07C *93/06*

U.S. Cl. 564—347 **1 Claim**

1. In a process for preparing 1-[3,4-dimethoxy-phenethyl-)amino]-3-(m-tolyloxy)-2-propanol (I)

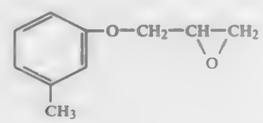


I



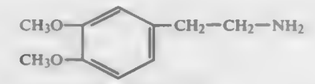
which comprises the reaction of 3-(m-tolyloxy)-1,2-epoxypropane

II



with beta-(3,4-dimethoxyphenyl) ethylamine (III)

III



the improvement which comprises:

(1) contacting compounds II and III in stoichiometric amounts at a temperature from about 5° C. to about 10° C.;

(2) adding a minor amount of a seeding agent until crystallization occurs;

(3) heating the crystallized mixture to a temperature of at least about 25° C. until the reaction is substantially complete;

(4) isolating the free base, and converting the free base to a pharmaceutically acceptable salt thereof.

4,994,619

SUBSTITUTED CYCLIC KETONES, SUBSTITUTED CYCLIC ENONES, AND PROCESS FOR PRODUCING THE SAME

Fumie Sato, Fujisawa; Kazutaka Arai, and Katsuaki Miyaji, both of Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

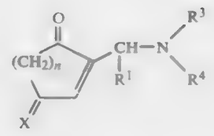
Filed Jun. 16, 1988, Ser. No. 207,549

Claims priority, application Japan, Jun. 16, 1987, 62-149873; Aug. 4, 1987, 62-194947; Feb. 10, 1988, 63-29709; Feb. 25, 1988, 63-43043

Int. Cl.[5] C07C *323/28, 217/52*

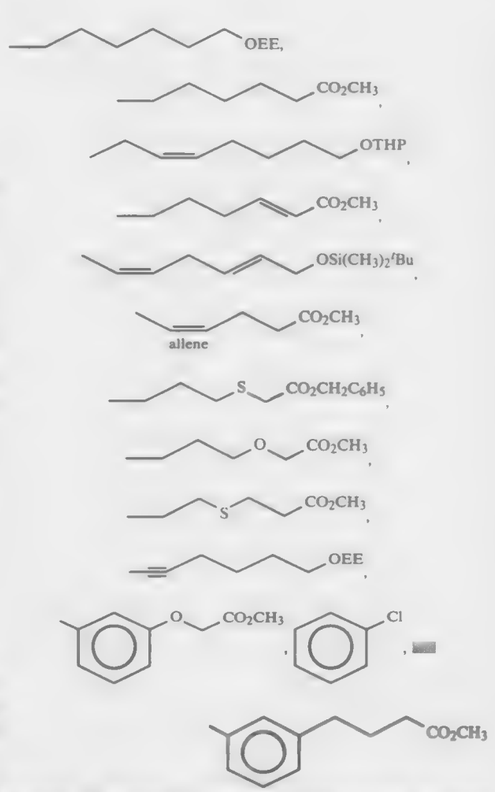
U.S. Cl. 564—455 **10 Claims**

1. A substituted cyclopentanone or cyclohexanone compound represented by the formula (IIIa):



(IIIa)

wherein X denotes (α-OZ, β-H) or (α-H, β-OZ); Z denotes a hydrogen atom or a protective group for the hydroxyl group; R^1 denotes a hydrogen atom, a C_{1-10} alkyl group, alkenyl group, alkynyl group, or phenyl group, or a member selected from the group consisting of



wherein THP denotes a tetrahydropyranyl group, ^{t}Bu denotes a tertiary butyl group and EE denotes an ethoxy ethyl group; R^3 and R^4 each denotes a C_{1-10} alkyl group or phenyl group, or a member selected from the group consisting of a p-chlorobenzyl group and a p-chlorophenyl group, R^3 and R^4 being the same or different from each other, and n is 1 or 2.

4,994,620

AMINES FOR ALCOHOLS

Pak Y. Fong; Kim R. Smith, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 133,733, Dec. 16, 1987, which is a continuation-in-part of Ser. No. 79,522, Jul. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 22,095, Mar. 5, 1987, abandoned. This application May 19, 1988, Ser. No. 195,883

Int. Cl.[5] C07C *209/26, 209/16*

U.S. Cl. 564—473 **20 Claims**

1. A process for making a trialkylamine by reacting an alcohol or aldehyde with mono- or dialkylamine at 150°–275° C. in the presence of hydrogen and in contact with a recyclable catalyst initially consisting essentially of (1) a copper compound selected from copper carbonate, copper oxide or copper hydroxide or mixtures thereof, (2) a zinc compound selected from zinc carbonate, zinc oxide or zinc hydroxide or mixtures thereof and (3) a metal compound selected from carbonates, oxides and hydroxides of Group IIA metals or mixtures thereof, at least a portion of at least one of said copper compound and zinc compound initially being introduced as a carbonate, said catalyst being in a solid form and easily separatable from the reaction product by filtration.

4,994,621

AMINATED, ALKOXYLATED HYDROXYL-TERMINATED POLYBUTADIENES

Ernest L. Yeakey; Robert L. Zimmerman, and Michael Cuscurida, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Apr. 17, 1989, Ser. No. 338,664

Int. Cl.[5] C07C *213/02, 215/22*

U.S. Cl. 564—475 **12 Claims**

1. Aminated, alkoxylated hydroxyl-terminated polymers made by a process comprising the steps of:

polymerizing one or more unsaturated hydrocarbons to form a liquid polymer, where at least one of the unsaturated hydrocarbons is butadiene;

providing the liquid polymer with terminal hydroxyl groups;

alkoxylating the hydroxylated liquid polymer with one or more alkylene oxides to provide secondary terminal hydroxyl groups; and

aminating the alkoxylated liquid polymer.

12. The aminated, alkoxylated hydroxyl-terminated polybutadienes of claim 10 wherein part or all of the double bonds present are reduced.

4,994,622

AMINES FROM ALCOHOLS

Pak Y. Fong; Kim R. Smith, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 22,095, Mar. 5, 1987, abandoned, and a continuation-in-part of Ser. No. 22,047, Mar. 5, 1987, abandoned, and a continuation-in-part of Ser. No. 79,522, Jul. 30, 1987. This application Dec. 16, 1987, Ser. No. 133,733

Int. Cl.[5] C07C *209/16*

U.S. Cl. 564—479 **39 Claims**

1. A process for making trialkylamine by reacting a lower alkylamine selected from mono- and di-lower alkylamines with a C_{8-22} primary alcohol in the liquid phase at a temperature of 150°–275° C. and in contact with a recyclable catalyst consisting essentially of copper and/or copper oxide, zinc and/or zinc oxide and an alkaline earth metal base, said catalyst being in a solid form and easily separatable from the reaction product by filtration.

32. In a process for making trialkylamines, said process comprising reacting an alkylamine selected from mono- and di-lower alkylamines in the liquid phase with a C_{8-22} primary alcohol or mixtures thereof in the presence of a recyclable copper-containing catalyst and in contact with hydrogen during at least a portion of the reaction period, the improvement of adding zinc oxide to the reaction mixture.

4,994,623

PROCESS FOR PRODUCING THIOALKYL OR THIOARYLPHENONES

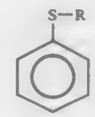
Kenneth G. Davenport, Hofheim, Fed. Rep. of Germany; Wilson B. Ray, Beeville, and Mohammad Aslam, Corpus Christi, both of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 247,985, Sep. 21, 1988, abandoned. This application Mar. 27, 1990, Ser. No. 500,112

Int. Cl.[5] C07C *319/12*

U.S. Cl. 568—42 **10 Claims**

1. A process for synthesizing thiophenones by reacting a thiophenolic ether of the formula:



wherein R is as an alkyl group containing from 1 to 12 carbon atoms or an aryl group with an acylating agent of the formula:



wherein R′ is an alkyl group containing from 1 to 12 carbon atoms or an aryl group;

and X is a halide or OR″, wherein R″ is hydrogen or a



group to provide a carboxylic acid or anhydride as the acylating agent to acylate and para-position of said thiophenolic ether at a selectivity of greater than 90% to yield a thiophenone of the formula:



wherein R and R′ are as defined above.

4,994,624

PROCESS FOR PREPARING ORGANOTHIOALKANOLS

John S. Roberts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 224,092, Jul. 26, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 464,848

Int. Cl.[5] C07C *319/14*

U.S. Cl. 568—55 **13 Claims**

1. A process for producing a stable tertiary aliphatic thioalkanol comprising:

(a) refluxing a tertiary aliphatic mercaptan having from about 1 to about 24 carbon atoms and an aliphatic oxygen-containing compound selected from the group consisting

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of aldehydes and ketones having less than or equal to about 18 carbon atoms;

(b) for a time and at a temperature sufficient to form a tertiary aliphatic thioalkanol reaction product;

(c) adding a water-insoluble organic solvent to said tertiary aliphatic thioalkanol reaction product to form a mixture; and wherein substantially all water is removed by

(d) discarding the resulting water layer,

(e) azeotropically distilling the remaining layer, and

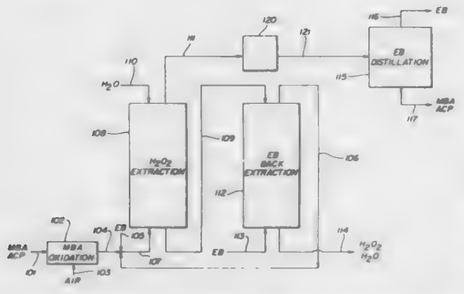
(f) recovering a stable tertiary aliphatic thioalkanol reaction product.

4,994,625

PRODUCTION OF HYDROGEN PEROXIDE

Rajendra S. Albal, and Robert N. Cochran, both of West Chester, Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Dec. 27, 1989, Ser. No. 457,605
Int. Cl.[5] C07C *27/00, 45/00*
U.S. Cl. 568—311 **3 Claims**



1. The process wherein an organic stream containing hydrogen peroxide and organic active oxygen-containing compounds are contacted with an alumina catalyst at conditions whereby the said hydrogen peroxide and organic active oxygen compounds are decomposed, said organic active oxygen-containing compounds selectively decomposing to acetophenone and methyl benzyl alcohol.

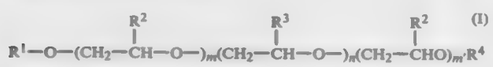
4,994,626

METHOD FOR THE PREPARATION OF METHYL ETHERS OF POLYETHER POLYOLS EMPLOYING DIMETHYLSULFATE AS A METHYLATING AGENT

Ronald E. Greenough, Southgate; Jay G. Otten, Flat Rock, both of Mich.; Stefan Birnbach, Ludwigshafen, and Jochen Houben, Worms, both of Fed. Rep. of Germany, assignors to BASF Corporation, Parsippany, N.J.

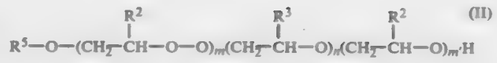
Filed Nov. 8, 1989, Ser. No. 433,133
Int. Cl.[5] C07C *41/01*
U.S. Cl. 568—618 **5 Claims**

1. A process for preparing an etherified polyoxyalkylene derivative of the formula



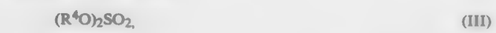
(I)

wherein R^1 and R^4 are identical or different and are each independently C_1–C_{20} alkyl, C_3–C_5 alkenyl, C_6–C_{20} aryl, C_6–C_{20} alkyl aryl, C_6–C_{20} cycloalkyl, and mixtures thereof, R^2 and R^3 are identical or different and independent of each other are H, CH_3, CH_3CH_2, and mixtures thereof, m, m′ and n are identical or different and are each greater than or equal to zero, with the proviso that m+m′+n is from 3 to 300; by reacting a polyoxyalkylene compound of the formula



(II)

wherein R^5 is hydrogen, C_1–C_{20} alkyl, C_3–C_5 alkenyl, C_6–C_{20} aryl, C_6–C_{20} alkyl aryl, C_6–C_{20} cycloalkyl, and mixtures thereof; R^2, R^3, m, m′ and n are as defined above, with a dialkyl, diaryl, dialkylaryl, dicycloalkyl sulfate, and mixtures thereof, of the formula



(III)

wherein R^4 is as defined above, in the presence of an aqueous solution of an alkali metal hydroxide at a temperature less than about 35° C., and using not less than one mole of alkali metal hydroxide per mole equivalent of organic hydroxyl groups, wherein all the alkali metal hydroxide is added at once before the addition of the sulfate of formula III.

4,994,627

PURIFICATION OF POLYOXYALKYLENE GLYCOLS

Michael Cuscurida, Austin, and Arthur J. Faske, Cedar Park, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Mar. 16, 1990, Ser. No. 494,353
Int. Cl.[5] C07C *41/36*
U.S. Cl. 568—621 **14 Claims**

1. A method for the purification of a polyoxyalkylene feedstock selected from the group consisting of polyoxyethylene glycols, polyoxypropylene glycols and C_1–C_4 monoalkyl ethers thereof having molecular weights of about 200 to about 5,000 and contaminated with more than about 100 ppm of alkali metal or alkaline earth metal ions which comprises contacting said feedstock with a basic ion exchange resin in the presence of from about 2 to about 10 wt. % of water, based on the weight of the feedstock, at a temperature of about 25° to about 100° C. and a pressure of about 0 to about 100 psig. for a period of time sufficient to lower the impurity level of said ions in said feedstock by at least about 90% to an impurity level of less than about 100 ppm,

said basic ion exchange resin being a fully hydrated boron specific basic styrene-divinyl benzene ion exchange resin in the free base form having an apparent density of about 40 to 45 lbs. per cubic foot.

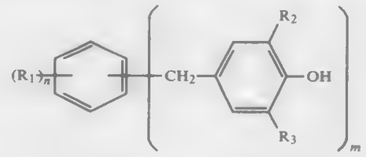
4,994,628

PHENOLIC ANTIOXIDANT PROCESS

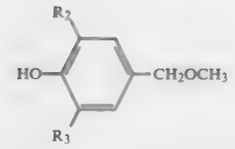
Lloyd E. Goddard, and George L. Mina, both of Orangeburg, S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 25, 1989, Ser. No. 411,631
Int. Cl.[5] C07C *39/12*
U.S. Cl. 568—720 **19 Claims**

1. A process for making a compound having the structure:



by reacting a reactant having the structure:



with a benzene compound having the structure:



wherein R_1 is a C_{1-3} lower alkyl and R_2 and R_3 are independently selected from the group consisting of C_{1-8} alkyl, C_{5-8} cycloalkyl and C_{7-12} aralkyl, n is zero or an integer from 1 to 4, m is an integer from 2 to 3, and m+n does not exceed 6, in an inert solvent in the presence of sulfuric acid at a temperature of about 20°–150° C. and at a pressure such that methanol by-product formed in the reaction distills out of the reaction mixture as a methanol-containing distillate as it is formed.

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4,994,629

ELECTRICAL GROUNDING SYSTEM

Joseph F. Tatum, Jr., and Thomas H. Lewis, Jr., both of Hattiesburg, Miss., assignors to Cathodic Engineering Equipment Co., Inc., Hattiesburg, Miss.

Continuation-in-part of Ser. No. 522,035, May 11, 1990. This application Jul. 10, 1990, Ser. No. 550,637

Int. Cl.[5] **H01R** *4/66;* **H01B** *1/18;* **C09K** *3/00*

U.S. Cl. 174—6 **18 Claims**

1. An electrical ground installed in the earth comprising an electrical conductor, said earth having a bore hole of a length and diameter to receive said conductor with said conductor in spaced relation from the sides of such bore hole, and a conductive non-porous cementitions composition substantially surrounding said conductor and in intimate contact with said rod means and the earth, said composition comprising a mixture of portland cement, sized calcined fluid petroleum coke, microcarbon rods, and carbon black.

4,994,630

SUSPENDED LIGHTWEIGHT CABLE SPLICE ENCLOSURE SLEEVE

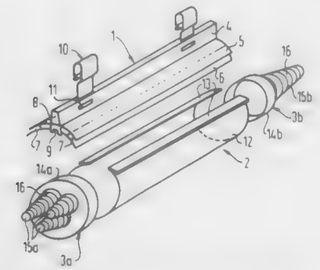
Werner Schilling, Wildenheid, Fed. Rep. of Germany, assignor to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,767

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842518

Int. Cl.[5] **H02G** *15/113*

U.S. Cl. 174—41 **27 Claims**



1. A cable splice enclosure sleeve comprising:
(a) a longitudinally slit substantially tubular envelope made of a flexible material;
(b) reinforcing strips attached along edges of the envelope formed by the slit;
(c) a locking profile strip engaging both edges of said slit in sealing relationship, said locking profile strip being sufficiently rigid to support the weight of said envelope;
(d) at least one suspension device attached to said locking profile strip for suspending said envelope from an object; and
(e) supporting elements contained within said envelope and positioned at least at the longitudinal ends of said envelope.

4,994,631

SELF-CLOSING LID FOR WIRING DEVICE COVER

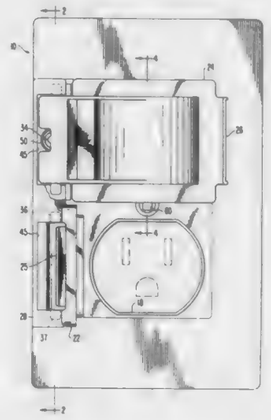
Howard M. Williams, Jr., Emmaus, Pa., assignor to Hubbell Incorporated, Orange, Conn.

Filed Jun. 6, 1989, Ser. No. 362,235

Int. Cl.[5] **H02G** *3/18*

U.S. Cl. 174—67 **3 Claims**

1. A self-closing lid structure for a wiring device cover comprising the combination of
a molded cover attachable to a box and having an opening therethrough to provide access to an electrical device within the box, said cover having a front surface;
a lid shaped and dimensioned to close said opening through said cover, said lid having a pair of collinear gudgeons protruding outwardly from opposite sides of one end thereof;
means adjacent one side edge of said cover forming a pair of spaced-apart bearings dimensioned to receive said gudgeons so that said cover is pivotable through an angle of about 90° between a closed position in which said opening through said cover is closed and an open position;



a first boss on said cover between said bearings;
a second boss on said lid between said gudgeons; and
a compression coil spring extending and acting between said first and second bosses, the centerline of said spring being closer to said one edge of said cover than a line between said gudgeons whereby said spring urges said cover toward said closed position.

4,994,632

ELECTRIC CABLE WITH LAMINATED TAPE INSULATION

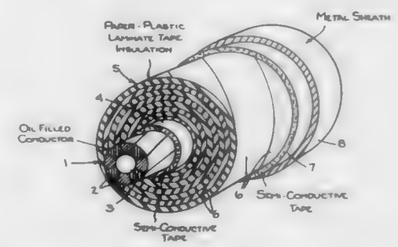
Claudio Bosisio, Brembate Sotto, and Antonio Campana, Milan, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Oct. 19, 1989, Ser. No. 424,052

Claims priority, application Italy, Oct. 21, 1988, 22397 A/88

Int. Cl.[5] **H01B** *7/02, 9/06;* **B32B** *23/08, 33/00*

U.S. Cl. 174—121 R **13 Claims**



1. In an electric cable comprising at least one conductor, a plurality of layers of insulation encircling said conductor and a sheath encircling said layers of insulation, said layers of insulation being formed by turns of at least one laminated tape and said tape comprising at least one layer of paper containing at least cellulose fibers bonded to a tensioned film of polymeric material by melted polymer wherein the improvement com-

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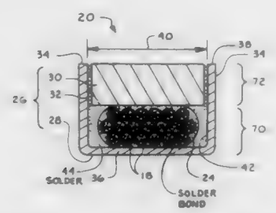
prises fibrils of said cellulose fibers extending from said fibers into, and embedded in, the polymeric material of said film.

4,994,633

BEND-TOLERANT SUPERCONDUCTOR CABLE

Frederick A. Puhn, National City, Calif., assignor to General Atomics, San Diego, Calif.

Filed Dec. 22, 1988, Ser. No. 289,226
Int. Cl.[5] H01B *12/00*
U.S. Cl. 174—125.1 **29 Claims**



1. A reinforcement for superconductor filaments subjected to lateral bending in a predetermined direction, said reinforcement comprising:

(a) an elongated, rectangular duct made of soft copper, having a pair of opposed sidewalls and a floor connecting corresponding ends of said sidewalls for holding the superconductor filaments, said sidewalls establishing a laterally extending opening therebetween and opposite said floor; and

(b) an elongated, rectangular lid made of hard copper and mounted across said opening and attached to said sidewalls of said duct to hold the superconductor filaments therein, said lid having sufficient thickness to locate the neutral surface of said reinforcement to substantially subject the superconductor filaments to compression during lateral bending of said reinforcement in a predetermined direction.

25. A method for fabricating an elongated superconductor structure bendable laterally in a predetermined direction, said method comprising the steps of:

(a) bending an elongated copper strip into a continuous longitudinally extending U-shaped duct;

(b) disposing in said duct a superconductor member;

(c) introducing into said duct a flowable filler to surround said superconductor member and stabilize said superconductor member in a fixed longitudinal relationship to said duct;

(d) closing said duct with an elongated reinforcing member of relatively substantially cross section compared to that of said duct; and

(e) securing said reinforcing member to said duct in a fixed longitudinal relationship by crimping, to fix said reinforcement member to said duct.

4,994,634

SHEET SWITCH

Shigeo Tanji; Kazutoshi Hayashi; Hideo Yamada, all of Kawasaki, and Norio Endoh, Suzaka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1989, Ser. No. 401,113
Claims priority, application Japan, Sep. 6, 1988, 63-222901
Int. Cl.[5] H01H *1/58, 13/70;* **H01C** *3/00;* **G06F** *3/00*
U.S. Cl. 200—5 A **16 Claims**

1. A sheet switch comprising:

an insulative film spacer having a plurality of through holes, said spacer being laminated between a pair of flexible insulative films;

a first one of said pair of flexible insulative films being provided on a surface thereof facing said spacer and including:

a plurality of first electrodes at positions corresponding to said through holes, respectively;

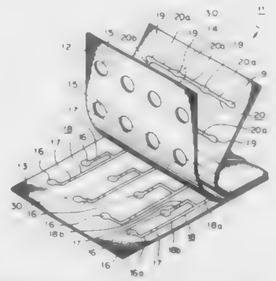
resistances connected to said first electrodes, respectively; and

first line patterns for externally connecting said first electrodes via said resistances;

each of said first line patterns being a laminated structure including:

an underlayer formed of a relatively low resistance paste; and

an upper layer formed of a relatively high resistance paste coated cover said underlayer, a width of said relatively high resistance paste being larger than a width of said relatively low resistance paste;



said underlayer formed of said relatively low resistance paste being partially disconnected to define a gap, so that said resistance is integrally formed with said upper layer formed of said relatively high resistance paste at a position corresponding to said gap, the width of said relatively high resistance paste being reduced at a position corresponding to said gap to define an essential part of said resistance;

a second one of said pair of insulative films being provided on a surface thereof facing said spacer and including:

a plurality of second electrodes at positions corresponding to said first electrodes, respectively; and

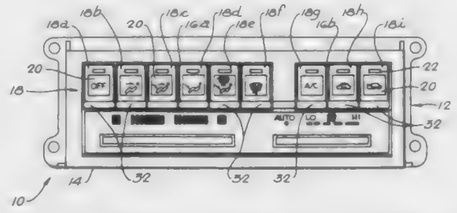
second line patterns for externally connecting said second electrodes.

4,994,635

PUSH BUTTON AUTOMOTIVE VACUUM-ELECTRIC AIR CONTROL DEVICES HAVING IMPROVED VALVING, SWITCHING AND DELATCHING

John G. Cummings, Cary, and Martin R. Cobb, Northbrook, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Mar. 20, 1989, Ser. No. 326,026
Int. Cl.[5] H01H *9/06*
U.S. Cl. 200—61.86 **15 Claims**



4. A vacuum-electric control device for automotive air control systems, said device comprising

a stationary housing,

a push button array including a plurality of push buttons for accomplishing various electrical switching and vacuum valving functions,

guiding means in said housing for guiding each of said push buttons for sliding movement in a predetermined direction between forwardly extended and rearwardly depressed positions,

said push buttons including respective carriages fixed thereon for sliding movement therewith,

each of said carriages having first and second opposite sides,

each of said carriages having a soft resilient individual valve member mounted on said first side thereof,

a stationary port member in said housing and slidably engageable by each valve member,

said port member having port means traversed by at least some of the valve members for accomplishing at least one vacuum valving function in response to the movement of the push buttons between the extended and depressed positions thereof,

at least some of said carriages having respective electrical contactors thereon for movement therewith,

each contactor being positioned on the second side of the corresponding carriage,

fixed contact means in said housing for selective sliding engagement by at least certain of said contactors,

and a plurality of individual coil springs compressed between stationary means in said housing and the respective carriages of the respective push buttons for biasing the push buttons outwardly toward their extended positions,

each carriage having a spring nest member thereon formed with a spring nest for receiving and locating a forwardly disposed portion of the corresponding coil spring,

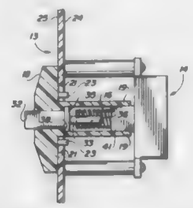
each spring nest member and the corresponding spring nest being offset laterally on the corresponding carriage relative to the positions of the corresponding valve member and contactor and being disposed alongside the positions of the corresponding valve member and contactor whereby the forwardly disposed portion of the corresponding coil spring is in an overlapping relation to the positions of the valve member and the contactor to accommodate a spring of exceptional length while affording a compact construction.

4,994,636

ELECTRICAL CONTROL DEVICE

Jui-S. Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.

Filed Dec. 7, 1989, Ser. No. 447,344
Int. Cl.[5] H01H *15/02, 9/28*
U.S. Cl. 200—548.000 **5 Claims**



1. A control comprising:

housing means;

activator means for effecting a control function;

actuator means coupled to said activator means and movable in a reciprocating rectalinear path on said housing means to control operation of said activator means;

operator means coupled to said actuator means and adapted for manual manipulation between active and inactive positions; said operator means in said active position rendering said actuator means functional to control operation of said activator means and in said inactive position rendering said actuator means dysfunctional to control operation of said activator means, and wherein said operator means comprises a latch portion that engages said housing means in said inactive position to prevent movement of said operator means; and

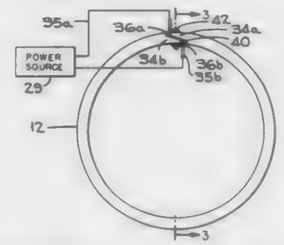
a spring seated between said activator means and said operator means and urging said latch portion into engagement with said housing means so as to bias said operator means in said inactive position.

4,994,637

INDUCTION COIL WITH LAPPED JOINT

Jin-Liou Fang, and J. Kirkwood H. Rough, both of San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 30, 1989, Ser. No. 429,688
Int. Cl.[5] H05B *6/40*
U.S. Cl. 219—10.53 **7 Claims**



1. An induction heating system for providing uniform heat around a complete circumference of a plastic food container to achieve uniform sealing of a lid to the food container wherein said lid has a layer of metallic material, said system comprising:

a single turn electrical coil having upper and lower surfaces lying in substantially parallel planes and having a first end and a second end, with said first end overlapping said second end to define a coil length in excess of 360 and to extend said coil over at least 360° of a container circumference;

a source of electrical power for selectively supplying an electrical current to first and second output leads;

a first means connecting said first output lead of said source to an extreme end portion of said first end of said single turn coil;

a second means connecting said second output lead of said source to an extreme end portion of said second end of said single turn coil; and

means for positioning said coil adjacent to a lid mounted on a container,

the distance between said lid and said coil extreme end portion at said first connecting means being stimulation equal to the distance between said lid and said coil extreme end portion at said second connecting means,

with said overlapping first and second ends of said coil disposed with respect to each other, respectively, radially outwardly and radially inwardly of said coil to form a single complete ring of substantially uniform radial thickness having said substantially equal to coil-lid extreme end portion distances,

said substantially equal coil-lid extreme end portion distances and said electrical current in said coil inducing a substantially uniform loop of electric current in said lid layer of metallic material to develop a loop of substantially uniform heat in said lid for uniformly sealing said lid to said container.

4,994,638

THERMALLY INSULATIVE AND SHOCK RESISTANT FOOD PACKAGING

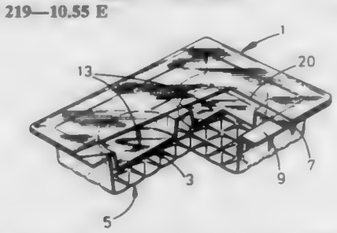
David S. Iorns, Workington; David S. Bruce, Whitehaven, both of United Kingdom; Hans-Joachim Biskup, Kempten, and Erhard Scheibel, Wolfertschwenden, both of Fed. Rep. of Germany, assignors to Smith Brothers (Whitehaven) Limited, Whitehaven, United Kingdom

Filed Feb. 24, 1988, Ser. No. 159,712

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 8704322; Oct. 16, 1987, 8724331; Nov. 20, 1987, 3739432

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E 10 Claims



1. A self supporting product container comprising an inner dished part formed with a peripheral edge portion thereabout and a first well for receiving said product, and an outer dished part formed with a peripheral edge portion thereabout and a second well into which said first well is entrant, the inner and outer parts contacting and being joined to each other at their respective peripheral edge portions, otherwise with their wells in all-round mutually-spaced relation and wherein the inner and outer dished parts are made each from a different thermoformable plastic material, said materials being selected such that one dished part has a higher resistance to thermal deformation than the other.

4,994,639

METHODS OF MANUFACTURE AND SURFACE TREATMENT USING LASER RADIATION

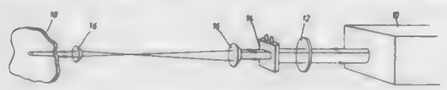
Peter H. Dickinson, and Geoffrey M. Proudley, both of Filton, United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Jan. 11, 1990, Ser. No. 463,683

Claims priority, application United Kingdom, Jan. 11, 1989, 8900550.8

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.69 11 Claims



1. A method of treating a surface to reduce the drag associated therewith, the surface including at least a layer of polymer material, said method comprising irradiating said surface with laser radiation in the ultraviolet waveband to provide a drag-reduction pattern therein.

4,994,640

WELDING ELECTRODE

Samuel D. Kiser, Catawba, N.C., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Apr. 2, 1990, Ser. No. 502,638

Int. Cl.[5] B23K *35/22*

U.S. Cl. 219—145.22 7 Claims

1. A flux cored welding electrode, the electrode comprising a sheath and a core, the sheath consisting essentially of about 40–50% nickel, about 11–20% manganese, up to about 1.5% carbon, the balance iron and residual impurities, and the flux consisting essentially of about 3.75–40% carbon, about 5–40% manganese, about 2.5–10% silicon, about 0.1–10% aluminum, about 1.5–5% calcium, about 1–5% magnesium, about 30–80% calcium fluoride, up to about 15% Na_3ALF_6, about 1.5–10% manganese oxide, and up to about 10% additional fluorides.

4,994,641

BEVERAGE BREWER WITH AN ELECTRIC FLOW-THROUGH HEATER OPERABLE IN TWO POWER STEPS

Heinz Schiebelhuth, Frankfurt, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 29, 1989, Ser. No. 400,168

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830633

Int. Cl.[5] F24H *1/10*

U.S. Cl. 219—308 12 Claims

1. A beverage brewer comprising an electrically operated flow-through heater, a heating resistor thermally coupled to said heater, said heating resistor having first and second leads, an electric conductor directly connecting said first lead of said heating resistor to a first power source terminal, a main conductor, a secondary conductor, said second lead of said heating resistor being adapted to be connected to a second power source terminal by either said main conductor or said secondary conductor, said secondary conductor including a switching element for reducing the heating power of said heating resistor, a first switch for connecting said second power source terminal to said main conductor, a second switch for connecting said second power source terminal to said secondary conductor, a first pilot lamp having a first lead connected to said electric conductor and a second lead adapted to be connected to said second power source terminal by closing of said first switch, a second pilot lamp having first and second leads, said second lead of said first pilot lamp being dead-ended in the open condition of said first switch and not connected to said main conductor until said first switch is closed, and said first lead of said second pilot lamp being connected to said electric conductor and said second lead of said second pilot lamp being dead-ended with said second switch in the open position, and not connected to said secondary conductor until said second switch is closed.

2. The beverage brewer of claim 1 wherein said second switch has first and second contact surfaces, and an additional contact which is electrically connected to said second lead of said second pilot lamp, said additional contact as said second switch closes being connected to said secondary conductor before contact is established between said first and second contact surfaces.

3. The beverage brewer of claim 2 wherein said secondary conductor is connected to said second contact surface and said second power source terminal is connected to said first contact surface of said second switch, said contact surfaces being adapted to be connected by movement of an electrically conducting contact member, and said additional contact is comprised of a contact spring fixedly located in the housing of said second switch and extending into the range of motion of said contact member, said spring resiliently engaging said contact member on movement of said contact member in the closing direction of said second switch before said contact member establishes contact between said first and said second contact surfaces.

4,994,642

SHEET HEATING DEVICE

Yumio Matsumoto, Kasugai; Yasuo Kimura, Ichinomiya, and Osamu Takagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 24, 1989, Ser. No. 425,919

Claims priority, application Japan, Oct. 25, 1988, 63-139771[U]; Oct. 25, 1988, 63-139772[U]; Oct. 25, 1988, 63-139773[U]; Oct. 25, 1988, 63-139774[U]; Oct. 25, 1988, 63-139775[U]

Int. Cl.[5] G03G *15/20*

U.S. Cl. 219—388 12 Claims

1. A sheet heating device for heating a sheet while the sheet is being fed, comprising:

a sheet feed path along which the sheet is fed;

a heater unit spaced from said sheet feed path; and

a slotted screen sheet protective member disposed between said sheet feed path and said heater unit, said sheet protective member having a plurality of holes defined therein for passing a heated air from said heater unit toward said sheet feed path, said holes extending in a direction inclined to the sheet feed path.

4,994,643

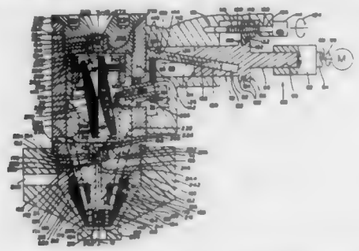
ELECTRICAL DISCHARGE MACHINE APPARATUS TILTED CURRENT PICKUP

Thomas J. Truty, South Barrington; William R. Fricke, Bloomingdale; James M. Ceriale, Green Oaks, all of Ill.; Jule L. French, Yoder, and Kevin M. Newell, Marion, both of Ind., assignors to Fort Wayne Wire Die, Inc., Fort Wayne, Ind. and T-Star Industrial Electronics Corp., Wheeling, Ill.

Filed Mar. 17, 1989, Ser. No. 325,283

Int. Cl.[5] B23H *7/10*

U.S. Cl. 219—69.12 71 Claims



1. A current pickup assembly for placing electric current on an electrical discharge machine apparatus moving wire electrode having a normal straight line of travel, said current pickup assembly comprising:

a conductive body;

a bore in said conductive body for receiving the wire electrode therethrough, said bore having a longitudinal axis and a wire contact wall;

wherein said bore longitudinal axis is at an angle with respect to the normal straight line of wire travel, and whereby the moving wire electrode contacts said contact wall; and,

means for rotating said body about said bore longitudinal axis.

4,994,644

APPARATUS FOR OVERHEAD SUBMERGED ARC WELDING

Pavel A. Vareschuk, ulitsa Prazhskaya, 3, kv. 426; Valentin D. Kovalev, ulitsa Malo-Kitaevskaya 58, kv. 2; Vsevolod N. Bernadsky, ulitsa A. Barbjusa, 22/26, kv. 15; Vladimir F. Biitsev, prospekt Mitra, 13v, kv. 10, all of Kiev; Pavel S. Nefedov, ulitsa Gagarina, 6, kv. 84, Donetskaya oblast, Zhdanov; Valentin P. Sadikov, ulitsa Granitnaya, 110, kv. 67, Donetskaya oblast, Zhdanov, and Evgeny N. Chilibin, prospekt Metallurgov, 127a, kv. 114, Donetskaya oblast, Zhdanov, all of U.S.S.R.

PCT No. PCT/SU88/00264, § 371 Date Feb. 27, 1990, § 102(e) Date Feb. 27, 1990, PCT Pub. No. WO89/11946, PCT Pub. Date Dec. 14, 1989

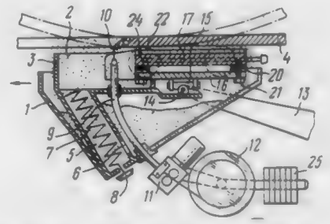
PCT Filed Dec. 14, 1988, Ser. No. 460,955

Claims priority, application U.S.S.R., Jun. 6, 1988, 4429055

Int. Cl.[5] B23K *9/18*

U.S. Cl. 219—73.2 3 Claims

1. An apparatus for overhead submerged arc welding, comprising: a hopper containing flux pivotally mounted on a suspension for rotation about a pivot pin, having a welding head provided with a nozzle for supplying a consumable-electrode and means for supplying flux and pressing it against a work being welded in a zone of the nozzle, a bowl accommodated in the hopper, an end of the nozzle for supplying the consumable electrode extending through the bowl, and a forming means having an adjusting bar for providing a preset pressure at various points along a joint being welded, mounted on the suspension, said forming means having copying members and being mounted for swinging movements in the longitudinal and transverse planes and for vertical adjustment with respect to the work being welded, the forming means comprising a U-shaped body having an open top part facing towards the



work being welded, legs of the body having, on the side of the nozzle, a pair of diverging wedge-shaped projections, the adjusting bar being provided inside the U-shaped body along the joint being welded, and the copying members being placed outside the U-shaped body on either side of its legs.

4,994,645

APPARATUS FOR OVERHEAD SUBMERGED-ARC WELDING

Pavel A. Vareschuk, ulitsa Prazhskaya, 3, kv. 426; Valentin D. Kovalev, ulitsa Malo-Kitaevskaya 58, kv. 2; Mikhail M. Ivanenko, prospekt Vatutina, 8, kv. 127; Nikolai T. Privalov, ulitsa Prazhskaya, 3, kv. 118; Vladimir I. Galinich, ulitsa Krasnoarmeiskaya 145, korpus 4, kv. 148; Anatoly V. Zelevsky, ulitsa Geroev Stalingrada, 48, kv. 64, and Georgy L. Atamanchuk, ulitsa Zatonskogo 27a, kv. 47, all of, Kiev, U.S.S.R.

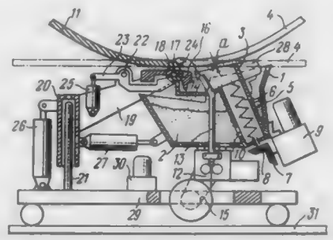
PCT No. PCT/SU88/00260, § 371 Date Feb. 6, 1990, § 102(e) Date Feb. 6, 1990, PCT Pub. No. WO89/11943, PCT Pub. Date Dec. 14, 1989

PCT Filed Dec. 14, 1988, Ser. No. 460,927

Claims priority, application U.S.S.R., Jun. 6, 1988, 4429059

Int. Cl.[5] B23K *9/18*

U.S. Cl. 219—73.2 2 Claims



1. An apparatus for overhead submerged-arc welding, comprising: a pivotally mounted hopper containing flux supported by a pivot pin and having a bowl which has an open part facing towards a work being welded and communicates with a driven auger feeder for supplying and pressing the flux to form a flux backing, a welding nozzle for supplying a consumable electrode extending through the bowl and a forming means provided adjacent to the welding nozzle above the brim of the open part of the bowl and mounted on a suspension for swinging in longitudinal and transverse planes, said apparatus further comprising a flux backing thickness pickup connected to a controlled drive of the auger feeder for varying the number of revolutions of the auger of the driven auger feeder during a preset time period.

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4,994,646

PULSE ARC DISCHARGE WELDING APPARATUS

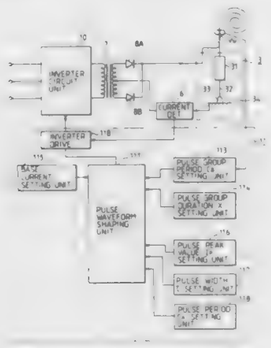
Yoichiro Tabata; Shigeo Ueguri, and Yoshihiro Ueda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Filed May 18, 1989, Ser. No. 353,430

Claims priority, application Japan, May 19, 1988, 63-122508; Oct. 20, 1988, 63-265083

Int. Cl.[5] B23K *9/09*

U.S. Cl. 219—130.51 **18 Claims**



1. A pulse arc discharge welding apparatus comprising:

a pulse current waveform control circuit for outputting a series of current pulses provided in pulse current groups, said pulse current groups being spaced apart by a predetermined interval, said current pulses each having a duration that is short relative to a duration of said pulse current groups and to said predetermined interval, said control circuit including base current output means for outputting at least one predetermined continuous base current and superimposing means for superimposing said pulse current groups on said at least one predetermined continuous base current;

pulse arc current supplying means for outputting a pulse arc current according to an output of said pulse current waveform control circuit; and

arc welding means for performing pulse arc discharge with an output of said pulse arc current supplying means, to carry out a pulse arc welding operation.

4,994,647

COVERED ELECTRODE FOR USE IN ARC WELDING OF CR-MO TYPE LOW ALLOY STEELS

Osamu Tanaka, Fujisawa; Shogo Natsume, Chigasaki, and Akinobu Goto, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 16, 1990, Ser. No. 480,974

Claims priority, application Japan, Feb. 21, 1989, 1-41173

Int. Cl.[5] B23K *35/22*

U.S. Cl. 219—146.23 **4 Claims**

1. A covered electrode for use in arc welding of Cr-Mo low alloy steel, said covered electrode being controlled to contain, through adjustment of the contents of additive elements in the core wire and/or the flux thereof, C≦0.12%, Mn≦1.0%, Si≦0.4%, Cr=1.9–3.5%, Mo=0.85–1.5%, Ni≦0.2%, N≦0.017%, V=0.16–0.4% and Nb=0.002–0.045% in a range according to Equation (1) below, and to have the value of P of Equation (2) below in the range of 1.00–1.70;

$$M=\{Bw\times[M(\%)]w\}+\{Af/1-Af\times Bf\times[M(\%)]f\} \quad (1)$$

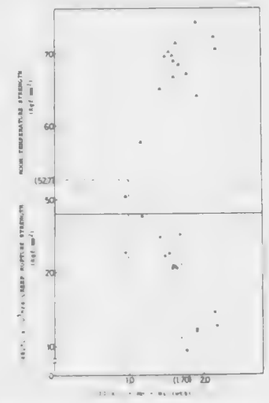
wherein

M: Content (%) of said additive element,

Bw: Coefficient of yield in the deposit metal of said element supplied from said core wire,

Bf: Coefficient of yield in the deposit metal of said element supplied from said flux,

[M(%)]w: Content (%) of the core wire constituent element in the total mass of said core wire,



[M(%)]f: Content (%) of the flux constituent element in the total mass of said flux, and

Af: Weight ratio (%) of the coated flux in the total mass of said electrode.

$$P=10\times C+Mn+Ni\ (\%). \quad (2)$$

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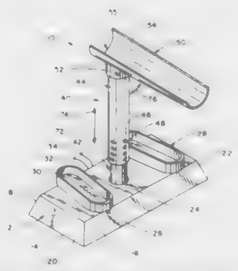
DEVICE FOR SUPPORTING A USER'S LEG

Yamila Gil, 13700 SW. 18th Ter., Miami, Fla. 33175

Filed Aug. 7, 1989, Ser. No. 390,275

Int. Cl.[5] A61H *33/00;* **A61F** *7/00*

U.S. Cl. 219—217 **1 Claim**



1. A device for supporting a user's leg during a pedicure comprising:

(A) a base having a top surface;

(B) two liquid-accommodating containers mounted on said top surface;

(C) a pedestal assembly mounted on said base between said liquid-accommodating containers and including

(1) a cylindrical pedestal element mounted on said base and having a plurality of pedestal holes defined therein to be arranged in rows that are spaced apart along the length of said cylindrical pedestal element and columns that are spaced apart around the circumference of said cylindrical pedestal element,

(2) a tubular sleeve telescopingly receiving said pedestal element and including a plurality of sleeve holes defined therein to be arranged in rows that are spaced apart along the length of said tubular sleeve and columns that are spaced apart around the circumference of said tubular sleeve, and

(3) a first bolt which is sized to fit through said pedestal holes and through said sleeve holes to attach said sleeve to said pedestal element when said pedestal and sleeve holes are aligned;

(D) a leg support assembly attached to said sleeve and including

(1) a cap which receives said sleeve, and

(2) a channel-like element attached at a rear end thereof to said cap to extend away from said cap and for supporting a use's leg;

(E) an angle adjusting means on said cap, said angle adjusting means including

(1) an upstanding arm connected at one end thereof to said cap, and having a second end spaced from said cap,

(2) a hinge element on said upstanding arm second end and being connected to said channel-like member rear end and connecting said channel-like member to said cap,

(3) an elongate arcuate arm mounted on said cap and having a plurality of arm holes defined therein at positions which are spaced apart from each other along a length dimension of said elongate arcuate arm,

(4) a bolt-receiving hole defined in said channel-like element near said channel-like member rear end,

(5) a second bolt sized to be received through said channel-like element holes and said arm holes to couple said arm to said channel-like element,

(6) a cap hole in said cap and a top hole defined in said sleeve and a third bolt which is inserted through said cap hole and said sleeve top hole,

(7) one of said arcuate arm holes being defined to cooperate with one of said channel-like member holes to position said channel-like member in contact with said cap when said second bolt is received through said cooperating holes; and

(F) a heater unit in at least one of said liquid-accommodating containers.

4,994,649

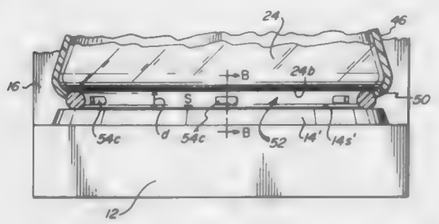
TEMPERATURE ATTENUATOR TO CONTROL HEATING OF THE CONTENTS OF A CONTAINER AND METHOD OF USING THE SAME

Paul G. Roland, Sr., 18 Woodridge Cir., West Hartford, Conn. 06107, and Paul G. Roland, Jr., 254 Richard St., #4, Newington, Conn. 06111

Continuation-in-part of Ser. No. 278,250, Nov. 30, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 418,035

Int. Cl.[5] H05B *3/68;* **F24C** *15/10*

U.S. Cl. 219—433 **23 Claims**



1. A temperature attenuator for a container having a container bottom which is dimensioned and configured to be seated upon a hot plate for heating the contents of the container, the temperature attenuator comprising:

(a) a thermally insulating spacer means having a central opening defined by a continuous peripheral structure is dimensioned and configured to be interposed between the container bottom and the hot plate to thereby enclose an air space between the container bottom and the surface of the hot plate, whereby the support means, when in its interposed position, supports the container bottom in spaced, facing proximity to the hot plate; and

(b) a retainer means secured to the spacer means and dimensioned and configured to retain the spacer means in its interposed position.

4,994,650

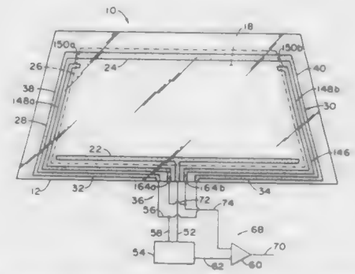
ELECTRIC FIELD DETECTOR FOR A HEATABLE WINDSHIELD

Harry S. Koontz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1989, Ser. No. 444,206

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—497 **21 Claims**



1. An electrically heatable transparency comprising:

a non-electrically conductive substrate;

an electroconductive heating member on said substrate;

a first bus bar electrically connected to said heating member at a first location;

a second bus bar electrically connected to said heating member at a second location spaced from the first location;

means for detecting voltage in said electroconductive heating member; and

means for electrically insulating said detecting means from said first and second bus bars.

4,994,651

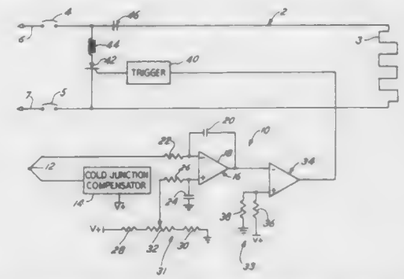
SOLID STATE TEMPERATURE DEPENDENT DIRECT VOLTAGE INTERRUPTER FOR A HEATER CIRCUIT

Thad M. Jones, 1302 High St., South Bend, Ind. 46618

Filed Jun. 2, 1989, Ser. No. 360,595

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—497 **1 Claim**



1. In combination, a heater circuit including a heater electrically associated with a voltage source with a circuit breaker member connected between said heater and said voltage source and an interrupter means for directly activating said circuit breaker member and interrupting voltage to said heater, said interrupter means being responsive to an over temperature condition in said heater, said interrupter means further including:

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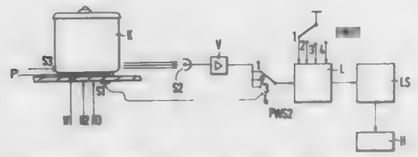
sensing means for directly sensing the temperature of said heater and outputting a voltage,
compensation means connected to said sensing means for compensating said voltage from said sensing means for ambient temperature,
comparator means connected to said sensing means and compensation means for comparing the compensated voltage from said sensing means to a predetermined maximum voltage representing a maximum temperature, said comparing means outputting a gating voltage when said compensated voltage from said sensing means is greater than said predetermined maximum voltage;
a switch means connected between said voltage source and said heater for conducting current between the voltage source supply lines, said switch means including a triac, the gate lead of said triac being connected to said comparing means, said triac conducts current between said lines when said comparing means outputs said gate voltage,
wherein current flow through said triac directly causes excessive current flow through said circuit breaker member causing said circuit breaker member to remove said voltage source from said heater.

4,994,652

DEVICE FOR CONTROLLING THE HEATING OUTPUT OF THE HEATING ELEMENT OF A COOKING OR HEATING PLATE

Kurt Wolf, and Wolfram Andre, both of Wildbad, Fed. Rep. of Germany, assignors to Fissler GmbH, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,625
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811925
Int. Cl.[5] H05B *1/00*
U.S. Cl. 219—497 **15 Claims**



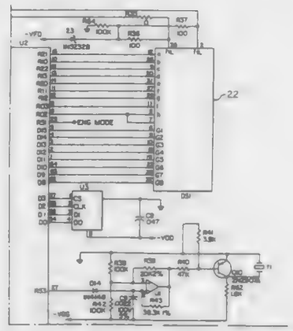
1. A control device for controlling a heat output of a heating element of a heating plate, on which a cooking vessel may be placed and heated, in which a cooking vessel temperature of the cooking vessel is determined by means of a plurality of temperature sensors, conveyed to a logic circuit, and used in said logic circuit for the control of the heating element by means of an output stage which depends on an actual temperature determined and a temperature increase in a heating phase, said control device comprising:
a program selection switch (PWS1, PWS2) provided for selection of cooking processes for rapid cooking, steaming, and warming, for each of the cooking processes said program selection switch (PWS1, PWS2) has a coordinated switching position (1, 2, 3), and for a roasting process, said program selection switch (PWS1, PWS2) has an additional switching position (4);
a first sensor (S1) of said temperature sensors in an area of said heating plate (P) additionally detecting said actual temperature whereby said switching positions (1, 2, 3) of said program selection switch (PWS1, PWS2) coordinate the cooking processes the temperature signal of the temperature sensors (S2, S3) and, in the additional switching position (4) for the roasting process the temperature signal is conveyed from said first sensor (S1) of said temperature sensors to a logic circuit (L) for evaluation therein;
the heating output of the heating element (H) is controlled during the heating phase by means of preset programs of said logic circuit (L) by switching element (H) on and off by means of the output stage (LS) depending on the actual temperature detected by means of at least one of the cooking temperature sensors (S2, S3) and said first sensor (S1).

4,994,653

CONTROL UNIT AND METHOD OF MAKING THE SAME

Brian J. Kadwell, Holland; Daniel L. Fowler, Kentwood, and Gregory F. Gawron, Holland, all of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 259,189, Oct. 18, 1988, Pat. No. 4,899,034, which is a division of Ser. No. 939,872, Dec. 10, 1986, Pat. No. 4,782,215. This application Nov. 30, 1989, Ser. No. 444,444
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—508 **18 Claims**



1. In a temperature regulating control unit comprising a RTD temperature sensor means, means for applying electrical signal means to said sensor means, and a microcomputer for receiving digital signal means from said sensor means in relation to the temperature being sensed by said sensor means, the improvement wherein said means for applying electrical signal means to said sensor means has means for applying a varying voltage to said sensor means and comparing the resultant current level through said sensor means at certain values of said voltage applied thereto with a fixed reference current level that has been predetermined as being the current level that would exist through said sensor means when that particular certain voltage is being applied to said sensor means while said sensor means would be sensing a particular certain temperature within a predetermined temperature range, said means for applying said varying voltage to said sensor means having means to apply said varying voltage in an increasing manner from a starting low voltage toward a higher stopping voltage until a particular certain voltage between said starting voltage and said stopping voltage is applied to said sensor means that creates a current level through said sensor means that substantially equals said fixed reference current level whereby said microcomputer will receive said digital signal means in a manner to determine the actual temperature being sensed by said sensor means at that time and when said actual temperature is within said temperature range.

4,994,654

HEATER COIL MOUNTING FOR A DRYER

Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Mississauga, Canada

Filed Sep. 27, 1989, Ser. No. 413,151
Claims priority, application Canada, Dec. 1, 1988, 584731
Int. Cl.[5] H05B *3/06*
U.S. Cl. 219—532 **9 Claims**

1. A support bracket for a heating coil mounting assembly comprising: a plate of unitary construction having at least one opening therethrough for receiving and supporting an insulating bushing; a pair of integral support legs at one end of said plate and adapted for engagement within cooperating slots in a support member to retain said plate perpendicular to said member; at least one section of said plate being folded upon itself to form a retaining rim for said insulating bushing.

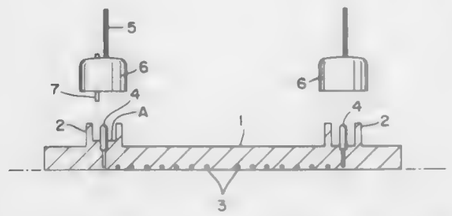


4,994,655

ELECTRO-FUSION JOINT

Takayuki Handa, Iwakuni, and Naotake Uda, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/01077, § 371 Date Jun. 8, 1989, § 102(e) Date Jun. 8, 1989, PCT Pub. No. WO89/03955, PCT Pub. Date May 5, 1989
PCT Filed Oct. 21, 1988, Ser. No. 363,883
Claims priority, application Japan, Oct. 22, 1987, 62-162069
Int. Cl.[5] H05B *3/48*
U.S. Cl. 219—535 **5 Claims**



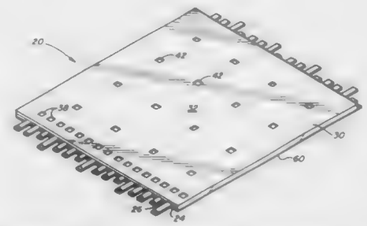
1. An electro-fusion joint for use with electrical control means for controlling the electrical power supplied to the joint from an electric power supply, said electro-fusion joint comprising
a joint body having an electric heating element disposed therein; and
a mating connector, electrically connected to said heating element, formed integrally with said joint body, said mating connector being integrally provided with a coding portion, said coding portion being configured to provide predetermined information usable by said electrical control means for controlling the electrical power supplied to said joint said mating connector being connectable to a connector provided with a sensor for detecting said configuration of said coding portion, said connector being electrically connected to said electric power supply, said sensor being operatively connected to said electrical control means and providing a signal representative of said predetermined information to said electrical control means, upon connection of said mating connector and said connector and detection of said configuration of said coding portion by said sensor.

4,994,656

LOGIC DESIGN SLIDE RULE

Wang C. Ng, 6545 Calvine Rd., Sacramento, Calif. 95823

Filed Nov. 14, 1988, Ser. No. 270,079
Int. Cl.[5] G06C *27/00*
U.S. Cl. 235—69 **13 Claims**



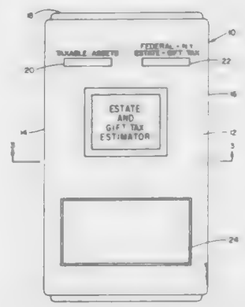
1. A slide rule for displaying indicia including:
front and rear planar covers spaced apart from each other and having means for viewing indicia;
a plurality of slides having front and rear slide beam surfaces, the slides provided in a space between the covers so as to be slideably moveable with respect to the covers; and
a plurality of indicia display plates attached to the front beam surfaces of the slides, at least one plate to a slide, the plates sandwiched between the front beam surfaces of the slides and the front cover.

4,994,657

ESTATE AND GIFT TAX ESTIMATOR

Mark S. Charwat, 19 Estate Dr., Jericho, N.Y. 11753

Filed Sep. 15, 1989, Ser. No. 408,138
Int. Cl.[5] G06G *1/02*
U.S. Cl. 235—70 R **8 Claims**



1. A device for estimating estate and gift taxes comprising:
a front cover substantially rectangular in shape having two sides forming a width and two sides forming a length of said device, said two sides forming said length being longer than said two sides forming said width,
a back cover substantially identical in length and width as said front cover, and attached to said front cover along said two sides forming said length, said front cover spaced from said back cover such that said device forms a pocket open at a top and bottom as defined by said two sides forming said width,
an insert card having a front and back and having a length slightly greater than the length of said front and back covers and a width slightly less than the width of said

covers, said insert card slidably mounted in said pocket formed between said front and back covers,

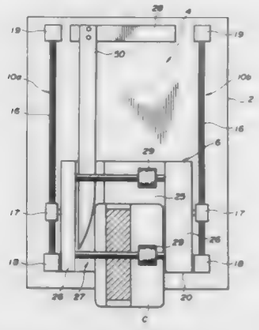
wherein said front and back covers are each provided with at least two cutout forming windows adjacent to each other and corresponding in position to columns of numbers on said insert card, said columns of numbers being parallel to said sides forming the length of said covers and said insert card and being positioned a same distance from both of said length sides and both of said width sides, said columns further being located on both the front and back of said insert card, said columns of numbers on said insert card comprising two columns on each of said front and back of said insert card, one column on each of said front and back corresponding to taxable assets and one column on each of said front and back corresponding to estate and gift taxes, such that a taxable asset number is adjacent to a corresponding tax number for display in corresponding windows of said front and back covers.

4,994,658

APPARATUS FOR CONTROLLING MOVEMENT OF AN OPTICAL MEMORY CARD FOR DATA TRANSFER THEREWITH

Shunzo Takahashi; Yukio Hamasaki; Akiyoshi Hashimoto, and Hidefumi Suzuki, all of Tokyo, Japan, assignors to CSK Corporation, Tokyo, Japan

Division of Ser. No. 4,343, Jan. 16, 1987, Pat. No. 4,933,537.
This application Feb. 13, 1990, Ser. No. 454,241
Claims priority, application Japan, Jan. 16, 1986, 61-006827; Sep. 18, 1986, 61-219962; Sep. 20, 1986, 61-222726
Int. Cl.[5] G06K *7/015, 7/10*
U.S. Cl. 235—473 14 Claims



1. A reader/writer apparatus suitable for use with an optical memory card for reading and/or writing data with respect to a data storing face of the optical memory card, comprising:

carriage means for receiving, holding and accurately transporting an optical memory card to a reading and/or writing position;

a stationary regulating member mounted to a stationary portion of the apparatus and disposed to extend through a portion of said carriage means transporting said optical memory card from the reading and/or writing position to a card inserting opening of the apparatus and also to abut against one side of the optical memory card that is being held and transported by the carriage means for regulating the angular orientation of the card with respect to its direction of motion; and

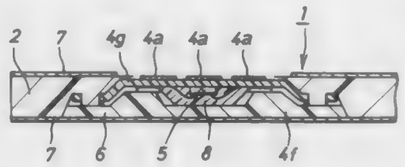
carriage driving means for driving the carriage.

4,994,659

IC CARD

Isao Yabe, Tokorozawa; Yoshihiro Shimada, Tokyo; Kazumi Machida, Higashiyamato, and Hiroyuki Kaneko, Kunitachi, all of Japan, assignors to Citizen Watch Col, Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,332
Claims priority, application Japan, Apr. 28, 1988, 63-105611; May 27, 1988, 63-129850; Jun. 10, 1988, 63-141574
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 10 Claims



1. An IC card comprising an IC module including a circuit board having contact patterns formed on one surface thereon and an IC chip mounted on the other surface of said circuit board, and a card base for housing said IC module so as to expose the contact patterns, wherein

said circuit board of said IC module has a pattern portion on which the contact patterns are formed and a bent portion formed by bending said pattern portion,

said card base includes an opening for exposing the contact patterns of said IC module, and a clamping portion, formed on a peripheral portion of said opening, for fixing said bent portion, and

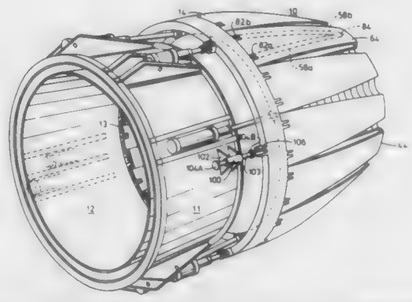
said bent portion of said IC module is fixedly clamped by said clamping portion such that the contact patterns are arranged on substantially the same plane as a surface of said card base.

4,994,660

AXISYMMETRIC VECTORING EXHAUST NOZZLE

Thomas A. Hauer, Westchester, Ohio, assignor to Hitachi, Ltd., Tokyo and Tagasangyo, Ltd., Hitachi, both of, Japan

Filed Apr. 11, 1989, Ser. No. 336,369
Int. Cl.[5] B64C *15/06*
U.S. Cl. 239—265.41 34 Claims



1. A means for vectoring the thrust of an axisymmetric convergent/divergent nozzle comprising:

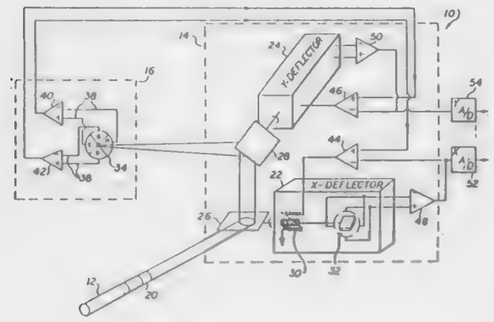
a divergent nozzle section having a longitudinal axis, said divergent nozzle section comprising a plurality of divergent flaps and a means for changing said divergent nozzle section from axisymmetrical about said longitudinal axis to asymmetrical.

4,994,661

OPTICAL TWO-DIMENSIONAL SERVO-LOOP FOR LASER BEAM STABILIZATION AND/OR POSITION ENCODING

Wojciech Majewski, Ottawa, Canada, and David Plusquellic, Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 23, 1989, Ser. No. 289,990
Int. Cl.[5] G01J *1/20;* G01B *11/26;* B23K *26/32*
U.S. Cl. 250—203.1 10 Claims



2. An electro-optical tracking system comprising:

means for producing a coherent beam of light;

first means for deflecting the beam of light with respect to a first direction corresponding to a first signal, and for producing a second signal corresponding to the deflection of the light beam with respect to the first direction;

second means for deflecting the beam of light with respect to a second direction corresponding to a third signal, and for producing a fourth signal corresponding to the deflection of the light beam with respect to the second direction, said second direction being approximately orthogonal to the first direction, said second deflecting means aligned to deflect the beam of light that has been deflected by the first deflecting means;

means for detecting the location of the light beam with respect to the first and second directions, said detecting means aligned to receive the beam of light that has been deflected by the second deflecting means, said detecting means providing the first signal and third signal to the first deflecting means and the second deflecting means, respectively, said first signal corresponding to the detecting location of the beam with respect to the first direction and causing the first deflecting means to deflect the light beam to a first predetermined position with respect to the first direction, said third signal corresponding to the detecting location of the beam with respect to the second direction and causing the second deflecting means to deflect the light beam to a second predetermined position with respect to the second direction; and

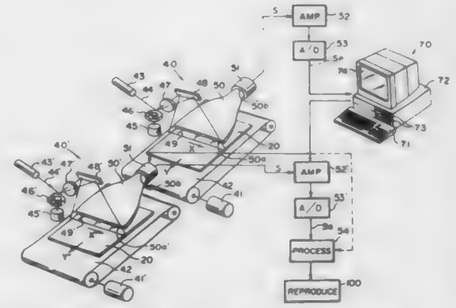
means for producing and detecting said second and fourth signals, which independently control the position of the first and second deflecting means with respect to the first and second directions, said second and fourth signals not limited to the range of motion of the first and second deflecting means.

4,994,662

RADIATION IMAGE READ-OUT APPARATUS AND METHOD FOR OPERATING THE SAME

Takeshi Funahashi, and Kazuhiro Hishinuma, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 12, 1990, Ser. No. 508,677
Claims priority, application Japan, Apr. 14, 1989, 64-94902
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 9 Claims



1. A radiation image read-out apparatus comprising:

(i) a read-out section provided with:

a preliminary read-out means for carrying out a preliminary read-out operation wherein a stimulable phosphor sheet having a radiation image stored thereon is exposed to stimulating rays, which cause said stimulable phosphor sheet to release part of energy stored thereon during its exposure to radiation as light emitted in proportion to the amount of said stored energy, and the emitted light is detected, and obtaining a preliminary read-out image signal which approximately represents said radiation image, and

a final read-out means for carrying out a final read-out operation wherein said stimulable phosphor sheet is exposed to stimulating rays having an energy level higher than that of said stimulating rays used during the preliminary read-out operation, and light emitted by said stimulable phosphor sheet during its exposure to the stimulating rays is detected, and obtaining a final readout image signal which represents said radiation image,

(ii) an image processing section provided with an image processing means for carrying out image processing on said final read-out image signal, and

(iii) a condition adjusting section which is provided with a plurality of modes of adjusting read-out conditions for the final read-out operation and/or image processing conditions to be used during the image processing, including a region selecting mode, said adjustment being effected on the basis of a mean-level value of said preliminary read-out image signal corresponding to a single region selected from among a plurality of regions on said stimulable phosphor sheet, and in which the read-out conditions for the final readout and/or the image processing conditions are determined in a mode selected from among the plurality of said modes of adjusting the read-out conditions for the final readout and/or the image processing conditions,

wherein said condition adjusting section is constituted of:

(a) a condition operating means for determining the read-out conditions for the final readout and/or the image processing conditions and feeding the information about the determined read-out conditions for the final readout into said final read-out means and/or feeding the information about the determined image processing conditions into said image processing means.

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(b) a first input means with which a mode selected from among the plurality of said modes of adjusting the read-out conditions for the final readout and/or the image processing conditions is designated, and from which the information about the designated mode is fed into said condition operating means,

(c) a display means for displaying an image represented by said preliminary read-out image signal,

(d) a judgment means for judging whether said region selecting mode has been or has not been designated, and

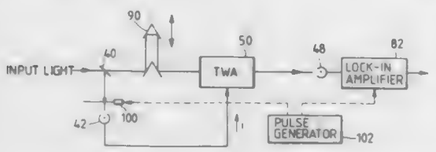
(e) a second input means with which a region to be used during the determination of the read-out conditions for the final readout and/or the image processing conditions, said region being selected from among the plurality of said regions on said stimulable phosphor sheet, a desired reproduced image density corresponding to the mean-level value of said preliminary read-out image signal corresponding to said region, and a desired image signal range including said mean-level value are designated with the timing independent of the designation of a mode effected with said first input means, and from which the information about said region, the information about said desired reproduced image density, and the information about said desired image signal range are fed into said condition operating means.

4,994,663

LIGHT INTENSITY CORRELATING APPARATUS

Shinichiro Aoshima; Tsuneyuki Urakami, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 23, 1989, Ser. No. 355,608
Claims priority, application Japan, May 30, 1988, 63-132050
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 R **9 Claims**



1. An apparatus for measuring an autocorrelation waveform of intensity of input light, comprising:

beam splitting means for dividing said input light into a first and second light beams, said second light beam having an intensity;

photoelectric converting means for converting said first light beam into an electrical signal;

delay means for creating a time delay between said second light beam and said electrical signal;

optical modulating means for modulating said intensity of said second light beam in accordance with said electrical signal to produce output light bearing said autocorrelation waveform, said autocorrelation waveform being a function of said intensity of said input light and said time delay between said second light beam and said electrical signal; [and]

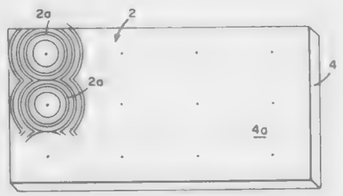
photodetecting means having a response time less than said delay time, for detecting said output light from said optical modulating means.

4,994,664

OPTICALLY COUPLED FOCAL PLANE ARRAYS USING LENSLETS AND MULTIPLEXERS

Wilfrid B. Veldkamp, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 27, 1989, Ser. No. 328,626
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—216 **11 Claims**



1. A detector array comprising:

a. a substrate having a top side and a back side;

b. an array of curvilinear diffractive lenses formed on the top side of the substrate;

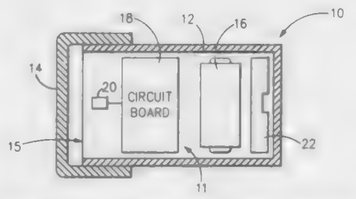
c. an array of sensor elements formed on the back side of the substrate, the sensor elements being disposed so that each sensor is aligned with a corresponding lens within the lens array.

4,994,665

APPARATUS FOR PROVIDING A REMOTELY DISCERNIBLE SIGNAL UPON PARTURITION OF A PREGNANT LIVESTOCK OR ZOOLOGICAL ANIMAL

William O. Wernsing, 125 Northview Rd., Ithaca, N.Y. 14850

Filed Jan. 4, 1990, Ser. No. 461,109
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 **20 Claims**



1. Apparatus for providing a remotely discernible signal upon parturition of a pregnant livestock or zoological animal comprising:

(a.) a housing having an internal cavity and an exterior perimeter configured for insertion into the birth canal of said pregnant animal;

(b.) means to retain said housing within said birth canal and to allow said housing to pass through said birth canal upon a fetus pushing said housing from said birth canal upon parturition;

(c.) means within said internal cavity of said housing adapted to generate an electric signal upon ejection from said birth canal;

(d.) a tone generator connected to said electric signal means for actuation thereby in response to emission of said electric signal; and

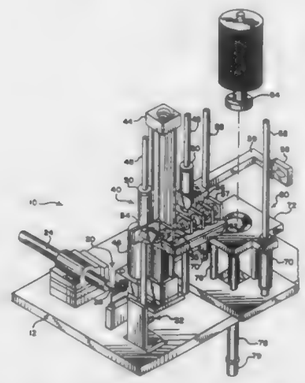
(e.) apparatus to remotely receive said tone generation, said receiving apparatus including means to provide a remotely perceivable signal whereby an attendant located a significant distance from the place of birth may be summoned to assist said animal and fetus as needed.

4,994,666

OPTICAL DISC COUNTER

John R. Higgison, and Thomas E. Derriso, both of Huntsville, Ala., assignors to Disctronics Manufacturing, Inc., Huntsville, Ala.

Filed Dec. 21, 1989, Ser. No. 454,379
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—222.2 **11 Claims**



3. An optical counter for use with a stack of discs of the type comprising at least one disc, said discs each including an outer edge and configured to define gaps between adjacent discs, said counter comprising:

a base;

means, connected to said base, for aligning a plurality of discs about an axis;

an optical source for generating a measuring beam;

means for focusing the measuring beam and directing the measuring beam at the stack of discs parallel to the discs;

means connected to said base for detecting the measuring beam after passing between the gaps between adjacent ones of the discs; and

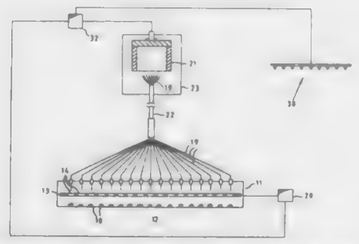
means responsive to the detecting means for generating a signal representative of the number of aligned discs.

4,994,667

SORTING APPARATUS WITH CONTROLLABLE WINDOWS AND FIBER OPTICS

Neville E. Brown, 1012 Kanarie Road, Randpark, Ridge Ext 7,, Randburg, Transvaal; David J. Hammond, 28 Wemmer Drive, Discovery, Florida, Transvaal, and Johannes H. Potgieter, Plot 1, Treesbank, Agricultural Holdings, Zevenfontein, Transvaal, all of South Africa

Filed Sep. 5, 1989, Ser. No. 402,817
Claims priority, application South Africa, Sep. 8, 1988, [illegible]/6675
Int. Cl.[5] G01N *9/04*
U.S. Cl. 250—223 R **9 Claims**



1. Light detection apparatus for determining which width zone of a stream of particles contains light-emitting particles, the apparatus comprising :

a) a plurality of openable and closable windows arranged across the width of the stream of particles to pass, when open, light emitted by particles in different width zones of the stream;

b) light detection means;

c) a plurality of optical fibres associated with the windows and arranged to transmit light passed by the windows to the light detection means for detection thereby;

d) means for opening and closing the windows; and

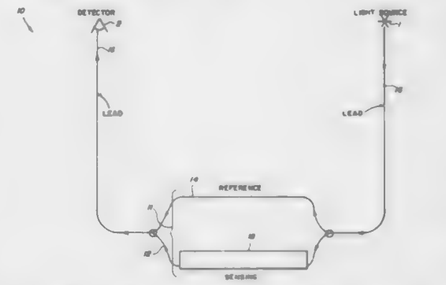
e) means for determining which window passed light detected by the detection means and accordingly which width zone of the stream the light emanated from.

4,994,668

PLANAR FIBER-OPTIC INTERFEROMETRIC ACOUSTIC SENSOR

Nicholas Lagakos, Silver Spring, Md., and Joseph A. Bucaro, Herndon, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1989, Ser. No. 402,174
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.19 **14 Claims**



1. A sensing portion for an interferometric acousto-optic sensor portion, comprising:

a concentrically wound or snaked sensor fiber having a solid light-transmitting core and a clad layer surrounding said core; and

a layer of a material within which said sensor fiber is embedded, said material having a bulk modulus of no greater than about $5(10^{10})$ dyn/cm^2 at 1 MHz at its ambient temperature of use, said layer being sufficiently thick to significantly increase the pressure sensitivity of said fiber within a frequency range of about 250–2500 Hz.

4,994,669

OPTO-ELECTRICAL JOYSTICK SWITCH HAVING A RESILIENT, RIGIDLY MOUNTED CENTRAL SHAFT

Michael A. Stern, 1010 N. Maclay Ave., San Fernando, Calif. 91340

PCT No. PCT/US89/00584, § 371 Jul. 29, 1990 § 102(e) Date Jul. 29, 1990
PCT Filed Jul. 29, 1990, Ser. No. 543,859
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—229 **15 Claims**

1. An opto-electrical joystick switch adapted for connection with electronic apparatus responsive to change in electrical state comprising:

(a) a housing having a separable top and bottom with an opening in the top and a cavity in the bottom;

(b) a resilient joystick shaft rigidly mounted within the cavity of the bottom portion of the housing extending beyond the housing top centrally through the opening thereof having the functional characteristics of returning to a center neutral position when manual external forces causing bending of the shaft are removed;

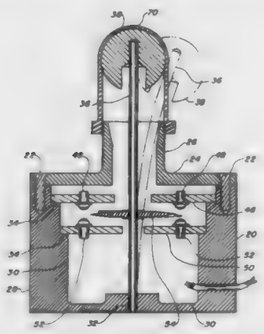
(c) a first printed circuit board having a plurality of light

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emitting diodes therein removably attached within an upper portion of the bottom housing cavity providing a light source for the switch;

(d) a second printed circuit board having a plurality of light detecting photodiode removably attached within a central portion of the bottom housing cavity with the photodiodes in direct alignment with the light emitting diodes providing a light sensing source for the switch;

(e) a light blocking commutator disc disposed upon said shaft between the first and second printed circuit boards



such that when the shaft is manually forced in a given direction, the light passing from an adjacent light emitting diode to a corresponding photodiode is blocked, interrupting communication therebetween; and,

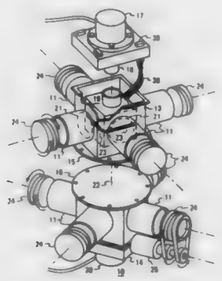
(f) signal circuit means operatively associated with each opposed light emitting diodes and photodiodes creating a defined circuit flowpath relative to the position the joystick shaft, creating a make or break correlation allowing a change in electrical characteristics defining a switch action;

4,994,670

DITHER SCANNED IR IMAGING SYSTEM HAVING A WIDE FIELD OF VIEW

Milton L. Noble, Liverpool, and Albert F. Milton, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 7, 1989, Ser. No. 447,912
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—235 18 Claims



1. A dither scanned imaging system providing predetermined elevation angle and azimuth angle coverage of a panoramic field of view referenced to the imaging system axis, said imaging system comprising:

(1) N objective lenses, each positioned at equal successive azimuth angles about said axis and forming an image of predetermined height and breadth in its image plane of an Nth sector shaped portion of said predetermined coverage, height and breadth in the image plane corresponding respectively to elevation angle and azimuth angle, where N is an integral number equal to 1 or more,

(2) N photodetector area arrays, each disposed in the image plane of said N objective lenses, each array comprising M columns of P photodetectors, the read out of which constitutes a frame, the photo- detectors in each column being tightly packed for full spatial sampling of the image of said coverage in height and said M columns being loosely packed in breadth for partial spatial sampling of the image of said coverage per frame, the column centers being spaced by the breadth of Q photodetectors,

(3) azimuthal scanning means for sequentially displacing each image in relation to the corresponding array in breadth by substantially the breadth of one photodetector, and repeating the displacement (Q−1) times to complete a dithered azimuthal scan for full spatial sampling of the image of said coverage in breadth, and

(4) means for reading out each array k times at each of said Q positions, where k is an integer, to obtain kQ frames for each completed azimuthal scan,

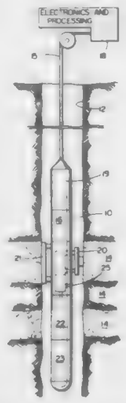
the arrangement providing P discrete samples of the coverage in elevation angle and (N×M×Q) discrete samples of the coverage in azimuth angle with increased detector integration time, decreased revisit time while requiring only a small azimuthal scanning angle for achieving substantial azimuthal coverage.

4,994,671

APPARATUS AND METHOD FOR ANALYZING THE COMPOSITION OF FORMATION FLUIDS

Kambiz A. Safinya, Ridgefield, and Jeffrey A. Tarvin, Brookfield Center, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 137,500, Dec. 23, 1987, abandoned.
This application Oct. 4, 1989, Ser. No. 418,748
Int. Cl.[5] G01V *9/00;* G01N *21/17*
U.S. Cl. 250—255 34 Claims



15. A borehole apparatus for analyzing the composition of a fluid obtained from a formation, said fluid comprised of at least one of water, oil, and gas, the apparatus comprising:

(a) a testing region;

(b) means for directing a sample of said fluid obtained from said formation into said testing region;

(c) a light source means for emitting light rays towards said fluid obtained from said formation in said testing region, said light source having a determinable spectrum;

(d) spectral detector means for detecting the spectrum of resulting rays which were emitted by said light source and which were at least one of scattered by and transmitted through said fluid, wherein said testing region, said means for directing, said light source means, and said spectral detector means, together at least partially comprise a borehole tool operating downhole in said formation such that said spectrum of resulting rays are detected downhole in said formation;

(e) data base means for storing spectral information of at least two of said water, oil and gas expected to be analyzed; and

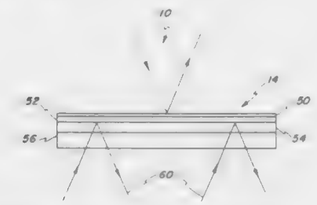
(f) processing means for obtaining said light source means spectrum and said detected spectrum and for substantially determining therefrom and from said spectral information of said data base means the composition of said fluid.

4,994,672

PYRO-OPTIC DETECTOR AND IMAGER

Leslie E. Cross; Amar S. Bhalla, both of State College, Pa.; Frank Ainger, Brockhall, United Kingdom, and Dragan Damjanovic, State College, Pa., assignors to Pennsylvania Research Corp., University Park, Pa.

Filed Sep. 20, 1989, Ser. No. 410,182
Int. Cl.[5] G01J *5/00;* G02F *1/00*
U.S. Cl. 250—330 8 Claims



1. An infrared imaging system comprising:

pyro-optic sensing means including a multilayer, planar sandwich structure comprising a film of energy absorbent material, a thin film of pyro-optic material selected from the group consisting of SbSI $BiVO_4$ and MoS_2, and a supporting thermally insulating layer transparent to an interrogating light beam, for receiving a thermal image on said energy absorbent material, said pyro-optic material exhibiting a change in its refractive index in response to changes in its temperature;

means for directing an interrogating optical beam onto said pyro-optic material, said optical beam being reflected and selectively altered by said pyro-optic material in accordance with local changes in tis refractive index; and means for receiving said reflected beam and responding to said selective reflectance alterations to derive a visible image of said thermal image.

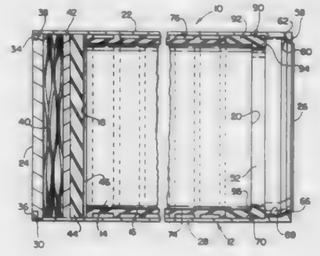
4,994,673

RUGGEDIZED SCINTILLATION DETECTOR

Louis Perna, Elyria; Christopher W. Linden, North Ridgeville, and Thomas C. Mincer, Maple Heights, all of Ohio, assignors to Solon Technologies, Inc., Solon, Ohio

Filed Jun. 6, 1989, Ser. No. 361,981
Int. Cl.[5] G01V *5/04*
U.S. Cl. 250—483.1 21 Claims

1. A scintillation detector comprising a scintillation crystal, a shock-absorbing boot comprising resilient material circumscribing said crystal, and a housing having a casing wall circumscribing said boot, whereby said boot is interposed between said crystal and said housing, and said boot having a



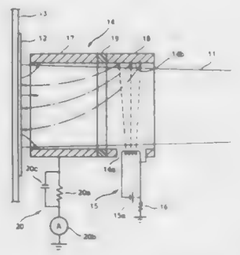
tubular wall and a plurality of outwardly directed protrusions for engaging said casing wall.

4,994,674

ION IMPLANTATION APPARATUS CAPABLE OF AVOIDING ELECTRIFICATION OF A SUBSTRATE

Tadamoto Tamai, Tokyo, and Junichi Murakami, Ehime, both of Japan, assignors to Sumitomo Eaton Nova Corporation, Tokyo, Japan

Filed May 8, 1990, Ser. No. 520,557
Claims priority, application Japan, May 9, 1989, 1-114097; May 19, 1989, 1-124518
Int. Cl.[5] H01J *37/317*
U.S. Cl. 250—492.2 7 Claims



1. In an ion implantation apparatus for injecting an ion beam into a substrate by guiding said ion beam in a predetermined direction, said substrate being located on a disk section transversely of said predetermined direction, said ion implantation apparatus comprising an electric conductor tube which is extended along said predetermined direction and which has an inner wall operable as a target section, electron supplying means for supplying said target section with a primary electron to emit a secondary electron from said target section and to thereby irradiate said secondary electron to the substrate, the improvement wherein said electric conductor tube comprises:

a first tube section located in proximity of said disk section;

a second tube section which is electrically insulated from said first tube section and which is remote from said disk section in comparison with said first tube section in said predetermined direction; said second tube section being used as said target section; and

ground means for grounding said first tube section to ground.

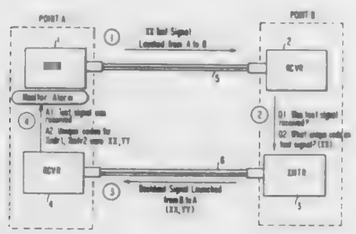
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4,994,675

METHOD AND APPARATUS FOR CHECKING CONTINUITY OF OPTIC TRANSMISSION

Paul Levin, Manhattan Beach, Calif., and Barry Minnerly, Rowayton, Conn., assignors to Rebo Research, Inc., New York, N.Y. and Meret, Inc., Santa Monica, Calif.

Filed Apr. 28, 1989, Ser. No. 345,138
Int. Cl.[5] G02B *27/00*
U.S. Cl. 250—551 23 Claims



1. An apparatus for checking continuity of optic transmission, comprising;

means for transmitting information optically;

means for receiving information from said transmission means;

means for detecting that said transmission means and said receiving means are in communication with each other so as to enable optical transmission therebetween, said detecting means including means for effecting transmission of a test signal from said transmitting means to said receiving means at a power level which is lower than that required for transmitting said information, said detecting means detecting successful reception of said test signal by said receiving means; and

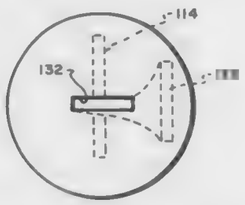
means for sending back a backhaul signal to said transmitting means in response to detection of said successful reception of the test signal by said receiving means.

4,994,676

ELECTRO-OPTICAL ION DETECTOR FOR A SCANNING MASS SPECTROMETER

Bruce E. Mount, 21810 Masada Ct., Diamond Bar, Calif. 91765

Continuation of Ser. No. 312,514, Feb. 21, 1989, abandoned.
This application Jun. 25, 1990, Ser. No. 544,798
Int. Cl.[5] H01J *39/44*
U.S. Cl. 250—298 8 Claims



1. In combination,

a scanning mass spectrometer with at least a magnetic sector in which the magnitude of the magnetic field is changeable and an electro-optical detector,

said magnetic sector having an exit plane and directing and focusing an ion beam of a limited range of ion masses at an angle into said electro-optical detector spaced from said exit plane,

said electro-optical detector including a channel electron multiplier assembly with an image plate, a fiberoptic window and a photodiode detector parallel with said exit plane,

said image plate being at an angle to the exit plane of said magnetic sector which angle corresponds to the angle at which said ion beam is focused so as to be impinged upon by said limited range of ion masses enabling a greatly increased speed of mass determinations by detecting said limited range of masses simultaneously, thus reducing the number of magnetic field changes required over a large range of masses,

said fiberoptic window having an entrance end coplanar with said image plate and an exit end coplanar with said photodiode detector and wherein,

said fiberoptic window comprises a plurality of optic fibers arranged in a flat ribbon-like configuration which is twisted so that an exit of an optical image of the ion masses from said window is rotated 90 degrees from an entry of said optical image and is parallel to said photodiode detector.

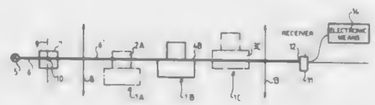
4,994,677

METHOD FOR POSITIONING AN OBJECT RELATIVE TO A PLANE AND MEASURING LENGTH AND APPARATUS FOR IMPLEMENTING SAME

Philippe Graindorge, Crimolois, France, assignor to Photonetics, S.A., Marly Le Roi, France

Filed May 9, 1989, Ser. No. 349,223
Claims priority, application France, May 11, 1988, 88 06413
Int. Cl.[5] G01B *11/02*
U.S. Cl. 250—560 15 Claims





1. A method of positioning an object relative to a plane, the object having a shoulder, comprising the steps of:

(a) providing a source assembly for producing a light-beam and a detection assembly for receiving the light-beam and emitting a signal which is a function of the light received;

(b) while the object is fixed, sweeping the light-beam to define a plane between the source assembly and the detection assembly, the signal emitted by the detection assembly being a function of the position of the object;

(c) translating the object approximately perpendicularly to the plane to place the object in successive positions for successive sweeps of the light-beam, and repeating said step (b) to cause a variation in the signal emitted by the detection assembly;

(d) measuring the signals emitted by the detection assembly as a function of time for successive sweeps of the light-beam and successive positions of the object;

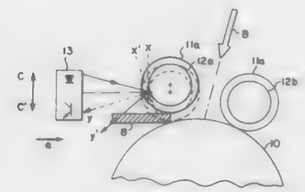
(e) halting the translation of the object when the signal as measured in said step (d) has a particular form which corresponds to a position of the object in which the shoulder masks a predetermined fixed part of the light-beam during part of the sweep of the light-beam.

4,994,678

APPARATUS FOR DETECTING A SHEET BY DISPLACEMENT OF A ROLLER

Yoshikazu Sasaki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1989, Ser. No. 328,050
Claims priority, application Japan, Mar. 24, 1988, 63-71463
Int. Cl.[5] G01N *21/86*; G01V *9/04*
U.S. Cl. 250—560 6 Claims



1. An apparatus for detecting a sheet comprising:

a transport roller set for transporting paper sheets gripped therebetween with a standard rotation cycle, said roller set incorporating a stationary roller having a fixed axis and a movable roller that is movable perpendicularly to the axis of the stationary roller and has a reflective portion thereon;

means for inducing the movable roller to contact with the stationary roller;

light-emitting means for projecting light rays toward the reflective portion;

light-emission control means for turning on and off said light-emitting means in a cycle that is not an integer multiple of the standard rotation cycle;

photosensor means for receiving the light rays reflected by the reflective portion and converting the quantity of received light into a quantity of electricity;

means connected to the photosensor means for generating detecting signals based on the quantity of electricity output by the photosensor means,

output means for outputting a fixed level signal for a fixed period greater than twice the turning cycle of the light-emitting means in response to the detecting signal generated by said generating means, and for changing the level of the output to a different level when the generating means does not generate said detecting signal for said fixed period.

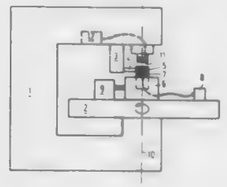
4,994,679

METHOD OF MEASURING THE ECCENTRICITY OF A WAVEGUIDE EMBEDDED IN A CYLINDRICAL CONNECTOR PIN

Hildegard Esser, Cologne; Ulrich Grzesik, Bergisch Gladbach, and Johann Vormann, Lohmar, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Feb. 28, 1989, Ser. No. 316,733
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810057
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 13 Claims

1. A method of measuring the eccentricity of a waveguide embedded in a cylindrical connector pin, wherein the optical center of the end face of the waveguide is introduced into the mechanical axis of rotation of rotatable means comprising a distance sensor scanning the outer surface of the connector pin, the eccentricity of the waveguide being determined from the measuring values obtained during the relative rotation of the



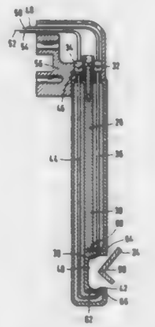
means comprising the distance sensor along the outer surface of the connector pin.

4,994,680

PHOTOELECTRIC MEASUREMENT HEAD FOR MONITORING A PLASTIC EXTRUDED SECTION

Dirk Brügmann, Schwerte, Fed. Rep. of Germany, assignor to Kunststoff-Verarbeitung GmbH Dirk A. Brügmann, Fed. Rep. of Germany

Filed May 3, 1990, Ser. No. 518,659
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921402
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 7 Claims



1. A photoelectric measurement head for monitoring a cross-section of a profiled section between an outlet of an extruder (10, 12) and calibrating device (14) of an extrusion press for manufacturing plastic profiled sections (24), which is provided, within a region of a free head end of a measurement-head housing (30) with two light-passage openings (38, 42) for emergence and entrance of light, respectively, which are arranged on opposite sides of a passage (40) for the profiled section, each of which openings has a light-transmitting glass cover (64, 66), characterized by an electric heating arrangement (60, 62; 60', 62') having a temperature-adjusting means which maintains a temperature at least of the free head end of the measurement-head housing (30) at the temperature of the profiled section (24) at the outlet of the extruder.

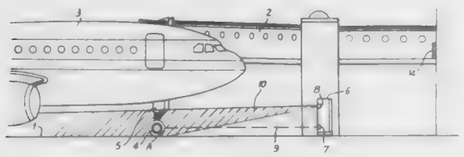
VOL 1123 ISS 3 FE 19 1991 UMI

4,994,681

DEVICE FOR DETECTING THE POSITION OF A MOVING BODY, IN PARTICULAR AN AIRCRAFT, IN A PLANE

Charles Mann, Paris, France, assignor to Societe D'Etudes et D'Enterprises Electriques (S.E.E.E.), Paris, France

Filed Oct. 6, 1989, Ser. No. 417,762
Claims priority, application France, Oct. 7, 1988, 88 13164
Int. Cl.[5] G01N *21/86;* **G08B** *21/00*
U.S. Cl. 250—561 **16 Claims**



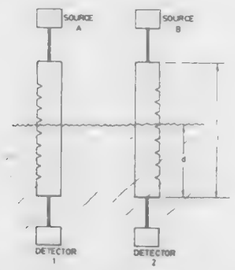
1. A device for detecting the position of a moving body in a plane, said device comprising:
- a source of laser radiation for emitting a laser beam in a sector of planar and thin cross section, in a geometrical plane substantially parallel to the plane of movement of the moving body, and with an angle of divergence adapted to possibilities of displacement of the moving body in said plane of movement for intercepting a given point of the moving body located in the geometrical plane of the beam,
- at least one camera for forming an image of reflections from said geometrical plane and being responsive essentially to reflections of said laser radiation for receiving radiation reflected by said point of the moving body in a position related to the distance and azimuth of said point relative to a fixed geometrical reference so that said camera generates data related to the position of the moving body in the plane of movement of the body,
- and calculating means responsive to data received by said at least one camera for utilizing said data.

4,994,682

FIBER OPTIC CONTINUOUS LIQUID LEVEL SENSOR

Shane H. Woodside, Halifax, Canada, assignor to Focal Technologies Incorporated, Nova Scotia, Canada

Filed May 19, 1989, Ser. No. 354,112
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—577 **9 Claims**



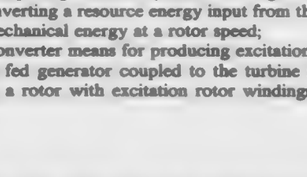
1. An indicating device for showing the level of fluids in a container, comprising: at least two optical fibres; one of said fibres being coupled at one end to an optical source, and at the other end to a source lightguide which emits light in a radial direction; the other fibre being coupled at one end to an optical detector, and at the other end to a detector lightguide which accepts light in a radial direction; the source lightguide and detector lightguide being oriented such that light emitted by the source lightguide is incident on a dielectric liquid sensing surface and undergoes total internal reflection in the presence of a first fluid, thus being coupled to the detector lightguide, and, in the presence of a second fluid of higher refractive index at the liquid sensing surface, the interface becomes primarily transmissive, offering relatively little reflective coupling to the detector lightguide, and where the source and detector lightguides are each similarly formed as a cylindrical optical waveguide with a plurality of notches formed therein along the length thereof.

4,994,683

STARTER PROTECTIVE DEVICE

Kyobei Yamamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 328,984
Claims priority, application Japan, Apr. 1, 1988, 63-82004
Int. Cl.[5] F02N *11/08*
U.S. Cl. 290—31 **7 Claims**



1. A protective device for a starter adapted to start an engine, comprising:
- sensor means for detecting at least one operating condition of said engine for indicating the start of said engine;
- detector means for detecting at least one starting condition of said engine to output a detection signal;
- setting means for setting at least one reference level for determination of the completion of the start of said engine wherein said setting means receives said detection signal and said at least one reference level is automatically determined according to said at least one starting condition that corresponds to said at least one reference level;
- decision means for comparing an output signal from said sensor means with said at least one reference level to output a start completion signal when said output signal from said sensor means exceeds said at least one reference level; and
- interruption means for interrupting the operation of said starter in response to said start completion signal.

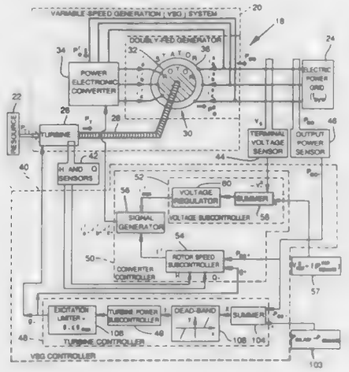
4,994,684

DOUBLY FED GENERATOR VARIABLE SPEED GENERATION CONTROL SYSTEM

Hian K. Lauw, and Gerald C. Alexander, both of Corvallis, Oreg., assignors to The State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University, Eugene, Oreg.

Filed Jan. 30, 1989, Ser. No. 304,044
Int. Cl.[5] F01D *15/10*
U.S. Cl. 290—52 **30 Claims**

1. An energy conversion generation system for receiving resource energy from a resource and converting the resource energy into an electrical power output for supply to a polyphase electric power grid operating at a system frequency, the energy generation conversion system comprising:
- a variable speed generation system including turbine means for converting a resource energy input from the resource into mechanical energy at a rotor speed;
- energy converter means for producing excitation power;
- a doubly fed generator coupled to the turbine means and having a rotor with excitation rotor windings and with means for applying the excitation power from the energy converter means to the rotor windings, the rotor being driven by the mechanical energy from the turbine means, and a stator with stator windings to supply the electrical power output to the power grid; and



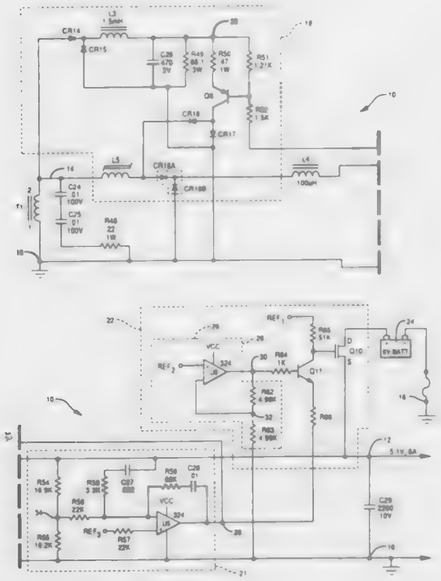
- control means for varying the rotor speed in response to the power output and resource energy input to increase the ratio of the electrical output power to the resource energy input received from the resource.

4,994,685

REGULATED POWER SUPPLY AND METHOD

Leslie C. Mathison, Columbia, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 26, 1989, Ser. No. 371,564
Int. Cl.[5] H02J *9/06;* **G05F** *1/46, 1/56*
U.S. Cl. 307—66 **28 Claims**



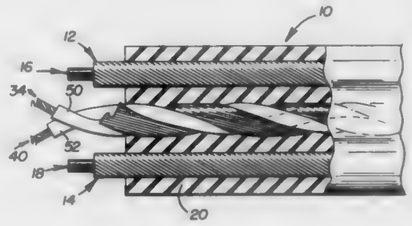
1. A power supply comprising:
- a magnetic amplifier for receiving a plurality of AC pulses and for controlling the pulse width of said pulses;
- a rectifier and filter for converting said pulses to a DC output;
- a back-up battery;
- a switch-over regulating circuit connecting said battery to said DC output; and
- an error amplifier for monitoring said DC output and providing, at its output, an error signal to said magnetic amplifier and said switch-over regulating circuit.

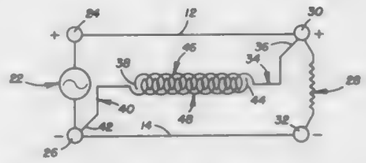
4,994,686

AUDIO FREQUENCY CABLE WITH REDUCED HIGH FREQUENCY COMPONENTS

Bruce A. Brisson, 3037 Grass Valley Hwy., Auburn, Calif. 95603

Filed Jan. 27, 1989, Ser. No. 302,840
Int. Cl.[5] H01B *7/08, 11/02*
U.S. Cl. 307—147 **30 Claims**



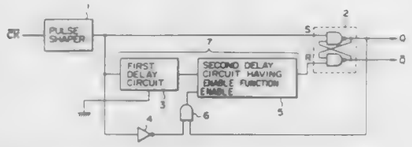


1. A cabling structure comprising:
- first source-load connecting means for direct electrical connection of a source positive side to a load positive side for transmitting a broad band audio signal from said source positive side to said load positive side;
- second source-load connecting means along the first source-load connecting means for direct electrical connection of a source negative side to a load negative side for transmitting a broad band audio signal from said source negative side to said load negative side;
- a first open circulated conductor having a first end in conductive communication with a selected one of the source positive side and the load positive side and having a second end extending towards and terminating free from connection to the load if the first end is connected to the source positive side and to the source if the first end is connected to the load positive side;
- a second open circulated conductor having a first end in conductive communication with a respective one of the source negative side and the load negative side and having a second end extending towards and terminating free from connection to the load if the first end is connected to the source negative side and to the source if the first end is connected to the load negative side; and
- said first and second open circulated conductors being separated by a non-conductor and being sufficiently long whereby they are in adjacent side by side relation at least along portions of the lengths thereof.

4,994,687
RETRIGGERABLE MULTIVIBRATOR

Shinji Fujii; Ikuo Tsuchiya, and Kazuhiko Kasai, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1988, Ser. No. 277,112
Claims priority, application Japan, Nov. 30, 1987, 62-302698
Int. Cl.[5] H03K *3/29*
U.S. Cl. 307—291 12 Claims

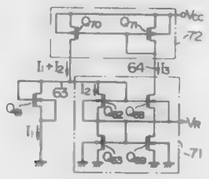


1. A retriggerable multivibrator comprising:
a flip-flop circuit which is set in accordance with an input signal;
a first delay circuit, which receives said input signal and outputs said input signal after a first predetermined delay time interval;
a second delay circuit which receives said input signal output from said first delay circuit and an enable signal, and which outputs said input signal to said flip-flop circuit after a second predetermined delay time interval, so as to reset said flip-flop circuit; and
control circuit means connected to an output of said flip-flop circuit for enabling said second delay circuit when a subsequent input signal is input to said flip-flop circuit during a time period when said flip-flop circuit is not reset.

4,994,688
SEMICONDUCTOR DEVICE HAVING A REFERENCE VOLTAGE GENERATING CIRCUIT

Masashi Horiguchi, Kawasaki; Masakazu Aoki, Tokorozawa; Kiyoo Itoh, Higashikurume; Yoshinobu Nakagome, Hachioji; Norio Miyake, Higashimurayama; Takaaki Noda, Kodaira; Jun Etoh, Hachioji; Hitoshi Tanaka, Tachikawa, and Shin'ichi Ikenaga, Koganei, all of Japan, assignors to Hitachi Ltd. and Hitachi VLSI Engineering Corporation, both of Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,966
Claims priority, application Japan, May 25, 1988, 63-125742; Dec. 2, 1988, 63-304152; Jan. 27, 1989, 1-16148
Int. Cl.[5] G05F *3/08*
U.S. Cl. 307—296.8 18 Claims

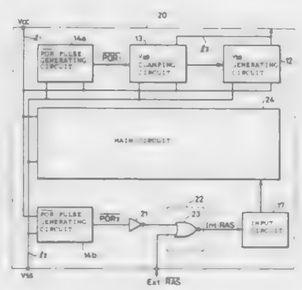


1. A semiconductor device comprising a reference voltage generating circuit for generating a fixed reference voltage, said reference voltage generating circuit including:
a first enhancement type FET having a first FET gate, a first FET source connected to a first potential, and a first FET drain, the first FET gate being connected to the first FET drain, and having a first FET threshold voltage;
a second enhancement type FET having a second FET gate, a second FET source, and a second FET drain, the second FET gate being connected to the second FET drain and the second FET drain being connected to the first FET drain to form a drain node, the second enhancement type FET having a second FET threshold voltage different from said first FET threshold voltage;
current mirror means, electrically coupled to the first potential, a second potential, and the drain node, for holding constant a current ratio between a first current flowing through said first enhancement type FET and a second current flowing through said second enhancement type FET to form a potential difference between the first FET source and the second FET source establishing the fixed reference voltage.

4,994,689
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Shigeru Kikuda, and Hiroshi Miyamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1989, Ser. No. 435,860
Claims priority, application Japan, Dec. 5, 1988, 63-308101
Int. Cl.[5] H03K *3/01, 3/353*
U.S. Cl. 307—296.2 4 Claims



1. A semiconductor integrated circuit device having a main circuit (**24**) on a semiconductor substrate thereof, said semiconductor integrated circuit device comprising, formed on the semiconductor substrate:
substrate bias applying means (**12**) for applying a constant reverse bias voltage;
an input circuit (**17**) for producing an internal signal defining the operation of said main circuit from an external signal;
first pulse signal generating means (**14***a*) for generating a first pulse signal which is inverted when a first time period has elapsed since turning on of a power supply;
second pulse signal generating means (**14***b*, **25**) for generating a second pulse signal which is inverted when a second time period being longer than said first time period has elapsed since turning on of the power supply;
clamping means (**13**) responsive to said first pulse signal for fixing a potential of said semiconductor substrate to a ground potential during said first time period after turning on of the power supply; and
prohibiting means (**22**) responsive to said second pulse signal for prohibiting the operation of said input circuit during said second time period after turning on of the power supply.

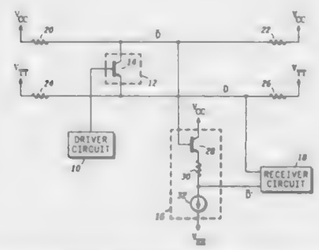
4,994,690
SPLIT LEVEL BUS

Ray D. Sundstrom, Chandler; Cleon Petty, and Dwight D. Esgar, both of Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 29, 1990, Ser. No. 471,581
Int. Cl.[5] H03K *19/003*
U.S. Cl. 307—443 9 Claims

1. A split level differential bus having true differential signals at first and second lines, respectively, and a controlled impedance for transferring differential data from a driver circuit which provides a logic low or a logic high output, to a receiver

circuit which has a first input coupled to the first line and a second input coupled to the second line, comprising:
the first line being terminated to a first independent voltage source while the second line is terminated to a second independent voltage source which provides a voltage level different than that provided by the first independent voltage source,

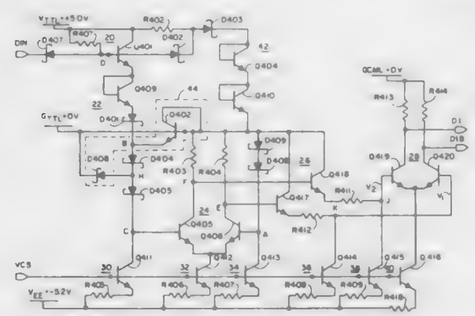


current switch means responsive to the logic high output of the driver circuit for switching current from the first line to the second line; and
level shifting means coupled between the first line and the first input of the receiver circuit for level shifting the signal at the first line by a predetermined voltage.

4,994,691
TTL-TO-CML TRANSLATOR CIRCUIT

Kianoosh Naghshineh, Menlo Park, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 16, 1990, Ser. No. 509,649
Int. Cl.[5] H03K *17/092, 17/16*
U.S. Cl. 307—475 20 Claims

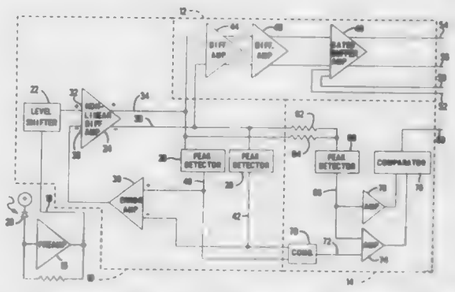


1. A logic translator circuit for converting TTL logic level signals into CML logic signals comprising:
a TTL input transistor (**Q401**) having its base coupled to an input terminal for receiving TTL logic level signals, its collector connected to a positive supply potential (VTTL), and its emitter connected to an internal node;
a translation chain (**22**) formed of a plurality of series-connected diodes, one end of said translation chain being connected to the internal node;
a first CML differential pair (**24**) formed of first and second input transistors (**Q405**, **Q406**) having their emitters connected together;
said first input transistor (**Q405**) having its collector connected to a TTL ground potential (GTTL) via a first load resistor (**R403**) and its base connected to the other end of said translation chain;
said second input transistor (**Q406**) having its collector connected to said TTL ground potential via a second load resistor (**R404**) and its base connected to a reference voltage;
a first current source (**32**) connected between the common emitters of said first and second input transistors (**Q405**, **Q406**) and a negative supply potential (VEE);
a level shifter (**26**) formed of first and second emitter follower transistors (**Q417**, **Q418**), said first emitter follower transistor (**Q417**) having its collector connected to said TTL ground potential and its base connected to the collector of said second input transistor (**Q406**), said second emitter follower transistor (**Q418**) having its collector connected to said TTL ground potential and its base connected to the collector of said first input transistor (**Q405**);
a second CML differential pair (**28**) formed of third and fourth input transistors (**Q419**, **Q420**) having their emitters connected together;
said third input transistor (**Q419**) having its collector connected to a CML ground potential (GCML) via a third load resistor (**R413**) and its base coupled to the emitter of said second emitter follower transistor (**Q418**), said CML ground potential being electrically isolated from said TTL ground potential;
said fourth input transistor (**Q420**) having its collector connected to said CML ground potential via a fourth load resistor (**R414**) and its base coupled to the emitter of said first emitter follower transistor (**Q417**);
a second current source (**40**) connected between the common emitters of said third and fourth input transistors (**Q419**, **Q420**) and said negative supply potential; and
the collector of said third input transistor (**Q419**) being connected to a first output terminal for providing a true CML-compatible signal and the collector of said fourth input transistor (**Q420**) being connected to a second output terminal for providing a complementary CML-compatible signal.

4,994,692
QUANTIZER SYSTEM

Alan E. Wolke, Ringoes, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 15, 1989, Ser. No. 437,476
Int. Cl.[5] H03K *3/295*
U.S. Cl. 307—494 12 Claims



1. A system for quantizing an input signal to two levels, said input signal varying in a range between a first voltage level and a second voltage level, the system comprising:
means for receiving said input signal;
differential sensing means responsive to said input signal and a threshold voltage for providing a pair of output signals each corresponding to a respective polarity of the difference between said input signal and said threshold voltage, said differential sensing means including a differential amplifier having first and second inputs and first and second outputs, said first input being coupled to receive said input signal and said second input being coupled to receive said threshold voltage; and
means for providing said threshold voltage at a level which is the midpoint of said input signal range, said threshold

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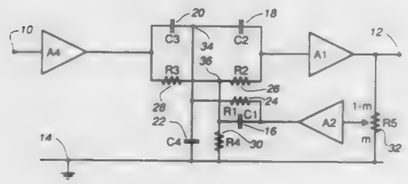
voltage providing means including a feedback loop around said differential amplifiers, said feedback loop having a first peak detector coupled to said differential amplifier first output and a second peak detector coupled to said differential amplifier second output.

4,994,693

SECOND ORDER ACTIVE FILTERS

Petre Popescu, Kirkland, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 30, 1989, Ser. No. 443,298
Int. Cl.[5] H03K 5/00; H03F 1/36, 3/52
U.S. Cl. 307—520 12 Claims



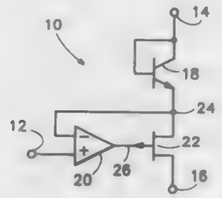
1. A filter comprising:
an input terminal, an output terminal, and a common terminal;
a first amplifier having an output coupled to the output terminal;
a second amplifier having an input coupled to the output terminal;
a first resistor coupled between an output of the second amplifier and a first junction point;
a first capacitor coupled between the output of the second amplifier and a second junction point;
a second capacitor coupled between the first junction point and an input of the first amplifier;
a second resistor coupled between the second junction point and the input of the first amplifier;
a third capacitor coupled between the first junction point and one of the input and common terminals; and
a third resistor coupled between the second junction point and one of the input and common terminals;
at least one of the third capacitor and the third resistor being coupled to the input terminal.

4,994,694

COMPLEMENTARY COMPOSITE PNP TRANSISTOR

Winthrop A. Gross, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 23, 1989, Ser. No. 397,213
Int. Cl.[5] H03K 17/60
U.S. Cl. 307—570 3 Claims



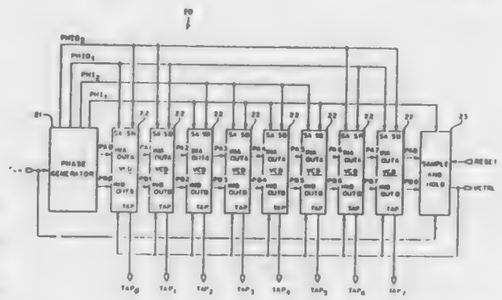
1. A complementary composite PNP transistor comprising:
(a) a collector terminal, a base terminal, and an emitter terminal;
(b) a p-channel JFET having a gate, a source, and a drain coupled to the collector terminal;
(c) diode means having an anode coupled to the emitter terminal and a cathode coupled to the source of the p-channel JFET; and
(d) amplifier means having a positive input, a negative input, and an output, the positive input being coupled to the base terminal, the negative input being coupled to the source of the p-channel JFET, and the output being coupled to the gate of the p-channel JFET.

4,994,695

SYNCHRONOUS DELAY LINE WITH QUADRATURE CLOCK PHASES

Mel Bazes, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 13, 1989, Ser. No. 434,408
Int. Cl.[5] H03K 5/13, 7/00
U.S. Cl. 307—602 18 Claims



1. An integrated circuit delay line apparatus for generating at least one delayed signal synchronized with a reference signal, comprising:
a plurality of delay means serially coupled, wherein each of said delay means for providing a controllable delay, and each of said delay means coupled to receive a control signal for controlling the durations of said delays;
a phase generation means coupled to receive said reference signal and for generating a first phasing signal which is substantially in phase with said reference signal and for generating a second phasing signal which is approximately 90° out of phase with said first phasing signal;
said first phasing signal coupled to some of said delay means and said second phasing signal coupled to others of said delay means;
control signal generating means coupled to receive a delayed reference signal from the last one of said sequentially coupled delay means and for generating said control signal;
wherein the use of said first and second phasing signals provides that an output from each of said delay means has a duty cycle which is operable with metal-oxide-semiconductor (MOS) circuits.

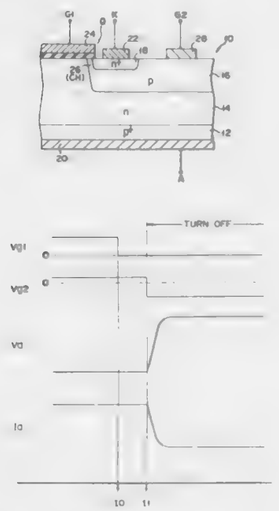
4,994,696

TURN-ON/OFF DRIVING TECHNIQUE FOR INSULATED GATE THYRISTOR

Tsuneo Ogura, Kamakura, and Akio Nakagawa, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 161,095, Feb. 26, 1988, Pat. No. 4,866,315. This application Jun. 26, 1989, Ser. No. 371,275
Claims priority, application Japan, Feb. 26, 1987, 62-41307; Feb. 26, 1987, 62-41308; Feb. 26, 1987, 62-41316; Dec. 28, 1987, 62-330064
Int. Cl.[5] H03K 17/72
U.S. Cl. 307—63.3 11 Claims

1. A method for turn-off driving a thyristor having a voltage-controlled switching transistor, said thyristor having a first emitter layer, a first base layer, a second base layer, a second emitter layer, a first gate electrode insulatively provided above said first base layer for functioning as the gate of said transistor, and a second gate electrode formed on said second base layer, said method comprising the steps of:
(a) applying to said first gate electrode a first voltage which renders said transistor nonconductive; and



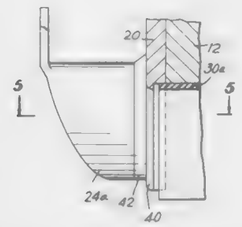
(b) applying to said second gate electrode a second voltage producing reverse biasing between said second emitter layer and said second base layer to quench said thyristor.

4,994,697

STATOR TERMINAL BOARD

Luciano Santandrea, Florence, Italy, assignor to Axis USA, Inc., Marlborough, Mass.

Filed Jul. 26, 1989, Ser. No. 385,570
Int. Cl.[5] H02K 11/00
U.S. Cl. 310—71 3 Claims



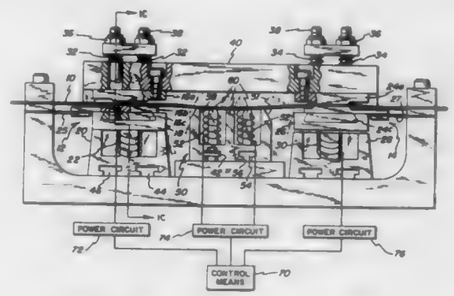
1. A terminal board for use on the axial end of an annular stator body having a plurality of radially inwardly projecting poles and an insulating member disposed in the channel between circumferentially adjacent poles, said terminal board having a bead which extends from the remainder of the terminal board adjacent the axial end of the insulating member and between the axial end of the stator body and the axial end of coils wound on the poles, said bead extending transverse to the longitudinal axis of the stator body by an amount sufficient to cover the axial end of the insulating member.

4,994,698

VIBRATORY LINEAR MOTOR SYSTEM

Gerald B. Kliman, Schenectady; Donald W. Jones, Burnt Hills; Russell E. Tompkins, Scotia, all of N.Y., and Roger W. Brockett, Lexington, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 13, 1990, Ser. No. 537,847
Int. Cl.[5] H02K 7/06, 7/065
U.S. Cl. 310—81 13 Claims



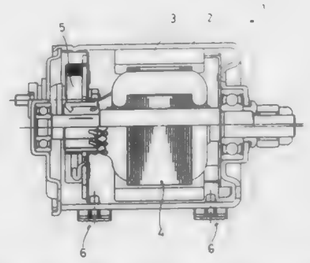
1. A vibratory linear motor system, comprising:
a spring-like beam;
electromagnetic excitation means for exciting and maintaining periodic transverse mechanical oscillations of said beam so as to produce approximately a standing wave therealong;
clamping means for selectively restricting translational motion of either end of said beam; and
electronic control means for controlling said electromagnetic excitation means and said clamping means by providing currents thereto so as to convert said transverse oscillations of said beam into rectilinear motion.

4,994,699

DRAIN COVER FOR YOKE OF DYNAMIC ELECTRIC MACHINE

Hiroyuki Shiina, Gunma, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Filed Jun. 13, 1990, Ser. No. 537,927
Claims priority, application Japan, Sep. 30, 1988, 63-128614
Int. Cl.[5] H02K 5/10
U.S. Cl. 310—88 11 Claims



1. A drain cover for covering at least one draining port formed in a yoke of a dynamic electric machine, said drain cover comprising;
a substantially rectangular bottom wall having an area large enough to cover a space under said draining port;
a pair of circumferentially extending side walls projecting upward from both axial end edges of said bottom wall into contact with the outer peripheral surface of said yoke;
a pair of axially extending side walls projecting upward from

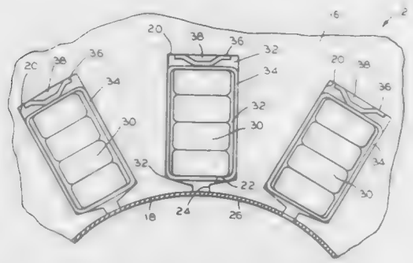
VOL 1123 ISS 3 FE 19 1991 UMI

both circumferential end edges of said bottom wall into contact with the outer peripheral surface of said yoke;
a discharge opening formed in at least one of said circumferentially extending side walls; and
means for preventing reverse flow of water through said discharge opening and said draining port into said machine.

4,994,700
DYNAMOELECTRIC MACHINE OIL-COOLED STATOR WINDING

Madan L. Bansal, and Barry J. Parker, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 15, 1990, Ser. No. 480,662
Int. Cl.[5] H02K *9/197, 3/24*
U.S. Cl. 310—215 **12 Claims**

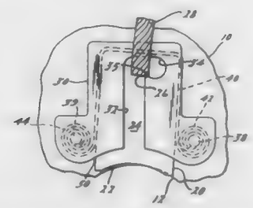


1. A dynamoelectric machine comprising:
a housing;
an elongate cylindrical stator within said housing, and stator having a plurality of longitudinally extending, angularly spaced slots;
a stator coil comprising an electrical winding having plural conductor portions wound in each said stator slot, whereby said conductor portions only partially fill said slots to provide longitudinally extending spaces along each conductor portion and between adjacent conductor portions in each of said slots;
elastic means for biasing said conductor portions against movement in each of said slots; and
means for providing liquid coolant to said stator so that the coolant flows through the spaces in said slots to provide direct cooling to said coil.

4,994,701
BRUSH HOLDER ASSEMBLY

John G. Bulick, Dexter, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 219,688, Jul. 11, 1988, Pat. No. 4,868,441. This application Jun. 28, 1989, Ser. No. 372,487
The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—239 **8 Claims**

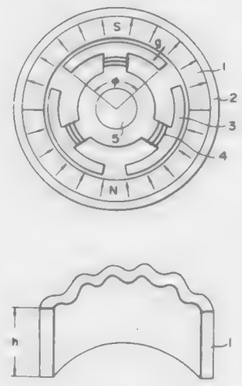


1. A brush holder for use in a machine in which electricity is to be transferred between a rotatable conductor and an electrically conducting brush element with an electrical wire extending therefrom and biased to make contact with said rotatable conductor, comprising:
means positioned adjacent the location of said rotatable conductor for rigidly supporting said brush holder;
bridge means formed with a pair of legs having one end of each leg connected to said supporting means and with a connecting element rigidly attached to the opposite ends of said legs, wherein said bridge means along with said supporting means define an aperture to receive an electrically conducting brush element;
spring means extending between said legs for biasing said brush element received in said aperture towards said rotatable conductor; and
said connecting element includes means for both restricting the lateral movement of said brush element by interfering with the corresponding lateral movement of said electrical wire extending from said brush element and simultaneously guiding said brush element in a predetermined path during operation.

4,994,702
MOTOR

Yoji Arita, Yokohama, Japan, assignor to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 554,892
Int. Cl.[5] H02K *1/12*
U.S. Cl. 310—254 **4 Claims**



1. A motor comprising:
a field magnet system comprising m-number of permanent magnetic poles arranged in a circle such that the adjacent two permanent magnetic poles have opposite polarity to each other; and
an armature with p-number of poles, the outer end of each of the poles facing the magnetic poles of the field magnet system:
said field magnet system having a magnetic flux generating area whose widthwise length h (θ) perpendicular to the rotational direction of the armature varies with a rotational angle θ of the armature in accordance with the following formula:

$$h(\theta) = h_0 + \sum_{n=1}^{\infty} a_n \cos(2\pi n\theta/T) + \sum_{n=1}^{\infty} b_n \sin(2\pi n\theta/T)$$

wherein n is an integer of $(i \times j) \pm 1$ where j is an even number of 2 to 20,

a_n is a coefficient for cosine components,
b_n is a coefficient for sine components and is not zero for at least one value of n,
T is a period of rotation of the armature through an angle corresponding to the peripheral length of a pair of adjacent N-pole and S-pole
i is an integer given by p/q where q is the greatest common measure of m/2 and p, and
h_o is equal to H when $0 \leqq \theta < \pi$ and equal to $-H$ when $\pi \leqq \theta < 2\pi$ where H is a standard widthwise length of the field magnet system.

4,994,703
PIEZOELECTRIC ELEMENT OF LAMINATE TYPE

Yasuo Oguri, Tokyo; Noriaki Takahashi, Yokohama, and Yukio Chida, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 377,046
Claims priority, application Japan, Jul. 26, 1988, 63-186374
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—363 **8 Claims**

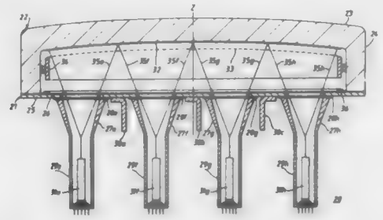


1. A piezoelectric element of a laminate type, comprising:
a plurality of films of thin sheets of piezoelectric material of the same size, each having an internal electrode formed on its entire surface, said films or sheets being laminated so that the end face of each internal electrode is exposed at the side of the laminate, the end face of every second electrode being covered with an insulating layer formed by a photosensitive composition and then the side of the laminate being covered with a connecting external electrode material which electrically connects every second internal electrode whose end face is not covered with photosensitive composition, said photosensitive composition being a photopolymerizable composition comprising (A) a vinyl-type binder polymer, (B) a polymerizable monomer having a polymerizable unsaturated group, (C) a photopolymerizaton initiator and (D) fine inorganic particles.

4,994,704
CATHODE RAY TUBE AND AN ENVELOPE THEREFOR

Shigeo Takenaka, and Takashi Nishimura, both of Saitama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1989, Ser. No. 413,583
Claims priority, application Japan, Nov. 16, 1988, 63-287522
Int. Cl.[5] H01J *29/86*
U.S. Cl. 313—2.1 **18 Claims**

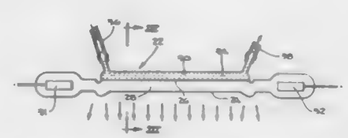


1. A color cathode ray tube comprising:
a vacuum envelope including a panel having a single glass faceplate including an inner surface and central axis and a skirt extending from the faceplate, a rear metal plate hermetically connected to the skirt through a first connecting means, a plurality of funnels coupled to the rear plate through a second connecting means, and a plurality of necks respectively extending from the funnels, at least one of the first and second connecting means having stabilizing means for absorbing strain caused by difference between a thermal expansion amount of the rear plate and that of the panel and the difference between a thermal expansion amount of the rear plate and that of the funnel, respectively;
a plurality of electron gun assemblies respectively received in the necks for emitting a plurality of electron beams;
a screen formed on the inner surface of the faceplate for emitting visible light by excitation of the electron beams from the electron gun assemblies; and,
a mask received in the vacuum envelope so as to face to the screen and having an effective region for allowing passage of the electron beams to impinge on the screen.

4,994,705
WATER-COOLED, LOW PRESSURE GAS DISCHARGE LAMP

Jacques F. Linder, Palos Verdes, and Steven H. Boland, Glendora, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 27, 1989, Ser. No. 329,050
Int. Cl.[5] H01J *61/30, 61/52*
U.S. Cl. 313—24 **14 Claims**



1. A liquid-cooled low pressure gas discharge lamp adapted for use in photochemical vapor deposition, said discharge lamp being of the type having a gas discharge chamber for providing radiation at wavelengths of 185 nm and 254 nm, said lamp comprising:
a lamp tube having an outside perimeter and having a centrally located wall extending the length of said lamp tube which divides said lamp tube into a discharge chamber and a separate cooling chamber;
a sufficient amount of gas in said discharge chamber to provide emission of radiation having wavelenghs of 185 nm and 254 nm when a electric arc is passed through said chamber when said chamber is maintained at a temperature of below about 70° C.;
means for providing an electric arc through said discharge chamber;
cooling means for providing a flow of cooling liquid through said cooling chamber to thereby remove sufficient heat generated during operation of said low pressure gas discharge lamp to maintain the temperature of said discharge chamber at a temperature of below about 70° C. and thereby maximize said radiation having wavelengths of 185 nm and 254 nm, wherein said radiation passes from said discharge tube through only the portion of said outside perimeter of said lamp tube which defines said discharge tube.

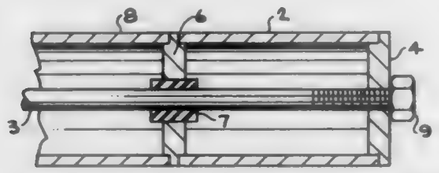
VOL 1123 ISS 3 FEB 19 1991 UMI

4,994,706

FIELD FREE, DIRECTLY HEATED LANTHANUM BORIDE CATHODE

Ka-Ngo Leung, Hercules; David Moussa, San Francisco, and Stephen B. Wilde, Pleasant Hill, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 2, 1987, Ser. No. 10,053
Int. Cl.[5] H01J *1/15, 1/92*
U.S. Cl. 313—30 4 Claims



1. A directly heated cylindrical lanthanum boride cathode assembly characterized by minimum generation of electron emission-inhibiting magnetic fields comprising:

(a) a lanthanum boride cylindrical cathode comprising a central cylindrical portion and end caps secured to a first end and an opposite end of said central cylindrical portion;

(b) a central support shaft coaxially passing through said central cylindrical portion of said lanthanum boride cathode and through central openings in said lanthanum boride end caps, said central shaft comprising a first electrode in electrical communication with said lanthanum boride end cap secured to said first end of said central cylindrical portion of said lanthanum boride cathode, to carry current flowing through said lanthanum boride cylinder;

(c) a hollow cylindrical second electrode coaxially positioned around said central support shaft and in electrical communication at one end thereof with the lanthanum boride end cap on the opposite end of said central cylindrical portion of said lanthanum boride cathode to carry current flowing through said lanthanum boride cathode cylinder;

(d) first and second washer means respectively positioned between said lanthanum boride end caps and said electrodes and constructed of nonreactive conductive material selected from the class consisting of rhenium, graphite, and carburized tantalum;

(e) means for securing said second electrode to said lanthanum boride end cap at said opposite end of said central cylindrical portion of said lanthanum boride cathode through said first washer means;

(f) threaded means on said central shaft to secure said shaft to the end cap at said first end of said lanthanum boride central cylindrical portion through said second washer means;

(g) cooling means comprising one or more cooling passageways between said first and second electrodes for cooling at least a portion of said electrodes; and

(h) bias means between said first and second electrodes to urge said electrodes respectively against the lanthanum boride end caps at the opposite ends of said lanthanum boride cathode to thereby provide an electrically secure connection between said lanthanum boride cathode and said electrodes which will compensate for thermal expansion during operation;

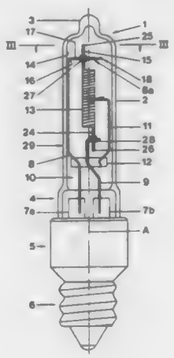
whereby magnetic fields generated by heater current flowing in one direction through said central support shaft are cancelled by an opposite magnetic field generated by current flowing through said lanthanum boride cylindrical cathode and said second coaxial electrode in a direction opposite to the current flow in said central shaft comprising said first electrode.

4,994,707

VIBRATION-RESISTANT SINGLE-ENDED HALOGEN INCANDESCENT LAMP

Roland Stark, Wellheim, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft für elektrische Glülampen m.b.H., Munich, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 405,518
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 8812010[U]; Sep. 22, 1988, 8812009[U]; Sep. 22, 1988, 8812011[U]
Int. Cl.[5] H01K *1/18*
U.S. Cl. 313—269 42 Claims



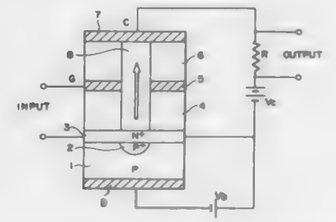
1. A single-ended halogen incandescent lamp (1) having
a cylindrical bulb (2) of transparent material;
a base (5);
an axially extending coiled incandescent filament (13) defining an axis and further defining a base end (24) and a remote end (15);
a filament mount (10) connected to and coupled to the respective ends (15, 24) of the filament and including
a cross bar (12) of non-conductive material; and
two internal current supply leads (8, 9) passing through the cross bar and being retained in position thereby,
one (8) of said current supply leads extending parallel to the axis (A) of the lamp towards the remote end of the filament and there defining an upper portion (8*a*),
the other (9) of said current supply leads extending towards the base end of the filament and being connected thereto; and
a press seal (4) securing the mount (10) in the bulb,
wherein a first corner or bend point (16) located in a vertical plane parallel to the axis of the filament is formed in said one current supply lead (8), said first bend point being located at about the level of the remote end of the filament, and extending said one current supply lead away from the wall in said plane;
said upper portion (8*a*) extends beyond said first corner or bend point (16) inwardly of said bulb (2);
said one current supply lead being further formed with at least one second and third spaced corner or bend point (21, 22);
a first connecting leg (17) located between the first corner or bend point (16) and the second corner or bend point (21);
a second connecting leg (18) located between the second corner or bend point (21) and the third corner or bend point (22);
wherein all of said corner or bend points (16, 21, 22) are in engagement with the inner wall (14) of the bulb (2); and
wherein the remote end (15) of the filament (13) is secured to said upper portion (8*a*) of said one current supply lead (8) in a region thereof beyond said first corner or bend point (16).

4,994,708

COLD CATHODE DEVICE

Akira Shimizu, Sagamihara; Takeo Tsukamoto, Atsugi; Akira Suzuki; Masao Sagata, both of Yokohama; Izumi Shimoda, Zama, and Masahiko Okunuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 341,298, Apr. 21, 1989, abandoned, which is a continuation of Ser. No. 185,302, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 65,403, Jun. 23, 1987, abandoned. This application Apr. 30, 1990, Ser. No. 515,351
Claims priority, application Japan, Jul. 1, 1986, 61-152700; Jan. 28, 1987, 62-16147
Int. Cl.[5] H01J *1/46*
U.S. Cl. 313—306 10 Claims



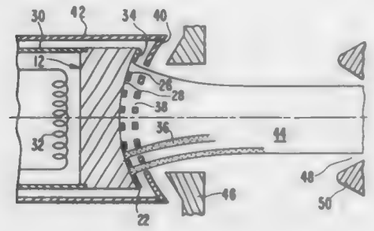
1. A cold cathode electronic tube for processing a signal comprising:
a cold cathode;
an anode opposed to said cathode;
an electron transit path disposed between said anode and said cathode;
a control electrode for inputting the signal to be processed, wherein said control electrode is electrically insulated, structurally, from said cathode and said anode and is exposed to said electron transit path; and
an output terminal connected between said anode and said cathode,
wherein an electron stream is provided along said electron transit path, and wherein the electron stream is modulated in accordance with the signal, to produce an output signal at said output terminal.

4,994,709

METHOD FOR MAKING A CATHADER WITH INTEGRAL SHADOW GRID

Michael C. Green, Palo Alto, and George V. Miram, Atherton, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 22, 1989, Ser. No. 327,222
Int. Cl.[5] H01J *1/20, 9/04, 9/14*
U.S. Cl. 313—310 6 Claims



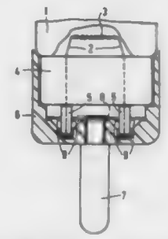
1. A process for making a cathode with integral shadow grid comprising the steps of:
(a) on a smooth, thermionically-emissive surface of a cathode body consisting of a porous matrix of refractory metal impregnated with an alkaline-earth aluminate, depositing from vapor a layer of conductive, non-emissive material,
(b) placing a mask on the surface of said non-emissive layer, said mask comprising apertures separated by interconnected bars,
(c) removing by bombardment through said mask the portions of said non-emissive layer between said bars,
(d) removing said mask intact.

4,994,710

ADAPTOR FOR A LOW-PRESSURE DISCHARGE LAMP

Bauke J. Roelevink; Frans J. Traksel, both of Roosendaal, and Johannes A. A. M. Van Heeswijk, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1989, Ser. No. 321,607
Claims priority, application Netherlands, Mar. 10, 1988, 8800596
Int. Cl.[5] H01R *33/02*
U.S. Cl. 313—318 15 Claims



1. A low-pressure discharge lamp assembly, comprising:
a low-pressure discharge lamp, said lamp comprising a tubular lamp vessel having ends sealed in a gas-tight manner, a pair of electrodes each disposed within said lamp vessel adjacent to respective sealed end, a lamp cap comprising a pair of contact pins fixed on each sealed end, and current supply conductors connecting said contact pins to a respective electrode; and
an adaptor mounted on each lamp cap, each adaptor comprising a shell of synthetic material enclosing said lamp cap contact pins, a single contact pin extending from said shell, said securing-contact means for securing said adaptor to a respective lamp cap contact pin and for electrically connecting said adaptor contact pin to a respective lamp cap contact pin, said means resiliently receiving a lamp cap contact pin in the insertion direction of said pin in said adaptor and lockingly securing said pin in the opposite direction to hold said adaptor on said lamp cap.

4,994,711

HIGH BRIGHTNESS SOLID ELECTROLYTE ION SOURCE

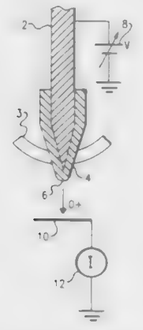
Jesse N. Matossian, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 22, 1989, Ser. No. 455,110
Int. Cl.[5] H01J *27/06*
U.S. Cl. 313—362.1 10 Claims

1. A high brightness ion source, comprising:
an ion emitting member formed from a solid electrolyte material and having an emitting tip,
means for establishing an ion extracting electric field directed onto said emitting tip, said tip having dimensions small enough to concentrate said electric field in the im-

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mediate vicinity of the tip compared to the field at more remote locations from the tip, and



means for heating said ion emitting member to a temperature sufficient to induce a thermionic ion emission from said tip.

4,994,712

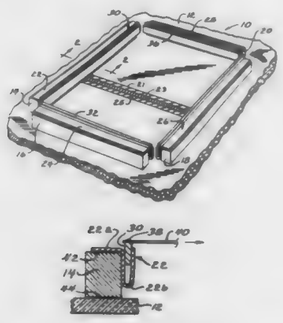
FOIL SHADOW MASK MOUNTING WITH LOW THERMAL EXPANSION COEFFICIENT

Paul Strauss, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 3, 1989, Ser. No. 358,928

Int. Cl.[5] H01J *29/07*

U.S. Cl. 313—405 **24 Claims**



1. A color cathode ray tube shadow mask mounting arrangement, comprising:

a glass faceplate having a centrally disposed cathodoluminescent screen on an inner surface;

mask support means affixed to opposed sides of said screen; and

a foil shadow mask supported on said mask support means and having a lower coefficient of thermal expansion than said faceplate which causes said mask and mask support means to be placed under extreme stress during high temperature processing of said CRT during its fabrication, said mask support means including stress relief means for preventing overstressing of said mask or said mask support means during said high temperature processing.

4,994,713

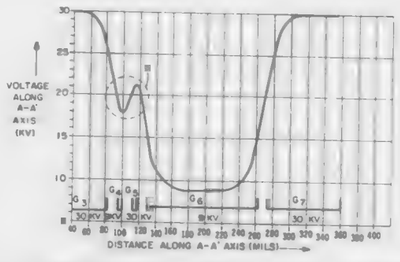
ASYMMETRIC UNIPOTENTIAL ELECTRON BEAM FOCUSING LENS

Hsing-Yao Chen, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 19, 1989, Ser. No. 354,655

Int. Cl.[5] H01J *29/48*

U.S. Cl. 313—414 **29 Claims**



1. An electron gun for a cathode ray tube, comprising:

cathode means for generating electrons;

means for receiving electrons from said cathode means and for forming a beam crossover; and

asymmetrical unipotential-type focus lens means for forming an image of said crossover at a distance from said gun, comprising prefocus electrode means for forming a prefocusing field and main focus electrode means for forming a main focusing field, said prefocus electrode means being constructed, configured and adapted to be excited to cause said prefocusing field to fall from a relatively high voltage to a relatively low voltage and have at least two inflection points therebetween such that said prefocusing field is weaker than said main focusing field such that at low beam currents the effective focal plane of said focus lens means is moved forwardly away from said cathode means and beam spot size performance is thereby improved, and such that the beam exit diameter is increased for reduced space charge effects and thereby improved high beam current performance.

4,994,714

AUTOMATIC ALTERATION OF THE OPERATION OF A RADIANT ENERGY TRANSMITTER

Earl B. Hoekman, Roseville, and Karl P. Schaller, both of St. Paul, Minn. (Cottage Grove, both of), assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 28, 1989, Ser. No. 344,909

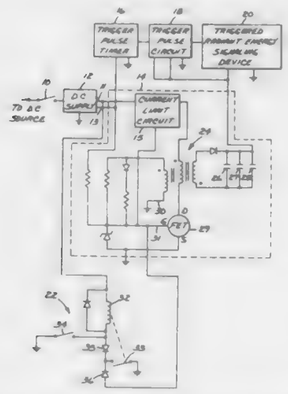
Int. Cl.[5] B60Q *1/26*; G08G *1/07*

U.S. Cl. 315—80 **10 Claims**

1. A radiant energy transmitter for use with a motor vehicle, the transmitter having a triggered radiant energy device and control circuitry for triggering the radiant energy device and supplying electrical energy to the radiant energy device when it is triggered with the control circuitry being energized via an operator actuated switch including:

an operation altering circuit portion for altering the operation of the triggered radiant energy device;

an alteration initiation switch means connected to said operation altering circuit portion, said alteration initiation switch means automatically assuming an alteration mode when the operator of the vehicle with which the radiant energy transmitter is used takes an action that is normally done following the stoppage of the vehicle, the alteration mode of said alteration initiation switch means being discontinued when the action taken by the operator is reversed; said alteration initiation switch means causing said operation altering circuit portion to operate to alter the operation of the triggered radiant energy device when the alteration mode position of said alteration initiation switch means is assumed with the altered operation continuing even though the alteration mode position of said



alteration initiating switch means is subsequently discontinued.

4,994,715

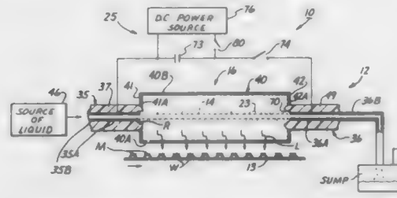
PLASMA PINCH SYSTEM AND METHOD OF USING SAME

John F. Asmus, La Jolla, Calif.; Ralph H. Lovberg, Santa Fe, N. Mex., and Keith Boyer, Chicago, Ill., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 129,152, Dec. 7, 1987. This application Jul. 21, 1988, Ser. No. 223,025

Int. Cl.[5] H01J *7/24*; C23C *14/00*

U.S. Cl. 315—111.71 **24 Claims**



1. A plasma pinch system comprising:

a pair of spaced apart combination liquid emitter and electrode means, and combination liquid receptor and electrode means;

means for establishing a fine stream of liquid under sufficient pressure in a substantially narrow, straight and focused configuration, to cause the formation thereabout of a tenuous liquid vapor preconditioning cloud surrounding the flowing fine stream of liquid; and

discharge means for establishing an electrical voltage potential difference between said electrode means of a sufficient high voltage to cause electrical current to flow through said liquid vapor cloud for establishing initially a low density plasma therealong sufficient to emanate energy therefrom to said flowing liquid stream to heat it sufficiently to cause it to become ionized and to be converted into a high density plasma in response to said low density plasma.

4,994,716

CIRCUIT ARRANGEMENT FOR STARTING AND OPERATING GAS DISCHARGE LAMPS

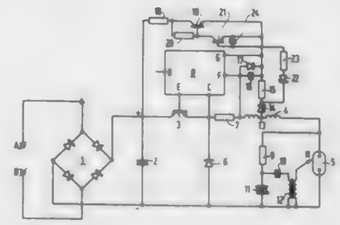
Hans-Günther Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans-Peter Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,191

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530638

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—200 R **11 Claims**



1. A circuit arrangement for starting and operating a gas discharge lamp with current of higher frequency comprising: an electronic ballast unit connected to terminals for an input d.c. voltage source and comprising an electronic switching element controlled by a control device and connected in series with an inductive element which is acted upon by the lamp current and from which a voltage can be derived which is fed as a d.c. supply voltage to the control device through a rectifier and a smoothing capacitor, and means connecting a first connection of the smoothing capacitor through a first ohmic resistor to a first terminal of the input direct voltage source and a second connection of the capacitor through the lamp to a second terminal of the input direct voltage source.

4,994,717

ELECTRONIC STABILIZER FOR A FLUORESCENT LAMP

Myoung S. Moon, Seoul, Rep. of Korea, assignor to Ham Lim Electronic Co., Ltd., Seoul, Rep. of Korea

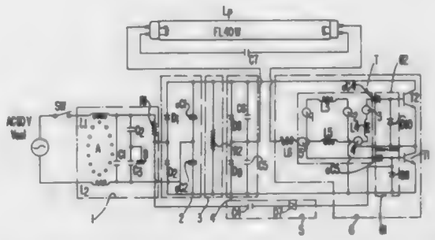
PCT No. PCT/KR88/00011, § 371 Date Jan. 9, 1990, § 102(e) Date Jan. 9, 1990, PCT Pub. No. WO89/11204, PCT Pub. Date Nov. 16, 1989

PCT Filed Jun. 10, 1988, Ser. No. 457,718

Claims priority, application Rep. of Korea, May 13, 1988, 88-5503

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—219 **3 Claims**

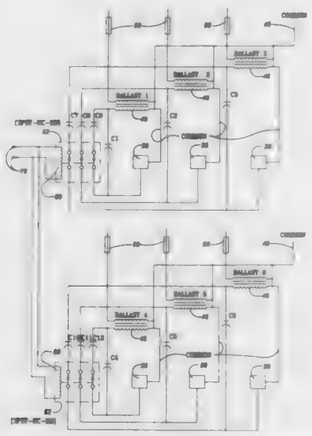


1. The electronic stabilizer for a fluorescent lamp characterized by the composition connected between the resonance circuit including inductor L6 and inverter 6 in accordance with the transistors T1, T2 and the current transformer T comprising: the first coils L3, L4 of the variable current transformer T, the first, and second high-speed starters 61, 62 with

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the electrolytic condensers eC4, eC5 and two diodes D10, D11, each connected to the input of the first, and second transistors T1, T2 in the said inverter 6; the first current limiters 3, 3' and the second current limiter 4 connected among the inverter 6, direct power source, and one side of filament in the fluorescent lamp; the input trigger 5 connected between the input of the first transistor T1 and the commercial power source in the inverter 6; the filament of one side of the fluorescent lamp Lp connected to the output of said inverter 6 through inductor L6; the capacitor C7 connected to the opening part of filament in said fluorescent lamp Lp in parallel.

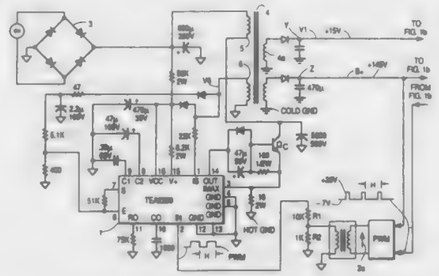
4,994,718
METHOD AND MEANS FOR DIMMING BALLASTED LAMPS
Myron K. Gordin, Oskaloosa, Iowa, assignor to Musco Corporation, Oskaloosa, Iowa
Filed Feb. 7, 1989, Ser. No. 308,107
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—240 31 Claims



1. A dimming means for ballasted lamps comprising:
one or more lamp means;
ballast means operatively connected to each lamp means for ballasting the lamp means to provide stable starting and operating power to the lamp means;
the ballast means including variable capacitor means operatively connected between the ballast means and the lamp means; and
control means operatively connected to all variable capacitor means for altering the capacitance of the capacitor means to vary operating power to each lamp means to allow dimming of all lamp means.

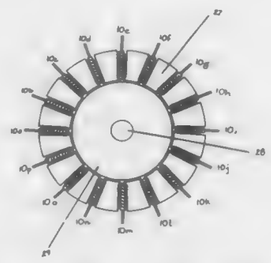
4,994,719
VOLTAGE REGULATOR WITH ACTIVE TURNOFF
Jeffery B. Leadaro, Noblesville, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Apr. 30, 1990, Ser. No. 515,498
Int. Cl.[5] H01J *29/70*; H04N *5/63*
U.S. Cl. 315—411 7 Claims

1. A power supply of a video display apparatus, comprising:
a source of an on/off control signal that is indicative when operation in a run mode is required and when operation in a standby mode is required;
means for generating a first supply voltage at a first supply terminal, during both said standby and said run mode;
a transistor having a first main current conducting terminal that is coupled to said first supply voltage and a second main current conducting terminal that is coupled to a load circuit;
a deflection circuit output stage responsive to said on/off control signal for generating a second voltage, during said run mode and during a transition interval that follows said run mode, said transition interval occurring after a change in said control signal occurs to becoming indicative that said standby mode operation is required; and
means responsive to said on/off control signal and to said



second voltage and coupled to a control terminal of said transistor for generating a third voltage at said control terminal at a first magnitude, in accordance with said second voltage, for enabling said transistor to produce a load current in said load circuit, during said run mode, and for generating said third voltage at said control terminal at a second magnitude for actively disabling said transistor from producing said load current to prevent said second voltage that occurs during said transition interval from enabling said transistor.

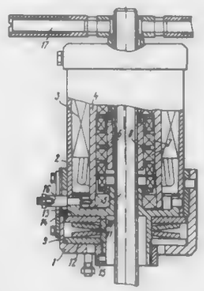
4,994,720
HGP[2] ELECTRIC MOTOR
Clifton Van Cott, 35 Spring St., Cold Spring Harbor, N.Y. 11724
Filed Jan. 23, 1990, Ser. No. 468,623
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 3 Claims



1. A brushless DC motor of the type having a rotor of permanent magnet poles and multiple stator coil windings and drive system for controlling the direction, speed and torque of the said DC motor, with said drive system comprising:
means for deriving angular position from a motor shaft of said motor as said motor rotates;
means for decoding said angular position into correlation signals for enabling said stator coil windings;
a variable oscillator having an output signal related to said correlation signals;
means for allowing current to flow in either direction through the said stator coil windings;
means for combining said variable oscillator output signal with said correlation signals for enabling and controlling the duty cycle of said driver switch current signals;

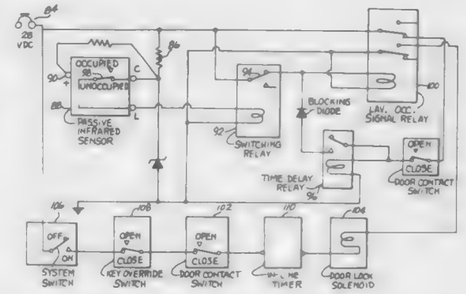
means for providing said current signals to said multiple coil windings simultaneouly;
a direct current power source;
means for providing frictionless rotation of said rotor;
means for providing a permanent magnetic force of said rotor greater than an electromagnetic force of each individual stator coil winding;
means for providing 360 degree angular coverage of interacting fields between said rotor and said stator coil windings;
means for determining the proximity and perpendicularity of said stator coil windings to said rotor;
means for generating signals for the self starting of said DC motor;
means for enabling said current signals to allow both the attraction and repelling of said rotor by said stator coil windings while said rotor is rotating in a single direction.

4,994,721
ELECTRIC DRIVE
Andrei D. Plotnikov, prospekt Nastavnikov, 25, Korpus 3, kv. 101; Nikolai P. Popov, ulitsa Proletarskaya, 107, kv. 76, Kolpino, and Grigory N. Klotsvog, ulitsa Gavanskaya, 11,kv. 43, all of Leningrad, U.S.S.R.
PCT No. PCT/SU88/00133, § 371 Date Nov. 22, 1989, § 102(e) Date Nov. 22, 1989, PCT Pub. No. WO89/12194, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 10, 1988, Ser. No. 444,138
Int. Cl.[5] H02P *3/00*
U.S. Cl. 318—434 2 Claims



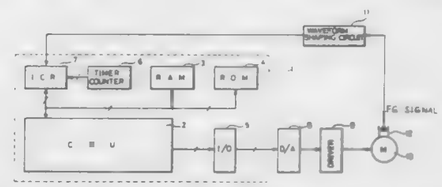
1. An electric drive comprising
a base;
an electric motor comprising a frame with a stator and a hollow rotor mounted therein;
a lead screw mounted within the hollow rotor; an axial force limiter comprising a first washer having a pressure bearing face and a second washer having a pressure bearing face and a resilient member mounted between the first and second washer;
a first stop means operatively connected to the base and adapted to contact the pressure bearing face of the second washer; and
a second stop means mounted to the frame and adapted to contact the pressure bearing face of the first washer, wherein when the lead screw undergoes an axial force which exceeds a preadjusted resiliency of the resilient member, the frame moves in a direction opposite to the lead screw and compresses the resilient member through one of said washers to thereby cause the electric motor to stop.

4,994,722
AUTOMATED DOOR LOCKING SYSTEM FOR AIRCRAFT LAVATORY
David C. Dolan, Seattle, Wash.; Jimmie L. Grimes, Maryland, Mo.; David C. Broman, Seattle; Kwan-Ho Bae, Lynnwood, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Oct. 2, 1989, Ser. No. 415,891
Int. Cl.[5] B64C *19/02*; G05B *24/02*
U.S. Cl. 318—480 1 Claim



1. A system for locking a door from a remote location comprising:
a system switch for activating said system;
means for sensing the presence of a person in the area behind said door;
means for locking said door when the presence of said person is not sensed by said sensing means;
means for overriding said locking means to open said door; and
wherein said system remains active until said system switch is turned off.

4,994,723
DIGITAL SERVO SYSTEM FOR CONTROLLING ROTATIONAL SPEED OF ROTARY BODY
Junichiro Tabuchi, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Dec. 14, 1989, Ser. No. 450,851
Claims priority, application Japan, Dec. 19, 1988, 63-320929
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—569 7 Claims



1. A digital servo system for controlling a rotational speed of a rotary body (10), comprising:
FG signal generating means (12) for generating an FG signal comprising a plurality of successive pulses and having a frequency proportional to the rotational speed of said rotary body,
first measuring means (1) for measuring a first period from a rise of one pulse of said FG signal to a rise of a subsequent pulse of said FG signal,
second measuring means (1) for measuring a second period from a fall of one pulse of said FG signal to a fall of a subsequent pulse of said FG signal,
means (1) for generating a speed error signal with respect to

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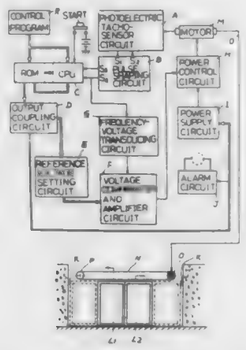
the rotational speed of said rotary body by alternately using the first or the second period measured by said first measuring means or said second measuring means, and means (9) for driving a rotation of said rotary body in response to said speed error signal.

4,994,724

SERVO-CONTROLLED AUTOMATIC DOOR HAVING AUTOMATIC DETECTING AND ADJUSTING MECHANISM

Chun-Pu Hsu, P.O. Box 10160, Taipei, Taiwan

Filed Mar. 29, 1990, Ser. No. 501,011
Int. Cl.[5] G05B 19/28
U.S. Cl. 318—603 1 Claim



1. A microprocessing automatic door comprising:

a driving motor operatively driving a pair of pulleys of a driving belt wound on the two pulleys, having a first door mounted on an upper loop portion of said driving belt and a second door mounted on a lower loop portion of said belt, both doors operatively closed or opened with each other as driven by said belt;

a pair of photoelectric tacho-sensor circuits respectively monitoring and sensing a running speed of said motor for detecting a pulse in response to said motor running;

a servo-controlled network mobilizably automatically adjusting a power supply for driving said motor for stabilizing a running of said motor depending upon a load of the automatic door;

a central processing unit prerecorded with programs of operating procedures and automatic adjusting, monitoring and control modes of the automatic door in a read only memory of said central processing unit, said central processing unit receiving a pulse signal as sensed by said photo-electric tacho-sensor circuits in response to the running speed of said motor to be compared with the prerecorded programs in said central processing unit for exerting series of control signal or operating instruction which are input into said servo-controlled network for controlling the stable running of said motor in accordance with the instructions from said central processing unit;

a pair of limiting stoppers formed on two opposite extremities of a reciprocal moving stroke of the doors serving as a positioning reference point of the automatic door; and

an alarm circuit operatively receiving an out-of-order instruction from said central processing unit for sounding a buzzer for warning purpose,

the improvement which comprises:

said servo-controlled network including:

a pulse shaping circuit receiving and shaping one pulse as sensed by one of said tacho-sensor circuits for producing square waves;

a frequency-voltage transducing circuit receiving one output signal from said pulse shaping circuit in response of one of the two tacho-sensor circuits for obtaining a voltage value proportional to the motor running speed;

a voltage comparator and amplifier circuit operatively receiving one voltage value from said frequency-voltage transducing circuit and also receiving a setting voltage value from a reference voltage setting circuit for comparing and amplifying an output voltage; and

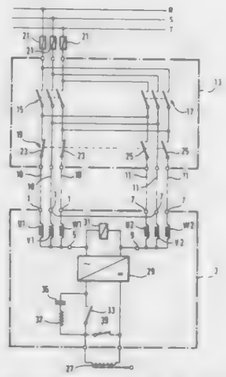
a power control circuit having a transistor of which a biasing voltage is supplied by said output voltage from said comparator and amplifier circuit for variating an internal resistance of said transistor in relation to the load change of the door for changing an oscillating frequency of an oscillator comprised of a resistor and a capacitor for controlling a conducting degree of a thyristor or silicon-controlled rectifier in said power control circuit for an output of mobilisable variating power for stably driving the motor and the door in accordance with an operating instruction ordered by said central processing unit.

4,994,725

DRIVE ARRANGEMENT, ESPECIALLY FOR A HOIST MECHANISM

Georg Gschlössl, Feldkirchen, Fed. Rep. of Germany, assignor to MAN GHH Krantechnik GmbH

Filed Mar. 5, 1990, Ser. No. 488,717
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907853
Int. Cl.[5] H02P 5/28, 5/40
U.S. Cl. 318—727 6 Claims



1. A drive arrangement, especially for a hoist mechanism, comprising: a three-phase motor having at least two three-phase field windings dimensioned for different pole numbers, each of the field windings having phase windings (U1, V1, W1, U2, V2, W2) connected with one another in star or delta connection and to connection terminals (1, 7; 1*a*, 7*a*) for the connection of three mains phases in a motor terminal box (3; 3*a*) forming one unit with the three-phase motor; a control box (13) separate from the three-phase motor, which box contains, for variation of direction of rotation of the three-phase motor at least one rotation direction control contactor (15, 17) exchanging the mains phases on a first and a second of the connection terminals of said two three-phase field windings by pairs and for variation of speed of rotation of the three-phase motor at least one speed control contactor (19) connecting in the three-phase field windings alternately, said control box (13) being connected through mutually separate leads (10, 11) with the connection terminals (1, 7; 1*a*, 7*a*) of the phase windings (U1, V1, W1, U2, V2, W2) in the motor terminal box (3; 3*a*) and at least on energization of one of the two three-phase field windings, said control box (13) is connecting a third of said connection terminals of each of the two three-phase field windings in common with the associated mains phase, a friction

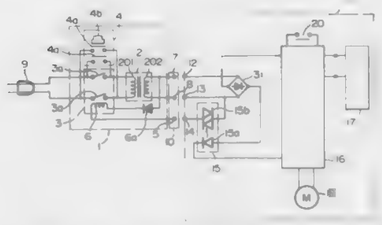
brake connected into one unit with the three-phase motor and braking a motor shaft of the three-phase motor in the rest condition, which brake can be released by an electromagnet (27; 27*a*) during motor operation; a rectifier circuit arrangement (29, 29*a*) arranged adjacent to the three-phase motor, said rectifier circuit arrangement having its alternating current input coupled to the control box (13) and its direct current output to the electromagnet (27; 27*a*); and a controllable switch (31, 33, 39; 31*a*, 33*a*) coupled to the electromagnet for controlling of direct current supplied thereto, wherein in the case of three-phase field windings connected in star connection, connection terminals (5, 9) in the motor box (3) are also allocated to star points of the two three-phase field windings and the rectifier circuit arrangement and the controllable switch (31, 33, 39) with its control input are connected to the star point connection terminals (5, 9) and the controllable switch is controllable in dependent upon a differential voltage between the two star points or wherein in the case of three-phase field windings connected in delta connection the rectifier circuit arrangement (29*a*) and the controllable switch (31*a*, 33*a*) with its control input are connected between phase-exchangeable connection terminal of the two three-phase field windings and the controllable switch is controllable in dependent upon a differential voltage between these two connection terminals.

4,994,726

POWER SUPPLY APPARATUS FOR CHARGING-TYPE DEVICE

Kozo Tamura; Syoichi Nihira; Yasuhiro Tsukamoto, and Akira Iida, all of Hitachi, Japan, assignors to Hitachi Ltd., Tokyo and Tagasangyo, Ltd., Ibaraki, both of, Japan

Filed Oct. 11, 1988, Ser. No. 255,833
Claims priority, application Japan, Oct. 12, 1987, 62-254552
Int. Cl.[5] H01M 10/46; H02J 7/02
U.S. Cl. 320—2 8 Claims



1. A power supply apparatus for charging-type device including a transformer disposed in a main body of the power supply apparatus, current supply connection terminals connected to a secondary winding of the transformer, current receiving connection terminals so disposed in a charging-type device as to be capable of being coupled to and detached from the current supplying connection terminals, a storage battery so disposed in the charging-type device as to be charged from said current receiving connection terminals, and a load connected to said storage battery, said power supply apparatus for charging-type device comprising:

relay contacts of a relay connected to a primary side of a primary winding of said transformer;

short-circuit means for said relay contacts;

a relay coil for opening and closing the relay contacts;

a first connection control terminal connected to said relay coil; and

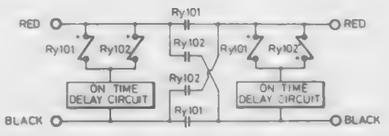
a second connection control terminal so disposed in said charging-type device as to be capable of being coupled and detached from said first connection control terminal, said relay coil being connected to a secondary side of a secondary winding of said transformer via said first and second control terminals.

4,994,727

CHARGING CIRCUITRY HAVING POLARITY DETECTING PROTECTION

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Division of Ser. No. 103,404, Oct. 1, 1987, Pat. No. 4,855,662, which is a continuation-in-part of Ser. No. 822,222, Jan. 24, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 338,149
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—26 1 Claim



1. A system for comparing the polarity of two sets of pairs of terminals and for electrically connecting the terminals of matching polarity comprising:

a left upper terminal;

a left lower terminal;

a right upper terminal;

a right lower terminal;

a first double coil relay, said first relay comprising a first coil, a second coil, a first pair of normally-open contacts, a second pair of normally-open contacts, each of said first and second coils having a first side and a second side, said relay activating when both said first and second coils are magnetized in the same direction, said first side of said first coil connected to said left upper terminal and said second side of said first coil connected to said left lower terminal, said first side of said second coil connected to said upper right terminal, said second side of said second coil connected to said right lower terminal, each of said first and second coils having the same specific polarity of magnetization on the same side of said coils, said same specific polarity of magnetization of each said first and second coil associated with said first side thereof;

one contact of said first pair of contacts connected to said left upper terminal, the other contact of said first pair connected to said right upper terminal;

one contact of said second pair of contacts connected to said left lower terminal, the other contact of said second pair of contacts connected to said right lower terminal;

and wherein said first pair of contacts and said second pair of contacts become closed during the time when; (1) the polarity applied on said upper left terminal is the same as the polarity applied on the upper right terminal; and (2) the polarity applied on said left lower terminal is the same as the polarity applied on the right lower terminal;

a second double-coil relay, said second relay comprising a third coil, a fourth coil, a third normally-open pair of contacts, a fourth normally-open pair of contacts, each of said third and fourth coils having a first side and a second side;

said second relay activating when both said third and fourth coils are magnetized oppositely;

said first side of said third coil connected to said left upper terminal and said second side of said third coil connected to said left lower terminal;

said first side of fourth coil connected to said right upper terminal and said second side of said fourth coil connected to said lower right terminal, said third and fourth coils having the opposite specific polarity of magnetization of the same side of said third and fourth coils;

one contact of said third pair of contacts connected to said left upper terminal and the other contact of said third pair connected to said right lower terminal;

one contact of said fourth pair of contacts connected to said left lower terminal and the other contact of said fourth pair connected to said right upper terminal;

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wherein said third and fourth pairs of contacts become closed during the time when: (1) the polarity applied on said left upper terminal is the opposite to the polarity of the right upper terminal; and (2) the polarity applied on said left lower terminal is the opposite to the polarity applied on the right lower terminal; and

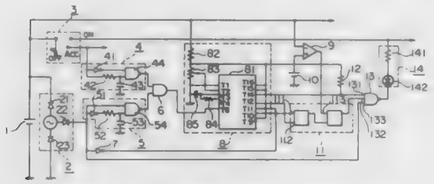
further comprising a first On-time delay circuit and a second On-time delay circuit, said first On-time delay circuit being interposed and connected between said first connector and said lower left terminal, said second On-time delay circuit being interposed and connected between said second connector and said lower right terminal.

4,994,728

APPARATUS FOR DIAGNOSING VEHICLE-MOUNTED BATTERY

Katsuhiro Sasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 314,743
Claims priority, application Japan, Feb. 24, 1988, 63-41076
Int. Cl.[5] G01R *31/36*
U.S. Cl. 320—48 **8 Claims**



1. An apparatus for diagnosing the residual charge of a battery for use with an engine, comprising:

a comparison means for comparing the terminal voltage of a battery with a reference voltage;

a stoppage detection means for detecting that the operation of an engine has stopped;

a timer means for determining that a predetermined time has elapsed since said stoppage detection means detected that the operation of said engine stopped;

a determination means for determining said residual charge of said battery from the comparison result provided by said comparison means when said timer means determined that the predetermined time has elapsed;

a holding means for holding the determination result of said determination means;

restart detection means for detecting that said engine has restarted; and

determination result outputting means for outputting the determination result held in said holding means when said restart detection means detects that said engine has restarted.

4,994,729

REFERENCE VOLTAGE CIRCUIT HAVING LOW TEMPERATURE COEFFICIENT SUITABLE FOR USE IN A GAAS IC

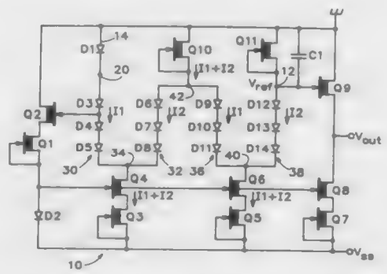
Stewart S. Taylor, 16927 NW. Hazelgrove Ct., Beaverton, Oreg. 97006

Filed Mar. 23, 1990, Ser. No. 499,732
Int. Cl.[5] G05F *3/20*
U.S. Cl. 323—314 **15 Claims**

5. A reference voltage circuit having a low temperature coefficient, comprising:

first and second series-connected reference voltage means for providing a substantially temperature invariant output voltage,

the first reference voltage means providing a first reference voltage that changes in accordance with a first temperature coefficient of predetermined magnitude and sign and the second reference voltage means including first and second sets of multiple diodes, each of the diodes of the first set having first diode junction dimensions and conducting a first electrical current and each of the diodes of the second set having second diode junction dimensions and conducting a second electrical current, the first and second sets of diodes being connected in series such that the net voltage developed across the series-connected diodes



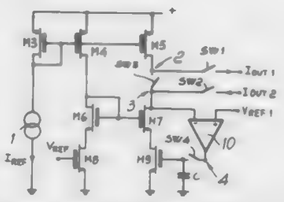
for providing a second reference voltage that changes in accordance with a second temperature coefficient substantially of equal magnitude but of opposite sign to the magnitude and sign of the first temperature coefficient, whereby the first and second temperature coefficients offset each other so that the output voltage is substantially constant.

4,994,730

CURRENT SOURCE CIRCUIT WITH COMPLEMENTARY CURRENT MIRRORS

Domenico Rossi, Cilavegna; Ermes Viani, Casalgrande; Guido Torelli, S. Alessio; Franco Maloberti, Torre D'Isola, and Carla Vacchi, Pavia, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Dec. 11, 1989, Ser. No. 448,498
Claims priority, application Italy, Dec. 16, 1988, 22964 A/88
Int. Cl.[5] G05F *3/20*
U.S. Cl. 323—316 **6 Claims**



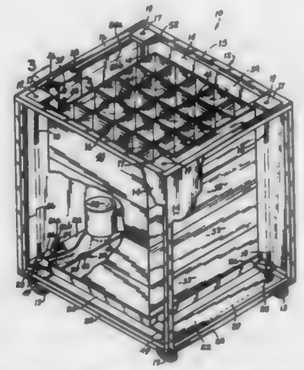
1. A current source circuit comprising a current source stage defining a first output and generating a first output current and an inverter stage connected to said source stage and defining a second output, said inverted stage generating a second output current with opposite polarity with respect to said first output current, said inverter stage comprising a variable current source defining a control electrode and a memory element connected to said control electrode and adapted to store a control signal for said variable current source, said current source circuit further comprising switch means interposed between said first and second outputs, said switch means being closed during a trimming step of said current source circuit, causing said first and second outputs to be short-circuited, said control signal to assume a value corresponding to an amplitude equivalence of said first and second output currents and said memory element to store said value of said control signal.

4,994,731

TWO WIRE AND MULTIPLE OUTPUT HALL-EFFECT SENSOR

John A. Sanner, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Nov. 27, 1989, Ser. No. 441,687
Int. Cl.[5] H03K *17/90*
U.S. Cl. 323—368 **21 Claims**



1. In a controller for driving vehicle instrumentation and electronic engine controls, a speed sensing unit having a first output terminal coupled to a DC voltage supply circuit and a second terminal connected to ground, a three-lead Hall effect element within said unit having one lead thereof connected to said first terminal and a second lead thereof connected to said second terminal, switching means coupled to the third lead of said Hall effect element and to said second terminal for sensing each time said element is exposed to a magnetic field which exceeds a predetermined value, impedance means connected between said first terminal and said switching means, said switching means supplying to said first terminal a periodically varying voltage whose instantaneous value is directly related to the frequency of appearance of said magnetic field, and means connected between said first and second terminals for providing overvoltage protection for said Hall effect element.

4,994,732

AUTOMATIC TEST SYSTEM HAVING A "TRUE TESTER-PER-PIN" ARCHITECTURE

A. Keith Jeffrey, Dorset; David J. Marsh, Ringwood, and Philip I. Collins, Dorset, all of England, assignors to Schlumberger Technologies, Inc., San Jose, Calif.

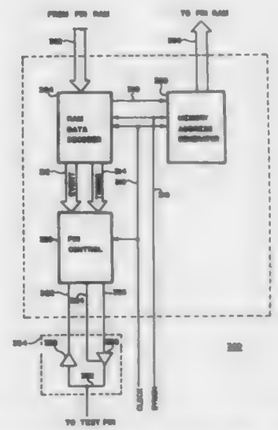
Division of Ser. No. 291,410, Dec. 22, 1988, which is a continuation of Ser. No. 205,529, Jun. 9, 1988, abandoned, which is a continuation of Ser. No. 810,476, Dec. 18, 1985, abandoned.
This application Oct. 5, 1989, Ser. No. 417,250
Int. Cl.[5] G01R *31/28;* **G01F** *11/12*
U.S. Cl. 324—73.1 **35 Claims**

1. Apparatus for testing an electronic circuit, said tester having a plurality of tester channels, each channel operating independently of all other channels, each channel comprising:

a test pins means for contacting a test point of a unit under test;

a channel control circuit means coupled to said pin for controlling the state of operation of said pin; and

a pin memory circuit means for storing test instructions which direct the sequence of operation of said channel control circuit, said pin memory circuit means being controlled by said channel control circuit means for cycling said pin memory means to a next address only when a new



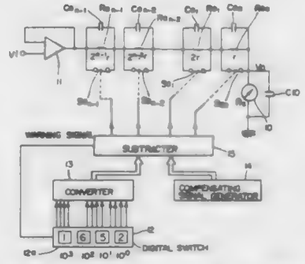
test instruction is required for that channel independent of a state of operation of all other channels.

4,994,733

POTENTIOMETER FOR VOLTAGE-MEASURING INSTRUMENT

Soichiro Yasunaga, Kawasaki, Japan, assignor to Riken Denshi Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 868,433, May 30, 1986, abandoned.
This application Jan. 31, 1989, Ser. No. 303,955
Claims priority, application Japan, Mar. 6, 1986, 61-49251
Int. Cl.[5] G01R *15/04, 15/06, 15/08*
U.S. Cl. 324—115 **6 Claims**



1. A potentiometer in association with a voltage-measuring instrument which exhibits a full-scale indication when a predetermined voltage is applied thereto and comprising:

an impedance transformer having an input terminal to which a voltage to be measured is applied, said transformer having a high input impedance and a low output impedance;

a bank of resistors connected in series to the output of the transformer and acting collectively as a variable resistor, each of the resistors having an associated switch connected in parallel across the same whereby by the opening and closing of such switches the resistors in said bank can be individually and selectively connected in series to give a variable resistance Rx, said resistors having resistance values r, 2r, 4r, 8r, . . . , 2^{n-1}r or 10^0(r, 2r, 4r, 8r), 10^1(r, 2r, 4r, 8r), . . . , 10^{n-1}(r, 2r, 4r, 8r), where r is the minimum, or unit, resistance value and n is an integer equal to at least four which determines an operative digit range;

said voltage-measuring instrument being connected in series

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with said bank of resistors and having an input resistance Rs, where Rs=K×r, K being a constant in dimensionless form corresponding in magnitude to said predetermined full-scale voltage of said voltage-measuring instrument;

a switch control circuit responsive to a signal delivered thereto for selectively and individually opening and closing the switches associated with the respective resistors of said variable resistor bank to thereby adjust the value of said variable resistance Rx of said variable resistor bank;

an adjustable multiplier-setting means operatively associated with said switch control circuit for setting in decimal notation a multi-digit multiplier number N within said operative digit range which is equal to the total of the collective resistance Rx of the variable resistor bank and the input resistance Rs of the voltage measuring instrument divided by the unit resistance value r, for regulating said switch control circuit to adjust the collective resistance value Rx of said variable resistor bank such that the voltage to be observed multiplied by the resistance value ratio Rs/(Rx+Rs) equals said predetermined full-scale voltage of said voltage measuring instrument, provided the magnitude of said voltage to be observed is not less than said constant K said multiplier-setting means delivering to said switch control circuit an output signal corresponding to the thus-set multiplier, whereby the multiplier setting number N directly corresponds to the magnitude of the voltage to be observed; and

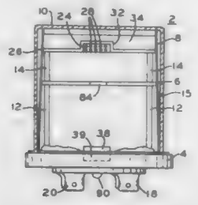
means for detecting if said multiplier number N is less in magnitude than said constant K of said instrument to thereby indicate said voltage to be observed is less in magnitude than said constant K and providing an indication of such detection to avoid an error.

4,994,734

REGISTER CIRCUIT BOARD FOR ELECTRONIC ENERGY METER

Warren R. Germer, Dover; Peter E. Coryea, Salem, and Jacob M. Stillwagon, Nottingham, all of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Sep. 25, 1989, Ser. No. 412,351
Int. Cl.[5] G01R *21/06, 1/04*
U.S. Cl. 324—142 **41 Claims**



1. An electronic energy meter to measure electric power and to fit standard industry base connections including means to connect and condition a plurality of signals between the interior of the meter and circuitry external to the meter including:

a base with terminals extending through the bottom surface thereof to connect the energy meter in circuit with a source of power and a load to be metered;

a plurality of spaced holes through the bottom surface of said base in the peripheral region thereof;

a register including electronic circuitry spaced from and substantially parallel to said base;

an edge connector secured to said register including a plurality of terminals extending substantially parallel to said register; and

a register circuit board adapted to be positioned between said spaced holes in said base and said edge connector secured to said register;

said register circuit board including a top and bottom with a first connector positioned at the top with terminals extending perpendicular to the register circuit board and adapted to mate with the terminals in said edge connector to form connections there between, and a plurality of male terminals secured to the bottom of said register circuit board;

said plurality of male terminals being spaced and adapted to pass through said spaced holes through said base;

said register circuit board being configured to connect and process signals between said electronic circuitry of said register and the outside of said meter when said male terminals are positioned to extend through said spaced holes in said base, and said first connector at the top of said signal board is mated with the terminals of said edge connector;

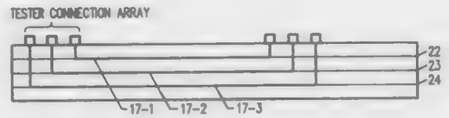
whereby said register circuit board extends between said base and said register and is positioned and supported by said first connector and said male terminals.

4,994,735

FLEXIBLE TESTER SURFACE FOR TESTING INTEGRATED CIRCUITS

Glenn J. Leedy, 1061 E. Mountain Dr., Santa Barbara, Calif. 93108

Division of Ser. No. 194,596, May 16, 1988, Pat. No. 4,924,589.
This application Nov. 14, 1989, Ser. No. 436,278
Int. Cl.[5] G01R *1/04, 1/067*
U.S. Cl. 324—158 F **14 Claims**



1. A tester surface for integrated circuits for contacting contact points of logic units on a surface of a semiconductor wafer, said tester surface comprising:

at least one layer, said layer comprising a dielectric predominantly silicon flexible material and having a thickness of no greater than fifteen microns;

a plurality of conductive vias formed in said thin flexible material; and

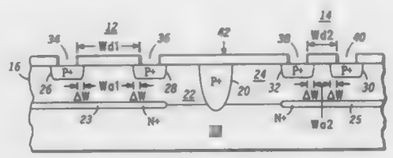
a thin film of patterned conductive metal deposited on said thin flexible material and in said vias to form conductive traces, including probe points for test contacting with said contact points.

4,994,736

METHOD AND STRUCTURE FOR EXTRACTING LATERAL PNP TRANSISTOR BASEWIDTH DATA AT WAFER PROBE

William F. Davis, Tempe, and Richard T. Ida, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 6, 1989, Ser. No. 431,807
Int. Cl.[5] G01R *31/26, 31/00*
U.S. Cl. 324—158 T **2 Claims**



2. In the fabrication of lateral PNP transistors in an integrated circuit wafer, a structure formed in the wafer which is utilized to determine the basewidth dimensions of the lateral PNP transistors after fabrication in the wafer, the structure comprising:

a first lateral PNP transistor having a known basewidth prior to being formed in the wafer which basewidth becomes a function of the fabrication processes used to fabricate said first lateral PNP transistor whereby said first transistor may have an actual basewidth that is different from said known basewidth; and

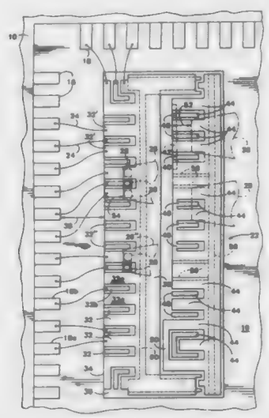
a second lateral PNP transistor having a known basewidth different than said known basewidth of said first transistor prior to being formed in the wafer in proximity to said first transistor, said known basewidth becoming a function of said fabrication processes whereby the actual basewidth of said second transistor formed in the wafer may be different than said known basewidth where however said actual basewidth has a dimension that is related to the difference in the known basewidths of said first and second transistors and a ratio of measured saturation currents that flow in said transistors.

4,994,737

SYSTEM FOR FACILITATING PLANAR PROBE MEASUREMENTS OF HIGH-SPEED INTERCONNECT STRUCTURES

Dale E. Carlton, Portland; Keith E. Jones, Aloha, and Thomas A. Myers, Beaverton, all of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Filed Mar. 9, 1990, Ser. No. 491,569
Int. Cl.[5] G01R *19/10*
U.S. Cl. 324—158 P **19 Claims**



1. A method of establishing a probe connection, for facilitating the measurement of the high-speed electrical characteristics of an interconnect structure having terminals thereon for conductively interfacing with spaced-apart connecting pads of a high-speed integrated circuit, said method comprising:

(a) providing an adapter, comprising a plurality of spaced-apart, substantially coplanar conductive strips on a dielectric substrate;

(b) connecting respective ones of said conductive strips of said adapter to respective ones of said terminals of said interconnect structure;

(c) providing a probe, comprising a controlled-impedance transmission line terminated at an end thereof by a plurality of spaced-apart, substantially coplanar contacts having a spacing substantially the same as that of said conductive strips of said adapter; and

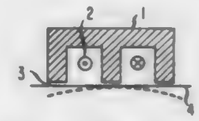
(d) conductively abutting respective ones of said contacts of said probe simultaneously with respective different ones of said conductive strips of said adapter to perform said measurement.

4,994,738

PROXIMITY SWITCH FOR DETECTING A MAGNETIC INDUCTIVE FIELD

Gerno Soyck, Höveler Weg 47, D-5884 Halver, and Peter Dahlheimer, Viktoriastr. 6, D-5885 Schalksmühle, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 33,151, Feb. 17, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,489
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3521816
Int. Cl.[5] G01B *7/14;* **H01H** *35/00, 83/00;* **G01N** *27/00*
U.S. Cl. 320—207.13 **5 Claims**



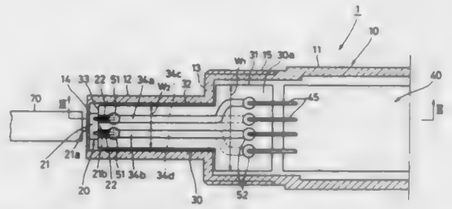
1. Inductive proximity switch comprising a high-frequency oscillator, wherein an oscillator coil is provided with an open core, saturation-sensitive to a magnetic field to be detected, in connection with an evaluation circuit, which detects the oscillation amplitude depending on the degree of the core saturation, and which, upon reaching of a certain amplitude value, triggers a switching process, wherein a foil-shaped anchor plate (4), made of a soft-magnetic metal alloy with a certain permeability, is coordinated to the open core (1) of the oscillator coil (2) under formation of an air gap (3), which anchor plate allows an oscillator current (I_o) to rise in a defined way upon intensification of the magnetic field from the damped state of said high frequency oscillator (10) or, respectively, upon a weakening of this field allows in a defined way to drop again in a damp state.

4,994,739

MAGNETIC SENSOR INCLUDING SENSING ELEMENT HAVING SUPPORT TERMINALS SOLDERED TO PRINTED CONDUCTORS

Naoko Honda, and Tsuneo Adachi, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,452
Claims priority, application Japan, Dec. 21, 1988, 63-164505[U]
Int. Cl.[5] G01P *3/487, 1/02;* **G01B** *7/30*
U.S. Cl. 324—207.14 **7 Claims**



1. A magnetic sensor comprising:

(a) a housing having a narrow elongate front portion;

(b) a holder mounted within said housing, said holder having an insertion portion inserted in said front portion of said housing, an outer surface of said insertion portion having a pair of oppositely facing surface sections on which elongate conductors are printed and which extend generally in the direction of the axis of said housing; and

(c) a magnetic sensing element comprising a body mounted within said front portion of said housing and disposed forwardly of said holder and terminals extending from opposite sides of said body toward said holder in generally parallel relation to said printed conductors so that said

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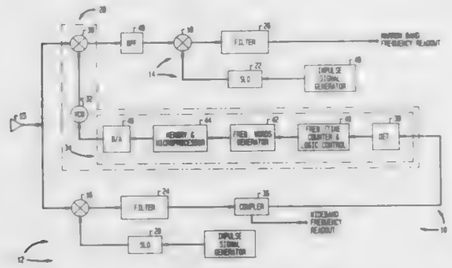
insertion portion is disposed between said terminals, said terminals being soldered respectively to said printed conductors, the terminals thereby supporting said sensing element on said holder.

4,994,740

HIGH RESOLUTION, WIDE BAND CHIRP-Z SIGNAL ANALYZER

William J. Skudera, Jr., Oceanport, N.J., and Charles E. Konig, Staten Island, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 25, 1989, Ser. No. 411,752
Int. Cl.[5] G01R *23/16*
U.S. Cl. 324—77 B 10 Claims



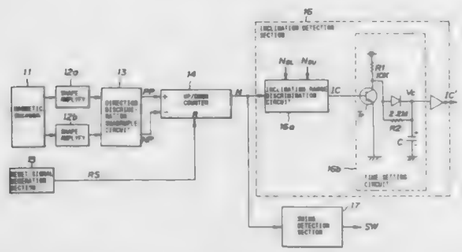
1. Apparatus for analyzing signal wave forms, comprising:
a wide band Chirp-Z channel having the sweeping local oscillator and filter frequency parameters thereof predetermined to derive the component wave forms of an incoming signal in a frequency segregated time domain;
a narrow band Chirp-Z channel having the sweeping local oscillator and filter frequency parameters thereof predetermined to present a selected component wave form of the incoming signal with enhanced resolution; and
means for matching the frequency characteristic of the selected component wave form to the frequency parameters of said narrow band channel in accordance with the relative position occupied by the frequency characteristic of the selected component wave form in the frequency segregated time domain of said wide band channel.

4,994,741

MAGNETIC MOTION SENSING DEVICE FOR SENSING INCLINATION AND SWAYING

Toshiaki Takahashi, Iwaki, Japan, assignor to Alpine Electronics Inc., Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 478,799
Claims priority, application Japan, Feb. 13, 1989, 1-33256
Int. Cl.[5] G01B *7/14;* G01C *9/06*
U.S. Cl. 324—207.23 7 Claims



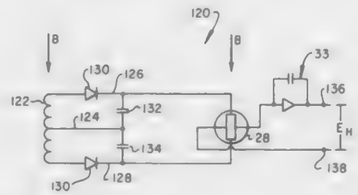
1. A motion detecting device, comprising:
an encoder for generating two signals of A phase and B phase which are out of phase with each other, said two signals being generated as a result of an inclination or swaying of a member being measured;
a pulse generation section coupled to said encoder for generating positive pulses or negative pulses, depending on whether said member inclines in a positive or negative direction, at each leading or trailing edge of said A phase and B phase signals;
an up/down counter coupled to said pulse generation section for counting up or down said positive or negative pulses, respectively, and outputting a counter value;
an inclination detection section for outputting an inclination generation signal when said member being measured inclines in said positive direction, causing said counter value to be above a first set value, or when said member being measured inclines in said negative direction, causing said counter value to be below a second set value; and
a swaying detection section coupled to said counter for setting a range of counter values and for setting a range of counter values and for detecting an inclination variation larger than a predetermined variation when said counter value outputted by said counter is within said range.

4,994,742

HALL EFFECT DEVICE AND MAGNETIC COIL CIRCUITS FOR MAGNETIC FIELD DETECTION

Frank E. Lowther, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 262,372, Oct. 25, 1988, Pat. No. 4,945,306. This application Sep. 6, 1989, Ser. No. 403,548
Int. Cl.[5] G01R *33/02, 33/06;* H03K *17/90*
U.S. Cl. 324—251 2 Claims



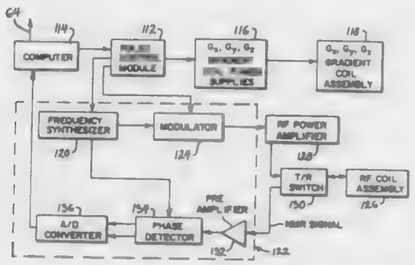
1. A circuit for detecting perceived changes in the intensity of a magnetic field comprising:
a coil adapted to be disposed in said magnetic field and including conductor means for conducting a current in response to a change in the intensity of said magnetic field as sensed by said coil;
a Hall effect device adapted to be disposed in said magnetic field with said coil and including conductor means for imposing a bias current thereon and connected to the conductor means of said coil for receiving as a bias current the current output by said coil in response to said change in said magnetic field;
output conductor means connected to said Hall effect device for producing a voltage signal which is proportional to said perceived change in said magnetic field;
a circuit element interposed in at least one of said conductor means of said coil for converting a generally sinusoidal output signal of said circuit to a generally half-wave output signal at said output conductor means; and
said coil includes an intermediate tap comprising a conductor which is interconnected with said conductor means of said coil by respective capacitances which are dischargeable into said Hall effect device to provide a time-delayed voltage output signal at said output conductor means.

4,994,743

METHOD FOR MONITORING RESPIRATION WITH ACQUIRED NMR DATA

Gary H. Glover, Delafield; Stephen W. Flax, Wauwatosa, both of Wis., and Ann Shimakawa, San Francisco, Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 27, 1989, Ser. No. 427,401
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 6 Claims



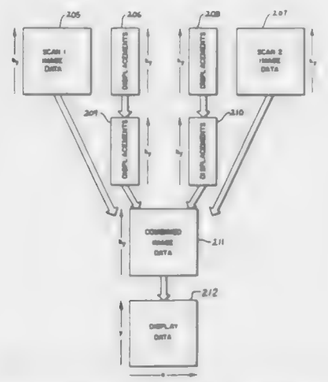
1. A system for providing respiratory phase information during an NMR scan of a subject, which comprises:
means for producing an NMR motion pulse sequence during the NMR image data scan;
means for acquiring the NMR motion signals produced by said NMR motion pulse sequence;
means for processing the motion NMR signals to produce a data set which indicates the position of features in the subject;
means for locating the position of a specific feature in said data set; and
means for producing a respiratory signal by correlating the current position of the specific feature with a reference position for that feature.

4,994,744

METHOD FOR COMBINING ACQUIRED NMR DATA TO SUPPRESS MOTION ARTIFACTS

Gary H. Glover, Menlo Park, Calif., and Stephen W. Flax, Wauwatosa, Wis., assignors to General Electric Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 427,401, Oct. 27, 1989, and Ser. No. 401,374, Aug. 31, 1989, abandoned. This application Mar. 26, 1990, Ser. No. 499,235
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 5 Claims



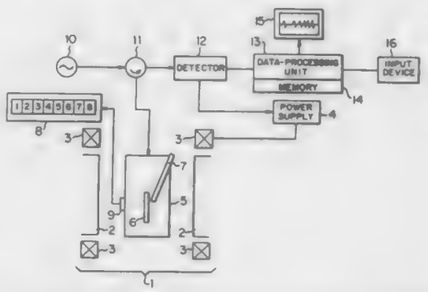
1. An NMR system for producing an image of a subject undergoing motion, the combination comprising:
means for acquiring a plurality of sets of NMR image data;
means for acquiring with each set of image data an associated set of motion data that indicates motion of the subject during each view of acquired image data;
means for generating a smooth reference curve for each set of acquired motion data;
means for determining the deviation of the acquired motion data from a reference curve; and
means for combining each view in the sets of NMR image data by weighting the NMR image data as a function of the deviation of its associated motion data.

4,994,745

ELECTRON SPIN RESONANCE SPECTROSCOPY

Yukio Mizuta, Tokyo, Japan, assignor to Jeol, Ltd., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,896
Claims priority, application Japan, Jan. 23, 1989, 1-13598
Int. Cl.[5] G01R *33/24*
U.S. Cl. 324—316 2 Claims



1. Electron spin resonance spectroscopy method comprising the steps of:
(a) obtaining an ESR spectrum containing both an ESR signal arising from a sample to be investigated and an ESR signal arising from Mn^{2+} contained in a reference sample;
(b) knowing the frequency ν of microwaves used to obtain the ESR spectrum;
(c) calculating the resonating magnetic field strengths H_{ci} and H_{cj} of two absorption lines S_i and S_j (i, j=1, 2, 3, . . . , 6; i≠j) of the six absorption lines S_1–S_6 arising from Mn^{2+}, from the microwave frequency ν, the nuclear spin quantum numbers m_I, m_J giving rise to the two absorption lines, a predetermined g value g_o intrinsic to Mn^{2+}, and a predetermined isotropic hyperfine coupling constant A, and in accordance with the following formulas:

$$H_c = H_o - A\,m_I - A^2\{(I+1) - m_I^2\}2H_o$$

$$H_o = h\nu/g_o\beta$$

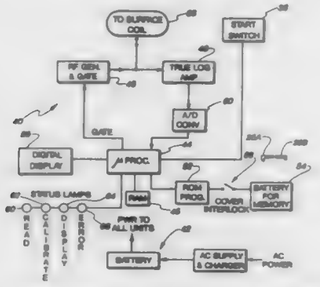
where I=5/2, m_{I1}=5/2, m_{I2}=3/2, m_{I3}=½, m_{I4}=−½, m_{I5}=−3/2, m_{I6}=−5/2, h is the Planck's constant, and β is the Bohr magneton;
(d) finding the magnetic field strength Hcx at a position x of interest from the distance between the two absorption lines S_i and S_j in the ESR spectrum, the distance between the position x and one of said two absorption lines in the spectrum, and the resonating magnetic field, strengths H_{ci}, H_{cj}.

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4,994,746
METHOD OF AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE ANALYSIS USING TRUE LOGARITHMIC AMPLIFIER

Richard L. Panosh, Lisle, Ill., assignor to Advanced Technics, Inc., Downers Grove, Ill.

Filed Sep. 5, 1989, Ser. No. 403,089
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 16 Claims



1. In an apparatus for testing a material for the presence of constituents using nuclear magnetic resonance analysis, the apparatus being of the type in which a first magnetic field aligns a magnetic dipole to a first position and in which a second magnetic field is cyclically energized to cause alignment of the magnetic dipole to a second position and then de-energized to allow the magnetic dipole to realign to the first position, and in which signals generated as a result of magnetic changes during realignment are detected and analyzed, the improvement comprising:

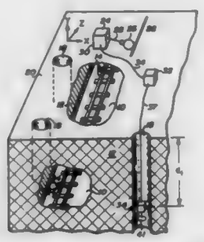
a) first circuit means for detecting the signals, the first circuit means including means for compressing the dynamic range of the detected signals to produce compressed detected signals; and

b) second circuit means for analyzing the compressed detected signals for the presence of information characteristic of at least one of the constituents.

4,994,747
METHOD AND APPARATUS FOR DETECTING UNDERGROUND ELECTRICALLY CONDUCTIVE OBJECTS

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Continuation-in-part of Ser. No. 143,727, Jan. 14, 1988, abandoned. This application Aug. 8, 1988, Ser. No. 230,711
Int. Cl.[5] G01V *3/11, 3/12, 3/30*
U.S. Cl. 324—334 17 Claims



1. A method for detecting underground electrically conductive objects which comprises:

a. drilling a plurality of drillholes about a region containing an underground electrically conductive object;

b. placing a transmitter and a transmitter antenna within said region, said transmitter having a port to accept a first synchronizing frequency over an electrically non-conductive fiber optic cable;

c. placing a receiver and a receiver antenna in one or more of the drillholes, said receiver having a port to accept a second synchronizing frequency over an electrically non-conductive fiber optic cable;

d. connecting by electrically non-conductive fiber optic cables, said transmitter first synchronizing frequency port, and said receiver second synchronizing frequency port to a first and a second port, respectively, of a coherent frequency source unit;

e. operating the transmitter to generate a first electromagnetic field synchronous to the first synchronizing frequency and sufficient in amplitude to induce a current flow in said electrically conducive object;

f. operating the receiver to detect a second electromagnetic field, said second electromagnetic field having been produced by re-radiation caused by said current flow in said electrically conductive object, and said second electromagnetic field being different in phase and amplitude from said first electromagnetic field;

g. amplifying the detected second electromagnetic field and outputting an amplified signal;

h. mixing the amplified signal with the second synchronizing frequency and outputting a difference signal;

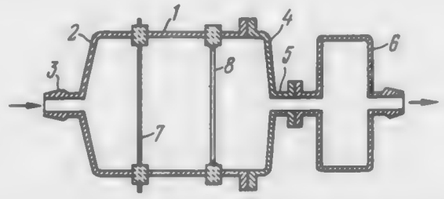
i. applying the difference signal to a first input of a synchronous detector and a third synchronous frequency to a second input of the synchronous detector, said synchronous detector also having an output; and

j. processing and analyzing the amplitudes and the phase differences of signals present on the output of the synchronous detector output, said amplitude and phase differences of the signals being in relation to the size and the relative position and orientation of the underground electrically conductive object.

4,994,748
SURFACE IONIZATION DETECTOR FOR ANALYZING GAS MIXTURES

Utkur K. Rasulev, prospekt Kosmonavtov, 17, kv. 3; Alexandr S. Avakov, ulitsa T.Shevchenko, 24, kv. 14; Erkinzhan G. Nazarov, Almazar, 10, kv. 115; Vladimir V. Palitsin, Junus-Abad, kvartal 5, 8, kv. 4, and Irina L. Telkanovskaya, Ts-2, 17, kv. 14, all of Tashkent, U.S.S.R.

PCT No. PCT/SU89/00151, § 371 Date Feb. 1, 1990, § 102(e) Date Feb. 1, 1990, PCT Pub. No. WO89/12227, PCT Pub. Date Dec. 14, 1989
PCT Filed May 31, 1989, Ser. No. 460,922
Claims priority, application U.S.S.R., Feb. 6, 1988, 4427690
Int. Cl.[5] G01N *27/62*
U.S. Cl. 324—468 3 Claims

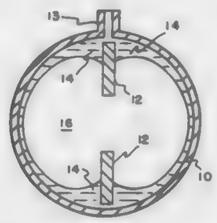


1. A surface ionization detector for analyzing gas mixtures, comprising a case (1) with an inlet connection (3) and an outlet connection (5) to bring in and out a gas mixture to be analyzed, housing a thermoemitter (7) with current leads (11) and an ion collector (8) connected to an electrometric lead (14), said thermoemitter and said ion collector being separated by a gap, characterized in that the ion collector (8) is made as a perforated element placed after the thermoemitter (7) in the direction of movement of the analyzed gas mixture substantially at right angles to the direction of its movement in the case (1), whereas the thermoemitter (7) is formed with at least one row of extended ionizing elements electrically insulated from one another, each element being connected to its own current lead (11).

4,994,749
LIQUID SENSOR WITH HIGH SENSITIVITY NEAR EMPTY

Keith Davies, Robbinsville, N.J., and William H. Meise, Wrightstown Township, Bucks County, Pa., assignors to General Electric Company, East Windsor, N.J.

Filed Dec. 16, 1988, Ser. No. 285,698
Int. Cl.[5] G01N *27/00*
U.S. Cl. 324—637 18 Claims



1. An arrangement for measuring the amount of liquid in a storage tank and adapted for use in a low gravity environment, which tank has a curved cross-section in at least one plane, said arrangement comprising:

a flat vane in the form of an annulus defining inner and outer edges, said vane being supported within said tank with said outer edge contiguous with the inner surface of said tank in said plane, wherein absent a dominant gravitational force said liquid will tend to accumulate in a region about said outer edge;

a plurality of elongated, open electromagnetic transmission lines, each including at least one elongated conductor, each of said transmission lines extending into said tank and, within said tank, extending in a curve which is in a substantially parallel relationship to at least one of said inner and outer edges of said vane, whereby each of said transmission lines extends in a curve substantially parallel to an expected surface of said liquid, and whereby each of said transmission lines is loaded by the presence of said liquid when said tank is full, and whereby each in turn is completely unloaded at a predetermined ullage condition of said tank; and

means coupled to said transmission lines for individually measuring a characteristic of each of said transmission lines which depends upon the loading by adjacent liquid.

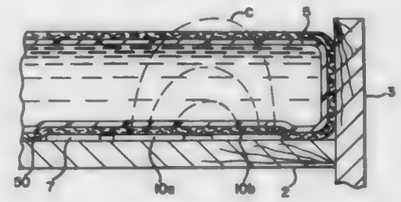
4,994,750
USE OF CAPACITANCE FOR PROTECTING AGAINST OVERHEATING OF A WATERBED HEATER

David W. Vrona, Glen Ellyn, and Manley S. Keeler, Naperville, both of Ill., assignors to Ohio Mattress Company Licensing & Components, Chicago, Ill.

Filed Jul. 14, 1989, Ser. No. 379,855
Int. Cl.[5] G01R *27/26;* H05B *1/02*
U.S. Cl. 324—671 7 Claims

1. In a waterbed having a frame with upstanding sidewalls, a water bladder for containing water, said water bladder received within said frame, and a water heater for heating water within the bladder, said heater electrically connected to a heater power supply, a waterbed protection device comprising:

probe means adjacent to said water bladder for detecting the presence of a dangerous condition, said probe means including detection means for measuring capacitance across said bladder and generating a signal corresponding to said capacitance, said capacitance having a threshold value indicative of the presence or absence of the dangerous condition; and

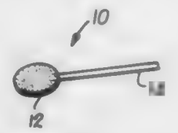


electrical circuit means responsive to said probe means to cut off power from said heater power supply to said water heater upon an indication by said probe means of the presence of said threshold value, whereby heating of said water bladder will not take place if said dangerous condition is present.

4,994,751
SYSTEM FOR ASSESSING LACHRYMAL FLUID CONTENT OF A SAMPLE PAD

Jerry W. Cook, 7400 NW. Whipple, Kansas City, Mo. 64152, and Edward T. Fago, Jr., Kansas City, Mo., assignors to Jerry W. Cook, Kansas City, Mo.

Filed Aug. 14, 1989, Ser. No. 393,223
Int. Cl.[5] G01R *27/26;* G01N *31/00*
U.S. Cl. 324—674 11 Claims



1. A lachrymal fluid assessment device comprising:

receiving means including a pair of electrodes for receiving a sample pad therebetween with the sample pad having an unknown quantity of lachrymal fluid present therein, and for presenting the sample pad for determination of the capacitance thereof, said unknown quantity being a representative sample of lachrymal fluid present in a person's eye, said capacitance being representative of said unknown quantity; and

circuit means operably coupled with said receiving means for determining said capacitance, for producing a capacitance signal representative of said capacitance, and responsive thereof for producing an output correlated with said unknown quantity of lachrymal fluid present in the sample pad,

said circuit means including processing circuit means responsive to said capacitance signal for producing said output;

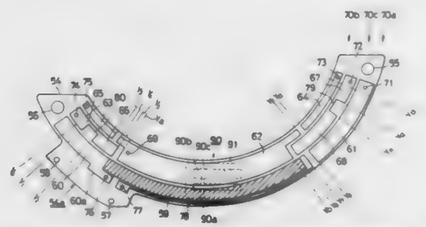
said processing circuit means including memory means for storing data correlating said output with said capacitance signal and thereby with said unknown quantity and with the amount of lachrymal fluid present in the person's eye.

4,994,752

POSITION DETECTING POTENTIOMETER FOR A MOVING BODY

Daisuke Hata, Funabashi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,373
Claims priority, application Japan, May 25, 1988, 63-125898
Int. Cl.[5] G01R *27/02;* **H01C** *10/32*
U.S. Cl. 324—714 **8 Claims**



1. A potentiometer for electrically detecting a present position of a moving body movable in two directions opposite to each other within a movable region, comprising:

a resistance section disposed on a first part of one surface of an insulating body so as to extend in one direction;

a plurality of conductive sections disposed on a second part of said one surface of said insulating body so as to be apart from each other and to extend in said one direction, said second part being in the vicinity of said first part of said one surface;

a brush means provided with a conductive brush, said conductive brush being adapted to be slidable in two directions opposite to each other in response to the moving of said moving body, said brush contacting at least two of said conductive sections when said moving body is positioned in a first region of said movable region and said brush contacting said resistance section and at least one of said conductive section when said moving body is positioned in a second region of said movable region;

a first position detecting means for detecting the present position of said moving body in said second region based on a resistance value corresponding to a location of said brush when said moving body is positioned in said second region; and

a second position detecting means for detecting the present position of said moving body in said first region based on the electric connection of said at least two conductive sections by said brush when said moving body is positioned in said first region.

4,994,753

SYNCHROTRON RADIATION SOURCE

Takashi Ikeguchi, Hitachi; Manabu Matsumoto, Ibaraki; Shinjiroo Ueda, Abiko; Tadasi Sonobe, Iwaki; Toru Murashita, Atsugi; Satoshi Ido, Isehara; Kazuo Kuroishi, Hitachi, and Akinori Shibayama, Isehara, all of Japan, assignors to Hitachi, Ltd.; Nippon Telephone & Telegraph Corp., both of Tokyo and Hitachi Service Engineering Co., Ltd., Ibaraki, all of, Japan

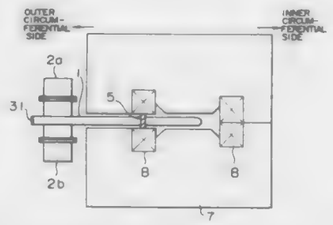
Filed Mar. 17, 1988, Ser. No. 169,598
Claims priority, application Japan, Mar. 18, 1987, 62-60982; Mar. 25, 1987, 62-68899
Int. Cl.[5] H05H *13/04*
U.S. Cl. 328—235 **11 Claims**

1. A synchrotron radiation source comprising:

a bending section/vacuum chamber having one end which a charged particle beam enters and the other end which the charged particle beam leaves;

a bending electromagnet so disposed as to encompass said bending section/vacuum chamber; and

beam absorbers made of copper of more than 99.99% purity and disposed inside said bending section/vacuum chamber



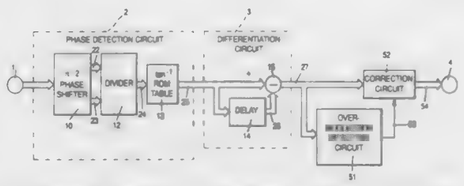
at at least positions upon which the synchrotron radiation is irradiated.

4,994,754

DIGITAL FM DEMODULATING APPARATUS

Haruo Ohta, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Inc., Osaka, Japan

Filed May 23, 1989, Ser. No. 356,327
Claims priority, application Japan, May 24, 1988, 63-126433
Int. Cl.[5] H03D *3/00*
U.S. Cl. 329—318 **5 Claims**



1. A digital frequency demodulating apparatus comprising:

a phase detection means for detecting a phase of an input frequency-modulated signal;

a differentiation means for time differentiating an output signal from said phase detection means to obtain a demodulated signal in proportion to an instantaneous frequency of said input frequency-modulated signal;

an over-medium detection means for detecting an occurrence of an over-modulation of said input frequency-modulated signal according to an amplitude value of said demodulated signal from said differentiation means to generate a detection signal; and

a correction means responsive to said detection signal for correcting said demodulated signal to obtain a demodulated output signal which has deterioration due to said over-modulation corrected.

4,994,755

ACTIVE BALUN

Ward S. Titus, Cambridge, and Manfred J. Schindler, Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 22, 1989, Ser. No. 355,739
Int. Cl.[5] H03F *3/60;* **H03B** *19/00;* **H03H** *5/00*
U.S. Cl. 330—54 **14 Claims**

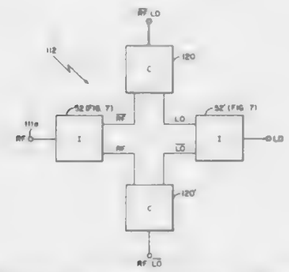
1. An r.f. double balun circuit comprising:

first inverter means fed by a first signal for providing a pair of output signals having equal amplitudes and 180° phase shift difference;

second inverter means fed by a second signal for providing a pair of output signals having equal amplitudes and 180° phase shift;

first combiner means for combining a first one of the signals

of each one of said first and second inverter means for providing a first output signal; and



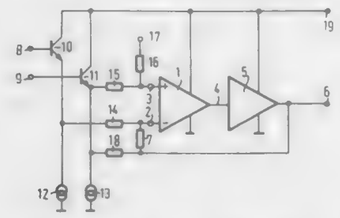
second combiner means for combining a second one of said signals of each one of said inverter means for providing a second output signal.

4,994,756

CIRCUIT ARRANGEMENT FOR AMPLIFYING A TELEVISION SIGNAL

Joachim C. Brilka, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 187,613, Apr. 28, 1988, abandoned.
This application Aug. 4, 1989, Ser. No. 391,409
Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714643
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—260 **1 Claim**



1. A differential amplifier circuit comprising:

first and second circuit inputs and a circuit output;

a differential amplifier having first and second amplifier inputs and an amplifier output, said amplifier output being coupled to said circuit output;

first and second impedance transformation stages for coupling said first and second circuit inputs to said first and second amplifier inputs, respectively;

a resistive feedback network for feeding back an output signal from said circuit output to said first amplifier input; and

a resistive compensation network coupling said circuit output to an output of said second impedance transformation stage for compensating non-linearities effected by said first and second impedance transformation stages.

4,994,757

EFFICIENCY IMPROVEMENT OF POWER AMPLIFIERS

Robert H. Bickley, and Richard A. Bory, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1989, Ser. No. 430,034
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—285 **12 Claims**

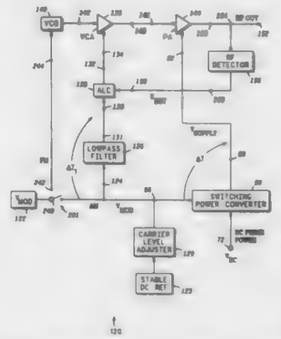
1. A power amplifier for efficiently increasing the electrical power of an amplitude modulated input signal having varying percentages of modulation to provide an output signal having a plurality of power levels, the power amplifier including in combination:

amplifying electron control means;

power supply means coupled to said electron control means, said power supply means providing supply voltages to said electron control means;

reference supply means coupled to said power supply means, said reference supply means providing reference voltages to said power supply means;

modulating signal supply means coupled to said reference supply means for amplitude modulating said reference voltage so that said power supply means provides an



amplitude modulated supply voltage to said electron control means, said amplitude modulated supply voltage having varying percentages of modulation in accordance with the varying percentages of modulation of said amplitude modulated input signal; and

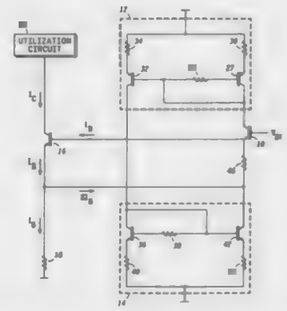
first circuit means having phase synchronization means, said first circuit means coupling said modulating signal supply means to said amplifying electron control means, said phase synchronizing means synchronizing the phases of said amplitude modulated supply voltage and the amplitude modulation of the input signal to facilitate efficient operation of the power amplifier.

4,994,758

ALPHA ENHANCEMENT OF A TRANSISTOR USING BASE CURRENT FEEDBACK TO THE EMITTER

Dennis L. Welty, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 15, 1989, Ser. No. 450,954
Int. Cl.[5] H03F *1/30*
U.S. Cl. 330—288 **21 Claims**



1. A circuit for enhancing the alpha of a transistor such that

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the apparent emitter current of the transistor is made substantially equal to the collector current of the transistor which is sourced from a utilization means, comprising:

current supplying means coupled to an input signal and to the base of the transistor for passing base current thereto;

a first current mirror having an input responsive to said current supplying means for passing current thereto which is substantially equal to the base current of the transistor, and an output; and

a second current mirror having an input coupled to said output of said first current mirror and an output coupled to the emitter of the transistor for sinking current therefrom which is a function of the base current of the transistor amplified by a gain of said first and second current mirrors such that the apparent alpha of the transistor is increased.

4,994,759

CURRENT EQUALIZING CIRCUIT

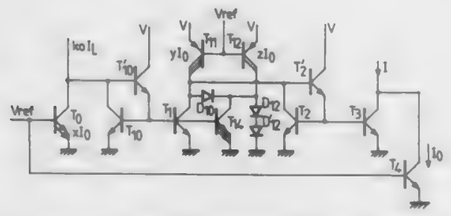
Philippe Jouen, Caen, France, and José Favoretto, Campinas, Brazil, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 21, 1989, Ser. No. 384,225

Claims priority, application France, Jul. 22, 1988, 88 09953

Int. Cl.[5] H03F *3/04*

U.S. Cl. 330—288 **13 Claims**



1. Equalizing circuit for producing an output current as a function of the value of an input current in accordance with an output current characteristic having a maximum and a minimum value, which circuit comprises a means for producing a first current which is proportional to the input current, connected in series with a first current source producing a second current which is proportional to a reference current, in order to produce a first resulting current which is positive when the first current is higher than the second current and zero in the opposite case, a first switching stage arranged for being non-conductive when the first resulting current is zero, and passed through thereby when it is positive, a second switching stage arranged for being passed through by the same current as the first switching stage, a second current source arranged for supplying a third current which is proportional to the reference current and connected in series with the second switching stage, in a manner such as to generate a second resulting current which is positive when the third current is higher than the resulting first current, a third switching stage arranged for not conducting when the second resulting current is zero, and for being passed through thereby when it is positive, a first current output stage arranged for supplying a current which is equal to the current passing through the third switching stage and a second current output stage connected in parallel with the first current output stage arranged for supplying a current which is equal to the reference current, whose value is thus the said minimum value of the output current characteristic, characterized in that it comprises at least an equalizing means connected in parallel with one of the first and second switching circuits and comprising on the one hand a third current source (T_{12}) arranged for supplying a fourth current (ZI_0) which is proportional to the reference current, connected in series with a fourth current source (T_{14}) arranged for supplying a current in proportion to the current supplied by the first switching stage and on the other a blocking circuit arranged for connecting the fourth current source in parallel with at least one of the first and second switching circuits when the current passing through the fourth current source is larger than the fourth current.

4,994,760

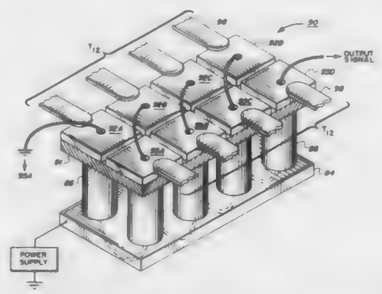
APPARATUS AND METHOD FOR COMBINING OUTPUT SIGNALS FROM PARALLELLY COUPLED POWER FIELD EFFECT TRANSISTORS IN HIGH FREQUENCY AMPLIFIERS

Don P. Roehrs, New River, Ariz., assignor to Signal One Corporation, Phoenix, Ariz.

Continuation of Ser. No. 96,629, Sep. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 58,592, May 26, 1987, Pat. No. 4,733,194, which is a continuation of Ser. No. 701,492, Feb. 14, 1985, abandoned. This application Jun. 7, 1989, Ser. No. 364,559

Int. Cl.[5] H03F *3/68*

U.S. Cl. 330—295 **18 Claims**



1. An RF transformer/power combining unit comprising:

a conducting plate having apertures formed therein;

a first plurality of RF broad band ferrite core units, each first plurality ferrite core unit having a conductive sleeve associated therewith and an aperture therethrough, each first plurality ferrite core unit having a first end of said conductive sleeve electrically coupled to said conducting plate, wherein apertures in said first plurality of ferrite core units are aligned with said conducting plate apertures; and

a conductor cable enclosed in and insulating material passing through each of said first plurality ferrite core unit aperture and aligned conducting plate aperture, wherein a second end of each of said first plurality of ferrite core unit conductive sleeves is adapted to receive first radio frequency signals, each of said first radio frequency signals being substantially in phase, said conductor cable passing through each of said first plurality of ferrite core unit apertures in a first direction relative to said conducting plate, wherein signals induced in said conductor cable by said radio frequency signals are additive.

4,994,761

VHF POWER AMPLIFIER

Scott Craft, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 6, 1989, Ser. No. 431,801

Int. Cl.[5] H03F *3/191*

U.S. Cl. 330—302 **20 Claims**

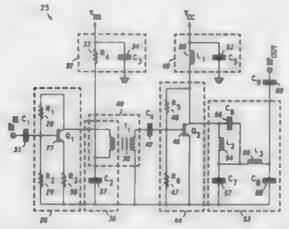
1. An amplifier having an input, output, and ground, said amplifier comprising:

a first transistor having a base coupled to said input of said amplifier;

degeneration means for limiting power dissipation in said first transistor, said degeneration means being coupled between a collector of said first transistor and a first supply voltage;

first decoupling means for removing signals from said first supply voltage, said first decoupling means being coupled between said collector of said first transistor and said ground of said amplifier;

a second transistor having a base coupled to said collector of



said first transistor and a collector coupled to said output of said amplifier; and

coupling means for matching impedance between said first and second transistors, said coupling means being coupled between said collector of said first transistor and a base of said second transistor.

4,994,762

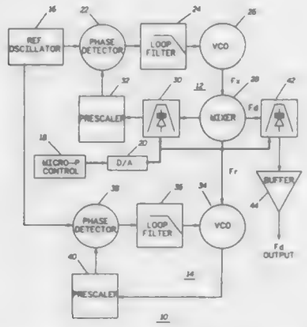
MULTILOOP SYNTHESIZER WITH OPTIMAL SPURIOUS PERFORMANCE

Wan F. Tay, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1989, Ser. No. 438,561

Int. Cl.[5] H03L *7/07, 7/18*

U.S. Cl. 331—2 **20 Claims**



1. A mixed down synthesizer scheme, comprising:

a first phase locked loop, providing a first frequency and having at least a first programmably turnable filter and a mixer;

a second phase locked loop, providing a second frequency having an output received by said mixer in the first phase locked loop; and

a controlling means for controlling said first and second frequencies and for tuning said first programmably tunable filter.

4,994,763

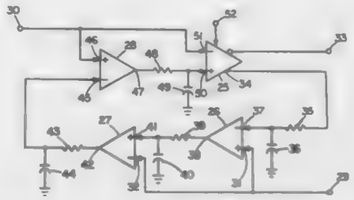
UNIVERSAL VOLTAGE-CONTROLLED MULTIVIBRATOR

Haw-Rean Chen, and Feichu H. Chen, both of 4057 Little Hollow Pl., Moorpark, Calif. 93021

Filed Nov. 13, 1989, Ser. No. 435,672

Int. Cl.[5] H03B *5/20*

U.S. Cl. 331—57 **7 Claims**



1. An electrical means for controlling the period of an electrical signal by varying controlling electrical signals comprising a signal state conversion circuit means and a feedback circuit means wherein said signal state conversion circuit means, having more than one input port with one of said input ports connected to one output of said feedback circuit means and more than one input port to be utilized as controlling input terminals, comprises an electrical circuit with the property of having output states, with propagation delay time to be controlled by said controlling input terminals, varying as a function of input states while said feedback circuit means, comprising one or more electrical comparing means and having more than one input port with one of said input ports connected to one output of said signal state conversion circuit means and more than one input port to be utilized as controlling input terminals, has a propagation delay time as a function of controlling electrical signals applied to said controlling input terminals and transmits the output signal of said signal state conversion circuit means back to said input port of said signal state conversion circuit means.

4,994,764

SINGLE-PIN OSCILLATOR

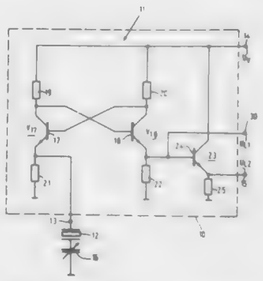
Matthias Peters, Halsteabek, Fed. Rep. of Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1989, Ser. No. 439,905

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839658

Int. Cl.[5] H03B *5/12, 5/36*

U.S. Cl. 331—116 R **12 Claims**



1. An oscillator comprising:

first and second directly cross-coupled inverters,

said first inverter comprising a first transistor connected between first and second resistances in a first series circuit coupled to terminals of a source of supply voltage for the oscillator,

said second inverter comprising a second transistor connected between third and fourth resistances in a second series circuit coupled to said terminals of the supply voltage source,

a frequency-determining element connected in parallel with one of the resistances in one of said inverters, and

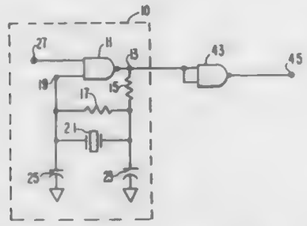
means for coupling an oscillator signal developed at a non-inverting output of the other one of said inverters to an output of the oscillator.

4,994,765

STABILIZED GATED OSCILLATOR UTILIZING A CERAMIC RESONATOR

David C. Greene, and Edwin R. Meyer, both of Knoxville, Tenn., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 4, 1990, Ser. No. 505,089
Int. Cl.[5] H03B *5/32*
U.S. Cl. 331—158 **7 Claims**



1. A pulse generator for providing a train of pulses at a predetermined repetition rate upon reception of, and in phase coherency with, a gating signal comprising:

a gated amplifier having an input terminal, an output terminal, and input means for receiving said gating signal, said amplifier enabled upon reception of said gating signal at said input means; and

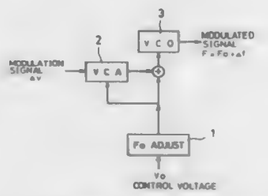
resonant circuit means coupled between said output terminal and said input terminal for establishing said predetermined repetition rate, said resonant circuit means including a ceramic resonator having a first resonant frequency and a second resonant frequency, said ceramic resonator operating in said resonant circuit means as an inductance element at frequencies between said first and second resonant frequencies.

4,994,766

FREQUENCY MODULATOR

Katsunori Miura, Shijonawate, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jul. 19, 1990, Ser. No. 554,497
Claims priority, application Japan, Jul. 20, 1989, 1-187809
Int. Cl.[5] A03C *3/00*
U.S. Cl. 332—117 **6 Claims**



1. A frequency modulator, comprising:

an oscillator an oscillation frequency of which is variable in response to a control signal inputted to a first control input thereof;

first means for generating a direct current signal which determines a center frequency of said oscillator;

second means for generating an alternating current signal which has an amplitude in proportion to a modulation signal and determines a frequency deviation amount of said oscillator, said second means having a second control input;

first voltage applying means for applying said direct current signal and said alternating current signal to said first input of said oscillator; and

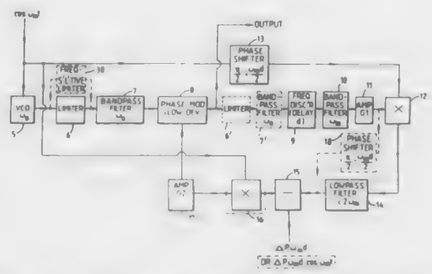
second voltage applying means for applying said direct current signal to said second control input of said second means so that said amplitude of said alternating current signal can be controlled by said direct current signal.

4,994,767

OSCILLATOR PHASE-NOISE REDUCTION

Henry W. Hawkes, Winchcombe, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/00517, § 371 Date Feb. 15, 1990, § 102(e) Date Feb. 15, 1990, PCT Pub. No. WO89/00788, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 1, 1988, Ser. No. 460,885
Claims priority, application United Kingdom, Jul. 13, 1987, 8716458
Int. Cl.[5] H03C *3/00, 3/09*
U.S. Cl. 332—123 **25 Claims**



1. A method of reducing the additive phase-noise in the output from an oscillator of given frequency, in at least one defined frequency band, comprising:

applying a frequency-modulating signal to the oscillator to produce a frequency-modulation sideband of said given frequency within said band, said signal having a frequency much higher than the highest multiplicative phase-noise frequency in that band and producing a modulation index much greater than the modulation index of the total phase-noise in that band, total phase noise comprising additive phase-noise plus multiplicative phase noise;

and phase-modulating the output from said oscillator with a signal at the modulating frequency selected by a filter means from the output of a frequency-discriminator having an appropriate delay which receives an amplitude-limited version of the oscillator output either before or after said phase-modulating thereof, in a sense and at an amplitude which tends to cancel the additive phase-noise modulation in the oscillator output;

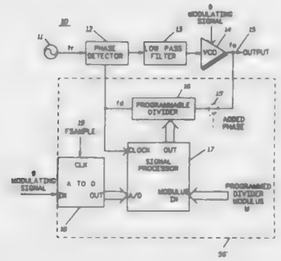
whereby the thus phase-modulated output from the oscillator is a frequency-modulated output having reduced additive phase-noise in said band.

4,994,768

FREQUENCY SYNTHESIZER WITH FM MODULATION

Wayne P. Shepherd; Darrell E. Davis, both of Sunrise, and Frederick L. Martin, Gainesville, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 328,834, Mar. 27, 1989, abandoned. This application Mar. 26, 1990, Ser. No. 499,102
Int. Cl.[5] H03C *3/09*
U.S. Cl. 332—127 **22 Claims**



1. A frequency synthesizer for providing a modulated output signal, comprising:

means for producing a reference frequency signal;

a voltage controlled oscillator;

programmable dividing means coupled to the output of the voltage controlled oscillator for dividing the frequency of the output signal from the voltage controlled oscillator by a divisor;

phase detector means having a first input coupled to said means for producing a reference frequency signal, a second input coupled to the output of said programmable dividing means, and an output coupled to the input of the voltage controlled oscillator to produce a phase-locked loop in which the frequency of the output signal from the voltage controlled oscillator is equal to the frequency of the reference frequency signal multiplied by said divisor;

first integrating means for integrating a modulating signal to provide an integrated signal and a first control signal;

second integrating means coupled to said first integrating means for integrating said integrated signal to provide a second control signal;

differentiating means coupled to said second integrating means for differentiating said second control signal to provide a third control signal; and

processing means coupled to said first integrating means, said second integrating means, and said differentiating means for processing said first, second, and third control signals and a divider modulus code, said processing means modifying said divider modulus code in response to said modulating signal and being coupled to said programmable dividing means to provide said divisor, whereby the frequency of the output signal from the voltage controlled oscillator is modulated by said modulating signal.

4,994,769

SSB MODULATION AND DEMODULATION APPARATUS

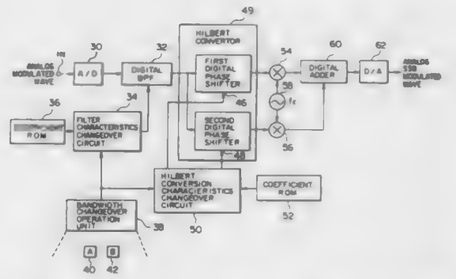
Takahiko Kishi, Tokyo, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Jun. 6, 1990, Ser. No. 533,858
Claims priority, application Japan, Jun. 5, 1989, 1-146481
Int. Cl.[5] H03C *1/52*
U.S. Cl. 332—170 **6 Claims**

1. An SSB modulation apparatus comprising a band-pass filter having a plurality of switchable bandwidths for restricting a signal transmission bandwidth, and Hilbert conversion means constructed of a network having a pass band over all frequency ranges for converting a modulating wave into two modulating waves each having a phase difference of 90 degrees, said apparatus comprising:

said Hilbert conversion means which is a digital Hilbert conversion means arranged to be set with switchable Hilbert conversion coefficients;

Hilbert conversion characteristics changeover information storage means for storing a plurality of Hilbert conversion coefficients corresponding to a plurality of Hilbert conversion coefficients for different bandwidths and different sideband suppressions; and



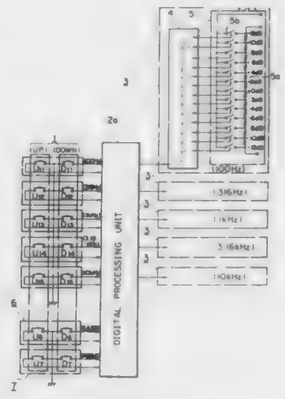
Hilbert conversion characteristics changeover means responsive to a change in the bandwidth of said band-pass filter for reading corresponding ones of said Hilbert conversion coefficients from said Hilbert conversion characteristics changeover information storage means, and supplying said read-out Hilbert conversion coefficients to said digital Hilbert conversion means to change said Hilbert conversion coefficients previously set.

4,994,770

TONE CONTROL DEVICE

Masaki Niwayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,350
Claims priority, application Japan, Oct. 21, 1988, 63-266499
Int. Cl.[5] H03G *5/02*
U.S. Cl. 333—28 T **15 Claims**



1. A tone control device comprising:

a first manipulation input means for entering first manipulation inputs to adjust a gain of each of N bands of an audio frequency band;

a plurality of memory means for storing the first manipula-

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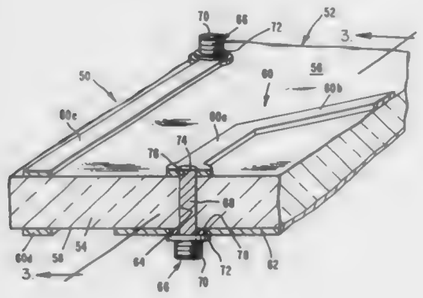
tion inputs by the first manipulation input means after converting the first manipulation inputs into digital values;
a plurality of electronic variable resistor assemblies for varying each resistance in accordance with gain setting data for each band in the N bands;
wherein an audio signal is controlled in tone on a basis of frequency characteristics that corresponds to the gain setting data fed to each band in the N bands; and characterized by further comprising:
a second manipulation input means for entering second manipulation inputs to adjust a gain of each of M bands of the audio frequency band, M being less than N;
a conversion means for converting the second manipulation inputs by the second manipulation input means into converted weighting values for each band in the N bands; and
a gain setting means for setting a gain of the each band in the N bands in accordance with the converted weighting values and the first manipulation inputs stored in the memory means.

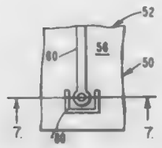
4,994,771

MICRO-CONNECTOR TO MICROSTRIP CONTROLLED IMPEDANCE INTERCONNECTION ASSEMBLY

Henry K. Takamine, and Allan E. Lange, both of Gardena, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 28, 1989, Ser. No. 372,803
Int. Cl.[5] H01P 5/08
U.S. Cl. 333—33 9 Claims





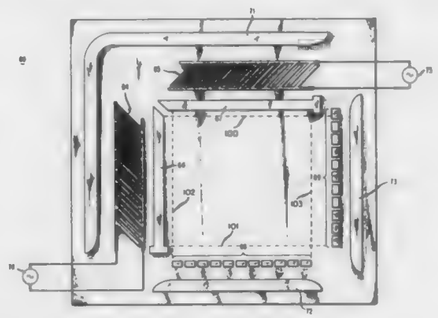
8. A controlled impedance interconnection assembly having a bandwidth sufficient to enable it to operate in excess of 14 GHz and in x-band frequencies, for connecting an x-band connector to a microstrip on a circuit board, comprising:
a circuit board having a core of dielectric material terminated by first and second surfaces, an electrically conductive microstrip on said first surface, and means defining a hole which is disposed substantially at right angles to said surfaces and which extends from said second surface through said core to said conductive microstrip;
a connector including a conductor extending through said hole means and having an angled mechanical and electrical connection to said microstrip, the angle and smoothness of said connection providing a flush transition from said conductor to said microstrip which avoids deleterious degradation in signal transmission through said connection resulting from excessive insertion losses and reactive impedances therein and which enables the circuit board to operate in excess of 14 GHz and in x-band frequencies;
etched microstrip means comprising conductive tuning material on said first surface substantially surrounding and electrically insulated from said connection between said conductor and said microstrip, said tuning material having a size and shape which inductively matches that of said microstrip; and
means electrically coupled between said tuning material and said conductive microstrip for grounding said tuning material.

4,994,772

ACOUSTIC CHARGE TRANSPORT PROCESSOR

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 27, 1988, Ser. No. 263,298
Int. Cl.[5] H03H 9/44; H01L 29/816, 41/00
U.S. Cl. 333—152 3 Claims



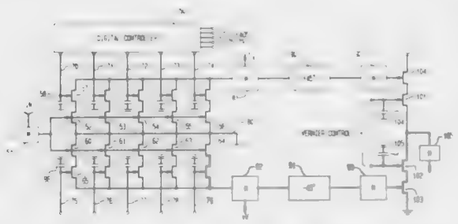
1. An acoustic charge transport device comprising:
a piezoelectric semiconductor having a channel for transporting charge packets;
dispersive transducer means for generating multiple surface acoustic waves in a first plurality of spatial regions in the semiconductor material, the surface acoustic waves being generated near a first portion of the channel and propagating through the channel to a second portion of the channel, said dispersive transducer means for generating multiple surface acoustic waves comprising a first and a second two dimensional array transducer arranged mutually perpendicular to each other;
oscillatory generator means coupled to said transducer means for providing a variable frequency signal for activating the dispersive transducer means, the dispersive transducer means generating selectively in different spatial regions of the first plurality of spatial regions a surface acoustic wave representative of the frequency provided to the dispersive transducer means by the oscillatory means;
means adjacent to the first portion of the channel for injecting the charge packets in a potential well created by the surface acoustic waves, said charge packet injecting means adjacent to the first portion of the channel including a first and a second electrode arranged mutually perpendicular to each other; and
means adjacent to the second portion of the channel, defining a second plurality of spatial regions in the semiconductor material, for detecting the charge packets in each of the multiple surface acoustic waves, the dispersive transducer means providing a time delay between the injecting of the charge packets and the detecting of the charge packets.

4,994,773

DIGITALLY CONTROLLED MONOLITHIC ACTIVE PHASE SHIFTER APPARATUS HAVING A CASCODE CONFIGURATION

Tzu H. Chen, 1 Braddock Rd., East Brunswick, N.J. 08816, and Mahesh Kumar, 112 Nassau Dr., Lawrenceville, N.J. 08648

Filed Oct. 13, 1988, Ser. No. 257,482
Int. Cl.[5] H03H 11/20
U.S. Cl. 333—164 27 Claims



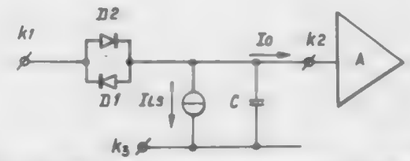
1. A digitally controlled active phase shifter apparatus operative to shift the phase of a signal within a given frequency range as applied to an input terminal between 0–90 degrees at an output terminal, comprising:
phase bit means having an input adapted to receive said input signal to provide at an output a signal shifted in phase by a given phase angle,
active power divider means having an input coupled to said output of said phase bit means, said power divider including first and second power divider paths, each path including a plurality of cascode FET devices, with each device comprising a first FET arranged in a cascode stage configuration with a second common gate FET, with each of said first and second FET's having a gate electrode, a source electrode and a drain electrode, with the gate electrodes of said first FET's in each device connected together and coupled to said input of said power divider means and with the gate electrodes of said common gate FET's each adapted to receive a first control signal for selectively biasing each cascode stage ON or OFF, with the drain electrodes of said common gate FET's in said first path connected together to provide a first output of said power divide means and with the drain electrodes of said common gate FET's in said second path connected together to provide a second output of said power divider means, with the source electrodes of said first FET's in each device connected together to a point of reference potential,
a pair of phase delay networks with a first one operative to provide a given fixed phase delay of a given polarity and having an input coupled to said first output of said power divider, and a second one operative to provide an opposite polarity given phase delay and having an input coupled to said second output of said power divider, each of said phase delay networks having a respective output,
an active power combiner means having a first and second pair of FET's, each FET pair is in a cascode configuration with each FET having a gate electrode, a source electrode and a drain electrode with one FET in said first pair having the gate electrode coupled to said output of said first network and one FET in said second pair having the gate electrode coupled to said output of said second network with the source electrodes of said one FET's coupled to a point of reference potential with the other FET in each pair arranged in a common gate configuration and having the gate electrode adapted to receive a second control signal, with the drain electrodes of said common gate FET's coupled together to provide said output terminal for said phase shifter,
digital control means coupled to said gate electrode of said common gate FET's of said power divider to select cascode stages of said power divider according to a desired phase shift to be implemented via said first and second paths,
whereby said power combiner can combine said signals from said power divider to provide a phase shift for said input signal between 0–90 degrees at said output terminal.

4,994,774

INTEGRATED LOW-PASS FILTER ARRANGEMENT

Cornelis Joosse, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1989, Ser. No. 306,008
Claims priority, application Netherlands, Feb. 19, 1988, 8800421
Int. Cl.[5] H03H 7/00
U.S. Cl. 333—172 13 Claims



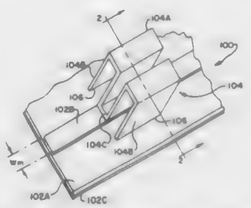
10. An integrated low pass filter arrangement comprising, first and second input terminals, first and second output terminals for connection to a load, first and second resistor sections connected between said first input and output terminals and between said second input and output terminals, respectively, of the filter arrangement, and at least one capacitor section connected to at least one output terminal of the filter arrangement, each resistor section comprising two anti-parallel diodes including an NPN transistor and a PNP transistor with each transistor having a short-circuited base-collector junction and its collector connected to the respective input terminal and its emitter connected to the respective output terminal.

4,994,775

HIGH-PASS FILTER FOR MICROSTRIP CIRCUIT

Marwan E. Nusair; Michael D. Valentine, and Stephen R. Scholl, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

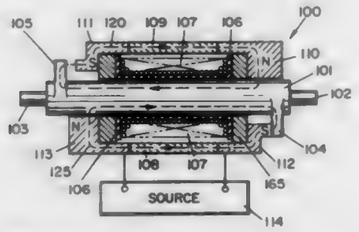
Filed Oct. 23, 1989, Ser. No. 425,693
Int. Cl.[5] H01P 1/203, 3/08
U.S. Cl. 333—204 17 Claims



1. A low loss high-pass microwave filter comprising:
a microstrip circuit having a dielectric substrate with a microstrip line on one side and ground plane on the other; and
a length of single-ridge waveguide having a top wall and sidewalls with a ridge projecting centrally from the top wall into said waveguide, said sidewalls extending through said dielectric substrate parallel to and on opposite sides of said microstrip line and being connected electrically and physically to said ground plane to form a bottom wall for said waveguide, said ridge having a width which is no wider than said microstrip line and is aligned

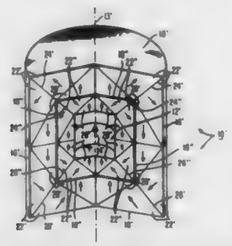
with and in good electrical and physical contact therewith.

4,994,776
MAGNETIC LATCHING SOLENOID
Gheorghe C. Junca, Fullerton, Calif., assignor to Babcock, Inc., Orange, Calif.
Filed Jul. 12, 1989, Ser. No. 378,764
Int. Cl.[5] H01F 7/06
U.S. Cl. 335—234 18 Claims



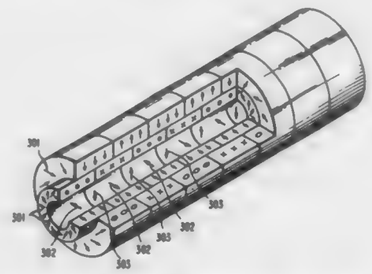
1. A solenoid comprising,
a coil means including an electrical conductor,
a moveable member within said coil means,
a magnetic flux path means disposed adjacent to said moveable member and adapted to retain said moveable member in a specified position,
said magnetic flux path means operative to continuously produce opposite sense magnetic flux fields of substantially constant strength within said moveable, and permanent magnet means associated with said magnetic flux path means in order to provide and maintain said substantially constant magnetic flux fields in said moveable member member.

4,994,777
ENHANCED MAGNETIC FIELD WITHIN ENCLOSED CYLINDRICAL CAVITY
Herbert A. Leupold, Eatontown, and Ernest Potenziani, II, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 14, 1989, Ser. No. 436,503
Int. Cl.[5] H01F 7/02, 3/10; G01R 33/38
U.S. Cl. 335—302 13 Claims



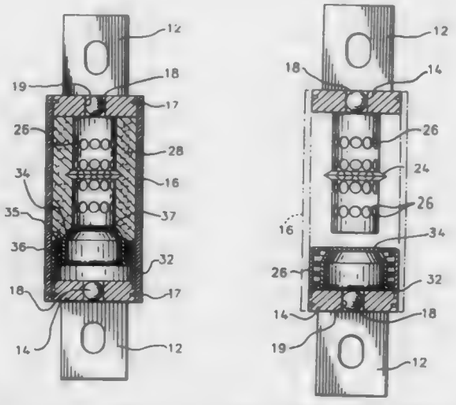
1. In a flux source of the type having an enclosed cylindrical cavity wherein a magnetic field of uniform density and enhanced magnitude is sustained in a direction parallel with the cylindrical axis of said cavity, the improvement comprising:
said flux source being fabricated of magnetically rigid material disposed in a plurality of nested layers, each said layer including a plurality of interfitting magnetized segments, said segments being configured and arranged in each said layer to construct a hollow cylinder and closures on both ends thereof with each said segment being substantially triangular in cross-sectional configuration.

4,994,778
ADJUSTABLE TWISTER
Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 14, 1989, Ser. No. 436,408
Int. Cl.[5] H01F 700
U.S. Cl. 335—306 6 Claims



1. A convertible magnetic structure which creates a magnetic modulation waveform for use in a field variable wiggler and twister comprising a linear array wherein each of the components of said array are composed of a plurality of truncated, concentric, hollow cylindrical flux source (HCFS) structures nested one within another such that the HCFS structures have a common longitudinal central axis in the central cavity, the outer radius of each HCFS structure beginning with the innermost HCFS structure being substantialy equal to the inner radius of the immediately adjacent larger HCFS structure, each HCFS structure being free to displace linearly with respect to the HCFS structure with which it is nested in a dirction parallel to the central axis, and also to rotate about said axis by any angular amount.

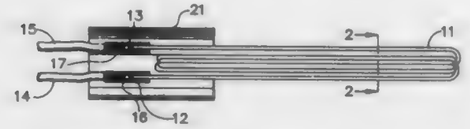
4,994,779
CLASS J TIME DELAY FUSE
Robert S. Douglass, Glencoe, Mo., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Aug. 21, 1989, Ser. No. 396,705
Int. Cl.[5] H01H 85/04
U.S. Cl. 337—163 13 Claims



11. An interrupting capacity time delay fuse comprising an electrically insulating cylindrical tube, a conductive first and second terminal respectively connected to a conductive first

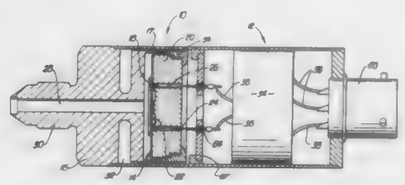
and second end bell and axially fastened to the open ends of said insulating cylindrical tube, and a fuse element coupled between said first and second end bells; said fuse element being comprised of a short circuit current element and a overload current trigger mechanism, said short circuit element being constructed of a fusible material formed into a cylinder and having a matrix of perforations forming a series of annular sections of reduced cross section along the major axis of the said short circuit element, said overload current trigger mechanism being connected to the said short circuit element by way of a fusible alloy which melts at a current higher than a rated current, said trigger mechanism being of a cylindrical form to match that of said short circuit element, said fuse element being of a cylindrical form such that each parallel path of said short circuit element created by said matrix of perforations is electrically and thermally equivalent to any other parallel path.

4,994,780
HEATED EXTENDED RESISTANCE TEMPERATURE SENSOR, APPARATUS FOR SENSING AND METHOD OF MAKING SAME
Malcolm M. McQueen, Fallbrook, Calif., assignor to Fluid Components, Inc., San Marcos, Calif.
Continuation of Ser. No. 854,802, abandoned. Filed May 2, 1988, Ser. No. 189,387
Int. Cl.[5] H01C 7/10
U.S. Cl. 338—24 71 Claims



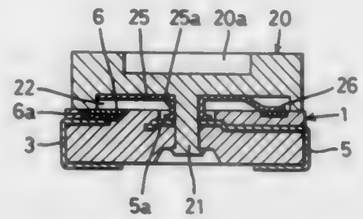
1. A distributed resistance temperature sensor for interrogating an extended field, said sensor comprising:
elongated resistance temperature detector (RTD) wire means having an electrically insulative coating thereon and formed in a longitudinal configuration for direct exposure to the condition being sensed;
means for connecting the ends of said RTD wire means to detection circuitry and to an external source of electrical power; and
means for heating said RTD wire means.

4,994,781
PRESSURE SENSING TRANSDUCER EMPLOYING PIEZORESISTIVE ELEMENTS ON SAPPHIRE
Armen N. Sahagen, 16757 Bolero La., Huntington Beach, Calif. 92649
Filed Apr. 7, 1988, Ser. No. 178,480
Int. Cl.[5] H01L 10/10
U.S. Cl. 338—47 36 Claims



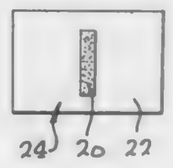
1. A piezoresistive pressure transducer for monitoring a fluid pressure, comprising:
a pressure cell base having a cavity in the upper surface thereof;
a crystalline sapphire force collector diaphragm having first and second major surfaces, mounted on said pressure cell base over said cavity, so that said first major surface faces toward said upper surface of said base and said second major surface faces toward said fluid being monitored so that the pressure of said fluid is applied in a direction that causes said diaphragm to flex toward said base; and
a thin layer of silicon formed on said first major surface of said diaphragm, said silicon layer having a thickness in the range of from 500 angstroms to 60,000 angstroms and wherein said silicon is doped with P-type dopant atoms in the range of from 5×10^{17} to 4×10^{21} atoms/cc.

4,994,782
VARIABLE RESISTOR
Hiroyuki Watanabe; Hiroji Tani, and Tsutomu Yokoi, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Aug. 25, 1989, Ser. No. 398,732
Claims priority, application Japan, Aug. 29, 1988, 63-215860
Int. Cl.[5] H01C 10/30, 10/32, 10/36
U.S. Cl. 338—160 1 Claim



1. A variable resistor comprising a resin substrate provided on the surface thereof with a resistor on which a sliding member is in slidable contact therewith, wherein said resistor is a carbon resistor integrally molded with a predetermined shape on the surface of the resin substrate and comprising diallyl phthalic binder resin, said resin substrate is formed of diallyl phthalic resin, and terminals are molded on said resin substrate and said carbon resistor and are electrically connected through conductive paste.

4,994,783
ELECTRONIC DEVICE FABRICATION ON NON-CONDUCTIVE POLYMER SUBSTRATE
Stuart I. Yaniger, Ventura, Calif., assignor to Lockheed Corporation, Calabasas, Calif.
Filed Jan. 26, 1989, Ser. No. 302,533
Int. Cl.[5] H01C 1/012
U.S. Cl. 338—308 11 Claims



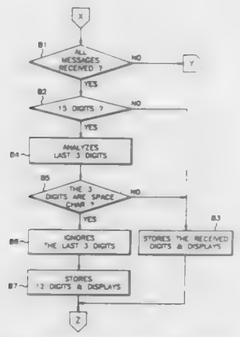
1. An electronic device free of metal, which comprises a base-type non-conductive polymer substrate containing carbon-nitrogen linkages and having an electrically conductive polymer region comprising an organic dopant group covalently linked to nitrogen atoms of said polymer substrate.

4,994,784

PAGING RECEIVER

Young-Han Yoon, Daegu, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Mar. 2, 1989, Ser. No. 317,756
Claims priority, application Rep. of Korea, Mar. 29, 1988, [illegible]
Int. Cl.[5] H04Q *1/30*
U.S. Cl. 340—311.1 8 Claims



1. A process for displaying paging receiver message, comprising:

receiving a message of five-unit code words in a POCSAG code, with any said unit able to contain a character or a space;

storing and displaying said code words if said message does not contain three or more of said code words;

determining, if said message contains three or more or said code words, whether units of said code words received in excess of twelve units contain spaces;

storing and displaying said code words in integer multiples of one code word if said message contains three or more of said code words and units of said code words in excess of twelve units do not all contain spaces; and

storing and displaying twelve units of said code words received if more than two of said code words are received and units of said code words received in excess of twelve units all contain spaces.

4,994,785

HOOD ORNAMENT ALARM

Marvin K. Perlman, 6138 Caminito Pan, San Diego, Calif. 92120, and Richard I. Perlman, 3852 Costa Bella Dr., La Mesa, Calif. 92041

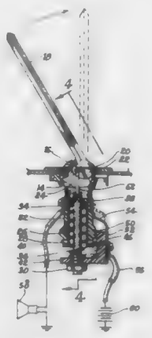
Continuation-in-part of Ser. No. 341,632, Apr. 21, 1989, Pat. No. 4,882,563. This application Dec. 4, 1989, Ser. No. 444,989
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—426 6 Claims

1. A vehicle hood ornament alarm for a vehicle hood ornament having an ornament element, a mounting bracket, a shaft connected to said ornament element, and extending down through said bracket, and bias means compressing said ornament element into said bracket and maintaining said ornament element in an upright position when not subject to a deflecting force and permitting said shaft to rise against said bias means when said ornament element is deflected, said alarm comprising:

(a) a fixed electrical contact mounted in said bracket;

(b) a sliding electrical contact mounted on said shaft below said fixed contact and insulated therefrom; and

(c) wiring connecting to said fixed and sliding contacts for connection into the horn circuitry of said vehicle such that deflecting said hood ornament raises said shaft in said



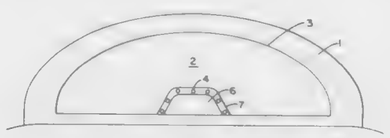
bracket, sliding said sliding contact into contact with said fixed contact, actuating the vehicle horn.

4,994,786

U-TURN SIGNAL

Michael Schaffer, 411 W. Lake Dasha Dr., Plantation, Fla. [illegible]

Filed Dec. 4, 1989, Ser. No. 444,841
Int. Cl.[5] B60Q *1/34*
U.S. Cl. 340—478 12 Claims



1. A U-turn signal for a vehicle, comprising an inverted "U", flashing means including a plurality of sequentially flashing lights in said "U", to indicate intended direction of said U-turn, actuating means for selectively activating said flashing lights in the intended direction of said U-turn, and wherein the U-turn signal is disposed rearwardly facing from said vehicle.

4,994,787

REMOTE INTRUSION ALARM CONDITION ADVISORY SYSTEM

Robert W. Kratt, 22481 Walnut Cir. S., Cupertino, Calif. 95014, and James C. Sprout, Los Altos, Calif., assignors to Robert W. Kratt, Cupertino, Calif.

Filed May 25, 1989, Ser. No. 356,521
Int. Cl.[5] G08B *26/00, 1/08*
U.S. Cl. 340—505 14 Claims

1. An alarm system monitor, comprising:

a base station at a location protected by an alarm system, and including means responsive to an alarm signal from an alarm system to produce an alarm condition in said base station, said base station remaining in such alarm condition after termination of said alarm signal;

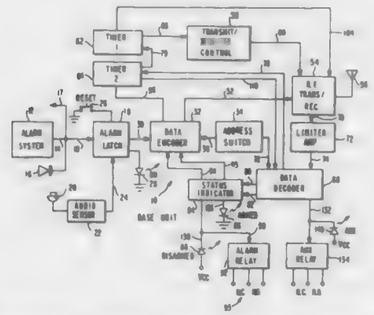
base transceiver means in said base station, said transceiver having a normal receive mode and having a selectable transmit mode;

alarm latch and alarm encoder means in said base transceiver responsive to an alarm condition at said base station location for producing an alarm condition signal for transmission by said base transceiver when in its transmit mode;

a remote station at a location remote from said protected location;

remote transceiver means in said remote station, said remote transceiver having a transmit mode for transmitting status signals to activate said base station and to shift said base station to its transmit mode, said remote transceiver further including a receive mode to receive signals transmitted from said base station; and

timer means in said base transceiver means responsive to a



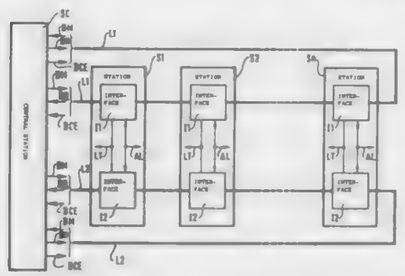
status signal received from said remote transceiver means and to said alarm condition signal to shift said base transceiver means from its normal receive mode to its transmit mode for a predetermined fixed time period, after which said base transceiver means reverts to its normal receive mode.

4,994,788

SYSTEM FOR COLLECTING ALARMS FROM A SET OF STATIONS

Dominique Philippe, Begard, and Jean-Yves Cozic, Lannion, both of France, assignors to Societe Anonyme dite: Alcatel Clt, Paris, France

Filed Sep. 26, 1989, Ser. No. 412,375
Claims priority, application France, Sep. 26, 1988, 88 12534
Int. Cl.[5] G08B *26/00*
U.S. Cl. 340—505 15 Claims



1. A system for collecting alarms from a set of n stations each specified by an address, said system comprising:

a central station where alarms are brought together;

a first and a second interface in each station;

means connecting all said first interfaces in series with the central station via a first loop and for connecting all said second interfaces in series with the central station via a second loop link; each loop link comprising:

a message loop conveying messages transmitted by the central station to at least one of the interfaces, and messages emitted by the interfaces to the central station;

a state control loop conveying a state control signal delivered by the central station to set one of an active and standby operating mode in all of the interfaces; said active operating mode enabling an interface to be remotely controlled by the central station, said standby operating mode disabling an interface to be remotely controlled, but for test purposes

said first interfaces and said second interfaces being respectively in said two operating modes; and

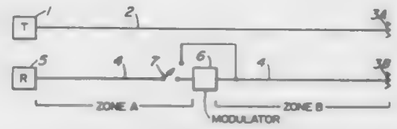
a clock signal loop conveying a clock signal delivered by the central station to all of the interfaces.

4,994,789

PHASE SHIFT DIVIDED LEAKY CABLE SENSOR

R. Keith Harman, Kanata, Canada, assignor to Senstar Corporation, Ontario, Canada

Filed Sep. 1, 1989, Ser. No. 401,820
Claims priority, application Canada, Sep. 27, 1988, 578563
Int. Cl.[5] G08B *13/18*
U.S. Cl. 340—552 19 Claims



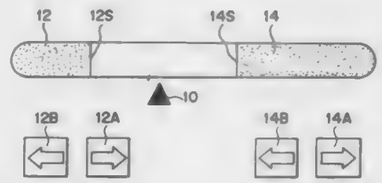
1. A continuous wave (CW) sensor for an intrusion detector comprising first cable means for causing propagation of a CW RF field in a detection zone, second cable means for receiving the field in the detection zone, and means connected at an intermediate location in series with one of the first and second cable means, for selectively modifying a signal received by the second cable means, whereby the detection zone is divided into separate regions on opposite sides of the modifying means.

4,994,790

METHOD FOR SETTING ALARM AND WAVE INDICATING SENSITIVITY

Shoji Ishii, and Yasuji Yukimitsu, both of Tokyo, Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,625
Claims priority, application Japan, Mar. 2, 1989, 1-50689; Mar. 2, 1989, 1-50690
Int. Cl.[5] G08B *23/00;* A61B *5/02*
U.S. Cl. 340—573 13 Claims



1. A method for setting an alarm in an apparatus for monitoring a plurality of patients, having a keyboard with a plurality of keys, said method comprising the steps of:

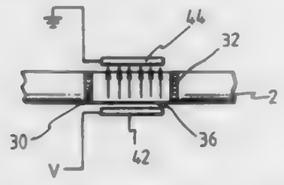
indicating the present time value, the upper limit and lower limit of a living body signal of one of said patients; and

setting a threshold of the upper limit and the lower limit based upon the present time value of said living body signal by depressing appropriate ones of said keys.

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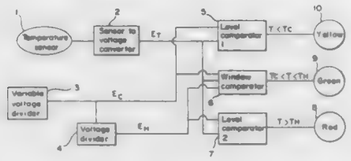
VOL 1123 ISS 3 FE 19 1991 UMI

4,994,791
PROGRESSIVELY MONITORABLE FIRE ALARM SYSTEM
Henry F. Taylor, College Station, Tex., assignor to Texas A & M University System, College Station, Tex.
Division of Ser. No. 108,270, Oct. 13, 1987, Pat. No. 4,848,999.
This application Dec. 19, 1988, Ser. No. 286,058
Int. Cl.[5] G08B *17/12*
U.S. Cl. 340—578 5 Claims



1. A progressively monitorable fire alarm system, comprising:
one or more thermally switchable fiber reflectors disposed along a continuous length of optical fiber, said reflectors being comprised of two optical fiber ends fused together, one of said fiber end having a reflective surface consisting of a vanadium oxide, the combination optical fiber and reflector having a thermally sensitive or an electrically resistive medium deposited along its length;
a pulsed light source disposed at one end of the optical fiber, and a receiver disposed to detect reflections of the pulsed light source such that a change in the general refractive index of each reflector may be individually monitored.

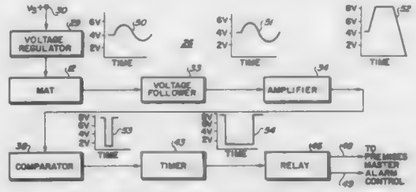
4,994,792
FLUID TEMPERATURE MONITORING SYSTEM
Eldon W. Ziegler, Jr., 10092 Hathrim Ter., Columbia, Md. 21046
Filed Dec. 6, 1989, Ser. No. 446,685
Int. Cl.[5] G08B *17/00*
U.S. Cl. 340—584 24 Claims



1. A temperature monitoring arrangement comprising:
desired temperature selection means including an adjustable variable voltage divider for selecting a desired temperature range for a fluid medium,
temperature detecting means for detecting whether the fluid medium temperature is above, below or at the desired temperature range,
and temperature indicating means for emitting three different temperature indicating signals indicating whether the fluid temperature is respectively above, below or at the desired temperature range.

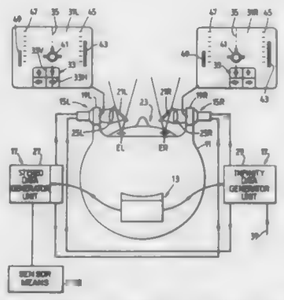
4,994,793
WEIGHT SHIFT DETECTOR
Kevin Curtis, 3265 Harrow Rd., Spring Hill, Fla. 34606
Filed Dec. 8, 1989, Ser. No. 447,623
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—666 17 Claims

1. A capacitance activated weight shift detector, especially useful as a security device for detecting intrusion or the like, comprising:
a mat having first and second sheets of conductive material disposed in superposed positional relationship and a layer of dielectric material disposed intermediate said sheets to maintain the same in separated position even when weight is applied to said mat, said sheets and said intermediate layer forming a capacitor of capacitance dependent on said positional relationship, and said sheets and layer being relatively configured, dimensioned and disposed so that said positional relationship is altered when weight is applied to or removed from said mat; said positional relationship being altered to give an increasingly greater magnitude of change in said capacitance for an increasingly greater magnitude of weight applied to or removed from said mat; and



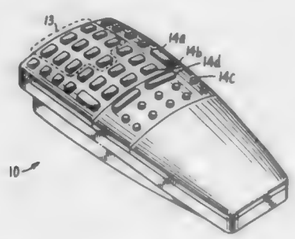
electrical circuitry connected to said mat to apply a voltage differential across said sheets and to respond to a change in said capacitance due to alteration of said positional relationship to generate a signal to actuate a desired response, said circuitry including means to give said signal only when said change in capacitance due to application of weight exceeds a first threshold magnitude, or said change in capacitance due to removal of weight exceeds a second threshold magnitude; and means for enabling independent user selection of said first and second threshold magnitudes.

4,994,794
METHODS AND APPARATUS FOR DISPLAYING DATA
Donald R. C. Price, Maidstone, and Colin J. Tredwell, Rainham, both of England, assignors to GEC-Marconi Limited, England
Filed Jun. 21, 1988, Ser. No. 209,538
Claims priority, application United Kingdom, Jun. 29, 1987, #715184
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—705 12 Claims



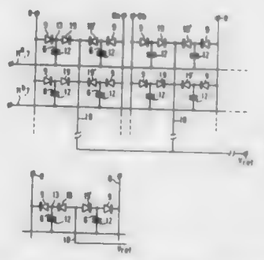
1. A method of displaying data in a vehicle using a head-up display system which includes a pair of combiner means disposed in spaced relationship so as each to lie, in sue of the system, on the line of sight of a respective one of the eyes of a user of the system; a pair of projector means, one for each combiner means, each arranged to project light from a display surface onto the associated combiner for reflection thereby to provide the associated eye of the user with a virtual image at infinity of a display on the display surface superimposed on the user's view through the combiner; and signal generating means operable to supply to the pair of projector means signals to produce displays on said display surfaces; the method comprising the step of: controlling said signal generating means so that at least one display element representative of a control means in the vehicle indicating a position of relative location the control means in the vehicle which is accessible to the user appears identically at both said display surfaces though with a transverse positional disparity of the element at one display surface as compared to the element at the other, with the result that while virtual images of the two elements viewed separately via the combiners each appear congruent with the plane at infinity, the stereoscopic effect created by the transverse positional disparity between he said virtual images, being a disparity resulting from said disparity of the two elements at the display surfaces, gives rise seemingly to a fused single virtual image representative of said control means seemingly congruent with a plane at a finite distance from the eyes of a suer of the system at said position within the vehicle such as to facilitate operation of the control means by the user, said distance being determined by the magnitude of said disparity at said display surfaces.

4,994,795
POSITION INDICATING DEVICE FOR A DIGITAL COMPUTER
Kirk F. MacKenzie, 1558 Siesta Dr., Los Altos, Calif. 94022
Filed Dec. 8, 1988, Ser. No. 282,012
Int. Cl.[5] G09G *5/00*
U.S. Cl. 340—710 10 Claims



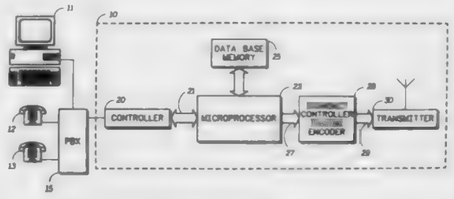
1. An input device for use with a digital computer having a video display, for displaying the position of an indicator thereon and responsive to cursor key signals for moving said indicator, said device comprising:
first transducing means for generating a first motion signal in response to said input device moving in a first direction;
second transducing means for generating a second motion signal in response to said input device moving in a second direction substantially perpendicular to said first direction;
a plurality of keys including a numeric keypad and a plurality of control keys for supplying input signals to said input device; and
means for processing said first and second motion signals and said input signals by supplying said input signals to said digital computer in the event said input signals are supplied to said input device, and for supplying input signals to said digital computer corresponding to the direction and amount of motion of said input device from said first and second motion signals, in the event no input signal from the plurality of keys is supplied to said input device.

4,994,796
ELECTRO OPTICAL DISPLAY DEVICE WITH REDUNDANT SWITCHING MEANS
Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 16, 1988, Ser. No. 208,184
Claims priority, application Netherlands, Jun. 18, 1987, 8701420; Jan. 28, 1988, 8800204
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 20 Claims



1. A display device comprising an electro-optical display medium between two supporting plates, a system of picture elements arranged in rows and columns, with each picture element being formed by picture electrodes arranged on the facing surfaces of the supporting plates, and a system of row and column electrodes for presenting selection and data signals by means of which a range of voltages dependent on the electro-optical display medium can be presented across the picture elements for the purpose of display, the picture electrode on one of the supporting plates connected in an electrically conducting manner to the common point of two non-linear switching units which are arranged in series between a column electrode for data signals and an auxiliary electrode, and means for applying prior to selection, an auxiliary voltage across the picture elements beyond or on the limit of the voltage range to be used for picture display, characterized in that at least a non-linear switching unit comprises a plurality of non-linear switching elements.

4,994,797
METHOD AND SYSTEM FOR USER CONTROLLED PAGE DISPOSITION
Robert L. Breeden, Boynton Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 8, 1989, Ser. No. 320,659
Int. Cl.[5] G08B *5/22;* H04M *1/56*
U.S. Cl. 340—825.44 23 Claims



1. A paging system comprising:
a paging controller having means for receiving a call placed by a caller from one of a plurality of call sources, means for identifying the call source, means for storing a table of predetermined call sources, means for generating a source tag when the identified call source corresponds to one of the predetermined call sources, and means for transmitting the source tag; and

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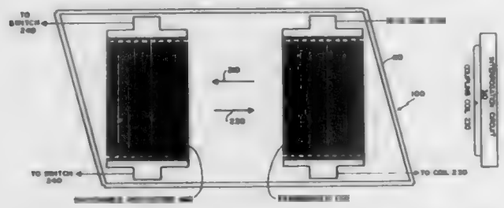
a plurality of paging receivers, each comprising means for receiving the transmitted source tag, means for storing a table of predetermined messages and predetermined source tags corresponding thereto, means for selecting one of the predetermined messages corresponding to the one predetermined source tag which matches the transmitted source tag, and means for displaying the selected message.

4,994,798

MULTIPLEXED SURFACE ACOUSTICAL WAVE APPARATUS

James R. McColl, Concord, Mass., assignor to GTE Laboratories, Inc., Danvers, Mass.

Filed Aug. 28, 1989, Ser. No. 399,133
Int. Cl.[5] H04Q *1/39*; H01L *41/107*
U.S. Cl. 340—825.540 **20 Claims**



1. An interrogation device supported in an automotive vehicle and operatively connected by means of a coil to a surface acoustical wave apparatus for interrogating the operative status of remote electronically operative automobile devices that are electrically isolated from said interrogation device by reason of said coil, comprising:

a medium having means defining a surface acoustical wave path;

an interface transducer carried by said medium for converting electromagnetic energy to surface acoustical waves, and for receiving reflected surface acoustical waves and converting said reflected surface acoustical waves to electromagnetic energy;

interrogation means operatively connected to said interface transducer through a coil, for receiving electromagnetic energy from said interface transducer as a function of the operative status of electrically isolated, electronically operative automotive devices; and

a plurality of programmable, spaced-apart, normally non-reflective transducers disposed along said surface acoustical wave path and positioned to receive surface acoustical waves from said interface transducer, said non-reflective transducers each operatively connected to and respectively programmable by a remotely located automotive device to become reflective and to reflect surface acoustical waves back to said interface transducer for converting the reflected waves to electromagnetic energy as a function of an operative state of each of said automotive devices.

4,994,799

SYSTEM FOR THE ELECTRICAL TRANSMISSION OF AN ANGULAR POSITION

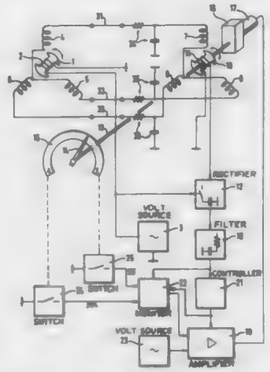
Manfred Levigion, Kelkheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 381,138
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832517
Int. Cl.[5] G08C *19/06, 19/38*
U.S. Cl. 340—870.3 **3 Claims**

1. A system for the electrical transmission of an angular position, particularly for transmission of angular position from a measurement instrument to an indicating instrument, the system comprising

a transmitter and a receiver, said transmitter and said receiver each having one rotor and one stator, each stator having multiple pairs of poles; and wherein alternating voltage is to be fed to a winding of the rotor of the transmitter, and voltages induced in windings of the stator of the transmitter are to be transmitted to windings of the stator of the receiver; the system further comprising

a first source and a second source of alternating voltage, an additional voltage outputted by said second source being independent of any voltage in said receiver;



a phase sensitive rectifier, a motor for driving the rotor of the receiver, a controller for the motor, the motor also driving a rotor of an indicating instrument; and wherein

the winding of the rotor of the receiver is connected to said phase-sensitive rectifier;

alternating voltage of said first source is transmitted to said rectifier;

an output of the phase-sensitive rectifier is connected to said controller; and

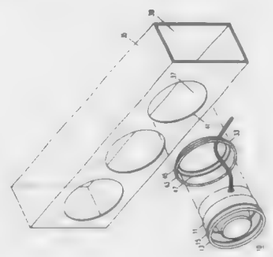
said additional alternating voltage of said second source is superimposed on the voltage fed to the motor.

4,994,800

SNAP-IN HOUSING FOR BACKUP ALARM

Franklin L. Milliken, 1154 Everett Ct., Concord, Calif. 94518

Filed Feb. 21, 1989, Ser. No. 141,930
Int. Cl.[5] G08G *1/00*; B60Q *7/00*
U.S. Cl. 340—901 **20 Claims**



1. A housing for mounting a backup alarm in a mounting hole preformed in a structural member of a vehicle, said housing comprising:

a tubular body having a front end and a rear end and being open at both ends, the shape of said tubular body being similar to and slightly smaller than said mounting hole, said tubular body including internal mounting means for mounting components of a backup alarm therein; and

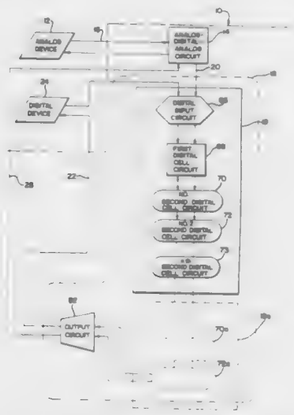
mounting means adapted to cooperate with edges of said structural member defining said preformed mounting hole for mounting and securing said tubular body therein on said structural member.

4,994,801

APPARATUS ADAPTABLE FOR USE IN EFFECTING COMMUNICATIONS BETWEEN AN ANALOG DEVICE AND A DIGITAL DEVICE

Safdar M. Asghar; John G. Bartkowiak, and Miki Z. Moyal, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1989, Ser. No. 428,614
Int. Cl.[5] H03M *1/00, 7/00*
U.S. Cl. 341—110 **16 Claims**



1. An apparatus adaptable for use in effecting communications between an analog device and a digital device, the apparatus comprising:

an analog-digital-analog means for converting analog signals to digital signals and for converting digital signals to analog signals; and

a decimator-interpolator means for decimating incoming digital signals received from said analog-digital-analog means and providing decimated incoming digital signals representative of said incoming digital signals to said digital device, and for interpolating outgoing digital signals received from said digital device and providing interpolated digital signals to said analog-digital-analog means;

said analog-digital-analog means converting incoming analog signals received from said analog device into said incoming digital signals, said incoming digital signals being representative of said incoming analog signals, and converting said interpolated digital signals into outgoing analog signals, said outgoing analog signals being representative of said interpolated digital signals and being provided to said analog device;

said analog-digital-analog means including a single digital-to-analog converter, a first group of switches, and a second group of switches;

said digital-to-analog converter, said first group of switches, and said second group of switches being operatively connected whereby closing said first group of switches, while keeping said second group of switches open, configures said analog-digital-analog means for delivering said incoming digital signals to said decimator-interpolator means, and whereby closing said second group of switches, while keeping said first group of switches open, configures said analog-digital-analog means for receiving said interpolated digital signals from said decimator-interpolator means;

said decimator-interpolator means comprising a first decimator-interpolator module, and an output means for providing digital outputs, said first decimator-interpolator module comprising a digital input circuit, a first digital cell circuit, and a second digital cell circuit;

said digital input circuit selectively receiving said incoming digital signal from said analog-digital-analog means and producing an incoming clocked input to said first digital cell circuit, or receiving said outgoing digital signal from said digital device and producing an outgoing clocked input to said first digital cell circuit;

said first digital cell circuit selectively producing a first iteration decimated digital signal to said second digital cell circuit in response to reception of said incoming clocked digital signal, or producing a first iteration interpolated digital signal to said second digital cell circuit in response to reception of said outgoing clocked input;

said second digital cell circuit selectively producing a second iteration decimated digital signal in response to reception of said first iteration decimated digital signal, or producing a second iteration interpolated digital signal in response to reception of said first iteration interpolated digital signal;

the products of said second digital cell circuit being the outputs of said first decimator-interpolator module;

said second digital cell circuit being operatively connected to provide its respective outputs to said output means;

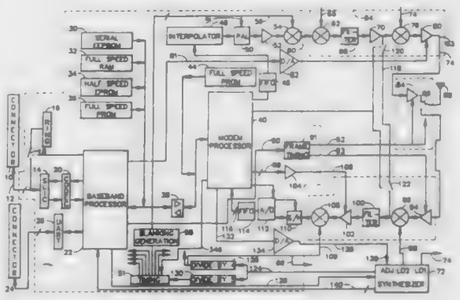
said output means selectively providing said interpolated digital signal to said analog-digital-analog means or providing said decimated incoming digital signal to said digital device, in response to settings of said first group of switches and said second group of switches.

4,994,802

SUBSCRIBER UNIT FOR WIRELESS DIGITAL TELEPHONE SYSTEM

David N. Critchlow; Graham M. Avis; Sandra J. K. Earlam, all of San Diego; Karie J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givataiim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to International Mobile Machines Corporation, King of Prussia, Pa.

Division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Oct. 12, 1988, Ser. No. 256,579
Int. Cl.[5] H03M *1/54*
U.S. Cl. 341—122 **1 Claim**



1. An analog to digital converter system comprising:

means to produce an analog signal;

amplifier means for receiving said analog signal and amplifying the same;

a mixer for receiving the amplified analog signal from said amplifier means and combining it with a timing signal received from a timing means;

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a sample and hold circuit for receiving the combined signal from said mixer and applying its output to an analog to digital converter to form a digital signal; and

a FIFO for receiving said digital signal and providing its output for further processing.

4,994,803

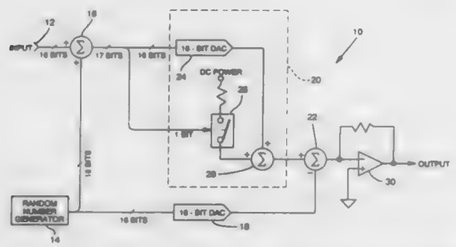
RANDOM NUMBER DITHER CIRCUIT FOR DIGITAL-TO-ANALOG OUTPUT SIGNAL LINEARITY

Raymond C. Blackham, Pean Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 27, 1989, Ser. No. 442,278

Int. Cl.[5] H03M *1/20*

U.S. Cl. 341—131 **4 Claims**



1. A method of low distortion digital-to-analog conversion comprising the steps:

providing an N bit sample of an input digital data signal;

generating an N bit digital random number;

adding said N bit sample and said N bit random number to yield an N+1 bit combined digital number;

converting said N bit random number into a first analog signal;

converting said N+1 bit combined digital number into a second analog signal by:

converting the most significant bit of said N+1 bit combined digital number into a third analog signal using a one-bit D/A converter;

converting the N least significant bits of said N+1 bit combined digital number into a fourth analog signal using an N-bit D/A converter; and

summing the third and fourth analog signals to yield the second analog signal;

wherein the use of separate one-bit and N-bit D/A converters instead of a single N+1 bit D/A converter reduces correlation between the third and fourth output signals; and

subtracting said first analog signal from the second analog signal to produce an analog output signal corresponding to the input digital data sample.

4,994,804

DOUBLE INTEGRATION DELTA-SIGMA MODULATION ANALOG TO DIGITAL CONVERTER

Takashi Sakaguchi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 14, 1989, Ser. No. 322,867

Claims priority, application Japan, Mar. 15, 1988, 63-61595

Int. Cl.[5] H03M *3/02*

U.S. Cl. 341—143 **24 Claims**

1. A delta-sigma modulation analog to digital converter for converting an analog input signal to a digital output signal, comprising:

input means for receiving the analog input signal;

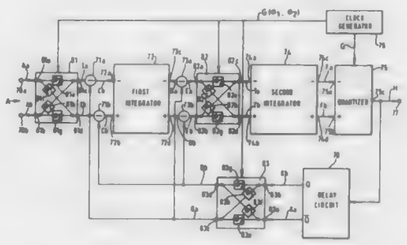
clock generator means for generating a very high frequency clock signal with first and second phases;

first switching circuit means, coupled to the input means, for modulating the analog input signal with the very high frequency clock signal;

integration means, coupled to the first switching circuit means, for integrating the modulated input signal, the integration means also generating a noise signal;

second switching circuit means, coupled to the integration means, both for demodulating the integrated modulated input signal and modulating the noise signal with the very high frequency clock signal;

second integration means, coupled to the second switching circuit means, for integrating the demodulated integrated modulated input signal and the modulated noise signal;



quantizer means, coupled to the second integration means and responsive to the second integrated demodulated integrated modulated input signal and the integrated modulated nose signal, for generating the digital output signal, the digital output signal including a separable portion corresponding to the integrated modulated noise signal; and

feedback circuit means, coupled between the quantizer means and the integration means, for both generating a feedback signal corresponding to the digital output signal and feeding the feedback signal to the integration means.

4,994,805

DELTA SIGMA MODULATOR ARRANGEMENTS COMPENSATED BY CHOPPER STABILIZATION

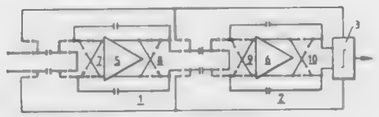
Ian J. Dedic, and Alexander W. Vogt, both of London, England, assignors to The General Electric Company, p.l.c., England

Filed Aug. 3, 1989, Ser. No. 389,369

Claims priority, application United Kingdom, Aug. 5, 1988, 8818703

Int. Cl.[5] H03M *3/02*

U.S. Cl. 341—143 **2 Claims**



1. A delta sigma modulator arrangement of the type including at least one component circuit in which noise or offset voltages may arise and which has a pair of input paths, a pair of input terminals, a pair of output terminals and a pair of output paths, said arrangement comprising: first changeover switch means operable periodically for connecting said pair of input paths at input connections to said pair of input terminals and for interchanging said input connections; and second changeover switch means operable periodically in step with said first changeover switch means for connecting said pair of output terminals at output connections to said pair of output paths and for interchanging said output connections.

4,994,806

FLASH-SUCCESSIVE APPROXIMATION ANALOG-TO-DIGITAL CONVERTER

Lee Yun-Tae, Pohang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

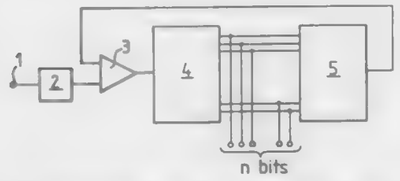
Continuation of Ser. No. 218,462, Jul. 13, 1988, abandoned.

This application Oct. 10, 1989, Ser. No. 419,003

Claims priority, application Rep. of Korea, Jul. 22, 1987, 87-7963

Int. Cl.[5] H03M *1/12, 1/36*

U.S. Cl. 341—155 **3 Claims**



1. A flash-successive approximation analog-to-digital converter for inputting an analog input signal and outputting n bits of digital output data which correspond to said analog input signal, comprising:

an n/2 bit flash conversion circuit for sampling said analog input signal and outputting a first digital signal comprising the most significant n/2 bits of said digital output data which correspond to said analog input signal, and a first analog signal comprising an analog voltage level which corresponds to said first digital signal; and

an n/2 bit successive approximation conversion circuit for subtracting said first analog signal from said analog input signal, and for outputting a second digital word comprising the least significant n/2 bits of said digital output data which corresponds to said analog input signal.

4,994,807

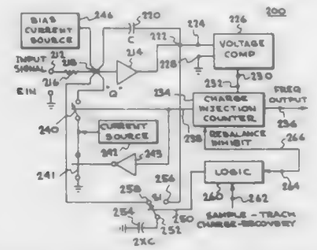
VOLTAGE-TO-FREQUENCY CONVERTER

Larry P. Hobbs, Brentwood, Calif., assignor to Systron Donner, Concord, Calif.

Filed May 25, 1990, Ser. No. 529,972

Int. Cl.[5] H03M *1/60*

U.S. Cl. 341—157 **7 Claims**



1. An improved integrating voltage-to-frequency converter for converting a DSB-SC signal having a reference carrier signal into a frequency-encoded signal, said DSB-SC signal adapted to being demodulated by using an up-down counter demodulator which is alternately switched between an up-count and a down-count in synchronism with the phase transitions of the reference carrier signal to digitally demodulate the frequency-encoded DSB-SC signal, comprising:

an integrator circuit including an operational amplifier having an output terminal and inverting input terminal, said integrator circuit including an integrating capacitor connected between the output terminal and the inverting input terminal of said operational amplifier, said integrator circuit also including a series input resistor connected between the inverting input terminal of said operational amplifier and an input signal voltage terminal for said voltage-to-frequency converter;

a comparator circuit having a signal input terminal coupled to the output terminal of said operational amplifier, said comparator circuit having a reference input terminal and an output signal terminal, said comparator circuit providing a comparator output signal when the level of the output signal of the integrator circuit exceeds a reference level at the reference input terminal;

means for rebalancing the integrator circuit output terminal to a predetermined level by injecting a predetermined charge into the inverting input terminal of said operational amplifier, said rebalancing being controlled by a rebalance control pulse which is generated in response to a comparator output signal;

means for tracking and storing a partial-bit analog signal level at the output of the integrator, said partial-bit analog signal level corresponding to the integrator output signal level just prior to a phase transition of the reference carrier signal from a one half-period to the next half-period of said reference signal;

means for correcting the count of the up-down counter to account for the partial-bit analog signal information.

4,994,808

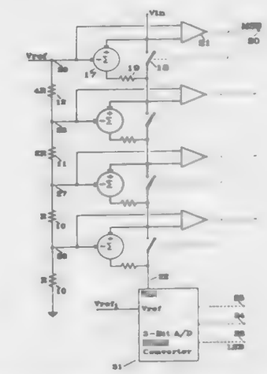
PIPELINED ANALOG TO DIGITAL CONVERTER WITH SUMMING AND COMPARATOR FUNCTIONS OCCURRING IN PARALLEL FOR EACH BIT

Karl F. Wichelman, P.O. Box 2000, Chico, Calif. 95927

Filed Dec. 14, 1989, Ser. No. 450,662

Int. Cl.[5] H03M *1/38*

U.S. Cl. 341—161 **13 Claims**



1. A parallel summing analog-to-digital converter for the conversion of an analog input signal to a binary output, comprising:

a first analog-to-digital converter bit comprising:

an analog input signal;

a means for generating a reference voltage;

a summing circuit means for adding two potential producing a difference of the said two potentials as an output;

said output being coupled to a resistance means;

said summing circuit and said resistances means being in parallel with a switching means;

said switching means being responsive to the output of a comparator means;

said comparator means for comparing said reference voltage to the said analog input signal;

said summing circuit subtracts said reference voltage from said analog input signal;

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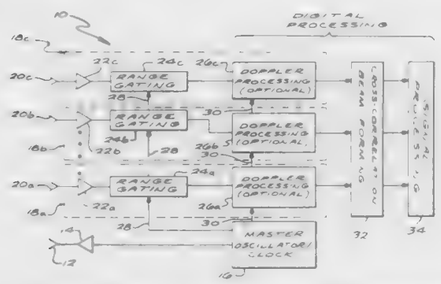
said analog input signal coupled through said switching means and said summing circuit means;
said output of said comparator means being a binary bit output;
means of coupling said output of said comparator means to external circuitry;
said output of said summing circuit means in parallel with said switching means generating a remainder analog output signal;
a plurality of said first analog-to-digital converter bits being connected in series with said analog input signal coupled to said remainder analog output of previous bit to make a plurality of binary output bits.

4,994,809

POLYSTATIC CORRELATING RADAR

Kar W. Yung, Torrance; Donald C. D. Chang, Thousand Oaks, and Samuel C. Reynolds, Los Angeles, all of Calif., assignors to Hughes Aricraft Company, Los Angeles, Calif.

Filed Mar. 7, 1990, Ser. No. 490,032
Int. Cl.[5] G01S *13/48*
U.S. Cl. 342—108 **14 Claims**



1. A polystatic correlating radar apparatus for detecting and locating an object, comprising at least means for transmitting a radar signal;
a plurality of radar signal receivers, including means for correlating said transmitted radar signal with a received signal for range gating said received radar signal for determining the range of said object from said receiver;
means for cross correlating the radar signal received by each of said plurality of said receivers with each said receiver to provide corrected received radar signals from all of said receivers;
signal processing means in electrical communication with said means for cross correlating said radar signals, for determining the angular location and the radial range of said object from said receivers;
wherein said signal processing includes means for determining the tangential velocity of said object relative to said receivers.

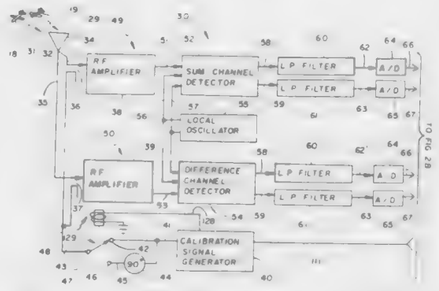
4,994,810

MONOPULSE PROCESSOR DIGITAL CORRECTION CIRCUIT

Allen I. Sinsky, Baltimore, Md., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 26, 1990, Ser. No. 498,792
Int. Cl.[5] G01S *13/44, 7/40*
U.S. Cl. 342—151 **8 Claims**

1. In a monopulse radar having sum Σ and difference Δchannels for providing angular measurements of a radar target from the radar,
said sum channel including a first quadrature detector,
said difference channel including a second quadrature detector,
each of said first and second detectors having an in-phase I channel and a quadrature Q channel;
a method for digital compensation of phase and gain drift in said first and second detectors comprising the steps of:
first, injecting a first signal of known amplitude and arbitrary phase into both said first and second detectors;
second, measuring the uncorrected voltage outputs of said in-phase I and quadrature Q channels of said first detector and said second detector to provide values $V_{\Sigma I}(1)$ from said in-phase channel of said first detector and $V_{\Sigma Q}(1)$ from said quadrature channel of said first detector and $V_{\Delta I}(1)$ from said in-phase channel of said second detector and $V_{\Delta Q}(1)$ from said quadrature channel of said second detector;
third, inserting a 90° phase shift in said first signal to provide a second signal;
fourth, injecting said second signal into both said first and said second detectors;
fifth, measuring the uncorrected voltage outputs of said in-phase I and quadrature Q channels of said first and second detectors to provide values $V_{\Sigma I}(2)$ from said in-



phase channel of said first detector and $V_{\Sigma Q}(2)$ from quadrature channel of said first detector and $V_{\Delta I}(2)$ from said in-phase channel of said second detector and $V_{\Delta Q}(2)$ from said quadrature channel of said second detector;
sixth, computing directly from said values $V_{\Sigma I}(1)$, $V_{\Sigma Q}(1)$, $V_{\Sigma I}(2)$ and $V_{\Sigma Q}(2)$ a first set of four correction coefficients K_1, K_2, K_3 and K_4;
seventh, computing directly from said values $V_{\Delta I}(1)$, $V_{\Delta Q}(1)$, $V_{\Delta I}(2)$ and $V_{\Delta Q}(2)$ a second set of four correction coefficients K_5, K_6, K_7 and K_8;
eighth, removing said first and second signals from both said first and second quadrature detectors;
ninth, applying said first set of coefficients to the output signals of said in-phase and quadrature channels of said first detector to provide third and fourth signals having compensation for phase and gain drift; and
tenth, applying said second set of coefficients to the output signals of said in-phase and quadrature channels of said second detector to provide fifth and sixth signals having compensation for phase and gain drift.

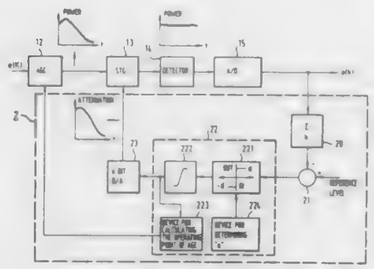
4,994,811

SENSITIVITY TIME CONTROL DEVICE

Joao Moreira, Landsberg, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fuer Luft - und Raumfahrt e. V., Cologne, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 548,796
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922429
Int. Cl.[5] G01S *13/34*
U.S. Cl. 342—205 **1 Claim**

1. A sensitivity time control device for an imaging radar system having a transmission/receiving device for transmitting radar pulses (k) and for receiving backscatter pulses (e(k)), having an automatic gain control attenuator (12), a sensitivity time control attenuator (13), an analog-digital converter, having a formatting unit and having a recording unit, in the above sequence: said sensitivity time control device comprising:
output signals of an analog-digital converter having an output;
a means for generating an average value connected to said converter output and having an output;
a control means (22) comprising:
a ideal on-off relay (221) connected to said comparator device output and said ideal on-off relay having an output;
an integrating member (222) connected to said ideal on-off relay (221) output, said member having an on output;



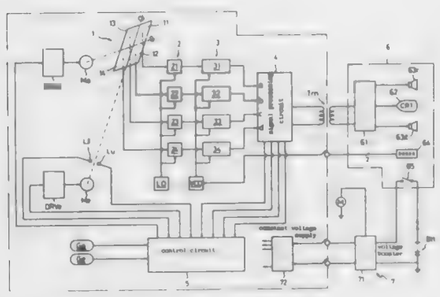
means for determining (224) a control parameter (d) connected to said ideal on-off relay (221), and
means for calculating (223) the operating point of said automatic gain control attenuator converter to said integrator member output;
an n-bit digital analog converter (23) is connected to said control means 22 output; and
the sensitivity time control attenuator (13) is connected to an output of said analog converter (23).

4,994,812

ANTENNA SYSTEM

Masahiro Uematsu; Ryuichi Hiratsuka, both of Otemachi, and Kazuro Kato, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo and System Uniques Corporation, Kanagawa, both of, Japan

Filed Dec. 12, 1989, Ser. No. 449,671
Claims priority, application Japan, Dec. 13, 1988, 63-314541; Jan. 10, 1989, 1-3071; Mar. 24, 1989, 1-72187
Int. Cl.[5] G01S *3/46*
U.S. Cl. 342—359 **9 Claims**



1. An antenna system comprising
an antenna support;
drive means for driving the antenna support for rotation about a single axis;
a first and a second antenna mounted on the antenna support and spaced apart from each other in the direction of rotation, the first and the second antenna having respective directivities which are oriented parallel to each other;
functional value detecting means for detecting a value of a

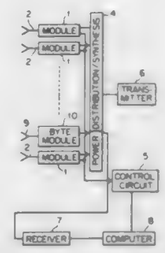
first function and a value of a second function which is orthogonal to the first function, each of the functions including a phase difference of the signal received by the second antenna with respect to the signal received by the first antenna as a parameter;
and control means for detecting the phase difference in terms of a ratio of a value of the first function to a value of the second function, and for determining a quadrant in which the phase difference is located from the positive or negative polarity of the values of the first and the second function, the control means energizing the drive means in the direction to reduce the detected phase difference and a declination of the directivity of the first antenna with respect to the travelling direction of the wave in the associated quadrant substantially zero.

4,994,813

ANTENNA SYSTEM

Kuniaki Shiramatsu; Ryuji Ishii; Takashi Katagi; Tetsuo Haruyama, and Nobutake Orime, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Denki, Tokyo, Japan

Filed Oct. 13, 1989, Ser. No. 421,427
Claims priority, application Japan, Oct. 13, 1988, 63-257791; Oct. 13, 1988, 63-257792
Int. Cl.[5] H01Q *3/00, 3/22*
U.S. Cl. 342—360 **13 Claims**



1. A phased array antenna comprising a plurality of first antenna elements and a plurality of phase shifters respectively connected to said first antenna elements, an amplitude and a phase of each of said first antenna elements being determined by a method of using a pick-up antenna to measure a composite power of said phased array antenna while changing phases of said phase shifters for determining a ratio of a maximum power to a minimum power and a phase value for said maximum power, from which said amplitude and phases are computed, wherein the improvement comprises:
a second antenna element incorporated in said phased array antenna and operating as a pick-up antenna, to measure with mutual coupling an amplitude and a phase of each of said first antenna elements by said method and to determine differences in amplitude and phase by comparing said amplitudes and phases measured by said second antenna element with amplitudes and phases measured according to said method by a pick-up antenna opposed at a distance from said phased array antenna so that amplitudes and phases subsequently measured with said second antenna element are corrected with said differences in amplitude and phase to determine an amplitude and a phase for each of said first antenna elements.

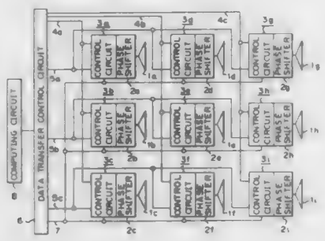
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4,994,814

PHASE SHIFT DATA TRANSFER SYSTEM FOR PHASED ARRAY ANTENNA APPARATUSES

Toshihiko Aoki; Susumu Hishinuma, and Nobutake Orime, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1989, Ser. No. 395,443
Claims priority, application Japan, Aug. 31, 1988, 63-217076
Int. Cl.[5] H01Q *3/22, 3/24, 3/26*
U.S. Cl. 342—372 21 Claims



1. Phase shift data transfer system for a phased array antenna apparatus, comprising:

a plurality of antenna means arranged in rows and columns in an X-Y plane, each being provided with a predetermined amount of phase shift to be given to a transmit/-receive signal to form a beam in a desired direction, the location of said antenna means in different columns being represented by different x coordinates and the location of said antenna means in different rows being represented by different y coordinates;

a computing means for computing a first component specified by an x coordinate and a second component specified by a y coordinate of an amount of phase shift to be set in each said antenna means to form a beam in a desired direction;

a first supply means for supplying first component data corresponding to said first component computed by said computing means to the antenna means located in a column having the x coordinate specifying said first component; and

a second supply means for supplying second component data corresponding to said second component computed by said computing means to the antenna means located in a row having the y coordinate specifying said second component,

each said antenna means being operative to determine the sum of the first and second component data supplied so that the amount of phase shift corresponding to said sum is set in each said antenna means.

4,994,815

TRACKING CONTROLLER FOR THREE-AXIS MOUNT ANTENNA SYSTEMS

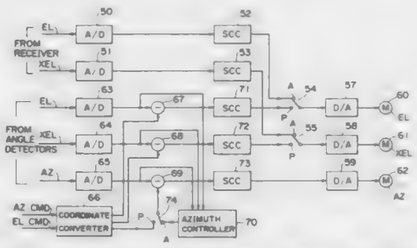
Makoto Nakayama, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 52,684, May 20, 1987, abandoned. This application Mar. 16, 1989, Ser. No. 324,951
Claims priority, application Japan, May 21, 1986, 61-117783; Nov. 19, 1986, 61-277156
Int. Cl.[5] H01Q *3/00*
U.S. Cl. 343—765 13 Claims

1. A tracking control system for controlling the orientation of an antenna for tracking a satellite, wherein the antenna is rotatable about a vertically extending azimuth axis, a horizontally extending elevation axis and a cross elevation axis extending in a direction normal to said horizontally extending elevation axis, and wherein receiver means is provided for receiving signals from said satellite and generating from the received signal a pair of first and second tracking signals having a quadratic relationship with each other, said first and second tracking signals respectively indicating the deviations of said orientation of the antenna in a coordinate system, said tracking control system comprising:

first drive means for rotating said antenna about said horizontally extending elevation axis in response to said first tracking signal;

second drive means for rotating said antenna about said cross elevation axis in response to said second tracking signal;



angle detector means for detecting angles of said antenna about said azimuth and cross elevation axes;

azimuth control means for deriving a third tracking signal from the angles detected by said angle detector means, said third tracking signal indicating a difference between the angles of said antenna about said azimuth axis and said cross elevation axis; and

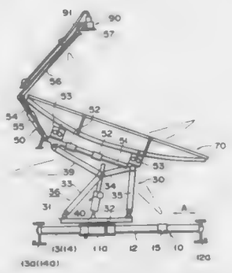
third drive means for rotating said antenna about said azimuth axis in response to said third tracking signal.

4,994,816

PORTABLE ANTENNA APPARATUS

Haruto Kondo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 7, 1989, Ser. No. 334,552
Claims priority, application Japan, Apr. 8, 1988, 63-86613; Apr. 8, 1988, 63-86614; Apr. 8, 1988, 63-86615; Apr. 8, 1988, 63-86616
Int. Cl.[5] H01Q *1/12, 15/16*
U.S. Cl. 343—762 12 Claims



1. A portable antenna apparatus, comprising:

a foldable leg unit including at least three legs each having a first jack, and a mount;

a foldable support unit coupled to the mount and including a plurality of beam members;

a foldable arm unit coupled to the support unit and including a reflector mounting member with extending means, an arm hinging at the reflector mounting member, and a primary horn mount attached to the arm;

a reflector supported on the reflector mounting member of the arm unit and including a plurality of divisions; and

a primary horn attached to the primary horn mount of the arm unit,

said support unit including a base member, and a second jack having a first end attached to the base member,

said base member and said beam members being hinged together in a manner to provide a substantially box-like shape, and

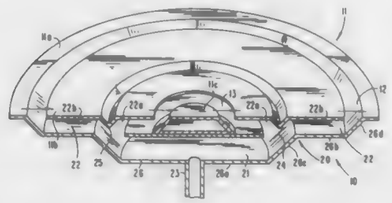
said second jack having a second end hinged to one of the beam members so as to allow an elevation angle of the reflector to be adjusted within a range of 5° to 80°.

4,994,817

ANNULAR SLOT ANTENNA

Robert E. Munson, Boulder, and Michel W. Schnetzer, Longmont, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Jul. 24, 1989, Ser. No. 383,785
Int. Cl.[5] H01Q *13/100, 13/120*
U.S. Cl. 343—770 54 Claims



33. A broadband, slot-type antenna with unidirectional sensitivity, comprising:

slot-forming means defining a plurality of substantially concentric and coplanar, annular slots;

antenna connection means for transmitting electromagnetic energy to and from the plurality of concentric, annular slots,

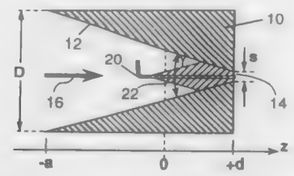
said antenna connection means comprising conductor means defining a plurality of interconnected radially extending cavities and forming an unobstructed path adapted to combine electromagnetic energy received at said plurality of concentric annular slots substantially in phase and to divide electromagnetic energy between said concentric, annular slots for transmission from said slots generally in phase along a central axis perpendicular to the plane of the plurality of annular slots.

4,994,818

SCANNING TIP FOR OPTICAL RADIATION

Fritz Keilmann, Stuttgart, Fed. Rep. of Germany, assignor to Max Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Oct. 27, 1989, Ser. No. 428,213
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837389
Int. Cl.[5] H01Q *13/00*
U.S. Cl. 343—786 21 Claims



1. A scanning tip for electromagnetic radiation with wavelengths under about 3 cm, comprising a hollow waveguide which has a surface of an electrically conductive material, said surface defining an internal volume, the transverse cross-section of said volume tapering from a first region at which said cross-section is dimensioned to have a magnitude which permits substantially unrestricted propagation of said electromagnetic radiation perpendicularly to said transverse cross-section toward an end aperture, said end aperture having a dimension (s) which is smaller than the dimension of said first region and small in comparison to the wavelength of said electromagnetic radiation, wherein said hollow waveguide, at a location (z=0), said location being between said first region and said end aperture, defines a cross-section having a dimension with respect to the wavelength which results in substantial refection of said electromagnetic radiation, propagated from said first region occurs and said end aperture is positioned in the volume defined by said waveguide and at a predetermined distance (d) said predetermined distance being a few wavelengths of said electromagnetic radiation in length from said location, and a rod insulated from said surface having an electrically conductive surface and extending from said end aperture at least up to said location (z=0).

4,994,819

PATTERN DIVERSITY IN A MICROWAVE DIGITAL RADIO SYSTEM UTILIZING A SINGLE HORN REFLECTOR ANTENNA

Anthony R. Noerpel, Long Branch, N.J., assignor to Bell Communications Research, Inc., Livingston, N.Y.

Filed Nov. 24, 1989, Ser. No. 440,887
Int. Cl.[5] H01Q *13/00, 19/00;* H01P *1/16, 5/12*
U.S. Cl. 343—786 14 Claims



1. A terrestrial digital microwave system comprising

antenna means responsive to the arrival of boresight and off-axis microwave signals for exciting therein fundamental and higher-order modes,

a main waveguide,

means interposed between said antenna means and said main waveguide for applying to said main waveguide specified horizontally polarized and vertically polarized fundamental and higher-order modes derived from the modes excited in said antenna means,

a standby receiver for receiving only higher-order modes,

means for abstracting one polarization of said higher-order modes directly from said main waveguide and delivering said abstracted mode via another waveguide to said standby receiver while allowing the polarizations of said fundamental mode and the other polarization of said higher-order modes to propagate substantially intact in said main waveguide,

and a main receiver coupled to said main waveguide for receiving therefrom the polarization of said fundamental mode that corresponds to the higher-order mode delivered to said standby receiver, said main receiver receiving only fundamental modes.

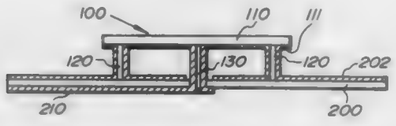
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4,994,820

PLANE ANTENNA

Hidetaka Suzuki, Yokohama; Harumi Okazaki, Fujisawa, and Motoki Hirano, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1989, Ser. No. 446,841
Claims priority, application Japan, Dec. 16, 1988, 63-316219
Int. Cl.[5] H01Q *1/48*
U.S. Cl. 343—846 6 Claims



1. A plane antenna comprising:
a first plate made of a synthetic resin, the first plate having a first metal film formed thereon;
a second plate made of a synthetic resin, the second plate having a second metal film formed thereon; and
a plurality of pins extending between the first and second plates for maintaining the first and second plates in spaced-parallel relation to each other with the first and second films facing to each other, the pins including at least one first pin for providing an electric connection between the first and second metal films and a second pin insulated from the second metal film for providing an electric connection of the first metal film to a lead wire;
the first and second metal films having a spacific resistance ρ [Ω·m] and a permeability μ [H/m], the first and second metal films having a thickness greater than a value t [m] calculated from an equation as follows:

$$t = \sqrt{\rho/\pi \cdot f \cdot \mu}$$

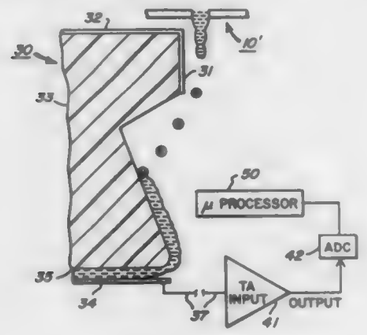
where f is a signal frequency (Hz) for which the plane antenna is used.

4,994,821

CONTINUOUS INK JET PRINTER APPARATUS HAVING IMPROVED SHORT DETECTION CONSTRUCTION

Randy L. Fagerquist, Dayton, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,578
Int. Cl.[5] G01D *18/00*
U.S. Cl. 346—75 2 Claims



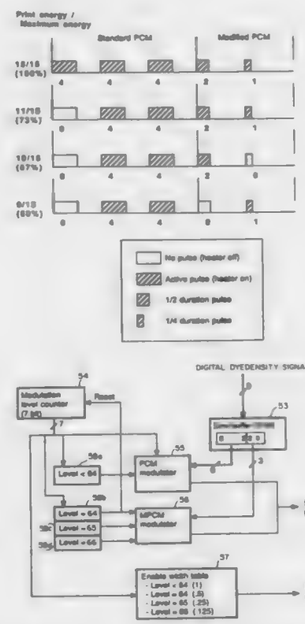
1. In a continuous ink jet printer of the kind having means for generating a plurality of droplet streams, a plurality of electrodes for selectively charging droplets of such streams and means for catching the charged, non print droplets, an improved detection system construction comprising:
(a) an electrically conductive sensor element located along an ink egress passage of said catching means;
(b) a dielectric surface formed along the drop impact region of said catching means, between said charge electrodes and said sensor element; and
(c) signal means responsive to a charge polarity reversal output by said sensor for signalling a charge electrode short condition.

4,994,822

PULSE COUNT MODULATION FOR THERMAL PRINTING

Holden Caine, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1990, Ser. No. 527,920
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—76 PH 1 Claim



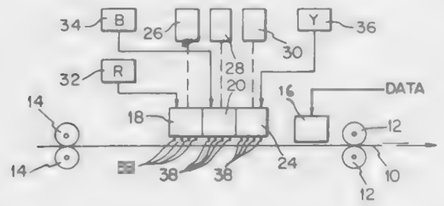
1. In a continuous tone color thermal apparatus including a print head having a plurality of heating elements for printing a line at a time of image pixels, each heating element being selectively energized in response to a digital dye density word signal to apply heat to a carrier having dye to cause such dye to transfer to a receiver to form a dye image pixel of a line, each dye image pixel having a density which is a function of the value of its corresponding digital dye density word signal, the improvement comprising:
(a) means responsive to significant digits of the digital dye density word signal to provide a selected number of constant current pulses having a first width (PCM); and
(b) means responsive to at least two least significant digits of the digital density dye word signal to selectively provide at least two constant current pulses having second and third different widths respectively, both of such second and third widths being smaller than the first width.

4,994,823

COLOR STRIPING THERMAL PRINTER

Richard Pandolfi, Smithtown, N.Y., assignor to Miltope Corporation, Melville, N.Y.

Filed Jul. 9, 1990, Ser. No. 550,120
Int. Cl.[5] B41J *2/32, 2/005*
U.S. Cl. 346—76 R 6 Claims



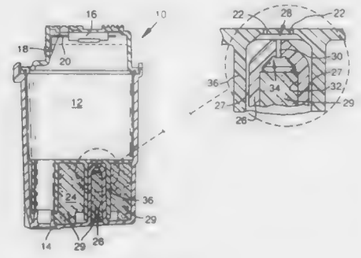
3. A printer for thermally sensitive paper comprising in combination:
(a) a thermal printing head;
(b) means for moving a document with a thermally sensitive coating on at least one of its surfaces along a predetermined path past said printing head;
(c) a first plurality of rolling-ball ink dispensers, arranged in a first row with adjacent balls closely spaced in a direction transverse to said path;
(d) a first means for selectively move said first row of ink dispensers into and out of engagement with the thermally sensitive coating on a document traveling along said path, whereby said first plurality of ink dispensers produce an ink band on said card when moved into engagement therewith;
(e) a second plurality of rolling-ball ink dispensers, arranged in a second row with adjacent balls closely spaced in a direction transverse to said path; and
(f) a second means to selectively move said second row of ink dispensers into and out of engagement with the thermally sensitive coating on a document traveling along said path, whereby said second plurality of ink dispensers produce an ink band on said card when moved into engagement therewith.

4,994,824

MODAL INK JET PRINTING SYSTEM

Thomas H. Winslow, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1988, Ser. No. 285,915
Int. Cl.[5] E01D *15/18*
U.S. Cl. 346—140 R 3 Claims



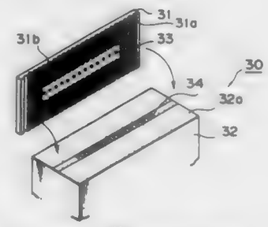
1. An ink jet pen, comprising:
an ink reservoir;
a drop-on-demand ink drop generator coupled to the ink reservoir;
an orifice located within the reservoir for limiting the negative pressure in the reservoir by permitting the controlled introduction of air thereto; and
a pressurizing mechanism connected to the reservoir and operable for forcing reservoir ink into a position for occluding the orifice so that the pressure in the ink reservoir rises above ambient.

4,994,825

INK JET RECORDING HEAD EQUIPPED WITH A DISCHARGING OPENING FORMING MEMBER INCLUDING A PROTRUDING PORTION AND A RECESSED PORTION

Akio Saito, Yamato; Kazuaki Masuda, Sagamihara; Toshio Kashino, Chigasaki, and Takashi Watanabe, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 373,502
Claims priority, application Japan, Jun. 30, 1988, 63-160712; Jun. 23, 1989, 1-159720
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R 25 Claims



1. An ink jet recording head comprising:
a plate member provided with a discharging opening for discharging ink;
a head main body having an ink channel communicating with the discharging opening, said head main body being bonded to said plate member at a bonding surface; and
an uneven portion comprising a protruding portion and a recessed portion being formed at the bonding surface of said plate member and said head main body;
wherein the recessed portion of said uneven portion at the bonding surface comprises a groove and is formed in a region excluding the peripheral region of the communicating portion between the ink channel of said head main body and the discharging opening of said plate member and wherein said plate member and said head main body in the protruding portion are bonded by an adhesive to form a gap between said head main body and said plate member at the forming region of said groove.

4,994,826

THERMAL INK JET PRINTHEAD WITH INCREASED OPERATING TEMPERATURE AND THERMAL EFFICIENCY

Thomas A. Tellier, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

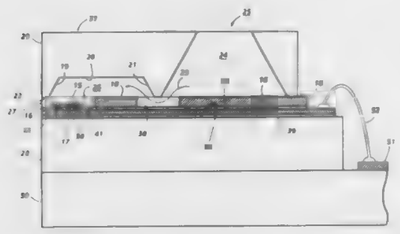
Filed Jan. 19, 1990, Ser. No. 467,439
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R 4 Claims

2. An ink jet printhead for thermally ejecting and propelling ink droplets from a printhead on demand toward a recording medium for printing thereon, the printhead having an array of nozzles, a refillable ink reservoir, and an array of parallel, ink flow directing channels providing communication between the nozzles and reservoir, the printhead comprising:
means to supply ink to the printhead reservoir under a slightly negative pressure;
each channel having a bubble generating region with a flat surfaced heating element therein a predetermined distance upstream of the nozzles, a back wall upstream of the

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heating element, and a cavity located directly over the heating elements, the nozzles having a predetermined vertical opening height and said back wall having a height equal tot he nozzle opening height, the back wall and nozzle opening being substantially perpendicular to and on opposite sides of the heating elements and extending from a plane containing the heating elements with the cavity located above the nozzles and back walls; and

means for selectively applying electrical pulses to the heating elements to form temporary vapor bubbles in the ink in contact therewith, said back wall and cavity cooperatively functioning to prevent lateral expansion of the bubble in a direction parallel to the heating element surfaces, while the cavity concurrently provides additional height and ink capacity above the heating elements, so that vertical bubble growth is promoted thereby enabling ejection of larger droplets at higher operating temperatures without reducing the droplet velocity or ingestion of air.

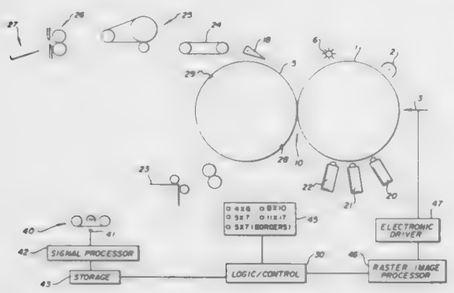


4,994,827

MULTICOLOR IMAGING METHOD AND APPARATUS

Fereidoon S. Jamzadeh, Fairport; Arun Chowdry, Pittsford, and Kevin M. Johnson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,237
Int. Cl.[5] G03G *15/01, 21/00;* B41B *19/00*
U.S. Cl. 346—157 14 Claims



1. Color printing apparatus, comprising:

an image member movable through an endless path,

electronic means for forming a series of electrostatic images of a first size on said image member as it moves through said path, each of said series of images representing the color separations of a multicolor image,

means for applying toner of different colors to said series of electrostatic images to create a series of different color toner images,

means for transferring said series of toner images in registration to a single receiving sheet to create a multicolor image thereon, said transfer means including a transfer roller positioned to rotate through transfer relation with said image member and means for securing a single receiving sheet to said transfer roller,

means for storing in memory color separation information for multicolor images to be printed, and

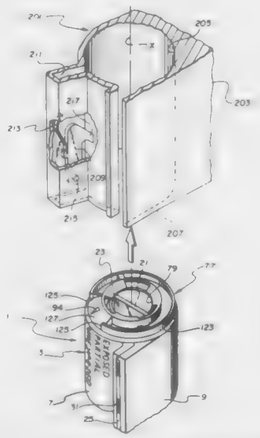
means for accessing the information stored in said memory and for controlling said electronic means to create each of said series of first size images as an array of smaller images, each of said smaller images being derived from the color separation information stored for a multicolor image to be printed.

4,994,828

CAMERA APPARATUS FOR PREVENTING LOAD OF EXPOSED FILM

David C. Smart, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1989, Ser. No. 436,265
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—21 16 Claims



1. A device to be used with a film cassette having a film-exposure status indicator movable from an unexposed position for providing a visible indication that a filmstrip within the cassette is unexposed, to a partly exposed position for providing a visible indication that the filmstrip is only partly exposed, and to an exposed position for providing a visible indication that exposure of the filmstrip is completed, wherein said device is characterized in that:

a loading chamber is configured to receive the film cassette; and

sensing means is adapted to cooperate with the status indicator of the cassette for preventing the cassette from being inserted into said loading chamber when the status indicator is in its exposed position.

4,994,829

WATERPROOF CAMERA AND LENS MOUNT THEREFORE

Masaaki Tsukamoto, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Nov. 15, 1989, Ser. No. 436,687
Claims priority, application Japan, Jul. 10, 1989, 1-175627
Int. Cl.[5] G03B *17/08, 17/12*
U.S. Cl. 354—64 9 Claims

1. A waterproof camera having a detachable imaging lens system, comprising:

an inner tube for holding the imaging lens system;

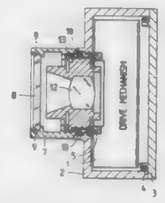
a waterproof optical member for covering a front of said imaging lens system;

an outer tube for holding said waterproof optical member and supporting said inner tube therein such that said inner tube is displaceable by a predetermined distance only along an optical axis;

an inner support member for supporting imaging means;

an outer casing for holding said inner support member therein;

a first bayonet mount arranged in said outer casing for removably supporting one end of the outer tube;



a second bayonet mount arranged in said inner support member to removably support said inner tube and having a reference plane for determining a position of said imaging lens system of said inner tube along the optical axis;

spring means arranged between said outer tube and said inner tube for biasing said inner tube toward the reference plane of said second bayonet mount when said outer tube is mounted on said outer casing through said first bayonet mount; and

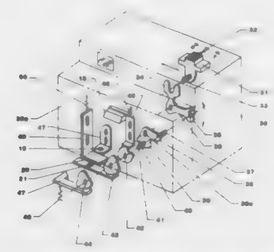
waterproof seal means provided between said outer tube and said first bayonet mount.

4,994,830

TELE PAN CAMERA DATA BACK SHIFTS AND REDUCES PRINTED DATA WITH CHANGES IN MODE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 22, 1990, Ser. No. 468,318
Int. Cl.[5] G03B *17/24*
U.S. Cl. 354—106 10 Claims



1. In a camera which takes photographs of different types, including normal and pseudo photographs, the Pseudo photographs utilizing a film frame area smaller than a normal photograph, a device for printing characters on the film, comprising:

a film pressure plate located behind the film plane and having a first opening within the normal film exposure area near one edge thereof, and a second opening spaced from said first opening and within the film frame area of a pseudo photograph,

character forming means,

a light source,

a lens, and

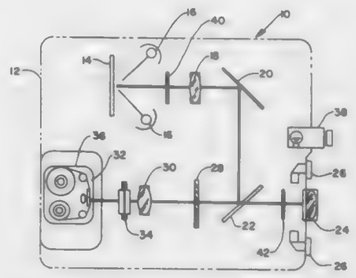
a mirror for reflecting through one of said openings onto the film, light projected through said character forming means and lens.

4,994,831

FLOATING IMAGE CAMERA

Ehsan S. Marandi, Chattanooga, Tenn., assignor to Beattie Systems, Inc., Cleveland, Tenn.

Filed Dec. 11, 1989, Ser. No. 448,702
Int. Cl.[5] G03B *17/24*
U.S. Cl. 354—109 23 Claims



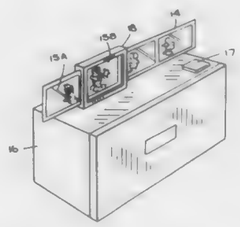
1. A camera for photographing a first image and a second image and merging said first and second images together on a photographic film such that no clear boundaries are presented between said first and second images, said camera comprising a real image forming screen, first focusing means including a first lens for focusing a real image of said first image on said screen, second focusing means including a second lens for focusing a real image of said second image on said screen so that said first and second images merge together on said screen to form a composite real image, a shutter intermediate said screen and said first film, and a third lens disposed intermediate said shutter and said screen for focusing said composite real image on said film when said shutter is opened.

4,994,832

PHOTOGRAPHIC TECHNIQUE FOR PRODUCING PICTURES OF INDIVIDUALS JOINTLY WITH CHARACTERS

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Jan. 2, 1990, Ser. No. 459,642
Int. Cl.[5] G03B *35/00*
U.S. Cl. 354—110 6 Claims



1. A technique for producing photographic pictures in each of which an individual whose picture is taken is seen jointly with a figurative character in such a way as to establish an apparent relationship therebetween, said technique comprising:

(a) loading a camera provided with a viewfinder with a light-sensitive film whose successive frames are partially pre-exposed so that each frame contains a latent image of a character at a predetermined position within the frame;

(b) placing a transparency slide in the viewfinder of an image that corresponds to that in the film frame then in a position to be exposed;

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(c) taking pictures with the loaded camera of at least one individual to expose the successive frames so that a latent image of the individual seen through the slide in the viewfinder appears in juxtaposition with that of the image of the character on that frame in a position to be exposed which is then completely exposed; and

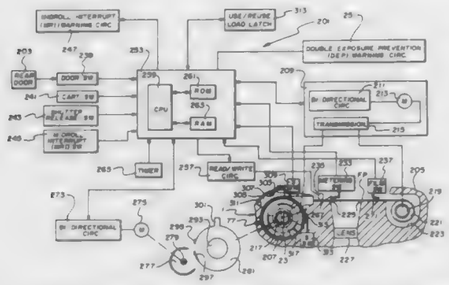
(d) developing and printing the exposed film to provide pictures in each of which the individual appears next to a character.

4,994,833

CAMERA APPARATUS FOR PREVENTING DOUBLE-EXPOSURE OF FILM RETURNED TO A SELF-THRUSTING CASSETTE

J. David Cocca, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 12, 1990, Ser. No. 492,038
Int. Cl.[5] G03B *19/02*
U.S. Cl. 354—207 3 Claims



1. A photographic camera for exposing a filmstrip normally stored in a light-tight cassette which is inherently capable of thrusting the filmstrip out of the cassette and has a film-exposure status indicator movable from an unexposed position for providing a visible indication that the filmstrip is generally unexposed to an exposed position for providing a visible indication that the filmstrip is substantially exposed, wherein said camera is characterized in that:

indicator sensing means is located with respect to the status indicator of the cassette for sensing whether the status indicator is in its exposed position, for determining whether the filmstrip is substantially exposed, and alternatively for sensing whether the status indicator is in its unexposed position, for determining whether the filmstrip is generally unexposed; and

control means is connected to said indicator sensing means for preventing exposure of the filmstrip when the status indicator is in its exposed position and for permitting exposure of the filmstrip when the status indicator is in its unexposed position.

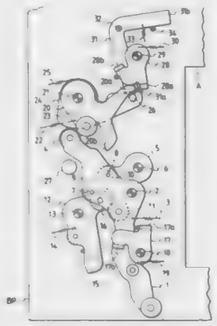
4,994,834

FOCAL PLANE SHUTTER FOR CAMERAS

Kenichi Watabe; Shigemi Takahashi; Toshihisa Saito, and Akira Suzuki, all of Itabashi, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,115
Claims priority, application Japan, Mar. 10, 1989, 1-26646[U]; Mar. 22, 1989, 1-32491[U]
Int. Cl.[5] G03B *9/08, 9/20*
U.S. Cl. 354—234.1 2 Claims

1. A focal plane shutter for cameras comprising a front blade group and a rear blade group capable of opening and closing an exposure aperture, and an electromagnetic device capable of sequentially operating said front blade group and said rear blade group, wherein said focal plane shutter for camera is equipped with a first release means for retaining said rear blade group tending to return to the folded position thereof at a position to close said exposure aperture, and a second release means adapted to be capable of maintaining said front blade group and said rear blade group at the unfolded position and



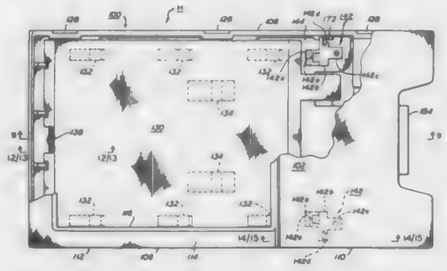
the folded position respectively until said front blade group and said rear blade group are retained at the folded position and the unfolded position respectively by said electromagnetic device.

4,994,835

FILM PACKET HOLDER IMPROVEMENT

Guenter H. Loose, Webster, and Robert P. Bresnan, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1989, Ser. No. 453,892
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—282 10 Claims



1. In a photographic holder adapted for use with a film assemblage including:

a photosensitive film sheet having first and second ends;

means detachably attached to the film sheet for facilitating use thereof, the facilitating means having first and second sections thereof projecting longitudinally beyond the film sheet first and second ends, respectively, the facilitating means second section having a transverse edge along which is secured a transversely disposed light-locking element; and

a light-shielding envelope removably enclosing the film sheet and facilitating means, the envelope having a film-covering part and first and second parts extending longitudinally therefrom and covering the facilitating means first and second sections, respectively, the envelope first part having a closed end that is manually graspable, the envelope second part having an open end that is closable by cooperative engagement with the light-locking element, the envelope being removable from the film sheet and facilitating means by longitudinal relative movement therebetween in a direction separating the envelope second part end from the light-locking element, the envelope further including a movement-limiting element secured to an exterior surface thereof;

said holder including:

a substantially rectangular-shaped housing having parallel, spaced-apart front and rear walls, opposing sides, and oppositely disposed first and second end regions, said front wall having a frame portion defining a film-exposure window, said first end region having means defining an access opening configured to permit ingress and egress of the film assemblage along a movement path extending to and from, respectively, a seated position wherein the film sheet is aligned with said window and the light-locking element is in said second end region;

a substantially flat pressure-applying member movably disposed between and substantially parallel with said housing front and rear walls, said pressure-applying member being movable in directions transverse to said front wall and normally urged by influence of biasing means thereon toward said movement path, to press the film assemblage, when in its seated position, against said front wall frame portion;

movement blocking means movably disposed in said housing second end region, said blocking means being movable in directions transverse to said front wall and normally urged by influence of biasing means thereon toward said movement path, to engage the light-locking element, when in its seated position, and thereby block movement thereof toward said access opening;

movement arresting means movably disposed between said front wall frame portion and said access opening, said arresting means being movable in directions transverse to said front wall and normally urged by influence of biasing means thereon toward said movement path, to engage the envelope movement-limiting element during movement thereof from its seated position toward said access opening, and thereby arrest further movement thereof toward said opening; and

a releasing member movably disposed between said pressure-applying member and said housing rear wall, said releasing member being movable in first and second opposing directions extending toward said housing first and second end regions respectively, said releasing member being normally urged by influence of biasing means thereon in said first direction to a rest position, said releasing member being configured for manual movement in said second direction away from said rest position, said releasing member having means thereon operatively associated with said pressure-applying member and said blocking and arresting means, and responsive to said manual movement in said second direction, for negating said biasing means influences normally urging said pressure-applying member and said blocking and arresting means toward said movement path, to remove said pressure-applying member and said blocking and arresting means from said path and thereby release the film assemblage for unrestricted movement therealong from its seated position and through said access opening;

an improvement comprising:

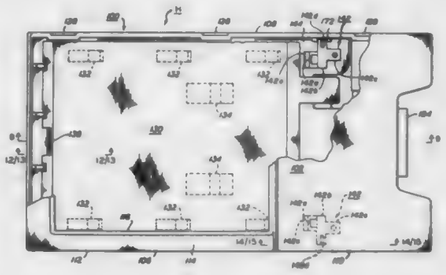
camming means disposed on said arresting means for engagement by the light-locking element during movement thereof toward said access opening, to deflect and guide the light-locking element past said arresting means and thereby facilitate continued movement thereof toward said opening.

4,994,836

FILM PACKET IMPROVEMENT

Guenter H. Loose, Webster, and Robert P. Bresnan, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1989, Ser. No. 453,893
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—282 10 Claims



1. In a film assemblage adapted for use with a cooperating photographic holder, said film assemblage comprising:

a photosensitive film sheet having leading and trailing ends;

an elongate carrier sheet having first and second outward-facing surfaces, said carrier sheet including leading and trailing end sections and an intermediate section between said end sections, said film sheet being detachably attached to said first outward-facing surface of said intermediate section with said leading and trailing ends thereof oriented toward said leading and trailing end sections respectively, said leading end section extending longitudinally beyond said intermediate section and terminating in a tab, said trailing end section extending longitudinally beyond said intermediate section and having a transversely disposed light-locking element secured thereto; and

a light-shielding envelope removably enclosing said carrier sheet and said film sheet, said envelope having first and second exterior surfaces overlying said first and second outward-facing surfaces respectively, said envelope including longitudinally extending leading and trailing end portions overlying said leading and trailing end sections respectively, said leading end portion being sealed closed, said trailing end portion being closable by cooperative engagement with said light-locking element, said leading end portion including first and second graspable zones, said first graspable zone overlying said tab so that, when grasped, said first zone is pressed against said tab, said second graspable zone not overlying said tab so that, when grasped, said second zone is not pressed thereagainst, said trailing end portion having a transversely disposed movement-limiting element secured to said first exterior surface thereof, said envelope being removable from said carrier sheet and film sheet by longitudinal relative movement therebetween in a direction separating said trailing end portion from said light-locking element;

the cooperating photographic holder including:

a substantially rectangular-shaped housing having parallel, spaced-apart front and rear walls, opposing sides, and oppositely disposed first and second end regions, the front wall having a frame portion defining a film-exposure window, the first end region having means defining an access opening configured to permit ingress and egress of said film assemblage along a movement path extending to and form, respectively, a seated position wherein said film sheet is aligned with the window and said light-locking element is in the second end region;

a substantially flat pressure-applying member movably disposed between and substantially parallel with the housing

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front and rear walls, the pressure-applying member being movable in directions transverse to the front wall and normally urged by influence of biasing means thereon toward the movement path, to press said film assemblage, when in its seated position, against the front wall frame portion;

movement blocking means movably disposed in the housing second end region, the blocking means being movable in directions transverse to the front wall and normally urged by influence of biasing means thereon toward the movement path, to engage said light-locking element, when in its seated position, and thereby block movement thereof toward the access opening;

movement arresting means movably disposed between the front wall frame portion and the access opening, the arresting means being movable in directions transverse to the front wall and normally urged by influence of biasing means thereon toward the movement path, to engage said envelope movement-limiting element during movement thereof form its seated position toward the access opening, and thereby arrest further movement thereof toward that opening, the arresting means having camming means extending therefrom, and engageable by said light-locking element during movement thereof from its seated position toward the access opening, for deflecting and guiding said light-locking element toward the arresting means, to thereby facilitate continued movement thereof toward the access opening; and

a releasing member movably disposed between the pressure-applying member and the housing rear wall, the releasing member being movable in first and second opposing directions extending toward the housing first and second end regions respectively, the releasing member being normally urged by influence of biasing means thereon in the first direction to a rest position, the releasing member being configured for manual movement in the second direction away from the rest position, the releasing member having means thereon operatively associated with the pressure-applying member and the blocking and arresting means, and responsive to the manual movement in the second direction, for negating the biasing means influences normally urging the pressure-applying member and the blocking and arresting means toward the movement path, to remove the pressure-applying member and the blocking and arresting means from the path and thereby release said film assemblage for unrestricted movement therealong from its seated position and through the access opening;

an improvement wherein said film assemblage light-locking element comprises:

first means thereon adapted to engage and follow the camming means extending from the arresting means, during movement of said light-locking element from its seated position toward the access opening, for causing said light-locking element to be deflected and guided by the camming means toward the arresting means; and

second means thereon defining a clearance opening disposed to be aligned with the arresting means, during movement of said light-locking element from its seated position toward the camming means, and configured to exceed and thereby receive the arresting means during continued movement of said light-locking element from the camming means to the arresting means;

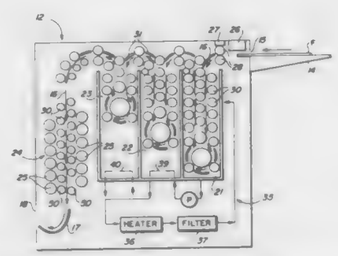
whereby said light-locking element moves freely past the arresting means during said movement thereof from its seated position toward the access opening.

4,994,837

PROCESSOR WITH TEMPERATURE RESPONSIVE FILM TRANSPORT LOCKOUT

James T. Samuels, and Roger D. Ellsworth, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1990, Ser. No. 494,647
Int. Cl.[5] G03D *3/08*
U.S. Cl. 354—299 20 Claims



1. In apparatus for the processing of exposed photosensitive media, said apparatus having means for automatically transporting said media from a feed point along a path through developer, fixer, wash and dryer stations, and means for regulating the temperature of developer located at said developer station in accordance with a reference temperature and in response to a temperature sensor, the improvement comprising:

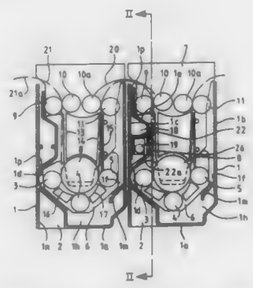
said apparatus further including a control panel, means responsive to user input at said control panel for selectively resetting said reference temperature to a different reference temperature; and means, responsive to said selectively resetting means and said temperature sensor, for automatically inhibiting the introduction of further media from said feed point along said path until actual developer temperature measured by said sensor is within a predefined acceptable range of said different reference temperature.

4,994,838

WET PROCESSING ARRANGEMENT AND METHOD FOR PHOTOGRAPHIC REVERSAL MATERIAL

Harald Fengler, Taufkirchen; Georg Fryda, and Wilfried Hehn, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 392,666
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828492
Int. Cl.[5] G03D *11/00, 3/08*
U.S. Cl. 354—306 18 Claims



1. An arrangement for wet processing exposed photosensitive material, comprising at least one vessel for a treating bath; a source of electromagnetic radiation in said at least one vessel;

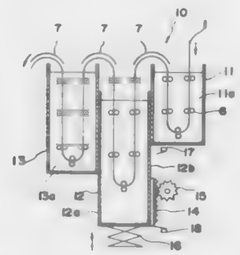
a container in said at least one vessel, said container having a section transparent to the radiation and said source being disposed in said container, said container being bounded by wall means and said wall means being provided with at least one opening which is accessible from exteriorly of said at least one vessel; and a holder for said source, said holder being insertable into and removable from said container through said at least one opening.

4,994,839

DEVELOPING DEVICE USING PLURALITY OF TANKS

Yukiyoshi Yamakoshi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1989, Ser. No. 358,825
Claims priority, application Japan, May 30, 1988, 63-132221
Int. Cl.[5] G03D *3/08*
U.S. Cl. 354—322 9 Claims



1. A developing device for developing an image formed on a light sensitive material, wherein said light sensitive material is sequentially transported through a developing fluid, a bleach fixing fluid and a stabilizing fluid, the device including:

a first tank containing the developing fluid;

a second tank containing the bleach fixing fluid;

a third tank containing the stabilizing fluid; and

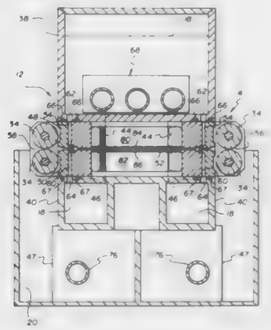
means for positioning said second tank in a first position and a second position, said second position being located below said first position, said positioning means including means for moving said second tank independently of said first and third tanks.

4,994,840

APPARATUS FOR PROCESSING PHOTOSENSITIVE MATERIAL

Douglas O. Hall, Canadaigua, and Bruce R. Muller, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1990, Ser. No. 495,671
Int. Cl.[5] G03B *3/06*
U.S. Cl. 354—324 7 Claims



1. A photographic processing unit adapted to have a processing fluid supplied thereto for processing a strip or sheet of photosensitive material, said processing unit comprising:

a vessel for retaining the processing fluid;

a processing device having at least one inlet and adapted to be submersed in the fluid in said vessel, said processing device having means forming a chamber to permit the material to travel therethrough; and

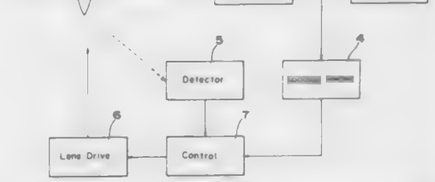
means for supplying the processing fluid to said vessel to a predetermined height such that a predetermined fluid pressure is created at said inlet whereby fluid flows from said vessel to said chamber to create a turbulent fluid flow in said chamber for processing the photosensitive material as the material travels through said chamber.

4,994,841

AUTOMATIC FOCUS DETECTING MEANS

Tokuji Ishida; Toshio Norita; Masataka Hamada, and Hiroshi Ootsuka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,304
Claims priority, application Japan, Nov. 6, 1987, 62-280482
Int. Cl.[5] G03B *13/36;* G02B *7/28*
U.S. Cl. 354—402 20 Claims



1. An automatic focus condition detecting device comprising:

an objective lens;

means for receiving light from an object through said objective lens;

a focus detecting means responsive to the output of said receiving means for detecting a focusing condition of said objective lens;

means responsive to the output of said receiving means for judging whether or not it is possible for said focus detecting means to detect a focusing condition of said objective lens;

a lens position detecting means for detecting whether or not said objective lens is positioned within a predetermined range included in the lens driving range;

means for driving said objective lens when said judging means judges that it is impossible for said focus detecting means to detect a focusing condition, for the purpose of a search for a lens position where said focus detecting means can detect a focusing condition; and

means for forbidding said driving means from driving said objective lens when said lens detecting means detects that said objective lens is not positioned within the predetermined range.

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4,994,842
CAMERA HAVING A CONVERTER-ATTACHABLE ZOOM LENS

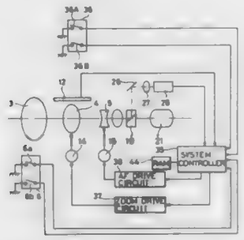
Masatoshi Itoh; Hidenori Fukuoka, and Kazuhiko Kojima, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 253,387, Oct. 3, 1988, abandoned, which is a continuation of Ser. No. 152,770, Feb. 5, 1988, abandoned. This application Oct. 19, 1989, Ser. No. 424,655

Claims priority, application Japan, Feb. 6, 1987, 62-26065; Feb. 6, 1987, 62-26066

Int. Cl.[5] G03B *13/36, 5/00;* **H04N** *5/232*

U.S. Cl. 354—402 **48 Claims**



1. A camera having a zoom lens unit, comprising:

a first lens included in said zoom lens unit freely movable in a prescribed range for varying a focal length of said zoom lens unit;

a second lens detachably attached between said first lens and an object, which has a magnification varying function of further changing the focal length of said zoom lens unit by said attachment;

attachment detecting means for detecting the attachment of said second lens and providing an output;

position determining means for determining a prescribed position of said first lens in response to the detection output of said attachment detecting means, wherein the effect of the attachment of said second lens is maximized with said first lens determined at said prescribed position, and

moving means for moving said first lens to said determined prescribed position in response to the determination output of said position determining means.

4,994,843
FOCUS INDICATING APPARATUS OF AUTOMATIC FOCUSING CAMERA

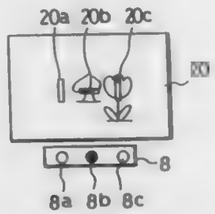
Toshiyuki Kitazawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1989, Ser. No. 397,670

Claims priority, application Japan, Aug. 25, 1988, 63-111436[U]; Aug. 25, 1988, 63-111437[U]; Sep. 5, 1988, 63-221567

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—409 **59 Claims**



1. A focus indicating apparatus of an automatic focusing camera, comprising a plurality of object distance measuring areas, object distance measuring means for detecting the amount of defocus or an object distance of objects in said object distance measuring areas, and focusing means for selecting the one of said object distance measuring areas including an object to be focused, in accordance with the object distance data or defocus data detected by said object distance measuring means and a predetermined algorithm to effect focusing for the object in said selected object distance measuring area, a plurality of indicating means corresponding to said object distance measuring areas and indication control means for driving the indicating means corresponding to said selected object distance measuring area, said indicating means comprising indicating elements located directly below said associated object distance measuring areas in a finder field of view.

4,994,844
CAMERA SYSTEM

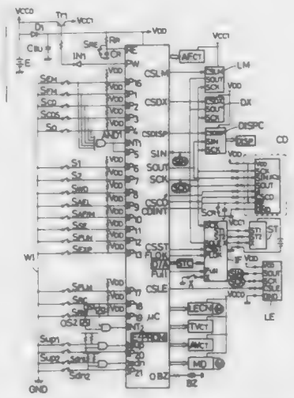
Yoshihiko Azuma; Takehiro Katoh; Yasuteru Yamano; Masayasu Hirano; Hiroshi Ootsuka; Takeshi Egawa; Masaaki Nakai; Toshihiko Ishimura, and Naohiro Kageyama, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1989, Ser. No. 337,639

Claims priority, application Japan, Apr. 15, 1988, 63-94365; Apr. 15, 1988, 63-94366; Apr. 16, 1988, 63-93653; Apr. 16, 1988, 63-93654

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—412 **27 Claims**



1. Camera system including a camera body and an accessory adapted to cooperate with the camera body, comprising:

means, provided in the accessory, for sending first exposure data to the attached camera body;

means, provided in the camera body, for receiving the first exposure data which is concerned with photographic exposure sent from the sending means;

means, provided in the camera body, for generating second exposure data which is concerned with photographic exposure;

an operable member provided in the camera body;

means, provided in the camera body, for selecting said first or second exposure data alternatively in response to the operation of said operable member; and

means, provided in the camera body, for controlling the exposure operation of the camera body in accordance with the selected exposure data.

4,994,845
LIGHT MEASURING DEVICE

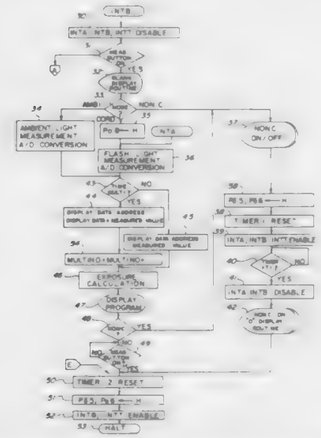
Kazuhiko Naruse, Nabari, and Yoshio Yuasa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 171,641, Mar. 22, 1988, Pat. No. 4,914,468, which is a continuation of Ser. No. 893,596, Aug. 6, 1986, abandoned. This application Dec. 5, 1989, Ser. No. 446,383

Claims priority, application Japan, Aug. 7, 1985, 60-173819

Int. Cl.[5] G03B *15/02;* **G01J** *1/44*

U.S. Cl. 354—415 **13 Claims**



1. A light measuring device for measuring flash light, comprising:

means for measuring a quantity of flash light to produce a light measuring signal corresponding to the measured quantity of flash light;

means for detecting a start of a flash emission to produce a starting signal;

control means for making the measuring means start a light measuring operation in response to the starting signal produced by the detecting means;

a first operating member which places the control means in a operable condition when it is manually operated;

means, having a counter for counting a predetermined time period after the first operating member is operated, for keeping the control means in an operable condition for the predetermined time period, so that the measuring means measures the quantity of flash light when the detecting means detects the start of a flash emission during the time period; and

means for resetting the time count of the counter in response to the light measuring operation of the measuring means.

4,994,846
AUTO STROBE CAMERA

Takeo Kobayashi, Tokyo; Yasushi Tabata, Chiba; Norio Numako, Tochigi, and Katsutoshi Nagai, Saitama, all of Japan, assignors to Asahi Kogaku Kogyo kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 373,981

Claims priority, application Japan, Jun. 30, 1988, 63-163895; Jun. 30, 1988, 63-163896; Jun. 30, 1988, 63-163897; Jun. 30, 1988, 63-163898; Jun. 30, 1988, 63-87120; Jun. 30, 1988, 63-163899

Int. Cl.[5] G03B *15/05*

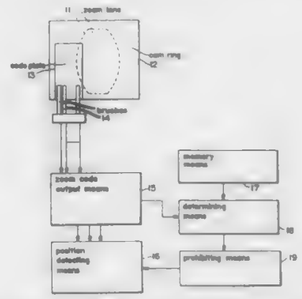
U.S. Cl. 354—418 **4 Claims**

1. A charging arrangement for a strobe of a camera comprising:

(a) means for determining whether flashing of said strobe is required;

(b) means for charging of said strobe in response to a determination made by said means for determining that flashing of said strobe is required;

(c) a photometric switch being operable between an actuated position and a non-actuated position; and



(d) means for warning that said strobe is being charged, only if said photometric switch is actuated and if it is determined by said means for determining that flashing of said strobe is required, until charging of said strobe is completed.

4,994,847
APPARATUS FOR SORTING AND TRANSPORTING SHEETS

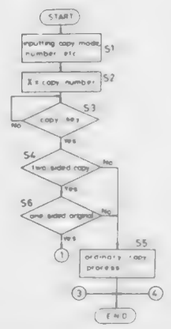
Yoshihisa Tanaka, Higashiosaka; Yukio Hashimoto, Kadoma; Tadashi Fujioka, Toyonaka, and Yoshiki Yoshioka, Tsuzuki, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Oct. 12, 1989, Ser. No. 420,314

Claims priority, application Japan, Oct. 12, 1988, 63-257899

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—26 **18 Claims**



1. An apparatus for sorting and transferring sheets comprising:

storing means for storing a group of stacked sheets;

first transferring means for transferring one of said sheets located at an end of said group of said sheets from said storing means in a first direction;

second transferring means for transferring one of said sheets located at the end of said group of said sheets from said storing means in a second direction; and

control means for controlling said first transferring means and said second transferring means, whereby said first transferring means and said second transferring means perform alternately; wherein

said first direction and said second direction are different from each other.

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4,994,848

IMAGING DEVICE

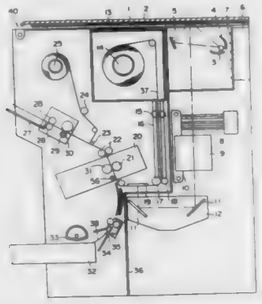
Katoh Tokunori; Sakakibara Kenji, both of Ichinomiya; Akao Michitoshi, Nagoya; Sawaki Yukichi, Gifu, and Sonoda Takakuni, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 5, 1989, Ser. No. 361,142

Claims priority, application Japan, Jun. 6, 1988, 63-74877[U]

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **15 Claims**



1. An imaging device employing a continuous-form recording sheet coated with a plurality of photo and pressure sensitive microcapsules and a cut-sheet type developing sheet being superposed on said recording sheet to develop a visible image thereon, said imaging device comprising:

exposing means for exposing a latent image on said recording sheet;

a pair of pressure-developing rollers, adapted to be brought into and out of contact with each other, for pressurizing said recording sheet and said developing sheet to develop a visible image on said developing sheet;

feed means for feeding said recording sheet and said developing sheet in an overlapped state toward said pair of rollers; and

controlling means including a detector for detecting at least a passing of a leading end of said developing sheet before said developing sheet is pressurized and for controlling said pair of rollers so as to be brought into contact after the detection of said developing sheet and in accordance with the feeding speed of the developing sheet as the developing sheet is fed into a space between said pair of rollers by said feed means.

4,994,849

IMAGING DEVICE

Takeshi Izaki; Yousuke Ito; Michitoshi Akao, all of Nagoya; Kenji Sakakibara; Tokunor; Katoh both of Ichinomiya; and Hirosh, Morisaki, Nishikasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 25, 1989, Ser. No. 426,884

Claims priority, application Japan, Oct. 25, 1988, 63-268833; Jan. 30, 1989, 1-20411

Int. Cl.[5] G03B *27/32*

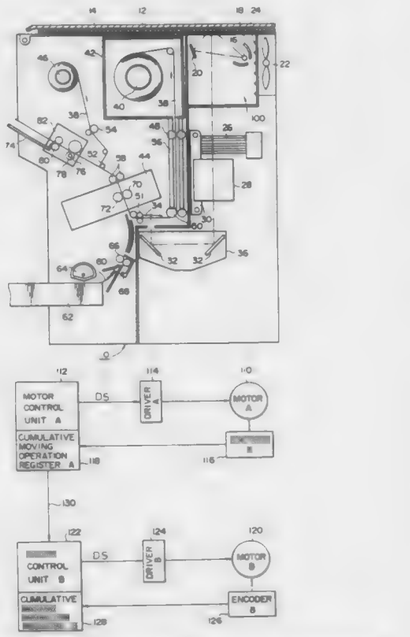
U.S. Cl. 355—27 **11 Claims**

1. An imaging device, employing a recording medium including at least two sheets arranged to be superposed with each other, comprising first form means for forming an optical image corresponding to an image of an original on a surface of one of said two sheets, second form means for forming a visible image corresponding to the image formed by said first form means on a surface of the other of said two sheets, said imaging device further comprises:

first feed means including a motor member for feeding the one of said two sheets at least from said first form means to said second form means;

second feed means including another motor member for feeding the other of said two sheets to said second form means; and

control means for detecting respective amounts of feeding of said two sheets and controlling said first feed means and



said second feed means based on the detected amounts of feeding of said two sheets so as to respectively feed said two sheets to maintain a predetermined relationship with each other.

4,994,850

IMAGE FRAME SELECTING APPARATUS FOR PHOTOGRAPHIC PRINTER

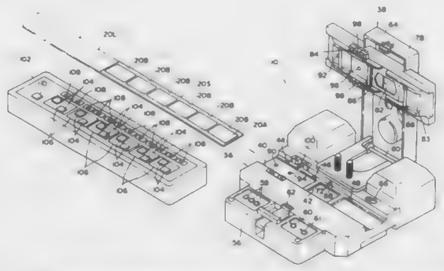
Takashi Imamura, and Toshiyuki Hiroishi, both of Kangawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 10, 1989, Ser. No. 419,248

Claims priority, application Japan, Oct. 12, 1988, 63-256654; Nov. 17, 1988, 63-290857

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—41 **17 Claims**



1. An image frame selecting apparatus for a photographic printer, having a printing position, which is operative to designate at least one selected image frame to be printed among

plural image frames serially arranged as a short photographic film, comprising:

operating means for selecting from the plural image frames on said short film an image frame to be printed, said operating means having a plurality of operating elements that are the same in number as said image frames on said short photographic film and which are arranged and ordered to correspond with the arrangement and order of said image frames of said short photographic film;

image frame designating means for individually designating each of said image frames in correspondence with said operating elements of said operating means;

conveying means for conveying said short photographic film; and

controlling means responsive to said operating means and said designating means for controlling said conveying means in such a manner that said image frame designated by said image frame designating means is positioned to said printing position,

whereby said designated image frames to be printed are consecutively positioned automatically to said printing position.

4,994,851

PHOTOSENSITIVE SHEET REWIND DEVICE FOR IMAGE FORMING APPARATUS

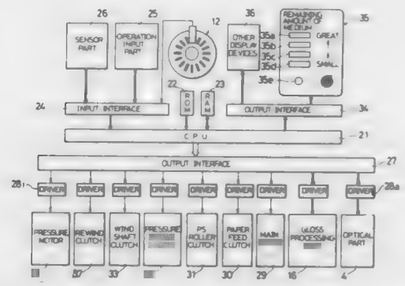
Shougo Iwai, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1990, Ser. No. 489,515

Claims priority, application Japan, Mar. 7, 1989, 1-54354

Int. Cl.[5] G03B *27/48, 27/50, 27/70*

U.S. Cl. 355—50 **14 Claims**



1. A rewind device for a photosensitive sheet in an image forming apparatus comprising:

supply shaft reversing means for winding back a photosensitive sheet by rotating a supply shaft rotatively supporting a photosensitive sheet roll in the reverse direction to the drawing direction of the photosensitive sheet;

rotation detection means for detecting the amount of rotation made by the photosensitive sheet roll, which is secured to the rotation system of the supply shaft and;

a control part which controls the supply shaft reversing means by measuring the rotation amount of the photosensitive sheet roll in the drawing direction detected by the rotation detection means in a fixed period of time as well as the same in the reverse direction and by comparing both of the rotation amounts with each other.

4,994,852

IMAGE FORMING APPARATUS HAVING A MALFUNCTION DETECTION DEVICE AND POWER SHUTDOWN THEREFOR

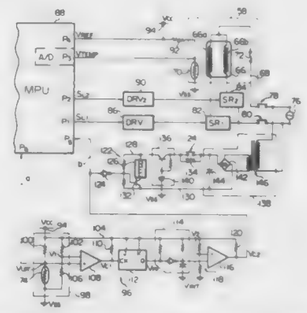
Yasuyuki Matsuuchi, and Kenzo Nagata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1988, Ser. No. 232,763

Claims priority, application Japan, Aug. 18, 1987, 62-204810; Aug. 18, 1987, 62-204811

Int. Cl.[5] G03G *21/00, 15/20*

U.S. Cl. 355—206 **8 Claims**



1. An image forming apparatus including a radiation emitting element having an operative condition emitting radiation and an inoperative condition not emitting radiation, comprising

(a) a power supply circuit for electrically energizing said radiation emitting element through switch means,

(b) a digital control network for producing a control signal effective to actuate said switch means to cyclically close and open for the purpose of inspecting said radiation emitting element for any malfunction,

(c) a detecting element directly responsive to the operative and inoperative conditions of said radiation emitting element, the detecting element being operative to produce a signal indicating the detected condition of the radiation emitting element,

(d) malfunction detecting means for producing a malfunction signal indicating a malfunction of said radiation emitting element on the basis of the signal from said detecting element in the presence of the control signal from said digital control network, the malfunction detecting means being operative to produce the malfunction signal when the signal from said detecting element indicates that said radiation emitting element is in a condition continuously emitting radiation, and

(e) means for forcibly disabling said power supply circuit in response to the malfunction signal from said malfunction detecting means.

4,994,853

APPARATUS FOR RECORDING COLOR IMAGES HAVING INTERCHANGEABLE PROCESS CARTRIDGES AND CARTRIDGE INFORMATION ON IC CARDS

Masakazu Fukuchi; Satoshi Haneda; Hisashi Shoji; Shunji Matsuo, and Shizuo Morita, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 439,282

Claims priority, application Japan, Nov. 25, 1988, 63-298867; Sep. 28, 1989, 1-256078

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—208 **10 Claims**

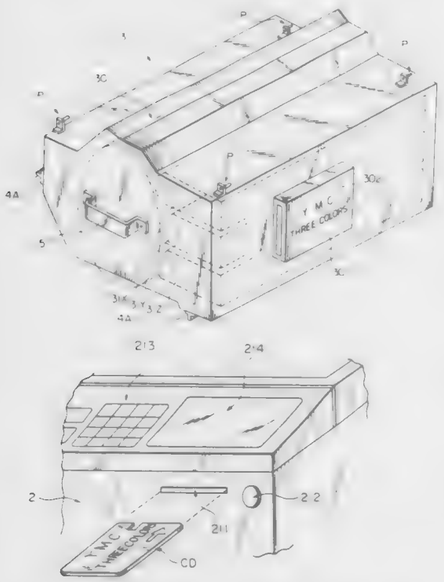
1. A color image forming apparatus comprising:

means for replaceably accommodating a selected one out of a plurality of interchangeable process cartridges each of which includes a unique set of at least one developing

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device out of a plurality of developing devices, each of said process cartridges having a predetermined operation mode related to the unique set of at least one developing device included therein;

a plurality of card-shaped memory means corresponding, respectively, to the plurality of process cartridges, with each card-shaped memory means being associated with



only one of said plurality of process cartridges and storing data representing its predetermined operation mode;

means for relating a card-shaped memory means with the one process cartridge to which the data stored therein corresponds; and

control means for receiving the data stored on said card-shaped memory means and, based thereon, performing said specific predetermined operation mode.

4,994,854

IMAGE FORMING APPARATUS FOR FORMING OUTLINE AND NORMAL IMAGES

Hirohisa Miyamoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1988, Ser. No. 222,167

Claims priority, application Japan, Jul. 21, 1987, 62-182836

Int. Cl.[5] G03G *15/00, 15/01, 21/00*

U.S. Cl. 355—210 **6 Claims**

1. An electrophotographic image forming apparatus capable of selectively forming a copy of an original image in which the outline of the original image is enhanced and a color reproduction of an original image, said apparatus comprising:

a photoreceptor drum rotatably supported in the apparatus, and means for rotating said photoreceptor drum in a predetermined direction of rotation;

corona charger means confronting the periphery of said photoreceptor drum for facilitating the formation of a latent electrostatic image on said drum that corresponds to the original image;

a first developing unit confronting the periphery of said photoreceptor drum at a location downstream of said corona charger means with respect to said direction of rotation, said first developing unit operable to develop the electrostatic latent image into a color image;

a unit mounting portion confronting the periphery of said photoreceptor drum upstream from said first developing unit with respect to said direction of rotation;

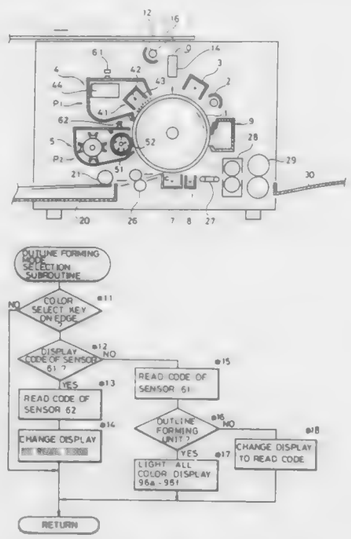
an exchangeable unit detachably mounted to the apparatus at said unit mounting portion,

said exchangeable unit being one of an outline forming unit having a scorotron charger operable to develop said latent electrostatic image into an image corresponding to the original image but with the outline thereof enhanced and a second developing unit operable to develop the electrostatic latent image into a color image corresponding to the original image;

detecting means for detecting whether the exchangeable unit mounted at said unit mounting portion is said outline forming unit or said second developing unit;

mode control means operatively connected to said detecting means for selectively establishing one of two different sets of copying modes in the apparatus depending upon whether said detecting means detects said outline forming unit or said second developing unit at said unit mounting portion,

the first one of said sets of copying modes including an outline forming mode in which the mode control means



can activate said outline forming unit to facilitate the formation of a copy of the original image with the outline thereof enhanced, and a first developing mode in which the mode control means can activate said first developing unit to facilitate the formation of a reproduction of the original image in a color associated with said first developing unit, when said detecting means detects said outline forming unit at said unit mounting portion,

the second one of said sets of copying modes including a second developing mode in which the mode control means can activate said second developing unit to facilitate the formation of a reproduction of the original image in a color associated with said second developing unit, and said first developing mode, when said detecting means detects said second developing unit at said unit mounting portion; and

input means operatively connected to said control means for causing said control means to carry out one of the modes in the respective one of said sets thereof that is established in the apparatus based on the detection by said detecting means,

said input means including only a single key which alternately readies said mode control means to activate either said outline forming unit or said first developing unit when said key is successively pressed by an operator while said first one of said sets of copy modes is established, and which alternately readies said mode control means to activate either said first developing unit or said second developing unit when said key is successively pressed by an operator while said second one of said sets of copying modes is established.

4,994,855

ELECTROPHOTOGRAPHIC IMAGE FORMATION APPARATUS WITH TWO BIAS VOLTAGE SOURCES

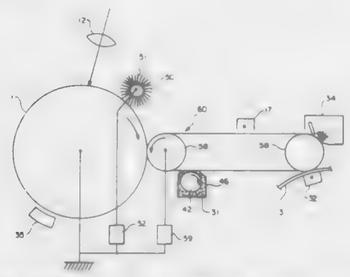
Kunio Ohashi; Yoshikazy Fujiwara; Shiro Narikawa; Shoichi Nagata, all of Nara; Kazuki Wakita, Osaka, and Takashi Hayakawa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1988, Ser. No. 199,127

Claims priority, application Japan, May 28, 1987, 62-133105; May 28, 1987, 62-133106; May 28, 1987, 62-133107; Jul. 25, 1987, 62-185767; Jul. 25, 1987, 62-185768; Jul. 25, 1987, 62-185769; Dec. 9, 1987, 62-311337

Int. Cl.[5] G03G *5/00, 15/18, 21/00*

U.S. Cl. 355—211 **6 Claims**



1. An image formation apparatus comprising

a photoreceptor with an electroconductive supporting member and a photosensitive layer formed thereon, said photosensitive layer being characterized as changing electrical resistance thereof by exposure to light,

an optical system which exposes said photosensitive layer to an image-carrying beam of light and thereby forms a resistance image by changing electrical resistance thereof,

a charging device for forming an electrostatic image on said photosensitive layer according to said resistance image,

a first bias voltage source so connected to apply a first bias voltage between said charging device and said photoconductive supporting member,

a dielectric sheet for transferring thereonto said electrostatic image from said photosensitive layer, and

a second bias voltage source for applying a second bias voltage between said dielectric sheet and said electroconductive supporting member to thereby cause said electrostatic image to be transferred from said photosensitive layer onto said dielectric sheet.

4,994,856

IMAGE FORMING APPARATUS

Eto Koichi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1990, Ser. No. 507,195

Claims priority, application Japan, Apr. 12, 1989, 64-43540

Int. Cl.[5] G03B *27/74*

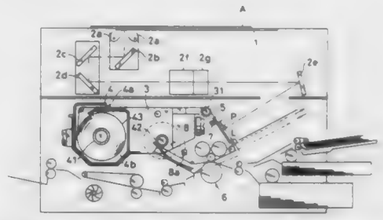
U.S. Cl. 355—68 **5 Claims**

1. An image forming apparatus comprising:

an image forming apparatus body;

a media cartridge removably housed in said image forming apparatus body, said media cartridge being provided with a feeding shaft about which a media sheet consisting of a photo and pressure sensitive recording sheet and a leader sheet which are connected to each other at their one end portions is wound, and said leader sheet having an information mark positioned at a distance longer than length L away from a free end thereof for showing characteristics of said photo and pressure sensitive recording sheet;

a winding shaft removably mounted in said image forming apparatus body for winding said media sheet fed from said media cartridge;



sheet detecting means disposed adjacent said winding shaft in said image forming apparatus body, said sheet detecting means being actuated by bringing a leader sheet into contact therewith when said free end of said leader sheet is wound about said winding shaft; and

mark reading means provided between said media cartridge and said winding shaft at a distance as same as the length L away from the winding shaft, for reading said information mark after actuation of said sheet detecting means.

4,994,857

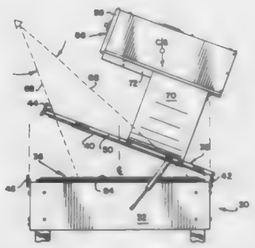
OVERHEAD LIGHT EXPOSURE APPARATUS

Charles J. Leonhart, Schaumburg, Ill., assignor to nuArc Company, Inc., Niles, Ill.

Filed Sep. 19, 1989, Ser. No. 407,808

Int. Cl.[5] G03B *27/04*

U.S. Cl. 355—93 **16 Claims**



1. An overhead light exposure unit for making copies on pre-sensitized sheets from images on sheets, comprising;

a base supporting a vacuum blanket for pressing said sheets and film against a transparent panel, said transparent panel mounted in a frame, said frame pivotally secured to said base for movement between a closed position for making copies and an upwardly tilted open position for loading and unloading said sheets and film;

a light source in spaced apart parallel relation above said panel for directing controlled light downwardly to produce said film images on said sheets placed below said panel on said vacuum blanket; and

support means extending between said frame and said light source for securing said light source in said spaced apart parallel relation above said panel to move in unison with said pivotally mounted frame, said support means securing said light source at a fixed spacing distance in relation to

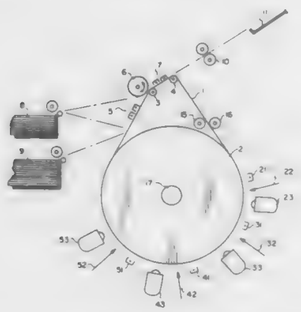
said transparent panel during pivotal movement of said transparent panel and said frame on said base.

4,994,858

ELECTROSTATOGRAPHIC APPARATUS FOR FORMING MULTICOLOR IMAGES ON A RECEIVING SHEET

Cor Lubberts, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1989, Ser. No. 440,161
Int. Cl.[5] G03G *15/00, 15/01*
U.S. Cl. 355—212 **4 Claims**



1. Apparatus for forming multicolor toner images on a receiving sheet, said apparatus comprising:
an imaging web supported by a large diameter drum and a small diameter roller and moveable through an endless path,
means for forming a first electrostatic image on a portion of said web as that web is backed by said drum,
means for toning said first electrostatic image with a toner of a first color to create a first toner image,
means for forming a second electrostatic image on the same portion of said web as said first toner image while said web continues to be backed by said drum,
means for toning said second electrostatic image with the toner of a second color to create a multicolor image on said portion,
means for transferring said multicolor image to a receiving sheet, and
means for separating said receiving sheet from said web as said web passes around said smaller roller.

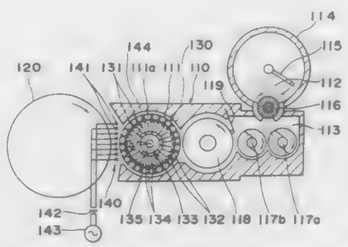
4,994,859

POWER CLOUD DEVELOPING APPARATUS WITH A FIRST AND SECOND ELECTRIC FIELD CURTAIN GENERATING MEANS

Hiroshi Mizuno; Hideo Hotomi; Yoshihisa Terasaka, and Masahiro Anno, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1990, Ser. No. 535,533
Claims priority, application Japan, Jun. 14, 1989, 1-151532
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—247 **8 Claims**

1. A developing apparatus which comprises:
an electrostatic latent image bearing member for bearing an electrostatic latent image;
a developer transporting member for transporting a developer along its surface;
a first electric field curtain generating means for generating a powder cloud of the developer on the surface of said developer transporting member by electric field curtain force, for causing an electric field curtain to act at positions except for a developing area where said developer transporting member confronts with said electrostatic latent image bearing member; and
a second electric field curtain generating means disposed between said electrostatic latent image bearing and said developer transporting member so as to supply the developer of the powder cloud to the electrostatic latent image at the developing area by electric field curtain force.

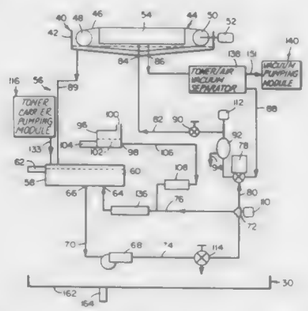


4,994,860

LIQUID TONERS HANDLING NETWORK FOR AN ELECTROGRAPHIC PRINTER

George G. Lunde; Gregory L. Zwadlo, and Larry J. Bresina, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Apr. 10, 1990, Ser. No. 507,379
Int. Cl.[5] G03G *15/10*
U.S. Cl. 355—256 **29 Claims**



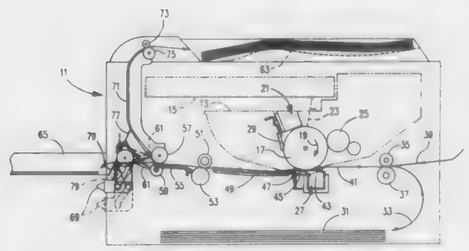
1. A liquid toners handling network, comprising:
a plurality of developing modules, with each developing module having a liquid toner handling system, including:
a toner supply reservoir for storing liquid toner;
a fluid connector coupled to the supply reservoir for liquid toner flow; a toner pump coupled in series for liquid toner flow with the supply reservoir and the fluid connector; and
a three-way valve coupled to the fluid connector for liquid toner flow, and further coupled to the developing module for forward liquid toner flow to the developing module and for return liquid toner flow from the developing module, the three-way valve having a first open position wherein the toner pump pumps liquid toner to the developing module, a first closed position wherein the toner pump recirculates liquid toner from the supply reservoir through the fluid connector and back to the supply reservoir, a second closed position wherein forward liquid toner flow is trapped between the three-way valve and the developing module so that liquid toner is delivered to the developing module instantly when the three-way valve is moved second open position wherein return the developing module and the three-way valve flows back to the supply reservoir for storage.

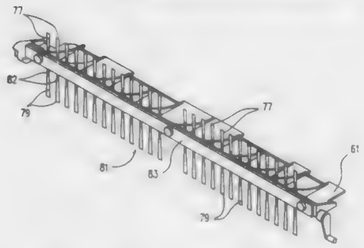
4,994,861

PRINTING MACHINE WITH CHARGE NEUTRALIZING SYSTEM

Fred Y. Brandon; James P. Harden; Paul D. Horrall, all of Lexington; Troy A. Lee, Nicholasville, and Kermit A. Meece, Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1989, Ser. No. 374,519
Int. Cl.[5] G03G *15/16, 21/00;* **B65H** *31/00*
U.S. Cl. 355—274 **6 Claims**





1. A printing machine for producing printed sheets comprising:
a sheet deflector for routing sheets along a first exit path when located in a first position and along a second exit path when located in a second position; and
brush means having first and second brush ends mounted on said deflector and connected to ground, said first brush ends contacting the sheet when deflected along said first path and said second brush ends contacting the sheet when deflected along said second path to thereby discharge static charge on the sheet as the sheet passes over either said first and second paths.

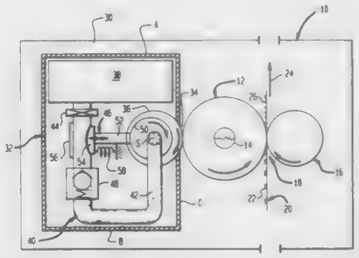
4,994,862

FUSING STATION HAVING RELEASE OIL APPLICATION CARTRIDGE

Linn C. Hoover, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,845
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—284 **5 Claims**

1. In an electrostatographic copier or printer, a fusing apparatus for fusing toner images on a receiver sheet, the fusing apparatus including:
(a) a heated fuser roller having an outside surface suitable for directly contacting and heating the toner images being fused;
(b) a pressure roller forming a fusing nip with said fuser roller; and
(c) a passive release oil application cartridge for applying release oil to said outside surface of said fuser roller in order to prevent the toner images in contact therewith from offsetting to such surface, said cartridge comprising:
(i) a housing including a front wall having an opening therein;
(ii) a rotatable shaft supported in said housing adjacent said opening;
(iii) a rotatable release oil application roll for receiving and applying release oil to said outside surface of the fuser roller, said application roll being mounted fixedly to said shaft for rotation therewith, and being positioned across said opening in said front wall, said application roll further projecting partially through said opening,



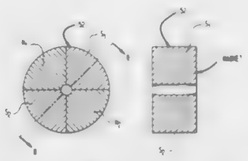
and frictionally contacting said outside surface of the fuser roller for applying release oil thereto, and for being driven thereby;
(iv) a reservoir of release oil mounted within an upper portion of said housing; and
(v) feed means located beneath said reservoir, said feed means connecting said reservoir to said application roll, and said feed means including a flow tube and a cam driven pressure bar assembly for intermittently compressing and releasing said flow tube so as to force release oil therein into said application roll.

4,994,863

ELECTROSTATIC SCAVENGER HAVING MAGNETIC DRIVE DISK

Timothy W. Reynolds, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,661
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—303 **2 Claims**



1. In an electrostatographic copier or printer, a development apparatus for developing electrostatic latent images on an image-bearing surface with charged toner particles contained in developer material consisting of charged magnetic carrier particles and such toner particles, the development apparatus including:
(a) a housing positioned adjacent the image-bearing surface and including a sump portion for holding a supply of developer material, and a top portion having an opening therein;
(b) a magnetic development roller located in said top portion across said opening therein for moving developer material across said opening and into developer applying relationship with the electrostatic latent images on the image-bearing surface thereby developing such images with

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toner particles in the developer material, said magnetic roller including a rotatable magnetic core consisting of a series of longitudinally extending, alternating pole magnets each generating a first magnetic field reaching beyond said development roller;

(c) means for feeding developer material from said sump portion to said development roller; and

(d) a scavenging device for recovering charged magnetic carrier particles (DPU), having a known polarity, and undesirably transferring from said development roller to the image-bearing surface during such image development with toner particles, said scavenging device comprising:

(i) a rotatable, non-magnetic scavenger roller mounted adjacent the image-bearing surface and within the reach of said first magnetic fields;

(ii) first and second magnetic disks mounted fixedly and coaxially within said scavenger roller near each end thereof for rotation therewith, each said first and second disk consisting of a series of circumferentially arranged, alternating pole magnets each generating a second magnetic field overlapping said first magnetic fields; and

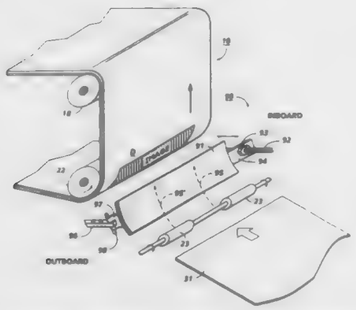
(iii) an electrical potential source connected to said scavenger roller for biasing said roller to a polarity opposite that of the charged magnetic carrier particles.

4,994,864

COPY SHEET SKEW ADJUSTMENT DEVICE

Richard A. Schieck; Don S. Walker; Vincent S. Carrozzi, all of Rochester, and H. William Gray, Lima, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1989, Ser. No. 447,322
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—317 **13 Claims**



1. In a printing apparatus having an image transfer area and copy sheet registration rolls for driving copy sheets into the transfer area where images are transferred to the copy sheets, the improvement characterized by a copy sheet skew adjustment device for insuring alignment of images transferred to the copy sheets, comprising:

pivotable baffle means positioned to contact the image side of copy sheets between the transfer area and the registration rolls; and

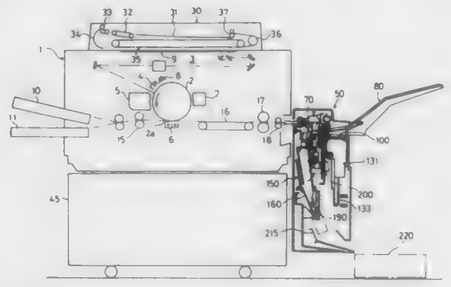
means for pivoting said pivotable baffle means in a predetermined direction in order to shorten a portion of the distance the copy sheets have to travel between the transfer area and the registration rolls and thereby adjust skew of the copy sheets.

4,994,865

COPYING APPARATUS

Kadotaro Nishimori; Masazumi Ito; Kimihiko Higashio, and Akio Kato, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1989, Ser. No. 400,867
Claims priority, application Japan, Aug. 31, 1988, 63-219294
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—324 **9 Claims**



1. A copying apparatus, comprising:

an image forming means for forming an image on a sheet of copy paper;

a stapling means for accommodating and stapling a number of the copy paper sheets on which the image is formed, the stapling means being capable of stapling a predetermined number of copy paper sheets;

a discharging means for accommodating the copy paper sheets on which the image is formed without stapling them;

a transporting means for selectively forwarding the image formed copy paper either to the stapling means or to the discharging means; and

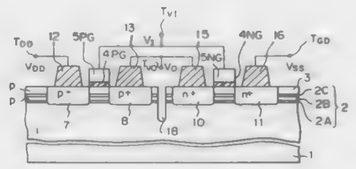
a control means for controlling the transporting means so as to transport the succeeding copy paper sheets to the discharging means when the number of copy paper sheets accommodated in the stapling means has reached the predetermined number of sheets.

4,994,866

COMPLEMENTARY SEMICONDUCTOR DEVICE

Yuji Awano, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 5, 1989, Ser. No. 293,527
Claims priority, application Japan, Jan. 7, 1988, 63-000742; Jul. 28, 1988, 63-188908
Int. Cl.[5] H01L *29/161, 29/80, 27/02, 29/78*
U.S. Cl. 357—16 **12 Claims**



1. A complementary semiconductor device including a p-channel transistor and an n-channel transistor comprising:

a silicon substrate;

a channel layer for the p-channel transistor comprising a first $Si_{1-x}Ge_x$ layer, a Ge layer, and a second $Si_{1-x}Ge_x$ layer formed in sequence on said silicon substrate; and

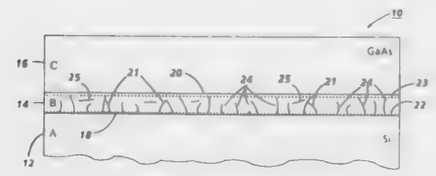
another channel layer for the n-channel transistor comprising a silicon layer formed on said channel layer.

4,994,867

INTERMEDIATE BUFFER FILMS WITH LOW PLASTIC DEFORMATION THRESHOLD FOR LATTICE MISMATCHED HETEROEPITAXY

David K. Biegelsen, Portola Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 223,036, Jul. 22, 1988, Pat. No. 4,935,385.
This application Feb. 28, 1990, Ser. No. 486,678
Int. Cl.[5] H01L *29/161*
U.S. Cl. 357—16 **5 Claims**



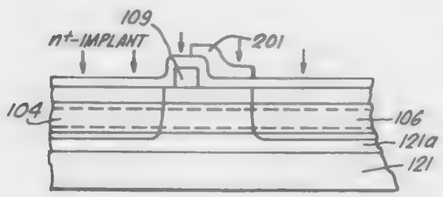
1. An intermediate buffer film for lattice matching between a support selected from the group comprising Si, Ge, Si on sapphire, and crystalline Si on glass and an overlayer compound material selected from GaAs, $(Al_XGa_YIn_Z)(P_AAs_BSb_C)$ and wherein said buffer film is characterized by having a lower plastic deformation threshold than said support and said overlayer and a thickness sufficiently thick to confine misfit dislocations to said buffer film due to lattice mismatch and sufficiently thin to permit lattice permutation of said support lattice structure through said buffer film to function as a lattice template for said overlayer, said buffer film selected from the group consisting of $(Zn_XCd_YHg_{1-X-Y})(S_ASe_BTe_{1-A-B})$ and $Cu(Cl_X.Br_YI_{1-X-Y})$ wherein X and Y respectively range between 0 and 1 such that $X+Y \leqq 1$ and A and B respectively range between 0 and 1 such that $A+B \leqq 1$.

4,994,868

HETEROJUNCTION CONFINED CHANNEL FET

Arthur E. Geissberger; Robert A. Sadler; Gregory E. Menk, and Matthew L. Balzan, all of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 6, 1988, Ser. No. 280,779
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—16 **18 Claims**



1. A high frequency power FET comprising:

a substrate;

a first epitaxial AlGaAs layer having a thickness between about 0.5 and 1.0 micrometer over said substrate;

an epitaxial GaAs channel layer having a thickness between about 200 and 4500 Angstroms directly on said first epitaxial AlGaAs layer;

a second epitaxial AlGaAs layer directly on said GaAs channel layer;

source and drain contacts and a gate over said second epitaxial AlGaAs layer;

said GaAs channel layer having an n-type active carrier concentration of at least $1\times10^{17}cm^{-3}$ beneath said gate;

said GaAs channel layer having an n-type active carrier concentration of at least $5\times10^{17}cm^{-3}$ beneath said source and drain contacts; and

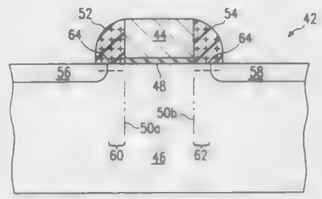
said first and second AlGaAs layers having an active carrier concentration of less than $5\times10^{16}cm^{-3}$, each of said first and second AlGaAs layers having a composition of $Al_x.Ga_{x-1}As$ where $0.35 \leqq x \leqq 0.37$.

4,994,869

NMOS TRANSISTOR HAVING INVERSION LAYER SOURCE/DRAIN CONTACTS

Mishel Matloubian, Emeryville, Calif., and Daniel C. Chen, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 30, 1989, Ser. No. 375,169
Int. Cl.[5] H01L *29/10*
U.S. Cl. 357—23.3 **8 Claims**



1. A transistor, comprising:

a semiconductor substrate;

a gate conductor adjacent said semiconductor substrate and defining first and second gate edges within said semiconductor substrate;

a sidewall spacer adjacent a side of said gate conductor and the surface of said semiconductor substrate;

positive charges trapped within said sidewall spacer such that a negative charge layer is formed opposite said sidewall spacer and within said semiconductor substrate; and

a diffused region within said semiconductor substrate and away from said first gate edge such that said negative charge layer provides an electrical connection from said diffused region to said first gate edge.

8. A method of operating a transistor having first and second gate edges, first and second diffused regions and first and second void areas between the gate edges and the diffused regions, respectively, comprising:

exposing the transistor to radiation such that a negative charge layer forms within the void areas to electrically connect the diffused regions to the gate edges;

selectively applying a first predetermined voltage to a gate of the transistor; and

selectively applying a second predetermined voltage across the first and second diffused regions such that a current is caused to flow between the first and second diffused regions.

4,994,870

STATIC INDUCTION TYPE SEMICONDUCTOR DEVICE

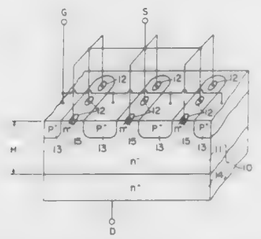
Shinobu Aoki; Haruo Takagi, both of Kariya; Hiroshi Tadano, Nagoya; Takashi Suzuki, Aichi, and Susumu Sugiyama, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of, Japan

Continuation of Ser. No. 339,161, Apr. 17, 1989, abandoned. This application Aug. 2, 1990, Ser. No. 563,680

Claims priority, application Japan, Apr. 20, 1988, 63-98954

Int. Cl.[5] H01L *29/78, 29/72, 29/80*

U.S. Cl. 357—23.4 12 Claims



1. A static induction type semiconductor device comprising:

a semiconductor substrate having a first surface on which a gate region of one conduction type is formed, said gate region surrounding and defining a unified area of said first surface;

at least two source regions of a conduction type different from said one conduction type formed on said first surface and located spaced apart within said unified area and spaced from said gate region, the space between said source regions and between each source region and said gate region being occupied by said substrate free of any material of a conduction type different from said conduction type of said source regions; and

a drain region of one of said conduction types located adjacent another surface of said semiconductor substrate.

4,994,871

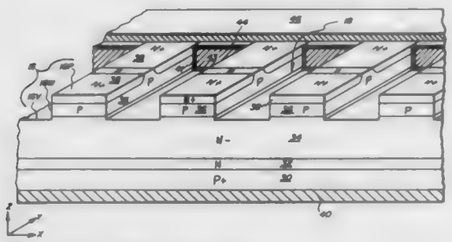
INSULATED GATE BIPOLAR TRANSISTOR WITH IMPROVED LATCH-UP CURRENT LEVEL AND SAFE OPERATING AREA

Hsueh-Rong Chang, Scotia, N.Y., and Bantval J. Baliga, Raleigh, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 2, 1988, Ser. No. 279,392

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.4 29 Claims



1. A UMOS IGBT comprising:

a body of semiconductor material having first and second opposed major surfaces;

said first major surface having a substantially planar plateau portion, a valley portion interspersed with said plateau portion and a pedestal wall portion connecting said plateau and valley portions, said pedestal wall portion and said plateau portion together bounding a pedestal portion of said body of semiconductor material;

a collector region of one type conductivity disposed adjacent said second major surface;

a drift region of opposite type conductivity disposed adjacent said collector region, forming a first PN junction therewith and extending to said valley portion of said first major surface;

a base region of said one type conductivity disposed in said pedestal portion of said body adjacent to said drift region, forming a second PN junction with said drift region and extending to said pedestal wall and plateau portions of said first major surface;

a source region of said opposite conductivity type, said source region being disposed in said pedestal portion of said body, forming a third PN junction with said base region and extending to said plateau and pedestal wall portions of said first major surface;

an insulated gate electrode disposed on said pedestal wall portion of said first major surface adjacent said base region and extending from said source region to said drift region for controlling the conductivity of a channel portion of said base region extending between said source and drift regions;

a collector electrode disposed on said second major surface in ohmic contact with said collector region;

a source electrode disposed on said plateau portion of said first major surface in ohmic contact with said base region and said source region; and

said base region comprising at least 40% of the area of said first major surface which is disposed in ohmic contact with said source electrode

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4,994,872

INSULATED GATE STATIC INDUCTION TRANSISTOR AND INTEGRATED CIRCUIT INCLUDING SAME

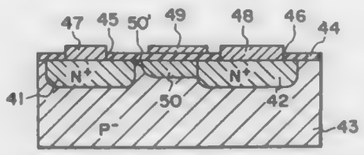
Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Division of Ser. No. 814,030, Dec. 23, 1985, which is a continuation of Ser. No. 570,440, Jan. 16, 1984, abandoned, which is a continuation of Ser. No. 167,343, Jul. 10, 1980, abandoned, which is a continuation of Ser. No. 867,298, Jan. 5, 1978, abandoned. This application Jul. 29, 1988, Ser. No. 225,870

Claims priority, application Japan, Jan. 11, 1977, 52-1756; Jan. 18, 1977, 52-4633; Oct. 1, 1977, 52-118380

Int. Cl.[5] H01L *29/10*

U.S. Cl. 357—23.4 10 Claims



1. A semiconductor integrated circuit including at least two semiconductor elements at least one of which is formed with an insulated-gate static induction transistor, said transistor comprising:

a source semiconductor region of a first conductivity type including a portion having a high impurity concentration;

a source ohmic contact electrode formed on said source semiconductor region;

a drain semiconductor region of said first conductivity type including a portion having a high impurity concentration;

a drain ohmic contact electrode formed on said drain semiconductor region;

at least one channel semiconductor region of a second conductivity type opposite to said first conductivity type, disposed between said source and drain regions and having a low impurity concentration;

an insulated-gate structure including an insulating film formed on said channel semiconductor region and a conductive gate electrode formed on said insulating film;

said source and drain regions defining a controlled current path therebetween through a portion of said channel semiconductor region;

said source and channel regions including adjacent recessed portions wherein said insulated-gate structure is formed;

said channel region including at least first and second adjacent layers, said first layer having an impurity concentration higher than said second layer and the impurity concentration of the channel region under said insulating film being non-uniform overall;

said channel region including a first channel portion disposed adjacent to said source region and a second channel portion disposed between said first channel portion and said drain region, adjacent to said first channel portion, said first channel portion having an impurity concentration greater than the impurity concentration of said second channel portion; and

means, including said insulating gate structure and said channel region with predetermined channel length and carrier concentration, for enabling the formation of a two-dimensional potential ridge coupled to both said gate electrode and said drain region in said first channel portion, whereby said transistor exhibits nonsaturating drain current-drain voltage characteristics which obey the exponential law;

said integrated circuit constituting at least one invertor including said insulated-gate static induction transistor.

4,994,873

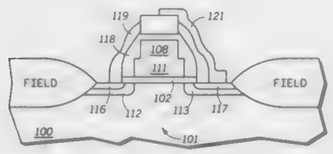
LOCAL INTERCONNECT FOR STACKED POLYSILICON DEVICE

Sudhir K. Madan, Dallas, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 258,545, Oct. 17, 1988. This application Dec. 26, 1989, Ser. No. 456,712

Int. Cl.[5] H01L *29/10, 29/68*

U.S. Cl. 357—23.5 3 Claims



1. A semiconductor device formed on an active region of a substrate, comprising:

a first conductive strip over and insulated from the active region;

a second conductive strip over and insulated from the first conductive strip;

a first sidewall spacer adjacent to a side of the first conductive strip;

a second sidewall spacer over all of the first sidewall spacer and having a portion adjacent to the second conductive strip;

a region in the active region adjacent to the second sidewall spacer; and

a contact between said region in the active region and the second conductive strip.

4,994,874

INPUT PROTECTION CIRCUIT FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

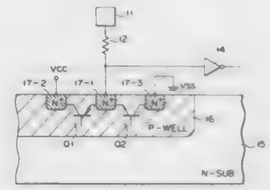
Mitsuru Shimizu, Sakura; Yoshio Okada, Tokyo; Syuso Fujii, Kawasaki, and Shozo Saito, Yokohama, all of Japan, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 24, 1989, Ser. No. 425,950

Claims priority, application Japan, Oct. 28, 1988, 63-272586

Int. Cl.[5] H01L *29/06, 29/72, 27/02*

U.S. Cl. 357—23.13 10 Claims



1. An input protection circuit formed in a chip in which a semiconductor integrated circuit device is formed, comprising:

a semiconductor body of a first conductivity type;

a first semiconductor region of a second conductivity type formed in a surface area of said semiconductor body and connected to a first wiring to which a first potential is applied, said first semiconductor region serving as a collector region of a first input protection bipolar transistor;

a second semiconductor region of the second conductivity type formed in the surface area of the semiconductor body, separately from said first semiconductor region, and connected to a second wiring to which a second potential is applied, said second potential being different from said first potential, the second semiconductor region serving as a collector region of a second input protection bipolar transistor; and

a third semiconductor region of the second conductivity type connected to a signal input pad and formed in the surface area of said semiconductor body, separately from said first and second semiconductor body regions, so as to be located between said first and second semiconductor regions, said third semiconductor region serving as an emitter region common to said first and second bipolar transistors, a portion of said semiconductor body which lies between said first and third semiconductor regions serving as a base region of said first bipolar transistor, a portion of said semiconductor body which lies between said second and third semiconductor regions serving as a base region of said second bipolar transistor, base potentials applied to said first and second bipolar transistors being equal to a potential applied to said semiconductor body.

4,994,875

VIRTUAL PHASE CHARGE TRANSFER DEVICE

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 665,074, Oct. 26, 1984, abandoned, which is a continuation of Ser. No. 338,045, Jan. 14, 1982, abandoned, which is a continuation of Ser. No. 99,267, Dec. 3, 1979, abandoned, which is a continuation of Ser. No. 906,385, May 16, 1978, Pat. No. 4,229,752. This application Apr. 25, 1989, Ser. No. 344,544

The portion of the term of this patent subsequent to Oct. 21, 1997, has been disclaimed.

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—24 3 Claims

1. A buried channel charge transfer device, comprising:

(a) an insulated gate on a semiconductor substrate of one conductivity type with a buried channel of an opposite conductivity type formed therein; and

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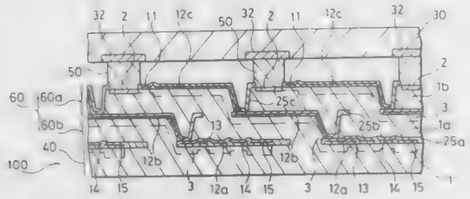
(b) at least one electrode on said substrate between said gate and channel, said electrode electrically connected to a fixed potential, whereby substantially zero potential change in said channel portion adjacent said electrode occurs due to changes in the potential of said gate.

4,994,876

LIGHT DETECTING ELEMENT AND LIGHT DETECTING ARRAY

Yoshihiro Hisa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 28, 1989, Ser. No. 398,956
Claims priority, application Japan, Aug. 31, 1988, 63-217624
Int. Cl.[5] H01L *29/78, 27/14, 31/00*
U.S. Cl. 357—24 39 Claims



1. A light detecting element comprising:
light responsive means for generating electrical charges in response to incident light;
charge storage means including at least first and second charge storage electrodes for storing the charges;
means for conveying the charges from said light responsive means to said charge storage means; and
charge transfer means including charge transfer electrodes for transferring at least a portion of the stored charges from said charge storage means to a charge coupled device electrode wherein said charge storage means comprises a semiconductor substrate on which at least a first layer of a semiconductor material is disposed, said first charge storage electrode and said charge transfer electrodes are disposed between said substrate and said first layer, and said second charge storage electrode is disposed on said first layer opposite said substrate and is interconnected to said first charge storage electrode.

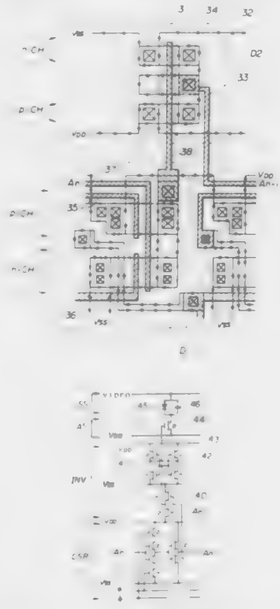
4,994,877

PHOTOELECTRIC CONVERSION SEMICONDUCTOR DEVICE WITH NOISE LIMITING CIRCUIT

Masamitsu Ino; Takehito Nagata, both of Yokohama, and Mitsuhiro Kohata, Shibatamachi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics, Miyagi, both of, Japan

Filed Feb. 10, 1988, Ser. No. 154,199
Claims priority, application Japan, Feb. 12, 1987, 62-30080; Feb. 12, 1987, 62-30081; Feb. 23, 1987, 62-39843; Feb. 23, 1987, 62-39844; Feb. 23, 1987, 62-39845; Mar. 11, 1987, 62-57619
Int. Cl.[5] H01L *27/140, 31/000, 45/000;* H04N *3/140*
U.S. Cl. 357—30 8 Claims

1. A photoelectric conversion semiconductor device comprising:
an insulating and transparent substrate;
a plurality of photoelectric conversion elements formed in a line on the insulating and transparent substrate;
selection switching elements comprising a plurality of first thin film transistors formed on the insulating and transparent substrate, for selection photoelectric conversion elements;
a driving circuit comprising a plurality of second thin film transistors formed on the insulating and transparent substrate, for driving the photoelectric conversion elements through the selection switching elements;
the driving circuit including a plurality of one-bit shift registers each having one switch and two series-connected complementary metal oxide semiconductor (CMOS) inverters, and input signal of each one-bit shift register being supplied to one of the CMOS inverters, an output signal of the other of the CMOS inverters being supplied to a next stage of the one-bit shift register, one of the output signals



of the two CMOS inverters being supplied to one of the selection switching elements; and
noise limiting means, coupled to the photoelectric conversion elements, for limiting levels of signals read therefrom at a predetermined level to eliminate noise on the read-out signals.

4,994,878

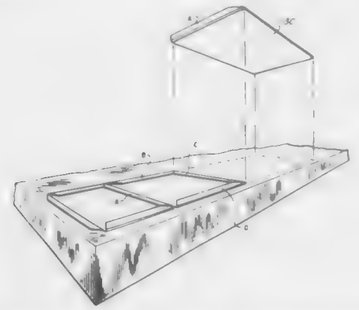
ARRAY INTERCONNECT SYSTEM AND METHOD OF MAKING SAME

Jules D. Levine, Dallas, and Millard J. Jensen, Balch Springs, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 647,606, Sep. 4, 1984, abandoned. This application Oct. 8, 1986, Ser. No. 917,269
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 22 Claims

1. An array interconnect system comprising:
(a) a pair of spaced-apart flexible electrically conductive sheets; and
(b) a plurality of discrete electronic components, each of said components secured to both of said sheets and providing both current flow between said sheets and maintaining

said sheets in spaced apart relation in the vicinity of said components,



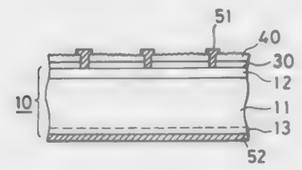
(c) wherein said sheets are formed of aluminum foil having a native oxide on the surfaces thereof.

4,994,879

PHOTOELECTRIC TRANSDUCER WITH LIGHT PATH OF INCREASED LENGTH

Yutaka Hayashi, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Nov. 13, 1989, Ser. No. 434,253
Claims priority, application Japan, Nov. 25, 1988, 63-297871
Int. Cl.[5] H01L *27/14, 31/00, 29/06*
U.S. Cl. 357—30 17 Claims



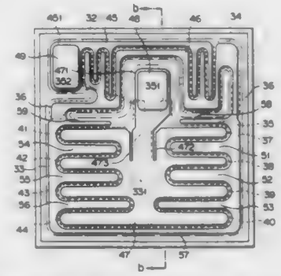
1. A photoelectric transducer with a light path of increase length, comprising:
a planar transduction element portion having a thickness dimension which is bounded by an incident light surface and an opposite surface substantially opposite to the light incident surface, wherein incident light causes photoelectric conversion;
an optically transparent protective layer which is provided at at least one of the incident light surface and the opposite surface of the planar transduction element portion to reduce carrier recombination at the associated surface of the planar transduction element portion at which the protective layer is provided to prevent introduction of an impurity into the associated surface of the planar transduction element portion; and
an optically transparent textured layer, with a textured surface and a planar surface, formed on the protective layer so that the planar surface is in contact with said protective layer.

4,994,880

SEMICONDUCTOR DEVICE CONSTITUTING BIPOLAR TRANSISTOR

Naohito Kato, Chiryu; Yoshiyuki Miyase, Okazaki; Tomoatsu Makino, Okazaki; Kazuhiro Yamada, Oobu; Masami Yamaoka, Anjo; Takeshi Matsui, Toyohashi; Masahiro Yamamoto, Gamagori; Yoshiki Ishida, Kariya, and Toru Nomura, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 114,287, Oct. 29, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,552
Claims priority, application Japan, Oct. 31, 1986, 61-260994; Dec. 4, 1986, 61-289424
Int. Cl.[5] H01L *29/72, 27/02, 29/90*
U.S. Cl. 357—34 14 Claims



1. A semiconductor device constituting a bipolar transistor, comprising:
a semiconductor substrate including a collector region, a collector electrode being formed in correspondence to said collector region;
a base region formed in correspondence to a principal surface of said semiconductor substrate;
an emitter region formed in said base region;
an emitter surface electrode formed on said semiconductor substrate in correspondence to said emitter region;
an emitter connection electrode formed on said semiconductor substrate and connected to said emitter surface electrode; and
current bypassing means constituted by slits formed in said emitter surface electrode at a location between said emitter region close to said emitter connection electrode and said emitter connection electrode for elongating a current path between said emitter region close to said emitter connection electrode and said emitter connection electrode, the current path following a path to bypass said slits, so as to provide for a uniform potential distribution over said emitter region.

4,994,881

BIPOLAR TRANSISTOR

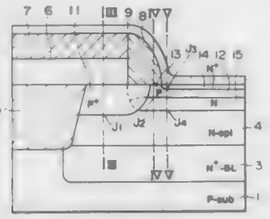
Takayuki Gomi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,235
Claims priority, application Japan, Feb. 16, 1988, 033686
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—34 4 Claims

1. A bipolar transistor in which a base region of a second conductivity type is formed in a semiconductor substrate of a first conductivity type and an emitter region of a first conductivity type is formed in the semiconductor region to provide a vertical type PNP or NPN, comprising
a semiconductor substrate of a first conductivity type having an exterior planar surface and with which a collector electrode is connected,
a device insulation region selectively formed for facing to the surface of said semiconductor substrate, and
a base region consisting of a graft base region formed on the exterior planar surface of said semiconductor substrate

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surrounded by said device insulation region, said graft base region being formed by diffusion of impurities from a base contact electrode extending on said surface, an intrinsic base region formed at a distance from said graft base region and including an emitter region, and a link impurity diffusion region linking said intrinsic base region and said graft base region,



whereby a diffusion suppression region formed by introduction of the impurities of the first conductivity type is provided in the vicinity of the junction between said base region and the semiconductor substrate of the first conductivity type.

4,994,882

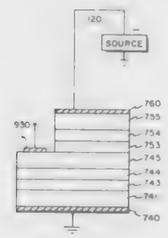
SEMICONDUCTOR DEVICE AND METHOD

Karl Hess, Urbana; James J. Coleman, Champaign; Ted K. Higman, Champaign, and Mark A. Emanuel, Champaign, all of Ill., assignors to University of Illinois, Urbana, Ill.

Continuation of Ser. No. 927,554, Nov. 5, 1986, abandoned. This application Feb. 10, 1989, Ser. No. 309,908

Int. Cl.[5] H01L *29/74, 29/80, 29/161*

U.S. Cl. 357—38 **27 Claims**



1. A semiconductor heterostructure device, comprising:

a first conductive semiconductor layer of one conductivity type;

a barrier layer disposed on said first semiconductor layer, said barrier layer having a thickness in the range between about 200 and 5000 Angstroms and being formed of an undoped semiconductor material having a wider bandgap than the material of said first semiconductor layer;

a carrier transport layer having a thickness in the range between about 200 and 5000 Angstroms, disposed on said barrier layer, said carrier transport layer being formed of a semiconductor material having a narrower bandgap than the material of said barrier layer and a carrier concentration in the range 5×10^{13} to 10^{16} carriers per cubic centimeter;

a semiconductor contact layer, of said one conductivity type, disposed on said carrier transport layer; and

means for applying a negative potential to said semiconductor contact layer with respect to said first semiconductor layer;

whereby, as said negative potential is increased, the increased field in the carrier transport layer will result in heated electrons in the carrier transport layer which cross over the barrier.

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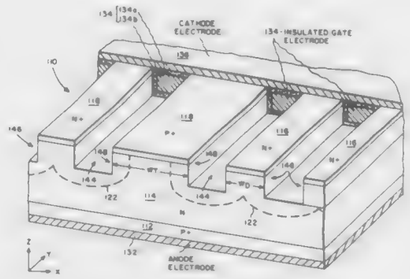
FIELD CONTROLLED DIODE (FCD) HAVING MOS TRENCH GATES

Hsueh-Rong Chang, Scotia, N.Y., and Bantval J. Baliga, Raleigh, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1989, Ser. No. 416,171

Int. Cl.[5] H01L *29/74, 29/80, 29/78*

U.S. Cl. 357—38 **13 Claims**



1. A semiconductor device comprising:

first and second power electrodes;

a body of semiconductor material having a first major surface and including adjoining first and second regions disposed in series between said first and second power electrodes, said first power electrode being disposed in ohmic contact with said first region and said second power electrode being disposed in ohmic contact with said second region, said first region being of one type conductivity and said second region being of opposite type conductivity, said first and second regions forming a PN junction at their interface; and

an insulated gate electrode disposed adjacent to said first region for pinching off said first region in response to appropriate gate bias conditions on said insulated gate electrode, to thereby block the flow of one type conductivity carriers from the vicinity of said first electrode to said second region to turn said device off.

4,994,884

GATE-CONTROLLED BI-DIRECTIONAL SEMICONDUCTOR SWITCHING DEVICE

Minoru Kato, Nagoya, and Junichi Miwa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1988, Ser. No. 174,982

Claims priority, application Japan, Mar. 31, 1987, 62-76185; Dec. 23, 1987, 62-325690

Int. Cl.[5] H01L *29/747*

U.S. Cl. 357—39 **9 Claims**

1. A gate-controlled bi-directional semiconductor switching device comprising:

a first conductive layer of a first conductivity type;

second to fourth conductive layers of a second conductivity type which are separately formed in a first surface area of said first conductive layer, the third conductive layer being located at one side of the second conductive layer, and the fourth conductive layer being located at the other side of the second conductive layer;

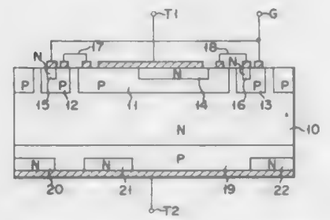
fifth to seventh conductive layers of the first conductivity type respectively formed in the surface areas of said second to fourth conductive layers;

an eighth conductive layer of the second conductivity type formed in a second surface area of said first conductive layer;

a ninth conductive layer of the first conductivity type formed in the surface area of said eighth conductive layer;

a first electrode formed in continuous contact with said second and fifth conductive layers;

a second electrode connected to said fourth and sixth conductive layers;



a third electrode formed in continuous contact with said eighth and ninth conductive layers;

a first wiring for connecting said second and third conductive layers to each other; and

a second wiring for connecting said second and seventh conductive layers to each other.

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BIDIRECTIONAL TRIODE THYRISTOR

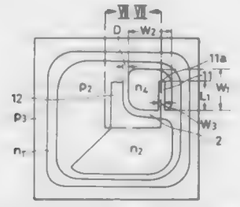
Yutaka Yoshizawa, Sakado, Japan, assignor to Sanken Electric Co., Ltd., Saitama, Japan

Filed Jun. 22, 1989, Ser. No. 370,385

Claims priority, application Japan, Jul. 1, 1988, 63-164357; Oct. 18, 1988, 63-263532

Int. Cl.[5] H01L *29/747*

U.S. Cl. 357—39 **11 Claims**



1. A bidirectional triode thyristor comprising:

(a) a semiconductor body having first and second opposite surfaces and comprising:

(1) a first region (n_1) of a first conductivity type within the semiconductor body;

(2) a second region (p_1) of a second conductivity type, opposite to the first conductivity type, contiguously disposed on a first side of the first region (n_1) and exposed at the first surface of the semiconductor body;

(3) a third region (p_2) of the second conductivity type contiguously disposed on a second side, opposite to the first side, of the first region (n_1) and exposed at the second surface of the semiconductor body, the filling portion of the third region (p_2) being peninsular in shape as seen on the second surface of the semiconductor body, the peninsular filling portion having a distal end portion away from the third region (p_2) as seen on the second surface of the semiconductor body, the length of the distal end portion of the filling portion being less than about ⅓ of the length of the peninsular filling portion;

(4) a fourth region (n_2) of the first conductivity type formed in the third region (p_2) and exposed at the second surface of the semiconductor body;

(5) a fifth region (n_4) of the first conductivity type formed in the third region (p_2) and isolated from the fourth region (n_2), the fifth region being exposed at the second surface of the semiconductor body, the fifth region (n_4) having the exposed surface area less than the exposed surface area of the fourth region (n_2);

(6) a sixth region (n_3) of the first conductivity type formed in the second region (p_1) and exposed at the first surface of the semiconductor body;

(7) there being a recess formed in the fifth region (n_4) so as to extend therethrough in a direction normal to the first and second opposite surfaces of the semiconductor body; and

(8) the third region (p_2) having a filling portion filling the recess in the fifth region, the filling portion being exposed at the second surface of the semiconductor body;

(b) a first main electrode (T_1) formed on of the second surface of the semiconductor body and contacting the third region (p_2) and the fourth region (n_2);

(c) a second main electrode (T_2) formed on the first surface of the semiconductor body and contacting the second region (p_1) and the sixth region (n_3); and

(d) a gate electrode (G) formed on the second surface of the semiconductor body and contacting the fifth region (n_4) and the filling portion of the third region (p_2), the gate electrode contacting only with the distal end portion of the filling portion.

4,994,886

COMPOSITE MOS TRANSISTOR AND APPLICATION TO A FREE-WHEEL DIODE

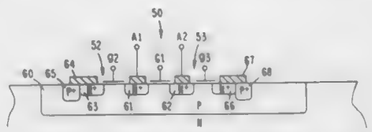
Bruno Nadd, Lourmarin Par Cadenet, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Aug. 30, 1989, Ser. No. 400,855

Claims priority, application France, Aug. 31, 1988, 88 11659

Int. Cl.[5] H01L *29/747, 29/10, 27/02*

U.S. Cl. 357—41 **10 Claims**



1. An integrated circuit comprising, a substrate area of a first conductivity type, a composite MOS transistor on the substrate area, the transistor including first and second main electrode regions of the second conductivity type, one of said regions selectively being at a lower potential than the other of said regions as a function of conditions of elements of the integrated circuit connected to the composite transistor, and means for connecting the region having the lowest potential at any particular time to the substrate area via a relatively low impedance path while providing a relatively high impedance path between the other region and the substrate area.

4,994,887

HIGH VOLTAGE MERGED BIPOLAR/CMOS TECHNOLOGY

Louis N. Hutter, Richardson; Mark E. Gibson, Mesquite; Jeffrey P. Smith, Plano; Shiu-Hang Yau, Richardson; Arnold C. Conway, Garland; John P. Erdeljac, Plano; James D. Goon, Dallas; AnhKim Duong, Garland; Mary A. Murphy, Richardson, all of Tex., and Susan S. Kearney, Tully, N.Y., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 13, 1987, Ser. No. 120,558

Int. Cl.[5] H01L *27/02, 27/04*

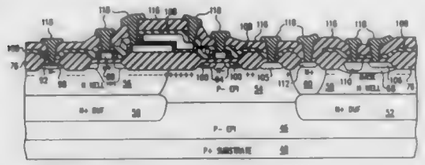
U.S. Cl. 357—43 **3 Claims**

3. An integrated circuit having NMOS, PMOS, and bipolar transistors, comprising:

a P+ layer of semiconductor material;

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a first P layer of semiconductor material on a surface of said P+ layer;
a second P layer of semiconductor material on said first P layer and having an interface with said first P layer, and separated from said P+ layer by said first P layer;
N+ regions at the interface of said first and second P layers and spaced from said P+ layer;
first and second N regions in said second P layer, each of



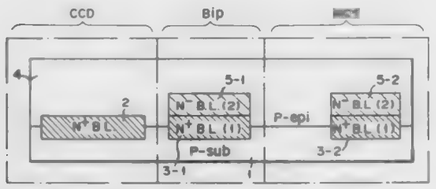
said N regions adjacent a corresponding one of said N+ regions;
N source and drain regions in said second P layer for an NMOS transistor;
P source and drain regions insaid first N region for a PMOS transistor; and
a P base region in said second N region, and an N emitter region in said P base region for a bipolar transistor with said second N region as collector.

4,994,888

MONOLITHIC SEMICONDUCTOR DEVICE HAVING CCD, BIPOLAR AND MOS STRUCTURES

Minoru Taguchi, Oomiya, and Kazuo Kihara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 18, 1990, Ser. No. 525,040
Claims priority, application Japan, May 22, 1989, 1-128314
Int. Cl.[5] H01L *27/02, 27/04, 29/78*
U.S. Cl. 357—43 8 Claims



1. A semiconductor device including a charge transfer device, comprising a bipolar transistor section, a MOS transistor section and a charge transfer device section which are formed in the same substrate, characterized in that a first well region in which said bipolar transistor section is formed has an impurity concentration profile which has at least three peaks of variation in the concentration of the same conductivity type impurity in a depth direction thereof.

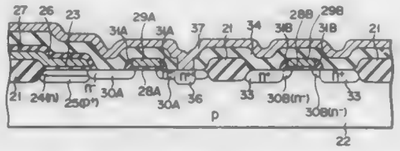
4,994,889

SEMICONDUCTOR MEMORY DEVICE

Yukio Takeuchi, Kawasaki, and Satoshi Shinozaki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 811,714, Dec. 20, 1985, abandoned.
This application Dec. 2, 1987, Ser. No. 335,721
Claims priority, application Japan, Dec. 28, 1984, 59-276181
Int. Cl.[5] H01L *27/10*
U.S. Cl. 357—45 10 Claims

1. A semiconductor memory device comprising:
a semiconductor substrate on which a memory cell array and a peripheral circuit area for driving the memory cell array are provided;
said memory cell array including a plurality of memory cells each comprised of a single transfer transistor, comprised of source and drain regions and a gate, and a single capacitor;
said peripheral circuit area including a peripheral circuit including at least one driver transistor comprised of source and drain regions and a gate, said peripheral circuit being operatively coupled to said plurality of memory cells to drive said plurality of memory cells;



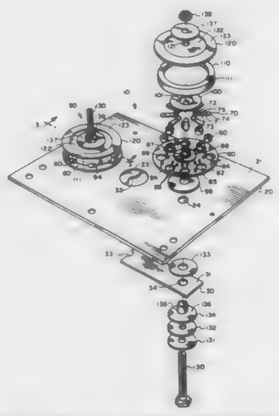
a bit line formed of a polysilicon film or metal silicide, said bit line being formed in contact with one of said source and drain regions of the transfer transistor of at least one of said memory cells;
wherein said source and drain regions of the transfer transistor in said memory cell have a low impurity concentration that precludes formation of a natural oxide film on a surface of the one of said source and drain regions in contact with said bit line; and
wherein the source and drain regions of the transfer transistor in the memory cell have an impurity concentration lower than that of the source and drain regions of the driver transistor of said peripheral circuit.

4,994,890

RECTIFIER STRUCTURE WITH INDIVIDUAL LINKS

Donald J. Caldwell, Milwaukee, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Nov. 27, 1989, Ser. No. 441,706
Int. Cl.[5] H01L *27/02, 23/16, 23/42*
U.S. Cl. 357—51 25 Claims



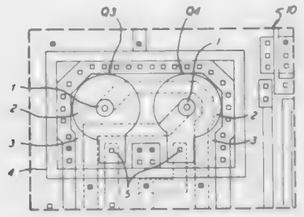
1. A rectifier structure comprising: a plurality of diodes each including a body and opposed first and second terminals, first means for electrically connecting said first terminals to one another, said diodes being arranged on said first means in a circular pattern, a plurality of individual links including inner and outer end portions and a fuse portion therebetween, said inner end portions respectively of said links being physically separate from one another, retainer means for locating said diodes on said first means and for locating said links such that said outer end portion of each of said links contacts the associated one of said second terminals, and second means in contact with said inner end portion of each of said links for electrically connecting said second terminals to one another.

4,994,891

SHIELDED TRANSISTOR DEVICE

Miki Moyal, Austin, Tex., assignor to Advanced Micro Devices, Austin, Tex.

Filed Jun. 20, 1989, Ser. No. 369,572
Int. Cl.[5] H01L *29/40*
U.S. Cl. 357—53 19 Claims



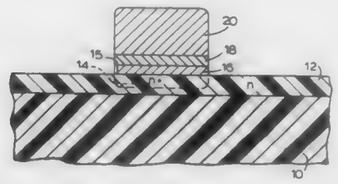
1. An operational amplifier circuit operating at a voltage approximately twice that of its transistor components, comprising:
a source of positive and negative voltage;
a number of operational stages, a first stage of which comprises a differential stage, followed by a number of cascading transistor devices and an output stage, each stage characterized by dual transistor pairs that are operatively voltage biased to said source of voltage slightly above an average of said positive and negative voltage; and
a shielded transistor device operatively connected to said number of operational stages and said voltage source, said transistor device utilizing an enclosed drain for shielding said operational amplifier circuit from voltage breakdown associated with voltage swings.

4,994,892

ALUMINUM GERMANIUM OHMIC CONTACTS TO GALLIUM ARSENIDE

Rainer Zuleeg, San Juan Capistrano; Stanley H. Watanabe, Gardena, and John M. Stephens, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 9, 1986, Ser. No. 916,835
Int. Cl.[5] H01L *23/54, 23/50*
U.S. Cl. 357—67 5 Claims



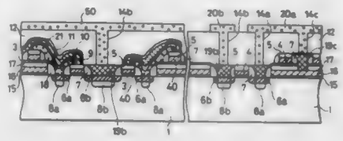
1. A ohmic contact metallization for use on semiconductor compounds comprising Gallium Arsenide (GaAs), the metallization comprising:
an alloyed ensemble of Germanium and Aluminum with sufficient Nickel to provide effective wetting and attachment for the Al and Ge to the GaAs upon alloying.

4,994,893

FIELD EFFECT TRANSISTOR SUBSTANTIALLY COPLANAR SURFACE STRUCTURE

Hiroji Ozaki; Takahisa Eimori; Yoshinori Tanaka; Wataru Wakamiya, and Shinichi Satoh, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 405,284
Claims priority, application Japan, Sep. 29, 1988, 63-247670
Int. Cl.[5] H01L *23/48, 29/40, 29/68*
U.S. Cl. 357—68 12 Claims



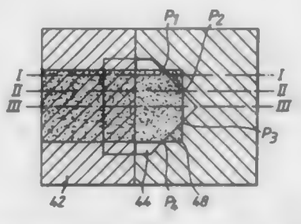
1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type having major surface,
field shield conductor layers formed spaced apart from each other on the major surface of said semiconductor substrate through an insulating film and with the surface thereof being covered with the insulating film,
a control gate conductor layer formed on the major surface of said semiconductor substrate between said field shield conductor layers through an insulating film and with the surface thereof being covered with the insulating film,
an impurity region of a second conductivity type formed between each of said field shield conductor layers and said control gate conductor layer and on the major surface of said semiconductor substrate, and
an interconnection layer formed so as to selectively fill a portion on an exposed major surface of said impurity region between each of said field shield conductor layers and said control gate conductor layer,
wherein said interconnection layer is formed substantially coplanar with said field shield conductor layers and said control gate conductor layer and top surfaces of said field shield conductor layers are substantially coplanar with a top surface of said central gate conductor layer.

4,994,894

SEMICONDUCTOR DEVICE HAVING AN IMPROVED WIRING PATTERN

Takeo Nakayama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 5, 1988, Ser. No. 293,848
Claims priority, application Japan, Jan. 21, 1988, 63-11390
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 1 Claim



1. In a semiconductor device comprising, a semiconductor substrate of a first conductivity type, an insulating layer formed on the substrate, an opening in the insulating layer exposing a portion of the substrate, a wiring layer containing impurities of a second conductivity type, a diffused region in the exposed portion of the substrate containing diffused impurities from the wiring layer, and an element region of the

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second conductivity type containing implanted impurities of the second conductivity type;

the improvement comprising, the opening being in the shape of a pentagon and the wiring layer crossing a perimeter of the opening at least least four locations of direct contact between the wiring layer and the diffused region to connect the wiring layer with the element region through the diffused region.

4,994,895

HYBRID INTEGRATED CIRCUIT PACKAGE STRUCTURE

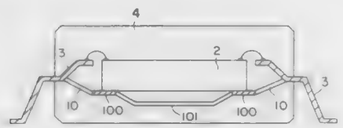
Toshio Matsuzaki, Yokohama, and Hiroaki Toshima, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 5, 1989, Ser. No. 375,708

Claims priority, application Japan, Jul. 11, 1988, 63-172433; Jan. 10, 1989, 1-003318; Jan. 19, 1989, 1-012605; May 9, 1989, 1-117126

Int. Cl.[5] H01L *23/48, 23/28*

U.S. Cl. 357—72 **21 Claims**



1. A hybrid integrated circuit, comprising:

(a) a circuit substrate having a bottom surface formed as a base member and at least one semiconductor active element and passive element disposed on the base member;

(b) a lead frame having a plurality of leads and a support plate, the plurality of leads being arranged outward relative to the support plate, and each of the plurality of leads having an inner lead and an outer lead,

wherein said circuit substrate is disposed on the support plate and selectively connected to the inner leads;

(c) a mold of resin material surrounding said circuit including at least one semiconductor active element and passive element and said support plate, and partially surrounding said inner leads to form a mold package including a top and bottom,

wherein a first ratio of a surface area of said bottom surface of said circuit substrate to a surface area of the bottom of the mold package is greater than 60%; and

(d) an opening formed in said support plate for exposing a portion of the bottom surface of said circuit substrate to the resin material,

wherein a second ratio of a portion of the bottom surface area of the circuit substrate that is exposed through the opening to an entire bottom surface area of the circuit substrate is greater than 50%.

4,994,896

SEMICONDUCTOR DEVICE

Shunichi Uemura, and Yashuhiro Murasawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1988, Ser. No. 194,944

Claims priority, application Japan, May 27, 1987, 62-130683

Int. Cl.[5] H01L *23/02, 23/12*

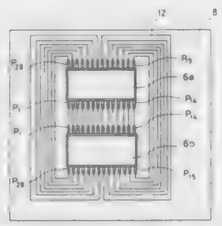
U.S. Cl. 357—74 **5 Claims**

1. A semiconductor device comprising

a first semiconductor package having external lead terminals arranged according to a predetermined configuration and upwardly bent with respect to a package surface thereof;

a second semiconductor package having external lead terminals arranged according to the same predetermined configuration as said first semiconductor package and downwardly bent with respect to a package surface thereof;

a package substrate having said first semiconductor package thereof mounted on one surface whereby the upward surface of said first package faces a first surface of said package substrate and having mounted on the first surface of said package substrate said second semiconductor package such that the downward surface of said second package faces said first surface of said package substrate; and



connecting means for electrically connecting said external lead terminals of said first semiconductor package with corresponding ones of said external lead terminals of said second semiconductor package.

4,994,897

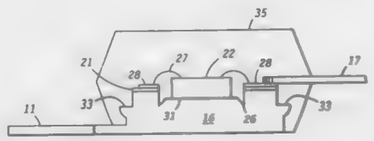
MULTI-LEVEL SEMICONDUCTOR PACKAGE

Theodore R. Golubic; Frank E. Polka, both of Phoenix, and Brian A. Webb, Mesa, all of Ariz., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1989, Ser. No. 427,056

Int. Cl.[5] H01L *23/02*

U.S. Cl. 357—81 **9 Claims**



1. A multi-level single-in-line semiconductor package, comprising: a heatsink having a pedestal on top of the heatsink for receiving a semiconductor device; and insulator on the pedestal and having patterned conductors on a top surface of the insulator; wires for making electrical connections between the patterned conductors and the semiconductor device; a plurality of leads connected and the patterned conductors; and encapsulating material surrounding the pedestal, semiconductor device, insulator, wires, and a portion of the leads, and wherein the pedestal has protrusions for gripping the encapsulating material.

4,994,898

COLOR TELEVISION SYSTEM FOR PROCESSING SIGNALS FROM A TELEVISION CAMERA TO PRODUCE A STEREOSCOPIC EFFECT

William Ling; Robert J. Taylor, and Glynne R. Lancaster, all of London, England, assignors to Aspex Limited, England

PCT No. PCT/GB88/00480, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO88/10546, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 22, 1988, Ser. No. 318,926

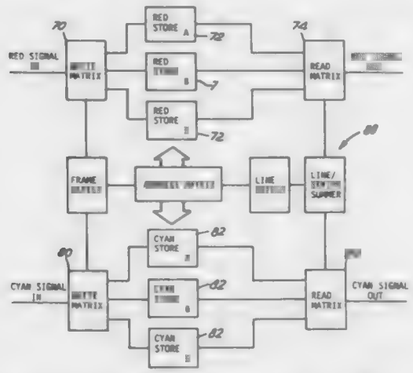
Claims priority, application United Kingdom, Jun. 22, 1987, 8714548; Feb. 29, 1988, 8804700; May 24, 1988, 8812208

Int. Cl.[5] H04N *15/00*

U.S. Cl. 358—3 **16 Claims**

1. A color television or video system for processing signals from a television camera, in which a number of different signals corresponding to images of different colors give rise to

different color partial images superimposed on a television screen to form a single full colour image, in which the signals are processed so that the partial images superimposed on the screen correspond to images seen by the camera at times separated by predetermined intervals, so that the partial images of an object moving relative to the camera are displaced relative to one another on the television screen to give a stereoscopic



effect when the different images are presented to different eyes of the viewer, characterised in that processing means are provided for processing the signals so that, at least over a number of successive fields, the full color images on the television screen include images in which the displacement between different color partial images, or parts, thereof, is in a direction appropriate to the predominant horizontal direction of movement in the scene.

4,994,899

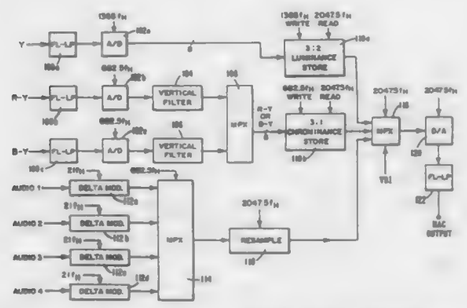
FREQUENCY GENERATION FOR EXTENDED BANDWIDTH MAC COLOR TELEVISION ENCODING AND DECODING

Charles W. Rhodes, South Salem, N.Y., assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Mar. 23, 1988, Ser. No. 172,279

Int. Cl.[5] H04N *11/10, 11/00, 7/93*

U.S. Cl. 358—11 **66 Claims**



1. An encoder to convert a television signal including luminance and chrominance information and accompanied by data information to a B-MAC television signal for further conversion by a decoder to a composite television signal, said encoder comprising:

sampling means for sampling the luminance information at a frequency f_1, sampling the chrominance information at a frequency f_2 and sampling the data information at a frequency f_3;

compression means for changing the frequency of the luminance and chrominance samples to a frequency f_4 and for changing the frequency of the data samples;

multiplex means for combining the compressed luminance and chrominance samples and the data samples into the B-MAC television signal;

a master clock to generate a master clock signal having a frequency f_0; and

dividing means for supplying to said sampling means and said compression means signals at frequencies f_1, f_2, f_3, f_4, derived from the master clock signal; wherein

$$f_0 = 3f_1 = 6f_2 = 2f_4 = 1365 \text{ k } f_h,$$

where k is a positive integer greater than 2 and f_3 is a predetermined constant frequency independent of k.

4,994,900

TELEVISION RECEIVER

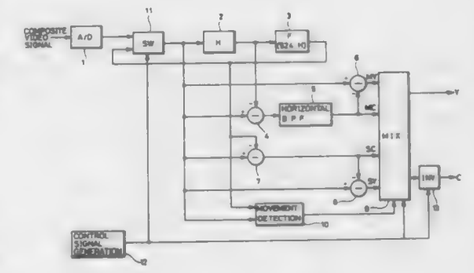
Masami Ebara; Hajime Mizugami, both of Osaka, and Tadashi Amino, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

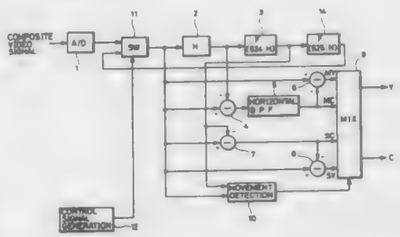
Filed Nov. 6, 1989, Ser. No. 431,956

Claims priority, application Japan, Nov. 9, 1988, 63-283225

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 **6 Claims**





1. A television receiver having a still picture reproducing function, comprising:

luminance signal/chrominance signal separating means for separating a luminance signal and a chrominance signal from a composite video signal, said luminance signal/-chrominance signal separating means including

delay means (2, 3, 14, 15, 16, 17) having a plurality of delay elements connected in series for delaying said composite video signal successively through 10, the respective delay elements, thereby outputting a plurality of composite video signals having different prescribed delay times,

first extracting means (4, 6) for evaluating an input signal and/or an output signal of said delay means and extracting a first luminance signal and a first chrominance signal based on line correlation of the composite video signal,

second extracting means (7, 8, 18, 19, 20, 21) for evaluating

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an input signal and/or an output signal of said delay means and extracting a second luminance signal and a second chrominance signal based on frame correlation of the composite video signal,

a movement detecting circuit (10) for detecting a movement of a picture, and

a mixing circuit (9) in which a mixing ratio of said first and second luminance signals and the mixing ratio of said first and second chrominance signals are controlled in response to an output of said movement detecting circuit;

control signal generating means (12) for generating a control signal in response to an instruction of still picture reproduction; and

switch means (11) controlled in response to said control signal for short-circuiting input and output terminals of said delay means in still picture reproduction, thereby forming a circulating circuit in which said composite signal circulates in said delay means,

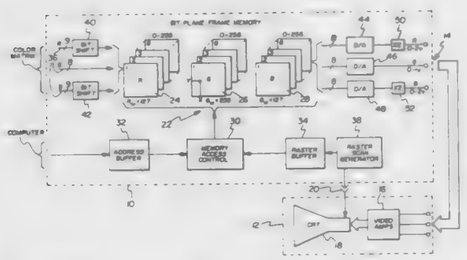
said luminance signal/chrominance signal separating means separating the luminance signal and the chrominance signal based on an output obtained from said circulating circuit in still picture reproduction.

4,994,901

METHOD AND APPARATUS FOR INCREASING THE GAMUT OF AN ADDITIVE DISPLAY DRIVEN FROM A DIGITAL SOURCE

Kenneth A. Parulski, and Donald C. Bellis, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1988, Ser. No. 289,107
Int. Cl.[5] G03F *3/10*
U.S. Cl. 358—76 22 Claims



1. Apparatus for driving an additive display with color signals from a digital source, the display having a characteristic white point comprised of predetermined signal values in each of several color components, said apparatus comprising:

means for digitally encoding the color component signals according to code values specifying predetermined ranges of color values, whereby the range of color values exceeding the white point of at least one color component is greater than the range of color values exceeding the white point of at least one remaining color component;

means for generating a display drive signal based on the values of the encoded color components, said drive signal including color drive component signals that are processed to produce a peak white according to the characteristic white point of the display; and

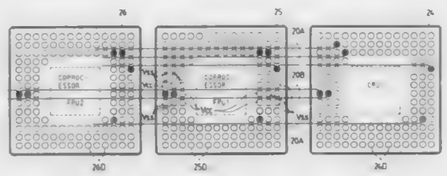
means for applying the color drive component signals to the display, thereby driving the display beyond the white point of said one color component and accordingly producing saturated colors including that component.

4,994,902

SEMICONDUCTOR DEVICES AND ELECTRONIC SYSTEM INCORPORATING THEM

Tatsuo Okahashi, Sayama; Masao Naito, Iruma; Atsushi Hasegawa, and Norio Nakagawa, both of Koganei, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Nov. 15, 1989, Ser. No. 437,373
Claims priority, application Japan, Dec. 5, 1988, 63-308522; Nov. 30, 1988, 63-300780
Int. Cl.[5] H01L *39/02, 23/02, 23/12, 23/16*
U.S. Cl. 357—80 23 Claims



1. An electronic system comprising:

a first semiconductor device comprising a microprocessor, said first semiconductor device having a first set of external pins located in a matrix pattern of rows and columns, said first set of external pins containing a subset of external pins which provide predetermined functions;

a second semiconductor device comprising a coprocessor, said second semiconductor device having a second set of external pins located in a matrix pattern of rows and columns, said second set of external pins containing a subset of external pins which provide said predetermined functions, said first and second semiconductor devices linearly mounted on a mounting board, said second semiconductor device disposed parallel with the rows of said first semiconductor device; and

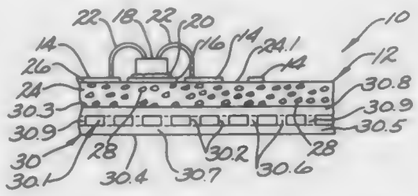
wiring means located linearly on said mounting board in the column direction, for electrically connecting said first and second external pins.

4,994,903

CIRCUIT SUBSTRATE AND CIRCUIT USING THE SUBSTRATE

Thomas Wroe, Dennis, and Henry F. Breit, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 18, 1989, Ser. No. 452,183
Int. Cl.[5] H01L *23/02, 39/02, 23/12, 23/48*
U.S. Cl. 357—81 4 Claims



1. A circuit substrate comprising a layer of organic electrically insulating material, a relatively high electrical conductivity metal layer adhered to and supported on one side of the organic electrically insulating material layer to be etched to form electrically conductive circuit paths and pads for mounting silicon semiconductor devices thereon, heat-sink metal layer means adhered to and supported on an opposite side of the organic electrically insulating material layer in electrically insulated relation to the relatively high electrical conductivity metal layer for withdrawing heat from said devices, the organic layer having a multiplicity of particles of material of relatively higher thermal conductivity than the organic layer material dispersed in the organic layer material for enhancing heat-withdrawal from the devices and the heat-sink metal layer means comprising a layer of metal of relatively low coefficient of thermal expansion with a plurality of apertures therein and a metal of a relatively higher thermal conductivity then said low expansion metal disposed in the apertures and defining thin metal layers of high thermal conductivity along each of two opposite sides of the layer of metal of relatively low coefficient of thermal expansion said metal of relatively higher thermal conductivity being metallurgically bonded to the layer of metal of relatively low coefficient of thermal expansion providing the heat-sink metal layer means with a selected heat-transfer properties and an effective coefficient of thermal expansion and having the organic layer adhered thereto along one side of the heat-sink metal layer means to cooperate with particles enhancing heat-withdrawal from the silicon semiconductor devices to conduct the withdrawn heat into and through the heat-sink metal layer means while also providing improved reliability of mounting of silicon semiconductor devices on said pads during the enhanced heat-withdrawal.

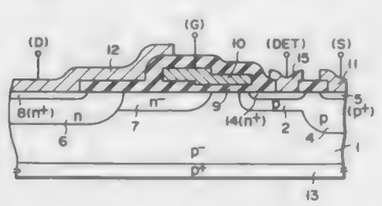
a voltage detection electrode which is in contact with said voltage detection terminal layer.

4,994,904

MOSFET HAVING DRAIN VOLTAGE DETECTION FUNCTION

Akio Nakagawa, Hiratsuka, and Yoshihiro Yamaguchi, Urawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1989, Ser. No. 356,371
Claims priority, application Japan, May 25, 1988, 63-127403; Feb. 14, 1989, 1-34404
Int. Cl.[5] H01L *29/72, 29/74, 29/10, 29/80*
U.S. Cl. 357—23.4 17 Claims



1. A MOSFET comprising:

a high-resistance semiconductor layer;

a base layer of a first conductivity type selectively formed in a surface layer of said high-resistance semiconductor layer;

a source layer of a second conductivity type selectively formed in a surface layer of said base layer of the first conductivity type;

a drain layer of the second conductivity type formed in one of front and rear surface layers of said high-resistance semiconductor layer so as to be separated from said base layer by a predetermined distance;

a gate insulating film formed on a channel region of said base layer;

a gate electrode formed on said gate insulating film;

a voltage detection terminal layer of the second conductivity type formed in said base layer so as to be isolated from said source layer;

a source electrode which is in contact with said source and base layers;

a drain electrode which is in contact with said drain layer; and

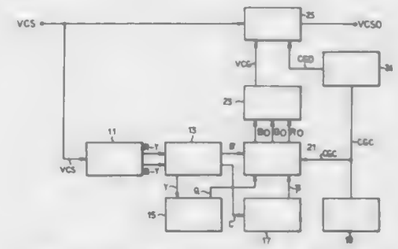
a voltage detection electrode which is in contact with said voltage detection terminal layer.

4,994,905

CHARACTER SYNTHESIZER FOR INSERTING INTO VIDEO SIGNALS CHARACTERS HAVING THE COMPLEMENTARY COLORS WITH THE VIDEO SIGNALS

Hyo-Sam Lee, and Sang-Jo Park, both of Suwon, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Oct. 20, 1989, Ser. No. 424,726
Claims priority, application Rep. of Korea, Dec. 31, 1988, 18091/1988
Int. Cl.[5] H04N *5/445, 9/77*
U.S. Cl. 358—22 4 Claims



1. A character synthesizer for inserting into video signals characters having the complementary colors with the video signals, comprising:

a video decoder **11** for decoding the incoming video color signals VCS to produce color-difference signals R-Y and B-Y;

a color-phase detector **13** for detecting the color-phase voltage ϕ of said color-difference signals R-Y and B-Y and separately producing the color signals C and the brightness signals Y;

an excessive white detector **15** for comparing said brightness signals Y with a reference voltage VYi to produce excessive white signal Q when said brightness signals Y are excessive white;

a low saturation detector **17** for comparing said color signals C with the low saturation voltage VCi to produce the low saturation signal P when said color signals C are low saturation;

a character generator **19** for generating character signals CGC;

a complementary color detecting and control means **21** for comparing said color-phase voltages ϕ of said video color signals with a plurality of reference color voltages **1...6** of given colors to decompose the colors of said video color signals VCS so as to obtain the colors complementary to said video color signals VCS, said complementary colors being used to output the color signals BO, GO, RO of the characters, said color signals BO, GO, RO being transformed according to said excessive white signal Q and said low saturation signal $\overline{P}$;

a video encoder **23** for encoding said color signals BO, GO, RO of the characters;

a mixer **25** for combining said incoming video signals VCS and said video-encoded color signals of characters to output the character-combined video signal VCSO; and

a delaying means **24** for delaying said character signals CGC by the time for the complementary color transformation and encoding to supply them as the character synthesizing control signal to said mixer **25**.

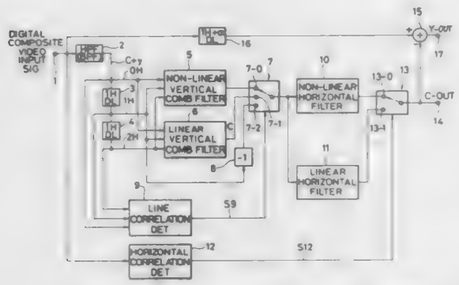
VOL 1123 ISS 3 FEB 19 1991 UMI

4,994,906

DIGITAL LUMINANCE/CHROMINANCE SEPARATION APPARATUS

Katsunakira Moriwake, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 25, 1989, Ser. No. 401,758
Claims priority, application Japan, Sep. 6, 1988, 63-223258
Int. Cl.[5] H04N 9/535
U.S. Cl. 358—31 13 Claims



1. An apparatus for separating a luminance signal and a chrominance signal from a digital composite video signal comprising:

first filter means for extracting from the composite video signal the chrominance signal and a high frequency component of the luminance signal included within the frequency band of said chrominance signal;

non-linear vertical comb filter means;

means for supplying three successive horizontal line signals of the chrominance signal and high frequency component of the luminance signal to said non-linear vertical comb filter means to generate a chrominance signal without color smear;

linear vertical comb filter means receiving said three successive horizontal line signals of the chrominance signal for generating a chrominance signal without aliasing noise;

correlation detection circuit means for detecting correlation between said three successive horizontal line signals; and

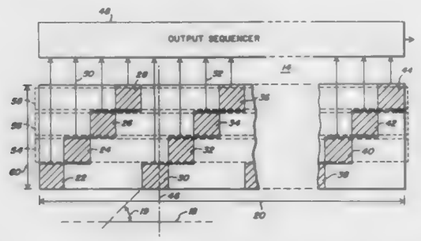
means responsive to said detecting for selecting an output of said non-linear vertical comb filter when there is an absence of correlation, and selecting an output of said linear vertical comb filter when correlation exists.

4,994,907

COLOR SENSING CCD WITH STAGGERED PHOTOSITES

James D. Allen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,105
Int. Cl.[5] H04N 27/02
U.S. Cl. 358—41 12 Claims



1. A line sensor having an elongated dimension in a direction establishing a predominant line axis of said line sensor, the line sensor being suited for color scanning an image on a document that is moved relative to said sensor in a direction perpendicular to the predominant line axis, said line sensor comprising:

a staggered array of coplanar photosensitive sites, said array containing only one site along a perpendicular line extended in the plane of the photosensitive sites from the predominant line axis, and said staggered array including identical subarrays repeated a plurality of times along said predominant line axis; and

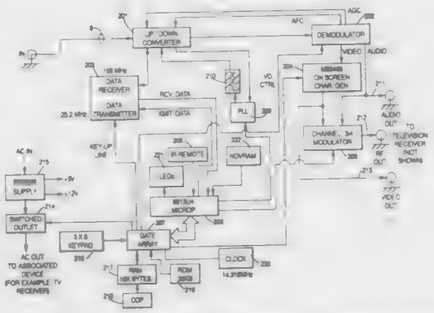
a plurality of color filters disposed across the sites, with all of the sites at the same perpendicular distance from the predominant line axis being aligned with a filter of the same color.

4,994,908

INTERACTIVE ROOM STATUS/TIME INFORMATION SYSTEM

Curt M. Kuban, Snellville; Jeffrey C. Ting, Lawrenceville; Fitzroy E. Williams, Lawrenceville; Lee R. Johnson, Lawrenceville; Elizabeth A. Smith, Cumming, and Howard L. Myers, Lawrenceville, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 289,218, Dec. 23, 1988. This application Apr. 20, 1989, Ser. No. 340,660
Int. Cl.[5] H04N 7/10
U.S. Cl. 358—86 42 Claims



1. Two-way interactive room terminal for communicating room status information with a system manager of a cable television system, the terminal comprising:

memory means for storing data for generating a plurality of predetermined character screens and for storing room status data, said character screen data comprising character screen commands and said room status data comprising room status information;

character generator means for generating character screens from the stored character screen data;

data entry means for entering room status information in response to at least one character screen;

two-way cable television transceiver means, for communicating with the system manager; and

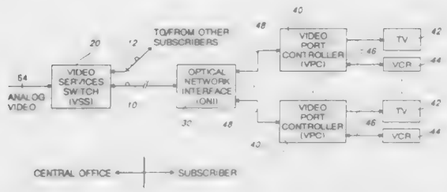
control means for processing entered room status information, for controlling said memory means and said character generator means for composing at least one predetermined character screen related to room status information requiring a data entry response, and for further controlling said two-way transceiver means for communicating processed room status information with the system manager.

4,994,909

VIDEO SIGNAL DISTRIBUTION SYSTEM

Alan F. Graves, Kanata; Robert C. Dittburner, Stittsville, and Barry B. Hagglund, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 4, 1989, Ser. No. 347,136
Int. Cl.[5] H04N 7/173, 7/14; H04J 15/00
U.S. Cl. 358—86 9 Claims



1. A signal distribution system for distributing video signals from a central location to a plurality of subscriber locations via respective communications paths, the system comprising, at the central location:

means for selecting for each subscriber location, from a first plurality of video signals a second, lesser, plurality of video signals and for delivering said second plurality of video signals to the respective subscriber location via a respective communications path;

and, at each subscriber location:

a plurality of control means each for supplying a respective video signal to at least one respective video signal receiver associated therewith; and

interface means coupled to the respective communications path and to each control means for delivering respective video signals thereto;

wherein each control means comprises means for requesting delivery of any of the first plurality of video signals and for communicating such request to the interface means, and wherein the interface means comprises means responsive to such request for:

determining whether the requested video signal is one of said second plurality of video signals delivered thereto via the respective communications path;

if so, delivering the requested video signal to the respective control means; and

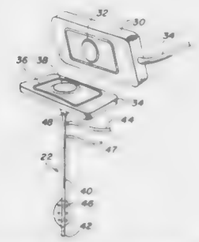
if not, communicating a request for the requested video signal to the central location to be selected from the first plurality of video signals and delivered as one of the second plurality of video signals.

4,994,910

MODULAR ENDOSCOPIC APPARATUS WITH PROBE

P. Michael Williams, San Carlos, Calif., assignor to Acuimage Corporation, San Carlos, Calif.

Filed Jul. 6, 1989, Ser. No. 376,881
Int. Cl.[5] A61B 1/04, 1/06
U.S. Cl. 358—98 23 Claims



1. A miniaturized video imaging device comprising:

a body;

sensing means for sensing an image, which sensing means is mounted in said body;

probe means for defining an elongate optical probe with a distal end and a proximal end and positionable in otherwise inaccessible areas;

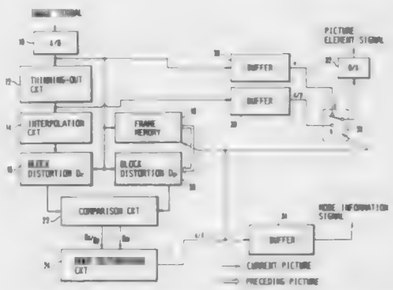
optical connector means mounted between said probe and said body for optical connecting the proximal end of the optical probe means and the image sensing means; and seal means sealing said sensing means within said body against fluids but exposed to said lens means, said probe means being connected to said body.

4,994,911

IMAGE INFORMATION SIGNAL TRANSMITTING SYSTEM WITH SELECTIVE TRANSMISSION OF INPUT DATA OR EXTRACTED DATA

Tadayoshi Nakayama; Hisashi Ishikawa, both of Kanagawa; Susumu Kozuki, Tokyo; Koji Takahashi, Kanagawa; Katsuji Yoshimura, Kanagawa; Kenichi Nagasawa, Kanagawa, and Tomohiko Sasatani, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,549
Claims priority, application Japan, Mar. 28, 1988, 63-071967
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—135 6 Claims



1. An image information signal transmitting system comprising:

(a) input means for inputting an image information signal composed of a plurality of picture element data corresponding to one picture;

(b) storing means for storing the plurality of picture element data inputted by said input means by blocks each of which is composed of a predetermined number of picture element data;

(c) extracting means for dividing the plurality of picture element data inputted by said input means into the blocks, for extracting from each of the blocks a fewer number of picture element data than the predetermined number of picture element data of which each of the blocks is composed, and for outputting the extracted picture element data;

(d) interpolating means for interpolating picture element data which has not been extracted by said extracting means by using picture element data which has been extracted by said extracting means to restore the plurality of picture element data;

(e) first computing means for comparing the plurality of picture element data inputted by said input means with the plurality of picture element data restored by said interpolating means for every one of the blocks to obtain differences therebetween, and for computing the sum of the differences for every one of the blocks to output the sum as first computed data;

(f) second computing means for comparing the plurality of picture element data inputted by said input means with the plurality of picture element data stored by said storing

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means for every one of the blocks to obtain differences therebetween, and for computing the sum of the differences for every one of the blocks to output the sum as second computed data;

(g) third computing means for computing and outputting third computed data by multiplying the first computed data output from said first computing means by a first constant, adding the result of multiplication to the second computed data output from said second computing means, subtracting a second constant from the result of addition and, after that, multiplying the result of subtraction by a third constant;

(h) fourth computing means for computing and outputting fourth computed data by multiplying the second computed data output from said second computing means by a fourth constant and adding the result of multiplication to the first computed data output from said first computing means;

(i) comparing means for comparing a level of the second computed data output from said second computing means with that of fifth computed data obtained by multiplying the first computed data output from said first computing means by a fifth constant and adding a sixth constant to the result of multiplication, and for outputting discrimination data indicative of the kind of computed data which is found to be at a lower level as a result of comparison;

(j) output switching means for selectively outputting one of the third- computed data output from said third computing means and the fourth computed data output from said fourth computing means according to the discrimination data output from said comparing means;

(k) transmission mode determining means for determining a transmission mode to be selected for every one of the blocks, according to the discrimination data output from said output switching means, from between a transmission mode in which all the predetermined number of picture element data of which each of the blocks is composed are transmitted and a transmission mode in which not all of the predetermined number of picture element data are transmitted; and

(l) selective output means for selectively outputting, in accordance with a transmission mode determined by said transmission mode determining means, one of the plurality of picture element data inputted by said input means and the picture element data extracted by said extracting means.

4,994,912

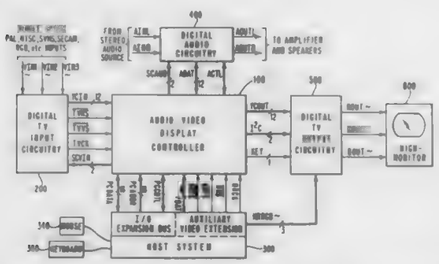
AUDIO VIDEO INTERACTIVE DISPLAY

Leon Lumelsky, Stamford, Conn., and Alan W. Peevers, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1989, Ser. No. 314,623

Int. Cl.[5] H04N *7/01*

U.S. Cl. 358—140 **10 Claims**



1. In a high resolution video display system, the combination comprising:

a high resolution display having a given scanline rate;

a computer for generating control signals, and video graphics signals;

an input device for receiving standard analog TV signals including a TV clock signal, and converting them to standard digital TV signals;

a display controller which operates under control of said control signals from said computer, said display controller including a two port display frame buffer, including means for reading said standard digital TV signals into said first port at a rate controlled by said TV clock signal and during a first time interval as controlled by said control signals from said computer for storage at predetermined locations of said display frame buffer, and including means for reading said video graphics signals into the first port at a rate controlled by said control signals from said computer and during a second time interval as controlled by said control signals from said computer for storage at predetermined locations of said display frame buffer, and including means for reading out said display frame buffer from the second port pel by pel and scanline by scanline at a rate compatible with the given scanline rate of said high resolution display, as controlled by said control signals from said computer; and

an output device including a digital to analog converter for converting the signal read out of the second port of said display frame buffer to an analog display signal, for display on said high resolution display.

4,994,913

STILL PICTURE TRANSMISSION-DISPLAY APPARATUS

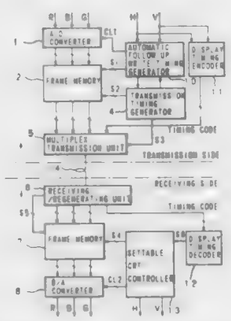
Kazuya Maeshima, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1989, Ser. No. 431,079

Claims priority, application Japan, Nov. 8, 1988, 63-283016

Int. Cl.[5] H04N *7/004*

U.S. Cl. 358—142 **10 Claims**



1. A still picture transmission-display apparatus comprising;

an analog/digital converter for converting inputted analog still picture data of raster scanning type into digital still picture data;

a first memory for storing therein said digital still picture data converted by said analog/digital converter;

signal generating means for generating a sampling clock for said analog/digital converter and a write control signal for said first memory corresponding to said analog still picture data;

an encoder for encoding display timing of said analog still picture data so as to output a display timing code;

transmission means for transmitting to a receiving side the digital still picture data read out from said first memory and the display timing code outputted from said encoder;

a second memory for storing therein the digital still picture data transmitted by said transmission means;

a digital/analog converter for converting into analog still picture data the digital still picture data read out from said second memory;

a decoder for decoding the display timing code transmitted by said transmission means so at to generate a display timing control signal; and

a controller for setting various display timing on the basis of said display timing control signal so at to generate a read control signal for controlling read-out from said second memory, a sampling clock for said digital/analog converter, and a horizontal synchronizing signal and a vertical synchronizing signal to a display device.

4,994,914

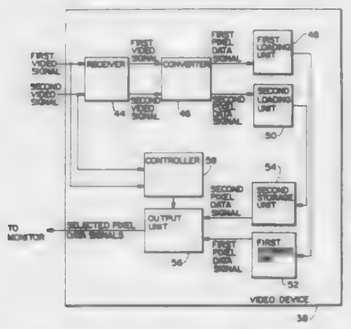
COMPOSITE VIDEO IMAGE DEVICE AND RELATED METHOD

John Wiseman, Rio Rancho; Ken Correll, and Paul Brooks, both of Albuquerque, all of N. Mex., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 209,608, Jun. 21, 1988, abandoned. This application Dec. 12, 1989, Ser. No. 453,132

Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—160 **12 Claims**



1. A video device for providing, for display on a monitor, a composite video image formed from first and second video signals, said video device comprising:

(a) means for receiving said first and second video signals, each of said first and second video signals representing a plurality of lines of video data;

(b) means for converting said first video signal into first pixel data signals and a control signal and for converting said second video signal into second pixel data signals;

(c) first and second storage means for storing said first and second pixel data signals, respectively;

(d) first and second loading means for independently loading said first and second pixel data signals, respectively, into said first and second storage means, respectively, at first and second frequencies corresponding respectively to said first and second pixel data signals, said first loading means thereby operating independently of said second loading means;

(e) output means, coupled to said first and second storage means, for forming an output signal representing said composite video image from portions of said first and second pixel data signals selected according to said control signal, said output signal having an output frequency set according to a timing control signal which is independent of at least one of said first and second frequencies; and

(f) control means, coupled to said output means for causing said output means to form said output signal by selecting said first or said second pixel data signal for each pixel to be displayed as said composite video image on said monitor and for generating said timing control signal.

4,994,915

APERTURE CORRECTION CIRCUIT

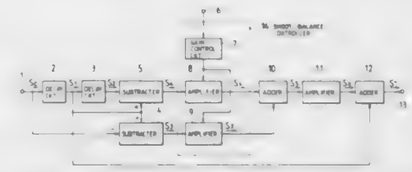
Satoshi Takahashi; Eiji Takagi; Yukinari Ueki, all of Yokohama; Hideaki Ohki, Fujisawa, and Koji Kamogawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1989, Ser. No. 349,869

Claims priority, application Japan, May 18, 1988, 63-119093; Sep. 7, 1988, 63-222361

Int. Cl.[5] H04N *5/208*

U.S. Cl. 358—162 **8 Claims**



1. An aperture correction device for video signals having:

video signal input means for receiving the video signal,

aperture correction signal generation means for generating a correcting shoot signal which corrects an aperture of the video signal, and

addition means connected to the video signal input means and the aperture correction signal generation means, for adding the video signal and the correcting shoot signal and delivering a resulting signal as an output;

said aperture correction signal generation means comprising:

preshoot signal generation means connected to said video signal input means, for generating a preshoot signal at an edge part of the video signal,

overshoot signal generation means connected to said video signal input means, for generating an overshoot signal at the edge part of the video signal, and

shoot signal composition means for receiving the preshoot signal and the overshoot signal and for adding the received signals at an addition ratio corresponding to a control signal, supplied to the composition means and for delivering a resulting signal as the correcting shoot signal.

4,994,916

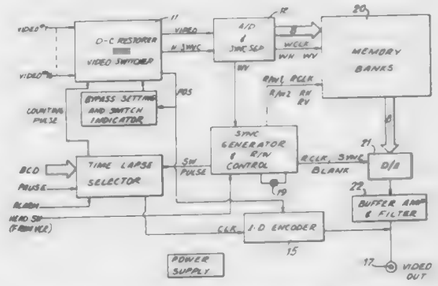
APPARATUS AND METHOD FOR ENCODING IDENTIFICATION INFORMATION FOR MULTIPLE ASYNCHRONOUS VIDEO SIGNAL SOURCES

Yacov Pshtissky, 1 Bayclub Dr., New York, N.Y. 11360, and Shiyang Gao, 185 California Ave., Uniondale, N.Y. 11553

Filed Aug. 25, 1988, Ser. No. 236,457

Int. Cl.[5] H04N *5/76, 5/262*

U.S. Cl. 358—181 **32 Claims**



1. Apparatus for encoding identification information for multiple asynchronous video signal sources comprising:

switching means for supplying in sequence a plurality of

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independent video signals, each from one of said sources and including at least image-representative signal components and line and field synchronizing signal components;

analog to digital video signal conversion means responsive to said independent video signals for converting said image-representative signal components associated with single field intervals to digital representations thereof;

first and second digital data storage means, each having a storage capacity at least sufficient to store digitized information representative of said a single field interval of video signals;

means for supplying a gating signal representative of the occurrence of a desired frame interval having a duration substantially equal to twice the field interval associated with said video signals;

means for enabling one of said data storage means during said desired frame interval to store said digitized information representative of said single field interval in said one data storage means and for enabling the other of said data storage means to read out twice in succession digitized video signals representative of video signals occurring during a previous frame interval; and

encoding means for adding, to said video signals which are read out twice in succession, identification information for distinguishing said last-named video signals from others of said plurality of independent video signals.

4,994,917

IMAGE PICKUP APPARATUS WITH PICKUP TIME CONTROL AND VARIABLE SIGNAL SUPPRESSION OR CLIPPING

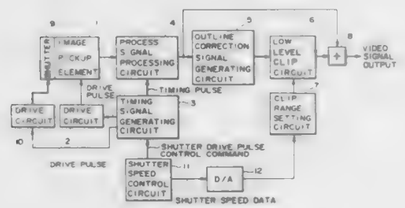
Tsutomu Takayama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,822

Claims priority, application Japan, Mar. 16, 1988, 63-060604

Int. Cl.[5] H04N *3/14, 5/335*

U.S. Cl. 358—213.15 **16 Claims**



1. An image pickup apparatus comprising:

(a) an image pickup element;

(b) photoelectric conversion time control means for variably controlling a photoelectric conversion time of said image pickup element;

(c) suppressing means for suppressing a signal of a predetermined band in a video signal from the image pickup element; and

(d) suppressing control means for changing characteristics of suppression by said suppressing means in response to variable control of the photoelectric conversion time.

4,994,918

METHOD AND CIRCUIT FOR THE AUTOMATIC CORRECTION OF ERRORS IN IMAGE STEADINESS DURING FILM SCANNING

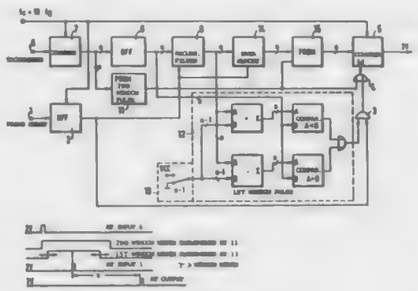
Karl-Heinz Lingemann, Pfungstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 25, 1990, Ser. No. 514,679

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914076

Int. Cl.[5] H04N *5/253*

U.S. Cl. 358—214 **8 Claims**



1. Method for the detection and automatic correction of horizontal and vertical errors in image steadiness during the image scanning of continuously moving motion picture films using image memories, comprising

producing horizontal and vertical image steadiness error signals, said vertical image steadiness error signals being produced in dependence upon the vertical position of a film frame relative to the television image scanner;

determining from said vertical image steadiness error signals the start of the scanning of the first television scan line of a new film frame and, simultaneously, the start of writing video signals in at least one image memory;

producing standard horizontal and vertical studio timing pulses;

selecting video signals from at least one image memory in synchronism with the studio timing pulses;

producing horizontal position values from the horizontal error signals and producing frame start pulses from the vertical error signals;

releasing the frame start pulse only during a portion of the scanning period and blocking said pulse during the remainder of this scanning period;

determining the blocking and releasing in each scanning period by a tachometer roll which engages the perforations of the film without slippage;

automatically providing substitute pulses derived from the tachometer during the release period in case frame start pulses are missing;

deriving first window pulses from the pulse signal of the tachometer roll and from the frame start pulses;

deriving second window pulses from the pulse signal of the tachometer roll;

determining the release portion of each scanning period by the first window pulse; and

generating substitute pulses by the second window pulses in case frame start pulses are missing during the release portion.

4,994,919

CAMERA FOR RECORDING TELEVISION, PHOTOGRAPHIC OR CINEMATOGRAPHIC IMAGES, INCLUDING AN AUTOMATIC FOCUS-SETTING DEVICE

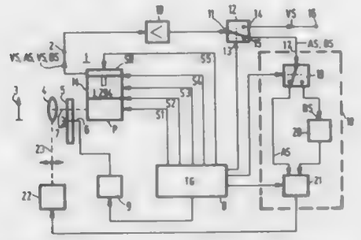
Munehisa Izushi, Osaka, Japan, and Cornelis A. M. Jaspers, Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Feb. 17, 1987, Ser. No. 15,420

Claims priority, application Netherlands, Feb. 17, 1986, 8600392

Int. Cl.[5] H04N *5/232*

U.S. Cl. 358—227 **6 Claims**



1. A camera for recording television, photographic or cinematographic images, including an automatic focus-setting device, in which camera an image of a scene to be picked-up is obtained via an optical lens system of an opto-electronic sensor in the form of a charge transfer device suitable for television comprising a pick-up member, an information storage member and a parallel-in, series-out shift register member connected to a sensor output terminal, said camera operating for the automatic focus-setting with first and second optical paths of different path lengths in the optical lens system, said camera including a signal comparator for comparing signals to be supplied by the sensor from the output terminal, which signals are associated with the presence of the first and second optical paths of different path lengths, the focus-setting device adjusting the focus setting in a manner dependent on a comparison of the scene image contrast between the first and second optical paths, characterized in that during a television field period the camera is consecutively operative with a scene recording period, a scene information transfer period for the transfer of information between the pick-up member and the storage member, at least one focus information recording period in which the first or second optical paths, respectively, are present in the optical lens system, and a focus information transfer period for the transfer of information between the pick-up member and the storage member.

4,994,920

DEVICE FOR FOCUS DETECTION WITH WEIGHTINGS OF THE FOCUS DETECTING SIGNALS OF PLURAL FOCUS DETECTORS

Akihiro Fujiwara; Masamichi Toyama; Hirofumi Suda, all of Kanagawa, and Kunihiko Yamada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 121,624, Nov. 17, 1987. This application Sep. 5, 1989, Ser. No. 403,188

Claims priority, application Japan, Nov. 19, 1986, 61-275828

Int. Cl.[5] H04N *5/232*

U.S. Cl. 358—227 **38 Claims**

1. A focus detecting device comprising:

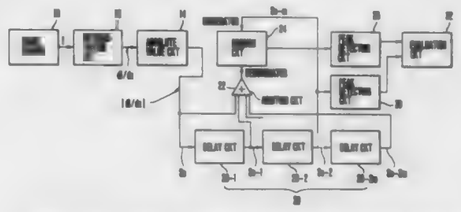
(a) image sensing means arranged to convert information on an object's image formed on an image sensing plane into an electrical image signal;

(b) differentiating means for differentiating said image signal obtained from said image sensing means;

(c) first detecting means arranged to detect the maximum value of a differential signal of said differentiating means obtained from within a detecting area set on the image sensing plane;

(d) second detecting means arranged to detect from said differential signal the width of an edge part of said object's image formed within said detecting area; and

(e) evaluating means arranged to discriminate an in-focus



state of said object's image on said image sensing plane on the basis of detection values of said first and second detecting means, said evaluating means including means for evaluating a focused state on the basis of the detection values of said first and second detecting means by weighting them according to the focused degree of said focused state.

4,994,921

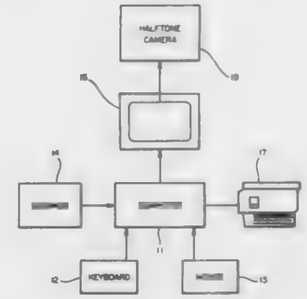
HALFTONE IMAGING SYSTEM AND METHOD

John Zajac, 1137 Angmar Ct., San Jose, Calif. 95121

Filed May 18, 1988, Ser. No. 195,712

Int. Cl.[5] H04N *5/84*

U.S. Cl. 358—244 **10 Claims**



1. In a system for producing a halftone image of an object: a computer having a video display screen, means for inputting data defining an image of the object to the computer for display on the video display screen, and a halftone camera positioned in front of the video display screen for making a photographic halftone image of the image displayed on the screen.

4,994,922

IMAGE STORAGE AND RETRIEVAL APPARATUS

Larry D. Goddard, Decatur, Ga., assignor to Goddard Technology Corporation, Atlanta, Ga.

Continuation of Ser. No. 68,268, Jun. 30, 1987, Pat. No. 4,823,196. This application Apr. 17, 1989, Ser. No. 339,061

Int. Cl.[5] H04N *5/782*

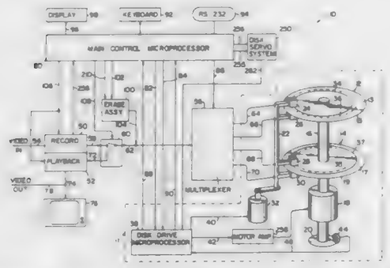
U.S. Cl. 358—310 **1 Claim**

1. A process for storing a plurality of still images comprising the steps of:

receiving a video signal representing one of said still images, including a sync signal, a luminance component and a chrome component;

separating the components;

frequency converting the chrome component by a first preselected reference to frequency;
frequency modulating the luminance component;
recombining the components to produce an analog signal;
transmitting said analog signal to a read/write head for recording the analog signal on a storage disk;
selecting a circular track of said disk for storage of the combined components;
separating the luminance component from the chroma component;



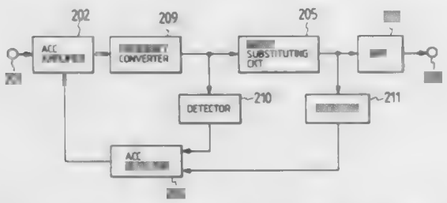
frequency demodulating and delaying the luminance component;
frequency converting the chroma component by a second preselected frequency;
recombining the components to form combined components; and
introducing the combined components as a video signal for display upon a video display device as a still image.

4,994,923

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS WITH SIGNAL PROCESSING CIRCUIT FOR IMPROVEMENT OF PICTURE QUALITY

Shigeyuki Itoh, Yokohama; Hikaru Masui, Ashiya, and Yoshizumi Watatani, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,622
Claims priority, application Japan, Feb. 5, 1988, 63-23924; Mar. 16, 1988, 63-60521
Int. Cl.[5] H04N *9/80*
U.S. Cl. 358—319 **21 Claims**



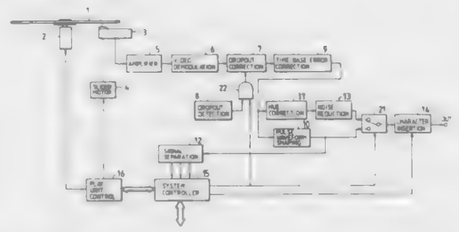
1. A video signal recording and reproducing apparatus for frequency-multiplexing both a signal frequency-modulated with a luminance signal and a down-converted chrominance signal, and recording and reproducing them, comprising:
first carrier generating means for generating a first carrier wave having a frequency lower than that of a color subcarrier of a color video signal;
second carrier generating means for generating a second carrier wave having a frequency equal to that of said color subcarrier of the color video signal;
first modulating means for modulating said first carrier wave with at least one color difference signal which is in a base frequency band and to be recorded, so as to generate a recording down-converted chrominance signal;
demodulating means for demodulating a reproduced down-converted chrominance signal so as to output at least one color difference signal in the base frequency band;
signal processing means for subjecting said at least one color difference signal outputted from said demodulating means to a predetermined processing for improvement of picture quality; and
second modulating means for modulating said second carrier wave with said at least one color difference signal outputted from said signal processing means so as to generate a chrominance signal of a color video signal.

4,994,924

REPRODUCING PROCESSOR ALLOWING SELECTIVE INHIBITION OF DROPOUT COMPENSATION AND VIDEO SIGNAL CORRECTION PROCESSING

Tetsuya Tenma, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,013
Claims priority, application Japan, Sep. 16, 1988, 63-231892
Int. Cl.[5] H04N *5/94*
U.S. Cl. 358—336 **13 Claims**



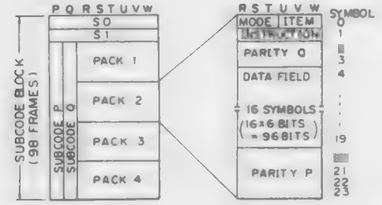
1. A reproducing processor a video format signal and allowing, during dropout, selective inhibition of at least one of dropout compensation and video signal correction processing, for preventing production of uncorrectable errors due to a processing of digital data of said video format signal, said processor comprising:
reproducing means for obtaining a video format signal from a medium in which a video format signal including a plurality of successive line signal portions is recorded, with each line signal portion including a horizontal synchronizing signal portion followed by an information signal portion, said video format signal containing video information corresponding to an image to be displayed and digital data;
command means for issuing a digital data signal reproducing command for inhibiting at least one of dropout compensation and video signal correction processing;
dropout compensation means for carrying out dropout compensation for a video format signal obtained from said reproducing means in the absence of said digital data signal reproducing command, and not carrying dropout compensation in response to; said digital data signal reproducing command;
signal processing means for carrying out video signal correction processing for an output from said dropout compensation means;
waveform shaping means for shaping a pulse waveform of an output from said dropout compensation means; and
signal selection means for selectively outputting an output of said waveform shaping means in response to said digital data signal reproducing command, and for selectively outputting an output of said signal processing means in the absence of said digital data signal reproducing command.

4,994,925

METHOD OF RECORDING AND REPRODUCING PICTURE INFORMATION, RECORDING MEDIUM, AND RECORDING MEDIUM PLAYING APPARATUS

Masayasu Yamashita; Masami Suzuki; Junichi Yoshio, and Osamu Watanabe, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Japan

Filed Sep. 23, 1988, Ser. No. 248,394
Claims priority, application Japan, Apr. 4, 1988, 63-82622
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—343 **6 Claims**



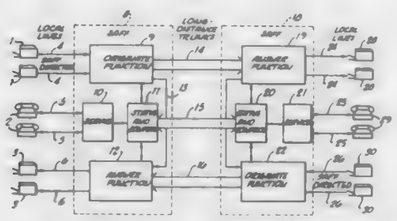
5. A picture information recording medium on which are record graphic codes, audio codes and identification codes as a subcode of a coded information signal, wherein said graphic codes include picture information, wherein said identification codes indicate whether a code is a graphic code or an audio code, and wherein said audio codes comprise codes by which said audio codes can be compressed at a compression rate higher than that of said coded information signal.

4,994,926

FACSIMILE TELECOMMUNICATIONS SYSTEM AND METHOD

Richard J. Gordon, Los Angeles, Calif., and James R. Keanedy, Tucson, Ariz., assignors to F-Mail Associates, L.P., Los Angeles, Calif.

Filed Sep. 22, 1988, Ser. No. 248,798
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—400 **39 Claims**



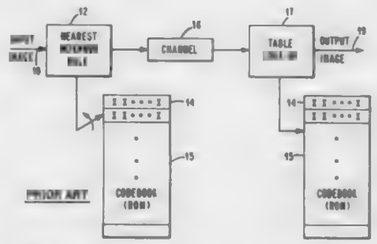
1. A system for facilitating facsimile communications between a transmitting facsimile machine and at least one intended receiving facsimile machine, comprising at least one store and forward facility, means coupling the at least one store and forward facility to the switched telephone network for receiving transmissions from a transmitting facsimile machine, said store and forward facility including computer means for controlling its operation and including mass storage means for storing facsimile transmissions together with information identifying the transmitting facsimile machine and the at least one intended receiving facsimile machine under control of said computer means, said store and forward facility also including means coupling it to the switched telephone network for transmitting facsimile messages stored in the mass storage means to at least one intended receiving facsimile machine, and wherein said mass storage means additionally includes mailboxes associated with particular system subscribers and wherein facsimile messages received and stored by the mass storage means and intended for receiving facsimile machines associated with those subscribers are stored in the respective mailboxes, said store and forward facility being responsive to instructions received from a subscriber to transmit the facsimile messages stored in that subscriber's mailbox to any particular facsimile machine designated in the instructions by the subscriber, whereby a subscriber who is traveling or otherwise away from the fixed location of his facsimile machine may have facsimile messages intended for receipt by his facsimile machine collected, and retrieve them from any location where any other facsimile machine is situated.

4,994,927

SELF-ADAPTIVE NEURAL NET BASED VECTOR QUANTIZER FOR IMAGE COMPRESSION

Sudhir S. Dixit, Norwood, and Yushu Feng, Worcester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 19, 1989, Ser. No. 368,489
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—426 **2 Claims**



1. A self-adaptive neural net-based vector quantizer for image compression comprising:
a first code book, previously compiled in a training process from a set of test images, containing a set of front-line vectors to represent common characteristics of all types of images;
a second code book, also previously compiled in a training process from said set of test images, containing a set of second-line vectors larger than said first set, which vectors, when matched with said front-line vectors, exceed a specified threshold in terms of euclidean distance;
said front-line vectors and said second-line vectors being interconnected through a neural net wherein the strength of interconnection of any two vectors, one from each set, is determined by their euclidean distance, said strength of interconnection having been determined during said training process in the compilation of said code books from test images;
each vector in each code book having an average coding error determined during said training process;
means to download said code books to an image transmitting system and to an image receiving system;
means to encode an image using vectors in said first code book and to send its code vectors to said receiving system;
means to update the average coding error for each vector used to encode said image;
means to retain a cumulative count indicating the frequency of use of each vector;
means to periodically recompute the strength of interconnection among said first set of code vectors and said second set of code vectors;
means to compute a rising function for each vector in said second set of code vectors based on said recomputed interconnection strengths, average coding error and frequency of use;
means to compute a falling function for each vector in said first set of code vectors based on said recomputed strengths, average coding error and frequency of use;

means to periodically exchange a preset number of code vectors having the largest rising function in said second code book with an identical number of code vectors having the smallest falling function in said first code book;

means to recompute the neural net to account after said exchange of vectors between said two code books;

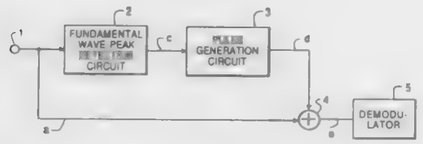
whereby the first code book is adapted to the context of images being processed.

4,994,928

FREQUENCY DEMODULATION CIRCUIT

Masahiro Honjo, Neyagawa, and Masaaki Kobayashi, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 2, 1988, Ser. No. 189,169
Int. Cl.[5] G11B *20/06*
U.S. Cl. 360—30 17 Claims



1. A frequency demodulation circuit comprising:

a fundamental wave peak detection circuit for detecting peaks of a fundamental wave of an input frequency-modulated signal;

a pulse generating circuit for generating, according to the detection result by the peak detection circuit, pulses respectively occurring at timings at which the peaks present, polarities of the pulses being equal to polarities of the respective corresponding peaks;

a level adjusting circuit for adjusting the level of the pulses generated by the pulse generating circuit;

a control circuit for controlling the level adjusting circuit according to a predetermined signal;

an adder for adding the level adjusted pulses outputted from the level adjusting circuit to the input frequency-modulated signal to obtain a frequency-modulated signal on which the level adjusted pulses are respectively superposed substantially at peaks thereof; and

a frequency demodulator for demodulating the frequency-modulated signal outputted from the adder.

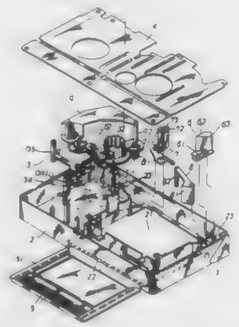
4,994,929

AUTOMATIC VIDEO TAPE CONVERTING DEVICE

Stephen Chen, No. 52, Lane 563, Chang Tsao Road, Changhua Hsien, Taiwan

Filed Oct. 27, 1989, Ser. No. 427,424
Int. Cl.[5] G11B *15/665, 23/08*
U.S. Cl. 360—94 2 Claims

1. A automatic video tape converting device comprising a box body having an upper opening, a front cap and a bottom cover, said device further comprising a drive cover, a pair of left and right fixing blocks, a pair of left and right arm members, a winding means, a first idle gear, a first drive gear and two extension springs, wherein a pair of corresponding due grooves are formed respectively on two sides of said upper opening for said drive cover to slidably associate therewith, and said drive cover has a rack portion, said first idle gear engaging with said rack portion and also meshing with said first drive gear, said first idle gear and first drive gear being pivoted to said box body, said right arm member being crank-shaped with its one end pivoted to said box body and the other end pivoted on a first shaft rod, said one end of said right arm member having fan tooth portion engaging with said first drive gear, said left arm member having one end pivoted to said box body opposite to said right arm member and an other end pivoted on a second shaft rod, a drive surface being formed on said left arm member, said left and right fixing blocks being respectively located in front of said left and right arm members and fixedly fitted to two pairs of guide posts, said extension springs being disposed to restrict said left and right fixing blocks, permitting the same to move forward and backward, back faces of said left and right fixing blocks being formed with



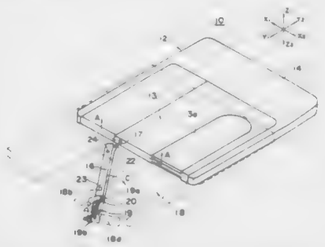
fixing grooves for said first and second shaft rods to be located therein, whereby means of moving said drive cover, said left and right arm members are rotated outwardly to stretch a tape member of a video tap and cause said left and right fixing blocks to fixedly associate with said left and right arm members so that a video tape is automatically converted when mounted into said video tape converting device.

4,994,930

MECHANISM FOR ACTUATING A PROTECTIVE SHUTTER PROVIDED ON A CARTRIDGE ACCOMMODATING A DISK

Keiji Uehara, Iruma, Japan, assignor to TEAC Corporation, Japan

Filed Dec. 7, 1988, Ser. No. 280,874
Claims priority, application Japan, Dec. 9, 1987, 62-187625[U]
Int. Cl.[5] G11B *5/012, 23/03*
U.S. Cl. 360—97.01 8 Claims



1. A mechanism for use in an information recording/reproducing apparatus, recording and/or reproducing an information signal on and from an information recording disk accommodated in a cartridge, for actuating a shutter of the cartridge so that a window defined in the cartridge is exposed responsive to an insertion of the cartridge into the apparatus and so that the window is covered responsive to the withdrawal of the cartridge from the apparatus, comprising:

a base having a front side and a rear side, said base having formed therein a space extending from the front side to the rear side, said space being defined, in part, by a top wall extending between the front side and the rear side such that the space is formed underneath the top wall, said base being provided in a body of the information recording/reproducing apparatus for accepting the cartridge inserted to said space from the rear side of the base to the front side of the base when the cartridge is inserted into the apparatus;

an arm held on the base so as to rotate freely in said space in a plane generally parallel to said top wall, said arm carrying a projection adapted to matingly cooperate with a depression formed at a front face of the shutter located at a front side of the cartridge which enters first into the space when the cartridge is inserted; and

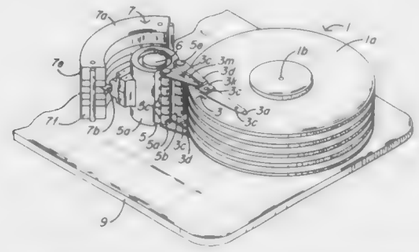
a coiled spring having a first end and a second end respectively secured on the base and the arm so as to urge the arm in a first direction opposing the rotation of the arm when the cartridge is inserted into said space and further in a second direction orthogonal to the first direction towards the top wall of the base such that the arm maintains a contact with said top wall which defines the space.

4,994,931

ACTUATOR STRUCTURE FOR A MAGNETIC HEAD SUSPENSION ASSEMBLY IN A DISK DRIVE

Wayne E. Foote, Eagle, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 13, 1989, Ser. No. 434,662
Int. Cl.[5] G11B *5/55, 21/08, 5/48, 21/16*
U.S. Cl. 360—106 11 Claims



1. An actuator structure for a magnetic head suspension in a disk memory drive, comprising:

an actuator body:

a plurality of mounting pads having holes therethrough;

cantilever support means comprising a deflectable cantilever support for at least some of said pads, joining said pads to said body in longitudinally spaced end-to-end positions with the holes aligned, in pad positions defining two laterally spaced columns of pads on said body, the longitudinal spacing of said pads defining slots therebetween, corresponding slots in the respective columns occupying positions in the same plane;

a plurality of arm structures of sheet material for individually supporting a magnetic head, disposed in back-to-back relationship in pairs with corresponding ends of said pairs having width straddling said columns and fitted into corresponding slots in said columns, laterally spaced openings in said ends being aligned with said holes in said pads; and

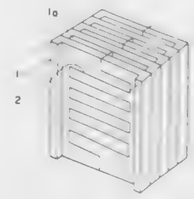
an elongated member extending through said holes in said pads in each column for applying a force to the end pads of each column directed inwardly of each column to deflect said cantilever supports which are deflectable and clamp said ends of said arm structures between said pads.

4,994,932

SUPERCONDUCTING CURRENT LIMITING APPARATUS

Masaru Okamoto, Kawasaki; Hitoshi Mizoguchi, Yokohama; Masayuki Ishikawa, Kawasaki; Hisatoshi Ikeda, Zushi; Katsumi Suzuki; Susumu Nishiwaki, both of Yokohama; Tsuneharu Teranishi, Kawasaki; Satoru Yanabu, and Tsutomu Fujioka, Machida, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 269,066, Nov. 9, 1988, abandoned. This application Jan. 26, 1990, Ser. No. 471,697
Claims priority, application Japan, Nov. 9, 1987, 62-281003; Dec. 16, 1987, 62-316159; Jan. 26, 1988, 63-13523; Feb. 19, 1988, 63-35150; May 6, 1988, 63-109129; May 6, 1988, 63-109130
Int. Cl.[5] H02H *9/02*
U.S. Cl. 361—19 16 Claims



1. A non-inductive superconducting current limiting apparatus, comprising:

a first container;

a superconducting current limiting element accommodated in said first container and comprising a stack of stack elements;

a superconducting current limiting wire accommodated in each of said stack elements;

a refrigerant filling said first container for cooling said superconducting current limiting element;

a second container for accommodating said first container with a gap in such a manner that said first container is heat insulted; and

a conductor means for connecting said superconducting current limiting element to an external power supply system;

said superconductive current limiting wire exhibiting an increase in resistance when a current in said superconductive current limiting wire exceeds a known value, wherein the superconducting current limiting wires of the stack elements are connected in series, said superconducting current limiting wire being arranged in each of the stack elements in a meandering manner so that magnetic fluxes generated by currents that flow in adjacent parts of the superconducting current limiting wire in each struck element are canceled to create a non-inductive state.

4,994,933

GROUND FAULT CIRCUIT INTERRUPTER HAVING LOSS OF NEUTRAL OR LOSS OF GROUND PROTECTION

Joseph M. Matsuoka, Lincoln, Nebr., assignor to Square D Company, Palatine, Ill.

Filed Apr. 19, 1989, Ser. No. 340,303
Int. Cl.[5] H02H *3/24*
U.S. Cl. 361—42 4 Claims

1. A ground fault circuit interrupter for use in a system having line, neutral and ground leads between an energy source and a load, said circuit interrupter comprising:

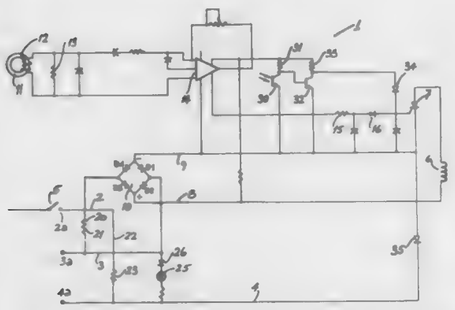
a circuit breaker arranged to open the line lead in response to a trip signal;

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a ground fault detection circuit for detection of a ground fault in the system;

a ground fault tripping circuit operatively connected to the ground fault detection circuit to provide a circuit breaker trip signal in response to detection of a ground fault;

a loss of neutral or ground detection circuit for detection of loss of neutral or loss of ground in the system, said detection circuit comprising means for detecting a potential



between the neutral and ground leads, said potential being indicative of loss of neutral or loss of ground; and

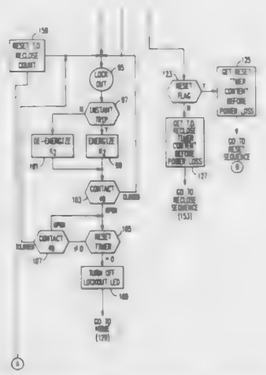
a loss of neutral or ground tripping circuit operatively connected to the loss of neutral or ground detection circuit by a nonelectrical signal transmission link for providing a circuit breaker trip signal in response to detection of loss of neutral or loss of ground, said loss of neutral or ground tripping circuit being separate from said ground fault tripping circuit.

4,994,934

MICROCOMPUTER BASED RECLOSING RELAY

Redjem Bouhenguel, North Lauderdale, Fla., assignor to ABB Power T & D Company Inc., Blue Bell, Pa.

Filed Dec. 1, 1989, Ser. No. 444,648
Int. Cl.[5] H02H *7/22*
U.S. Cl. 361—71 **16 Claims**



1. A reclosing relay for controlling reclosure of a circuit breaker from a tripped state to a closed state, said relay comprising:

input means detecting the tripped and closed states of said circuit breaker;

digital processing means generating, in response to the state of said circuit breaker as detected by said input means, a succession of a preset number of reclosure signals at selected reclosure timing intervals;

volatile memory means in which are maintained working variables having dynamic values used by said digital processing means in generating said succession of reclosure signals at selected reclosure timing intervals;

output means responsive to the generation of a reclosure signal by said digital processing means initiating reclosure of said circuit breaker to the closed state; and

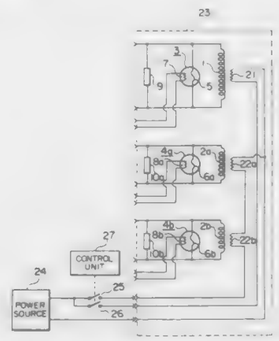
non-volatile memory means, said digital processing means selectively while generating said succession of reclosure signals copying the dynamic values of said variables in said volatile memory into said nonvolatile memory, and upon restoration of power following an interruption of power to the volatile memory means at a given point in said succession of reclosure signals, recopying the dynamic values of said variables from the nonvolatile memory means back and into the volatile memory means and using the dynamic values of of said variables recopied into the volatile memory means to continue generating said succession of reclosure signals from said given point in said succession.

4,994,935

SUPERCONDUCTING MAGNET APPARATUS WITH AN EMERGENCY RUN-DOWN SYSTEM

Moriaki Takechi, Ako, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 13, 1990, Ser. No. 542,703
Claims priority, application Japan, Jun. 15, 1989, 1-150567
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—141 **5 Claims**



1. A superconducting magnet apparatus comprising:

a superconducting main coil for generating a uniform magnetic field;

a superconducting shim coil electromagnetically coupled to said superconducting main coil for increasing the uniformity of said magnetic field generated by said superconducting main coil;

an emergency run down main coil heater element disposed adjacent to said superconducting main coil for demagnetizing the latter;

an emergency run down shim coil heater element disposed in proximity of said superconducting shim coil for demagnetizing the latter;

a heater power source for supplying an electrical power to said heater elements; and

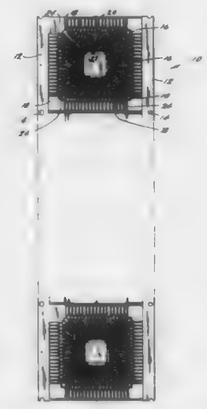
switching means, connected between said heater elements and said heater power source, for connecting said heater power source to said superconducting shim coil heater element and to said superconducting main coil heater element at different time points with a predetermined time interval therebetween, said predetermined time interval being such that said superconducting main coil revert to a normal state after said superconducting shim coil has reverted to a normal state.

4,994,936

MOLDED INTEGRATED CIRCUIT PACKAGE INCORPORATING DECOUPLING CAPACITOR

Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Feb. 12, 1990, Ser. No. 479,075
Int. Cl.[5] H01G *1/14;* **H05K** *7/02;* **H01L** *23/02*
U.S. Cl. 361—306 **22 Claims**



1. A molded integrated circuit (IC) package comprising:

lead frame means, said lead frame means including a plurality of conductive fingers arranged in a pre-selected pattern, said fingers each having a first end and a second end, said first ends of said fingers terminating at an inner space;

an integrated circuit support platform being positioned within said space in close proximity to said first ends of said fingers, said support platform having opposed first and second surfaces:

an integrated circuit chip on said first surface of said support platform, said integrated circuit chip being electrically connected to said first ends of said fingers;

a capacitor attached to said second surface of said support platform, said capacitor including leads extending outwardly therefrom, said leads being electrically connected to selected fingers of said lead frame means; and

molding material encapsulating said integrated circuit chip and capacitor and at least part of said lead frame means.

4,994,937

HYDRAULIC THERMAL CLAMP FOR ELECTRONIC MODULES

Robert A. Morrison, Long Beach, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

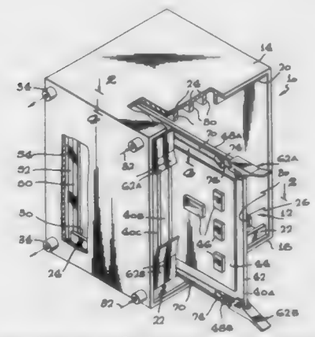
Filed Dec. 22, 1989, Ser. No. 455,212
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 **10 Claims**

1. A system for clasping a circuit board module by an edge to spaced guide rails within an enclosure, the guide rails forming a channel for a module, the system comprising:

a circuit board module having an edge;

at least one hollow closed-off tube filled with a fluid-like material joined to said edge of said module, said at least one tube having a semi-flexible wall and a specific width and volume; and

means mounted to said module for decreasing the volume of a first portion of said at least one tube causing the remaining second portion of said at least one tube to increase in width.

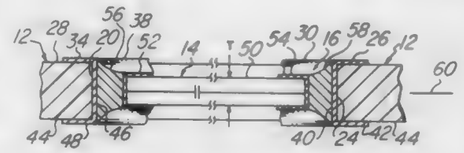


4,994,938

MOUNTING OF HIGH DENSITY COMPONENTS ON SUBSTRATE

Daniel A. Baudouin, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1988, Ser. No. 290,972
Int. Cl.[5] H05K *1/18*
U.S. Cl. 361—401 **12 Claims**



1. A printed circuit card assembly comprising:

A. a substrate of insulating material, said substrate having at least one opening through said substrate defined by sidewalls of said insulating material, said opening having dimensions between said sidewalls selected to receive an electrical component;

B. circuit leads formed on said substrate, at least one lead extending into said opening to form one bonding pad on one sidewall and at least another lead extending into said opening to form another bonding pad on another sidewall, said one and another sidewalls being selected for said bonding pads to confront the terminals of the component;

C. an electrical component dimensioned to fit in said opening, said component having terminals at its ends and being located in said opening with said terminals respectively confronting said one and another bonding pads; and

D. a solder fillet extending between each said bonding pad and component terminal, said fillets substantially center and fasten the component in the opening both axially of the component and in the height of the opening to provide both mechanical and electrical connections between said one and another bonding pads and said component terminals.

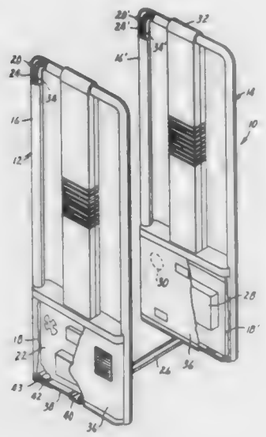
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4,994,939

UNIVERSAL LATTICE FOR MAGNETIC-ELECTRONIC ARTICLE SURVEILLANCE SYSTEM

Roland W. Rubertus, Hudson, Wis.; Roger K. Westerberg, Cottage Grove, and Peter J. Zarembo, Shoreview, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1989, Ser. No. 437,074
Int. Cl.[5] H02B *1/01*
U.S. Cl. 361—429 5 Claims



1. A universal lattice assembly for use with magnetic electronic article surveillance systems comprising

(a) a structural chassis having a bottom section adapted to be secured to a floor mounted base, a top section spaced from and parallel to the bottom section, and opposing parallel side sections rigidly secured to opposite ends of the top and bottom sections, and having means for indexing and interlocking the chassis with other members of the assembly, the chassis forming an open framework within which electronic sub-assemblies may be mounted;

(b) a coil assembly comprising a drive coil and a sense coil, at least one of which has a figure-8 configuration, and

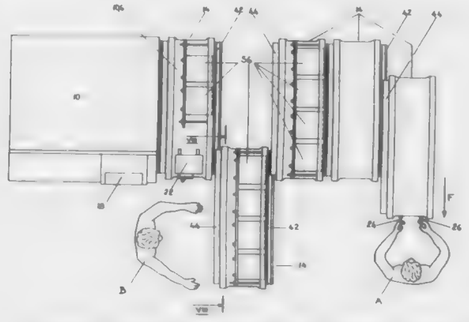
(c) a frame having opposing spaced apart vertical legs, a top horizontal section connected across the top of the legs, a lower horizontal section connected between the legs and spaced upward of the bottom thereof, and a centermost vertical section connected between the top and lower horizontal sections, said frame having an interior cavity extending through said horizontal sections, said centermost vertical section and the portion of the legs between the horizontal sections and having means for receiving and rigidly anchoring said coil assembly in place, said centermost vertical section further comprising means for securing the crossover portion of the figure-8 coil and for controllably altering the horizontal displacement thereof to allow electrical nulling, the portions of each leg below the lower horizontal section being indexed, interlocked, and bonded, enclosing and coupled to the respective side section of said chassis, thereby enclosing said chassis to form a completed composite lattice assembly of high integral strength suitable for use in a hostile user environment.

4,994,940

MODULAR CABINET FOR ELECTRICAL BATTERY BANKS

Jean-Marie Thouvenin; Jean-Pierre Bochard, both of Seyssins, and Jacques Doize, Meylan, all of France, assignors to Merlin Gerin, France

Filed Sep. 26, 1989, Ser. No. 412,331
Claims priority, application France, Sep. 29, 1988, 8812881
Int. Cl.[5] H02B *1/01*
U.S. Cl. 361—429 10 Claims



1. A modular cabinet for electrical battery banks, comprising a plurality of parallely arranged longitudinal battery modules, each of said modules having a frame comprising:

a rectangular plinth;

rolling means disposed on a bottom surface of said rectangular plinth for providing movement of the battery modules between a stored position within the modular cabinet and a withdrawn position;

a vertical front flange extending in a direction perpendicular to said plinth;

a vertical rear flange arranged parallel to said vertical front flange;

a plurality of horizontal shelves interposed between said vertical front flange and said vertical rear flange;

a side plate connecting the flanges and the rectangular plinth, thereby closing one side of the module;

and lateral guiding means for

(i) mechanically coupling adjacent modules, or a single module to a structure arranged adjacent said modular cabinet, when said modules are in said stored position, and

(ii) guiding said modules during withdrawal thereof from the modular cabinet;

wherein a plurality of batteries are arranged on each of said horizontal shelves such that a transverse free space is provided between the batteries and an open side, opposing the closed side, of each said module, and said batteries are fully accessible via said open side when at least one module is in said withdrawn position.

4,994,941

SIGN OF CHARACTER AND FIGURE

Hung-Sheng Wen, 5F, No. 87, Sung Chiang Rd., Taipei, Taiwan 10428

Filed Jan. 3, 1989, Ser. No. 292,994
Int. Cl.[5] G01D *11/26*
U.S. Cl. 362—26 15 Claims

1. A display for displaying figures and characters, comprising:

a power supply;

a lighting arrangement body;

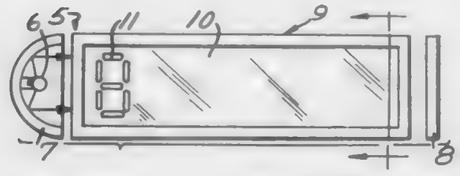
a light source, powered by the power supply, disposed on one end of the lighting arrangement body;

a reflecting mirror disposed on the other end of the lighting arrangement body for reflecting light from the light source;

a parabolic mirror disposed such that the light source is positioned at the focus thereof and such that light from the light source is reflected and emitted parallel into the body;

display means for displaying figures and characters;

a transparent rectangular cover plate pressing on the display means; and



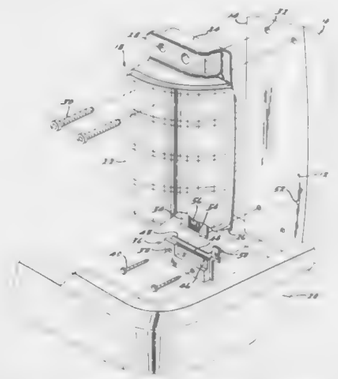
a thin refractive plate of arcuate cross-section provided within the lighting arrangement body, and outer surface thereof below the display means having a multiplicity of parallel strips each being serrated at 90 degrees and disposed parallel to light from the light source. an inner surface being smooth for light from the light source to be multi-reflected to product uniform and bright illuminating light for displaying the figures.

4,994,942

VEHICLE TAIL LIGHT CONSTRUCTION

Robert B. Georgeff, Ferndale, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 26, 1990, Ser. No. 569,306
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—80 4 Claims



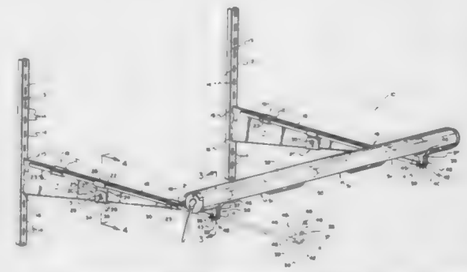
1. A tail light assembly for a vehicle wherein the lower portion of the tail light assembly is covered by vehicle bumper fascia structure, the tail light assembly including a main body portion having an upper end and a lower end, the upper end including opening means to receive fasteners for securing the upper end to a vehicle body structure, the lower end including a downwardly depending first tab, a bracket, the bracket having opening means to receive fasteners for securing the bracket to vehicle body structure in a position adjacent to the lower end of said main body portion, the bracket having a pocket to receive the first tab, the first tab having an opening therein, said lower end of the main body portion having a downwardly depending second tab positioned within said lastmentioned opening, the second tab being flexible and angled outwardly with respect to the first tab, the second tab including a tang, the bracket including detent means to receive the tang and yieldingly maintain the first and second tabs within the bracket pocket.

4,994,943

CANTILEVERED LIGHTING SYSTEM

John E. Aspenwall, 301 Draper La., Provo, Utah 84603

Filed May 14, 1990, Ser. No. 522,744
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—219 4 Claims



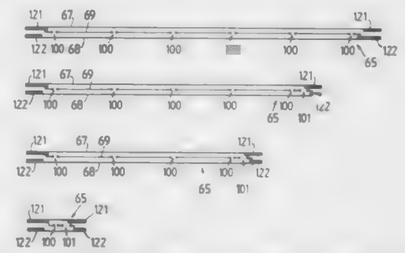
1. A cantilevered lighting system comprising: at least a pair of spaced apart support posts; a support bracket extending from each said support post, said support bracket having a top edge and a bottom edge angled with respect to said top edge; a support rod for each said support bracket; means for adjustably securing each said support rod to a support bracket, said means including at least a pair of spaced apart top clips, each having a hook for extending over the top edge of said support bracket and a passage through which said support rod is inserted and a lower bracket having a bore through which said support rod is inserted and a hook angled with respect to the bore to contain the bottom edge of said support bracket; an elongate light housing having at least one lamp therein; and means fixed to an end of each said support rod to attach to the light housing.

4,994,944

DECORATIVE LIGHTING SYSTEM

David R. Vernondier, Woking, England, assignor to Consumerville Limited, Shepperton, England

Filed Mar. 24, 1989, Ser. No. 328,455
Claims priority, application United Kingdom, Mar. 31, 1988, 8807752
Int. Cl.[5] F21V *1/00*
U.S. Cl. 362—238 14 Claims



1. A lighting system including a plurality of modular components comprising a plurality of elongate strips of different finite lengths, each strip having an elongate lighting circuit extending along the strip, which lighting circuit provides a pair of voltage supply lines extending along the length of the strip and ann electrical connecting line for connecting at least one illuminating device in parallel between said pair of voltage supply lines, said lighting circuit of at least one of said strips being

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adapted to connect at least one predetermined resistor in series with said at least one illuminating device thereof so that the total electrical resistance of said at least one illuminating device and said at least one resistor of each of the strips is substantially the same to provide a set of voltage compatible elongate strips; connector means for engaging juxtaposed ends of said strips to connect the strips end to end, said connector means comprising at least one connector element for location between a pair of adjacent strips and having means for resiliently gripping each of said juxtaposed ends of the strips and means for making an electrical connection between the voltage supply lines at the adjacent ends of said electrical lighting circuits associated with the strips; and a voltage supply connector means for connecting to one end of one of said strips to provide an electrical connection between the voltage supply lines associated with that particular strip and a voltage supply.

4,994,945

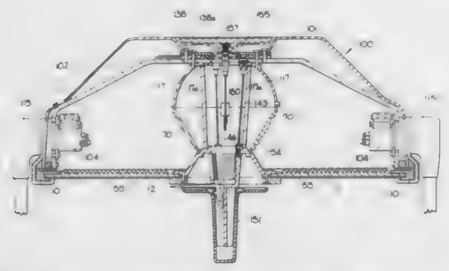
LAMP SYSTEM FOR OPERATING THEATRES AND THE LIKE

Donald C. O'Shea, Atlanta, Ga.; James L. Oliver, Asheville, N.C., and James L. Sketo, Stockbridge, Ga., assignors to Kirschner Medical Corporation, Timonium, Md.

Continuation-in-part of Ser. No. 302,566, Jan. 26, 1989, Pat. No. 4,937,715. This application Dec. 22, 1989, Ser. No. 456,102

Int. Cl.[5] F21V *13/00*

U.S. Cl. 362—268 **7 Claims**



1. In a lamp providing uniform luminosity in an area to be illuminated, such as an operating theatre and the like, and comprising a light source, a planar circular prism field, said planar circular prism field having a substantial number of radial sectors containing a plurality of transverse, outwardly curved prisms, the curvature of said prisms of said sectors varying such that the curvature of the prisms toward the center of said planar circular prism field is greater than the curvature of those prisms toward the periphery of said planar circular prism field, said radial sectors of said planar circular prism field being held together by attachment to one another, a toroidal lens system rendering the light emanating from said light source substantially columnar and directing said light onto said planar circular prism field, the improvement comprising a conical Fresnel lens, molded of plastic, and constituting the lens portion of said toroidal lens system.

4,994,946

MOVABLE REFLECTING RAY TRANSMITTER

Yoshiro NakaMats, 1-10-1150 Minami Aoyama, 5-chome, Minato-ku, Tokyo, Japan

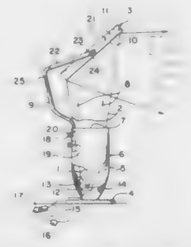
Division of Ser. No. 253,449, Oct. 4, 1988, Pat. No. 4,933,822, which is a continuation-in-part of Ser. No. 44,930, May 1, 1987, abandoned. This application Dec. 12, 1989, Ser. No. 449,681

Claims priority, application Japan, Nov. 15, 1986, 61-270874

Int. Cl.[5] F25V *29/00*

U.S. Cl. 362—282 **4 Claims**

1. A lighting device comprising a hollow body having a cylindrical portion and a closure portion, said cylindrical portion having a longitudinal vertical axis, one longitudinal end of said cylindrical portion being open, said closure portion having a closed end, an open end joined to the other end of said cylindrical portion, and a surface inclined radially inwardly from said open end to said closed end of said closure portion, a light source means mounted within said body longitudinally inwardly of said open end of said cylindrical portion including a light bulb located above the inclined surface of said closure portion, mounting means mounted on said body and extending externally of said body, reflecting means movably mounted on said mounting means in a position spaced from said open end of said cylindrical portion and generally aligned with said longitudinal axis of said cylindrical portion such that the light radiated from said light bulb passes to said reflecting means to be reflected by said reflecting means, and ventilation means in said inclined surface of said closure portion disposed below said light bulb for admitting a flow of ambient air into said body below said light bulb, said light bulb heating the air admitted into said body such that said heated air flows generally longitudinally in said body to exit upwardly from said open end of said cylindrical portion as further ambient air is



drawn into said body below said light bulb through said ventilation means, whereby the lighting device is cooled by said flow of air upwardly through said body, said ventilation means comprising a plurality of spaced openings in said inclined surface of said closure portion, said body and said ventilation means being constructed and arranged to provide a chimney effect for air flow from said ventilation means to said open end of said cylindrical portion of said body when heated by said light bulb, said mounting means comprising arm means and fastening means fastening said arm means to said cylindrical portion, said arm means having a fastening section extending into said cylindrical portion, said fastening means fastening said fastening section to the inside of said cylindrical portion, said arm means having an extending section extending from said fastening section, said extending section extending in a direction generally radially outwardly of said cylindrical portion of said body such that said extending section is disposed outside the path of air flowing from said open end of said cylindrical portion.

4,994,947

REFLECTOR AND LIGHTING FIXTURE COMPRISING SAME

Donald G. Fesko, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 20, 1989, Ser. No. 438,559

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—297 **16 Claims**

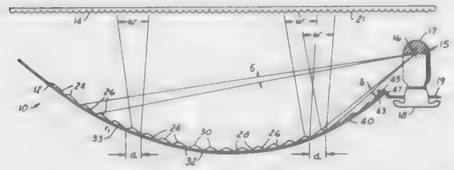
1. A lighting unit comprising a light emitting element, a reflector having a generally concave surface exposed to said light emitting element and a generally planar lens spaced from said reflector, at least a portion of said concave surface being a series of facets, each said facet having a reflective surface area exposed to said light emitting element and a back surface area extending approximately from the outer edge of the reflective surface area of that facet to the inner edge of the reflective surface area of the adjacent facet and lying in a plane substantially parallel to the direction of travel of light from said light source location to the intersection of said back surface area

with the reflective surface area of said adjacent facet, each said reflective surface area being

(a) convex with a substantially constant radius of curvature,

(b) oriented to reflect light through said lens in a direction approximately normal to the plane of said lens, measured approximately at its midpoint of convex curvature,

(c) laterally larger than that of the facet next closest to said light emitting element, intercepting an angle δ of light from said light emitting element wherein δ is the same for



all said facets, while the lateral dimension, d, of each said facet, being the sum of the lateral dimensions of the back surface area and of the reflective surface area of said facet, is equal to that of the other said facets, and

(d) sufficiently convex to cause substantial overlapping at said lens, laterally, of light reflected by it to said lens with light reflected by the reflective surface area of adjacent facets, the lateral dimension, w, at said lens of the light from said reflective surface area being larger than d.

4,994,948

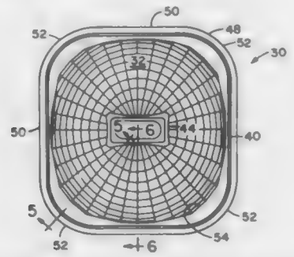
CONCAVE LIGHT REFLECTOR

Stephen L. Cooch, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Apr. 16, 1990, Ser. No. 509,132

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—346 **8 Claims**



1. In a bowl-shaped, concave reflector, for assembly with a lamp to provide light reflection, wherein the reflector has an inner surface that converges from a large, front opening to a small, rear opening adapted to receive a lamp base, the large, front opening being bordered by a peripheral rim composed of four corner zones and four side zones alternating therewith, the width of the rim in the four corner zones being greater than that of the intermediate side zones and the wall of the reflector having four flattened zones that are adjacent the four side zones of the rim, whereby the reflector has the exterior appearance of a four sided body.

4,994,949

STRETCHING DEVICE FOR A PLEATED LAMPSHADE

Chao H. Yeh, and Chao K. Yeh, both of 3F-1, No. 28, Lane 265, Sec. 4, Sin Yi Rd., Taipei, Taiwan

Filed Jul. 14, 1989, Ser. No. 380,023

Int. Cl.[5] F21V *1/06*

U.S. Cl. 362—352 **1 Claim**

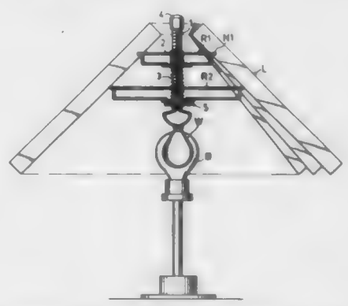
1. A stretching device for stretching a pleated lampshade, comprising:

a threaded spindle;

a first ring coaxially mounted on said spindle, said first ring exerting an upward and outward force on the inner side of said lampshade;

a coil spring axially received on said spindle, with its lower end urging against said first ring;

a second ring having a smaller diameter than said first ring



and mounted coaxially on said spindle in a vertically spaced-apart relationship from said first ring;

an adjusting nut mounted on said spindle above said second ring, wherein each pleat of said lampshade is provided with a notch into which said second ring is inserted;

and wherein said second ring is axially slidably retained on said spindle, while an upper end of said coil spring urges said second ring against said adjusting nut.

4,994,950

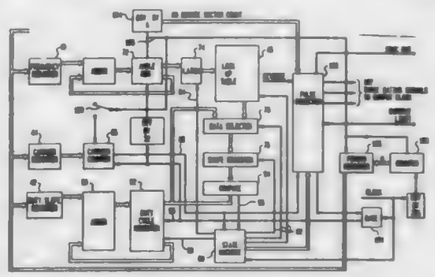
WAVEFORM GENERATOR FOR INVERTER CONTROL

David J. Gritter, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1990, Ser. No. 560,112

Int. Cl.[5] H02M *7/5387*

U.S. Cl. 363—41 **6 Claims**



1. In a control for an inverter for supplying pulse width modulated voltage from a DC bus to a three phase variable frequency induction motor having a microcontroller for determining desired motor operation by outputting frequency, carrier period and duty cycle parameters, and a waveform generator responsive to said parameters for commanding voltage vectors for inverter control, the waveform generator comprising:

holding registers for each of the frequency, carrier period and duty cycle parameters;

carrier period means responsive to the carrier period parameter for generating a carrier signal at each half period;

a look up table containing two sets of sine functions;

a state machine for sequentially assuming a plurality of states in each carrier period and for commanding a specific voltage vector for each state, the state machine having an

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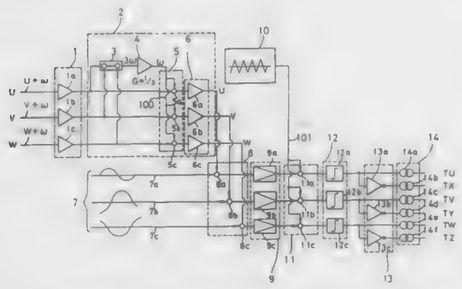
address associated with each state for selecting which set of sine functions to address;
means for generating angle values from the frequency parameter, and for addressing the look up table on the basis of the angle value and the state machine address to select a sine value;
means responsive to the duty cycle parameter for producing a ramp signal having a slope determined by the duty cycle parameter;
comparator means for comparing the ramp signal with the selected sine value to produce a signal when the ramp signal reaches the value of the selected sine value;
the state machine including transition means responsive to the comparator means signal and the carrier signal for changing from one state to another, whereby a sequence of voltage vectors are commanded by the state machine at a rate determined by the frequency parameter and each having a duration depending on the selected sine value and the slope of the ramp signal; and
means responsive to the means for generating angle values and to the commanded voltage vectors for issuing switching signals to the inverter.

4,994,951

PWM INVERTER CONTROL UNIT

Masao Iwasa, Chiba, and Yasutami Kito, Aichi, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 20, 1989, Ser. No. 340,988
Claims priority, application Japan, Apr. 21, 1988, 63-99226
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—41 **2 Claims**



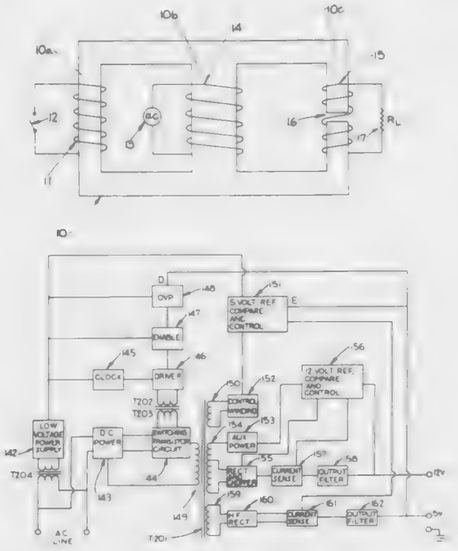
1. An apparatus for controlling an inverter, comprising:
detection means responsive to inverter output signals, each of said inverter output signals having a fundamental component and harmonic components, for detecting an inverter output fundamental component and providing a fundamental signal, including
a summing means, responsive to output signals from the inverter and providing a summed inverter harmonic signal, which signal is the sum of the inverter output signals;
an amplifier, responsive to said summed inverter harmonic signal having a gain equal to the inverse ratio of the number of inverter output signals, and providing a harmonic signal equal to the harmonic signal of only one of any said inverter output signals;
a subtracting means, responsive to said harmonic signal and each of the individual inverter output signals, for subtracting and harmonic signal from each of said inverter output signals and providing a fundamental signal of each of said inverter output signals;
comparing means responsive to said fundamental signal for comparing said fundamental component to an inverter command signal and providing a difference signal having a magnitude indicative of the difference therebetween; and
means responsive to said difference signal for producing pulse-width-modulated (PWM) signals for controlling said inverter.

4,994,952

LOW-NOISE SWITCHING POWER SUPPLY HAVING VARIABLE RELUCTANCE TRANSFORMER

Donald M. Silva, West Lafayette; LeRoy F. Silva, Lafayette, and Fred M. Fehsenfeld, Sr., Indianapolis, all of Ind., assignors to Electronics Research Group, Inc., West Lafayette, Ind.

Continuation-in-part of Ser. No. 154,863, Feb. 10, 1988, Pat. No. 4,876,638. This application Sep. 20, 1989, Ser. No. 410,142
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.[5] H02M *7/538, 3/337*
U.S. Cl. 363—56 **11 Claims**



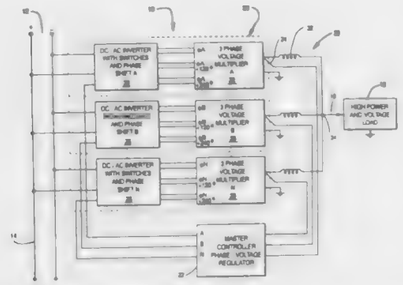
1. A low noise switching power supply for producing a regulated output voltage from an unregulated supply to a load, comprising:
(a) a transformer including:
i. a transformer core including first, second and third core legs;
ii. a set of transformer windings associated with said transformer including:
a. a control winding associated with said first core leg;
b. a primary winding associated with said second core leg; and
c. a load winding associated with said third core leg for producing said output voltage; and
(b) control means for controlling said output voltage comprising:
i. switching means responsive to said unregulated supply for providing an oscillating voltage of substantially constant frequency to said primary winding;
ii. means for comparing the actual output voltage produced at said load winding with a reference representative of the desired output voltage value to produce an error signal representative of the difference between said actual output voltage and said reference; and
iii. means responsive to said error signal for short circuiting said control winding as required to maintain said output voltage at said desired value.

4,994,953

DC POWER SUPPLY FOR HIGH POWER APPLICATIONS

David A. Haak, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 15, 1989, Ser. No. 393,717
Int. Cl.[5] H02M *3/00, 7/10*
U.S. Cl. 363—71 **24 Claims**



1. A DC power supply comprising:
a plurality of DC to DC converters, each converter converting a multiple phase AC potential to a DC output potential containing an undesired AC component, each DC to DC converter comprising a DC to AC inverter for converting a DC input into a multiple phase output with each phase of an inverter being phase displaced with respect to a phase of another inverter by the angle θ, the time reference controlling on-off switching points of inverter switches contained within the inverter;
means for combining the DC output potential of each converter into a combined DC output potential and arithmetically cancelling the undesired AC component;
a controller for producing a time reference applied to each of the converters to set an angular relationship of each of the phases of each converter with respect to the applied time reference, the time reference of each of the converters being spaced apart from a time reference of another of the converters by an angle

$$\theta = \frac{360^\circ}{6n}$$

wherein n is equal to 2^x where x is an integer and n is the number of converters;
a plurality of multiple phase voltage multipliers, a different multiplier being coupled to the multiple phase output of each inverter for producing a combined DC multiplier output potential greater in magnitude than the magnitude of the multiple phase input to the multiplier; and wherein
the means for combining combines the DC multiplier output potentials of the multiple phase voltage multipliers into the combined DC output potential.

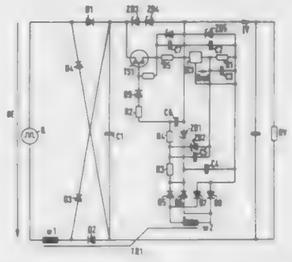
4,994,954

CONTROL CIRCUIT FOR REGULATING A CURRENT FLOW THROUGH A LOAD AND USE THEREOF

Hanspeter Katz, Stuttgart, and Franz Ohms, Oberrot, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 2[illegible], 1989, Ser. No. 454,014
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843260
Int. Cl.[5] H02M *7/155*
U.S. Cl. 363—89 **13 Claims**

1. In a circuit wherein the output of an AC voltage source is rectified by a first rectifier and thereafter supplied as direct current via a regulator means to a load, and wherein a current sensor positioned between the first rectifier and the AC voltage source provides first potential free, i.e., floating potential, output signal proportional to the load current, the improvement characterized by:
the regulator means including a control element in series with the load and having at least one load terminal and one control terminal;
means for rectifying the output of the current sensor;
a first circuit including a series connection of a first constant voltage element, an auxiliary voltage regulator and a first current measuring resistor; said first circuit receiving the output from said current sensor rectifying means, the



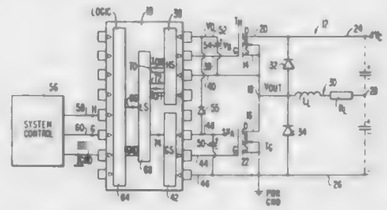
junction of the first constant voltage element and the auxiliary voltage regulator operably connected to one of the load current conducting terminals of the control element; and
a second circuit including a series connection of a second constant voltage element, a resistor, and said first current measuring resistor; said second circuit also receiving the output from said current sensor rectifying means, the junction of the resistor and the second constant voltage element connected to the control terminal of the control element.

4,994,955

HALF-BRIDGE DRIVER WHICH IS INSENSITIVE TO COMMON MODE CURRENTS

Franciscus A. C. M. Schoofs, Valkenswaard, Netherlands, and Armin F. Wegener, Aachen, Fed. Rep. of Germany, assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 29, 1989, Ser. No. 459,095
Int. Cl.[5] H02M *7/521*
U.S. Cl. 363—95 **15 Claims**



1. A device for controllably driving a half-bridge including a high side switch means and a low side switch means, said high side switch means coupled to an output of the half-bridge and having a drive input, said device including a high side driver comprising:
a high side drive output for coupling to the drive input of said high side switch means for selectively placing said high side switch means in an ON state or an OFF state;-
means for receiving high side control currents in two lines, each line having its own sense resistors in series with said each line; and
differential means coupled between said sense resistors and said high side drive output for controlling the state of the

high side switch means in response to the difference between the voltages at said sense resistors within an operational dynamic range;

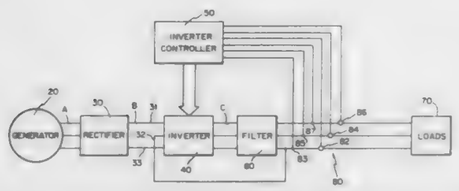
whereby substantial operational immunity is provided to common mode currents injected in said lines by parasitic capacitance.

4,994,956

ENHANCED REAL TIME CONTROL OF PWM INVERTERS

Maurice A. Kirchberg, Jr., Dubuque, Iowa, and Alexander Cook, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 25, 1990, Ser. No. 514,666
Int. Cl.[5] H02M *7/48*
U.S. Cl. 363—95 **3 Claims**



1. A controller for an inverter of the type including a source of d.c. voltage, inverter switches controlled by the controller to chop said d.c. voltage to generate a pulse width modulated pattern to produce a generally sinusoidal output, said controller selecting from a plurality of stored switching angle sets an initial switching angle set for controlling said inverter switches based on sensed parameters at an output of said inverter, comprising:

means for computing an AxB sensitivity matrix, where A is the number of controlled harmonics, and B is the number of independent switching angles in a switching angle set, the elements of said matrix representing sensitivity to change of controlled harmonics with respect to individual switching angles

means for computing an unbalance vector, said unbalance vector being a function of the harmonic coefficients of the output of the inverter for the controlled harmonics;

means for determining whether said unbalance vector is less than a predetermined threshold; and

means responsive to said sensitivity matrix and said unbalance vector for adjusting individual ones of said switching angles when said unbalance vector is greater than said predetermined threshold.

4,994,957

SYSTEM FOR SIMULTANEOUSLY DISPLAYING ALL LADDER DIAGRAM SEGMENTS IN WHICH AN OPERATOR DESIGNATED RELAY APPEARS AS AN INPUT OR OUTPUT

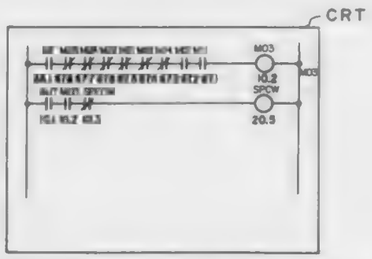
Hidetsugu Komiya, and Shinichi Isobe, both of Hino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 797,784, Nov. 13, 1985, abandoned, which is a continuation of Ser. No. 474,342, Mar. 11, 1983, abandoned. This application Apr. 22, 1987, Ser. No. 41,618
Claims priority, application Japan, Mar. 11, 1982, 57-38568
Int. Cl.[5] G06F *3/14*; G05B *19/05*
U.S. Cl. 364—147 **7 Claims**

1. A method of displaying a ladder diagram having segments in a numerical control system wherein sequence processing is executed based on a sequence program to deliver commands from a numerical control device to a machine and signals from the machine to the numerical control device, the sequence program being displayed on a display unit in the form of the ladder diagram segments composed of relays and other ladder diagram elements, said method comprising the steps of:

(a) entering data, a single time, specifying a predetermined relay composed of a relay identification symbol or a memory address storing a logical state of said relay;

(b) retrieving the numerical control device sequence program instructions segments including the specified relay as both input and output relays using said data; and


CRT
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secondary element physical system address with an address from said system address transfer means,

a counter for receiving said clock signal and said synchronization signal from said primary element, for synchronization of said secondary element counter to said primary element counter, and for receiving said selectable interrupt priority address signal from said logical address register for providing a counter output signal according to the number of received clock signals and the received selectable interrupt priority address signal,

means for providing an interrupt initiate signal,

interrupt request means, for providing said interrupt request signal to said primary element upon the occurrence of said interrupt initiate signal and the concurrence of said secondary element counter output signal with said interrupt initiate signal, wherein said primary element means for storing said primary element counter output count is responsive to said interrupt request signal for storing the output count of said primary element counter upon receipt of said interrupt request signal, and

means for storing a selected interrupt vector, and for providing said stored interrupt vector to said primary element upon the equivalence of said primary element counter output count with said selected interrupt priority address, for providing said stored interrupt vector to said primary element for servicing said interrupt request from said secondary element.

4,994,961

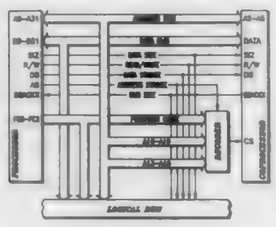
COPROCESSOR INSTRUCTION FORMAT

Douglas B. MacGregor; John Zolnowsky, and David Mothersole, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 889,591, Jul. 25, 1986, Pat. No. 4,715,013, which is a continuation of Ser. No. 485,676, Apr. 18, 1983, abandoned. This application Sep. 18, 1987, Ser. No. 98,441

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—200 **1 Claim**





1. In a coprocessing system in which a general purpose data processor and each of a plurality of special purpose coprocessors are coordinated by address and data buses wherein the general purpose data processor coordinates execution by a selected one of the plurality of special purpose coprocessors of a single instruction of a selected program, when said single instruction is received by said processor for execution by that processor during the processing of said selected program, the processor and coprocessors cooperating in said coprocessing system wherein the processor and coprocessors follow different and independent instruction streams, wherein the processor includes means for executing said single instruction and comprises:

first means coupled to said address and data buses for receiving a coprocessor identifier bit field containing a selected one of a plurality of coprocessor identifier values, and means for decoding said identifier bit field to identify to said processor a selected one of said plurality of coprocessors with which said processor is to cooperate in the execution of said single instruction;

second means coupled to said address and data buses for receiving a command select bit field containing a selected one of a plurality of command select values, and said means for decoding also decoding said command select bit field to select a predetermined one of a plurality of functions to be executed by said selected coprocessor;

third means coupled to said address and data buses for receiving an operation code bit field containing a predetermined operation code value and said means for decoding also decoding said operation code bit field to transfer said command select value to said selected coprocessor;

fourth means coupled to said address and data buses responsive to said means for decoding to transfer said command select value to said selected coprocessor for selectively performing any of a plurality of predetermined tasks in response to the operation code bit field of the third means in support of the execution by said coprocessor of the function selected by said command select value.

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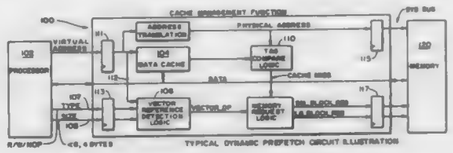
VARIABLE LENGTH CACHE FILL

Paul Magean, Townsend, Mass., and John S. Yates, Nashua, N.H., assignors to Apollo Computer Inc., Chelmsford, Mass.

Filed Oct. 28, 1988, Ser. No. 264,260

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—200 **10 Claims**



1. A method of selectively receiving and storing data blocks of selected lengths of data from a main memory, into a cache memory said method comprising the steps of:

requesting a transfer of data between a processor and a cache memory, the data having a corresponding indicia and at least one of a first and a second length;

determining if said indicia corresponding to the data to be transferred indicates the presence of the data in said cache;

determining if a virtual address transferred with the data corresponds to a physical main memory location that is an integer multiple of a given number of bytes, if said data is not present in said cache;

selectively transferring from said main memory to said cache a data block of one of a third and a fourth length in response to determining if said virtual address transferred with the data corresponds to a physical main memory location that is an integer multiple of said given number of bytes, wherein

said second length is greater than said first length,

said fourth length is greater than said third length,

said third length is a higher multiple of said second length, and

said data block of said fourth length is transferred into said cache memory if data of said second length is requested and if said virtual address transferred with the data corresponds to a physical main memory location that is an integer multiple of said given number of bytes.

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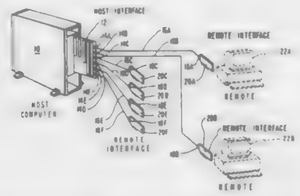
SYSTEM AND METHOD FOR SHARING RESOURCES OF A HOST COMPUTER AMONG A PLURALITY OF REMOTE COMPUTERS

Randall J. Rorden, Orem; Ronald B. Arthur, Provo; Michael E. Rex, Orem; Darryl J. Stewart, Provo; Mark Muhlestein, Orem, and Dennis A. Fairclough, Orem, all of Utah, assignors to Icon Systems International, Inc., Orem, Utah

Filed Nov. 1, 1988, Ser. No. 266,381

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—200 **43 Claims**



1. A high speed digital communication system for linking a first digital processor connected to a first bus and a second digital processor connected to a second bus, the system comprising:

first port means for presenting digital data in a parallel configuration;

first control means for conveying digital data between the first bus and the first port means;

second port means for presenting digital data in a parallel configuration;

memory means for receiving all digital data presented to the second port means destined for the first digital processor and for receiving all data presented on the first bus destined for the second digital processor;

second control means for directing flow of designated data among the second port means, the memory means, and the second bus; and

interconnecting means for establishing a parallel digital communication path between the first port means and the second port means for rapidly transferring digital data between the first bus and the second bus to permit high speed communication between the first and second digital processors.

4,994,964

TRANSACTION TRACKING DATA PROCESSING SYSTEM

Larry Wolfberg, Honolulu, Hi.; Brent A. Wolfberg, Los Angeles, Calif., and Jan E. Rhoads, Virginia Beach, Va., assignors to L & C Family Partnership

Filed Apr. 16, 1987, Ser. No. 39,196

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—408 **27 Claims**

1. A transaction tracking data processing system comprising:

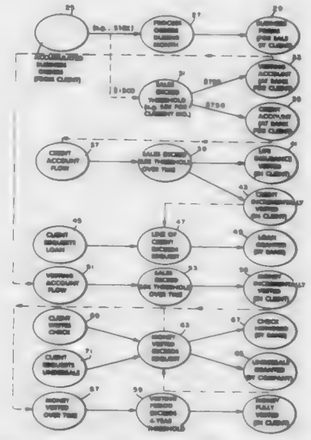
a data entry means for entering client business sales order data and client account identification data;

memory means for storing business sales order data in a plurality of client account files, each client account file being identifiable by said client account identification data;

central processing control means for processing said business sales order data, said control means including means for accessing at least one of said client account files and for retrieving client business sales order data relating to a predetermined time period, means for determining a cumulative business sales order related total for said predetermined time period for a plurality of client accounts, means for comparing a predetermined sales order related threshold with said sales order related total;

means for determining a predetermined percentage of said business sales order total for said predetermined time period, and

means, responsive to said means for comparing, for storing in said memory means an indication of an amount of funds



to be credited to at least one client account corresponding to said predetermined percentage of the business sales order total for said predetermined time period when said client business sales order total exceeds said predetermined threshold,

wherein said control means further includes control status word means including at least one control status word having a plurality of bit positions each defining a state of said one control status word, each bit position being indicative of a predetermined control state, said control means including means for controlling the program execution sequence depending upon the states of said at least one control status word.

4,994,965

METHOD FOR REDUCING MOTION INDUCED IMAGE ARTIFACTS IN PROJECTION IMAGING

Carl R. Crawford, Milwaukee, and Norbert J. Pelc, Wauwatosa, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 23, 1988, Ser. No. 276,249

Int. Cl.[5] G06G *7/60*

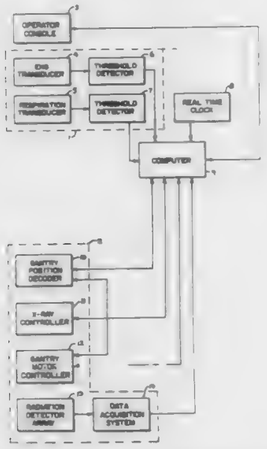
U.S. Cl. 364—413.15 **8 Claims**

1. A method for reducing image artifacts in an image object resulting from periodic motion of the object, where the image is produced from a projection set taken continuously during an acquisition period along a plurality of projection axes about the object, the periodic motion having a quiescent period during which the periodic motion is at a minimum, the quiescent period being less than the acquisition period, said method comprising:

producing a signal indicative of said periodic motion;

producing a series of reference signals which indicate a pre-established point in each of a series of said periodic motions;

relating the quiescent period to the pre-established point in each reference signal;



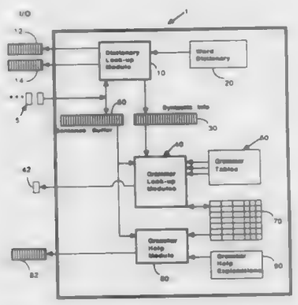
starting the acquisition period at a time related to the reference signal so that the acquisition period for the projection set is centered around the quiescent period.

4,994,966

SYSTEM AND METHOD FOR NATURAL LANGUAGE PARSING BY INITIATING PROCESSING PRIOR TO ENTRY OF COMPLETE SENTENCES

Sandra E. Hutchins, Del Mar, Calif., assignor to Emerson & Stern Associates, Inc., San Diego, Calif.

Filed Mar. 31, 1988, Ser. No. 176,133
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—419 54 Claims



1. A language parsing system for processing a string of words, comprising:

means for entering into the system strings of characters comprising words;

means for assigning syntax tags to entered words;

parsing means for grouping syntax tags of entered words into phrases according to a first set of predetermined grammatical rules relating the syntax tags to one another;

checking means for verifying the conformance of sequences of the phrases to a second set of predetermined grammatical rules relating the phrases to one another; and

control means for coordinating the assigning means, parsing means and checking means;

wherein the system processes each word of the word string upon entry of such word.

19. In a digital computer for processing information, a language parsing system for processing a sentence of at least one word, comprising:

means for entering characters comprising the words of the sentence into the system;

means for locating syntax tags of entered words in a dictionary lookup table as each word is entered;

means for deducing syntax tags for words not found in the dictionary, wherein the syntax tags are deduced from the words not found in the dictionary;

parsing means for locating phrases associated with the entered words in a first lookup table mapping sequences of syntax tags into phrases, wherein the phrases are located as each word is entered;

combining means for combining phrases by locating phrases combinations in a second lookup table mapping sequences of phrases into phrase combinations;

checking means for verifying, as each word is entered, the conformance of sequences of the phrase combinations and phrases not combined into the phrase combinations to a set of predetermined grammatical rules relating phrases and phrases combinations to one another, the checking means being responsive to the combining means; and

control means for coordinating operation of the locating means, the deducing means, the parsing means, the combining means and the checking means.

4,994,967

INFORMATION RETRIEVAL SYSTEM WITH MEANS FOR ANALYZING UNDEFINED WORDS IN A NATURAL LANGUAGE INQUIRY

Satoshi Asakawa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1989, Ser. No. 295,758
Claims priority, application Japan, Jan. 12, 1988, 63-5073
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 5 Claims



1. In an information retrieval system adapted to perform information retrieval in response to an inquiry sentence inputted in natural language, by carrying out a semantic analysis of the natural language inquiry sentence by means of a semantic analysis unit, and by producing a retrieval condition from a result of said semantic analysis, the improvement comprising:

undefined word processing means for classifying an undefined word in the inputted inquiry sentence in accordance with a process of producing a retrieval condition from a semantic analysis of another word in the inquiry sentence, said undefined word being a word unregistered in a dictionary and incapable of direct semantic analysis; and

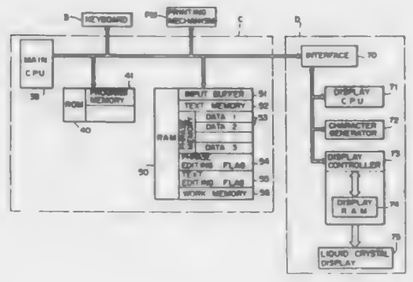
display processing means for displaying a message based on a result of classifying the undefined word by said undefined word processing means.

4,994,968

WORD PROCESSING DEVICE

Kumiko Kato, and Chiharu Hori, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 27, 1990, Ser. No. 499,803
Claims priority, application Japan, Mar. 30, 1989, 1-78960
Int. Cl.[5] G06F *15/40*
U.S. Cl. 364—419 19 Claims



1. A word processing device capable of registering character phrases with abbreviated phrase names, said device comprising:

phrase name data input means for inputting said registered phrase name;

formatting means for inputting formatting codes for formatting said phrase name inputted through said phrase name input means; and

replacing means for replacing said phrase name inputted through said phrase name input means with registered phrase text data corresponding thereto and for formatting said registered phrase in accordance with any formatting codes inputted through said formatting means in such a fashion that said phrase, when converted, is formatted in accordance with the formatting codes set by said formatting means.

8. A word processing device comprising:

register means for registering character phrases with abbreviated phrase names, respectively;

phrase name text input means for inputting one of said registered phrase names in capital or small letters;

discriminating means for discriminating whether said registered phrase name text inputted through said phrase name input means is with capital letter or with small letter; and

replacing means for replacing said phrase name text inputted through said phrase name input means with the letter type discriminated by said discriminating means.

13. A word processing device comprising:

phrase register means for registering character phrases with abbreviated names:

phrase name text input means for inputting one of said registered phrase names in capital or small letters;

formatting means for inputting formatting codes for formatting said phrase name text inputted through said phrase name input means;

discriminating means for discriminating whether said registered phrase name text inputted through said phrase name input means is with capital or with small letters; and

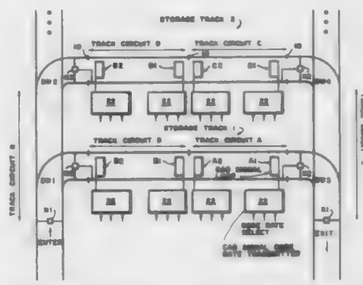
replacing means for replacing said phrase name text inputted through said phrase name input means with a registered phrase text data corresponding thereto with the letter type discriminated by said discriminating means, and for formatting said registered phrase in accordance with the formatting codes inputted by said formatting means.

4,994,969

AUTOMATIC YARD OPERATION USING A FIXED BLOCK SYSTEM

William A. Petit, Spencerport, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Dec. 27, 1989, Ser. No. 457,660
Int. Cl.[5] G06F *7/70, 15/48;* G06G *7/70, 7/76*
U.S. Cl. 364—424.01 6 Claims



1. A fixed block system for automatic operation of rapid transit vehicles in a railway yard, each of said vehicles having a receiver means which is responsive to information communicated thereto and control means responsive to said receiver means for controlling the continued operation of said vehicles, said system further including:

a first entry/exit track circuit having at least one transmitting means for transmitting vehicle control information to vehicles within its section of said first entry/exit track circuit, and at least one switching means for reversing said first entry/exit track circuit;

a second entry/exit track circuit having at least one transmitting means for transmitting vehicle control information to vehicles within its section of said second entry/exit track circuit, and at least one switching means for reversing said second entry/exit track circuit;

at least two storage tracks disposed between said first entry/exit track circuit and said second entry/exit track circuit, each storage track having at least two storage track circuits, each of which is slightly longer than a vehicle length, each said storage track circuit having at least one transmitting means for transmitting vehicle control information to vehicles within said storage track circuit; and

a computer capable of sending commands to each of said transmitting means to allow said vehicles to operate.

4,994,970

WORKING ROBOT

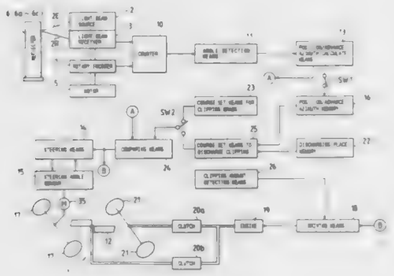
Akio Noji; Toru Takeda; Makoto Imada, and Kenji Kamimura, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

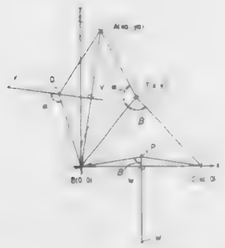
Filed Jul. 24, 1989, Ser. No. 383,496
Claims priority, application Japan, Aug. 16, 1988, 63-202697
Int. Cl.[5] G05B *19/42*
U.S. Cl. 364—424.02 5 Claims

1. A moving type working robot comprising a vehicle that moves within a working region defined by at least three reference points disposed adjacent a periphery of said working region, said vehicle having first detecting means for detecting a position of said vehicle relative to said reference points, said first detecting means including means for detecting an advance direction of said vehicle with respect to said reference points, first control means on said vehicle for controlling a travelling direction of said vehicle on a basis of information from said first detecting means, said vehicle being operative to perform a predetermined working operation as it moves within said working region and being loaded with a material whose amount changes with progress of said predetermined working

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operation, second detecting means on said vehicle for detecting the amount of said material loaded on said vehicle, said second detecting means being operative to provide an output which indicates that the amount of said material loaded on said vehicle has changed to a predetermined value, means for stopping the working operation of said vehicle in response to said output from said second detecting means during said working operation, memory means for storing the position and the travelling direction of said vehicle with respect to said reference points when said working operation is stopped, means for





storing the position of an accumulating/replenishing place where the material loaded on said vehicle is to be accumulated or replenished, means for setting a travelling course extending between the position at which the working operation was stopped and the position of said accumulating/replenishing place, and second control means on said vehicle for travelling said vehicle along said travelling course from said position at which the working operation was stopped to said accumulating/replenishing place where the material loaded on the vehicle is to be accumulated or replenished.

4,994,971

SYSTEM FOR SETTING UP AND KEEPING UP-TO-DATE DATAFILES FOR ROAD TRAFFIC

Theo J. Poelstra, Klokkengietershoeve 104, 7326 SC Apeldoorn, Netherlands

Continuation-in-part of Ser. No. 112,569, Aug. 5, 1987, abandoned. This application Jan. 6, 1989, Ser. No. 295,176

Claims priority, application Netherlands, Dec. 6, 1985, 8503378; European Pat. Off., Dec. 23, 1985, 85202132.8; PCT Int'l Appl., Dec. 2, 1986, PCT/EP86/00731

Int. Cl.[5] G01B *11/30*

U.S. Cl. 364—424.04 **4 Claims**

1. A road inventory system comprising a mobile unit and a stationary unit;

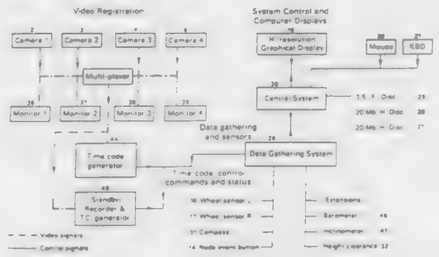
wherein said mobile unit includes a vehicle used for surveying a geographic area of interest, said vehicle having:

metric data base means for delivering digital topographical information relating to the area to be surveyed;

a plurality of video cameras which are operated in a continuous manner to make video pictures of respective parts of the area to be surveyed, said cameras being connected to a video recording apparatus via a multiplexer so as to record video frames from said cameras in a given alternation on a single first recording medium, together with address signals for individually identifying each of said frames, said recording taking place under control of a time base; and

a data recording apparatus connected to said data base means and to external sensing means for sensing vehicle motion parameters, including the length, direction and inclination of the route followed by said vehicle, said data recording apparatus recording, under control of said time base, on a second recording medium relevant data from said data base means together with output information of said sensing means, said apparatus producing respective address signals for identifying corresponding video frames on said first recording medium;

wherein said stationary unit includes:



video display means for reproducing, on a plurality of display screens, the video information on said first recording medium via a de-multiplexer, the latter separating the video frames recorded on said medium into individual series each corresponding to the video camera from which the frames in question originated;

data reproducing means for reproducing the data recorded on said second recording medium, and for storing said data in a data inventory system, the addresses stored therein being used for selecting the corresponding video information on said first recording medium; and

data processing means for combining and recording, on a suitable third recording medium, a selection of said video and data information originating from said first and second recording media.

4,994,972

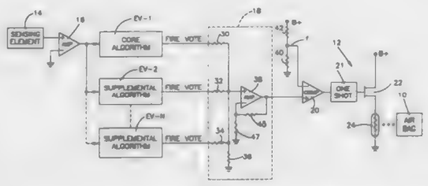
APPARATUS AND METHOD EMPLOYING MULTIPLE CRASH EVALUATION ALGORITHMS FOR ACTUATING A RESTRAINT SYSTEM IN A PASSENGER VEHICLE

Robert W. Diller, Pasadena, Calif., assignor to TRW Technar Inc., Irwindale, Calif.

Filed Nov. 6, 1989, Ser. No. 432,801

Int. Cl.[5] G06F *7/70;* **B60R** *21/32, 21/00*

U.S. Cl. 364—424.05 **9 Claims**



1. Apparatus for actuating a passenger restraint system in a passenger vehicle, comprising:

sensor means for sensing vehicle deceleration and providing a deceleration signal having a value which varies in accordance therewith;

a plurality of crash evaluation circuits each responsive to said deceleration signal for evaluating said deceleration signal in accordance with respectively different crash evaluation algorithms, each said evaluation circuit having a vote and each providing a vote signal when its evaluation of the deceleration signal indicates that the restraint system should be actuated;

summing means for summing said vote signals to provide a summation signal having a fractional value dependent upon the ratio of the number of vote signals to the total number of evaluation votes; and,

means for providing a trigger signal for actuating said restraint system when the value of said summation signal exceeds that of a threshold level.

4,994,973

CONTROL SYSTEM FOR INDUSTRIAL USE VEHICLES

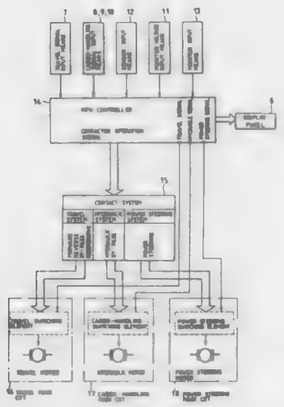
Noriaki Makino, Shiga, and Sampei Kikuchi, Kyoto, both of Japan, assignors to Nippon Yusoki Co., Ltd., Nagaokakyo, Japan

Filed Dec. 22, 1989, Ser. No. 454,975

Claims priority, application Japan, Dec. 28, 1988, 63-331098; Dec. 28, 1988, 63-331099

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—424.07 **18 Claims**



1. A control system for controlling an industrial use vehicle powered from a power source, comprising:

a travel signal input means for generating an output signal indicative of the position of a travel accelerator;

cargo-handling signal input means for generating a cargo-handling output signal indicative of the position of cargo-handling signal input means;

a travel circuit for causing the vehicle to move in at least a forward direction and a reverse direction, the travel circuit outputting a signal indicative of the magnitude of a current flowing in a travel motor armature of a travel motor;

a cargo-handling circuit for causing cargo to be manipulated by the vehicle; and

a controller for generating predetermined control signals to control the travel circuit and the cargo-handling circuit, the control signals being generated according to the output signals of said travel signal input means and said cargo-handling signal input means, the controller causing the travel circuit to switch into a regenerative brake mode to redirect current flowing in the travel motor armature back into the power source when the direction of travel indicated by the travel signal input means is changed and when the magnitude of the current flowing in the travel motor armature exceeds a predetermined amount.

4,994,974

TOUCH SENSITIVE NAVIGATION SYSTEM

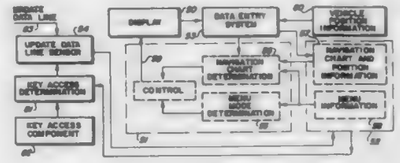
Elihu C. Cummings, P.O. Box 300, Santa Ynez, Calif. 93460

Continuation of Ser. No. 870,534, Jun. 4, 1986, Pat. No. 4,796,190. This application Nov. 14, 1988, Ser. No. 270,082

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—443 **1 Claim**



1. A navigation system for a vehicle, including

(a) a display screen;

(b) read-write memory means for storing navigation chart information for a selected geographical area, including fixed environmental checkpoints in said area;

(c) sensor means for detecting the touching of a fingertip to said display screen to generate signals representing certain environmental checkpoints and other chart information contained in said memory means for a portion of said selected geographical area;

(d) means in communication with said sensor means to recall from said memory means said chart information for said portion of said selected geographical area; and,

(e) means in communication with said recall means for generating signals corresponding to said chart information in said portion of said selected geographical area to display said information on said screen.

4,994,975

PROCESS AND APPARATUS FOR REGISTER ADJUSTMENT OR MAINTENANCE, WITH AUTOMATIC INITIAL REGISTER ADJUSTMENT, OF A WEB OF PREPRINTED MATERIAL

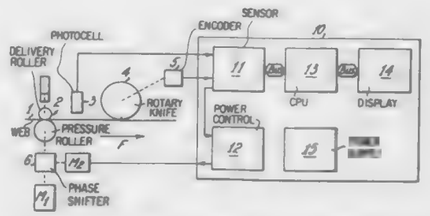
Marc G. Minschart, Hockeylaan 15, B-1940 Zaventem, Belgium

Filed Oct. 20, 1988, Ser. No. 260,268

Claims priority, application Belgium, Oct. 20, 1987, 08701190

Int. Cl.[5] G06F *15/46;* **B65H** *23/18*

U.S. Cl. 364—469 **9 Claims**



1. A process of register adjustment or maintenance of a continuous printed web of material in a processing station of a machine in which a position pulse train is produced whose relative position with regard to an index pulse, is a measurement of the instantaneous position of a processing element, of said processing station, during each of its cycles a detector signal is picked up from a printed format on the web continu-

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ously and which is a function of a difference of characteristic between the material that makes up said web and the printed format on said web that is carried thereon, wherein the signal from the detector is sampled during one of said cycles, in synchronism with the position pulses, and wherein signals which are the result of said sampling are written in a memory, in a numerical form at successive address therein, with a register mark being selected from said memory contents and said that the deviation between a real position and a set point position of the register mark is determined, and from the deviation thus determined, the desired correction is applied to bring the deviation to zero,

comprising in that, to permit an automatic initial register adjustment and maintenance of register of a preprinted web in an off-line machine, the steps of:

storing, in the form of a digital sequence, at least one characteristic of the register mark selected, acting on said detected signal;

continuously sampling the detected signal and writing the results in memory;

periodically analyzing the contents of the memory to locate in it a sequence of numerical values corresponding best to that determined as a function of the register mark selected, and

calculating any deviation between the actual position and the set point position of the register mark from a determined address of said sequence and from the position of the processing element associated with it.

4,994,976

FILM THICKNESS CONTROLLER

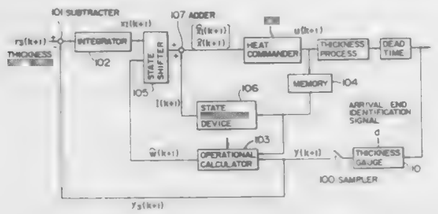
Noriyuki Akasaka, Mitsubishi, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 311,223

Claims priority, application Japan, Feb. 17, 1988, 63-32784; Feb. 19, 1988, 63-35123; Nov. 30, 1988, 63-300962; Nov. 30, 1988, 63-300963

Int. Cl.[5] B29C *55/00*

U.S. Cl. 364—473 10 Claims



1. A film thickness controller which employs state equations to control an extrusion molding apparatus and a flowing type molding apparatus of film including a die having a control mechanism which controls a discharge amount of molten plastic along the width of the film and a thickness gauge for detecting variation of thickness of the film after the lapse of a dead time L_1 corresponding to a time required for movement of the film between the die and the thickness gauge, comprising:

a subtracter for producing a difference between a thickness value detected by the thickness gauge in a predetermined position along the width of the film and a set value of thickness in the predetermined position,

an integrator for time-integrating the difference of thickness produced by said subtracter,

a memory for storing past time sequence data of operation amounts of the control mechanism during a time equal to a sum of the dead time L_1 and a time L_2 until the thickness gauge reaches an end of the film after detection of thickness in the predetermined position,

an operational calculator for producing the past time sequence data of operation amounts of the control mechanism stored in said memory and an estimated value of state variable at a time earlier than a time when the set value of the detected thickness value of a film has been inputted by a dead time L,

a state shifter for receiving an output of said integrator and an output of said operational calculator and multiplying a coefficient for shifting the state by the dead time L to produce a state estimated value at a predetermined time,

a state prediction device for receiving the past time sequence data of operation amounts of the control mechanism stored in said memory to produce state variation based on establishment of input from a certain time to a time after the lapse of the dead time L,

an adder for adding an output of said state shifter and an output of said state prediction device to produce the state estimated value at the predetermined time, and

an operation amount commander for multiplying a state estimated value at a certain time produced from said adder by a state feedback gain to produce an operation amount command value for the control mechanism.

4,994,977

METHOD OF DETECTING AN INTERFERENCE IN THE CONTROL OF A PLURALITY OF MECHANICAL SYSTEMS

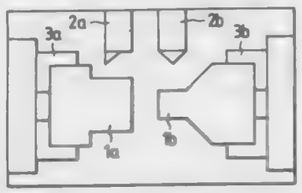
Yoshinori Tsujido, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,574

Claims priority, application Japan, Feb. 12, 1988, 63-28801

Int. Cl.[5] G06F *15/46;* G05B *23/02*

U.S. Cl. 364—474.2 2 Claims



1. A method of detecting the interference of a plurality of mechanical systems by simulating a general asynchronous control of said mechanical systems in a motion simulation mode, wherein a plurality of workpieces may be moving independently of each other and a plurality of work tools may be moving independently of each other, said method comprising the steps of:

for each individual one of said mechanical systems within said plurality, calculating the mutual positions of said individual one of said mechanical systems with respect to the other of said mechanical systems within said plurality and calculating the degrees of risk obtained from the proximity of said mutual positions to one another;

detecting a highest degree of risk occurring in a predetermined period of time which is determined according to a possible time error between an actual machining operation and a simulation and identifying the highest risk positions corresponding to said highest risk; and

displaying said mutual positions thus calculated and said highest risk positions, in said motion simulation mode, said mutual position of each said mechanical system being displayed separately or jointly prior to the actual machining process.

4,994,978

ACCELERATION/DECELERATION CONTROL APPARATUS

Hideaki Kawamura; Takao Sasaki, both of Hachioji, and Kentaro Fujibayashi, Musashino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

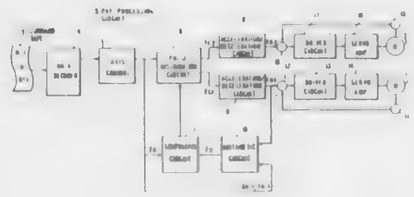
PCT No. PCT JP88/00603, § 371 Date Jan. 6, 1989, § 102(e) Date Jan. 6, 1989, PCT Pub. No. WO88/10171, PCT Pub. Date Dec. 29, 1988

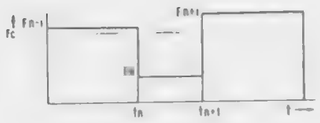
PCT filed Jan. 6, 1989, Ser. No. 296,056

Claims priority, application Japan, Jun. 17, 1987, 62-150767

Int. Cl.[5] G05B *13/00*

U.S. Cl. 364—474.3 5 Claims





1. An acceleration/deceleration control apparatus for controlling acceleration/deceleration of a controlled object when command data blocks are read successively from a machining program and the controlled object is driven to a predetermined position at a command velocity using servomotors, said apparatus comprising:

pulse distributing means for setting interpolation data with regard to the controlled object and processing a current command data block of the command data blocks successively read from the machining program to distribute the interpolation data as distributed pulses to the servomotors;

acceleration/deceleration setting means for setting an acceleration/deceleration control variable to accelerate or decelerate each of the servomotors;

comparison means for comparing an actual velocity of the controlled object with the command velocity of a next command data block successively read from the machining program; and

control means for controlling the pulse distribution, when the command velocity in the next command data block to be processed net by said pulse distributing means is less than the velocity command in the current command data block presently being processed by said pulse distributing means, to stop the pulse distribution by said pulse distributing means until an actual velocity of the controlled object decelerated based on the acceleration/deceleration control variable is less than the command velocity of the next command data block.

4,994,979

SYSTEM FOR PREVENTING THE COLLISION OF TWO CUTTING TOOLS

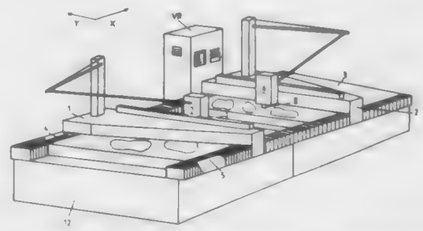
Wolfgang Bruder, Bielefeld; Klaus Biervert, Spenge, and Gerd Kupper, Bad Salzuflen, all of Fed. Rep. of Germany, assignors to Durkopp System Technik GmbH, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,301

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3809630

Int. Cl.[5] B26D *5/00;* B23Q *15/007*

U.S. Cl. 364—474.09 15 Claims



1. A cutting unit, having a safety system for preventing the collision of two cutting tools which are movable toward each other in a longitudinal direction of said cutting table, said cutting unit comprising:

a cutting table;

first and second cutting portals which are independently movable longitudinally over said cutting table in said longitudinal direction and are driven respectively by first and second motors;

first and second cutting devices which are respectively movable transversely over the first and second cutting portals; and

control means for controlling said motors and cutting devices for cutting asymmetrical patterns from work pieces on said cutting table, and for optimizing a time required to cut said patterns by permitting both of the two cutting portals to occupy at least one given position along said longitudinal direction on said cutting table, but at different times;

said safety system comprising safety means for preventing the cutting portals from colliding by determining when the cutting portals are not separated by a predetermined minimum spacing and controlling the motors to prevent the movement of the cutting portals toward each other when this occurs;

wherein said control means comprises a central computer which receives feedback position data and issues cutting instructions; first and second displacement pickups directly connected to said first and second motors which generate said feedback position data in direct response to running of said first and second motors; and first and second numerical control units responsive to said cutting instructions which issue respective control signals to control said motors to move said cutting portals to positions indicated by said cutting instructions; and

said safety means comprises a feedback unit which receives said control signals from said numerical control units and receives said feedback position data generated by said displacement pickups, and determines whether said control signals would cause said cutting portals to be separated by less than said predetermined minimum spacing, and if so, issues a stop signal to stop said motors so that said control signals are not effective; wherein said feedback unit comprises:

first and second input registers which receive said control signals from said first and second numerical control units, respectively;

a subtractor for determining the difference between the contents of said first and second input registers;

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a safety zone register which receives said predetermined minimum spacing from said central computer; and

a comparator which compares (a) the output of said subtractor with (b) the contents of said safety zone register, and if a<b, issues said stop signal;

wherein said control signals are representative of respective instructed cutting position data $P_1(x)$ and $P_2(x)$ which represent longitudinal positions of said first and second cutting portals with respect to a predefined zero point on said cutting unit, and said safety zone register receives respective safety zone data $P(1a)$ and $P(2a)$ for the first and second cutting portals which represent respective safety zone widths for each cutting portal in the longitudinal direction toward the other cutting portal, and said comparator issues said stop signal if said data indicate that the control signals would cause said cutting portals to be separated by less than said safety zones, by issuing said stop signal if $P_1(x)+P(1a)<P_2(x)-P(2a)$.

4,994,980

AUTOMATIC MACHINING SCHEDULING METHOD BASED ON AN EXPERT SYSTEM

Bong J. Lee, Yamanashi, and Ryoji Yokomori, Nirasaki, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00886, § 371 Date Mar. 24, 1989, § 102(e) Date Mar. 24, 1989, PCT Pub. No. WO89/02341, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 2, 1988, Ser. No. 335,538

Claims priority, application Japan, Sep. 9, 1987, 62-223855

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—474.15 5 Claims

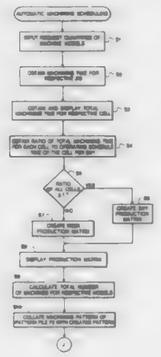
1. An automatic machining scheduling method based on an expert system, comprising the steps of:

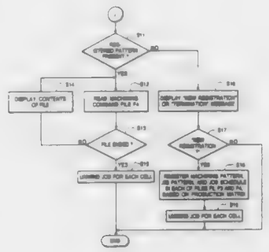
(a) obtaining a total machining time required for each of a plurality of machine tools to machine various component parts of machines to be produced, based on requested quantities of respective machine models;

(b) comparing the required total machining time of each of the machine tools, obtained in said step (a), with a predetermined operating time for the corresponding machine tool per a first predetermined period, and determining whether the first predetermined period or a second predetermined period longer than the first predetermined period should be used as a unit time for creating a machining schedule;

(c) creating a production matrix in accordance with the unit time determined in said step (b) and based on the requested quantities of respective machine models;

(d) retrieving a machining pattern coinciding with the production matrix created in said step (c), from among various machining patterns registered previously; and





(e) retrieving a machining schedule corresponding to the machining pattern retrieved in said step (d), from among various machining schedules registered previously.

4,994,981

METHOD AND APPARATUS FOR CONTROLLING A POWER CONVERTER

Loren H. Walker, Salem; Russel G. Shiflett, and Roy A. Carter, both of Roanoke County, all of Va., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 30, 1988, Ser. No. 251,908

Int. Cl.[5] G06F *15/56*

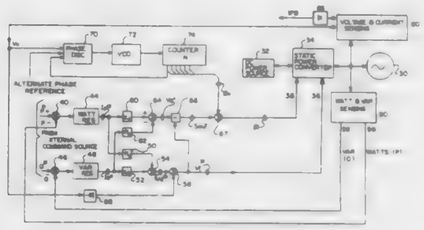
U.S. Cl. 364—492 12 Claims

1. A controller for a static power converter connecting an auxiliary power source to an AC power bus operating at a selected AC voltage such that said power converter operates to selectively interchange power between said auxiliary source and said AC power bus, each having internal impedances including an internal resistance and an internal reactance component, said controller acting in response to externally generated commands for real and reactive power interchanges and producing an internal voltage command signal and a phase command signal for controlling said power converter to produce an interchange current having a selected magnitude and phase corresponding to the desired real and reactive power interchanges, said controller comprising in combination:

a) first means for generating a signal proportional to said AC voltage of said AC power bus;

b) second means for generating a sensed real power signal and a sensed reactive power signal indicative of the power being interchanges between said auxiliary power source and said AC power bus as a result of said interchange current;

c) third means responsive to a real power command and to a reactive power command, said real power signal and said reactive power signal to generate an in-phase current command signal and a quadrature current command signal;



d) fourth means responsive to said in-phase current command signal, to said quadrature current command signal and to said signal proportional to the AC bus voltage of said AC power bus to generate said internal voltage command signal;

e) fifth means responsive to said in-phase current command signal, to said quadrature current command signal and to said signal proportional too said AC voltage to generate said phase command signal.

4,994,982

NEURAL NETWORK SYSTEM AND CIRCUIT FOR USE THEREIN

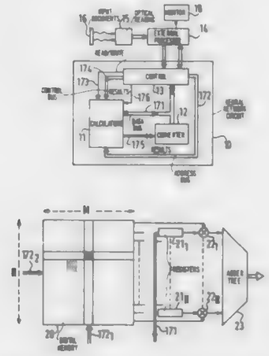
Marc Duranton, Boissy-Saint-Leger; Jean Gobert, Maisons Alfort, and Jacques-Ariel Sirat, Limeil-Brevannes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1988, Ser. No. 289,648

Claims priority, application France, Dec. 23, 1987, 87 18044

Int. Cl.[5] G06F *15/18*

U.S. Cl. 364—513 29 Claims



1. A neuronal circuit for a neural network system which circuit enables digital determination of new states of M neurons by determining products of states of N input neurons and M input vectors of N synaptic coefficients which are associated with each interconnection between neurons and which are stored in a programmable memory,

characterized in that the neuronal circuit comprises an integrated circuit for performing for a given neuron chosen from the M neurons, parallel processing of all synaptic coefficients of the given neuron and which comprises:

(a) the programmable digital memory which is integrated in the circuit for storing the N×M synaptic coefficients of all M neurons encoded on p bits, and for simultaneously supplying all synaptic coefficients of the given neuron,

(b) N digital multipliers for determining the products of the N synaptic coefficients of the given neuron and the states of the N input neurons,

(c) an adder tree for determining the sum S of all said products for the given neuron, and

(d) a digital state memory for receiving the states of the N input neurons which may be encoded from 1 to n bits in a reconfigurable mode, the circuit being controlled by control means,

where N, M, p, and n represent positive integers and S represents a number.

4,994,983

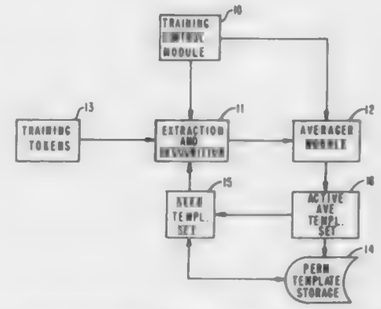
AUTOMATIC SPEECH RECOGNITION SYSTEM USING SEED TEMPLATES

Blakely P. Landell, Burlington, N.J.; Robert E. Wohlford, Kildeer, Ill., and Lawrence G. Bahler, San Diego, Calif., assignors to ITT Corporation, New York, N.Y.

Filed May 2, 1989, Ser. No. 346,054

Int. Cl.[5] G10L *5/00*

U.S. Cl. 364—513.5 14 Claims



1. A training subsystem for an automatic speech recognition system having a training capability for training a vocabulary of words to be recognized by said system, comprising:

a seed template set for maintaining templates of template parameters for a limited set of seed words which are preselected to be short, commonly-used, and easily recognized words;

a training input for providing a training speech sample for training each vocabulary word to be recognized by the automatic speech recognition system, wherein each training speech sample consists of a spoken phrase of a vocabulary word juxtaposed with at least one seed word included in said seed template set;

an extractor for extracting template parameters for each of the words of a training speech sample provided by said training input, wherein said extractor is enabled to extract the template parameters for the vocabulary word of the training speech sample by using the template maintained in said seed template set for the at least one seed word of the training speech sample;

a training control module for controlling said extractor to provide the extracted template parameters for each vocabulary word of the respective training speech samples

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and for generating corresponding vocabulary word templates;

a dictionary storage for storing the templates for the respective vocabulary words as extracted by said extractor and generated under control of said training control module; and

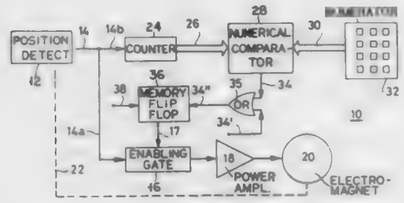
said training control module being operative for controlling said extractor to provide the extracted template parameters for the at least one seed word of the training speech sample and for updating the corresponding seed word template of said seed template set so that the updated seed word template can be used for subsequent training speech samples.

4,994,984

SYSTEM AND DEVICE FOR SUPPLYING DESIRED LIQUID VOLUMES BY MEANS OF A METERING PUMP IN VARIABLE FLOW RATE CONDITION

Sanna Massimo, Agrate Brianza, Italy, assignor to Tecnolab Snc di Sanna Massimo & C., Milan, Italy

Filed Mar. 29, 1988, Ser. No. 174,941
Claims priority, application Italy, Mar. 31, 1987, 19909 A/87
Int. Cl.[5] G01F *1/24*; F04B *49/06*
U.S. Cl. 364—510 **23 Claims**



1. A metering vibrating pump, comprising:

a piston actuated by a movable core moveable in response to the activation of an electromagnet (20);

a piston position detector (12) and a power amplifier (18) for driving said electromagnet (20);

an enabling gate (16) between said piston position detector (12) and said power amplifier (18) enabling the driving of said electromagnet (20);

a microprocessor (290) for carrying out and controlling all the functions of presetting and counting the desired liquid volumes to be supplied by said pump; and

said microprocessor (290) comprising at least an input/output (I/O) port (292), a read only memory (ROM) (294), a random access memory (RAM) (296), an address bus (298), a date transfer bus (299), a central processing unit (CPU) (300), a clock (302, 304), and input and output buses (306, 308) from and to peripheral units, said central processing unit (CPO) being coupled through said input-/output (I/O) port to said piston position detector means (12) for counting pulses coming therefrom.

4,994,985

METHODS OF APPENDING A REPLY IN AN ELECTRONIC MAIL SYSTEM

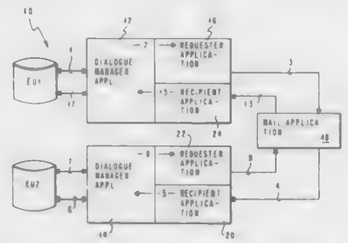
Charles M. N. Cree, and Margaret G. MacPhail, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 138,229, Dec. 23, 1987, abandoned. This application Jul. 21, 1989, Ser. No. 384,930
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—514 **4 Claims**

1. In an information processing system having a plurality of end users exchanging documents therebetween, a method of selectively appending and maintaining a reference to an original document exchanged within the system, said method comprising the steps of:

determining whether said original document includes an append attribute;

selectively appending said original document to a reply document to be transmitted in response to said original



document according to said append attribute associated with said original document; and

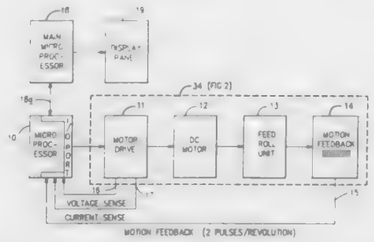
transmitting, in response to said step of selectively appending, said reply document and said original document appended thereto within said system to an end user selected to receive both said reply document and said original document.

4,994,986

ONLINE PERFORMANCE MONITORING AND FAULT DIAGNOSIS TECHNIQUE FOR DIRECT CURRENT MOTORS AS USED IN PRINTER MECHANISMS

Philip K. Cihiwsky, Binghamton, and Andrew C. Jaw, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 27, 1989, Ser. No. 303,715
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 **10 Claims**



1. In combination with a printer apparatus of the type used as output equipment with computer devices, at least one part of said printer apparatus having a direct current motor for causing a preselected function to be performed, a control system for said motor, comprising:

microprocessor means connected with said direct current motor for monitoring the performance of said preselected function and for generating a predetermined signal when said performance deviates from a pre-established condition of operation;

fault diagnosis means responsive to said predetermined signal to identify in real time a part causing said performance deviation while operation of said printer apparatus is continuing; and

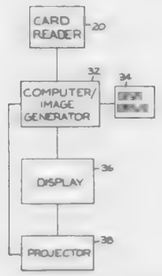
display means energized at least when a shutdown procedure is initiated for indicating the identity of said part causing said performance deviation.

4,994,987

IMAGE ACCESS SYSTEM PROVIDING EASIER ACCESS TO IMAGES

Dwight G. Baldwin, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 361,822, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 123,188, Nov. 20, 1987, abandoned. This application Dec. 15, 1989, Ser. No. 455,834
Int. Cl.[5] G09B *7/06*
U.S. Cl. 364—518 **18 Claims**



1. A system for retrieving image information stored in a storage device and displaying images, said image information having a predetermined storage address in said storage devices, said system comprising:

an image access document, separate from said storage device, comprising a supportive substrate containing human readable information and machine readable information, said human readable information being representative of said image information stored in said storage device, and said machine readable information being associated with said predetermined storage address;

image access document reading means for reading said machine readable information;

image address correlation means for accepting said machine readable information from said image access document reading means and correlating said storage address associated therewith;

image retrieval means for accepting said storage address from said image address correlation means and retrieving said image information stored at that address; and

display means connected to said image retrieval means for displaying an image corresponding to said image information.

4,994,988

PRINTER HAVING A MULTI-MODE CONTROL PANEL SELECTIVELY MANIPULATABLE BETWEEN VARYING MODES OF OPERATION

Takeshi Yokoi, Kagamihara, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1988, Ser. No. 165,100
Claims priority, application Japan, Apr. 8, 1987, 62-86302
Int. Cl.[5] G06F *3/023*; H01H *13/70*
U.S. Cl. 364—519 **7 Claims**

1. A printer selectively manipulatable between a first mode of operation and a second mode of operation, and attachable to a host computer, the printer comprising:

a main printer body having an operating portion disposed thereon;

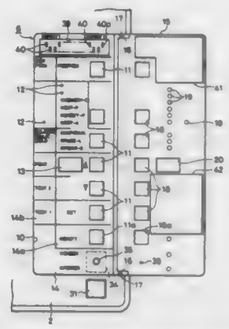
switches disposed at said operating portion, each of said switches for performing different functions in each of said first and second modes, at least a portion of said switches being allocated with a plurality of selectable functions within each mode of operation;

a first label portion fixed to said printer body at the operating portion and disposed adjacent said switches, said first label portion containing a first group of labels indicating first mode functions of said switches;

a lid member movable between a first position for exposing said first label portion, and a second position for covering said first label portion, said first position corresponding to said first mode and said second position corresponding to said second mode;

a second label portion disposed on said lid member, said second label portion containing a second group of labels indicating second mode functions of said switches;

control means for changing the function of said switches between their first mode functions and their second mode functions, said control means comprising a central processing unit, a read-only memory connected to said central processing unit for storing programs for controlling overall operations of said printer, said read-only memory



for also storing information for setting said printer at an initialized state, a random access memory connected to said central processing unit for temporarily storing output data from said host computer, and an erasable and programmable read-only memory connected to said central processing unit for storing renewal information corresponding to a change of functions in said printer, said switches being connected to said central processing unit;

detection means responsive to a change in the position of the lid member for changing the function of the switches between the first and second mode, said detection means being connected to said central processing unit; and

dual in-line package switches disposed in said operating portion and connected to said central processing unit, one of said dual in-line switches having a function for selecting priority between said read-only memory and said erasable and programmable read-only memory.

4,994,989

DISPLAYING METHOD AND APPARATUS FOR THREE-DIMENSIONAL COMPUTER GRAPHICS

Yoshiaki Usami, Hitachi; Kenichi Aajyo, Hitachiota, and Yoshimi Oota, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 256,393
Claims priority, application Japan, Oct. 9, 1987, 62-253681
Int. Cl.[5] G06F *15/66*
U.S. Cl. 364—522 **33 Claims**

1. An apparatus for displaying computer graphics, comprising:

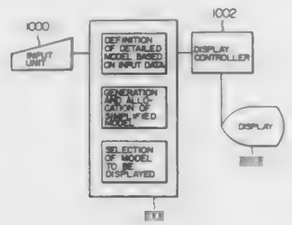
(a) memory storing a first three-dimensional model as a detailed model of a body represented by at least one of a desired number of dimensions, a desired number of parameters and desired parametric quantities;

(b) arithmetic unit creating a second three-dimensional model as a simplified model of said body by varying at least one of said number of dimensions, said number of parameters and said parametric quantities;

(c) selector selecting said detailed model or said simplified model with reference to a preset index; and

(d) display displaying said detailed model or said simplified model in accordance with a selection by said selector;

wherein a distance between a three-dimensional model on said display and a visual point is compared with said preset index



which comprises a preset change-over distance value, said selector selecting between said detailed model and said simplified model in accordance with the comparison, and wherein said display displays and detailed model when said distance is smaller than said preset change-over distance value and displays said simplified model when said distance is greater than said preset change-over distance value.

4,994,990

MICRO-DIMENSIONAL MEASUREMENT APPARATUS

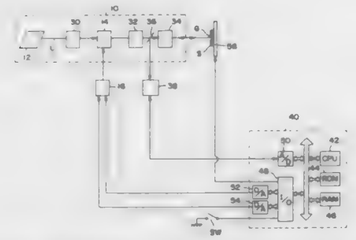
Hiroo Fujita, Sayama, and Kazuo Takahashi, Komoro, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 151,699, Feb. 2, 1988, abandoned. This application Nov. 6, 1989, Ser. No. 436,923

Claims priority, application Japan, Feb. 3, 1987, 62-22982; Mar. 6, 1987, 62-51617; Apr. 7, 1987, 62-85545

Int. Cl.[5] G01B *11/02, 11/00*

U.S. Cl. 364—561 **70 Claims**



1. A micro-dimensional measurement apparatus for optically measuring a dimension between opposed edges formed on a surface of a substrate, the zone between said opposed edges and the surface of said substrate having a uniform reflectivity, the reflectivity of the zone between said opposed edges being different from that of said substrate surface, the reflectivity of the zone between said opposed edges being known, said apparatus comprising:

an optical scanning system for scanning the substrate with a twin light beam so that said beam crosses a distance between the opposed edges of said substrate, said twin light beam being defined as a beam composed of two parallel light beams having substantially the same spot diameter and substantially the same light intensity distribution having a maximum peak intensity at a center of the spot thereof, so that a light intensity distribution of said twin light beam is composed of both light intensity distributions of said two parallel light beams;

means for detecting light intensity information of the twin light beam reflected from the substrate during the scanning operation;

means for fetching the light intensity information detected by said detection means and for storing the fetched light intensity information to form a reflected light intensity data pattern;

means for calculating a minimum peak value and a maximum peak value from said reflected light intensity data pattern;

means for storing two kinds of reference data which correspond to said minimum and maximum peak values, respectively, said two kinds of reference data being obtained from a series of reflected light intensity sample pattern which are prepared with respect to predetermined sample dimensions;

means for calculating two distance values as a dimension to be measured between said opposed edges from said two kinds of reference data, receptively, on the basis of said minimum and maximum peak values calculated from said reflected light intensity data pattern;

means for calculating a difference value between said two distance values;

means for determining whether or not said difference value falls within a permissible range; and

means for calculating a mean value from said distance values to evaluate said mean value as a true dimension to be measured between said opposed edges when said difference value falls within said permissible range.

4,994,991

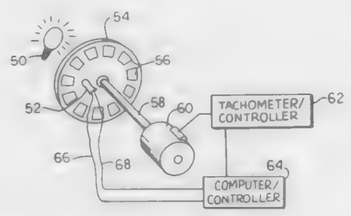
DIGITAL SYNCHRONOUS DETECTOR SAMPLING

Isaac Richman, Newport Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 30, 1988, Ser. No. 292,456

Int. Cl.[5] G06G *7/12*

U.S. Cl. 364—581 **11 Claims**



1. A digital detector comprising:

means for producing a periodic signal of a known frequency;

means responsive to said periodic signal, for producing an output signal;

control means for periodically sampling said output signal at a known rate synchronously and pseudorandomly such that the ratio of the sample rate to signal frequency, when reduced to lowest terms, is the ratio of large whole numbers;

means to convert the samples to digital values; and,

means for calculating weighted sums of these values to result in the computation of the sine and cosine Fourier components of said output signal, to yield the magnitude of said output signal.

4,994,992

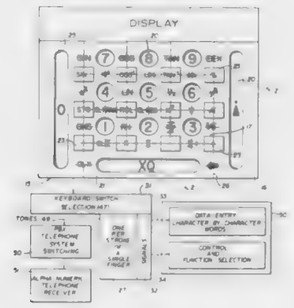
CONTOURED TOUCH TYPE DATA PROCESSING KEYBOARD

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 850,565, Apr. 11, 1986, abandoned, which is a continuation of Ser. No. 493,613, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 488,692, Apr. 26, 1983, Pat. No. 4,549,279. This application Mar. 21, 1989, Ser. No. 327,422

Int. Cl.[5] G06F *3/023*

U.S. Cl. 364—709.15 **4 Claims**



3. In a touch type data processor keyboard assembly system of the type having a field of side-by-side keys arranged on a keyboard field for selective manual actuation by the stroke of a single finger of either selected keys individually or multiplicities of simultaneously actuated side-by-side keys arranged in said field by bridging the multiplicity of keys with a single finger, the improvement comprising:

three differing tactile feedback patterns placed in the keyboard field to define finger placement positions for actuating respectively one key, two keys simultaneously and more than two keys simultaneously wherein said patterns comprise keys of different surface configuration,

wherein the three differing tactile feedback patterns constitute raised, indented and substantially flat surface configurations.

4,994,993

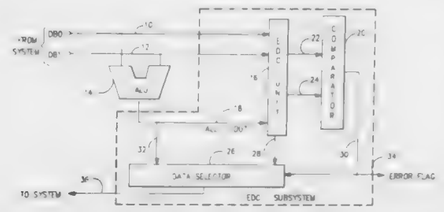
SYSTEM FOR DETECTING AND CORRECTING ERRORS GENERATED BY ARITHMETIC LOGIC UNITS

Safdar M. Asghar; John G. Bartkowiak, and Eric A. Suss, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 25, 1988, Ser. No. 262,658

Int. Cl.[5] G06F *11/00*

U.S. Cl. 364—740 **13 Claims**



1. A system for detecting and correcting an error in a result of an arithmetic operation, said arithmetic operation involving at least two operands, each of said at least two operands comprising at least one element; the system comprising:

a first arithmetic operation means for performing said arithmetic operation, said first arithmetic operation means receiving said at least two operands as at least one input and generating a first output, said first output having at least one first digit being representative of said results;

a second arithmetic operation means for performing said arithmetic operation, said second arithmetic operation means receiving said at least one input and generating a second output, said second output being representative of said result;

an error detection means for detecting an error by said first arithmetic operation means, said error detection means generating an error indicating signal when said error is detected; and

a data selector means for effecting selection of said first output or said second output; said selection being responsive to said error indicating signal, said data selector means providing a system output; said system output comprising either said first output or said second output according to said selection;

said error detection means performing the steps of:

(a) receiving said at least one input and performing check-adding of each of said at least one element of each of said at least two operands to calculate an intermediate sum for each of said at least two operands;

(b) reiteratively performing step (a) appropriately to calculate a single-digit intermediate sum for each of said at least two operands;

(c) performing said arithmetic operation using said single-digit intermediate sum for each of said at least two operands to produce an interim result, said interim result comprising at least one interim digit;

(d) adding each of said at least one interim digit to calculate an iterative interim result;

(e) repeating step (d) until a single-digit iterative interim result is calculated;

(f) receiving said first output;

(g) adding each of said at least one first digit to calculate an interim first result comprising at least one first interim digit;

(h) adding each of said at least one first interim digit to calculate a first iterative interim result;

(i) repeating step (h) until a single-digit first iterative interim result is calculated;

said error detection means generating said error indicating signal when said single-digit iterative interim result and said single-digit first iterative interim result are different.

4,994,994

APPARATUS PERFORMING MODULO P ADDITION, WHERE OPERANDS ARE EXPRESSED AS POWERS OF A GENERATOR, USING A REDUCED SIZE ZECH LOOK-UP TABLE

Ian A. Burgess, Horley, and Christopher B. Marshall, Lindfield, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1989, Ser. No. 345,392

Claims priority, application United Kingdom, Apr. 29, 1988, [redacted]

Int. Cl.[5] G06F *7/72*

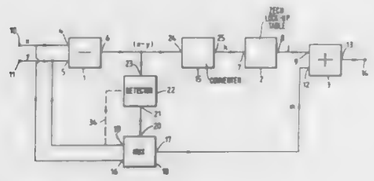
U.S. Cl. 364—746 **5 Claims**

1. Apparatus for generating a representation module p-1 of the power index i to which a generator g has to be raised to give the value X+Y in modulo p arithmetic in response to the application to said apparatus of representations modulo p-1 of x, where $g^x=X$, and y, were $g^y=Y$, which apparatus has first and second inputs for the representations of X and Y, respectively, and an output for the representation of i and comprises

(a) a subtractor circuit, having

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(i) first and second inputs coupled to the first and second inputs, respectively, of the apparatus, and
(ii) an output, at which the subtractor circuit generates a representation module p-1 of x−y,
(b) a look-up table circuit having
(i) an input coupled to the output of the subtractor circuit, and
(ii) an output at which the look-up table circuit generates a representation modulo p-1 of the power index j to which g has to be raised to give the value g^k+1 in modulo p arithmetic in response to the application to said input of a representation modulo p-1 of any member of a set of values k, and
(c) an adder circuit having
(i) first and second inputs to which are coupled the second input of the apparatus and the output of the look-up table circuit, respectively, and
(ii) an output at which the adder generates a representation modulo p-1 of m+j in response to the application to the first and second inputs of the adder circuit of residue representations modulo p-1 of m and j, respectively, which output constitutes the output of the apparatus,
wherein the improvement comprises:
(d) a multiplexer circuit having



(i) a first multiplexer input,
(ii) a second multiplexer input,
(iii) a control input, and
(iv) a multiplexer output, which multiplexer circuit, in response to a control signal to said control input, couples either the first multiplexer input to the multiplexer output or the second multiplexer input to the multiplexer output, the first multiplexer input being coupled to the first input of the apparatus and the coupling from the second input of the apparatus to the first input of the adder circuit being though said multiplexer circuit from the second multiplexer input to the multiplexer output,
(e) a converter circuit, coupled between the output of the subtractor circuit and the input of the look-up table circuit, for converting each representation of at least one specific value x-y generated by the subtractor circuit to a representation modulo p-1 of y−x, and
(f) means, coupled between the output of the subtractor circuit and the control input of the multiplexer circuit, for supplying a control signal to the multiplexer circuit to cause the multiplexer circuit to couple its first input to its output in response at least tot he presence at the subtractor circuit output of any representation which will be so converted by the converter circuit.

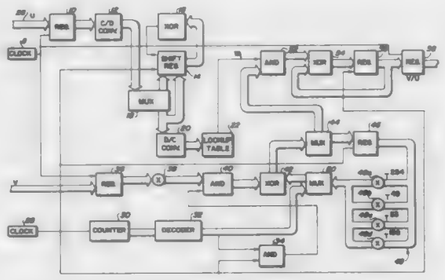
4,994,995

BIT-SERIAL DIVISION METHOD AND APPARATUS

Robert W. Anderson, Morgan Hill; Ralph L. Gee; Trung L. Nguyen, both of San Jose, and Martin A. Hassner, Palo Alto, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1990, Ser. No. 493,568
Int. Cl.[5] G06F *7/00*
U.S. Cl. 364—746.1 **10 Claims**

1. A bit-serial division method for computing the value v/u, where v and u each are n-bit vectors that are elements in a finite Galois field $GF(2^n)$ consisting of 2^n elements and wherein the n-bit components of each element in said field are the coordinates of such element in a canonical basis of said field, comprising the steps of:
converting the vector u from the canonical basis to a dual basis, said vector u in said dual basis also comprising n bits ordered according to an index i that takes on values from 0 to (n−1);
loading into a shift register in parallel all bits n of the converted vector u;



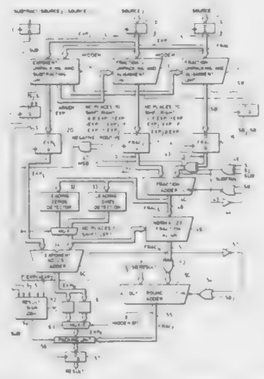
converting the converted n-bit vector u from the dual basis back to canonical basis to produce a single bit output w_O from a lookup table which generates bitwise the inverse of the n-bit vector u;
shifting the bits in the shift register (n−1) times to generate successive additional single bit outputs w_i with said lookup table; and then
multiplying each bit w_i by the vector v and a corresponding element c_i in dual basis to generate a cumulative sum of these products that provides, upon completion of said (n−1) shifts, the bit-serial division result v/u.

4,994,996

PIPELINED FLOATING POINT ADDER FOR DIGITAL COMPUTER

Tryggve Fossum, Northboro; William R. Grundmann, Hudson, and Muhammad S. Haq, Shrewsbury, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 3, 1989, Ser. No. 306,343
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **35 Claims**



1. A method of subtracting two floating-point binary numbers in a pipelined floating-point adder/subtractor in a digital computer, each of said numbers having a fraction, an exponent and a sign, said method comprising the steps of

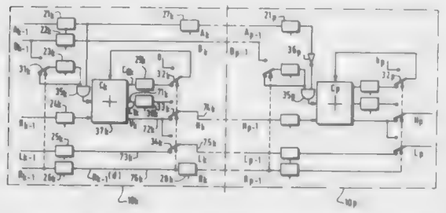
aligning the two fractions for subtraction,
arbitrarily designating the fraction of one of the two floating-point numbers as the subtrahend,
subtracting the designated fraction from the other fraction to obtain a corresponding difference, and normalizing said difference,
determining whether said difference is negative and, when it is, complementing the normalized difference, and
selecting the larger of the exponents of said two floating-point numbers, and adjusting the value of the selected exponent in accordance with the normalization of said difference.

4,994,997

PIPELINE-TYPE SERIAL MULTIPLIER CIRCUIT

Philippe Martin, Fresnes; Thierry Bonnet, Champigny, and Yves Mathieu, Boulogne, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 16, 1988, Ser. No. 245,887
Claims priority, application France, Sep. 25, 1987, 87 13291
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—759 **18 Claims**



1. A pipeline-type serial multiplier circuit having a cellular structure for multiplying two synchronized streams of digital data, that is to say a stream A consisting of n bits $\{a_n \ldots a_k \ldots a_1\}$ and a stream B consisting of p bits $\{b_p \ldots b_k \ldots b_1\}$, where n, k and p are integers, by forming in each cell of the structure, in the pipeline mode, the partial products of the multiplicand A and each bit of the multiplier B, after which the partial products are successively added at a clock frequency F, each cell of the order k comprising:
an elementary one-bit adder which receives data x_k, y_k and carries c_k, and which at a given instant outputs a result v_k and a carry c_{ok}, so that

$$v_k=(x_k \,\&\, y_k \,\&\, c_k) \text{ modulo } 2$$

$$c_{ok}=(x_k \,\&\, y_k \,\&\, c_k)/2$$

where c_k is at a given instant equal to the carry c_{ok} determined in a same cell during a previous clock period, after which the carry c_{ok} is delayed so that $c_k=c_{ok}(d)$,
delay means for synchronizing the data output by two successive cells,
means for temporary storage of a data bit and the carry c_{ok},
characterized in that the multiplier circuit comprises means for delivering the exact result of the operation in first and second consecutive bit segments under control of a signal R, the first consecutive bit segment L being formed by the p bits having the lowest binary weight, the second consecutive bit segment H being formed by the n bits having the highest binary weight, the multiplier circuit having an output rate F/n, where n is an integer greater than p, which means for delivering comprise:
respective means, disposed within each cell, for receiving a signal R_{k-1} from the previous cell;
means for generating, after the temporary storage, data c_{1k} so that:

$$c_{1k}=(x_k \,\&\, y_k \,\&\, c_{ok}) \text{ modulo } 2,$$

the data c_{1k} being delivered during the same clock period as the carry c_{ok},
means for determining the partial segments L_k and H_k supplied by each cell of order k so that

$$L_k=L_{k-1}(d).R_{k-1}(d)+v_k.\overline{R}_{k-1}(d) \text{ and}$$

$$H_k=v_k.R_{k-1}(d)+c_{1k}(d).\overline{R}_{k-1}(d)$$

where $R_{k-1}(d)$ is the signal R_{k-1} applied to the cell k via the preceding cells, delayed by one clock period in the cell k,
means for reintroducing the carry c_k in the adder of the order k under control of the signal $R_{k-1}(d)$ in accordance with

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$c_k = c_{ok}(d).R_{k-1}(d)$, for the p-1th cells, and
$c_p = b_p.R_{p-1}(d) + R_{p-1}(d).c_{op}(d)$, for the pth cell,

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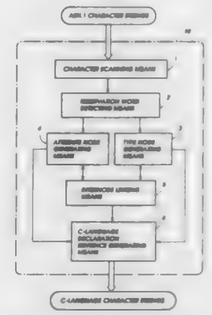
means for delaying the data c_{1k} by a clock period in the kth cell to form $c_{1k}(d)$, and
means for combining the data A and B so that all cells but the pth cell perform operations of type $A.b_k$ and the pth cell performs an operation of the type $\overline{A}.b_p$,
the symbols used being (.): AND-logic; (+) OR-logic; (&): addition.

4,994,998

APPARATUS AND METHOD FOR STRUCTURING DATA WRITTEN ACCORDING TO ISO/8824/ASN.1 SPECIFICATION

Akihiro Anezaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,911
Claims priority, application Japan, Feb. 5, 1988, 63-26465
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—900 **2 Claims**



1. A data structuring apparatus comprising:
means for decomposing input character strings written in accordance with the specification of ISO/8824/ASN.1 (International Organization for Standardization 8824 Abstract Syntax Notation One);
means for detecting keywords representative of types and attributes from said decomposed character strings;
type node generating means for deriving type nodes from said detected keywords representative of said types;
attribute node generating means for deriving attribute nodes from said detected keywords representative of said attributes;
internode linking means for establishing links between said type nodes and said attribute nodes according to hierarchical relationships between said type nodes and said

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attribute nodes and forming a tree structure by the established links; and

means for tracing said tree structure and translating said input character strings according to the links of said tree structure into a declaration sentence which can be processed by a computer program.

4,994,999

HIGH-SPEED AND HIGH-DENSITY SEMICONDUCTOR MEMORY

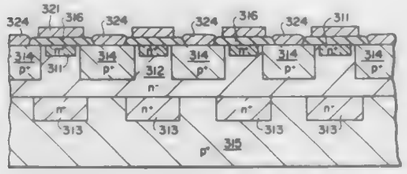
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 514,595, Jul. 18, 1983, abandoned, which is a division of Ser. No. 174,724, Aug. 4, 1980, Pat. No. 4,434,433, which is a continuation of Ser. No. 878,441, Feb. 16, 1978. This application Aug. 17, 1987, Ser. No. 87,974

Claims priority, application Japan, Feb. 21, 1977, 52-18465; Feb. 26, 1977, 52-20653; Mar. 30, 1977, 52-35956; Mar. 31, 1977, 52-36304; Apr. 2, 1977, 52-37905; Jul. 11, 1977, 52-83226

Int. Cl.[5] G11C *11/40;* **A01L** *27/04*

U.S. Cl. 365—149 **12 Claims**



1. A semiconductor memory cell array comprising a semiconductor body, a plurality of bit lines and a plurality of word lines crossing said bit lines to form a matrix and at least one semiconductor memory cell disposed at one of the cross points of said bit lines and word lines, said semiconductor memory cell comprising a source semiconductor region of a low resistivity and a first conductivity type, a storage semiconductor region of said first conductivity type and being disposed separate and apart from said source region and constituting one electrode of a capacitor for storing a charge, means for forming the other electrode of said capacitor, a channel semiconductor region formed with a high resistivity semiconductor region of a second conductivity type opposite to said first conductivity type, disposed between said source and said storage regions, being depleted without any bias voltage applied thereto, and establishing a potential barrier which is controllable by at least the voltage of said source region with respect to said storage region,

said memory cell further comprising gate means disposed in the neighborhood of said channel region, and said source region is electrically connected to one of said bit lines and said gate means is electrically connected to one of said word lines,

said source region constituting said one bit line,

said gate means constituting one said word line,

means for driving said memory cell, comprising: means for establishing a reference potential against which voltages are referenced,

means for applying a write-in voltage to said source region; and

means for applying write-in and read-out address gate voltages to said gate region at the time of write-in and read-out operations,

said gate region being provided with means for rendering the potential difference of said gate region with respect to said reference potential the same as the potential difference of said source region with respect to said reference potential in the state of the memory cell that its memory content is stored, and for applying, only at the time of write-in and read-out operations, write-in and readout address gate voltages with respect to said other electrode means having an electric polarity relative to said reference potential the same as that of the write-in voltage applied between said source region and said other electrode means.

4,995,000

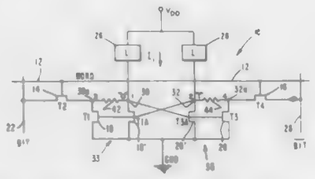
STATIC RAM CELL WITH HIGH SPEED AND STABILITY

William C. Terrell, Thousand Oaks, Calif., assignor to Vitesse Semiconductor Corporation, Camarillo, Calif.

Continuation of Ser. No. 214,175, Jul. 1, 1988, abandoned. This application Apr. 18, 1990, Ser. No. 512,061

Int. Cl.[5] G11C *11/00*

U.S. Cl. 365—154 **7 Claims**



1. A static random access memory cell formed on a semiconductor substrate which provides both high speed due to large cell read current and high stability due to isolated cross-coupled inverter storage nodes, comprising: first, second third, and fourth switching means (18, 18', 20', 20), each of said switching means comprising a transistor having a drain region, a source region, and a gate region which controls the flow of current between said drain region and said source region, wherein said source regions of said first, second, third, and fourth switching means are connected at a first node (GND), said gate regions of said first and second switching means are connected at a second node (32,) said gate regions of said third and fourth are connected at a third node (30);

first and second load means (26, 28) wherein said first load means is connected to and between said drain region of said second switching means and a fourth node (V_{DD},) said second load means is connected to and between said drain region of said third switching means and said fourth node;

first and second access transistor means (14, 16), each of said access transistor means having a drain region, a source region, and a gate region which controls the flow of current between said drain region and said source region, wherein said source region of said first access transistor means is connected to said drain region of said first switching means, said gate region of said first access transistor means is connected to a fifth node (12,) said drain region of said first access means is connected to a sixth node (22,) said source region of said second access means is connected to said drain region of said fourth switching means, said gate region of said second access means is connected to said fifth node, said drain region of said second access means is connected to a seventh node (28;)

first and second isolation means (42, 44,) for separating the first and fourth switching means, which are responsible for static memory cell read current, from the second and third switching means, which are responsible for holding stable logic levels in the cross-coupled inverters and which are isolated from cell read currents, wherein said first isolation means is directly connected between said drain region of said first switching means and said drain region of said second switching means, said second isolation means is directly connected between said drain region of said third switching means and said drain region of said fourth switching means;

wherein said second node, which is said gate regions of said

first and second switching means, is connected to said drain region of said third switching means, said third node, which is said gate regions of said third and fourth switching means, is connected to said drain region of said second switching means, wherein said second and third switching means and said first and second load means form cross-coupled inverters with stable logic values provided at said gate regions of said second and third switching means, and wherein said first and second access means and said first and fourth switching means provide static memory cell read current to said sixth and seventh nodes when said fifth node is selected for read access, and wherein said first and second isolation means provide isolation of said cross-coupled inverter storage nodes from read access logic values.

4,995,001

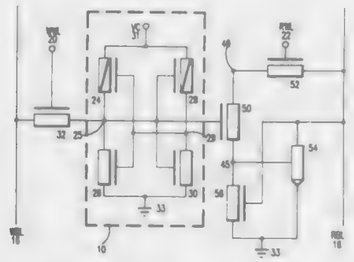
MEMORY CELL AND READ CIRCUIT

James W. Dawson, Poughkeepsie, and Panagiotis A. Phillips, Newburgh, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,075

Int. Cl.[5] G11C *11/00, 11/34, 7/00, 8/00*

U.S. Cl. 365—154 **60 Claims**



1. A memory cell comprising:

a storage unit for storing a data signal;

a pass device and a pass/isolation device, each having a signal path and a control terminal, the signal paths therethrough being coupled together in series between a control node and a read line, the control terminal of the pass device being coupled to an enable line and the control terminal of the pass/isolation device being coupled to the storage unit; and

a driver having a signal path coupled between the read line and a constant-signal node, and having a control terminal coupled to the control node, and arranged to cause a read signal proportional to the data signal to appear on the read line in response to an enable signal on the enable line.

4,995,002

SEMICONDUCTOR MEMORY DEVICE

Shigeru Yamada, Yokohama, and Takuya Fujimoto, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1989, Ser. No. 406,421

Claims priority, application Japan, Sep. 13, 1988, 63-229401

Int. Cl.[5] G11C *7/00;* **H01L** *21/00*

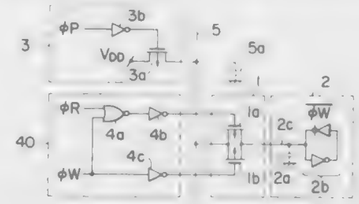
U.S. Cl. 365—189.01 **5 Claims**

1. A semiconductor memory device in which a data line and a holding circuit for storing data thereon are connected through a transmission gate comprised of an N-type MOS transistor and a P-type MOS transistor,

said semiconductor memory device comprising:

an initial potential setting circuit for setting an initial potential on said data line prior to readout operation of data from said holding circuit, and

a control circuit operative to allow both of said MOS transistors of said transmission gate to be turned on at the time of writing data into said holding circuit, and to allow one of



said MOS transistors to be turned on at the time of reading data from said holding circuit.

4,995,003

SERIAL DATA TRANSFER CIRCUIT FOR A SEMICONDUCTOR MEMORY DEVICE

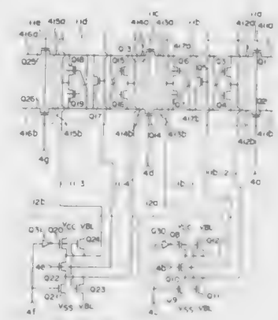
Yuji Watanabe, Kawasaki; Haruki Toda, Yokohama; Hiroshi Sahara, and Shigeo Ohshima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1988, Ser. No. 289,115

Claims priority, application Japan, Dec. 26, 1987, 62-330500

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—189.05 **13 Claims**



1. A circuit for transferring data from a first RAM section to a first serial port section during a read transfer cycle in response to activation of a row address strobe signal, comprising:

first latch means for holding data in response to activation of a first sense signal;

second latch means for holding data in response to activation of a second sense signal;

first RAM section coupling means, coupled to the first RAM section, for transferring data to and from the first RAM section;

first serial port section coupling means, coupled to the first serial port section, for transferring data to and from the first serial port section;

first gate means, coupled between the first RAM section coupling means and the first latch means, for transferring data between the first RAM section coupling means and the first latch means in response to activation of a first gate control signal, wherein the first gate means is rendered conductive at times when the first gate control signal is activated and is rendered nonconductive at times when the first gate control signal is not activated;

second gate means, connected between the first latch means and the second latch means, for transferring data between the first latch means and the second latch means in response to activation of a second gate control signal, wherein the second gate means is rendered conductive at times when the second gate control signal is activated and

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is rendered nonconductive at times when the second gate control signal is not activated;

third gate means, coupled between the first serial port section coupling means and the second latch means, for transferring data between the first serial port section coupling means and the second latch means in response to activation of a third gate control signal, wherein the third gate means is rendered conductive at times when the third gate control signal is activated and is rendered nonconductive at times when the third gate control signal is not activated; and

control means, coupled to the first and second latch means and to the first, second, and third gate means, and responsive to activation of the row address strobe signal, for activating and deactivating the first and second sense signals and the first, second, and third gate control signals, wherein the control means includes:

means, during a read transfer cycle, for activating the first sense signal after first data is transferred to the first latch means in response to activation of the first gate control signal, and for subsequently deactivating the first sense signal after the first data is transferred from the first latch means in response to activation of the second gate control signal;

means, during a read transfer cycle, for deactivating the second sense signal after second data is transferred from the second latch means in response to activation of the third gate control signal, and for subsequently activating the second sense signal after the first data is transferred to the second latch means in response to activation of the second gate control signal;

means, during a read transfer cycle, for activating the first gate control signal when the first RAM section coupling means is transferring the first data in response to activation of the row address strobe signal, and for subsequently deactivating the first gate control signal after the first data is transferred to the first latch means;

means, during a read transfer cycle, for activating the second gate control signal when the first latch means is holding the first data, and for subsequently deactivating the second gate control signal after the first data is transferred to the second latch means; and

means, during a read transfer cycle, for activating the third gate control signal when the second latch means is holding the first data, and for subsequently deactivating the third gate control signal after the first data is transferred to the first serial port section coupling means.

4,995,004

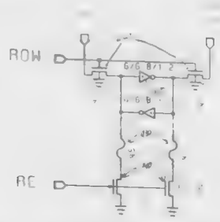
RAM/ROM HYBRID MEMORY ARCHITECTURE

Robert D. Lee, Denton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed May 15, 1989, Ser. No. 352,142

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—189.11 **20 Claims**



1. An integrated circuit memory, comprising:

an array of memory cells arranged in rows and columns, with word lines running along rows of said array;

word line driver circuitry, connected to drive a selected one of said word lines when one of said cells in said selected row is sought to be accessed;

a sense amplification and output stage, connected to amplify the output of a selected one of said cells, and column selection circuitry, configured to connect the output of a selected one of said cells to said sense amplification and output stage;

wherein each said cell in said array includes:

a latch having first and second nodes,

two pass transistors, controlled by a respective one of said word lines, and operable to connect said first and second nodes of said latch to a respective bit line pair;

and wherein at least some of said cells in said array each also include:

nonvolatile shorting elements, connected to pull one of said nodes of said latch toward a constant potential.

4,995,005

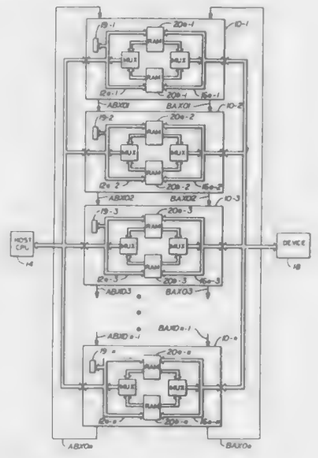
MEMORY DEVICE WHICH CAN FUNCTION AS TWO SEPARATE MEMORIES OR A SINGLE MEMORY

Nusra Lodhi, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 373,743, Jun. 29, 1989, which is a division of Ser. No. 908,559, Sep. 18, 1986, Pat. No. 4,847,812. This application Sep. 26, 1989, Ser. No. 413,507

Int. Cl.[5] G11C *7/00, 19/00, 8/00*

U.S. Cl. 365—221 **8 Claims**



1. A memory device comprising:

first data storage means having n locations for storing n words of data, where n is an integer greater than one;

second data storage means having m locations for storing m words of data, where m is an integer greater than one; and

control means for functioning in one of a first mode and a second mode, said control means receiving a first set of words of data and storing said first set of words of data in sequential locations within said first data storage means when said control means is in said first mode, said control means receiving a second set of words of data and storing said second set of words of data in sequential locations within said second data storage means when said control means is in said first mode, said control means providing data stored in said sequential locations within said first and second data storage means, thereby causing said first and second data storage means to function as an n location FIFO memory and an m location FIFO memory, respectively, when said control means is in said first mode, said control means storing a third set of words of data in sequential locations within said first data storage means and then storing words of data within said third set in sequential locations within said second data storage means after storing data in the last location in said first data storage means when said control means is in said second mode, said control means providing data stored in sequential locations within said first data storage means and then providing data stored in sequential locations within said second data storage means after providing data stored in the last location of said first data storage means when said control means is in said second mode, thereby causing said first and second data storage means to function as a single n+m location FIFO memory.

4,995,006

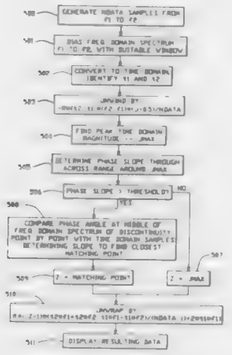
APPARATUS AND METHOD FOR LOW-PASS EQUIVALENT PROCESSING

Robert G. Huenemann, Hollister, and Frederick J. Harris, Lemon Grove, both of Calif., assignors to Wiltron Company, Morgan Hill, Calif.

Filed Mar. 31, 1988, Ser. No. 175,762

Int. Cl.[5] G01R *23/177*

U.S. Cl. 364—485 **22 Claims**



1. A method for generating data used for analyzing a network, comprising the steps of:

supplying excitation signals to the network at frequencies in a range from f1 to f2;

measuring and recording a plurality of frequency domain samples of a signal generated by the network in response to the excitation signals;

converting the frequency domain samples to a plurality of time domain samples within a range from t1 to t2, wherein a selected discontinuity is located between t1 and t2;

correcting phase errors in the plurality of time domain samples independent of location of the selected discontinuity;

estimating the location of the selected discontinuity in the first corrected time domain samples;

identifying a time domain sample closet to the estimated location from the plurality of time domain samples;

correcting phase errors in the time domain sample closest to the estimated location to generate resulting data; and

displaying the resulting data.

4,995,007

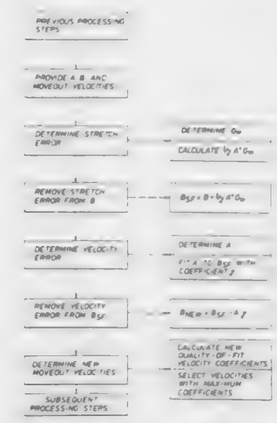
METHOD FOR PROCESSING SEISMIC DATA

Chris T. Corcoran, Houston; Jacques P. Leveille, Bellaire, both of Tex., and Eduardo S. Velasco, Mansfield, Pa., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1989, Ser. No. 454,572

Int. Cl.[5] G01V *1/36*

U.S. Cl. 367—52 **5 Claims**



2. A method for processing seismic data, comprising:

estimating zero-offset amplitude, A, and amplitude variation with offset, B, traces for each of a plurality of trial velocities from said seismic data,

differentiating the estimated zero-offset amplitude, A, traces with respect to time,

estimating components of amplitude variation with offset, B, traces that are correlated with said differentiated zero-offset amplitude traces,

removing said estimated components from the amplitude variation with offset traces to obtain a new estimate, B_{new} of the amplitude variation with offset trace,

computing an RMS error in the least squares fit of dynamically corrected data to a form $A+B_{New}\sin^2\theta$ using the new estimate of amplitude variation with offset traces,

generating quality-of-fit velocity coefficients for moveout velocity estimation from said RMS error, and

determining moveout velocity estimates from said generated quality-of-fit velocity coefficients.

4,995,008

METHOD OF USING A CIRCULARLY-POLARIZED SOURCE TO CHARACTERIZE SEISMIC ANISOTROPY

Scott C. Hornbostel, and Azik I. Perelberg, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Dec. 27, 1989, Ser. No. 457,267

Int. Cl.[5] G01V *1/34, 1/28, 1/053*

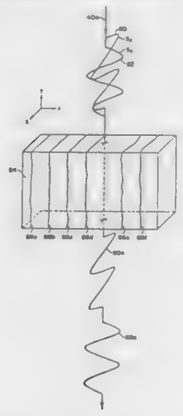
U.S. Cl. 367—75 **6 Claims**

1. The method of detecting seismic anisotropy and determining its orientation in a lithological formation, which comprises,

directing a wave of circularly polarized energy toward said lithological formation,

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detecting reflected arrivals of said wave from said lithological formation using two-component receivers, and



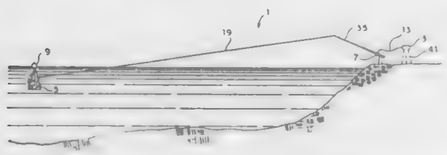
ascertaining the presence and orientation of linear polarization in said reflected arrivals as an indication of the presence and orientation of anisotropy.

4,995,009

CASTABLE FISH/DEPTH FINDER

Jeffrey J. Altmire, 23 E. Maple St., Alexandria, Va. 22301, and John E. Paskert, 2582-F, Arlington Mill Dr., Arlington, Va. 22206

Filed Aug. 3, 1990, Ser. No. 562,668
Int. Cl.[5] G01S *15/96*
U.S. Cl. 367—107 3 Claims



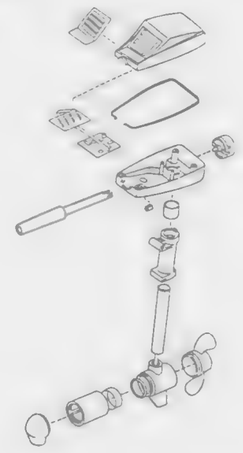
1. In combination, a castably fish/depth finder for use by an onshore fisherman for continuously ascertaining and indicating the presence of fish in a particular section of a body of water and the depth of the water in such particular section, including:
onshore fish/depth display unit means for continuously sending first electronic signals and for continuously receiving second electronic signals, respectively, and, for continuously indicating, responsive to said respective second electronic signals, the presence of fish in such particular section of such body of water and the depth of the water in such particular section;
power source means powering said display unit means;
transducer means for receiving said continuous first electronic signals from said onshore display unit means, for changing said first electronic signals to continuous and respective first ultrasonic signals travelling downwardly through such particular section of the body of water until said first ultrasonic signals strike the bottom of such body of water or fish above the bottom of such body of water to produce continuous second ultrasonic or echo signals, respectively, bouncing back to said transducer means, and receiving and changing said second ultrasonic or echo signals to said second electronic signals for reception by said onshore display unit means for indication by said onshore display unit means of the presence of fish and the depth of the water in such particular section of the body of water;
first conductor means for electrically connecting and establishing continuity of said onshore display unit means with onshore rod and reel means;
second conductor means for electrically connecting and establishing continuity of said onshore rod and reel means with said transducer means; and
said onshore rod and reel means having connecting means for electrically connecting and establishing continuity between said first conductor means and said second conductor means, said rod and reel means receiving in winding relationship only said second conductor means in response to winding action by the onshore fisherman of said rod and reel means, and said rod and reel means paying out only said second conductor means in response to casting action by the onshore fisherman to dispose and place said transducer means offshore in such particular section of the body of water.

4,995,010

DEPTH FINDING-TROLLING SYSTEM

Steven J. Knight, Mapleton, Minn., assignor to Johnson Fishing, Inc., Mankato, Minn.

Filed Jul. 21, 1989, Ser. No. 383,835
Int. Cl.[5] G01S *15/08*
U.S. Cl. 367—111 9 Claims
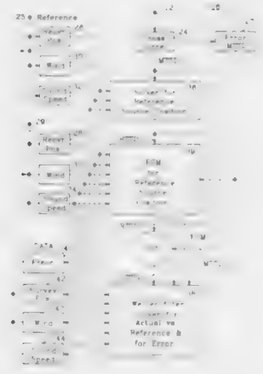


1. A depth finding-trolling system, comprising:
a motor housing;
an electric propulsion motor disposed in said housing;
a control box;
means for operatively connecting said housing to said control box;
means for steering and speed controlling said motor;
a sonic transducer disposed in said motor housing;
a main circuit electrically connected to said transducer for electrically developing a transmitted sonic signal and processing a received sonic echo signal into a signal corresponding to a depth distance;
an electrical cable operatively connecting said transducer to said main circuit, said cable extending from said housing and through said support means to said control box;
a gain control circuit operatively associated with said main circuit for automatically amplifying the sonic echo signal;
a display board circuit operatively associated with said main circuit for translating said signal corresponding to a depth distance into visual information operatives; and
a display including a plurality of light emitting diodes, said diodes being arranged in rectilinear descent from left to right to illustrate numbers in ascending order of a set of ten numbers, said display comprising four arrays of said diodes, each said array illustrating ten feet of depth.

4,995,011

ACOUSTIC MAPPING SYSTEM USING TOMOGRAPHIC RECONSTRUCTION

John L. Spiesberger, North Falmouth, Mass., assignor to Woods Hole Oceanographic Institute, Woods Hole, Mass.

Filed Sep. 20, 1989, Ser. No. 409,924
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—127 28 Claims



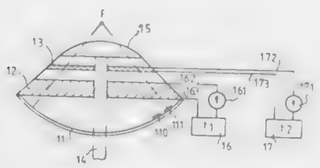
1. A method of determining mapping information comprising the steps of:
acquiring acoustic data from at least five receivers in the environment to be mapped;
determining travel time differences between receivers for the acoustic data;
estimating error in the acoustic data;
applying the estimates and the travel time differences to a model of the environment to be mapped; and
extracting the mapping information.

4,995,012

METHOD OF GENERATING AN ELASTIC WAVE

Jacques Dory, Coupvray, France, assignor to EDAP International, France

Division of Ser. No. 187,178, Apr. 28, 1988, Pat. No. 4,856,107.
This application Aug. 8, 1989, Ser. No. 390,861
Claims priority, application France, Apr. 28, 1987, 87 05981
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] H01R *1/02;* A61B *8/00*
U.S. Cl. 367—150 2 Claims



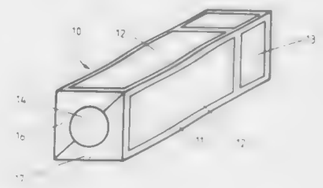
1. A method of generating an elastic wave comprising the steps of:
(a) generating an elastic wave having positive and negative pressure half waves focused at a focal region;
(b) interposing an acoustic filter in the path of said wave upstream of said focal region to attenuate the negative pressure half waves of said elastic wave, said path including a liquid therein having a predetermined temperature and mean static pressure when said elastic wave is transmitted therethrough in which the vapor tension of said liquid at said temperature, is selected at a predetermined value for causing vapor filled cavities to be formed within said liquid; and
(c) transmitting said elastic wave through said acoustic filter to attenuate the negative pressure half waves of said elastic wave.

4,995,013

DIRECTIONAL MODULAR LINEAR HYDROPHONIC ANTENNA

Bruno Dumaine, La Colle Saint Loup; Gilbert Roman, Saint Paul; Francois Ramoger, Cannes, and Guy Bertrand, Nice, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 13, 1989, Ser. No. 449,769
Claims priority, application France, Dec. 20, 1988, 88 16803
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—153 8 Claims



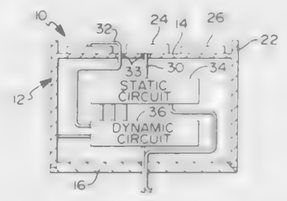
1. A linear hydrophonic antenna formed by a plurality of omnidirectional hydrophonic sensors comprising at least one directional module antenna wherein two pairs of hydrophonic sensors form two orthogonal dipoles, said modules being associated with means for identifying a direction of sources of waves picked up, wherein the hydrophonic sensors are surface pressure sensors placed on a support by means of an interface made of a visco-elastic material, wherein said support is a parallelepiped-shaped support having lateral faces and bearing a hydrophonic sensor on each of said lateral faces.

4,995,014

LOW FREQUENCY HYDROPHONE AND DEPTH SENSOR ASSEMBLY

Stanley J. Hoornstra, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Jan. 29, 1990, Ser. No. 471,600
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—153 6 Claims



1. A combined hydrophone and depth sensor comprising:
a sealed housing,
a plurality of sensor means on the housing exposed to static and dynamic pressure inputs,
the sensor means including static sensor means for responding to the static pressure due to the depth of the assembly

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and dynamic sensor means for responding to dynamic pressure due to pressure waves at a frequency below 1 Hz., and

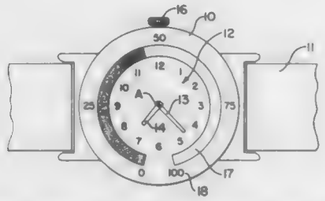
electronic means within the housing electrically coupled to the sensor means through the housing for receiving signals from the sensor means and for outputting signals containing depth information and low frequency pressure wave information.

4,995,015

DIVER'S WATCH WITH DEPTH GAUGE

Richard C. Chiang, Woodside, N.Y., assignor to Telux-Pioneer, Inc., Woodside, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,597
Int. Cl.[5] G04B 47/06
U.S. Cl. 368—11 **1 Claim**



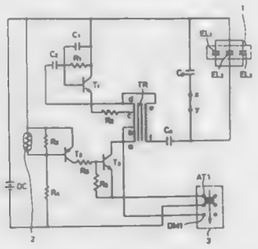
1. A wrist watch comprising a casing having a face, an analog time display on the face on which the current time is marked by a pair of hands, a circularly arcuate bar depth gauge display on the face on which the depth is marked, said depth gauge having an arcuate bar display which surrounds and lies outside the orbits of the hands on the watch face, said bar depth gauge being a significant part of a circle and concentric with the axis of the hands of the watch, and said bar gauge including a liquid-crystal display which changes color only as the watch is submerged to provide easy readability and no readout when the watch is out of the water.

4,995,016

TIMEPIECE WITH LIGHT EMITTING DEVICE

Isato Watanabe, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Oct. 17, 1989, Ser. No. 422,630
Claims priority, application Japan, Oct. 17, 1988, 63-260868
Int. Cl.[5] G04B 19/22
U.S. Cl. 368—67 **9 Claims**



1. A timepiece having a light emitting device, comprising:

a light emitting element mounted on a display portion of said timepiece;

light detecting means for detecting the brightness around said timepiece; and

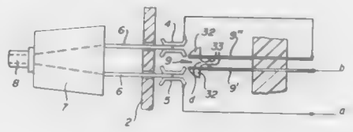
switching means for switching into a first mode, in which said light emitting element is caused to illuminate when in the darkness where the brightness of the light detected by said light detecting means is lower than a predetermined brightness and not to illuminate when in the brightness where the detected brightness is higher than a predetermined brightness, and into a second mode in which said light emitting element is caused to illuminate more brightly than the illumination in the darkness of said first mode.

4,995,017

SAFETY POWER RECEPTACLE

Christopher G. Sellati, and Valentine Sellati, both of Miami, Fla., assignors to TEC Products, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 135,924, Dec. 21, 1987, Pat. No. 4,871,924. This application Aug. 4, 1989, Ser. No. 372,718
Int. Cl.[5] H02J 1/10
U.S. Cl. 307—86 **20 Claims**



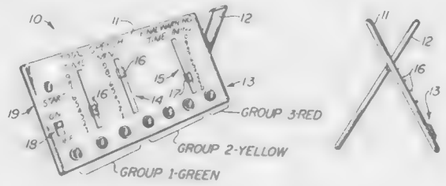
1. A safety power outlet connected to a plurality of power lines for connection with a matching power plug, having an equal plurality of prongs, comprising: a receive terminal associated with each of the power lines; a front plate having a receive hole aligned with each receive terminal for receiving a respective prong; switch means in engagement with at least two of said prongs for generating a connect signal in response to each of said two prongs being fully inserted into respective ones of said receive terminals, and electrical connecting means being responsive to said connect signal for connecting at least one of said power lines with its respective receive terminal.

4,995,018

METHOD AND APPARATUS FOR TIMING THE DELIVERY OF A SPEECH

Drew Edwards, 6075 The Corners Pkwy., Ste. 115, Norcross, Ga. 30092

Filed Oct. 10, 1989, Ser. No. 418,561
Int. Cl.[5] G04F 7/00
U.S. Cl. 368—107 **9 Claims**



1. An apparatus for timing the delivery of a speech of the type composed of at least two distinct timed portions with said apparatus comprising:

a case sized and configured to be carried in the pocket of a user and having a face;

means for supporting said case upon a podium with its face oriented toward a speaker behind the podium;

a first array of light emitting elements prominently displayed on said face and arranged to indicate the progressive lapse, of the first timed portion of the speech when activated in a predetermined sequence;

a second array of light emitting elements prominently displayed on said face and arranged to indicate the progressive lapse of the second timed portion of the speech when activated in a predetermined sequence subsequent to activation of said first array of light emitting elements;

electronic control means coupled to said first and second arrays of light emitting elements and adapted to activate said first array in a predetermined sequence to indicate the progressive lapse of the first timed portion of the speech and subsequently to activate said second array in a predetermined sequence to indicate the progressive lapse of the second timed portion of the speech;

adjustable means coupled to said control means for selecting the timing of sequenced activation of said first and second arrays of light emitting elements; and

means for selectively activating said control means to initiate sequenced activation of said first and second arrays of light emitting elements;

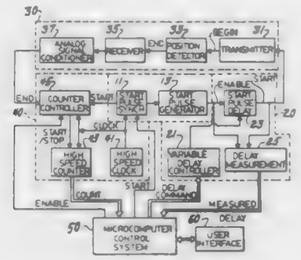
a third light emitting means prominently displayed on said face for indicating the lapse of a third timed portion of the speech, said control means being coupled to and adapted to activate said third light emitting means a predetermined time prior to the end of the speech, and second adjustable means coupled to said control means for selecting the time for activation of said third light emitting means.

4,995,019

TIME PERIOD MEASURING APPARATUS WITH ADAPTIVE AVERAGING

John Begin, Troy, Mich., assignor to MagneTek Controls, Clawson, Mich.

Filed Jun. 6, 1990, Ser. No. 534,187
Int. Cl.[5] G04F 8/00
U.S. Cl. 368—117 **20 Claims**



1. An adaptive time period measuring apparatus for measuring a time period provided by a transducer apparatus corresponding to a physical quantity to be measured, said adaptive time period measuring apparatus comprising:

a clock/counter circuit for counting the number of repetitive clock pulses produced at a predetermined fixed clock cycle rate during a counting interval between the receipt of a start count signal and the receipt of a stop count signal;

a start device connected to said clock/counter circuit for transmitting a start count signal to said clock/counter circuit when triggered;

a stop device connected to the transducer apparatus and said clock/counter circuit for transmitting a stop count signal to said clock/counter circuit upon termination of the time period of the transducer apparatus;

a variable time delay device connected to at least one of the transducer apparatus and said clock/counter circuit having a delay time variable over an interval corresponding to at least one clock cycle, for delaying one of the starting of said counting interval of said clock/counter circuit or the stopping of said counting interval of said clock/counter circuit relative to the time period of the transducer apparatus; and

an adaptive control device connected to said clock/counter circuit, said start device and said variable time delay device for producing a measure of the time period provided by the transducer apparatus by

repeatedly triggering said start device,

controlling the delay time of said variable time delay device for each triggering of said start device in accordance with a predetermined sequence of delay times over a range of one clock cycle,

forming a current time period measure equal to the algebraic sum of said count of said clock/counter circuit and said delay time of said variable time delay device for each triggering of said start device, and

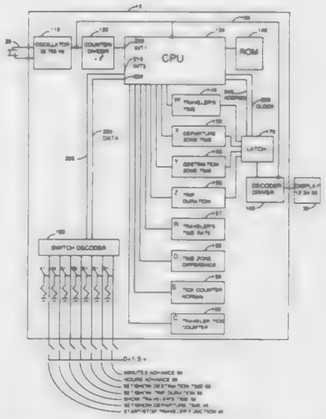
producing said measure of the time period provided by the transducer apparatus corresponding to a filtered quantity of said current time period measures for a number of triggerings of said start device.

4,995,020

TIMEPIECE WITH SPEED ADJUSTMENT FOR TIME STANDARD CHANGE ADAPTATION

Ross E. Mitchell, 4 Allston St., Newtonville, Mass. 02160

Continuation-in-part of Ser. No. 455,564, Dec. 22, 1989, which is a continuation of Ser. No. 325,293, Mar. 17, 1989, Pat. No. 4,901,296. This application May 7, 1990, Ser. No. 520,260
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] G04C 9/00
U.S. Cl. 368—185 **23 Claims**



1. In a timepiece for continuously advancing an indication of time at a standard rate, an improvement for assisting a user to accommodate to a change, over a given adaptation period, from one time standard originally applicable to said user, to another different time standard, subsequently applicable to said user, comprising:

input means for supplying to said timepiece, control data representing at least two of the following: said one time standard originally applicable to said user, said other time standard, subsequently applicable to said user, said adaptation period, and a desired operation rate for said timepiece;

storage means for storing data representing at least two of the following: the time under said original time standard, the time under said other time standard, said adaptation period, and said operation rate;

calculation means, responsive to said data in said storage means, for automatically calculating and supplying, during said adaptation period, output data representing a non-standard rate of advance of time for said timepiece

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based upon said control data, such that said non-standard rate of advance will correspond to the rate at which time would progress if the time standard experienced by said user gradually changed during said adaptation period from said original time standard to said other time standard;

display means, responsive to said output data of said calculation means, for indicating time to said user at said non-standard rate during said adaptation period,

such that the time indicated by said timepiece varies gradually during said adaptation period, between the time under said original time standard and the time under said other time standard, and such that said user by observing said timepiece during said adaptation period, will tend to become gradually psychologically adapted to the time under said other time standard or that said user can change the indicated advancement of time of other purposes.

4,995,021

TIME MEASURING DEVICE AND METHOD FOR USING THE SAME

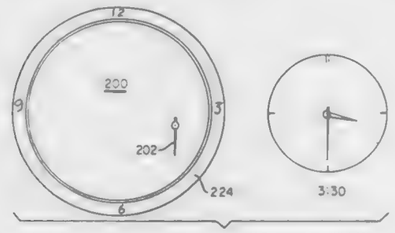
Scott L. Sullivan, 3 Garden Ridge, Chappaqua, N.Y. 10514

Continuation-in-part of Ser. No. 226,235, Jul. 29, 1988, Pat. No. 4,852,072. This application Jul. 24, 1989, Ser. No. 384,509

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] G04B *19/06*

U.S. Cl. 368—233 **5 Claims**



1. A timepiece for measuring time comprising:

drive means having a shaft rotatable at an hours rate;

an hours hand rotatable about said shaft of said drive means;

a minutes hand attached to said hours hand at a satellite point, said minutes hand being rotatable about said satellite point at a minutes rate and said satellite point being located at any position on said hours hand except said location of said shaft of said drive means;

a fixed gear located adjacent to said hours hand, said fixed gear being stationary with respect to said drive means;

a rotatable gear drivably attached to said minutes hand and centered about said satellite point, said rotatable gear engaging said stationary gear, said gears engaging such that said drive means rotates said hours hand at said hours rate, said rotatable gear rotates along said fixed gear at said minutes rate thereby rotating said minutes hand.

4,995,022

POWER SUPPLY DEVICE FOR HAND WITH LUMINESCENCE ELEMENT

Hidetsugu Ikeda; Shoichiro Kumazawa; Satoru Yamauchi; Isato Watanabe, and Kouichi Miyagi, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Sep. 14, 1989, Ser. No. 407,408

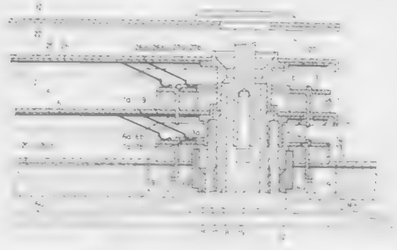
Claims priority, application Japan, Sep. 19, 1988, 63-233974; Oct. 31, 1988, 63-142182[U]

Int. Cl.[5] G04B *19/32, 19/04*

U.S. Cl. 368—226 **10 Claims**

1. A power supply device for a hand with a luminescence element comprising:

a contact receiver secured on the upper side of the hand and having two annular conductors on the upper side thereof concentrically with the center of rotation of the hand, and a pair of contact members for supplying a drive power to the luminescence element mounted on the hand, the contact



members being disposed on the under side of the hand and having contact segments whose paths of travel define concentric circles with the center of rotation of the hand, wherein the annular conductors are connected electrically with the contact members.

4,995,023

WATCHCASE AND WATCH PROVIDED WITH SUCH CASE

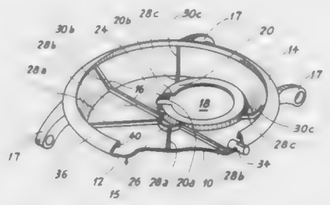
Jacques Müller, Reconvilier, and Clément Meyrat, Le Landeron, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Switzerland

Filed Jan. 3, 1990, Ser. No. 460,456

Claims priority, application Switzerland, Jan. 13, 1989, 00096/89

Int. Cl.[5] G04B *37/00*

U.S. Cl. 368—276 **9 Claims**



1. A watch case comprising a dome, lugs attached to the outer face of said dome and defining zones of attachment, and a stiffening structure obtained from the dome material which together define a back cover and caseband, said structure including, as additional dome thickness, a central projection integral with said back cover, and stiffening elements extending radially from said projection towards the dome periphery, certain of said stiffening elements terminating at the caseband of the dome in the attachment zones of the lugs to the dome.

4,995,024

MAGNETO-OPTICAL RECORDING ELEMENT

Hisao Arimune; Takashi Maeda; Mitsuo Miyazaki, and Yasuo Nishiguchi, all of Hayato, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Oct. 28, 1988, Ser. No. 264,159

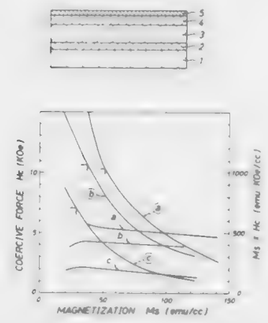
Claims priority, application Japan, Oct. 30, 1987, 62-276733

Int. Cl.[5] G11B *13/04, 11/10, 11/12*

U.S. Cl. 369—13 **12 Claims**

1. A magneto-optical recording element operable with at least one of an applied recording retention magnetic field and an applied recording reversal magnetic field, the recording element comprising a dielectric layer and an amorphous perpendicular magnetization film on a substrate, wherein the perpendicular magnetization film is a perpendicular magnetization film comprising at least Gd element as the rare earth metal element and Fe metal as the transition metal component, in which the Fe sub-lattice moments are dominant, the dielectric layer is a dielectric layer composed of amorphous silicon nitride, the perpendicular magnetization film has a magnetization Ms and a coercive force Hc such that the magnetization Ms is within a range represented by the following formula:

$$20 \text{ emu/cc} \leqq Ms \leqq 70 \text{ emu/cc}$$



and the product of the magnetization Ms and the coercive force Hc is set within a range represented by the following formula:

$$100 \text{ emu·KOe/cc} \leqq Ms \cdot Hc \leqq 500 \text{ emu·KOe/cc}$$

and wherein said recording element has an ability to overwrite at a recording retention magnetic field having an absolute value smaller than 150 Oe and a recording reversal magnetic field having an absolute value smaller than 150 Oe.

4,995,025

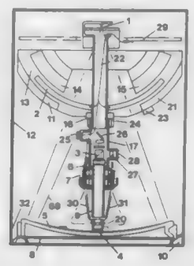
SPHERICAL PIVOTING ACTUATOR FOR READ/RECORD HEAD

Dieter M. Schulze, 18956 Sara Park Cir., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 274,217, Nov. 18, 1988, which is a continuation-in-part of Ser. No. 104,727, Oct. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 916,743, Oct. 6, 1986, abandoned. This application Nov. 18, 1988, Ser. No. 274,217

Int. Cl.[5] G11B *17/22*

U.S. Cl. 369—32 **111 Claims**



1. An actuator for data retrieval and/or storage with media means comprising;

structure for supporting at least a portion of read and/or record means, said structure having free end for placement adjacent to media means;

pivot means coupled to said structure for allowing relative movement between said structure and said pivot means in at least two orthogonal directions or components thereof, such that said free end can move relative to and essentially along a portion of a sphere in at least two planes; and

means for moving said structure and said pivot means relative to each other.

4,995,026

APPARATUS AND METHOD FOR ENCODING AUDIO AND LIGHTING CONTROL DATA ON THE SAME OPTICAL DISC

Dai Makabe, Shinjuku, and Yuji Kumai, Shinagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

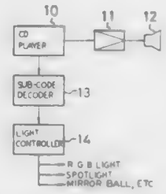
PCT No. PCT/JP88/00108, § 371 Date Oct. 5, 1988, § 102(e) Date Oct. 5, 1988, PCT Pub. No. WO88/06338, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 5, 1988, Ser. No. 265,800

Claims priority, application Japan, Feb. 10, 1987, 62-29358

Int. Cl.[5] G11B *31/00, 7/013;* **A63J** *17/00*

U.S. Cl. 369—70 **3 Claims**



3. An optical disc reproducing apparatus for reproducing an audio signal an d a lighting control signal from an optical disc to control at least one illumination device such as a spot light, a mirror ball or red, green or blue lights, an optical disc player for reproducing said audio signal and said lighting control signal from said optical disc, a light controller receiving said lighting control signal to produce at least one signal for controlling at least one of said spot light, said mirror ball, said red, green or blue lights and the light controller producing information for hue control, intensity control fade-in and fade-out control including the speed of fade-in and fade-out.

4,995,027

AUTOMATIC LOADING DISC PLAYER

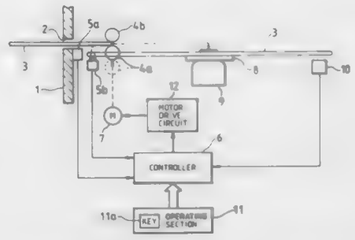
Yoshio Aoyagi; Toshiyuki Kimura; Yoshinori Yamada; Fumio Endo, and Kiyoshi Morikawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,839

Claims priority, application Japan, Mar. 5, 1988, 63-52178; Mar. 5, 1988, 63-52179; Mar. 5, 1988, 63-52180

Int. Cl.[5] G11B *33/02, 05/016*

U.S. Cl. 369—77.1 **6 Claims**



1. An automatic loading disc player for automatically detecting an attempted insertion of a data recording disc of improper size and ejecting such disc, in which conveying rollers are arranged near a disc insertion opening, and said conveying rollers are rotated in a forward direction to move a data re-

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cording disc to a disc-playing position, and are rotated in a reverse direction to move said data recording disc to said disc insertion opening therefrom, said player comprising:

first detecting means provided near said conveying rollers for detecting the presence or absence of a data recording disc;

second detecting means for detecting when a data recording disc is loaded at said disc-playing position; and

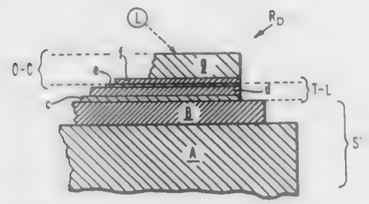
control means for controlling the driving of said conveying rollers in the forward or reverse direction, said control means operating to stop the driving of said conveying rollers in the forward direction when, in loading a data recording disc, the detection of the presence of said disc by said first detecting means is interrupted before said second detecting means detects the completion of loading of said disc, wherein the interruption of a detection of said first detecting means before said second detecting means detects the completion of loading being an indication that the data recording disc is improper in size with respect to said player.

4,995,028

COATED MEDIA FOR OPTICAL RECORDING, WITH SOFT/HARD OVERCOAT

Norman L. Boling; Thomas Mayer, and James D. Rancourt, all of Santa Rosa, Calif., assignors to Unisys Corp., Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,804
Int. Cl.[5] G11B *7/24*
U.S. Cl. 369—275.5 **29 Claims**



1. A radiation-recording element comprising:

a rigid substrate having a prescribed carrier surface;

a radiation-sensitive metallic recording structure disposed on said surface; and

protective bi-functional cover means laid over this structure, the cover means comprising a "soft pad" overcoating relatively transparent to the radiation laid over the structure, operatively adjacent thereto, plus a relatively hard protective outer-seal coating over the "soft pad"; the "soft pad" being comprised of chemically-stable, insulative material adapted to accommodate micro-excursions of about 100 A° or less from translation and/or deformation of portions of the recording structure.

4,995,029

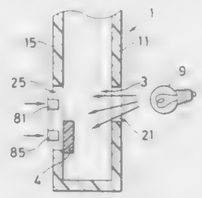
OPTICAL DISK IDENTIFYING METHOD, MANUFACTURE OF CARTRIDGE-ENCLOSED OPTICAL DISKS, AND OPTICAL DISK CARTRIDGES

Hideo Kobayashi; Giichi Shibuya, and Osamu Murakami, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 423,980
Claims priority, application Japan, Oct. 24, 1988, 63-267970
Int. Cl.[5] G11B *7/26, 15/04, 23/02;* **B65D** *85/30*
U.S. Cl. 369—291 **7 Claims**

1. A method for identifying an optical disk in a cartridge in a disk drive system, wherein the cartridge is provided with a variable hole whose opening configuration can be changed to provide at least four predetermined opening configurations each representing a type of identifying information, and the disk drive system is equipped with sensor means, said method comprising the steps of:

setting the opening configuration of the hole to one of the four predetermined opening configurations representing a particular type of identifying information, and



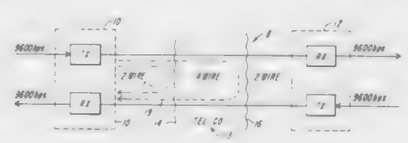
detecting the opening configuration of the hole by said sensor means to obtain the particular type identifying information represented by the detected opening configuration.

4,995,030

FAR END ECHO CANCELLATION METHOD AND APPARATUS

Brant M. Helf, Newtonville, Mass., assignor to Memotec Datacom, Inc., North Andover, Mass.

Continuation of Ser. No. 150,975, Feb. 1, 1988, abandoned. This application Nov. 2, 1989, Ser. No. 431,713
Int. Cl.[5] H04B *3/20*
U.S. Cl. 370—32.1 **19 Claims**



1. In a full duplex communications apparatus having at least two communicating modem stations, each station having

a transmitter for placing transmit communications signals onto a two wire communications path,

a receiver for receiving received communications signals from said communications path, and

wherein each said received communications signal at a station has a noise-free signal component and a noise signal component, said noise signal component including a far end echo signal generated from said transmit signals of the station,

apparatus for reducing the effect of the far end echo signal at the receiver comprising

quadrature detection and equalization circuitry for generating from a said received signal an I and a Q equalized receiver signal,

receiver decision circuitry responsive to a compensated I and Q equalized receiver signal for generating a receiver decision and for using the receiver decision for generating an I and a Q error update signal,

far end echo compensation circuitry responsive to said I and Q error update signals and a reference signal from the transmitter of the station for generating an I and a Q far end echo cancellation signal,

means for combining said I echo cancellation signal and said I equalized receiver signal for generating said compensated I equalized receiver signal for delivery to said receiver decision circuitry, and

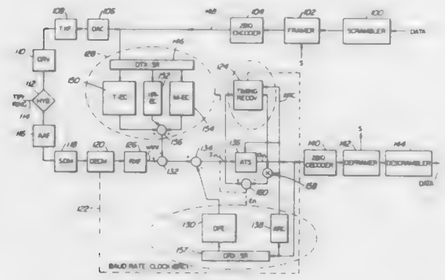
means for combining said Q echo cancellation signal and said Q equalized receiver signal for generating said compensated Q equalized receiver signal for delivery to said receiver decision circuitry.

4,995,031

EQUALIZER FOR ISDN-U INTERFACE

Sami A. H. Aly, Kanata, and Babak Sayar, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 19, 1989, Ser. No. 368,239
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—32.1 **12 Claims**



1. A receiver for a digital data transmission system comprising sampling means having an input for receiving digital data signals from a subscriber loop, said sampling means being operable to sample a received digital data signal, precursor equalizer means for equalizing the output from said sampling means, and timing recovery means for controlling said sampling means in dependence upon the output of said precursor equalizer means, said precursor equalizer means having a difference equation such that the equalized digital data signal has at least one zero-crossing occurring substantially one baud before the main cursor of each pulse, wherein said precursor equalizer means has a difference equation:

$$w(n) = \frac{-h_{-1}}{h_o}\, y(n) + y(n-1)$$

where n is the baud index, y(n) is the input to the precursor equalizer, w(n) is its output, h_0 is the main cursor height before equalization and h_1 is the first precursor height before equalization.

4,995,032

LABEL-SWITCHING AND CONTROL INTERFACE FOR ASYNCHRONOUS FAST-PACKET SWITCHING

Carlo Demichelis; Paolo Mattone, and Alessandro Zappalorto, all of Turin, Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Aug. 22, 1989, Ser. No. 397,123
Claims priority, application Italy, Oct. 17, 1988, 67924 A/88
Int. Cl.[5] H04J *3/28*
U.S. Cl. 370—60 **6 Claims**

1. A label-switching and control interface for fast packet switching, comprising:

a plurality of bidirectional asynchronus multiplex lines forwarding information-signal cells representing respective packets and corresponding to different calls;

respective programmed-logic units connected to each of said bidirectional asynchronous multiplex lines for fast cell processing;

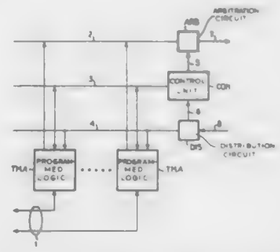
a multiplex switching network having an input bus connected to all of said programmed-logic units;

an arbitrating circuit between said input bus and said multiplex switching network and having a first bus connected therewith, said arbitrating circuit controlling communication between said programmed-logic units selectively and said multiplex switching network;

a distribution circuit connected to all of said programmed-logic units by a second bus and to an output bus of said multiplex switching network;

a common control circuit connected to all of said programmed-logic units by a third bus and accessing said multiplex switching network through a first connection to said arbitration circuit; and

means forming a second connection between said distribution circuit and said control circuit whereby said multiplex switching network accesses said common control circuit.

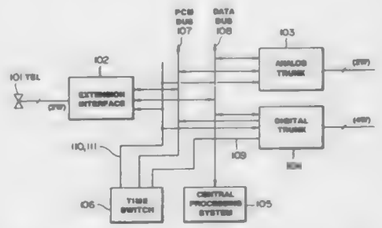


4,995,033

DIGITAL PRIVATE BRANCH EXCHANGE AND METHOD OF MANUFACTURING SAME

Kimio Ikemori, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 20, 1989, Ser. No. 341,015
Claims priority, application Japan, Apr. 22, 1988, 63-99638
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—68.1 **15 Claims**



1. A digital private branch exchange comprising:

a digital trunk adapted to a plurality of channels, said channels establishing a plurality of audio paths and at least one communication path, said at least one communication path being a connection request reject channel;

means for detecting a connection request to the connection request reject channel from an extension telephone set; and

means for sending a return signal to the extension telephone set indicating that the connection request to the connection request reject channel is rejected.

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4,995,034

METHOD OF INTEGRATING ONE OR MORE ACCESSORY FUNCTION MODULES IN TELECOMMUNICATIONS SYSTEMS AND ACCESS CIRCUIT FOR USE THEREWITH

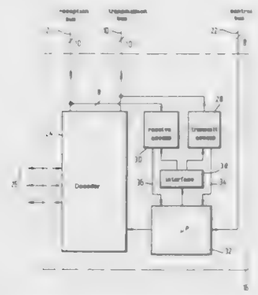
Hartmut Lubcke; Martin Backhaus, both of Paderborn, and Harald Schreiber, Salzkotten, all of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Continuation of Ser. No. 1,800, Jan. 9, 1987, abandoned. This application Dec. 8, 1989, Ser. No. 449,120

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3603013

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.1 **11 Claims**



1. For use in a telecommunication system of the type including plurality of user terminals (16) and a central exchange which provides time division multiplexed communications between the terminals (16) and at least one accessory function module (18), a method of providing communication between said accessory function module (18) and said terminals (16), comprising the steps of:

(A) assigning at least on fixed time slot for communications between said accessory module (18) and said terminals (16);

(B) accessing said communications in said one fixed time slot assigned in step (A);

(C) dividing said one fixed time slot into a plurality of communication channels; and

(D) selecting only a portion of said channels for each communication between one of said modules (18) and one of said terminals (16).

4,995,035

CENTRALIZED MANAGEMENT IN A COMPUTER NETWORK

Leo J. Cole, Raleigh; Curtis J. Frantz, Durham; Jeannette Lee; Zvonimir Ordanic, both of Raleigh, all of N.C., and Larry K. Plank, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,104

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.2 **16 Claims**

1. An improved method for managing a computer network including a plurality of nodes interconnected by a communications network, said method comprising the steps of:

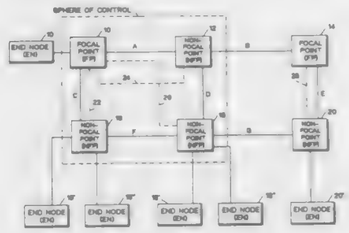
(a) partitioning the network into at least one Focal Point (FP) node and a plurality of Non-Focal Point (NFP) nodes;

(b) at the Focal Point node, maintaining a sphere of control (SOC) table than includes a listing of names of the Non-Focal Point nodes;

(c) at each Non-Focal Point node, maintaining a Focal Point authorization table with said table at least containing indicia which indentifies the Focal Point node;

(d) generating and sending from the Focal Point node to active Non-Focal Point nodes a "Request to be Your Focal Point" message;

(e) for each Non-Focal Point node receiving the message of step (d), responding with an "Accept Request" message



only if a None-Focal Point node ascertains that the Focal Point node is its primary Focal Point node; and

(f) thereafter, said each Non-Focal Point node generating and forwarding information messages to the Focal Point node.

4,995,036

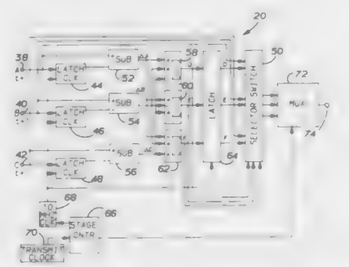
MULTICHANNEL DATA COMPRESSOR

William A. Copen, Bloomfield; Ashok M. Patel, Taylor, and Daniel R. Bush, Middleville, all of Mich., assignors to General Dynamics Land Systems, Inc., Troy, Mich.

Filed Aug. 7, 1989, Ser. No. 390,885

Int. Cl.[5] H04J *15/00*

U.S. Cl. 370—118 **41 Claims**



1. A data compressor for a data transmission system having a plurality of data sources repetitively generating data values and a transmitter for transmitting data comprising:

a plurality of difference means, one associated with each data source, each difference means subtracting sequentially generated data value generated by its associated data source, to generate difference data values;

means for summing said difference data generated by said plurality of difference means in a plurality of different sequences to generate a plurality of composite data values; and

multiplexer means connected to said transmitter for multiplexing said composite data values in a predetermined format to generate a compressed data word for transmission by said transmitter.

4,995,037

ADJUSTMENT METHOD AND APPARATUS OF A COMPUTER

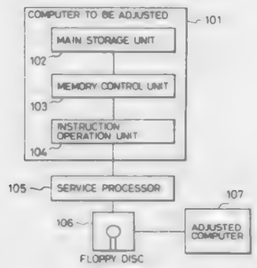
Toyohisa Imada, and Yoshiharu Kazama, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,521

Claims priority, application Japan, May 13, 1987, 62-114571

Int. Cl.[5] G06F *11/22*

U.S. Cl. 371—16.1 **10 Claims**



5. A system for providing data for adjusting an electronic computer including a main storage unit, comprising:

means for executing an adjusting program having a series of instructions for operating said electronic computer until a logical failure is detected in said electronic computer;

means for stopping execution of said adjusting program at an instruction an arbitrary number of instructions before the instruction on which said failure of said electronic computer was detected;

means for causing said electronic computer to re-execute said adjusting program after said stopping means is activated;

means for determining minimum and maximum addresses of said main storage unit used during execution of said adjusting program;

an external storage unit for storing therein data of internal registers and data of a region from said minimum address to said maximum address of said main storage unit, when said electronic computer stops re-execution of said adjusting program, said data being supplied to said external storage unit;

a previously adjusted electronic computer for constructing a simulation model of said electronic computer to be adjusted;

means for setting data of said external storage unit in said simulation model;

means for starting execution of a simulation using said simulation model in said previously adjusted electronic computer; and

a file for storing a state of said internal registers of said electronic computer obtained from execution of said simulation using said simulation model.

4,995,038

FINDING FAULTS IN CIRCUIT BOARDS

David C. Brown, Templeton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 225,504, Jul. 28, 1988, abandoned. This application May 11, 1990, Ser. No. 522,479

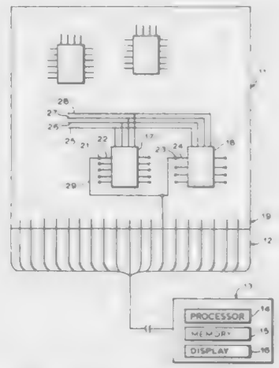
Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—16.1 **14 Claims**

1. An integrated circuit chip having chip operating circuitry and at least one service supply terminal for receiving at least one service voltage within a predetermined range used in the function of said chip operating circuitry, said integrated circuit chip adapted for installation on a circuit board having a diagnostic interface for connection to a test computer, said chip comprising:

diagnostic circuitry means located within said chip for generating a diagnostic output signal during an interval between application of a diagnostic initiation signal and a diagnostic termination signal to said chip, said diagnostic output signal being generated in response to sensing at said diagnostic circuitry said at least one service voltage within said predetermined range;

service supply structure means coupled to said at least one



service supply terminal for delivering said at least one service voltage to said diagnostic circuitry means and said chip operating circuitry; and

diagnostic output signal connection means coupled to said diagnostic circuitry means and said diagnostic interface for presenting said diagnostic output signal to said test computer.

4,995,039

CIRCUIT FOR TRANSPARENT SCAN PATH TESTING OF INTEGRATED CIRCUIT DEVICES

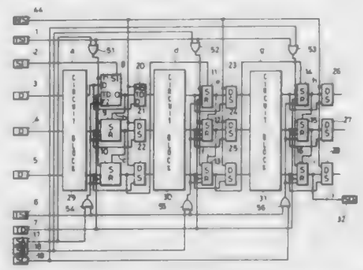
Kazuhiro Sakashita; Ichiro Tomioka, and Takeshi Hashizume, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,289

Claims priority, application Japan, Sep. 25, 1987, 62-242320

Int. Cl.[5] G01R *15/12, 31/28*

U.S. Cl. 371—22.3 **13 Claims**



1. A method of controlling a test circuit for testing a circuit having a plurality of circuit blocks, said test circuit having a test signal circuit for providing test signals to and collecting response signals from at least one of said circuit blocks, said test signal circuit having a plurality of scan register stages, each including two latch circuits, each of said latch circuits including a pair of cross-coupled inverters, a first transfer gate at an input of a first one of said pair of cross-coupled inverters and a second transfer gate between said pair of latches, the method including the steps of:

selecting at least one of said circuit blocks to be tested;

supplying a plurality of clock signals suitable for rendering

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said transfer gates alternately conductive to respective ones of said transfer gates corresponding to a circuit block which has been selected to transfer a pattern of said test signals under control of said clock signals thereto; and

supplying a constant signal suitable for rendering said transfer gates corresponding to a circuit block which has not been selected simultaneously conductive,

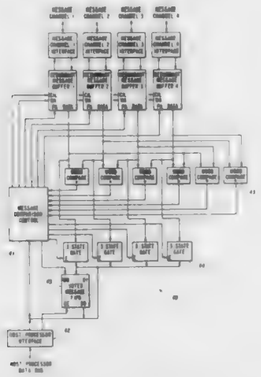
whereby test signals appearing at an input of ones of said scan registers corresponding to a circuit block which has not been selected are transferred therethrough without clocking.

4,995,040

APPARATUS FOR MANAGEMENT, COMPARISON, AND CORRECTION OF REDUNDANT DIGITAL DATA

David W. Best, Marion, Iowa, and Kevin L. McGahee, Kansas City, Mo., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 3, 1989, Ser. No. 306,611
Int. Cl.[5] G06F *11/18*
U.S. Cl. 371—36 19 Claims



1. A redundancy management unit, comprising:

means for receiving asynchronous redundant digital messages;

means for storing the asynchronous digital messages as they are received;

means for determining when a predetermined number of said asynchronous digital messages has been received;

means connected to said receiving means for comparing said redundant digital messages;

means connected to said comparing means for voting to select a correct message from said redundant messages; and

means connected to said voting means for storing said correct message.

4,995,041

WRITE BACK BUFFER WITH ERROR CORRECTING CAPABILITIES

Ricky C. Hetherington; Tryggve Fossum, both of Northboro; Maurice B. Steinman, Grafton, and David A. Webb, Jr., Berlin, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

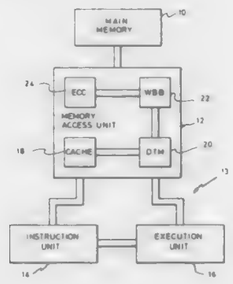
Filed Feb. 3, 1989, Ser. No. 306,703
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—40.1 17 Claims

1. A digital computer system having an apparatus for controlling write back operations between a cache memory located in a central processing unit and a main memory, comprising:

means for detecting the absence of desired data in the cache and delivering a refill request signal to the main memory, said main memory including means for processing said refill request signal during a predetermined duration of time and delivering said desired data to said cache;

a write back buffer for temporarily holding data from said cache;

means for delivering preexisting data from a location in the cache to said write back buffer during said predetermined duration of time;



means for receiving said desired data from the main memory and storing said desired data in said location in the cache;

means for delivering said preexisting data from the write back buffer to the main memory in response to delivery of said desired data to the cache being completed; and

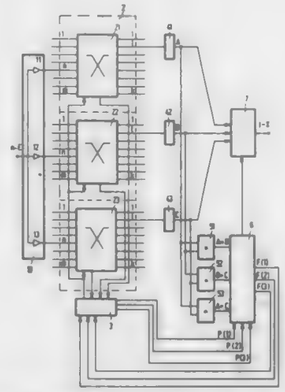
means for correcting errors in said preexisting data having been delivered from said location in said cache before said preexisting data are received by said main memory.

4,995,042

SWITCHING EXCHANGE

Roland Güthaus, Nuremberg, and Andrea Lamm, Neunkirchen-Speikern, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1989, Ser. No. 296,269
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1988, 3801123
Int. Cl.[5] G06F *11/18*
U.S. Cl. 371—68.2 11 Claims



1. A switching exchange for switching in a computer-controlled manner digital input data words having constant data word lengths, which input data words are applied to a switching network through a plurality of input lines and which input data words are transferred by the switching network to an output line in accordance with a connection request, wherein the switching network (2) comprises

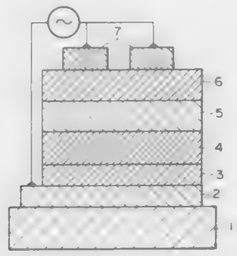
three parallel sub-switching networks (21, 22, 23), each data input word being applied to each sub-switching network and wherein three respective corresponding outputs of the sub-switching networks (21, 22, 23) are connected to inputs of a multiplexer (7) and connected in pairs to the inputs of three comparators (51, 52, 53), which comparators pairwise compare complete versions of the input data words as the input data words appear at the corresponding outputs of the three sub-switching networks, the outputs of the comparators (51, 52, 53) being connected to a selection logic (6), whose output is connected to a control input of the multiplexer (7).

4,995,043

THIN-FILM ELECTROLUMINESCENCE APPARATUS INCLUDING OPTICAL INTERFERENCE FILTER

Jun Kuwata, Katano, and Atsushi Abe, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 29, 1990, Ser. No. 471,967
Claims priority, application Japan, Mar. 24, 1989, 1-072422
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—7 7 Claims



1. A thin-film electroluminescence apparatus comprising: a pair of electrode layers at least one of which is light-transmissible; a fluorescent material layer or a laminated structure of a fluorescent material layer and a dielectric material layer, a voltage being applied to said fluorescent material layer or said laminated structure through said pair of electrode layers; and reflecting mirror layers provided on two sides of said fluorescent material layers or said laminated structure of fluorescent and dielectric material layers, said reflecting mirror layers having a reflectivity equal to or larger than 0.7 and smaller than 1 with respect to a wavelength λ of light emitted from said fluorescent material layer; wherein the following relationship is established between the refractive index n of said fluorescent material layer or said laminated structure of fluorescent and dielectric material layers;

$$d = K \cdot n^{-1} \cdot \lambda/2$$

where K is a positive integer equal to or larger than 1 and where d is the total thickness of said fluorescent material layer or said laminated structure.

4,995,044

LASER DIODE IMPULSE CIRCUIT

Stephen F. Blazo, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

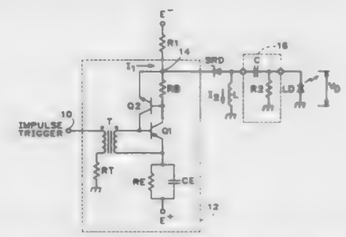
Filed Mar. 23, 1990, Ser. No. 498,177
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—25 2 Claims

1. A laser diode impulse circuit comprising:

a current pulse generating circuit for generating a current pulse in response to an input trigger signal;

a step recovery diode coupled to the output of the current pulse generating circuit, the step recovery diode being normally forward biased with the current pulse causing the step recovery diode to become reverse biased;

an inductor coupled in series with the step recovery diode opposite of the current pulse generating circuit to store energy when the step recovery diode is reverse biased;



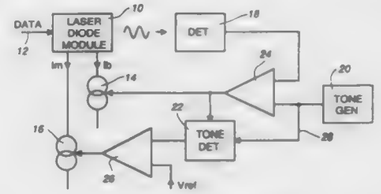
a pulse shaping network coupled in series with a laser diode, the series combination in turn being coupled in parallel with the inductor, so that the energy stored in the inductor is transferred to the laser diode in the form of a short current pulse to produce an optical pulse.

4,995,045

LASER CONTROL CIRCUIT

Gregory S. Burley, Mississauga, and Kim B. Roberts, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 1, 1990, Ser. No. 473,513
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—38 9 Claims



1. A laser diode control circuit comprising:

first control means, including an amplifier, having an input and an output, for controlling a bias current for a laser diode;

means for supplying a pilot signal to the input of the amplifier; and

second control means connected to the output of the amplifier and responsive to an amplified level of the pilot signal at the output of the amplifier for controlling a modulation current of the laser diode.

4,995,046

ROOM TEMPERATURE 1.5 μM BAND QUSAI-THREE-LEVEL LASER

Yuan X. Fan, Mountain View, and Richard G. Schlecht, San Jose, both of Calif., assignors to Laserqenics, San Jose, Calif.

Filed Aug. 23, 1989, Ser. No. 397,410
Int. Cl.[5] H01S *3/16*
U.S. Cl. 372—41 23 Claims

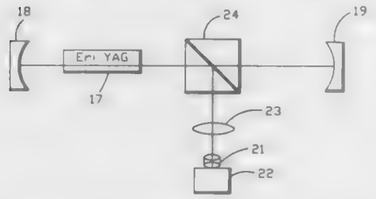
1. A method for producing laser radiation from a solid-state lasant material efficiently by a quasi-three-level laser transition system, comprising the steps of:

a. providing a solid-state lasant material made up of a host material and a single dopant within the same which is in a

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concentration which is not sufficiently high to provide up-conversion or significant energy transfer between dopant particles, said lasant material having a ground state energy manifold and at least one other higher energy manifold, both of which have a plurality of energy levels defining between said manifolds one or more frequencies at which optical energy is absorbable and one or more frequencies making up the desired radiation;

b. selecting a source of optical pumping energy having an optical output concentrated at one or more frequencies



which are generally the same as said one or more frequencies which are absorbable;

c. pumping said lasant material with the optical output of said source to cause a population inversion between energy levels respectively of said ground state and higher energy manifolds and consequent lasing of the desired radiation;

d. enclosing said solid-state lasant material within a resonant cavity selected to oscillate said desired radiation within said material; and

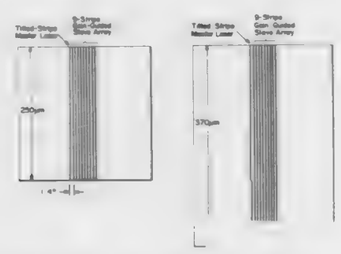
e. generating output radiation from said resonant cavity.

4,995,047

INTEGRATED INJECTION-LOCKED SEMICONDUCTOR DIODE LASER

G. Ronald Hadley; John P. Hohimer, and Adelbert Owyoung, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 30, 1989, Ser. No. 400,621
Int. Cl.[5] H01S *3/19, 3/098*
U.S. Cl. 372—50 **22 Claims**



1. A semiconductor laser apparatus, comprising:

a slave array of semiconductor laser elements, and

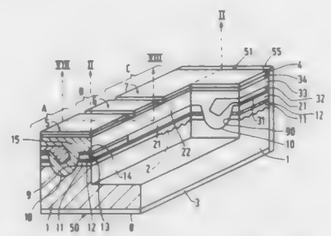
a master laser, integrated on one semiconductor chip with said slave array, for producing a laser beam and for controlling said slave array to produce a single, phase-locked, steerable emission beam from said slave array.

4,995,048

TUNABLE SEMICONDUCTOR DIODE LASER WITH DISTRIBUTED REFLECTION

Pieter I. Kuindersma, and Teunis Van Dongen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 6, 1989, Ser. No. 446,740
Claims priority, application Netherlands, Dec. 16, 1988, 8803080
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **9 Claims**



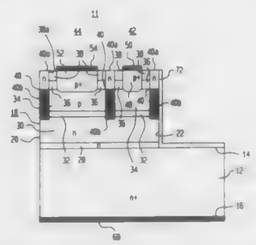
1. A tunable semiconductor diode laser with distributed reflection comprising a semiconductor body having a passive layer and in which a first radiation-conductive layer is present on said first passive layer and in which a strip-shaped resonant cavity is formed between two surfaces extending substantially perpendicularly to said layers and within which resonant cavity are juxtaposed a first section having a first current supply and an associated active region with a p-n junction which at sufficiently high current strength in the forward direction generates coherent electromagnetic radiation, which active region is situated within the amplification profile of the radiation-conductive layer, a second section having a second current supply by which the refractive index of a part of the radiation-conductive layer present within said second section can be varied, and a third section having a third current supply in which the part of the resonant cavity present within the said third section comprises a periodic variation of the refractive index in the longitudinal direction, characterized in that the semiconductor diode laser comprises means for making the relative intensity of that part of the radiation generated in the first section which is reflected at the junction between the first and the second section small with respect to the intensity of the radiation returning from the second section to the junction.

4,995,049

OPTOELECTRONIC INTEGRATED CIRCUIT

Keith B. Kahen, Rochester, and Gopalan Rajeswaran, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1990, Ser. No. 529,830
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **27 Claims**



1. An optoelectronic integrated circuit comprising:

a body of a group III-V semiconductor material having an active layer extending therethrough;

a first insulating layer sandwiched between the body and a second insulator or semiconductor layer extending parallel to the active layer;

a laser diode, which is adapted to generate light in the active layer during operation thereof, formed in a first section of the circuit which comprises a first portion of the body and first portions of the first and second layers;

a photodiode, which is adapted to receive at least some of the light generated by the laser diode and to generate electron-hole pairs, formed in a second section of the circuit which comprises a second portion of the body and second portions of the first and second layers;

the first and second sections of the circuit being electrically isolated from each other;

an electrical device being formed in a portion of the second layer in a third section of the circuit which comprises a third portion of the body and third portions of the first and second layers; and

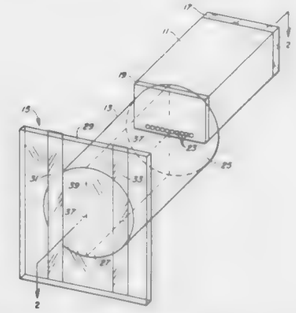
at least one electrical insulation region extending through a portion of the body including through the active layer.

4,995,050

DIODE LASER WITH EXTERNAL LENS CAVITY

Robert G. Waarts; William Streifer, both of Palo Alto, and Donald R. Scifres, San Jose, all of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Filed Nov. 17, 1989, Ser. No. 438,600
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—95 **42 Claims**



1. A laser configuration comprising,

a diode laser having a back facet reflector and a front partially transmitting facet,

a lens system positioned in front of said front facet for transforming a near field distribution of light transmitted through said front facet to a far field pattern, and

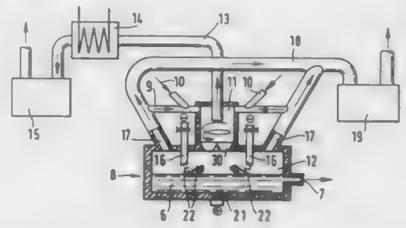
means placed in front of said lens system in said far field pattern for reflecting said far field pattern of light in a spatially selective manner back toward said diode laser, said spatially selective reflecting means including a first high reflectivity thin stripe and a second partially reflective and partially transmissive thin stripe, said second thin stripe having a reflectivity that is substantially less than the reflectivity of said first stripe, said first and second thin stripes being positioned in front of lobes of said far field pattern corresponding to a desired laser mode so as to reflect substantially more light of said desired mode than light of other undesired modes, said second thin stripe partially transmitting one lobe of said far field pattern to provide a laser output.

4,995,051

SMELTING FURNACE AND METHOD FOR FEEDING MATERIAL TO BE PROCESSED THEREIN

Nils H. Hakulin, Espoo, Finland; Risto M. Heikkilä, Haparanda, Sweden; Matti E. Honkaniemi, Tornio, Finland; Helge J. Krogerus, and Launo L. Lilja, both of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Feb. 21, 1989, Ser. No. 313,960
Claims priority, application Finland, Feb. 22, 1988, 880819
Int. Cl.[5] F27B *3/18*
U.S. Cl. 373—81 **15 Claims**



1. A smelting furnace comprising:

wall means bounding a smelting zone, said wall means including a floor and a roof, the roof defining a feed gate for introducing feed material into the smelting zone, the feed gate being at substantially the same height as the roof, or being higher than the roof, and the roof also defining at least one discharge opening for discharging gases from the smelting zone,

at least three cathodes extending through the roof of the wall means, the cathodes being disposed at locations spaced apart around a circle, the feed gate being inside said circle and the discharge opening being outside said circle,

an anode at the floor of the wall means, and

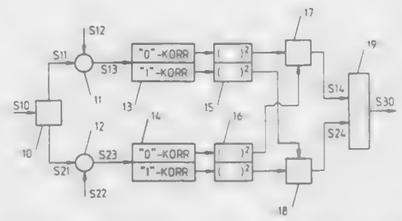
supply means for providing a supply of feed material to the feed gate in an even suspension over the cross-sectional area of the gate.

4,995,052

DEMODULATION METHOD

Terje Thorvaldsen, Wittedal, Norway, assignor to Forsvarets forskningsinstitutt, Kjeller, Norway

PCT No. PCT/NO88/00075, § 371 Date Apr. 13, 1990, § 102(e) Date Apr. 13, 1990, PCT Pub. No. WO89/04095, PCT Pub. Date May 5, 1989
PCT Filed Oct. 12, 1988, Ser. No. 473,962
Claims priority, application Norway, Oct. 19, 1987, 874342
Int. Cl.[5] H04B *15/00;* H03D *3/10*
U.S. Cl. 375—1 **3 Claims**



1. Method for demodulating data represented by orthogonally coded Direct Sequence Spread Spectrum Signals (DSSS) which in a transmitter is modulated on a carrier with MSK (Minimum Shift Keying) (or related continuous phase modulation types) and which in a receiver is down converted to baseband with a frequency which is shifted with ¼ chiprate relatively to the center frequency of the received signal by two

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signals which are 90 degrees out of phase with each other, in two orthogonal channels with individual identical correlators (or banks of correlators), squared in quadrature devices and thereafter added in adding devices, characterized in this that information about the transmitted code and thereby also about the transmitted data are extracted in a discriminator device by choosing the code which gives the highest correlation peak out of the adding devices in spite of the fact that the phase difference between the signal which is used for down conversion to baseband and the center frequency of the transmitted signal remains unknown and even slowly varying (incoherent demodulation), and in spite of the fact that the modulation method used to modulate the carrier is MSK or a related modulation type.

4,995,053

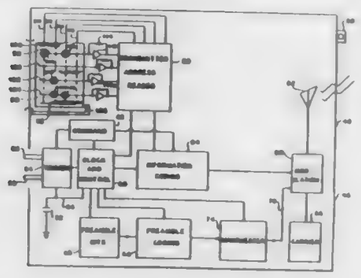
REMOTE CONTROL SYSTEM, COMPONENTS AND METHOD

Raymond W. Simpson, Hamilton Square; Donald G. Chandler, Pennington, and John H. Bowers, Monmouth Junction, all of N.J., assignors to Hillier Technologies Limited Partnership, Washington Crossing, Pa.

Division of Ser. No. 386,583, Jul. 27, 1989, Pat. No. 4,932,037, which is a division of Ser. No. 13,577, Feb. 11, 1987, Pat. No. 4,864,588. This application Apr. 25, 1990, Ser. No. 514,181

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **7 Claims**



1. A remote control receiver for incorporation in the electrical wiring of a building or an electrical appliance, the receiver comprising:

(a) recovery means for receiving a spread-spectrum radio signal propagated through free space within the building, and recovering from said radio signal digital information including a transmitted address and a transmitted command;

(b) address storage means for storing a preset receiver address;

(c) address comparison means for comparing said transmitted address and said preset receiver address and determining whether or not said addresses match;

(d) control signal means for generating a control signal in response to said transmitted command when said transmitted address matches said preset address; and

(e) action means for controlling flow of electricity through the wiring in response to said control signal.

4,995,054

DATA TRANSMISSION USING SWITCHED RESONANCE

Gregory P. Eckersley, 5 Reeves Court, Kew, Victoria 3101, Australia

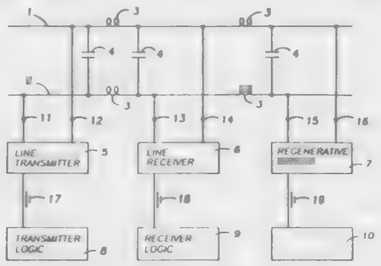
PCT No. PCT/AU88/00244, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO89/00364, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 8, 1987, Ser. No. 335,082

Claims priority, application Australia, Jul. 8, 1987, PI2990

Int. Cl.[5] H04B *3/36;* **H04L** *25/02*

U.S. Cl. 375—4 **9 Claims**



1. An arrangement for the transmission of binary data via electrical conductors, said arrangement including inductance, capacitance, an electronic switching device and a regenerative energy replacement circuit, said electronic switching device being in series with said inductance and in parallel with said capacitance, said capacitance being in parallel with said conductors, said capacitance and inductance forming a switched resonant circuit, said electronic switching device adapted to be switched on to permit current flow through said inductance until the charge on said capacitance has changed sign and returned to approximately the same magnitude present before switching on said electronic switching device, thus creating a reversal of the data state signalled via electronic conductors, after which point in time said electronic switching device is switched off until the next change of data state requiring to be signalled and said regenerative energy replacement circuit replacing any loss of charge due to losses occurring in any of the elements forming said arrangement, whereby the state of said binary data is represented by the polarity of the voltage between said electrical conductors.

4,995,055

TIME SHARED VERY SMALL APERTURE SATELLITE TERMINALS

Howard L. Weinberger, Marina del Rey, and Jamal Sarraf, Irvine, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 16, 1988, Ser. No. 207,425

Int. Cl.[5] H04L *27/04*

U.S. Cl. 375—5 **10 Claims**

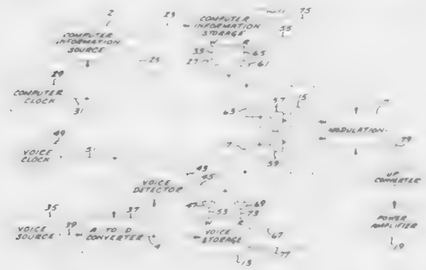
1. A time shared power amplifier comprising:

first data storage means, operative to store a first data signal;

second data storage means, operative to store a second data signal;

control means, responsive to the first storage means to initiate transfer of a stored data signal out of the first storage means and during the transfer to inhibit initiation of transfer of any signal out of the second storage means, and responsive to the second storage means to initiate transfer of a stored data signal out of the second storage means and during the transfer to inhibit initiation of transfer of any signal out of the first storage means;

modulation means, operative to provide a carrier signal, to receive a data signal being transferred out of either storage means, and to modulate the carrier signal with the received data signal, said carrier signal comprising a first frequency when modulated with a data signal from said first storage means and a second frequency when modulated with a data signal from said second storage means; and



a power amplifier, operative to receive any modulated carrier signal from the modulation means and to amplify the same to a desired power level.

4,995,056

SYSTEM AND METHOD FOR DATA COMMUNICATIONS

Richard G. Fogg, Jr., Austin; Joseph R. Mathis, Georgetown, and Carl Zeitler, Jr., Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 13, 1989, Ser. No. 297,776

Int. Cl.[5] H04B *1/38*

U.S. Cl. 375—7 **9 Claims**



4. A method for transmitting data from a first system to a second system, comprising the steps of:

transmitting over a communications channel, from the first system to the second system, a request to send message;

transmitting over the communications channel, from the second system to the first system, a message indicating a number of distinct physical receive buffers available in the second system, and the size of such buffers;

transmitting blocks of data over the communications channel from the first system to the second system, wherein the blocks of data have a length no greater than the size of the second system receive buffers;

receiving the transmitted blocks of data at the second system and placing them into the receive buffers, wherein each block of data is placed into a separate receive buffer;

removing blocks of data from the receive buffers; and

transmitting over the communications channel, from the second system to the first system, an acknowledge message each time a block of data is removed from a receive buffer;

wherein the first system transmits a next block of data only when the number of unacknowledged data blocks are less than the number of physical receive buffers in the second system.

4,995,057

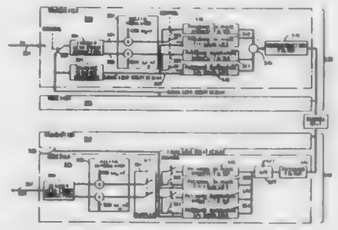
TECHNIQUE FOR ACHIEVING THE THEORETICAL CODING GAIN OF DIGITAL SIGNALS INCORPORATING ERROR CORRECTION

Hong Y. Chung, Eatontown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 266,435, Nov. 2, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 304,051

Int. Cl.[5] H03H *7/30*

U.S. Cl. 375—13 **29 Claims**



1. A point-to-point communications system which transmits digital signals from a first location to only one second location via a communications medium having varying transmission characteristics, said system comprising

a first adjustable equalizer at said first location for compensating for amplitude and phase distortion in said medium,

a second adjustable equalizer at said second location for compensating for amplitude and phase distortion in said medium,

means, responsive to digital signals received at said second location, for generating equalization coefficients for said second equalizer which are suitable for compensating for said amplitude and phase distortion, and for transmitting said generated equalization coefficients from said second location to said first equalizer

a first Nyquist filter at said first location,

a second Nyquist filter at said second location, and

control means for assuring that only one of said first and second equalizers and only one of said first and second Nyquist filters is operative at any time.

4,995,058

WIRELINE TRANSMISSION METHOD AND APPARATUS

Terry B. Byers, Yorktown, Conn., and Vladimir Vaynshteyn, Houston, Tex., assignors to Baker Hughes Inc., Houston, Tex.

Continuation-in-part of Ser. No. 117,935, Nov. 4, 1987, abandoned, which is a continuation of Ser. No. 876,790, Jun. 20, 1986, abandoned. This application Feb. 7, 1989, Ser. No. 307,901

Int. Cl.[5] H04J *3/00;* **G01V** *1/00*

U.S. Cl. 375—23 **20 Claims**

1. In a transmission system for sending signals between the surface and downhole in a wellbore, over a wireline conductor path which produces phase distortion of digitally encoded data transmitted in a multi-voltage level digital data format at a baud rate above the cut off frequency of the wireline conductor, means for transmitting data without any phase shift error thereto, which means comprises:

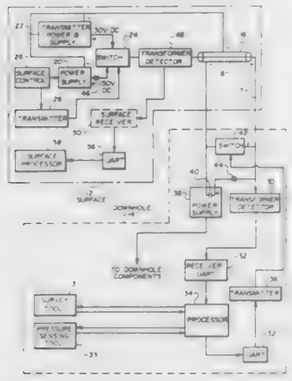
means generating data signals in a multi-voltage level data format representing data to be transmitted;

means for detecting the transitions between voltage levels in the multi-voltage level data format;

means responsive to said detecting means for transmitting a voltage pulse in time relation with the transitions and

VOL 1123 ISS 3 FE 19 1991 UMI

having a data rate frequency that is at least greater than the cut off frequency of the wireline conductor;



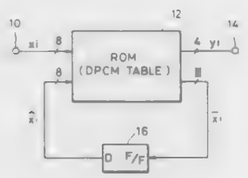
means for imparting said pulse to the wireline conductor path for transmission to a spaced location; and
means at the spaced location for detecting said pulse.

4,995,059

PREDICTIVE CODING DEVICE

Hisashi Ishikawa, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 288,994
Claims priority, application Japan, Jan. 14, 1988, 63-6069; Feb. 24, 1988, 63-41455
Int. Cl.[5] H04B *14/06*
U.S. Cl. 375—27 **17 Claims**



1. A predictive coding device, comprising:
input means arranged to input a sampled value;
predicting means for outputting a predicted value for said sampled value input through said input means; and
look-up table means which includes a memory in which predictive coded values and local decoded values corresponding to sampled values and predicted values are memorized, arranged to read out a predictive coded value and a local decoded value from an address of said memory determined by said sampled value input through said input means and said predicted value output from said predicting means.

4,995,060

CARD COUNTER WITH CARD COUNTING PRESET DATA ENTRY SYSTEM METHOD

James E. Hill, Wheeling, Ill., assignor to Dynetics Engineering Corporation, Lincolnshire, Ill.

Division of Ser. No. 246,516, Sep. 16, 1988. This application Feb. 7, 1990, Ser. No. 476,556
Int. Cl.[5] H03K *21/40*; G06M *3/12, 9/00*
U.S. Cl. 377—8 **11 Claims**

1. In a card counter having means for counting cards, means for storing the number of cards actually counted and means for comparing the number of cards actually counted with a preset number, the improvement being a preset memory system comprising:
a preset memory for recording said preselected number; and



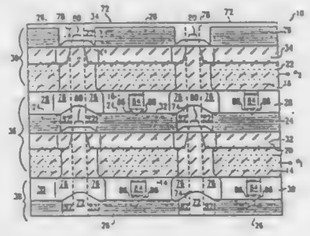
a preset data entry system including means responsive to said cards counting means for selectively causing the number of cards actually counted to be entered into said preset memory as the preset number.

4,995,061

TWO-PHASE CCD IMAGER CELL FOR TV INTERLACE OPERATION

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1987, Ser. No. 134,283
Int. Cl.[5] G11C *19/28*; H01L *29/78, 27/14*; H04N *3/14*
U.S. Cl. 377—58 **18 Claims**



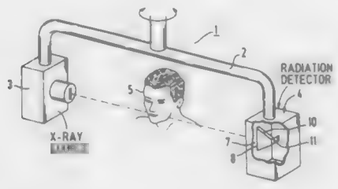
1. A charge-coupled device imager cell formed in a semiconductor substrate comprising:
adjacent first and second phase regions, each said phase region including a clocked region and a virtual region, said clocked region defined by a first series of dopants in said substrate, said virtual region defined by a second series of dopants in said substrate and accumulating charge therein in response to incident light;
a gate electrode insulatively disposed over each clocked region;
antiblooming region in said substrate adjacent said clocked and virtual region and bordering said first and second phase regions;
a controller for transferring the charge from the virtual region to the clocked region of each respective phase region and subsequently selectively transferring the charge in one said clocked region of one of said phase regions to another said selected region in an adjoining one of said phase regions by applying a predetermined voltage to a selected one of said gate electrodes; wherein
said predetermined voltage applied to said selected one of said gate electrodes to transfer the charge from one said clocked region to another said clocked region disables said antiblooming region during transfer of the charge.

4,995,062

X-RAY DIAGNOSTICS INSTALLATION FOR PRODUCING PANORAMA TOMOGRAMS OF THE JAW OF A PATIENT

Ulrich Schulze-Ganzlin, Lorsch; Joachim Pfeiffer, Bensheim, and Axel Schwotzer, Buettelborn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 386,603
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827474
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.
Int. Cl.[5] A61B *6/14*
U.S. Cl. 378—22 **8 Claims**



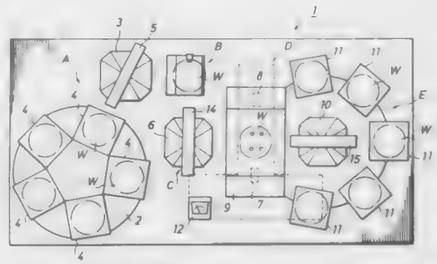
1. A dental x-ray diagnostics installation for producing panorama tomograms of the jaw of a patient which simulate tomograms obtained by moving x-ray sensitive film behind and past a diaphragm opening at a selected film moving speed, comprising:
radiator means for generating x-radiation;
detector means for converting x-radiation incident thereon into corresponding light radiation;
a secondary diaphragm disposed in front of said detector means having a diaphragm opening which limits said x-radiation incident on said detector means;
means for supporting said radiator means and said detector means, with said secondary diaphragm, on opposite sides of a patient's preceding jaw and for rotating said radiator means, said secondary diaphragm and said detector means such that x-radiation attenuated by said jaw passes through said secondary diaphragm and is incident on said detector means;
CCD sensor means on which said light radiation is incident for converting said light radiation into electrical signals, said CCD sensor means having an image zone with a plurality of lines and columns in each of which charge is generated corresponding to a portion of said light radiation incident, said charge forming a charge image;
storage means into which charge from said image zone of said CCD sensor means is transferred for storing said charge image in rows and columns;
means for reading out said storage means; and
clock means connected to said CCD sensor means for generating clock pulses at a clock frequency to control the speed of transfer of charge from said lines to said storage means, and connected to said means for reading out to control the speed of reading out of said charge image from said storage means, said clock means generating said clock pulses at a clock frequency to transfer charge line-by-line from said image zone to said storage means and to read out said charge image from said storage means line-by-line at a speed selected to simulate said moving film speed, and for generating further clock pulses for driving different columns of said CCD sensor means at different clock frequencies via separate clock inputs respectively connected to said different columns to simultaneously obtain a plurality of tomograms corresponding to respective slices at different depths of said jaw.

4,995,063

SINGLE CRYSTAL ORIENTATION IDENTIFYING AND DETERMINING APPARATUS FOR SEMICONDUCTOR WAFER AND ITS OPERATION METHOD

Shigeo Enoki, and Kenichi Okamura, both of Annaka, Japan, assignors to Shin-Etsu Handotai Company, Ltd., Tokyo, Japan

Filed Jan. 17, 1990, Ser. No. 466,184
Claims priority, application Japan, Jan. 20, 1989, 1-9997
Int. Cl.[5] G01N *23/20*; B65H *1/00*; B65G *29/00*
U.S. Cl. 378—70 **8 Claims**



1. A single crystal orientation identifying and determining apparatus for semiconductor wafers capable of conducting the facial discrimination of a semiconductor wafer and the determination of the crystal orientation thereof, which comprises:
a first wafer store means for storing wafers at different addresses,
an alignment means for aligning the wafer in a predetermined orientation,
an X-ray inspection means for inspecting the wafer as to whether or not the inspected face of the wafer is a predetermined particular face, and whether or not the orientation of the principal plane of the wafer is within a predetermined range, said X-ray inspection means including an X-ray generator, an X-ray detector, and an X-ray inspection stage,
a second wafer store means for storing X-ray inspected wafers at different addresses,
a first conveyor means for conveying the wafer from the first wafer store means to the alignment means,
a second conveyor means for conveying the wafer from the alignment means to the X-ray inspection means, and
a third conveyor means for conveying the wafer from the X-ray inspection means to an arbitrary address in the second wafer store means determined based on the result of the X-ray inspection and the wafer's addressing the first wafer store means.

4,995,064

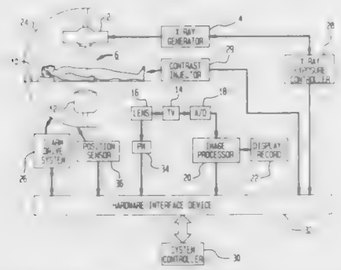
CONTINUOUSLY SWEEPING MULTIPLE-PASS IMAGE ACQUISITION SYSTEM FOR PERIPHERAL ANGIOGRAPHY

David L. Wilson, Trenton, and Lawrence R. Tarbox, Belford, both of N.J., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Jan. 29, 1990, Ser. No. 471,317
Int. Cl.[5] H05G *1/64*; A61B *6/00*; H04N *5/32*
U.S. Cl. 378—99 **17 Claims**

8. An X-ray examination apparatus, comprising:

an X-ray source for providing an imaging beam of X-ray radiation pulses;
an X-ray imaging device positioned for receiving said imaging beam and acquiring images in response thereto;
image processing means coupled to said X-ray imaging device for electronically processing and storing said acquired images;
position adjusting means for providing a spatial displacement between said X-ray imaging device and an object to be examined, said displacement being a smooth sweep in the direction of the given dimension of said object and



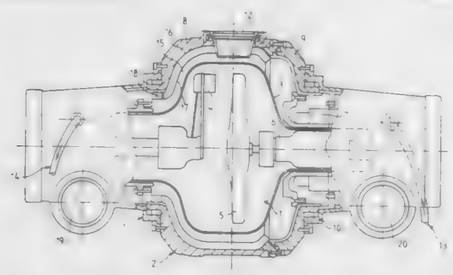
occurring simultaneously with said X-ray imaging device acquiring a series of images along the given dimension of said object; and
means for calculating exposure control values which are applied to said X-ray source for controlling the emission of pulses of X-ray radiation emitted from said X-ray source, wherein said means determines said values in a manner so that said X-ray pulse widths are caused to substantially be less than a preset duration so as to provide a blur in the acquired images which is less than a predetermined amount.

4,995,065

X-RAY TUBE COOLING DEVICES

Serge Janouin, Issy Les Moulineaux; Philippe Masse, Morsang-/Orge, and Bernard Pouzergues, Villemoisson/Roge, all of France, assignors to General Electric CGR S.A., Issy les Molineaux, France

Filed Oct. 3, 1989, Ser. No. 416,298
Claims priority, application France, Oct. 7, 1988, 88 13195
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—130 **9 Claims**



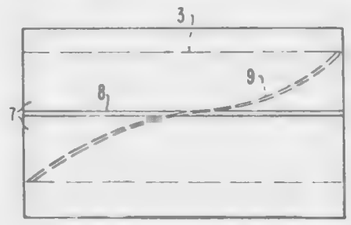
1. An improved X-ray tube cooling apparatus for cooling an X-ray tube surrounded by a sheath, the sheath and tube defining a space for the flow of a cooling fluid in communication with a cooler, the apparatus comprising the combination of
a casing in said space in heat exchange relationship with the cooling fluid, and
a substance in said casing selected to have a latent heat of fusion which melts and absorbs heat during X-ray generating operation of said tube and solidifies during periods between generation of X-rays.

4,995,066

DEVICE FOR FORMING AN X-RAY OR GAMMA BEAM OF SMALL CROSS-SECTION AND VARIABLE DIRECTION

Geoffrey Harding, Hamburg; Josef-Maria Kosanetzky, Norderstedt; Karl-Heinz Fischer, and Alfred G. Meyer, both of Hamburg, all of Fed. Rep. of Germany, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1989, Ser. No. 400,188
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829688
Int. Cl.[5] G21K *5/10*
U.S. Cl. 378—146 **20 Claims**



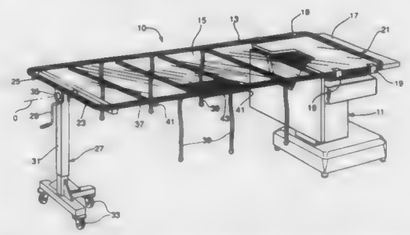
1. A device for forming an X-ray beam or gamma ray beam of small cross-section and variable direction, comprising an X-ray source or gamma source which supplies a radiation beam and a diaphragm device which forms the X-ray beam from the radiation beam and which comprises a stationary diaphragm section provided with a rectilinear slit and a cylindrical first diaphragm body which rotates about an axis of rotation and which is provided with a helical slit on its outer surface, characterized in that the diaphragm body has an approximately semi-circular cross-section over at least a part of its length.

4,995,067

SURGICAL AND X-RAY OPERATION TABLE EXTENSION

Robert M. Royster, Social Circle, Ga., and Tracy A. Gordon, San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 5, 1989, Ser. No. 417,533
Int. Cl.[5] G03B *42/02;* **A61B** *6/04;* **A47C** *19/00*
U.S. Cl. 378—177 **2 Claims**



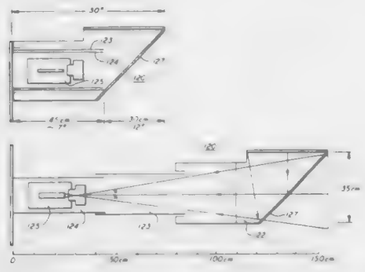
1. An extension for an operating table having an adjustable table element defining a surface for supporting a patient for surgical procedures, said extension comprising:
(a) a platform defining an upper surface of sufficient size for supporting a patient thereon, said platform comprising a material transparent to x-rays;
(b) means at a first end of said platform for attachment of said platform to an operating table;
(c) adjustable support means at a second end of said platform for selectively raising and lowering said platform, said support means including swivel means for selectively tilting said platform about a longitudinal axis of said platform in cooperation with position adjustments of the adjustable table element of said operating table; and
(d) side rails on each side of said platform and a belt attached to each of said rails for use in restraining said patient during a surgical procedure; and
(e) means attached to said platform and mounted on the under surface thereof for holding x-ray film for use in taking intra-operative x-ray images of said patient.

4,995,068

RADIATION THERAPY IMAGING APPARATUS

T. Jason Chou, Fayetteville; Harold Shoenfeld, Brooklyn, and William C. Greenway, Liverpool, all of N.Y., assignors to S&S Inficon, Inc., Liverpool, N.Y.

Filed Oct. 2, 1989, Ser. No. 415,994
Int. Cl.[5] H01J *31/49;* **A61B** *6/00;* **G01N** *23/04*
U.S. Cl. 378—189 **9 Claims**



1. Radiation therapy imaging apparatus for providing images of a patient being treated on a radiation therapy apparatus for verification and monitoring of patient positioning and verification of alignment and shaping of the radiation field of the radiation therapy apparatus, wherein said radiation therapy apparatus includes a high-energy treatment head for applying a radiation dose to a patient positioned on a treatment table, and a gantry rotatable about an isocentric axis and carrying said treatment head for permitting said radiation dose to be applied to the patient from any of a range of angles about said isocentric axis; the radiation therapy imaging apparatus including a radiation therapy image detector which comprises a video camera mounted on said gantry diametrically opposite said treat head, an elongated light-excluding enclosure enveloping said camera to exclude ambient light from said camera, a fluoroscopic plate positioned on a distal end of said enclosure remote from said camera and aligned with said head to produce a fluoroscopic image in response to radiation applied from said head through said patient, mirror means in said enclosure and oriented for reflecting said image to said camera to permit monitoring on a viewing screen of the positioning of the radiation field in respect to the patient, and means for retracting at least the distal end of said enclosure from a position in which the fluoroscopic plate is disposed opposite the treatment head without disturbing the position of the camera on said gantry, so that said enclosure can be collapsed and kept from projecting under said treatment table when the patient is being positioned on the treatment table.

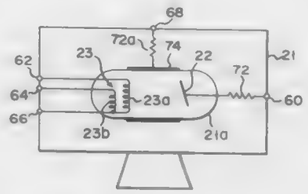
4,995,069

X-RAY TUBE APPARATUS WITH PROTECTIVE RESISTORS

Shigeru Tanaka, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 13, 1989, Ser. No. 337,821
Claims priority, application Japan, Apr. 16, 1988, 63-94312
Int. Cl.[5] H01J *35/12*
U.S. Cl. 378—200 **26 Claims**

1. An X-ray tube apparatus comprising:
an X-ray tube having an anode and a cathode;
a protective resistor connected to at least one of said anode and said cathode;



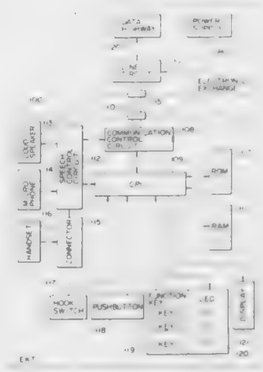
a power supply coupled to said X-ray tube and said resistor; and housing means for housing said X-ray tube and said protective resistor immersed in an insulating oil, said power supply being outside said housing means.

4,995,070

ELECTRONIC KEY TELEPHONE SET WITH FUNCTION OPERATION TEST FUNCTION AND METHOD OF CONTROLLING THE SAME

Kimitoshi Shin, Akishima, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1989, Ser. No. 410,355
Claims priority, application Japan, Sep. 29, 1988, 63-244831
Int. Cl.[5] H04M *1/24*
U.S. Cl. 379—27 **16 Claims**



1. An electronic key telephone set comprising:
a light-emitting means for state indication;
an acoustic converting means for converting a voice signal into an acoustic wave;
display means for displaying characters and the like;
operation key means for starting an operation; and
control means, for initializing said electronic key telephone set when said electronic key telephone set is connected to an external exchange, said control means including a self-test means for sequentially testing said light-emitting means, said acoustic converting means, and said display means, when said operation key means is actuated within a predetermined period after said electronic key telephone set was initialized, and a means for setting said electronic key telephone set to a normal mode after a completion of the testing function.

4,995,071

VIDEO CONFERENCE INSTALLATION

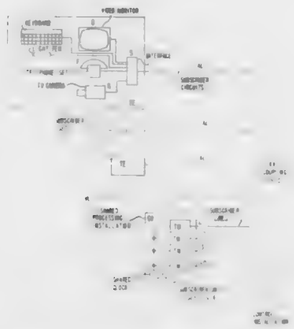
Jens Weber, Bad Soden, and Rolf Loos, Muenster, both of Fed. Rep. of Germany, assignors to Telenorma Telefonbau und Normalzeit GmbH, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 359,028

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823219

Int. Cl.[5] H04N *7/12, 7/14*

U.S. Cl. 379—53 21 Claims



1. A video conference installation for a plurality of subscriber points, each subscriber point having transmission and reception devices for audio signals and video signals, the subscriber points having access to a shared processing installation operable to transmit audio signals and video signals to and from the subscriber points, the processing installation having individual subscriber units which are permanently assignable at the beginning of a conference for a duration of the conference, to any respective subscriber point participating in the conference, each individual subscriber unit having an image memory and reading and writing devices communicating with the image memory such that a full frame of the video signals is available to the installation, multiplexers allowing optional access to video signals of all the subscriber points, and means for processing the audio signals and the video signals for transmission to the individual subscriber points based upon control signals from the individual subscriber units, said installation comprising:

a digital communication system and a plurality of connection channels connecting the shared processing installation to the digital communication system, each of a plurality of telephone sets being connectable to the digital communication system via a subscriber circuit having two identical utility channels and one data signalling channel for transmission of information in each direction over each of the subject subscriber circuits, audio signals transmitted to and from the telephone sets during the conference being transmitted in pulse code modulated words on one said utility channel, and compressed video signals for at least one of a television camera and a video monitor being transmitted over the other said utility channel;

each of said subscriber points having input means including at least one of an input keyboard, a light pen and means for producing data indicating a digital position on the screen as selected by a user, symbols being displayed on the screen from data representing the symbols produced by an overlay generator in the individual subscriber unit and added to the video signal, while control and positioning signals from the subscriber point are produced as a function of operation of the input means and are transferred over the signalling channel to initiate control and switching actions for the respective said subscriber point.

4,995,072

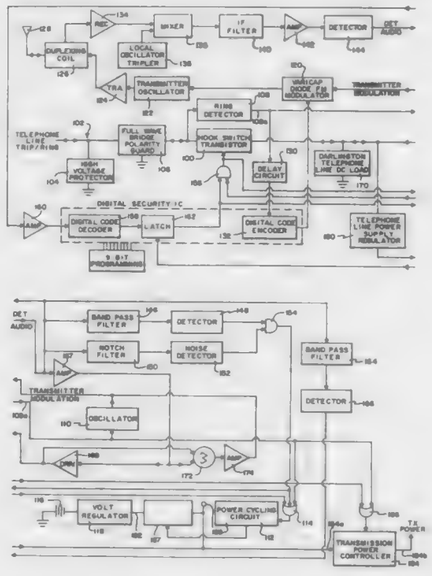
SELF-POWERED BASE AND REMOTE TELEPHONE COMMUNICATION SET

Michael K. Pedigo, Indianapolis, Ind., assignor to Harold Sandler, Roslyn, N.Y.

Filed Jun. 30, 1989, Ser. No. 373,759

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—61 22 Claims



1. A cordless remote telephone system including a base unit and remote unit in radio communication with said base unit, said remote unit having a handset which is normally on hook, said base unit having a ring detector and a hook switch connectable to a telephone line, said base and remote units each comprising respective radio transmitter modulator circuits and respective radio receiver circuits, said system comprising:

telephone line power supply means in said base unit for furnishing power from said telephone line to an output node whenever said hook switch is closed;

base power cycling means in said base unit for periodically providing power for limited durations to the receiver circuits in said base unit, said base power cycling means comprising:

(a) battery means,

(b) voltage regulator means connected to said output node for regulating the voltage supplied by said battery means,

(c) battery power switching means for turning off power supplied from said battery means whenever said telephone line power supply means begins furnishing power from said telephone line,

(d) receiver power switching means for periodically connecting said output node to said base unit radio receiver circuits;

remote signaling means in said remote unit for sending activation signals to said base unit whenever said handset is taken off hook; and

base control means in said base unit responsive to said ring detector and to said activation signals from said remote unit for interrupting said receiver power switching means so that said base unit power cycling means stops cycling and instead provides continuous power, and responsive to said activation signals for closing said hook switch, whereby said power cycling means provide continuous power from said battery means until said telephone line power supply means begins supplying telephone line power from said hook switch.

4,995,073

COMMUNICATION APPARATUS AND COMMUNICATION SYSTEM HAVING AUTOMATIC ATTRIBUTION SWITCHING

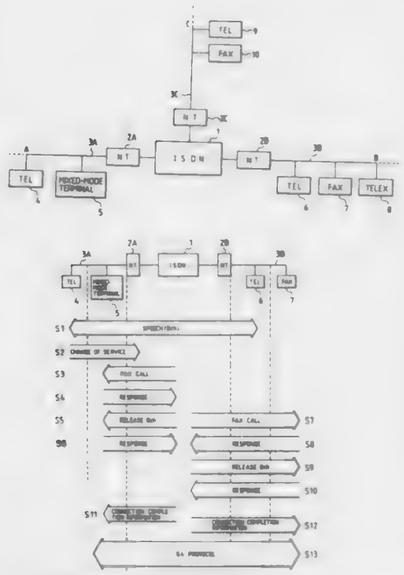
Naoyuki Okata, Yokohama; Kazuhiko Yoshioka, Tokyo, and Kazutaka Matsueda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,768

Claims priority, application Japan, Oct. 10, 1987, 62-264623; Oct. 19, 1987, 62-264627; Jan. 8, 1988, 63-1296; Jan. 8, 1988, 63-1297

Int. Cl.[5] H04M *11/06;* H04Q *11/04*

U.S. Cl. 379—94 15 Claims



1. A communication system comprising:

a first station wherein a first terminal and a second terminal are connected on a first subscriber's line, attribution of the first terminal being different from attribution of the second terminal;

a second station wherein a third terminal and a fourth terminal are connected on a second subscriber's line, attribution of the third terminal being different from attribution of the fourth terminal; and

an integrated services digital network for connecting said first station and said second station,

wherein said second terminal comprises:

memory means for storing data to be transmitted when said first terminal requests a communication;

discrimination means for discriminating whether or not said first terminal requests the communication in a state where said first terminal and said third terminal are connected to use a line; and

transmission means for automatically transmitting, when said discrimination means discriminates that said first terminal requests the communication, the data stored in said memory means to said fourth terminal in said second station by using said line which had been used by said first and third terminals.

4,995,074

SWITCHED LINE MODEM INTERFACE SYSTEM

Bruce J. Goldman, and Gerald M. Goldman, both of Knollwood Extension, Elmsford, N.Y. 10523

Filed Apr. 3, 1989, Ser. No. 332,710

Int. Cl.[5] H04M *3/20, 11/06*

U.S. Cl. 379—97 19 Claims

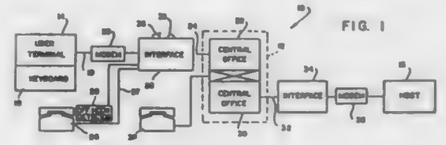


FIG. 1

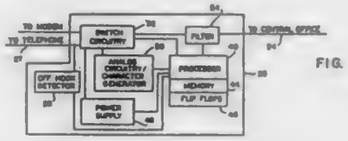


FIG. 2

2. In a circuit switched network data transmission link between terminal means at a terminal location and a host computer at a remote location wherein the host computer is accessed through the circuit switched network at a host end and, the terminal means is connected to the circuit switched network by a single line which includes at least one service feature, the improvement comprising a transparent switched line modem interface system, the system comprising means for determining when a user desires to utilize the service feature on the single line during a data session and means for preventing loss of the data session when the user utilizes the single line for the service feature, the means for preventing loss of the data session including means at the terminal location for generating a signal indicating that the host computer is not ready in simulation of a signal generated at the host location and transmitted to the terminal location through the circuit switched network, the system further including means responsive to the termination of the service feature on the single line for reestablishing the data session.

4,995,075

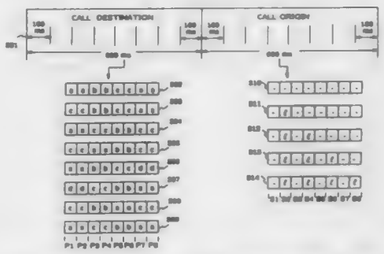
APPARATUS AND METHOD FOR ENCODING TELEPHONE RINGING SIGNALS

Joel S. Angiolillo-Bent, Freehold, and Linda A. Roberts, Sea Bright, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 5, 1989, Ser. No. 402,401

Int. Cl.[5] H04M *3/02, 3/42*

U.S. Cl. 379—142 22 Claims



12. A method of encoding an audible ringing signal of a communication system, said method comprising the steps of:

dividing an active ring interval of an audible ringing signal into a first and a second segment;

generating during said first segment one of multiple groups

VOL 1123 ISS 3 FEB 19 1991 UMI

of first encoded audible tone signals arranged in a melodic contour pattern, each group providing information for specifying the destination of a received call; and

generating during said second segment one of a group of second encoded audible tone signals, each signal of the group providing information for specifying the origin of the received call.

4,995,076

CALL PROGRESS CAPABILITY FOR A SWITCHED CHANNEL DATA SERVICE UNIT

Daniel M. Joffe, North Plainfield, and Charles R. Eberle, Jr., Rockaway, both of N.J., assignors to Integrated Network Corporation, Bridgewater, N.J.

Filed Feb. 9, 1990, Ser. No. 477,760
Int. Cl.[5] H04M *1/26, 3/22*
U.S. Cl. 379—257 28 Claims

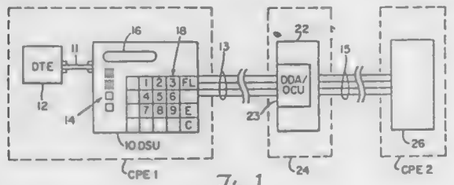


Fig. 1

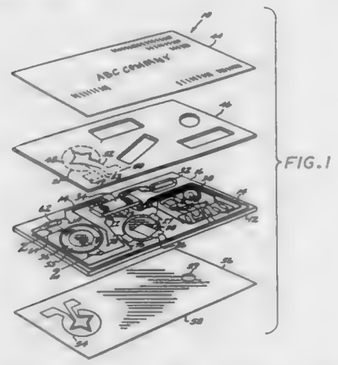
20. A switched channel data service unit, comprising a processing means for receiving a sequence of digital signals that are not byte aligned from a switching machine, wherein the sequence of digital signals originate in response to a call placed by the switched data service unit and for analyzing said sequence of signals to derive call progress information.

4,995,077

CARD-LIKE DEVICE HAVING A MICROPROCESSOR AND SPEAKER FOR COMMUNICATING WITH A TELEPHONE LINE

Igor P. Malinowski, 1716 W. 265th St., Harbor City, Calif. 90710

Filed Oct. 30, 1989, Ser. No. 429,123
Int. Cl.[5] H04M *1/27*
U.S. Cl. 379—355 4 Claims



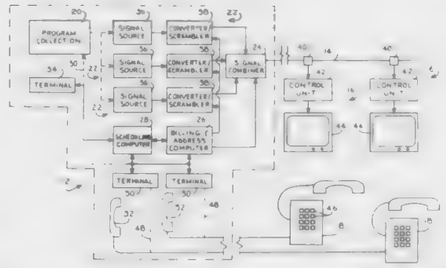
1. A telephone dialer card device comprising a microprocessor including a memory device for storing a signal corresponding to desired telephone number, a power source, said microprocessor having the capability of generating an electrical signal corresponding to said desired telephone number when activated, transducer means for converting the electrical signal to an acoustic signal for coupling to a telephone line, and switch means mounted on said card for supplying power from said power source to said microprocessor, said switch means being a first operative position when a user applies a firs amount of pressure thereto, said switch means being in a second operative position when a user applies a second amount of pressure thereto.

4,995,078

TELEVISION BROADCAST SYSTEM FOR SELECTIVE TRANSMISSION OF VIEWER-CHOSEN PROGRAMS AT VIEWER-REQUESTED TIMES

H. Vincent Monslow, 11815 Rosehill Rd., Overland Park, Kans. 66210, and Steven R. Dickey, 2009 West 103rd St., Leawood, Kans. 66206

Division of Ser. No. 204,585, Jun. 9, 1988, Pat. No. 4,890,320. This application Oct. 10, 1989, Ser. No. 419,263
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—10 16 Claims



1. A method of operating a television transmission system using land lines for transmitting television programs for reception by a plurality of receivers coupled with land lines for viewing the programs on the receivers by viewers respectively associated therewith, the system including means for selectively preventing intelligible viewing of certain programs by certain receivers, said method comprising the steps of:

providing a collection of stored programs stored on a medium allowing selective reproduction and real-time transmission of said stored programs over the land lines;

selecting a prospective chosen program from said collection for transmission at a requested time in response to a request therefor from a requesting viewer;

transmitting said chosen program in real-time over the land lines at said requested time for reception by and viewing on a receiver associated with said requested viewer;

preventing intelligible viewing of said chosen program at said requested time on receivers other than said receiver associated with said requesting viewer;

identifying a section of the land lines having a subset of receivers operably coupled thereto wherein said subset includes a plurality of receivers less than the total number of receivers included in the system, and remaining portions of the land lines having a plurality of receivers other than said subset coupled thereto,

transmitting said chosen program over said section of the land lines,

identifying a juncture between said section and said remaining portion, and

preventing transmission of said chosen program beyond the juncture from said section to said remaining portion by use of a blocking device located at said juncture.

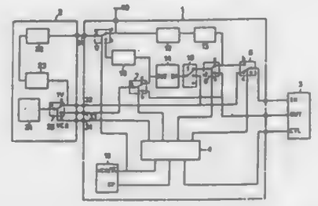
4,995,079

CANAL+ DECODER SWITCHING CIRCUIT FOR VIDEO CASSETTE RECORDERS

Jin K. Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Aug. 7, 1989, Ser. No. 390,193
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—20 4 Claims

FIG. 1



1. A canal+decoder switching circuit for VCRs having a canal+decoder for receiving a canal+broadcast comprising:

switch control means providing first, second, third and fourth control signals by combining a control signal provided by said canal+decoder, a canal+channel designation signal and a VCR/TV mode selection signal provided by a system control means respectively;

first switch connecting the input of said canal+decoder to the output of a demodulator of said VCR or to the output of a demodulator of a TV in dependence upon said first control signal;

second switch connecting the tuner signal input of an input selection switch to the output of said demodulator of said VCR or to the output of said canal+decoder in dependence upon said second control signal;

third switch connecting the VCR signal input of a VCR/TV mode selection switch to the output of a video signal processing circuit of said VCR or to the output of said canal+decoder in dependence upon said third control signal; and

said VCR/TV mode selection switch connecting the input of a video signal processing circuit of said TV to the output of said demodulator of said TV or to the output of said third switch in dependence upon said fourth control signal.

4,995,080

TELEVISION SIGNAL SCRAMBLING SYSTEM AND METHOD

Caitlin B. Bestler, Chicago; Richard W. Citta, Oak Park, and Michael E. Long, Oak Brook, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

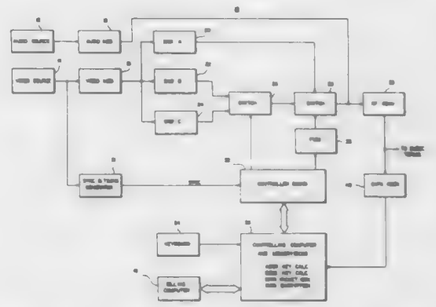
Continuation of Ser. No. 228,905, Aug. 4, 1988, abandoned. This application Jul. 16, 1990, Ser. No. 552,375
Int. Cl.[5] H04L *9/08;* H04N *7/167*
U.S. Cl. 380—21 6 Claims

1. A method of operating a television scrambling system including a plurality of subscriber terminals having selectively controllable descrambling means and a first session key comprising the steps of:

alternately transmitting a scrambled television signal with a data packet encrypted with said first session key and transmitting said scrambling television signal with said data packet encrypted with a second session key, to all subscriber terminals to permit operation of said descrambling means to descramble the television signal by subscriber terminals having said first session key or said second session key;

transmitting said second session key to authorized subscriber terminals only; and

alternately transmitting said scrambled television signal with a data packet encrypted with said second session key and transmitting said scrambled television signal with said packet encrypted with a third session key to all subscriber



terminals, whereby subscriber terminals with said first session key and without said second session key or said third session key cannot descramble said television signal.

4,995,081

METHOD AND SYSTEM FOR PERSONAL IDENTIFICATION USING PROOFS OF LEGITIMACY

Frank T. Leighton, 965 Dedham St., Newton Center, Mass. 02159, and Silvio Micali, 224 Upland Rd., Cambridge, Mass. 02140

Continuation-in-part of Ser. No. 170,734, Mar. 21, 1988, Pat. No. 4,879,747. This application Nov. 6, 1989, Ser. No. 432,130
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 17 Claims

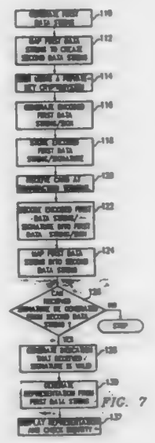


FIG. 7

1. A method for enabling an authorized user of a personal identification card to effect a transaction using a transaction terminal, comprising the steps of:

generating a first data string having a portion thereof which is derived from a physical characteristic of the authorized user and need not be retained secret;

digitally signing the first data string to generate a signature corresponding to the first data string;

encoding the first data string and the signature using a predetermined encoding function to generate an encoded first data string/signature;

storing the encoded first data string/signature on the personal identification card;
receiving the personal identification card at the transaction terminal;
decoding the encoded first data string/signature on the received personal identification card to generate the first data string and a received signature;
digitally verifying whether the received signature can be generated from the first data string;
if the received signature can be generated from the first data string, generating an indication that the signature is valid;
generating a representation from the first data string; and
displaying the representation and the indication on a display of the transaction terminal to enable an operator thereof to verify that the user is authorized to effect a transaction using the personal identification card.

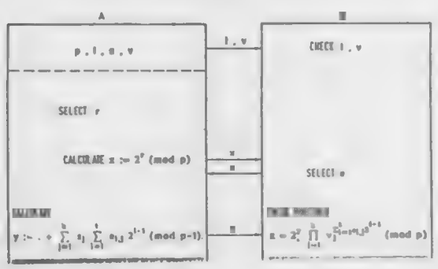
4,995,082

METHOD FOR IDENTIFYING SUBSCRIBERS AND FOR GENERATING AND VERIFYING ELECTRONIC SIGNATURES IN A DATA EXCHANGE SYSTEM

Claus P. Schnorr, Frankfurterstr. 81, 6350 Bad Nauheim, Fed. Rep. of Germany

Filed Feb. 23, 1990, Ser. No. 484,127
Claims priority, application European Pat. Off., Feb. 24, 1989, 89103290.6
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 11 Claims

FIG 1



1. In a method for mutual identification of subscribers in a data exchange system working with processor chip cards and using identification data coded into the cards by a card-issuing center including subscriber-related public keys and stored in the respective chip cards along with private keys which have a logical relationship to the public keys, whereby random number-dependent check data are exchanged between the subscribers, comprising the steps of:
transmitting from a chip card the coded identification data together with a signature of the center to a subscriber entering into an information exchange with the chip card;
at the subscriber checking the correctness of the coded identification data with reference to known information including a public list or reference to the signature of the center;
forming in the chip card a x value proceeding from a random, discrete logarithm $r \in \{1, \ldots, p-1\}$, where p is a declared prime number modulus, and according to the rule

$$x := 2^r \pmod{p};$$

transmitting the x value to the subscriber;
transmitting from the subscriber a random bit sequence

$$e = (e_{1,1} \ldots, e_{t,k}) \in \{0,1\}^{kt}$$

to the chip card;
multiplying the stored, private key s_j representing a discrete logarithm with a binary number formed from the bits of the random bit sequence e transmitted from the subscriber to the chip card and adding the random number r allocated to the previously-transmitted x value to calculate, at the chip card, a number y according to the rule

$$y := r + \sum_{j=1}^{k} s_j \sum_{i=1}^{t} e_{ij} 2^{i-1} \pmod{p-1}$$

transmitting the number y to the subscriber;
at the subscriber, calculating a number x with reference to the number y according to the rule

$$x = 2^y \prod_{j=1}^{k} v_j \sum_{i=1}^{t} e_{ij} 2^{i-1} \pmod{p};$$

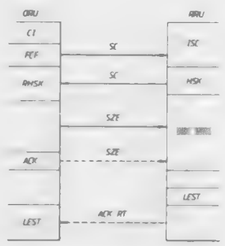
checking the identity of the chip card user by comparing the calculated number x and the x value previously communicated to the subscriber.

4,995,083

METHOD OF ESTABLISHING A RADIO LINK IN ONE OF A PLURALITY OF CHANNELS BETWEEN TWO RADIO UNITS

John M. Baker; Peter N. Proctor, both of Basingstoke, and Andrew S. Pearce, Nottingham, all of Great Britain, assignors to GEC Plessey Telecommunications Limited, Coventry, England

Filed Jul. 31, 1989, Ser. No. 387,156
Claims priority, application United Kingdom, Sep. 2, 1988, 8820774
Int. Cl.[5] H04K *1/00, 9/00;* H04M *11/00*
U.S. Cl. 380—23 3 Claims



1. A method of establishing synchronization in a digital radio link in one of a plurality of channels between two radio units of a multi-channel communication system, comprising transmitting an initiating signal in the form of a bit pattern as a continuous burst from one radio unit to the other unit, said continuous data stream burst having a timing which is independent of the synchronism achieved, and said other unit temporarily achieving bit synchronism without changing frame synchronism, the bit pattern incorporating a preamble pattern and a security code comprising a plurality of bit sequences, each bit sequence being transmitted a plurality of times in said continuous burst, comparing the received security code with one or more codes stored within said other radio unit, whereupon, if a matching pair of codes is identified, a response signal is transmitted from said other radio unit to said one unit, the response signal incorporating the preamble pattern for establishing synchronisation between the radio units.

4,995,084

SEMICONDUCTOR EMULATION OF TUBE AMPLIFIERS

Eric K. Pritchard, Rte. 1, Box 536, Berkeley Springs, W. Va. 25411

Continuation-in-part of Ser. No. 29,144, Mar. 23, 1987, Pat. No. 4,809,336. This application Nov. 1, 1988, Ser. No. 280,213
Claims priority, application PCT Int'l Appl., Mar. 23, 1988, PCT/US88/01025
Int. Cl.[5] H04M *11/06;* H04Q *11/04*
U.S. Cl. 379—94 38 Claims



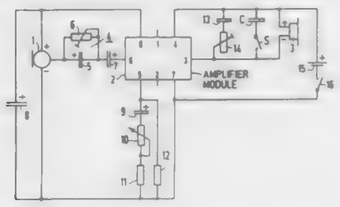
1. A semiconductor distortion system comprising: input means for receiving an input signal; a first distortion means for introducing distortion to produce a first distorted signal; a tone control means for altering the tonality of the first distorted signal and producing a tone control signal; a second distortion means for clipping the tone control signal at a level which is a function of a resulting clipped signal; and an output means.

4,995,085

HEARING AID ADAPTABLE FOR TELEPHONE LISTENING

Reinhard Kern; Gerhard Krauss, both of Nuremberg, and Helmut Schlosser, Roettenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,540
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734946
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—68.2 12 Claims



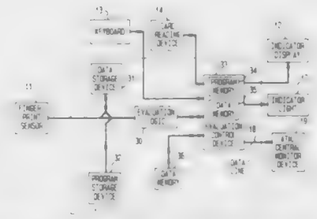
1. A hearing aid adaptable for telephone listening comprising:
a microphone which receives incoming audio signals, said incoming audio signals sometimes including telephone audio signals;
means connected to said microphone for amplifying output signals from said microphone, thereby producing amplified audio signals;
a receiver connected to an output of said means for amplifying;
first means to said means for amplifying for lowering the amplitudes of high frequency components in said amplified audio signals;
second means connected to said means for amplifying for lowering the amplitudes of high frequency components in said amplified audio signals differently from said first means for lowering so that said telephone audio signals in said amplified audio signals are comfortable for listening by a user of the hearing aid; and
switch means in series with said second means and operable by said user of said hearing aid for actuating said second means for lowering the amplitudes of high frequency components during telephone listening by said user when said telephone audio signals are thus included in said audio signals.

4,995,086

ARRANGEMENT AND PROCEDURE FOR DETERMINING THE AUTHORIZATION OF INDIVIDUALS BY VERIFYING THEIR FINGERPRINTS

Robert M. Lilley, Knypersley, and Paul J. Ridgway, Congleton, both of United Kingdom, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 47,359, May 5, 1987, abandoned. This application Sep. 13, 1988, Ser. No. 244,586
Claims priority, application European Pat. Off., May 6, 1986, 86106231.3
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—4 12 Claims



1. Fingerprint verification apparatus comprising:
means for storing an arbitrary non-fingerprint related image;
means for reading a fingerprint of an individual whose fingerprint is to be verified;
means for comparing said fingerprint with said arbitrary image and establishing a degree of correlation therebetween;
means for reading data on a data carrier associated with said individual; and
means for comparing data read by said data reading means with said determined degree of correlation for verification purposes.

4,995,087

MACHINE VISION SYSTEM

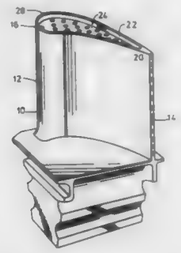
Rajendra P. Rathi, West Chester, Ohio; David G. Tashjian, Wilmington, N.C.; Richard H. Burkel, Maineville; Randall C. Gantner, Dayton, both of Ohio; John J. Bottoms, Arkansas City, Kans., and Steven M. Wolff, Sprongboro, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 290,476, May 15, 1989. This application Aug. 11, 1989, Ser. No. 392,517
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—8 4 Claims

1. A method for guilding a tool along a workpiece surface, the steps comprising:
generating an image of said workpiece surface; dissecting said image into a plurality of picture elements;
identifying the coordinates of a set of picture elements associated with a boundary of said workpiece surface;
generating a mathematical equation from said picture element coordinates, said equation defining a curve formed by the boundary of said workpiece surface;
selecting a first plurality of points along said curve;
electronically determining a slope for said curve at each of said first plurality of points ;
generating a set of mathematical equations, each of said equations defining a line normal to said curve and each

normal line intersecting said curve at a different one of said first plurality of points;

identifying a second plurality of points, each one of said second plurality of points being located along a different



one of said normal lines at a predetermined distance from an associated one of said first plurality of points; and

guiding said tool along a path including said second plurality of points.

4,995,086

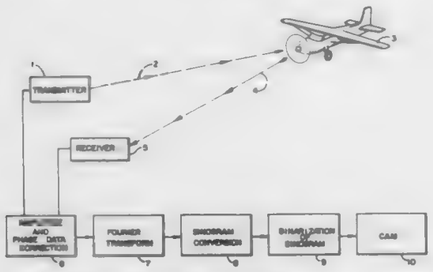
SUPER RESOLUTION

Nabil Farhat, Philadelphia, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 36,490, Apr. 9, 1987, abandoned. This application Nov. 22, 1989, Ser. No. 441,195

Int. Cl.[5] G06K *9/62*

U.S. Cl. 382—15 59 Claims



1. A data analysis system comprising:

a first array for receiving input data comprising a plurality of neural elements for transmitting data signals;

a memory matrix for processing the data signals transmitted by the elements of the first array, said memory matrix having associatively stored therein in accordance with a Hebbian model of learning for neural networks, at least one quantized feature space classifier of a known data set;

a second array having a plurality of neural elements for receiving the data signals processed by the memory matrix;

the neural elements of the second array being operatively coupled in feedback with the neural elements of the first array wherein the neural elements of the second array provide feedback input for the neural elements of the first array.

4,995,089

METHOD AND APPARATUS FOR PROVIDING FONT ROTATION

Frederick E. Altrieth, III, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1990, Ser. No. 461,970

Int. Cl.[5] G06F *12/02*

U.S. Cl. 382—46 10 Claims

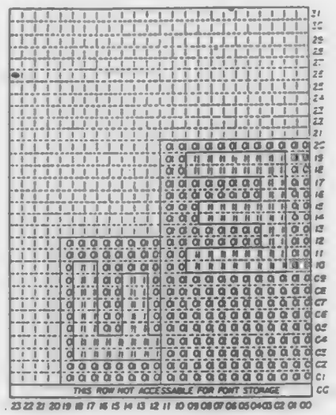


FIG. 3

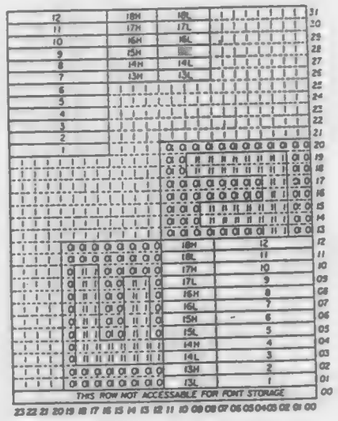


FIG. 4

1. A method for providing font data comprising the steps of:

(a) storing font data representative of a character in a first orientation in a first section of a memory cell of a font memory unit, said first section of said memory cell being divided into a top portion and a bottom portion;

(b) generating first translated font data representative of a second orientation of a portion of said character from said font data stored in said top portion of said first section and storing said first translated font data in a second section of said memory cell adjacent to said first section;

(c) generating second translated font data representative of a second orientation of a further portion of said character from said font data stored in said bottom portion of said first section and storing said second translated font data in a third section of said memory cell; and

(d) switching said font data stored in said bottom portion of said first section with the second translated font data stored in said third section of said memory cell to change from a first printing mode to a second printing mode.

4,995,090

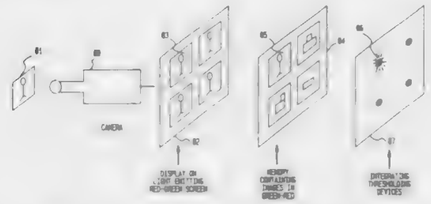
OPTOELECTRONIC PATTERN COMPARISON SYSTEM

Jasprit Singh, Ann Arbor, Mich., and Songcheol Hong, Seoul, Rep. of Korea, assignors to The University of Michigan, Ann Arbor, Mich.

Filed Feb. 7, 1989, Ser. No. 307,669

Int. Cl.[5] G06K *9/74, 9/38*

U.S. Cl. 382—50 6 Claims



1. A system for comparing a subject pattern to be tested against at least one known pattern, the system comprising:

light source means having a predetermined light output characteristic;

first pattern storage means for storing the subject pattern to be compared;

second pattern storage means for storing a complement of the subject pattern to be compared;

third pattern storage means for storing a known pattern;

fourth pattern storage means for storing a complement of the known pattern;

photodetector means for receiving output light from said light source means; and

threshold control means for controlling a trigger threshold, said threshold control means being coupled to said photodetector means, said threshold control means having integrator means for accumulating an electrical charge responsive to said photodetector means.

4,995,091

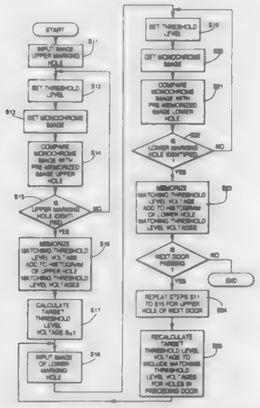
METHOD OF AND APPARATUS FOR DETECTING OBJECTS IN AN ASSEMBLY LINE

Yoshimi Shimbara, Hiroshima, Japan, assignor to Mazda Motor Manufacturing (USA) Corporation, Flat Rock, Mich.

Filed Oct. 25, 1989, Ser. No. 426,231

Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—50 8 Claims



1. A method of detecting the presence of an object moving along an assembly line among a succession of objects and which objects have at least two identifying features thereon, comprising:

obtaining an image of the first identifying feature of one of the objects constituted by a plurality of voltage signals of more than two different voltages;

choosing a first threshold level voltage for the first identifying feature of said one object;

classifying the signals of said plurality of voltage signals for said first identifying feature of said one object into signals greater than the first threshold level voltage and signals less than the first threshold level voltage;

forming from said thus classified signals a monochrome image;

comparing said monochrome image with a pre-memorized image of the first identifying feature constituted by a plurality of voltage signals for determining whether the monochrome image corresponds to the pre-memorized image;

when said image of said first identifying feature corresponds with the pre-memorized image, designating the threshold level voltage at which the correspondence occurs as matching threshold level voltage A_n;

obtaining an image of the second identifying feature of said one object constituted by a plurality of voltage signals of more than two different voltages;

calculating a target threshold level voltage B_{nt} for the second identifying feature of said one object according the expression:

$$B_{nt}=f(A_n^*, B_{n-1}^*, A_n)$$

where A_n^* is the average matching threshold level voltage for the first identifying features of preceding objects in the succession and B_{n-1}^* is the average matching threshold level voltage for the second identifying features of the preceding objects in the succession;

classifying the signals of said plurality of voltage signals for said second identifying feature into signals greater than the target threshold level voltage and signals less than the target threshold level voltage;

forming from said thus classified signals a monochrome image of second identifying feature;

comparing said monochrome image of the second identifying feature with a pre-memorized image of the second identifying feature constituted by a plurality of voltage signals for determining whether the monochrome image of the second identifying feature corresponds to the pre-memorized image of the second identifying feature;

when said image of said second identifying feature corresponds with the pre-memorized image, designating the threshold level voltage at which correspondence occurs as matching threshold level voltage B_n;

obtaining an image of the first identifying feature of the next succeeding object and carrying out the steps of choosing a first threshold level voltage, classifying the signals, forming the monochrome image, and comparing the image for the last-mentioned first identifying feature to obtain a matching threshold level voltage A_{n+1} for said last mentioned first identifying feature,

calculating a target threshold level voltage $B_{n+1)T}$ for the second identifying feature on said next succeeding object according to the expression:

$$B_{n+1)T}=f(A_{n+1}^*, B_n^*, A_{n+1})$$

where A_{n+1}^* is the average matching threshold level voltage for the first identifying features of the succession of objects including matching threshold level voltage A_{n+1}, B_n^* is the average matching threshold level voltage for the second identifying features of the succession of objects including matching threshold level voltage B_n; and

obtaining an image of the second identifying feature of the next succeeding object and carrying out the steps of classi-

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fying the signals using the newly calculated target threshold level voltage, forming the monochrome image and comparing the image for the last mentioned second identifying feature.

4,995,092

CIRCUIT ARRANGEMENT FOR WHITE LEVEL ACQUISITION FOR THE BLACK/WHITE QUANTIZATION OF THE SCAN SIGNALS OF INDIVIDUAL PHOTO SENSORS

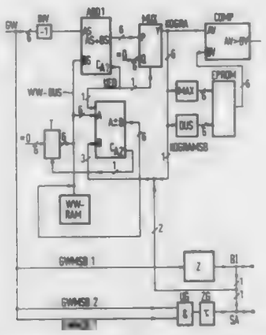
Wilfried Kochert, Konstanz; Dietmar Dowe, Stockach-Wahlwies; Hans-Joachim Schwarz, and Eberhard Ullrich, both of Konstanz, all of Fed. Rep. of Germany, assignors to Computergesellschaft Konstanz, Fed. Rep. of Germany

Filed Sep. 25, 1989, Ser. No. 411,744

Claims priority, application European Pat. Off., Sep. 30, 1988, 88116236.6

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—53 9 Claims



1. A circuit arrangement for white level acquisition for the black/white quantization of the scan signals of individual photosensors having different gray levels, comprising:

a first adder including a first input for receiving digitized output signals of the photosensors, a second input, a first output and a second output;

a white level memory connected to said second input of said first adder;

a second adder including a first input connected to said white level memory, a second input, a first output and a second output;

a comparator connected to said first adder and supplying a black signal or a white signal dependent on a threshold value derived from maximum blackening values and average blackening values from said first adder; and

said second output of said first adder connected to said second adder to cause said second adder to provide a variable correction signal derived from a plurality of influencing variables dependent on a carry signal appearing at said second output of said first adder such that said second adder provides a white level increment/decrement to said white level memory.

4,995,093

RADIATION FIELD RECOGNITION METHOD

Takeshi Funahashi, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1988, Ser. No. 175,446

Claims priority, application Japan, Mar. 31, 1987, 62-79490

Int. Cl.[5] G06K *9/00*

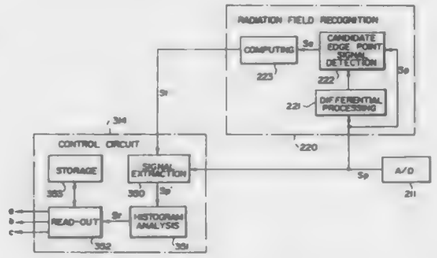
U.S. Cl. 382—6 4 Claims

1. A radiation field recognition method for recognizing a radiation field emitted by a stimulable phosphor sheet having a central portion, wherein said stimulable phosphor sheet has been irradiated and a latent image formed thereon, and a light image signal carrying the latent radiation image is derived by exposing said stimulable phosphor sheet to stimulating rays to cause light to be emitted by said stimulable phosphor sheet and using a photodetection means to photoelectrically detect said emitted light comprising:

obtaining candidate edge points that may be considered to be edge portions of said radiation field on said stimulable phosphor sheet in the course of obtaining a light image signal carrying the latent radiation image information recorded thereon;

obtaining curves in respect of candidate edge point coordinates (x_0, Y_0), said curves being expressed as

$$\rho = x_0 \cos\Theta + y_0 \sin\Theta$$



with x_0, y_0 being constants, when coordinates of said candidate edge points in a rectangular coordinate system set on the sheet are taken as (x_0, y_0);

from points of mutual intersection (ρ_0, Θ_0) of said curves thus obtained, obtaining a first plurality of first straight lines in said rectangular coordinate system that are defined by

$$\rho_0 = x \cos\Theta_0 + y \sin\Theta_0$$

and

recognizing a region enclosed by said first straight lines as a radiation field.

4,995,094

DC MOTOR CONTROL CIRCUIT PROVIDING VARIABLE SPEED OPERATION

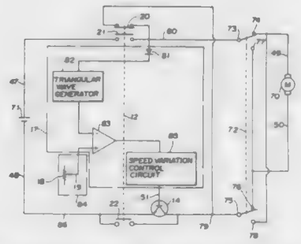
Tatsuo Aio, Ibaragi, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 180,621, Apr. 1, 1988, abandoned, which is a continuation of Ser. No. 944,221, Dec. 22, 1986, abandoned. This application Feb. 13, 1990, Ser. No. 480,340

Claims priority, application Japan, Jul. 19, 1985, 60-160918[U]; Jul. 19, 1985, 60-111267

Int. Cl.[5] H02P *5/17*

U.S. Cl. 388—840 10 Claims



1. A control circuit for a DC motor, comprising:

first generating means for generating a triangular voltage wave;

second generating means for generating a variable reference voltage;

comparing means for comparing the voltage from said first generating means and the voltage from said second generating means, and for producing a speed variation control output signal according thereto;

speed variation control means for controlling the supply of electric current to said DC motor according to said speed variation control output signal, said speed variation control means comprising a speed variation control circuit connected to a transistor means;

stroke triggering means for activating the means for generating the variable reference voltage which is compared with the constant triangular voltage wave, and wherein the variable reference voltage varies relative to the stroke of said triggering means; and

bypassing means for selectively bypassing the speed variation control means so that the speed variation control means does not control the supply of current to the DC motor, wherein said bypassing means is arranged to turn on after the transistor means is turned on.

4,995,095

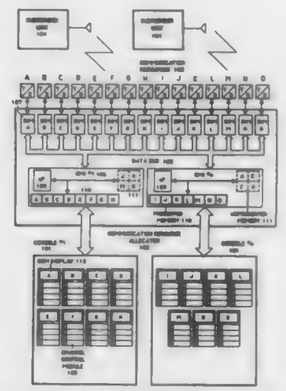
METHOD AND APPARATUS FOR UTILIZING UNPRESENTED COMMUNICATION GROUPS

Jeffrey G. Lohrbach, Elgin; Gregory A. Dertz, Lake in the Hills, and Michael S. Deanmoor, Wheeling, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 5, 1990, Ser. No. 489,297

Int. Cl.[5] G05B *23/00;* H04B *1/60, 17/00*

U.S. Cl. 455—9 6 Claims



1. In a communication system having a plurality of repeaters that transceive information on a plurality of communication resources, a plurality of communication groups, a plurality of consoles, and a communication resource allocator having a plurality of operator MUX interface modules (OMIs), wherein each of the plurality of consoles is operably associated with an OMI of the plurality of OMIs to produce an associated OMI and each of the plurality of consoles monitors, as monitored communication groups, a predetermined number of presented communication groups of the plurality of communication groups, a method for a console of the plurality of consoles to automatically utilize unpresented communications groups comprising the steps:

(a) storing unpresented communication groups of the plurality of communication groups as phantom communication groups in phantom memory of the associated OMI;

(b) accessing at least one of the phantom communication groups prior to performing a predetermined communication function;

(c) executing the predetermined communication function, wherein the predetermined communication function incorporates the at least one of the phantom communication groups and is executed without intervention from an operator of the console of the plurality of consoles.

4,995,096

DEMAND-ASSIGNMENT MULTIPLE ACCESS CONTROL SYSTEM

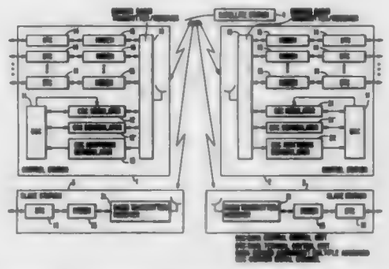
Yasuhito Isoe, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation-in-part of Ser. No. 292,385, Dec. 30, 1988, abandoned. This application May 10, 1989, Ser. No. 352,686

Claims priority, application Japan, Jan. 11, 1988, 63-4135

Int. Cl.[5] H04B *7/185*

U.S. Cl. 455—12 1 Claim



1. A DAMA (Demand Assignment Multiple Access) control system comprising:

a first central station including a first DAMA central control unit for performing centralized DAMA control for assigning a plurality of communication channels using different carriers by channel requests, receiving a channel request through a first common signaling channel using a carrier different from those of said communication channels, sending out a channel assignment result for the received channel request, and sending out predetermined pattern data through said first common signaling channel upon occurrence of an abnormal state;

a second control station including a second DAMA central control unit tuned to said first common signaling channel in a normal state to receive the predetermined pattern data, said second DAMA central control unit, upon non-reception of the carrier of said first common signaling channel, being operated to perform centralized DAMA control in place of said first DAMA central control unit and being tuned to a second common signaling channel using a carrier different from those of said communication channels and said first common signaling channel to receive the channel request and send out a communication channel assignment result for the received channel request; and

a plurality of slave stations each including at least one transmitter/receiver tunable to any of said first and second common signaling channels and said communication channels, and a DAMA terminal control unit for controlling tuning of said transmitter/receiver such that said transmitter/receiver is tuned to said first common signaling channel to receive the predetermined pattern data through said transmitter/receiver in a normal state, and that, upon non-reception of the carrier of said first common signaling channel, said transmitter/receiver is tuned to said second common signaling channel to send out the channel request for its own station through said transmitter/receiver tuned to said first or second common signaling channel and to receive the communication channel assignment result of its own station, thereby controlling

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tuning of said transmitter/receiver to allow communication on the basis of the received communication channel assignment result.

4,995,097

RADIO SYSTEM TO ALLOW OF EXCHANGING MESSAGES BETWEEN A SET OF STATIONS

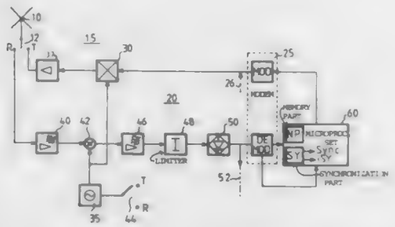
Daniel-Marie Leclerc, Clamart, France, assignor to U.S. Philips Corporation, N.Y.

Filed Dec. 21, 1988, Ser. No. 289,283

Claims priority, application France, Dec. 23, 1987, 87 18048

Int. Cl.[5] H04Q *7/00*; H04B *1/00*

U.S. Cl. 455—33 **3 Claims**



1. In a radio system, means for establishing a connection for two-way communication between one of a set of relay stations and an access station, said connection establishing mean comprising:

means for controlling said relay stations to simultaneously transmit in digital form in a semaphore channel at first predetermined instants first code signals in one to one correspondence with the relay stations, and separately transmit in said semaphore channel at second predetermined instants in one to one correspondence with the relay stations, second code signals;

means in said access station for tapping said semaphore channel at said first and second predetermined instants, and for choosing a relay station from among said set of relay stations according to first and second criteria, said first criterion being based on recognition of a first code signal received in said first predetermined instants, and said second criterion being based on the quality of the second code signals received in the second predetermined instants.

4,995,098

ADAPTIVE SCANNING METHOD

Buddy S. Tanassaleh, Arlington, and Michael A. Krzystyniak, Haslet, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 6, 1988, Ser. No. 240,181

Int. Cl.[5] H03J *7/20*

U.S. Cl. 455—165 **3 Claims**

1. In a scanning radio receiver having means for detecting carrier activity and having a frequency synthesizer that may be programmed to provide an output signal of a desired frequency and that provides a "lock status " indication when said output signal is stably tuned to said programmed desired frequency, said frequency synthesizer output signal initially being stably tuned to an active frequency, a method for determining the earliest time at which said frequency synthesizer is stably tuned to a scanned frequency so that carrier activity may be detected thereat with the minimum time delay, comprising the following steps:

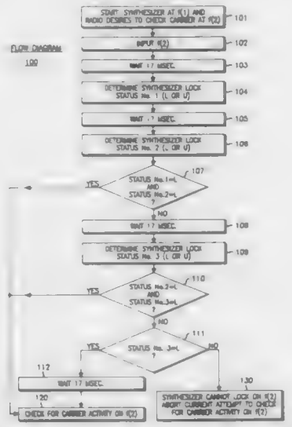
(1) programming said frequency synthesizer with said scanned frequency:

(2) after the passage of at least a first predetermined time interval, then determining a first lock status of said frequency synthesizer;

(3) after the passage of least a second predetermined time interval, then determining a second lock status of said frequency synthesizer:

(4) when said first lock status and said second lock are both locked, thereupon detecting carrier activity on said scanned frequency:

(5) otherwise, when at least one of said first lock status and



said second lock status is unlocked, and after the passage of at least a third predetermined time interval, then determining a third lock status of said frequency syntheiszer; and,

(6) when said second lock status and said third lock status are both locked, thereupon detecting carrier activity on said scanned frequency.

4,995,099

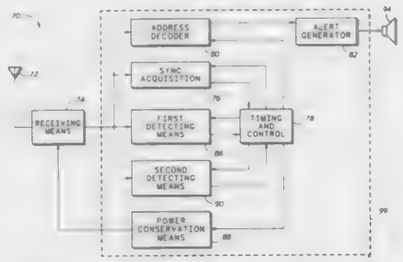
POWER CONSERVATION METHOD AND APPARATUS FOR A PORTION OF A PREDETERMINED SIGNAL

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 278,319, Dec. 1, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 504,073

Int. Cl.[5] H04B *1/16*

U.S. Cl. 455—343 **24 Claims**



1. A method for conserving power within a receiver which receives a transmitted signal having a predetermined signal inserted periodically at predetermined time intervals for synchronizing the receiver, the predetermined signal having at least a first portion including a first predefined signal, and a second portion including a second predefined signal, said method comprising the steps of:

(a) receiving and detecting a first predetermined signal to obtain synchronization of the receiver with the transmitted signal;

(b) thereafter receiving and detecting at least the first portion of each subsequently transmitted predetermined signal to maintain synchronization with the transmitted signal; and

(c) conserving power during the second portion of each subsequently transmitted predetermined signal following the detection of the first portion of each subsequently transmitted predetermined signal.

4,995,100

AMPLICATION OF OPTICAL SIGNALS

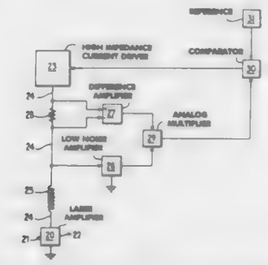
William A. Stallard, Colchester; Andrew D. Ellis, and Derek Malyon, both of Ipswich, all of England, assignors to British Telecommunications public limited company, United Kingdom

Filed Mar. 2, 1989, Ser. No. 318,221

Claims priority, application United Kingdom, Mar. 4, 1988, 8805204; Jul. 29, 1988, 8818107

Int. Cl.[5] G02F *1/00*

U.S. Cl. 455—606 **10 Claims**



1. An optical communications system which comprises optical amplifying means connected to receive optical signals from a signal generator, which generator is adapted to modulate an optical control tone onto the optical signals, wherein said amplifying means comprises a laser amplifier and drive means for providing a drive current to said laser amplifier, wherein said laser amplifier is adapted to amplify said optical signals and to superimpose an electrical control tone equivalent to received optical control tone onto the drive current, and wherein the optical amplifying means also comprises an automatic gain control circuit responsive to the electrical control tone and adapted to vary the drive current so as to reduce the variation in the output power of the laser amplifier.

4,995,101

SECURE TWO-WAY COMMUNICATIONS WITH SUBMERGED SUBMARINES

Paul J. Titterton, Palo Alto; Frederick Martin, Menlo Park; Dan J. Radecki, San Jose, and Robert W. Cotterman, Rocklin, all of Calif., assignors to GTE Government Systems Corporation, Mountain View, Calif.

Filed Sep. 19, 1989, Ser. No. 409,208

Int. Cl.[5] H04B *10/00*

U.S. Cl. 455—607 **44 Claims**

1. A method of providing secure two-way communications between a submerged platform in an ocean and an airborne platform travelling above the ocean, said method comprising the steps of:

generating at the airborne platform a downlink beam comprising a first pulse-modulated laser beam having a blue-green wavelength λ_1 and having encoded therein downlink information, said information comprising:

(i) a predetermined downlink IFF code for use at least during an acquisition mode during which the airborne platform seeks to establish two-way communications with the submerged platform, and

(ii) supervisory data, for use during said acquisition mode and during a communicating mode during which two-way communications take place between the airborne platform and the submerged platform;

downwardly transmitting said downlink beam while controlling its divergence and pointing angle, such that during said acquisition mode said downlink beam has an elongated elliptically-shaped cross-sectional pattern with a wide dimension transverse to the direction of travel of the airborne platform and a narrow dimension parallel to the direction of travel of the airborne platform;

optically sensing at the submerged platform during a standby operating mode corresponding to said acquisition mode for the presence of said downlink beam, and at the end of said standby operating mode optically receiving said downlink beam from the airborne platform;

filtering said received downlink beam through an optical filter having a very narrow passband centered at the wavelength λ_1 to suppress any background radiation;

converting said filtered downlink beam into first electrical pulses;

decoding said electrical pulses and outputting said downlink information;

verifying said predetermined downlink IFF code in said downlink information, said standby operating mode ending upon such verification;

generating, in response to said verified IFF code, an uplink beam comprising a second pulse-modulated laser beam

having a wavelength λ_1 and having encoded therein uplink information, said information including an uplink IFF code to acknowledge receiving said downlink beam;

adjusting the uplink beam power in response to said supervisory data contained in said decoded downlink information;

upwardly transmitting said uplink beam to said airborne platform;

optically scanning at the airborne platform during said acquisition mode, a spatial area using a variable field of view to detect the presence of said uplink beam, and during said communicating mode, optically receiving said uplink beam from a substantially stationary spatial location;

filtering said received uplink beam through an atomic resonant filter having a very narrow passband centered at the wavelength λ_1 thereby greatly attenuating any background radiation;

converting said filtered uplink beam into second electrical pulses;

decoding said second electrical pulses and outputting said uplink information;

verifying said uplink IFF code in said uplink information; and

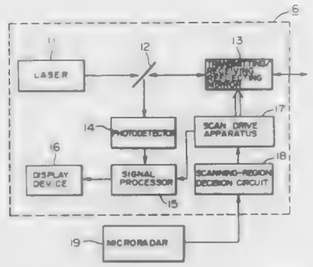
generating a correction signal related to the S/N of said received uplink beam, said correction signal being added to said supervisory data for encoding therewith.

4,995,102

SCANNING METHOD USED BY LASER RADAR AND LASER RADAR FOR CARRYING OUT THE METHOD

Yuuji Ichinose, Hitachi; Fuminobu Takahashi, Katsuta, and Yoshiaki Ichikawa, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1988, Ser. No. 192,179
Claims priority, application Japan, May 13, 1987, 62-114665
Int. Cl.[5] G01S *17/88*
U.S. Cl. 342—158 **15 Claims**



1. A scanning method used by a laser radar for scanning a predetermined scanning region with a laser beam to detect a target, the scanning method comprising the steps of:

scanning a scanning region with a laser beam so that a spiral scanning path is outwardly formed, and then scanning the scanning region with the laser beam so that a spiral scanning path is inwardly formed; and

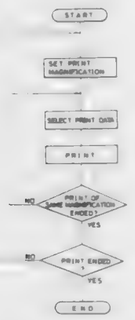
repeating the outward and inward spiral scanning while effecting smooth switchover at a switchover point from the inward spiral scanning to the outward spiral scanning.

4,995,103

PRINT CONTROL METHOD AND SYSTEM

Masaki Tsukada, Katsuta, and Kikuo Hatazawa, Atsugi, both of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Sep. 13, 1989, Ser. No. 406,596
Claims priority, application Japan, Sep. 14, 1988, 63-231097
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 **20 Claims**



1. A print control method for use with a printing system which includes setting means for setting a printing magnification and is capable of printing data for print with the set printing magnification, comprising the steps of:

selecting data having a printing magnification corresponding to that set by said setting means with priority over other data of a different magnification or magnifications to transmit said data of said set magnification to the printing system to let the printing system print said data of said set magnification preferentially; and

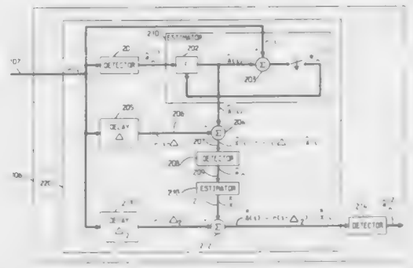
setting another printing magnification in the printing system after completion of the printing of said data of said set printing magnification to allow the printing system to start printing with said another printing magnification.

4,995,104

INTERFERENCE CANCELLING CIRCUIT AND METHOD

Richard D. Gitlin, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 8, 1989, Ser. No. 348,442
Int. Cl.[5] H04B *3/14*
U.S. Cl. 370—6 **15 Claims**



1. Apparatus for detecting a desired digital data signal in a received signal corrupted by a crosstalk signal, said apparatus comprising:

first estimating means for forming an estimate of the desired signal from the received signal,

second estimating means for forming an estimate of the crosstalk signal in the received signal by subtracting the estimated desired signal from the received signal, and

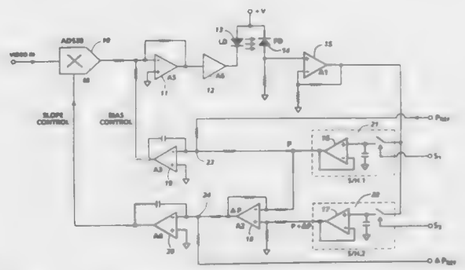
means for determining the desired signal by subtracting the estimated crosstalk signal from the received signal.

4,995,105

ADAPTIVE LASER DIODE DRIVER CIRCUIT FOR LASER SCANNERS

Erwin R. Wechsler, La Crescenta, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 18, 1989, Ser. No. 408,823
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—38 **2 Claims**



1. The process of calibrating the light output of a laser diode, the output amplitude of which is controlled by a bias level, used in a raster scanning system for generating a scan comprising a laser driver circuit having an adjustable gain and a video input signal applied to said laser driver circuit before the scan begins or after the scan ends in a time interval where the laser

is turned on for start of scan (or end of scan) detection comprising the steps of:

first applying a first preset video signal voltage to said laser driver circuit,

first measuring the laser output generated by said first applying,

storing the value of first said measuring,

second applying a second preset video signal voltage to said laser driver circuit,

second measuring the laser power generated by said second applying,

storing the value of second said measuring,

comparing one of the said measured power values to a first reference value to generate a first error,

using said first error to adjust the bias level of the laser until said first error becomes zero,

calculating the difference between the value of said first measuring and the value of said second measuring,

comparing said difference to a second reference value to generate a second error, and

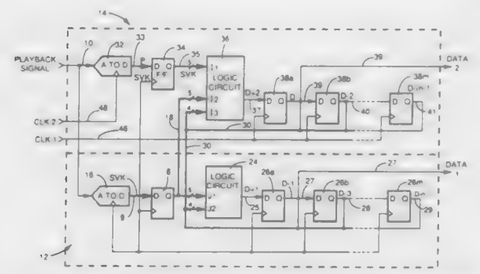
using said second error to adjust the gain of the video signal until the said second error becomes zero.

4,995,106

FAST DECISION FEEDBACK DECODER FOR DIGITAL DATA

Dan E. Bower, Newark, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 24, 1989, Ser. No. 398,191
Int. Cl.[5] H04L *25/06*
U.S. Cl. 375—76 **16 Claims**



1. A decision feedback apparatus for decoding a digital data stream transmitted by a signal transmission channel, comprising:

a first signal path having a first logic means receiving sequentially digital values corresponding to every other data bit of said transmitted data stream, for providing and outputting therefrom a decision determining a value of each said corresponding data bit, and a first storage means for storing a predetermined number of consecutive previous decisions provided by said first logic means;

a second signal path, parallel with said first path, having a second logic means receiving sequentially digital values corresponding to each data bit of said transmitted data stream, providing a decision determining a value of each said corresponding data bit, and outputting a decision determining the value of each said decision provided by said first logic means, and a second storage means for storing a predetermined number of consecutive previous decisions provided by said second logic means; and

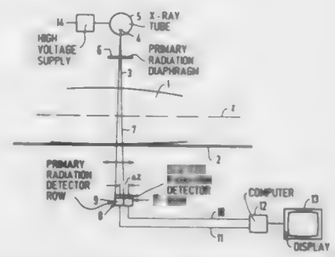
said first and second storage means both applying said previous decisions stored therein to both said first and second logic means.

4,995,107

COMPUTER TOMOGRAPHY APPARATUS WITH AXIALLY DISPLACEABLE DETECTOR ROWS

Klaus Klingenbeck, Nuernberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 408,068
Claims priority, application European Pat. Off., Oct. 17, 1988, 88117262.1
Int. Cl.[5] G01N *23/00*
U.S. Cl. 378—7 **1 Claim**



1. A method for operating a computer tomography apparatus having an x-ray source which generates a fan-shaped x-ray beam adapted to penetrate an examination subject in a slice plane, the passage of said x-ray beam through said examination subject generating attenuated primary radiation, a row of primary radiation detector elements disposed in said slice plane in an original position for, during an examination, receiving primary radiation attenuated by the patient, and a row of scatter radiation detector elements disposed in an original position out of said slice plane and next to, in the axial direction, said row of primary radiation detector elements so that each scatter radiation detector element has a corresponding axially adjacent primary radiation detector element, for receiving scatter radiation during an examination, said method comprising the steps of:

energizing said x-ray source with said row of primary radiation detectors and said row of scatter radiation detector elements in their respective original positions;

axially displacing said row of primary radiation detector elements and said row of scatter radiation detector elements so that said row of primary radiation detector elements occupies the original position of said row of scatter radiation detector elements;

placing a standardized scattering object in the path of said x-ray beam;

energizing said x-ray source with said standardized scattering object in said x-ray beam, said row of primary radiation detector element receiving scatter radiation, to obtain a first calibration value for each detector in the row of primary radiation detector elements;

returning said row of primary radiation detector elements and said row of scatter radiation detector element to their respective original positions;

energizing said x-ray source with said standardized scattering object in said x-ray beam to obtain second calibration values for each detector in said row of scatter radiation detector element;

placing a patient in the path of said x-ray beam;

conducting an examination of said patient by rotating said x-ray source, said row of primary radiation detector elements and said row of scatter radiation detector elements around said patient so that said patient is irradiated by said x-ray beam from a plurality of different angles, and thereby obtaining an examination radiation value from detector in said row of primary radiation detector elements and from each detector in said row of scatter radiation detector elements;

multiplying each of said examination radiation values from said detectors in said row of scatter radiation detector

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elements by a factor which is the ratio of said first and second calibration values to obtain a product; and

subtracting the product obtained for a scatter radiation detector element from the examination value from its corresponding primary radiation detector element to obtain an actual radiation value.

4,995,108

MARK-BEARING SUPPORT FOR DENTAL X-RAY FILM PACK

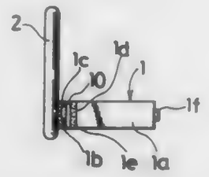
Hiroyuki Tanaka, Yokohama, Japan, assignor to Nix Company, Ltd., Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,303

Claims priority, application Japan, Dec. 19, 1988, 63-163540[U]

Int. Cl.[5] A61B *6/14*

U.S. Cl. 378—168 16 Claims



1. A mark-bearing support for a dental X-ray film pack, said mark-bearing support comprising:

an X-ray pervious bite portion adapted to be clenched between upper and lower teeth; and

a support portion means for temporarily holding the dental X-ray film pack thereon;

wherein the support portion is provided with a first mark formed of an X-ray impervious material; and

wherein an X-ray pervious sheet bearing the first mark printed thereon with an X-ray impervious ink is provided on the support portion via a first adhesive layer.

4,995,109

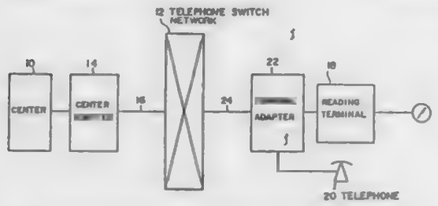
COMMUNICATION WITH A NON-TELEPHONE TERMINAL VIA A TELEPHONE SWITCHING NETWORK USING TWO CONSECUTIVE CALLS

Masato Arizumi; Norio Ozawa, both of Tokyo, and Yasurou Fukawa, Hiratuka, all of Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo and Any Co., Ltd., Kanagawa, both of, Japan

Filed May 24, 1989, Ser. No. 356,209

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—107 19 Claims



1. A telecommunications system comprising:

a telephone switching network for switching a plurality of telephone lines;

a telephone terminal accessible to said telephone switching network;

a non-telephone terminal for performing data communication via said telephone switching network;

first network control means connected to a first telephone line of said plurality of telephone lines for controlling connection of said telephone terminal and said non-telephone terminal and said telephone switching network;

center equipment for supervising data communication to said non-telephone terminal on a call terminated via said telephone switching network to the first telephone line; and

second network control means connected to a second telephone line of said plurality of telephone lines for controlling connection of said center equipment and said telephone switching network;

said second network control means having means for originating a first call to said telephone switching network in response to said center equipment by using a subscriber number which is assigned to said telephone terminal so that said telephone switching network terminates the first call at said first telephone line in response to the subscriber number and informs said second network control means via said second telephone line of the termination of the first call at said first telephone line;

said second network control means having means for releasing the first call on detecting the termination at said first telephone line and, thereafter, originating a second call to said telephone switching network by using the subscriber number;

said telephone switching network terminating the second call in response to the subscriber number;

said first network control means having means for detecting the termination of the first call over the first telephone line and subsequent release of the first call and then detecting the termination of the second call, and for answering the second call by connecting said non-telephone terminal to said first telephone line in response to the termination of the second call with said telephone switching network setting up a connection between said first and second telephone lines in response to the answer to the second call by said first network control means and with said first network control means connecting said non-telephone terminal to said first telephone line to allow the data communication between said non-telephone terminal and said center equipment.

4,995,110

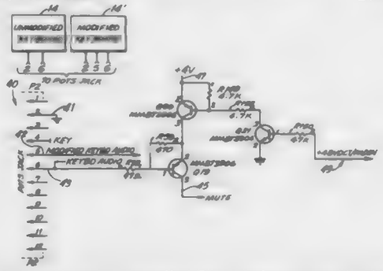
METHOD AND APPARATUS FOR KEYBOARD ADAPTATION TO A LOW POWER CONTROLLER IN A COIN OPERATED TELEPHONE

Patrick J. McGarry, West Chester, Pa., assignor to Mars Incorporated, McLean, Va.

Filed Sep. 15, 1989, Ser. No. 407,895

Int. Cl.[5] H04M *17/00, 19/00*

U.S. Cl. 379—155 27 Claims



13. A low power controller for a coin operated telephone connected to a phone line, said controller being adapted for operation with a keyboard which will draw a current ranging from a minimum to a maximum standard operational current depending upon the conditions of a line to which it is connected, said controller comprising:

an artificial line connected to the keyboard for providing line conditions so that the keyboard operates using a current near its minimum standard operational current, said artificial line producing an output signal; and

an audio circuit connected to the artificial line output signal for balancing the output signal to the phone line.

4,995,111

RING TRIP CIRCUIT FOR SUBSCRIBER TELEPHONE

Toshiro Tojo; Kenji Takato; Kazumi Kinoshita; Yuzo Yamamoto, all of Kawasaki; Yozo Iketani, Yokohama, and Shin-ichi Ito, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP88/00607, § 371 Date Feb. 21, 1989, § 102(e) Date Feb. 21, 1989, PCT Pub. No. WO88/10542, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 18, 1988, Ser. No. 320,297

Claims priority, application Japan, Jun. 19, 1987, 62-152636; Dec. 24, 1987, 62-325330

Int. Cl.[5] H04M *3/02*

U.S. Cl. 379—382 31 Claims

1. A ring trip circuit for a subscriber telephone, the ring trip circuit operatively connected to a ringer sending resistor having first and second ends, the ringer sending resistor operatively connected between the subscriber telephone and a ringer source, said ring trip circuit comprising:

voltage detecting means, operatively connected between the second and second ends of the ringer sending resistor, for detecting a voltage difference between the first and second ends of the ringer sending resistor and for converting the voltage difference to a current difference, the voltage difference varies in response to whether the subscriber telephone is in one of an on-hook state and an off-hook state, said voltage detecting means includes a plurality of current mirror circuits for the converting of the voltage difference to the current difference, each of the current mirror circuits formed by at least two transistors; and

state detecting means, operatively connected to said voltage detecting means, for detecting one of the on-hook state and the off-hook state of the subscriber telephone based upon the voltage difference, said state detecting means including comparator means formed by a plurality of transistors,

wherein said voltage detecting means includes at least

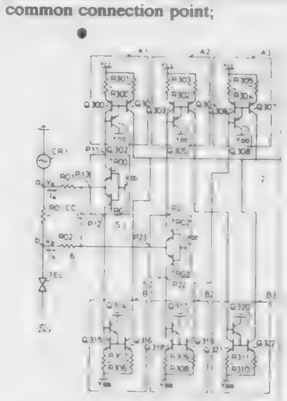
a first current switching circuit operatively connected to the first end of the ringer sending resistor and having first to third ports, said first current switching circuit supplies a first current from the second port to the third port when a first voltage at the first end is positive, or supplies the first current from the first port to the first end through the third port when the first voltage at the first end is negative; and

a second current switching circuit operatively connected to the second end of the ringer sending resistor and having first to third ports, said second current switching circuit supplies a second current from the second port to the third port when a second voltage at the second end is positive, or supplies the second current from the first port to the second voltage end through the third port when the second voltage at the second end is negative.

wherein said plurality of current mirror circuits of said voltage detecting means includes at least

a first current mirror circuit having a first terminal connected to the first port of said first current switching circuit and a second terminal;

a second current mirror circuit having a first terminal Connected to the second port of said first current switching circuit and a second terminal connected to said second terminal of said first current mirror circuit at a common connection point;



a third current mirror circuit having a first terminal connected to the first port of said second current switching circuit and a second terminal;

a fourth current mirror circuit having a first terminal connected to the second port of said second current switching circuit and a second terminal;

a fifth current mirror circuit having a first terminal connected to the second terminal of said fourth current mirror circuit and a second terminal connected to the common connection point; and

a sixth current mirror circuit having a first terminal connected to the second terminal of said third current mirror circuit and a second terminal connected to the common connected point,

wherein the common connection point of the second terminals of said first and second current mirror circuits and the second terminals of said fifth and sixth current mirror circuits is the current difference corresponding to the voltage difference between first and second ends of the ringer sending resistor, and

wherein said ring trip circuit further comprises a voltage conversion circuit, operatively connected to the common connection point of the voltage detecting means, for converting the current difference to a reconstructed voltage difference and outputting the same.

4,995,112

SECURITY SYSTEM

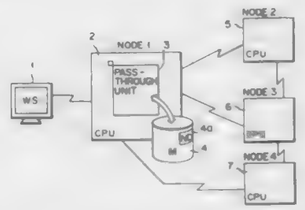
Mitsunobu Aoyama, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 30, 1989, Ser. No. 374,067

Claims priority, application Japan, Jul. 5, 1988, 63-167605

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—25 9 Claims



1. A security system for use in a distributed processing system having a plurality of nodes, comprising:

passthrough means for passing access request data through an intra node to another one of said plurality of nodes, said

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access request data including at least address information for specifying one of said plurality of nodes and security information for obtaining access to one of said plurality of nodes;

node directory storing means for storing a node directory representing a correspondence between each of said plurality of nodes and respective security information; and

control means for receiving said access request data, and upon determining that said address information does not specify said intra node and that said security information of said access request data corresponds to said address information in accordance with said correspondence represented by said node directory, for causing said pass-through means to pass said access request data through said intra node to said other one of said plurality of nodes.

4,995,113

DEVICE FOR PROCESSING AN AUDIO-FREQUENCY ELECTRICAL SIGNAL

Philippe Robineau; Eric Vincenot, both of Paris, and Didier Dal Fitto, Metz, all of France, assignors to Nexo Distribution, Paris, France

PCT No. PCT/FR87/00457, § 371 Date May 19, 1989, § 102(e) Date May 19, 1989, PCT Pub. No. WO88/04124, PCT Pub. Date Jun. 2, 1988

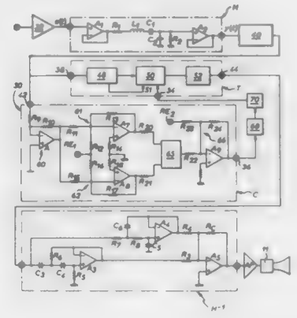
PCT Filed Nov. 19, 1987, Ser. No. 358,351

Claims priority, application France, Nov. 21, 1986, 86 16244

Int. Cl.[5] H04R *3/00*

U.S. Cl. 381—117 **10 Claims**

1. Device for processing an audio-frequency electrical signal intended to be applied to an electro-acoustic transducer, characterised in that it comprises means (T) for receiving said audio-frequency signal (e(t)) or a signal (y(t)) derived therefrom and to delay it by a variable amount depending on its amplitude, said amount changing to compensate substantially a variable propagation phase-shift affecting the sound wave generated by said transducer.



DESIGN PATENTS

GRANTED FEB. 19, 1991

ERRATA

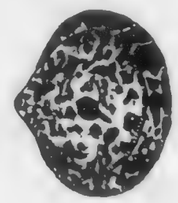
For CLASS	See PATENT NO.
D09–448	314,688

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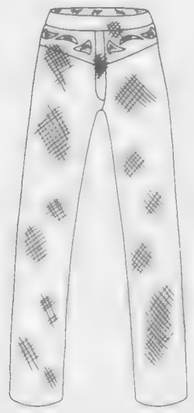
DESIGNS

FEBRUARY 19, 1991

314,659
BREAST IMPLANT ENHANCER
Schuyler C. Metlis; Laurie Metlis, both of 3341 Pine Hill Trail, Palm Beach Gardens, Fla. 33480; Zeger Muller, and Margaretha Muller, both of 220 Seabreeze Cir., Jupiter, Fla. 33477
Filed Jul. 29, 1987, Ser. No. 79,492
Term of patent 14 years
U.S. Cl. D2—24



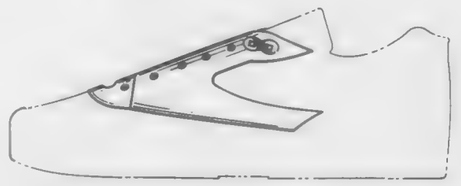
314,660
WOMEN'S SLACKS
Barbara Startin, 8400 S. 4000 West #116, West Jordan, Utah 84004
Filed Nov. 9, 1987, Ser. No. 118,806
Term of patent 14 years
U.S. Cl. D2—28



314,661
SHAWL COAT
Susana Vasquez-Solis, North Miami Beach, Fla., assignor to Peruvian Design Center, Chicago, Ill.
Filed Jul. 19, 1988, Ser. No. 221,236
Term of patent 14 years
U.S. Cl. D2—184

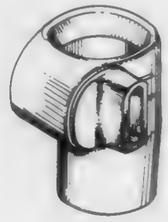


314,662
ELEMENT OF A SHOE UPPER
Patricia D. Quan, Hermosa Beach; Angelo Maccano, Simi Valley, and Robert Y. Greenberg, Woodland Hills, all of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Division of Ser. No. 119,415, Nov. 10, 1987, Pat. No. Des. 304,515. This application Dec. 12, 1988, Ser. No. 283,893
Term of patent 14 years
U.S. Cl. D2—314

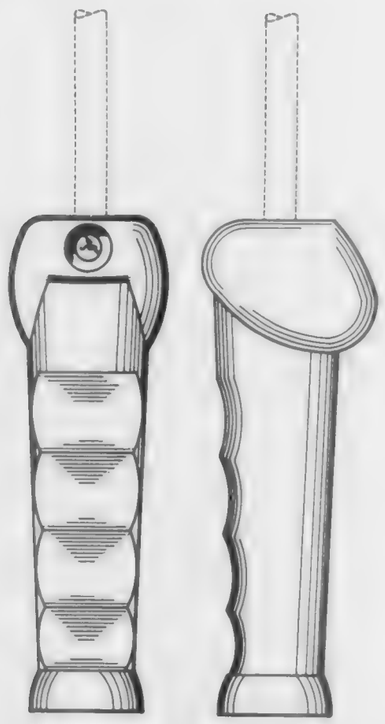


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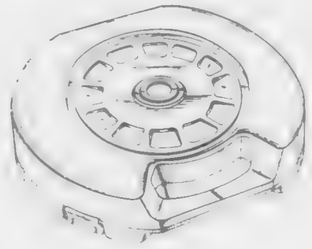
314,663
CLAMP FOR THE SHAFT OF A STATIC UMBRELLA
Joachim Seidel, Solingen, and Klaus Stiller, Langenfeld, both of Fed. Rep. of Germany, assignors to Kortenbach Verwaltungs- und Beteiligungsgesellschaft mbH & Co., Soligen, Fed. Rep. of Germany
Filed Apr. 5, 1988, Ser. No. 200,771
Term of patent 14 years
U.S. Cl. D3—10



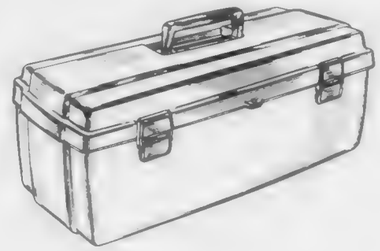
314,664
ILLUMINATED UMBRELLA HANDLE
Joseph D. Bonanno, 194 Hicksville Rd., Bethpage, N.Y. 11714
Filed Jun. 22, 1988, Ser. No. 210,293
Term of patent 14 years
U.S. Cl. D3—13



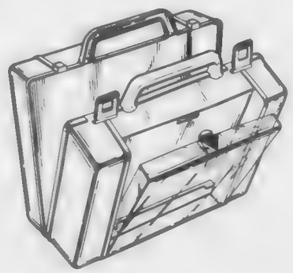
314,665
TOOL CASE FOR SOCKETS AND THE LIKE
Jason Wu, and Davis Chen, both of 7F-1, No. 293-3, Sec. 2, Fu-Hsing S. Rd., Taipei, Taiwan
Filed May 31, 1990, Ser. No. 531,262
Term of patent 14 years
U.S. Cl. D3—73



314,666
TOOL BOX
Charles A. Lanius, Prairie du Sac, Wis., assignor to Flambeau Corporation, Baraboo, Wis.
Filed Jul. 20, 1987, Ser. No. 75,316
Term of patent 14 years
U.S. Cl. D3—72



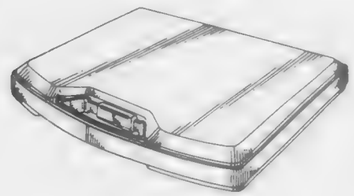
314,667
CASE
Mukhtar F. Hussain, Slough, England, assignor to Alia Mouldings Limited, England
Filed Dec. 28, 1988, Ser. No. 291,196
Claims priority, application United Kingdom, Nov. 24, 1988, [illegible]
Term of patent 14 years
U.S. Cl. D3—73



314,668
ATTACHE CASE
Michael A. Cousins, New York, N.Y., assignor to Tumi Imports, Middlesex, N.J.
Filed Jul. 5, 1988, Ser. No. 217,762
Term of patent 14 years
U.S. Cl. D3—76



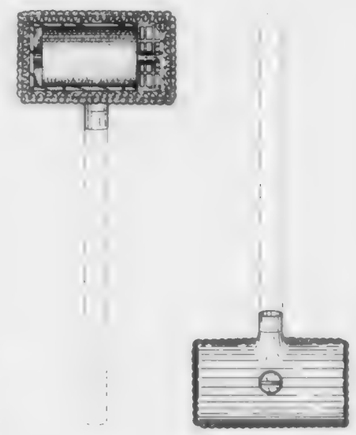
314,669
CASE
Noriaki Kunimune, Higashiosaka, Japan, assignor to Kunimune Kogyosho Co., Ltd., Osaka, Japan
Filed Oct. 26, 1988, Ser. No. 262,674
Claims priority, application Japan, Apr. 26, 1988, 53-17200
Term of patent 14 years
U.S. Cl. D3—76



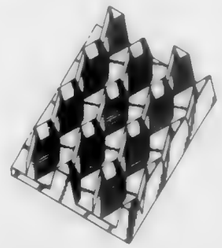
314,670
HOLSTER FOR CORDLESS TOOLS
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed Jun. 24, 1988, Ser. No. 211,714
Term of patent 14 years
U.S. Cl. D3—105



314,671
WATER DRIVEN ROTARY BRUSH FOR WASHING VEHICLES
Robert A. Swanson, Rte. 9, Box 9, McMinnville, Tenn. 37110, and Richard L. C. Lau, A-2402 Westlands Gardens, 4 Westlands Road, Quarry Bay, Hong Kong
Filed Jan. 15, 1988, Ser. No. 144,869
Term of patent 14 years
U.S. Cl. D4—115

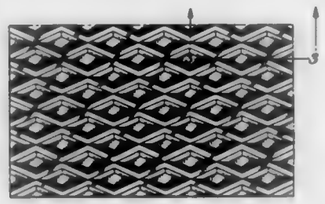


314,672
EMBOSSED DIAPER COVER STOCK OR SIMILAR ARTICLE
Richard J. Legare, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jun. 26, 1987, Ser. No. 66,685
Term of patent 14 years
U.S. Cl. D5—53

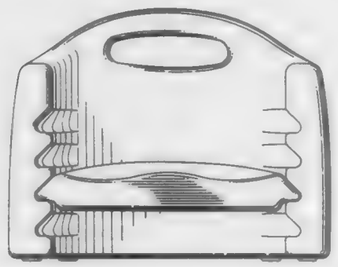


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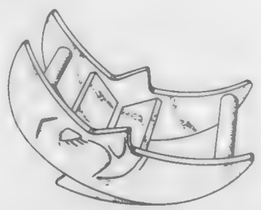
314,673
EMBOSSED DIAPER COVER STOCK MATERIAL OR SIMILAR ARTICLE
Richard J. Legare, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 13, 1987, Ser. No. 73,235
Term of patent 14 years
U.S. Cl. D5—53



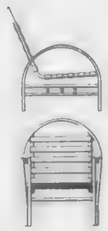
314,674
ADJUSTABLE BOOSTER SEAT
Louis M. Kohus, 1312 Mayland Dr., Cincinnati, Ohio 45230; Michael H. Young, 1896 Alder Branch La., Germantown, Tenn. 38138, and Mark R. Drane, 4442 BrookCreek Cove, Memphis, Tenn. 38115
Filed Mar. 7, 1988, Ser. No. 164,988
Term of patent 14 years
U.S. Cl. D6—333



314,675
ROCKING CHAIR
John B. Watts, 4629 Lorraine, Dallas, Tex. 75209
Filed Mar. 21, 1988, Ser. No. 171,290
Term of patent 14 years
U.S. Cl. D6—345



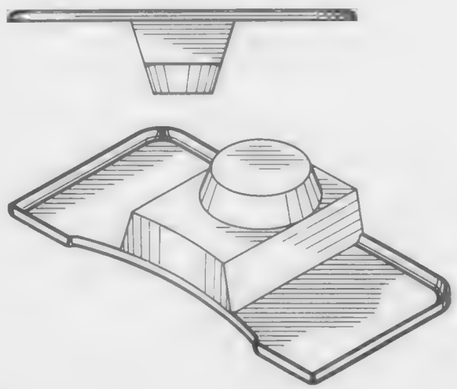
314,676
CHAIR
Steve C. Hess, Birmingham, Ala., assignor to Winston Furniture Company Inc., Birmingham, Ala.
Filed Aug. 28, 1987, Ser. No. 90,561
Term of patent 14 years
U.S. Cl. D6—370



314,677
BENCH
Robert M. Hanna, Philadelphia, Pa., assignor to Hanna/Olin, Ltd., Philadelphia, Pa.
Filed Jan. 22, 1987, Ser. No. 6,633
Term of patent 14 years
U.S. Cl. D6—381



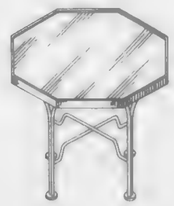
314,678
LAP TRAY
Waiel R. Ali, 1601 Aspen Dr., Plainsboro, N.J. 08536
Filed Oct. 26, 1987, Ser. No. 112,763
Term of patent 14 years
U.S. Cl. D6—406



314,679
BOOK SHELF UNIT
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Division of Ser. No. 295,566, Jan. 10, 1989. This application Oct. 30, 1989, Ser. No. 429,193
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—465



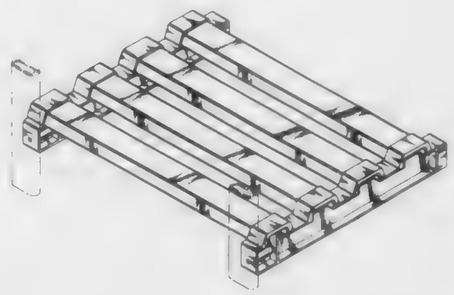
314,680
TABLE
Richard D. McCarthy, and William P. Taylor, both of Winston-Salem, N.C., assignors to Winston Furniture Company, Inc., Birmingham, Ala.
Filed Mar. 13, 1987, Ser. No. 25,774
Term of patent 14 years
U.S. Cl. D6—487



314,681
TABLE LEG OR THE LIKE
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 6, 1988, Ser. No. 141,348
The portion of the term of this patent subsequent to Oct. 3, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—499

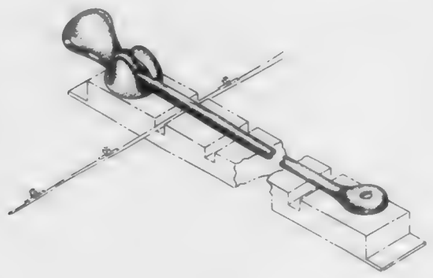


314,682
SHELF
Kenneth K. Kellems, Costa Mesa; William F. Ryczek, Azusa, and Douglas R. Smith, Glendora, all of Calif., assignors to The Stanley Works, New Britain, Conn.
Filed Mar. 2, 1989, Ser. No. 318,930
Term of patent 14 years
U.S. Cl. D6—511

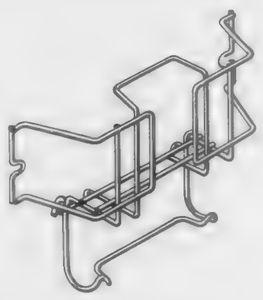


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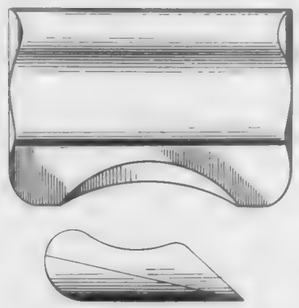
314,683
FISHING ROD RETAINER
Miles F. Scanland, 144 Deer Run, Castorville, Tex. 78009
Filed Feb. 17, 1989, Ser. No. 311,890
Term of patent 14 years
U.S. Cl. D6—552



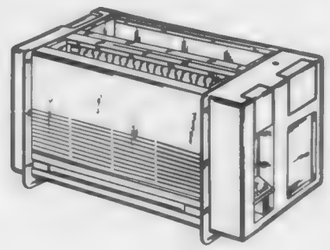
314,684
APPLIANCE AND ACCESSORIES ORGANIZER
Thomas R. Bajek, LaGrange Park, and John P. Chap, Lemont, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Jan. 13, 1989, Ser. No. 297,084
Term of patent 14 years
U.S. Cl. D6—566



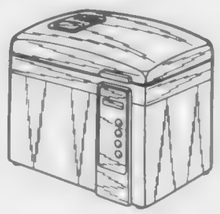
314,685
SCULPTED CONTOUR PILLOW
Gary C. Hudson, 2124 Hanover Ave., Richmond, Va. 23231
Filed May 22, 1989, Ser. No. 354,936
Term of patent 14 years
U.S. Cl. D6—601



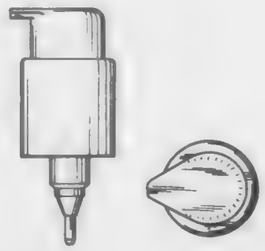
314,686
COMBINED TOASTER AND GRILL
Dominique Hantz, and Dominique Antoine, both of Vagney, France, assignors to SEB, Selongey, France
Filed Mar. 25, 1988, Ser. No. 173,534
Claims priority, application France, Sep. 30, 1987, 87 5706
Term of patent 14 years
U.S. Cl. D7—329



314,687
BREAD BAKING MACHINE
Hae S. Kim, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 8, 1988, Ser. No. 281,510
Claims priority, application Rep. of Korea, Jun. 30, 1988, 9136/1988
Term of patent 14 years
U.S. Cl. D7—350



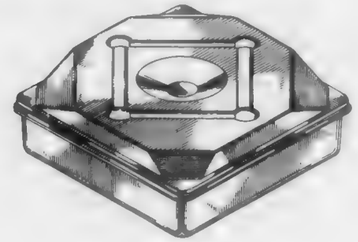
314,688
PUMP DISPENSER CLOSURE
Hervë Guillerm, Creteil, France, assignor to Reboul-Smt, Creteil, France
Filed Dec. 22, 1989, Ser. No. 454,846
Term of patent 14 years
U.S. Cl. D9—448



314,689
TUMBLER
Helene K. Claudius, 108 Alexsandra Ct., #167, Frederick, Md. 21072
Filed Sep. 6, 1988, Ser. No. 247,439
Term of patent 14 years
U.S. Cl. D7—507



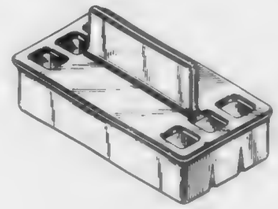
314,690
COMBINED FOOD CONTAINER AND SERVER
Jerrilyn C. Kiyokane, Seal Beach, Calif., assignor to Namkung Promotions, Inc., Costa Mesa, Calif.
Filed Apr. 14, 1988, Ser. No. 182,064
Term of patent 14 years
U.S. Cl. D7—539



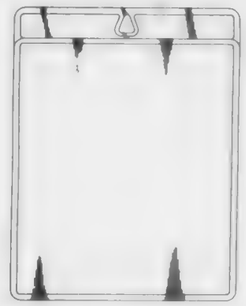
314,691
ELECTRIC KNIFE
Lutz Gebhardt, Darmstadt, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH
Filed May 12, 1988, Ser. No. 194,021
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 5MR10800
Term of patent 14 years
U.S. Cl. D7—646



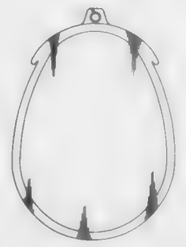
314,692
BREADSTICKS CUTTER
James B. Marston, Wichita, Kans., assignor to Pizza Hut, Inc., Wichita, Kans.
Filed Sep. 22, 1987, Ser. No. 99,513
Term of patent 14 years
U.S. Cl. D7—673



314,693
CHOPPING BOARD
Shigenori Sata, Osaka, Japan, assignor to Kobayashi Manufacturing Company, Ltd., Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,717
Term of patent 14 years
U.S. Cl. D7—698



314,694
CHOPPING BOARD
Shigenori Sata, Osaka, Japan, assignor to Kobayashi Manufacturing Company, Ltd., Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,718
Term of patent 14 years
U.S. Cl. D7—698

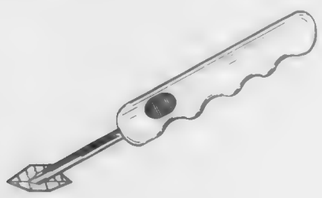


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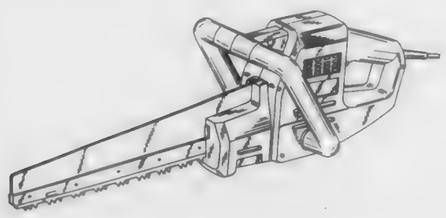
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CHOPPING BOARD
Shigenori Sata, Osaka, Japan, assignor to Kobayashi Manufacturing Company, Ltd., Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,715
Term of patent 14 years
U.S. Cl. D7—699



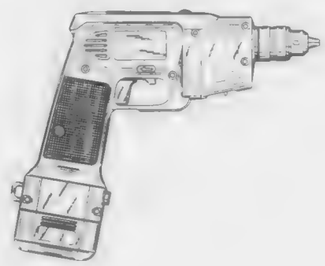
314,696
DECAULKING TOOL
Louis V. Lucarelli, 5967 King School Rd., Bethel Park, Pa. 15102
Filed Mar. 28, 1988, Ser. No. 174,015
Term of patent 14 years
U.S. Cl. D8—45



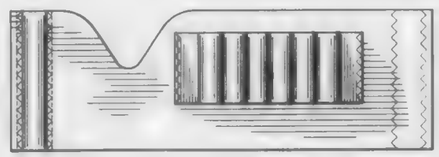
314,697
HAND-HELD POWER SAW
Peter P. Ploch, Idstein/Ts., and Ulrich Berghäuser, Traunstein, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.
Filed Jun. 3, 1988, Ser. No. 202,911
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 261/88
Term of patent 14 years
U.S. Cl. D8—64



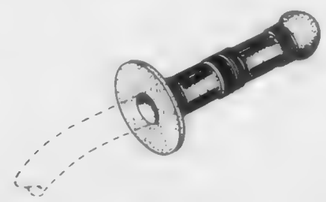
314,698
CORDLESS DRILL
Donald W. Zurwelle, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 10, 1988, Ser. No. 166,847
Term of patent 14 years
U.S. Cl. D8—68



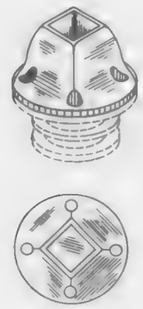
314,699
TOOL ACCESSORY HOLDER ATTACHMENT FOR A DRILL
Patricia L. Tamosaitis, P.O. Box 251, and Edwin Tamosaitis, II, P.O. Box 754, both of Medical Lake, Wash. 99022
Filed Aug. 13, 1987, Ser. No. 84,735
Term of patent 14 years
U.S. Cl. D8—71



314,700
BICYCLE HANDLEBAR GRIP
Jeffry L. Lurkis, 7626 Willow Glen Rd., Los Angeles, Calif. 90046
Filed Feb. 21, 1989, Ser. No. 312,234
Term of patent 14 years
U.S. Cl. D8—303



314,701
POST HOLDER
John D. Mykines, P.O. Box 476, Ione, Wash. 99139
Filed Dec. 2, 1988, Ser. No. 280,190
Term of patent 14 years
U.S. Cl. D8—354



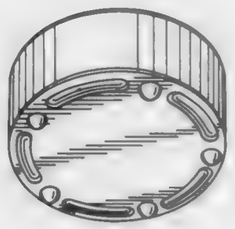
314,702
BOTTLE
Ronaldo V. Gonzalez, Alameda, Calif., assignor to Iolab Corporation, Claremont, Calif.
Filed Jan. 19, 1988, Ser. No. 146,145
Term of patent 14 years
U.S. Cl. D9—307



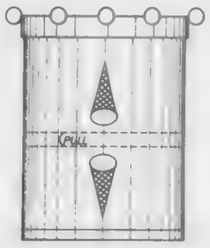
314,703
BOTTLE
Umberto D. I. Segati, Brussels, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Mar. 31, 1988, Ser. No. 176,138
Term of patent 14 years
U.S. Cl. D9—375



314,704
CONTAINER OR THE LIKE
Stig Lillelund; Eskil H. Olsen, both of Gentofte, Denmark, and Robert H. C. M. Daenen, Erembodegem, Belgium, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Oct. 28, 1988, Ser. No. 264,307
Term of patent 14 years
U.S. Cl. D9—414

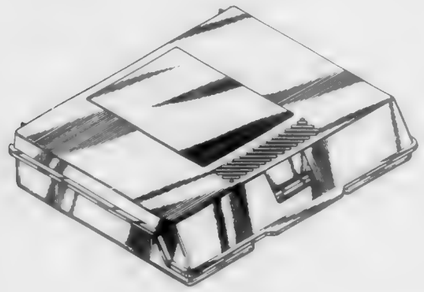


314,705
CONTAINER
Dennis J. Brown, P.O. Box 1268, Clairmore, Okla. 74018, and Casey L. Dorris, 6250 S. 31st. W. Ave., Tulsa, Okla. 74132
Filed Aug. 11, 1988, Ser. No. 231,044
Term of patent 14 years
U.S. Cl. D9—416

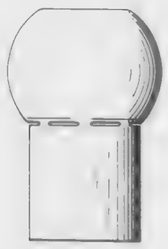


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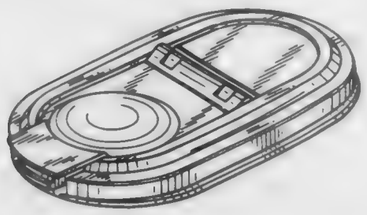
314,706
UTILITY BOX
Charles W. Craft, Jr., Apple Creek; Bob Mervar, Columbus, both of Ohio; Scott E. Stropkay, Boston, Mass., and Robert J. Hayes, Gahanna, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 24, 1988, Ser. No. 261,483
Term of patent 14 years
U.S. Cl. D9—423



314,707
BOTTLE CAP
Jacques Granger, Libourne, France, assignor to Cebal, Clichy, France
Filed Jan. 28, 1988, Ser. No. 149,193
Claims priority, application World Int. Prop. O., Jul. 30, 1987, DM/009031
Term of patent 14 years
U.S. Cl. D9—435



314,708
CONTAINER CLOSURE
Pieter K. J. DeCoster, Aalst, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.
Filed May 26, 1988, Ser. No. 199,400
Term of patent 14 years
U.S. Cl. D9—449



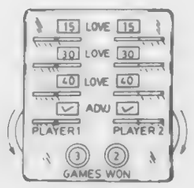
314,709
LAP TIMER WATCH
Rafael Braun, Woodmere, N.Y., assignor to E. Gluck Corporation, Long Island City, N.Y.
Filed Sep. 14, 1987, Ser. No. 95,991
Term of patent 14 years
U.S. Cl. D10—30



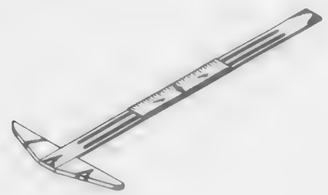
314,710
WRISTWATCH AND BRACELET
Raymond L. Weil, Geneva, Switzerland, assignor to Raymond Weil, S.A., Geneva, Switzerland
Filed Sep. 10, 1987, Ser. No. 95,336
Claims priority, application World Int. Prop. O., Mar. 13, 1987, DMA/000597
Term of patent 14 years
U.S. Cl. D10—32



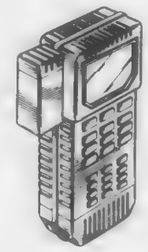
314,711
TENNIS SCORE RECORDER
Dewey L. Cox, Rte. 1, Box 97-B, Mosheim, Tenn. 37818
Filed Dec. 7, 1987, Ser. No. 129,679
Term of patent 14 years
U.S. Cl. D10—46.1



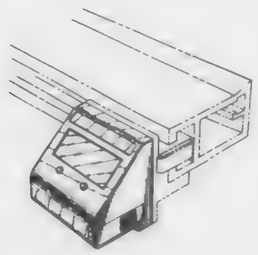
314,712
T-SQUARE WITH CENTERING RULER
Perry L. Kunz, 1416 Steele Ave., Modesto, Calif. 95351
Filed Jul. 25, 1988, Ser. No. 224,082
Term of patent 14 years
U.S. Cl. D10—62



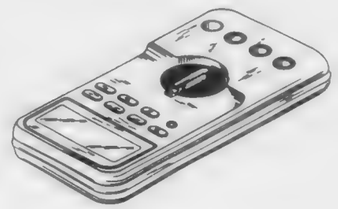
314,713
NAVIGATION DEVICE
Joan M. Ciranny, Laguna Niguel; Matthew F. Duncan, Westminster; Richard K. Jung, Laguna Niguel; Douglas M. Patton, Irvine, and Dennis C. Rich, Long Beach, all of Calif., assignors to Magellan Systems Corporation, Monrovia, Calif.
Filed Nov. 18, 1988, Ser. No. 273,326
Term of patent 14 years
U.S. Cl. D10—65



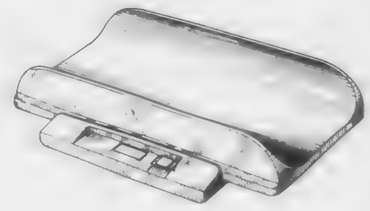
314,714
MEASUREMENT SYSTEM DISPLAY MODULE
Barry D. Wixey, and Raymond L. Wilson, both of Pittsburgh, Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.
Filed Aug. 19, 1988, Ser. No. 233,491
Term of patent 14 years
U.S. Cl. D10—74



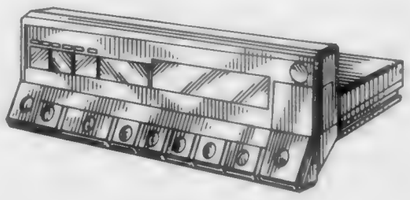
314,715
DIGITAL MULTIMETER
Michael D. Nelson, and Heiman Wong, both of Seattle, Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Nov. 13, 1987, Ser. No. 122,651
Term of patent 14 years
U.S. Cl. D10—78



314,716
INFANT SCALE
Rido Busse, Elchingen, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany
Filed Oct. 18, 1988, Ser. No. 259,579
Claims priority, application World Int. Prop. O., Apr. 26, 1988, DM/010830
Term of patent 14 years
U.S. Cl. D10—91

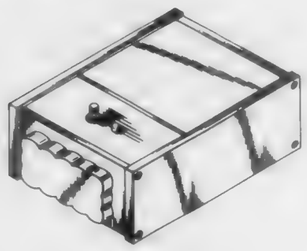


314,717
TAXI METER
Lars-Göran Rosenblad, Huskvarna, Sweden, assignor to Garphyttan Haldex AB, Landskrona, Sweden
Filed Nov. 6, 1987, Ser. No. 117,661
Claims priority, application Sweden, May 7, 1987, 87-1039
Term of patent 14 years
U.S. Cl. D10—97



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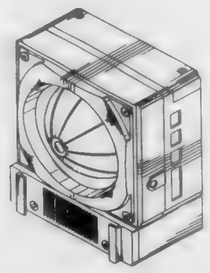
314,718
PORTABLE SIGNALLING TRANSMITTER FOR DISABLED PERSONS
Bill McWilliams, 9155 Highway 101 North #16, Redwood Valley, Calif. 95470
Filed Jul. 8, 1988, Ser. No. 241,560
Term of patent 14 years
U.S. Cl. D10—106



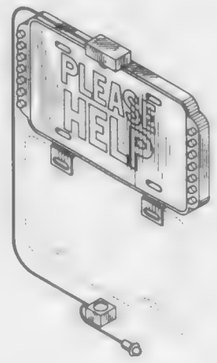
314,719
HEAT AND SMOKE DETECTOR
John Gardner, Fountain Valley, Calif., assignor to Figgie International, Inc., Willoughby, Ohio
Filed Nov. 21, 1988, Ser. No. 274,429
Term of patent 14 years
U.S. Cl. D10—106



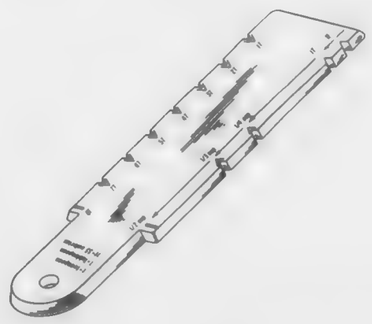
314,720
BURGLER ALARM FOR AN AUTOMOBILE
Michael Chen, Taipei, Taiwan, assignor to Equus, Inc., Taiwan
Filed Feb. 3, 1989, Ser. No. 305,975
Term of patent 14 years
U.S. Cl. D10—106



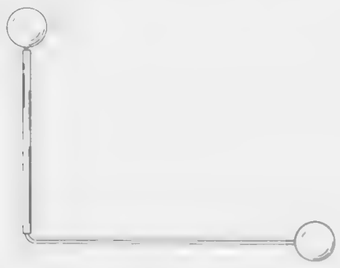
314,721
FLASHING DISTRESS SIGNAL FOR VEHICLES WITH PUSH BUTTON ACTIVATOR AND STATUS INDICATOR LIGHT
Toxie P. Williams, Jr., and Jill Williams, both of Rte. 3, Box 168-1, Seminary, Miss. 39479
Filed May 18, 1988, Ser. No. 195,529
Term of patent 14 years
U.S. Cl. D10—114



314,722
MEASURING STICK
Francine G. Silver, 3413 Lacewood Rd., Tampa, Fla. 33618
Filed Jul. 11, 1988, Ser. No. 217,283
Term of patent 14 years
U.S. Cl. D10—46.2



314,723
DIVINING RODS
Thomas R. Emick, 10333 Tigrina Ave., Whittier, Calif. 90603
Filed Sep. 8, 1988, Ser. No. 241,565
Term of patent 14 years
U.S. Cl. D10—46



314,724
BRACELET
Daniel Lauper, Giviziez, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Feb. 4, 1988, Ser. No. 152,052
Claims priority, application France, Aug. 7, 1987, 874706
Term of patent 14 years
U.S. Cl. D11—12



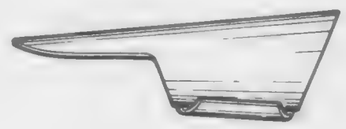
314,725
BRACELET
Daniel Lauper, Giviziez, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Feb. 4, 1988, Ser. No. 152,054
Claims priority, application France, Aug. 7, 1987, 874706
Term of patent 14 years
U.S. Cl. D11—12



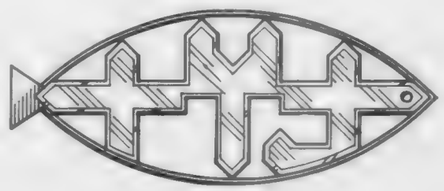
314,726
BRACELET
Daniel Lauper, Giviziez, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Feb. 4, 1988, Ser. No. 152,055
Claims priority, application France, Aug. 7, 1987, 874706
Term of patent 14 years
U.S. Cl. D11—12



314,727
FINGERTIP JEWELRY
Mary S. Samaras, 157 Thereas Way, Chula Vista, Calif. 92011
Filed Oct. 28, 1988, Ser. No. 264,174
Term of patent 14 years
U.S. Cl. D11—27



314,728
JEWELRY PIN
Diane A. Wick, 45 Leland Hill Rd., Sutton, Mass. 01527
Filed Oct. 7, 1988, Ser. No. 254,787
Term of patent 14 years
U.S. Cl. D11—50

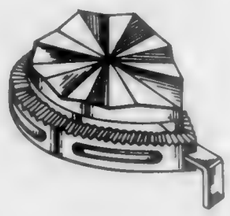


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314,729
JEWELRY FINDING
Lavonne Geary, 1558 Croton Dr. SW., Ft. Myers, Fla. 33908
Filed Nov. 21, 1988, Ser. No. 274,134
Term of patent 14 years
U.S. Cl. D11—82



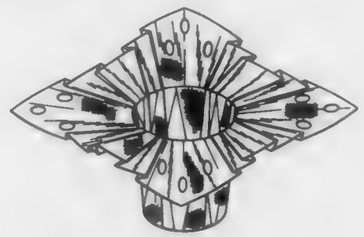
314,730
JEWELRY LINK
Meang Chia, and Cheo Chia, both of 412 W. 6th St., Los Angeles, Calif. 90014
Filed Nov. 15, 1989, Ser. No. 436,668
Term of patent 14 years
U.S. Cl. D11—93



314,731
FLOWER CADDY
Diane L. Ryason, 2049 Paseo Dorado, La Jolla, Calif. 92037, and Jolene V. Telles, 4341 N. Van Ness, Fresno, Calif. 93704
Filed Apr. 4, 1988, Ser. No. 177,006
Term of patent 14 years
U.S. Cl. D11—148



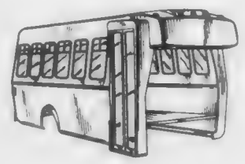
314,732
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 262,663, Oct. 25, 1988, which is a continuation-in-part of Ser. No. 108,315, Oct. 13, 1987, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application May 25, 1989, Ser. No. 356,858
Term of patent 14 years
U.S. Cl. D11—164



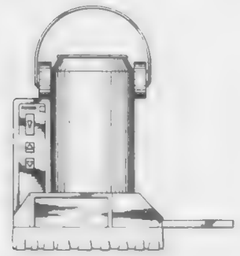




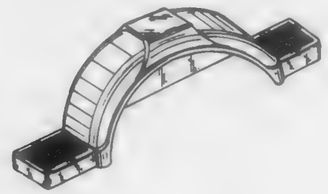
314,733
VEHICLE BODY
Brent A. Richter, Jr., and Bobbie L. Robbins, both of Hutchinson, Kans., assignors to Collins Bus Corporation, Hutchinson, Kans.
Filed Dec. 26, 1989, Ser. No. 456,275
Term of patent 14 years
U.S. Cl. D12—84



314,734
TRAILER BODY
Robert G. Sapp, Cave Spring, Ga., assignor to Creative Promotional Products, Inc., Atlanta, Ga.
Filed Nov. 4, 1988, Ser. No. 267,517
Term of patent 14 years
U.S. Cl. D12—102



314,735
BOAT TRAILER FENDER
Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445
Filed Jul. 11, 1988, Ser. No. 217,279
Term of patent 14 years
U.S. Cl. D12—106



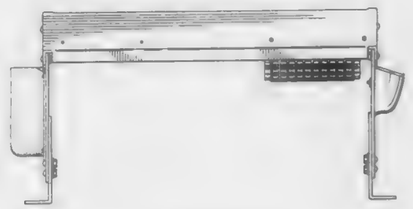
314,736
BICYCLE PUMP AND BOTTLE BRACKET
Guy L. Ring, 125 Pacific St., No. 14, Santa Monica, Calif. 90405, and Adrianne R. Fincham, 1045 Ocean Ave., No. 15, Santa Monica, Calif. 90403
Filed Apr. 7, 1989, Ser. No. 334,995
Term of patent 14 years
U.S. Cl. D12—114



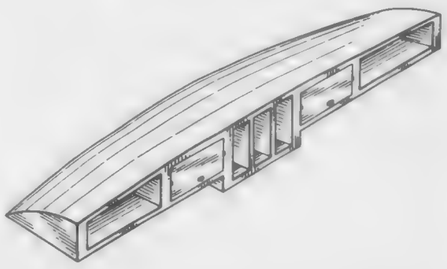
314,737
TIRE
Darrell E. Covert, Uniontown, and Paul B. Maxwell, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 14, 1988, Ser. No. 271,146
Term of patent 14 years
U.S. Cl. D12—147



314,738
EQUIPMENT MOUNTING RACK FOR USE IN AUTOMOTIVE VEHICLES
Tony W. Stiles, P.O. Box 436, Golden City, Mo. 64748
Filed May 11, 1988, Ser. No. 192,506
Term of patent 14 years
U.S. Cl. D12—155



314,739
STORAGE UNIT FOR A VAN OR THE LIKE
Claudio Mallone, c/o Integra Industries, 213 Church St., Weston, Ontario, Canada (M9N 1N9), assignor to Claudio Mallone, Woodbridge, Canada
Filed Oct. 19, 1988, Ser. No. 260,323
Term of patent 14 years
U.S. Cl. D12—155

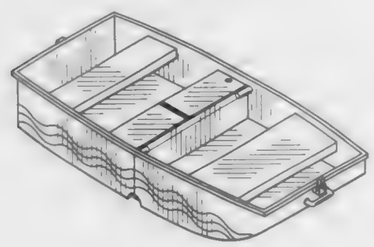


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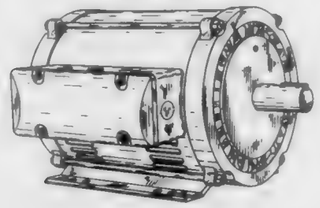
314,740
FAIRING FOR MOTORCYCLES
Karl-Heinz Abe, Steinebach, and Klaus V. Gevert, München, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Feb. 28, 1989, Ser. No. 316,685
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, M 8801346.4
Term of patent 14 years
U.S. Cl. D12—182



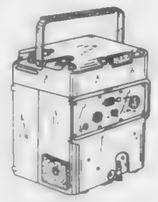
314,741
FOLDABLE BOAT
Gary G. Loper, Star Rt., Box, Millry, Ala. 03655
Filed May 18, 1988, Ser. No. 195,188
Term of patent 14 years
U.S. Cl. D12—300



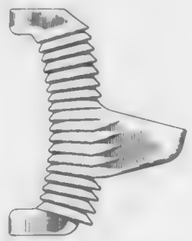
314,742
DYNAMOELECTRIC MACHINE
Robert L. Sieber, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Filed Feb. 27, 1987, Ser. No. 20,251
Term of patent 14 years
U.S. Cl. D13—114



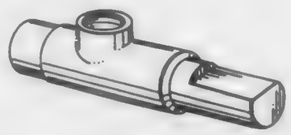
314,743
PORTABLE ENGINE GENERATOR
Akira Ishii, Sakaishi, Japan, assignor to Kubota Ltd., Osaka, Japan
Filed Oct. 20, 1988, Ser. No. 261,025
Claims priority, application Japan, Jul. 5, 1988, 63-26988
Term of patent 14 years
U.S. Cl. D13—116



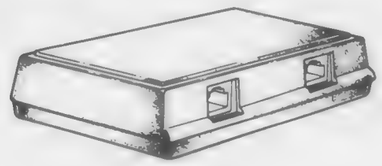
314,744
CUTOUT INSULATOR
Robert W. Harmon, Centralia, Mo., assignor to A. B. Chance, Centralia, Mo.
Division of Ser. No. 113,726, Oct. 27, 1987, Pat. No. Des. 310,062. This application Apr. 17, 1990, Ser. No. 510,406
Term of patent 14 years
U.S. Cl. D13—132



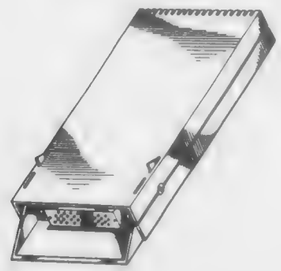
314,745
GROUND CLAMP ADAPTOR
Herbert C. Southoff, P.O. Box 791, Kaslo, B.C. V0G 1M0, Canada
Filed Feb. 22, 1988, Ser. No. 159,043
Term of patent 14 years
U.S. Cl. D13—133



314,746
DUAL CONNECTING BLOCK
James M. Benjamin, Indianapolis, Ind.; Chris G. Johnson; Kristin E. Olson, both of New York, N.Y., and William T. Spitz, Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 14, 1988, Ser. No. 169,182
The portion of the term of this patent subsequent to Nov. 13, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—133

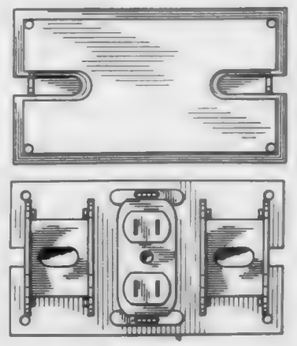


314,747
CONNECTOR FOR LINKING AN INTEGRATED SYSTEM DIGITAL NETWORK ADAPTOR TO A DATA TERMINAL OR THE LIKE
Bruno Centola, and Antoine Pantani, both of Vence, France, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 13, 1988, Ser. No. 243,880
Term of patent 14 years
U.S. Cl. D13—133



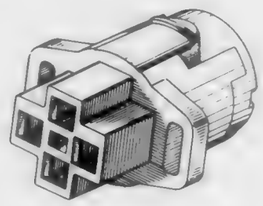
314,748
MULTIPLE FUNCTION ELECTRICAL OUTLET AND DISTRIBUTION BOX OR THE LIKE
Gary L. Littrell, 1403 Carlisle Dr., Inverness, Ill. 60010
Filed Sep. 6, 1988, Ser. No. 240,571
Term of patent 14 years
U.S. Cl. D13—137

314,749
COMBINED ELECTRICAL RECEPTACLE AND CORD REELS FOR ELECTRICAL EXTENSION PLUGS
W. Wayne Davidson, 612 Hwy. 1187 West, Crowley, Tex. 76036
Filed Aug. 17, 1987, Ser. No. 86,163
Term of patent 14 years
U.S. Cl. D13—140

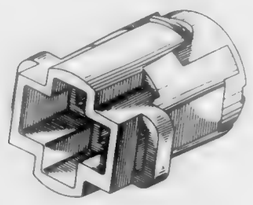


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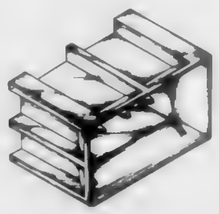
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MALE ELECTRICAL CONNECTOR
Joseph S. Wegrzyn, Stratford, and Robert M. Johnstone, Fairfield, both of Conn., assignors to Dual-Lite, Inc., Newtown, Conn.
Filed Dec. 7, 1988, Ser. No. 281,234
Term of patent 14 years
U.S. Cl. D13—146



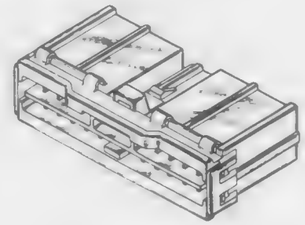
314,751
FEMALE ELECTRICAL CONNECTOR
Joseph S. Wegrzyn, Stratford, Conn., and Robert M. Johnstone, Fairfield, both of Conn., assignors to Dual-Lite, Inc., Newtown, Conn.
Filed Dec. 7, 1988, Ser. No. 281,235
Term of patent 14 years
U.S. Cl. D13—146



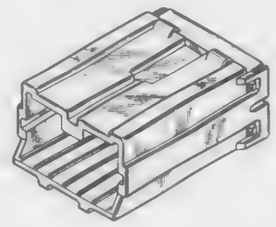
314,752
ELECTRICAL CONNECTOR WITH HOUSING
Toshiro Maejima; Seiji Kozono, and Masaru Fukuda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Mar. 15, 1988, Ser. No. 168,336
Claims priority, application Japan, Sep. 16, 1987, 62-37496; Sep. 16, 1987, 62-37497
Term of patent 14 years
U.S. Cl. D13—147



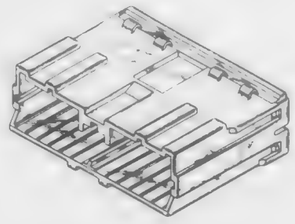
314,753
HOUSING FOR AN ELECTRICAL CONNECTOR
Takayoshi Endo, and Hitoshi Saitoh, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 255,169
Claims priority, application Japan, Apr. 8, 1988, 63-13923
Term of patent 14 years
U.S. Cl. D13—147



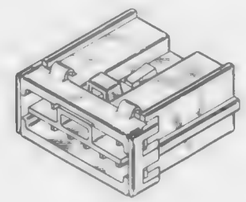
314,754
HOUSING FOR AN ELECTRICAL CONNECTOR
Takayoshi Endo, and Hitoshi Saitoh, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 255,173
Claims priority, application Japan, Apr. 8, 1988, 63-13921
Term of patent 14 years
U.S. Cl. D13—147



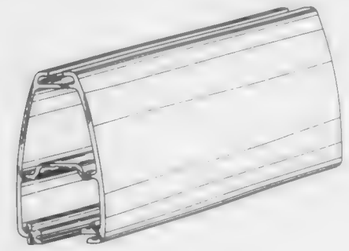
314,755
HOUSING FOR AN ELECTRICAL CONNECTOR
Takayoshi Endo, and Hitoshi Saitoh, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 255,174
Claims priority, application Japan, Apr. 8, 1988, 63-13924
Term of patent 14 years
U.S. Cl. D13—147



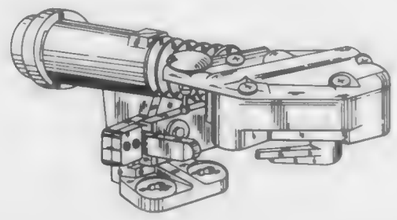
314,756
HOUSING FOR AN ELECTRICAL CONNECTOR
Takayoshi Endo, and Hitoshi Saitoh, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 255,175
Claims priority, application Japan, Apr. 8, 1988, 63-13922
Term of patent 14 years
U.S. Cl. D13—147



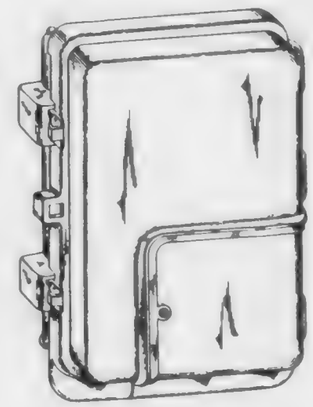
314,757
ELECTRIC POWER SUPPLY TRACK
Bruno Gecchelin, Milan, Italy, assignor to Iguzzini Illuminazione S.p.A., Recanati, Italy
Filed Mar. 7, 1988, Ser. No. 164,629
Claims priority, application Italy, Sep. 15, 1987, 22337B/87
Term of patent 14 years
U.S. Cl. D13—155

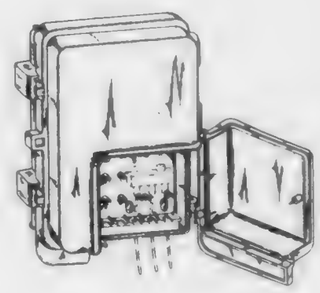


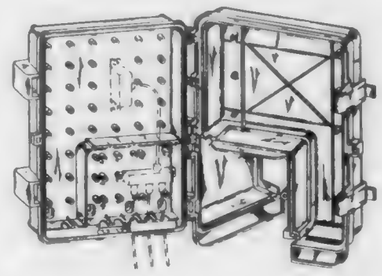
314,758
DESIGN FOR AN INTERRUPTER UNIT FOR A SWITCH ASSEMBLY
Edward J. Rogers, Chicago, and Leonard V. Chabala, Maywood, both of Ill., assignors to S&C Electric Company, Chicago, Ill.
Filed Nov. 18, 1988, Ser. No. 273,433
Term of patent 14 years
U.S. Cl. D13—158



314,759
ON-PREMISE ENCLOSURE FOR CABLE TELEVISION COMPONENTS OR THE LIKE
Thomas J. Collins, Wall, and Anthony L. Nieves, Bradley Beach, both of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.
Filed Nov. 28, 1988, Ser. No. 277,038
Term of patent 14 years
U.S. Cl. D13—184

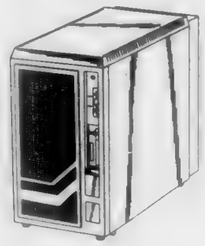




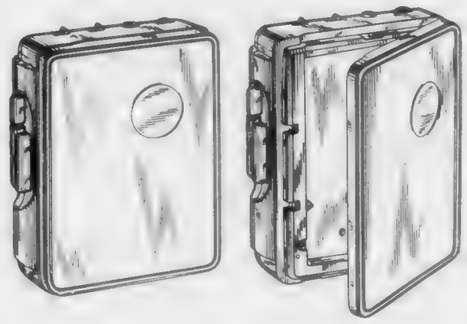


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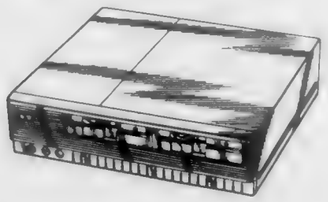
314,760
OPERATION CONTROLLER EQUIPPED WITH MAGNETIC DISK DRIVE AND MAGNETIC TAPE DRIVE FOR ELECTRONIC COMPUTER
Hideyuki Horie, Kamagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Nov. 17, 1989, Ser. No. 437,925
Claims priority, application Japan, May 19, 1989, 1-18070
Term of patent 14 years
U.S. Cl. D14—100



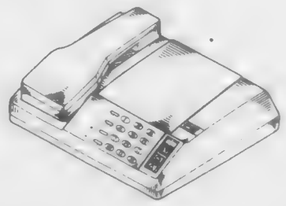
314,762
TAPE PLAYER
Masayoshi Tsuchiya, Tokyo, and Tohru Ichikawa, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 3, 1988, Ser. No. 252,443
Claims priority, application Japan, Apr. 1, 1988, 63-13419
Term of patent 14 years
U.S. Cl. D14—165



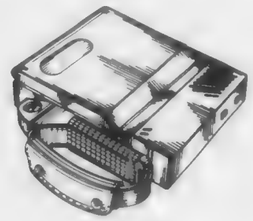
314,761
CENTRAL PROCESSING UNIT FOR A COMPUTER
Tetsuya Imamura, and Susumu Yamamoto, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 10, 1990, Ser. No. 463,630
Claims priority, application Japan, Jul. 31, 1989, 1-28315
Term of patent 14 years
U.S. Cl. D14—100



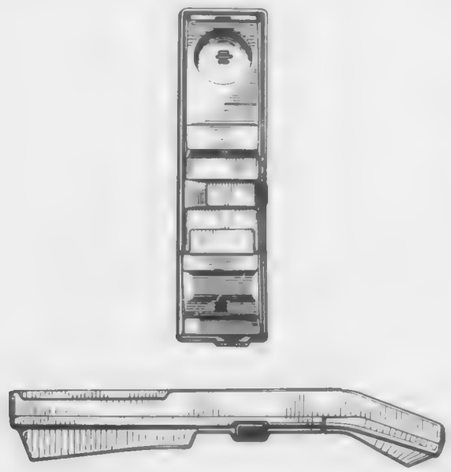
314,763
FACSIMILE
Rong S. Chang, 6th Fl., 30, Lane 81, Chungshan N. Road, Sec. 7, and Joey Chou, 10F-4, 1010, Ming Sheng E. Road, both of Taipei, Taiwan
Filed Nov. 7, 1988, Ser. No. 267,108
Term of patent 14 years
U.S. Cl. D14—118



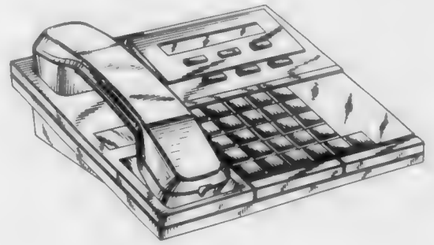
314,764
VOICE TRANSLATOR
Stephen A. Rondel, Redmond; William C. Quann, Renton; Kevin L. Falk, Mercer Island; Wallace A. Petola, Redmond, and James R. Smith, Kirkland, all of Wash., assignors to Advanced Products and Technologies, Inc., Redmond, Wash.
Filed Jan. 8, 1988, Ser. No. 141,885
Term of patent 14 years
U.S. Cl. D14—124



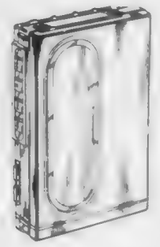
314,765
TELEPHONE HANDSET
Gunder W. Eriksson, Taby, and Kjell Nordenskjold, Lidingo, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Feb. 29, 1988, Ser. No. 162,361
Claims priority, application Sweden, Aug. 28, 1987, 87-1886
Term of patent 14 years
U.S. Cl. D14—248



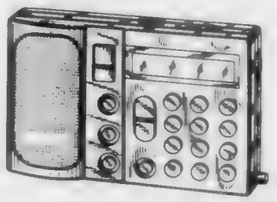
314,766
TELEPHONE SET
Michael C. Goatman, Tetbury Gloucestershire, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 905,991, Sep. 10, 1986, Pat. No. D. 302,815.
This application May 19, 1989, Ser. No. 355,245
Claims priority, application United Kingdom, Mar. 12, 1986, 1032775; Mar. 12, 1986, 1032776
Term of patent 14 years
U.S. Cl. D14—151



314,767
COMBINED TAPE PLAYER AND TUNER
Kazuharu Yamamoto, Yokohama, and Masahiko Kobayashi, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 7, 1988, Ser. No. 164,734
Claims priority, application Japan, Sep. 11, 1987, 62-36927
Term of patent 14 years
U.S. Cl. D14—163

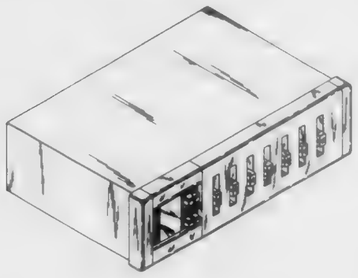


314,768
RADIO RECEIVER
Shuhei Taniguchi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed May 12, 1988, Ser. No. 193,359
Claims priority, application Japan, Nov. 12, 1987, 62-46356
Term of patent 14 years
U.S. Cl. D14—194



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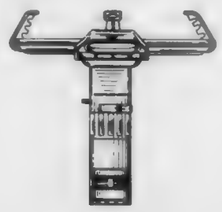
314,769
GRAPHIC EQUALIZER OR SIMILAR ARTICLE
John Stoddard, and Clive Grinyer, both of London, England, assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 5, 1988, Ser. No. 254,012
Term of patent 14 years
U.S. Cl. D14—217



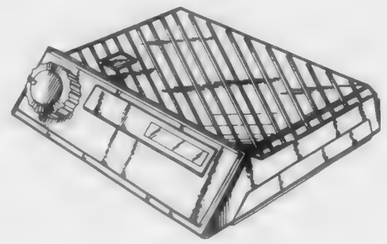
314,770
TELEPHONE BASE STATION
Gus E. Desbarats, Putney, England, assignor to British Telecommunications public limited company, England
Filed Dec. 19, 1988, Ser. No. 286,022
Claims priority, application United Kingdom, Jun. 22, 1988, 1051765
Term of patent 14 years
U.S. Cl. D14—240



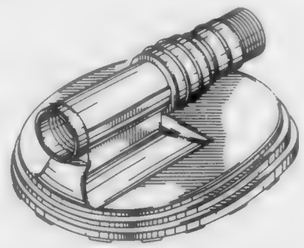
314,771
PIVOTABLE TELEPHONE STAND
Balthasar Kirchner, and Siegfried Schleicher, both of Eferding, Austria, assignors to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria
Filed Jul. 19, 1989, Ser. No. 382,807
Claims priority, application Austria, Jan. 20, 1989, 27.175; Jan. 20, 1989, 27.176
Term of patent 14 years
U.S. Cl. D14—251



314,772
CONTROL HEAD FOR A TWO-WAY MOBILE RADIO
Paul M. Pierce, Syracuse, N.Y., and Patrick J. K. Deighan, Northfield, Ohio, assignors to General Electric Company, Lynchburg, Va.
Filed Aug. 22, 1988, Ser. No. 234,833
Term of patent 14 years
U.S. Cl. D14—257



314,773
VACUUM WATER PUMP
George Tash, 5777 Balcom Canyon, Somis, Calif. 93021, and Warren Hartmann, 337 Emma Ave., Ventura, Calif. 93003
Filed Nov. 28, 1988, Ser. No. 276,993
Term of patent 14 years
U.S. Cl. D15—7



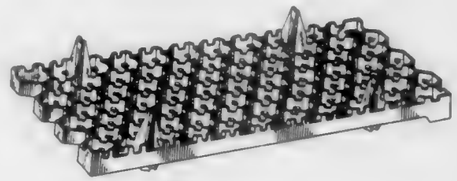
314,774
AQUARIUM PUMP
Heinz Turbanisch, Nuremberg, Fed. Rep. of Germany, assignor to Jet-Pumpen HT GmbH, Fed. Rep. of Germany
Filed Jun. 18, 1987, Ser. No. 63,904
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, MR VII 324
Term of patent 14 years
U.S. Cl. D15—8



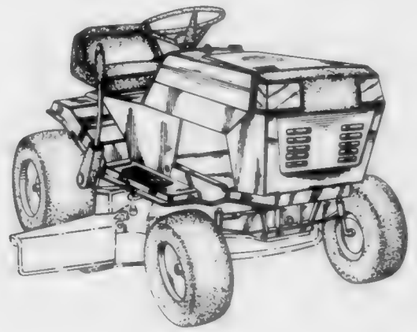
314,775
SNOW PLOW
Isao Yoshida; Tatsuya Okuhara, and Takahiro Hoshino, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 30, 1987, Ser. No. 115,031
Claims priority, application Japan, May 27, 1987, 62-21025
Term of patent 14 years
U.S. Cl. D15—11



314,776
EGG INCUBATING FLAT FOR LARGE EGGS
Matthew R. Foster, Cambridge, Canada, assignor to The Marmon Corporation, Chicago, Ill.
Filed Jan. 19, 1988, Ser. No. 145,192
Term of patent 14 years
U.S. Cl. D15—144.1



314,777
LAWN TRACTOR HOUSING
Joe Crabtree; Alex Gafford, both of Franklin, and Richard D. Williams, Brentwood, all of Tenn., assignors to The Murray Ohio Manufacturing Company, Brentwood, Tenn.
Filed Oct. 6, 1988, Ser. No. 254,041
Term of patent 14 years
U.S. Cl. D15—15



314,778
COVER PANELS FOR COMBINE SKID PLATE PANELS
Thermon D. Rabitsch, P.O. Box 349, Monticello, Ga. 31064
Division of Ser. No. 908,616, Sep. 18, 1986, Pat. No. D. 302,432.
This application Dec. 16, 1988, Ser. No. 285,238
Term of patent 14 years
U.S. Cl. D15—28



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314,779
PAIR OF SUNGLASSES OR THE LIKE
Robert H. Ramp, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed May 5, 1988, Ser. No. 190,444
Term of patent 14 years
U.S. Cl. D16—115



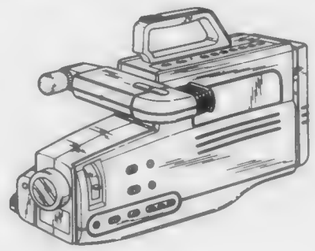
314,780
PAIR OF SUNGLASSES OR THE LIKE
Robert H. Ramp, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed May 5, 1988, Ser. No. 191,655
Term of patent 14 years
U.S. Cl. D16—115



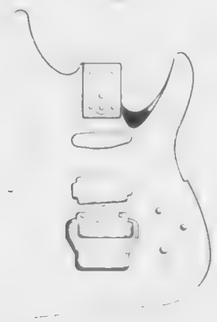
314,781
END PIECE FOR EYEGLASS TEMPLES
Helmut Wiedmann, Heilbronn, Fed. Rep. of Germany, and Wilhelm Anger, St. Moritz-Suvretta, Switzerland, assignors to Eyemetrics-Systems AG, Chur, Switzerland
Filed May 22, 1987, Ser. No. 52,963
Term of patent 14 years
U.S. Cl. D16—127



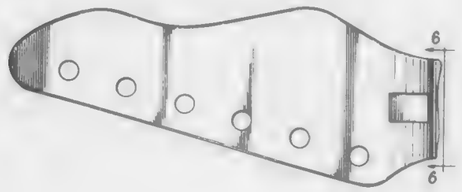
314,782
COMBINED VIDEO CAMERA AND VIDEO CASSETTE RECORDER
Sa Yun Hong, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 10, 1988, Ser. No. 204,781
Term of patent 14 years
U.S. Cl. D16—202



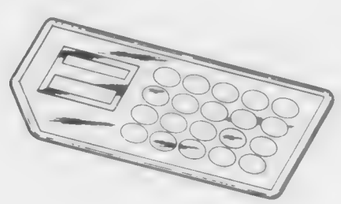
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GUITAR BODY
Adrian Vandenberg, El Enschede, Netherlands, and Michael V. Powers, Meridian, Miss., assignors to Peavey Electronics Corporation, Meridian, Miss.
Filed May 31, 1988, Ser. No. 200,200
Term of patent 14 years
U.S. Cl. D17—20



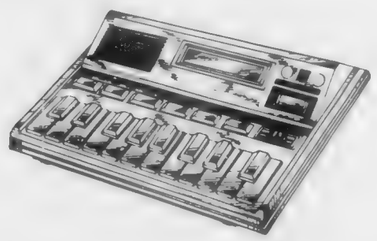
314,784
GUITAR PEGHEAD
Michael V. Powers, Meridian, Miss., assignor to Peavey Electronics Corporation, Meridian, Miss.
Filed Aug. 26, 1988, Ser. No. 236,771
Term of patent 14 years
U.S. Cl. D17—20



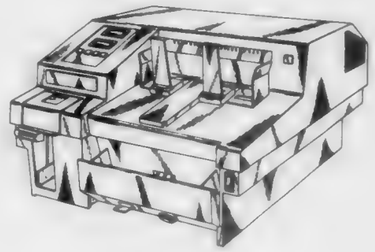
314,785
ELECTRONIC CALCULATOR
Hiroshi Sakaguchi, and Katsuhiro Iida, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 30, 1987, Ser. No. 44,452
Claims priority, application Japan, Nov. 5, 1986, 61-43757
Term of patent 14 years
U.S. Cl. D18—7



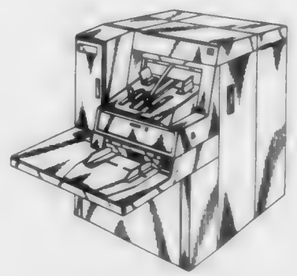
314,786
CALCULATOR
Chiu Y. Chen, Chung-Ho, Taiwan, assignor to Datel Electrocraft Corp., Taiwan, China
Filed Jan. 19, 1988, Ser. No. 145,488
Term of patent 14 years
U.S. Cl. D18—7



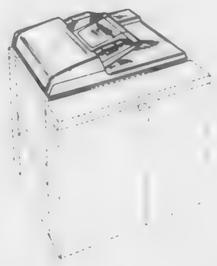
314,787
MICROFILM CAMERA
David R. Gotham, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 10, 1988, Ser. No. 166,846
Term of patent 14 years
U.S. Cl. D18—36



314,788
MICROFILM CAMERA
David R. Gotham, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 20, 1988, Ser. No. 196,638
Term of patent 14 years
U.S. Cl. D18—36

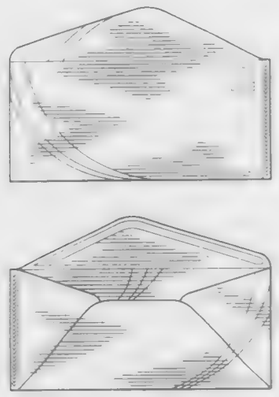


314,789
ORIGINAL SHEET FEEDING DEVICE FOR A COPYING MACHINE
Tomohiko Hirata, Kawasaki, and Yosuke Ohsawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 9, 1988, Ser. No. 230,122
Claims priority, application Japan, Feb. 12, 1988, 63-5423
Term of patent 14 years
U.S. Cl. D12—42

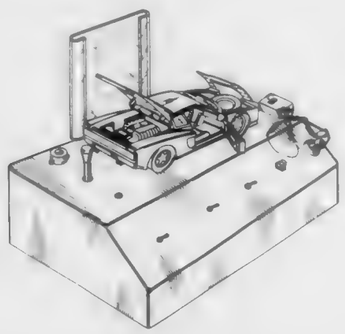


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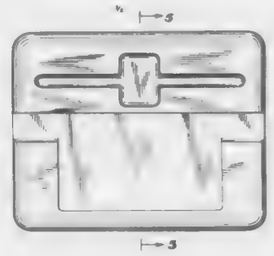
314,790
ENVELOPE
James W. Hager, 4817 Kiowa La., Virginia Beach, Va. 23462
Filed Mar. 27, 1989, Ser. No. 328,603
Term of patent 14 years
U.S. Cl. D19—3



314,791
SECURITY SYSTEM DEMONSTRATOR
Shih-Ming Hwang, 17811 Sky Park Circle, Suite D & E, Irvine, Calif. 92714
Filed Dec. 19, 1988, Ser. No. 286,490
Term of patent 14 years
U.S. Cl. D19—62



314,792
HOLDER FOR ASSORTED DESK ARTICLES
Peter V. Ilaria, East Hanover, and William Macowski, Caldwell, both of N.J., assignors to Tropar Manufacturing Co., Inc., Florham Park, N.J.
Filed Feb. 16, 1988, Ser. No. 155,741
Term of patent 14 years
U.S. Cl. D19—78



314,793
WRITING INSTRUMENT STAND
Arnold G. Lockwood, Saunderstown, and Jens von Edler, Cranson, both of R.I., assignors to A. T. Cross Company, Lincoln, R.I.
Filed Apr. 11, 1988, Ser. No. 180,027
Term of patent 14 years
U.S. Cl. D19—84



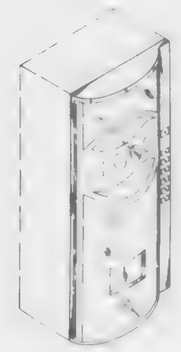
314,794
BASE FOR A COIN OPERATED BULK-VENDING MACHINE
Murray R. Kovens, Timonium, Md., assignor to A & A Company, Timonium, Md.
Filed Jun. 29, 1987, Ser. No. 67,203
Term of patent 14 years
U.S. Cl. D20—4



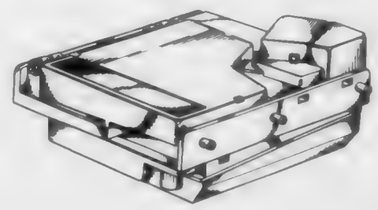
314,795
VENDING MACHINE FOR BEVERAGES
Robert McGarrah, Melville, N.Y., assignor to PepsiCo Inc., Purchase, N.Y.
Filed Jan. 16, 1987, Ser. No. 4,025
The portion of the term of this patent subsequent to Jun. 9, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D20—5



314,796
DOOR FOR A VENDING MACHINE FOR BEVERAGES
Robert McGarrah, Melville, N.Y., assignor to PepsiCo Inc., Purchase, N.Y.
Division of Ser. No. 4,025, Jan. 16, 1987, which is a continuation-in-part of Ser. No. 718,881, Apr. 2, 1985. This application Mar. 16, 1987, Ser. No. 25,862
The portion of the term of this patent subsequent to Jun. 9, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D20—5

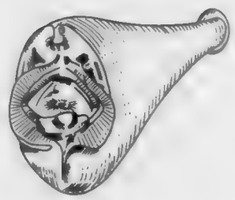


314,797
COIN SORTING MECHANISM
Jesus Echapare Ibarrola, Pamplona, Spain, assignor to Azkoyen Industrial S.A., Perralta, Spain
Filed Aug. 18, 1987, Ser. No. 86,666
Claims priority, application Spain, Feb. 19, 1987, 112362
Term of patent 14 years
U.S. Cl. D20—9

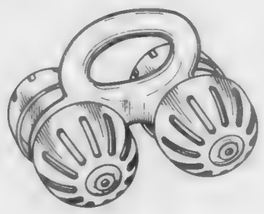


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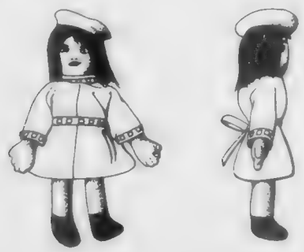
314,798
TAXIDERMY FISH BODY MANNIKIN
Daniel J. Rinehart, Milton, Wis., assignor to The American Institute of Taxidermy, Inc., Janesville, Wis.
Filed Nov. 7, 1988, Ser. No. 276,461
Term of patent 14 years
U.S. Cl. D20—30



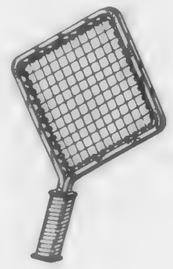
314,799
TOY BELL
Takehiko Takahashi; Yoshiyasu Ishii, and Taira Hanashima, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jul. 7, 1988, Ser. No. 215,954
Claims priority, application Japan, Jan. 22, 1988, 63-2147
Term of patent 14 years
U.S. Cl. D21—64



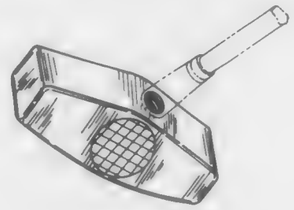
314,800
DOLL
Madeline Ziolkowski, 345 NW. 49th Ave., Plantation, Fla. 33317
Filed Oct. 19, 1988, Ser. No. 259,618
Term of patent 14 years
U.S. Cl. D21—171



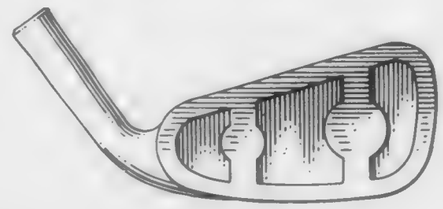
314,801
BALL RACKET
Richard A. McMahon, Mendota Heights, Minn., assignor to Rammer, Inc., West St. Paul, Minn.
Filed Jan. 14, 1988, Ser. No. 143,758
Term of patent 14 years
U.S. Cl. D21—212



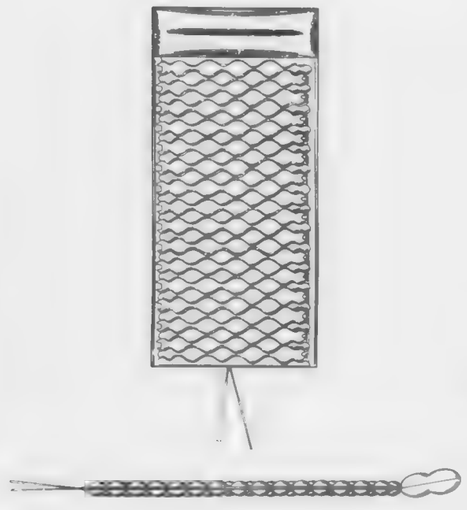
314,802
GOLF PUTTER HEAD OR SIMILAR ARTICLE
Richard F. Warner, 28999 Gates Mills Blvd., Pepper Pike, Ohio 44124
Filed Sep. 28, 1987, Ser. No. 101,993
Term of patent 14 years
U.S. Cl. D21—218



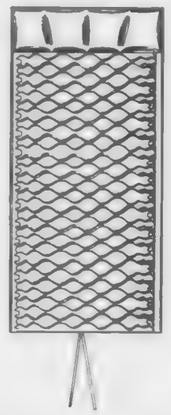
314,803
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed May 10, 1988, Ser. No. 192,122
Term of patent 14 years
U.S. Cl. D21—220



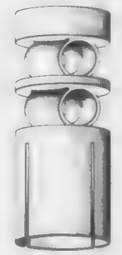
314,804
FLOAT OR THE LIKE
Fred A. Thomas, Clearwater, Fla., assignor to The Frenry Company, Inc., Clearwater, Fla.
Filed Mar. 10, 1989, Ser. No. 322,552
Term of patent 14 years
U.S. Cl. D21—237



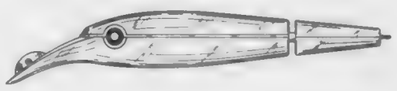
314,805
FLOAT OR THE LIKE
Fred A. Thomas, Clearwater, Fla., assignor to The Frenry Company, Inc., Clearwater, Fla.
Filed Mar. 10, 1989, Ser. No. 322,553
Term of patent 14 years
U.S. Cl. D21—237



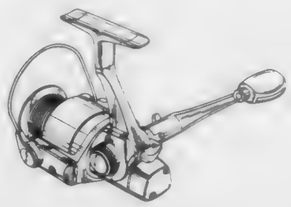
314,806
SHOTGUN CARTRIDGE WAD OR SIMILAR ARTICLE
William T. Cole, Cooperstown, N.Y., assignor to Remington Arms Company, Wilmington, Del.
Filed Sep. 8, 1986, Ser. No. 905,060
Term of patent 14 years
U.S. Cl. D22—116



314,807
FISHING LURE
Clyde S. Gudermuth, Jr., Fort Smith, Ark., assignor to EBSCO Industries, Inc., Leeds, Ala.
Filed Jul. 8, 1988, Ser. No. 222,104
Term of patent 14 years
U.S. Cl. D22—133

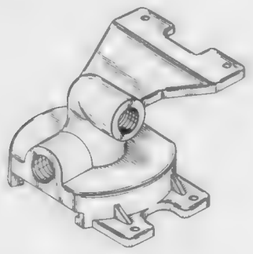


314,808
REEL FOR FISHING
Toshiaki Yoshikawa, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jul. 19, 1988, Ser. No. 221,182
Claims priority, application Japan, Jan. 20, 1988, 63-1798
Term of patent 14 years
U.S. Cl. D22—141

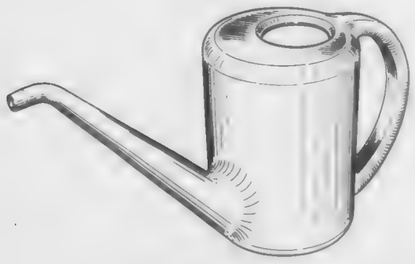


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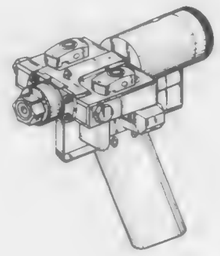
314,809
HEAD FOR A QUICK-CHANGE FILTER CARTRIDGE
Raymond M. Petrucci, Middlebury; Bruce G. Taylor, Kensington; Edward C. Giordano, Manchester, all of Conn.; James M. Padilla, Covina Heights, and Carl Palmer, La Habra Heights, both of Calif., assignors to Cuno, Incorporated, Meriden, Conn.
Division of Ser. No. 128,505, Dec. 3, 1987, Pat. No. Des. 306,755, which is a continuation-in-part of Ser. No. 822,549, Jan. 27, 1985, abandoned. This application Sep. 26, 1989, Ser. No. 412,873
Term of patent 14 years
U.S. Cl. D23—209



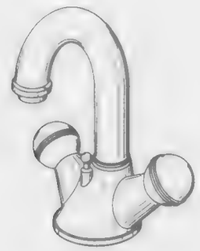
314,810
WATERING CAN
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation Proprietary Limited, Victoria, Australia
Filed Apr. 29, 1988, Ser. No. 188,282
Term of patent 14 years
U.S. Cl. D23—212

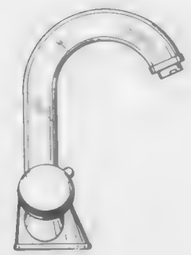


314,811
URETHANE FOAM DISPENSING GUN
Robert C. Gammons, Southington, and C. Marshall Davidson, Hamden, both of Conn., assignors to Olin Corporation, Cheshire, Conn.
Filed May 4, 1987, Ser. No. 46,056
Term of patent 14 years
U.S. Cl. D23—226

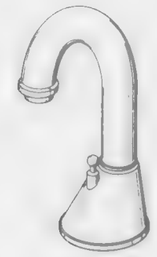


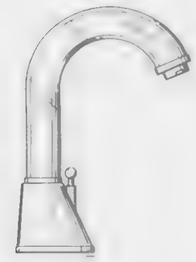
314,812
FAUCET
Franz W. Jans, Offenbach am Main, Fed. Rep. of Germany, assignor to Jado Bathroom and Hardware Manufacturing Corp., Camarillo, Calif.
Filed May 22, 1987, Ser. No. 52,959
Term of patent 14 years
U.S. Cl. D23—241



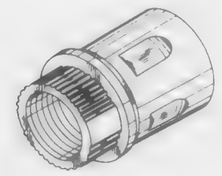


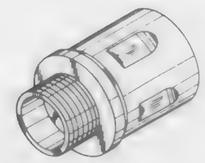
314,813
SPOUT
Franz W. Jans, Offenbach am Main, Fed. Rep. of Germany, assignor to Jado Bathroom and Hardware Manufacturing Corp., Camarillo, Calif.
Filed May 22, 1987, Ser. No. 52,958
Term of patent 14 years
U.S. Cl. D23—257



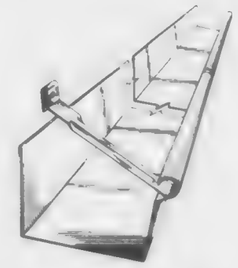


314,814
HOSE COUPLER
Peter H. Lubeck, Grand Rapids, Mich., assignor to Root Lowell Manufacturing Co., Lowell, Mich.
Filed Nov. 12, 1986, Ser. No. 929,660
Term of patent 14 years
U.S. Cl. D23—262



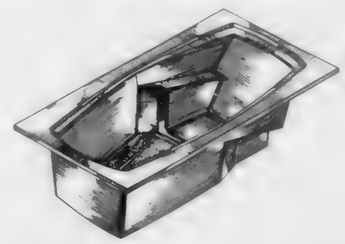


314,815
GUTTER SECTION WITH COMBINED GUTTER AND SUPPORT
Arne Paulsson, Järnforsen, Sweden, assignor to AB Siba-Verken, Sweden
Filed Nov. 13, 1987, Ser. No. 120,007
Claims priority, application Sweden, May 13, 1987, 871072
Term of patent 14 years
U.S. Cl. D23—267



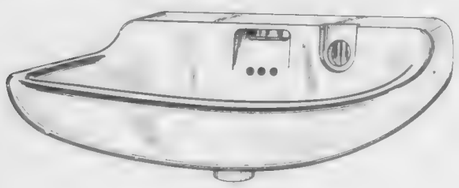
314,816
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Aichi, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Oct. 10, 1985, Ser. No. 786,111
Claims priority, application Japan, Apr. 19, 1985, 60-16256
Term of patent 14 years
U.S. Cl. D23—338

314,817
BATHTUB
Scott G. Lenahan, 20140 Delight St., Canyon Country, Calif. 91351
Filed Feb. 12, 1987, Ser. No. 13,715
Term of patent 14 years
U.S. Cl. D23—281

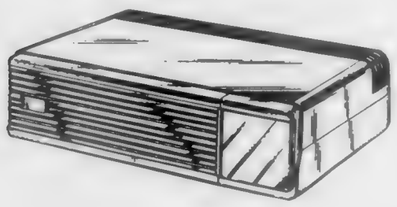


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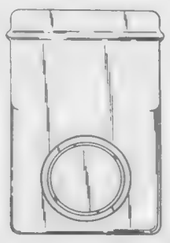
314,818
LAVATORY OR SIMILAR ARTICLE
Axel Enthoven, Wijnegem, Belgium, assignor to American Standard Inc., New York, N.Y.
Filed Sep. 16, 1987, Ser. No. 97,470
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 20MR2128
Term of patent 14 years
U.S. Cl. D23—291



314,819
ENCLOSURE FOR AN ELECTRONIC AIR CLEANER
Gary D. Thompson, East Syracuse; Matthew P. Placito, Baldwinsville, and Walter W. Hoyle, Fayetteville, all of N.N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Feb. 13, 1989, Ser. No. 309,628
Term of patent 14 years
U.S. Cl. D23—364



314,820
AIR DUCT BOOT
John F. Sullivan, 12513 Greenlea Chase West, Oklahoma City, Okla. 73170
Filed May 22, 1987, Ser. No. 52,952
Term of patent 14 years
U.S. Cl. D23—393



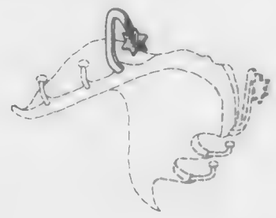
314,821
DENTAL PIN
Alan Miller, New City, N.Y., assignor to Coltene/Whaledent Inc., New York, N.Y.
Filed Dec. 27, 1988, Ser. No. 290,770
Term of patent 14 years
U.S. Cl. D24—10



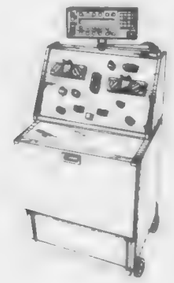
314,822
DENTAL PIN
Alan Miller, New City, N.Y., assignor to Coltene/Whaledent Inc., New York, N.Y.
Filed Apr. 13, 1989, Ser. No. 337,455
Term of patent 14 years
U.S. Cl. D24—10



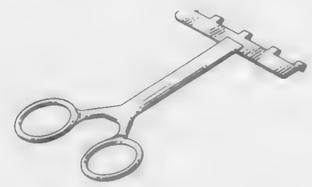
314,823
WIREFORM FOR AN ORTHODONTIC APPLIANCE OR SIMILAR ARTICLE
Ellen M. Moran, 4146 Hyde Park Ct. #H, Indianapolis, Ind. 46240, and James M. Moran, Indianapolis, Ind., assignors to Ellen Moran, Laboratory, Ind.
Filed Oct. 27, 1988, Ser. No. 263,602
Term of patent 14 years
U.S. Cl. D24—16



314,824
BLOOD CENTRIFUGE OR THE LIKE
Charles G. Moon, Castle Rock, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.
Filed Jun. 9, 1987, Ser. No. 59,868
Term of patent 14 years
U.S. Cl. D24—22



314,825
SKIN RETRACTOR
Randall J. Torre, 842 S. Clover, San Jose, Calif. 95128
Filed Mar. 31, 1989, Ser. No. 332,093
Term of patent 14 years
U.S. Cl. D24—27



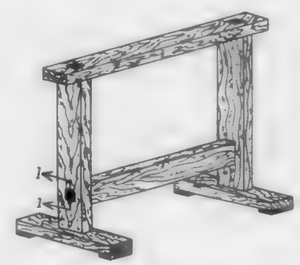
314,826
SHORT BONE RETRACTOR
Randall J. Torre, 842 S. Clover Ave., San Jose, Calif. 95128
Filed Apr. 27, 1989, Ser. No. 345,533
Term of patent 14 years
U.S. Cl. D24—27



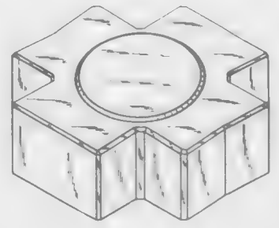
314,827
CONDOM
Ronald D. Hendren, Bloomington, Minn., assignor to Universal Technologies, Inc., Minnetonka, Minn.
Filed Jul. 27, 1988, Ser. No. 224,783
Term of patent 14 years
U.S. Cl. D24—99



314,828
SAWBUCK
Brent M. Lanier, 5747 Hagan Stone Pk. Rd., Pleasant Gardens, N.C. 27313
Filed Jan. 28, 1988, Ser. No. 149,679
Term of patent 14 years
U.S. Cl. D25—67



314,829
INTERLOCKING PAVING STONE
Jean-Jacques Brock, Chemin des Thiers 31, B - 4040 Tilff, Belgium
Filed Aug. 19, 1988, Ser. No. 234,848
Claims priority, application Benelux, Feb. 23, 1988, 62994-01
Term of patent 14 years
U.S. Cl. D25—113

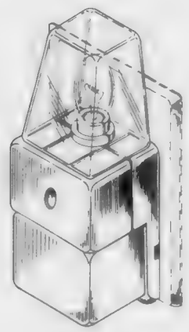


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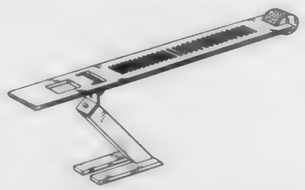
314,830
ROOFING TILE OR SIMILAR ARTICLE
Gordon W. J. Taylor, 102 Birch Avenue, Judea, Tauranga, New Zealand
Filed Oct. 10, 1989, Ser. No. 418,504
Claims priority, application New Zealand, May 24, 1989, 22613
Term of patent 14 years
U.S. Cl. D25—138



314,831
COMBINATION NIGHTLIGHT AND ELECTRICAL OUTLET COVER
Karen H. Heverly, and Larry R. Heverly, both of 894 Village Cir., Blue Bell, Pa. 19422
Filed Apr. 27, 1987, Ser. No. 42,963
Term of patent 14 years
U.S. Cl. D6—26



314,832
TABLE LAMP
Mario Botta, Lugano, Switzerland, assignor to Artemide S.p.A., Milan, Italy
Filed Jan. 20, 1987, Ser. No. 5,524
Claims priority, application Italy, Jul. 23, 1986, 22609/86[U]
Term of patent 14 years
U.S. Cl. D26—63



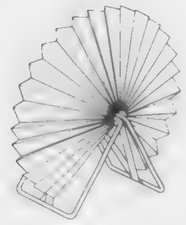
314,833
OUTDOOR LIGHTING FIXTURE
Robert W. Beachy, Saint Paul; Steven T. O'Brien, Champlin; Jay J. Kakuk, Plymouth, and Anthony N. Pink, Shakopee, all of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Jul. 21, 1989, Ser. No. 383,968
Term of patent 14 years
U.S. Cl. D26—68



314,834
HANGING LANTERN
Mark W. Rottner, Atlanta, Ga., assignor to Georgian Art Lighting Designs, Inc., Lawrenceville, Ga.
Filed Dec. 30, 1988, Ser. No. 292,513
Term of patent 14 years
U.S. Cl. D26—87



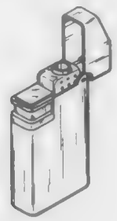
314,835
COLLAPSIBLE MULTI-FUNCTION LAMP
Daniel T. Ebihara, 91 Grand St., New York, N.Y. 10013
Filed Jan. 13, 1988, Ser. No. 143,603
Term of patent 14 years
U.S. Cl. D26—93



314,836
LAMP
Robert A. Sonneman, New York, N.Y., assignor to Sonneman Design Group Inc., Long Island City, N.Y.
Filed Apr. 26, 1989, Ser. No. 344,023
Term of patent 14 years
U.S. Cl. D26—108



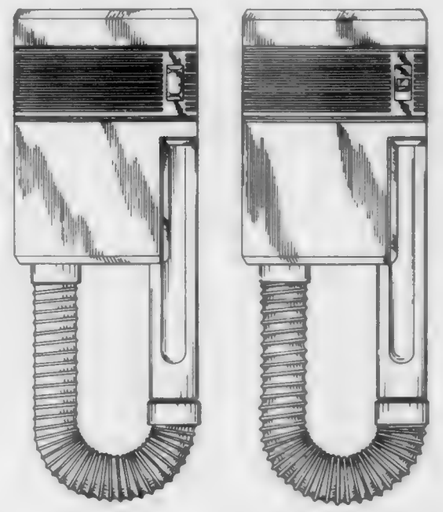
314,837
CIGARETTE LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Mar. 31, 1989, Ser. No. 331,143
Claims priority, application Japan, Oct. 14, 1988, 63-39988
Term of patent 14 years
U.S. Cl. D27—154



314,838
CIGARETTE PACKAGE SUPPORT ELEMENT
Benjamin Suson, and Susie Suson, both of 3355 S. Arville St., Apt. #78, Las Vegas, Nev. 89102
Filed Aug. 8, 1990, Ser. No. 564,296
Term of patent 14 years
U.S. Cl. D27—175

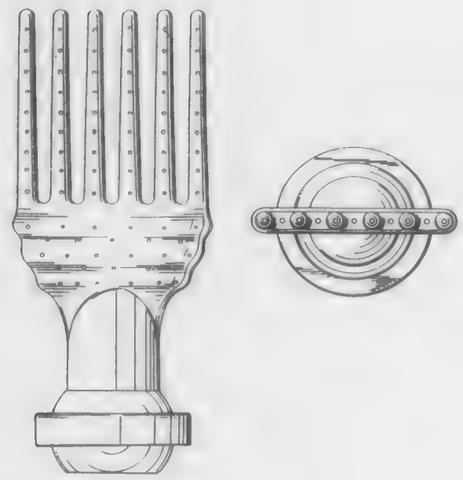


314,839
WALL MOUNT HAIR DRYER
Elizabeth Ho, Kowloon, Hong Kong, assignor to Windmere Corporation, Fla.
Filed Oct. 12, 1988, Ser. No. 257,031
Claims priority, application United Kingdom, May 11, 1988, 1050673
Term of patent 14 years
U.S. Cl. D28—12

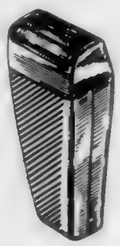


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314,840
HEATED HAIR COMB
Sonja Graley, 13506 Beanington Ave., Cleveland, Ohio 44135
Filed Jun. 23, 1988, Ser. No. 210,616
Term of patent 14 years
U.S. Cl. D28—25



314,841
SHAVER
David R. Locke, Bridgeport, Conn., and Elaine C. Barber, Princeton, N.J., assignors to Remington Products, Inc., Bridgeport, Conn.
Filed Aug. 16, 1988, Ser. No. 232,919
Term of patent 14 years
U.S. Cl. D28—49



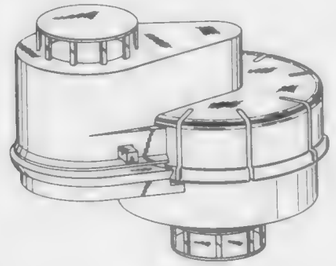
314,842
POWDER COMPACT
Beverly J. Fleming, Kernersville, N.C., assignor to MBJ Products, Inc., Flower Mound, Tex.
Filed Mar. 6, 1989, Ser. No. 319,470
Term of patent 14 years
U.S. Cl. D28—79



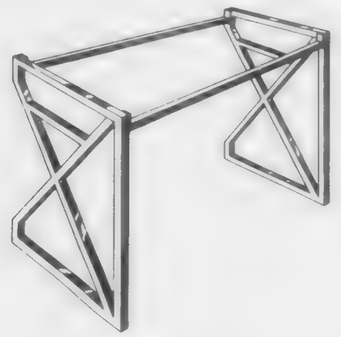
314,843
PERFUME ATOMIZER
Norma Kamali, New York, N.Y., assignor to Norma Kamali, Inc., New York, N.Y.
Filed Jan. 25, 1989, Ser. No. 301,745
Term of patent 14 years
U.S. Cl. D28—91.1



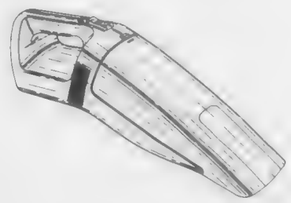
314,844
RESPIRATOR'S BLOWER-FILTER UNIT
Ram Baharad, Kfar Azar, Israel, assignor to Shalon Chemical Industries Ltd., Tel Aviv, Israel
Filed Jul. 13, 1988, Ser. No. 218,618
Claims priority, application Israel, Feb. 8, 1988, 13442
Term of patent 14 years
U.S. Cl. D29—7



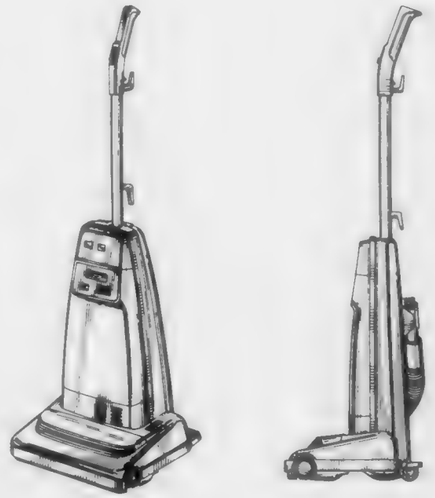
314,845
FRAME FOR CAR WASH EQUIPMENT OR THE LIKE
Silas Seamster, Jr., Rte. 1, Box 1641, Ringgold, Va. 24586
Filed Oct. 30, 1986, Ser. No. 925,404
Term of patent 14 years
U.S. Cl. D32—4



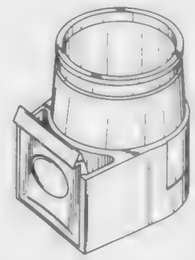
314,846
HAND-HELD PORTABLE VACUUM CLEANER
Bryan P. deBlois, West Haven, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Jul. 8, 1988, Ser. No. 216,854
Term of patent 14 years
U.S. Cl. D32—18



314,847
ELECTRIC VACUUM CLEANER
Takashi Shouji, Osaka, and Toru Abe, Hyogo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 23, 1990, Ser. No. 527,789
Claims priority, application Japan, Mar. 15, 1990, 2-8795
Term of patent 14 years
U.S. Cl. D32—22

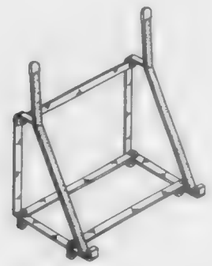


314,848
VACUUM CLEANER HOSE CONNECTOR
Kazimir Földes, Holmvägen, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Jul. 25, 1988, Ser. No. 223,778
Claims priority, application Sweden, Feb. 9, 1988, 88-0292
Term of patent 14 years
U.S. Cl. D32—31

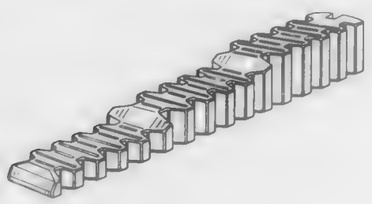


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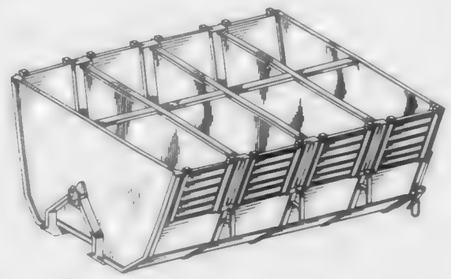
314,849
STORAGE CART
Richard S. Dunchock, South Laguna, Calif., assignor to Troy Marketing Corporation, Troy, Mich.
Continuation-in-part of Ser. No. 929,675, Nov. 12, 1986, abandoned, and a continuation-in-part of Ser. No. 58,254, Jun. 4, 1987, abandoned, and a continuation-in-part of Ser. No. 220,992, Jul. 13, 1988, Pat. No. 4,867,465. This application Nov. 7, 1988, Ser. No. 267,789
The portion of the term of this patent subsequent to Dec. 6, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—17



314,850
RECREATIONAL VEHICLE LEVELING RAMP
Christopher H. Arnold, 7500 E. Easy St., Simi Valley, Calif. 93065
Filed Aug. 7, 1987, Ser. No. 83,419
Term of patent 14 years
U.S. Cl. D34—32



314,851
RECYCLE CONTAINER
Dale W. Heikkinen, Prentice, Wis., assignor to Multitek, Inc., Prentice, Wis.
Filed Jan. 9, 1989, Ser. No. 294,597
Term of patent 14 years
U.S. Cl. D34—46



314,852
MAILBOX SIGNAL
Philip F. Taylor, 881 Walnut Dr., Dundee, Ill. 60118
Filed Sep. 19, 1988, Ser. No. 245,552
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1991

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

ABB Atom AB: *See—*
Nylund, Olov, 4,994,234, Cl. 376-445.000.
ABB Power T & D Company Inc.: *See—*
Bouhenguel, Redjem, 4,994,934, Cl. 361-71.000.
Grimes, Frank H.; and Hammack, Eugenius S., 4,993,140, Cl. 29-606.000.
Grimes, Frank H.; and Hammack, Eugenius S., 4,993,141, Cl. 29-606.000.
Abbott Laboratories: *See—*
Bieniarz, Christopher; Welch, Christopher J.; and Barnes, Grady, 4,994,385, Cl. 435-177.000
Chu, Daniel T., 4,994,599, Cl. 560-43.000.
Kempf, Dale J.; Rosenberg, Saul H.; Plattner, Jacob J.; Shan, Hing L.; and De, Biswanath, 4,994,477, Cl. 514-359.000.
Osip, Thomas W.; Montgomery, Jerold W.; and Pezzoli, Paul A., 4,993,569, Cl. 215-226.000.
Schoenleber, Robert W.; Kebabian, John W.; DeNinno, Michael P.; Michaelides, Michael R.; and Thomas, Sheela A., 4,994,486, Cl. 514-456.000.
Abe, Atsushi: *See—*
Kuwata, Jun; and Abe, Atsushi, 4,995,043, Cl. 372-7.000.
Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Card dispensing apparatus for card vending machine. 4,993,587, Cl. 221-21.000.
Abe, Kazuya; Shinozaki, Toshiya; and Akinaga, Masaru, to Fujikura Ltd. Composite overhead cable structure having high seal properties and a process for producing the same. 4,993,805, Cl. 350-96.230.
Abe, Kuniomi; and Kasahara, Tatsuya, to Konan Camera Research Institute Inc. Device for photographing eye movement. 4,993,825, Cl. 351-210.000.
Abe, Masaharu: *See—*
Oizumi, Masayuki; Uekira, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,994,133, Cl. 156-270.000.
Abe, Masahiro: *See—*
Fukuda, Shuzo; Abe, Masahiro; Fukunaka, Shiro; Nakayama, Michio; Arima, Koichiro; Sugiyama, Shunichi; and Matsui, Koji, 4,993,939, Cl. 431-351.000.
Abe, Mitsutoshi: *See—*
Kikuchi, Toshiyuki; Fujii, Maski; Abe, Mitsutoshi; and Matsuno, Yuji, 4,993,283, Cl. 74-858.000.
Abe, Ryoji: *See—*
Hashiyama, Kouichi; Okita, Junichi; Hatamura, Kouichi; Abe, Ryoji; and Iwata, Noriyuki, 4,993,370, Cl. 123-90.170.
Abe, Yoshiyuki: *See—*
Kamimoto, Masayuki; Abe, Yoshiyuki; Takahashi, Yoshio; Sakamoto, Ryuji; Tanaka, Kotaro; Negishi, Akira; Yamauchi, Hidetoshi; Tsukada, Kiyotaka; and Ohashi, Yoshimi, 4,993,481, Cl. 165-10.000.
Aberdeen Manufacturing Corporation: *See—*
Bouthillier, Robert, 4,993,338, Cl. 112-315.000.
Aboczky, Robert I. Instrument for orienting, inserting and impacting an acetabular cup prosthesis. 4,994,064, Cl. 606-91.000.
Abraham, Tonson; and Corneli, Gary R., to B. F. Goodrich Company, The. High temperature, oil-resistant elastomers from hydrogenated copolymers of 1,3-dienes containing fluorine. 4,994,527, Cl. 525-326.200.
Abraham, Tonson; Starmer, Philip H.; and Jorgensen, August H., to BFGoodrich Company, The. Composition of and a method for preparing high-temperature oil-resistant elastomers from hydrogenated butadiene-acrylate copolymers. 4,994,528, Cl. 525-338.000.
Abretske, Anthony I.: *See—*
Abretske, Edward V.; Abretske, Joseph M.; and Abretske, Anthony I., 4,993,610, Cl. 224-42.004.
Abretske, Edward V.; Abretske, Joseph M.; and Abretske, Anthony I., to Canyon City 4×4. Protective box bumper and associated movable frame, on vehicle. 4,993,610, Cl. 224-42.004.
Abretske, Joseph M.: *See—*
Abretske, Edward V.; Abretske, Joseph M.; and Abretske, Anthony I., 4,993,610, Cl. 224-42.004.
Absenger, Erich, to Motorenfabrik Hatz GmbH & Co. KG. Internal combustion engine having a sound-damping casing. 4,993,381, Cl. 123-198.00E.
ACC Automation, Inc.: *See—*
Stevanovich, Srbo M., 4,993,935, Cl. 425-270.000.
AccuSpray, Inc.: *See—*
Hufgard, John W., 4,993,642, Cl. 239-300.000.
Achterholt, Rainer. Automatic hand weapon. 4,993,312, Cl. 89-155.000.
Ackeret, Peter, to Licinvest AG. Device for the cyclic rearrangement of a pile of rectangular or square sheets. 4,993,178, Cl. 40-513.000.
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Ackeret, Walter; and Mondini, Gian-Carlo, to Reiter Machine Works, Ltd. Nipper for a combing machine using bonded fiber material. 4,993,122, Cl. 19-225.000.
Acuimage Corporation: *See—*
Williams, P. Michael, 4,994,910, Cl. 358-98.000.
Acuna, Thomas J. Anchor bolt marker. 4,993,168, Cl. 33-666.000
Acuto, Giovanni; and Rovero, Giuseppe, to Fiat Auto S.p.A. Vehicle seat. 4,993,776, Cl. 297-216.000.
Adachi, Keiichi: *See—*
Inagaki, Yoshio; Yabe, Masao; and Adachi, Keiichi, 4,994,343, Cl. 430-270.000.
Adachi, Kohei; Takada, Mitsuyuki; Endo, Atsushi; Gofuku, Eishi; and Takasago, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a circuit board. 4,993,148, Cl. 29-832.000.
Adachi, Osao: *See—*
Ameyama, Minoru; and Adachi, Osao, 4,994,382, Cl. 435-119.000.
Adachi, Takashi; Ishii, Takafumi; and Hidaka, Hidemasa, to Meiji Seika Kaisha, Ltd. Process for improving quality of fruit. 4,993,185, Cl. 47-58.000.
Adachi, Tsuneo: *See—*
Honda, Naoko; and Adachi, Tsuneo, 4,994,739, Cl. 324-207.140.
Adair, Paul C.; Bhalla, Lalit M.; and Mueller, Ronald L., to DXImaging. Organometallic compounds as mottle prevention additives in liquid electrostatic developers. 4,994,341, Cl. 430-115.000.
Adam, Peter; Deynet, Rolf; and Gleixner, Ronald, to Siemens Aktiengesellschaft. Configuration for limiting the axial play of the shaft of a motor-drive mechanism. 4,993,277, Cl. 74-425.000.
Adamek, Manfred; and Schock, Heinz-Gerhard, to U.S. Philips Corporation. Printing head for a needle printer. 4,993,855, Cl. 400-124.000.
Adams, Anthony L.; and Stewart, John G., to Texas Instruments Incorporated. Method and apparatus for reliable integrated circuit package construction. 4,993,534, Cl. 198-347.300.
Adeka Argus Chemical Co., Ltd.: *See—*
Sekiguchi, Tetsuo; Yagi, Masaki; Nakahara, Yutaka; and Sonoda, Naotoshi, 4,994,529, Cl. 525-375.000.
Advanced Micro Devices: *See—*
Moyal, Miki, 4,994,891, Cl. 357-53.000.
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Ishii, Fumio: *See—*
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Ishii, Hidee: *See—*
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Sugiyama, Yoshiaki; Sagae, Kyuta; and Tanabe, Susumu, to Terumo Kabushiki Kaisha. Balloon cathetercu4,994,032, Cl. 604-96.000.

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546 4,993,606
590 4,993,607
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42.2 4,993,609
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160 4,993,612
251 4,993,613
253 4,993,614
309 4,993,615

CLASS 227
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CLASS 228
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135 4,993,619
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171 4,994,201
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34.3 4,993,722
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81.1 4,993,729
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250.1 4,993,732
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160 4,993,773
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CLASS 299
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CLASS 320
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207.13 4,994,738

CLASS 323
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CLASS 324
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CLASS 330
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234 4,994,776
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160 4,994,782
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CLASS 340
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552 4,994,789
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584 4,994,792
666 4,994,793
705 4,994,794
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870.3 4,994,799
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157 4,994,807
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CLASS 342
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151 4,994,810
158 4,995,102
205 4,994,811
359 4,994,812
360 4,994,813
372 4,994,814

CLASS 343
762 4,994,816
765 4,994,815
770 4,994,817
786 4,994,818
4,994,819
846 4,994,820

CLASS 346
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140 R 4,994,824
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4,993,813
426 4,993,814
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432 4,993,816
465 4,993,817
505 4,993,818
557 4,993,819
4,993,820
584 4,993,821
4,993,822
611 4,993,823
641 4,993,824

CLASS 351
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212 4,993,826
221 4,993,827

CLASS 352
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CLASS 354
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64 4,994,829
106 4,994,830
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110 4,994,832
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234.1 4,994,834
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299 4,994,837
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324 4,994,840
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412 4,994,844
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27 4,994,848
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50 4,994,851
68 4,994,856
93 4,994,857
206 4,994,852
4,994,853
210 4,994,854
211 4,994,855
212 4,994,858
247 4,994,859
251 4,993,829
256 4,994,860
274 4,994,861
284 4,994,862
303 4,994,863
317 4,994,864
324 4,994,865

CLASS 356
4 4,993,830
124 4,993,831
128 4,993,832
252 4,993,833
328 4,993,834
376 4,993,835
4,993,836
401 4,993,837
439 4,993,838

CLASS 357
16 4,994,866
4,994,867
4,994,868
23.13 4,994,874
23.3 4,994,869
23.4 4,994,870
4,994,871
4,994,872
4,994,904
23.5 4,994,873
24 4,994,875
4,994,876
4,994,877
4,994,878
4,994,879
34 4,994,880
4,994,881
4,994,882
39 4,994,883
4,994,884
41 4,994,885
43 4,994,886
4,994,887
4,994,888
45 4,994,889
51 4,994,890
53 4,994,891
67 4,994,892
4,994,893
71 4,994,894
72 4,994,895
74 4,994,896
4,994,902
4,994,897
4,994,903

CLASS 358
3 4,994,898
11 4,994,899
22 4,994,905
31 4,994,900
4,994,906
41 4,994,907
76 4,994,901
4,994,908
4,994,909
4,994,910
135 4,994,911
140 4,994,912
142 4,994,913
160 4,994,914
162 4,994,915
181 4,994,916
213.15 4,994,917
214 4,994,918
227 4,994,919
4,994,920
244 4,994,921
310 4,994,922
319 4,994,923
336 4,994,924
343 4,994,925
4,994,926
426 4,994,927

CLASS 360
4,994,928
4,994,929
97.01 4,994,930
106 4,994,931

CLASS 361
19 4,994,932
42 4,994,933
71 4,994,934
141 4,994,935
4,994,936
386 4,994,937
4,994,938
429 4,994,939
4,994,940

CLASS 362
26 4,994,941
80 4,994,942
219 4,994,943
238 4,994,944
268 4,994,945
282 4,994,946
297 4,994,947
346 4,994,948
352 4,994,949

CLASS 363
41 4,994,950
4,994,951
56 4,994,952
71 4,994,953
89 4,994,954
95 4,994,955
4,994,956

CLASS 364
147 4,994,957
148 4,994,958
153 4,994,959
200 4,994,960
4,994,961
4,994,962
4,994,963
4,994,964
413.15 4,994,965
419 4,994,966
4,994,967
4,994,968
424.01 4,994,969
424.02 4,994,970
424.04 4,994,971
424.05 4,994,972
424.07 4,994,973
443 4,994,974
469 4,994,975
473 4,994,976
474.09 4,994,979
474.15 4,994,980
474.2 4,994,977
474.3 4,994,978
485 4,995,006
492 4,994,981
510 4,994,984
513 4,994,982
513.5 4,994,983
514 4,994,985
518 4,994,987
519 4,994,986
4,994,988
4,995,103
522 4,994,989
4,994,990
581 4,994,991
709 15 4,994,992
740 4,994,993
746 4,994,994
746 1 4,994,995
748 4,994,996
759 4,994,997
4,994,998

CLASS 365
149 4,994,999
154 4,995,000
4,995,001
189 01 4,995,002
189 05 4,995,003
189.11 4,995,004
221 4,995,005

CLASS 366
7 4,993,839
205 4,993,840
274 4,993,841

CLASS 367
52 4,995,007
75 4,995,008
107 4,995,009
111 4,995,010
127 4,995,011
150 4,995,012
153 4,995,013
4,995,014

CLASS 368
11 4,995,015
67 4,995,016
107 4,995,018
117 4,995,019
4,995,020
226 4,995,022
233 4,995,021
276 4,995,023

CLASS 369
13 4,995,024
32 4,995,025
70 4,995,026
77.1 4,995,027
275.5 4,995,028
291 4,995,029

CLASS 370
4,995,104
32.1 4,995,030
4,995,031
4,995,032
68.1 4,995,033
95.1 4,995,034
95.2 4,995,035
118 4,995,036

CLASS 371
16.1 4,995,037
4,995,038
22.3 4,995,039
36 4,995,040
40.1 4,995,041
68.2 4,995,042

CLASS 372
7 4,995,043
25 4,995,044
38 4,995,045
4,995,105
41 4,995,046
50 4,995,047
4,995,048
4,995,049
95 4,995,050

CLASS 373
4,995,051

CLASS 374
11 4,995,015
67 4,995,016
39 4,993,842
160 4,993,843

CLASS 375
1 4,995,052
4,995,053
4,995,054
4,995,055
7 4,995,056
13 4,995,057
23 4,995,058
27 4,995,059
76 4,995,106

CLASS 376
4,994,230
261 4,994,231
4,994,232
4,994,233
445 4,994,234

CLASS 377
4,995,060
4,995,061

CLASS 378
7 4,995,107
22 4,995,062
4,995,063
4,995,064
130 4,995,065
146 4,995,066
4,995,108
177 4,995,067
4,995,068
4,995,069

CLASS 379
27 4,995,070
53 4,995,071
4,995,072
4,995,073
4,995,084
97 4,995,074
107 4,995,109
142 4,995,075
155 4,995,110
257 4,995,076
355 4,995,077
382 4,995,111

CLASS 380
10 4,995,078
4,995,079
21 4,995,080
23 4,995,081
4,995,082
4,995,083
25 4,995,112

CLASS 381
68.2 4,995,085
117 4,995,113

CLASS 382
4,995,086
6 4,995,093
8 4,995,087
15 4,995,088
46 4,995,089
50 4,995,090
4,995,091
53 4,995,092

CLASS 383
38 4,993,844
40 4,993,845
127 4,993,846

CLASS 384
21 4,993,847
97 4,993,848
447 4,993,849
477 4,993,850
512 4,993,851

CLASS 385
4,995,094

CLASS 400
63 4,993,852
121 4,993,853
124 4,993,854
4,993,855
621.1 4,993,856

CLASS 401
34 4,993,858
75 4,993,857
4,993,859
214 4,993,860

CLASS 402
8 4,993,861

CLASS 403
59 4,993,862
133 4,993,863
343 4,993,864

VOL 1123 ISS 3 FEB 19 1991 UMI

4,993,865
4,993,866

CLASS 404

12 4,993,868
4,993,867
117 4,993,869

CLASS 405

21 4,993,870
4,993,871
125 4,993,872
128 4,993,873
4,993,874
157 4,993,875
216 4,993,876
262 4,993,879
282 4,993,877
4,993,878
283 4,993,880

CLASS 406

31 4,993,882
39 4,993,883
49 4,993,884
88 4,993,881
89 4,993,885
192 4,993,886
193 4,993,887

CLASS 407

11 4,993,888
15 4,993,889
34 4,993,890
42 4,993,891
114 4,993,892
116 4,993,893

CLASS 408

14 4,993,894
103 4,993,895

CLASS 409

138 4,993,896
180 4,993,897

CLASS 410

12 4,993,898
69 4,993,899

CLASS 411

4,993,900
4,993,901
430 4,993,902
510 4,993,903

CLASS 414

223 4,993,904
277 4,993,905
4,993,906
472 4,993,908
563 4,993,909
4,993,910
4,993,911
729 4,993,912
4,993,913
738 4,993,914
795.3 4,993,907
796.9 4,993,915
798.7 4,993,916

CLASS 415

105 4,993,917
191 4,993,918

CLASS 416

35 4,993,919

CLASS 417

4,993,920
218 4,993,921
279 4,993,922
283 4,993,923
402 4,993,924
413 4,993,925
490 4,993,926

CLASS 418

55.3 4,993,927
55.4 4,993,928
55.6 4,993,929
4,993,930

CLASS 420

495 4,994,235
4,994,236

CLASS 422

21 4,994,237
4,994,238
4,994,240
4,994,239
219 4,994,241
224 4,994,242

CLASS 423

29 4,994,243
111 4,994,253
121 4,994,244
238 4,994,245
242 4,994,246
247 4,994,247
320 4,994,248
328 4,994,249
4,994,250
4,994,251
4,994,254
499 4,994,252
4,994,255
502 4,994,256
577 4,994,257

CLASS 424

1.1 4,994,258
4,994,259
10 4,994,260
4,994,261
52 4,994,262
59 4,994,263
63 4,994,264
73 4,994,265
76.7 4,994,266
78 4,994,267
4,994,268
85.8 4,994,269
118 4,994,270
120 4,994,271
195.1 4,994,272
422 4,994,273
427 4,994,274
438 4,994,275
4,994,276
443 4,994,277
449 4,994,278
494 4,994,279
497 4,994,281
672 4,994,280

CLASS 425

112 4,993,931
154 4,993,932
190 4,993,933
238 4,993,934
270 4,993,935
4,993,936
444 4,993,937

CLASS 426

74 4,994,282
4,994,283
4,994,284
104 4,994,285
231 4,994,286
4,994,287
249 4,994,288
330.4 4,994,289
330.5 4,994,290
399 4,994,291
422 4,994,292
501 4,994,293
519 4,994,294
548 B1 4,626,441
549 4,994,295
574 4,994,366
4,994,296
650 4,994,297

CLASS 427

41 4,994,298
54.1 4,994,299
4,994,300
56.1 4,994,301
96 4,994,302
127 4,994,304
131 4,994,306
132 4,994,305
173 4,994,303
236 4,994,307
255.1 4,994,308

CLASS 428

34 4,994,309
34.2 4,994,310
36.5 4,994,312
36.7 4,994,313
36.92 4,994,314
76 4,994,315
122 4,994,311
4,994,316
4,994,317
331 4,994,318
335 4,994,319
336 4,994,320
4,994,321
4,994,330
343 4,994,322
349 4,994,324
364 4,994,325
372 4,994,323
405 4,994,326
447 4,994,327
4,994,328
678 4,994,329

CLASS 429

17 4,994,331
27 4,994,332
190 4,994,333
206 4,994,334
254 4,994,335

CLASS 430

5 4,994,336
4,994,342
67 4,994,337
76 4,994,338
78 4,994,339
106.6 4,994,340
115 4,994,341
264 4,994,345
270 4,994,343
273 4,994,344
280 4,994,346
282 4,994,347
287 4,994,348
314 4,994,349
358 4,994,350
379 4,994,351
495 4,994,352
4,994,354
496 4,994,353
509 4,994,355
522 4,994,356
536 4,994,357
547 4,994,358
551 4,994,359
4,994,360
557 4,994,361
558 4,994,362
564 4,994,363
598 4,994,364
4,994,365

CLASS 431

1 4,993,938
351 4,993,939

CLASS 432

14 4,993,942
105 4,993,940
107 4,993,943
222 4,993,944

CLASS 433

30 4,993,945
32 4,993,946
80 4,993,941
4,993,947
90 4,993,948
141 4,993,949
173 4,993,950
226 4,993,951

CLASS 434

191 4,993,952
365 4,993,953

CLASS 435

2 4,994,367
4,994,368
4,994,369
4,994,370
4,994,371
4,994,372
4,994,373
15 4,994,374
17 4,994,375
24 4,994,376
25 4,994,377
29 4,994,378
69.1 4,994,379
4,994,380
106 4,994,381
119 4,994,382
166 4,994,383
172.2 4,994,384
177 4,994,385
235.1 4,994,386
240.2 4,994,387
240.243 4,994,388
252.35 4,994,389
262 4,994,390
4,994,391
790 4,994,392

CLASS 436

8 4,994,393
55 4,994,394
79 4,994,395
133 4,994,117
136 4,994,396
149 4,994,397
4,994,398

CLASS 437

11 4,994,399
31 4,994,400
4,994,401
41 4,994,402
43 4,994,403
4,994,404
53 4,994,405
67 4,994,406
70 4,994,407
133 4,994,408
164 4,994,409
192 4,994,410
209 4,994,411
220 4,994,412
244 4,994,413

CLASS 439

68 4,993,954
73 4,993,955
76 4,993,956
4,993,957
91 4,993,958
92 4,993,959
4,993,960
125 4,993,961
136 4,993,962
142 4,993,963
272 4,993,964
374 4,993,965
411 4,993,966
4,993,967
492 4,993,968
499 4,993,969
535 4,993,970
607 4,993,971
627 4,993,973
628 4,993,974
637 4,993,972
751 4,993,975

CLASS 440

53 4,993,976
67 4,993,977
71 4,993,978
75 4,993,979

CLASS 441

129 4,993,980

CLASS 445

9 4,993,981
22 4,993,982

CLASS 446

94 4,993,983
118 4,993,984
133 4,993,985
140 4,993,986
268 4,993,987
394 4,993,988
487 4,993,989

CLASS 452

116 4,993,116
134 4,993,112
136 4,993,113
4,993,114
138 4,993,110
169 4,993,111
4,993,115

CLASS 453

7 4,993,990

CLASS 455

4,995,095
12 4,995,096
33 4,995,097
165 4,995,098
343 4,995,099
4,995,100
607 4,995,101

CLASS 460

4,993,991

CLASS 464

137 4,993,992

CLASS 474

111 4,993,993
4,993,994
4,993,995
152 4,993,996
155 4,993,997
165 4,993,998
205 4,993,999
240 4,994,000
265

CLASS 475

4,994,001
72 4,994,002
4,994,003
149 4,994,004
162 4,994,005
286 4,994,006
346 4,994,007

CLASS 493

2 4,994,008
14 4,994,009
215 4,994,010
316 4,994,011

PLANT 911

12 4,994,414
4,994,415
88 4,994,416
90 4,994,417
95 4,994,418
125 4,994,419
126 4,994,420
139 4,994,421

CLASS 502

5 4,994,422
25 4,994,423
41 4,994,424
4,994,425
158 4,994,426
166 4,994,427
330 4,994,428
401 4,994,429
439 4,994,430

CLASS 503

4,994,431

CLASS 505

1 4,994,432
4,994,433
4,994,434
4,994,436
4,994,437
001 4,994,435

CLASS 514

2 4,994,438
3 4,994,439
8 4,994,440
4,994,441
4,994,442
45 4,994,443
56 4,994,444
60 4,994,445
63 4,994,446
75 4,994,447
114 4,994,449
171 4,994,450
183 4,994,451
202 4,994,452
211 4,994,453
212 4,994,455
216 4,994,456
218 4,994,457
226.5 4,994,448
227.5 4,994,458
251 4,994,459
252 4,994,460
4,994,461
253 4,994,463
254 4,994,464
256 4,994,465
282 4,994,466
284 4,994,467
293 4,994,468
314 4,994,469
320 4,994,470
326 4,994,471
333 4,994,472
335 4,994,473
339 4,994,474
348 4,994,475
356 4,994,476
359 4,994,477
364 4,994,478
381 4,994,479
383 4,994,480
391 4,994,481
406 4,994,482
415 4,994,483
445 4,994,484
4,994,485
456 4,994,486
476 4,994,487
508 4,994,488
510 4,994,489
522 4,994,490
529 4,994,491
561 4,994,492
567 4,994,493
569 4,994,494
574 4,994,495
775 4,994,496
887 4,994,497

CLASS 518

714 4,994,498

CLASS 521

56 4,994,499
92 4,994,500
117 4,994,501
137 4,994,502
4,994,503

CLASS 523

4,994,504
145 4,994,505
155 4,994,506
415 4,994,507

CLASS 524

14 4,994,508
35 4,994,509
162 4,994,510
202 4,994,511
209 4,994,512
210 4,994,513
262 4,994,514
269 4,994,515
275 4,994,516
357 4,994,517
449 4,994,518
519 4,994,519
547 4,994,520
575 4,994,521

CLASS 525

63 4,994,522
4,994,523
66 4,994,524
4,994,525
146 4,994,526
326.2 4,994,527
338 4,994,528
375 4,994,529
386 4,994,530
391 4,994,531
464 4,994,532
469 4,994,533

CLASS 526

4,994,534
259 4,994,535
262 4,994,536
273 4,994,537
279 4,994,538

CLASS 528

44 4,994,540
51 4,994,541
70 4,994,542
83 4,994,543
125 4,994,544
170 4,994,545
194 4,994,546
201 4,994,547
219 4,994,548
272 4,994,549
335 4,994,550
354 4,994,551
480 4,994,552

CLASS 530

327 4,994,553
4,994,554
344 4,994,555
351 4,994,556
391 4,994,557
4,994,558
399 4,994,559

CLASS 534

10 4,994,560
582 4,994,561
618 4,994,562
728 4,994,563
766 4,994,564

CLASS 536

27 4,994,565

CLASS 540

141 4,994,566
215 4,994,454
222 4,994,567
350 4,994,568

CLASS 544

55 4,994,569
111 4,994,570
252 4,994,462
331 4,994,571

CLASS 546

220 4,994,572
318 4,994,573

CLASS 548

213 4,994,574
352 4,994,575
367 4,994,576
4,994,577
433 4,994,578
461 4,994,579
4,994,580

CLASS 549

219 4,994,581
270 4,994,582
272 4,994,583
4,994,584
323 4,994,585
529 4,994,586
534 4,994,587
4,994,588
4,994,589

CLASS 556

21 4,994,590

137 4,994,591
404 4,994,592
424 4,994,593

CLASS 558

268 4,994,594
281 4,994,595
332 4,994,596
342 4,994,597
462 4,994,598

CLASS 560

43 4,994,599
56 4,994,601
051 4,994,600
186 4,994,602
232 4,994,603

CLASS 562

401 4,994,604
445 4,994,605
456 4,994,606
496 4,994,607
519 4,994,608
580 4,994,609
864 4,994,610

CLASS 564

50 4,994,611
88 4,994,612
259 4,994,613
300 4,994,614
304 4,994,615
346 4,994,616
347 4,994,618
355 4,994,617
455 4,994,619
473 4,994,620
475 4,994,621
479 4,994,622

CLASS 568

42 4,994,623
55 4,994,624
311 4,994,625
618 4,994,626
621 4,994,627
720 4,994,628

CLASS 576

326 4,994,539

CLASS 600

5 4,994,012
13 4,994,014
4,994,015
14 4,994,016
16 4,994,017
18 4,994,018
30 4,994,019
31 4,994,020
008 4,994,013

CLASS 604

6 4,994,021
7 4,994,022
20 4,994,023
22 4,994,024
28 4,994,025
29 4,994,026
53 4,994,027
60 4,994,028
84 4,994,030
85 4,994,031
4,994,029
96 4,994,032
101 4,994,033
110 4,994,034
118 4,994,035
158 4,994,036
160 4,994,040
164 4,994,041
165 4,994,042
191 4,994,043
192 4,994,044
198 4,994,045
4,994,046
264 4,994,047
283 4,994,048
307 4,994,049
320 4,994,050
349 4,994,051
355 4,994,052
367 4,994,053
4,994,037
385.1 4,994,038
391 4,994,054
403 4,994,055
408 4,994,039
410 4,994,056
416 4,994,057

CLASS 606

5 4,994,058
7 4,993,412
12 4,994,059
28 4,994,060
43 4,994,061
46 4,994,062
75 4,994,063
91 4,994,064
92 4,994,065
100 4,993,410
108 4,994,066
159 4,994,067
181 4,994,068
191 4,994,069
4,994,070
194 4,994,071
4,994,072
206 4,994,079
220 4,994,073
230 4,994,074
235 4,994,075
236 4,994,076

CLASS 623

2 4,994,077
3 4,994,078
5 4,994,080
4,994,081
6 4,994,082
4,994,083
11 4,994,084
23 4,994,085
26 4,994,086

CLASSIFICATION OF DESIGNS

D2—	24	314,659		673	314,692	D11—	12	314,724			314,755		36	314,787		393	314,820
	28	314,660		698	314,693			314,725			314,756			314,788	D24—	10	314,821
	184	314,661			314,694			314,726		155	314,757	D19—	3	314,790			314,822
	314	314,662		699	314,695		27	314,727		158	314,758		62	314,791		16	314,823
D3—	10	314,663	D8—	45	314,696		50	314,728		184	314,759		78	314,792		22	314,824
	13	314,664		64	314,697		82	314,729	D14—	100	314,760		84	314,793		27	314,825
	72	314,666		68	314,698		93	314,730			314,761	D20—	4	314,794			314,826
	73	314,665		71	314,699		148	314,731		118	314,763		5	314,795		99	314,827
		314,667		303	314,700		164	314,732		124	314,764			314,796	D25—	67	314,828
	76	314,668		354	314,701	D12—	42	314,789		151	314,766		9	314,797		113	314,829
		314,669	D9—	307	314,702		84	314,733		163	314,767		30	314,798		138	314,830
	105	314,670		375	314,703		102	314,734		165	314,762	D21—	64	314,799	D26—	63	314,832
D4—	115	314,671		414	314,704		106	314,735		194	314,768		171	314,800			314,833
D5—	53	314,672		416	314,705		114	314,736		217	314,769		212	314,801		87	314,834
		314,673		423	314,706		147	314,737		240	314,770		218	314,802		93	314,835
D6—	26	314,831		435	314,707		155	314,738		248	314,765		220	314,803		108	314,836
	333	314,674		448	314,688			314,739		251	314,771		237	314,804	D27—	154	314,837
	345	314,675		449	314,708		182	314,740		257	314,772			314,805		175	314,838
	370	314,676	D10—	30	314,709		300	314,741	D15—	7	314,773	D22—	116	314,806	D28—	12	314,839
	381	314,677		32	314,710	D13—	114	314,742		8	314,774		133	314,807		25	314,840
	406	314,678		46	314,723		116	314,743		11	314,775		141	314,808		49	314,841
	465	314,679		46.1	314,711		132	314,744		15	314,777	D23—	209	314,809		79	314,842
	487	314,680		46.2	314,722		133	314,745		28	314,778		212	314,810		91.1	314,843
	499	314,681		62	314,712			314,746		144.1	314,776		226	314,811	D29—	7	314,844
	511	314,682		65	314,713		137	314,747	D16—	115	314,779		241	314,812	D32—	4	314,845
	552	314,683		74	314,714		140	314,748			314,780		257	314,813		18	314,846
	566	314,684		78	314,715		140	314,749		127	314,781		262	314,814		22	314,847
	601	314,685		91	314,716		140	314,749		127	314,781		262	314,814		22	314,847
D7—	329	314,686		97	314,717		146	314,750		202	314,782		267	314,815		31	314,848
	350	314,687		106	314,718			314,751	D17—	20	314,783		281	314,817	D34—	17	314,849
	507	314,689			314,719		147	314,752			314,784		291	314,818		32	314,850
	539	314,690			314,720			314,753	D18—	7	314,785		338	314,816		46	314,851
	646	314,691		114	314,721			314,754			314,786		364	314,819	D99—	29	314,852

CLASSIFICATION OF PLANTS

P.—	7	7,448		7,449		8	7,450		46	7,451		68	7,452		74	7,453

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PATENTS

01	:	4,993,165		4,993,422		4,994,047		4,994,686		4,993,634	4,993,602
		4,993,273		4,993,424		4,994,056		4,994,691		4,993,725	4,993,641
		4,993,286		4,993,426		4,994,057		4,994,705		4,993,874	4,993,707
		4,993,397		4,993,427		4,994,060		4,994,706		4,993,964	4,993,708
		4,993,557		4,993,429		4,994,069		4,994,709		4,994,186	4,993,710
		4,994,666		4,993,432		4,994,075		4,994,711		4,994,817	4,993,731
04		4,993,080		4,993,442		4,994,080		4,994,715	09 :	4,993,093	4,993,749
		4,993,085		4,993,449		4,994,084		4,994,735		4,993,175	4,993,819
		4,993,301		4,993,468		4,994,086		4,994,744		4,993,338	4,993,824
		4,993,483		4,993,486		4,994,101		4,994,763		4,993,485	4,993,867
		4,993,559		4,993,552		4,994,107		4,994,771		4,993,826	4,993,918
		4,993,561		4,993,560		4,994,110		4,994,776		4,993,901	4,993,973
		4,993,768		4,993,585		4,994,116		4,994,780		4,993,919	4,994,030
		4,994,211		4,993,609		4,994,127		4,994,781		4,994,073	4,994,040
		4,994,406		4,993,610		4,994,131		4,994,783		4,994,153	4,994,061
		4,994,408		4,993,628		4,994,166		4,994,785		4,994,199	4,994,071
		4,994,412		4,993,629		4,994,188		4,994,787		4,994,271	4,994,081
		4,994,422		4,993,671		4,994,213		4,994,795		4,994,331	4,994,123
		4,994,690		4,993,680		4,994,215		4,994,800		4,994,455	4,994,248
		4,994,736		4,993,686		4,994,219		4,994,802		4,994,457	4,994,267
		4,994,757		4,993,712		4,994,223		4,994,803		4,994,482	4,994,278
		4,994,758		4,993,738		4,994,238		4,994,807		4,994,649	4,994,280
		4,994,760		4,993,751		4,994,246		4,994,808		4,994,912	4,994,375
		4,994,761		4,993,759		4,994,250		4,994,809		4,995,058	4,994,466
		4,994,897		4,993,766		4,994,256		4,994,867	10 :	4,993,706	4,994,648
		4,994,936		4,993,767		4,994,259		4,994,869		4,993,718	4,994,762
05	:	4,993,446		4,993,770		4,994,261		4,994,892		4,994,096	4,994,768
		4,994,432		4,993,783		4,994,269		4,994,910		4,994,202	4,994,786
06	:	Re.33,539		4,993,791		4,994,274		4,994,921		4,994,347	4,994,793
		4,993,078		4,993,793		4,994,282		4,994,926		4,994,537	4,994,797
		4,993,082		4,993,796		4,994,284		4,994,937	12 :	4,993,081	4,994,934
		4,993,084		4,993,818		4,994,294		4,994,966		4,993,153	4,995,017
		4,993,086		4,993,821		4,994,316		4,994,972		4,993,155	4,995,099
		4,993,090		4,993,875		4,994,320		4,994,974		4,993,180	13 : 4,993,140
		4,993,112		4,993,879		4,994,366		4,994,991		4,993,184	4,993,141
		4,993,125		4,993,888		4,994,368		4,994,995		4,993,244	4,993,436
		4,993,154		4,993,895		4,994,369		4,995,000		4,993,246	4,993,604
		4,993,168		4,993,897		4,994,379		4,995,005		4,993,254	4,993,830
		4,993,192		4,993,914		4,994,397		4,995,006		4,993,268	4,993,877
		4,993,201		4,993,948		4,994,402		4,995,025		4,993,280	4,993,878
		4,993,220		4,993,950		4,994,407		4,995,028		4,993,281	4,994,079
		4,993,223		4,993,969		4,994,438		4,995,046		4,993,325	4,994,145
		4,993,236		4,993,977		4,994,439		4,995,050		4,993,343	4,994,265
		4,993,239		4,993,985		4,994,473		4,995,055		4,993,344	4,994,546
		4,993,265		4,993,986		4,994,488		4,995,077		4,993,345	4,994,908
		4,993,269		4,993,988		4,994,501		4,995,101		4,993,346	4,994,922
		4,993,291		4,994,019		4,994,538		4,995,105		4,993,351	4,994,945
		4,993,339		4,994,025		4,994,633		4,995,106		4,993,364	4,995,018
		4,993,348		4,994,029		4,994,637	08 :	4,993,100		4,993,399	4,995,067
		4,993,358		4,994,031		4,994,656		4,993,136		4,993,404	15 : 4,994,076
		4,993,412		4,994,034		4,994,669		4,993,139		4,993,450	4,994,964
		4,993,414		4,994,039		4,994,675		4,993,579		4,993,471	16 : 4,993,077
		4,993,415		4,994,046		4,994,676		4,993,633		4,993,472	4,993,271

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PATENT AND TRADEMARK OFFICE
Harry F. Manbeck, Jr., *Commissioner*

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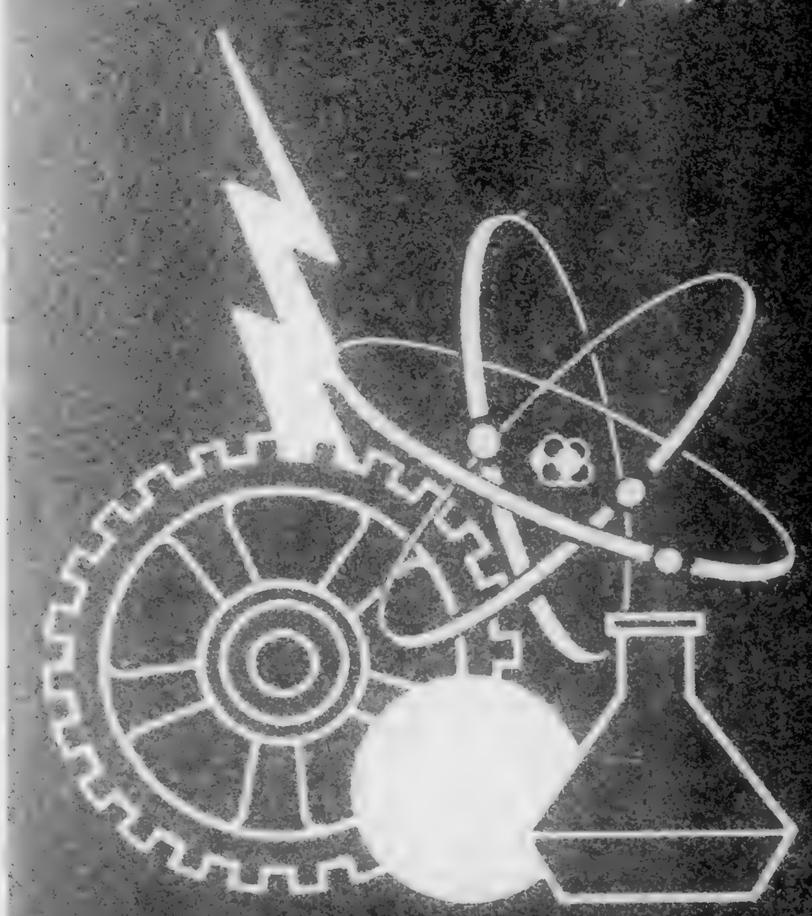
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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS
February 26, 1991



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OFFICIAL GAZETTE of the
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 14 on Nov. 27. 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17,1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 566 on Jan 1, 1991.

International fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 6, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 23, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,726,074 through 4,727,601
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 21, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,432,099 through 4,433,438
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 16, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,363,140	06/287,251	12/14/82
4,363,148	06/234,112	12/14/82
4,363,149	06/231,761	12/14/82
4,363,151	06/244,074	12/14/82
4,363,154	06/263,695	12/14/82
4,363,178	06/272,812	12/14/82
4,363,182	06/271,417	12/14/82
4,363,187	06/304,617	12/14/82
4,363,194	06/238,443	12/14/82
4,363,210	06/271,224	12/14/82
4,363,220	06/305,689	12/14/82
4,363,221	06/234,820	12/14/82
4,363,243	06/259,565	12/14/82
4,363,250	06/250,028	12/14/82
4,363,265	06/268,004	12/14/82
4,363,267	06/220,900	12/14/82
4,363,283	06/233,719	12/14/82
4,363,301	06/234,326	12/14/82
4,363,304	06/268,826	12/14/82
4,363,310	06/234,637	12/14/82
4,363,311	06/297,153	12/14/82
4,363,314	06/216,658	12/14/82
4,363,318	06/288,393	12/14/82
4,363,325	06/226,304	12/14/82
4,363,331	06/297,447	12/14/82
4,363,334	06/287,787	12/14/82
4,363,337	06/252,074	12/14/82
4,363,340	06/263,474	12/14/82
4,363,360	06/225,301	12/14/82
4,363,382	06/221,262	12/14/82
4,363,385	06/232,489	12/14/82
4,363,391	06/273,464	12/14/82
4,363,408	06/223,161	12/14/82
4,363,419	06/300,052	12/14/82
4,363,420	06/229,896	12/14/82
4,363,422	06/248,556	12/14/82
4,363,440	06/231,964	12/14/82
4,363,470	06/326,733	12/14/82
4,363,474	06/258,610	12/14/82
4,363,482	06/233,461	12/14/82
4,363,527	06/220,863	12/14/82
4,363,561	06/245,713	12/14/82
4,363,600	06/251,070	12/14/82
4,363,612	06/314,508	12/14/82
4,363,615	06/307,253	12/14/82
4,363,617	06/284,352	12/14/82
4,363,628	06/271,796	12/14/82
4,363,636	06/311,642	12/14/82
4,363,641	06/279,704	12/14/82
4,363,676	06/297,262	12/14/82
4,363,705	06/284,052	12/14/82
4,363,708	06/263,909	12/14/82
4,363,710	06/316,797	12/14/82
4,363,713	06/226,512	12/14/82
4,363,726	06/267,635	12/14/82
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4,363,791	06/260,308	12/14/82
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4,363,893	06/287,528	12/14/82
4,363,911	06/298,935	12/14/82
4,363,920	06/266,965	12/14/82
4,363,921	06/253,276	12/14/82
4,363,922	06/273,605	12/14/82
4,363,931	06/239,192	12/14/82
4,363,932	06/275,936	12/14/82
4,363,940	06/243,619	12/14/82
4,363,942	06/232,315	12/14/82
4,363,943	06/314,272	12/14/82
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4,364,045	06/240,107	12/14/82
4,364,061	06/235,184	12/14/82
4,364,069	06/260,113	12/14/82
4,364,106	06/229,420	12/14/82
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4,628,562	06/608,215	12/16/86
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4,628,592	06/848,837	12/16/86
4,628,603	06/714,200	12/16/86
4,628,604	06/703,223	12/16/86
4,628,610	06/832,953	12/16/86
4,628,625	06/819,616	12/16/86
4,628,626	06/630,539	12/16/86
4,628,633	06/705,428	12/16/86
4,628,642	06/719,496	12/16/86
4,628,648	06/683,362	12/16/86
4,628,654	06/533,761	12/16/86
4,628,655	06/678,714	12/16/86
4,628,656	06/725,941	12/16/86
4,628,665	06/707,227	12/16/86
4,628,667	06/235,946	12/16/86
4,628,674	06/800,811	12/16/86
4,628,678	06/780,091	12/16/86
4,628,681	06/794,169	12/16/86
4,628,682	06/627,541	12/16/86
4,628,684	06/540,824	12/16/86
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4,628,687	06/610,509	12/16/86
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4,628,706	06/769,866	12/16/86
4,628,709	06/712,930	12/16/86
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4,628,821	06/752,275	12/16/86
4,628,823	06/617,216	12/16/86
4,628,827	06/605,232	12/16/86
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4,628,927	06/837,423	12/16/86
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4,628,937	06/637,159	12/16/86
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4,628,956	06/797,444	12/16/86
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4,628,958	06/760,497	12/16/86
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4,629,040	06/649,700	12/16/86
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4,629,067	06/743,495	12/16/86
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4,630,211	06/602,696	12/16/86
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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,342,988, Re. S. N. 07/640,290, Filed Jan. 11, 1991, Cl. 340/679, RUPTURE DISC ALARM SYSTEM, Leonard K. Thompson, Owner of Record: *Continental Disc Corp., Kansas City, Mo.*, Attorney or Agent: Paul E. Krieger, Ex. Gp.: 268

4,789,855, Re. S. N. 07/622,613, Cl. 340/703, DEVICE FOR EDITING DOCUMENT IN COLORS, Masayoshi Ozeki, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 269

4,797,160, Re. S. N. 07/638,827, Filed Jan. 8, 1991, Cl. 106/660, PHASE CHANGE COMPOSITIONS, Ival O. Salyer, Owner of Record: *University of Dayton, Dayton, Ohio*, Attorney or Agent: Richard A. Killworth, Ex. Gp.: 118

4,797,661, Re. S. N. 07/639,819, Filed Jan 9, 1991, Cl. 340/664, MOTION SENSING DEVICE, Wallace F. Wiley, Owner of Record: *Robert Hooke Memorial Laboratories Inc., Prairie Village, Ks.*, Attorney or Agent: Frank R. Agovino, Ex. Gp.: 268

4,800,348, Re. S. N. 07/616,167, Filed Nov. 20, 1990, Cl. 333/202, ADJUSTABLE ELECTRONIC FILTER AND METHOD OF TUNING SAME, George C. Rosar, et al., Owner of Record: *Motorola, Inc., Schaumburg, Ill.*, Attorney or Agent: Ronald R. Hackbart, Ex. Gp.: 252

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4,802,364, Re. S. N. 07/640,264, Filed Jan. 11, 1991, Cl. 73/505, ANGULAR RATE SENSOR, Donald R. Cage, et al., Owner of Record: *Inventor*, Attorney or Agent: Donald M. Duft, Ex. Gp.: 265

4,817,817, Re. S. N. 07/639,914, Filed Jan. 10, 1991, Cl. 220/445, DOUBLE WALL STORAGE TANK AND METHOD OF MAKING SAME, David T. Palazzo, Owner of Record: *Inventor*, Attorney or Agent: C. Douglas McDonald, Ex. Gp.: 241

4,951,185, Re. S. N. 07/639,557, Filed Dec. 20, 1990, Cl. 363/17, RESONANT INVERTER EMPLOYING FREQUENCY AND PHASE MODULATION USING OPTIMAL TRAJECTORY CONTROL, Michael J. Schutten et al., Owner of Record: *General Electric Co., Schenectady, N.Y.*, Attorney or Agent: Jill M. Breedlove, Ex. Gp.: 212

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,376,286, Reexam. No. 90/002,254, Requested Jan. 17, 1991, Cl. 357/023.4, HIGH POWER MOSFET WITH LOW ON RESISTANCE AND HIGH BREAKDOWN VOLTAGE, Alexander Lidow, et al., Owner of Record: *International Rectifier Corp., Los Angeles, Calif.*, Attorney or Agent: Samuel H. Weiner, Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 258, Requester: Harris Corp., Melbourne, Fla.

Errata

"All reference to Patent No. 4,957,825 to Masaaki Futamoto et al. of Kanagawa-Ken, Japan for `MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME' appearing in the Official Gazette of Sept. 18, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,982,319 to Vance J. Nau et al. of Calif. for `CONTROL SYSTEM FOR A SAMPLE PREPARATION SYSTEM' appearing in the Official Gazette of Jan. 1, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 4,981,910 to Aubert Y. Coran et al. of Ohio for `RUBBER COMPOSITIONS CONTAINING POLYMERIC ACTIVATORS' appearing in the Official Gazette of Jan. 1, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 4,983,018 to David L. Jungkman of New Hampshire for `METHOD AND APPARATUS FOR PROVIDING A MOSIAC LENS ARRAY' appearing in the Official Gazette of Jan. 8, 1991 should be deleted since no patent was granted."

REGISTRATION TO PRACTICE

The results of the examination for registration to practice before the United States Patent and Trademark Office held on October 10, 1990 were mailed to 712 candidates. The following list contains the names of the 429 persons who successfully passed the examination and who are entitled at this time to receive provisional recognition pursuant to 37 CFR §10.9(a) have been given the same to prepare and prosecute applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR § 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before April 11, 1991.

Jan. 29, 1991 CAMERON WEIFFENBACH, *Director*
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Status of PTO Services

The following is an update of the status of PTO services for Jan. 1991:

Service Item	FY 1991 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	18
Trademarks	30	52
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	1
Mail Coupons	12	4
Letter Orders	16	18
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	19
Applications-As-Filed	17	6
File-Wrapper/Contents	N/A	14
Walk-up Certification	1	1
Patent Application Expedited	5	3
Trademark Search Library:		
Filing Pending Marks	23	34
Filing Reg. Certificates	Issue Date+2 days	On Goal
Filing Temp. Drawings	8	17
Assignments:		
Recording Patent-New Applications	20**	20
Recording Patent-Mail Room Recpts.	20	33
Return Patents-New Applications	34**	47
Return Patents-Mail Room Recpts.	34	49
Recording Trademarks	20	28
Returning Trademark Documents	34	39
Avg. Days from Issue Fee Payment to Issue Date	90-100	99
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	94% on Issue Date
Trademark Copies Available	95% on Issue Date	97% on Issue Date

* Unless otherwise noted.
** Goal reflects the number of days from the date the filing receipt is mailed.

February 1, 1991

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

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PATENT NOTICES

Certificates of Correction For Week of February 26, 1991

D. 305,104	4,852,975	4,879,327	4,895,744
D. 306,254	4,853,489	4,879,331	4,896,232
4,514,818	4,855,347	4,880,492	4,896,656
4,633,416	4,859,457	4,883,420	4,896,810
4,633,481	4,861,702	4,883,849	4,897,268
4,634,548	4,862,205	4,883,963	4,897,452
4,636,021	4,862,633	4,883,968	4,898,406
4,689,295	4,862,731	4,885,615	4,898,662
4,756,020	4,864,360	4,885,708	4,898,884
4,761,684	4,864,760	4,885,918	4,899,088
4,762,534	4,865,117	4,886,024	4,899,096
4,767,447	4,865,431	4,886,331	4,899,316
4,776,948	4,865,476	4,887,315	4,900,315
4,778,567	4,865,872	4,887,366	4,901,082
4,788,005	4,866,934	4,887,650	4,901,174
4,801,829	4,867,061	4,887,683	4,901,779
4,809,271	4,867,816	4,887,818	4,902,275
4,814,994	4,867,825	4,888,246	4,902,553
4,817,643	4,867,875	4,888,269	4,902,620
4,818,770	4,868,145	4,888,812	4,902,640
4,818,846	4,868,469	4,891,742	4,902,793
4,820,302	4,870,353	4,892,182	4,903,285
4,822,590	4,870,469	4,892,214	4,903,702
4,822,678	4,871,646	4,892,234	4,904,741
4,823,839	4,871,709	4,892,530	4,905,303
4,828,355	4,872,737	4,892,740	4,905,322
4,829,667	4,873,556	4,892,892	4,905,678
4,832,036	4,873,680	4,893,063	4,906,168
4,832,968	4,874,245	4,893,155	4,907,324
4,834,909	4,874,643	4,893,980	4,909,671
4,845,513	4,874,807	4,894,362	4,963,695
4,846,283	4,875,927	4,894,510	4,971,654
4,847,419	4,876,015	4,894,694	
4,847,755	4,876,618	4,894,815	

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These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
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	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
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Expiration of patents: The patents within the range of numbers indicated below expire during January 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,778,914 to 3,789,426 inclusive
Plant Patents ..... 3,413 to 3,462 inclusive

Notice for the Official Gazette

NOTICE OF INTENT OF IN VITRO INTERNATIONAL, INC., TO TERMINATE STATUS OF INTERNATIONAL DEPOSITARY AUTHORITY UNDER BUDAPEST TREATY

Since November 30, 1983, In Vitro International, Inc., ("IVI"), of Linthicum, Maryland, has been recognized as an international depositary authority under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure.

The Patent and Trademark Office has received a letter from Jacob B. Davis, Esq., of the law firm of Lechowicz & Davis, Glen Burnie, Maryland, dated January 4, 1991, which states, inter alia:

> [M]y client, In Vitro International, Inc. ("IVI") . . . is presently an international depository for microorganisms for the purposes of patent procedure.
>
> IVI would like to terminate its status as a depository and transfer all microorganisms which it is presently storing to another depository.

The Patent and Trademark Office has also received a second letter from Mr. Davis, dated January 14, 1991, which states, inter alia:

> My client has no funds to pay another depository for taking these microorganisms.

By letter dated February 8, 1991, the Patent and Trademark Office has notified the Director General of the World Intellectual Property Organization that "the United States has determined that it can no longer assure that IVI is able to continue to comply with the requirements of Article 6(2) of the Budapest Treaty with respect to any new deposits."

Currently under review are what steps should be taken to ensure that (1) guarantees made for IVI to acquire the status of an international depositary authority, and (2) its obligations under the Treaty and Regulations, are fulfilled to the fullest extent possible.

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Questions may be directed to Michael K. Kirk, Assistant Commissioner for External Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231; telephone (703) 557-3065.

February 8, 1991

HARRY F. MANBECK, JR.
Assistant Secretary and Commissioner
of Patents and Trademarks

REEXAMINATIONS

FEBRUARY 26, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,094,432 (1418th)
INDUSTRIAL DRUMS
Seymour Zilbert, Demarest, N.J., assignor to Bergen Barrel & Drum Co., Demarest, N.J.
Reexamination Request No. 90/001,878, Oct. 30, 1989.
Reexamination Certificate for Patent No. 4,094,432, issued Jun. 13, 1978, Ser. No. 767,137, Feb. 9, 1977.
Int. Cl.[5] **B65D** *1/12, 25/14*
U.S. Cl. 220—404

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** and **11–21** is confirmed.

Claim **10** was previously disclaimed.

1. An industrial drum constructed of synthetic resin material and capable of being gripped by a clamp of a drum-handling apparatus to facilitate mechanized handling of the drum, said drum comprising:

a generally tubular body member extending longitudinally between opposite ends and including a cylindrical side wall;

first and second end members, at least one of which is unitary with the tubular body member at one end thereof and closes said one end, the first and second members each including a circular end wall; and

at least one chime molded unitary with a member of the drum, the chime having a configuration including portions extending longitudinally and laterally outwardly for being gripped by the clamp of the drum-handling apparatus, the chime being annular and being located at the intersection of one of the end members and the body member so as to extend circumferentially around substantially the entire permimeter of said one of the end members, the longitudinally extending portion of the chime extending outwardly beyond the end wall of said one of the end members at said intersection and including an outer edge spaced longitudinally from said intersection, and the laterally extending portion of the chime extending laterally beyond the cylindrical side wall;

the tubular body member, and at least the one of the end members unitary therewith, being rotationally molded of a crosslinkable high density polyethylene resin having the ability to crosslink as the drum is molded.

B1 4,685,239 (1419th)
SPEAR POINT FOR FISHING SPEAR GUNS
Joseph B. LaMonica, Orange, Calif., assignor to Ann Runnels, Orange, Calif.
Reexamination Request No. 90/001,956, Mar. 13, 1990.
Reexamination Certificate for Patent No. 4,685,239, issued Aug. 11, 1987, Ser. No. 913,321, Sep. 30, 1986.
Int. Cl.[5] **A01K** *81/04*
U.S. Cl. 43—6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

1. A spear point for fishing spear guns which comprises:

a. a spear point shaft formed of a metal having a Rockwell hardness of at least 30, and distally bearing a pointed end;

b. an annular groove about the opposite end of said shaft from said pointed end; and

c. a spear point retainer sleeve formed of a softer steel than said shaft, and receiving in one end, said opposite end of said shaft, with an internally upset wall in said one end, opposite said annular groove and projecting therein, whereby said spear point is permanently secured to said spear point retainer sleeve.

B1 4,742,142 (1420th)
METHOD FOR PRODUCING SILICONE RUBBER POWDER
Koji Shimizu, and Mitsuo Hamada, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd.
Reexamination Request No. 90/001,991, Apr. 9, 1990.
Reexamination Certificate for Patent No. 4,742,142, issued May 3, 1988, Ser. No. 34,368, Apr. 6, 1987.
Filed Apr. 9, 1990, Ser. No. 34,368
Claims priority, application Japan, Apr. 17, 1986, 61-89063
Int. Cl.[5] **C08G** *77/06*
U.S. Cl. 528—15

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** to **5** are cancelled.

[1. A method for preparing a cured silicone rubber powder in the form of microfine particles, said method comprising (1) emulsifying a curable liquid silicone rubber composition in a mixture comprising water and a surfactant where said mixture is maintained at a temperature of from 0 to 25 degrees C., (2) curing the liquid silicone rubber into a powder by dispersing the resultant emulsion into water maintained at a temperature of at least 25 degrees C., and (3) isolating the resultant cured powder.**]**

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REISSUES

FEBRUARY 26, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

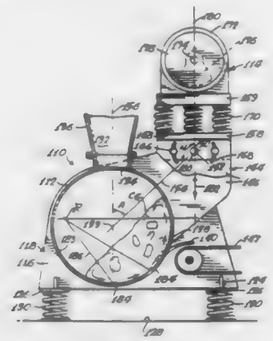
Re. 33,542
TUMBLING APPARATUS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Original No. 4,709,507, dated Dec. 1, 1987, Ser. No. 922,062, Oct. 22, 1986. Continuation of Ser. No. 777,821, Sep. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 685,121, Dec. 21, 1984, abandoned. Application for reissue Apr. 17, 1990, Ser. No. 516,711

Int. Cl.[5] B24B *31/06*

U.S. Cl. 51—7 **14 Claims**



2. Vibratory apparatus comprising:

a container having a central axis and a material supporting surface;

mounting means for resiliently mounting the container for unconstrained vibratory movement relative to a mounting surface;

vibration generator means [for generating] *mounted on said container at a location offset on one side of the central axis of the container, said vibration generator means comprising shaft means disposed substantially parallel to the central axis, an eccentric weight means carried by the shaft means, motor means for rotating the shaft means to generate* vibratory force *having a component* along a linear path offset from the central axis [and from a center of gravity] of the container on [the] *said one*side of the [center of gravity spaced from the] central axis *of the container,*

[said vibration generator means being mounted on the container] *said container and said vibration generator means having a center of gravity offset from said central axis of the container,*

said vibratory forces vibrating each point on the material supporting surface along segments of circles, each segment having a center at a position *offset* from said central axis and from the center of gravity [on the side of the central axis spaced from the center of gravity] *and on the opposite side of the central axis of the container from said linear path of vibratory forces.*

Re. 33,543
Patent Not Issued For This Number

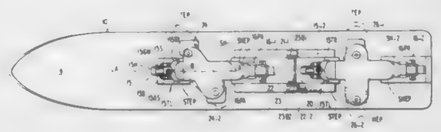
Re. 33,544
RELEASABLE BINDING SYSTEM FOR SNOWBOARDING

David Dennis, Virginia Beach, Va., assignor to Look Alpine Products, Inc., Highland Park, Ill.

Original No. 4,652,007, dated Mar. 24, 1987, Ser. No. 798,492, Nov. 15, 1985. Application for reissue Mar. 23, 1989, Ser. No. 331,325

Int. Cl.[5] A63C *9/00*

U.S. Cl. 280—618 **36 Claims**



25. Snowboard apparatus for supporting a rider having boots comprising,

a snowboard having a longitudinal axis,

releasable binding means secured to the forward and rearward ends, respectively, of said snowboard,

mounting plate means releasably engaged with said releasable binding means at the forward and rearward ends of said snowboard, respectively,

means for securing a rider's boots to said mounting plate means with the rider's trailing rear boot being substantially normal to said longitudinal axis and the rider's forward boot being secured to said snowboard at a predetermined angle relative to said longitudinal axis of said snowboard, and

means for causing a substantially simultaneous release of said mounting plate means and with both of said rider's boots being secured thereto, from said snowboard upon the release of one of said forward and rearward releasable binding means.

Re. 33,545
PREPARATION OF A HIGH MOLECULAR WEIGHT POLY(ARYLENE SULFIDE KETONE)

Roger G. Gaughan, Piscataway, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,716,212, dated Dec. 29, 1987, Ser. No. 905,615, Sep. 5, 1986. Application for reissue Jul. 14, 1989, Ser. No. 379,858

Int. Cl.[5] C08G *16/00, 75/16*

U.S. Cl. 528—226 **12 Claims**

1. A method for preparing a poly(arylene sulfide ketone) comprising:

contacting in a reaction mixture (a) at least one polyhalobenzophenone, employing about [1.004:1 to about 1.038:1 molar ratios] *0.004 to about 0.038 molar excess* of alkali metal hydrosulfide relative to said polyhalobenzophenone, and at least one of (b) or (c), wherein (b) is at least one alkali metal sulfide and at least one alkali metal hydrosulfide, and (c) is at least one alkali metal hydroxide and at least one alkali metal hydrosulfide, under polymerization conditions effective for producing the poly(arylene sulfide ketone);

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PLANT PATENTS

GRANTED FEBRUARY 26, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,454

MINIATURE ROSE PLANT NAMED 'MICHOME'

Michael C. Williams, P.O. Box 203, Cross Hill, S.C. 29332

Filed Jan. 2, 1990, Ser. No. 459,468
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as herein shown and described, characterized particularly by high-centered blooms of light rose pink coloring, with firm, thick petals, borne freely on an upright plant with glossy dark green new foliage and semi-glossy darker green old foliage, said plant being easy to propagate from cuttings, and said blooms being long-lasting on the plant and as cut flowers.

7,455

ROSE PLANT NAMED DEVLOREN

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Jul. 24, 1989, Ser. No. 383,614
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. The new and distinct variety of greenhouse rose plant substantially as herein shown and described, characterized by its profuse and continuous production of flowers of large size and scarlet to crimson coloration.

7,456

MAGNOLIA TREE NAMED BUTTERFLIES

Philip G. Savage, and Roy G. Klehm, both of S. Barrington, Ill., assignors to Justine B. Savage and Sarah L. Klehm, both of South Barrington, Ill.

Filed Nov. 9, 1989, Ser. No. 433,960
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct cultivar of magnolia tree named Butterflies, as illustrated and described.

7,457

AZALEA HYBRID 'JESSICA DAWN'

Rose M. Mossholder, Fallbrook, Calif., assignor to Hines Nurseries Inc., Irvine, Calif.

Filed May 12, 1989, Ser. No. 351,138
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—56 **1 Claim**

1. A new variety of hybrid evergreen azalea plant as described and illustrated, characterized by a compact horizontally spreading form with ascending branches, a uniform, strong and vigorous rooting habit, and blooms which appear in clusters of two to four, is a mid-season bloomer (early March–April) in Irvine, Calif., the blooms having a diameter of about 7.6 to 8.9 cm, a double hose-in-hose open funnel shaped form with petaloid stamens, and petals having an upper surface marbled in four shades of pink.

7,458

KALANCHOE PLANT NAMED VANGUARD

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 16, 1989, Ser. No. 422,089
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct plant of Kalanchoe named Vanguard, as described and illustrated.

7,459

CARNATION NAMED HILSTEFA

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda b.v., Netherlands

Filed Jan. 23, 1989, Ser. No. 299,773
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct spray carnation cultivar substantially as herein shown and described, characterized by its relatively small flowers each having about thirty to thirty-four petals, the inner side of which have a dark pink coloration, the flowers being produced profusely on long, rigid and erect stems of a tall, strong plant having a vigorous and upright growth habit and abundant foliage.

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GRANTED FEB. 26, 1991

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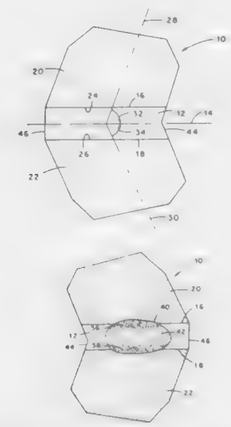
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564-216	4,996,322
377-060	4,996,686

PATENTS

GRANTED FEBRUARY 26, 1991

GENERAL AND MECHANICAL

4,995,114
UNIVERSAL EYE PATCH
James A. Price, Jr., 26 Windwood Hill, Jackson, Tenn. 38305
Filed Jan. 17, 1990, Ser. No. 466,246
Int. Cl.[5] A61F *9/00, 13/12*
U.S. Cl. 2—15 **14 Claims**



1. An eye patch comprising a relatively non-yielding central portion having a length dimension, and first and second wing portions, each having a length dimension, connected to and extending from said central portion on opposite sides of said length dimension along said central portion, said first and second wing portions each having an outer edge portion which defines an included angle of between about 65 and 75 degrees with a respective elongated edge of said central portion whereby when said eye patch is disposed in covering relationship to the eye, said central portion extends generally horizontally across the opening of the eye orbit and said wing portions extend angularly outwardly away from the nasal region to anchor the patch across the opening of the eye orbit.

4,995,115
GARMENT FOR A WHEELCHAIR OCCUPANT
Janice Ellis, 1221 Morton Ave., Aurora, Ill. 60506
Filed Mar. 12, 1990, Ser. No. 491,722
Int. Cl.[5] A41D *13/12, 27/10, 10/00*
U.S. Cl. 2—69 **8 Claims**



1. A garment for wear by a person while occupying a wheelchair, said garment comprising:
gown apparel including a body portion and sleeve portions, said gown further comprising selectively closable slits positioned along each side of said gown and thereby defining a back panel thereto moveable between an upper and lower position; and
means for fastening the lower edge of said back panel to the back of said gown when saaid back panel is raised to said upper position.

4,995,116
ARMS FREE PRIVACY CAPE FOR BREAST FEEDING INFANTS
Matthew R. Beauchamp, and Maryellen S. Beauchamp, both of 2056 Lincoln Rd., Yuba City, Calif. 95991
Filed Nov. 6, 1989, Ser. No. 432,376
Int. Cl.[5] A41D *1/26, 1/22*
U.S. Cl. 2—104 **4 Claims**



1. An arms free nursing cape worn over both a mother and a breast feeding infant under said nursing cape to provide a privacy covering for the mother and infant in a public place, said nursing cape being a covering folded along a shoulder section and draped over the mother's shoulders with said covering continuing downwardly from said shoulder section, the downward continuation of said covering divided into two substantially equal halves, there being a neck opening generally centrally through said nursing cape for the mother's neck, said two substantially equal halves being a front half and a back half, said front half divided into two front panels separated by a frontal opening extending through said neck opening and downwards from said neck opening through a bottom edge of said front half, said frontal opening releasably fastened closed by a fastening means, said shoulder section extending on both sides of said neck opening sufficiently to provide covering over the mother's arms, said front half of said nursing cape being of sufficient length to provide covering for the breast feeding infant, said two front panels each having one short transverse surveillance opening positioned over the breasts of the mother providing an opening to allow the mother to view the infant breast feeding under said front panels, said surveillance openings each having fastening means thereon adapted to provide releasable closing of said surveillance opening, said surveillance openings being openable in a generally horizontal plane limiting viewing therethrough downwardly by the mother wearing said nursing cape, stiffening means affixed to said nursing cape around said surveillance openings adapted to maintain said surveillance openings sufficiently opened for viewing by the mother of the breast feeding infant, said nursing cape fabricated of a pliable light weight material being foldable for storage in a purse or in a diaper bag.

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4,995,117

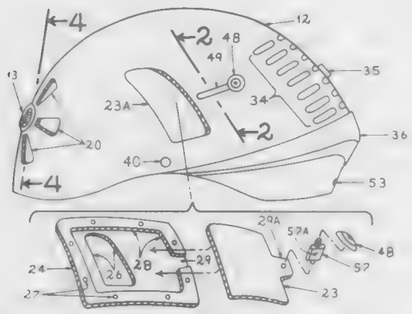
(AIRLOCK) BICYCLE HELMENT WITH ADJUSTABLE VENTILATION SYSTEMS AND ACCESSORIES

James A. Mirage, 50 W. 77 St., Dept. #10G, New York, N.Y. 10024, assignor to James A. Mirage, New York, N.Y.

Continuation-in-part of Ser. No. 270,823, Nov. 4, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 437,222

Int. Cl.[5] A42B *1/06*

U.S. Cl. 2—410 **22 Claims**



1. A helmet comprising an outer helmet shell and a buffer liner attached to the inner surface of said outer helmet shell, said helmet further comprising,

(a) front-facing ventilation openings arranged in a circular, daisie-like pattern, at a front of said outer helmet shell, as a means for ventilation,

(b) and singular vent openings on a left and a right side, of said outer helmet shell,

(c) and rearward facing exhaust openings comprising a plurality of apertures arranged in a louver-like pattern, at a rear of said outer helmet shell,

(d) chin straps attached to said helmet at the sides and at the rear of said outer helmet shell for the purpose of maintaining said helmet on a wearer's head,

(e) said liner being provided with openings corresponding to the openings of said outer helmet shell for ease of airflow to a wearer's head.

4,995,118

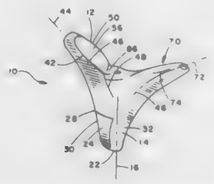
PRE-TIED NECKTIE SET

Anthony E. Paduano, Sr., 20 Irvington St., New Haven, Conn. 06513

Filed May 23, 1990, Ser. No. 527,343

Int. Cl.[5] A41D *25/00*

U.S. Cl. 2—150 **15 Claims**



1. A support element for use in a neckwear combination comprising:

a monolithic Y-shaped body having

(1) a cylindrical central portion which includes

(a) a longitudinal centerline,

(b) a front surface portion,

(c) a rear surface portion,

(d) a lower tip,

(e) an upper area spaced from said lower tip,

(f) a C-shaped slot extending along said central portion longitudinal centerline from said lower tip adjacent to said rear surface portion to adjacent to said upper area in said front surface portion, said slot being concave,

(g) side surface portions connecting said rear surface portion to said front surface portion, and

(h) all of said surface portions being curved around said longitudinal centerline, with said side surface portions having similar curvatures which are different from the curvature of said front surface portion which is different from the curvature of said rear surface portion, with said side surface portions being planar adjacent to said slot,

(2) a wing section extending from said body central portion upper area and including

(a) a first wing extending at a skewed angle with respect to said central portion longitudinal centerline and extending upwardly from said lower tip and which includes

(i) a longitudinal axis which extends at an angle that is skewed with respect to said central body longitudinal centerline and which is in a plane different from a plane containing said central body longitudinal centerline,

(ii) an outer tip,

(iii) a front surface which is located adjacent to said central body portion front surface and which is curved about said first wing longitudinal centerline, said first wing front surface merging with said central body front surface and having a curvature that is different from the curvature of said central body front surface curvature and intersecting said central body front surface to form a rounded shoulder which extends at a skewed angle with respect to said central body longitudinal centerline,

(iv) a rear surface which has a curvature about said first wing longitudinal centerline, said first wing rear surface being in a plane that is different from a plane containing said central body rear surface,

(v) a top surface which slopes downwardly toward said central body lower tip from said first wing front surface to said first wing rear surface,

(vi) a concave dimple defined in said first wing outer tip,

(vii) a concave groove defined in said first wing top surface from adjacent to said outer tip and extending along said first wing longitudinal centerline,

(b) a second wing extending at a skewed angle with respect to said central portion longitudinal centerline and extending upwardly from said lower tip and which includes

(i) a longitudinal axis which extends at an angle that is skewed with respect to said central body longitudinal centerline and which is in a plane different from a plane containing said central body longitudinal centerline and which is skewed with respect to said first wing longitudinal centerline and in a plane that is different from the plane containing said first wing longitudinal centerline,

(ii) an outer tip,

(iii) a front surface which is located adjacent to said central body portion front surface and which is curved about said second wing longitudinal centerline, said second wing front surface merging with said central body front surface and having a curvature that is different from the curvature of said central body front surface curvature and different from the curvature of said first wing front surface and intersecting said central body front surface at said rounded shoulder,

(iv) a rear surface which has a curvature about said second wing longitudinal centerline, said second wing rear surface being in a plane that is different from a plane containing said central body rear surface and forming a continuation of said first wing rear surface,

(v) a top surface which slopes downwardly toward said central body lower tip from said second wing front surface to said second wing rear surface, said second wing top surface having a curvature which is different from said first wing top surface curvature and intersecting said first wing top surface to form a top surface shoulder which extends at a skewed angle with respect to said rounded shoulder and which is located in a plane that is different from a plane containing said rounded shoulder,

(vi) a concave dimple defined in said second wing outer tip,

(vii) a concave groove defined in said second wing top surface from adjacent to said second wing outer tip and extending along said second wing longitudinal centerline.

4,995,119

PROTECTIVE GLOVE OR GLOVE LINERS

Doris Codkind, 10 Houston Ave., Monroe, N.Y. 10950

Filed Nov. 18, 1988, Ser. No. 273,450

Int. Cl.[5] A41D *19/00*

U.S. Cl. 2—163 **13 Claims**



13. A glove for protecting long fingernails comprising

an outer protective layer in the form of a flexible polymeric glove having a plurality of finger stalls of a length sufficient to accommodate fingernails which extend past the distal end of the fingertip, the outer protective layer having an inner surface and an outer surface;

a least one flexible polymeric finger pad of a dome-shaped and curved configuration and of a length at the distal end of the fingertip sufficient to accommodate fingernails which extend past the distal end of the fingertip, installed in a finger stall, said pad being substantially impenetrable to sharp objects, the finger pad having an outer surface, an inner surface and a proximal length substantially less than the length of the finger stall in which the pad is installed, the outer surface of the pad being adhesively secured to the inner surface of the outer protective layer; and optionally

an inner protective layer in the form of a flexible polymeric glove having a plurality of finger stalls of a length sufficient to accommodate fingernails which extend past the distal end of the fingertip, the inner layer having an inner surface and an outer surface, the outer surface of the inner protective layer being adhesively secured to the inner surface of the flexible polymeric finger pad and in abutment with the inner surface of the outer protective layer.

4,995,120

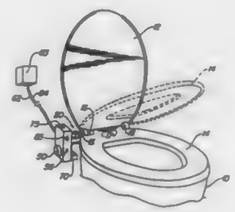
TOILET SEAT CLOSING DEVICE

Benny L. Tager, Rte. 5, Box 7013, Quinlan, Tex. 75474

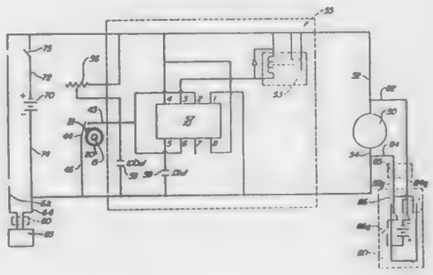
Filed Aug. 16, 1989, Ser. No. 394,576

Int. Cl.[5] A47K *13/10*

U.S. Cl. 4—251 **12 Claims**





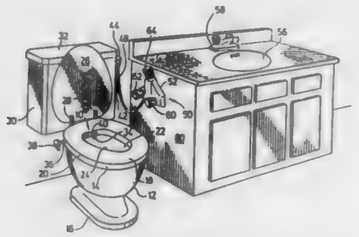


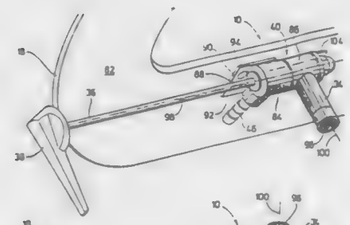
1. A toilet seat connectable to a toilet bowl comprising: a toilet seat; means pivotally securing said toilet seat to a toilet bowl, said means being rotatable to move said toilet seat from a generally horizontal plane to a generally vertical plane; a motor; ratchet means drivingly connecting said motor to said toilet seat, said ratchet means being adapted to permit said toilet seat to be rotated manually from a generally horizontal plane to a generally vertical plane; and timer means associated with said motor to energize said motor to move said toilet seat from a vertical plane toward a horizontal plane upon expiration of a predetermined time period after said seat has been raised.

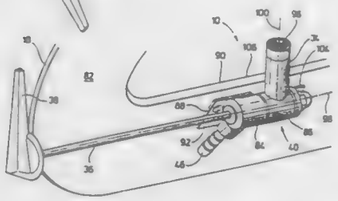
11. A toilet seat connectable to a toilet bowl comprising: a toilet seat; a primary power supply a remove power supply; a rod secured to said toilet seat; means pivotally securing said rod to a toilet bowl, said rod being rotatable to move said toilet seat from a generally horizontal plane to a generally vertical plane; a motor; means connecting said primary power supply and said remote power supply to said motor, said remote power supply being adapted for driving said motor in opposite directions to rotate said rod in opposite directions to rotate said seat between generally horizontal and vertical planes in the event of failure of said primary power source; and ratchet means connecting said motor to said rod, said ratchet means being adapted to permit said toilet seat to be rotated manually from a generally horizontal plane to a generally vertical plane.

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4,995,121
COMPACT BIDET ASSEMBLY WITH EXTERNAL ADJUSTMENT
Douglas J. Barker, 1280 Sunshine La., Southlake, Tex. 76092
Filed Sep. 22, 1989, Ser. No. 410,956
Int. Cl.[5] A47K *3/22, 3/20;* A61H *35/00*
U.S. Cl. 4—443 8 Claims







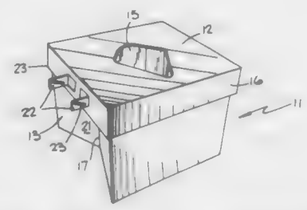
1. An improved compact bidet assembly for inobtrusive attachment to the seat portion of a conventional toilet to be used by a seated user for personal hygiene without otherwise significantly affecting appearance or use of the toilet, comprising a mounting spacer for attachment to the undersurface of a toilet seat adjacent the rearmost portion of the seat opening; a fixed element having a fluid inlet mounted on a portion of the mounting spacer; a rotatable element in fluid tight connection with the fixed element, having a fluid directing nozzle being rotatable with the rotatable element in response to a control rod extending from a portion of the rotatable element to at least the outer edge of the seat; a passageway in fluid communication between the fluid inlet and the fluid directing nozzle;

said mounting spacer having a flat mounting surface and a spacing surface, the fixed element being mounted on the spacing surface and providing support for the rotatable element, the rotatable element being spaced apart from the undersurface of the seat when the mounting spacer is positioned on the seat and mounted for use;

said control rod having a central axis which coincides with a central axis of the fixed element and a central axis of the rotatable element,

wherein the control rod passes through the fixed element and the rotatable element and includes means for rotatably fluid sealing the passageway in the fixed element; the control rod further including a locking surface which engages a corresponding locking surface formed in a wall of the rotatable element, a means for sealing the rotatable element from leakage and, means for drawing and holding the fixed and rotatable elements together in fluid tight engagement.

4,995,122
PORTABLE COMMODE
Elmer J. Mohnhaupt, P.O. Box 705, Evergreen, Colo. 80439
Filed Jul. 5, 1988, Ser. No. 214,947
Int. Cl.[5] A47K *11/02*
U.S. Cl. 4—483 5 Claims



1. A portable commode made of a biodegradeable material and having an operational mode and a transport mode comprising:

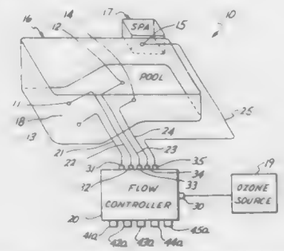
an outer base support configured as a rectangle with two opposing walls bent inwardly at preformed creases to form a bow-tie shape, that can be bent further at said preformed creases until almost flat when in the transport mode;

an inner base support that fits within said outer base, that can be folded almost flat when in the transport mode;

an upper seat part of lid-like construction which includes a top seat portion having an opening therein and downwardly extending edges, that fits over the top of said inner and outer base supports when in the operational mode;

said inner base support is configured as a rectangle with preformed creases in two opposing walls, so that said opposing walls may bend inwardly and outwardly, although tending to bend inwardly; said inner base support comprises an upper portion and a bottom portion and has first means for attachment on the upper portion at two opposite corners of said rectangle, said outer base support comprises an upper portion and a bottom portion and has second means for attachment on the upper portion in the center of the two walls adjacent to said opposing walls, and when in the operational configuration, said first means cooperate with said second means to hold the support bases together in a fixed physical relationship..

4,995,123
OZONE DISPERSION SYSTEM
Donald W. Kern, 5290 Orcutt Rd., San Luis Obispo, Calif. 93401
Filed Nov. 9, 1989, Ser. No. 434,919
Int. Cl.[5] E04H *3/20;* C02F *1/78*
U.S. Cl. 4—490 12 Claims



5. A system for sanitizing swimming pool water with ozone, comprising:

a swimming pool;

a source of ozone;

a plurality of ozone-injection ports at spaced-apart locations in the swimming pool;

means for communicating ozone from the source of ozone to each of the ozone-injection ports; and

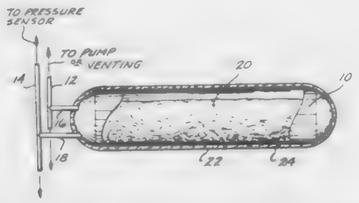
flow control means for controlling the rate at which the ozone flows from the source of ozone to each of the ozone-injection ports;

the plurality of ozone-injection ports including at least a first ozone-injection port located at a first elevation and a second ozone-injection port located at a second elevation that is different from the first elevation;

the flow control means enabling a user to separately adjust the rate at which the ozone flows from the source to each of the first and second ozone-injection ports in order to compensate for differences in hydrostatic pressure at the first and second ozone-injection ports; and

the means for communicating ozone including a manifold and the flow control means includes a plurality of manually adjustable valves carried by the manifold for separately controlling the rate at which the ozone flows from the source of ozone to each of the ozone-injection ports, respectively.

4,995,124
CONSTANT PRESSURE LOAD BEARING AIR CHAMBER
Wilbur S. Wridge, Jr., Portland, Oreg., and Lloyd D. Everard, Kent, Wash., assignors to Sustena, Inc., Kent, Wash.
Filed Oct. 20, 1988, Ser. No. 261,027
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—450 25 Claims



1. An air mattress capable of supporting a load comprising:

(a) an inflatable membrane defining a chamber having a chamber air pressure;

(b) load supporting material disposed in said chamber;

(c) a selectively actuatable air pump in fluid communication with said chamber to supply pressurized air thereto;

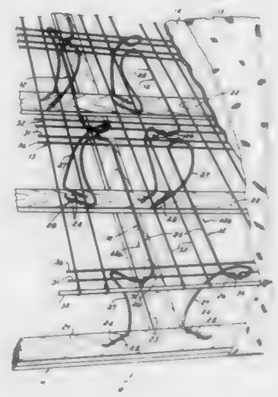
(d) a selectively openable vent valve in fluid communication with said chamber;

(e) a pressure sensor in fluid communication with said chamber for generating a sensed pressure signal representative of said chamber air pressure;

(f) a pressure selector generating a desired pressure signal representative of a desired chamber air pressure; and

(g) a control means connected to said air pump and said vent valve and receiving said sensed pressure signal and said desired pressure signal for maintaining said chamber at approximately said desired chamber air pressure whereby when the load on said membrane causes said chamber air pressure to rise above said desired air pressure, said vent valve is opened until at least a portion of the load is supported by said load supporting material so that said chamber air pressure falls to approximately said desired chamber air pressure.

4,995,125
BEDDING BOX SPRING HAVING SNAP-FIT MODULAR ELEMENTS
Timothy D. Dennison, Carthage, Mo., assignor to Leggett & Platt, Incoporated, Carthage, Mo.
Filed Aug. 7, 1990, Ser. No. 564,055
Int. Cl.[5] A47C *23/04*
U.S. Cl. 5—247 9 Claims



1. A box spring for supporting a bedding mattress, said box spring comprising

a rectangular base frame, said base frame comprising a pair of opposed side members, a pair of opposed end members, and transverse slats extending between said side members,

a plurality of modular spring elements mounted atop said base frame, each of said modular spring elements comprising a horizontal straight center section terminating in curved horizontal end sections, at least some curved end sections having spring sections extending vertically downwardly therefrom, said modular elements being arranged in parallel rows with adjacent elements of each row being spaced apart at said curved end sections,

a wire grid mounted atop said modular elements, said wire grid comprising a rectangular border wire and a plurality of pairs of wires extending between opposed sides of said border wire, each wire of said pairs of wires having a plurality of upwardly, open offset hooks formed therein, said offset hooks of one wire of each pair of wires being opposed to said offset hooks of the other wire of the same pair, and each pair of wires having a plurality of modular spring elements extending therebetween with the curved end sections of said modular elements being snap-fitted into said offset hooks such that said curved end sections of said modular elements extend beneath said grid wires on opposite sides of each of said offset hooks and are located above the open section of each of said offset hooks,

a fabric pad overlying said wire grid, and

an upholstered covering encasing said base frame, said modular elements, said wire grid, and said fabric pad.

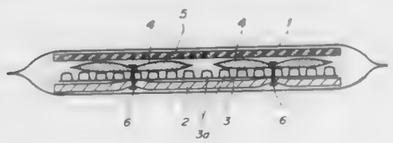
4,995,126
CUSHION WITH HEATING PAD
Toshihiko Matsuda, Mino, Japan, assignor to Marumanji Sangyo Co., Ltd., Osaka, Japan
Filed Apr. 23, 1990, Ser. No. 512,747
Claims priority, application Japan, May 18, 1989, 1-57656[U]
Int. Cl.[5] A47C *21/04;* A61F *7/08*
U.S. Cl. 5—421 2 Claims

1. A cushion comprising:

a ventilated outer bag (1) having a lower side and an upper side adapted to be contacted by the body of a user, said

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outer bag having an interior containing, in successive layers arranged between said lower and upper sides,
mat means (2) positioned adjacent to said lower side;
sheet means (3) disposed above said mat means, said sheet means having on its upper side at least one recessed air passage;



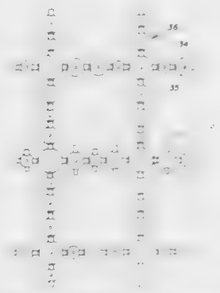
disposable heat pad means (4) at the upper side of said sheet means (3);
cushion means (5) between said heat pad means (4) and said upper side of said outer bag; and
fastener means (6) for interconnecting said mat means (2), sheet means (3) and heat pad means (4).

4,995,127

BED PAD, AN AUTOMOBILE SEAT PAD, A PILLOW OR A SIMILAR CUSHIONLIKE ITEM

Jitsuo Inagaki, 71, Aza Kamiyashiki, Itsusikicho Hazugun, Aichi, Japan 444-04

Division of Ser. No. 454,020, Dec. 20, 1989, Pat. No. 4,945,591, which is a division of Ser. No. 294,566, Nov. 2, 1988, Pat. No. 4,924,541. This application Mar. 12, 1990, Ser. No. 491,835
Claims priority, application PCT Int'l Appl.; Mar. 10, 1987, PCT/JP87/00146
Int. Cl.[5] A47C *27/00*
U.S. Cl. 5—461 **9 Claims**



1. An item for use as a bed pad, an automobile seat pad, a pillow, a cushion or the like, said item comprising an enclosure containing a large number of hollow and spherical stuffing elements of synthetic resin each having an airing hole therein, said stuffing elements being connected together vertically and horizontally in order to increase the airing function of the item.

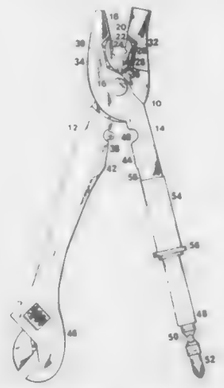
4,995,128

ELECTRICIAN'S COMBINATION TOOL

Robert D. Montgomery, 1685 W. 12th, Reno, Nev. 89503, and Harold L. Hull, 401 Canyon Way, Sparks, Nev. 89434

Filed Jan. 22, 1990, Ser. No. 468,135
Int. Cl.[5] B25B *7/22*
U.S. Cl. 7—127 **11 Claims**

1. A combination tool comprising; a first and second plier member having a jaw section, said jaw sections having cutting edges, said cutting edges being aligned so that they coact to cut an object placed between them when said jaw sections are pivotally displaced toward and away from each other, said cutting edges having at least one notch, said notches being aligned so that they engage a wire placed between them when said jaw sections are pivotable displaced toward and away from each other, a first and second handle section, said handle sections having a first and second position, said plier members being pivotably attached together to allow said jaw section to be pivotably displaced toward and away from each other by moving said first and second handle sections to and away from each other, said handle sections being substantially parallel to each other when said handle sections are in a first closed position, said handle sections being at substantially a ninety degree angle to each other when said handle section are in said second open position, a gripping area, said gripping area being an



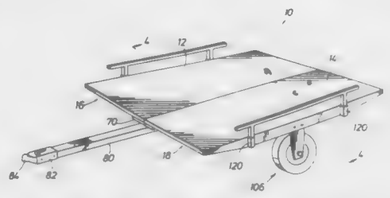
independent cylinder surround a section of said first handle, said cylinder cooperating with said first handle section to allow said cylinder to turn freely on said first handle section, said gripping area cooperating with said first handle section to allow the thumb and fingers of a user to grasp said gripping area of said first handle section of said first plier member to put substantially pressure on the distal end of said first handle section, said first handle section having on it's distal end means to receive and hold releasable attached tips, said second plier member having on it's distal end a crescent wrench, said first and second handle sections having means between them to grasp a wire, and said first and second handle sections having means between them to crimp an electrical connector.

4,995,129

COLLAPSIBLE TRAILER/RAMP ASSEMBLY

Mathis P. Comardo, 5301 Nolda St., Houston, Tex. 77007

Continuation of Ser. No. 179,628, Apr. 8, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 302,924
Int. Cl.[5] B65G *67/02*
U.S. Cl. 14—71.1 **20 Claims**



1. A collapsible trailer/ramp assembly comprising:
(a) a pair of generally rectangular deck plates having a plurality of end and side flanges extending downwardly therefrom and a plurality of structural members including transverse members extending downwardly from the

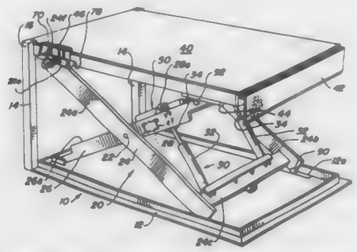
under side thereof and cooperating with said deck plates to form a pair of deck sections of efficient structural integrity, two of said side flanges of said deck plates being pivotally interconnected by hinge member at the lower portions thereof and forming a longitudinal pivot axis forming a longitudinal centerline of said trailer/ramp assembly and permitting said deck sections to form a compartmentalized box-like enclosure when folded about said longitudinal pivot axis, said deck sections when unfolded to substantially coextensive relation, forming a ramp for supporting objects moving thereon, said structural members defining opposed walls disposed in normal relation with said deck plates and forming wheel receptacle means and cooperating in the folded condition of said deck sections to form storage receptacle means for trailer parts, said opposed walls having pin receiving apertures formed therein;
(b) a pair of wheel assemblies each having a bifurcated wheel support providing wheel support legs supporting an axle and wheel and having close fitting relation between said opposed walls and thus being removably received in substantially immovable relation by said wheel receptacle means;
(c) a plurality of transverse structural bridge members being removably secured in assembly with said transverse members of said deck sections at spaced locations along the length thereof and in transverse relation to said longitudinal centerline and securing said deck sections to prevent folding thereof;
(d) drawbar means being removably received by said deck sections in parallel relation with said longitudinal centerline and providing hitch receiving means for connection to the trailer hitch of a tow vehicle; and
(e) a plurality of locking pins releasably securing said wheel assemblies, said transverse structural bridge members and said drawbar means to said deck sections.

4,995,130

DOCK LEVELER LIFT ASSEMBLY AND METHOD FOR OPERATION

Norbert Hahn, Franklin, Wis., and Robert W. Naegeli, Edmond, Okla., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Sep. 25, 1989, Ser. No. 411,866
Int. Cl.[5] E01D *1/00*
U.S. Cl. 14—71.3 **11 Claims**



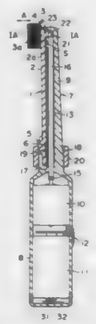
1. A dock leveler lift assembly for facilitating loading and unloading operations from a substantially horizontal platform surface of a loading dock, said assembly comprising
a frame having a base section, and a rear elevated portion adapted to be disposed adjacent to but beneath the platform surface;
a first means mountable on the base section and selectively movable between a predetermined lowered position, a predetermined elevated position, and a predetermined intermediate position;
a first actuating means connected to the first means for raising and lowering said first means;
a deck releasably mountable on said first means and movable between a lowered position and a raised position, the latter being substantially coplanar with the platform surface;
a lip hingedly connected to a front edge portion of the deck and movable between a depending position and an outwardly extended cantilevered position;
a second means disposed proximate a rear edge portion of the deck and releasably retaining the deck rear edge portion pivotally attached to the frame rear elevated portion;
a second actuating means mounted on said first means having a distal end operatively connected to the deck for affecting pivotal movement thereof between an upwardly inclined position and a lowered declining position,
whereby the lowering of the first means to the predetermined intermediate position allows pivotal movement of the deck to the lowered declining position when the second means has pivotally attached the rear edge portion of the deck to the frame rear elevated portion.

4,995,131

ELECTRIC TOOTHBRUSH

Hiroshi Takeda, 1-3-15, Tomigaya, Shibuya-ku, Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,118
Claims priority, application Japan, Nov. 25, 1988, 63-297822
Int. Cl.[5] A46B *13/02*
U.S. Cl. 15—22.1 **4 Claims**



1. An electric toothbrush comprising:
a holder having a tubular body, an electrical driving device in said tubular body, an arm having a longitudinal hole and extending from said tubular body, and a rotary shaft connected to said electrical driving device and extending through said longitudinal hole,
a toothbrush member having a longitudinal lever, a head portion at an end of said lever, a tail portion at the other end thereof, and brush-fillings implanted in a portion of said head portion,
transducer means for converting a rotational movement of said rotary shaft to a reciprocal, linear movement to said head portion so that said head portion is reciprocally moved at right angles relative to a longitudinal direction of said rotary shaft, and
fixing means for releasably holding said tail portion of said lever of the toothbrush member to said arm of said holder in a cantilever configuration.

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4,995,132

GUIDING DEVICE FOR SPIRAL PIPE CLEANERS

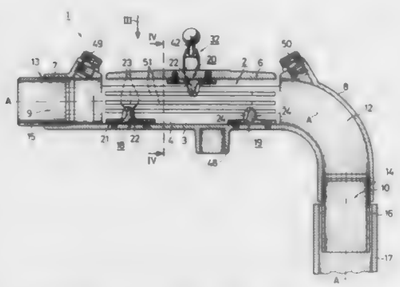
Reiner Seitz, Heisa-Eschenstruth, Fed. Rep. of Germany, assignor to ROWO Rohr und Kanal Reinigungsgernete GmbH, Hessisch-Lichtenau, Fed. Rep. of Germany

Filed Jun. 28, 1989, Ser. No. 372,863

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821667

Int. Cl.[5] B08B *9/02*

U.S. Cl. 15—104.33 18 Claims



1. Guiding device for a spiral pipe cleaner which is rotated about its axis to thread it through said guiding device, said pipe cleaner being of the type comprising a plurality of coil sections fixed to coupling elements which are connected to space adjacent coil sections apart by a distance D, said coil sections having a common coil axis and a common circumference, each coil section comprising a plurality of turns separated by interspaces, said guiding device comprising

a guide housing with opposed openings for receiving said pipe cleaner axially therethrough, said housing having engaging jaws fixed therein which are received in the interspaces and are aligned to positively engage the turns, said jaws being distributed in an axial succession in the housing about the circumference of the pipe cleaner, successive engaging jaws being circumferentially spaced apart, the axial distance between successive engaging jaws being greater than half of the distance D.

4,995,133

MOP HEAD COMPRISING CAPACITIVE WEB ELEMENTS, AND METHOD OF MAKING THE SAME

Robert D. Newell, 429 N. Main St., Roxboro, N.C. 27973

Continuation-in-part of Ser. No. 189,484, May 2, 1988, Pat. No. 4,923,738. This application Apr. 5, 1990, Ser. No. 505,062

Int. Cl.[5] A47L *13/20*

U.S. Cl. 15—229.001 27 Claims



1. A mop head comprising a unitary array of plural web elements, comprising elongate web element strands having involutions therein formed by differential stressing of elongate web element strips to a sufficient extent to permanently impart said involutions thereto and form said elongate web element strands therefrom, with said strands having a reduced transverse dimension relative to said elongate web element strips.

4,995,134

MOP CONNECTOR

Patrick H. Monahan, 239 S. Pine St., Arcola, Ill. 61910

Continuation of Ser. No. 95,323, Sep. 10, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,242

Claims priority, application New Zealand, Aug. 31, 1988, 225998; Australia, Sep. 6, 1988, 21887/88

Int. Cl.[5] A47L *13/258*

U.S. Cl. 15—151 14 Claims



1. Apparatus for connecting a mop to a handle comprising a mop support and a cap which are separate and distinct elements, said mop support comprising a narrow elongated saddle portion having at each end of one surface thereof means defining a relatively projected, self stabilized support strap, said support straps having a limited degree of flexibility and being laterally aligned and normally conditioned to position in a relatively outwardly biased divergent relation, said saddle portion of said mop support being adapted to mount a mop over, in draped relation thereto, and intermediate the limits thereof defined by said support straps, said support straps each having coupling means in connection therewith, said cap being an integral shell-like structure having a top and a peripherally dependent wall structure the dependent limit of which bounds an opening at its bottom and includes means for the interconnection thereto of a mop handle, said peripherally dependent wall structure being rectangular and oblong in horizontal section, the opposite most remote inner side wall surfaces of said dependent wall structure defining the limits of the length thereof, each of said opposite most remote portions of the inner surface of said wall structure having strap retention means in connection therewith, said retention means being cup shaped at least in part, disposed within the interior of said cap and, in the assembled relation of said mop support and said cap, respectively nesting coupling means of one of said support straps, within the cup shaped part thereof in the interior of said cap, in a laterally contained biased relation thereto precluding inadvertent or accidental displacement of said mop support from said cap, said strap retention means each comprising two strap-like portions which are in a side by side spaced parallel relation, connected at one end to one of said remote opposite portions of said inner surface of said wall structure and projected therefrom in the direction of the other of said remote opposite surface portions of said inner surface of said wall structure and the strap-like portions of the retention means which project therefrom.

4,995,135

OSCILLATING WIPER DEVICE FOR MOTOR VEHICLE WINDSHIELDS

Gerd Kühbauch, Bühlertal, and Gotthilf Schaller, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

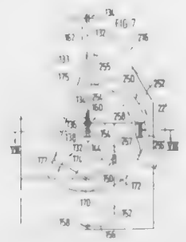
PCT No. PCT/DE87/00497, § 371 Date Apr. 4, 1989, § 102(e) Date Apr. 4, 1989, PCT Pub. No. WO88/03486, PCT Pub. Date May 19, 1988

PCT Filed Nov. 5, 1987, Ser. No. 347,771

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638159

Int. Cl.[5] B60S *1/44*

U.S. Cl. 15—250.21 12 Claims



1. An oscillating wiper device for windshields of motor vehicles, said oscillating wiper device comprising an elongate wiper arm including an inner partial arm having oscillating support means and bush guide means, and a rod-like outer partial arm having a longitudinal axis and a control element; a wiper blade supported by said rod-like outer partial arm; means cooperating with said control element of said rod-like outer partial arm for enabling rotation of said rod-like outer partial arm about the longitudinal axis thereof upon oscillating movement of said wiper arm, said bush guide means of said inner partial arm supporting said rod-like outer partial arm for rotation about the longitudinal axis thereof and for relative longitudinal displacement thereof relative to said inner partial arm during operation of said oscillating wiper device; an elongate swivelling arm extending transverse to said inner partial arm and pivotably secured thereto, said means cooperating with said control element of said outer partial arm being arranged on said elongate swivelling arm and extending transverse thereto; a guide column extending parallel to the longitudinal axis of said rod-like outer partial arm and adjacent thereto, said elongate swivelling arm being connected to said guide column; and a guide bush connected with said rod-like outer arm and slidably and rotatably mounted on said guide column.

4,995,136

CONTROL SYSTEM FOR AUTOMATIC CAR WASH BLOWER

Charles R. Smith, Erial, N.J., assignor to Sherman Industries, Palmyra, N.J.

Continuation-in-part of Ser. No. 280,125, Dec. 5, 1988, Pat. No. 4,949,423. This application Jan. 12, 1990, Ser. No. 464,248

Int. Cl.[5] B60S *3/06*

U.S. Cl. 15—312.1 15 Claims

1. Automatic car wash equipment comprising:

(a) a forced-air dryer including a blower for producing high velocity air and a nozzle for directing said high velocity air toward vehicles being washed;

(b) support means for mounting said forced-air dryer above a path followed by said vehicles to direct said high velocity air from said nozzle to surfaces of said vehicles;

(c) drive means for moving said nozzle along a path toward and away from said vehicles;

(d) imaging means fixedly mounted to said support means

(1) for beaming a first signal toward the vehicle being dried, said vehicle producing a reflected second signal; and

(2) for receiving said reflected second signal;

(e) means for comparing said first signal to said second reflected signal and producing an output signal representative of the position of said vehicle;



(f) means for measuring the position of the blower nozzle relative to the vehicle and producing a position signal corresponding to the relative position of the blower nozzle; and

(g) means responsive to said output signal and said position signal for controlling said drive means to position said blower and blower nozzle in a predefined close proximity range of said vehicle.

4,995,137

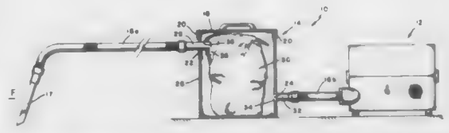
APPLIANCE FOR ASH REMOVAL

Per K. Reichborn, Greenwich, Conn., assignor to Goodway Tools Corporation, Stamford, Conn.

Filed Aug. 14, 1989, Ser. No. 393,593

Int. Cl.[5] A47L *5/36*

U.S. Cl. 15—327.1 1 Claim



1. An applicance for removing ash from a fireplace comprising a vacuum source, an intermediate container, and vacuum hoses attached to the intermediate container and defining a vacuum path from a fireplace through the intermediate container to the vacuum source, the intermediate container having a collector receptacle and a lid adapted for vacuum-tight attachment to the container, an inlet opening in the receptacle side wall to the interior of the receptacle, an inlet tube affixed to the side wall through the inlet opening having one portion thereof projecting into the interior of the receptacle defining a mounting for a vacuum bag and another portion thereof projecting outwardly from the side wall for receiving a vacuum hose defining a vacuum path to the fireplace, an outlet opening and an outlet tube affixed thereto for receiving a vacuum hose for defining the vacuum path to the source, the inlet and outlet tubes being located along a first container diameter on opposite sides of the container, a flame arrester covering the outlet opening, and a vacuum bag fitted to the inlet tube within the container and defining a closed portion of the vacuum path for receiving and containing soot and ash removed from the fireplace and cooperating with the flame arrester as first and

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second barriers to hot coals passing out of the container into the vacuum source, and a bail affixed along the second diameter displaced approximately 45° from the first diameter.

4,995,138

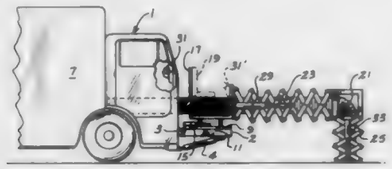
VACUUM APPARATUS FOR DEBRIS COLLECTION

Lawrence H. Pullen, 24301 Kakae Dr., Damascus, Md. 20872

Filed Nov. 6, 1989, Ser. No. 434,858

Int. Cl.[5] A47L *5/12*

U.S. Cl. 15—340.1 **3 Claims**



1. The combination with a motor vehicle for collecting debris having a vacuum tank collector and means for generating a vacuum therein comprising

a platform member mounted on the front of said motor vehicle for pivotal movement in a vertical plane,

first means for producing pivotal motion in said platform member,

a support base member mounted on said motor vehicle for pivotal movement in a horizontal plane,

second means for producing pivotal motion in said support base member,

an extendible tube having one end coupled to the vacuum tank collector and the other end adapted to be moved along the surface of the ground,

support linkage for supporting said tube along its length, one end of said support linkage being coupled to said support base member,

third means having one end coupled to said support base member and the other end coupled to said support linkage for extending and retracting said support linkage with respect to said support base member, thereby causing said tube to be extended or retracted,

whereby said tube is extendible and retractable along its longitudinal axis and pivotal in both horizontal and vertical planes.

4,995,139

TORQUE CONTROL SYSTEM FOR ENGINE PERFORMANCE TEST MACHINE FOR INTERNAL COMBUSTION ENGINES

Yorikatsu Suzuki, Kanagawa, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 402,790

Claims priority, application Japan, Sep. 5, 1988, 63-221582

Int. Cl.[5] G01L *5/13*

U.S. Cl. 73—116 **15 Claims**

15. A torque control system for an engine performance test machine for internal combustion engines comprising:

an oscillating type electric dynamometer including a rotor and an oscillating member being oscillatably supported around said rotor;

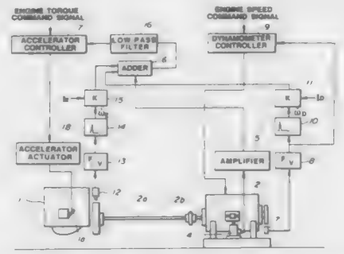
means for interconnecting the rotor shaft of said rotor and the rotating member of an internal combusion engine;

means for monitoring oscillating torque of said oscillating member to generate a signal representative of the oscillating torque;

means for generating a first torque signal representative of a first torque occurring at said rotor;

means for generating a second torque signal representative of a second torque occurring at said rotating member of said engine;

means for controlling the torque generated from said engine according to a control value derived on the basis of said



oscillating torque signal, and said first and second torque signals.

4,995,140

SLIVER CAN TRANSPORTING APPARATUS AND METHOD FOR A DRAW FRAME OF A TEXTILE MACHINE

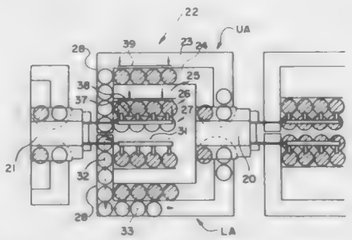
Siegfried Guenkinger, Heiningen; Markus Wurster, Owen/-Teck; Manfred Langen, Moenchengladbach, and Gregor Gebald, Korschenbroich-Pesch, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Feb. 2, 1990, Ser. No. 482,555

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905279

Int. Cl.[5] B65G *65/30*

U.S. Cl. 19—159 A **15 Claims**



1. A sliver can transporting apparatus for circulating sliver cans between a double row draw frame and a sliver supply station at which empty sliver cans are filled with sliver, comprising:

inner track means having a final can ready portion generally adjacent the double rows of the draw frame for supporting full sliver cans thereat in readiness for one-to-one replacement for empty sliver cans in the double rows of the draw frame, said inner track means extending from the sliver supply station and including means for transporting full sliver cans along said inner track means from the sliver supply station to said final can ready portion;

outer track means having a preliminary can ready portion generally adjacent said final can ready portion 11 of said inner track means for supporting a plurality of full sliver cans, said outer track means extending from the sliver supply station to the draw frame and including means for transporting empty sliver cans along said outer track means from the draw frame to the sliver supply station;

sliver can discharge means for discharging empty sliver cans from the draw frame to said outer track means;

final transfer means for transferring full sliver cans from said final can ready portion to the double rows of the draw frame; and

preparatory transfer means for transferring full sliver cans between said preliminary can ready portion and said final can ready portion.

4,995,141

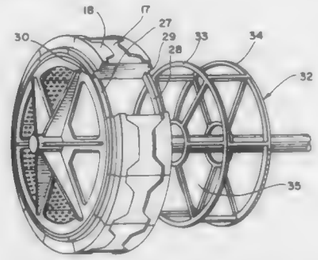
METHOD AND APPARATUS FOR FACILITATING PRODUCT CHANGEOVER IN THE MANUFACTURE OF FLUFF PADS FOR DISPOSABLE DIAPERS

Steven G. Gould, Denmark, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 16, 1990, Ser. No. 552,766

Int. Cl.[5] D01G *25/00;* **D04H** *5/05*

U.S. Cl. 19—148 **8 Claims**



6. Apparatus for facilitating product changeover in the manufacture of fluff pads for disposable diapers comprising a frame having a spaced bearing and clamp means, a tube slidably mounted in said bearing and clamp means, a shaft rotatably mounted in said tube and having an end extending beyond said tube, a pad forming drum mounted on said shaft end, said tube being slidable in said bearing means upon release of said clamp means to move said drum from a first position to a second position, a fluff delivery hood on said frame aligned with said drum when the drum is in said first position, said drum in said second position being unaligned with said hood, said drum having a plurality of circumferentially extending screen forms releasably mounted thereon, said forms being releasable from said drum when said drum is in said second position.

4,995,142

APPARATUS FOR REMOVING FIBER FLOCKS FROM A LINE OF FIBER BALES

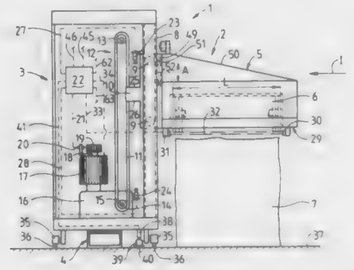
Rolf Binder, Schottikon, Fed. Rep. of Germany, and Daniel Hanselmann, Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Feb. 3, 1989, Ser. No. 306,402

Claims priority, application Switzerland, Feb. 4, 1988, [illegible]

Int. Cl.[5] D01G *7/00*

U.S. Cl. 19—80 R **9 Claims**



1. An apparatus for removing fiber flocks from a line of fiber bales, said apparatus comprising:

at least one machine frame mounted for reciprocating along a path parallel to a line of bales;

at least one fiber removal means mounted in said machine frame for vertical up and down movement over a fiber bale, said means including at least one rotatable and drivable removal roll for removing fiber flock from a respective fiber bale;

means for pivoting said fiber removal means about a pivot axis within said machine frame; and

control means for pivoting said removal means in said machine frame into a predetermined inclined position while simultaneously and independently moving said removal means vertically during movement of said machine frame along said path.

4,995,143

DOOR OPERATING MECHANISM

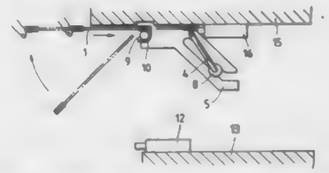
Toshiaki Demura, and Ikuo Tonoki, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan

Filed Feb. 8, 1989, Ser. No. 307,761

Claims priority, application Japan, Mar. 16, 1988, 63-34828; Jul. 30, 1988, 63-101925

Int. Cl.[5] E05D *11/06*

U.S. Cl. 16—357 **10 Claims**



1. A door operating mechanism for opening and closing a door with respect to a vertically-disposed opening of a case, said door adapted to move pivotally from a vertically closed position to a horizontally extended open position and horizontally from said horizontally extended open position to a horizontally retracted open position; said mechanism comprising:

hinge means for selectively connecting an upper end of the door to the case in a hinged manner so as to guide said pivotal movement of the door between a said vertical closed position and said horizontally extended open position wherein the door is extended outwardly from the case, said hinge means comprising a hook-shaped hinge member fixedly mounted on the upper end of said door; and a roller rotatably mounted on the case, said hinge member being selectively engaged with an outer periphery of said horizontally from said horizontally extended open position to a horizontally retracted open position; said mechanism comprising:

hinge means for selectively connecting an upper end of the door to the case in a hinged manner so as to guide said pivotal movement of the door between a said vertical closed position and said horizontally extended open position wherein the door is extended outwardly from the case;

means for guiding said horizontal movement of the door between said horizontal extended open position and said horizontal retracted open position where the door is received in the case;

a lateral movement preventing bar, said lateral movement preventing bar being defined by a main straight portion, a pair of opposed arm portions extending right-angularly respectively from opposite ends of said main straight portion, and a pair of end portions extending right-angularly respectively from one end of said opposed arm portions respectively remote from said main straight portion, said main straight portion being pivotally secured to the upper end of the door in such a manner that said lateral movement preventing bar is prevented from moving laterally of the door, said guiding means comprising a pair of opposed guide plates adapted to be fixedly mounted respectively on opposed said walls of the case and each having a slot, each of said end portions of said lateral movement preventing bar being engaged in a respective one of said slots so as to be moveable therea-

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long in such a manner so that lateral displacement of said lateral movement preventing bar is prevented.

4,995,144

CONNECTOR

Martin F. Gateley, Kings Langley, England, assignor to Systemworks Limited, Hertfordshire, England

Filed Sep. 28, 1989, Ser. No. 414,028

Claims priority, application United Kingdom, Sep. 29, 1988, 8822880

Int. Cl.[5] E05D *7/00*

U.S. Cl. 16—261 **12 Claims**

9. An assembly comprising two elongate profile members connected together by two or more connectors for movement about a longitudinal hinge axis between a first, facing position in which a transverse axis of each said profile member extends in a common plane containing said hinge axis, and a second, side by side position, in which the transverse axes of the two profile members are substantially parallel and are on opposite sides of said hinge axis, wherein each said connector comprises two elongate link members each extending between and coupling the two profile members, said link members being arranged to cross relative to each other at a central portion of each link member in said first position of the profile members, and to extend substantially parallel to each other in said second position, wherein the connectors further comprise two connecting parts hingedly connected by way of said link members, each said connecting part being connected to a respective profile member whereby the two profile members are in their turn hingedly connected together, each said connecting part comprising a substantially U-shaped bracket fastened into a corresponding recess provided in the respective profile member, one end of each of the link members being received within, and pivotably fastened to, the U-shaped bracket, and wherein each said link member comprises an elongate web having a first face carrying two spaced, projecting pins and a substantially planar second face, the two link members being arranged with their second faces adjacent and with their pins projecting substantially longitudinally in opposite directions away from one another, the link members extending into the connecting parts with their pins being received in appropriate bores or recesses in the connecting parts.

4,995,145

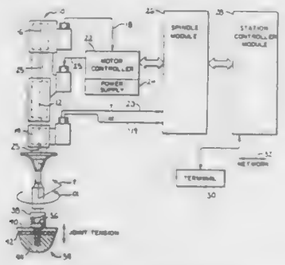
REDUCTION OF RELAXATION INDUCED TENSION SCATTER IN FASTENERS

Siavash Eshghy, Solon, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jan. 8, 1990, Ser. No. 461,633

Int. Cl.[5] B23Q *17/00*

U.S. Cl. 29—407 **8 Claims**



1. A method of tightening a threaded fastener in a joint that may experience relaxation of tension with time to produce a desired tension related to a dynamic torque T_d, using a nutrunner including means for sensing the values of the torque applied to the threaded fastener and the angle of rotation of the threaded fastener comprising the steps of:

(a) applying torque to the fastener for advancing the fastener with respect to the joint;

(b) ceasing the application of torque to the fastener at the dynamic torque level T_d;

(c) waiting a relaxation time t_{rec} without the application of torque to the fastener; and

(d) reapplying torque to the fastener until the fastener first advances with respect to the joint after the reapplied torque.

4,995,146

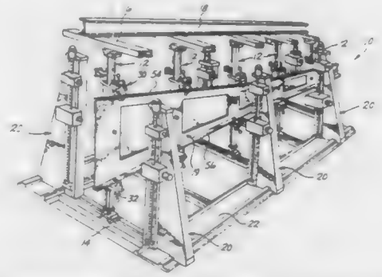
ASSEMBLY JIG AND METHOD FOR MAKING WING SPARS

Quentin T. Woods, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 26, 1988, Ser. No. 262,894

Int. Cl.[5] B23Q *3/02*

U.S. Cl. 29—281.3 **11 Claims**



1. A universal spar assembly jig characterized in that said jig is adaptable for use in producing wing spars having varies sizes, the size of any one wing spar being dictated by the particular wing design in which the wing spar is to be used, wherein each of said spars commonly include an elongated web, and upper and lower chord sections extending, respectively, along upper and lower longitudinal edges of said web, said spar assembly jig comprising:

a plurality of vertically upstanding spar-holding posts, each post including first clamp means, positioned adjacent said web's upper longitudinal edge, for both holding said web in a vertically upright position and for holding said upper chord section against said upper longitudinal edge, and second clamp means, positioned adjacent said web's lower longitudinal edge, for both holding said web vertically upright and holding said lower chord section against said lower longitudinal edge, wherein both said first and second clamp means are connected to said spar-holding post in a manner so that the vertical position of each clamp means is adjustable, to accommodate a variation in width of the web for the particular spar which is to be assembled on said jig; and

transverse track means for permitting lateral positional adjustment of said spar-holding posts with respect to each other along the length of said spar.

4,995,147

ROLL HAVING IMPROVED TRANSVERSE END SEALS

Karl-Heinz Ahrweiler, Willich, and Bernhard Funger, Krefeld, both of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Filed Dec. 15, 1989, Ser. No. 451,210

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843434

Int. Cl.[5] B21B *13/02*

U.S. Cl. 29—116.1 **19 Claims**

1. A roll comprising:

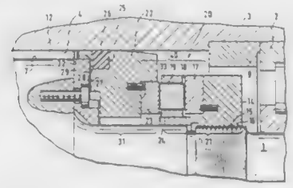
a rotatable hollow cylinder having an inner circumference and an outer working circumference;

a stationary crosshead extending lengthwise through the hollow cylinder to form a surrounding clearance space with the inner circumference of the hollow cylinder, said crosshead having ends protruding from the hollow cylinder upon which external forces for supporting the roll can be applied;

means provided in the clearance space for hydraulically supporting the hollow cylinder;

transverse end seals mounted near the ends of the crosshead extending between the crosshead and the inner circumference of the hollow cylinder to seal the clearance space, each transverse end seal including:

first and second radially extending, flat surfaces spaced from each other to define a clearance gap therebetween, said first and second surfaces being axially supported on the crosshead;



a first bearing ring mounted for rotation with the hollow cylinder and having ann outer portion, slightly displaceable relative to the remaining portion of the first bearing ring, sealing the clearance space at the inner circumference of the hollow roll, said first surface being formed on the first bearing ring;

a second bearing ring mounted on the crosshead; and

a roller bearing disposed between said first and second bearing rings maintaining, in conjunction with hydraulic fluid contained in the clearance space, the spacing between said first and second surfaces independent of relative displacement between the hollow cylinder and the crosshead.

4,995,148

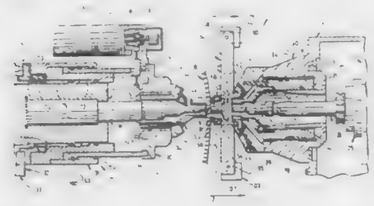
ROBOTICALLY CONTROLLED MULTI-TASK END EFFECTOR

Giovanni B. Bonomi, and Battistino Oldani, both of Rockford, Ill., assignors to IMTA, Rockford, Ill.

Filed Mar. 30, 1990, Ser. No. 502,541

Int. Cl.[5] B23B *39/18;* **B25J** *11/00*

U.S. Cl. 29—26 A **14 Claims**



1. A multi-task end effector attachable to the articulatably moveable twist head of a computer controlled robot capable of imparting multiple linear and rotational axis movements to the end effector, comprising:

generally cylindrical interface means for detachably connecting the end effector coaxially over the outer end of the robot's twist head; said interface means also coupling power actuated means of the end effector to power supply systems of the robot;

a generally cylindrical tool head having an elongated hollow body connected coaxially to the outer end of said interface means.

a generally cylindrical nose piece mounted coaxially over the outer end of said body for limited pivotal movement relative thereto; and

sensor means responsive to pivotal movements of said nose piece for indicating non-coaxial alignment of said nose piece and body.

4,995,149

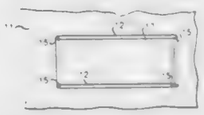
METHOD FOR HERMETICALLY SEALING ELECTRONIC DEVICES

Ram J. Arvikar, N. Andover, Mass.; John W. Benko, Trenton, N.J.; Alexander Coucoulas, Basking Ridge, N.J., and Thaddeus Wojcik, Hopewell, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 26, 1990, Ser. No. 498,789

Int. Cl.[5] H01L *41/22*

U.S. Cl. 29—25.35 **16 Claims**



1. A method for making a hermetically sealed package for an electronic device comprising the steps of:

making in a stencil member an opening in the shape of a closed loop that surrounds an inner portion of the stencil member;

the closed loop opening being an opening that is continuous except for a plurality of web members each of which extends across the opening to secure the inner stencil portion to the remainder of the stencil member;

forcing a glass slurry through the opening onto a first substrate so as to form on the first substrate a substantially closed loop of glass slurry;

glazing the slurry to form a glass loop that is bonded to the first substrate;

placing the first substrate over a second substrate such that the glass loop surrounds an electronic device and contacts the second substrate along the entire length of the glass loop;

heating the glass loop sufficiently to soften it and to cause it to bond to the second substrate;

and cooling the glass loop so as to develop continuous hermetic seals to both the first and second substrates, thereby to isolate the electronic device from the external environment.

4,995,150

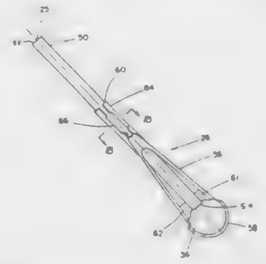
METHOD AND APPARATUS FOR MAKING FEMININE HYGIENIC INTERLABIA PADS

Roland W. Gerstenberger, Arden, and Philip E. Cantrell, Hendersonville, both of N.C., assignors to Xtramedics, Inc., Deerfield, Ill.

Filed Mar. 5, 1990, Ser. No. 488,989

Int. Cl.[5] D04H *1/22;* **A61F** *13/20*

U.S. Cl. 28—119 **14 Claims**



1. An apparatus for producing absorbent pads comprising:

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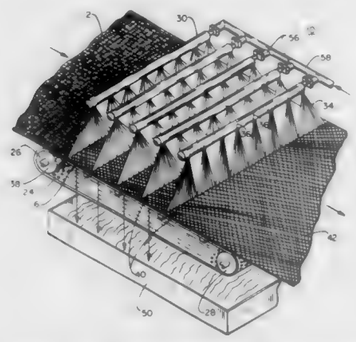
a supply of absorbent material in elongated rope form;
a supply of outer cover material in elongated web form; said web of outer cover material having parallel elongated edges;
a die for joining said rope of absorbent material and said web of outer cover material; said die including a hollow tube; said tube having first and second open ends; said first open end receiving said rope of absorbent material and said web; means for sealing the elongated edges of said web of outer cover material; said open end of said tube expelling an elongated strand including said rope of absorbent material covered by said sealed web.

4,995,151

APPARATUS AND METHOD FOR HYDROPATTERNING FABRIC

Jodie M. Siegel, Watertown, Mass.; Herschel Sternlieb, Brunswick, Me.; Timothy J. Connolly, Norwood; J. Michael Greenway, Westwood, both of Mass.; D. A. Parker, Somers, Conn., and Arlene T. Simon, Dorchester, Mass., assignors to International Paper Company, Purchase, N.Y.

PCT No. PCT/US89/01585, § 371 Date Jul. 17, 1989, § 102(e) Date Jul. 17, 1989, PCT Pub. No. WO89/09850, PCT Pub. Date Oct. 19, 1989
Continuation-in-part of Ser. No. 81,284, Apr. 14, 1988, Pat. No. 4,960,630. This PCT application Apr. 14, 1989, Ser. No. 411,491
Int. Cl.[5] D06B *5/08;* **D06C** *23/00*
U.S. Cl. 26—69 R **20 Claims**



11. A method for hydropatterning a visual pattern in a woven or bonded, nonwoven fabric, comprising the steps of:
conveying a sheet of the woven or bonded, nonwoven fabric along a machine direction supported on a support surface formed with a pattern of raised or solid areas and lowered or void areas interspersed therein;
directing a curtain of fluid downwardly to impact on the fabric as it is conveyed on the support surface, wherein said fluid curtain is substantially continuous across the fabric, such that a visual property of the fabric become altered in correspondence to the pattern of raised or solid areas and lowered or void areas of the support surface due to the impact of the curtain of fluid on the fabric against the support surface.

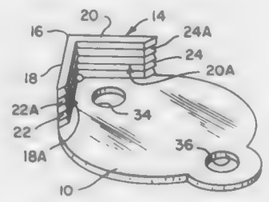
4,995,152

CHALKING LINE RETAINER

Edward T. Steckler, 124 Hershey Mill Rd., Apt. #A-1, Mountville, Pa. 17554

Filed Dec. 26, 1989, Ser. No. 456,535
Int. Cl.[5] F16G *11/00;* **B43L** *13/00*
U.S. Cl. 24—129 R **8 Claims**

1. A chalking string retainer for holding one end of a chalking string at the edge or corner of a surface to be marked with said string, said retainer comprising a plate, a bracket shaped in the form of a V depending from said plate, said V bracket having a pair of elongated legs forming an enclosed angle, said legs extending longitudinally adjacent a surface of said plate, a first hole on said retainer near the apex of the V through which



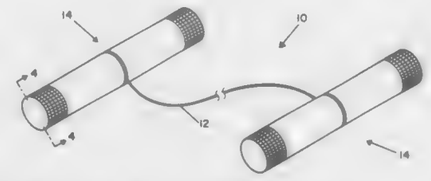
the string passes and at which the string is knotted and a second hole on said plate through which the string also passes for pulling.

4,995,153

GLASS CUT-OUT WIRE GRIPPER APPARATUS AND METHOD

Ray Asbery, Round Rock, Tex., assignor to Equalizer Tools, Inc., Round Rock, Tex.

Filed Mar. 9, 1990, Ser. No. 491,342
Int. Cl.[5] A21C *5/00*
U.S. Cl. 30—116 **14 Claims**



1. A glass cut-out device comprising:
(a) a length of cutting wire;
(b) a first handle piece for each wire end;
(c) a second handle piece for each first handle piece;
(d) a first grip surface formed on each first handle piece;
(e) an elongated wire and container extending into each first handle piece, each wire end container having a wire receiving opening through which a wire end may be inserted and a closed end at the end opposite to the wire receiving opening, each wire end container also being positioned on the first handle piece so that a portion of the wire near the wire end extends over a portion of the first grip surface when an end of the cutting wire is received in the container;
(f) a second grip surface formed on each second handle piece; and
(g) connector means for connecting each first handle piece to one of the second handle pieces with the first and second grip surfaces held closely together so as to grip at least some of the cutting wire extending over the first grip surface.

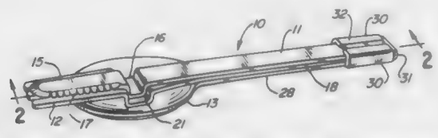
4,995,154

NESTING FLATWARE SET

David J. Bamber, Wichita, Kans., assignor to Coleman Outdoor Products, Inc., Wichita, Kans.

Filed Aug. 16, 1989, Ser. No. 394,487
Int. Cl.[5] A47J *43/28, 43/00*
U.S. Cl. 30—147 **11 Claims**

1. A nesting flatware set comprising a pair of eating utensils, each of the utensils having a pair of end portions and an intermediate locking portion, the intermediate locking portion of one of the utensils having a dovetail slot and the intermediate locking portion of the other utensil having a dovetail projec-



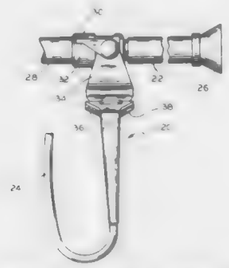
tion sized to be frictionally retained within the dovetail slot whereby the utensils are releasably retained together.

4,995,155

SHOWER SHAVER

Jefferson L. Gentry, Deerfield, Ill.; Alfons Rundzaitis, Beverly Shores, Ind., and Ronald O. Hilger, Elmhurst, Ill., assignors to Associated Mills, Inc.

Filed Mar. 29, 1990, Ser. No. 501,029
Int. Cl.[5] B26B *19/48, 19/38;* **B25F** *3/00*
U.S. Cl. 30—41 **8 Claims**



1. A shower shaver comprising a handle having an upper generally flat somewhat tray-like surface and further having a channel extending through said handle, said channel having two opposite ends one of which terminates at and communicates into said upper surface, a flexible tubing having a thin wall connected directly to said handle at an opposite end of said channel, said tubing having a length and wall thickness such that said shaver may be held in virtually any comfortable shaving position without requiring any special swivel fitting at any point between said tubing and said shaver, a generally flat cover part with an internal surface attached to and above the upper tray-like surface, said internal surface of said cover part and said upper surface of said handle part cooperating to form a generally flat somewhat fan shaped cavity, said shower shaver having an external surface with a forward edge having means thereon for attaching a razor blade thereto and at least one orifice in said cavity for emitting water directed toward said blade, said fan shaped cavity directing a sheet of water toward said orifice, thereby bathing said blade with a fast moving stream of water.

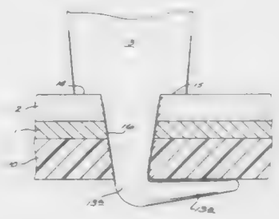
4,995,156

METHOD FOR ASSEMBLING COMPONENTS UPON PRINTED CIRCUIT BOARDS

Giuseppe R. Pinnavaia, Rieti, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 25, 1985, Ser. No. 748,390
Claims priority, application Italy, Oct. 4, 1984, 48499 A/84
Int. Cl.[5] H05K *3/32*
U.S. Cl. 29—838 **1 Claim**

1. A method for assembling electronic components upon printed circuit boards comprising the steps of:
providing a printed circuit board to have a selected thickness of conductive material on one side of the board embodied in circuit paths and portions of the circuit paths on which electronic components are to be mounted and to which the electronic components are to be electrically connected;
providing electronic components having lead pins which are tapered toward distal ends thereof and which have shoulders on the pins disposed to face said distal pin ends;
applying the distal ends of the tapered pins of the components upon the board in places on the conductive circuit path material on which and to which the electronic components are to be mounted and connected and pressing the components for forcing the pins to penetrate through the thickness of the board and conductive circuit path material to form respective tapered penetration hole portions in the board and entraining the conductive circuit path material into said tapered penetration hole portions thereby



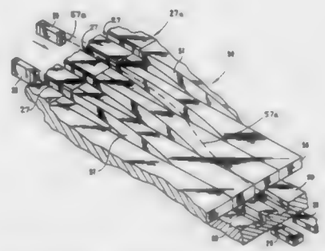
electrically engaging the pins with the entrained conductive circuit path material within the tapered penetration hole portions, abutting said side-shoulders with the conductive circuit path material adjacent the tapered penetration hole portions, and protruding the distal ends of the pins from an opposite back side of the board, said pressing being carried out with sufficient slowness for thereby entraining the conductive circuit path material to creep into the tapered penetration hole portions without discontinuities; and
clinching the distal ends of the pins protruding from the back side of the board for retaining the pins and pin shoulders in electrical engagement with the conductive circuit path material.

4,995,157

COMPONENT FEEDER SYSTEM

Douglas R. Hall, Indianapolis, Ind., assignor to Reel-Tech Inc.

Filed May 16, 1989, Ser. No. 352,750
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—740 **20 Claims**



1. A chip component handling and loading system for orienting and transporting a plurality of generally rectangular solid chip components, said system comprising:
dispensing means for storing and delivering a plurality of randomly oriented chip components;
a plurality of substantially parallel component conveying tracks disposed in cooperating communication with said dispensing means;

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a roll-over insert for changing the orientation of a plurality of generally rectangular solid chip components, each chip component having different length, width and thickness dimensions, said roll-over insert including (a) a plurality of entry ports arranged side by side and each being sized with a side-to-side width dimension corresponding to the thickness dimension of said chip components such that said entry port is only able to receive a corresponding chip component when it is oriented on its edge such that its side-to-side dimension is the thickness dimension and such that said entry port rejects any chip component which is oriented such that the side-to-side dimension of said chip component is either the length or width dimension of said chip component, (b) a plurality of exit ports arranged side by side and each being sized to a width dimension so as to receive the width dimension of the corresponding chip component and (c) a plurality of longitudinal channels, each having a longitudinal axis, connecting each entry port with its corresponding exit port, each channel configured with a helical twist about said longitudinal axis for turning the entering chip component approximately 90 degrees prior to leaving the exit port; and

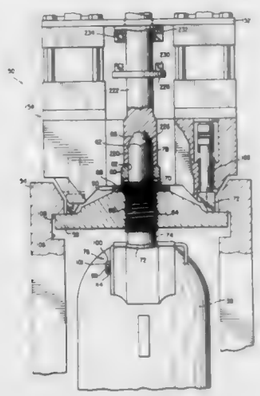
pick and place means for concurrently transferring a plurality of chip components from said plurality of exit ports to a different location.

4,995,158

APPARATUS FOR SERVICING A JET PUMP HOLD DOWN BEAM IN A NUCLEAR REACTOR

David A. Howell, Plum Boro; Jeffrey E. Hydeman, Murrysville; Jeffrey L. Slater, Munhall; Richard J. Bodnar, Monroeville; Leonard R. Golick, Trafford; Robert S. Sekera, Monroeville, and Charles H. Roth, Jr., N. Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 8, 1989, Ser. No. 308,271
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—723 39 Claims



1. An apparatus for replacing the hold down beam of a fluid circulating jet pump mounted in a nuclear reactor, the hold down beam having a beam body, a pair of opposed beam tabs and a pair of opposed beam positioning trunnions extending outwardly from the beam body, the apparatus comprising:

a housing having a lower surface configured to be positionable over the body of the hold down beam;

means coupled to said housing for engaging the beam trunnions and securing the beam body against the lower surface of the housing;

means coupled to said housing for depressing the beam tabs while the beam body is secured against the lower surface of the housing;

means coupled to said trunnion engaging means and said beam tab depressing means for selectively actuating said trunnion engaging means and said beam tab depressing means from a position remote from the nuclear reactor; and

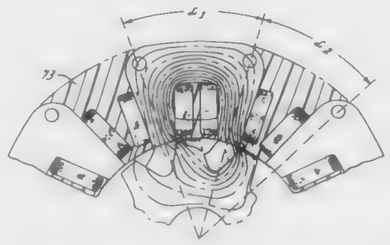
means connectable to said housing for selectively changing the directional orientation of the beam.

4,995,159

METHOD OF MAKING AN ELECTRONICALLY COMMUTATED RELUCTANCE MOTOR

Clyde J. Hancock, Loves Park, and James R. Hendershot, Rockford, both of Ill., assignors to Pacific Scientific Company, Newport Beach, Calif.

Division of Ser. No. 329,777, Mar. 28, 1989, which is a continuation-in-part of Ser. No. 232,436, Aug. 15, 1988, Pat. No. 4,883,999. This application Dec. 19, 1989, Ser. No. 452,513
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—596 4 Claims



1. A method of constructing a stator for a motor comprising the steps of:

cutting a plurality of U-shaped laminations from sheets of material characterized by high magnetic permeability;

stacking said plurality of U-shaped laminations to form a pair of poles;

winding insulated wire of a single phase about said pair of poles of said stacked U-shaped laminations such that energization of said windings forms magnetic poles of opposing polarity; and

repeating the foregoing steps for each phase of said motor and assembling the stacks of U-shaped laminations into an annular configuration that defines an annular spacing α_2 between adjacent poles of different pairs and an angular spacing α_1 between poles of the same pair, where the value of α_1 does not equal the value of α_2.

4,995,160

APPARATUS FOR MACHINING AXIALLY SYMMETRICAL WORKPIECE SURFACES

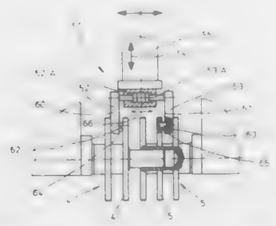
Karlheinz Schmid, Nürtingen, Fed. Rep. of Germany, assignor to Gebr. Heller Maschinenfabrik GmbH, Nürtingen, Fed. Rep. of Germany

Filed Feb. 9, 1989, Ser. No. 308,827
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804502
Int. Cl.[5] B23C *3/06*; B23Q *3/157*
U.S. Cl. 29—568 28 Claims

1. In an apparatus for machining axially symmetrical workpiece surfaces, including two vises on the same axis and receiving a workpiece between them for the workpiece that is to be machined, and two headstocks, each of which has an arbor for a respective tool, the two headstock arbors being on a common axis and each therewith holds an end portion of a respective tool therebetween, with said two tools being aligned with one another, said vise axis being parallel to said headstock axis, comprising the improvement therewith wherein:

each of said tools has two ends, with one end of one of said tools facing one end of the other of said tools, and

means for installation of said facing tool ends thus being supported against one another and including cooperating facing means on the tools so that said tools can be rotated independently and shifted axially relative to one another and so that for removal said tools are pushed together to such an extent that said tools are released from the arbors and can be automatically removed from the apparatus to minimize downtimes during removal and replacement of the tools.



2. An apparatus according to claim 1, in which said cooperating facing means comprise an axially extending projection at one end of the tool thereof, with the other of said tools being supported on said projection.

3. An apparatus according to claim 2, in which the other of said tools is provided with a recess for receiving said projection of said one tool.

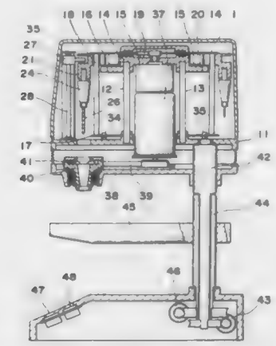
15. An apparatus according to claim 3, which includes a loading mechanism for the installation and removal of said tools.

4,995,161

ELECTRICALLY CONTROLLED MACHINE TOOLS WITH TOOL CHANGING MEANS

Yasushi Okamura, Yamaga; Toshiro Sosogi, Tamana, and Kosuke Takaki, Hotaku, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 3, 1989, Ser. No. 374,921
Claims priority, application Japan, Jul. 1, 1988, 63-165426; Jul. 1, 1988, 63-165428; Aug. 17, 1988, 63-204314
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 4 Claims



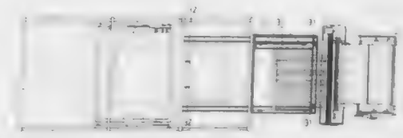
1. A machine tool which comprises a chassis, a magnetic chuck support rotatably mounted on the chassis and magnetically removably carrying a plurality of chucks in a circular row, each of said chucks holding an associated rotatable processing tool, a chuck carrier operable to remove one of the chucks, carried by the chuck support and brought to a predetermined position relative to the chassis, from the chuck support, and a chuck drive unit for driving the chuck, removed from the chuck carrier, to bring the processing tool into a condition ready to process a workpiece.

4,995,162

MATTRESS ASSEMBLY INSTALLATION USING POSITIONING ROBOT

Antonio Beteré Cabeza, Madrid, Spain, assignor to Fabricas Lucia Antonio Betere, S.A. (Flabesa), Madrid, Spain

Filed Jul. 11, 1989, Ser. No. 378,292
Claims priority, application Spain, Jul. 12, 1988, 8802191; Apr. 6, 1989, 8901202
Int. Cl.[5] B23P *19/04*; B68G *7/00*
U.S. Cl. 29—564.2 14 Claims



1. A mattress assembly installation, comprising:

a plurality of mattress padding material spools for supplying separate matress padding materials in a material supply direction;

a receiving stage positioned downstream of said spools for receiving the mattress padding materials from said plurality of spools such that the mattress padding materials are superposed;

cutting means for cutting superposed mattress padding material portions from the supply of the mattress padding materials from said spools, said cutting means moving transverse to said material supply direction;

a first gluing means for deposition regulable strips of adhesive on the superposed mattress padding materials in a longitudinal direction parallel to said material supply direction;

a second gluing means for depositing regulable strips of adhesive on the superposed mattress padding materials in a lateral direction perpendicular to said material supply direction, wherein said first and second gluing means together provide strips of adhesive at four sides of the superposed mattress padding materials portions;

a conveyor means for conveying said superposed mattress padding material portions; and

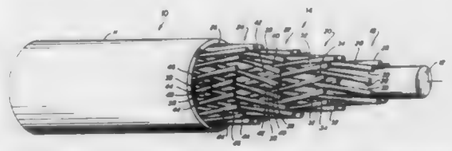
a folding means for receiving an inverted mattress covering thereon, receiving said superposed mattress padding material portions from said conveyor means on said inverted mattress covering, and folding said superposed mattress padding material portions together with said inverted mattress covering onto a spring frame of a spring casing.

4,995,163

METHOD OF ASSEMBLING A CHROMATOGRAPHY COLUMN

Marcel Golay, La Conversion, Switzerland, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 41,554, Apr. 22, 1987, Pat. No. 4,872,979. This application Aug. 25, 1989, Ser. No. 398,676
Int. Cl.[5] B23P *19/04, 25/00*
U.S. Cl. 29—527.1 10 Claims



1. A method of assembling a chromatography column com-

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prising the steps of; providing a cylindrical core element, forming plural layers of fibers onto said core element, each of said layers having plural fluid passageways, each of said passageways is defined by a space existing between every two adjacent fibers, wherein the step of forming the layers comprises,

winding an innermost layer of uniformly spaced fibers helically about the core element,

winding a plurality of concentric annular layers of uniformly spaced fibers about the innermost layer so that the fibers of each layer are helically wound about the next inwardly adjacent layer in reverse hand orientation relative to the next inwardly adjacent layer,

enveloping the outermost layer of fibers in a column housing, and

coating the fibers with stationary phase material.

4,995,164

MOTOR-DRIVEN CAN OPENER

Georg Borger, Steinbach; Hartwig Kahlcke, Kronberg, and Ludwig Littmann, Königstein, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 428,058

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1988, 3836925

Int. Cl.[5] B67B *7/46*

U.S. Cl. 30—423 **12 Claims**



1. A hand-held can opener for severing a lid from a can, comprising an elongated casing that defines a longitudinal axis, a drive wheel mounted on a shaft for rotation about a drive wheel axis, a cutter blade which is adapted to pivot about a cutter blade axis parallel to said drive wheel axis for operative association with said drive wheel, said casing having a working surface from which both said cutter blade and said drive wheel project, an electric motor arranged in the interior of said casing and having an output shaft that drives said shaft of said drive wheel through a gear train, said gear train including a series of spur gears, said electric motor, said spur gears and said drive wheel shaft being arranged along said longitudinal axis of said casing,

said output shaft of said electric motor, the shafts of said spur gears and said shaft of said drive wheel extending parallel to each other, and said longitudinal axis of said casing forming an angle (a) smaller than 90° with said shaft of said drive wheel.

4,995,165

ROLL-INDEPENDENT MAGNETO METER SYSTEM

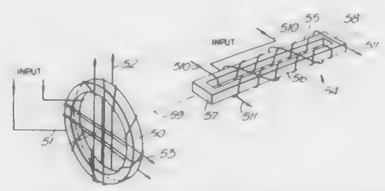
Brian W. Daniels, Weymouth, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 29, 1989, Ser. No. 416,238

Claims priority, application United Kingdom, Apr. 14, 1987, 8708953; Nov. 3, 1987, 8725715

Int. Cl.[5] G01R *33/04*

U.S. Cl. 33—361 **13 Claims**



1. A roll-independent magnetometer system comprising two magnetic field sensors, said system comprising:

a first magnetic field sensor mountable on a moveable object and arranged to have iso-angular flux sensitivity about a roll axis; and

a second magnetic field sensor mountable on the object and arranged to have sensitivity along the roll axis wherein said second sensor is an elongate toroidal magnetic body having a large length to width ration, arrangeable lengthwise of the roll axis of the object and dimensioned to permit accurate spatial colocation with the first sensor, said second sensor is provided with a primary coil for connection to a source of an energizing alternating signal and a secondary pick-off coil encircling the magnetic body and having an axis parallel to the roll axis;

the arrangement being such that a component of a magnetic field along the roll axis is measured by the second unidirectional sensor and the component of the magnetic field lateral to the roll axis is measured by the first sensor.

4,995,166

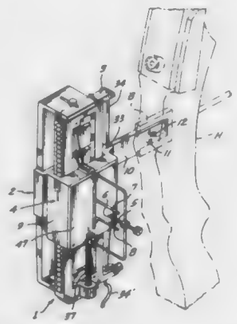
ARCHERY BOW RANGE FINDER AND SIGHT

Loren A. Knemeyer, 200 Rimrock Way Southeast, East Wenatchee, Wash. 98802

Filed May 18, 1990, Ser. No. 526,072

Int. Cl.[5] F41G *1/46*

U.S. Cl. 33—265 **13 Claims**



1. A range finder for an archery bow comprising an elongated frame having a cam member extending generally lengthwise thereof, means for mounting said frame on the bow in upright position extending generally lengthwise of the bow, a slide member movable lengthwise along said frame, a pair of spaced range finder pins, a cam follower member carried by said slide member and including a portion engageable by said cam member of said frame for adjusting the position of said follower member in a direction transversely of said frame as said slide member is moved along said frame, and pin-mounting means carried by said slide member and carrying said range finder pins, said pin-mounting means being moved by said cam follower member so as to adjust the spacing between said pins based on the position of said cam member of said frame relative to said slide member.

4,995,167

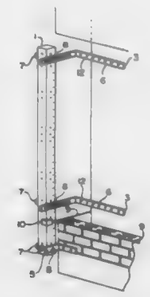
MASONRY GUIDE

William Sanchez, 303 Smith St., Clio, Mich. 48420

Filed Mar. 24, 1989, Ser. No. 328,403

Int. Cl.[5] G01C *15/10*

U.S. Cl. 33—404 **10 Claims**



1. A masonry guide for a building comprising:

(a) at least one vertical member having a first vertical face;

(b) at least two L shaped attachment brackets each having a first portion 90 degrees from a second portion thereof, the longitudinal axes of said portions being coplanar;

(c) means for connecting each first portion of each attachment bracket to the vertical member on the fast first vertical face thereof;

(d) means for attaching the second portion of each attachment bracket to a first surface of the building;

(e) an L shaped foot bracket having a first portion 90 degrees from a second portion thereof, the longitudinal axis of the portions being coplanar;

(f) means for attaching the L shaped foot bracket to the first vertical face of the vertical member.

4,995,168

TECHNIQUE FOR LOCATING SUBMERGED AND BURIED PIPELINES

James A. Shiner, 6926 Aswan, Corpus Christi, Tex. 78412

Filed Aug. 7, 1989, Ser. No. 390,385

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—529 **13 Claims**

1. A marine surveying device for locating pipelines buried under the floor of a body of water, comprising

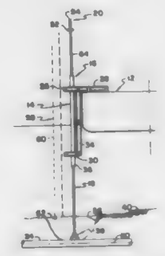
a barge having a template thereon including a multiplicity of vertical guides providing laterally spaced vertical axes extending into the water;

each of the vertical guides having a probe conduit constrained for vertical movement thereby and having

a foot on a lower end of each of the probe conduits of substantially larger cross-sectional size than the probe conduit and of substantially larger cross-sectional size than the guide;

means for delivering a pressurized fluid through each of the probe conduits for washing out the floor; and

means connected to the probe conduits for separately raising and lowering each of the probe conduits while delivering the pressurized fluid to penetrate the floor and locate the



buried pipeline by physical contact between the probe conduit and the buried pipeline

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4,995,169

DEVICE FOR INDICATING ANGULAR POSITION

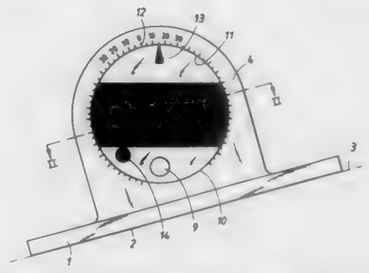
Göran Lundén, Falsterbo, Sweden, assignor to Moagon AG, Zurich, Switzerland

Continuation of Ser. No. 372,337, Jun. 19, 1989, abandoned. This application May 22, 1990, Ser. No. 527,651

Claims priority, application Sweden, Dec. 18, 1986, 8605437

Int. Cl.[5] G01B *3/56, 11/14;* **G01C** *9/12*

U.S. Cl. 33—534 **3 Claims**



1. A device for indicating angular position between a first part (5) and a part (6) which is rotatable relative to the first part, each of the parts exhibiting a grating (15, 16) consisting of a pattern which, for each grating, comprises opaque lines (17, 18), separated by interspaces (19, 20, 21, 22), the gratings together being arranged to provide an easily readable moreépattern which indicates whether the opaque lines in the one grating have a certain position relative to the opaque lines in the other grating, comprising:

the interspaces (19–22) of each grating (15, 16) exhibit mutually deviating width with a width increasing gradually over the height of the one grating (15) in a direction transverse to the longitudinal direction of the interspaces, and with a width gradually decreasing over the height of the second grating (16) transverse to the longitudinal direction of the interspaces in the same direction;

the opaque lines (17, 18) in each grating exhibit equal width and the opaque lines of the one grating (15) exhibit the same width as the opaque lines of the other grating; and

said two gratings (15, 16) being mutually identical but mirror-inverted so that the edge of the grating, at which the interspace having the least width is located, is located adjacent to the edge of the other grating (16), at which the interspace having the greatest width is located; and

said two gratings (15, 16) are so positioned in relation to one another that, at a central axis of symmetry (24), the one grating (15) exhibits a central opaque line (23) and the

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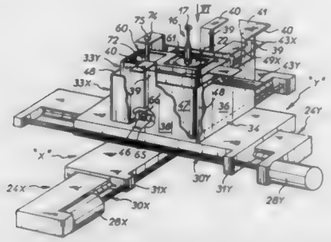
other grating (16) exhibits an interspace (25) directly in front of the central opaque line of the one grating.

4,995,170

CONTOUR READING DEVICE SUITABLE FOR USE ON EYEGLASS FRAMES

Francois Brulé, Sevran, and Alain Chansavoir, Luzancy, both of France, assignors to Essilor International Cie General d'Optique, Creteil Cedex, France

Continuation of Ser. No. 187,010, Apr. 27, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 503,102
Claims priority, application France, Apr. 28, 1987, 87 06021
Int. Cl.[5] G01B *7/28*
U.S. Cl. 33—551 **20 Claims**



1. Device for reading closed contours of articles, comprising a feeler adapted to continuously bear against and move with respect to an article to read its closed contour, a first carriage supporting said feeler, a guide guiding said first carriage for to-and-fro movement, a drive motor means for moving said first carriage on said guide, an auxiliary carriage associated with said first carriage and mounted for to-and-fro movement parallel to said first carriage, resilient means for floatingly mounting said auxiliary carriage relative to said first carriage and permitting limited movement in opposed directions, sensing means responsive to relative movement between said auxiliary carriage and said first carriage, said drive motor means effecting displacement of said feeler in bearing contact with the articles through said first carriage and said auxiliary carriage, said sensing means operably connected to said drive motor means for controlling the displacement of said feeler and for maintaining said feeler in bearing contact with an article in response to the relative movement between said auxiliary carriage and said first carriage.

4,995,171

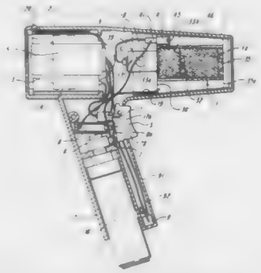
GAS COMBUSTION TYPE DRYER

Sadao Yoshinaga, Ichikawa, and Hiroyoshi Mashine, Souka, both of Japan, assignors to Prince Industrial Development Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00015, § 371 Date May 13, 1988, § 102(e) Date May 13, 1988, PCT Pub. No. WO89/06095, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 8, 1988, Ser. No. 214,736
Int. Cl.[5] A45D *2/00, 2/06*
U.S. Cl. 34—97 **4 Claims**

1. A gas combustion type dryer comprising:
- a dryer main body having a blowing barrel at the front thereof and a suction barrel at the back thereof, the former having a combustor therein and the latter having a fan, a fan motor and a battery therein;
- a handle mounted below said dryer main body, said handle having therein a liquefied gas tank and a piezoelectric unit for electric discharge ignition and having an actuator mounted at the inner and upper wall of said handle;
- a temperature controller mounted within said blowing barrel in cooperative association with said combustor; and
- a pressure regulator mounted within said handle and coupled to said liquefied gas tank;

wherein said pressure regulator is coupled to said combustor via said temperature controller via a tube, and said combustor comprises:
- a hollow tube main body having a jet nozzle at the back portion thereof and a combustion nozzle at the front portion thereof;



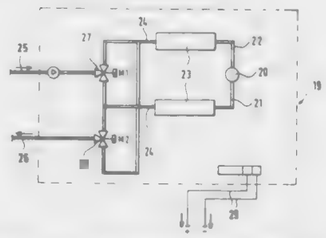
- a tubular heater net mounted on said hollow tube main body at its front outer periphery; and
- a block cover closing the front end of said heater net.

4,995,172

METHOD FOR HIGH-FREQUENCY DRYING OF COMBUSTIBLE GOODS AND, WITH FIRE SUPPRESSION

Kurt Friedrichs, Muckelhoven, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Fed. Rep. of Germany

Division of Ser. No. 323,805, Mar. 15, 1989, Pat. No. 4,896,433. This application Nov. 24, 1989, Ser. No. 504,412
Int. Cl.[5] F26B *3/34*
U.S. Cl. 34—1 **4 Claims**



1. A method of drying combustible goods by a high-frequency electric field wherein said goods are continuously advanced through a drying tunnel wherein moisture is extracted and then carried off by an air stream traversing said tunnel, the improvement which comprises extracting an increment of said air stream, passing said extracted increment through filter means to remove impurities other than CO from said increment, subjecting said filtered increment to a sensor adapted to evaluate CO content of said filtered increment and activating a fire control system responsive to concentrations of CO sensed by said sensor in excess of a predetermined concentration.

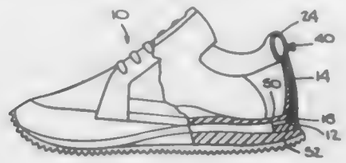
4,995,173

HIGH TECH FOOTWEAR

I. Martin Spier, New York, N.Y., assignor to Leonard Cooper and Judith Cooper, both of Pelham Manor, N.Y., a part interest

Filed Apr. 13, 1989, Ser. No. 337,265
Int. Cl.[5] A43B *13/20, 7/06*
U.S. Cl. 36—29 **10 Claims**

1. In footwear having a toe end and a heel end and having an outer sole extending from said toe end toward said heel end, said outer sole having an exterior surface for contact with the ground, and said footwear having an upper portion connected to said sole forming an enclosure for enclosing at least a part of the foot of a wearer between the outer sole and the upper portion, and within said enclosure an inner supporting surface for supporting the bottom of a foot, said inner supporting surface extending from the heel end toward said toe end, the improvement therein comprising:
- bladder means for holding air, said bladder means being positioned at least partially within said enclosure;
- pumping means including a compressible chamber for delivering outside ambient air to said bladder means by flexing said chamber, said pumping means being at least in part



located in a hollow space at said heel end, said hollow space being between said inner supporting surface and said exterior surface of said footwear, a flexible segment extending from a main portion of said sole and forming a surface of said hollow space and a portion of said exterior surface and having two ends, one said end being closer to said toe end of said footwear and connected to said main sole portion, said segment being subject to deflection by a force applied to said segment exterior surface, whereby said hollow space may be alternately reduced and returned to its unreduced size, in flexing in response to said force, the degree of flexure of said segment increasing as the distance from said main sole portion increases, said segment flexing said chamber to deliver said air.

4,995,174

SHOE WITH DETACHABLE TOE COVER

Ming-Che Hong, No. 5, Lane 76, Sec. 2, Shan Hsi Rd., Pei Chu, Taichung; Ching K. Wu, No. 1-4, Alley 174, Lane 77, Sec. 1, An Ho Rd., Tainan, and Martin Lee, Room 704, No. 592, Lin Sen N. Rd., Taipei, all of Taiwan

Filed Apr. 20, 1990, Ser. No. 512,740
Int. Cl.[5] A43C *13/14*
U.S. Cl. 36—72 R **3 Claims**



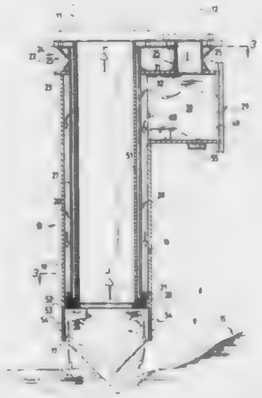
1. A shoe with a detachable toe cover including the combination of:
- (a) a toe cover (20) comprising a sheath portion (25) at an upper end thereof and a rim portion (21) at a lower end thereof which are integral with each other with, said sheath portion (25) having a rounded front end (24) and an open rear end (23), said rim portion (21) having respective apertures (22) proximate to distal ends thereof; and
- (b) a sole (10) with a placement track (11) at a front perimeter thereof for slidably receiving said rim portion (21), respective distal ends of said placement track (11) terminating in respective engagement cavities (12) which are substantially triangular in shape, said engagement cavities (12) having a securement wedge (13) which protrudes from a lower surface of said placement track (11) for engaging with said rim portion (21) at said aperture (22) thereof when said detachable toe cover (20) is slid to said distal ends of said placement track (11).

4,995,175

PNEUMATIC EXTRACTION HEAD

Johann Winter, Weikfeldstr. 9, 7085, Bopfingen-Aufhausen, Fed. Rep. of Germany

PCT No. PCT/EP88/00355, § 371 Date Oct. 20, 1989, § 102(e) Date Oct. 20, 1989, PCT Pub. No. WO88/08470, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 27, 1988, Ser. No. 424,263
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714073
Int. Cl.[5] E02F *3/88*
U.S. Cl. 37—63 **11 Claims**



1. Pneumatic extraction head for underwater debris, for instance, sand and gravel, comprising a housing including a debris inlet opening in an open underside and a flange plate located at the top of the housing for connection with an extraction pipe and a compressed air duct, wherein a connecting pipe surrounding the debris inlet opening extends inside the housing between the debris inlet opening and the flange plate for forming a compressed air space between the inner wall of the housing and the outer wall of the connecting pipe and plural compressed air outlet openings are provided in the compressed air space, said extraction head further comprising, a base plate surrounding the debris inlet opening and arranged at the underside of the housing, said plural compressed air outlet openings being arranged at the base plate around the debris inlet opening in spaced relationship to one another; nonreturn valves for controlling the exit of compressed air and at said plural compressed air outlet openings; and control means arranged for controlling selectively at least one of the nonreturn valves to cause arbitrary opening and closing;
- whereby air pressure exits from the compressed air outlet openings towards the debris, subsequent to which the air pressure, after being reversed, enters into the debris inlet opening together with the debris, and conveys the debris, together with the water, to the water surface.

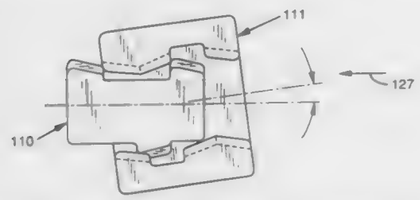
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,176

REPLACEABLE WEAR ELEMENT, ASSEMBLY AND METHOD

Terry L. Briscoe, Portland, and Paul C. Sprunger, Dundee, both of Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed May 24, 1990, Ser. No. 528,087
Int. Cl.[5] **E02F** *9/28*
U.S. Cl. 37—141 R **12 Claims**



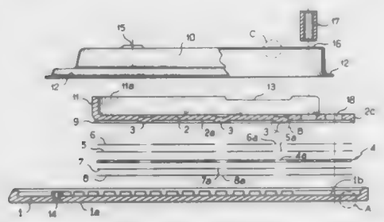
10. An assembly of wear elements for installation on the wearable part of a structure engageable with abrasive material comprising a relatively elongated base element adapted to be secured to said wearable part and a relatively elongated wear element releasably mounted on said base element along the longitudinal centerlines thereof said elements having confronting faces, each of said elements having opposed outstanding sidewalls equipped with mating dovetail surfaces within a plane containing the face thereof, a first sidewall of each element having a pair of longitudinally spaced apart dovetail surfaces both of which are inclined at the same angle to said centerline within said plane, the second of said opposing walls having a single dovetail surface inclined in said plane at the reverse angle to said centerline and positioned intermediate the adjacent ends of said first opposing wall pair of dovetail surfaces.

4,995,177

LAUNDRY-IRON SOLE-PLATE FORMED BY ASSEMBLING TOGETHER A PLURALITY OF METAL SHEETS BRAZED TO EACH OTHER

Bernard Louison, Chauanay, and Camille Burton, Villefranche s/Saone, both of France, assignors to SEB S.A., Selongey, France

Filed Dec. 29, 1989, Ser. No. 459,303
Claims priority, application France, Jan. 4, 1989, 89 00049
Int. Cl.[5] **D06F** *75/00, 75/14, 75/38, 75/18*
U.S. Cl. 38—88 **9 Claims**



1. A steam-iron sole-plate formed by assembling together a plurality of metal sheets brazed to each other and comprising a flat resistance heating element (**4**) between two of said sheets, wherein said sole-plate comprises :

a first plate (**1**) constituting, the sole-plate and having a face (**1***a*) adapted to come into contact with a textile article to be ironed, said first plate being formed by die-stamping a sheet of aluminum provided on the face (**1***b*) opposite to the face aforesaid with a roll-bonded layer of brazing alloy (**1***c*),

a second plate (**2**) constituting the bottom wall of a steam chamber and formed by die-stamping an aluminum sheet provided on the face (**2***a*) adjacent to the first plate (**1**) with a roll-bonded layer (**2***b*) of brazing alloy as well as with a series of bosses (**3**) in contact with said face (**1***b*) of the first plate (**1**) provided with a roll-bonded layer of brazing alloy,

said flat resistance heating element (**4**) being inserted between the two plates aforesaid (**1, 2**) and separated therefrom by electrically insulating layers (**5, 6, 7, 8**), the bosses (**3**) of the second plate (**2**) being engaged in gaps (**4***a*, **5***a*, **6***a*, **7***a*, **8***a*) formed in said heating element (**4**) and said insulating layers (**5, 6, 7, 8**),

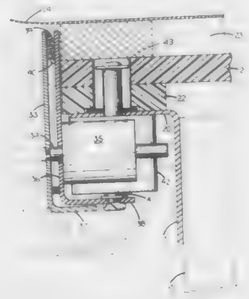
the two plates (**1, 2**) being assembled together by a peripheral fluid-tight brazed joint and a series of brazed joints formed at the level of the bosses (**3**).

4,995,178

MACHINE FOR STRETCHING FABRIC OVER A PANEL FRAME

Travis M. Randolph, 276 W. 13th St., Holland, Mich. 49423

Filed Sep. 19, 1989, Ser. No. 409,159
Int. Cl.[5] **D06C** *3/00, 3/08*
U.S. Cl. 38—102 **14 Claims**



1. A fabric-stretching machine having a frame and means on said frame providing a supporting surface, and also having opposed jaws disposed along at least a portion of the periphery of said supporting surface, said jaws being movably mounted with respect to said frame, wherein the improvement comprises:

means for establishing a direction of linear traversing movement of said jaws in a direction substantially perpendicular to said supporting surface from a position displaced from said supporting surface to and from a position to further displacement therefrom; and

means operable to open and close said jaws in a direction parallel to said supporting surface.

4,995,179

CARTRIDGE CLIP

Robert D. Switzer, 2200 N. Ft. Thomas Ave., Ft. Thomas, Ky. 41075

Filed Nov. 9, 1989, Ser. No. 413,279
Int. Cl.[5] **F41A** *9/25*
U.S. Cl. 42—50 **15 Claims**

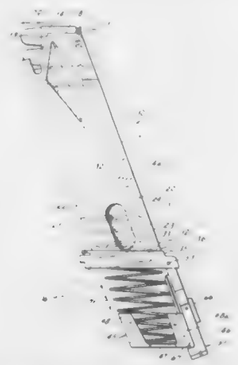
1. A spring release kit for a cartridge clip, said kit being initially detached from said clip, said clip having a magazine with an ejection end and a closed end, and a compression spring positioned within said magazine, cartridges that are loadable into said magazine being spring-loaded toward one end of said magazine for subsequent ejection therefrom, said kit comprising

a door frame initially detached from said magazine, said door frame being connectable to said magazine's closed end,

an access door mounted to said door frame, when said kit is connected with said clip said access door being movable between a closed position where said magazine is operable to eject cartridges loaded in said clip and an open position where said compression spring length may be extended out of said magazine's closed end through said door frame to relieve temporarily the compression spring force within said magazine while loading additional cartridges into said clip through said magazine's ejection end,

a spring seat within which one end of said spring is receivable when said kit is connected with said clip, said spring seat thereafter being telescopable through said door frame into said magazine when said access door is closed and telescopable through said door frame out of said magazine when said access door is open, and said one end of said compression spring thereafter being continuously seated in said spring seat whether said spring seat is telescoped inside or outside said magazine, and

a drop out limit device partially carried by said magazine and partially carried by said spring seat, said drop out limit device functioning to limit the telescope out position of said spring seat when said access door is in said open position.



4,995,180

GUN LOCK

Leslie R. Tucker, New Metford Farm, East Bower, and Robin Tucker, Channel View, Over Stowey, both of Nr Bridgewater, Somerset, England

Filed May 14, 1990, Ser. No. 523,380
Int. Cl.[5] **F41A** *17/02*
U.S. Cl. 42—70.07 **5 Claims**



1. A lock for a gun comprising:

a body having a rear face;

first and second elongate jaw means mounted to said body and extending rearwardly of said rear face, said first and second jaw means having oppositely directed hook formations;

pivot means pivotally mounting said first jaw means to said body so that it is pivotable towards and away from said second jaw means;

cam means displaceably mounted to said body adjacent said first jaw means, said cam means having a cam surface and said first jaw means having follower means for cooperating with said cam surface, said cam surface being shaped so that displacement of the cam means in one sense urges said first jaw means to pivot away from said second jaw means; and

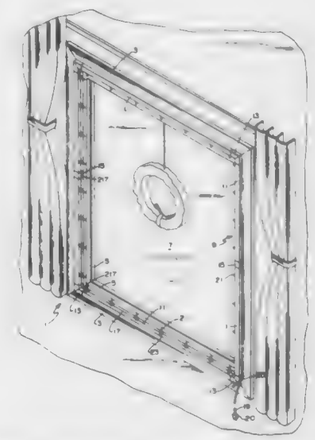
security actuator means for actuating displacement of said cam means.

4,995,181

LUMINOUS DISPLAY FRAME AND KIT

Hugh M. Wolf, 2343 S. Embers La., Arlington Heights, Ill. 60005

Continuation of Ser. No. 125,700, Nov. 27, 1987, abandoned.
This application Aug. 22, 1989, Ser. No. 398,290
Int. Cl.[5] **A47G** *1/06;* **G09F** *13/00*
U.S. Cl. 40—152.2 **21 Claims**



1. A frame for displaying a plurality of individual light bulbs which are connected by a common wire, comprising:

(a) a plurality of substantially tubular side frame members, each of which has at least five faces defining a hollow passage, wherein an adjacent pair of said faces have edges which are spaced apart so as to define a continuous longitudinal slot for receiving the common wire, the width of the slot being such that the spaced-apart edges serve as means for gripping and retaining the individual light bulbs at any point along the slot and substantially perpendicular to the slot; and

(b) a plurality of corner frame members, each corner frame members connecting the ends of two of said side frame members in a non-linear orientation;

at least one of said frame members having an exit passage through which the common wire extends.

4,995,182

SIGN HOLDER WITH SHELF ATTACHMENT

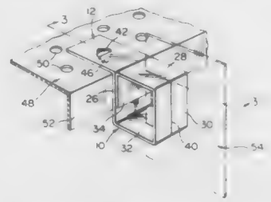
Jacob Fast, 7561 NW. 9th Street, Plantation, Fla. 33317

Filed Jul. 27, 1988, Ser. No. 224,822
Int. Cl.[5] **G09F** *3/20*
U.S. Cl. 40—649 **7 Claims**

1. A sign holder for attachment to supermarket and like product-display shelving for mounting a label or like card in a prominent position projecting from a front edge of a shelf, the holder comprising an elongate member in the form of a strip of flexible sheet material having a mounting panel, an elongate

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body portion extending from the mounting panel, securing means for securing a distal part of the body portion remote from the mounting panel to a proximal part of the body portion adjacent the mounting panel in a manner forming the body



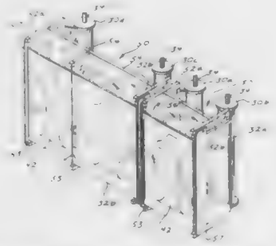
portion into a closed-loop formation, an elongate slit in the body portion between said parts for receiving the label or like card, and attachment means on the mounting panel for attaching the same to a shelf with the closed-loop formation projecting adjacent a front edge of the shelf.

4,995,183

SCROLLING SIGN WITH IMPROVED WEB GUIDE

Robert B. Aiken, Sr., 1970 Bobolink Avenue, Grafton, Wis. 53024

Filed Feb. 26, 1988, Ser. No. 160,791
Int. Cl.[5] G09F *11/18*
U.S. Cl. 40—518 18 Claims



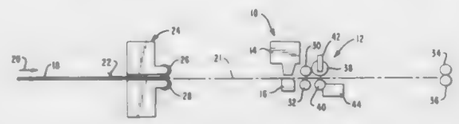
12. In combination, a scrolling sign having a framework and a sign face with a window in which indicia may appear, a pair of rotatable web rolls with a web containing serially arranged indicia wound thereon, said web extending along a path between the web rolls and across the window for selectively displaying indicia in the window, and a guide means for said web, said guide means comprising: a pair of plate-like members, said members lying along the path of the web and spaced from each other along the path, said members receiving the web, at least along an edge of each of said members, said web extending between said members from one member of said pair to the other member of said pair, said members lying parallel to each other and generally normal to the portion of the web extending between said members; brace means mounted to and extending between said plate-like members for joining said members into a unitary structure, said brace means extending between said plate-like members at a location removed from said edges of said plate-like members receiving the web so that the portions of said members containing said edges receiving said web are cantilevered beyond said brace means, adjustable length means extending between said cantilevered portions of said plate-like members, said adjustable length means establishing the distance between said plate-like members in a direction parallel to the path of the web; and means suitable for mounting said unitary structure containing said plate-like members on said framework so that said guide means positions the portion of the web extending between said members across the window.

4,995,184

PASSBOOK PAGE TURNING MECHANISM

Ken Ebato, Yokohama, and Susumu Sato, Ninomiya, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 6, 1989, Ser. No. 432,254
Claims priority, application Japan, Apr. 28, 1989, 1-107927
Int. Cl.[5] G09F *19/00*; B41F *19/00*; B41J *13/00*
U.S. Cl. 40—531 8 Claims



1. A page turning mechanism for a multiple-page record medium in a printer having means for feeding said multiple-page record medium along a feed path to a page turning station,

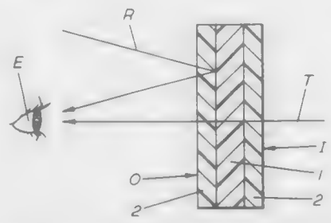
said page turning mechanism comprising a first movable roller and a second movable roller positioned at said page turning station, said first and second rollers being movable in a first direction parallel to said feed path to predetermined positions, means to rotate said first roller to turn up a page of said record medium, means for mounting said second roller for displacement from said first roller in said first direction parallel to said feed path and then for movement in a second direction perpendicular to said feed path toward said record medium so as to effect a bowed condition thereof, said first roller being movable from said predetermined position in a direction opposite said first direction parallel to said feed path for completing the turning of one page of said record medium.

4,995,185

PICTURE PLATE USING BOTH TRANSPIERCING LIGHT AND REFLECTION LIGHT

Chiang-Ming Cheng, 630-1, Diouke, Oaza-okubo, Urawa-shi, Saitama, 338, Japan

Filed Mar. 2, 1989, Ser. No. 317,991
Int. Cl.[5] G09F *13/16*
U.S. Cl. 40—582 12 Claims



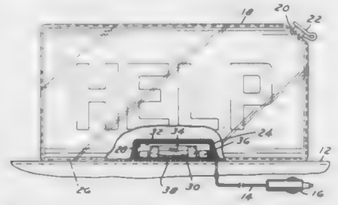
1. A device that uses either transpiercing light or reflection light to exhibit a visibly clear picture for both indoor and outdoor advertisement, display, or decoration purposes, said device comprising a semitransparent white plate fitted in between two transparent picture units each of the transparent picture units including one picture, the pictures being identical and in alignment with each other, and means for attaching each of the transparent picture units to the semitransparent white plate.

4,995,186

INFLATABLE WARNING SIGN

Russell Collie, Lake Worth, Fla., assignor to Boudreau and Collie, Lake Worth, Fla.

Filed Apr. 20, 1990, Ser. No. 511,744
Int. Cl.[5] G09F *21/04*
U.S. Cl. 40—591 9 Claims



1. An illuminated sign comprising a substantially airtight translucent bag, inflation means on the bag, said bag inflatable to a generally triangular prismatic shape with one of the rectangular sides thereof being the base of the bag,

illumination means for said sign comprising a box, lighting means in the box and a translucent cover forming a part of the box,

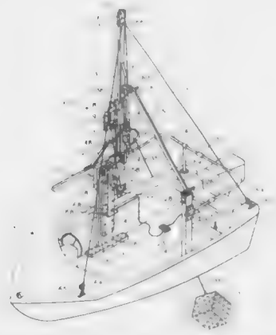
a pocket molded into the base of the bag and sized to accept the box, said pocket being separate from the box, means externally attaching the box in the pocket of the bag with the translucent cover facing the inside of the bag, the bottom of the box being substantially flush with the base of said bag as inflated, and means on the bottom of the sign for attachment to a vehicle.

4,995,187

CRAB POT MANAGING DEVICE

George M. Smyly, Sr., 1903-B, Carlton St., North Charleston, S.C. 29405

Continuation of Ser. No. 313,071, Feb. 21, 1989, abandoned.
This application Dec. 15, 1989, Ser. No. 440,671
Int. Cl.[5] A01K *73/00*
U.S. Cl. 43—8 4 Claims



1. A crab pot and the like managing device for a fishing vessel comprising:

(a) a first stanchion fixedly attached to the vessel deck and adjacent to the vessel gunnel such that said stanchion extends above said gunnel;

(b) a pivotable cross tee member secured at the upper outboard surface of said first stanchion, the combination of said cross tee member with said first stanchion forming a "T", said cross tee member having a fore, vessel bow directed lever arm and an aft, vessel stern directed support arm, and means for having a removably attached fastener adjacent to said cross tee member pivot point, said fastener providing means for locking and unlocking rotation means of said pivotable cross tee member;

(c) an elongated slide rail fixedly attached that the upper surface of said cross tee support arm such that said slide rail is perpendicular to said cross tee support arm, said slide rail being positioned near the aft end of said cross tee support arm and extending upward from said cross tee support arm when said pivotable cross tee member is locked, via means of said removably attached fastener, upon said first stanchion;

(d) a traveling open faced pulley assembly captured upon said slide rail such that cabling and winching means can move said open faced pulley assembly upwardly along said slide rail, the force of gravity providing means for downward movement of said traveling open faced pulley assembly along said slide rail;

(e) a pivotable plate, being a member of said traveling open faced pulley assembly, having two longitudinally spaced-apart, open faced pulleys fixedly attached thereto, and means for having interlocking pivotal levers for locking and unlocking the rotating of said pivotable plate;

(f) an open faced pulley fixedly attached to the outboard surface of said cross tee member support arm such that said pulley is in a coplanar relationship with said plate member pulleys when said pivotable plate member is locked via means of said interlocking levers;

(g) a spring loaded pull cord reel fixedly attached at a convenient location on said crab pot managing device such that a pull cord extends from said cord reel to the end of an unlocking lever arm member of said interlocking pivotal lever means;

(h) a fork shaped buoy retainer fixedly attached to said fishing vessel such that a buoy will be retained thereby when tension upon a hauling line extending from said buoy to a crab pot is trained about said coplanar pulleys;

(i) a second stanchion fixedly attached to said fishing vessel deck and adjacent to said vessel gunnel such that said second stanchion also extends above said gunnel, said second stanchion being laterally opposite said slide rail such that a detachably secured, diagonally positioned brace member extends downwardly from bracket attaching means on said slide rail to bracket attaching means at the top of said second stanchion;

(j) detachably secured guy lines extending from upper attaching means on said slide rail to fore and aft attaching means on said fishing vessel; and

(k) a protective tubular railing fixedly attached to said stanchions and said fishing vessel such that said railing surroundingly envelopes the work area of said fishing vessel.

4,995,188

FISHING ROD AND METHOD FOR WEIGHING A FISH AND A SCALE FOR WEIGHING AN OBJECT

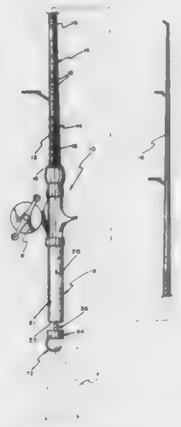
Brent L. Ewing, 1043 Coolidge, Wichita, Kans. 67203

Filed Sep. 8, 1989, Ser. No. 404,554
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—23 33 Claims

1. A fishing rod comprising a structurally tapering rod section having a structure defining a generally longitudinal bore; a rod with an external surface and slidably disposed in said generally longitudinal bore, said rod having weight calibrations spaced longitudinally along the external surface thereof; a calibrated spring helically surrounding the external surface of the rod within the generally longitudinal bore and biasingly urging continuously the rod within the generally longitudinal bore; a hook support member connected to an end of the rod; and a hook member pivotally connected to the hook support member; and said calibrated spring yieldably, biasingly maintains the hook support member in an abutting relationship

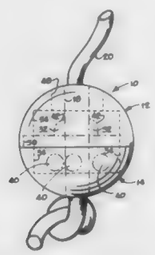
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against said rod section when the rod is not being extended away from the rod section; and said hook support member has



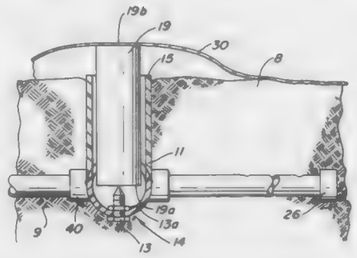
a structure defining an external wall, a top, and a hook recess formed along a portion of the external wall and the top.

4,995,189
RATTLING FISH LURE
Michael W. Crihfield, 14101 Michoud Blvd., Apt. 504, New Orleans, La. 70129
Filed Dec. 4, 1989, Ser. No. 445,003
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.31 15 Claims



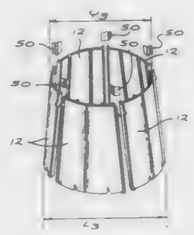
1. A rattling fishing lure comprising:
a. a partially hollow cap member having a generally hemispherical exterior,
b. a plurality of metal spheres,
c. a partially hollow base member having a generally hemispherical exterior, said base member having chamber means therein for containing said metal spheres for making sound waves in water attractive to fish, said chamber means having wall means therein which divides said chamber means into two equal parts, said base member and said cap member being force fitted together to form a partially hollow sphere which contains said metal spheres therein for producing sound waves in water attractive to fish, said base member having sleeve means therein for receipt of a fishing line.

4,995,190
SOIL STERILIZATION APPARATUS
C. Richard Royer, Box 363, Spruce Hill Rd., Ottsville, Pa. 18942
Filed Oct. 27, 1988, Ser. No. 263,004
Int. Cl.[5] A01C *00/00*
U.S. Cl. 47—1.01 17 Claims



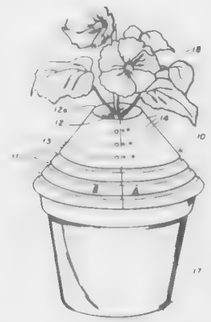
1. An apparatus for sterilizing unsterilized soil which comprises:
(a) a length of enclosed conduit means;
(b) a plurality of tubular means wherein each tube is closed at one end, and their respective second ends are coupled along the length of said conduit means, and wherein each of said tubular means includes a plurality of apertures along its length,
(c) said apertures being directed in an upward and downward direction;
(d) means further coupled to said conduit means for controllably releasing a pressurized and premeasured quantity of fumigant through said apertures for permeating said unsterilized soil to cause it to become sterilized; and
(e) said coupled means being partially located within said conduit means for facile distribution of said fumigant throughout said tubular means.

4,995,191
COMBINED ROOT BARRIER AND WATERING COLLAR ARRANGEMENT
James N. Davis, 3551 Scotland Dr. N., Highlands, Calif. 95660
Filed Oct. 11, 1988, Ser. No. 256,050
Int. Cl.[5] A01G *17/00*
U.S. Cl. 47—25 22 Claims



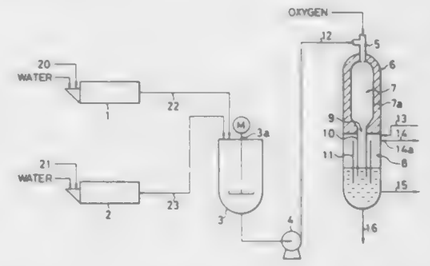
1. A panel for a multiple panel combined planter and watering collar, said panel comprising, in combination:
a thin, flexible body means having an upper arcuate edge, a lower arcuate edge spaced from said upper arcuate edge, a first lateral edge, a second lateral edge spaced from said first lateral edge, an inner surface and an outer surface;
interior rib means on said inner surface of said body means and projecting therefrom and said interior rib means intermediate said first lateral edge and said second lateral edge of said body means;
body means weakening means adjacent said interior rib means at said lower arcuate edge for providing an initial location for tearing said body means for the condition of a root exerting body means tearing force at said body weakening means; and
joining means on said first and said second lateral edges.

4,995,192
SOIL COVER FOR POTTED OR IN-GROUND PLANTS
Richard DeWid, Raleigh, N.C.
Filed Nov. 27, 1989, Ser. No. 441,549
Int. Cl.[5] A01G *13/00*
U.S. Cl. 47—30 13 Claims



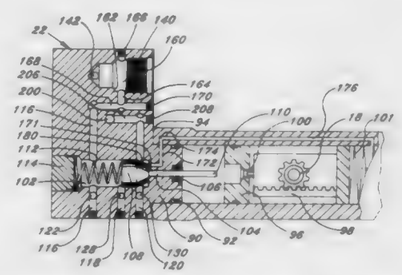
1. A soil cover for protecting soil surrounding a plant that extends upwardly from the soil wherein the soil cover is transformable from a sheet-like configuration to a self-supporting conical soil protector that extends around the plant and over underlying soil extending around the plant, comprising:
(a) a flexible collar having a main body portion, inside and outside curved edges, and a pair of end portions;
(b) attachment means formed on the collar for attaching the respective end portions together;
(c) the flexible collar being adapted to assume a sheet-like configuration but which is transformable into a conically shaped soil protector that wraps around the plant and extends over the underlying soil;
(d) wherein in the transformed soil protector configuration the collar forms an upright conically shaped soil protector having a relatively small upper opening for the plant to extend therethrough and a relatively large lower base opening disposed below the upper opening, wherein when the opposite end portions of the collar are attached the cut out forms the relatively small upper opening within the conically shaped soil cover that enables a plant to project therethrough; and
(e) wherein the transformed soil protector mode the collar forms a surrounding side wall structure that surrounds the plant and from the upper opening extends downwardly and outwardly from the plant such that water falling on the side wall structure of the soil protector tends to run downwardly and outwardly along the side wall structure such that the soil protector is effective to cover a portion of the soil surrounding the plant and thereby covers a portion of the underlying soil so as to effectively control the amount of water reaching the soil surrounding the plant.

4,995,193
METHOD OF PREVENTING ADHERENCE OF ASH TO GASIFIER WALL
Kunio Soga; Kazuo Okada; Noriaki Tanaka; Morio Sogame, and Toshio Tsujino, all of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Ube, Japan
Filed Jul. 18, 1990, Ser. No. 553,632
Int. Cl.[5] C10J *3/46*
U.S. Cl. 48—197 R 4 Claims



1. A method of partially oxidizing petroleum coke and coal while preventing the adherence of the ash to the wall of a gasifier, said method comprising the steps of: pulverizing said petroleum coke and coal; introducing the pulverized petroleum coke, 10 to 30 wt % of coal based on said petroleum coke and oxygen in a smaller amount than the amount necessary for burning said petroleum coke and coal so as to partially gasify said petroleum coke and coal at a temperature higher than the melting point of the ash of said coal; blowing the gas produced during said partially oxidizing step to the water in a quench chamber through a throat and a dip tube in said gasifier; and taking out said gas which has passed through said water of said gasifier.

4,995,194
POWER-ASSIST DOOR CLOSER
Eckart F. Schultze; Richard Easter, and Robert V. Funderburk, all of Charlotte, N.C., assignors to Yale Security Inc., Monroe, N.C.
Filed Mar. 27, 1990, Ser. No. 500,023
Int. Cl.[5] E05F *15/10*
U.S. Cl. 49—32 14 Claims

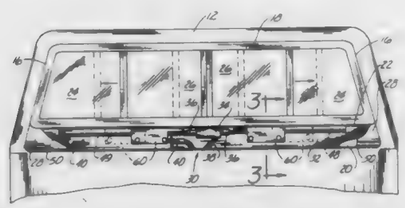


1. An hydraulic power-assist door closer comprising
(a) a cylinder having a pinion mounted therein with an external drive shaft operatively connected to the door,
(b) a piston operatively disposed in the cylinder and formed with a rack engaging the piston,
(c) a manifold block secured against the cylinder and having a boss sealingly disposed in an end of the cylinder,
(d) check valve means in the piston adapted to close as the piston moves toward the said end and open when the door is opened manually,

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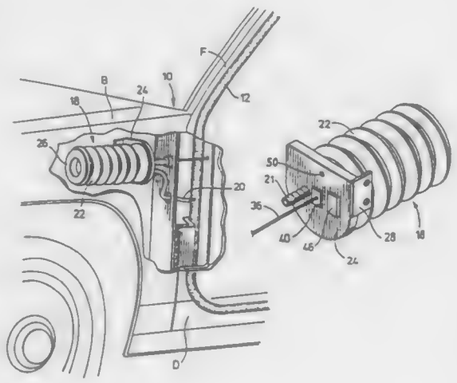
(e) spring means in the cylinder urging the piston in the direction of the block,
(f) a pump mounted against the opposite side of the block from the cylinder and having an inlet port and a pressure outlet port disposed flat against the manifold,
(g) means to drive the pump,
(h) door-opening pressure passage means in the manifold conducting oil from the pressure outlet port through the boss and into the said end of the cylinder,
(i) a plunger chamber in the manifold adjacent the boss,
(j) door-opening return passage means in the cylinder and manifold conducting oil from the cylinder at a point on the opposite side of the piston from the boss, through the boss and into the plunger chamber adjacent the boss and out the chamber adjacent the boss and into the inlet port of the pump.

4,995,195
AUTOMATIC REAR WINDOW
Gordon D. Olberding, P.O. Box 95, and Mahlon W. Shearer, HC 71, Box 33, both of Stuart, Nebr. 68780
Filed Aug. 22, 1990, Ser. No. 570,769
Int. Cl.[5] E05F *17/00*
U.S. Cl. 49—118 2 Claims



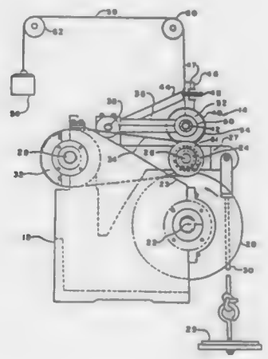
1. An automatic rear window for a vehicle, comprising:
a frame including lateral sides, a top, and a bottom;
a track disposed between the top and the bottom of the frame and disposed to extend between the lateral sides of the frame;
a stationary side window pane disposed at least lateral side of the frame between the track and the top;
a pair of movable central window panes disposed in the frame between the track and the top adapted to simultaneously move on the track in opposite lateral directions between an open position wherein the central panes extend over the side panes, and a closed position wherein the central panes abut one another; and
drive means for simultaneously moving the central panes in opposite lateral directions, the drive means being disposed below the track and including:
a reversible electric motor operably connected to a power source in the vehicle, said motor being disposed in the frame below the track, said motor including rotating output shafts extending laterally from each side of the motor;
means for selectively activating the motor; a left-hand threaded shaft having one end attached to the output shaft on one side of the motor and the other end journalled in a first support bearing;
a right-hand threaded shaft having one end attached to the output shaft on the other side of the motor, and the other end journalled in a second support bearing;
a first bracket having a lower portion threadably attached to the left-hand threaded shaft and an upper portion attached to one of the central panes; and
a second bracket having a lower portion threadably attached to the right hand threaded shaft and an upper portion attached to the other of the central panes.

4,995,196
PROGRAMMED AIR LEAK FOR DEFLATABLE WEATHERSTRIP SYSTEM
Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 17, 1989, Ser. No. 380,421
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—477 3 Claims



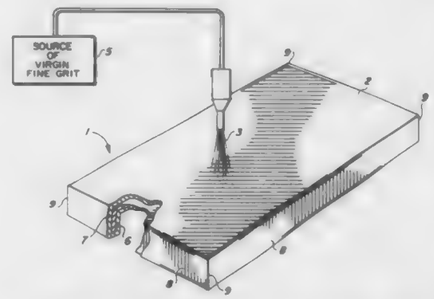
1. An apparatus for sealing between a closure and a body such as a door and door frame of a vehicle, comprising:
a deflatable sealing member for resilient interference engagement between said closure and said body;
vacuum source means in the form of a bellows actuatable by resilient memory to form a vacuum when connected to said deflatable sealing member; means for mounting said bellows at one end to one of said closure or said body and including an opposite, relatively displaceable end for actuating said bellows to condition said bellows for actuation by resilient memory;
means for connecting said relatively displaceable end of said bellows to the other of said closure or said body to contract said bellows for actuation by resilient memory only during opening of said closure, said bellows being expanded by resilient memory during closing of said closure; and
a flow control circuit connected to said bellows including first valve means operable to open said bellows to atmosphere during contraction of said bellows, second valve means operable to connect said sealing means to said bellows during actuation by resilient memory to deflate said sealing member to a reduced cross section only during closing of said closure so as to allow passage of air from inside the vehicle past said sealing member to substantially reduce closing effort and eliminate compression shock, and a bleed port continuously directly connecting said bellows with atmosphere, said bleed port having a predetermined size that assuredly allows said bellows to overcome air flowing from the atmosphere through said bleed port into said bellows during contracture so as to effect the deflation of said sealing member but also assuredly allows the internal pressure of said sealing member to return to atmospheric pressure and expand said sealing member by resilient memory to full cross section after closing of said closure so as to provide firm sealing engagement with the desired resilient interference between said closure and said body.

4,995,197
METHOD OF ABRADING
Chiung-Huei Shieh, 5 Philbrook Ter., Lexington, Mass. 02173; John M. Funt, 11 Bryon Dr., Nashua, N.H. 03062, and George B. Ouyang, 127 Follen Rd., Lexington, Mass. 02173
Filed Jan. 29, 1990, Ser. No. 471,552
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—281 R 26 Claims



1. A method of abrading a tire tread compound to determine the irregular wear characteristics of the compound, comprising the following steps:
weighing at least two sample wheels, wherein each sample wheel includes a tire tread compound;
abrading the tire tread compound of each sample wheel by rotating each sample wheel in engagement with a respective grindstone at a first slip value, the slip value being based on the difference between the velocities of the sample wheels and the grindstones;
weighing each sample wheel again to measure the abrasion resistance of the tire tread compound at the first slip value and generating a first index value indicative thereof, the index value being based on a comparison of the abrasion resistance of the tire tread compound to the abrasion resistance of a reference compound at the same slip value;
abrading the tire tread compound of each sample wheel by rotating each sample wheel in engagement with a respective grindstone at a second slip value, the second slip value causing a higher level of abrasion severity than the first slip value;
weighing each sample wheel again to measure the abrasion resistance of the tire tread compound at the second slip value and generating a second index value indicative thereof;
abrading the tire tread compound of each sample wheel by rotating each sample wheel in engagement with a respective grindstone at a third slip value, the third slip value causing a higher level of abrasion severity than the second slip value; and
weighing each sample wheel again to measure the abrasion resistance of the tire tread compound at the third slip value and generating a third index value indicative thereof, and comparing the first, second and third index values to each other and/or to the corresponding index values of other tire tread components tested to determine the irregular wear characteristics of the tire tread compound.

4,995,198
METHOD FOR MAKING A REFLECTANCE CALIBRATION PLATE HAVING A NEAR-LAMBERTIAN SURFACE
Joseph E. Zupanick, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Sep. 17, 1984, Ser. No. 651,023
Int. Cl.[5] B24C *1/00*
U.S. Cl. 51—319 9 Claims



1. A method for making a test plate having a reflective surface exhibiting a near-Lambertian characteristic comprising the steps of:
(A) bonding a ceramic coating to a surface of a rigid substrate, said ceramic coating being of sufficient thickness to prevent alteration of its surface spectral characteristics during the performance of step (B); and (B) sandblasting at least one surface of the ceramic coating employing a fine abrasive in such condition that angular, and not rounded, pits are obtained in the sandblasted ceramic surface.

4,995,199
MAGNETIC TAPE CASSETTE HAVING IMPROVED GUIDE POLE STRUCTURE
Takahito Miyoshi; Minoru Kanazawa; Tsutomu Sugisaki; Takuzi Yamada, and Yasutoshi Okuzawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan
Division of Ser. No. 205,759, Jun. 13, 1988, Pat. No. 4,930,032.
This application Dec. 19, 1989, Ser. No. 452,654
Claims priority, application Japan, Jun. 15, 1987, 62-90717[U]; Jun. 26, 1987, 62-97437[U]
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—326 5 Claims



1. A method for manufacturing a guide pole for a cassette tape, comprising the steps of: providing a cylindrical stainless steel base member; subjecting said base member to centerless grinding to roughen a surface of said base member; and subjecting said base member to barrel finishing using as an abrasive inorganic particles having a Moh's hardness of more than 9 to secure some of said particles to said finished surface.

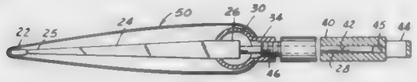
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,200

SANDING TOOL

Edward Eberhart, 116 S. Rogers, Northville, Mich. 48167

Filed Feb. 27, 1990, Ser. No. 485,971
Int. Cl.[5] B24D 15/00, 17/00
U.S. Cl. 51—358 3 Claims



1. A sanding tool which utilizes a closed flexible loop of material with an abrasive surface which comprises:

(a) an elongate body support member having a generally first axis with a relatively thin loop, transverse reaction bar at one end lying transversely of the first axis and to lie within and to support a distal end of a closed abrasive loop, and an elongate, flat tongue member extending from said reaction bar to a proximal head end and tapering in two dimensions from a narrow dimension smaller than the reaction bar to a wider dimension at the proximal head end,

(b) a control shaft on said first axis extending from said head end of said tongue,

(c) a retainer and tensioning element at said head end having a recess on said axis to receive an acircular portion of said head end of said tongue member in a sliding relationship and having a proximal surface to support a proximal end of an abrasive loop, said retainer having a threaded boss extending away from said proximal surface, and

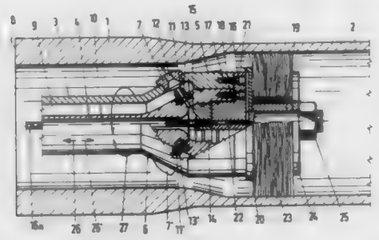
(d) a hollow handle on said first axis having an axial bore and having a threaded portion to cooperated with said boss, and means at the proximal end of said bore to contact the end of said control shaft to move said shaft and tongue and transverse reaction bar toward the distal end of an abrasive loop to tension the loop between said reaction bar and said retainer element as said threaded portion on said handle is moved relative to the threaded boss.

4,995,201

DEVICE FOR THE SURFACE CLEANING OF A HOT DEFORMED PIPE END

Wulff-Eckard von Borcke, Haan, and Wilfried Meyerling, Krefeld, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 27, 1990, Ser. No. 485,303
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1989, 3906937
Int. Cl.[5] B24C 3/16, 3/32; B08B 3/00
U.S. Cl. 51—411 5 Claims



1. In a device for surface cleaning of the inner surface of a hot deformed pipe end, having an axially moveable blast lance carrying a blast nozzle head having a closed end, with at least one blast nozzle on the blast nozzle head, and a supply line for a gaseous medium and an abrasive which are mixed together in the blast head and discharged through the blast nozzle, the blast nozzle for being adjusted at an angle relative to the inner surface of the pipe, the improvement wherein:

the blast lance has inner and outer coaxially aligned rotatable hollow tubes communicating with the blast nozzle head, each tube having an enlarged outer end;

the inner tube has at least one injector for directing gaseous medium to said at least on blast nozzle, which is located on the outer tube, for discharge therethrough,

the outer tube for transporting the abrasive to mix it with the gaseous medium and to discharge the mixture through said at least one blast nozzle;

an axial pipe is disposed coaxially within the inner hollow tube, forming an axial bore between the pipe and the inner hollow tube, and extends through the closed end of the blast nozzle head:

a deflector attached to the closed end of the blast nozzle head having radially extending passageways which communicate with said axial pipe and penetrate through the periphery of said blast nozzle head to provide a gas curtain between the blast nozzle head and the inner surface of the pipe being cleaned; and

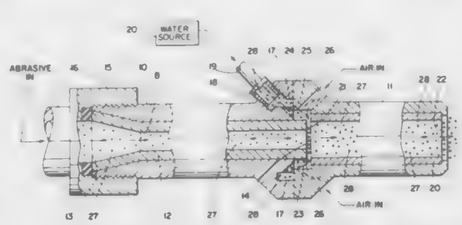
a removeable flexible heat resistant element, attached to the deflector, having an outer diameter at least as large as the largest inner diameter of the pipe being cleaned.

4,995,202

NOZZLE UNIT AND METHOD FOR USING WET ABRASIVES TO CLEAN HARD SURFACES

Jeffrey G. Gardner, Traverse City, and Dennis J. Gulau, Kingsley, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 26, 1990, Ser. No. 515,146
Int. Cl.[5] B24C 5/04
U.S. Cl. 51—439 1 Claim



1. A nozzle unit for use with wet abrasive materials to clean hard surfaces, the unit comprising:

a first nozzle body having a lengthwise bore therein, the bore defining a venturi structure, and including a fist metallic liner having a receiving end and a discharge end, the receiving end of the liner having a larger diameter than the discharge end of said liner, and the receiving end being connected into a source for supplying an abrasive material to the nozzle unit;

the first nozzle body including a joiner face that is normal to the lengthwise bore, and the discharge end of the metallic liner extending beyond the joiner face;

the first nozzle body further including an annular cavity that surrounds the lengthwise bore, the cavity having an open side along the joiner face, and said nozzle body including an inlet port that communicates with the annular cavity and a source of water;

a second nozzle body having a lengthwise bore therein, the bore defining a venturi structure, and including a second metallic liner with a receiving end, and a discharge end, the receiving end of the liner having a smaller diameter than the discharge end of said liner;

the second nozzle body including a joiner face that is normal to the lengthwise bore, and the first and second nozzle bodies being fastened together at their joiner faces;

the second nozzle body further including a mixing chamber, the mixing chamber communicating with the discharge end of the first liner, and the receiving end of the second liner;

the first nozzle body including several water passages that connect the annular cavity with the mixing chamber;

the second nozzle body of the second cylindrical part including several air passages that connect the mixing chamber with air surrounding the nozzle unit;

wherein, in operation, an abrasive material is directed into the lengthwise bore of the first nozzle body and is carried into the mixing chamber in the second nozzle body;

water is directed through the inlet port in the first nozzle body, and into the annular cavity therein, and is carried from the annular cavity through the water passages into the mixing chamber;

air is drawn into the mixing chamber through the air passages in the second nozzle body;

the abrasive material, water, and air are mixed together in the mixing chamber, to form a wet abrasive stream; and

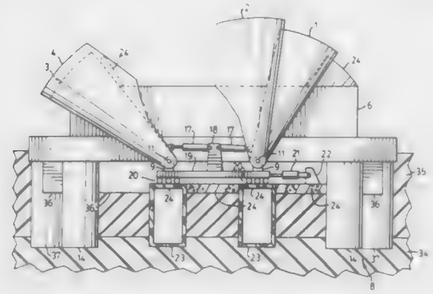
the wet abrasive stream is carried down the lengthwise bore in the second nozzle body, and is discharged from the nozzle unit onto a hard surface to be cleaned.

4,995,203

RETRACTABLE ROOF FOR STADIUM STRUCTURE

Brian Brisbin; Felim McCaffrey, and Peter Sheffield, all of Toronto, Canada, assignors to Stadium Consultants International Inc., Toronto, Canada

Filed Feb. 2, 1990, Ser. No. 474,553
Int. Cl.[5] E04B 1/34
U.S. Cl. 52—6 25 Claims



1. A roof assembly comprising:

a roof structure mounted for rotation about a generally horizontal axis between raised and lowered conditions such that the weight of the roof assembly generates a variable turning moment about said axis dependent on the stage of transition between said conditions, said roof structure in a raised condition covering an area and in a lowered condition uncovering said area;

at least one strut, having upper and lower ends, the upper end being pivotally connected to said roof structure at a distance from said axis;

a body of liquid adjacent the lower end of each strut;

float means, connected to the lower end of each strut, such that displacement of liquid in said body applies a buoyant force to said roof structure through said strut opposite said turning moment when said float means is at least partially immersed in said body of liquid;

guide means for constraining said float means to follow a path within said liquid as said roof structure rotates, such that the total buoyant force, applied through said at least one strut to the roof structure, substantially counterbalances said variable turning moment throughout the transition of the roof structure between its raised and lowered conditions; and

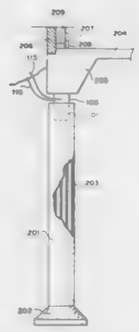
actuating means for rotating said roof structure between said raised and lowered conditions.

4,995,204

FOUNDATION LEVELING SHIM AND SYSTEM

Kenneth J. Kelso, P.O. Box 37222, Houston, Tex. 77036

Filed Feb. 13, 1989, Ser. No. 309,181
Int. Cl.[5] E04B 1/16
U.S. Cl. 52—126.1 12 Claims



2. A foundation leveling pier for leveling a structure on a solid concrete foundation, comprising in combination:

a concrete pier poured in place beneath the structure to be leveled; and

a self contained foundation leveling shim at the upper end of and said pier between said pier and said structure, said leveling shim being placed into said concrete pier before curing with said pier being cured about said leveling shim;

said self contained foundation leveling shim comprising:

an outer cylindrical housing;

a base within the lower end of said housing;

a piston slidably mounted above said base within said housing in sealing engagement with the inner walls of said housing and defining a fluid chamber above said base;

inlet means for injecting a hydraulic fluid between said base and said piston into said chamber; and

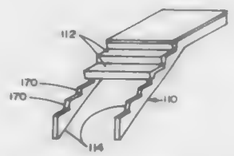
outlet means for removing said hydraulic fluid.

4,995,205

PRECAST STAIR SYSTEM

Eldon R. Bennett, 13011 Cross Creek Blvd., Apt. 82, Fort Myers, Fla. 33912

Filed Mar. 13, 1989, Ser. No. 322,496
Int. Cl.[5] E04F 19/10
U.S. Cl. 52—189 24 Claims



1. A precast stair system comprising:

a plurality of individually precast steps, each step including a tread portion and a riser portion that is integrally connected to said tread portion and extends generally downwardly therefrom;

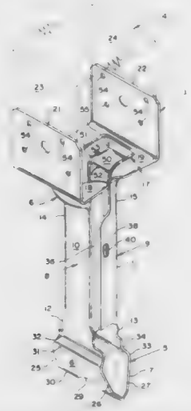
elongate stringer means that are precast independently of said steps for supporting said steps, said stringer means including a generally horizontal extension portion formed on at least one end for supporting a landing;

means for securing at least one said extension portion to a building which said stair system ascends; and

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means for releasably fastening said steps to said stringer means.

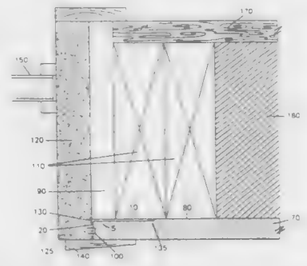
4,995,206
ELEVATED POST BASE
Karen W. Colonias, Lafayette; Alfred D. Commins, Danville; Tyrell T. Gilb, Berkeley; Jin-Jie Lin, Livermore, and Richard D. Moore, Newark, all of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed Jul. 11, 1990, Ser. No. 550,961
Int. Cl.[5] E02D *27/00, 27/42, 27/44, 27/50*
U.S. Cl. 52—297 10 Claims



1. A metal integral elevated post base formed from a sheet metal blank embedded and supported by a concrete base for supporting a wood post comprising:
a. a metal foot member having upstanding sides adapted for embedment in said concrete base;
b. a pair of metal post members each having side members and each having lower ends individually and respectively integrally connected to said opposite sides of said foot member and adapted for embedment in said concrete base, and having upper ends extending above said concrete base;
c. a pair of base members integrally connected to said upper ends of said post members and extending upwardly and laterally away from said upper ends of said post members;
d. a pair of seat members integrally connected to said base members and forming a support for the end of said wood post; and
e. laterally disposed side members integrally connected to and extending upwardly from said seat members and adapted for attachment to at least two sides of said post member.

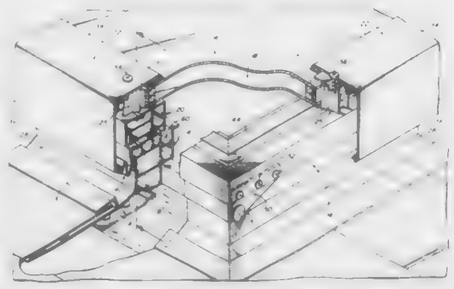
4,995,207
AIR-VAPOR BARRIER CONTINUITY DEVICE
William L. Powis, 1304 13th Street North, Lethbridge, Alberta, Canada (T1H 2T9)
Continuation of Ser. No. 884,543, Jul. 11, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 434,071
Int. Cl.[5] E06B *1/04*
U.S. Cl. 52—210 14 Claims

7. In a wall construction around a door or window jamb between the jamb and a wall stud or rough sill, and over and across an airspace between the same, the improvement comprising an air-vapour barrier continuity device, said device comprising a flexible first generally rectangular longitudinal planar member and a second generally rectangular longitudinal planar member, said first member angularly connected at a first back longitudinal edge thereof to said second member along a longitudinal line of said second member whereby said first member extends away from a front longitudinal edge of said second member at an angle greater than 90° to provide



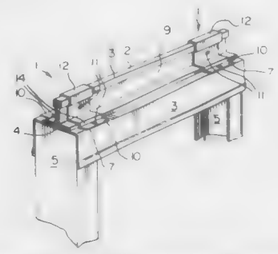
biased contact with said wall stud or rough sill, said second member positioned adjacent the inner wall edge of said jamb, the breadth of said first member being sufficient to extend from said jamb across said airspace to said wall stud or rough sill.

4,995,208
SKYLIGHT CONSTRUCTION
Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.
Filed Dec. 13, 1988, Ser. No. 283,802
Int. Cl.[5] E04D *13/14*
U.S. Cl. 52—200 15 Claims



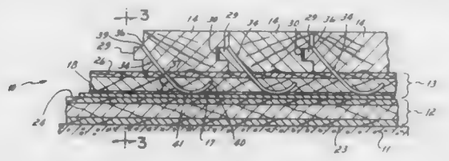
1. A skylight construction for an opening in a building or the like comprising: a frame means extending about the opening and including means securable about the opening, translucent or transparent means covering the opening and extending at edges to overlie the frame means, means for retaining the covering means on the frame means, said means securable about the opening comprising a securing clip adapted to be received in a recess of the frame means and having means for providing positive interlocking with the frame means, as well as means for attachment to the building, said means for providing positive interlocking comprising means defining a channel in said securing clip, said frame means having a hook segment extending into the recess of the frame means, wherein said securing clip, in a first position, is disposed with its end extending into the recess beyond said hook segment, and, in a second position, is disposed so that the hook segment engages in edge defining said channel so as to interlock the securing clip and frame means.

4,995,209
WALL CONNECTOR DEVICE
William Cobb, 75 Queen Alexandra Close S.E., Calgary, Alberta, Canada (T2J 3P9)
Filed Aug. 4, 1989, Ser. No. 389,374
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—238.1 8 Claims



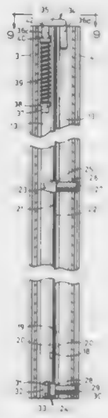
1. A connector device for connecting a generally C-shaped wall channel member to the base of a T-bar used in a conventional suspended ceiling assembly comprising elongated strip means for mounting on the T-bar, in use said strip means having an inverted T-shape, said strip means including a generally inverted U-shaped central portion for straddling and extending downwardly about the stem of the T-bar, and arms means extending outwardly from said central portion beyond the arms of the T-bar for overlying and fastening to the base of the channel member.

4,995,210
FREE FLOATING FLOOR SYSTEM AND METHOD FOR FORMING
Michael Niese, and James H. Stoehr, both of Cincinnati, Ohio, assignors to Robbins, Inc., Cincinnati, Ohio
Continuation-in-part of Ser. No. 162,088, Feb. 29, 1988, Pat. No. 4,831,806. This application May 16, 1989, Ser. No. 352,284
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] E04F *13/08*
U.S. Cl. 52—391 26 Claims



1. A free floating floor system comprising:
an upper subfloor having a bottom surface;
a plurality of flat nail clinching strips underlying said upper subfloor, said bottom surface of said upper subfloor engaging said strips;
a plurality of floorboards disposed on said upper subfloor, said floorboards being substantially coextensive with said upper subfloor; and
a plurality of clinching nails extending through said floorboards and into said upper subfloor above said clinching strips to secure said floorboards to said upper subfloor wherein the clinching strips remain in the floor system.

4,995,211
EDGE-TO-EDGE ATTACHMENT SYSTEM FOR DISPLAY PANELS
John S. Malott, Cincinnati, Ohio, assignor to Downing Displays, Inc., Cincinnati, Ohio
Filed Jan. 25, 1990, Ser. No. 470,300
Int. Cl.[5] E04C *1/30*
U.S. Cl. 52—582 18 Claims



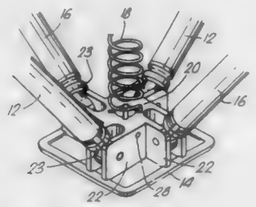
1. An attachment system for joining display panels, each panel having first and second side edges, said first side edge of each panel being joinable with said second side edge of any other of said panels and said second side edge of each panel being joinable with said first side edge of any other of said panels, each of said panels having a body portion, said first and second edges of each panel comprising first and second frame members affixed to said panel body, said first and second frame members being substantially identical, rectilinear and coextensive, said first and second frame members each having a pair of longitudinal sides, an upper end, a lower end, and a longitudinal outer face with abutment surfaces thereon, each of said first and second frame members having a longitudinal opening therein extending from said upper end through said lower end, cooperating means on said first and second frame members of each panel for joining the first and second frame members of adjacent panels near said lower ends thereof, cooperating means on said first and second frame members of each panel, between the upper and lower ends thereof, for aligning said first and second frame members of adjacent panels when joined together, and latch means captively mounted in said opening at the upper end of the same one of said first and second frame members of each panel and shiftable between an inoperative position and an operative position wherein it engages the opening in the other of said first and second frame members of an adjacent panel.

4,995,212
COLLAPSIBLE FRAMEWORK
James N. Morgan, St. Albans, and Simon A. S. Rivers-Bland, London, both of United Kingdom, assignors to Marler Haley Exposystems Limited, United Kingdom
Filed Aug. 4, 1989, Ser. No. 389,402
Claims priority, application United Kingdom, Aug. 4, 1988, 8818550
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—646 4 Claims

1. A collapsible framework comprising a plurality of spars pivotally connected with hub members, and with one another to form a two-dimensionally expanding linkage, and at least one upright brace, detachably connectable between at least one said hub member and an adjoining said hub member above

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it, to brace the linkage in an expanded condition and wherein said upright brace comprises a plurality of rigid lengths detachably connected end-to-end by plug and socket connections and



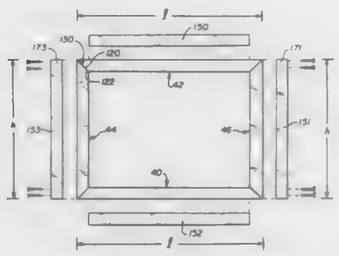
by resilient tensioning means which serve to draw adjacent lengths into interfitting relationship when said lengths are aligned.

4,995,213

FIBERGLASS REINFORCED PLASTIC WINDOW SASH FRAME AND ASSOCIATED METHOD

William P. Bezubic, Indiana, Pa., assignor to Season-All Industries, Inc., Indiana, Pa.

Filed Sep. 13, 1989, Ser. No. 406,686
Int. Cl.[5] E04C 2/38
U.S. Cl. 52—656 12 Claims



1. A window sash frame, comprising:
a plurality of framing members each made of fiberglass reinforced plastic and each having a pair of ends;
said framing members each defining a channel;
a plurality of subframing members, each said subframing member being received in said channel; and
mechanical fastener means securing a first subframing member to an adjacent second subframing member to create a substantially rigid subframe for said window sash frame, whereby said ends of said framing members are drawn towards each other to form said window sash frame having tight fitting corner joints and whereby said subframe is secured to said window sash frame without requiring penetration of fasteners into said window sash frame.

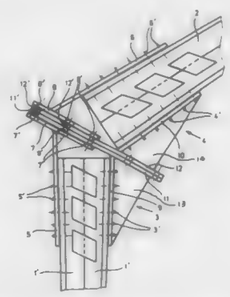
4,995,214

CONNECTING ELEMENT

Johann Wolf, Scharnstein, Austria, assignor to Wolf Systembau Gesellschaft m.b.H. KG., Scharnstein, Austria

Filed Oct. 26, 1988, Ser. No. 262,715
Claims priority, application Austria, Nov. 4, 1987, 2916/87
Int. Cl.[5] E04C 2/38
U.S. Cl. 52—657 3 Claims

1. A truss having a lower end connecting elements for upright wooden columns with an included roof trusses comprising two components (3, 4) one for the upper end of said upright column (1) and the other for the lower end of said inclined roof truss (2), each component comprising a pair of mutually opposed steel bands (5, 9 and 6, 10) one pair of bands (5, 9) being attachable to opposite sides of said column (1) and the other pair of bands (6, 10) being attachable to said roof truss (2) each said pair of steel bands being joined by means of a flange (11 or 12) projecting laterally on all sides past the column (1) and the roof truss (2); means to secure said flanges to each other; and a



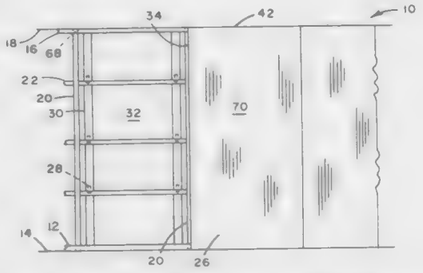
connecting plate (13, 14) interconnecting one band of each said pair of mutually opposed bands and a said flange and disposed in a common vertical plane below said lower end of said roof truss when said flanges are secured to each other.

4,995,215

PANELS WITH LAMINATED STRIPS FOR CLIPS

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Continuation-in-part of Ser. No. 299,200, Jan. 23, 1989, Pat. No. 4,976,083. This application Sep. 21, 1989, Ser. No. 410,449
Int. Cl.[5] E04G 21/00, 5/06; E04B 1/40; A47B 96/06
U.S. Cl. 52—747 6 Claims



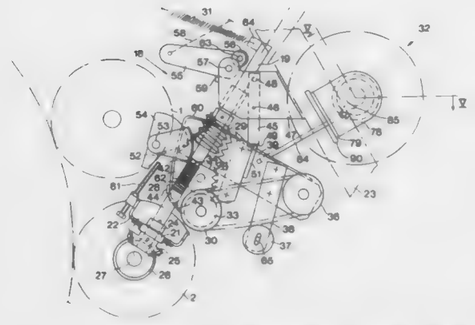
1. The method of mounting wallboard comprising the steps of inserting a back leg portion of each of a plurality of angled suspension clips through thin tear-resistant material, said thin tear-resistant material being adhered to a back face of said wallboard along spaced apart portions of said thin tear-resistant material, said adhering being essentially solely by an adhesive material, inserting each of said clips upwardly through an opening in said thin tear-resistant material into a pocket between said wallboard back face and an unadhered area of said thin tear-resistant material located between said spaced apart adhered portions and immediately above said opening, and subsequently disposing outwardly and downwardly extending hanger legs of said plurality of clips on horizontally extending channel members of a wall framing structure.

4,995,216

BALE WRAPPING CONTROL APPARATUS FOR ROUND BALERS

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Jun. 5, 1989, Ser. No. 361,063
Claims priority, application United Kingdom, Jun. 14, 1988, 88140868
Int. Cl.[5] B65B 11/04, 41/12
U.S. Cl. 53—64 19 Claims



1. In a round baler having a bale chamber in which cylindrical bales of crop material are formed, a source of bale wrapping material, bale wrapping control means, and cutter means for cutting the wrapping material, said bale wrapping control means comprising:
first drive means operable to drive the cutter means to a position ready for cutting the bale wrapping material;
second drive means operable to determine the length of wrapping material dispensed from the source of wrapping material for wrapping a cylindrical bale and then to initiate operation of the cutter means to effect cutting of the wrapping material dispensed from the source thereof; and
single control means including a driven master shaft rotatable about its longitudinal axis and mounted for rocking movement in opposite directions about a point on its longitudinal axis in order to alternately control the operation of the first and second drive means.

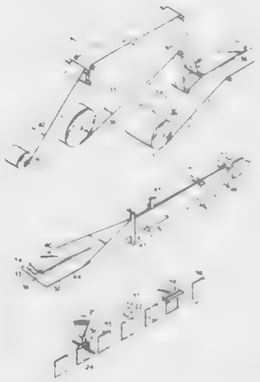
4,995,217

METHOD OF MAKING A CHEMICAL THERMAL PACK

Sam E. Francis, Jr., 5260 Lake Washington Rd., Melbourne, Fla. 32935

Continuation of Ser. No. 136,621, Dec. 22, 1987, Pat. No. 4,856,651. This application Aug. 11, 1989, Ser. No. 392,401
Int. Cl.[5] B65B 9/08, 11/58
U.S. Cl. 53—410 6 Claims

1. A method of making a thermal pack having a closed top, bottom and side edges, comprising the steps of:
(a) feeding a continuous strip of plastic sheet material from a supply roll, the plastic sheet material having first and second opposed side edges and a longitudinal axis extending in the direction of feeding;
(b) feeding a continuous strip of insulated material from a supply roll and placing it in intimate contact with the strip of plastic sheet material;
(c) feeding a continuous strip of transparent material from a supply roll and placing it in intimate contact with the strip of insulated material;
(d) folding the strip of plastic sheet material along its longitudinal axis to define a sandwich structure having a fold line at its bottom and an open top;
(e) forming a horizontal weld line along the fold line of the structure;
(f) forming spaced-apart, parallel, double-width vertical weld lines in the structure perpendicular to the fold line;
(g) cutting the vertical weld lines in half to form individual bags having opposed sides, closed opposed side edges, a closed bottom edge, and an open top edge;



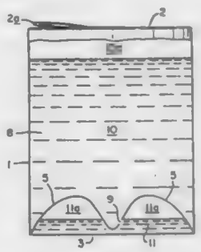
(h) opening the top of one of the bags and introducing a portion of heat transfer powder into the interior of the bag;
(i) inserting a rupturable bag pre-filled with liquid into the interior of the bag above the heat transfer powder; and
(j) forming a top weld at the top of the bag to close the top.

4,995,218

METHOD OF PACKAGING A BEVERAGE

William J. Byrne, Mount Merrion, Ireland, assignor to Arthur Guinness Son & Company (Dublin) Limited, Dublin, Ireland

Filed Apr. 28, 1989, Ser. No. 345,209
Claims priority, application United Kingdom, Sep. 12, 1988, 8821264
Int. Cl.[5] B65B 31/00, 3/02, 29/06; B65D 85/72
U.S. Cl. 53—410 14 Claims



1. A method of packaging a beverage having gas in solution therewith which comprises providing an open topped container and charging the container with the beverage; locating a partition wall having a restricted orifice over the beverage in the container to form a primary chamber within which the beverage is contained and which primary chamber is sealed other than for said orifice; locating a closure wall over the partition wall to provide a sealed package in which the closure wall forms with the partition wall a secondary chamber which is sealed other than for the restricted orifice through which the secondary chamber communicates with the primary chamber, and which further comprises subjecting the container over the

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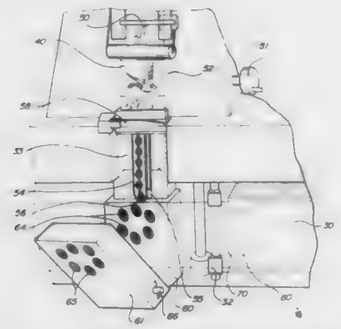
beverage to a gasifying medium prior to sealing the package so that a gas pressure greater than atmospheric is provided in the sealed package and inverting the sealed package so that the beverage enters the secondary chamber from the primary chamber through said restricted orifice to form a primary headspace in the primary chamber and a secondary headspace in the secondary chamber when the gas and beverage are at equilibrium.

4,995,219

COMBINATION CUTTER AND BAGGER FOR PHOTOGRAPHIC NEGATIVES

Ray T. Hicks, 2605 Corunna Rd., Flint, Mich. 48503-3362

Filed Dec. 13, 1989, Ser. No. 450,203
Int. Cl.[5] B65B *63/00, 5/08, 35/28, 43/30*
U.S. Cl. 53—411 18 Claims



1. A device for cutting photographic film into individual negatives and placing said individual negatives into individual continuous feed storage envelopes, each said envelope having a first face base side and a second face opening side, said device having cutting means for severing said photographic film into individual negatives, means for transferring said negatives to said envelopes and means for opening said envelopes for insertion of said individual negatives, wherein said means for opening said envelopes comprises:

a track for supporting a plurality of continuous feed storage envelopes;

a first suction assembly having a stationary operating position operative to direct a flow of air away from said first face of one envelope at a time causing a vacuum to secure said envelope with respect to said track; and

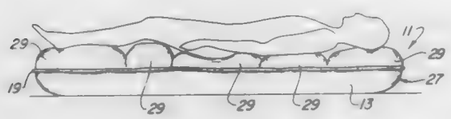
a second independent suction assembly having a stationary operating position operative to direct a flow of air away from said second face of said envelope causing a vacuum to open said envelope.

4,995,220

METHOD OF MAKING A THERAPEUTIC MATTRESS

Charles R. Thomas, 120 E. Golden Gate, Detroit, Mich. 48203

Division of Ser. No. 242,525, Sep. 12, 1988, Pat. No. 4,922,564.
This application Feb. 12, 1990, Ser. No. 478,364
Int. Cl.[5] B65B *1/20, 43/02, 51/07*
U.S. Cl. 53—418 2 Claims



1. The method of making a therapeutic mattress comprising the steps of:

taking a first sheet of fabric material of rectangular shape;

taking a second sheet of fabric material and folding it over to provide a top cover and an underlying intermediate bottom fabric cover of the same dimensions as said first sheet;

applying a plurality of parallel spaced rows of stitching across the width of said top and intermediate bottom cover;

superimposing the folded cover second fabric sheet over the first fabric sheet;

peripherally stitching the top fabric cover, the intermediate bottom fabric cover and bottom fabric cover together defining a series of rectangular tubes within the top cover and intermediate bottom cover, and a unit chamber between the bottom intermediate cover and the bottom cover;

stuffing, filling, compacting and retaining a fibrous material within said plurality of rectangular tubes, defining a plurality of firm resilient top mattress sections;

stuffing, filling, retaining a resilient fabric material within said chamber defining a bottom mattress section supportably underlying said top mattress sections; and

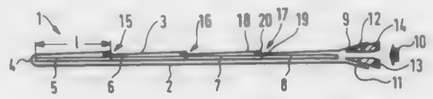
transversely stitching closed the open ends of said tubes and chamber.

4,995,221

FILM JACKET FOR FLAT ARTICLES, PARTICULARLY SLIDE FRAMES

Gottfried Stemmer, Jr., Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Geimuplast Peter Mundt GmbH & Co. KG., Farchant, Fed. Rep. of Germany

Division of Ser. No. 168,770, Mar. 16, 1988, Pat. No. 4,848,576.
This application May 8, 1989, Ser. No. 348,505
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708880
Int. Cl.[5] B65B *43/04, 43/30*
U.S. Cl. 53—455 11 Claims



1. A process for jacketing flat articles, comprising:

joining top and bottom film plies at one end and at opposite side edges, the top and bottom film plies including forward ends which together form an opening between said plies opposite said one end,

providing one of said top and bottom film plies with a plurality of transversely extending slits extending between said opposite side edges and substantially parallel to said one end,

spacing one of said slits apart from said one end by a distance corresponding to the length of one of said flat articles,

spacing each remaining slit apart from another said slit by the same distance,

inserting each of said flat articles in succession through said opening into said film jacket, and

withdrawing the flat articles individually through one of said transversely extending slits.

4,995,222

AMPOULE SEALING APPARATUS

Charles R. Whitman, Ross Township, Kalamazoo County, and John J. Dougherty, Jr., Paw Paw, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

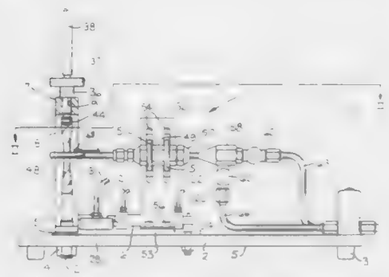
Filed Jan. 8, 1990, Ser. No. 462,128
Int. Cl.[5] B65B *31/02, 1/22, 51/10*
U.S. Cl. 53—510 7 Claims

1. An ampoule sealing apparatus comprising:

means for receiving an unsealed ampoule;

means for pivotably moving said unsealed ampoule sequentially from a first position to a second position and back to said first position;

means for vibrating said unsealed ampoule at said first position;



means for pulling a vacuum on said unsealed ampoule at both of said positions and removing air therefrom; and

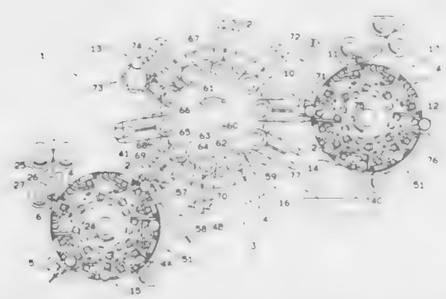
means for heating and sealing said ampoule at said second position.

4,995,223

CONTINUOUS WRAPPING MACHINE

Mario Spatafora, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D. Societa' per Azioni, Bologna, Italy

Filed Mar. 14, 1990, Ser. No. 494,133
Claims priority, application Italy, Mar. 14, 1989, 3376 A/89
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—176 8 Claims



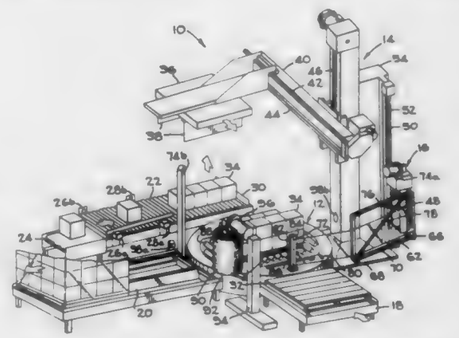
1. A continuous wrapping machine comprising a number of seats (4), each designed to receive a respective unwrapped product (2); first conveying means (3) for successively feeding said seats (4) at constant speed along a predetermined route; and a number of work stations (5, 13) located along said route; a first (5) of said stations being designed to feed a said product (2) inside each said seat (4), together with a respective portion (6) of wrapping material, for forming, about said product (2), at least a first tubular wrapping (7) comprising two opposite end portions (8) projecting from the respective ends (9) of said product (2); and a second (13) of said stations being designed to close said end portions (8) of each said tubular wrapping (7) about the respective ends (9) of said product (2); characterised by the fact that said second work station (13) is located in a fixed position along said route, and that second conveying means (68) are provided, at least along a portion of said route extending through said second station (13), for reversing each said seat (4), in said second station (13), in relation to said first conveying means (3) and at said travelling speed.

4,995,224

STRETCH WRAPPING PALLETIZER

Ray A. Yourgalite, Hoopeston, Ill.; Malcolm Moore, Green Bay, Wis.; Neal C. Chamberlain, Hoopeston, Ill.; Kenneth F. Becicka, Alvin, Ill.; Samuel J. Hilgeman, Hoopeston, Ill., and Kevin D. Moore, Potomac, Ill., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 167,949, Mar. 14, 1988, abandoned.
This application Dec. 5, 1989, Ser. No. 445,936
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—540 2 Claims



1. Apparatus for creating a unitized stack of articles by alternately forming a layer of articles and wrapping said layer of articles without the need for an article guide frame and wherein a portion of the stack of articles is free standing the stack is unitized, the apparatus comprising:

an elevatable turntable for supporting said stack of articles, said elevatable turntable receiving a layer of articles and then being lowered to receive a subsequent layer of articles;

a palletizer cooperating with said elevatable turntable for stacking a layer of said articles on said turntable or on a previously deposited layer of articles;

wrap means serving means for serving wrap means to said turntable to wrap a layer of articles unsupported by a guide frame while said turntable is rotated after said palletizer has located said articles to form a layer of articles on said turntable or on a previously formed layer of articles and prior to said palletizer locating subsequent articles on said previously deposited articles;

cutting element means for severing said wrap means after said wrap means serving means has served wrap means to multiple layers of articles stacked on said turntable by said palletizer.

4,995,225

COMPACT FOOD TRAY FILM WRAPPING MACHINE

Frank Terminella; Manuele Terminella, and William Stroud, all of Fayetteville, Ark., assignors to Pacmac, Inc., Fayetteville, Ark.

Filed Sep. 7, 1989, Ser. No. 404,215
Int. Cl.[5] B65B *11/18*
U.S. Cl. 53—556 15 Claims

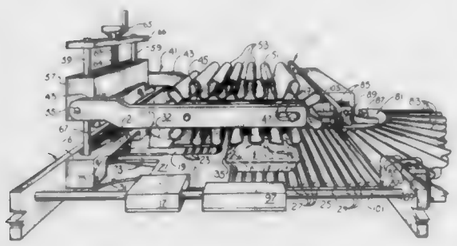
1. In a food tray film wrapping machine having a wrapping station and having film folding arms to fold edges of the film under the tray at said wrapping station, the improvement comprising

a powered conveyor for receiving said trays from one side of said wrapping station and moving them along a path with a predetermined final direction of travel,

a tray pusher bar and means for actuating said pusher bar following the operation of said folding arms to push a tray from said wrapping station at right angles to said final direction of travel onto said conveyor, and

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an endless belt looped around two freely rotatable end rollers and means for mounting said belt and rollers above said wrapping station with said belt extending in a direction transverse to said final direction of travel and with



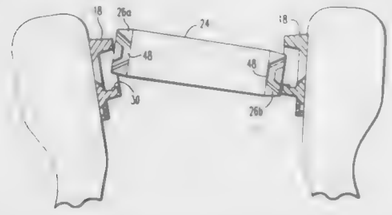
partially restrained freedom of vertical movement of said belt thereby causing it to exert downward force on a tray being displaced from said wrapping station by said pusher bar while rotated only by motion of said tray.

4,995,226

SAFETY STIRRUP

George F. Kuhn, Jr., 721 Harrison City Rd., Trafford, Pa. 15085

Filed Jul. 10, 1989, Ser. No. 377,721
Int. Cl.[5] B68C *3/02*
U.S. Cl. 54—49 13 Claims



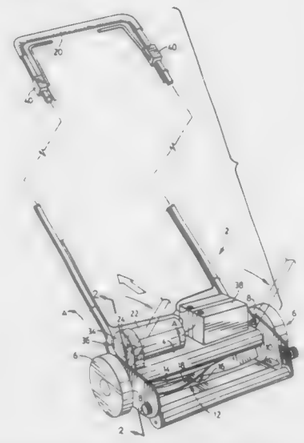
1. A safety stirrup comprising a substantially U-shaped flexible bottom frame, said U-shaped frame including a foot rest portion and a pair of side members extending upwardly from said foot rest portion, hollow hub means affixed to said U-shaped frame on the interior side thereof proximate the ends of said U-shaped frame, rotatable axle means extending horizontally between said hub means, said axle means including substantially cylindrical solid hub engaging end portions, said axle end portions being housed within said hub means, said hub means on the interior surface thereof having a nub means affixed thereto protruding radially inwardly at the lowest point on said interior surface of said hub means in predetermined position, one of said axle end portions having a first U-shaped nub engaging channel therein on the underside thereof, the other of said axle end portions having a second U-shaped nub engaging channel therein on the underside thereof, said first U-shaped channel opening towards the adjacent end of said axle means, said second U-shaped channel opening towards the other end of said axle means, said first U-shaped channel and said second U-shaped channel each being bisected by an imaginary coaxial line extending along the lowest point on the underside of said axle means between the ends of said axles, said first U-shaped channel and said second U-shaped channel each having a central locking portion, said central locking portion of said first U-shaped channel and said central locking portion of said second U-shaped channel being in substantial parallel relationship and substantially equally distant from the respective ends of said axle means, said first U-shaped channel and said second U-shaped channel each having nub camming and receiving portions adjacent each side of said central locking portion, said nub camming and receiving portions each forming a nub receiving notch in said ends of said axle means, whereby when said U-shaped flexible bottom frame member is rotated to the extent said nub means enters said nub camming and receiving portions of said U-shaped channel, said side members of said frame member are caused to simultaneously spread apart until said nub means exits said U-shaped channel via said nub receiving notch, thereby disengaging said frame member from said axle means thereby permitting a horseback rider's foot to be released from said stirrup to prevent the possibility of serious injury.

4,995,227

POWER ASSISTED REEL TYPE LAWN MOWER

Harry C. Foster, R.R. 1, Georgetown, Ontario, Canada L7G

Filed Oct. 25, 1989, Ser. No. 426,207
Int. Cl.[5] A01D *35/24*
U.S. Cl. 56—249 16 Claims



1. In a reel-type lawn mower for cutting lawns, including cutting reel means propelled in a first direction by electric motor means connected to said cutting reel means by transmission means upon energizing said electric motor means for cutting said lawn, and; drive wheel means engageable with said cutting reel means by unidirectional clutch means for propelling said cutting reel means upon manually activating said drive wheel means and said uni-directional clutch means so as to assist said electric motor in propelling said cutting reel means when greater cutting speeds of said cutting reel means is required than delivered by said electric motor means and where said drive wheel means are disengageable with said cutting reel means through said unidirectional clutch means where said electric motor means provides sufficient cutting speed to propel said cutting reel.

4,995,228

CUTTING BLADE FOR ROTARY CUTTING MACHINERY

Joseph C. Hladik, Jr., R.R. #1, P.O. Box 145A, Hennessey, Okla. 73742

Filed Apr. 30, 1990, Ser. No. 516,973
Int. Cl.[5] A01D *34/73*
U.S. Cl. 56—255 4 Claims

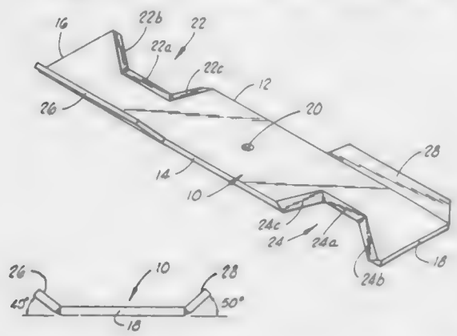
1. A rotary cutting blade comprising:

an elongated metallic plate having a pair of opposed, parallel longitudinal side edges defining between them the width of the blade, and having a pair of opposite ends

means at substantially the center of the plate for mounting the plate on a rotating power shaft;

a first trapezoidally-shaped cutting recess opening into the plate from one of said longitudinal side edges at a location adjacent one of the ends of the plate, said first cutting recess having an internal sharpened cutting edge extending parallel to said one longitudinal side edge, and having a pair of diagonal cutting edges extending from said internal cutting edge to said one longitudinal cutting edge, each of said diagonal cutting edges extending at an angle of from about 40° to about 50° to said internal cutting edge;

a second trapezoidally-shaped cutting recess opening into the plate from the other of said longitudinal side edges at a location adjacent the other end of the plate which is opposite the end nearest said first cutting recess, said



second cutting recess having an internal sharpened cutting edge extending parallel to said longitudinal side edges, and having a second pair of diagonal cutting edges extending from the internal cutting edge of said second recess to said other longitudinal cutting edges, each of said diagonal cutting edges extending at an angle of from about 40° to about 50° to the internal cutting edge of said second recess;

a first turbulence flange secured to said one longitudinal edge at a location directly across said plate from said second cutting recess and extending upwardly from said plate at an angle of from about 40° to about 50°; and

a second turbulence flange secured to said other longitudinal edge at a location directly across said plate from said first cutting recess and extending upwardly from said plate at an angle of from about 40° to about 50°.

4,995,229

PROCESS AND AN ARRANGEMENT FOR PICKING UP A YARN END OF A SPOOL PACKAGE DURING A PIECING OPERATION

Fritz Stahlecker, Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

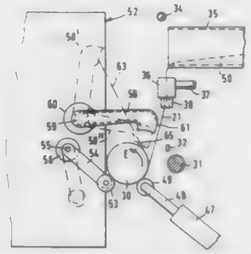
Filed Aug. 21, 1989, Ser. No. 396,348
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, 3828323
Int. Cl.[5] D01H *1/115, 15/013*
U.S. Cl. 57—261 23 Claims

1. A process for retrieving a yarn end being wound onto a spool package during a piecing operation at a spinning unit of the type supplying two adjacent prestrengthened yarns to form said spool package, said process comprising:

detecting breakage of one of the prestrengthened yarns,

interrupting winding onto the spool package in such a manner that the unbroken prestrengthened yarn is disposed in a predetermined yarn pick-up position,

applying a suction gripper to the unbroken prestrengthened yarn at said predetermined yarn pick-up position and moving the suction gripper and unbroken yarn to a position withdrawing the broken yarn and from the spool package for a first piecing attempt, and



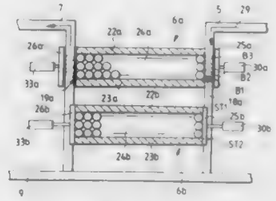
applying the suction gripper to adjacent the circumference of the spool package at a position spaced from the predetermined yarn pick-up position to locate the broken yarn end in the event of an unsuccessful first piecing attempt.

4,995,230

STEAM SETTING SYSTEM FOR SPINNING BOBBIN

Shoichi Tone, Kyoto, and Masaharu Kiriake, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 12, 1988, Ser. No. 256,599
Claims priority, application Japan, Oct. 19, 1987, 62-264775; Feb. 19, 1988, 63-38436
Int. Cl.[5] D01H *13/32*
U.S. Cl. 57—281 1 Claim



1. In a bobbin transferring system for transferring bobbins along a path, the improvement comprising:

a steam setting device arranged along the bobbin path, the steam setting device comprises a housing having an interior suitable for accommodating a plurality of bobbins, simultaneously, a bobbin inlet and a bobbin outlet;

a first bobbin conveyor extending toward the bobbin inlet, and a second bobbin conveyor extending from the bobbin outlet;

a bobbin reservoir arranged along the first bobbin conveyor;

wherein the bobbins transferred along the path are conveyed by the first conveyor to the bobbin inlet and by the second conveyor from the bobbin outlet;

stopping means for stopping bobbins conveyed by the first conveyor adjacent the bobbin inlet of the steam setting device; and

bobbin transferring means for transferring bobbins stopped by the stopping means into the housing of the steam setting device through the bobbin inlet;

wherein the bobbin transferring means comprises a movable door movable adjacent the bobbin inlet between an open position, at which the bobbin inlet is open, and a closed position, at which the bobbin inlet is traversed by the door, wherein the movable door comprises a surface which is arranged to contact and push bobbins stopped by the stopping means through the bobbin inlet upon the movable door being moved to the closed position.

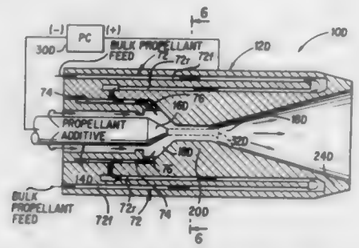
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,231

PERFORMANCE ARCJET THRUSTER

Richard D. Smith, Kirkland; Steve Knowles, Seattle; R. J. Cassady, Bellevue; William Smith, Seattle, and Mark A. Simon, Redmond, all of Wash., assignors to Olin Corporation, Stamford, Conn.

Division of Ser. No. 150,591, Feb. 1, 1988, Pat. No. 4,926,637.
This application Sep. 25, 1989, Ser. No. 411,798
Int. Cl.[5] F02K *11/00*
U.S. Cl. 60—203.1 12 Claims



1. In an arcjet thruster, the combination comprising:
(a) a body forming an annular-shaped constrictor and an annular-shaped nozzle being tandemly-arranged and having respective surfaces which together define an arc chamber, at least said nozzle being electrically conductive to constitute an anode;
(b) an elongated member having a tip disposed adjacent to and spaced upstream from said constrictor, said member being electrically conductive to constitute a cathode spaced from said anode by a gap generally coextensive with said arc chamber;
(c) means for applying an electrical potential to said anode and cathode so as to generate an electrical arc in said arc chamber from said cathode to said anode which produces thermal heating of propellant gases flowing through said chamber and expansion thereof through said nozzle; and
(d) means for separately injecting a separately supplied bulk propellant having a first specific impulse and a propellent additive having a second specific impulse greater than said first specific impulse into said arc chamber in the region of said tip of said cathode, said injecting means including means for injecting the propellant additive from along the exterior of said cathode into said arc chamber at the region of said cathode tip and into a central region of the arc formed between said cathode and anode.

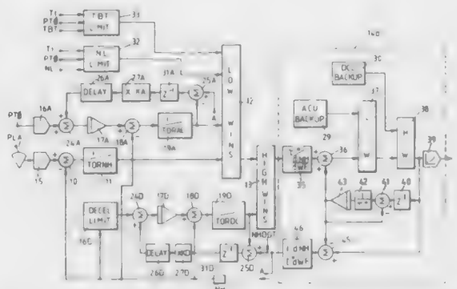
4,995,232

RUNNING CONTROL FOR A GAS TURBINE ENGINE

Arthur E. Sutton, Birmingham, England, assignor to Lucas Industries, Birmingham, England

Filed Aug. 4, 1986, Ser. No. 901,039
Claims priority, application United Kingdom, Aug. 2, 1985, 8519454
Int. Cl.[5] F02K *3/00*
U.S. Cl. 60—243 4 Claims

1. In a running control for a gas turbine engine having a fuel flow control which receives as input a signal representing a desired rate of change of engine speed, a speed governor circuit which receives a demand speed signal and an actual speed signal and provides a first output signal determined by the difference between said speed signals, an acceleration control circuit and a deceleration control circuit, each control circuit including a limit signal generator the output of which represents the maximum permitted rate of change of engine speed in current operating conditions and each control circuit also including an integrator connected to integrate the output of the respective limit signal generator and means for generating second and third output signals determined by the difference between the output of the respective one of the integrators and the actual engine speed, selection means for selecting whether the first, second or third output signal is applied to the fuel flow control as the input thereof and means for resetting the integrators of the acceleration and deceleration control circuits, the improvement wherein the integrator resetting means



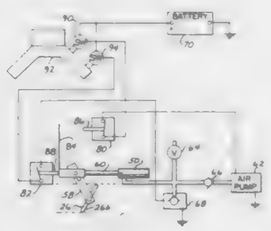
of at least one of the acceleration and deceleration control circuits comprises a feedback arrangement which modifies the input to the integrator of that control circuit in accordance with the difference beween the input to the fuel flow control and the second or third output signal as the case may be.

4,995,233

AUTOMATICALLY CONTROLLED EXHAUST ASSEMBLY FOR MARINE STERN DRIVE

Ricky H. Lulloff, Neenah, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 7, 1990, Ser. No. 476,352
Int. Cl.[5] B63H *21/32*
U.S. Cl. 60—324 14 Claims



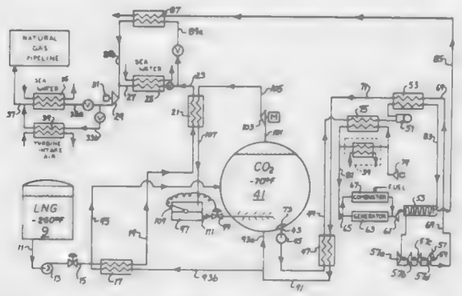
1. A stern drive marine propulsion system for a boat having a transom, comprising:
an inboard engine with an exhaust;
an outboard drive unit and propeller operatively coupled to said engine and separated therefrom by said transom;
an exhaust control assembly aft of said engine exhaust and forward of said transom, said assembly having an inlet connected to said engine exhaust, and having first and second outlets, and a valve in said assembly having a first condition providing communication of said inlet with said first outlet, and a second condition blocking communication of said inlet with said first outlet;
first passage means connected to said first outlet and extending aft through said transom;
second passage means connected to said second outlet and extending aft through said transom;
automatic control circuitry for automatically controlling actuation of said valve between said first and second conditions in response to a given parameter.

4,995,234

POWER GENERATION FROM LNG

Richard J. Kooy, Western Springs; John S. Andrepont; Roger F. Gyger, both of Naperville, all of Ill., and Lewis Tyree, Jr., Lexington, Va., assignors to Chicago Bridge & Iron Technical Services Company, Plainfield, Ill.

Filed Oct. 2, 1989, Ser. No. 415,649
Int. Cl.[5] F01K *25/10*
U.S. Cl. 60—648 19 Claims



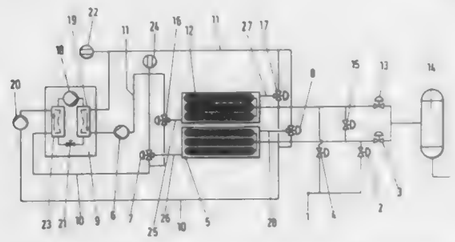
1. A method for generating power from LNG and storing energy , which method comprises
providing a source of LNG at a temperature of about −250° F. or lower,
increasing the pressure of said LNG to at least about 400 psia,
creating a reservoir of carbon dioxide liquid at about the triple point thereof which reservoir contains a substantial amount of solid carbon dioxide,
vaporizing said LNG to natural gas by removing heat from CO_2 at about the triple point temperature,
heating said high pressure natural gas,
expanding said heated natural gas to create rotary power, and
employing the carbon dioxide in said reservoir in a useful manner which results in the creation of CO_2 vapor that is subsequently reliquefied.

4,995,235

METHOD AND APPARATUS FOR COMPRESSING HYDROGEN GAS

Clemens Halene, Düsseldorf, Fed. Rep. of Germany, assignor to Huit Gesellschaft Fur-Hydrid-Und Wasserstofftechnik m.b.H., Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 325,267
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, [illegible]
Int. Cl.[5] F17C *11/00*
U.S. Cl. 62—46.2 24 Claims



1. Apparatus for compressing hydrogen gas comprising:
a hydrogen source;
hydrogen receiver means;
at least one hydride reservoir means;
said hydride reservoir means having means for receiving said hydrogen gas from said hydrogen source at a first pressure and for discharging said hydrogen gas to said hydrogen receiver means at a second pressure;
said second pressure being substantially higher than said first pressure;
said hydride reservoir means including means for supplying a heating and cooling medium thereto and means for discharging said heating and cooling medium therefrom;
heat sink means;
heat pump means operably connected to said hydride reservoir means through said means for supplying and said means for discharging said heating and cooling medium and to said heat sink means for selectively cooling said hydride reservoir means while heating said heat sink means and heating said hydride reservoir means while cooling said heat sink means; and
said heat sink means including means for receiving heat during said heating, means for storing said received heat, and means for releasing a substantial portion of said received heat during said cooling; and
said heat pump means being configured to provide said heating of said hydride reservoir means for generating a pressure of said hydrogen gas of said hydride reservoir means at least as great as said second pressure.

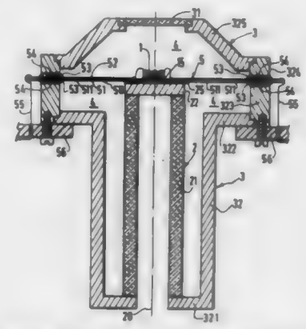
19. A method of compressing hydrogen gas, said method comprising the steps of:
supplying said hydrogen gas at a first pressure to at least one hydride reservoir means;
transferring heat with heat pump means from said hydride reservoir means to a heat sink means to cause said hydrogen gas to be absorbed in said hydride reservoir means;
receiving said heat in said heat sink means;
transferring said heat with said heat pump means to said hydride reservoir means from said heat sink means to cause a discharge of said hydrogen gas at a second pressure which is higher than said first pressure; and
removing said hydrogen gas at said second pressure from said hydride reservoir means.

4,995,236

CRYOSTATIC DEVICE FOR A RADIATION DETECTOR

Pierre Rouquier, Versailles; Michel Pele, Saint-Benoit; André Ic, Dourdan, and Pierre Crestey, Biard, all of France, assignors to Société Anonyme de Telecommunications, France

Filed Oct. 11, 1989, Ser. No. 420,154
Claims priority, application France, Oct. 13, 1988, 88 13470
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.1 8 Claims



1. A cryostatic device for a radiation detector, comprising:
(a) a cooled finger extending along an axis and having an end supporting at least one detector for detecting radiation and for generating a signal indicative of the detected radiation;
(b) a case surrounding said finger and said detector and

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transparent to said radiation at least in the vicinity of said detector, said case forming about said finger and said detector a heat insulating enclosure; and

(c) feed-through means for conveying said signal from the detector outside said enclosure, including

(i) a disk made from an electrically insulating material, and extending in a plane perpendicular to the axis of said finger, said disk having a central portion fixed to said end of the finger and a peripheral portion fixed to said case, said peripheral portion passing through and beyond said case for radially immobilizing said end of the finger with respect to said case, and

(ii) a plurality of conductors supported by said disk for conveying said signal.

4,995,237

METHOD FOR CARRYING OUT MAINTENANCE WORK ON A REFRIGERATOR, DEVICE AND REFRIGERATOR FOR CARRYING OUT THE METHOD

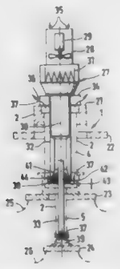
Wilhelm Strasser, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 110,936

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1986, 3635604

Int. Cl.[5] F25D *17/06*

U.S. Cl. 62—93 **12 Claims**



1. A method for performing maintenance on structural components located within a refrigerator housing while preventing condensation of gases in the refrigerator, said refrigerator housing having two sections separable from each other for accessing the refrigerator interior, the maintenance being carried out by first opening the housing, completing the maintenance, and thereafter closing the housing then sweeping the housing with a working gas, the method comprising heating local areas of the refrigerator housing endangered by condensation to a temperature prior to the maintenance which ensures that the maintenance and working gas sweep of the housing will be completed before the local area temperature falls below the dew point of condensable gases.

4,995,238

CHILLED BEVERAGE CONTAINER DISPLAY BIN

Leslie C. King, Snellville, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed May 31, 1990, Ser. No. 530,998

Int. Cl.[5] F25B *49/00*

U.S. Cl. 62—125 **8 Claims**

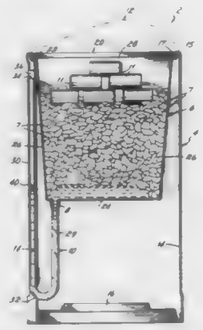
4. A container assembly for containing and displaying iced products comprising

a hollow, open top, self-supporting body having a bottom, a sidewall, and an open top, said bottom of said self-supporting body being adapted to be floor supported,

a liquid impervious storage tank supported from and contained internally of the self-supporting body, said storage tank having a bottom, a sidewall, and an open top, the bottom of the storage tank being located in a plane substantially above the bottom of the self-supporting body,

a drainage opening located near the bottom of the storage tank, and

a flexible drainage hose having one end portion located internally of the self-supporting body and an opposite end portion located externally of the self-supporting body, said one end portion of said hose having a first end connected to the drainage opening of said storage tank and said opposite end portion of said hose having a second end releasably supported near the top of said self-supporting body, by a releasable support means whereby said hose functions as a telltale of the level of liquid in said storage tank while supported near the top of said self-supporting body and facilitates draining of liquid from said storage tank without the provision of a flow control valve when not supported near the top of said self-supporting body.



4,995,239

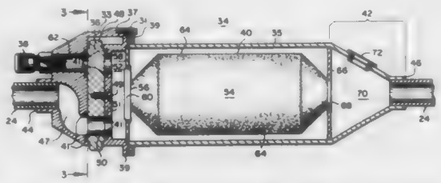
LIQUID LINE SERVICE AND PROCESS DEVICE

Michael D. Carey, Holmen, Wis., assignor to American Standard Inc., New York, N.Y.

Filed May 4, 1990, Ser. No. 519,071

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—149 **11 Claims**



1. A liquid line service and process device for use in the liquid line of a refrigeration system comprising:

a housing, respectively including an inlet, a filter core and an outlet forming a refrigerant flow path through the housing; the housing also including an access port, means for connecting the access port to the refrigerant flow path, a moisture indicator in the refrigerant flow path, and means for controlling the flow of refrigerant in said flow path.

4,995,240

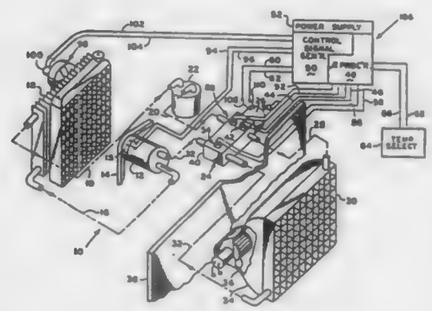
CONTROLLING REFRIGERATION HAVING CONTROL MODULE DIRECTLY ATTACHED ON VALVE BODY

Richard C. Barthel, Harwood Heights; Peter J. Malone, Rosemont, both of Ill.; Charles D. Orth, Cedarburg, Wis., and George W. Jarosch, Elkgrove, Ill., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 210,159, May 2, 1988, Pat. No. 4,848,100, which is a continuation of Ser. No. 7,147, Jan. 27, 1987, abandoned. This application Jun. 6, 1989, Ser. No. 362,138

Int. Cl.[5] F25B *49/00*

U.S. Cl. 62—225 **4 Claims**



1. A controller assembly for controlling refrigerant flow in a vehicle air conditioning system comprising:

(a) valve body means defining an inlet adapted to receive pressurized refrigerant, an outlet adapted for discharging said refrigerant at a lower pressure and a valving passage therebetween having therein a valve member movable between an open and closed position for controlling flow in said passage between said inlet and outlet;

(b) motor means attached to said body means and operable upon periodic energization to move said valve member between said open and said closed position, said motor means having at least one electrical connector extending therefrom;

(c) a first temperature sensing means attached to said body means and operative, upon electrical energization, for sensing the temperature in said outlet, said sensing means having at least one electrical connector extending therefrom;

(d) said body means further defining an auxiliary passage therethrough, said auxiliary passage adapted for having refrigerant leaving an evaporator flow therethrough;

(e) second temperature sensing means attached to said body means and operative, upon electrical energization for sensing the temperature in said auxiliary passage, said second sensing means having at least one electrical connector extending therefrom;

(f) control circuit means comprising a module including a microcomputer and means operable to periodically energize said valve, said module attached to and in direct contact with said body means which has for heat conduction therewith, said module having receptacle means received therein, in plug-in arrangement, said motor electrical connector and said electrical connectors of said first and second temperature sensing means; and,

(g) electrical supply connector means provided on said module and adapted for connection to an on-board source of electrical power.

4,995,241

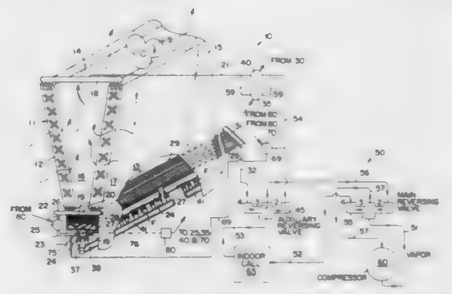
HIGH EFFICIENCY HEAT EXCHANGER

Gerry Vandervaart, Nigara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Filed Sep. 13, 1989, Ser. No. 406,409

Int. Cl.[5] F25B *27/00*

U.S. Cl. 62—238.7 **34 Claims**



1. A heat exchanger comprising outdoor coil means for circulating a heat-exchange medium therethrough, said outdoor coil means having an inlet and an outlet for respectively receiving and discharging the heat-exchange medium therefrom, compressor means for compressing a vapor phase of the heat-exchange medium, means for effecting ambient air flow relative to said outdoor coil means during a heating phase of said heat exchanger whereby the heat-exchange medium absorbs heat from ambient air to elevate the temperature of said heat-exchange medium, means for generating heat to further increase the temperature of the heat-exchange medium beyond that created by the heat absorbed from ambient air, control means for at times simultaneously operating said ambient air flow effecting means and said heat-generating means, accumulator means for receiving the heat-exchange medium in its liquid phase from said outdoor coil means outlet and collecting the liquid phase heat-exchange medium therein, said heat-generating means being effective for heating the liquid phase of the heat-exchange medium while collected in said accumulator means and transforming the liquid phase heat-exchange medium into its vapor phase, means for conducting the heat-exchange medium vapor phase from said accumulator means to said compressor means whereby the vapor phase of the heat-exchange medium is compressed, and means for conducting the compressed vapor phase of the heat-exchange medium from said compressor means to said indoor coil means inlet.

4,995,242

METHOD OF AND MEANS FOR CONTROLLING THE CONDITION OF AIR IN AN ENCLOSURE

Gad Assaf, Rehovot, Israel, assignor to Ormat Turbines, Ltd., Yavne, Israel

Continuation of Ser. No. 479,009, Mar. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 377,368, Jul. 30, 1982, abandoned. This application Jan. 6, 1989, Ser. No. 294,114

Int. Cl.[5] F25D *23/00*

U.S. Cl. 62—271 **15 Claims**

1. Apparatus for controlling the condition of air in an enclosure comprising:

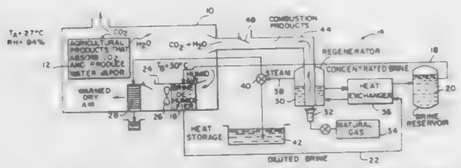
(a) a brine dehumidifier to which concentrated brine is supplied from a reservoir and from which diluted brine is obtained;

(b) means for recirculating air in the enclosure through said brine dehumidifier;

(c) a boiler associated with said reservoir and fired by a combustible fuel that produces carbon dioxide and water vapor for adding heat to the diluted brine, including means for concentrating said diluted brine and producing steam;

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(d) means for selectively supplying said carbon dioxide and water vapor to said enclosure; and



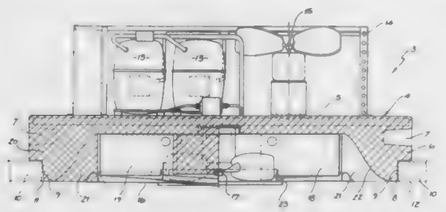
(e) means for selectively returning to the enclosure substantially all the heat added to the brine by the boiler.

4,995,243

DROP-IN REFRIGERATION UNIT

Allan Ward, San Souchi, Australia, assignor to F Muller Pty Limited, Kingsgrove, Australia

Filed Jan. 23, 1989, Ser. No. 299,760
Claims priority, application Australia, Jan. 28, 1988, PI6466
Int. Cl.[5] F25D *19/02*
U.S. Cl. 62—298 6 Claims



1. A drop-in package refrigeration unit for installation within an aperture in the roof of a refrigerator cabinet, said refrigeration unit comprising a heat insulating plug closing said aperture when said unit is installed, a depending peripheral skirt integral with said plug and defining a compartment at the underside of the plug, abutment means on said plug engageable with the roof of said cabinet to ensure that said skirt does not intrude substantially into said cabinet, refrigeration components mounted upon the top of the plug, a refrigeration evaporator positioned within said compartment, an air impeller within said compartment operating to create air flow over said evaporator, and air ducting defined by said skirt which includes a wall inwardly curved along its length and tapering towards a lower end of said skirt to direct said air flow from the evaporator in a path adjacent the ceiling within said cabinet.

4,995,244

REFRIGERATING MACHINE COMPRISING AN END-OF-DEFROSTING DETECTOR

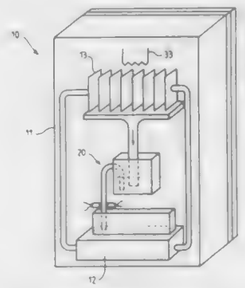
Michel Steers, La Quelle En Brie; Jean-Pierre Hazan, Sucy-En-Brie, and Gilles Delmas, Epinay-Sous-Senart, all of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 5, 1989, Ser. No. 446,504
Claims priority, application France, Dec. 30, 1988, 88 17494
Int. Cl.[5] F25D *21/08*
U.S. Cl. 62—155 7 Claims

1. A refrigerating machine of the refrigerator or freezer type comprising a device for defrosting cold parts to transform the ice into water to be discharged characterized in that it comprises an end-of-defrosting detector comprising:

(1) a reservoir which receives the water to be discharged, one of the branches of a siphon extending into said reservoir in order to drain the reservoir when the water reaches the level required for activation of the siphon, the other branch being situated externally of the reservoir,

(2) a light barrier, comprising a light source and a light receiver arranged around the other branch of the siphon in such a way that a light beam of the light barrier is interrupted by the passage of water through said other branch while defrosting is in progress, and



(3) an electric circuit which processes an electric signal supplied by the light barrier to detect the end of defrosting when the light beam is not interrupted for a predetermined time,

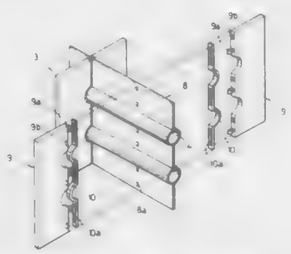
said detector being effective to render the defrosting element inoperative when said end of defrosting is detected.

4,995,245

EVAPORATOR FOR ICE MAKER

Eui Y. Chang, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Oct. 5, 1989, Ser. No. 416,677
Claims priority, application Rep. of Korea, Oct. 6, 1988, [illegible]16501
Int. Cl.[5] F25B *39/02*
U.S. Cl. 62—515 20 Claims



1. An evaporator for ice maker, comprising:

plate means made of a material exhibiting good heat conductivity and joined together in a unitary body, for forming therein a plurality of evaporating pipes arrayed in said unitary body between said plate means;

a plurality of separating means made of a substance exhibiting a characteristic of low heat conductivity disposable in pairs of said separating means each extending across said evaporating pipes on opposite sides of said unitary body, with each of said separating means in each said pair being interconnected through said unitary body; and

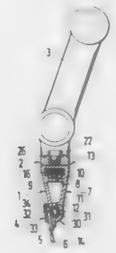
connecting means formed as integral elements of each of said separating means, for joining each said pair of the separating means with the unitary body of the plate means.

4,995,246

WARP KNITTING MACHINE WITH AT LEAST ONE BAR

Ferdinand Reich, Seligenstadt, Fed. Rep. of Germany, assignor to Karl Mayer Testilmaschinenfabrik GmbH, Fed. Rep. of Germany

Filed Nov. 27, 1989, Ser. No. 441,376
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1988, 3840531
Int. Cl.[5] D04B *15/20*
U.S. Cl. 66—125 R 18 Claims



1. In a warp knitting machine having guide holders and holding arms, a guide bar assembly comprising a guide bar made of reinforced synthetic polymeric materials, said guide bar having along substantially its entire length a substantially hollow profile, said guide bar having surrounding a plurality of walls substantially enclosing said hollow profile, said guide bar comprising:

a first fastening segment adapted to be attached to said holding arms; and

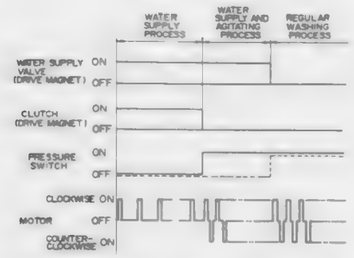
a second fastening segment adapted to support said guide holders.

4,995,247

WASHING MACHINE

Takashi Ishino; Isao Hiyama; Yousuke Nagano, all of Hitachi; Tamotu Shikamori, Ibaraki; Shizuo Turuta, Kitaibaraki; Toshiyasu Kamano, and Hiroshi Ohsugi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 228,128, Aug. 4, 1988, abandoned, which is a division of Ser. No. 84,218, Aug. 12, 1987, abandoned.
This application Nov. 14, 1989, Ser. No. 434,470
Claims priority, application Japan, Aug. 22, 1986, 61-19540
Int. Cl.[5] D06F *33/02, 39/08*
U.S. Cl. 68—12 R 4 Claims



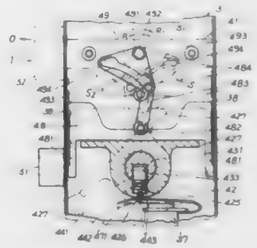
1. A washing machine comprising a washing tank, an agitating vane unit rotatably mounted in the washing tank, motor means for driving the agitating vane unit, means including water supply valves means for supplying water to the washing tank, pressure switch means for detecting a water level in the washing tank and providing output signals respectively representing a rated standard water level and a fixed water level less than the rated standard water level, control means for providing operating instructions to said motor means and said water supply valve means in response to the output signal from said pressure switch detecting means, said control means being adapted to maintain the water supply valve means in a continuously open position while instructing said motor means to operate said agitating unit to wash and agitate upon receipt of the output signal representing the fixed water level less than the rated standard water level and to close the water supply valve means upon receipt of the output signal representing the rated standard water level while instructing said motor means to continue operating the agitating vane unit.

4,995,248

CONTROL MECHANISM OF ELECTRONIC LOCK HAVING DOUBLE BOLTS

Yin-Chic Liu, P.O. Box 10160, Taipei, Taiwan

Filed Apr. 16, 1990, Ser. No. 509,905
Int. Cl.[5] E05B *47/06, 59/00*
U.S. Cl. 70—107 12 Claims



1. A control mechanism of electronic lock comprising:

an outside cover fixed on an outside surface of a door having an outside knob rotatably mounted in said outside cover and a sensor fixed on an inside surface of the outside cover operatively reading a coded number card inserted through a slot formed in said outside cover;

an inside cover corresponding to said outside cover fixed on an inside surface of the door having an inside knob rotatably mounted in said inside cover and a thumbturn pivotally formed in said inside cover;

a base secured between said outside cover and said inside cover having a battery socket for storing batteries therein for powering said sensor;

a locking bolt means having a latch bolt formed on a lower portion of the locking bolt means normally resilently protruding outwardly and a dead bolt formed on an upper portion of the locking bolt means; and

a control means operatively retracting or extending said two bolts when actuated by the sensor reading a correct coded card for opening or closing the door, said thumbturn operatively retracting or extending said dead bolt for unlocking or locking the door,

said control means including a fixing plate secured to said base between said outside cover and inside cover, a rotating cylinder rotatably mounted in said fixing plate and said base, a rotating axle rotatably engageable in said cylinder and secured to both said outside knob and said inside knob by passing through said latch bolt for operatively retracting said latch bolt for opening the door when the dead bolt is unlocked, said rotating cylinder rotating engageabble with said axle, a tumbler set operatively coupling said cylinder with said axle, a restoring spring restoring said cylinder for a specific orientation of said cylinder, an electromagnetic coil formed under said cylinder operatively coupling said cylinder with said axle when powered by said batteries as sensed by said sensor, a counterweight rider normally overlain on said cylinder pivotally mounted with a biasing arm member thereon, and a bolt positioning member pivotally connected between said fixing plate and said base operatively biased by said arm

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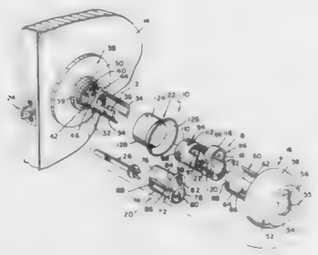
member of said counterweight rider, when rotating said outside knob, said axle, and said cylinder to bias and raise said rider, for rotating said bolt positioning member for retracting said dead bolt for opening the door.

4,995,249

DOOR HANDLE ASSEMBLY WITH HOLLOW KNOB AND INTERCHANGEABLE LOCK CORE

Christopher M. Preissler, Indianapolis, and William R. Foshee, deceased, late of Indianapolis, both of Ind. (Carolyn S. Foshee, administratix), assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Oct. 23, 1989, Ser. No. 425,704
Int. Cl.[5] E05B *13/10*
U.S. Cl. 70—224 24 Claims



1. A door handle assembly for connection to a rotatable spindle assembly, the door handle assembly comprising

a hollow knob shell having a front face, the knob shell being formed to include an interior cavity having a front opening in the front face,

a lock core having a front end formed to include a keyway passage opening, and

a unitary core retainer sleeve situated inside the interior cavity and coupled to the knob shell, the unitary core retainer sleeve being formed to include means for supporting the lock core inside the interior cavity so that the front end of the lock core is positioned to lie in the front opening of the knob shell to permit a user to insert a key into the keyway passage opening, and wherein the unitary core retainer sleeve is mounted on the rotatable spindle assembly for rotation therewidth.

4,995,250

COMBINATION LOCK FOR THE SHIFT ROD AND THE HAND-BRAKE ROD OF A CAR

Chuang C. Chiou, #34 Badding 1: Street, Taoyuan City, Taiwan

Filed Sep. 13, 1989, Ser. No. 406,684
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—238 3 Claims

1. A combination lock for the shift rod and the hand-brake rod of a car comprising:

a fixing head for locking the shift rod, and said fixing head being furnished with a shift rod hole and a projected portion, and said projected portion having a screw hole;

a movable sleeve having a socket at its front end and female threads in its rear end;

a lock head member, of which the center core is furnished with a shaft hole and a kerf;

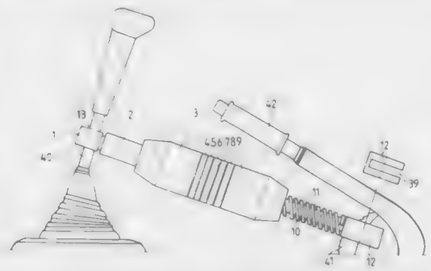
a plurality of combination rings, and each of said combination rings having a shaft hole and a kerf;

a lock tail member having a shaft hole and a kerf;

a main rod having a threaded head, a slot at one side of said rod, and main rod tail;

a spring;

an extension rod, of which the front end being connected with a toothed strip, while the rear thereof being formed into one piece with a ratchet strip jaw; and said toothed strip of said extension rod being movably mounted in the slot of said main rod, and said extension rod being movably mounted in the center of said main rod tail; and said spring being mounted between said ratchet strip jaw and said main rod tail in a retractable manner; and said main



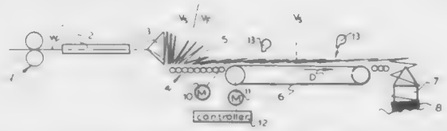
rod being mounted in place after passing through the shaft holes of said lock tail member, said combination rings, and said lock head member respectively; and said toothed strip passing through the said kerfs respectively, and then said main rod being fitted with the female threads in said movable sleeve.

4,995,251

SYSTEM FOR TRIMMING LEADING AND TRAILING ENDS FROM A WIRE COIL

Manfred Reumann, Neu-Wulmstorf; Wolfgang Preiss, Buxtehude-Eilendorf, and Andreas Kubicek, Hamelworden, all of Fed. Rep. of Germany, assignors to Hamburger Stahlwerke GmbH and Schwerdtfeger & Kubicek Systemtechnik GmbH & Co. KG, both of Hamburg, Fed. Rep. of Germany

Filed Apr. 5, 1990, Ser. No. 505,673
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1989, 3913695; Jun. 17, 1989, 3919836
Int. Cl.[5] B21F *11/00;* B21B *41/10;* B26D *7/00*
U.S. Cl. 72—132 6 Claims



1. In a method of making wire coils comprising the steps of:

rolling a length of wire having a leading end and a trailing end and displacing the wire in a longitudinal travel direction;

coiling the wire into succeeding overlapping loops and depositing same onto an upstream conveyor;

transferring the loops from the upstream conveyor to a downstream conveyor; and

depositing the loops from the downstream conveyor onto a centering device to form a coil thereon, the improvement comprising the steps of:

driving the downstream conveyor to move the loops at a generally constant slow transport speed;

driving the upstream conveyor to move the loops at a substantially faster transport speed when loops of a portion of the wire having one of the ends are being deposited on the upstream conveyor but otherwise driving the upstream conveyor at the same slow speed as the downstream conveyor, whereby the loops of the end portion will be spaced more in the travel direction than the other loops of the wire; and

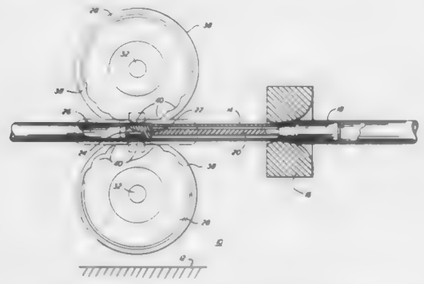
cutting through the wire at the end portion on the downstream conveyor and removing from the downstream conveyor end-portion loops including the one end of the wire.

4,995,252

METHOD AND APPARATUS FOR INTERNALLY ENHANCING HEAT EXCHANGER TUBING

Gerald F. Robertson, Manlius; Ross A. Moyer, LaFayette, and John R. McManus, Marcellus, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,363
Int. Cl.[5] B21C *37/20*
U.S. Cl. 72—194 20 Claims



1. A method of producing an internal enhancement on a metal tubular heat exchanger pipe which comprises the steps of moving the pipe axially over a generally cylindrical mandrel that is supported within the pipe at a substantially stationary position, the mandrel having a plurality of grooves therein that extend from one axial end to another axial end thereof; and sinking the tubular heat exchanger pipe into the grooves on the mandrel to produce internal ribs at the locations of said grooves, by rotating a plurality of pairs of opposed rotary dies to strike against the outer surface of the pipe all at one transverse plane substantially at the location of said mandrel, said dies being in the form of wheels having axes generally perpendicular to the axis of the tubular heat exchanger pipe and having circumferential portions which roll into contact with the pipe parallel to the axis of the pipe at said transverse plane, so that the dies together strike the pipe over substantially its entire circumference at said transverse plane.

4,995,253

METHOD FOR TAKING UP A BILLET PRODUCED IN THE EXTRUSION OR TUBE-MAKING PRESS AND CONTROL OF A TAKE-UP DEVICE FOR THIS PURPOSE

Horst Groos, Mettmann, and Karl-Heinz Schütte, Kaarst, both of Fed. Rep. of Germany, assignors to SMS Sutton, Inc., Pittsburgh, Pa. and SMS Hasenclever GmbH, Dusseldorf, Fed. Rep. of Germany, a part interest

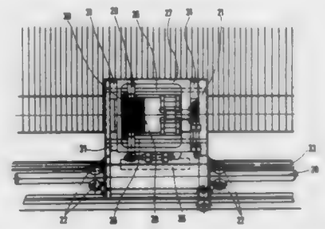
PCT No. PCT/DE88/00439, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989
PCT Filed Jul. 18, 1988, Ser. No. 327,809
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723824
Int. Cl.[5] B21C *35/02*
U.S. Cl. 72—257 9 Claims

1. A method for taking up a billet produced in an extrusion or tube making press with a controlled tractive force while maintaining the billet straight and without affecting the formation of the billet in a die of the press comprising:

applying a pull-away tractive force to the billet;

increasing said pull-away tractive force in proportion to the billet length, weight per unit length of the billet and coefficient of friction between the billet and a delivery table for receiving the billet;

determining the take-up tractive force dependent on the cross-section and flow characteristics in the die; and



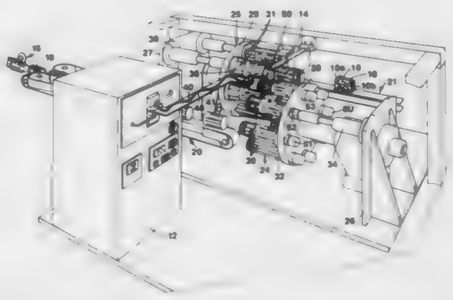
superimposing said pull-away tractive force on said take-up tractive force for determining the desired tractive force to be exerted on the billet.

4,995,254

METHOD AND APPARATUS FOR ENSURING THE DIMENSIONAL ACCURACY OF A FRUSTO-PYRAMIDAL CAN BODY

Kurt Alznauer, Lauchringen, Fed. Rep. of Germany; Michael Baumgartner, Rekingen, Switzerland; Werner Boegli, Bergdietikon, Switzerland, and Jürgen Brauer, Boniswil, Switzerland, assignors to Elpatronic AG, Zug, Switzerland

Filed Feb. 2, 1990, Ser. No. 474,470
Claims priority, application Switzerland, Feb. 16, 1989, 534/89
Int. Cl.[5] B21D *51/26*
U.S. Cl. 72—342.1 14 Claims



1. A method of ensuring the dimensional accuracy of a frusto-pyramidal can body produced from a rectangular sheet metal blank that is shaped cylindrically and longitudinally seam welded, comprising the steps of: shaping the seam welded can body into a tapered oval body; and then shaping the tapered oval body into a regular frustum of a pyramid which is rectangular in cross section with rounded side edges; and heating the can body after the step of shaping the tapered oval body and before the step of shaping the frustum of a pyramid.

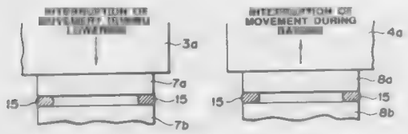
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,255

METHOD OF CHANGING DIES FOR A PRESS MACHINE

Shigekazu Noda, Ishikawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/01039, § 371 Date May 30, 1989, § 102(e) Date May 30, 1989, PCT Pub. No. WO89/03262, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 12, 1988, Ser. No. 365,160
Claims priority, application Japan, Oct. 12, 1987, 62-254790
Int. Cl.[5] B21D *37/00*
U.S. Cl. 72—446 13 Claims



1. A method of changing dies in a press machine having a plurality of dies each having an upper die half respectively supported by corresponding slides and a lower die half, said slides arranged with their respective lower dead points different from each other based on a common crank angle, which comprises:

interposing elastic means between said upper die half and said lower die half of said plurality of dies, and

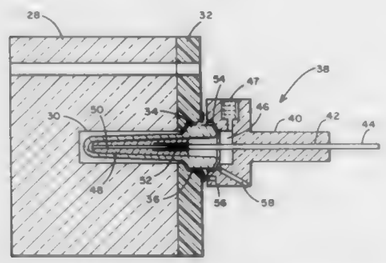
interrupting movement of said corresponding slides at a crank angle in proximity of an intermediate angle between said respective lower dead points for clamping of said upper die halves to or unclamping of said upper die halves from their corresponding slides during said interrupting of movement of said corresponding slides.

4,995,256

ZIRCONIA CELL O_2 SENSOR FOR RESPIRATORY GAS ANALYSIS

John A. Norlien, St. Paul; James M. Huhn, Arden Hills, both of Minn., and A. Gerrit Crawford, San Francisco, Calif., assignors to Medical Graphics Corporation, St. Paul, Minn.

Filed Mar. 20, 1989, Ser. No. 326,100
Int. Cl.[5] G01N *27/12*
U.S. Cl. 73—31.04 9 Claims



1. Apparatus for sensing the partial pressure of oxygen in a gaseous mixture comprising, in combination:

(a) an electrical heater having a cavity therein:

(b) a conical zirconia ceramic element having an internal bore defining a lumen with a closed distal end and an open proximal end, the wall defining said lumen being of generally uniform thickness and having a conductive coating on opposed internal and external surfaces thereof;

(c) a manifold member including a probe conforming generally to the shape of internal bore and insertable into said lumen in said element to define a narrow annular flow path between the internal wall surface of said internal bore and the exterior of said probe, said manifold member including a longitudinal bore extending completely through said probe from a proximal end to a distal end;

(d) means for coupling a gas sample to be tested to said longitudinal bore of said manifold member at said proximal end of said manifold member, sand manifold member including means for coupling a source of negative pressure in fluid communication with said annular flow path to draw said gas sample through said longitudinal bore of said manifold member and uniformly over said surface of said wall via said annular flow path; and

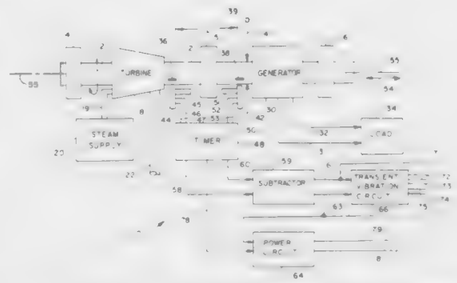
(e) means for conductively coupling said conductive coatings on the opposed surfaces of said wall to voltage measuring means.

4,995,257

MONITOR FOR SHAFT VIBRATION IN AN OPERATING TURBINE

Robert L. Leon, Roslyn, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 23, 1989, Ser. No. 327,523
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—116 19 Claims



1. An apparatus for detecting torsional events on a rotating shaft subjected to torsional loads comprising:

two marks placed on said shaft longitudinally spaced apart,

means, longitudinally spaced apart by a predetermined distance, for sensing said two marks as each mark passes a respective position as said shaft rotates,

means for measuring the lapse time for each mark to make one rotation on said shaft as the shaft rotates,

means for subtracting the lapse time of rotation of one mark from the lapse time of rotation of the other mark, whereby a difference in lapse time is indicative of torque on the shaft, and

transient vibration circuit means connected to said subtracting means for determining torsional vibrations on the shaft.

4,995,258

METHOD FOR DETERMINING AIR MASS IN A CRANKCASE SCAVENGED TWO-STROKE ENGINE

Richard M. Frank, Beverly Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

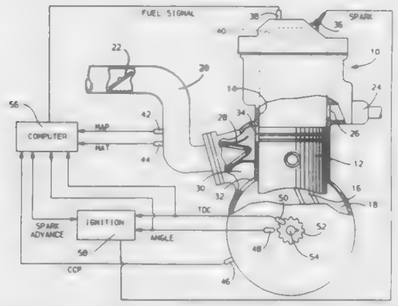
Filed Apr. 26, 1990, Ser. No. 514,997
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.2 14 Claims

1. In a crankcase scavenged two-stroke engine characterized by an operating cycle including portions during which air is inducted into a crankcase chamber, is thereafter trapped and compressed within the shrinking volume of the crankcase chamber, and is then transferred to a combustion chamber; a method for determining the mass of air transferred to the combustion chamber during the engine cycle, comprising the steps of:

deriving indications of the pressure P, volume V, and temperature T, of air within the crankcase chamber during the engine operating cycle;

determining the mass of air M_T trapped in the crankcase chamber from indicated values of pressure P, volume V, and temperature T derived during that portion of the operating cycle when air is trapped and compressed within the crankcase;

determining the residual mass of air M_R remaining in the



crankcase chamber from indicated values of pressure P, volume V, and temperature T derived during that portion of the operating cycle after the transfer of air to the combustion chamber is substantially completed; and

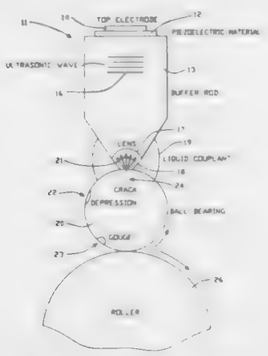
estimating the mass of air M transferred to the combustion by chamber as a function of the difference between the mass of air M_T trapped within the crankcase chamber and the mass of air M_R remaining within the crankcase chamber.

4,995,259

ACOUSTIC MICROSCOPE SURFACE INSPECTION SYSTEM AND METHOD

Butrus T. Khuri-Yakub, Palo Alto, Calif.; Philippe Parent, Chilly-Mazarin, France, and Paul A. Reinholdtsen, Seattle, Wash., assignors to The Board o Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 9, 1989, Ser. No. 320,950
Int. Cl.[5] G01N *29/06*
U.S. Cl. 73—593 11 Claims



1. An acoustic microscope surface inspection system for detecting surface defects in a test object comprising:

means for generating pulses of high frequency electrical energy;

a transducer for receiving said high frequency electrical energy pulses and generating and focusing acoustic wave pulses which impinge at a selected location on the object under test and receiving acoustic wave pulses emanating from said location and generating output signal pulses;

means for generating a reference electrical signal, at said high frequency;

means for controlling and incrementally shifting the phase between said reference signal and said high frequency electrical energy pulses at said selected location through 360 electrical degrees; and

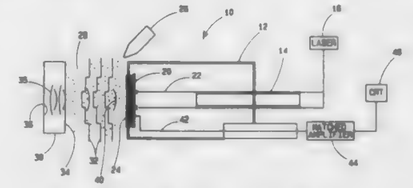
means for receiving said reference signal and said transducer output signal pulses at said selected location and provide an output signal indicative of the difference in amplitude and phase of said reference signal and transducer output signal pulses for each pulse of the pulses at said selected location.

4,995,260

NONDESTRUCTIVE MATERIAL CHARACTERIZATION

Vance A. Deason; John A. Johnson, and Kenneth L. Telschow, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 14, 1989, Ser. No. 379,832
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—632 20 Claims



1. A method for nondestructive material characterization comprising:

acoustically coupling a piezoelectric (PZ) transducer to test a material;

exciting the PZ transducer using a pulsed laser such that the transducer generates an acoustic pulse which impacts the test material;

propagating an ultrasonic wave generated from said acoustic pulse through at least a portion of the test material;

reflecting said ultrasonic wave from the test material back to the transducer as a reflected acoustic pulse;

generating an electrical signal from the interaction of said reflected acoustic pulse and said PZ transducer and inputting said electric signal to an impedance matched amplifier to produce an amplified signal; and

coupling said amplifier to a read-out device to measure the amplified signal.

4,995,261

FIELD-BASED MOVEMENT SENSING APPARATUS

Stephen C. Jacobsen, and John E. Wood, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah

Continuation-in-part of Ser. No. 332,593, Apr. 3, 1989. This application Oct. 20, 1989, Ser. No. 424,406
Int. Cl.[5] G01B *7/16*
U.S. Cl. 73—767 8 Claims

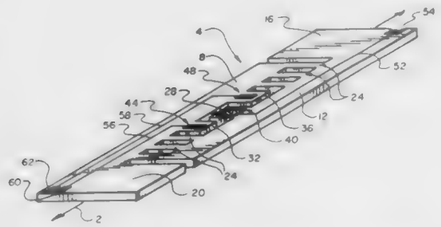
1. A transducer for measuring strain in an object on which the transducer is disposed comprising

a flexible generally planar frame member for disposition on the object and including a pair of generally parallel beams one of which is moveable with respect to the other when the object is subject to strain, and a plurality of spaced-apart laterally flexible connecting beams extending between the pair of beams,

means disposed on said one moveable beam for producing a force field which emanates therefrom and which dimin-

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ishes in strength with distance from the force field producing means,
spacer means disposed on the other of said beams,
substrate means disposed on said spacer means above and spaced from said frame member, and



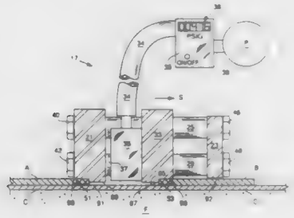
detection means disposed on the substrate means at a location generally above the force field producing means for detecting the presence of the force field and for producing signals representing force field strength and thus the distance of the detection means from the force field producing means.

4,995,262

TILE SHEAR TESTING APPARATUS AND METHOD

Ray M. Reed, 7906 S. Pierce Way, Littleton, Colo. 80123

Filed Apr. 13, 1990, Ser. No. 509,019
Int. Cl.[5] G01N *3/24*
U.S. Cl. 73—842 7 Claims



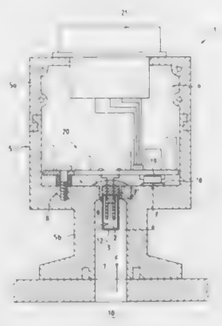
1. An apparatus for shear testing bonding strength between a floor and tile cemented to the floor, comprising:
(a) a rigid frame including:
a reaction head being generally rectangular and having at least four holes disposed therein, said reaction head having a lateral notch therein on a rear, lower corner thereof,
an alignment end plate being generally rectangular and having at least four holes disposed therein, said alignment end plate lying in a plane generally parallel to said reaction head,
first, second, third, and fourth alignment rods each connecting said reaction head to said alignment end plate and each respectively disposed in one of said four holes in said alignment end plate and one of said four holes in said reaction head, wherein each of said alignment rods has an enlarged central portion along a length thereof and corresponding narrower portions at a front end and a rear end thereof to form a front rod shoulder and a rear rod shoulder on each rod to bear against and prevent inward movement of said alignment end plate and said reaction head respectively, and
threaded securement members on said front end and said rear end of each of said first, second, third and fourth rods to rigidly secure said rods to said reaction head and to said alignment end plate;
(b) a centrally located movable head being generally rectangular and having at least four holes disposed therein, said movable head lying in a plane generally parallel to and inbetween said reaction head and said alignment end plate, wherein said four holes in said movable head each have a hardened steel liner disposed therein and disposed around a respective enlarged central portion of a respective one of said first, second, third and fourth alignment rods, wherein said movable head is slidable along said rods between said reaction head and said alignment end plate in a slide direction generally parallel to the floor with said movable head and said reaction head each in a planar orientation generally perpendicular to the floor, wherein said movable head has a laterally curved notch therein on a front, lower corner thereof;
(c) a fluid-pressure activated expansion unit positioned between said reaction head and said centrally located movable head to force said reaction head and said centrally located movable head to force said reaction head and said movable head away from one another responsive to increased fluid pressure in said expansion unit, wherein said expansion unit includes a pressure readout having increments with precision of at least ten pounds per square inch;
(d) a first hardened steel jaw attached in said notch of said reaction head, said first jaw bearing against a first tile cemented to the floor; and
(e) a second hardened steel jaw attached in said curved notch of said movable head, wherein said second jaw is laterally curved on one face to correspond to said curved notch and is slidable in said curved notch, and wherein said second jaw is generally flat along an opposite face to said curved face to bear against a second tile cemented to the floor, wherein sliding along said curved notch creates a swivel action in said second jaw to engage said second tile flush.

4,995,263

TUNING FORK QUARTZ MANOMETER

Rudolf Stocker, Azmoos, Switzerland, assignor to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Filed Dec. 14, 1989, Ser. No. 450,857
Claims priority, application Switzerland, Jan. 23, 1989, 00204/89
Int. Cl.[5] G01L *11/00*
U.S. Cl. 73—702 17 Claims



1. Turning fork manometer having
a measuring head (1) including
a tuning fork quartz (2);
a self-oscillating feedback circuit (23) having circuit components (19, 20), said tuning fork quartz (2) being connected in said circuit; and

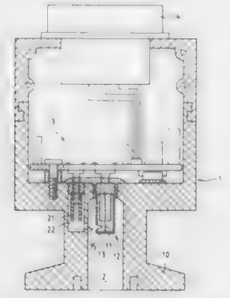
a protective casing (3) surrounding the turning fork quartz,
wherein the measuring head comprises
a mounting support for retaining said tuning fork quartz (2) and said protective casing (3) in position and, further, for mounting said circuit components; and
wherein said tuning fork quartz and said circuit components are secured to said mounting support and thermally coupled together in heat transferring relation, and said circuit components and said tuning fork quartz are physically located close to each other to minimize connecting line lengths and enhance said thermal coupling.

4,995,264

GAS PRESSURE GAUGE AND PRESSURE MEASURING METHOD

Rudolf Stocker, Azmoos, and Walter Schaedler, Triesen, both of Switzerland, assignors to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Filed Dec. 14, 1989, Ser. No. 450,856
Claims priority, application Switzerland, Jan. 23, 1989, 00206/89
Int. Cl.[5] G01L *11/00, 21/12*
U.S. Cl. 73—702 20 Claims



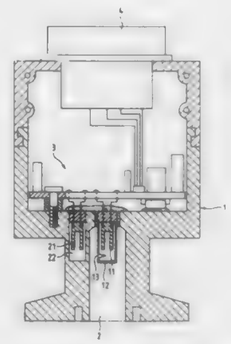
11. A compensated gas pressure measuring gauge, providing a combined pressure output signal which is essentially independent of the molecular mass (M) of the gas, the pressure of which is to be determined,
and especially for measuring low pressure values in the vacuum pressure level range, comprising
a heat conduction gauge (12, 12, 13) exposed (15) to the gas, the pressure of which is to be measured, and furnishing a first signal which is inversely proportional to $M^{\frac{1}{2}}$;
a gas friction gauge (21) exposed (15) to said gas, the pressure of which is to be measured, and furnishing a second signal which is directly proportional to $M^{\frac{1}{2}}$;
and a combining circuit (3; W-G, W+G) coupled to receive said first measuring signal (W) and said second measuring signal (G) and combining said first and second measuring signals in such a manner that the inverse dependency of said first measuring signal on gas molecular mass, and the direct dependency of said second measuring signal on gas molecular mass effectively cancel each other to form a common output signal, which is essentially independent of the type of the gas, the pressure of which is to be measured, and hence of its molecular mass.

4,995,265

DEGRADATION AND CONTAMINATION COMPENSATED TUNING FORK QUARTZ MONOMETER, AND METHOD TO COMPENSATE FOR TUNING QUARTZ DEGRADATION AND CONTAMINATION

Rudolf Stocker, Azmoos, Switzerland, assignor to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Filed Dec. 14, 1989, Ser. No. 452,112
Claims priority, application Switzerland, Jan. 23, 1989, 00205/89
Int. Cl.[5] G01L *11/00*
U.S. Cl. 73—702 16 Claims



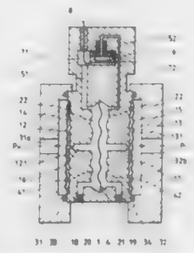
1. Process for measuring pressure with a tuning fork quartz operated at resonant frequency, in which the pressure (p) of a measuring volume is determined by measuring a damping value corresponding to the oscillation damping of the quartz, characterized in that the damping value is combined with a correction value proportional to the resonant frequency (f_R).

4,995,266

DIFFERENTIAL PRESSURE TRANSMITTER

Tomoyuki Tobita, Katsuta, and Yoshimi Yamamoto, Naka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,916
Claims priority, application Japan, Sep. 2, 1988, 63-218361
Int. Cl.[5] G01L *7/08, 9/06, 13/06*
U.S. Cl. 73—706 7 Claims



1. A differential pressure transmitter, comprising:
a body;
pressure-receiving diaphragms disposed on both sides of the body, and the periphery of the diaphragms being fixed to the body forming recesses filed with a pressure transmission medium;
a diaphragm disposed between the pressure-receiving diaphragms forming chambers filed with the pressure transmission medium into the body;
two first communication passages for communicating the chambers with the respective recesses;

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two second communication passages for transmitting the pressure of the chambers; and

a differential pressure sensor with pressure-measuring chambers for receiving the pressures transmitted by the two second communication passages, and converting a differential pressure of the pressures transmitted from the two second communication passages into an electrical signal, wherein the diameter D of the first communication passage is

$$\sqrt{\frac{\left(\text{viscosity of the medium}\right)}{\left(\text{volume elasticity modulus of the medium}\right)} \times \left(\text{kinematic coefficient of viscosity of the medium}\right) \times \left(\text{length of each second communication passage}\right) \times \left(\text{volume of each pressure measuring chamber}\right)^{2}}$$

$$\left(\text{diameter of each second communication passage to recess}\right)$$

4,995,267

METHOD OF MONITORING THE STATE OF ELONGATED OBJECT AND APPARATUS FOR PERFORMING THIS METHOD

Sergei M. Mikheev, ulitsa Zelenodolskaya, 17, korpus 5, kv. 72; Valery N. Zemerov, prospekt Vernadskogo, 67, kv. 16, and Petr V. Elshansky, Volzhsky bulvar, 6, korpus 1, kv. 17, all of Moscow, U.S.S.R.

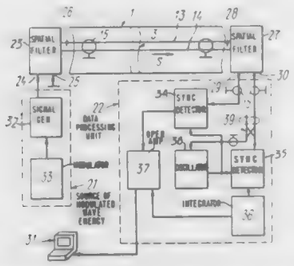
PCT No. PCT/SU88/00082, § 371 Date Jan. 5, 1989, § 102(e) Date Jan. 5, 1989, PCT Pub. No. WO88/08331, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 14, 1988, Ser. No. 299,832

Claims priority, application U.S.S.R., May 5, 1987, 4232328

Int. Cl.[5] G01L *1/24*

U.S. Cl. 73—800 **8 Claims**



1. A method of monitoring the state of an elongated object, comprising the steps of selecting an element responsive to variation of a parameter being monitored representative of the state of an elongated object (1), selecting an extended line (3) of transmission of wave energy capable of carrying the information on variation of the monitored parameter representative of the state of the elongated object (1), integrating said selected responsive element in said extended line (3) of transmission of wave energy, locating said integrated responsive element and extended line (3) of transmission of wave energy in the zone of monitoring on a predetermined coordinate (S), along which the monitored parameter representative of the state of the elongated object (1) tends to vary, shaping and feeding, to the input of the extended line (3) of transmission of wave energy, a time-modulated reference signal transformable in the course of propagation along said line (3) in accordance with variation of the monitored parameter representative of the state of the elongated object (1), measuring the parameters of the converted reference signal at the output of the extended line (3) of transmission of wave energy, and determining the physical and mechanical characteristics of the state of the elongated object (1) on the predetermined coordinate (S), along which the monitored parameter tends to vary, in accordance with the measured parameters of the converted reference signal, which comprises the additional steps of selecting the extended line (3) of transmission of wave energy, providing for propagation of signals therein in the form of modes with known-space- and time-dependent patterns of physical fields, providing in the extended line (3) of transmission of wave energy at least one reference channel (13) and at least one measurement channel (14) with known decelerations of the phase velocities of the modes in each said channel, providing for directional interaction along the extended line (3) of transmission of wave energy in the fields of the modes in at least one reference channel (13) and in at least one measurement channel (14), depending on variation of the monitored parameter, for obtaining in the measurement channel (14) a signal varying in the course of propagation of the signal in the reference channel (13) in accordance with variation of the monitored parameter representative of the state of the elongated object (1), shaping said time-modulated reference signal in the form of time-modulated oscillation of physical fields and converting this oscillation into a signal with a predetermined spatial pattern of the fields of the modes, converting the fields of the modes at the outputs of at least one reference channel and at least one measurement channel (14) of the extended line (3) of transmission of wave energy into exclusively time-dependent electric signals for determining the physical and mechanical characteristics of the state of the elongated object (1) on the predetermined coordinate (S), along which the monitored parameter tends to vary, extracting the amplitude of the electric signal at the output of the reference channel (13), amplifying the electric signal at the output of the measuring channel (14) in inverse proportion to the value of the amplitude of the electric signal at the output of the reference channel (13), and employing linear scale transformation relating the value of the differential of decelerations of the phase velocities of the modes in the reference channel (13) and in the measurement channel (14) of the extended line (3) of transmission of wave energy to the current time of monitoring and the count of the dimension of the coordinate (S) along the extended line (3) of transmission of wave energy.

4,995,268

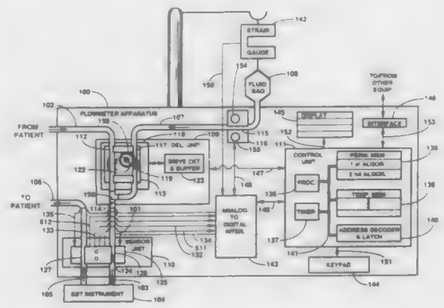
METHOD AND APPARATUS FOR DETERMINING A RATE OF FLOW OF BLOOD FOR AN EXTRACORPOREAL BLOOD THERAPY INSTRUMENT

Stephen R. Ash, Lafayette, and Terrance G. Echard, West Lafayette, both of Ind., assignors to Ash Medical System, Incorporated, West Lafayette, Ind.

Filed Sep. 1, 1989, Ser. No. 402,073

Int. Cl.[5] G01F *1/704*

U.S. Cl. 73—861.05 **30 Claims**



1. For use with an extracorporeal blood therapy instrument, apparatus for determining a rate of flow of blood through a channel, comprising:

delivery means for producing a trailing interface of another fluid and between said blood and said another fluid at a first predetermined position in said channel;

sensor means for producing an output signal indicative of when said trailing interface is at a second predetermined position in said channel, said channel having a predetermined volume between said first and second predetermined positions; and

control means utilizing a predetermined algorithm and an indication of said volume and responsive to said output signal and an indication of when said trailing interface is produced for calculating said blood flow rate through said channel.

4,995,269

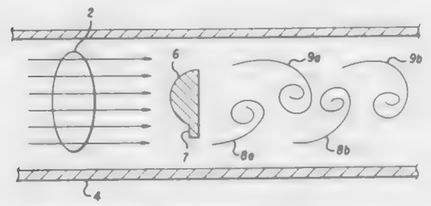
VORTEX FLOWMETER HAVING AN ASYMMETRIC CENTER BODY

George Mon, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 8, 1990, Ser. No. 491,805

Int. Cl.[5] G01F *1/32*

U.S. Cl. 73—861.22 **8 Claims**



1. A Karman vortex street generating device comprising:

a flow tube;

an asymmetrical blunt body rigidly mounted on at least one end in a stream of flowing fluid contained within said flow tube so as to form vortices downstream of said asymmetrical blunt body, said asymmetrical blunt body comprising the shape of a hemisphere with a tab at one side.

4,995,270

MOLTEN METAL SAMPLING

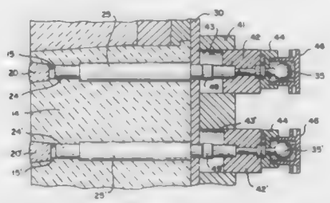
Anthony Thrower, Nr. Sheffield, and Kenneth W. Bates, Chesterfield, both of England, assignors to Injectall Limited, Sheffield, England

Continuation of Ser. No. 285,497, Dec. 29, 1988, abandoned. This application Apr. 10, 1990, Ser. No. 507,667

Claims priority, application United Kingdom, May 1, 1987, [illegible]

Int. Cl.[5] G01N *1/00*

U.S. Cl. 73—863.85 **35 Claims**



25. A sample for use in taking a sampler of metal from a vessel containing molten metal comprising a dispensible unit including a rigid, elongated pipe for extending into said vessel through the wall of said vessel and a sample mould for remaining outside the wall of said vessel operatively associated with an end of said pipe, the mould being detached from the pipe while the pipe remains in said wall after a metal sample has been collected in the sampler.

4,995,271

APPARTAUS FOR DETERMINING THE PERMEABILITY OF A WEB TO AIR

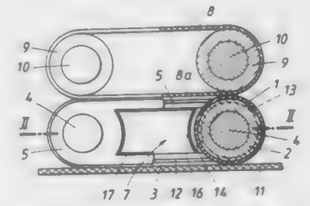
Ludwig Kis, Puchenau, Austria, assignor to Textilmaschenenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Feb. 9, 1990, Ser. No. 478,231

Claims priority, application Austria, Feb. 27, 1989, 428/89

Int. Cl.[5] G01N *15/08*

U.S. Cl. 73—38 **7 Claims**



1. In an apparatus for determining the permeability of a web to air, comprising

a testing head, which is adapted to be applied to a web in airtight contact therewith and is operable to pass a stream of measuring air through said web, and

a connecting line connected to said testing head and adapted to be connected to a measuring device for measuring said measuring air stream,

the improvement residing in that

said testing head comprises two laterally spaced apart end walls,

two laterally spaced apart, parallel contact rollers extend between and are rotatably mounted in said end walls,

each of said contact rollers is provided on its periphery with a rubber-elastic sheath and has to mutually opposite end portions axially protruding from said sheath,

two endless sealing belts are provided, each of which has two wrapping portions, which are trained around corresponding ones of said end portions of said contact rollers and closely adjoin said sheaths, whereby said wrapping portions and said sheath constitute a gapless peripheral surface portion on each of said contact rollers,

each of said sealing belts has an axially outer edge portion, which axially protrudes from said contact rollers and constitutes a sealing lip in sealing contact with the adjacent one of said end walls,

said contacting rollers and said sealing belts define between them an air-guiding space and have a contacting side adapted to contact said web and an outer side opposite to said contacting side,

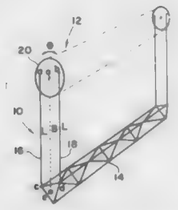
two laterally spaced apart reversing pulleys, which are parallel to said contact rollers, are disposed on said outer side of said contact rollers,

an endless covering belt is trained around said reversing pulleys and in sealing contact with said contact rollers and said sealing belts on said outer side thereof to seal said air-guiding space on said outer side, and

said connecting line extends from one of said end walls and communicates with said air-guiding space.

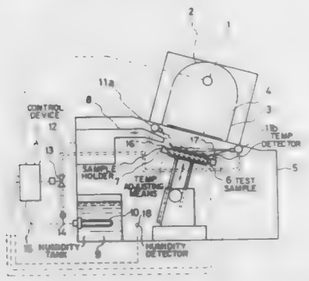
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,272
TORSIONAL SUSPENSION SYSTEM FOR TESTING SPACE STRUCTURES
Wilmer H. Reed, III, Hampton, and Ronald R. Gold, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed May 26, 1989, Ser. No. 357,757
Int. Cl.[5] G01M *7/02, 19/00*
U.S. Cl. 73—865.6 8 Claims



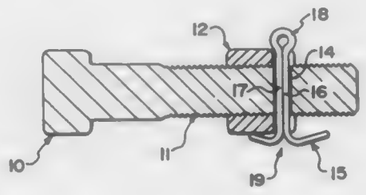
1. A low frequency torsional suspension system for testing a space structure having a length and a center of gravity, the system comprising:
a plurality of suspension stations attached to the space structure along the length thereof for suspending the space structure from an overhead support, each suspension station including a disk pivotally mounted to the overhead support and having a horizontal pivot axis, two cables each having upper and lower end and the same length, the lower ends of the two cables being connectable to the space structure and the upper ends being connectable to the disk so that the points of attachment for the upper and lower ends define a parallelogram with the center of gravity of the space structure being vertically beneath the pivot axis of the disk.

4,995,273
METHOD OF AN APPARATUS FOR WEATHER RESISTANCE TEST
Yoshio Kisima, Tokyo; Teruo Iwanaga, and Hitoshi Goto, both of Gyoda, all of Japan, assignors to Dainippon Plastics Co., Ltd., Tokyo, Japan
Filed May 18, 1989, Ser. No. 353,727
Claims priority, application Japan, May 31, 1988, 63-131627
Int. Cl.[5] G01N *17/00*
U.S. Cl. 73—865.6 18 Claims



1. An apparatus for performing weather resistance test on a sample surface comprising:
means for holding a sample having a surface to be tested;
means including a source of ultraviolet light for applying ultraviolet rays to said sample surface;
means including a source of moisture of condensing moisture on the surface of said sample;
means for washing said surface of said sample with a cleaner; and
means for controlling a repetitive cycle of operation of each of said means such that said ultraviolet light source is turned on for a first period of time after which the application of ultraviolet rays is terminated, whereafter said condensing means is operated for a second period of time after which the condensing is concluded, and said washing means is operated at least for a time between the time said condensing operation is concluded and said ultraviolet light source is turned on.

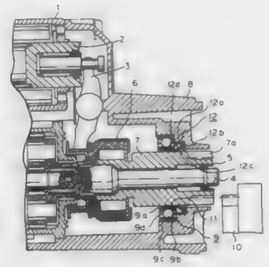
4,995,274
LOCKING PIN AND NUT COMBINATION AND METHOD FOR VISUAL INSPECTION THEREOF
Henry Kleeman, Box 191, Oakville, Manitoba, Canada R0H 0Y0
Filed Nov. 20, 1989, Ser. No. 438,041
Int. Cl.[5] G01N *21/29;* G01M *11/00;* F16B *39/04, 41/00*
U.S. Cl. 73—865.8 8 Claims



1. A method of inspecting an assembly including a plurality of elements, and a plurality of fasteners, each for fastening one of the elements to a respective other one of the elements and comprising a male screw threaded member, a nut having a female screw thread cooperating with the member so as to be fastened on the member and a locking pin engaging the member and a nut to prevent an intended rotation of the nut, the method comprising forming the pins with an outer surface which has a visibly distinctive color difference from that of the associated nut and visually inspecting the assembly to locate those nuts from which the associated pin is inadvertently missing.

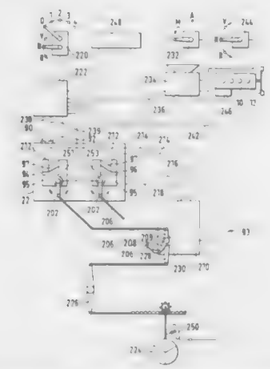
4,995,275
DEVICE FOR SUPPORTING PINION SHAFT OF ELECTRIC MOTOR FOR STARTING ENGINE
Kyoichi Okamoto, and Kazuo Takami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 171,951, Mar. 23, 1988, Pat. No. 4,895,035. This application Oct. 16, 1989, Ser. No. 422,018
Claims priority, application Japan, Mar. 26, 1987, 62-45224
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] F02N *15/06;* F16J *15/32;* F16C *21/00*
U.S. Cl. 74—7 A 11 Claims

1. An overhang-type starter comprising:
a housing having an interior and an exterior with an opening passing from said interior to said exterior;
a shaft with an axis;
a tubular clutch pinion shaft with an axis coincident with said shaft axis, slidable over said shaft and being driven by said shaft;
means for sliding said pinion shaft over said shaft through said housing opening;
a ball bearing having an annular outer race mounted in said housing opening, an annular inner race through which said pinion shaft and said shaft slide and bearing balls located between said outer race and said inner race;
an oil seal disposed adjacent to said bearing on the side of said ball bearing facing said exterior of said housing, said oil seal and said ball bearing forming a cavity for holding lubricant, said oil seal having an outer periphery mounted



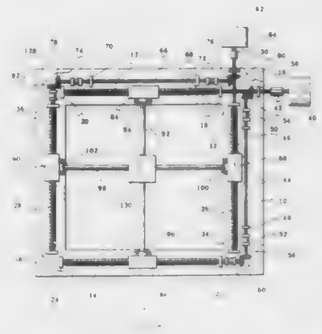
in said housing and two annular lips which contact said pinion shaft.

4,995,276
TRACKED VEHICLE DRIVE SYSTEM
Franz X. Zaunberger, Augsburg, Fed. Rep. of Germany, assignor to Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany
Continuation of Ser. No. 251,337, Sep. 30, 1988, abandoned, which is a division of Ser. No. 113,748, Oct. 26, 1987, Pat. No. 4,890,508. This application Feb. 14, 1990, Ser. No. 480,366
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636211; Oct. 24, 1986, 3636267; Oct. 24, 1986, 3636153
Int. Cl.[5] G16H *27/02;* G05G *11/00, 13/00*
U.S. Cl. 74—89.15 19 Claims



9. A control element position setting apparatus comprising a first input element, means mounting the first input element for rotation about an axis in response to a first input, a second input element, means mounting the second input element for translational movement in response to a second input, a position setting output element for adjusting the control element, means mounting the output element for rotation about a fixed axis coincident with the axis of the first input element, means for interconnecting the first and the second input elements with the output element, the means for interconnecting including means rotating the output element as a function of the position of both the first input element and the second input element.

4,995,277
TWO DIMENSIONAL DRIVE SYSTEM
Ken Yanagisawa, c/o, Kabushiki Kaisha Mechanic Sekkei Jimusho, 5175-1, Ooaza Toyoshina, Toyoshina-machi, Minamiazumi-gun, Nagano-ken, Japan
Filed May 11, 1989, Ser. No. 350,238
Claims priority, application Japan, May 31, 1988, 63-134209; May 31, 1988, 63-134210
Int. Cl.[5] F16H *19/02*
U.S. Cl. 74—89.15 18 Claims



1. A two dimensional drive system comprising:
a pair of first guide means provided in parallel;
a pair of second guide means provided in parallel and perpendicular to said first guide means;
a pair of first travellers movably provided on said first guide means, said first travellers being movable in a first direction along said first guide means;
a pair of second travellers movably provided on said second guide means, said second travellers being movable in a second direction perpendicular to the first direction along said second guide means;
at least one first rod having both ends, respectively, connected to said first travellers provided in parallel to said second guide means;
at least one second rod having both ends, respectively, connected to said second travellers provided in parallel to said first guide means;
a slider movably provided on said at least one first rod and said at least one second rod, said slider being of a predetermined shape with a central opening therethrough, said central opening having a perimeter being spaced a predetermined distance from at least two edge surfaces of said slider with portions of said slider being disposed between said perimeter of said central opening and said at least two edge surfaces, said at least one first rod and said at least one second rod pass through said portions of said slider disposed between said perimeter of said central opening and said at least two edge surfaces;
first drive means for synchronously moving said first travellers in the first direction; and
second drive means for synchronously moving said second travellers in the second direction.

4,995,278
CAR MARK EMBLEM DISPLAY AND STORAGE DEVICE
Yung C. Huang, 4 Fl., No. 136, Sec. 3, Yeng Ping N. Rd., Taipei, Taiwan
Filed Jul. 27, 1989, Ser. No. 386,454
Int. Cl.[5] F16H *27/02;* G03F *7/00*
U.S. Cl. 74—89.15 20 Claims

1. A car mark emblem display and storage device for displaying a car mark emblem to protrude from a car engine hood

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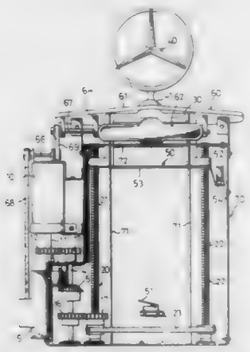
or storing the car mark emblem in the car engine hood, comprising:

a motor;

a guide screw unit actuated by said motor, including two elongated parallel spaced vertically extending guide screws, a distance defined between said two elongated guide screws being such that said mark emblem retained therewithin is readily movable in a vertical direction;

a seat for supporting said mark emblem, said seat being slidable vertically along said two elongated guide screws and including a partially circular rack for fixing a spherical stand of said mark emblem;

a limit control unit including a lower limit switch, an upper



limit switch, and a bottom panel having a side wing, said bottom panel being slidable vertically along said two elongated guide screws; a lower face of said bottom panel being contactable with said lower limit switch when said mark emblem has been fully lowered, said side wing being contactable with said upper limit switch when said mark emblem has been fully raised;

a top cover unit for mounting on said car engine hood, said top cover unit including a top cover with a first opening for the passage of said mark emblem and a movable cover for movably covering said opening, said movable cover being actuated by said motor;

a body frame for retaining said motor, said guide screw unit, said seat and combined with said top cover unit.

4,995,279

TRANSMISSION SYSTEMS

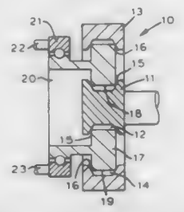
Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Division of Ser. No. 230,787, Aug. 10, 1988. This application Mar. 15, 1990, Ser. No. 493,988

Claims priority, application United Kingdom, Aug. 25, 1987, 8720051; Aug. 25, 1987, 8720053

Int. Cl.[5] F16H *15/08*

U.S. Cl. 74—199 **13 Claims**



1. A transmission system comprising; a disc drivingly connected to a first shaft, said disc having a frustoconical groove in its outer periphery, the walls of the groove being inclined inwardly towards one another; an annular element mounted for rotation about the disc, so that the inner periphery of the annular element is located within the groove, opposite faces of the annular element engaging the opposed walls of the groove; means for moving the annular element eccentrically relative to the disc; and an Oldham coupling for transmitting rotary motion of the annular element to a second shaft.

4,995,280

BICYCLE SPEED CHANGE LEVER ASSEMBLY

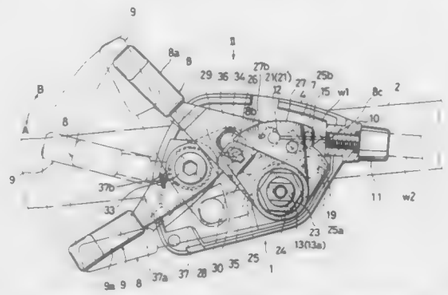
Koichi Tagawa, Kawachinagano, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Apr. 25, 1990, Ser. No. 514,279

Claims priority, application Japan, Jun. 26, 1989, 1-165005

Int. Cl.[5] B62M *25/04*; **G05G** *11/00*

U.S. Cl. 74—480 R **13 Claims**



1. A bicycle speed change lever assembly comprising:

a first lever pivotally supported by a first pivot shaft, said first lever being connected to one end of a control cable;

a second lever pivotally supported by a second pivot shaft which is displaced from said first pivot shaft but extends in parallel thereto; and

a reversal connecting mechanism for connecting said first lever to said second lever in such a way that when one of said levers is progressively pivoted in one direction, the other lever is progressively pivoted in the opposite direction.

4,995,281

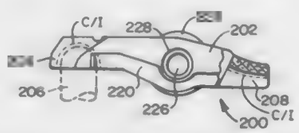
LIGHTWEIGHT ROCKER ARM

Richard L. Allor, Livonia; John A. Herman, Sr., Trenton, and George C. DeBell, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1989, Ser. No. 386,755

Int. Cl.[5] G05G *1/10*

U.S. Cl. 74—559 **13 Claims**



1. A lightweight rocker arm assembly of the cam follower type for an internal combustion engine comprising:

an elongated rocker arm body formed of a metal matrix composite material, said rocker arm body having a generally rectangular centralized opening extending between sidewalls thereof, a first end formed to engage a support upon which said rocker arm pivots and a second end for engaging and activating a valve stem; and

cam engaging means comprising a roller formed of a first ceramic material for engaging a cam on a rotating cam shaft to pivot said rocker arm assembly, said roller being

mounted for rotation on a roller shaft formed of a second ceramic material and mounted in circular openings in the sidewalls of said rocker arm body intermediate said rocker arm body first and second ends.

4,995,282

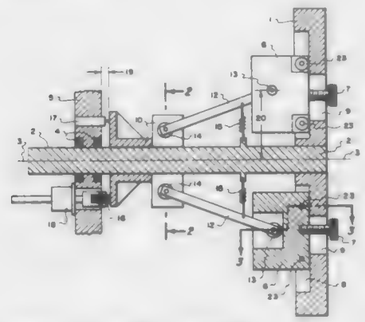
CONTROLLABLE INERTIA FLYWHEEL

Larry L. Schumacher, 18876 Tenderfoot Trail, Newhall, Calif. 91321

Filed Jul. 19, 1989, Ser. No. 381,800

Int. Cl.[5] F03G *3/08*

U.S. Cl. 74—572 **3 Claims**



1. A flywheel apparatus comprising:

a. a drive shaft supporting said flywheel apparatus cantilevered from a single bearing;

b. a constant inertia flywheel fixedly attached to said drive shaft;

c. at least two control masses slidingly attached to said constant inertia flywheel by slots and threaded means and translatable orthogonal to a drive shaft rotational axis;

d. a shaft collar constrained to rotate with sad drive shaft and forced by an inertia control actuator to slid on said drive shaft's surface parallel to said drive shaft rotational axis;

e. linkage structures attaching said shaft collar to each control mass through bearings that minimize lost linear or angular motion;

f. springs attaching said linkage structures to said drive shaft;

g. a control actuator positioning said shaft collar and said control masses to achieve a desired flywheel inertia.

4,995,283

HYDRAULIC CONTROL SYSTEM FOR STEPLESSLY VARIABLE POWER TRANSMISSION

Tomoo Sawasaki, and Chitoshi Morishige, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 19, 1989, Ser. No. 354,519

Claims priority, application Japan, May 19, 1988, 63-123273

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—866 **26 Claims**

1. A hydraulic control system for a steplessly variable power transmission comprising:

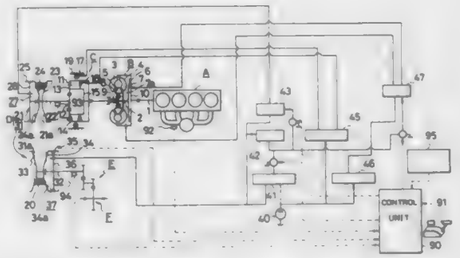
primary and secondary pulleys, each provided with a stationary conical plate mounted on a shaft and a movable conical plate mounted so as to be axially movable on the shaft,

a belt connected with both of the primary and secondary pulleys for transmitting engine power from said primary pulley to said secondary pulley,

said primary and secondary pulleys each including a hydraulic chamber into which a hydraulic pressure is introduced for controlling axial movement of the movable conical plates so that effective diameters of the primary and secondary pulleys are changed for controlling a speed ratio transmitted through the transmission,

a speed ratio control valve for controlling the hydraulic pressure introduced into the hydraulic chamber in accordance with a pilot pressure introduced into a pilot chamber provided in the speed ratio control valve,

a solenoid valve for controlling the pilot pressure for the speed ratio control valve,



fluid pressure producing means for producing a control pressure in accordance with a vehicle driving condition,

switching means for selectively connecting the pilot chamber with either the solenoid valve or the fluid pressure producing means, the switching means being actuated to connect the pilot chamber with the fluid pressure producing means when a deviation between an actual pilot pressure and a desirable pilot pressure is increased beyond a predetermined value.

4,995,284

ACCUMULATOR CONTROL DEVICE FOR HYDRAULIC CONTROL DEVICE FOR AUTOMATIC TRANSMISSION FOR VEHICLE WITH ENGINE LOAD DEPENDENT BACKUP CONTROL

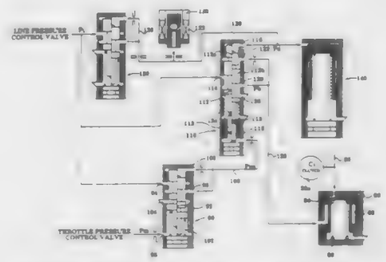
Mitsuru Takada; Hiroshi Itoh, both of Toyota; Tokuyuki Takahashi, Aichi, and Makoto Funahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 2, 1989, Ser. No. 388,515

Claims priority, application Japan, Aug. 2, 1988, 63-192965; Nov. 11, 1988, 63-285137; Nov. 21, 1988, 63-294409

Int. Cl.[5] F16H *61/12*

U.S. Cl. 74—868 **4 Claims**



1. A hydraulic control device for an accumulator in a speed stage shifting device of an automatic transmission for a vehicle such as an automobile, comprising:

an electromagnetic valve means for generating a first hydraulic pressure having a pressure level characteristic for primarily determining a second hydraulic pressure to be supplied to a back pressure chamber of said accumulator according to an electric signal supplied thereto, said electromagnetic valve means decreasing the pressure level of

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said first hydraulic pressure substantially to zero when it fails to operate; and

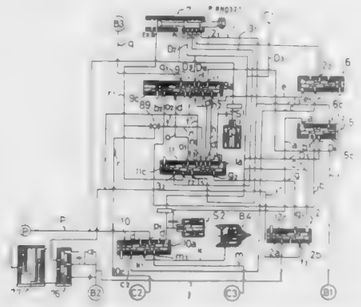
an accumulator control valve means for generating said second hydraulic pressure to be supplied to the back pressure chamber of said accumulator by modulating a source of hydraulic pressure therefor according to a balance between said second hydraulic pressure itself and a third hydraulic pressure available in said automatic transmission as having a pressure level characteristic increasing or decreasing along with an increase or decrease of engine output power, under an influence of said first hydraulic pressure, so that said second hydraulic pressure increases or decreases along with an increase or decrease of said third hydraulic pressure under said influence of said first hydraulic pressure, wherein said accumulator control valve has a spool element having a first pressure receiving area exposed to said second hydraulic pressure to provide a positive feed back effect of decreasing said second hydraulic pressure along with an increase thereof and a second pressure receiving area exposed to said third hydraulic pressure, said first pressure receiving area having an effective pressure responsive sectional area which generates a first force under said second hydraulic pressure, said second pressure receiving area having an effective pressure responsive sectional area which generates a second force substantially equal in the magnitude thereof and opposite in the orientation thereof to said first force under said third hydraulic pressure.

4,995,285

FAIL-SAFE HYDRAULIC CONTROL VALVES IN AN AUTOMATIC TRANSMISSION

Youichi Hayakawa, Toyoake; Yoshinari Kuwayama, Tokoname, and Yoshihiro Yamada, Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed Jan. 4, 1989, Ser. No. 293,253
Claims priority, application Japan, Oct. 6, 1988, 63-252737
Int. Cl.[5] F16H *59/00, 61/00, 45/00*
U.S. Cl. 74—869 3 Claims



1. A hydraulic control device for an automatic transmission, comprising:

a shift gear mechanism having rotational elements and frictional engaging elements;

a plurality of hydraulic servos for connecting the frictional engaging elements, to rotational elements;

first, second and third shift valves to control hydraulic pressure working on the hydraulic servos, said first and second shift valves having control chambers, respectively;

a first solenoid valve for controlling said first and third shift valves;

a second solenoid valve for controlling said second shift valve;

a manual valve having a D range port, a 1 range port, a 2 range port and a 3 range port;

a first emergency control valve having a first port connected to the D range port of the manual valve; a second port connected to the control chamber of the first shift valve, hydraulic pressure applied to the control chamber of the first shift valve operating against control pressure applied through the first solenoid valve; a first control chamber connected to the second solenoid valve so that the first and second ports are connected together by applying control pressure to the first control chamber; and a second control chamber connected to the 1 range port of the manual valve so that the first port and second port are disconnected by applying control pressure to the second control chamber when the first and second solenoid valves are off, and

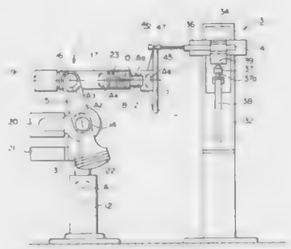
a second emergency control valve having a first port connected to the 2 range port of the manual valve; a second port connected to the control chamber of the second shift valve, hydraulic pressure applied to the control chamber of the second shift valve operating against control pressure applied through the second solenoid valve; and a control chamber connected to the first solenoid valve so that the first port and second port are connected together by applying control pressure to the control chamber of the second emergency control valve.

4,995,286

APPARATUS FOR REMOVING FLASH FROM MOLDED PRODUCTS

Sadao Kobayashi; Hidemi Tomono, and Kazunobu Yoshida, all of Shizuoka, Japan, assignors to Nihon Plast Co., Ltd., Fuji, Japan

Filed Sep. 19, 1988, Ser. No. 196,133
Claims priority, application Japan, May 22, 1987, 62-125397
Int. Cl.[5] B23B *3/04*
U.S. Cl. 82—101 20 Claims



1. An apparatus for removing flash from a molded product comprising:

a cutter means;

a cutter carrier means for carrying said cutter means to a predetermined working position at which flash is removed from said molded product, said carrier means being supported in free movement;

a work carrier means for holding said molded product, for moving said molded product to said working position and for shifting said molded product relative to said cutting means at said working position to establish contact between a portion of said molded product where flash thereof is to be removed and said cutter means; and

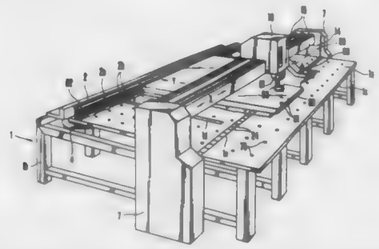
means for depressing said cutter means onto said portion of said molded product with a predetermined magnitude of force.

4,995,287

APPARATUS FOR CUTTING LAMINATED SHEET MATERIAL

Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Hiroshima, Japan

Division of Ser. No. 177,968, Apr. 5, 1988. This application Dec. 19, 1989, Ser. No. 452,785
Claims priority, application Japan, Apr. 23, 1987, 62-100955
Int. Cl.[5] B26D *7/01;* D06H *7/00*
U.S. Cl. 83—169 1 Claim



1. An apparatus for cutting sheet material, comprising:

(a) means defining a support surface for supporting the sheet material to be cut, said support surface having an elongated guide groove recessed therein, said groove having parallel sidewalls;

(b) means for reciprocally supporting a cutting element disposed in the sheet material;

(c) means for moving said reciprocating cutting element supporting means in a direction normal to the direction of reciprocation of said cutting element and axially of said elongated guide groove;

(d) a movable support strip supported in said guide groove and disposed relative to said cutting element supporting means to receive the end of the cutting element after passing through the sheet material, said movable support strip including means for receiving the end of said cutting element;

(e) means for moving said strip along said guide groove in the direction of movement of said cutting element support and in synchronism with such movement, said strip having parallel sidewalls disposed adjacent mating sidewalls of said guide groove, thereby providing an uninterrupted coplanar support surface at the location of said movable strip on said support surface; and

wherein said guide groove has a recessed shoulder associated with each sidewall thereof, and said support strip has a thickness at its lateral edges equal to the depth of said shoulders from said support surface, whereby the bottoms of the lateral edges of said support strip slidably engage said shoulders, and the top surface of said support strip is flush with said support surface.

4,995,288

SAW GUIDE

Michael DellaPolla, 1048 W. Mill Dr., Kennesaw, Ga. 30144

Continuation-in-part of Ser. No. 252,903, Oct. 3, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 369,540
Int. Cl.[5] B26D *5/08*
U.S. Cl. 83—574 7 Claims

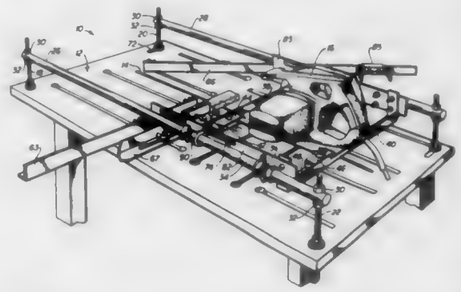
1. A saw guide comprising:

(a) a base having a flat upper surface;

(b) a pair of parallel guide rails affixed to said base by a rail supporting means, each guide rail having a forward and a rearward end;

(c) a saw carriage assembly capable of holding a saw or other power tool, slidably mounted to said guide rails, said guide rails maintaining said saw in a predetermined path when said saw assembly is slid along said guide rails; and

(d) said rail supporting means attaching at the first end to said base and at the second end to said guide rails; said rail supporting means having a calibration means that allows said guide rails to be adjusted vertically from a known starting point on said supporting means a known given amount wherein said rail supporting means of at least one



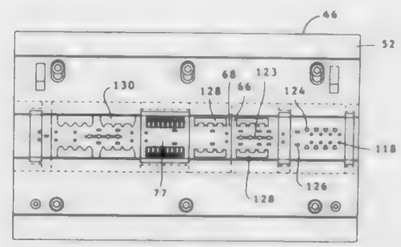
guide rail are adjustably attached to said base in a lateral axis in order to maintain a given distance between said guide rails to prevent the saw carriage assembly from binding when said guide rails are at differing heights.

4,995,289

DIE ASSEMBLY HAVING IMPROVED INSERT RETAINING SYSTEM AND HAVING REVERSIBLE DIE INSERTS

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 7, 1989, Ser. No. 376,485
Int. Cl.[5] B26F *1/14*
U.S. Cl. 83—690 13 Claims



1. A die assembly having a facial surface, a recess in the facial surface and die insert means in the recess, the die assembly being characterized in that:

the recess extends entirely across the facial surface from a first end thereof to a second end, the insert means comprises a plurality of inserts in side-by-side relationship between the ends of the recess,

a pair of parallel spaced apart retaining plates are provided on the facial surface which extend parallel to, and which overhang, the recess, one of the retaining plates being movable parallel to, and on, the facial surface between a retaining position and a retracted position,

at least two spacers are provided in the recess for locating the inserts, the spacers and the one retaining plate having interengaging portions which precisely locate the spacers in the recess, the interengaging portions being effective to retain the spacers in the recess when the one plate is in its retaining position, the spacers being removable from the recess when the one plate is in its retracted position, the inserts being removable from the recess after removal of the spacers by sliding the inserts past one of the ends of the recess.

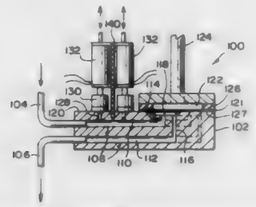
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,290

APPARATUS AND METHOD FOR CONTROLLING A PNEUMATICALLY POWERED MUSIC-MAKER

Norman Heischober, Massapequa, and Paul Keogler, Valley Stream, both of N.Y., assignors to H. & K. Automated Musical Creations Co., Massapequa Park, N.Y.

Filed Jun. 7, 1989, Ser. No. 362,615
Int. Cl.[5] G10F *5/04*
U.S. Cl. 84—160 7 Claims



1. An apparatus for controlling a mechanical music-maker of the type using a vacuum as the motive force for driving a multiplicity of mechanical actuators, each mechanically actuating a corresponding musical key, the music-maker includes a multiplicity of valves for connecting the vacuum to the multiplicity of mechanical actuators when opened, the valves being held closed by a vacuum applied to a vacuum side thereof and opened upon having the vacuum side thereof vented to atmosphere, the music-maker including a first means for opening the valves by coupling the vacuum side of selected valves to atmosphere, the apparatus further comprising:

second means for opening the valves by coupling the vacuum side of selected valves to atmosphere;

said second means including an electrically energizable solenoid valve directly connected to said vacuum side of each of said valve means and venting said vacuum side to atmosphere upon energization of the solenoid thereof; and

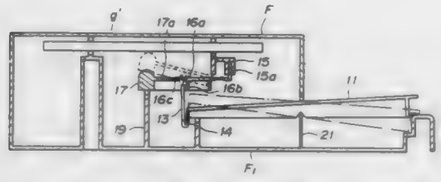
selector means for selectively isolating said first means from the valves so that opening selected valves by coupling the vacuum side of each selected valve to atmosphere is accomplished solely by said second means.

4,995,291

ACTION MECHANISM FOR THE PIANO

Fumitaka Takahashi, Shizuoka, Japan, assignor to Kawai Gakki Seisakusho Co., Ltd., Hamamatsu, Japan

Filed Aug. 24, 1989, Ser. No. 397,897
Claims priority, application Japan, Aug. 29, 1988, 63-112070[U]
Int. Cl.[5] G10C *3/18*
U.S. Cl. 84—237 6 Claims



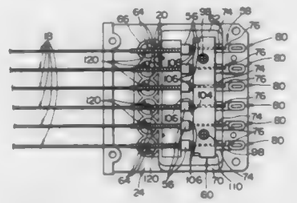
1. A piano action including, in combination, a hammer having a horizontal shank including a base end mounted for free angular displacement to swing said hammer, in a vertical plane between rest and actuated positions, an elongated horizontal key having a first finger engagable end and a second hammer actuating end and mounted, intermediate its opposite ends, beneath said shank for rocking oscillatory movement of said key in a vertical plane between first and second limit positions, said second end including an upstanding jack, having upper and lower ends, supported therefrom and displaced upwardly toward said base end during movement of said key from said first position toward said second position, the lower end of said jack being supported from said second end for limited angular displacement of said upper end toward and away from said base end and yieldingly biased toward said base end, said shank base end defining a substantially right angle seat including a first portion extending along said shank and facing downward toward and engagable by the upper end of said jack and a second horizontally facing portion defining an abutment spaced below said first portion and facing along a path extending beneath said first portion and toward said hammer, said upper end, when said key and hammer are in said first and rest positions, respectively, being spaced below said first portion and engagable with the said first portion during initial upward movement of said second end of said key toward said second position, for elevating said first portion, and thus swinging said hammer from said rest position toward said actuated position, upon movement of said hammer past a predetermined position between said rest and actuated positions, said second portion being operable to engage said upper end and to angularly displace the said upper end toward said hammer and out of engagement with said first portion, to thereby allow said hammer to return to said rest position independent of return movement of said key to said first position.

4,995,292

STRING VIBRATION DETECTING DEVICE FOR ELECTRONIC STRINGED INSTRUMENT

Yoshio Nomura, Oome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,737
Claims priority, application Japan, Mar. 22, 1988, 63-36411[U]; Sep. 1, 1988, 63-115211[U]
Int. Cl.[5] G10H *3/18*
U.S. Cl. 84—726 14 Claims



14. A string vibration detecting device for an electronic stringed instrument, comprising:

a string support unit arranged on an instrument body unit;

at least one string member supported by said string support unit;

a cylindrical member for covering at least a portion of an outer surface of said string member to follow vibrating movement of said string member, one end portion of said cylindrical member being detachably mounted to said string support unit, and said cylindrical member being made of such a material that its movement can be detected electro-magnetically and

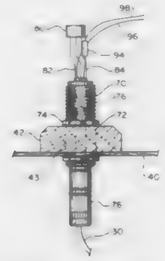
string vibration detecting means arranged on said instrument body unit in operative relation with the cylindrical member, for electro-magnetically detecting vibration of said cylindrical member.

4,995,293

ACOUSTIC INSTRUMENT WITH INTERNALLY POSITIONED MICROPHONE MEANS FOR RECEIVING ACOUSTICAL VIBRATIONS

Peter N. Anderson, 1571 El Camino, #39, Mountain View, Calif. 94040

Continuation of Ser. No. 186,726, Apr. 22, 1988, abandoned, which is a continuation of Ser. No. 746,987, Jun. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 696,327, Jan. 30, 1985, abandoned. This application Jul. 13, 1989, Ser. No. 378,465
Int. Cl.[5] G10H *3/18*
U.S. Cl. 84—733 14 Claims



1. In an acoustic instrument, the apparatus comprising

electrical jack means carried within the body of said acoustic instrument, said electrical jack means having self-tapping threads formed thereon to provide an intimate contact over an extended area between the body of said jack means and the material of said acoustic instrument, thus enabling secure installation of the jack means completely from the exterior of the instrument without need for internal locking or tightening, and

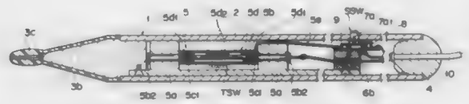
condenser microphone means directly connected and supported by said electrical jack means in close proximity to one end of said electrical jack means within said acoustic instrument such that said microphone means is located sufficiently close to the internal body of said acoustic instrument but spaced therefrom for generating electrical signals corresponding solely to the natural or true undistorted acoustic sound within said acoustic instrument when said instrument is played.

4,995,294

ELECTRONIC PERCUSSION INSTRUMENT

Yukio Kashio, Tokyo, and Yoneaki Arai, Hanno, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 53,384, May 22, 1987, abandoned. This application Aug. 29, 1989, Ser. No. 401,526
Claims priority, application Japan, May 26, 1986, 61-120724; Jun. 30, 1986, 61-98967[U]; Jul. 9, 1986, 61-104238[U]; Sep. 10, 1986, 61-138883[U]
Int. Cl.[5] G10H *1/02*
U.S. Cl. 84—738 18 Claims



1. An electronic percussion instrument, comprising:

a stick-shaped striker which is operated in a striking manner or swinging manner;

musical sound initiating command signal generating means provided in said stick-shaped striker and including switching means for performing switching actions each time said striker is operated in the striking manner or in the swinging manner, and a signal generator for generating a musical sound initiating command signal each time said switching means performs a switching action; and

a musical sound producing unit for producing a musical sound with a preset timbre each time the musical sound initiating command signal is generated by said command signal generating means,

wherein said musical sound-initiating command signal generating means comprises:

a conductive member held rigidly within the striker;

a plurality of insulating members securely fitted on the outer surface of said conductive member at a predetermined distance; and

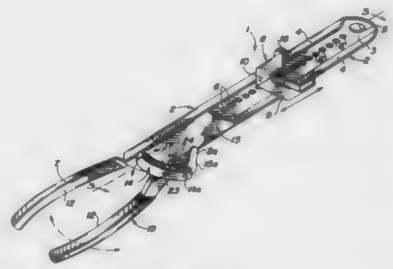
an elastic and conductive member arranged in such a manner that its middle portion is separated from said conductive member by said plurality of insulating members when the striker is not used, and comes into electrical contact with said conductive member when the striker is striking or swinging.

4,995,295

LID WRENCH

Fred D. Floyd, 1403 Fairview Ave., Monroe, La. 71201

Continuation-in-part of Ser. No. 375,678, Jul. 5, 1989, Pat. No. 4,949,576. This application Apr. 9, 1990, Ser. No. 506,158
Int. Cl.[5] B07B *7/00*
U.S. Cl. 81—3.44 28 Claims



1. A lid wrench for removing a lid from a container, comprising a lug support; a plurality of openings provided in said lug support; lug means pivotally carried by said lug support, said lug means adapted to selectively engage and disengage said openings in slidably adjustable relationship; a fixed handle carried by said lug support in fixed relationship; jaw means pivotally carried by said lug support in spaced relationship with respect to said lug means; and a jaw handle carried by said jaw means in fixed relationship, whereby said lug means and said jaw means engage the lid and the lid is loosened on the container responsive to insertion of said lid wrench over the lid between said lug means and said jaw means, squeezing said jaw handle toward said fixed handle and twisting said lid wrench in the counterclockwise direction.

4,995,296

LARGE TIRE BOLT FIXING TOOL

Sheng N. Chen, 3th Floor, No. 8, Alley 1, Lane 32, YiShin 2nd Rd., Kaohsiung, Taiwan

Filed Jan. 23, 1990, Ser. No. 469,016
Int. Cl.[5] B25B *21/00*
U.S. Cl. 81—57.44 2 Claims

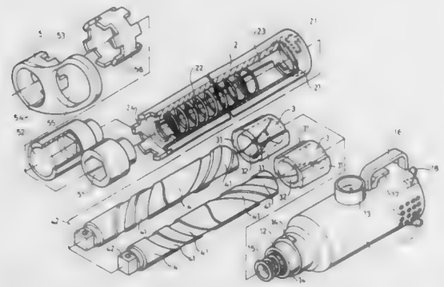
1. A wheel bolt rotating tool comprising:

a compressed air cylinder having an inlet valve for leading in compressed air, a tubular shaft extensible outward from the cylinder by the action of compressed air, a spring contained in the tubular shaft to push a rotating shaft, a first element of a bayonet fitting to releasably attach the

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cylinder with a position tube and a handle for gripping the cylinder;

a position tube having a second element of the bayonet fitting at one end to combine releasably with the first element on the cylinder, teeth at the other end to engage releasably with a bolt fitter, a helical spring contained in the interior of the position tube which also contains an orientation tube and a rotating shaft, the spring and orientation tube being arranged end to end around the shaft, at least one linear groove in the inner surface of the position tube for receiving a projecting section on the outer surface of the orientation tube;



the orientation tube further provided with at least one helical projection in the inner surface to engage with a helical groove in the rotating shaft;

the rotating shaft having an outer end fitting in a removable bolt-engageable cap;

a bolt fitting having teeth to engage releasably with the teeth on the position tube, and a round hole for receiving said cap to fit and rotate therein; and

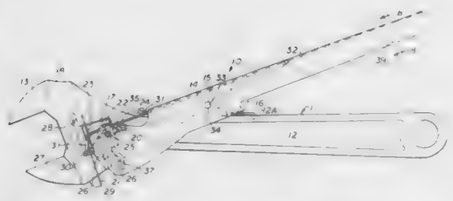
the tubular shaft in the cylinder capable of being pushed forward by compressed air coming through the inlet valve so that the rotating shaft can be rotated by forward movement of the orientation tube and the cap fitted at the front end of the rotating shaft can be rotated to rotate a bolt fitted in the cap.

4,995,297

LOCKING RATCHET WRENCH

John E. Richards, 16307 Summerwind, Houston, Tex. 77090

Filed Jul. 12, 1989, Ser. No. 378,783
Int. Cl.[5] B25B *13/12, 7/14*
U.S. Cl. 81—126 14 Claims



1. A locking ratchet wrench comprising;

a main body having an elongate handle portion with an integral stationary jaw at one end and a slotted guideway extending between the top and bottom surfaces of said stationary jaw,

an opening having a rear wall, extending transversely through said stationary jaw and rearwardly from said slotted guideway,

a movable jaw slidably fitted in said guideway for movement toward and away from said stationary jaw and having ratchet teeth at the rearward end thereof,

a locking pawl block member slidably retained for forward and rearward movement within said opening and having said teeth at the forward end thereof corresponding to said movable jaw ratchet teeth and movable into and out of engagement with said movable jaw ratchet teeth,

locking pawl spring means between said opening rear wall and said locking pawl block member to normally urge the same forwardly away from said rear wall,

an elongate movable handle pivotally mounted on said main body and having a front portion with sides which are slidably received on each side of said opening and operativly connected to said locking pawl block member to move the same into and out of toothed engagement with said movable jaw,

jaw control spring means operatively connected between said movable jaw and said movable handle to apply upward pressure on said movable jaw to urge said movable jaw toward said stationary jaw, and

handle return spring means operatively connected between said main body and said movable handle to normally urge the rear portion of said movable handle pivotally away from the handle portion of said main body when the handles are not being gripped together, whereby

when said movable handle is pivoted away from said handle portion the teeth of said locking pawl block member are disengaged from the teeth of the movable jaw allowing the jaws to be moved for placing around a nut or bolt, and

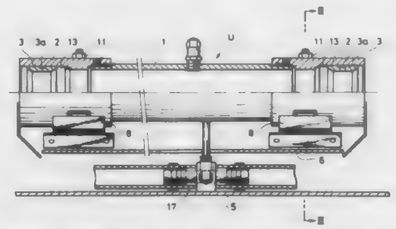
as said movable handle is pivoted toward said handle portion, said jaw control spring means applies upward pressure on the movable jaw to bias it against a nut or bolt to be turned, and subsequent movement of said movable handle moves said movable jaw toward the closed position to firmly grip the nut or bolt allowing it to be turned in either direction.

4,995,298

APPARATUS FOR ROTATABLY SUPPORTING AND FEEDING ELONGATED ROD MEMBER

Tomokichi Arisaka, and Mitsuyoshi Yamaguchi, both of Nagano, Japan, assignors to Kabushiki Kaisha ALPS Tool, Japan

Filed Oct. 21, 1987, Ser. No. 112,094
Claims priority, application Japan, Oct. 24, 1986, 61-253271; May 28, 1987, 62-129946
Int. Cl.[5] B23B *5/14*
U.S. Cl. 82—127 4 Claims



1. An elongated rod member supporting apparatus provided in a rod feeding machine having a frame for feeding and rotatably supporting said elongated rod member to a working machine, said apparatus comprising:

a plurality of rod supporting units each positioned spaced away and arranged along a length of said rod feeding machine, each of said rod supporting units having both axial end portions provided with bearing portions for rotatably supporting said elongated rod member;

damper means provided between each of said rod supporting units and said frame for elastically supporting said rod supporting units;

means for supplying oil to each space defined betweens said bearing portions said elongated rod member;

each of said rod supporting units comprising a bushing support for internally supporting said bearing portions, said bushing support being supported by said damper means;

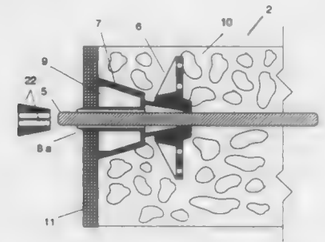
each of said bearing portions being formed with an annular groove, and further comprising a locking pin engageable with said annular groove and a coil spring interposed between said brushing support and said bearing portion, each of said bearing being urged toward axial ends of said rod supporting unit by said coil spring.

4,995,299

TORQUE TRANSMITTING TOOL FOR REMOVING GROMMETS FROM CONCRETE

Gary M. Rarden, 9313 13th Pl. SE., Everett, Wash. 98205

Filed May 25, 1990, Ser. No. 528,440
Int. Cl.[5] B25B *13/48*
U.S. Cl. 81—176.15 7 Claims



1. A tool for transmitting torque in combination with a grommet embedded in concrete and a portion of a cable extending outwardly from said grommet for post tensioning the concrete, said grommet having an open cavity and at least one wing extending transverse across the entire length of said cavity, said tool comprising:

a head portion for insertion into said cavity of said grommet, said head portion comprising a body, said body having an outer peripheral surface and a longitudinal bore therethrough, said body further comprising an open notch extending radially from said bore to said peripheral surface for allowing said body to be placed around said cable and inserted into said cavity of said grommet,

a means for transmitting torque to said grommet extending outwardly from said head portion, said torque transmitting means of a length to transmit torque across the entire length of said wing of said grommet to dislodge said grommet from an embedded position;

a handle for rotating said head portion.

4,995,300

LATHE FOR GENERATING ASPHERICAL SURFACES ON WORK PIECES

Samuel S. Kaplan, Orlando, Fla., and Donald S. Dill, Lancaster, Ohio, assignors to Chariot Star, Inc., Orlando, Fla.

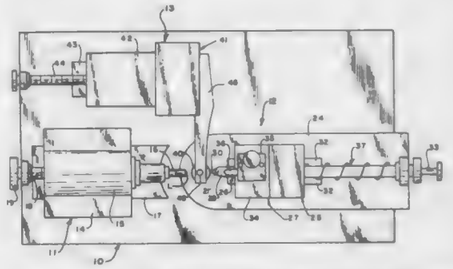
Filed Apr. 28, 1989, Ser. No. 345,418
Int. Cl.[5] B23B *7/00*
U.S. Cl. 82—12 5 Claims

1. A lathe for generating surfaces of revolution on a work piece comprising

a base;

a spindle assembly mounted on said base and including an elongated, rotatably supported spindle having a longitudinal axis and an end for mounting of a work piece thereon and means for rotating said spindle, said spindle axis being disposed in a predetermined plane;

a turret assembly mounted on said base and including a rotatable base mount for pivotally supporting said turret assembly about a vertical axis of rotation disposed transversely to said spindle axis, a cam follower and cutting tool support assembly secured to said base mount for relative displacement along an axis of displacement in a plane disposed in transverse relationship to said vertical axis of rotation of said turret assembly, a cam follower



having an end portion of V-shaped configuration having an apex and side walls divergent from said apex, a cutting tool and resilient biasing means for urging said cam follower and cutting tool support assembly in a predetermined direction along said axis of displacement, and

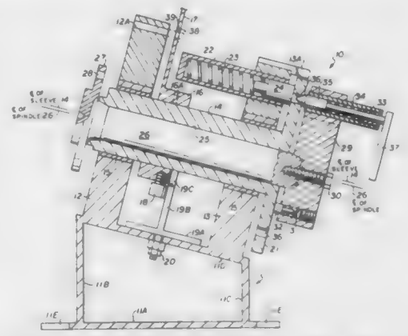
a control cam assembly mounted on said base and including a roller cam carried by a support assembly for supporting and positioning said roller cam for free rotation about an axis of rotation parallel to the axis of rotation of said turret assembly, said roller cam having a cylindrically shaped surface against which said cam follower bears.

4,995,301

TRI-MOTION GRINDING FIXTURE

Douglas B. Phillips, Sr., 4124 Greenleaf, Spring, Tex. 77389

Filed Dec. 14, 1989, Ser. No. 450,678
Int. Cl.[5] B24B *19/16*
U.S. Cl. 51—219 R 14 Claims



1. A fixture for holding and positioning reamers, bits, and the like for grinding and adapted for operation relative to a rotating grinding wheel positionable at selective angles relative to a flat horizontally surface, said fixture comprising:

a support base having a lower portion adapted for connection to a flat horizontal surface and an upper portion positioned at a selective angle relative to the horizontal surface,

a longitudinal cylindrical sleeve rotatably mounted on the upper portion of said support base and having an eccentric

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longitudinal bore and a radial flange portion at its rearward end,

a longitudinal cylindrical spindle rotatably received within said sleeve eccentric bore and having a mounting flange at its forward end adapted to receive a chuck for holding the reamer or other object to be ground and a rear flange reassembly secured to the rear end of the spindle adjacent said sleeve radial flange,

handle means operatively connected on said sleeve for rotating said sleeve about its longitudinal axis relative to said support base,

an axial guide flange operatively connected between said support base and said sleeve and having an upstanding portion positionable at selective angles transverse to the longitudinal axis of said sleeve to simultaneously move said sleeve forward and rearward a selective distance along its longitudinal axis upon rotation of said sleeve,

roller means operatively connected with said handle and said sleeve and engageable with said guide flange upstanding portion such that when said handle means is pivoted said sleeve will rotate about its longitudinal axis and said roller means rolling across the angularly transverse positioned upright portion of said guide flange causes said sleeve to move forward or rearward along its longitudinal axis as it rotates, and

engagement means operatively connected between said spindle and said sleeve for selectively locking said spindle with said sleeve for rotational movement as a single unit about the longitudinal axis of said sleeve or releasing said spindle from said sleeve for rotating only said spindle about its longitudinal axis relative to said sleeve,

said spindle being eccentrically mounted in said sleeve such that the longitudinal axis of said spindle will rotate partially about the centerline of said sleeve when said spindle and said sleeve are locked together whereby the reamer or other object being ground is eccentrically rotated in a radial spiral motion when said handle means is pivoted,

when said axial guide flange upstanding portion is angularly positioned said reamer or other object being ground will move forward or rearward in a radial spiral motion as said handle means is pivoted, and

when said spindle and said sleeve are unlocked from one another the reamer or other object being ground may be rotated only about its own longitudinal axis.

4,995,302

NEGATIVE PRESSURE BOOSTER EQUIPMENT

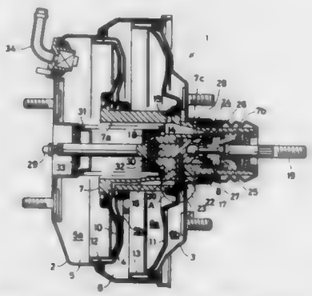
Haruo Suzuki, and Atushi Satoh, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd, Tokyo, Japan

Filed Sep. 19, 1989, Ser. No. 409,472

Claims priority, application Japan, Sep. 21, 1988, 63-238166

Int. Cl.[5] F15B *9/10*

U.S. Cl. 91—369.3 **5 Claims**



1. A negative pressure booster equipment, comprising a front shell and a rear shell defining a space therebetween, a predetermined number of center plates dividing said space into two or more chambers, a valve body air-tightly and slidably passing through said center plates, power pistons equal in number to said two or more chambers each arranged to divide said chambers respectively into constant pressure chambers where negative pressure is introduced and variable pressure chambers where air under atmospheric pressure is introduced, a valve plunger with an input shaft connected thereto both slidably mounted within said valve body, communication means for communicating between said constant pressure chambers and said variable pressure chambers, a first pathway for communicating said variable pressure chambers with atmosphere air, control valve means for controlling said communication means and said first pathway, a second pathway communicating between said variable pressure chambers, a variable orifice means provided in said second pathway for varying an amount of air passage to at least one of said variable pressure chambers relative to other variable pressure chambers by gradually decreasing said amount of air passage when said valve plunger is moved forward relative to said valve body and gradually increasing said amount of air passage when said valve plunger is moved backward relative to said valve body.

4,995,303

SENSOR-EQUIPPED ACTUATOR FOR POWER CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-17927 Sontheim, Fed. Rep. of Germany

Filed Jan. 8, 1990, Ser. No. 461,987

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929011; European Pat. Off., Oct. 18, 1989, 89119302.1

Int. Cl.[5] F01B *25/26*

U.S. Cl. 92—5 R **13 Claims**

1. A power actuator comprising:

a hollow cylinder housing generally centered on an axis;

a piston axially displaceable but nonrotatable in the housing and defining therein a pair of axially opposite pressurizable compartments;

a piston stem centered on the axis, fixed to the piston, extending axially from the piston, and formed with a pair of separate feed passages each having one end opening into a respective compartment and an opposite end opening axially on the stem;

a distributor body rotatable about the axis on the stem at the opposite ends of the passages but axially nondisplaceable on the stem, the body being provided with respective connections communicating with the opposite ends, whereby the compartments can be pressurized via the respective passages and connections for axial movement of the piston and stem in the housing;

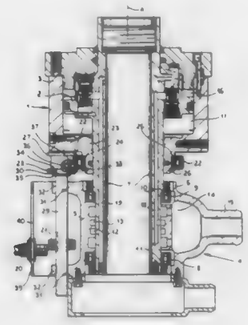
a pair of axially spaced guides fixed on the distributor body;

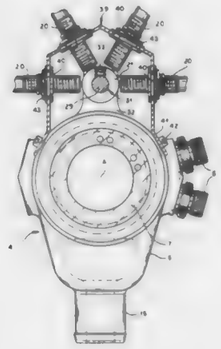
a bearing having a race axially rotatable on the housing about the axis but axially nondisplaceable on the housing;

an axially extending rod axially displaceable in the guides on the distributor body and having a front end juxtaposed with the race;

means interconnecting the front end of the rod and the race for permitting limited relative radial movement between the rod front end and the race and for prohibiting relative axial movement between the rod front end and the race;

an actuating element coupled to the rod; and



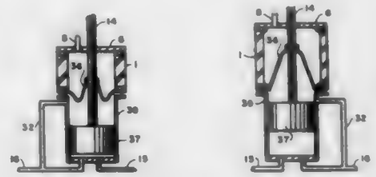


a sensor fixed on the distributor body and actuatable by the element of the rod.

(d) a piston disposed in said rigid cylinder and arranged to move slidably within said rigid cylinder;

(e) a piston rod, extending through said extendible and rigid cylinders between said first cover and said piston;

(f) a second cover disposed at, and closing the end of said rigid cylinder that faces away from said extendible cylinder, said second cover having at least one fluid opening to permit a fluid to enter the pumping space within said rigid cylinder between said piston and said second cover; and



(g) flexible membrane connected across the coupled, facing ends of said extendible cylinder and said rigid cylinder, said membrane having a hole therethrough for the passage of said piston rod, said membrane being attached in a leakproof manner to said facing cylinder ends and said piston rod to prevent fluid from passing from one side thereof to the other.

4,995,304

EXTENDABLE CYLINDERS OF ELASTICALLY VARIABLE LENGTH FOR USE IN A PUMP

Berthold Daimler, Remscheid, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Division of Ser. No. 804,155, Dec. 3, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 117,048

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3444978; Jul. 3, 1985, 3523717

Int. Cl.[5] F01B *19/04*

U.S. Cl. 92—92 **14 Claims**

1. A pumping device comprising, in combination:

(a) an extendible cylinder having a cylindrical wall which is extendible in the axial direction and having means, embedded in said cylindrical wall, for reinforcing said extendible cylinder against radial expansion or contraction in response to an overpressure or underpressure, respectively, inside said extendible cylinder;

(b) a first cover disposed at, and closing one end of said extendible cylinder;

(c) a rigid pumping cylinder mounted on the end of said extendible cylinder which is opposite to said one end;

4,995,305

ACTUATOR EMPLOYING A FLUID UNDER PRESSURE FOR THE DRIVING IN ROTATION OF A ROTARY SHAFT

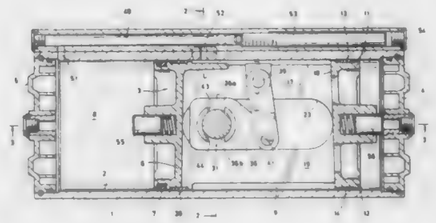
Jean-Claude Garrigues, Cadaujac; Rene Laulhe, Villenave D'Ornon, and Pierre Rieuvernet, Merignac, all of France, assignors to Applications Mecaniques et Robinetterie Industrielle, Bagnolet Cedex, France

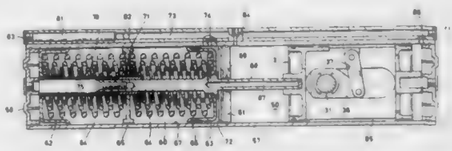
Filed Mar. 9, 1989, Ser. No. 321,195

Claims priority, application European Pat. Off., Mar. 9, 1988, [illegible]

Int. Cl.[5] F01B *9/00*

U.S. Cl. 92—138 **5 Claims**





1. Actuator using a pressurized fluid, for driving a rotary shaft in rotation comprising:

a one piece tubular body having a cylindrical bore;

a piston slidable within said bore and comprising;

a circular member having a sealing ring on the periphery of the member providing a sliding seal with the cylindrical surface of the bore, said member defining, inside said bore, two chambers at least one of which forms a work

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chamber into which opens a conduit for the intake of pressurized fluid,

a guide element sliding in the bore, without providing sealed separation of the volume defined by said bore,

said guide element being connected to the closure member by four longitudinal members disposed symmetrically with respect to the longitudinal axis of symmetry of the bore so as to define at least one free volume of cruciform section having a first and second perpendicular branches;

a control shaft extending inside said bore and passing through at least one orifice provided in said body and through said first branch; and

means for converting said rectilinear movement of the piston into a rotary movement of said control shaft comprising;

at least one link having one end articulated to the piston and the other end to a lever arm fixedly mounted on said control shaft,

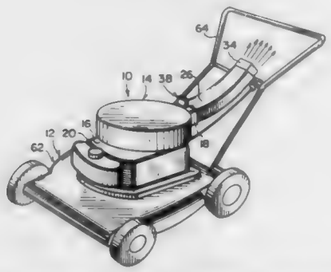
said link and said arm extending in planes orthogonal to the axis of said control shaft, said lever arm and said link moving in said second branch.

4,995,306

AIR CIRCULATING SYSTEM FOR A PERSON OPERATING AN ENGINE POWERED PIECE OF AGRICULTURAL EQUIPMENT

Robert E. Rush, 560 Mellon Bridge Rd., Oxford, Ala. 36203

Filed Jan. 18, 1990, Ser. No. 467,010
Int. Cl.[5] B60H *3/06*
U.S. Cl. 98—1 **5 Claims**



1. An air circulating system for a person operating an engine powered piece of agricultural equipment, said system comprising:

(a) a housing having an air inlet port and an air outlet port, said housing mounted onto the piece of agricultural equipment adjacent the engine;

(b) a fan rotatably carried within said housing;

(c) means between the engine and said fan, for rotating said fan;

(d) an elongated duct connected to the air outlet port of said housing for directing air driven by said fan towards the person to increase the rate of evaporation of perspiration thus keeping the person cooler while operating the agricultural equipment to afford a degree of comfort during hot days;

(e) a filter carried in the air inlet port of said housing for removing dust particles from the air entering said housing;

(f) a screen carried on the air inlet port of said housing below said filter for removing larger foreign particles from the air entering said housing;

(g) a discharge outlet member affixed to the distal end of said elongated duct, said discharge outlet member having a plurality of vertical slots therein to diffuse the air driven be said fan towards the person;

(h) means for selectively closing the air outlet port of said housing so as to stop the flow of air into said elongated duct, when the circulation of air is not desired, debris is being blown into the air by wind and additional power consumed by said fan is needed by the agricultural equipment; and

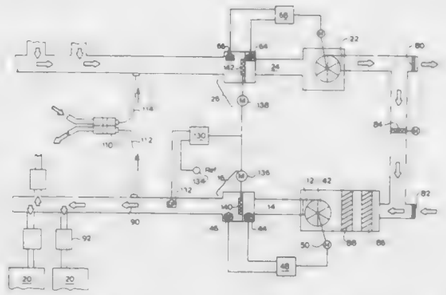
(i) said selectively closing means is an insertable filter gate valve carried in the air outlet port of said housing having a filter area on one half thereof and a solid area on the other half thereof so that when said filter area is inserted within the air outlet port more dust particles will be removed from the air leaving said housing and when said solid area is inserted within the air outlet port it will closed the air outlet port and stop the flow of air from within said housing through said elongated duct.

4,995,307

VARIABLE AIR VOLUME VENTILATION SYSTEM AND METHOD

Bobby Floyd, 5N960 Medinah Rd., Addison, Ill. 60101

Filed Sep. 11, 1989, Ser. No. 405,762
Int. Cl.[5] F24F *7/08*
U.S. Cl. 98—34.5 **11 Claims**



1. In a ventilation system for a building having a supply duct to a building space, a return duct from a building space, a supply fan and a return fan, the improvement comprising:

a first flow control unit positioned within the supply duct and a second flow control unit positioned within the return duct, said flow control units including an orifice, a first static pressure sensor positioned upstream of said orifice and a second static pressure sensor positioned downstream of said orifice to provide signals responsive to the sensed pressure on the opposite sides of said orifice, and a controller for providing an output responsive to the differential in the said sensed pressure;

first damper means positioned in said supply duct and operably connected to said controller of said first control unit to provide control of air flow therethrough in response to said sensed pressure differential in said first flow control unit;

second damper means positioned in said return duct and operably connected to said controller of said second flow control unit to provide control of air flow therethrough in response to said sensed pressure differential in said second control unit;

a remote static pressure sensor positioned downstream of said first flow control unit for providing an output signal responsive to the sensed pressure at said remote location;

a remote controller for providing a signal responsive to the difference between said sensed static pressure and a reference pressure; and

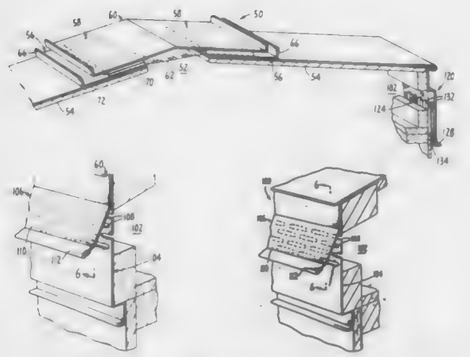
first and second motor controlled dampers positioned within said first and second flow control units respectively and operably connected to said controller to respond to said controller output signal to vary the damper openings in said flow control units in the respective supply and return ducts in response to said remote controller.

4,995,308

ROOF VENTILATING APPARATUS

Richard L. Waggoner, Riverside, Calif., assignor to Alumax Inc., San Mateo, Calif.

Filed May 24, 1989, Ser. No. 356,432
Int. Cl.[5] F24F *7/02*
U.S. Cl. 98—37 **4 Claims**



1. For ventilating a building through a roof having a gap extending transversely along the cornice of the roof, a fascia ventilator comprising:

ventilating means for allowing air to pass between an interior building space below the roof and the building exterior, said ventilating means comprising a ventilating member configured for receipt over the gap in the cornice and provided with a plurality of apertures; and

a cover member configured for receipt by the cornice above the gap and for extending down over but spaced apart from said ventilating member, said cover member provided with a drip lip to prevent precipitation shed by the roof from running down a wall of the building.

3. For ventilating a building through a roof having a gap extending transversely along the cornice of the roof, a fascia ventilator comprising:

ventilating means for allowing air to pass between an interior building space below the roof and the building exterior, said ventilating means comprising a corrugated ventilating member configured for receipt by the cornice beneath the gap; and

closure means for covering the cornice gap and for joining with said ventilating means to define a plurality of substantially parallel closed channels through air may pass.

4,995,309

RADON GAS EXHAUST SYSTEM

Steven K. Weaver, Carmel, Ind., assignor to Radon Control, Inc., Carmel, Ind.

Filed Jan. 25, 1990, Ser. No. 470,145
Int. Cl.[5] F24F *7/013*
U.S. Cl. 98—42.07 **15 Claims**

9. A reversible exhaust system for removing radon gas from a building comprising:

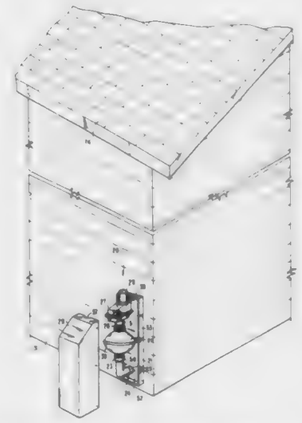
a base plate mountable exteriorly to said building;

a first tube spaced apart from said building;

a fan coupled to said first tube;

a second tube positionable adjacent said building;

a reversible transition box coupling said fan and said second tube, said box mountable to said base plate in one position to extend said second tube upwardly over said transition box and in an second position to extend said second tube downwardly beneath said transition box; and,



a housing enclosing said reversible transition box and said fan mounted to said base plate.

4,995,310

DISPOSABLE FILTER CARTRIDGE, WHETHER OR NOT COMBINED WITH A WATER RESERVOIR

Joost van der Lijn, Utrecht, and Bernardus M. Van Thoor, Maarsenbroek, both of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Continuation of Ser. No. 928,969, Nov. 10, 1986, Pat. No. 4,860,645. This application May 5, 1989, Ser. No. 303,860
Claims priority, application Netherlands, Nov. 11, 1985, 8503092; Apr. 16, 1986, 8600958
Int. Cl.[5] A47J *31/06*
U.S. Cl. 99—295 **7 Claims**



1. A disposable filter cartridge comprising a housing including a bottom and an upright side wall, the bottom having at least one hole formed therein, said filter cartridge being provided at its top and bottom with filter material, the bottom filter material being cup-shaped and connected to the housing by a sealed joint, a space being formed outwardly of the sealed joint between the housing and the cup-shaped bottom filter material, said space being in open communication with said at least one hole in the bottom.

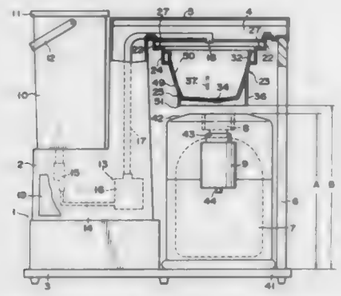
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4,995,311

DEVICE FOR MAKING LIQUID COFFEE

Masaru Naya, Tama; Masayuki Kuzumaki, Machida, and Susumu Ishikawa, Sakai, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki; Koyusha Co., Tokyo and Kanazawa Industry Co. Ltd., Sashima, all of, Japan

Filed Sep. 5, 1989, Ser. No. 402,777
Claims priority, application Japan, Sep. 5, 1988, 63-221631
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—295 9 Claims



1. A device for making liquid coffee comprising:
a main body having a bracket section;
a dripper attached to the bracket section of the main body, said dripper having a filter attached thereto and an outlet formed at the bottom thereof and containing coffee powder therein;
a liquid coffee receiver located under the dripper and having an opening which is opposed to the outlet of the dripper at a certain interval; and
a means for supplying hot water into the dripper to make liquid coffee, which is collected in the liquid coffee receiver, passing through the outlet of the dripper and the opening of the liquid coffee receiver;
said dripper including a holder attached to the bracket section of the main body, a means connected to the holder and movable up and down, said means serving to enclose the space between the outlet of the dripper and the opening of the liquid coffee receiver to thermally shield liquid coffee flowing through the space from outside air when it is at its lower position, and guide means formed on the holder to guide the outside air shielding means downward and upward.

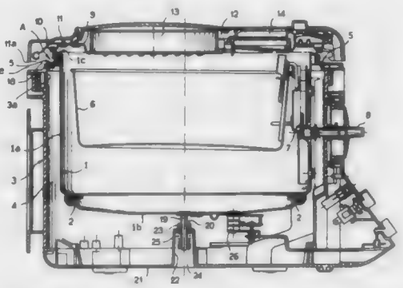
4,995,312

COOKING APPLIANCE WITH ELECTRIC HEATING

Ernest Leiros, Dijon, France, assignor to SEB S.A., Selongey, France

Continuation of Ser. No. 488,504, Mar. 5, 1990, abandoned, which is a continuation of Ser. No. 191,864, May 9, 1988, abandoned. This application Aug. 28, 1990, Ser. No. 574,529
Claims priority, application France, May 13, 1987, 87 06728
Int. Cl.[5] A47J *37/12*
U.S. Cl. 99—411 13 Claims

1. An electrical deep fryer comprising a metal pan (1) having a wall, and an electric heating resister (2) that heats said wall directly by conductive heating to a temperature higher than 150° C., said pan (1) being surrounded by a plastic skirt (3), wherein said skirt (3) is of plastic material which does not continuously withstand a temperature of 150° C., said skirt (3) entirely surrounding the lateral wall (1*a*) and the base (1*b*) of the pan and being separated from said wall and said base by an air space (4) of sufficient width to limit the temperature of the skirt (3) to a value which is compatible with the thermal resistance of the plastic material of the skirt (3), said skirt (3) being completely free with respect to the pan (1) with the exception of a ring (5) which joins only the top edge (3*a*) of the skirt to the top edge (1*c*) of the pan and to which this latter is attached, said ring (5) being of heat-insulating material which is continuously resistant to the temperature of the top edge (1*c*) of the pan (1).

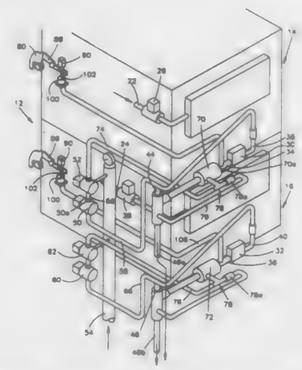


4,995,313

COOKING APPARATUS

William D. Delau, Royalton; James Garman, Wickliffe, and Kevin Keith, Cleveland, all of Ohio, assignors to Welbilt Corporation, New Hyde Park, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,401
Int. Cl.[5] F24D *1/00*; F24N *1/10*; A21B *1/08*; A01J *11/04*
U.S. Cl. 99—467 35 Claims



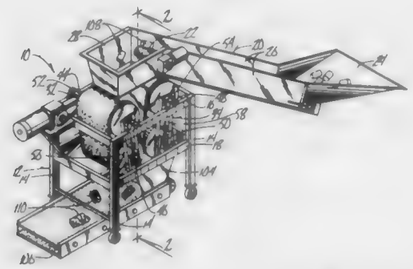
30. A steam processor capable of operating in convection and pressure modes, comprising:
(a) a housing defining a least 1 closed, insulated cooking chamber for heating food items placed in said chamber by contact with steam, said chamber having a steam inlet and an outlet for discharging steam and condensate;
(b) door means for providing access into the interior of said cooking chamber;
(c) steam control means for controlling the communication of steam from a steam source to the steam inlet;
(d) drain manifold means connecting said steam outlet with an ambient drain;
(e) drain shut-off means disposed in a drain flow path intermediate said steam outlet and said ambient drain;
(f) means for activating said drain shut-off means when a pressure mode of operation is selected by an operator, said drain shut-off means comprising a fluid pressure operated pinch valve including elastomeric member defining a collapsible passageway forming part of said drain and flow path;
(g) a first water control means operative to communicate water under pressure to said pinch valve when the pressure mode of operation is desired;
(h) steam condensing means including a first water spray nozzle located near said steam outlet and a second water spray nozzle located near an output end of said pinch valve, said first and second nozzles emitting a water mist into said drain manifold means when said cooking chamber is operating in a convection mode;
(i) a conduit means for communicating water from said first water control means to said pinch valve, said conduit means further including a restricted bleed passage located near a coupling connecting a conduit segment to said pinch valve, said restricted bleed operative to allow predetermined quantity of water to flow through said coupling when said pinch valve is activated whereby cooling is provided.

4,995,314

CAN FLATTENING MACHINE

Jeffrey J. Buer, Lakewood, Iowa, assignor to Midamerica Recycling Company, Des Moines, Iowa

Filed Oct. 23, 1989, Ser. No. 425,331
Int. Cl.[5] B30B *5/04*
U.S. Cl. 100—152 6 Claims



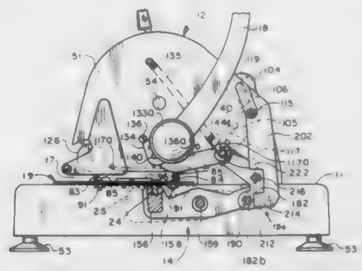
1. A can flattening machine for flattening disposable metal cylindrical beverage cans comprising:
a machine frame having an upper end, and a lower end;
hopper means on said upper end of said frame having an open upper hopper end and an open lower hopper end;
first conveyor means for delivering said beverage cans to said hopper means and for permitting said beverage cans to fall by gravity downwardly through said open lower end of said hopper means;
a can flattening assembly below said hopper means for receiving and flattening said cans after said cans fall from said open lower end of said hopper means;
second conveyor means below said can flattening assembly for carrying said cans from said flattening assembly after being flattened by said flattening assembly;
said flattening assembly comprising a first belt assembly and a second belt assembly, each of which includes an upper roll, a lower roll, and a continuous flattening belt trained around said upper roll and said lower roll, one of said lower rolls being mounted to said frame for movement toward and away from the other said lower rolls; each of said belt assemblies having a spacer frame interconnecting said upper and lower rolls, said spacer frame having a track therein;
bearing means movably mounted within each of said tracks of said spacer frames and being movable within said tracks toward and away from said upper rolls, said lower rolls being rotatably mounted to said bearing means;
first adjustment means interconnecting said bearing means to said frames for permitting selective adjustment of the distance between said upper and lower rolls to adjust the tension in said belts;
a second adjustment means for moving said one lower roll independently of said first adjustment means to selected positions relative to said other lower roll, said second adjustment means including spring means which yieldably holds said one roll against movement away from said other roll, and being capable of yielding in response to a predetermined force to permit said one lower roll to move away from said other lower roll in response to large objects passing therebetween;
said upper rolls of said first and second belt assemblies being spaced apart from one another and said lower rolls of said first and second belt assemblies being closely adjacent one another so as to create a V-shaped slot between said first and second belt assemblies, said slot being located below said open lower end of said hopper means for receiving said cans therefrom whereby said cans will fall into said V-shaped slot, will be flattened between said lower rolls of said first and second belt assemblies, and will fall to said second conveyor means.

4,995,315

MONEY ORDER IMPRINTER

Robert P. Koper, Bensenville, and Howard R. Konieczka, Chicago, both of Ill., assignors to The Paymaster Corporation, Chicago, Ill.

Filed Oct. 10, 1989, Ser. No. 418,670
Int. Cl.[5] B41J *1/58*, *32/00*
U.S. Cl. 101—96 30 Claims



1. In an imprinting apparatus for imprinting money orders and like instruments, the combination comprising:
a frame,
a plurality of type segment members supported by said frame and at least certain ones of said type segment members each having first and second sets of printing characters, said type segment members being movable to locate printing characters of said first and second sets on first and second printing lines, respectively,
an inked ribbon and ribbon support means for supporting said ribbon adjacent to printing characters disposed on the first and second printing lines,
platen means supported by said frame and including a first platen adapted for cooperation with printing characters of said first set and a second platen adapted for cooperation with printing characters of said second set,
actuating means supported by said frame and including an operating lever having a normal non-printing position and being movable to a printing position for effecting a printing operation,
means coupled to said operating lever for moving said first and second platens into pressure contact with an instrument disposed between said platen means and printing characters disposed on the printing lines, said means for moving including
a first mechanism coupled to said first platen for moving same into pressure contact with the instrument and printing characters on the first printing line,
and a second mechanism coupled to said second platen and operable independently of said first mechanism to effect impact movement of said second platen into pressure

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contact with the instrument and printing characters on the second printing line

and said means for moving said first and second platens being adapted to return said first and second platens to their normal position in the return movement of said operating lever to its normal position.

4,995,316

SCREEN PRINTING MACHINE SQUEEGEE SUPPORT ARRANGEMENT

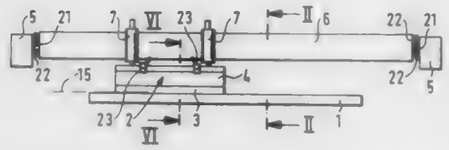
Karl Kölblin, Emmendingen, and Peter Geiger, Teningen, both of Fed. Rep. of Germany, assignors to KG Maschinenfabrik, Fed. Rep. of Germany

Filed Nov. 9, 1988, Ser. No. 268,976

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3738039

Int. Cl.[5] B41F *15/46*

U.S. Cl. 101—123 **15 Claims**



1. A screen printing machine comprising a printing table;

a support extending transversely of the printing table and guidingly supported at guide rail means disposed at opposite sides of the printing table;

pressure cylinder means connected to and carried by the support;

squeegee holder means carried by the pressure cylinder means for movement therewith,

and pressure control means for controlling pressure applied via the pressure cylinder means to the squeegee holder means during printing operations;

whereby squeegee printing pressures can be controlled independently of the spacing between the support and printing table, wherein the pressure cylinder means includes a plurality of double acting pressure cylinders and associated squeegee holder means spaced along the length of a squeegee means being held thereby; and

wherein the squeegee holder means includes swivel guide means for adjustable pivotally mounting the squeegee means at the pressure cylinder means.

4,995,317

SAFE-AND-ARM DEVICE FOR THE FUZE OF A SPIN-STABILIZED PROJECTILE

Adolf Bankel, Uttenreuth; Hans Strauss, Reichenschwand, and Stephan Kerk, Schnaittach, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

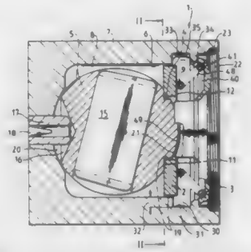
Filed Sep. 15, 1989, Ser. No. 408,140

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831863

Int. Cl.[5] F42C *15/26*

U.S. Cl. 102—235 **2 Claims**

1. A safe-and-arm device for a fuze for a spin-stabilized projectile; comprising a supporting housing for said fuze; a spherical rotor being rotatably supported within the supporting housing; a radially groove formed in said supporting housing, said rotor having a bore; a detonator inserted in said bore; an annular groove in a peripheral region of said rotor extending in a pane axially offset relative to said radial groove, a spreadable restraining means inserted in said rotor groove for arming the rotor which is retained in a secured position only after firing of the projectile through the spreadable restraining means which are axially displace and spread apart only subsequent to firing of the projectile responsive to axial and spin fores, and said spreading facilitating pivoting of the rotor with the detonator into the armed position after release thereof, said restraining means comprising a restraining ring; spring means located in said housing for said fuze so as to cause said restraining ring to contact an end surface of the annular groove in said rotor in the secured position of said rotor, said restraining ring



having a plurality of substantially wedge-shaped grooves with radially inwardly extending supporting tongues and supporting surfaces distributed about the circumference thereof, and including an outer ring portion having a slot therethrough and forming a plurality of permanently deformable connectors intermediate said tongues each of similar cross-section, and said restraining ring being maintained between the bottom of the annular groove and the fuze housing under the formation of an inner and an outer annular gap.

4,995,318

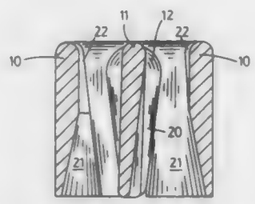
INTERNALLY RIFLED PROJECTILE

Harvey Stidston, and Merritte W. Stidston, both of 1456 Wrenwood, Clovis, Calif. 93612

Filed Apr. 13, 1989, Ser. No. 337,645

Int. Cl.[5] F42B *10/34*

U.S. Cl. 102—503 **7 Claims**



1. An internally rifled projectile comprising a cylindrical annular wing surrounding a teardrop-shaped axial core connected to such annular wing by three helical, canted vanes which run the length of the wing but which core and vanes do not extend beyond the front outer cylindrical surface of the annular wing, such vanes being tapered from front to rear.

4,995,319

SHEAVE TRAIN ASSEMBLY FOR CABLE TRANSPORTATION SYSTEMS

Jean-Francois Mugnier, Grand Junction, Colo., assignor to Poma of America, Inc., Grand Junction, Colo.

Filed Jun. 9, 1989, Ser. No. 364,651

Int. Cl.[5] B61B *7/00, 11/00*

U.S. Cl. 104—112 **16 Claims**

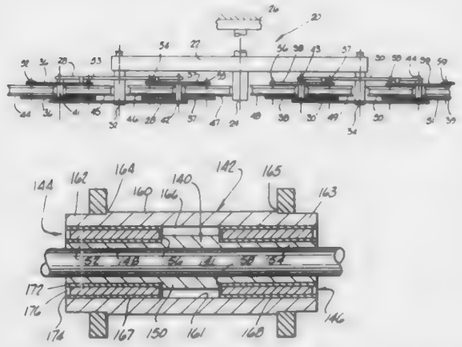
1. A sheave support system for supporting the sheaves of a multiple sheave assembly relative to a support structure such as a ski lift tower and comprising:

at least two sheave means rotatable mounted on the sheave assembly in spaced parallel relationship for supporting the ski lift cable;

at least one main support shaft means for movably supporting the sheave assembly relative to the ski lift tower;

at least two intermediate support arm means mounted on said main support shaft means;

at least two intermediate support shaft means mounted on opposite ends of said intermediate support arm means for rotatably supporting said sheave means;



each of said support shaft means comprising a support shaft, a hub member mounted circumjacent said support shaft, and an elastic bushing means mounted between and circumjacent said support shaft and said hub member for connecting said hub member to said shaft member while enabling limited relative rotative movement therebetween of less than approximately 15° and also limiting transmission of vibration therebetween.

4,995,320

CARRIAGE FOR INSPECTING A PIPING

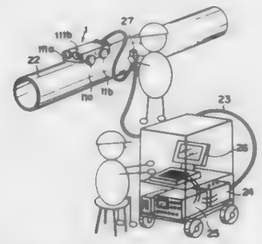
Tomoaki Sato, and Munetake Kondo, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,045

Claims priority, application Japan, Nov. 28, 1988, 63-154386

Int. Cl.[5] B61B *13/04*

U.S. Cl. 104—118 **12 Claims**



1. In a carriage for inspecting an elongated pipe, which carriage is adapted to carry inspection instruments on board and travels on the outer surface of the pipe, the improvement comprising:

support means for carrying said inspection instruments on board the carriage;

a pair of first wheeled travel bodies coupled to said support means, each of said first travel bodies including:

at least two first magnetic wheels which are magnetically attracted to said pipe; and

first driving means for driving said at least two first magnetic wheels;

said at least two first magnetic wheels having a common rotation plane which is parallel with the axial direction of said pipe;

a pair of second wheeled travel bodies coupled to said support means, each of said second travel bodies including:

at least two second magnetic wheels which are magnetically attracted to said pipe; and

second driving means for driving at least two second magnetic wheels;

said at least two second magnetic wheels having a common rotation plane which is substantially perpendicular to the axial direction of said pipe;

elevating means coupled at least to said at least two second magnetic wheels of said second wheeled travel bodies for adjusting a distance between said support means and said wheels to which said elevating means is coupled said elevating means including:

at least one rotatable screw mounted for rotation vertically with respect to said support means;

female threaded members provided in the same number as said rotatable screws and threadably engaged with a respective rotatable screw, said female threaded members being mounted on a respective second wheeled travel body;

said female threaded members being coupled to said wheels for selectively raising and lowering said wheels relative to said at least one adjustable height wheeled body; and

motor means for rotatably driving said rotatable screws for selectively raising and lowering said adjustable height wheeled body relative to a pipe on which said wheels are magnetically mounted; and

means for inclining said at least two first magnetic wheels relative to said support means, thus inclining said common rotation plane of said at least two first magnetic wheels.

4,995,321

CAR BODY FOR RAILWAY ROLLING STOCK

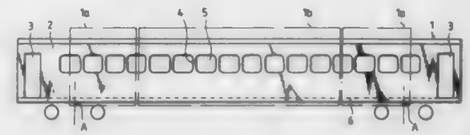
Keiji Ohmura; Sunio Okuno; Michifumi Takeichi; Masato Okazaki, and Hitoshi Tsuruda, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 13, 1989, Ser. No. 365,439

Claims priority, application Japan, Jun. 13, 1988, 63-143730

Int. Cl.[5] B61D *17/04, 25/00*

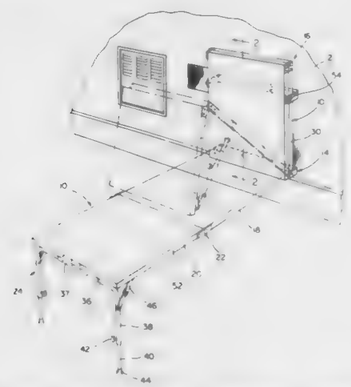
U.S. Cl. 105—397 **13 Claims**



1. A car body for railway rolling stock, the car body comprising a roof means for forming a roof of the car body, a side means for forming respective sides of the car body, end means for forming respective ends of the car body, an underframe means for forming a bottom of the car body, and body bolster means provided on said underframe means and supported by truck means, wherein a shearing rigidity with respect to a vertical load is maximum in a portion of the car body near the body bolster means but slightly displaced in a longitudinal direction of the car body toward a central part of the car body.

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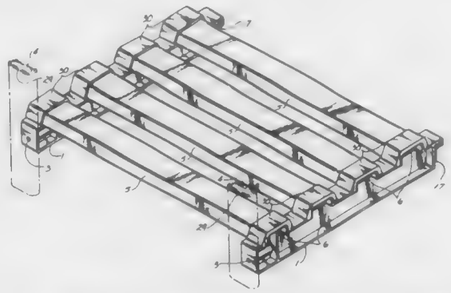
4,995,322
EXTERNALLY MOUNTED R.V. TABLE
Percy R. Frederick, 14578 Tulloch Dam Rd., Jamestown, Calif. 95327
Filed Dec. 4, 1986, Ser. No. 938,078
Int. Cl.[5] A47B *23/00*
U.S. Cl. 108—44 6 Claims



1. A table comprising a pair of elongated tabletop panels each having a planar top surface, a hinged connection between adjacent ends of said panels, an adjustable leg assembly supporting an end of one of the tabletop panels remote from the hinged connection and means pivotally connecting an end of the other tabletop panel remote from the hinged connection to a vertical exterior wall of a R.V., and means securing the table in stowed position against the wall of the R.V., said adjustable leg assembly including a generally U-shaped member having an elongated bight portion, a hinged connection between said bight portion and the edge portion of said one tabletop panel remote from the hinged connection between said panels, said U-shaped member having tubular leg portions extending laterally from the ends of the bight portion, each of the leg portions including a telescopically received leg member secured in adjusted position by a setscrew means, and a folding brace interconnecting the leg assembly and said one tabletop panel enabling the leg assembly to be pivoted to a collapsed position underlying said one tabletop panel whereby the adjustable leg members accommodate uneven terrain alongside the R.V.

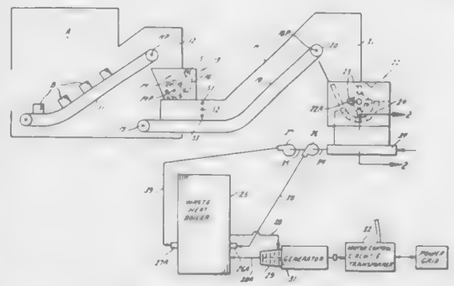
4,995,323
MODULAR SHELVING AND HANGER BAR SYSTEM
Kenneth K. Kellems, Costa Mesa; William F. Ryczek, Azusa, and Douglas R. Smith, Glendora, all of Calif., assignors to The Stanley Works, New Britain, Conn.
Filed Mar. 2, 1989, Ser. No. 319,428
Int. Cl.[5] A47B *3/06*
U.S. Cl. 108—157 30 Claims

1. A self system comprising:
a pair of horizontal shelf brackets, each bracket comprising a plurality of raised plank securing members spaced apart along its upper face for engaging a plurality of shelf planks and retaining each plank at a selected location spaced apart along the length of the shelf bracket; and
a plurality of elongated shelf planks on top of the shelf brackets, each plank having a cross section transverse to its length complementary to a raised plank securing member on the shelf brackets for elastically engaging the plank



securing member and retaining it on the brackets without additional fasteners.

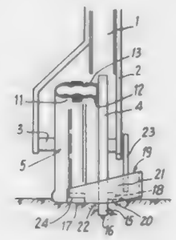
4,995,324
METHOD OF DISPOSING OF WASTE MATERIAL
Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124
Filed Jul. 16, 1990, Ser. No. 552,922
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—234 12 Claims



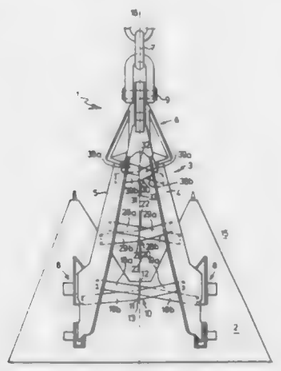
1. A method of disposing of baled waste material as a fuel in a system of direct firing a boiler having a variable demand for fuel and recovering the heat value thereof as a source of power, the method comprising:
(a.) subjecting stored bales of waste material to a step of breaking up the bales to free the waste material as needed;
(b.) feeding the freed waste material into a live bottom storage unit;
(c.) conveying the freed waste material out of the storage unit at a rate determined by the boiler demand and reducing the waste material to a predetermined particle size;
(d.) direct firing the particles of the waste material in a boiler for reduction to an ash condition while producing steam and;
(e.) utilizing the steam to generate electrical power.

4,995,325
SETTING WHEELS FOR SEED DRILLS
Auguste Herriau, Paris, and Paul Herriau, Cambrai, both of France, assignors to Societe Sogefina, Societe De Gestion Financiere Armoricaine, Paris, France
Filed Feb. 22, 1989, Ser. No. 314,217
Claims priority, application France, Mar. 4, 1988, 88 02755
Int. Cl.[5] A01C *13/00*
U.S. Cl. 111—189 9 Claims

1. A setting wheel assembly for use in a sowing machine, said assembly comprising a setting wheel having a peripheral portion adapted to urge sown seeds more deeply into a furrow, and a gauging wheel attached to one side of said setting wheel, said gauging wheel having a rolling radius smaller than the radius of said peripheral portion of the setting wheel, wherein said gauging wheel comprises a resiliently deformable ground-engaging surface, said resiliently deformable ground-engaging surface being a low pressure pneumatic tire, said assembly further comprising a common axle on which said setting wheel and said gauging wheel are independently rotatably mounted, said gauging wheel exerting a tractive force on said setting wheel solely by frictional contact of said ground-engaging surface on said one side of said setting wheel.



4,995,326
ANCHOR WITH CROSS CONNECTION
Rob van den Haak, Meerkoetstraat 83a, 2920 AC Krimpen a/d Ijssel, Netherlands
Filed Nov. 30, 1989, Ser. No. 444,743
Claims priority, application Netherlands, Dec. 2, 1988, 8802975
Int. Cl.[5] B63B *21/26*
U.S. Cl. 114—301 11 Claims



1. An anchor comprising a fluke and a shank assembly, the latter including at one end, located at the front of said anchor, means for attaching an anchor cable and being joined to said fluke at the other end, said fluke extending along a major plane and said shank assembly comprising two substantially elongated plate-shaped shank members which are joined at said one end and define inbetween a passage for anchor soil, wherein at least one means connecting said two shank members has been arranged in said passage, characterized in that said connecting means (**10**, **20**, **30**) each comprise one pair of crossing connecting parts (**18**, **19**; **28**, **29**; **38**, **39**), each part extending from the one shank member (**4**) to the other shank member (**5**) and comprising two portions (**18***a*, **18***b*; **19***a*, **19***b*; **28***a*, **28***b*; **29***a*, **29***b*; **38***a*, **38***b*; **39***a*, **39***b*) arranged on either side of the point (**11**; **21**; **31**) where the connecting parts cross.

4,995,327
SEED PLANTING APPARATUS
Walter L. Jeffers, Sr., 1507 Enfinger Rd., Pace, Fla. 32571
Filed Feb. 5, 1990, Ser. No. 475,388
Int. Cl.[5] A01C *7/02*; B67D *5/64*
U.S. Cl. 111—82 3 Claims



1. A seed planter apparatus comprising,
a support tray including a plurality of seed storage containers mounted thereto for storage of a variety of selective seeds within the containers, and
a flexible securement means for securement of the tray to an individual, and
a funnel member integrally mounted to the tray defined by a funnel axis, wherein the axis is oriented orthogonally relative to the storage tray, and
an elongate conduit directed downardly from the funnel in an axial alignment and communicating with the funnel, and
wherein the support tray defines a planar support surface including an upstanding perimeter rim extending upwardly of the surface to prevent inadvertent spillage of seeds from the support surface, and the support tray defined by a generally "C" shaped configuration to receive a torso of the individual therewithin, wherein the "C" shaped configuration is defined by spaced legs of the tray, and
wherein the flexible securement means include a first torso strap mounted to exterior surfaces of the legs, wherein the torso strap includes a buckle for adjustment thereof, and the securement means include a flexible neck strap secured adjacent a forward end of the support tray, with a neck strap buckle for adjustment of the neck strap, and
wherein each of the containers is mounted integrally to and extends above support surface of the support tray, and wherein each container includes a flexible cover releasably mounted thereto, wherein the cover includes a lip defining a central opening, wherein the lip restricts loss of seed from a respective container when secured thereto, and
further including a horizontal link integrally and orthogonally mounted to the elongate conduit, and the horizontal link mounted to the elongate conduit at a forward terminal end, and a rear terminal end of the horizontal link mounted medially and integrally to a rear surface of an arcuate concave leg rest.

4,995,328
EDGE TRACING SEWING MACHINE
Takafumi Tanaka, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Filed May 21, 1990, Ser. No. 525,765
Claims priority, application Japan, Jul. 18, 1989, 1-185651
Int. Cl.[5] D05B *3/02*
U.S. Cl. 112—453 10 Claims

1. An edge tracing sewing machine comprising:
a reciprocable needle bar having a needle at a lower end thereof;
feeding means for feeding a workpiece in a sewing direction;
relative position changing means for changing the relative

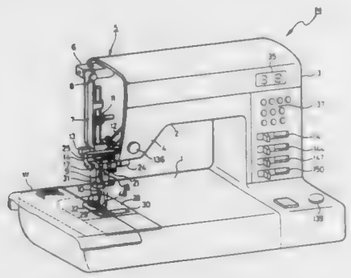
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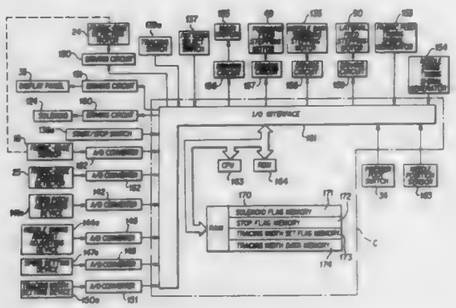
position between the needle and the workpiece in a lateral direction perpendicular to the sewing direction;

edge position detecting means for detecting an edge position of the workpiece in the lateral direction, and generating an edge position signal;

tracing width setting means for setting a tracing width from the edge of the workpiece to the needle in the lateral direction;

control means for controlling said relative position changing means based on the edge position signal generated by said edge position detecting means and the tracing width set by





said tracing width setting means, so as to carry out a tracing sewing with the tracing width;

interruption detecting means for detecting an interruption of the tracing sewing in a vicinity of a corner portion of the workpiece; and

tracing width changing means for changing the tracing width set by said tracing width setting means to a new tracing width corresponding to a distance between the needle and the edge of the workpiece in the lateral direction based on the interruption of the tracing sewing detected by said interruption detecting means.

4,995,329

TIEDOWN DEVICE AND SYSTEM

Larry B. Kleine, 1937 Leicester Way, Fort Collins, Colo. 80526

Filed Aug. 23, 1989, Ser. No. 397,243

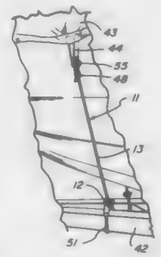
Int. Cl.[5] B63B *17/00*

U.S. Cl. 114—361 **12 Claims**

1. A tiedown device comprising:

a rigid, hook-like end fastening member having a generally bifurcated main body with a bight portion from which extends first and second diverging arm portions and an inturned transverse end portion extending in from said first arm portion and arranged generally at right angles thereto to define a transverse cord retaining surface at one end of said first arm portion opposite said bight portion, and

a flexible cord of a selected length and capable of being stretched along its length, said cord having a first end portion secured to said second arm portion and having an opposite free end portion, said second arm portion of said main body terminating in an eyelet through which the secured end of said cord is passed, said end fastening



member having a rigid, metal inner body and a resilient external surface, said restricted opening being less than the diameter of the cord in an unstretched condition and the cord sliding through said restricted opening when stretched.

4,995,330

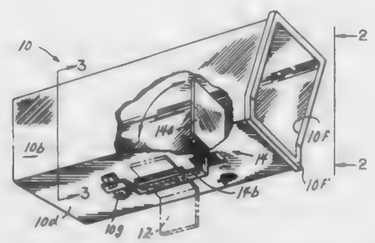
DELIVERY BOX SIGNALING ARRANGEMENT

Billy G. Likens, 5800 Plainview Dr., Evansville, Ind. 47712

Filed Oct. 23, 1989, Ser. No. 425,037

Int. Cl.[5] G09F *17/00;* **B65D** *91/00*

U.S. Cl. 116—175 **4 Claims**



1. A signaling arrangement for a delivery box including a bottom wall comprising a control plate assembly pivotably mounted within said delivery box and operatively responsive to the placement of an article into said box, where said control plate assembly includes a strip having a forward portion within said box and a rearwardly extending portion below said bottom wall of said box, where said forward portion and said rearwardly extending portion of said strip are selectively vertical with respect to said bottom wall of said box, where a free rear end of said rearwardly extending portion of said strip selectively cooperates with securing means on said bottom wall of said box and releasably maintains said control plate assembly at a predelivery location, where placement of said article releases said free rear end and causes said strip to pivot from an article blocking position to a signaling position, where a control plate is mounted on said strip within said box in a blocking relationship with said article, and where a signal plate is mounted on said rearwardly extending portion of said strip below said box and between said rear free end and said forward portion thereof.

4,995,331

APPARATUS FOR GLAZING ARTICLES OF EARTHENWARE OR PORCELAIN

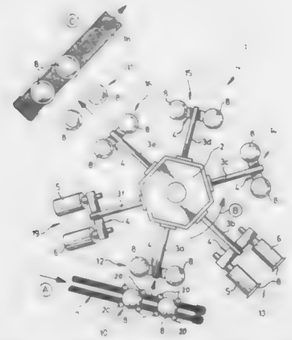
Karl Voit, Weissenstadt, Fed. Rep. of Germany, assignor to Michael Voit, GmbH, Weissenstadt, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,353

Claims priority, application Fed. Rep. of Germany, May 9, 1988, 3815822

Int. Cl.[5] B05C *3/10, 13/00*

U.S. Cl. 118—46 **19 Claims**



1. Apparatus for glazing an article, comprising:

a rotating support means for glazing the article in a glazing station and transporting the article in a working cycle from said glazing station to a discharge station from which the finished article is transported away for further processing, said support means including a capstan, at least one supporting arm defining an axis and having one end connected to said capstan, a workpiece holder mounted to the other end of said arm, and at least one glaze vessel defining an axis of rotation and mounted to said workpiece holder;

centering means provided in a centering station for centering the article in alignment with a first suction means by which the article is transferred from said centering station to said glaze vessel;

means for rotating said glaze vessel about said axis of rotation;

means for tilting said glaze vessel relative to said axis of said supporting arm; and

means for holding the article on said glaze vessel.

4,995,332

APPARATUS FOR STOCKING GOLF CLUBS

Shigeyoshi Tsuruoka, and Saigiro Hayashi, both of Chiba, Japan, assignors to Hoyu Bussan Kabushiki Kaisha, Chiba, Japan

Continuation-in-part of Ser. No. 316,225, Feb. 27, 1989, abandoned. This application Jun. 7, 1989, Ser. No. 362,683

Int. Cl.[5] B05B *15/12;* **A63B** *57/00;* **A46B** *13/04;* **B65G** *29/00*

U.S. Cl. 118—66 **22 Claims**

1. An apparatus for cleaning, waxing and stocking a plurality of golf clubs, comprising:

(a) an apparatus floor;

(b) a turn table supporting member which is substantially of a disc shaped metal located above said floor of the apparatus via legs;

(c) a turn table rotatably supported on the turn table supporting member;

(d) means for cleaning and waxing golf clubs wherein said means has a club output port, a golf club transport mechanism, a golf club cleaning portion, a golf club waxing portion, and a grip drying portion;

(e) a plurality of golf club housings removably attached onto the turn table, each having a club introducing inlet in radial directions of the turn table with equal angles of intervals with respect to the turn table for housing respective golf clubs delivered from the club output port of the golf club cleaning and waxing means;

(f) a turn table drive mechanism for turning the turn table so that any one of the golf club introducing inlets is communicated with the club output port of the club cleaning and waxing means to receive one of the golf clubs delivered through the output port; and

(g) means for delivering the cleaned and waxed golf clubs from the output port to the club introducing inlet of said housing.

4,995,333

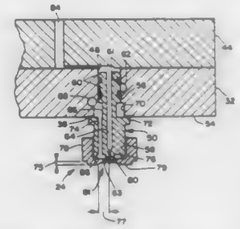
SPRAYED ADHESIVE SYSTEM FOR APPLYING A CONTINUOUS FILAMENT OF THERMOPLASTIC MATERIAL AND IMPARTING A SWIRLING MOTION THERETO

Richard F. Keller, Fremont; Terry L. Springer, Menasha, and Jeffrey J. Jeanquart, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 15, 1989, Ser. No. 408,019

Int. Cl.[5] B05B *7/00;* **B05C** *5/00*

U.S. Cl. 118—300 **34 Claims**



1. An apparatus for forming a substantially continuous filament of a thermoplastic work material and imparting a swirling motion thereto, comprising:

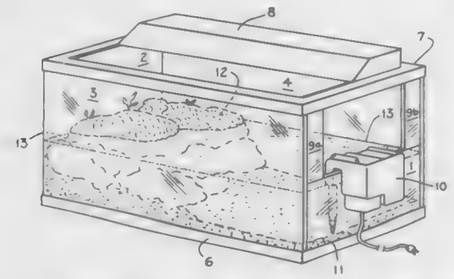
a body member which has a work material supply passage and a gas supply passage formed therein, said gas supply passage substantially aligned with and generally radially spaced from a longitudinal central axis of said body member, and said gas supply passage having substantially no inclination along a radial direction toward said central axis of said body member;

an outlet nozzle section which is connected to said body member and has a substantially conically tapered shape, said nozzle section having a nozzle extrusion passage formed therein in communication with said work material supply passage; and

a housing member which operably connects to said body member to delimit a substantially annular gas transfer zone in fluid communication with said gas supply passage and to delimit a substantially annular gas outlet passage around said nozzle section and in fluid communication with said gas transfer zone, said housing member including an exit section having inner wall surfaces which substantially parallel the substantially conically tapered shape of said nozzle section, and which are in a selected spaced relation from said nozzle section to define said gas outlet passage, said gas supply passage, said housing exit section and said nozzle section configured to provide for a selected gas flow which imparts said filament swirling motion substantially without disintegrating said filament, said apparatus thereby constructed to deposit a substantially continuous, swirled filament of said work material onto a selected substrate.

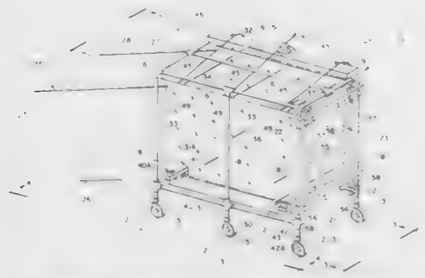
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,334
AQUARIUM-TERRARIUM TANK
Lawrence I. Wechsler, 1 Wooleys La., Great Neck, N.Y. 11023
Continuation of Ser. No. 279,915, Dec. 5, 1988, abandoned. This application May 8, 1990, Ser. No. 520,845
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 4 Claims



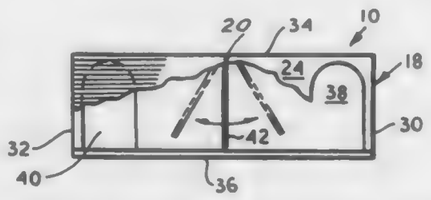
1. An aquarium tank having a bottom wall peripherally bounded by vertical side walls, each vertical side wall having a top edge, at least one of the vertical peripheral side walls being at least partially shorter in height than the other side walls, for holding water at a level below the top edge of said at least partially shorter peripheral side wall, and a hanging filter mounted on the top edge of said at least partially shorter peripheral side wall having a water intake extending downwardly therefrom to withdraw water from the interior of the tank.

4,995,335
ANIMAL RESTRAINT CAGE
John H. Wright, 6608 Flying Cloud Dr., Eden Prairie, Minn. 55344
Filed Sep. 10, 1990, Ser. No. 579,890
Int. Cl.[5] A01K *1/06*
U.S. Cl. 119—98 5 Claims



1. In an animal restraint means comprising in combination, frame means defining a generally rectangular parallelepipedon and having an elevated base platform plane, a top plane, opposed side planes and opposed end planes, an open animal access port arranged at one end and a stanchion securing means disposed at the opposed end thereof, said animal restraint means being characterized in that:
(a) ramp receiving means removably positioned between the ground and said base platform plane at said access end for elevating an animal accessing said animal restraint means;
(b) side wall plates removably positioned between said side planes and having axially aligned pairs of bores formed therein for releasably receiving restraint rods therewithin for restraining upward movement of an animal positioned within said animal restraint means;
(c) looking means disposed generally along said base platform plane and secured to said frame means for receiving the base edge surfaces of each of said side wall plates within said frame means in predetermined spaced-apart relationship, and means for snugging and releasably securing the upper edge surface of each of said side wall plates in position about the opposed sides within said animal restraint means; and
(d) said stanchion securing means comprising a pair of laterally spaced-apart rod members and having locking means for releasably securing said rods to said frame means for the adjustable positioning of said rods to form said stanchion means.

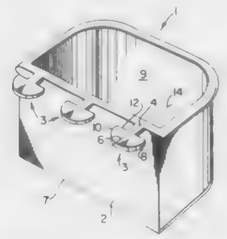
4,995,336
ANIMAL ENTRANCE
Mary M. Deemer, 106 E. Seventh St., and Lois K. Kugler, 606 North St., both of Oil City, Pa. 16301
Filed Apr. 25, 1990, Ser. No. 514,205
Int. Cl.[5] E05B *65/00*
U.S. Cl. 119—15 4 Claims



1. An animal entrance adapted to be received in a window opening of an open window in a wall having a double hung window comprising an elongated enclosure;
said elongated enclosure defined by a front wall, a rear wall spaced from said front wall, a top, a bottom, a first closed end and a second closed end;
a first door opening in said front wall adjacent said first closed end and;
a second door opening in said rear wall adjacent said second closed end defining a passage in said elongated enclosure between said first door opening and said second door opening; and
a swinging door in said elongated enclosure disposed generally perpendicular to said front wall and to said rear wall between said first door opening and said second door opening;
said swinging door being swingably supported on said elongated enclosure by hinge means;
said swinging door being urged toward a closed position by gravity whereby an animal can enter said first door opening, pass through said swinging door and exit said second door opening and thereby enter into or exit from one side of said elongated enclosure to the other.

4,995,337
CAGE FEEDER WITH NOVEL CAGE ATTACHMENT MEANS
Lionel Abrams, 10 Dawes Road, Toronto, Ontario, Canada (M4C 5A7); Arthur Fisher, and Ronald F. Jameson, both of Markham, Canada, assignors to Lionel Abrams, Toronto, Canada
Filed Mar. 6, 1990, Ser. No. 488,882
Int. Cl.[5] A01K *39/01*
U.S. Cl. 119—18 9 Claims

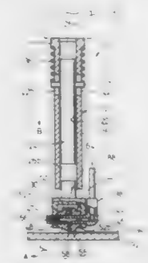
1. A small animal cage feeder comprising:
a feed holding means;
at least one resilient protrusion extending from said feed holding means comprising a neck joined at one end to said feed holding means and terminating at its other end in the base of an enlarged head, said head enlarged transversely of said neck so as to have a greater extent from side to side than the distance between adjacent horizontally spaced vertical bars in a vertical bar cage with which the cage feeder is intended to be used and so that the distance, transversely of said neck, between one side of said neck and the more distal side of said head is greater than the distance between adjacent vertically spaced horizontal bars in a horizontal bar cage with which the cage feeder is intended to be used;
said neck having a resilient limit and said head being turnable about a central longitudinal axis of said neck so as to enable one to twist said neck beyond its resilient limit in order to reorientate said head with respect to said feed holding means;
whereby, in a vertical bar animal cage, the enlarged head of said at least one protrusion may be deflected to snap be-



tween adjacent horizontally spaced vertical bars so that such bars are positioned on either side of the neck of said at least one protrusion and are sandwiched between the base of the enlarged head and the feed holding means and thereafter the animal cage feeder may be lowered so that said neck rests on a horizontal support bar of the cage;
and whereby, in a horizontal bar animal cage, said at least one protrusion may be inserted between two vertically spaced horizontal bars an rested upon the lower of the two horizontal bars and the enlarged head turned about said axis of said neck to twist said neck beyond its resilient limit so that said head has a new orientation which is such that said two horizontal bars are positioned on either side of the neck of said at least one protrusion and are sandwiched between the base of the enlarged head and the feed holding means.

4,995,338
COATING APPARATUS
Hirobumi Morita; Eiichi Matsuzaki; Yukio Chiba, and Shigeo Kato, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 22, 1988, Ser. No. 247,853
Claims priority, application Japan, Sep. 24, 1987, 62-241997; Nov. 18, 1987, 62-175035[U]
Int. Cl.[5] B05C *1/04*
U.S. Cl. 118—410 19 Claims

1. A coating apparatus for coating an object with a coating material in a coating direction, comprising:
a holder adapted to be mounted on a controllable support member;
a shaft slidably supported in said holder;
a head member mounted on said shaft for angular movement with respect to said shaft, said head member having sliding surfaces for slidably contact with an object and a coating material outlet positioned forwardly of said sliding surface in the coating direction; and
a recess defined between said sliding surfaces in fluid communication with said coating material outlet, said recess having a substantial width in a direction transverse to the coating direction and a greater widthwise dimension than said coating material outlet, wherein said coating material



is uniformly applied to said object according to dimensions of said recess.

4,995,339
COATING APPARATUS
Seiichi Tobisawa, Hachioji; Takemasa Namiki, Iruma, and Shigetoshi Kawabe, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Feb. 16, 1989, Ser. No. 311,250
Claims priority, application Japan, Feb. 17, 1988, 63-34859; Mar. 4, 1988, 63-50695
Int. Cl.[5] B05C *3/12, 5/00*
U.S. Cl. 118—410 8 Claims

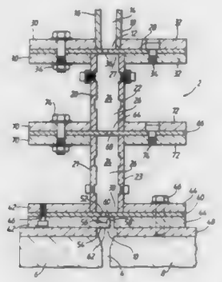
1. An apparatus for coating a flexible support with a coating solution from a supply thereof comprising:
a coating head having a coating surface including an upstream side and a downstream side;
means for moving the support along the coating surface, the coating surface defining a front face disposed on the upstream side of the coating surface and a back face disposed on the downstream side of the coating surface;
a slit in the coating surface between the front and back faces, the slit being in communication with the supply of the coating solution, for extruding the coating solution through the slit onto the flexible support as the support moves along the coating surface from the front face to the back face;
the front face including an introducing segment, a turning portion and an end section, wherein the end section has a radius of curvature r_1;
the back face including an arcuate surface having radius of curvature r_2 along its entirety, the radii of curvature being related according to the relationships;

$1\ mm < r_1 < r_2/2$
$3\ mm < r_2 < 20\ mm$; and

the end section having a downstream end and at least a art of the back face extending beyond a line tangent to the downstream end of the front face.

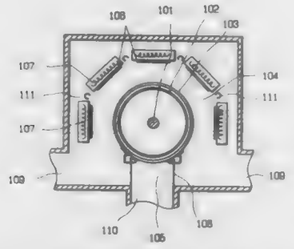
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,340
GLASS COATING APPARATUS
David Martlew, Merseyside, and Malcom J. Rigby, Lancashire, both of England, assignors to Pilkington PLC, Merseyside, England
Filed Oct. 12, 1989, Ser. No. 420,381
Claims priority, application United Kingdom, Oct. 14, 1988, 8824103
Int. Cl.[5] B05C *3/02*
U.S. Cl. 118—715 10 Claims



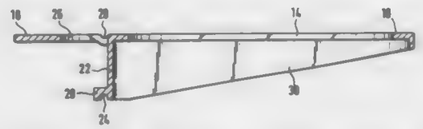
1. Apparatus for coating flat glass by directing a reactant gas over the glass surface, the apparatus incorporating a gas flow restrictor having an inlet and an outlet, which gas flow restrictor comprises a chamber which is adapted to receive a supply of reactant gas and is adapted to output a flow of the reactant gas over the flat glass being coated, a series of at least two restrictions, each restriction comprising a plate member extending across the chamber and having a plurality of apertures therethrough, and a gas flow deflector at the outlet of the restrictor for deflecting the gas flow from the outlet and preventing the gas flow from impinging directly on the glass.

4,995,341
MICROWAVE PLASMA CVD APPARATUS FOR THE FORMATION OF A LARGE-AREA FUNCTIONAL DEPOSITED FILM
Jinsho Matsuyama, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 21, 1989, Ser. No. 439,817
Claims priority, application Japan, Nov. 24, 1988, 63-294740
Int. Cl.[5] C23C *16/48*
U.S. Cl. 118—723 2 Claims



1. A microwave plasma chemical vapor deposition apparatus for continuously forming a functional deposited film on a substrate, comprising (a) a substantially enclosed film forming chamber containing means for holding said substrate, said film forming chamber including (b) means for feeding a film-forming raw material gas into a film forming space contained within said film forming chamber, (c) means for evacuating said film forming space, (d) a microwave introducing window means connected to a microwave power source; (e) an etching chamber for cleaning said microwave introducing window with an etching gas; said etching chamber including (f) an etching space, (g) means for feeding an etching raw material gas into said etching space, and (h) means for applying an activation energy into said etching space to excite said etching raw material gas to convert it into said etching gas, wherein said microwave introducing window means comprises:
(i) at least one fixed cylindrical microwave transmitting window;
(ii) a movable cylindrical microwave transmitting window concentrically disposed about said at least one fixed window; means for rotating said movable cylindrical microwave transmitting window between the film forming chamber and the etching chamber, whereby a portion of the movable microwave transmitting window is cleaned in the etching chamber by etching off any film deposited on said movable microwave transmitting window with the etching gas in the etching chamber and a second etched portion of said movable microwave transmitting window is rotated to a position in the film forming chamber from said etching chamber.

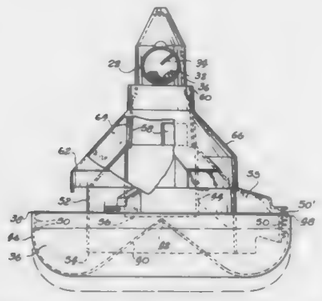
4,995,342
HOLDER FOR BIRD FOOD PACKED IN PORTION CONTAINERS
Michael Hinrichs, Kirchlinteln-Luttum; Jurgen Homolla, Minden; Eckart Schormair, Otersen; Klaus Czempik, Verden, and Rolf Hornig, Kirchlinteln-Luttum, all of Fed. Rep. of Germany, assignors to EFFEM GmbH, Verden, Fed. Rep. of Germany
Filed Mar. 26, 1990, Ser. No. 499,088
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 8903972[U]; Sep. 14, 1989, 8911093[U]
Int. Cl.[5] A01K *5/01*
U.S. Cl. 119—18 19 Claims



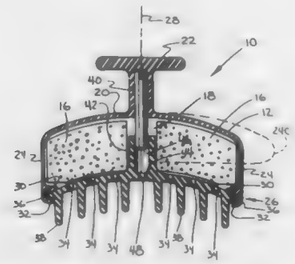
1. A holder for bird food packed in portion containers comprising a reception portion extending horizontally when in use and having an opening forming a receptacle for a bird food portion container, a gripping portion connected thereto and a first notch between said reception portion and said gripping portion extending at right angles thereto, an end flange fixed at right angles to said reception portion adjacent said notch provided at its end remote from said reception portion with a second notch oriented vertically with respect to said first notch during use.

4,995,343
FEEDER APPARATUS
Theodore J. Cole, and Ray E. Swartzendruber, both of Syracuse, Ind., assignors to CTB, Inc., Milford, Ind.
Filed Jan. 26, 1989, Ser. No. 302,015
Int. Cl.[5] A01K *39/012*
U.S. Cl. 119—53 11 Claims

1. A feeder for poultry and other domestic birds and animals comprising, a pan member for containing and presenting feed for consumption, feeder tube means disposed above said pan member and connectible with a feed conveyor source, said feeder tube means having upper and lower feed gates for directing feed supplied from said feed conveyor source into said pan member, and rotatable collar means surrounding said feeder tube means for controlling a first feed flow directed through said upper feed gate into the pan member independently of a second feed flow directed through said lower feed gate into said pan member, said rotatable collar means independently controlling said first feed flow when said feeder, including said pan member, is resting on a feeding surface and when said feeder is elevated above said feeding surface.

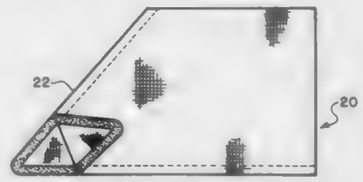


4,995,344
APPARATUS FOR CLEANING WITH AQUEOUS SOLUTION
Anita D. Olson, 3106 Hwy 169 So., Grand Rapids, Minn. 55744
Filed Nov. 22, 1989, Ser. No. 440,520
Int. Cl.[5] A01K *13/00;* A46B *11/04*
U.S. Cl. 119—85 9 Claims



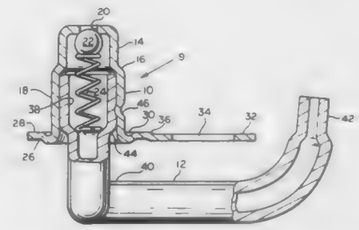
1. A manual scrubbing device comprising
(a) a cover member having an imperforate top member and a handle extending upward from the top member;
(b) a scrub member having downward facing scrubbing means for contacting and scrubbing the hair and skin of a mammal, and a resiliently pliable perforate platen to which said scrubbing means is secured, said platen being positioned between said cover and said scrubbing means;
(c) a resiliently collapsible tubular section connecting a perimeter of the platen to a perimeter of the top member;
(d) compound holding means between said top member and said platen and within said tubular section for holding an aqueous soluable scrubbing compound;
(e) platen moving means operatively connected between a center of said top member and a center of said platen for enabling repetitive movement of the perforate platen toward and away from the top member and for transversely driving said platen in a scrubbing motion, in response to forces manually applied upon the handle; and in which
(f) said platen moving means includes a strut which is normal to the platen and a socket slip fitted on the strut, said strut being fixed in one of the cover member or the platen.

4,995,345
DE-LOUSING BAG FOR PETS
Hilda G. Friedman, 637 S. DePeyster St., Kent, Ohio 44240
Filed Dec. 11, 1989, Ser. No. 448,350
Int. Cl.[5] A01K *13/00*
U.S. Cl. 119—160 2 Claims



1. An animal delousing container comprising:
a tube section, having an angularly disposed forward end, rearward end, top side and bottom side and closed on all sides and ends, except for a closeable opening provided on the forward end and bottom side, said closeable opening operating as the means for the introduction of an animal into said tube section, said animal being introduced into said tube section such that the animal's head is adjacent to said top side thereby providing the animal more room at the bottom end thereof for movement, said tube section separating into a hollow body upon the introduction of said animal into said tube section, said closure opening means further operating as the means for the introduction of pest insecticides into said hollow body, said closeable opening operating to close said hollow body to the extent that the animal's body, excepting the head portion, is completely encapsulated thereby containing said pest insecticide within the proximity of the animal's body for greater effectiveness in eradicating said pests.

4,995,346
OIL JET PISTON COOLER
Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.
Filed Jun. 28, 1989, Ser. No. 372,322
Int. Cl.[5] F01P *1/04*
U.S. Cl. 123—41.35 15 Claims



1. An improved oil jet piston cooling device for directing a stream of oil upwardly towards the inside of a reciprocable piston of an internal combustion engine, said device comprising: a body member having an upstream cylindrical end section defining a first upstream portion of an entrance chamber, said body member having a valve aperture and a surrounding seat on its upstream end, a spout member having an upstream cylindrical end section defining a second portion of said entrance chamber, said upstream end of said spout member being tightly fitted inside said body member and coaxially aligned with said upstream end of said body member, said spout member also having an intermediate section followed by a nozzle section on its downstream end, and a pressure responsive valve mechanism contained in said entrance chamber.

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4,995,347

INTAKE DEVICE OF A TWO STROKE ENGINE WITH SUPERCHARGER BYPASS PASSAGE

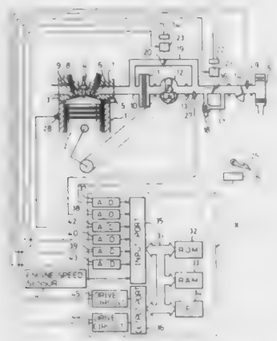
Takao Tate, Susono; Norihiko Nakamura, Mishima; Hiroshi Noguchi, Gotemba; Michio Kawagoe, Susono; Toyokazu Baika, Susono; Kichiro Kato, Susono; Yoshio Kido, Gotemba; Katsuhiko Hirose, Susono; Hiroaki Nihei, Susono, and Masahiko Masubuchi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 30, 1989, Ser. No. 443,314

Claims priority, application Japan, Dec. 6, 1988, 63-306807; Mar. 8, 1989, 1-53680

Int. Cl.[5] F02B 75/02

U.S. Cl. 123—65 BA 37 Claims



1. An intake device of a two stroke engine; comprising:
an intake passage having a throttle valve therein;
a mechanically driven supercharger driven by the engine and arranged in said intake passage downstream of said throttle valve;
a bypass air passage branched from said intake passage between said throttle valve and said supercharger and connected to said intake passage downstream of said supercharger;
a bypass air control valve arranged in said bypass air passage;
detecting means for detecting a level of vacuum in said intake passage between said throttle valve and said supercharger and producing an output signal representing said level of vacuum; and
bypass control means for controlling a degree of opening of said bypass air control valve in response to the output signal of said detecting means to bring said level of vacuum to a predetermined level when the engine is idling.

4,995,348

TWO-STROKE INTERNAL COMBUSTION ENGINES AND PROCESS FOR OPERATING SAID ENGINES

Jean F. Melchior, 126Bld du Montparnasse, 75 014 Paris, France

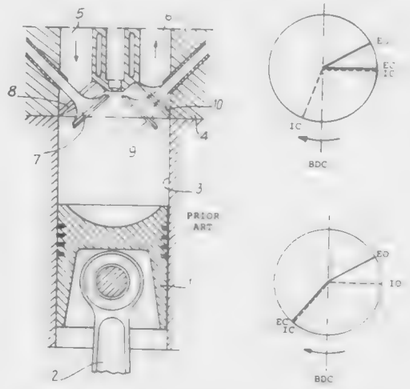
Continuation of Ser. No. 67,918, Aug. 3, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,146

Claims priority, application France, Nov. 6, 1985, 85 16430

Int. Cl.[5] F02B 75/02

U.S. Cl. 123—65 VD 58 Claims

1. An internal combustion engine operating on a two-stroke cycle comprising:
at least one work chamber including a cylinder and a reciprocating piston in said cylinder, said work chamber having a predetermined compression ratio;
an engine shaft which rotates in synchronization with the movement of said piston and defining an angular position of a cycle of operation of said work chamber;
an intake means for allowing the introduction of fresh air into said work chamber when in an open position and for preventing any fluid flow through said intake means when in a closed position, said intake means operating in synchronization with the rotation of said engine shaft;
an exhaust means for allowing the removal of exhaust gases from said work chamber when in an open position and for preventing any fluid flow through said exhaust means when in a closed position, said exhaust means operating in synchronization with the rotation of said engine shaft;
a supercharger including (a) a turbine having a gas inlet which communicates with the exhaust gases from said work chamber to drive said turbine, and (b) a compressor which is mechanically driven by said turbine and which has an air outlet which communicates with said intake means;
a sensing means for sensing at least one power-dependent



parameter of the engine during operation and for determining when the engine is operating at one of start up and low power in contrast to a normal operation; and
a control means for controlling a normal opening of said intake means and of said exhaust means as a function of the angular position of said rotating engine shaft during the normal operation of the engine, said control means further being responsive to the sensing of said sensing means of the start up or low power operation of the engine to advance a beginning of the opening of said intake means relative to a beginning of opening of said intake means during normal operation while maintaining the opening of said intake means subsequent to a beginning of the opening of said exhaust means whereby a sufficient quantity of fresh air is supplied by said supercharger to said intake means during all operations.

4,995,349

STRATIFIED AIR SCAVENGING IN TWO-STROKE ENGINE

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

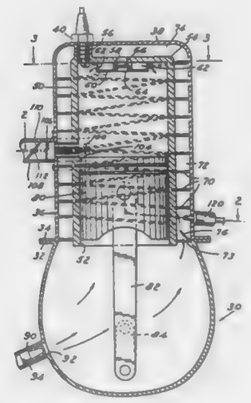
Continuation-in-part of Ser. No. 153,204, Feb. 8, 1988, abandoned. This application Aug. 7, 1989, Ser. No. 390,540

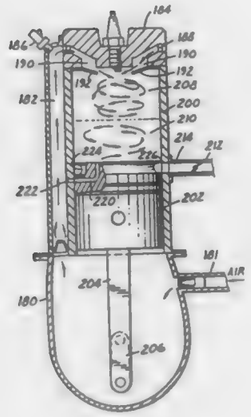
Int. Cl.[5] F02B 75/02

U.S. Cl. 123—65 VB 4 Claims

1. In a two-cycle engine having a cylinder, a cylinder head having a fuel and air inlet port, a cylinder wall, a piston in said cylinder, a spark plug in said cylinder head, and a crankcase,
(a) a unidirectional air inlet into the crankcase,
(b) a transfer passage for air from the crankcase to said inlet port in said cylinder head,
(c) a unidirectional valve between the crankcase and said transfer passage, allowing flow from the crankcase to said passage,

(d) said transfer passage being adapted to carry fuel and air to said cylinder head,
(e) a valve positioned in said fuel and air inlet port operable to close during the compression phase of said cylinder,
(f) means associated with said inlet port in said cylinder head to impart a swirling motion to air and a fuel-air mixture passing through said inlet port into said cylinder to create a stratification of residual exhaust gases, air, and a fuel-air mixture,
(g) an exhaust passage in said cylinder wall,





(h) a throttle means in said exhaust passage to control directly the outlet of exhaust gases and indirectly the quantity of air and fuel-air mixture entering the cylinder, and
(i) said piston in said cylinder having an annular groove around the circumference directly adjacent the top of the cylinder positioned to register with said exhaust passage when said piston is in the bottom dead center position, the top of the piston at the top of said annular groove having a diameter slightly less than the inner diameter of the cylinder to allow exhaust gases to pass into said groove as the piston descends to the bottom position.

4,995,350

2-CYCLE UNI-FLOW SPARK-IGNITION ENGINE

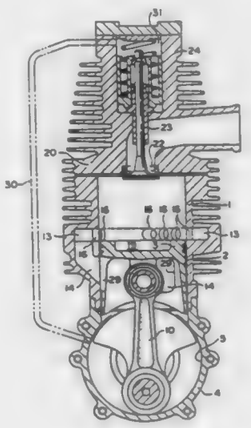
Seiichiro Kumagai, Tokyo; Michikata Kono, Hachioji; Masakazu Okai, Kanagawa, and Hisashi Inaga, Tokyo, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,386

Claims priority, application Japan, Oct. 17, 1988, 63-261125

Int. Cl.[5] F02B 75/02

U.S. Cl. 123—65 VC 2 Claims



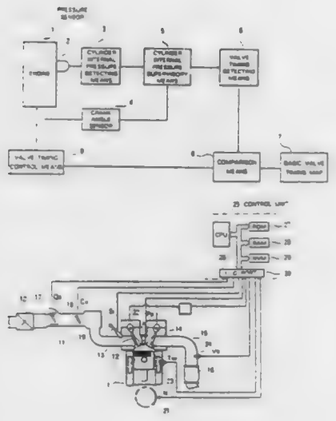
1. A 2-cycle uni-flow spark-ignition engine comprising:
at least one cylinder defining therein a cylinder chamber;
a piston reciprocatively received in said cylinder;
a crank case defining therein a crank chamber;
a scavenging system including an annular scavenging chamber provided on said cylinder along the inner periphery of said cylinder over the entire circumference of said cylinder, a plurality of scavenging ports provided in the wall of said cylinder so as to be opened to said cylinder chamber at the end period of the downward stroking of said piston and communicating with said annular scavenging chamber, and scavenging passages means for communicating said annular scavenging chamber with said crank chamber, so that the fluid introduced into said crank chamber is pressurized by the downward stroking of said piston so as to accumulate a pressure in said annular scavenging chamber through said scavenging passages means and is supplied through said scavenging ports into said cylinder chamber so as to form a scavenging uni-flow with a swirl in said cylinder chamber;
a spark plug provided on said cylinder so as to confront said cylinder chamber; and
an exhaust valve provided on the top of the cylinder and normally opened by being driven with a predetermined force exerted by driving coiled spring means (24) towards the inside of said cylinder chamber;
whereby said exhaust valve is closed in the beginning period of compressing upward stroking of said piston so as to allow compression of the mixture introduced into said cylinder chamber and is automatically opened at an end period of expansion downward stroking of said piston after explosion and generation of power so as to enable the combustion gas to be discharged as exhaust gas.

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4,995,351
VALVE TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Satoru Ohkubo, Amagasaki, and Akira Demizu, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,022
Claims priority, application Japan, Nov. 21, 1989, 1-304259
Int. Cl.[5] F01L *9/04, 1/34*
U.S. Cl. 123—90.11 2 Claims



1. A valve timing control apparatus for an internal combustion engine equipped with an intake valve and exhaust valve, said valve timing control apparatus comprising:

a pressure sensor for sensing the internal pressure in an engine cylinder;

a crank angle sensor for sensing the crank angle of the engine;

valve timing detecting means for detecting the opening and closing timings of the intake and exhaust valves from the sensed cylinder internal pressure and the sensed engine crank angle;

disabling means for disabling the operation of said valve timing detecting means during combustion periods of the engine;

valve timing storage means for storing basic valve opening and closing timings for the intake and exhaust valves which are predetermined based on the operating conditions of the engine;

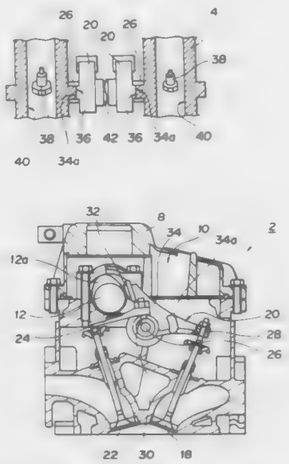
comparison means for comparing the detected valve opening and closing timings as detected by said valve timing detecting means and the predetermined valve opening and closing timings stored in said valve timing storage means so as to calvulate deviations therebetween; and

valve timing control means for controlling the opening and closing timings of the intake and exhaust valves in accordance with the deviations thus calculated in such a manner that the actual opening and closing of the intake and exhaust valves take place at the predetermined basic valve opening and closing timings.

4,995,352
DYNAMIC VALVE MECHANISM OF INTERNAL COMBUSTION ENGINE

Atsumi Machino, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 13, 1990, Ser. No. 509,335
Claims priority, application Japan, Apr. 28, 1989, 1-110720
Int. Cl.[5] F01L *1/18*
U.S. Cl. 123—90.39 3 Claims



1. A dynamic valve mechanism in an internal combustion engine including a rocker shaft mounted on a cylinder head, a cam shaft rotatably mounted on the cylinder head and disposed in generally parallel relationship to the rocker shaft, the cam shaft having a cam thereon, a rocker arm swingably supported on the rocker shaft and having a first arm projecting radially therefrom for engagement with the cam and a second arm projecting radially therefrom for engagement with the stem of a valve projecting through the cylinder head, the improvement comprising a positioning portion fixedly and integrally joined to one arm of said rocker arm and projecting sidewardly thereof along a direction which is generally parallel with the axial direction of said rocker shaft, said positioning portion terminating in an axial free end defined by an axially facing abutment surface, and a holding portion fixed to said cylinder head and projecting axially toward said positioning portion and terminating in an axial free end which defines thereon a contact surface which is abutted against said abutment surface.

4,995,353
VALVE TRAIN WITH LASH/COMPLIANCE COMPENSATION

George T. Stegeman, Union Lake; Tony H. Zarger, Rochester, and Robert J. Outland, Grosse Pointe Woods, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1990, Ser. No. 508,072
Int. Cl.[5] F01L *1/14, 1/24, 1/08*
U.S. Cl. 123—90.48 12 Claims

1. A valve train for an internal combustion engine, said valve train comprising;

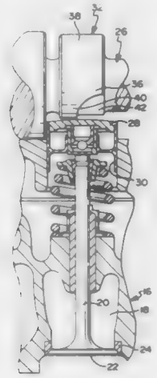
a poppet valve reciprocably movable to open and closed positions,

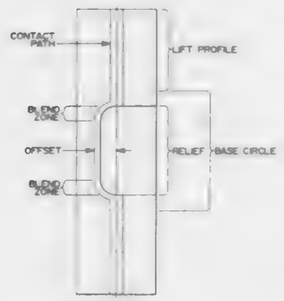
a valve spring urging the valve toward its closed position with a predetermined seating force,

a rotatable cam for causing controlled opening and closing of the valve against the force of the valve spring,

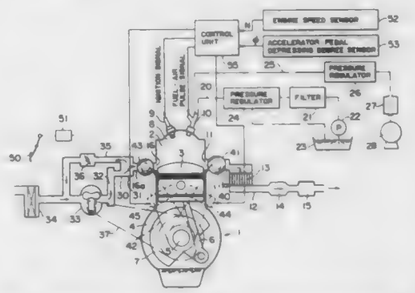
actuator means operable by the cam for activating the valve, the actuator means including a cam follower having a crowned surface in contact with the cam, the crowned surface including a crest,

and the cam having a lift profile operative to open and close the valve as it passes over the cam follower, a base circle portion shaped to contact the crest of the crowned surface in first regions adjacent the lift profile and to contact the crowned surface at a distance offset from the crest in a second region opposite the lift profile, the base circle portion being operative to compress the actuator means to near the point of valve opening when the base circle contacts the crest and to unload the actuator means when the base circle contacts the crowned surface at a distance offset from the crest.





detector means for detecting an operating condition of the engine; and

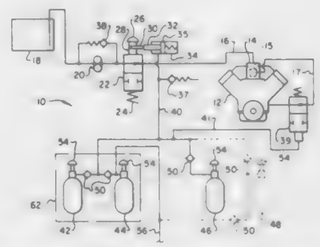


control means responsive to the operating condition of the engine for variably controlling timings of opening and closing the exhaust and scavenge rotary valves.

4,995,355
RAPID SHUT-OFF SYSTEM FOR A TRUCK ENGINE

Trent E. Cowley, Wright, Wyo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 403,633, Sep. 6, 1989, Pat. No. 4,926,815. This application May 8, 1990, Ser. No. 520,692
The portion of the term of this patent subsequent to May 20, 2007, has been disclaimed.
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 DB 7 Claims



1. An engine shut-off system particularly adapted for use in conjunction with a propulsion engine for an off-highway vehicle such as a large dumper truck and the like, said system comprising:

a supply conduit for supplying fuel to said engine and in communication with a source of fluid fuel;

fuel flow shut-off valve means interposed in said conduit, said shut-off valve means including means for biasing said shutoff valve means to an open position and being actuated to a closed position by pressure fluid operated valve actuating means; and

a source of pressure fluid disposed for operation from at least one of an operator's cab for said vehicle and a position in proximity to the ground surface and exterior of said vehicle for operation of said actuating means to cause said shut-off valve means to shut off fuel flow to said engine.

4,995,354
TWO-CYCLE ENGINE

Koji Morikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 449,816
Claims priority, application Japan, Dec. 21, 1988, 63-324665
Int. Cl.[5] F02B *75/02*
U.S. Cl. 123—65 V 6 Claims

1. A two-cycle engine having a cylinder, a piston slidable in the cylinder, an exhaust port for being opened and closed by the piston, a scavenge port for being opened and closed by the piston, a scavenge pump connected to said scavenge port for supplying scavenging air into the cylinder, and a fuel injector for injecting fuel into the cylinder, comprising:

an exhaust rotary valve connected to said exhaust port for opening and closing the exhaust port;

a scavenge rotary valve connected to said scavenge port for opening and closing the scavenge port;

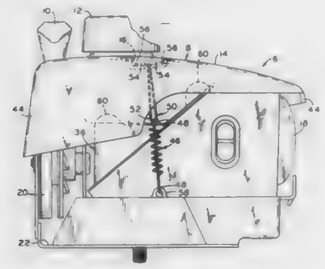
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,356

ENGINE FUEL TANK SHROUD HAVING DAMPENED SPRING RETAINERS

Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jun. 4, 1990, Ser. No. 532,438
Int. Cl.[5] F02B 77/00
U.S. Cl. 123—198 E 27 Claims



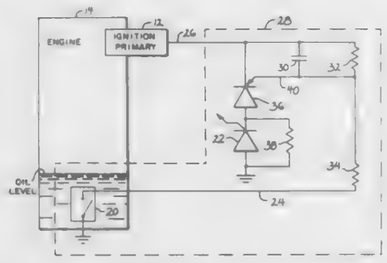
1. An internal combustion engine comprising:
a crankcase including a first mounting portion;
a fuel tank and shroud unit disposed over said crankcase, said shroud unit including a second mounting portion engaging said first mounting portion which results in a nonrigid attachment that minimizes unit fatigue or detachment caused by vibrations; and
spring means for resiliently clamping said shroud unit to said crankcase.

4,995,357

ENGINE SHUT-OFF CIRCUIT

John B. Gonnering, West Bend, and Paul A. Tharman, Milwaukee, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Nov. 13, 1989, Ser. No. 435,284
Int. Cl.[5] F02B 77/00
U.S. Cl. 123—198 DC 4 Claims



1. In an apparatus having an internal combustion engine including a crankcase containing oil and an ignition system having a main core that includes a primary winding to produce ignition pulses, the improvement of a circuit for shutting off the engine, comprising:
a first switch that is activated when a particular condition exists;
an electronic switch connected in circuit with said primary winding;
switch control means, connected in circuit with said first switch and with said electronic switch and including a voltage divider, for turning on said electronic switch to ground the ignition pulses and shut off said engine when said first switch is activated; and
indicator means for indicating that the ignition pulses are being grounded
said ignition system being grounded via said electronic switch and said indicator means when said electronic switch is on.

4,995,358

INTERNAL COMBUSTION ENGINES

Robert J. Gayler, and Timothy M. Lancefield, both of Ashford, England, assignors to Piper-Mechadyne Limited, Oxfordshire, England

PCT No. PCT/GB88/00914, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO89/03932, PCT Pub. Date May 5, 1989
PCT Filed Oct. 21, 1988, Ser. No. 469,439
Claims priority, application United Kingdom, Oct. 23, 1987, [illegible]
Int. Cl.[5] F01L 3/00
U.S. Cl. 123—188 M 8 Claims



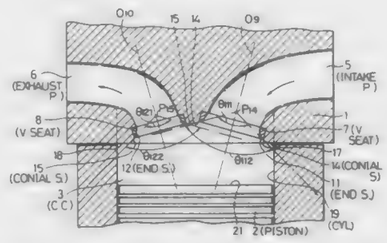
1. A dual duct portion system for an internal combustion engine, which system comprises a pair of juxtaposed supply ducts (14,15) which merge into a single supply passage (16) formed to define a venturi section (17) and communicating with a valve port (11) with the single supply passage surrounding the stem of a poppet valve (13) associated with the valve port, characterized in that said supply ducts each comprise a bent supply duct (14,15) and in that each bent supply duct is provided with means (20,22) for creating eddies in the gas flow at a specific position along the radially inner region of the duct bend to cause a controlled breakaway of the gas flow at that position and subsequent reattachment of the gas flow with the wall of the respective supply duct or of said passage and wall portion (21) at a radially outer region of the duct bend, which portion bulges radially outwardly of the tubular envelope defining the profile of the respective supply duct.

4,995,359

COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Junichi Yokoyama; Tomonori Urushihara, both of Yokosuka; Teruyuki Itoh, Tokyo, and Hiroyuki Fujii, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 27, 1989, Ser. No. 372,245
Claims priority, application Japan, Jun. 28, 1988, 63-160210
Int. Cl.[5] F02M 35/10
U.S. Cl. 123—188 M 26 Claims



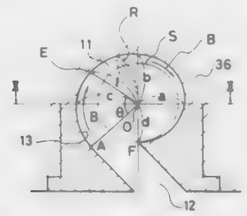
1. A combination chamber for an internal combustion engine having a cylinder, a cylinder head, a piston, at least one intake valve seat for supporting an intake valve at an intake port, at least one exhaust valve seat for supporting an exhaust valve at an exhaust port, and an ignition plug, wherein an intake side conical wall surface is formed in an inner wall of the cylinder head in continuous connection with a conical surface formed at an end of the intake valve seat to smoothly introduce intake air into the cylinder through the intake valve, and wherein an apex of the intake side conical wall surface matches an apex of the conical surface formed at the end surface of the intake valve seat.

4,995,360

COMBUSTION CHAMBER

Toshiaki Adachi, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,456
Claims priority, application Japan, Aug. 31, 1988, 63-214824
Int. Cl.[5] F02B 19/00
U.S. Cl. 123—262 20 Claims



1. A combustion chamber for an internal combustion engine, comprising:
a piston having a main combustion chamber formed in the top thereof;
an auxiliary combustion chamber formed in the cylinder head of said engine and within which air may swirl; and,
passage in said cylinder head connecting said main combustion chamber with said auxiliary combustion chamber and directing air from said main combustion chamber into said auxiliary combustion chamber during the compression stroke of said piston,
said auxiliary chamber having a wall defining a generally spherical cavity communicating with one end of said passage, the distance between the center of said cavity and said wall being reduced from said one side of said passage in the direction of air swirl within said auxiliary combustion chamber all the way around said auxiliary combustion chamber to the area at which said auxiliary combustion chamber meets the opposite side of said passage.

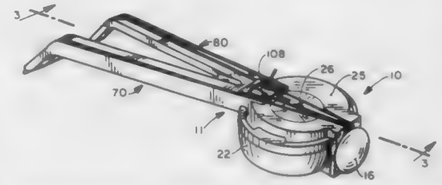
4,995,361

DENTAL FLOSS TOOL

Moises B. Lorenzana, 601 Lake Hinsdale Dr., Willowbrook, Ill. 60559, and Vance A. Lorenzana, 698 Spring Hill Cir., Naperville, Ill. 60540

Filed Jan. 27, 1989, Ser. No. 302,602
Int. Cl.[5] A61C 15/00
U.S. Cl. 132—324 15 Claims

1. A dental floss, comprising:
a floss housing having a fixed spool of dental floss located therein, said fixed spool of dental floss being symmetric about a spool axis, said floss housing having an aperture formed in said floss housing in substantial alignment with said spool axis for withdrawal of a quantity of dental floss from said housing;
a fork attached to said housing having a first arm and a second arm, said first arm having a first arm portion extending from said housing substantially at a right angle to said spool axis, said second arm having a second arm portion extending from said housing substantially at a right angle with respect to said spool axis, said first and second arms each being formed with a lengthwise extending groove from said housing to an end remote from said housing, and a dental floss lock means mounted on said the other opposite said fork for locking both ends of a length of floss, extending the entire length of said first and second arms within said grooves and extending and between said remote ends of said first and second arms, said lock means being substantially aligned with said grooves in said first



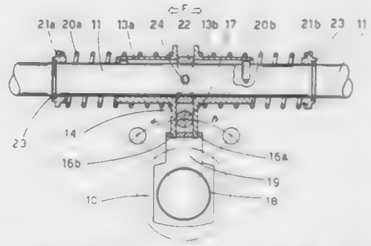
and second arms, said first and second arm portions being at an acute angle to each other and being readily flexed to tension the dental floss extending between said first and second arms, said lock means being positioned to permit securing of the free end of a length of floss one end of which is already secured to said lock means so that the resilience of said arm portions will maintain said length of floss under tension with both ends secured to said lock means.

4,995,362

MALFUNCTION OVERRIDE DEVICE FOR THE FUEL INJECTION SYSTEMS OF COMPRESSION-IGNITION ENGINES

Mario Brighigna, Cento, Italy, assignor to VM Motori S.P.A., Italy

Filed Jan. 30, 1990, Ser. No. 472,321
Claims priority, application Italy, Sep. 7, 1989, 3613 A/89
Int. Cl.[5] F02D 31/00; F02B 77/00
U.S. Cl. 123—365 5 Claims



1. A malfunction override device applicable to the fuel injection system in a compression-ignition diesel engine, comprising:
a crankcase and block accommodating a plurality of pistons disposed parallel one with another and invested with reciprocating motion;
a cylinder head fitted over and combining with the block to create a plurality of combustion chambers, and supporting a corresponding plurality of fuel injectors mounted each with one end penetrating the relative combustion chamber and connected by the remaining end to one corresponding element of a fuel injection pump;
drive means, synchronized with the movement of the pistons, by which the elements of the injection pump are engaged and operated;
rotatable means associated with each element of the injection pump and serving to meter the volume of fuel supplied to the relative injector;

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a control rod disposed parallel to the drive means and adjacent to the injection pump, by which the metering means of the various pumping elements are interconnected, exhibiting a plurality of rigidly associated shoulders located one alongside each element, and linked at one end to control means capable of inducing rectilinear movement of the rod such as will ensure uniform operation of all the metering means in concert;

a plurality of sliders associated with the control rod in contraposed pairs, each pair positively separated by a respective shoulder, capable singly of movement in relation to the rod and affording peripherally embodied linkage and transmission means that project transversely in the direction of an adjacent pump element in such a way as to engage and maneuver the relative metering means between two limit positions corresponding respectively to the maximum and minimum delivery settings of the injection pump;

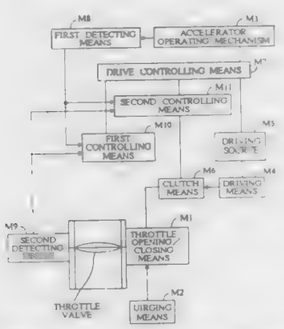
tension means associated with each slider, located between the control rod on the one hand and the relative slider on the other, of which the elastic force is calibrated with respect to the rectilinear reaction force of the rotatable metering means in a way such as enables continued rectilinear movement of the rod even in the event that regular movement of at least one of the metering means between its two limit positions should become inhibited.

4,995,363

THROTTLE CONTROLLER

Tadashi Terazawa, Toyota; Hiroshi Nakashima, Nishio, and Yoshinori Taguchi, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 14, 1990, Ser. No. 523,026
Claims priority, application Japan, May 29, 1989, 1-135253
Int. Cl.[5] F02D *11/10*
U.S. Cl. 123—399 **3 Claims**



1. A throttle controller including throttle opening and closing means for opening and closing a throttle valve, urging means for urging said throttle opening and closing means in a direction in which said throttle valve is closed, an accelerator operating mechanism, driving means capable of driving said throttle opening and closing means independently of said accelerator operating mechanism in directions in which said throttle valve is opened and closed, a driving source for rotatively driving said driving means, clutch means for connecting and disconnecting said throttle opening and closing means and said driving means, and drive controlling means for controlling the engagement and disengagement of said clutch means and controlling the driving of said driving source in response to at least the accelerator operation of said accelerator operating mechanism, said throttle controller comprising:

first detecting means for outputting a signal corresponding to an amount of the accelerator operation of said accelerator operating mechanism;

second detecting means for outputting a signal corresponding to an opening of said throttle valve;

first controlling means for permitting drive control by said drive controlling means in such a manner that said clutch means separates said throttle opening and closing means from said driving means, when an output signal of said first detecting means is a signal representative of an amount of operation not more than a predetermined amount of accelerator operation and when an output signal of said second detecting means is a signal representative of an opening exceeding a predetermined throttle opening; and

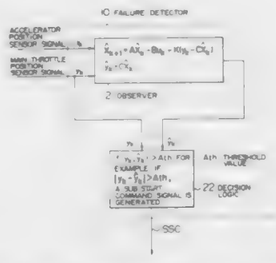
second controlling means disposed in parallel with and independently of said first controlling means and adapted to permit control of the driving of said clutch means by said drive controlling means, said second controlling means permitting control of the driving of said clutch means by said drive controlling means in such a manner that said clutch means connects said throttle opening and closing means and said driving means, when an output signal of said first detecting means is a signal representative of an amount of operation not more than said predetermined amount of accelerator operation and when an output signal of said second detecting means is a signal representative of an opening exceeding said predetermined throttle opening.

4,995,364

THROTTLE CONTROL APPARATUS FOR ENGINES

Eiichi Kamei, Nagoya; Hideaki Namba, Obu; Masahiro Ohba, Okazaki; Shinichiro Tanaka, Mishima, and Keiji Aoki, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 10, 1990, Ser. No. 463,035
Claims priority, application Japan, Jan. 18, 1989, 1-010234
Int. Cl.[5] F02M *7/00*
U.S. Cl. 123—442 **14 Claims**



1. A throttle control apparatus for engines comprising:

a throttle valve provided in an intake pipe of, an engine for controlling an intake air flow;

an additional actuator for controlling the operation of the engine;

command means for generating a throttle opening command signal indicative of a command value for controlling the intake air flow into the engine; and

throttle control system including driving means for electrically driving the throttle valve, detecting means for detecting a position of the throttle valve and producing a throttle position signal, and electronic control means for calculating a control signal from the throttle position signal and the throttle opening command signal and applying the control signal to said driving means,

said electronic control means comprising:

observer means for outputting a presumed value of the position of the throttle valve when the throttle valve is normally operating and has not failed, the presumed value being obtained in accordance with a mathematical model of said throttle control system; and

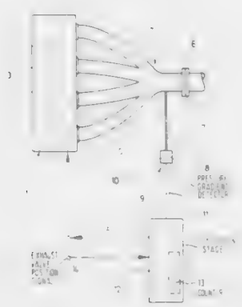
decision means for comparing the throttle position signal with the presumed value from said observer means and outputting a start command signal to drive said additional actuator when said decision means has decided that said throttle control system has failed.

4,995,365

SYSTEM FOR DETECTING ENGINE IGNITION FAILURES IN AN INTERNAL COMBUSTION ENGINE

Helmut Denz, Stuttgart, and Werner Herden, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 19, 1989, Ser. No. 453,403
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1989, 3903566
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—479 **18 Claims**



1. Apparatus for detecting ignition failures in an internal combustion engine having a plurality of cylinders for internal combustion, exhaust valves for each of said cylinders and an exhaust manifold having a collecting tube and connections thereof to each of said exhaust valves, said apparatus comprising:

a pressure gradient sensor means (**10**), exposed to pressure prevailing inside said exhaust manifold and to pressure gradients passing downstream of said exhaust valves, for sensing pressure shock waves generated by opening of said exhaust valves without regard to slower fluctuations of pressure in said manifold; and

an evaluation stage (**12**) electrically connected to said pressure gradient sensor means and having means for detecting and reporting a pressure wave deficiency relating to the opening of any of said exhaust valves.

4,995,366

METHOD FOR CONTROLLING AIR-FUEL RATIO FOR USE IN INTERNAL COMBUSTION ENGINE AND APPARATUS FOR CONTROLLING THE SAME

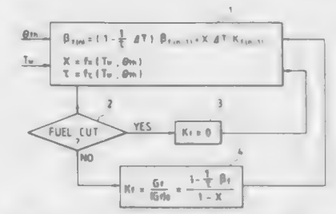
Toshio Manaka, Katsuta, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,649
Claims priority, application Japan, Sep. 19, 1988, 63-232507
Int. Cl.[5] F02D *41/10, 41/12*
U.S. Cl. 123—492 **10 Claims**

1. A method of controlling air-fuel ratio in an internal combustion engine, comprising the steps:

detecting operating parameters of said internal combustion engine including intake air flow amount, a physical quantity representing the load on the internal combustion engine and engine speed;

calculating at intervals ϕT a fuel adhesion amount βf corresponding to a ratio of an amount of fuel adhering to an inner wall surface portion of an intake pipe of the internal combustion engine during a transient state of operation of



the engine to an amount of fuel supplied during steady state operation of the engine, using the following relationship:

$$\beta_{f(n)} = \left(1 - \frac{1}{\tau}\phi T\right) \cdot \beta_{f(n-1)} + X \cdot \phi T \cdot K_{f(n-1)}$$

where X is the rate of adhesion of fuel to said inner wall surface portion, τ is the evaporation time constant of fuel adhering to said inner wall surface portion, ϕT is the calculation cycle time period and K_f is a transitional correction coefficient;

calculating the transitional correction coefficient K_f using the following relationship:

$$K_f = \frac{1 - \frac{1}{\tau} \cdot \beta_{f(n)}}{1 - X}$$

calculating a basic fuel injection amount using said detected operating parameters; and

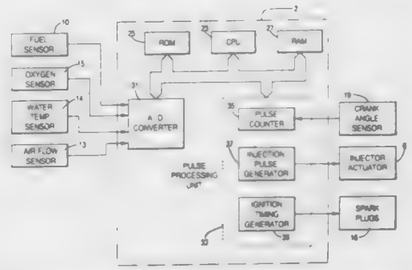
controlling air-fuel ratio during a transitional operating state of the internal combustion engine by adjusting said basic fuel injection amount using said calculated transitional correction coefficient K_f.

4,995,367

SYSTEM AND METHOD OF CONTROL OF INTERNAL COMBUSTION ENGINE USING METHANE FUEL MIXTURE

Teruo Yamauchi, Farmington Hills, Mich., and Akao Sasayama, Bronxville, N.Y., assignors to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Jun. 29, 1990, Ser. No. 545,711
Int. Cl.[5] F02B *75/12*
U.S. Cl. 123—494 **32 Claims**



1. A system for controlling an internal combustion engine operating on a fuel mixture of gasoline and methanol, comprising:

a fuel sensor for detecting the mixture ratio (P) of methanol to gasoline in the fuel mixture to be supplied to said internal combustion engine;

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at least one fuel injector for supplying a metered amount of fuel mixture at periodic intervals to a cylinder of said internal combustion engine; and

a control unit for controlling said fuel injector, including:

(1) means for calculating an air/fuel ratio (A/F) according to the following relationship:

$$A/F = 14.8 - 0.0853P$$

(2) means for determining a fuel injector opening time period based on said calculated air/fuel ratio; and

(3) means for periodically actuating said fuel injector based on said determined fuel injector opening time.

4,995,368

FUEL INJECTION TIMING APPARATUS

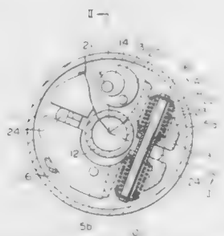
Masayuki Nakamura, Toyota; Kazuyuki Katayama, Obu, and Yasuhiro Furuhashi, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Hino Jidosha Kogyo Kabushiki Kaisha, Hino, both of, Japan

Filed Feb. 3, 1989, Ser. No. 305,894

Claims priority, application Japan, Feb. 4, 1988, 63-024760

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—501 **8 Claims**



1. A fuel injection timing apparatus comprising:

a pair of opposed weights adapted to be connected to an engine for synchronous rotation with the engine, said weights having an initial position and being movable away from each other in proportion to centrifugal forces acting on said weights as a result of rotation thereof and being adapted to be operatively connected to a fuel injection pump to control injection timing thereof in accordance with movement of said weights;

means for biasing said weights to return the same close to each other in the absence of said centrifugal forces;

at least one stopper provided adjacent opposed ends of said weights to be movable in a direction perpendicular to a direction of movement of said weights; and

temperature-sensitive driving means for moving said stopper in accordance with ambient temperatures, whereby said stopper being moved in response to the ambient temperatures to project between the opposed ends of said weights and restrain said weights which tend to return to their initial positions by a force of said biasing means, so that the fuel injection timing is varied in response to the ambient temperatures when the engine is operated at low rotational speeds.

4,995,369

REGULATED FLOW CANISTER PURGE SYSTEM

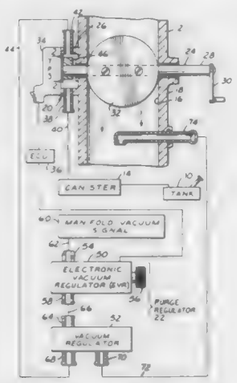
John E. Cook, Chatham, Canada, assignor to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada

Filed Dec. 18, 1989, Ser. No. 452,664

Int. Cl.[5] F02M *25/08*

U.S. Cl. 123—520 **20 Claims**

1. In an evaporative emission control system of an internal combustion engine wherein volatile fuel that has evaporated from a liquid fuel tank is collected in a collection canister that, under certain engine operating conditions detected by an electronic control system of the engine, is purged to the engine by a purge regulator under the control of said electronic control system so as to cause collected fuel vapors to be combusted by the engine, the improvement which comprises a variable orifice that conjointly with said purge regulator exercises control over the vapor flow from said canister to the engine and functions to selectively restrict vapor flow from the canister to the



engine in correlation with the degree to which the engine is being throttled, and a sensor for supplying the electronic control system with a signal indicative of the degree to which the engine is being throttled and hence also the degree of restriction imposed by said variable orifice on the flow from the canister to the engine so that the electronic control system can take the degree of restriction imposed by said variable orifice into account in setting the purge regulator.

4,995,370

LINKED OPERATING DEVICE FOR MULTIPLE CARBURETORS

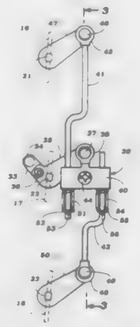
Hirofumi Imaeda, and Kyoji Hakamata, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushika Kaisha, Hamamatsu, Japan

Filed Feb. 22, 1990, Ser. No. 483,102

Claims priority, application Japan, Feb. 23, 1989, 1-43988

Int. Cl.[5] F02B *13/00*

U.S. Cl. 123—583 **5 Claims**



1. A synchronizing mechanism for synchronizing the operation of a plurality of butterfly valves operated by a single operator for the induction system of an engine comprising means for directly coupling said operator to one of said butterfly valves, an operating member affixed to said one butterfly valve for movement therewith, a coupling member coupled for movement with said operating member, a rod coupled to the other of said throttle valves and slidable relative to said coupling member, biasing means interposed between said rod and said coupling member for urging said rod relative to said coupling member and means for clamping said rod to said coupling member.

4,995,371

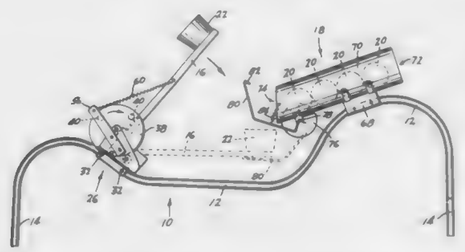
BALL THROWING MACHINE

Joseph Kuizinas, 34 Merriam Rd., North Oxford, Mass. 01537

Filed Jan. 29, 1990, Ser. No. 471,620

Int. Cl.[5] F41B *3/04;* **A63B** *69/40*

U.S. Cl. 124—7 **16 Claims**



16. An automatic ball-tossing device comprising, in combination:

(a) a turnable shaft part,

(b) power means for turning said shaft part,

(c) a catapult arm part having means for releasably carrying a ball,

(d) means driven by said shaft part for causing said arm part to automatically periodically move against and away from said shaft part, and

(e) cushioning means carried by one of said parts and engageable with the other part, for absorbing the impact when the arm part moves to strike against the shaft part.

4,995,372

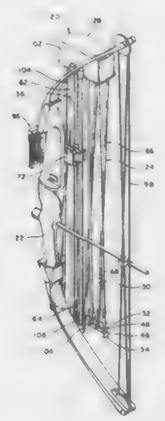
QUIVER HAVING A NECK-GRIPPING AND ALIGNMENT MECHANISM

Kenneth D. Topel, 11220 - 164th St. E., Puyallup, Wash. 98374

Continuation of Ser. No. 120,571, Nov. 12, 1987, abandoned. This application May 25, 1989, Ser. No. 358,454

Int. Cl.[5] F41B *5/06*

U.S. Cl. 124—25.5 **11 Claims**



1. A quiver for holding a plurality of arrows, each of said arrows including a point, a nock, and a shaft joining said point and said nock, said quiver comprising:

first means for releasably holding the points of said arrows in spaced relationship to one another;

second means for releasably engaging the nocks of said arrows in spaced relationship to one another, said second means including a nock bar having discrete arrow separation means for receiving said nocks, each said separation means holding one nock, said arrow separation means including a series of adjacent boxlike compartments having a first wall separating each compartment from the next and a second wall that includes a nock-receiving edge that fits into a slot formed in the nock of said arrow; and

a mounting bar connecting said first and second means.

4,995,373

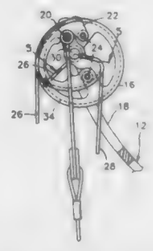
CABLE AND BOWSTRING RETAINER ARRANGEMENT FOR COMPOUND ARCHERY BOW

Kevin R. Mussack, Clifton Springs, N.Y., assignor to Golden Eagle Archery, Inc., Farmington, N.Y.

Filed Mar. 26, 1990, Ser. No. 498,965

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—25.6 **2 Claims**



1. A retainer arrangement for a compound bow of the kind having a handle, elongated flexible limbs mounted at opposite respective ends of the handle, tension cables for tensioning a bowstring between the distal ends of the limbs, and cam-like rotatable elements at the distal ends of the limbs for receiving terminal portions of the cables and the bowstring, the arrangement comprising cylindrical pins, one of said pins being fixed at the end of each cable extending radially therefrom and having a circumferential groove at its end away from the cable, said pin extending through an axial aperture in one of the rotatable elements and receiving the bowstring in said circumferential groove, when assembled the cable lying on one face of said one rotatable element and the bowstring lying on the opposite face thereby entrapping the pin in the aperture.

4,995,374

THROW AND FETCH DOGGIE TOY

William L. Black, 2800 N. State Rd. 7, Margate, Fla. 33063

Filed Feb. 23, 1990, Ser. No. 484,126

Int. Cl.[5] A01K *15/02;* **A63B** *69/40*

U.S. Cl. 124—54 **66 Claims**



66. A ball-launching system for a dog's ball comprising:

a ball-launching tube having a hollow interior, an open front end, and a rear end portion;

means for elevating said open front end of said tube a substantial distance above the level of said rear end portion

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for launching a ball on an airborne path to be chased, fetched and returned by a dog;

means for feeding a returned ball into the hollow interior of said tube;

means for detecting a ball loaded into the hollow interior of said tube as it rolls downwardly past a predetermined position and before it comes to rest at a firing position adjacent said rear end portion of said tube; and

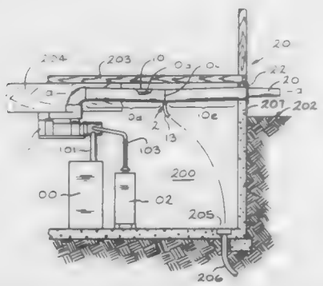
means operatively disposed exterior to said tube and at least partially behind said rear end portion of said tube and responsive to said detection means and to a predetermined time delay sufficient for said ball to come to rest in said firing position for launching same upwardly through the hollow interior of said tube, out of said open front end, and along said airborne path to again be chased, fetched and returned by said dog.

4,995,375

HEAT EXCHANGE PIPES FOR A FURNACE SYSTEM

Bert W. Jackson, 1219 Garfield Rd., Lansing, Mich. 48917

Filed Apr. 2, 1990, Ser. No. 502,816
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—85 B **12 Claims**



1. In a flue products exhaust and preheated combustion air supply assembly for use in association with a heating furnace wherein an air intake pipe is provided outside of and around an exhaust product pipe and wherein each of the pipes extend horizontally to openings outside of a building, the improvement which comprises:

(a) an air intake pipe and exhaust products pipe having a downwardly inclined section and then an upwardly inclined section from a horizontal axis with a lowest point between the inclined sections and between the furnace and the openings outside of the building into which liquid condenses from the flue products and with a conduit means from the exhaust product pipe through the air intake pipe in a sealed relationship at the lowest point for removing the condensed liquid; and

(b) a drain means connected to the conduit means to empty the condensed liquid from the conduit means.

4,995,376

PULSE FURNACE

Garry O. Hanson, 3055 Balsam Ct., Edgewood, Ky. 41017

Filed Jul. 12, 1989, Ser. No. 378,656
Int. Cl.[5] F24H *3/02;* **F23C** *11/04*
U.S. Cl. 126—110 C **26 Claims**

1. A furnace for heating ambient air, said furnace comprising:

(a) means for providing ambient air to be heated;

(b) a combustion assembly for combusting an air-fuel mixture;

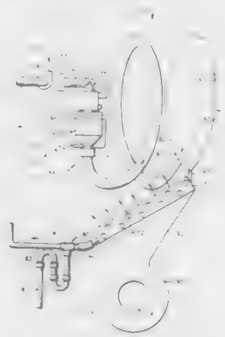
(c) means for providing combustion air to said combustion assembly;

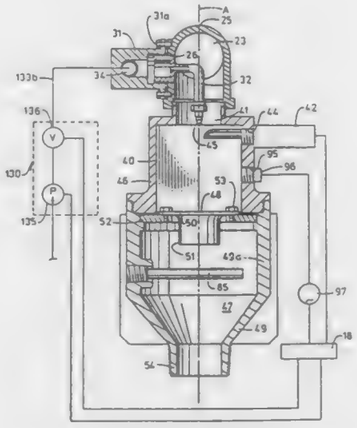
(d) means for providing fuel to said combustion assembly; and

(e) said combustion assembly comprising:

(i) an internal cavity having a mixing chamber and a combustion chamber;

(ii) an outlet in communication with said internal cavity and adapted to exhaust gases which result from the combustion of said air-fuel mixture;





(iii) a flame tube disposed intermediate said mixing chamber and said combustion chamber, said flame tube having an exit;

(iv) the cross sectional area of said outlet being less than the cross sectional area of said combustion chamber adjacent said flame tube exit; and

(v) means for igniting said air-fuel mixture within said mixing chamber.

4,995,377

DUAL AXIS SOLAR COLLECTOR ASSEMBLY

Glenn E. Eiden, 302 U.S. 30 East, New Haven, Ind. 46774

Filed Jun. 29, 1990, Ser. No. 546,010
Int. Cl.[5] F24J *2/38*
U.S. Cl. 126—424 **20 Claims**

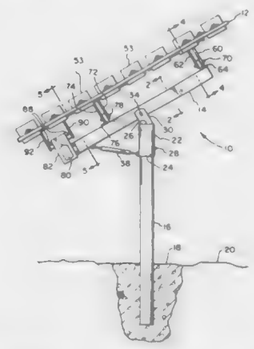
1. A solar collector comprising:

an elongate main boom having a longitudinal axis;

a solar collector frame;

first mounting means for pivotally mounting said solar collector frame to said main boom for pivotal motion about a first pivotal axis substantially parallel to the longitudinal axis of said main boom; and

first motor means, separate from said first mounting means, mounted to said main boom and having a rotary output shaft coaxially aligned with said first pivotal axis and



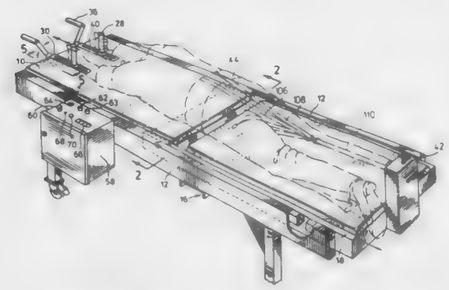
drivingly connected to said frame, for pivoting said frame about said first pivotal axis.

4,995,378

THERAPEUTIC TABLE

Allan E. Dyer, 1400 Dixie Rd., Suite 703, Mississauga, Ontario, Canada, and Ernest Savoia, Weston, Canada, assignors to Allan Dyer, Toronto, Canada

Continuation of Ser. No. 135,533, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 860,985, May 8, 1988, abandoned. This application Jun. 30, 1989, Ser. No. 376,154
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—75 **10 Claims**



1. A therapeutic table for use when applying traction to a patient's lumbar region when the patient is supported on the table in a prone position comprising:

a frame;

a table top having an upper-body section rigid with respect to said frame and a lower-body section slidably mounted with respect to said frame, said sections providing separable surfaces on which a patient may lie in a face-down prone position;

upper-body restraint means for restraining the patient with respect to the upper-body section, said restraint means including a pair of spaced hand grips which are rigid with respect to the upper-body section and extending upwardly from the plane of the table top to be accessible to a patient when resting upon the table with the arms extended above the head along the plane of the axis of the patient's spine to provide a manually releasable anchor for the upper body;

a pelvic belt anchor rigidly mounted with respect to the lower-body section to provide an anchor to which a pelvic belt can be connected;

extensible pneumatic cylinder and piston means extending between the frame and the lower-body section and operable to move the lower-body section with respect to the upper-body section to increase or decrease the distance between said upper-body restraint means and said pelvic belt anchor to apply traction through the patient's arms to the lumbar region of the spine;

said upper-body restraint means being completely releasable by the patient as said lower-body section moves with respect to said upper-body section to thereby permit the patient to limit the amount of traction placed on the lumbar region,

hydraulic damper means extending between the frame and the lower body section for damping the movement of the lower body section with respect to the frame to control the rate of movement of the lower-body section with respect to the upper-body section;

means for alternately applying a predetermined pneumatic pressure to said pneumatic cylinder and piston means in a first direction and a second direction opposite to said first direction to cyclically apply traction to a patient in use;

traction measuring means mounted on said pelvic belt anchor and connectable to a pelvic belt trap for measuring the tension in the strap and thereby determining the traction load applied to the patient;

means for translating the traction load detected by the traction measuring means into a digital read-out;

timing means responsive to the traction measuring means for controlling the timing of the movement of the lower-body section in each said direction.

4,995,379

INSTANT FACE LIFT

Joan Brooks, 6594 Bellaire Dr., New Orleans, La. 70124

Filed Mar. 13, 1989, Ser. No. 322,174
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—76 B **4 Claims**



1. A face lift device comprising a flexible band of material adapted to be adhesively attached to a human scalp, said band being flat on a first surface, and having a plurality of loops provided on the opposing surface; a two-piece strap wherein the first strap piece has a first end that is adapted to be adhesively attached to one side of the wearer's head or neck and the second and end of said first strap piece is shaped to permit it to pass through one of the loops on the said band, the second strap piece has a first end that is adapted to be adhesively attached to the other side of the head or neck of the wearer, and the second end of the second strap piece has a locking member through which the second end of said first strap piece enters after it has passed through said one of the loops, whereby the strap can slide relative to its loop as the head of the wearer moves.

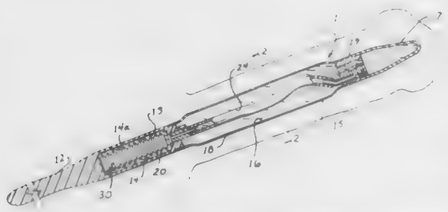
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4,995,380

PENILE PROSTHESIS

James T. Maerzke, Kenosha, and Robert E. Trick, Racine, both of Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Nov. 7, 1989, Ser. No. 433,052
Int. Cl.[5] A61F *2/26*
U.S. Cl. 128—79 4 Claims



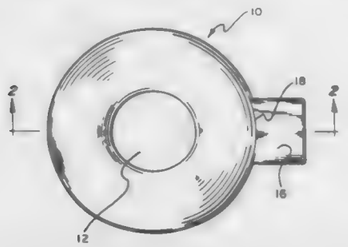
1. In a penile implant comprising a cylindrical member containing a pressure chamber, a reservoir for pressurizing fluid and means operatively connected between the reservoir and the pressure chamber for transferring fluid into the pressure chamber from the reservoir, the improvement in which the reservoir contains a longitudinally compressible and radially incompressible member which expands and prevents the reservoir wall from collapsing when the pressurizing fluid in the reservoir is transferred to the pressure chamber.

4,995,381

MALE THERAPEUTIC DEVICE

Joel L. Marmar, Cherry Hill, N.J., and Brian R. Henderson, Coopersburg, Pa., assignors to Performance Plus, Inc., Berlin, N.J.

Filed Oct. 2, 1989, Ser. No. 415,823
Int. Cl.[5] A61F *5/41*
U.S. Cl. 128—79 10 Claims



1. A therapeutic device for assisting in the maintenance of an erection in the male penis comprising a continuous ring of elastic material having a substantially circular inner diameter and a circular cross-section adaptable to be placed about and snugly engage the base end of a penis with sufficient radial compressive force applied thereto during a penile erection to restrict outward venial flow of blood from the penis without complete occlusion of arterial blood flow, said elastic material consisting essentially of a very soft solid elastomeric material having a durometer hardness (Shore A) of between about 7 and 28 which is highly extensible, exhibits a very low modulus and will relax sufficiently after a period of use without conscious effort of a user to reduce the radial compressive force imposed thereby.

4,995,382

WOUND DRESSING, MANUFACTURE AND USE

Stephen M. Lang, Saffron Walden, and David F. Webster, Bishops Stortford, both of United Kingdom, assignors to Smith and Nephew Associated Companies Limited, United Kingdom

Continuation of Ser. No. 946,362, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 812,963, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 522,415, Aug. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 516,119, Jul. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 506,501, Jun. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 396,754, Jul. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 396,732, Jul. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 345,550, Feb. 3, 1982, abandoned, which is a continuation-in-part of Ser. No. 345,488, Feb. 3, 1982, abandoned. This application Apr. 28, 1989, Ser. No. 345,099
Claims priority, application United Kingdom, Feb. 13, 1981, 8104568; May 22, 1981, 8115742; Feb. 12, 1982, 8204132; Feb. 12, 1982, 8204133; Jun. 22, 1982, 8218088; Jul. 21, 1982, 8221112; Aug. 12, 1982, 8223254
Int. Cl.[5] A61L *15/00*
U.S. Cl. 128—156 10 Claims

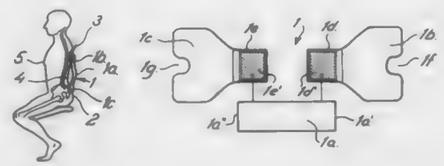
1. A wound dressing which consists essentially of a low adherency wound facing layer, an absorbent layer and an outer layer, wherein said low adherency wound facing layer has a wound contacting, first adhesive coating over its wound facing surface, said low adherency wound facing layer comprises a conformable apertured film, a conformable net of elastomer or an adhesive layer pattern spread in a conformable net-like configuration, the absorbent layer comprises a conformable hydrophilic foam and the outer layer is a continuous or discontinuous moisture vapour transmitting conformable backing layer which has a layer of a second adhesive on one surface thereof, at least one of said backing layer and said second adhesive layer being continuous to provide a barrier to bacteria and to liquid water.

4,995,383

CORRECTIVE POSTURE DEVICE

Roland Andersson, Hantverkargatan 4, 722 12 Västerås, Sweden

Filed Aug. 26, 1988, Ser. No. 236,931
Claims priority, application Sweden, Aug. 27, 1987, 8703313
Int. Cl.[5] A61F *13/00, 15/00*
U.S. Cl. 128—157 2 Claims



1. A corrective posture device attachable to a person's body for indicating to a person wearing the device when that person has an undesirable back posture, said device being large enough to extend between the lumbar region of the back and the region of the lower or intermediate thoracic vertebrae comprising:

means for providing discomfort to a person wearing said device when the person has an undesirable back posture, said means comprising body attachment means for attaching said device to the person at two spaced-apart locations and adjustment means having a length sufficient to extend at least half the distance of a person's spine for adjusting a distance said device can be extended without providing discomfort to the person wearing the device, said attachment means including adhesive adhering said device to skin of the person's body at said two locations, the adhesive providing the discomfort by pulling on the person's skin when the adjusting means is extended, said adjustment means comprising an elongated flat strap and said attachment means comprising a pair of flat elements, one side of said elements being coated with said adhesive for securing said elements to the skin of a person wearing the device, each of said elements having fastening means on only a portion thereof for releasably holding a respective end of said strap, at least one of said elements including a cut-out in a portion thereof at which said fastening means is not located, said cut-out comprising a recess extending inwardly from an edge of said one element.

4,995,384

NECK SUPPORT FOR NASAL CANNULA

James L. Keeling, 5939 S. Newland St., Littleton, Colo. 80123

Filed Oct. 30, 1989, Ser. No. 429,071
Int. Cl.[5] A61M *15/08*
U.S. Cl. 128—207.18 2 Claims



1. In a nasal cannula assembly having a nasal cannula and having a pair of supply tubes connected to the nasal cannula and placed over and around a patient's ears and connected below the patient's chin to a main supply conduit, a neck support comprising:

a support bracket including a central opening therethrough for engaging the main supply conduit of the nasal cannula assembly and an access slot portion therethrough for providing access for the main supply conduit into the central opening;

neck securing means attached to said support bracket for placement loosely around the patient's neck said neck securing means comprising an endless loop of flexible chain that is placed across the access slot of said support bracket to prevent movement of the main supply conduit out of the central opening; and

said support bracket includes chain mounting openings through said support bracket located on either side of said central opening for attaching said flexible chain to said support bracket;

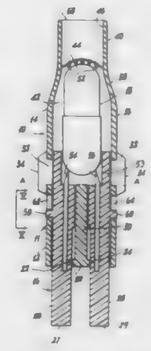
whereby the weight of the nasal cannula assembly and said support bracket are supported largely by said neck securing means.

4,995,385

INHALER WITH REGULAR COMPLETE EMPTYING OF THE CAPSULE

Luigi Valentini, and Giancarlo Ceschel, both of Milan, Italy, assignors to Phidea S.P.A., Milan, Italy

Filed Feb. 23, 1990, Ser. No. 483,744
Claims priority, application Italy, Feb. 23, 1989, 19539 A/89
Int. Cl.[5] A61M *15/08*
U.S. Cl. 128—203.21 7 Claims



1. An inhaler for administering medicaments in finely divided form contained in capsules, comprising:

a body enclosing a nebulization chamber, said nebulization chamber having a circular cross-section and being sufficiently large to enable the capsule to move during inhalation, said nebulization chamber further including:

(i) a plurality of air discharge apertures disposed at one end of said chamber whereby the air laden with said finely divided medicament may be drawn out of said chamber; and

(ii) a plurality of air inlet apertures provided near the end of the chamber opposite to said air discharge apertures, said inlet apertures allowing said chamber to communicate with the outside and said air inlet apertures being formed in such a manner as to generate within the chamber during inhalation a swirling air flow which passes through said air discharge apertures; and

(b) a piercing device which is movable within said body for the purpose of piercing the capsule at one end;

wherein the end surface of said nebulization chamber near said air discharge apertures is shaped such that when the capsule rests on said end surface during inhalation, said capsule does not substantially prevent air passage through any of the air discharge apertures, said nebulization chamber being tapered towards the end surface of said chamber which includes said air discharge apertures.

4,995,386

NEONSTAL MUCUS EXTRACTOR

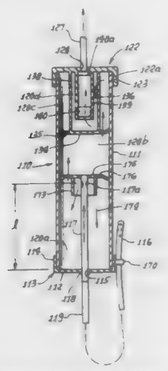
Raymond C. Ng, 1737 Oak Grove Ave., San Marino, Calif. [redacted]

Continuation-in-part of Ser. No. 273,022, Nov. 18, 1988, Pat. No. 4,947,841. This application May 30, 1989, Ser. No. 358,566
Int. Cl.[5] A62B *7/00*
U.S. Cl. 128—205.19 21 Claims

1. In a suctioning device for use in removal of fluid mucus from the trachea and nostrils of a newborn infant, to prevent aspiration of such fluid into the infant's lungs before first breath, the combination comprising:

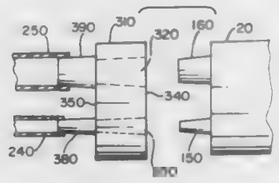
(a) a vertically, longitudinally, upright container having a bottom wall with an opening therein to pass mucus into the container via a tubular catheter, and a top cap with an opening therein to pass suction air from the container interior toward a suction mouthpiece,

(b) a baffle means in the container to intercept upward flow of mucus toward the top cap,
(c) a duct in the container to receive flow of mucus via the opening in the bottom wall, the duct having an outlet end located to eject mucus to fall in a generally downward direction in the container,
(d) and a filter above the baffle, to filter air being sucked from the container interior toward the mouthpiece via the



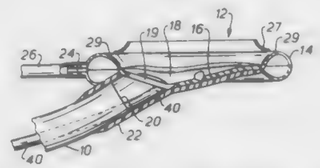
top cap opening and wherein the filter and one part of the baffle means are carried by the top cap for endwise insertion downwardly into the upper extent of the container, which is tubular, and wherein there is a bottom cap on the container and which defines said bottom wall, the duct and another part of the baffle means are carried by the bottom cap for endwise insertion upwardly into the lower extent of the container.

4,995,387
DUAL-PURPOSE CATHETER
Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903
Continuation of Ser. No. 871,789, Jun. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 577,986, Jul. 8, 1984, abandoned. This application Nov. 14, 1988, Ser. No. 270,057
Int. Cl.[5] A62B *9/02*
U.S. Cl. 128—205.24 **20 Claims**



1. A dual purpose catheter assembly comprising
a first flexible tube,
a second flexible tube,
one of said tubes being used to supply oxygen to a patient and the other of said tubes being used to apply suction to a patient,
each of said tubes having a patient end and a second end, both said second ends being adapted to be connected to valve means for controlling the alternate providing of oxygen and suction to a patient, and
a rigid unitary coupling member adapted to couple said first and second tubes to valve means for supplying oxygen and suction, said coupling member being secured to said second end of each of said first and second flexible tubes to form a unitary assembly of said coupling member and said first and second flexible tubes,
said coupling member, carrying said first and second flexible tubes, being adapted to be coupled to valve means for providing oxygen and suction,
said rigid coupling member and said first and second ends of said first and second tubes having such configuration that they can be coupled together in only one orientation which, when said rigid coupling member is coupled to valve means for supplying oxygen and suction, insures the correct coupling of oxygen and suction to a patient.

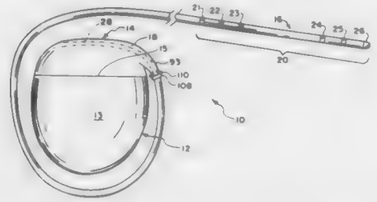
4,995,388
ARTIFICIAL AIRWAY DEVICE
Archibald I. Brain, 10 Preston Drive, Wanstead, London E11, England
Filed Mar. 22, 1990, Ser. No. 512,791
Claims priority, application United Kingdom, Mar. 22, 1989, 8906570
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—207.15 **13 Claims**



1. An artificial airway device to facilitate lung ventilation in an unconscious patient, comprising an airway tube and a mask carried at one end of the airway tube, the mask having a flexible annular peripheral formation of roughly elliptical shape capable of conforming to and of readily fitting within the actual and potential space behind the larynx so as to form a seal around the circumference of the laryngeal inlet without the device penetrating into the interior of the larynx, the annular peripheral formation surrounding a hollow interior space or lumen of the mask into which the airway tube opens, and carrying a soft flexible upstanding collar surrounding the lumen of the mask, wherein the artificial airway device further comprises a drainage tube having one end region arranged for insertion with the mask and the other end capable of being positioned below the patient for extracting fluid from the area of the mask by syphonic action, or of being connected to suction apparatus for extracting such fluid by suction.

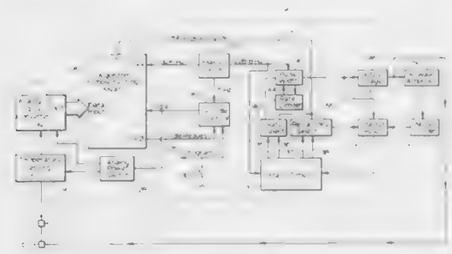
4,995,389
MULTIELECTRODE QUICK CONNECT CARDIAC PACING LEAD CONNECTOR ASSEMBLY
Donald L. Harris, Key Largo, Fla., assignor to Telectronics Pacing Systems, Inc., Suffield, Conn.
Filed Dec. 16, 1985, Ser. No. 809,665
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 P **24 Claims**

1. A cardiac pacing system including:
a multiconductor, multielectrode pacing lead having a distal end and a proximal end, and
a cardiac pacer comprising a metal case with a plurality of insulated conductor feedthroughs in a top side thereof and a neck mounted to said top side of said metal case, said neck being made of a soft pliable material, flexible means within said neck material for connecting each insulated conductor feedthrough to a specific electrode of a multielectrode pacing lead, said flexible connecting means comprising a plurality of U-shaped electrical contacts, each having a bight and two upstanding legs for contacting ring contacts at the proximal end of the pacing lead, said neck having a lumen with a closed proximal end and an open distal end which receives said multiconductor pacing lead, said upstanding legs of each U-shaped electrical contact straddling the lumen in position to flexibly



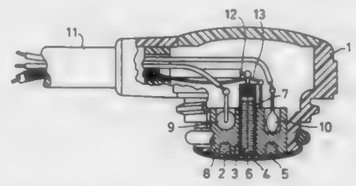
engage and grip a respective ring contact on the pacing lead, and said neck having a slit on its top side extending along the length of the neck and inwardly to a position above said lumen and between upper ends of said two upstanding legs of each U-shaped contact.

4,995,390
EXERCISE RESPONSIVE CARDIAC PACEMAKER
William A. Cook, Bloomington; Neal E. Fearnot, West Lafayette, and Leslie A. Geddes, W. Lafayette, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.
Continuation of Ser. No. 915,887, Oct. 2, 1986, Pat. No. 4,726,383, which is a continuation of Ser. No. 781,945, Sep. 30, 1985, abandoned, which is a continuation of Ser. No. 542,590, Oct. 17, 1983, Pat. No. 4,543,954, which is a continuation-in-part of Ser. No. 379,667, May 19, 1982, Pat. No. 4,436,092. This application Feb. 22, 1988, Ser. No. 158,402
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 PG **15 Claims**



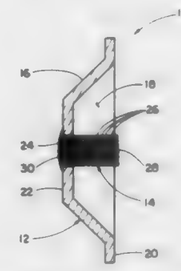
1. A rate-responsive cardiac therapy device, comprising:
a reference-temperature memory;
a current-temperature sensor;
a cardiac rate control signal generator having one input coupled to said reference-temperature memory and another input coupled to said current-temperature sensor;
a cardiac pulse generator having an input coupled to said cardiac rate control signal generator;
a differentiator having an input coupled to said current-temperature sensor and an output coupled to said cardiac rate control signal generator; and
a base-heart-rate memory having an output coupled to said cardiac rate control signal generator;
wherein said cardiac rate control signal generator includes means responsive to said base-heart-rate memory for determining a first rate control factor;
means responsive to said reference-temperature memory and said current-temperature sensor for determining a second rate control factor proportional to the difference between current temperature and reference temperature;
means coupled to said differentiator for determining the sign of the derivative and for determining a third rate control factor therefrom; and
means for adding said first, second and third factors to form a cardiac rate control signal.

4,995,391
ELECTRODE DEVICE
Ole J. Jensen, Soborg, and Steen G. Melberg, Bagsvaerd, both of Denmark, assignors to Radiometer A/S, Denmark
Continuation of Ser. No. 727,191, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 451,141, Nov. 22, 1982, abandoned. This application Jan. 24, 1986, Ser. No. 821,872
Claims priority, application Denmark, Mar. 20, 1981, 1252/81
Int. Cl.[5] A61B *5/14*
U.S. Cl. 128—635 **14 Claims**



1. An electrode device for determining the partial pressure of CO_2 and comprising an electrode housing, a CO_2-permeable membrane, a pH-sensitive measuring electrode arranged behind the membrane and having a measuring area which is in contact with a bicarbonate-containing exterior electrolyte which is present between the measuring area and the membrane and having an interior electrolyte and an interior reference electrode, and an exterior reference electrode in contact with the exterior electrolyte, the interior electrolyte being so adapted to the exterior electrolyte that the potential difference measured over the exterior reference electrode and the interior reference electrode at in vivo CO_2 partial pressure is substantially temperature-independent with a temperature dependence corresponding to a temperature dependence for the CO_2 partial pressure determination in the range $-1\%/°$ C. $-+1\%/°$ C.

4,995,392
SELF-PREPARING ELECTRODE WITH REMOVABLE PLASTIC ABRADING BRUSH
Gary W. Sherwin, South Huntington Township, Westmoreland County; Edward E. Kovach, Penn Hills, and Albert L. Schmidt, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 29, 1988, Ser. No. 290,390
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—639 **9 Claims**



1. A self-preparing electrode for sensing the electrical potential of a person's skin, comprising:
(a) a conductive disk having a first side, a second side and a

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central aperture with said first side adapted to face the person's skin; and

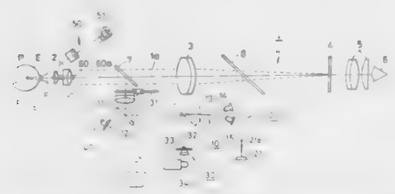
(b) a nonconductive multi-strand abrading brush frictionally mounted within said aperture in said disk and removable from said second side of said disk.

4,995,393

ALIGNMENT APPARATUS OF NONCONTACT TYPE TONOMETER

Kenjiro Katsuragi, and Kouji Nishio, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Japan

Filed Apr. 6, 1989, Ser. No. 333,949
Claims priority, application Japan, Apr. 8, 1988, 63-86588
Int. Cl.[5] A61B *3/16*
U.S. Cl. 128—648 **7 Claims**



1. An alignment apparatus of a noncontact type tonometer, comprising:

a target projecting system for forming first and second target images on an eye, said target projecting system including a half mirror,

first and second light emitting sources for emitting light which impinges on said eye and respectively form said first and second target images, and

said first and second light emitting sources being oriented such that light emitted from both said first and second light emitting sources is reflected by said half mirror before impinging on said eye;

a fluid discharging nozzle for discharging a fluid along an axial line, the light emitted from both said first and second light emitting sources being directed along the axial line;

a light receiving sensor for providing a position signal representative of the position of light projected thereon;

an alignment light receiving optical system operatively coupled for receiving the first and second target images along the axial line of the nozzle and forming respective images of the first and second target images on said light receiving sensor; and

a control unit operatively coupled to receive said position signal and responsively determine the positions of the respective images of the first and second target images formed on said light receiving sensor, said control unit outputting an alignment completion signal when such determined positions are within a preset range on said light receiving sensor.

4,995,394

FAST NMR CARDIAC PROFILE IMAGING

Harvey E. Cline, and Christopher J. Hardy, both of Schenectady,, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,315
Int. Cl.[5] A61B *5/05*
U.S. Cl. 128—653 A **14 Claims**

1. A method for providing a nuclear-magnetic-resonance (NMR) image of movement of a selected portion of a sample, relative to a predetermined center location at the origin of a set of axes defining an imaging volume, comprising the steps of:

(a) immersing the sample in a static magnetic field formed in the imaging volume;

(b) exciting spin magnetization of nuclei in a region of the sample defined by a relatively narrow elongated probe beam;

(c) moving the probe beam to extend through the selected sample portion;

(d) acquiring a NMR response signal from the excited region, in the presence of a readout magnetic field gradient oriented along the probe beam and with a magnitude establishing the location of the selected portion therealong; and

(e) displaying said acquired NMR response signal as a profile of the sample along the beam versus time.

4,995,395

METHOD AND APPARATUS FOR LOCATION FINDING OF ELECTRODES PLACED ONTO THE BODY, PARTICULARLY TO THE HEAD

Risto Ilmoniemi, and Seppo Ahlfors, both of Espoo, Finland, assignors to Neuromag OY, Espoo, Finland

Filed Aug. 30, 1989, Ser. No. 400,786
Claims priority, application Finland, Sep. 12, 1988, 884187
Int. Cl.[5] A61B *5/04;* **G01R** *33/02*
U.S. Cl. 128—653 R **9 Claims**



6. An apparatus for finding locations of electrodes attached to a head, comprising:

a plurality of electrodes;

at least one first coil attached to each electrode, said at least one first coils attached to the electrodes forming a first coil group to be localized;

a plurality of second coils adapted to be arranged in a vicinity of the electrodes so that a position of said second coils is uniquely known, said second coils forming a fixed second coil group;

current means for generating a magnetic field with either said first coil group or said second coil group, whereby said coil group not generating the magnetic field is used for detecting the induced magnetic field;

measuring means electronically connected to said coil group detecting the induced magnetic field, for detecting a signal representing the induced magnetic field; and

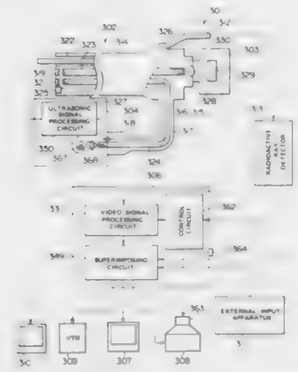
data processing means , connected to said measuring means, for processing said signal to determine the position of the electrodes.

4,995,396

RADIOACTIVE RAY DETECTING ENDOSCOPE

Makoto Inaba; Masaaki Hayashi, both of Hachioji; Toshihiko Hashiguchi, Sagamihara; Hiroki Hibino, Hachioji; Hiroyuki Sasa, Tokyo, all of Japan; David E. Barlow, Hicksville, N.Y.; Yutaka Ohshima, Hachioji, Japan; Kohichiro Ishihara, Hachioji, Japan; Yutaka Yanagawa, Hachioji, Japan; Motoyuki Tagawa, Hachioji, Japan; Shuichi Takayama, Hachioji, Japan; Takashi Tsukaya, Hachioji, Japan; Frank Klosterman, Hicksville, and Jack Goodman, Huntington, both of N.Y., assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,426
Int. Cl.[5] A61B *1/00, 1/06*
U.S. Cl. 128—654 **25 Claims**



1. A radioactive ray detecting endoscope comprising:

an elongated insertable part having a tip part and a rear end;

ultrasonic imaging means provided in the tip part of said insertable part and having a transmitting means for transmitting ultrasonic waves toward an observed part and receiving means for receiving echoes, from the observed part, of the ultrasonic waves emitted from said transmitting means, said ultrasonic imaging means for outputting a signal which forms an ultrasonic image of said observed part; and

a radioactive ray detecting means arranged in the tip part of said insertable part for detecting radioactive rays.

4,995,397

PULSE DOPPLER FLOW SPEED METER

Hisashi Nishiyama; Kageyoshi Katakura, and Toshio Ogawa, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,060
Claims priority, application Japan, Sep. 30, 1988, 63-244164; Nov. 16, 1988, 63-287673
Int. Cl.[5] A61B *12/08*
U.S. Cl. 128—661.09 **9 Claims**

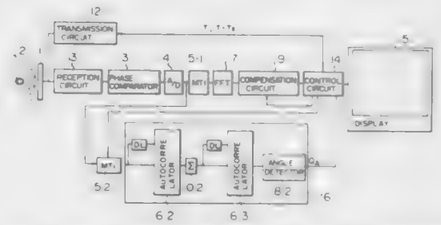
1. A pulse Doppler flow speed meter comprising:

transmission/reception means for transmitting repetitively to an object ultrasonic pulses in the form of pulsed continuous waves at first transmission intervals T during a first term but at second transmission intervals (T + Ts) during a second term following the first term and detecting reflected waves from the object which results from reflection of individual pulses;

phase detection means for detecting phases of the reflected waves;

filtering means for eliminating signals representative of stationary objects from phase signals sequentially produced from said phase detection means;

first Doppler shift angle calculating means for determining either distributions between phase shifts of phase signals delivered out of said filtering means which correspond to at least one of a first group of phase signals transmitted at first transmission intervals T and a second group of phase signals transmitted at second transmission intervals (T + Ts) or representative values of the distributions;



second Doppler shift angle calculating means for determining a first value of center of gravity of phase differences between the phase signals of said first group and a second value of center of gravity of phase differences between the phase signals of said second group and for determining a phase difference between said first and second values of center of gravity; and

compensation means responsive to an output signal of said second Doppler shift angle calculating means to compensate output signals of said first Doppler shift angle calculating means for their aliasing and for delivering compensated values indicative of either speed distributions of said object or representative values of the speed distributions.

4,995,398

CORONARY ANGIOGRAPHY IMAGING SYSTEM

Patrick A. Turnidge, 5334 Quail St. NE., Salem, Oreg. 97305

Filed Apr. 30, 1990, Ser. No. 516,763
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—668 **31 Claims**

1. A method of thermal coronary angiography for assessing graft patency, coronary anatomy and perfusion fields in coronary by-pass surgery, which comprises:

(a) positioning a thermal camera between 70° to 90° perpendicular to the exposed surface of the heart;

(b) positioning the thermal camera a distance between 0.8 meters to 1.2 meters from the exposed surface of the heart;

(c) setting the thermal camera to the expected temperatures such that expected temperatures are near one of the two ends of the scale;

(d) injecting cold crystalloid cardioplegia into a proximal vein graft; and

(e) recording and displaying images on a monitor in real time.

4,995,399

BLOOD PRESSURE MEASURING SYSTEM

Ressei Hayashi, Tokyo, and Tokuji Hayakawa, Komaki, both of Japan, assignors to Colin Electronics Co., Ltd., Japan

Filed Jul. 21, 1989, Ser. No. 382,991
Claims priority, application Japan, Jul. 26, 1988, 63-98601[U]
Int. Cl.[5] A61B *5/02, 5/0205*
U.S. Cl. 128—680 **14 Claims**

1. A blood pressure measuring system for continuously measuring blood pressure values of a subject, comprising

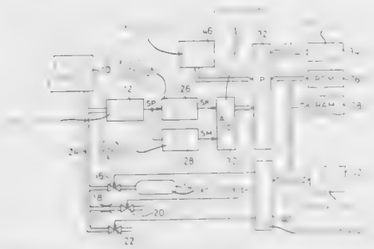
measuring means for repetitively measuring a blood pressure value of the subject;

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display means for indicating a time-wise trend of the measured blood pressure values;

memory means for storing a plurality of sets of data representing a plurality of predetermined time-wise trends of blood pressure, respectively;

designating means for designating one of said plurality of sets of data such that the designated one set of data corresponds to a value of at least one parameter of the subject; and



control means for commanding said display means to indicate, according to the designated one set of data, a corresponding one of said plurality of predetermined time-wise trends of blood pressure, together with the time-wise trend of said measured blood pressure values.

4,995,400

PNEUMOTACH AND COMPONENTS THEREFOR

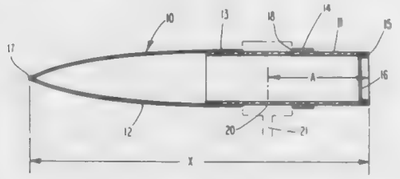
John R. Boehringer; Jay B. Nelson, both of Wynnewood, and John Karpowicz, Havertown, all of Pa., assignors to Boehringer Laboratories, Wynnewood, Pa.

Continuation of Ser. No. 412,227, Aug. 27, 1982, Pat. No. 4,807,641. This application Jan. 27, 1989, Ser. No. 303,493

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] A61B *5/08*

U.S. Cl. 128—725 **4 Claims**



1. A pneumotach flow tube with a mouthpiece end and an opposite end, with at least said mouthpiece end being of generally cylindrical construction, said opposite end being at least substantially closed against the passage of exhaled air therethrough, said flow tube having a substantially non-porous mouthpiece portion and a substantially porous portion between the non-porous portion and the closed end, a transverse pressure tap opening through the cylindrical wall of said substantially non-porous portion, said opposite end and said pressure tap opening each being located so spaced from the mouthpiece end and the porosity of the porous flow tube portion being so sized, to be sufficient to produce substantially laminar flow in the tube and to permit substantially linear flow pressure measurements through the tap opening at the location of said pressure tap opening.

4,995,401

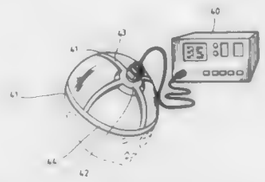
DEVICE FOR MEASURING ANTERIOR FONTANELLE PRESSURE

Leonid Bunegin, and Maurice S. Albin, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Feb. 26, 1988, Ser. No. 160,870

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—748 **25 Claims**



1. A pressure sensing device comprising:

rigid housing having a base end and an end opposite said base end, said base end defining an opening adapted for engaging a cranium of an infant circumferential to the anterior fontanelle and said opposite end defining an aperture adapted to receive means for sensing pressure.

4,995,402

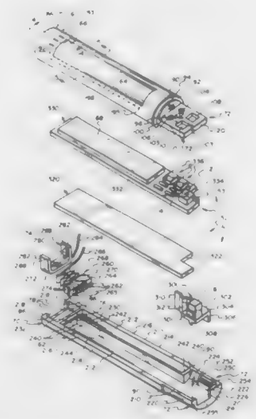
MEDICAL DROPLET WHOLE BLOOD AND LIKE MONITORING

Roger E. Smith, Bountiful; Mark E. Astill, Centerville; Jay L. Smith, Ogden, and Gale H. Thorne, Bountiful, all of Utah, assignors to Thorne, Smith, Astill Technologies, Inc., Ogden, Utah

Filed Oct. 12, 1988, Ser. No. 256,678

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—771 **38 Claims**



1. Whole blood analyte sensor structure comprising:

packet means comprising a plurality of disposable analyte sensor means for respective sequential use in testing of samples of whole blood for a predetermined analyte, the packet means comprising means by which the sensor means are contemporaneously loaded into an analyte instrument and means by which sensor means are sequentially disassociated from the packet means and discarded after use;

each sensor means comprising testing means responsive to said predetermined whole blood analyte upon delivery of the whole blood to the testing means and means by which said response is measured.

4,995,403

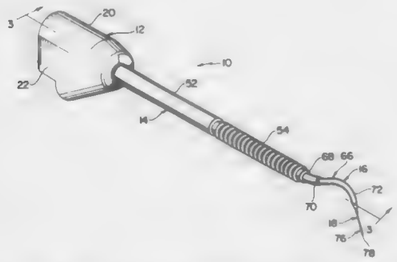
PERIODONTAL PROBE

Ralph A. Beckman; Henry D. Sharpe, III, both of Providence; Len Curado, East Greenwich, and James W. Barfoot, Providence, all of R.I., assignors to Bausch & Lomb Professional Dental Products, Inc., Tucker, Ga.

Filed Feb. 24, 1989, Ser. No. 315,131

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—776 **17 Claims**



1. A periodontal probe comprising sequentially disposed, connected sensor, shaft and tip portions, and an elongated flexible fiber element extending longitudinally through said tip portion and at least a portion of said shaft portion, said tip portion terminating in a terminal end, said fiber element having distal and proximal ends and being assembled in said tip portion and said shaft portion so that it normally projects beyond the terminal end of said tip portion terminating in said distal end, said fiber element being supported in said tip portion and said shaft portion so that it is longitudinally slidable therein along a predetermined path of movement, said tip portion and said shaft portion being integrally and permanently connected, the combined length of said tip portion and said shaft portion being at least approximately 4½ inches, said sensor portion communicating with the proximal end of said fiber element for sensing relative longitudinal movement between said fiber element and said tip portion, said shaft portion being detachable from said sensor portion to permit replacement of said shaft portion, said tip portion and said fiber element.

4,995,404

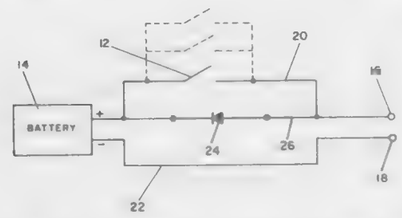
APPARATUS FOR TREATING BRUXISM

David C. Nemir, 1221 Baltimore Dr., El Paso, Tex. 79902

Filed Aug. 25, 1988, Ser. No. 236,455

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—777 **33 Claims**



1. An aversive conditioning apparatus completely fittable into a user's mouth for treating both diurnal and nocturnal bruxism, said apparatus comprising:

a mouth guard housing comprising biting surfaces against which the user's teeth are positionable;

switch means communicating with said biting surfaces, said switch means being responsive to the user's biting said biting surfaces with force above a predetermined threshold amount, and to the cessation of the user's biting;

shock delivering electrode means communicating to a preselected portion of the user's mouth for delivering electric shock thereto, said electric shock being sufficient to consciously shock and alert the user when the user bites said biting surfaces with force above said predetermined threshold amount; and

means responsive to said switch means and operably connected to said shock delivering electrode means for providing electric current to said shock delivering electrode means only when said switch means is bitten with force above said predetermined threshold amount by user and for stopping said electric current to said shock delivering electrode means when the user ceases biting.

4,995,405

PROCESS AND APPARATUS FOR PRODUCING AROMATIZED STRAND-SHAPED SMOKING MATERIAL

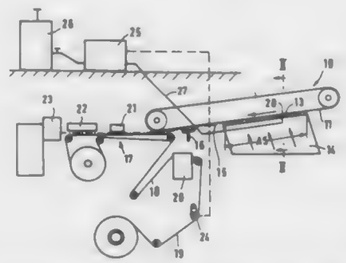
K. Dieter Lettau, Konz, Fed. Rep. of Germany, assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 27, 1989, Ser. No. 372,413

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821677

Int. Cl.[5] A24B *3/12, 9/00*

U.S. Cl. 131—84.1 **3 Claims**



1. A process for producing aromatized strand-shaped smoking material in a strand machine comprising feeding tobacco for the formation of a tobacco layer (15) of increasing thickness via a settling path (AS) to a conveyer (10) and subsequently forming the tobacco layer into a strand, providing it with a wrapping (18) and dividing it into longitudinal sections, a liquid containing an aromatic substance being added to the tobacco during its transport, characterized in that while the tobacco accumulates at the conveyer (10), the liquid is inserted into a region which, upon termination of the tobacco accumulation, corresponds to the center of the thickness of the tobacco layer (15) onto which additional tobacco is deposited thereon, and characterized in that the liquid is applied in an airless jet.

4,995,406

APPARATUS AND METHOD FOR OPENING A REEL OF PAPER STRIPPING

Domingos da Silva, Cortaillod, Switzerland, assignor to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Feb. 27, 1989, Ser. No. 316,224

Claims priority, application Switzerland, Feb. 25, 1988, 711/88

Int. Cl.[5] A24C *5/00, 5/14*

U.S. Cl. 131—105 **12 Claims**

1. Apparatus for opening a closed reel of a strip wound in successive turns, comprising:

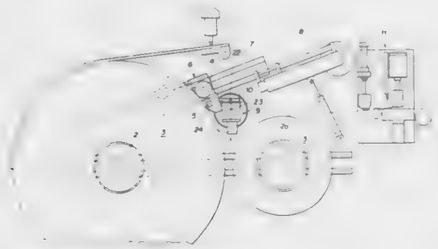
means for supporting the reel for rotation about a fixed axis at a predetermined location,

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a roller for driving the reel having an axis parallel to the axis of the reel,

a knife assembly having a straight knife edge parallel to the axis of the reel, and movable to cut a plurality of turns of said strip, thus forming scraps and a leading edge of said strip,

a movable carriage bearing said roller and said knife assembly,



a fixed slide bearing said carriage,

suction and exhaust means, having a movable inlet able to be placed in proximity to said roller, and arranged for sucking in through said inlet the scraps cut from said strip by said knife, and for straightening the leading end of said strip, and

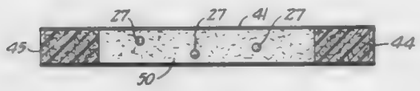
a movable holding member for fixing said straightened leading end of said strip.

4,995,407

NON-COMBUSTIBLE ARTIFICIAL CIGARETTE

Nicolas Kossiakoff, Chambourcy, and Daniel Augis, Nanterre, both of France, assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Jul. 25, 1989, Ser. No. 384,727
Int. Cl.[5] A24D *3/00*; A24F *47/00*
U.S. Cl. 131—359 **17 Claims**



1. A non-combustible artificial cigarette comprising a tube resembling a cigarette closed at both ends by porous plugs and confining a quantity of a vapor emitting tobacco-free material where said material includes at least one or more stress reactivity-reducing substances selected from the group consisting of nutmeg oil, mace extract, neroli oil, valerian oil, myristicin, elemicin, and isoelemicin, said quantity being chosen sufficient to evolve during the act of oral inhalation through said tube physiologically effective amount of vapor which becomes entrained in the inhalant.

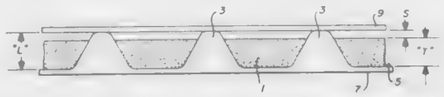
4,995,408

COSMETIC SAMPLE APPLICATOR AND METHOD OF CONSTRUCTION

Gunnar J. Wallschlaeger, Fort Lauderdale, Fla., assignor to Lip-Prints, Inc., Pompono Beach, Fla.

Filed May 15, 1989, Ser. No. 351,708
Int. Cl.[5] A45D *40/26*
U.S. Cl. 132—320 **15 Claims**

1. A cosmetic sampler comprising: a base support; a coating of cosmetic composition having a predetermined thickness disposed upon said base support; a detachable cover for covering said coating and a multiplicity of finger-like projections extending and penetrating through said coating in a direction substantially transverse to said base support and said cover, respectively, with the projections distributed throughout said coating and having a length greater than the thickness of said



coating, such that said cover is spaced apart from said coating by said projections.

4,995,409

AUTOMOTIVE PARTS WASHER UTILIZING A VOLATILE CLEANING SOLUTION

Craig L. Watts, 30 W. Clarkston Rd., Lake Orion, Mich. 48035

Filed Jan. 29, 1990, Ser. No. 471,472
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—58 R **11 Claims**



1. An apparatus for cleaning automotive parts, particularly transmission parts, comprising:

a small, portable cabinet including four side walls and a bottom adapted to contain a volatile cleaning solution;

a lid hingedly attached to one of said side walls and including a transparent central portion to permit viewing a part being cleaned inside said cabinet, said transparent portion being delineated by a seal for contacting the upper end of said side walls on the inside of said lid;

a closed system for recycling said cleaning solution including a three arm rotating spray device supported on the bottom of said cabinet adapted to provide a cleaning action to said part, each said arm including spray holes at the outer end thereof;

means for supporting the part to be cleaned;

a filter for said solution to pass through; and

means for circulating said cleaning solution through said rotating spray device.

4,995,410

OSTOMY CLEANING AND RECEPTACLE REPLACEMENT STATION

Richard L. Lash, P.O. Box 8, Montpelier, Id. 83254

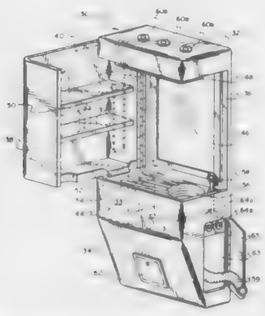
Filed Jan. 9, 1990, Ser. No. 462,644
Int. Cl.[5] B08B *3/02, 13/00*
U.S. Cl. 134—113 **21 Claims**

1. A station for use in storing, replacing and cleaning an ostomy bag and its associated equipment, comprising:

frame means;

support means mounted on said frame means adapted for securing said frame means against a wall, said support means being adapted to extend laterally, wherein said frame means may be displaced outwardly from said wall to a location above a disposal location;

a generally horizontal countertop mounted on said frame means adapted for a placement and retention of an ostomy bag thereon during cleaning of said ostomy bag, said countertop having a sink formed therein for draining liquid and waste materials from said ostomy bag and from said countertop; a mirror moujnted upright on said frame means;



a light source mounted to said frame means for illuminating said countertop, a user and said mirror; and

a drainage conduit, having a first end connected to said sink, said drainage conduit being adapted for carrying said waste materials and said liquid from said sink to said disposal location.

4,995,411

MASS SOLDERING SYSTEM PROVIDING AN IMPROVED FLUID BLAST

Charles R. Lowell, Concord, Mass., and Janet R. Sterritt, Hollis, N.H., assignors to Hollis Automation, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 254,712, Oct. 7, 1988, abandoned. This application May 11, 1989, Ser. No. 350,544
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—198 **1 Claim**



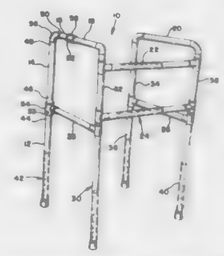
1. In a wash system for cleaning residual flux from a soldered printed circuit board having surface mounted circuit elements, conveyor means for moving said circuit board past a liquid nozzle for providing a high velocity sheet of liquid of substantially uniform velocity, density and volume extending in a predetermined direction and arranged to impact a circuit board to be treated by said sheet of liquid as said circuit board is moved past said nozzle, said nozzle comprising an outer tube having an elongated slot along one side thereof from which said sheet of fluid is emitted, an inner generally round tube mounted within said outer tube supplying high pressure fluid to said outer tube, said inner tube having an inlet at one end and being closed at the other end, a plurality of fluid vent holes in said inner tube communicating with said outer tube, said vent holes being spaced at least 90° around said inner tube from the position of the slot, the improvement wherein the outer tube is generally square and the elongated slot is along one edge thereof and the vent holes are all of substantially the same size and are positioned more closely together adjacent the inlet end of said inner tube than further along said inner tube.

4,995,412

COMBINATION WALKER/CANE/QUAD CANE

Doris D. Hirn, 5747 N. Sheridan, Chicago, Ill. 60660-4755; Joyce R. Boin, 1524 Ashland Ave., Park Ridge, Ill. 60068, and Susan L. Breakwell, 2240 W. Farwell, Chicago, Ill. 60645

Filed Sep. 7, 1989, Ser. No. 404,277
Int. Cl.[5] A61H *3/00*
U.S. Cl. 135—67 **9 Claims**



1. A walker-forming frame, part of which is convertible into a cane, for aiding the movement of an invalid or other infirm person, comprising:

(a) a right and a left rigid frame section, each of said sections having front and rear vertical leg-forming element means interconnected at their upper end portions by a horizontally extending element means forming a gripping bar for the walker, the front vertical element means of said sections being interconnected by horizontally extending element means and the rear vertical elements being unconnected to form an unobstructed opening into the space between said right and left frame sections, at least one of said vertical element means including a relatively short horizontal portion at the upper end portion thereof, which horizontal portion has a sufficient length to form a readily graspable handle and;

(b) junction means for removably securing said at least one vertical element means to the rest of the frame to form a cane when removed therefrom.

4,995,413

COKE DRUM INLET LINE ALIGNMENT DEVICE

Daniel L. Torres, Bellingham; Darryl C. Gullikson, Custer; M. Bruce Case, and Ralph A. Neher, both of Bellingham, all of Wash., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 15, 1989, Ser. No. 451,401
Int. Cl.[5] B65G *67/00*
U.S. Cl. 137—1 **14 Claims**

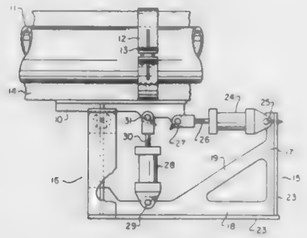
1. A method for moving a first line having a first end flange to a second line having a second end flange, wherein said first line is movable in mutually orthogonal x, y and z directions and said second line is substantially immovable, said method comprising:

actuating means for moving said first line in a first of said x, y and z directions so as to decrease distance between said first end flange and said second end flange in said first direction;

actuating means for moving said first line in a second of said x, y and z directions so as to decrease distance between said first end flange and said second end flange in said second direction; and

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actuating means for moving said first line in a third of said x, y and z directions so as to decrease distance between said



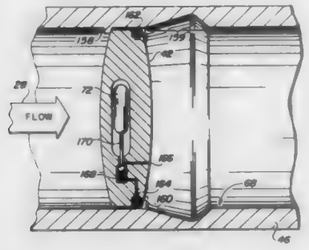
first end flange and said second end flange in said third direction.

4,995,414

BUTTERFLY VALVE METHOD AND APPARATUS

John N. Tervo, Scottsdale, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 6, 1990, Ser. No. 534,052
Int. Cl.[5] F16K *1/22*
U.S. Cl. 137—1 **4 Claims**



1. In a balanced-torque butterfly valve having a valve plate which is pivotally disposed in an elongate flow path defined by a duct, wherein the valve plate is pivotal from a first rotational position closing fluid communication along the path to a second rotational position maximally permitting fluid communication along the path, wherein the valve plate at the first rotational position separates a high-pressure, upstream region of the flow path from a lower-pressure, downstream region of the flow path, wherein the valve plate comprises a peripherally-disposed seal which cooperates with the duct to close fluid communication at the first rotational position, and wherein the seal at the first rotational position is subjected to peripherally outward pressure exerted thereon by pressurized fluid, a method for opening the valve comprising the steps of:

first, effecting a slight translational movement of the valve plate at the first position and in a direction substantially parallel to the plate, whereby the peripherally outward pressure exerted on the seal is decreased; and

second, rotating the valve plate away from the first position and toward the second position to open the valve.

4,995,415

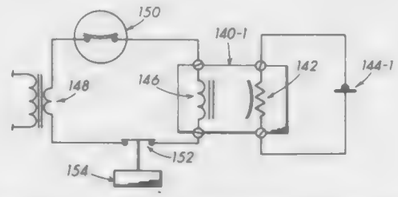
PARTIALLY FLOODED GAS APPLIANCE SAFETY SHUT-OFF METHOD AND APPARATUS

Harold J. Weber, 313 Washington St., Holliston, Mass. 01746

Filed Mar. 9, 1989, Ser. No. 320,998
Int. Cl.[5] F16K *17/36;* **F22B** *37/46*
U.S. Cl. 137—1 **20 Claims**

1. Safety method for gas burner apparatus having a pilot light means and a thermocouple means mounted at a level substantially above the level of gas flow path path produced by any main gas jet means whereby the main gas jet means is protected from improperly injecting gas into any surrounding environment when the burner apparatus is partially flooded by water through the steps of:

predetermining a critical level for any condition of water flooding where the water level is sufficient to interfere with the gas flow path produced by the main gas jet means



while the water level is substantially less than a level where it may extinguish the pilot light flame;

sensing the presence of any surrounding floodwater level when it has reached at least the predetermined critical level; and,

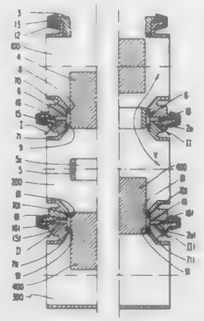
stopping any flow of gas to the main jet means when at least the critical level of floodwater has been sensed.

4,995,416

PROCESS FOR CONTROLLING THE MEDIUM INLET INTO AT LEAST ONE LEAKAGE CAVITY OF A VALVE AND AN APPARATUS FOR ITS PERFORMANCE

Hans O. Mieth, Sandkrug 3,, D-2058 Schnakenbek, Fed. Rep. of Germany

PCT No. PCT/EP89/00045, § 371 Date Aug. 31, 1989, § 102(e) Date Aug. 31, 1989, PCT Pub. No. WO89/06764, PCT Pub. Date Jul. 27, 1989
PCT Filed Jan. 17, 1989, Ser. No. 399,462
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801544
Int. Cl.[5] F16K *3/00, 11/065, 51/00*
U.S. Cl. 137—1 **16 Claims**



16. A method for controlling a valve comprising

a casing including a first end casing part, a middle casing part, and a second end casing part arranged in series, said casing defining an inner space;

first sealing means for providing a seal between said first end casing part and said middle casing part, and second sealing means for providing a seal between said middle casing part and said second end casing part, at least one of said first and second sealing means comprising two seals disposed in series;

at least one leakage cavity in the inner space of said casing, said cavity being connected with the environment of the valve between the two seals of one of said first and second sealing means;

closing means engageable with said first sealing means for placing said middle casing part out of communication with said first end casing part and simultaneously engageable with said second sealing means for placing said middle casing part out of communication with said second end casing part, said closing means comprising at least one closing member; and

shutter means selectively engageable with either one of said first and second sealing means for providing fluid communication between a selective adjacent pair of said casing parts, said shutter means comprising at least one shutter member having a through passage, said shutter member selectively engaging one of said first and second sealing means to thereby provide said fluid communication between one of said pairs of adjacent casing parts, and said closing means selectively engaging the other of said first and second sealing means to block fluid communication between the other of said pair of adjacent casing parts, said closing means and said shutter means comprising means for selectively isolating said leakage cavity from the remainder of the inner space of said casing;

said method comprising:

moving said closing member between a first position in engagement with said first sealing means and a second position out of engagement with sealing means; and

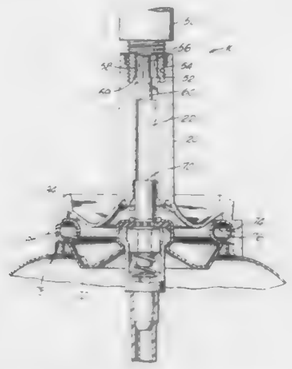
moving said shutter element into engagement with said first sealing means when said closing member is in said second position.

4,995,417

ONE-PIECE TIRE VALVE ADAPTOR

Virgil Naku, Hawthorne, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Apr. 2, 1990, Ser. No. 503,231
Int. Cl.[5] F16K *15/20*
U.S. Cl. 137—231 **30 Claims**



1. A one piece tire valve adaptor for connection to an aerosol container comprising;

a base including a means for attachment to a mounting cup; and

a hollow tube having a first end connected to said base, a second end comprising a spout for connection to a tire valve, and a flow passage extending from said first end to said second end;

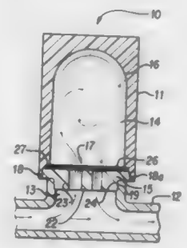
said spout including a sealing means comprising a circumferential inner wall for engaging a threaded portion of the tire valve, an annular lower wall attached essentially perpendicular to said inner wall for engaging the end of the tire valve and an opposing wall attached to said lower wall, essentially parallel to said inner wall, said opposing wall being at least partially transverse to said inner wall, for engaging the inner surface of the threaded portion of the tire valve.

4,995,418

FERTILIZER SPRINKLER APPARATUS

William F. Cervola, 6856 Espanita St., Long Beach, Calif. 90815

Filed Oct. 18, 1989, Ser. No. 423,226
Int. Cl.[5] B05B *7/14;* **B01D** *11/02*
U.S. Cl. 137—268 **1 Claim**



1. An apparatus for the doping of water with fertilizer comprising:

a fertilizer chamber having an inner surface and an outer surface,

said inner surface being substantially cylindrical,

said inner surface having an open end,

said inner surface meeting with said outer surface at said open end,

said inner surface having a threaded surface at said open end,

said threaded surface being removably engagable with a chamber cap,

said chamber cap defining two openings therethrough,

said chamber cap being cylindrical in shape and having a threaded edge,

said threaded edge threadably engaging with said threaded surface of said open end of said inner surface of said fertilizer chamber,

said chamber cap having a threaded cylindrical element protruding therefrom,

a water conduit,

said threaded cylindrical element of said chamber cap threadably engaging said water conduit, and

a noncorrosive screen juxtaposed between said chamber cap and said fertilizer chamber preventing the fertilizer contained within said fertilizer chamber from exiting from said openings;

wherein said threaded surface at said open end of said fertilizer chamber and said threaded edge of said chamber cap oppose the orientation of the threads of said threaded cylindrical element protruding from said chamber cap.

4,995,419

MIXING VALVE FOR SINGLE-LEVER FAUCET

Manfred Pawelzik, Soest, and Horst Titze, Hagen, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Jan. 22, 1990, Ser. No. 467,985
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903998
Int. Cl.[5] F16K *11/02*
U.S. Cl. 137—316 **4 Claims**

1. In a single-control mixing valve comprising:

a housing generally centered on an axis and having an open end;

a base plate closing the open end, formed with inlet and outlet passages, and formed around the passages with grooves;

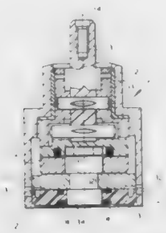
respective seals seated in the grooves;

a control plate formed with a crossflow cavity and displace-

VOL 1123 ISS 4 FEB 26 1991 UMI

able in the housing to interconnect the passages of the base plate; and

a lever pivoted on the control plate for displacing same, the improvement comprising



means including a plurality of outwardly directed barbs formed on an edge of the base plate and inwardly open axially elongated recesses receiving the barbs and formed on the housing for securing the base plate in the housing for only limited axial movement therein, and

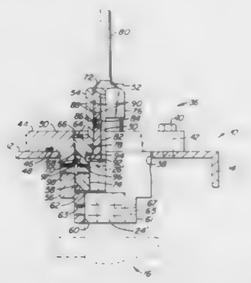
formations pinching the seals in the grooves.

4,995,420

GLOVE BOX VALVE SYSTEM

Rodney K. Wiggins, Danville, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 10, 1990, Ser. No. 565,526
Int. Cl.[5] F16K *31/46*
U.S. Cl. 137—360 7 Claims



1. A valve system for a hermetically-sealed container having walls and a valve within said container comprising:

a face plate means mounted over an opening in one of said walls, said face plate means having a body portion thereof projecting through said opening and adapted to restrain rotation of a valve body of said valve in said container;

a packing tightener means sealingly rotatable within said face plate means and adapted to be manipulated outside said container to impart rotation to a packing nut rotatably mounted on said valve body to thereby tighten packing in said valve; and,

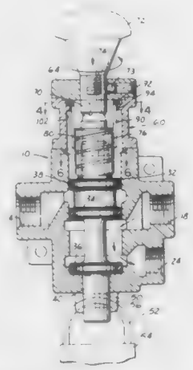
a valve stem turner means sealingly rotatable within said packing tightener means and adapted to be manipulated outside said container to impart rotation to a valve stem rotatably mounted in said valve to thereby control the opening and closing of said valve.

4,995,421

LOCK-OUT VALVE WITH CONTROLLED RESTART

Dennis L. Bonacorsi, Howell; Donald E. McGeachy, Milford, and Alan L. Smith, Livonia, all of Mich., assignors to Numatics, Incorporated, Highland, Mich.

Continuation-in-part of Ser. No. 405,964, Sep. 12, 1989, abandoned. This application Jan. 9, 1990, Ser. No. 462,591
Int. Cl.[5] F15B *13/04, 13/01*
U.S. Cl. 137—383 6 Claims



1. A fluid control valve comprising:

(a) a valve housing having a pressure port, an operational port and an exhaust port,

(b) a valve movable to connect a pressure port to said operational port in a first position and to connect said operational port to said exhaust port in a second position,

(c) manually operable means to shift said valve respectively to said two positions, and

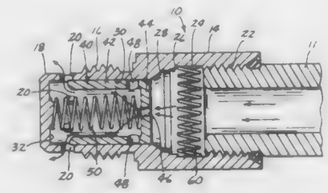
(d) means associated with said valve and said manually operable means to effect rapid axial movement of said valve from said first position to said second position and to restrict movement of said valve from said second position to said first position.

4,995,422

FLOW CONTROL VALVE

Timmy L. Chew, Council Bluffs, Iowa, and Glen Brand, Omaha, Nebr., assignors to Brand Hydraulics Co. Inc., Omaha, Nebr.

Filed Nov. 13, 1989, Ser. No. 434,191
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—504 10 Claims



1. A pressure compensated flow control valve for use in combination with a hydraulic fitting having female threads wherein the flow control valve comprises:

an elongated body member having an axial bore extending through said body member to a point near a closed end, said body member having a radially aligned port formed therein in the vicinity of said closed end and male threads formed upstream of said radially aligned port wherein said male threads will operatively engage the female threads on said hydraulic fitting;

a cylindrical spool including an open tubular skirting and an end plate having an orifice sized to allow flow of a fluid at a predetermined flow rate, said skirting being disposed in mating relationship with said axial bore with said end plate being directed away from said closed end, said spool being movable between a controlled flow position wherein the skirting extends over a portion of the radially aligned port and a reverse flow position wherein the radially aligned port is unobstructed;

means for biasing said spool away from said closed end; and

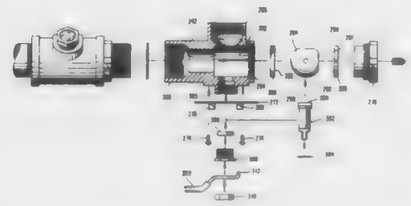
means for retaining said spool within the axial bore wherein said retaining means includes a stop attached to said body member and disposed to engage the end plate when said spool is in the reverse flow position and wherein said stop is a compression spring having opposite ends disposed to engage portions of an annular recess formed in said body member.

4,995,423

VALVE AND ARRANGEMENT FOR FIRE SUPPRESSION WATER SPRINKLER SYSTEM

George J. McHugh, Broomall, Pa., assignor to AGF Manufacturing, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 138,436, Dec. 28, 1987, Pat. No. 4,832,610, which is a continuation-in-part of Ser. No. 881,270, Jul. 2, 1986, Pat. No. 4,741,361, which is a continuation-in-part of Ser. No. 874,653, Jun. 16, 1986, abandoned. This application Mar. 8, 1989, Ser. No. 320,713
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—559 54 Claims



1. An arrangement for testing and draining a fire suppression water sprinkler system, comprising:

conduit means for supplying water to a plurality of sprinklers;

means for sensing a flow of water in said conduit means;

valve means provided downstream of said means for sensing and in communication with said conduit means, said valve means comprising

a housing defining an interior chamber having an inlet and an outlet, said inlet and outlet being generally perpendicular to one another,

a valve member provided within said interior chamber, the valve member having first, second and third ports arranged about a surface of the valve member, said valve member having a turning axis and said first, second and third ports including central axes which are generally perpendicular to one another, said first port having a size which is smaller than either of the second and third ports;

seat means for selectively sealingly receiving a surface of the valve member adjacent the outlet; and

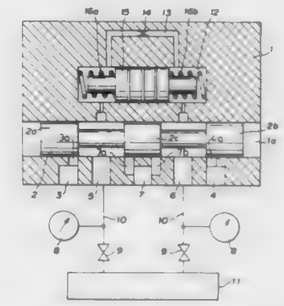
means for selectively moving said valve member within said interior chamber whereby communication between said inlet and outlet may be sequentially closed, opened to a first preselected flow rate and then opened to a second preselected flow rate, said second preselected flow rate being greater than the first preselected flow rate.

4,995,424

DIRECTIONAL CONTROL VALVE

Hidenobu Ako, Ogaki, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 326,884, Mar. 20, 1989, Pat. No. 4,913,191. This application Feb. 16, 1990, Ser. No. 480,844
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[5] F15B *13/04*
U.S. Cl. 137—596 2 Claims



1. A directional control valve comprising a valve body having a sleeve formed therein, a spool slidable in said sleeve, two output ports, a pump port and two tank ports formed in said valve body, said ports and said spool arranged so that said output ports can operate at an output pressure or an exhaust pressure by operation of said spool, the directional control valve further comprising:

(a) a communicating passage formed in said valve body connecting said output ports with each other to permit a flow of fluid between said output ports;

(b) a fixed orifice disposed in said communicating passage;

(c) a control passage arranged in parallel with said communicating passage, in communication with said output ports; and

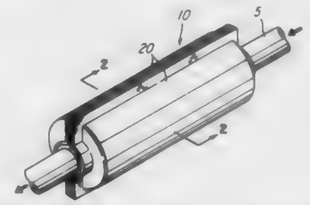
(d) a control spool disposed in said control passage, said control spool movable in response to a differential pressure between said output ports to block said communicating passage to provide a maximum output pressure.

4,995,425

MAGNETIC FLUID CONDITIONER

Gale M. Weisenberger, 140 Woodland Dr., Eaton, Ohio 45320, and John C. Moran, 3124 Lake Ave., Fort Wayne, Ind. 46805

Filed May 11, 1990, Ser. No. 522,091
Int. Cl.[5] F15C *1/04*
U.S. Cl. 137—827 7 Claims



1. A magnetic fluid conditioner for acting on a fluid being transmitted through a fluid transmitting conduit, said fluid conditioner comprising:

(a) a housing for externally abutting against a portion of said fluid conducting conduit, said housing having at least one elongated cavity therein to be substantially parallel with the longitudinal axis of said transmitting conduit;

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(b) an elongated permanent bar magnet within each cavity of said housing positioned to be substantially parallel with the longitudinal axis of said fluid transmitting conduit; and,

(c) a magnetic flux deflection shield within each cavity of said housing, each of said deflection shields being positioned between said permanent bar magnets and the outer wall of said cavities in said housing, each of said deflection shields being elongated with an arcuate transverse cross-section for deflecting a portion of the magnetic flux which would otherwise form flux paths outside of said magnetic fluid conditioner and deflecting said flux in the direction of said fluid transmitting conduit.

4,995,426

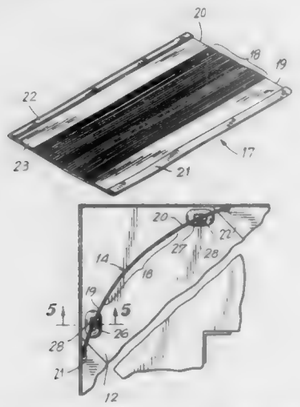
STOCK MATERIAL FOR FORMING AIR TURNING VANES AND AIR GUIDE DEVICES

Milton Hinden, Rte. #110, Farmingdale, N.Y. 11735

Filed Oct. 17, 1988, Ser. No. 258,493

Int. Cl.[5] F15D *1/04*; B32B *3/24*

U.S. Cl. 138—39 **7 Claims**



1. As a new article of manufacture, a coil of stock material for the fabrication of air turning vanes comprising, in combination, a coiled elongate band of sheet metal, the edge portions of said band being bent through an angle of 180° and flattened against a first surface of said band thereby to define double thickness margins of said band, said band including a central portion having longitudinally directed striations defining a weakened bend area, the transverse extend of said striated central portion being at least about one half of the transverse dimension of said band, said band including areas free of striations between said margins and said central portion.

4,995,427

PIPE SECTION, ESPECIALLY FOR ABRASIVE AND/OR CORROSIVE MATERIAL PIPELINES

Rütger Berchem, Essen, Fed. Rep. of Germany, assignor to Metalpraecis Berchem & Schaberg Gesellschaft für Metallformgebung mit beschraänkter Haftung, Gelsenkirchen, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 369,993

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3821985

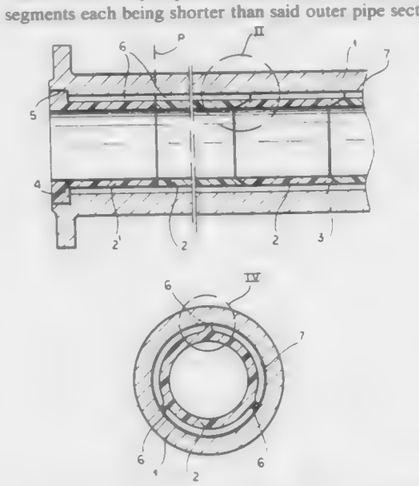
Int. Cl.[5] F16L *19/02, 9/22*

U.S. Cl. 138—155 **10 Claims**

1. A piping length, comprising:

an outer pipe section of metallic material having ends connectable in a pipeline; and

an inner lining extending substantially over the entire interior length of said outer pipe section and formed by a plurality of tubular lining segments disposed end to end in said outer pipe section, composed of a nonmetallic material and removably disposed in said outer pipe section, said segments each being shorter than said outer pipe section,



said segments including terminal segments at opposite ends of said lining formfittingly engaging and braced against respective ends of said outer pipe section.

4,995,428

PAPERMAKING FABRIC HAVING RECESSES ON PAPERMAKING SURFACE FILLED WITH AUXILIARY WEFTS

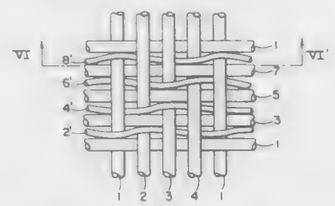
Takuo Tate; Taketoshi Watanabe, and Hiroyuki Nagura, all of Tokyo, Japan, assignors to Nippon Filcon Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,235

Claims priority, application Japan, Aug. 31, 1988, 63-215022

Int. Cl.[5] D03D *13/00*

U.S. Cl. 139—383 A **7 Claims**



1. A single-layer papermaking woven fabric having a paper side and a running side formed of warps and primary and auxiliary wefts and having more than three shafts in a repeating unit, said running side formed from long crimped primary wefts, where, in said repeating unit, at least one auxiliary weft having a smaller diameter than that of said primary weft is disposed between two adjacent primary wefts and each primary weft is disposed between two adjacent auxiliary wefts, each of said warps extending on the paper side over at least two primary wefts and over at least two auxiliary wefts, where each repeating unit has at least one warp extending from the paper side over one of the said adjacent primary wefts to the running side of a second of said adjacent primary wefts, or has at least one warp extending from the running side of one of said adjacent primary wefts to the paper side of a second adjacent primary weft, each of said auxiliary wefts being woven into said fabric at least once by a warp to be over at least one warp and under at least one adjacent warp in said repeating unit, whereby said auxiliary wefts are disposed in recesses which will otherwise make appearance on said paper side at locations corresponding to the said warps extending from one of said paper side and said running side toward the other to thereby form a smooth paper side.

4,995,429

PAPER MACHINE FABRIC

Robert H. Kositzke, Appleton, Wis., assignor to Albany International Corp., Menands, N.Y.

Filed Feb. 5, 1986, Ser. No. 826,308

Int. Cl.[5] D03D *11/00, 15/00*

U.S. Cl. 139—383 R **8 Claims**

1. A papermaking machine fabric, which comprises:

an upper layer of interwoven first machine direction and first cross-machine direction yarns, said first yarns being of a synthetic, polymeric resin;

a lower layer of interwoven second machine direction and second cross-machine direction yarns, said second yarns being of a synthetic, polymeric resin;

the first machine direction yarns of the upper layer being in vertical alignment with the corresponding underlying second machine direction yarns of the lower layer; and/or

the first cross-machine direction yarns of the upper layer being in vertical alignment with the corresponding underlying second cross-machine direction yarns of the lower layer; and

one of cross-machine direction binder yarns interwoven with the machine direction yarns in the upper and the lower layers at positions between the vertically aligned first and second machine direction yarns of the upper and the lower layers : said dryer fabric having a projected open area of at last about 30–55% of the total area of the fabric.

4,995,430

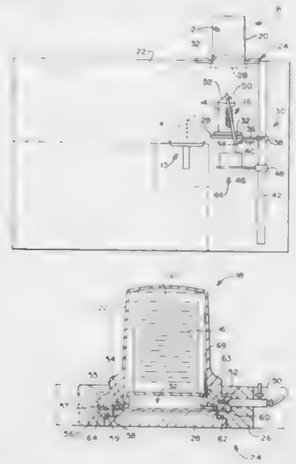
SEALABLE TRANSPORTABLE CONTAINER HAVING IMPROVED LATCH MECHANISM

Anthony C. Bonora, Menlo Park, and Frederick T. Rosenquist, Redwood City, both of Calif., assignors to Asyst Technologies, Inc., Milpitas, Calif.

Filed May 19, 1989, Ser. No. 354,027

Int. Cl.[5] B65B *1/04*; B05G *65/00*

U.S. Cl. 141—98 **12 Claims**



1. A sealable, transportable container, comprising:

a box having an interior region and a first sealing surface;

a box door having a peripheral edge and a second sealing surface adapted to mate with said first sealing surface when said box door is moved in a sealing direction; and

latch means for non-scraping motion in a first direction between a first position, which allows motion of said box door with respect to said box, and a second position, which limits the motion of said box door with respect to said box, and for non-scraping motion in a second direction between said second position and a third position, in which said latch means supports said box door at positions spaced from said peripheral edge of said box door to prevent said box door from deflecting, to move said box door in the sealing direction and to bring said first and second sealing surfaces into contact.

4,995,431

APPARATUS FOR FILLING SPECIFIED AMOUNT OF LIQUID

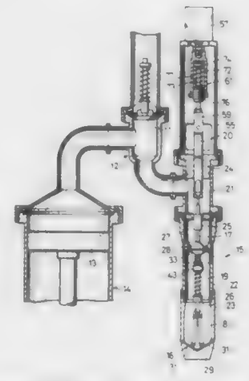
Shigeru Wakabayashi; Yoshihiro Saijo; Yoshitaka Yamane, and Yasuji Fujikawa, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Mar. 8, 1990, Ser. No. 490,247

Claims priority, application Japan, Mar. 24, 1989, 1-33489[U]

Int. Cl.[5] B67C *3/02*

U.S. Cl. 141—116 **5 Claims**



1. An apparatus for filling a specified amount of liquid comprising:

a vertical tubular filling nozzle;

an annular seat coupled to the vertical tubular filling nozzle, the seat facing downward and being formed on the inner surface of the filling nozzle approximately at the midportion of the height thereof;

a damper attached to the lower end of the filling nozzle and pivotally movable upward and downward, the damper being closeable when the damper is moved upward;

a vertical rod supported upwardly and downwardly movably inside the filling nozzle and extending through the seat inwardly thereof;

a connecting member connecting the free end of the damper to the lower end of the vertical rod;

a spring biasing the vertical rod upward to hold the damper closed against the gravity on the liquid within the filling nozzle;

a liquid channel blocking annular member slidably mounted on the vertical rod and biasing means for biasing said member upwardly with respect to said rod such that when the vertical rod is moved upward, an upper peripheral surface of the member comes into abutment with the downwardly facing seat whereby said blocking member closes said filling nozzle simultaneously when or immediately before the damper is closed; and

a metering cylinder for feeding the liquid to the filling nozzle in a volume at a time, the volume being greater than the volume of the liquid to be accommodated in the filling nozzle in the portion thereof under the blocking member.

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4,995,432

DOSAGE EQUIPMENT

Jukka Tervamäki, Helsinki; Mauno Heinonen; Matti Priha, both of Vantaa, and Juha Koivisto, Helsinki, all of Finland, assignors to Labsystems Oy, Helsinki, Finland

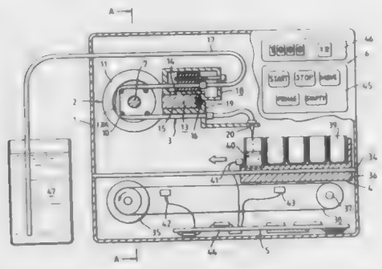
PCT No. PCT/FI88/00024, § 371 Date Oct. 13, 1988, § 102(e) Date Oct. 13, 1988, PCT Pub. No. WO88/06138, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 17, 1988, Ser. No. 265,876

Claims priority, application Finland, Feb. 20, 1987, 870733

Int. Cl.[5] F04B *43/12*; G01N *1/14*

U.S. Cl. 141—130 16 Claims



1. A dosage equipment for feeding liquid doses to a plurality of receiving vessels which comprises:

a frame **1**,

a peristaltic pump having a stationary part **2** including a stepping motor **11** mounted on said frame **1** and having a motor shaft **7** extending therefrom,

a body piece **12** spaced from said motor and fixed with respect to said frame **1**,

said shaft **7** being journalled to said body piece **12**,

said peristaltic pump having a two-part hose cassette **3** cooperatively associated therewith,

a pair of spaced end flanges **8** and **9** fixedly mounted on said shaft **7** between said motor and said body piece **12**,

a plurality of revolvable shafts **10** spaced about motor shaft **7**, each being journalled to said pair of spaced apart end flanges **8** and **9**

a counter-piece **13** mounted on said frame **1** and connected to said body piece **12** to fixedly secure said body piece with respect to motor shaft,

said counter-piece further being adapted to support said two-part hose cassette,

said two-part hose cassette **3** comprising cooperatively associated upper part **18** and a lower part **19** connected along adjacent sides thereof solely by unstretchable strands **33** such that the two parts **18, 19** fit together about and are supported by said counter-piece **13**,

said counter-piece **13** including a free end and having means for engaging with locking means on said upper and lower parts **18, 19** for cooperatively holding said upper and lower parts about said counter-piece **13**,

a plurality of spaced-apart elastic hoses **17** passing continuously through said upper and lower parts **18, 19** and providing a loop **17A** thereof outside said upper and lower parts for passing around said revolvable shafts **10** in tension engagement therewith to compress said hose and maintain said upper and lower parts in contact with said counter-piece **13**,

a set of receiving vessels **39** arranged to receive dosed liquid therein,

each of said hoses **17** being connectable to a source of liquid to be dosed and having a nozzle **20** at one end for feeding dosed liquid to said receiving vessels **39**; and

a carriage **36** supporting said vessels **39** and displaceable relative to said peristaltic pump and located beneath said nozzles **20**.

4,995,433

FUEL DISPENSER SEAL

Bernd Beicht, Gross Umstadt OT Rischen; Joachim Heinemann, Weinheim; Frank Keller, Heddesheim, and Reinhard Tinz, Gross Biberau, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 387,014

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3829948

Int. Cl.[5] B65B *3/04*

U.S. Cl. 141—312 12 Claims

1. The combination of a fuel dispenser seal and an inlet of a fuel tank having an orifice of a reduced diameter comprising: an inlet of a fuel tank having an orifice of a reduced diameter and having a radial direction and an axial direction and having a projecting portion facing in the radial direction of the orifice inwardly of the orifice, a hollow, elongated support body, and a sealing ring made of a polymeric material which is provided with a sealing lip which can engage with a fuel dispenser, the sealing ring being held in the support body and at least a portion of the support body being elastically configured for insertion into the inlet through the orifice by means of an elastic diameter reduction and said inlet engaging the support body with the projecting portion of the inlet facing in the radial direction of the orifice inwardly of the orifice and the support body being firmly attached in the axial direction of the orifice.

4,995,434

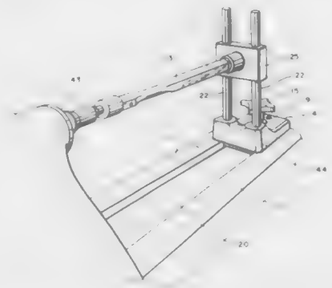
WOODWORKING LATHE TAILSTOCK ASSEMBLY

Clead M. Christiansen, 3086 N. 150 East, North Ogden, Utah 84414

Filed Aug. 8, 1989, Ser. No. 391,154

Int. Cl.[5] B27C *7/04, 7/06*; B23B *23/04, 43/02*

U.S. Cl. 142—48 5 Claims



1. A tailstock assembly for a wood-turning lathe, said lathe having a horizontal bed and a headstock assembly including a rotatable chuck for gripping the head end of a wooden spindle workpiece or the like, the tailstock assembly comprising:

a rotatable chuck adapted to retain the tail end of the workpiece and having a drill bit guide bore therethrough along its axis of rotation; and

means for securing the chuck selectively positioned along the bed with the axis of rotation of the chuck aligned with that of the headstock chuck; wherein

the lathe includes a pair of parallel horizontal ways and the selective position chuck securing means comprises:

releasable clamping means carried by the tailstock assembly for its attachment upstanding from the ways in selective longitudinal, lateral, and rotational positions thereon; wherein

the tailstock includes means for positioning the chuck upon the tailstock elevated at selective elevated at selective distances above the ways.

4,995,435

APPARATUS FOR AND METHOD OF CUTTING JOINTS

Christopher M. V. Godfrey, The Old School, Godney Wells, Somerset BA5 1RY, Great Britain

Filed Nov. 21, 1989, Ser. No. 439,633

Claims priority, application United Kingdom, May 22, 1987, 8712094; Feb. 12, 1988, 8803340

Int. Cl.[5] B27B *1/00*

U.S. Cl. 144—363 16 Claims

1. An apparatus for machining at least one half of an interconnecting joint between the end regions of two components, the apparatus comprising:

a support;

a carrier movable on and fixable with respect to the support and having a first clamping means, for clamping to the carrier a first component for machining of that component, and a second clamping means for clamping a second component, having a previously machined end profile, to the carrier in a predetermined position to act as a template to enable the end region of the first component to be machined to a profile capable of co-operating with the second component;

a cutting means mounted on the support for machining the end of the component; and

means defining a datum point;

the arrangement being such that, in use, when the second component is sequentially held by the second clamping means in a series of predetermined positions in relation to the means defining a datum point, the first component to be machined is correspondingly held in a series of positions in relation to the cutting means whereby the end of the first component is capable of being machined by the cutting means to a profile capable of co-operating with the profile of the second component.

4,995,436

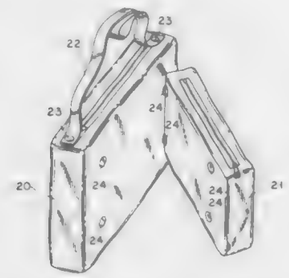
ANTI-THEFT HANDBAG

Joseph L. Cantor, 175 E. Mt. Pleasant Ave., Livingston, N.J. 07039

Filed Jun. 16, 1989, Ser. No. 368,412

Int. Cl.[5] A45C *1/02, 3/06, 13/18, 13/22*

U.S. Cl. 150—102 18 Claims



1. An anti-theft handbag device comprising two adjacent handbag segments, one handbag segment being larger than the other handbag segment and a means for detachably securing a side of the larger handbag segment to a side of the other handbag segment so that said means mate with each other in between the adjacent handbag segments wherein a cavity means is located between the adjacent handbag segments when they are joined together, said cavity means being capable of receiving and enveloping a hand of the holder of the anti-theft bag and said larger handbag segment having a carrying strap mounted thereon so that upon extraordinary pulling of either the carrying strap or the larger handbag segment, the carrying strap and larger handbag segment will separate along a generally horizontal direction from the other handbag segment.

4,995,437

HEAVY DUTY PNEUMATIC RADIAL TIRES INCLUDING A BENT GROOVE IN THE SIDE FACE OF THE TREAD

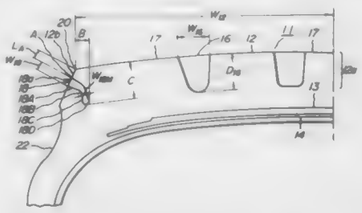
Yasutaka Enoki, Sayama; Shigeo Makino, Tokorozawa, and Shinji Murase, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 25, 1988, Ser. No. 275,999

Claims priority, application Japan, Nov. 25, 1987, 62-298036; Oct. 21, 1988, 63-266903

Int. Cl.[5] B60C *11/00, 13/02*

U.S. Cl. 152—209 R 18 Claims



10. A radial tire comprising; a tread portion having a ground contact portion with main grooves, a tread portion side face not in ground contact, a fine groove opening in said tread portion side face and extending in the peripheral direction of said tire, said fine groove in cross-section having a first segment directed inward from said tread portion side face and a second segment bent at an angle from said first segment such that centerlines of said first and second segments form to different angles relative to a circumferential plane of said tire.

4,995,438

MULTI-CHAMBERED PNEUMATIC TIRE AND WHEEL ASSEMBLY HAVING AN INNER TIRE AND AN OUTER TIRE

Michael J. Weber, Akron, and Stuart D. Grant, Silver Lake, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 2, 1989, Ser. No. 430,469

Int. Cl.[5] B60C *17/01, 5/20*

U.S. Cl. 152—518 3 Claims



1. A tire and rim assembly comprising:

a rim having a pair of diametrically opposed annular bead seating portions, each bead seating portion having a ledge and a radially outwardly extending flange;

a tubeless pneumatic outer tire mounted on said rim having an inner cavity and a pair of axially opposed bead portions, each bead portion being disposed adjacent to a ledge and a respective flange of one of said beat seating portions of said rim;

a tubeless pneumatic inner tire disposed within said tire cavity, mounted on said rim, dividing said inner cavity into inner and outer chambers and, having first and second axially opposed bead portions, the first bead portion of the

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inner tire being disposed adjacent to a ledge of one of said bead seating portions of the rim and the respective bead portion of the outer tire, and the second bead portion of the inner tire being disposed adjacent to the ledge of the other bead seating portion of the rim and is both disposed adjacent to and spaced from the respective bead portion of the outer tire to form a circumferentially extending air passageway, and said second bead portion of said inner tire having a radially inner end adjacent to the ledge of the respective bead seating portion and an axially outer portion located radially outwardly from the inner end adjacent said ledge and extends axially outwardly from said radially inner end to a protrusion tapering radially outwardly, said protrusion being adjacent to said bead portion of the outer tire and located radially outwardly of the ledge of the respective bead portion a distance in the range of from 30% to 80% of the height of the flange, and said protrusion having a radially extending groove therein to allow the passage of air to and from the air passageway to the outer chamber; and

an inflation valve carried by said rim for allowing the passage of air to and from the air passageway; and an inflation means carried by said rim for allowing the passage of air to and from the inner chamber.

4,995,439

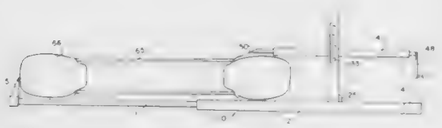
TIRE BEAD BREAKER

Leonard F. Burge, Sheoak - Lot 1, Plenty Road, Yan Yean, Victoria, Australia (3755), assignor to Leonard F. Burge and Elaine R. Burge, Yan Yean, Australia

Filed Jan. 24, 1990, Ser. No. 469,390

Int. Cl.[5] **B60C** *25/132*

U.S. Cl. 157—1.17 **20 Claims**



1. A tire bead breaker comprising:

a base upon which a wheel and tire is initially adapted to be located;

a stop attached at one end of the base to restrict outward movement of the wheel and tire;

an arm assembly having proximal and distal ends, wherein the proximal end of the arm is pivotally connected to the base at a desired position locatable on a side of the wheel and tire away from the stop near the other end of the base;

a breaker assembly having first and second telescopic members, the first telescopic member being pivotally connected on the arm assembly at a point near the distal end of the arm assembly, and the second telescopic member having proximal and distal ends, wherein a breaker plate is attached to the distal end of the second telescopic member; and

means for rotating the breaker assembly so that there is an inward and downward movement of the breaker plate to effect separation of the tire from a rim of the tire,

wherein the second telescopic member is slidable outwardly relative to the first telescopic member of the breaker assembly, to enable the breaker plate to be located between the tire and the rim, and wherein further having means for inducing relative movement between the breaker assembly and the stop such that the wheel and tire tend to rotate upwardly about the stop member.

4,995,440

ROLLING SHUTTER FOR WALL OR ROOF OPENINGS, ESPECIALLY IN CONNECTION WITH TURNABLE ROOF WINDOW

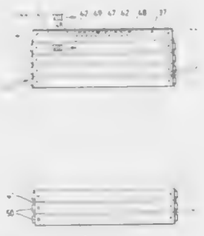
Franz Vorsmann, Marsberger Str. 14, 3538 Marsberg 4, Fed. Rep. of Germany

Filed Feb. 13, 1990, Ser. No. 479,354

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1989, 8901615[U]; Oct. 11, 1989, 8912065[U]

Int. Cl.[5] **E06B** *9/26*

U.S. Cl. 160—32 **25 Claims**



1. A rolling shutter for wall or roof openings, especially in connection with a turnable roof window, comprising a rolling shutter web composed of a plurality of rolling shutter elements pullable from one another for forming light gaps; a rolling shutter shaft for winding and unwinding of said rolling shutter web; supports for rotatably supporting said rolling shutter web; two parallel side walls connected with said supports for guiding lateral ends of said rolling shutter webs; an actuating device having a mechanism for an opening movement of the rolling shutter web and a pulling device engaging a free front end of said rolling shutter web and supporting or performing its closing movement, said rolling shutter elements including a front rolling shutter element and a rear rolling shutter element; a pulling rope connecting said front rolling shutter element and said rear shutter element, said pulling rope being fixedly connected with said rear rolling shutter element and being connected with said front rolling shutter element by means of a spring provided for closing of said light gaps, said spring having a force selected so that during starting an opening movement of said rolling shutter web at least said light gaps located between said front and rear rolling shutter elements are opened under the action of said pulling device and then said rolling shutter web is wound in an opening direction.

4,995,441

SECTIONAL DOORS AND FLEXIBLE HINGE ASSEMBLIES

Alan R. Leist, 1038 Jonquil Lane, Cincinnati, Ohio 45231; Thomas G. Mushaben, 5541 Bosworth Place, Apt. #4, Cincinnati, Ohio 45212, and Thomas E. Youtsey, 854 Lincoln Road, Bellevue, Ky. 41073

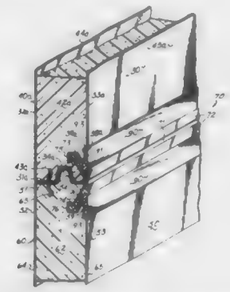
Filed May 1, 1989, Ser. No. 345,562

Int. Cl.[5] **E06B** *3/70*

U.S. Cl. 160—229.1 **15 Claims**

1. An elongated flexible hinge assembly for hingedly securing together abutting panel sections of a sectional door for articulation of the panel sections with respect to each other, each said panel section being formed with an elongated slot, said flexible hinge assembly comprises:

an elongated flexible hinge or generally V-shape cross-section when inserted in the elongated slots of the abutting panel sections and having an elongated central web comprised of an elastomer material which is substantially resistant to flexure fatigue, said elongated central web having an exterior side surface and an elongated area alongside the exterior side surface for flexing thereat, said elongated central web further having first and second ends wherein each said end is connected to an elongated flange, said flanges being spaced apart from one another, one said flange being adapted to be inserted into one said elongated slot of one said abutting panel section and said other flange being adapted to be inserted into said other elongated slot of said other abutting panel section for hingedly connecting said abutting panel sections to one another in an abutting relationship, said elongated central web further having a pair of elongated receiving means extending along the exterior side surface and being spaced from each other;



two elongated retainer slats for said elongated flexible hinge, each said retainer slat having first and second elongated edges, each said first elongated edge of each said retainer slat being adapted to be inserted into one said elongated slot of one said abutting panel section in contact with said flange therein and each said second elongated edge of each said retainer slat being received by one said elongated receiving means along the exterior side surface of said elongated central web for locking said elongated flexible hinge in said elongated slots of said abutting panel sections.

4,995,442

CURTAIN OPENING DEVICE

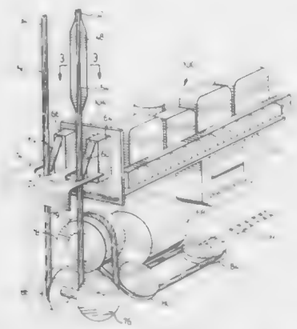
Stanley E. Marzec, 14 Rusholme Drive, Apt. 3, Toronto, Ontario, Canada M6J 3G9

Continuation-in-part of Ser. No. 365,151, Jun. 12, 1989, abandoned. This application Mar. 5, 1990, Ser. No. 489,119

Claims priority, application Canada, Jun. 10, 1988, 569146

Int. Cl.[5] **A47H** *5/02*

U.S. Cl. 160—331 **16 Claims**



1. A device for opening and closing at least one closure member, a cord being associated with the closure member and having a bight portion located in a first plane and a pair of substantially parallel, spaced first and second reaches located in a second plane spaced from said first plane, the device comprising a drive roller for driving engagement with the bight portion, reversible electric motor means for driving the drive roller, the diameter of the drive roller being larger than the spacing between the parallel reaches, and first and second pulleys between the reaches and the bight to allow a change in direction of the cord between the reaches and bight, at least a first pulley being rotatable about an axis skewed relative to the first and second planes.

4,995,443

PROCESS FOR EVAPORATIVE PATTERN CASTING

Jay Easwaran, Portage, Mich., assignor to The Board of Trustees of Western Michigan University, Kalamazoo, Mich.

Filed Feb. 8, 1989, Ser. No. 308,313

Int. Cl.[5] **B22C** *9/02*

U.S. Cl. 164—34 **21 Claims**

19. A method for producing a cast metal part comprising the steps of forming a pattern of the metal part out of a polymeric material; applying 2–5 ceramic coatings to said pattern and drying each ceramic coating prior to the application of a subsequent ceramic coating to form a ceramic shell containing said pattern; applying a fused silica coating to each ceramic coating prior to said drying of said each ceramic coating; introducing said ceramic shell into a bed of fluidized sand at a temperature of about 1500°–2000° F.; compacting said fluidized sand around said ceramic shell; decomposing said pattern to form a mold; introducing molten metal into said mold without removing said mold from said compacted sand; solidifying said molten metal; and removing said solidified molten metal from said mold to form a cast metal part.

4,995,444

METHOD FOR PRODUCING METAL OR ALLOY CASTING COMPOSITES REINFORCED WITH FIBROUS OR PARTICULATE MATERIALS

Mark Jolly, Vessy; Guy Negaty-Hindi, Onex, and Georges Haour, Geneva, all of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 162,257, Feb. 29, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 535,986

Claims priority, application European Pat. Off., Mar. 2, 1987, 87810114.6

Int. Cl.[5] **B22D** *19/14*

U.S. Cl. 164—97 **19 Claims**

1. A method for producing metal or alloy casting composites, consisting essentially of a metal matrix reinforced with fibers or particles of reinforcing material distributed in this matrix according to a desired pattern, which comprises the steps of:

(a) providing a self-supporting template preform structure having no to little reinforcing properties, made of a porous body or of a network of cross-linked building constituents containing particles or fibers of reinforcing material distributed in pores or in voids between said constituents of the structure and binding said particles or fibers of reinforcing material according to a desired pattern, to said constituents of said preform structure by adding a binder substance;

(b) introducing said preform structure into a casting mould or die, filling said mould or die with a molten metal or alloy and causing said molten metal or alloy to infiltrate interstices in the preform structure and thus embed said particles or fibers within the metal to form a matrix of a casting composite; and

(c) allowing the molten metal or alloy to solidify, and separating the resulting solidified casting composite from the mould.

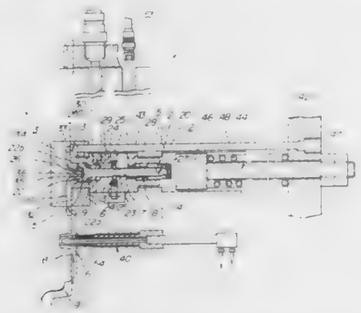
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,445

GAS VENT SYSTEM OF A MOLD

Masatomo Shigyo, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 20, 1990, Ser. No. 481,368
Claims priority, application Japan, Feb. 20, 1989, 64-39560
Int. Cl.[5] B22D *17/20*
U.S. Cl. 164—305 17 Claims



1. A gas vent system of a mold, comprising:

a gas vent passageway formed on mating surfaces of a pair of mold halves and communicating a mold cavity with the outside of a mold when the mold is closed; and

a gas vent valve mounted on one of the mold halves and disposed intersecting in a direction substantially perpendicular to the gas vent passageway so as to block the gas vent passageway in response to a pressure from a molten material forced into the mold cavity;

wherein the gas vent valve is provide don its end surface receiving the pressure from the molten material with a concave portion opening toward the other of the mold halves;

a projection is formed on the other of the mold halves and disposed so as to be fitted tightly in the concave portion of the gas vent valve when the mold is fastened; and

the projection is provided with part of the gas vent passageway, which is directed toward the concave portion of the gas vent valve so as to pass gases therethrough from the mold cavity to the concave portion of the gas vent valve.

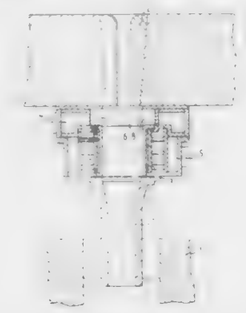
4,995,446

DEVICE FOR COOLING A METAL DURING CASTINGS

Paul Naveau, Alleur, and Stephan Wilmotte, Chaudfontaine, both of Belgium, assignors to Centre De Recherches Metallurgigues, Centrum Voor Research In Demetallurgie, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,320
Claims priority, application Belgium, Feb. 3, 1988, 08800130
Int. Cl.[5] B22D *11/00*
U.S. Cl. 164—437 4 Claims

1. In a continuous casting assembly of the type including a dispenser and a mold, a device intermediate said dispenser and mold for cooling a metal during casting having a vertical duct and means for distributing metal over the inner surface of the vertical duct and disposed substantially at the inlet thereof, the improvement comprising a supply chamber disposed around the vertical duct and having a front wall which at a spacing intimately follows the shape of the vertical duct, an evacuation chamber disposed around the supply chamber, an intermediate wall separating the evacuation chamber from the supply chamber, a rear wall surrounding the evacuation chamber, the front wall having a plurality of first and second passages therethrough, said first and second passages each including passages disposed in a plurality of locations spaced about said duct as well as a plurality of locations spaced along said duct intermediate the opposite ends thereof, said first passages each having an end opening toward the vertical duct, and another end opening into the supply chamber, said second passages each having a tube connected to one end thereof,the tubes extending through the supply chamber and the intermediate wall and



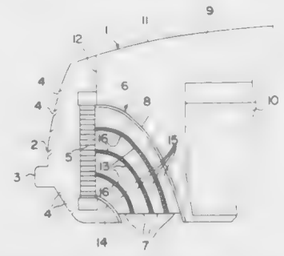
opening into the evacuation chambers, means for supplying cooling liquid to the supply chamber, and means for evacuating the cooling liquid from the evacuation chamber.

4,995,447

AIR DUCTING SYSTEM FOR COOLING AIR IN THE FRONT END OF A MOTOR VEHICLE

Werner Weidmann, Weinstadt, and Rainer Tiefenbacher, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 524,423
Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917108
Int. Cl.[5] B60H *3/00;* B61D *27/00;* B60K *11/02*
U.S. Cl. 165—44 10 Claims



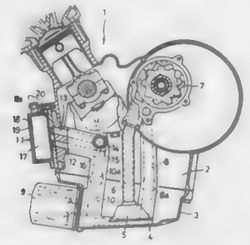
1. Air ducting system for cooling air in an air duct in a front end of a motor vehicle, which duct is arranged in front of at least one wall defining a capsule surrounding an engine compartment in the direction of travel of the motor vehicle and has an essentially vertically positioned air inlet opening at a forward front end wall and an essentially horizontally positioned air outlet opening at an underside of the front end, wherein a plurality of aerodynamically shaped guide vanes divide the air duct into a plurality of sub-ducts, said guide vanes being arranged in the air duct to extend as far as the air outlet opening at the underside of the front end, and wherein the guide vanes are of hollow design and are flowed through by a cooling medium transversely to the direction of flow of the cooling air.

4,995,448

ENGINE OIL COOLING SYSTEM

Takashi Inagaki; Tokuji Yoshimoto; Michio Okubo; Kouji Okazaki, and Tsugio Ikeda, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 149,586, Jan. 28, 1988, abandoned. This application Aug. 29, 1989, Ser. No. 401,473
Claims priority, application Japan, Feb. 6, 1987, 62-024742; Mar. 13, 1987, 62-056701
Int. Cl.[5] F01P *11/08;* B62D *61/02;* B61D *27/00*
U.S. Cl. 165—44 6 Claims



5. A system for cooling engine oil in a vehicle engine comprising:

a cooler operative to transfer heat from said engine oil to a cooling fluid;

wall means on said vehicle engine forming an oil collection reservoir having a front wall fixedly connecting said cooler on a forwardly facing surface on the front wall thereof for exposure to air flowing during vehicle movement whereby said cooling fluid comprises said flowing air;

means for supplying engine oil to said cooler including inlet and outlet passages extending through said vehicle engine wall means and communicating with said cooler and an upstanding flow conductor positioned interiorly of said engine, an orifice in said flow conductor dividing the interior thereof into an oil inlet portion and an oil outlet portion, and oil flow pipes extending between said wall means and said flow conductor for connecting said oil inlet portion of said conductor to said cooler inlet passage and said oil outlet portion of said conductor to said cooler outlet passage; and

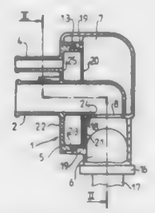
said oil flow passages are disposed in mutually divergent relation between said flow conductor and said wall means.

4,995,449

RAPID ACTION COUPLING SYSTEM FOR A HEAT EXCHANGER FLUID TANK INTEGRAL WITH AN EXPANSION VESSEL

Christophe Renault, Le Chesnay, France, assignor to Valeo Thermique Moteur Hutchinson, Paris, France

Filed Oct. 13, 1989, Ser. No. 421,080
Claims priority, application France, Oct. 13, 1988, 88 13489
Int. Cl.[5] F28F *9/00;* F16L *39/02*
U.S. Cl. 165—76 12 Claims



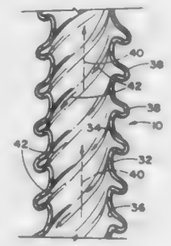
1. A rapid action coupling system for simultaneous coupling to an external circuit of a fluid inlet chamber and a fluid outlet chamber (10, 11) made in the same heat exchanger fluid tank and separated from one another by a partition (12), the system including adjacent inlet and outlet openings (8), for the two chambers which are provided in the fluid tank, and a coupling device (1) cast en bloc which is provided with at least two fluid passages (2, 3) and is arranged to be attached to the fluid tank in such a way that these two fluid passages communicate respectively with the two openings in the fluid tank, characterized in that the openings are made in a wall portion (18) separating the fluid tank from an expansion vessel (7) formed in a single piece with it and the internal volume of which is adjacent to the two chambers, and that the coupling device penetrates into the expansion vessel.

4,995,450

HEAT PIPE

Elmo W. Geppelt, and William H. Poore, both of Tulsa, Okla., assignors to G.P. Industries, Inc.

Filed Aug. 18, 1989, Ser. No. 395,581
Int. Cl.[5] F28D *15/02*
U.S. Cl. 165—104.21 2 Claims



1. A heat pipe for transferring heat from a heat sink, such as the earth, to a separate medium comprising:

an elongated tube having a first and a second end, and being closed at each end and having a heat absorption portion adjacent the first end and a heat dissipation portion adjacent the second end, the tube having a wall with an internal surface and an external surface and the wall of the tube having an internal spiraled groove therein providing a spiraled valley and a spiraled ridge in both the interior and exterior surfaces, the heat dissipation portion of the tube being elevationally above the heat absorption portion, the spiraled valley and ridge defining a trough having opposed wall portions that, in a plane of the tube longitudinal axis, are of height greater than the portion between the wall portions providing a spiraled fluid carrying trough on the wall internal surface extending from said heat absorption portion to said heat dissipation portion; and

a refrigerant within said tube having a liquid and a vapor phase and wherein at least a portion of the refrigerant liquid is convertible to vapor in the heat absorption portion and wherein at least a portion of the vapor is convertible to liquid in the heat dissipation portion and wherein at least part of the liquid refrigerant is conducted from said heat dissipation portion to said heat absorption portion in said tube wall spiraled fluid carrying trough.

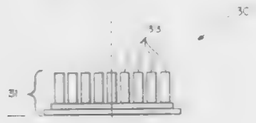
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4,995,451

EVAPORATOR HAVING ETCHED FIBER NUCLEATION SITES AND METHOD OF FABRICATING SAME

William R. Hamburgen, Menlo Park, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 29, 1989, Ser. No. 458,909
Int. Cl.[5] H01L 23/427
U.S. Cl. 165—104.33 10 Claims



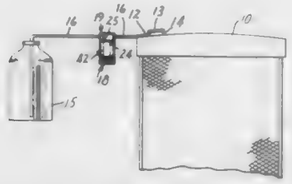
1. An evaporator apparatus, comprising a reservoir containing a fluid and a plurality of graphite-metal composite pin fins in said reservoir, said pin fins each having a plurality of nucleation sites thereon.

4,995,452

FILTER-CONDITIONER FOR MOTOR COOLING LIQUID

Gerald R. Franck, St. Paul, and David B. Olsen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 303,520, Sep. 18, 1981, Pat. No. 4,444,247, which is a continuation of Ser. No. 26,406, Apr. 2, 1979, abandoned. This application Aug. 10, 1983, Ser. No. 521,834
Int. Cl.[5] F28F 13/12; F01P 3/22
U.S. Cl. 165—119 5 Claims



3. In combination with an internal combustion engine cooling system having overflow port means permitting overflow of liquid engine coolant when the cooling system overheats, and providing suction as the cooling system cools, a filtering apparatus comprising:

filtering means for removing debris from engine coolant passing through the filtering means, including filter inlet means for receiving engine coolant to be filtered and filter outlet means for releasing filtered engine coolant;

a reservoir in fluid communication with the filter outlet means for receiving and containing the filtered engine coolant;

conduit means for placing each of the filter inlet means and the interior of the reservoir into fluid communication with the overflow port means to permit flow of engine coolant therebetween; and,

valve means for directing the flow of fluids through the conduit means so that in use

(a) engine coolant overflowing from the overflow port means is forced through the filter means into the reservoir and,

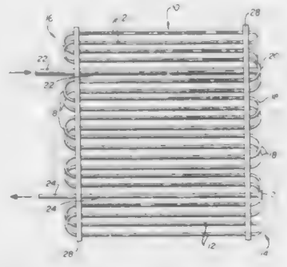
(b) the suction provided at the overflow port means when the cooling system cools draws filtered engine coolant from the reservoir.

4,995,453

MULTIPLE TUBE DIAMETER HEAT EXCHANGER CIRCUIT

Matthew T. Bartlett, Lexington, Ky., assignor to Signet Systems, Inc., Harrodsburg, Ky.

Filed Jul. 5, 1989, Ser. No. 375,593
Int. Cl.[5] F28D 1/047; F25B 39/00
U.S. Cl. 165—150 34 Claims



11. A heat exchanger assembly comprising:

a pair of header members;

a plurality of heat transfer tubes of substantially the same interior cross-sectional area extending between said header members;

a plurality of convective cooling fins forming an array over said heat transfer tubes, said heat transfer tubes and fins adapted to transfer heat between the exterior of said tubes and fins and a working fluid in a gaseous or liquid phase within said tubes; and

a pressure drop minimizing tube extending between said header members and within said heat transfer tube and fin array, said pressure drop minimizing tube have an interior cross-sectional area significantly larger than said heat transfer tubes and adapted to carry said working fluid in a gaseous phase as an inlet for said heat exchange assembly.

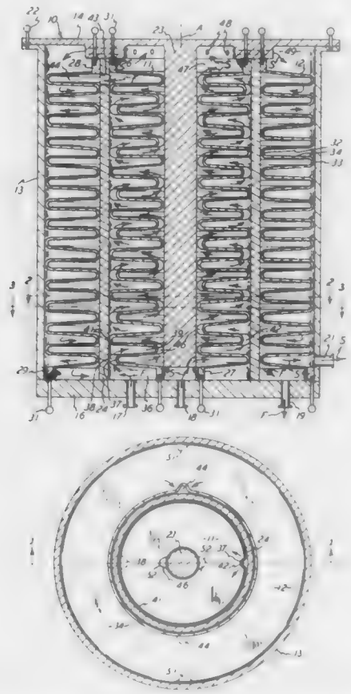
4,995,454

HEAT EXCHANGER WITH CORRUGATED TUBES

Donovan S. Thompson, 2727 Lincolnwood Dr., Racine, Wis. 53403

Filed Nov. 17, 1989, Ser. No. 438,309
Int. Cl.[5] F28D 7/10
U.S. Cl. 165—155 18 Claims

14. In a heat exchanger of the type including a corrugated tube having a plurality of convolutions therealong with inner and outer diameters and with the exchanger arranged for the flow of two separated fluids respectively on the inside and the outside of said tube for the exchange of heat between said fluids, the improvement comprising partitions in respective contact with said inner and outer diameters of said convolutions and extending the length of said tube for respectively confining the flow of the fluids relative to the inner and outer diameters of said convolutions, flow openings spaced along said tube and said partitions, and therebetween, for the flow of fluid through said openings and successively from each of said convolutions to a convolution adjacent said each convolution,



and said exchanger having fluid passageways for directing the flow of the fluids through said exchanger.

4,995,455

PLATE HEAT EXCHANGER WITH GLUELESS GASKETS

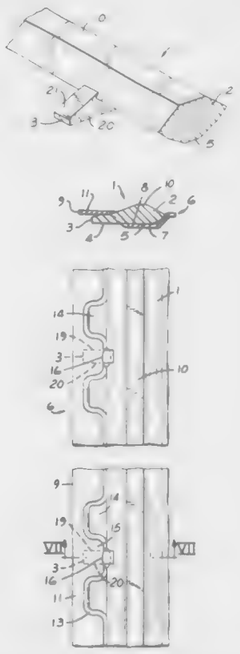
Achint P. Mathur, Wichita Falls, Tex., assignor to Tranter, Inc., Augusta, Ga.

Continuation-in-part of Ser. No. 375,190, Jul. 3, 1989, Pat. No. 4,905,758. This application Mar. 6, 1990, Ser. No. 489,227
Int. Cl.[5] F28F 3/10
U.S. Cl. 165—166 20 Claims

1. In combination, a heat exchanger plate having an elongated groove spaced inwardly from an edge of said plate and depressed downwardly relative to a marginal plate portion between said groove and said plate edge, said groove having a bottom wall and laterally spaced inner and outer side walls, a plurality of openings in said outer side wall, said openings being located entirely in said outer side wall and spaced apart longitudinally of said groove, a gasket of flexible, compressible material having an elongated main body portion seated in said groove, said gasket having tabs integral with said main body portion projecting into and through said openings, said tabs being elongated and projecting sufficiently beyond said openings so that they may be grasped by hand or by a tool from the side of said plate opposite the side in which said groove is formed and pulled completely through said openings to fully seat said main body portion of said gasket in said groove.

4. In combination, a heat exchanger plate having an elongated groove spaced inwardly from an edge of said plate and depressed downwardly relative to a marginal plate portion between said groove and said plate edge, said groove having a horizontal bottom wall and laterally spaced inner and outer side walls, a plurality of openings in said outer side wall, said openings being spaced apart longitudinally of said groove, a gasket of flexible, compressible material having an elongated main body portion seated in said groove, said gasket having tabs integral with said main body portion projecting into and through said openings, said tabs tapering laterally outwardly and having a wedging interference with opposite edges of said openings.

13. In combination, a heat exchanger plate having an elongated groove spaced inwardly from an edge of said plate and depressed downwardly relative to a marginal plate portion



between said groove and said plate edge, said groove having a bottom wall and laterally spaced upwardly and outwardly flaring inner and outer side walls, a plurality of openings in said outer side wall, said openings being spaced apart longitudinally of said groove, a gasket of flexible, compressible material having an elongated main body portion seated in said groove, said gasket having tabs integral with said main body portion projecting at least partially into said openings, said tabs each having a button on the outer end engaged under the upper edge of an opening.

4,995,456

GRAVEL PACK WELL COMPLETIONS

Holley M. Cornette, Plano, and Jean M. S. Weingarten, Frisco, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 4, 1990, Ser. No. 518,048
Int. Cl.[5] E21B 43/04
U.S. Cl. 166—51 2 Claims

1. A gravel-pack completion assembly comprising:

a body adapted to be connected at one end to the lower end of a well conduit;

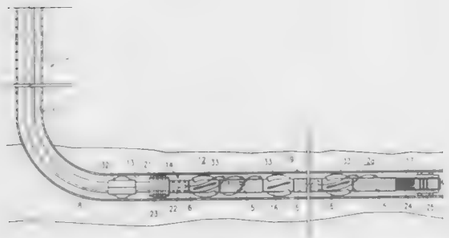
a fluid-permeable liner connected to the other end of said body; and

a distributor means on said completion assembly for imparting spiral flow to any fluid flowing past said completion assembly when said completion assembly is in an operable position wherein said distributor means comprises:

a plurality of distributors longitudinally-spaced along said

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completion assembly; and wherein each of said plurality of distributors comprises:



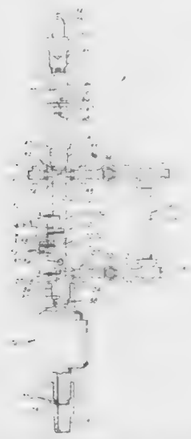
a plurality of helically-shaped vanes affixed on said completion assembly.

4,995,457

LIFT-THROUGH HEAD AND SWIVEL

Morris G. Baldridge, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 1, 1989, Ser. No. 444,657
Int. Cl.[5] E21B *33/05, 33/16*
U.S. Cl. 166—70 16 Claims



13. A cementing head apparatus, comprising:
a container body having a generally cylindrical body bore defined therethrough, said body bore having an inside diameter;
a first cylindrical release plunger operably associated with said body and being movable between a first position wherein said plunger extends into said body bore and a second position wherein said plunger is withdrawn from said body bore, said cylindrical plunger having a plunger outside diameter;
a spherical releasing ball located above and initially engaging said plunger when said plunger is in its said first position, said ball having a ball diameter greater than one-half of a difference between said inside diameter of said body bore and said plunger outside diameter so that when said plunger is in its said first position, said ball is prevented from moving downward through said body bore past said plunger, and so that when said plunger is withdrawn to its said second position said ball is permitted to drop through said body bore; and
upper and lower cementing lines connected to said container body by hammer unions welded to said container body.
14. A swivel for use with a well, comprising:
a swivel body including:
an upper body portion having a body flow passage defined therethrough, and having a downward facing first counterbore adjacent said flow passage; and
a lower body portion connected to said upper body portion so that a body cavity is defined between said upper and lower body portions, said lower body portion having a lower opening defined therethrough;
a swivel mandrel extending through said lower opening of said lower body portion and having an enlarged diameter mandrel shoulder received in said body cavity, said mandrel having an upper end closely received within said first counterbore of said upper body portion, said swivel mandrel having a mandrel flow passage defined therethrough and communicated with said body flow passage;
bearing means disposed in said body cavity between said swivel body and said swivel mandrel;
first and second seal means, disposed between said upper body portion and said upper end of said swivel mandrel, for sealing between said body cavity and said flow passages and for preventing contamination of an oil lubricating bath in said body cavity by fluids in said flow passages;
an inspection passage means defined in said upper body portion, for detecting failure of either of said first and second seal means; and
wherein said bearing means further comprises:
an upper thrust bearing between said upper end of said swivel mandrel and said upper body portion;
a lower thrust bearing between said mandrel shoulder and said lower body portion; and
an alignment bearing between said swivel mandrel and said lower body portion.

4,995,458

WEAR BUSHING RETRIEVAL TOOL

Keith Garbett, Castleford, England, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 9, 1989, Ser. No. 434,345
Int. Cl.[5] E21B *17/12*
U.S. Cl. 166—85 12 Claims



1. A tool for use in retrieving a wear bushing positioned in surrounding relationship to a casing string from a wellhead assembly comprising:
a generally annular body portion which can be located around a length of casing positioned within a wear bushing within the wellhead assembly,
means for supporting the body portion relative to a length of casing so that it can be lowered into a wellhead with said casing, and

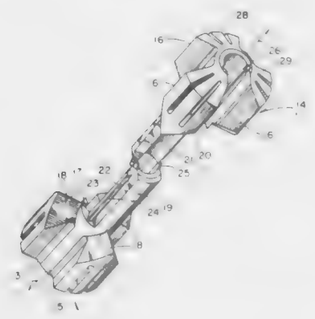
latching means carried by said body portion,
said latching means being so shaped and arranged that it can engage a correspondingly shaped portion on said wear bushing, and
means for actuating the latching means to move it into engagement with the wear bushing.

4,995,459

ROD GUIDE/PARAFFIN SCRAPER

John F. Mabry, 307 E. 24 Court, Owasso, Okla. 74055

Filed Jun. 16, 1988, Ser. No. 207,492
Int. Cl.[5] E21B *37/02*
U.S. Cl. 166—176 6 Claims



1. A rod guide and paraffin scraper comprising; with a body including longitudinal ribs spaced radially and extending out from said body; having two identical halves with said body surrounding a bore to accept a sucker rod, and each of said identical halves having a locking and tightening feature using a tongue and groove concept for interfitting said halves together over said sucker rod, wherein the improvement comprises:
a rod guide and paraffin scraper with two identical halves comprising;
a cylindrical central body including, at each end, three longitdinal ribs radially spaced to form a triad leaving three flow channels, at each end of said body, of essentially the same size and spacing as the ribs; and an angular wedge with opposingly ramped sides at the inside end of each of said ribs for scraping and directing material into said flow channels;
and a set of triangular shaped tongues that interfit with a set of triangular shaped grooves for tightening saids identical halves together and over the sucker rod;
and a pair of cone-shaped male locks at one end of said identical half to mate with a pair of cone-shaped female locks at the opposite end of said other identical half.

4,995,460

METHOD AND APPARATUS FOR DISPOSING OF WATER AT GAS WELLS

Ronald L. Strahan, 2416 Apple Way, Edmond, Okla. 73013

Filed Dec. 18, 1989, Ser. No. 451,822
Int. Cl.[5] E21B *43/34*
U.S. Cl. 166—267 16 Claims

1. A method for disposing of water produced by a gas well assembly, which gas well assembly includes a gas compressor which produces hot exhaust and a muffler for muffling the noise of the exhaust from the gas compressor, the method comprising:
circulating the water in heat exchange relation with the hot exhaust under conditions permitting the water to vaporize, wherein such circulation is carried out in a vessel through which a conduit carrying the hot exhaust is submerged;
venting steam produced by such circulation; and



feeding a stream of hot exhaust from the muffler through the vessel for promoting the venting of steam from the vessel.

4,995,461

WELL KILL TREATMENT FOR OIL FIELD WELLBORE OPERATIONS

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 380,057, Jul. 14, 1989. This application Oct. 24, 1989, Ser. No. 426,131
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] E21B *33/13*
U.S. Cl. 166—295 21 Claims

1. A process of killing a well to substantially reduce volumetric flow of a formation fluid across a wellbore face into a wellbore penetrating a formation having a formation matrix and containing said formation fluid below an earthen surface, comprising:
admixing components of a continuous nonflowing gel at said surface to form a partial flowing gel comprising a water-soluble carboxylate-containing polymer, a complex capable of crosslinking said polymer and formed of at least one electropositive chromium III species and at least one electronegative carboxylate species, and an aqueous solvent for said polymer and said complex;
placing said partial gel in said wellbore at said wellbore face, said partial gel which is placed at said wellbore face does not significantly penetrate the formation matrix;
forming said nonflowing gel from said partial gel in said wellbore at said wellbore face to substantially reduce said volumetric flow of said formation fluid across said wellbore face into said wellbore, thereby killing said well; an
removing substantially all of said nonflowing gel from said wellbore face to substantially restore the volumetric flow of said formation fluid into said wellbore.

4,995,462

DEWAXING CONTROL APPARATUS FOR OIL WELL

David Sask; Marcel Obrejanu, and Allen Grimshaw, all of Calgary, Canada, assignors to Maralda Oilwell Technology Ltd., Calgary, Canada

Filed Mar. 30, 1990, Ser. No. 502,402
Claims priority, application Canada, Sep. 29, 1989, 614434
Int. Cl.[5] E21B *37/06, 34/10*
U.S. Cl. 166—304 8 Claims

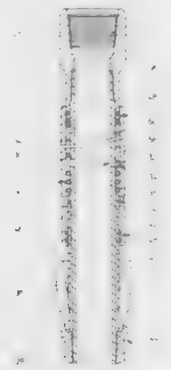
1. Dewaxing control apparatus for use in a well casing containing a tubing string which defines an annulus within the well casing and containing a down hole pump which pumps oil in a lower portion of the well annulus up through the interior of the tubing string, the dewaxing control apparatus comprising:
a housing having a liquid transfer passage and adapted to be installed in-line with the tubing string above the pump with a first end of the liquid transfer passage communicat-

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ing with the annulus and a second end of the liquid transfer passage communicating with the interior of the tubing string;

packer means mounted on the housing for closing the annulus against downward flow of liquids at a position below the first end of the liquid transfer passage;

means defining a gas by-pass passage with an upper end positioned to communicate with the annulus above the packer means and a lower end positioned to communicate with the annulus below the packer means;



valve menas for regulating fluid flows along the liquid transfer and gas by-pass passages and operable to assume first and second states, the valve means in the first state closing the liquid transfer passage against transfer of liquids between the annulus and the interior of the tubing string and allowing transfer of gases upwardly along the gas by-pass passage, the valve means in the second state allowing transfer of liquids along the liquid transfer passage between the annulus and the interior of the tubing string and closing the gas by-pass passage against downward flow of liquids.

4,995,463

METHOD FOR FRACTURING COAL SEAMS

Robert C. Kramm, and Robert H. Lane, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 4, 1990, Ser. No. 532,830
Int. Cl.[5] E21B *43/267*
U.S. Cl. 166—308 **14 Claims**

1. A method for fracturing a coal seam comprising:

injecting a water-based fracturing fluid into said coal seam to initiate and propagate a fracture in the coal seam, said fracturing fluid comprising:

a wetting agent for converting the coal fines which are formed during the fracturing of the coal seam from their natural hydrophobic state to a hydrophilic state; and

a dispersant for dispersing said hydrophilic fines in said fracturing fluid.

4,995,464

WELL APPARATUS AND METHOD

Bruce J. Watkins, and Blake T. DeBerry, both of Houston, Tex., assignors to Dril-Quip, Inc., Houston, Tex.

Filed Aug. 25, 1989, Ser. No. 398,716
Int. Cl.[5] F16L *27/12;* **E21B** *33/035*
U.S. Cl. 166—382 **26 Claims**

1. A longitudinally adjustable sub for connecting tubular well conduits, comprising

a first tubular member connectable to a first conduit,

a second tubular member connectable to a second conduit and being spaced concentrically of the first tubular member, and

a sleeve disposed within the space and having first and second threads engaged with threads on the first and second tubular members, respectively, and so related to one another that rotation of the sleeve causes the tubular members to move longitudinally with respect to one another,

the sleeve having means thereon to which a tool removably disposable within the sub may be connected for imparting rotation thereto in order to adjust the sub, and

the threads on the sleeve remaining engaged with longitudinally overlapping threads on the tubular members so as to transmit axial loading between said members essentially in shear.

19. In a method of drilling and/or completing a subsea well, wherein a pipe string anchored at its lower end to a mudline hanger within a well bore at the ocean floor is to be suspended in tension from a seat within a casing head on a platform at the water surface, the steps of



connecting the upper end of the pipe string to a hanger body by means of longitudinally retractable sub to support a shoulder about the hanger body above the seat in the head, said sub comprising

a first tubular member connected to the hanger body,

a second tubular member connected to the upper end of the string and spaced concentrically of the lower end of the first member,

a sleeve disposed within the space and having first and second threads connected to the first and second members, respectively, and so related with respect to one another that rotation of the sleeve causes the tubular members to move longitudinally with respect to one another, and

lowering a tool through the head and hanger body to engage and rotate the sleeve in order to retract the sub and thereby lower the hanger body to land its shoulder on the seat and place the string in tension,

the threads on the sleeve remaining engaged with longitudinally overlapping threads on the tubular members so as to transmit axial loading between said members which is essentially in shear.

4,995,465

ROTARY DRILLSTRING GUIDANCE BY FEEDRATE OSCILLATION

Jeffrey L. Beck, Centerfield, Utah, and Larry D. Taylor, Morgantown, W. Va., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 27, 1989, Ser. No. 441,788
Int. Cl.[5] E21B *3/92, 7/08*
U.S. Cl. 175—27 **12 Claims**

1. A drilling apparatus for drilling a borehole comprising:

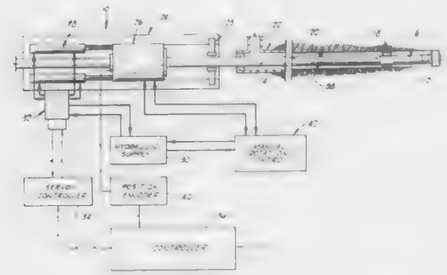
(a) a drill rod having a drill bit;

(b) a bent-sub connected with said drill rod behind said drill bit to position said drill bit to extend angularly with respect to said drill rod;

(c) means for exerting thrust along the axis of said drill rod on said drill bit;

(d) means for rotating said drill rod and said drill bit; and

(e) means for controlling said means for exerting thrust, comprising means for selectively exerting thrust on said drill bit along said drill rod at predetermined angular positions of the drill bit as said drill rod rotates.



9. A method for controlling directional drilling of a bit on the end of a drillstring, comprising the steps of:

(a) providing a drill rod with a drill bit and bent-sub;

(b) rotating said drill rod; and

(c) selectively exerting thrust forces along the axis of the drill rod at predetermined angular positions of the drill bit as the drill rod rotates for changing the direction of drilling.

4,995,466

METHOD AND DEVICE FOR STABILIZING THE PATH OF A DRILLING TOOL

Roy W. Snow, Jr., 2409 Oakhollow Dr., Newcastle, Okla. 73102

Filed Dec. 22, 1989, Ser. No. 455,976
Int. Cl.[5] E21B *7/10, 7/08*
U.S. Cl. 175—61 **7 Claims**



1. An apparatus for use in a drill string having a drilling fluid passageway inserted into a borehole to stabilize the path of travel of a drilling tool in a borehole attached to the lower end of the drill string, comprising:

a tubular section secured in the drill string having a passageway therethrough communicating with the drilling fluid passageway through the remainder of the drill string, and having an outer wall essentially circular in cross section;

a sleeve telescoped over said tubular section having at least two camming surfaces on the outer periphery thereof substantially on opposite sides of the sleeve and spaced longitudinally along the sleeve; and

means for selectively controlling rotation of the sleeve on the tubular section comprising:

at least one shoe carried by the tubular section; and

means for urging the shoe into frictional engagement with the inner periphery of the sleeve comprising:

at least one recessed portion in the outer periphery of the tubular section sized to receive the shoe;

at least one reservoir in the recessed portion sized to receive a spring; and

said spring disposed in the reservoir capable of urging the shoe into frictional engagement with the inner periphery of the sleeve,

wherein the shoe is disposed in the recessed portion.

7. A method for stabilizing a path of travel of a drilling tool in a borehole, the drilling tool being attached to a lower end of a drill string having a drilling fluid passageway therethrough, comprising:

attaching an apparatus to the drill string wherein the apparatus has a first end and a second end, the first end being attached to a portion of the drill string, wherein the apparatus comprises:

a tubular section secured in a portion of the drill string having a passageway therethrough communicating with the drilling fluid passageway, and having an outer wall essentially circular in cross section;

a sleeve telescoped over said tubular section having at least two camming surfaces on the outer periphery thereof substantially on opposite sides of the sleeve and spaced longitudinally along the sleeve; and

means for selectively controlling rotation of the sleeve on the tubular section comprising:

at least one shoe carried by the tubular section; and

means for urging the shoe into frictional engagement with the inner periphery of the sleeve, comprising:

at least one recessed portion in the outer periphery of the tubular section sized to receive the shoe;

at least one reservoir in the recessed portion sized to receive a spring; and

said spring disposed in the reservoir capable of urging the shoe into frictional engagement with the inner periphery of the sleeve; and

attaching the second end of the apparatus to one of another drill string terminating in a drilling tool or a drilling tool;

inserting the drilling tool, apparatus and at least a portion of the drill string into the borehole; and

rotating the drilling tool, apparatus and drill string thereby drilling a path of travel,

wherein the camming surfaces are capable of contacting walls of the borehole when the drilling tool deviates from a substantially straight bath of travel realigning the path of travel in the drilling tool in a substantially straight path of travel.

4,995,467

METHOD AND APPARATUS FOR WEIGHING AND DISPENSING OBJECTS

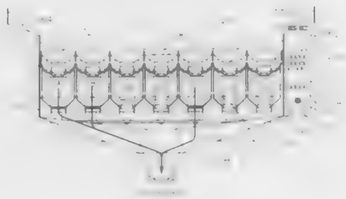
Gary O. Niemann, 3204 E. Lake Hartridge Dr., Winter Haven, Fla. 33880

Filed Jun. 9, 1989, Ser. No. 363,931
Int. Cl.[5] G01G *13/16*
U.S. Cl. 177—25.18 **15 Claims**

4. Apparatus for supplying a combination of objects having an optimum weight comprising a plurality of lanes, each of said lanes being for receiving a group of said objects, means for supplying each of said lanes with a predetermined number of

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said objects, means for weighing each of said groups of objects in each of said lanes, means for determining the combination of



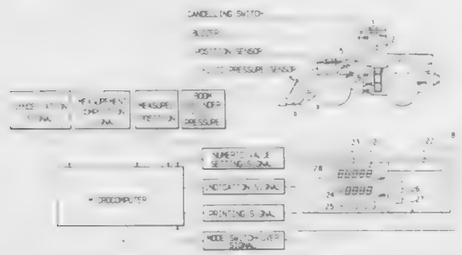
said groups having an optimum weight, and means for releasing said combination of groups for collection.

4,995,468

LOAD WEIGHT MEASURING SYSTEM MOUNTED ON A CONSTRUCTION MACHINE

Masao Fukuda, Kawagoe, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP87/00942, § 371 Date Jun. 2, 1989, § 102(e) Date Jun. 2, 1989, PCT Pub. No. WO88/04413, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 4, 1987, Ser. No. 368,325
Claims priority, application Japan, Dec. 4, 1986, 61-287590
Int. Cl.[5] G01G *19/08, 19/10*
U.S. Cl. 177—139 **2 Claims**



1. A load weight measuring system mounted on a construction machine of the type which includes a boom operative by fluid pressure in a boom actuating cylinder which controls said boom having a load-transferring member connected thereto, comprising:

a boom position sensor for sensing a position of said boom;

a boom actuating cylinder fluid sensor for sensing boom cylinder pressure in said boom actuating cylinder;

a first weight indicating unit for indicating the weight of a load actually laded on a loadable vehicle by said construction machine each time as a cumulative measured load weight;

a second weight indicating unit for indicating a substracted weight as the weight obtained by substracting the current cumulative measured load weight from a preset weight of the load to be laded thereon to define the weight of the load which can be laded further on said loadable vehicle by said construction machine; and

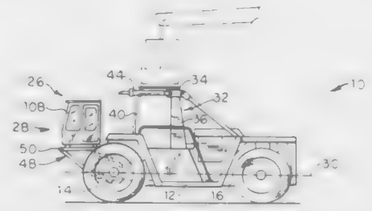
controlling means for controlling the weight indication in the first and second weight indicating units using at least the fluid pressure in the boom actuating cylinder and the boom position as detecting elements, whereby the weight of the load actually loaded by the load-transferring member of said construction vehicle is measured and compared by computation with a preset weight of the load to be laded thereon thereby to indicate the weight of the remaining load which can be further laded thereon so that overloading thereof can be prevented.

4,995,469

OPERATOR'S STATION MOUNTING ARRANGEMENT AND METHOD

Jan Mikkelsen, Borre, and Kjell Sorlie, Tonsberg, both of Norway, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Sep. 25, 1989, Ser. No. 412,048
Int. Cl.[5] B62D *33/063, 33/077*
U.S. Cl. 180—89.13 **13 Claims**



1. A mounting arrangement for facilitating the positioning of an operator's station on the frame of a work vehicle at a plurality of elevationally spaced apart positions relative to a longitudinal axis of the work vehicle comprising:

a first frame having a supporting portion and being connected to the vehicle frame, said supporting portion being spaced a first preselected elevational distance from the longitudinal axis and defining a first position at which the operator's station is supportable;

a second frame having a supporting portion and being connectable to the vehicle frame, said second frame supporting portion being elevationally spaced from said first frame supporting portion and defining a second elevational position at which the operator's station is supportable;

connecting means for connecting said operator's station to the supporting portion of the first and second frames;

a lift mast assembly;

means for releasably connecting a selected one of the lift mast assembly and the second frame to the vehicle frame, said lift mast assembly and second frame each having first and second spaced apart flanges and an aperture disposed through each of said flanges, said releasable connecting means including;

a first pair of spaced apart ears connected to the vehicle frame, said ears each having an aperture and said apertures being axially aligned;

a second pair of spaced apart ears connected to the vehicle frame; said second pair of ears each having and aperture and said apertures of the second pair or ears being axially aligned, said first flange being disposable between the ears of the first pair or ears and said second flange being disposable between the ears of the second pair of ears;

a first shaft disposable in the apertures of the first pair of ears and the first flange; and

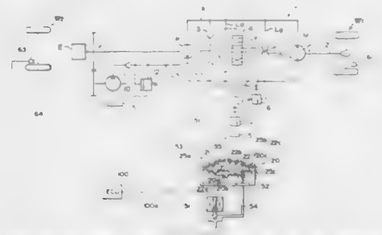
a second shaft disposable in the apertures of the second pair of ears and the second flange.

4,995,470

CONTROL APPARATUS FOR HYDRAULIC CONTINUOUSLY VARIABLE SPEED TRANSMISSION

Kouji Yamaguchi, Saitama, and Kazuya Maki, Aichi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,877
Claims priority, application Japan, Oct. 22, 1987, 62-267436
Int. Cl.[5] B60K *17/10*
U.S. Cl. 180—197 **9 Claims**



1. A control apparatus for a continuously variable speed transmission for a vehicle having a hydraulic pump connected to an engine, a hydraulic motor connected to driving wheels, and a hydraulic closed circuit hydraulically connecting said hydraulic pump with said hydraulic motor, said hydraulic closed circuit comprising a first hydraulic line through which a delivery port of said pump communicates with a suction port of said motor and a second hydraulic line through which a suction port of said pump communicates with a delivery port of said motor, at least one of said hydraulic pump and said hydraulic motor being a variable displacement type,

the control apparatus comprising:

a slip detecting means for detecting slip of the driving wheels driven by said hydraulic motor, and

hydraulic control means for lowering hydraulic pressure in said hydraulic closed circuit in accordance with a magnitude of the slip detected by said slip detecting means, in such a way that driving force applied to said driving wheels is reduced so as to be less than a slip limit force, the slip of said driving wheels being increased when the driving force applied to said driving wheels exceeds said slip limit force.

4,995,471

AIR CLEANER AND CARBURETOR LAYOUT FOR MOTORCYCLES

Naoki Hara, and Nobuo Yamaguchi, both of Asaka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 814,548, Dec. 30, 1985, Pat. No. 4,815,554. This application Feb. 3, 1989, Ser. No. 306,739
Claims priority, application Japan, Jan. 17, 1985, 60-4346
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] B60K *13/02, 13/04;* **B62K** *25/20;* **F02B** *61/02*
U.S. Cl. 180—219 **3 Claims**

1. In a motorcycle having a rear wheel, a pivotally mounted power unit rotatably mounting the rear wheel about a rotational axis and comprising:

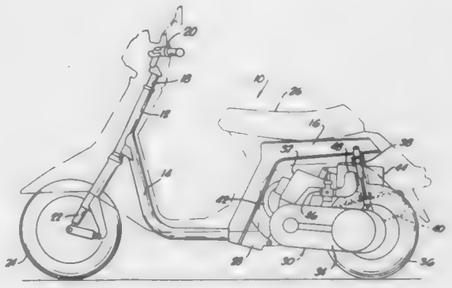
an engine;

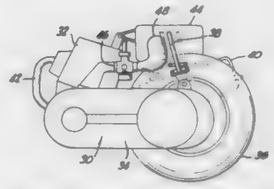
a power train disposed both forwardly of and to one side of the rear wheel to operatively couple said engine to the rear wheel;

a muffler extending rearwardly from the engine and disposed on the other side of the rear wheel from said power train;

a carburetor coupled with said engine;

an air cleaner having an air flow passage communicating with said carburetor, said air cleaner being superposed above said muffler;





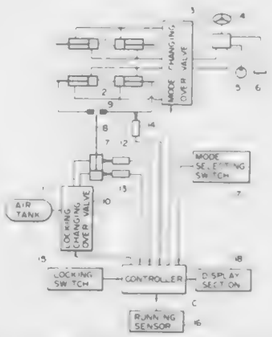
a connecting tube extending between said carburetor and said air cleaner and extending above and forwardly of the rotational axis of the rear wheel.

4,995,472

STEERING CONTROLLING DEVICE FOR WHEEL CRANE

Norihiko Hayashi; Tsuyoshi Katada, both of Kakogawa, and Yukio Koizumi, Akashi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 17, 1989, Ser. No. 437,740
Claims priority, application Japan, May 11, 1989, 1-54626[U]
Int. Cl.[5] B60K *17/358*
U.S. Cl. 180—234 **2 Claims**



1. A steering controlling device for a wheel crane, comprising a front wheel steering cylinder for steering front wheels of said wheel crane, a rear wheel steering cylinder for steering rear wheels of said wheel crane, a mode changing over valve for controlling operation of said front and rear wheel steering cylinders and comprising means to change over a steering mode between a normal steering mode in which only said front wheels are steered and a special steering mode in which at least said rear wheels are steered, a mode selecting switch for selecting one of the normal steering mode and the special steering mode, a locking device comprising means for locking said rear

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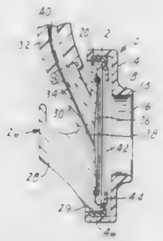
wheels from operation in the normal steering mode, a locking switch comprising means for selecting one of a locking operation and an unlocking operation of said locking device, a running detecting means for detecting which one of a normal running condition and a stopping or a low speed running condition said crane is in, a locking change-over controlling means operable in response to a signal from said locking switch and to a signal from said running detecting means that the crane is only in a stopping or a low speed running condition for forwarding an instruction signal for one of a locking operation and an unlocking operation to said locking device when said crane is not in the normal running condition, and a mode change-over controlling means responsive to a signal from said running detecting means for forwarding a steering mode selected by said mode selecting switch to said mode changing over valve only when said crane is not in the normal running condition.

4,995,473

STETHOSCOPE WITH DIAPHRAGM HEAD ADAPTER

Thomas J. Packard, Somerset, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1989, Ser. No. 454,178
Int. Cl.[5] A61B 7/02
U.S. Cl. 181—137 21 Claims



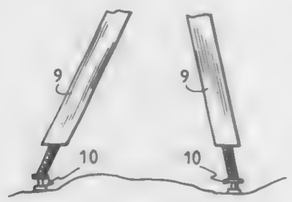
1. A stethoscope head, comprising:
a body surrounded by a releasable engagment perimeter,
a diaphragm residing in said body and having a sound receiving surface area within said perimeter, and
an adapter releasably engaging said perimeter, said adapter comprising a perimeter engaging edge portion, a cover portion extending from said edge portion, and a rim at which said cover portion terminates to define a central opening having an area less than said sound receiving surface area.

4,995,474

SAFETY LADDER

Edward Gauthier, 38 Colorado St., Springfield, Mass. 01118

Filed Jan. 22, 1990, Ser. No. 467,400
Int. Cl.[5] E06C 7/44
U.S. Cl. 182—201 8 Claims



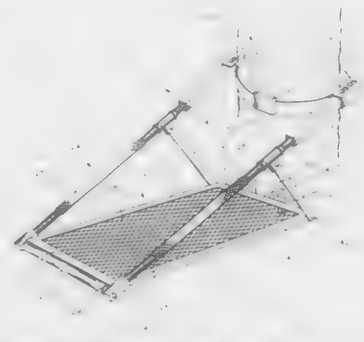
1. An adjustable ladder, comprising:
(a) at least two legs each of which containing a smooth longitudinal blind bore;
(b) a steel hollow pipe having an outer surface and being smoothly disposed in said longitudinal blind bore while providing additional strength to said at least two legs;
(c) a rod disposed concentrically in said steel hollow pipe and vacillating up and down therein without any hindrance so that its ease of operation is increased;
(d) a solid piece of steel drilled and tapped so as to contain a throughbore that will accommodate said steel hollow pipe; and
(e) a flat steel plate affixed to said solid piece of steel and containing a skewly drilled hole so that said skewly drilled hole lines up with said outer surface of said steel hollow pipe.

4,995,475

HUNTER'S PORTABLE TREE STAND

Ronald L. Berkbuegler, 209 E. Marceau, St. Louis, Mo. 63111

Filed Oct. 13, 1989, Ser. No. 421,401
Int. Cl.[5] A45F 3/26; A47C 9/10
U.S. Cl. 182—187 13 Claims



1. A hunter's portable tree stand comprising:
an elongated platform having a front end and a rear end;
a pair of laterally spaced support arms each having a front end and a rear end;
means pivotally securing the front ends of said support arms to the front end of the platform;
a pair of laterally spaced upright brace members each having a top end and a bottom end, the bottom ends of said brace members being adjustable and connected to the rear end of the platform, the top ends of said brace members being connected to the rear ends of said support arms by a pivot pin; and
a clamping yoke that passes around the trunk of a tree and it has opposite ends that are detachably connected to the respective rear ends of said support arms;
said support arms each including means for selectively adjusting angle of the platform with respect to the trunk of the tree while said support arms continuously support the front end of the platform and the weight of a hunter thereon.

4,995,476

SAFETY ATTACHMENTS FOR LADDERS

Robert J. Buck, Box 263, St. Marys, W. Va. 26170

Filed May 21, 1990, Ser. No. 525,990
Int. Cl.[5] E04C 7/48
U.S. Cl. 182—206 9 Claims

1. A safety attachment for a ladder adapted to clamp the ladder to a utility pole or the like comprising a support mount adapted to be secured to rails of the ladder, a channel member carried by said mount and having convergent flanges with spaced apart end portions, bearing blocks fixed in said channel member adjacent opposite ends of said channel member, a screw shaft rotatably mounted in said respective bearing

blocks, said shaft including a right hand threaded portion and a left hand threaded portion and a stop element centrally fixed therebetween a right hand threaded guide block operatively disposed on said right hand threaded portion of said shaft and a left hand threaded guide block operatively disposed on said right hand threaded portion whereby rotation of said shaft causes axial movement of said guide blocks toward and away from each other, a pole engaging arm on each guide block for



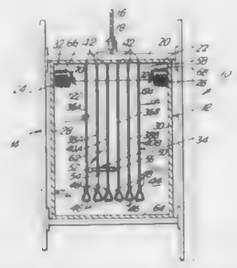
movement therewith, said shaft having a free end extending beyond its adjacent bearing block so as to be outside of the ladder rail, a pulley fixed on said free end; and a rope looped over said pulley and having end portions extending toward the bottom of the ladder whereby an operator at the bottom of the ladder may rotate said pulley and said shaft for movement of said guide blocks causing said arms to release and engage the pole.

4,995,477

SAFETY DEVICE FOR ELEVATORS

Ann Perricone, 6802 Ridge Blvd., Brooklyn, N.Y. 11220

Filed Mar. 1, 1990, Ser. No. 487,155
Int. Cl.[5] B66B 9/00
U.S. Cl. 187—1 R 12 Claims



1. A safety device for elevators which can support passengers above a floor of an elevator car, said device comprising:
at least one overhead panel extending across an upper portion of the elevator car to provide an overhead compartment within the elevator car;
a plurality of rope-like means for supporting the passengers above the floor of the elevator car when said one overhead panel is in an opened position;
said rope-like means being stored within said overhead compartment prior to use thereof when said one overhead panel is in a closed position;
each of said rope-like means having one end secured to a roof of the elevator car within said overhead compartment, and having an opposite free end provide with foot means for supporting a passenger's foot;
opening means for opening said one overhead panel so that said rope-like means are released from said overhead compartment and said free ends of said rope-like means with said foot means thereon fall into an internal space of the elevator car occupied by the passengers; and
actuating means disposed within the elevator car at a selected position below said one overhead panel within reach of the passengers for actuating said opening means for opening said one overhead panel;
whereby one of the passengers activates said actuating means to actuate said opening means to open said one overhead panel so that said free ends of said rope-like means fall into the internal space of the elevator car to permit the passengers to step into said foot means to raise themselves above the elevator car floor

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4,995,478

START COMPENSATION DEVICE FOR ELEVATORS

Kenji Oshima, Narita, and Yasutami Kito, Tokyo, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 20, 1989, Ser. No. 340,987
Claims priority, application Japan, Apr. 21, 1988, 63-99227
Int. Cl.[5] B66B 1/30
U.S. Cl. 187—115 1 Claim



1. A start compensation device for an elevator motor controller performing start compensation by detecting a load of a passenger cage and adding a compensation signal corresponding to the detected load to a torque command signal, the elevator start compensation device comprising:
a load sensor, for providing a load detection signal indicative of the load upon the elevator car;
a speed sensor for providing a speed signal proportional to a rotating speed of the elevator motor;
a speed command circuit, responsive to direction indicating command signals, for providing a speed command signal for commanding lifting and lowering of the elevator car at a selected speed;
an automatic speed control amplifier, responsive to a signal having a magnitude indicative of a difference between said speed command signal and said speed signal, for providing a torque command signal;
a static frictional torque compensator, responsive to said load detection signal and to said direction indicating command signals, for determining a static frictional torque according to the magnitude of the load and the direction of hoisting, for providing a compensation signal corresponding to said static frictional torque;
a first summing means for adding said load detection signal to said compensation signal and providing a load-boosted compensation signal; and
a second summing means for adding said load-boosted signal to said torque command signal and providing a load-boosted compensated torque signal for driving said elevator motor.

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4,995,479

DISPLAY GUIDE APPARATUS OF ELEVATOR AND ITS DISPLAY METHOD

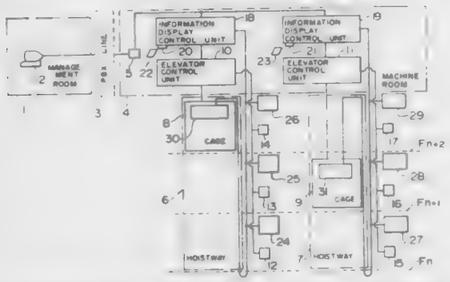
Michio Fujiwara; Hiroshi Matsumaru, both of Katsuta; Yasushi Kobayashi, Yokohama; Yoshio Sakai, Ibaraki; Kenzi Yoneda, Katsuta; Osamu Dohi, Katsuta, and Akihiko Noguchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,308

Claims priority, application Japan, Mar. 9, 1988, 63-53539; Apr. 25, 1988, 63-100351

Int. Cl.[5] B66B *3/00*

U.S. Cl. 187—135 24 Claims



1. An elevator display guide apparatus comprising an elevator control unit, an information production unit and an information display control unit, said elevator display guide apparatus displaying running information of an elevator and general information on display units at least disposed in halls according to a running situation of the elevator, wherein:

the information display control unit is so configured that an auxiliary memory medium storing information required to display the running information of the elevator may be mounted thereon;

the information display control unit derives information required to display the running information of the elevator from said auxiliary memory medium;

the information display control unit derives information required to display general information from the information production unit; and

the running information of the elevator and general information are displayed on display units at least disposed in halls according to information relating to the running situation of the elevator derived from the elevator control unit.

4,995,480

VEHICLE BRAKE

Roger J. Hazelden, Redditch; Ian J. Sheppard, Kenilworth, and Philip A. Taft, Cheswick Green, all of Great Britain, assignors to Lucas Industries public limited company, Birmingham, England

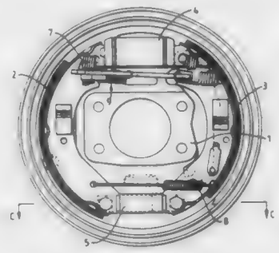
Filed Mar. 9, 1990, Ser. No. 491,098

Claims priority, application United Kingdom, Mar. 17, 1989, 8906137

Int. Cl.[5] F16D *66/00*

U.S. Cl. 188—1.11 11 Claims

1. A vehicle brake comprising a relatively fixed torque-bearing member carrying at least one friction element and an actuator operable to urge said element into braking engagement with a rotatable braking surface, deflectable means arranged in the force transmission path between said element and the torque-bearing member so as to be subject to torque arising on said element during braking and deflectable by load arising from said torque, radiation input means arranged to direct radiation at a surface on said deflectable means and means arranged to sense radiation which has impinged on said surface and to transmit the sensed radiation to means producing a



responsive electrical output representing deflections of said portion.

4,995,481

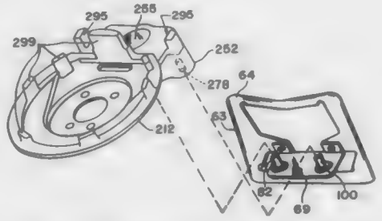
INTEGRATED DISC BRAKE AND DRUM BRAKE CONSTRUCTION

Robert B. Temple, and James J. Colpaert, both of Granger, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 240,661, Sep. 6, 1988, abandoned, which is a division of Ser. No. 73,923, Jul. 15, 1987, Pat. No. 4,784,241, which is a continuation-in-part of Ser. No. 911,836, Sep. 26, 1986, abandoned. This application Oct. 23, 1989, Ser. No. 425,459

Int. Cl.[5] F16D *63/00*

U.S. Cl. 188—70 R 4 Claims



1. A support member connected with a vehicular axle and providing support for a disc and drum brake, said support member extending radially outwardly to a piston housing integral with said support member, characterized in that the piston housing has at least one through opening receiving therein piston means and the housing having blind bores extending therein, the disc brake comprising an axially movable yoke member having load bearing pin means connected thereto and extending into said bores for slidable movement relative to said housing and providing means for transmitting service braking torque from a yoke carried first brake pad to said housing and support member, the support member extending into a central opening of the yoke member to provide radial and circumferential support portions for a second brake pad, and the support member extending axially to provide an anchor plate for drum brake shoes of said drum brake, the support member, housing, and anchor plate comprising an integral member of a combined disc and drum brake construction such that service braking torque is transmitted to the housing and support member and parking brake torque from the drum brake shoes is received by the support member through the anchor plate.

4,995,482

DISC BRAKE

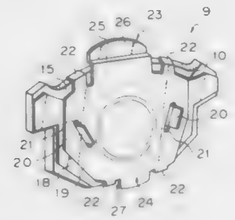
Kinzo Kobayashi, Kanagawa; Shinichi Nakayama, and Shigeo Suzuki, both of Yamanashi, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 360,868, Jun. 2, 1989. This application Jan. 23, 1990, Ser. No. 468,909

Claims priority, application Japan, Jun. 14, 1988, 63-78529; Oct. 19, 1989, 65-122565

Int. Cl.[5] F16D *65/847*

U.S. Cl. 188—73.1 4 Claims



1. A disc brake comprising:

a carrier member;

a disc;

a pair of friction pads respectively disposed on each side of said disc,

said friction pads slidably supported by said carrier member to allow sliding in the axial direction of the disc, one of said friction pads having a backing member;

a caliper straddling the disc and slidably mounted to said carrier to allow sliding in the axial direction of the disc, said caliper having at least a cylinder portion;

a piston slidably mounted in said cylinder portion of said caliper to allow sliding in the axial direction of the disc,

said piston facing said one of said friction pads at the side thereof remote from said disc;

a boot means for shielding a sliding contact area defined between said piston and said cylinder portion;

a shim means disposed between said piston and said backing member of said one of said friction pads; and

a shielding plate formed integrally with said shim means and located between said disc and said boot means,

said shielding plate having a first portion axially extending from said shim toward said disc and a second portion radially outwardly extending from the extension of said first portion.

4,995,483

MOTOR POSITION FEEDBACK CONTROLLED ELECTRICALLY ACTUATED AIRCRAFT BRAKE

Douglas D. Moseley, Uniontown, and Edgar J. Ruof, Akron, both of Ohio, assignors to Aircraft Braking Systems Corporation, Akron, Ohio

Filed Dec. 18, 1989, Ser. No. 451,691

Int. Cl.[5] B60T *13/24*

U.S. Cl. 188—162 12 Claims

1. An electrically controlled brake actuator for an aircraft multi-disk brake assembly comprising in combination:

a reciprocating drive mechanism operatively mounted to effect brake clearing and release of the multi-disk brake through a pressure plate of the assembly, the drive mechanism converting a rotational motion of one of its members to an axial translation of another member which is positioned for contacting engagement with the brake pressure plate;

gear drive means operatively mounted in association with the reciprocating drive mechanism to effect rotation of the one member;

an electrically responsive torque motor operatively mounted to work the gear drive means;

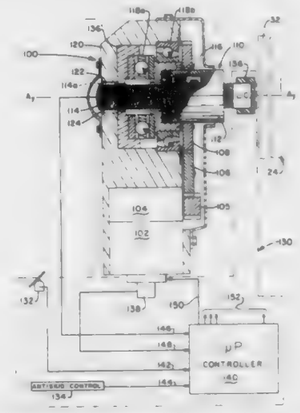
means operatively mounted in association with the torque motor to provide an electrical signal indicative of the motor rotor position at any instant in time;

means operatively mounted in association with the reciprocating drive mechanism to provide an electrical signal indicative of the initiation of a brake clamping force on the multi-disk brake;

means providing an electrical signal indicative of a pilot's command for wheel braking;

means providing an electrical signal indicative of brake release for antiskid braking; and

a microprocessor controller including a counter calibrated to the number of torque motor rotor revolutions required



to move the axially translating member of the reciprocating drive mechanism an axial distance equal to one-hundred percent brake clamping, said controller adapted to receive the signals indicative of (i) the motor rotor position, (ii) the initiation of brake clamping, (iii) a pilot's command for braking, and (iv) brake release for antiskid braking, to provide an output feedback signal to the torque motor which effects an adjustment of the motor position, in revolutions, to increase or decrease brake clamping in accordance with the pilot's command for braking and to effect brake release in accordance with an overriding command for antiskid braking.

4,995,484

BRAKE DISCS OR BRAKE DRUMS

Karl Kadel, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 386,235

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1988, 3826063

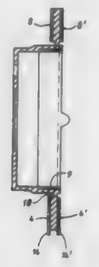
Int. Cl.[5] C23F *15/00*; F16D *65/12*

U.S. Cl. 188—218 R 11 Claims

1. Spare part element, comprising at least one of a brake disc and a brake drum which are provided with rotationally symmetrical braking surface areas, wherein, in a braking surface region of the braking surface areas, there is adhered to the

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braking areas at least one peelable piece cut to size from a sheet of material and completely covering the braking surface area,



said peelable piece having an anti-corrosive coating applied thereto so as to cover completely said spare part element.

4,995,485

SEALING STRUCTURE OF AN ACCUMULATOR

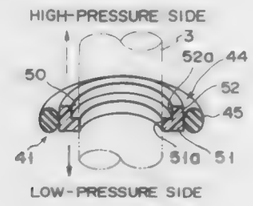
Kouji Nakamura, and Mamoru Akeda, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jul. 27, 1989, Ser. No. 386,567

Claims priority, application Japan, Aug. 5, 1988, 63-103983[U]

Int. Cl.[5] F16F *9/36*

U.S. Cl. 188—322.17 **10 Claims**



1. A sealing structure of an accumulator which comprises a housing, having a closed end and an open end and containing a hydraulic fluid therein, and a rod adapted to be inserted into the housing through the open and thereof, the rod having an outer peripheral surface, said sealing structure being located at that portion of the accumulator where the rod is inserted into the housing,

said sealing structure comprising:

a high-pressure sealing device situated at a position near to the open end of the housing;

a low-pressure sealing device disposed between the high-pressure sealing device and the open end of the housing;

said high-pressure sealing device including:

(A) a seal ring disposed in the vicinity of the open end of the housing and having a substantially L-shaped section at each circumferential part thereof, the seal ring including a thin wall portion situated on the high-pressure side and a thick wall portion situated on the low-pressure side, the thin and thick wall portions having respective inner peripheral surfaces, the inner peripheral surface of the thick wall portion being in contact with the outer peripheral surface of the rod so that a gap for the hydraulic fluid is defined between the inner peripheral surface of the thin wall portion and the outer peripheral surface of the rod;

(B) seal retaining means attached to the housing and including an annular groove containing the seal ring, the annular groove having a bottom; and

(C) an O-ring interposed between an outer peripheral surface of the seal ring and the bottom of the annular groove so as to be in intimate contact with the outer peripheral surface of the seal ring and the bottom of the annular groove, throughout the circumference thereof;

drain means connected between the high- and low-pressure sealing devices; and

a hydraulic power unit means, coupled to the drain means, for replenishing the liquid chamber of the housing with hydraulic fluid recovered by means of the drain means.

4,995,486

IMPACT ABSORBER FOR A MOTOR VEHICLE

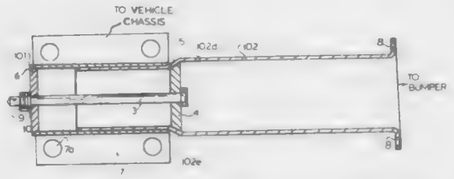
Peter Garneweidner, Salzburg, Austria, assignor to Austria Metall Aktiengesellschaft, Salzburg, Austria

Filed Sep. 28, 1989, Ser. No. 414,143

Claims priority, application Austria, Sep. 28, 1988, 2394/88

Int. Cl.[5] F16F *7/12*

U.S. Cl. 188—374 **1 Claim**



1. An impact absorber for a motor vehicle comprising:

an outer tube and at least one inner tube, said inner tube having a small diameter portion received in said outer tube and a large diameter portion disposed outside said inner tube at one end thereof, said large diameter portion having an outer diameter greater than an inner diameter of said outer tube at said end, whereby upon the application of a collision force axially to said tubes, said tubes are telescopingly contracted by permanent deformation of at least one of said tubes as said large diameter portion is driven into said outer tube, said inner tube being formed with a transition region of conical configuration between said large diameter portion and said small diameter portion of said inner tube;

means confining a space between said tubes which is reduced inn volume upon telescoping contraction of said tubes;

an elastic material received in said space;

means providing a circumferential reinforcement bracing one of said tubes at said transition region, thereby confining deformation to the other of said tubes;

said reinforcement being a member received in said inner tube and braced against an inner surface of said transition region; and

bolt means bracing said member against said outer tube, said outer tube being provided with a further member braced against an end thereof opposite said first mentioned end and said bolt bridges said members and draws said members together.

4,995,487

WHEELED SUITCASE AND LUGGAGE SUPPORT

Robert V. Plath, 3030 NE. 44th St, Lighthouse Point, Fla. 33064

Filed Aug. 8, 1989, Ser. No. 390,960

Int. Cl.[5] A45C *5/14, 13/30, 13/38*

U.S. Cl. 190—18 A **14 Claims**

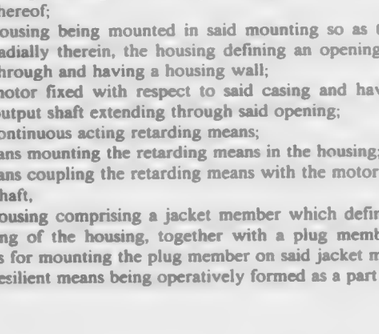
1. A wheeled suitcase and luggage support comprising:

a body portion

a plurality of roller type wheels partially recessed within said body portion,

a generally U-shaped handle having a means for gripping said handle and having two essentially parallel spaced elongated rod members, said rod members each having an axial center line and being slidably retractable between an extended and a retracted position within said body portion,

a locking means for said U-shaped handle comprising means inside said body portion for receiving said rod members of said handle, and a pair of guides, one each attached to the lowermost end of each of said rod members, said guides



being offset with respect to the axial centerline of said rod members of said U-shaped handle, said guides causing said rod members to frictionally engage said means for receiving whereby said handle remains in any position with respect to said body portion that the user places it in between said extended and retracted position of said handle.

4,995,488

CONTROL DEVICE FOR A COUPLING MEANS SUCH AS A CLUTCH

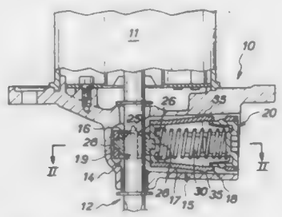
Patrice Bertin, Mery-Sur-Oise, and Yvon Sévénnec, Vernouillet, both of France, assignors to Valeo, Paris, France

Filed Jan. 16, 1990, Ser. No. 464,928

Claims priority, application France, Jan. 18, 1989, 89 00534

Int. Cl.[5] F16D *23/12, 49/16*

U.S. Cl. 192—1.1 **10 Claims**



1. A servo control device for a torque coupling means, said control device comprising:

a casing defining a mounting defining an internal surface thereof;

a housing being mounted in said mounting so as to float radially therein, the housing defining an opening therethrough and having a housing wall;

a motor fixed with respect to said casing and having an output shaft extending through said opening;

a continuous acting retarding means;

means mounting the retarding means in the housing; and

means coupling the retarding means with the motor output shaft,

the housing comprising a jacket member which defines said opening of the housing, together with a plug member and means for mounting the plug member on said jacket member, and resilient means being operatively formed as a part on one of said housing or said mounting for biasing said housing against said mounting.

4,995,489

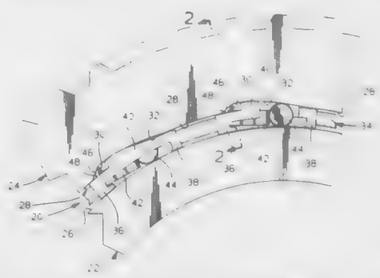
ROLLER CLUTCH WITH SIMPLIFIED INSTALLATION

Frederick E. Lederman, Sandusky, and Albert D. Johnston, Huron, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1990, Ser. No. 570,652

Int. Cl.[5] F16D *41/07, 15/00*

U.S. Cl. 192—45 **2 Claims**



1. A roller clutch cage adapted for installation to a cam race having a plurality of evenly spaced cam hooks, each of which slopes in one circumferential direction, said cage comprising,

a plurality of evenly spaced planar reaction faces, each sloping in the same direction as, and shaped to conform closely to, a respective cam hook, and,

at least one lead in ramp axially adjacent to a respective reaction face and sloped axially toward, and in the same circumferential direction as, said reaction face, and terminating at the plane of said reaction face,

whereby, said cage may be installed by moving it coaxially toward said cam race and indexing it progressively until said lead in ramp engages a cam hook, after which continued axial movement only of said cage acts to slide said cam lead in ramp along said cam hook, thereby twisting said cage in said one circumferential direction until said reaction faces register with said cam hooks.

4,995,490

ROLLER-SYNCHRONIZED ONE-WAY CLUTCH ASSEMBLY

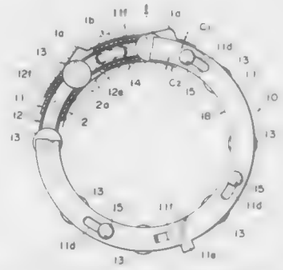
Kenichi Kanai, Chigasaki, Japan, assignor to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 173,398, Mar. 25, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 405,093

Claims priority, application Japan, Mar. 25, 1987, 62-69167

Int. Cl.[5] F16D *41/07*

U.S. Cl. 192—45 **13 Claims**



1. A roller-synchronized one-way clutch assembly, comprising:

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a ring-shaped first retainer element;

a ring-shaped second retainer element operatively coupled to said first retainer element to thereby define a retainer sub-assembly such that said second retainer element may move relative to said first retainer element in a circumferential direction over a predetermined range;

a plurality of rollers supported by said retainer sub-assembly and arranged spaced apart from one another in a circumferential direction; and

urging means having a first end connected to said first retainer element and a second end connected to said second retainer element for normally urging said first and second retainer elements to move in opposite directions in the circumferential direction, said urging means being located substantially in a circumference defined by said plurality of rollers and wherein said urging means comprises a pair of discrete springs, each spring being disposed between a pair of adjacent ones of said plurality of rollers.

4,995,491

POWER TRANSMISSION APPARATUS

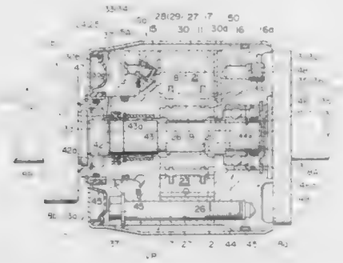
Takeo Hiramatsu, Nagaokakyo; Kenjiro Fujita, Kusatsu; Yoshimasa Nagayoshi, Kyoto; Yoshiaki Hamasaki, and Satoshi Kawai, both of Minamiku, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Koyo Seiko Kabushiki Kaisha, both of, Japan

Filed Dec. 6, 1988, Ser. No. 280,409

Claims priority, application Japan, Dec. 8, 1987, 62-310472; Jun. 7, 1988, 63-140117

Int. Cl.[5] F16D *31/00*

U.S. Cl. 192—58 R **10 Claims**



1. A power transmission apparatus suitable for use in a four-wheel drive vehicle having a pair of front wheels and a pair of rear wheels, comprising a first rotary shaft to be connected to one pair of wheels, a second rotary shaft to be connected to the other pair of wheels and a hydraulic transmission coupling mechanism of the vane pump type including a cam ring connected to the first rotary shaft, a rotor connected to the second rotary shaft and accommodated for rotation in said cam ring to define a pump chamber therebetween, a pair of side plates closing the axial opposite ends of said cam ring and each having a through-hole formed therein through which said second rotary shaft extends, said pump chamber containing working fluid therein, said power transmission apparatus being designed to transmit driving force between said first and second rotary shafts in accordance with a pressure of the working fluid in said pump chamber which is produced in response to rotation of said first and second rotary shafts relative to each other, and a frictional force applying mechanism interposed between said first and second rotary shafts for applying predetermined frictional force between said first and second rotary shafts;

wherein said frictional force applying mechanism comprises an annular friction face, an annular friction member, and an annular spring member for biasing said friction member toward said friction face;

wherein said annular friction member is mounted on said second rotary shaft for contacting with said annular friction face formed either on one of said side plates or on a member integral with one of said side plates along a circumferential direction of said second rotary shaft;

wherein said friction member is mounted for axial sliding movement on and integral rotation with said second rotary shaft and said annular spring member is securely mounted on said second rotary shaft; and

wherein said friction face is formed on an annular friction plate mounted on an end face adjacent said first rotary shaft of the one side plate adjacent which said first rotary shaft is connected to said hydraulic transmission coupling mechanism, and said annular spring member is securely mounted at an end of said second rotary shaft adjacent said first rotary shaft by means of a bolt.

4,995,492

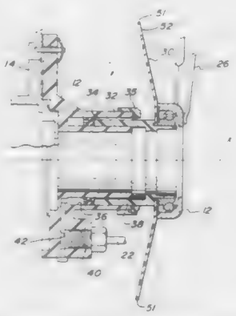
REUSABLE POSITION RETAINING STRAP FOR CLUTCH RELEASE MECHANISM

Bryce W. Babcock, Saline; Daniel F. Kiblawi, Rochester Hills, and Eugene A. Wolbers, Northville, all of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Oct. 10, 1989, Ser. No. 418,615

Int. Cl.[5] F16D *25/08, 23/14;* **F15B** *15/26;* **B65D** *63/00*

U.S. Cl. 192—85 CA **19 Claims**



1. A reusable retaining strap for shipment and installation of a hydraulic actuator and clutch release bearing assembly having a housing defining a cavity and a movable piston received in the cavity, said strap being unbreakable by movement of said piston and comprising:

at least one arm member including means at its forward end for connecting said arm member to said movable piston;

reusable anchoring lugs provided on said arm member at its distal end for connecting said arm member to said housing both before and after operation of said clutch release bearing assembly; and

said arm member having preferential flexing regions at said distal end for providing bending relief, said flexing regions being unbreakable by movement of said piston so as to allow said anchoring lugs to shift position relative to each other upon extension of the piston from said cavity to release said arm member from said housing without breaking said strap.

4,995,493

ROBOT TOOL CHANGER AND OVERLOAD DEVICE

David N. Cotsman, Southfield; John Kovach, Utica; Dante C. Zuccaro, Allenton, and Frank J. Kudwa, Swartz Creek, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1990, Ser. No. 487,520

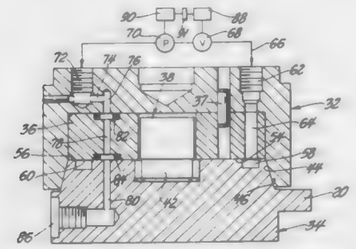
Int. Cl.[5] B25J *17/00, 19/00*

U.S. Cl. 192—150 **10 Claims**

1. A robot tool changer and overload device having a robot connectible first plate and an end of arm tooling device connectible second plate and a magnet means for producing a magnetic force for holding the first and second plates together characterized by:

means forming coacting inclined surface means on said first and second plates defining a pivot point for separation of said first and second plates when a moment is applied therebetween of a magnitude to overcome the magnet force therebetween; said coacting inclined surface means having a depth and an included inclination angle formed acutely with respect to the longitudinal axis through said first and second plates to produce pivoting of one of said first and second plates through an acute angle corresponding substantially to that of said included angle to release said first and second plates when an overload occurs so as to release all force on the robot by complete separation of said first and second plates; and

release means for imposing a release force between said first and second plates to produce separation between said first and second plates independently of the imposition of any overload moment thereon to allow movement of said first plate with respect to said second plate in a Z axis direction without imposing any load on the robot during such movement.



4,995,494

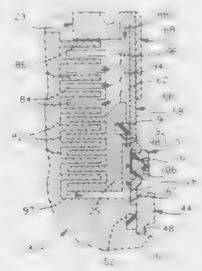
PRESSURE-RESPONSIVE FLUID CHECK VALVE AND METHOD FOR VISCOUS FLUID CLUTCH

Lawrence C. Kennedy, Kettering, and Ronald G. Huth, Huber Heights, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 355,535, May 22, 1989, Pat. No. 4,924,987. This application Dec. 29, 1989, Ser. No. 459,406

Int. Cl.[5] F16D *35/00*

U.S. Cl. 192—58 B **14 Claims**



1. A pump plate assembly for separating a pumping chamber and a reservoir of a viscous fluid clutch, wherein the pumping chamber receives fluid from a shear zone, the pump plate assembly comprising:

(a) a plate member having a front surface in communication with the reservoir and a rear surface in communication with the pumping chamber; and

(b) pressure-responsive fluid control means mounted on the pump plate, the fluid control means including

(i) a resilient body,

(ii) a chamber provided in the body having an inlet in communication with the pumping chamber, and

(iii) a pair of convergent side walls in the chamber terminating in a normally-closed outlet in communication with the reservoir;

whereby when a predetermined fluid pressure is reached in the pumping chamber, the side walls are forced apart to open the outlet, and when the fluid pressure falls below the predetermined level, the side walls return to their original position to close the outlet.

4,995,495

CRUDE OIL EMULSION TREATING APPARATUS

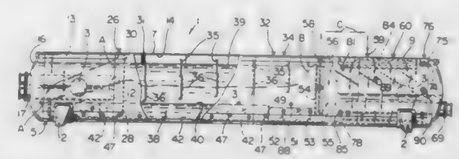
Stephen V. Krynski, Calgary, Canada, assignor to HTI Technology Canada Ltd., Calgary, Canada

Filed Mar. 16, 1990, Ser. No. 494,442

Claims priority, application Canada, Apr. 7, 1989, 596112

Int. Cl.[5] C10G *33/00;* **B01D** *19/00*

U.S. Cl. 196—46 **5 Claims**



1. An apparatus for treating crude oil comprising casing means; first partition means separating the interior of said casing means into a treating section and a flashing section; inlet pipe means in said casing means for introducing crude oil into the treating section of said casing means; first heater means in said treating section for reducing the viscosity of the crude oil; first baffle means in said treating section for facilitating the separation of water and gas from the oil; gas outlet means in said casing means for discharging gas from said treating section; desand means in said casing means for discharging sand from said treating section; water outlet means in said casing means for discharging water from said treating section; first trough means proximate said first partition means in said treating section for receiving at least partially desanded and dewatered crude oil; oil outlet means for feeding oil from said trough means to said flashing section; oil inlet means in said flashing section of said casing means; second baffle means in said flashing section for distributing oil in said flashing section; second trough means in said flashing section of said casing means for receiving oil introduced through said oil inlet means from said first trough means and discharging the oil to said second baffle means; second heater means in said flashing section for vaporizing water remaining in said oil; vapor outlet means in said casing means for discharging water vapor from said flashing section; and treated oil outlet means in said casing means for discharging treated oil from said flashing section.

4,995,496

APPARATUS FOR PROTECTING AN EXTERNAL MECHANISM

Constantine Xigas, Dianella, Australia, assignor to Xigas Holdings Pty. Ltd., Dianella, Australia

Filed Jun. 23, 1989, Ser. No. 371,224

Claims priority, application Australia, Jun. 23, 1988, PI8933

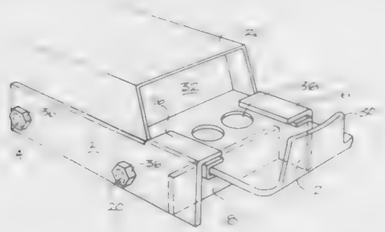
Int. Cl.[5] G07F *9/00*

U.S. Cl. 194—350 **3 Claims**

1. An apparatus for protecting a coin insertion mechanism arranged to be attached to a housing having a front and a pair of sides with the coin insertion mechanism projecting from the front of the housing, said apparatus comprising a pair of spaced, substantially parallel flat plates each having respective, opposed first and second ends, said second ends spaced from said housing with a spacer extending between the plates adja-

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cent the opposed second ends thereof so as to secure the plates together and to hold them apart by a predetermined distance, a respective flange on each plate located adjacent the second end thereof and projecting towards the flange on the opposed second end of the other plate a limited distance such that a slot



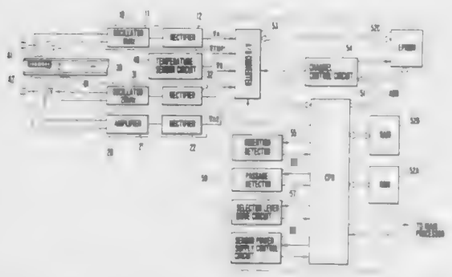
is disposed between inner ends of the flanges, the spacer being spaced from and located below the flanges so that a coin insertion mechanism can be disposed between the plates below the flanges and above the spacer, the plates being provided with means arranged to fix rigidly the plates to the sides of the housing.

4,995,497

COIN DISCRIMINATION APPARATUS

Osamu Kai; Masaaki Tsukada, and Hiroshi Tachibana, all of Tokyo, Japan, assignors to Tamura Electric Works, Ltd., Japan

Filed Jun. 30, 1987, Ser. No. 68,563
Claims priority, application Japan, Jul. 21, 1986, 61-171419
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—318 7 Claims



1. A coin discrimination apparatus which determines authenticity and a denomination of a coin by oscillating magnetic fields of high and low frequencies in a low frequency band in which the generated magnetic fluxes pass through a coin, comprising:

first and second oscillators, for generating low and high frequency signals, the frequencies of both said signals being within a low frequency band whereby fields generated from said signals pass through coins;

a first oscillation coil, arranged at a coin contact surface of an inclined coin path, and connected to said first oscillator for generating an oscillating magnetic field at said low frequency, the impedance of said first oscillator coil changing upon the passage of a coin, said change being indicative of a material characteristic of a coin;

a reception coil arranged at a non-contact surface of said inclined coin path and facing said first oscillation coil for sensing changes in said low frequency oscillating magnetic field upon the passage of a coin;

a second oscillation coil, which is arranged on the coin non-contact surface and separated from the reception coil by a predetermined distance in a coin rolling direction, and connected to said second oscillator for generating an oscillating magnetic field at said high frequency, the impedance of said second oscillation coil changing upon the passage of a coin, said change being indicative of said coin's thickness;

maximum change detecting means for detecting respective values in relation to maximum values of said changes in impedances and fields of said oscillation coils and said reception coil upon passage of a coin;

change detecting means for detecting a value in relation to changes in impedances of said first and second oscillation coils when the changes in the impedances thereof coincide with each other as an indication of coin diameter; and

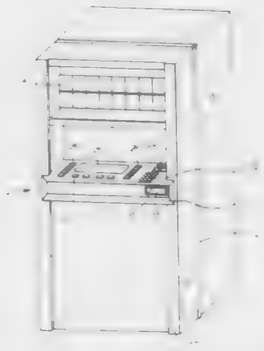
discriminating means for determining authenticity and the denomination of the coin based on coin physical characteristics in accordance with the detection results from said maximum change detecting means and said change detecting means.

4,995,498

RENTAL AND VENDING MACHINE, PARTICULARLY FOR VIDEO CASSETTES, AND CASSETTE CASE FOR VIDEO CASSETTES

Wilhlem Menke, Wiesbaden, Fed. Rep. of Germany, assignor to NSM Apparatebau GmbH & Co. KG, Bingen, Fed. Rep. of Germany

PCT No. PCT/DE87/00496, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO88/03688, PCT Pub. Date May 19, 1988
PCT Filed Nov. 5, 1987, Ser. No. 353,670
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637894; Jan. 28, 1987, 3702407
Int. Cl.[5] G07F *7/08*
U.S. Cl. 194—205 22 Claims



1. Rental and vending machine, particularly for video cassettes, the machine comprising: a cabinet-like housing, two oppositely disposed compartmented arrangements accommodated in the housing for storage of cassette cases containing the video cassettes; a computer controlled cassette transporting device including a horizontal guide and a vertical guide with associated drive motors along which the device can be moved between the two compartmented arrangements to receive cassette cases and to transport them from and to a certain storage compartment and an inserting/dispensing chute, respectively, in the housing; a reading device for reading identification codes which characterize the cassettes; an operating field for selection of the desired cassette and for requesting and loading a cassette, said operating field being attached to the exterior of the housing and including input keys and a display; a cassette transporting carriage which is movable within the housing together with the horizontal or vertical guide and is adjustable in the vertical and horizontal directions with the drive motors being actuable simultaneously in the horizontal and in the vertical directions; and two push-pull mechanisms

comprising gripper arms provided opposite one another at the cassette transporting carriage for transporting a cassette case from a storage compartment or from the inserting/dispensing chute, respectively, into the cassette receiving area of the cassette transporting carriage and vice versa, said gripper arms being movable from a rest position in the cassette transporting carriage in the direction of the respective storage compartment or inserting/dispensing chute, respectively, wherein the two opposing push-pull mechanisms are attached to the cassette transporting carriage so as to face one another and each gripper arm is configured as an articulated lever having a cam-like profile with a recess and a protuberance, sam cam-like profile being contacted by a switch shaft to control said lever so that, if a cassette case is taken from a storage compartment or from the inserting/dispensing chute, a pivoting movement cases one of its recesses to engage in a corresponding opening in the cassette case and, if a cassette case is transported into a storage compartment or to the inserting/dispensing chute, a protuberance on said lever lies against the frontal face of the cassette case.

4,995,499

METHOD AND APPARATUS FOR REDUCING THE VELOCITY OF PARTICULATE MATTER

Lloyd G. Berquist, Rte. One, Box Fifty-Four, Loomis, Nebr. 69958

Filed Dec. 15, 1989, Ser. No. 451,130
Int. Cl.[5] B65G *11/20*
U.S. Cl. 193—32 14 Claims



1. An apparatus for reducing the velocity of a stream of a flowable substance falling in a downwardly inclining conduit, comprising,

a flowable substance braking chamber, having

an inlet port adapted for accepting a flowable substance from a conduit, and

an outlet port adapted for discharging a flowable substance,

a curvilinear support surface having opposing ends connected to said ports,

said curvilinear support surface including an ascending arcuate portion between said inlet port and said outlet port, and

said curvilinear support surface decreasing incrementally between said inlet and outlet port so as to form a spiral providing both the upper and lower surfaces of said braking chamber whereby the velocity of a stream of said flowable substance is reduced before discharge to prevent damage to said flowable substance.

4,995,500

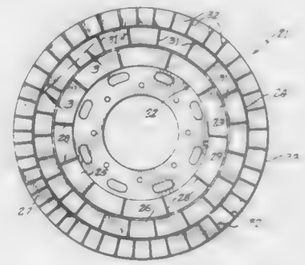
GROOVE PATTERN FOR HIGH THERMAL CAPACITY WET CLUTCH

Parviz Payvar, Wilmette, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 16, 1986, Ser. No. 907,937
Int. Cl.[5] F16D *13/64, 13/74*
U.S. Cl. 192—107 R 8 Claims

1. A friction facing for a wet clutch plate comprising an annular facing having inner and outer diameters and a facing surface grooved to receive cooling oil, the improvement comprising that the grooving has a pattern including an annular groove intermediate the inner and outer diameters dividing said surface into two annular bands, and a plurality of radial grooves in each band connecting said annular groove with the inner or outer diameter of said facing, said radial grooves in the inner band being out of radial alignment with the radial grooves of the outer band, the depth of the radial grooves in the outer band is less than that for the radial grooves of the inner band.

8. A friction facing for a wet clutch plate comprising an annular facing having inner and outer diameters and a facing



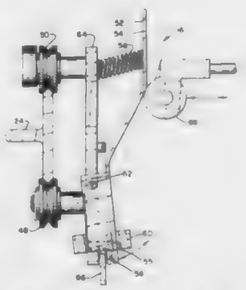
surface grooved to receive cooling oil, the improvement comprising that the grooving has a pattern including an annular groove centrally disposed between said inner and outer diameters dividing said surface into two annular bands, and a plurality of radial grooves in each band connecting said annular groove and the inner or outer diameter of said facing, said radial grooves in the inner band being out of radial alignment with the radial grooves of the outer band, the number of radial grooves in the outer band exceeding the number of radial grooves in the inner band, and the radial grooves in each band are substantially circumferentially equally spaced.

4,995,501

TRANSPORT SYSTEM AND METHOD FOR EMBOSSING APPARATUS

Robert W. Lundstrom, Plymouth; Benjamin H. Sannel, St. Louis Park, and Dennis J. Warwick, Richfield, all of Minn., assignors to DataCard Corporation, Minneapolis, Minn.

Filed Nov. 23, 1988, Ser. No. 276,233
Int. Cl.[5] B65G *49/00*
U.S. Cl. 198—341 25 Claims



1. A card handling and transport system for transporting cards from an input to an output along a card transport path extending from the input to the output, comprising:

a plurality of spaced apart locations defined along the card transport path having card processing stations associated with the spaced apart locations placed along the card transport path, wherein the card processing station performs processing operations on plastic cards at the spaced apart locations, the card processing stations being remov-

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able for varying the card processing without changing the card transport path;

card transporting means for carrying the card along the card transport path through the card processing stations, the card transporting means comprising card retaining means for retaining the card continuously while transporting the card along the card transport path, and motive means for advancing the card retaining means along the card transport path, wherein the card retaining means comprises a card carriage having a plurality of card grippers, each card gripper mounted on an associated pivoting arm, each arm being positioned by an associated compression spring biasing the arm toward a closed position for pressing the gripper against a card and pushing the card against a backing plate, thereby securing the card; and

programmable control means for positioning the card transporting means and for stopping the retained cards at selected locations for performing selected processing operations, the selected locations corresponding to the associated card processing stations.

4,995,502

PALLET CHANGER

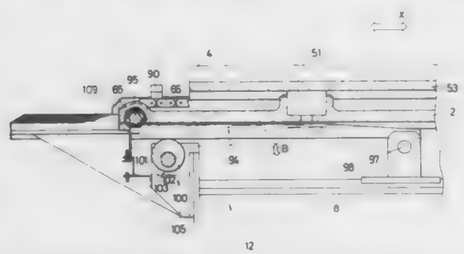
Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan

Filed Oct. 11, 1989, Ser. No. 419,953

Claims priority, application Japan, Oct. 17, 1988, 63-259395

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—346.1 **8 Claims**



1. A pallet changer including a support (1), a table (2) movable on the support (1) along one direction, a plurality of pallets (4, 14) each for holding a workpiece, a drive means (3) for moving the table (2) along the one direction, a transfer means (12) for moving the pallet (4, 14) along the one direction relative to the table (2) when the table (2) is moved by the drive means (3), the transfer means (12) comprising:

a pinion shaft (95) rotatably mounted on the table (2), the pinion shaft (95) having sprockets (65) at the opposite ends thereof and a pinion (96) at an intermediate portion thereof;

a rack member (94) movably mounted on the support (1);

a rack member displacing means (100) mounted on the support (1) for moving the rack member (94) between a first position wherein the rack member (94) can engage the pinion (96) and a second position wherein the rack member (96) can disengage the pinion (96);

counter sprockets rotatably mounted on the table (2) each cooperating with the sprocket (65) of the pinion shaft (95);

chains (66) each placed between the sprocket (65) and the counter sprocket (64); and

engaging means (67) for detachably engaging the chains (66) and the pallet (4, 14), the engaging means (67) including chain hooks (90) fixed to the chains (66) and pallet hooks (63, 91) fixed to the pallet (4, 14),

wherein, when the rack member (94) is in the first position to engage the pinion (95) and the chain hook (90) engages the pallet hook (63), the table (2) is moved along the one direction by the drive means (3) so that the pinion (95) is rotated and moved along the one direction relative to the rack member (94), whereby the sprockets (65) and the chains (66) are rotated so that the pallet (4, 14) is moved along the one direction relative to the table (2) by drive force of the drive means (3).

4,995,503

STARWHEEL CAP SELECTING APPARATUS

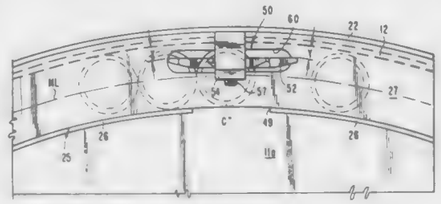
S. Neal Graham, 12997 Fauns Ridge, Fishers, Ind. 46038, and Thomas E. Terry, 328 N. West St., Tipton, Ind. 46072

Continuation of Ser. No. 198,831, May 26, 1988, Pat. No. 4,895,243. This application Nov. 1, 1989, Ser. No. 430,496

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—392 **6 Claims**



1. An apparatus for feeding caps, comprising:

a disk rotatable about its normal axis and having a peripheral portion and a working surface;

means for containing caps disposed on said disk during rotation of said disk, each of said caps having a closed end and an open end;

primary cap selecting means for selecting properly oriented caps from a procession of caps rotating with said disk at said peripheral portion and for ejecting improperly oriented caps onto said working surface;

secondary cap selecting means, rotationally downstream from said primary cap selecting means, for engaging every cap passing said primary selecting means such that properly oriented caps are permitted to pass said secondary selecting means and improperly oriented caps are ejected from said peripheral portion, said secondary cap selecting means including self-clearing means for interrupting said procession of caps at said secondary cap selecting means as said disk is rotating by restraining the downstream rotation of an improperly oriented cap, whereby the interrupted procession of caps exerts pressure on said improperly oriented cap sufficient to urge said improperly oriented cap from said peripheral portion onto said working surface, and further whereby said procession of caps past said secondary cap selecting means resumes when said improperly oriented cap is urged from said peripheral portion; and

a stationary discharge chute intersecting said peripheral portion for feeding properly oriented caps after they have passed said secondary cap selecting means.

4,995,504

DEVICE FOR STRAIGHTENING ARTICLES SUCH AS LETTERS AND SIMILAR FLAT TRANSPORTED ARTICLES

Werner Kühn, Konstanz, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt, Fed. Rep. of Germany

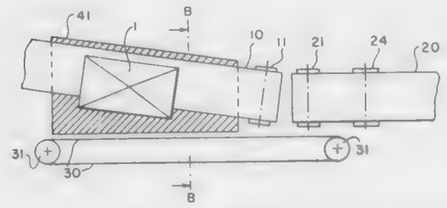
Filed Nov. 4, 1987, Ser. No. 117,240

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709659

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—408 **4 Claims**

1. A device for straightening and feeding articles such as a letter in a mail handling station, comprising a bottom endless conveyor having an upper reach over which the articles are moveable, a free wheeling conveyor section adjacent said bottom endless conveyor comprising a pair of conveyor belts arranged side by side and between which the article is supported and being moveable through a substantially vertical



plane which extends toward said bottom conveyor, a guide plate behind each conveyor belt having a lower portion of a configuration and position such that it extends substantially up to the adjacent conveyor belt, and parallel to the direction of movement of said free wheeling conveyor section, said guide plate having a width substantially equal to the thickness of the associated conveyor belt.

4,995,505

TRANSFER METHOD AND DEVICE AND DRIVING SYSTEM THEREFOR FOR TRANSFER PRESSES

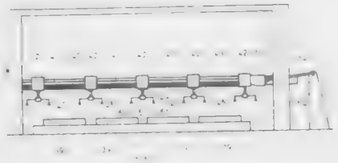
Yoshio Takahashi; Mitsuo Sudo, both of Yokohama; Takamasa Arikawa, Kawasaki; Kenji Nakamura, Kamakura; Izumi Sato, Yokosuka; Katsuyuki Onogi, Yokohama; Takao Iura, Yokosuka, and Nobuji Ishida, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Oct. 20, 1988, Ser. No. 260,449

Claims priority, application Japan, Oct. 31, 1987, 62-276589; Nov. 13, 1987, 62-287011; Nov. 20, 1987, 62-293203; Nov. 20, 1987, 62-177373; Nov. 20, 1987, 62-177370; Nov. 20, 1987, 62-177372; Dec. 29, 1987, 62-198888; May 9, 1988, 63-112090

Int. Cl.[5] B65G *25/04*

U.S. Cl. 198—468.4 **2 Claims**



1. A driving system for driving a transfer device for transfer presses comprising

a transfer lever swingably movable about a pivot shaft by a transfer cam,

a lift link rotatably attached to an upper end portion of said transfer lever with a horizontal shaft,

a lift lever carried by said pivot shaft and swingable by a lift cam, and

a lift rod connecting said lift lever with said lift link in parallel with a line interconnecting said pivot shaft and said horizontal shaft, said lift rod being equal in length to said interconnecting line.

4,995,506

CONVEYOR INCLUDING AN ENDLESS FLEXIBLE CONVEYING ELEMENT AND A TENSIONING DEVICE FOR THE CONVEYING ELEMENT

Markus Langenbacher, Kornwestheim, and Gernot Maier, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

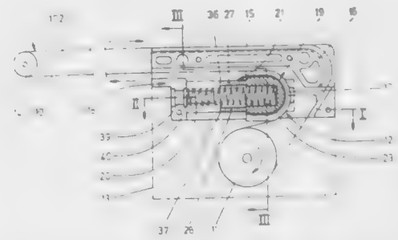
PCT No. PCT/DE87/00541, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/07489, PCT Pub. Date Oct. 6, 1988

PCT Filed Nov. 21, 1987, Ser. No. 427,856

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710044

Int. Cl.[5] B65G *23/44*

U.S. Cl. 198—814 **8 Claims**



1. A conveyor comprising an endless flexible conveying element; means for driving said conveying element; means for reversing a direction of movement of said conveying element; and at least one means for tensioning said conveying element, said tensioning means including a housing having opposite side walls, each of said opposite side walls having a longitudinal inner edge; a tensioning element engaging the conveying element and formed as a carriage displaceable between said opposite side walls; a tension spring for biasing said tensioning element into engagement with said conveying element; and a unidirectional blocking mechanism including a first group of stationary locking teeth formed in said housing and a second group of locking teeth connected with said carriage for joint displacement therewith, each tooth of said first and second groups of teeth having a lateral side which extends transverse to a direction of displacement of said carriage at an acute angle to a tensioning direction of said carriage, and a manual unlocking key supported on said carriage and carrying said second group of locking teeth, said manual unlocking key being laterally movable relative to a displacement direction of said carriage; one of said side walls defining a longitudinal guide having an opening, said tensioning device further comprising a pressure spring supported in said carriage for biasing said unlocking key in a direction transverse to the displacement direction of said carriage outward through said opening in said longitudinal guide; said first group of locking teeth including two laterally spaced rows of locking teeth formed on the inner longitudinal edge of said one side wall, said carriage having a side surface facing said two rows of locking teeth of said first group of locking teeth, and a recess, said unlocking key having a transverse web engaged in said recess, and said second group of locking teeth comprising at least two spaced locking teeth formed on said transverse web for engaging said two rows of locking teeth of said first group of locking teeth, respectively.

4,995,507

TICKET DISPENSING STRUCTURE

Christopher E. Schafer, R.R. 2, Adair, Iowa 50002

Filed Dec. 16, 1988, Ser. No. 285,682

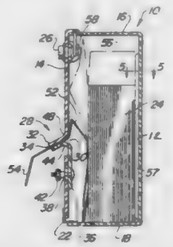
Int. Cl.[5] B65D *83/12, 35/07*

U.S. Cl. 206—39.7 **2 Claims**

1. A dispenser for series-connected tickets comprising a structure having front, rear, side, top and bottom walls for containing a quantity of such tickets, means in the rear wall

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providing a transverse ticket-exit slot through which the tickets are extracted via rearwardly directed manual force applied to the leading ticket, said rear wall being movable away from the remainder of the structure to provide access to the interior of the structure, means for selectively connecting and disconnecting the rear wall to and from the remainder of the structure and including a security lock cooperative between the rear



wall and another wall of the structure, said lock including a portion extending into the interior of the structure in spaced relation to the ticket-exit slot and exposed to the quantity of tickets within the structure, and deflector means integral with and projecting inwardly from the rearwall adjacent to the interior portion of the lock for preventing tickets form engaging the interior portion of the lock.

4,995,508

DISPLAY CASE FOR SPORTSCARDS

David A. Burley, 2505 Wisconsin Ave., N. Muskegon, Mich. [illegible]

Filed Jan. 10, 1990, Ser. No. 462,488
Int. Cl.[5] G09F *1/10*; B65D *1/34*
U.S. Cl. 206—44 B **5 Claims**



1. A tray comprising a plurality of cassette box lids, means for fastening the lids together so that each lid in a longitudinal row is placed upside down and overlaps an adjacent lid at an approximately forty five degree angle to form a plurality of pockets.

4,995,509

DISPLAY TOOTHBRUSH SANITIZING AND STORAGE DEVICE

Joseph Kornfeind, 124 Hillcrest Dr., Coplay, Pa. 18037

Filed Apr. 30, 1990, Ser. No. 516,543
Int. Cl.[5] B65D *25/20*
U.S. Cl. 206—209.1 **5 Claims**

1. A disposable device for simultaneously storing and cleaning a toothbrush, said toothbrush having an end body portion and bristles affixed to said end body portion comprising:

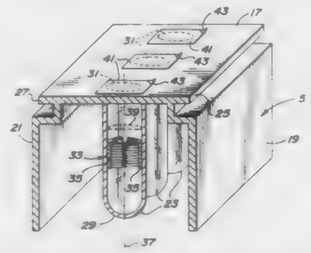
a. a first support means for supporting the device on a surface;

b. a disposable toothbrush storage means removably mounted on the first support means, for receiving one or more toothbrushes;

c. said toothbrush storage means comprising one or more downwardly extending tubular toothbrush receptacles, each receptacle further comprising;

i. a closed bottom end and an open top end;

ii. bristle means within each receptacle, having oppositely spaced, flexibly deformable bristle arms extending in-



wardly to meet at about a vertical centerline of said receptacle, for continuously contacting the bristles and end body portion of a toothbrush during insertion and withdrawal of a toothbrush into said receptacle;

iii. Liquid disinfectant within each receptacle to a level to substantially cover said bristle means; and

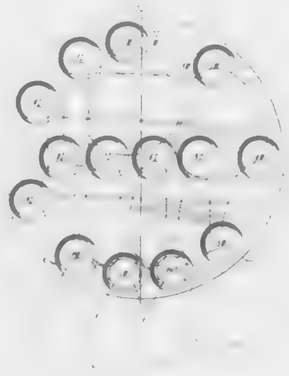
iv. a strippable cover means secured to the open end of each receptacle, for retaining the disinfectant therein, until a toothbrush is inserted into said receptacle.

4,995,510

CLUB-SEPARATING INSERT SYSTEM FOR GOLF BAGS

Carl C. Fletcher, Jr., 717 Winding Way, Bartlesville, Okla. [illegible]

Filed Mar. 21, 1985, Ser. No. 714,479
Int. Cl.[5] A63B *35/00*
U.S. Cl. 206—315.6 **7 Claims**



1. A process of designing and producing a club-separating insert system for a golf bag to arrange a set of golf clubs in a pattern of groups convenient for normal play and to provide maximum effective clearance between the heads of said clubs when inserted in said bag, comprising the steps of:

(a) projecting the plan view contour of each club head onto a horizontal plane and determining the locus of maximum expected rotation movement of each said contour in a horizontal plane when said clubs are inserted vertically into suitable apertures,

(b) determining the vertical height of each club head from the end of the club handle,

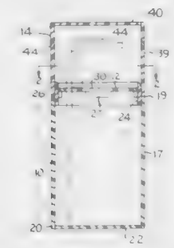
(c) preparing at least one insert for said golf bag containing a plurality of apertures for each golf club of the set, said apertures being positioned in groups and spaced within groups at intervals, at least some of which non-uniform, so as to maximize the effective clearance between the club heads while said golf bag is in use, as determined by the lateral and vertical separation between said club heads and the rotational and vertical motion of said club heads while said golf bag is in use, and to group together the types of clubs most often used in each phase of play.

4,995,511

TOOTHBRUSH AND TOOTHPASTE HOLDER

Marilyn B. Evans, 200 W. Arbor Vitae #10, Inglewood, Calif. 90301

Filed Jun. 1, 1990, Ser. No. 531,759
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—362.1 **3 Claims**



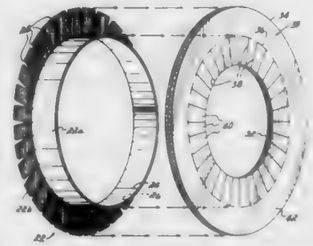
1. A free-standing covered container for storing toothbrushes, comprising a first elongated plastic tube having an upper end and a lower end; a flat plastic walls element closing the lower end of said tube; a second relatively short plastic tube telescopically inserted into the upper end of the first tube, said second tube having an outer surface adhesively secured to the inner surface of said first tube, said second tube having an upper end extending above the upper end of the first tube so that an outer side surface of the second tube is exposed; a multiple number of ledge elements secured to the inner surface of said second tube at regularly-spaced points therearound; a flat plastic plate removably fitting within the second tube on the ledge elements; said plastic plate having a centrally located hole therethrough adapted to accommodate the fingers of a person's hand for removing the plate from within the second tube; said plate having a multiple number of openings located near its peripheral edge and adapted to individually receive the handle portions of toothbrushes, whereby the brush portions of the toothbrushes are located above the plate; and a cover for the container, said cover comprising a third plastic tube having the same diameter as the first tube, and a second flat plastic wall element closing one end of said third tube with the other end left open; said cover being adapted to have its other end inserted onto the container so that an inner surface of the third plastic tube is in frictional facial contact with the exposed side surface of the second tube; said third plastic tube having an outer side surface that forms a smooth planar continuation of the outer surface of the first tube when the cover is positioned on the container; and a multiple number of vent slots extending through the wall of the third plastic tube, each vent slot extending angularly through the tube wall, each vent slot being narrower than the wall thickness of the third plastic tube so that the slots are relatively inconspicuous.

4,995,512

INTERIOR CORE PROTECTOR

Henry L. Liebel, Cincinnati, Ohio, assignor to Shippers Paper Products Company, Loveland, Ohio

Filed Jun. 5, 1990, Ser. No. 533,460
Int. Cl.[5] B65D *85/66*
U.S. Cl. 206—396 **9 Claims**



1. An interior core protector for positioning about the inner circumference of a coil of material having a core to protect the material from damage, comprising:

a rigid preformed angle having a first leg and a second leg generally at right angles one to another and a pair of opposed ends,

said first leg being bendable whereby said opposed ends may be brought together to form an annulus,

said second leg having a plurality of spaced cuts therein extending from the apex of said right angle to the outer edge thereof,

the length of said angle being such that the diameter of said annulus is substantially at least as great as the diameter of the core,

the spaces between said cuts in said second leg widening on bending of said first leg permitting bending of said angle to conform to the circumference of the core,

an annular retainer disk having an inner diameter, an outer diameter, and an intermediate diameter therebetween, said intermediate diameter defining an annular fold line equal in diameter substantially to the diameter of the annulus formed by said first leg of said rigid preformed angle and substantially to the diameter of said core,

said disk having a plurality of spaced cuts therein extending from said inner diameter to said intermediate diameter,

said disk being receivable on said first leg of said preformed angle when said first leg is bent to an annulus, the material between said spaced cuts in said disk being folded to a right angle to lie against said first leg of said angle, the material between said intermediate diameter and said outer diameter lying against said second leg of said angle so that when said interior core protector is operatively positioned in a coil of material the space between each cut in said second leg of said angle is covered by said disk and the space between each cut in said disk is covered by said first leg of said angle to provide protection for the coil of material around substantially the entire circumference of the core.

4,995,513

CONTAINER FOR OBLONG ARTICLES

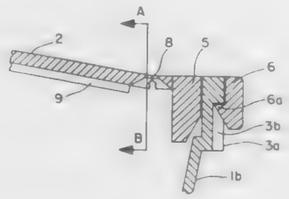
Peter Rösler, Wangen, Fed. Rep. of Germany, assignor to Rose-Plastic GmbH, Hergensweiler, Fed. Rep. of Germany

Filed Apr. 12, 1990, Ser. No. 508,935
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 8904671[U]
Int. Cl.[5] B65D *85/24*
U.S. Cl. 206—446 **12 Claims**

1. In a container for oblong articles, the container including a lower part having a bottom wall, two side walls extending from the bottom wall and diverging at the same angle and two end walls extending from the bottom wall and connecting the

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side walls, the end walls and the side walls having upper edges, the container further including a cover for closing the opening formed by the upper edges of the side walls and the end walls, the cover having an inner surface facing the lower part and a longitudinal axis, the cover being attached through a hinge at one of the end walls, the, cover being pivotable between a closed position and an open position, the cover being in a locking engagement with the end wall opposite the hinge when the cover is in the closed position, the improvement comprising the end walls of the lower part diverging from the bottom wall essentially at the same angle as the side walls, each side wall having above half the height thereof and at an outer surface thereof a projecting wall portion which defines two lateral projections which extend downwardly from the upper edge, of the end wall and a recess, with upper sides defined between the projections, the upper sides of the recess being spaced from the upper edge of the end wall, a tongue extending upwardly from the upper edge of each end wall in a middle portion thereof above the recess, the cover having at both ends



thereof a web which projects essentially perpendicularly from the inner surface of the cover and extends transversely of the longitudinal axis of the cover, wherein, when the container is closed, a wall surface of the web facing the end wall is in contact with an inner surface of the end wall of the lower parts, the cover additionally having at each end and at the inner surface thereof and outwardly in longitudinal direction of the cover from the web a flange which projects essentially perpendicularly and extends parallel to the web, the flange being of resilient or flexible material and, when the cover is in the closed position, a wall surface of the flange facing the interior of the lower part being in contact with outer surfaces of the wall portions projecting from the end walls, the flange having a projecting nose directed toward the end wall of the lower part, the nose being movable into the recess defined between the lateral projections for obtaining a locking engagement with the upper side of the recess, and a slot being defined in the cover between each rib and flange for receiving the tongues which project upwardly from the upper edge of the end wall.

4,995,514

METHOD AND MEASUREMENT SYSTEM FOR THE PRODUCTION OF GARMENT KITS

Horst Forschner, Scheffelstrasse 4, D-8011 Kircheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 115,007, Oct. 28, 1987, Pat. No. 4,860,900. This application Apr. 13, 1989, Ser. No. 337,357

Int. Cl.[5] **A41H** *3/08;* **B65D** *85/00*

U.S. Cl. 206—574 **20 Claims**

1. A process for the manufacture of industrially prefabricated garment kits, the garment kits being for the self-assembly of garments by consumer-wearers, said garment kits for being made in a range of sizes, each of said sizes within said range of said sizes having a corresponding plurality of measurements associated therewith, said process comprising the steps of:

dividing said range of said sizes into a plurality of subranges of said sizes, said subranges of said sizes being consecutive and, in total, covering said range of said sizes;

each of said subranges of said sizes extending over a plurality of said sizes, and at least two of said consecutive subranges of said sizes overlapping such that each of said at least two consecutive overlapping subranges of said sizes encompass at least one common size;

selecting, for each of said subranges of said sizes, at least one of said corresponding plurality of measurements to be common to each of said plurality of sizes over which said each subrange of said sizes extends;

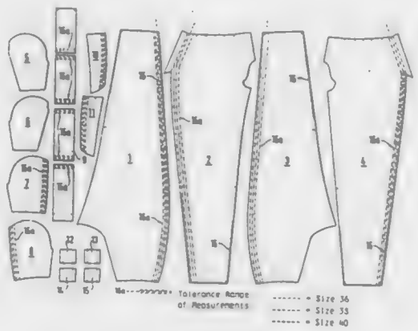
dimensioning a fabric according to said corresponding plurality of measurements of at lest one of said sizes, including said common measurement; and

marking the fabric with sizing indicia according to said corresponding plurality of measurements of at least one of said sizes, including said common measurement.

10. A process for the manufacture of industrially prefabricated fabric garment kits, said garment kits being for the self-assembly of garments by consumer-wearers, said garment kits for being manufactured from fabric in a limited plurality of sizes, each of said limited plurality of sizes being determined by a corresponding plurality of measurements, said process comprising the steps of:

selecting at least one measurement of each said corresponding plurality of measurements to be common to each of said limited plurality of sizes;

dimensioning a fabric according to at least one of said corresponding plurality of measurements of at least of said sizes, including said common measurement; and



marking said fabric with sizing indicia corresponding to said corresponding plurality of measurements of said limited plurality of sizes, including marking with fabric with said common measurement that is common to each of said limited plurality of sizes.

15. A plurality of prefabricated garment kits, said plurality of garment kits being for the self-assembly of garments by consumer-wearers, in a range of sizes, each of said sizes within said range of sizes having a corresponding plurality of measurements associated therewith, each of said plurality of garment kits comprising:

fabric marked thereon sizing indicia for a subrange of said range of sizes, said subrange of said range of sizes comprising a plurality of sizes of said range of sizes, said sizing indicia comprising markings indicated at least some of said corresponding plurality of measurements for each of said plurality of sizes of said subrange of said range of sizes; and

at least one common sizing indicia marked on said fabric, said common sizing indicia being common to and substantially the same for each of said plurality of sizes of said subrange of said range of sizes.

4,995,515

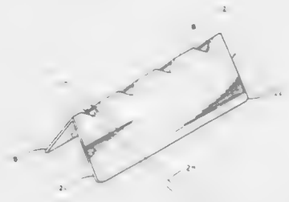
FINE ARTIST PAINT BRUSH REST

Timothy C. Smith, 1924 University Ave., Berkeley, Calif. 94704

Filed Feb. 6, 1989, Ser. No. 307,694

Int. Cl.[5] **A47F** *7/00*

U.S. Cl. 211—65 **1 Claim**



1. A fine artist paint brush rest made from a single blank of stamped, formed, thin durable aluminum comprising:

an extended A-frame configuration having a single bend therein, said bend forms the apex of said A-frame, a first side of said A-frame comprising a plane having an upper edge and a lower edge, a second side of said A-frame having an upper edge and a lower edge, the two upper edges joined at said single bend, a plurality of notches located along the length of said single bend, said notches extending partially down each side of said A-frame, said lower edges resting on a support surface to provide a means for supporting a plurality of paint brushes in said notches.

4,995,516

CLOTHES HANGER STRUCTURE

James M. Fine, P.O. Box 330489, Miami, Fla. 33233

Filed Nov. 13, 1989, Ser. No. 434,710

Int. Cl.[5] **A47F** *5/08*

U.S. Cl. 211—87 **1 Claim**



1. A hanger structure designed to support clothes or like articles from a wall mounted hook closely adjacent a ceiling surface above the hook and within the locker, said hanger structure comprising:

a. a support arm having a first end and a second end and having an elongate configuration of sufficient length and shape to hold an article of clothing thereover,

b. said first end of said support arm comprising a free end having a mounting means formed thereon and structured for removable attachment of said hanger structure to the hook,

c. said mounting means and said support arm cooperatively disposed and configured to dispose said support arm in an operative position when said mounting means is attached to the hook,

d. said operative position defined by an outwardly extending substantially horizontal orientation of said support arm relative to the wall on which the hook is mounted and closely adjacent the locker ceiling,

e. a body portion connected to said support arm in spaced relation to said mounting means,

f. said body portion extending from the second end of said support arm outwardly therefrom and away from said mounting means when said support arm is in said operative position,

g. said body portion being disposed and configured in coplanar disposition with said support arm and mounting means and said body portion depending downwardly from said support arm when said support arm is in said operative position,

h. said support portion comprising a handle means for carrying the support arm and an article of clothing thereon when not attached in said operative position to the hook,

i. said handle means being configured for gripping by the hand of a user and orienting said support arm in an inverted position when so gripped,

j. said handle means comprising a supporting hook configured to removably support the support arm and an article of clothing thereon to a horizontally oriented clothes rod when in said inverted position relative to said operative position,

k. said support arm comprising a substantially straight line configuration along its length and said body portion secured to said support arm at the second end thereof relative to said supporting means being spaced from said support arm along a major portion of the length of said support arm,

l. said support arm being configured to engage the article of clothing on a first exposed surface extending along the length of said support arm when in said operative position and on a second exposed surface extending along the length of said support arm and oppositely disposed to said first surface when said support arm is in said inverted position,

m. said mounting means comprising an outwardly extending angularly oriented finger extending from said first exposed surface away from said handle means,

n. said mounting means comprising an elongate recess dimensioned and configured to receive an outer free end of the locker hook therein so that said support arm and said body portion extend transversely outwardly from the hook structure and in cantilevered attachment thereto when in said operative position within a locker, and said channel is formed within and extends along a length of said finger integrally formed on said free end of said support arm.

4,995,517

MECHANISM FOR SUPPRESSING VIBRATIONS OF TRAVELLING CRANE

Yoshimi Saotome, Takasago, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 30, 1990, Ser. No. 516,731

Claims priority, application Japan, Oct. 14, 1989, 1-267771

Int. Cl.[5] **B66C** *13/06, 23/26;* **F16D** *31/62*

U.S. Cl. 212—146 **1 Claim**

1. A mechanism for suppressing vibrations in travel of mobile type crane, comprising:

a vehicle body;

a boom pivotally mounted on said vehicle body;

a boom lifting hydraulic cylinder with a first load-supporting oil chamber and a second opposingly located oil chamber, said cylinder being connected between said vehicle body and said boom of the mobile crane;

a main hydraulic pump;

an auxiliary hydraulic pressure source;

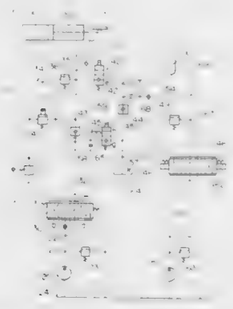
a direction control valve connected between said boom lifting hydraulic cylinder and said main hydraulic pump and comprising means for supplying the discharge oil of said main hydraulic pump selectively to and from said first

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load-supporting oil chamber and said opposingly located second oil chamber of said boom lifting cylinder;

a vibration suppressing accumulator connected between said boom lifting cylinder and said direction control valve;

a first change-over valve connected between said boom lifting cylinder and said direction control valve and comprising means for selectively switching between a travel mode position for forming a closed circuit through said first and second oil chambers and a working mode position for supplying oil pressure from said direction control valve independently to and from said first and second oil chambers;



a second change-over valve selectively switchable between a travel mode position for communicating said accumulator with said closed circuit and a working mode position for blocking oil flow from said closed circuit to said accumulator;

a boom position detecting means operative to actuate one of said change-over valves when a predetermined position of said boom is detected;

a first selector means for switching on and off oil pressure supply to said oil chamber from an auxiliary oil pressure source; and

a second selector means for switching on and off oil pressure supply to said accumulator from an auxiliary oil pressure source.

4,995,518

DETACHABLE FLOATING COUNTERWEIGHT

James R. McGhie, 4362 Metcalf Dr., Eagan, Minn. 55122

Filed Aug. 11, 1989, Ser. No. 392,470

Int. Cl.[5] B66C *23/74*

U.S. Cl. 212—178 17 Claims

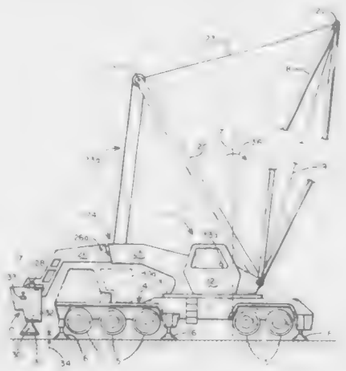
9. A combination crane assembly and detachable counterweight for counterweighting said assembly comprising

(a) a crane having a platform pivotably mounted about a vertical axis supported by a ground-borne base, the platform further having a lifting means and a counterweight arm extending radially and opposingly outward from said platform, relative to said lifting means;

(b) a counterweight having a substantial mass and a base, the base extendably attached to said mass and having a frustoconical shape for supporting the counterweight, the counterweight further having means for controllably extending said base therefrom;

(c) a connection means for attaching said counterweight proximate the end of said arm, said connection means including a linkage for suspending said counterweight beneath the underside of said arm;

(d) a control means for operating said counterweight including at least means for extending said counterweight base



to contact the ground to unload the weight of suspension of said counterweight beneath said arm.

4,995,519

AMPOULES

Howard Rose, 55A Popes Avenue, Strawberry Hill, Twickenham, Middlesex TW2 5TD, and Ian G. C. McAffer, Westerham, both of Great Britain, assignors to Howard Rose, United Kingdom

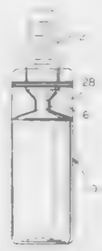
Filed Jan. 26, 1989, Ser. No. 301,685

Claims priority, application United Kingdom, Jan. 26, 1988, 8801655

The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.[5] A61J *1/06*

U.S. Cl. 215—32 12 Claims



1. A plastic ampoule having an internal cavity, an opening to said internal cavity and a removable head sealing said opening, said opening comprising a dispensing neck extending from said internal cavity towards a mouth of said opening and adapted to receive a syringe head; the improvement comprising:

said opening further comprising a funnel between said dispensing neck and said mouth, said funnel having an aperture with an internal diameter which is at least $\sqrt{3}$ times the minimum diameter of said dispensing neck to facilitate engagement of said syringe head with said dispensing neck by providing a protected docking target for said syringe head.

4,995,520

SAFETY CAP

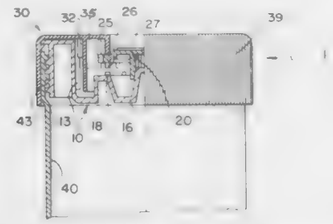
Evans Santagiuliana, Vicenza, Italy, assignor to Taplast SNC di Evans Santagiuliana & C., Vicenza, Italy

Filed Dec. 30, 1988, Ser. No. 292,535

Claims priority, application Italy, Jan. 11, 1988, 85501 A/88

Int. Cl.[5] B65D *55/02*

U.S. Cl. 215—220 10 Claims



1. A safety cap for a container having an essentially cylindrical shape, said cap comprising:

an inner element having a thread and two concentric rings connected together through a flat ring, the outer ring has a thread while the inner ring has elastic notches and a closed button with a central frustum shaped indentation and another toroid indentation concentric therewith, the toroid indentation having a flat annular surface with frontal teeth thereon;

an outer element placed over the inner element, said outer element having a generally flat surface with a through hole defined therein;

means provided on the inner element and outer element for rigidly connecting the inner and outer element when the cap is turned in a tightening direction;

a central push button positioned between the inner element and the outer element, said central push button being lodged within the through hole of the outer element; and

means provided on the central push button, the inner element and the outer element for rigidly connected the inner and outer element when the cap is turned in an untightening direction and when axial pressure is applied to the central push button.

4,995,521

STOPPER FOR INFUSION AND TRANSFUSION BOTTLES

Alfred von Schuckmann, Kevelaer, Fed. Rep. of Germany, assignor to Pohl GmbH & Co. KG, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 314,469

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806875

Int. Cl.[5] B05D *51/20*

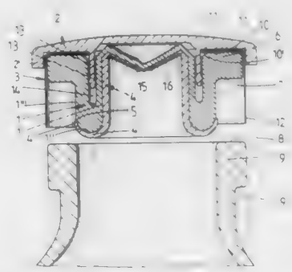
U.S. Cl. 215—249 13 Claims

1. A closure stopper, in particular for bottles and the like containing infusion solutions, comprising

an elastic stopper part which is insertable in sealing fashion into a bottle neck and which has a resting shoulder adapted to rest on the bottle neck,

a cover part having a flange projecting downwardly therefrom, and the stopper part being formed with a recess extending substantially lower than said resting shoulder for entrance in said recess of said flange of the cover part extending downwardly beyond the resting shoulder and forming a removable clamping insertion connection with the stopper part, and

a flanged cap having an annular-shaped neck, the neck extending crosswise to said flange and being clamped between a top side of the resting shoulder of the stopper part and a bottom side of said cover part, said flanged cap comprising an outer peripheral portion extending from said neck and having a lower end region for extending around the bottle neck and being rolled in below an inwardly recessed edge of the bottle neck for clamping said



stopper part in cooperation with said neck, and sealing the stopper part in the bottle neck.

4,995,522

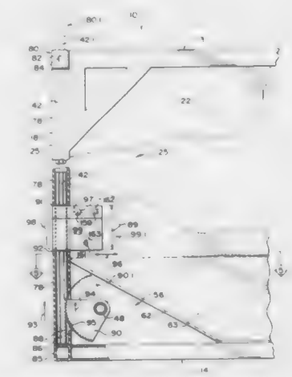
BOTTOM DUMPING BULK CONTAINER APPARATUS

Fraser M. Barr, 3916 Sharon Place, West Vancouver, British Columbia, Canada (V7V 4T6)

Filed Apr. 24, 1989, Ser. No. 341,976

Int. Cl.[5] B65G *67/58*

U.S. Cl. 220—1.5 21 Claims



1. A container apparatus having:

(a) generally horizontal, spaced apart, top and bottom walls, and vertical walls connecting the top and bottom walls to define an interior of the container apparatus, the bottom wall having at least one discharge opening therein communicating with the interior,

(b) at least one door means for opening and closing the discharge opening, the door means being mounted adjacent the bottom wall of the container and being moveable relative to the discharge opening,

(c) actuating means for controlling opening and closing of the discharge opening, the actuating means cooperating with, and being mounted for vertical movement relative to, the container apparatus, the actuating means having an upper end portion which includes connection means for connecting to twist lock devices, hooks or dogs of a container lifting apparatus,

(d) transmission means for moving the door means in response to the said vertical movement of the actuating means, the transmission means cooperating with the actuating means and the door means.

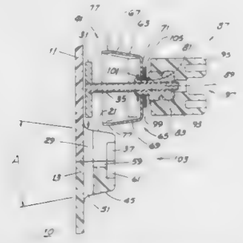
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,523

TANK CLAMPING MECHANISM

Gary L. Brooks, Lake Geneva, Wis., assignor to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed May 29, 1990, Ser. No. 530,113
Int. Cl.[5] B65D *45/16*
U.S. Cl. 220—4.12 12 Claims



1. An improved tank clamping mechanism comprising:

a first tank shell having a first flange protruding therefrom, the first flange including a first aperture configured to restrain an abutment member;

a second tank shell having a second flange protruding therefrom and positioned in general registry with the first flange, the second flange including a second aperture in general registry with the first aperture and configured to restrain the abutment member;

a clamping assembly including the abutment member received in the first aperture and the second aperture, the clamping assembly further including a clamp and adjusting means for adjustably moving the clamp relative to the abutment member;

the clamp being configured to engage the first flange and the second flange and urge the flanges toward clamped engagement with one another as the clamp is urged toward the abutment member;

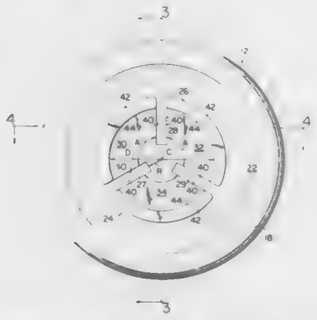
the tank shells thereby being clamped together for confining a pressurized medium therewithin.

4,995,524

DRIPLESS SAUCER

Franklin G. Welles, 458 Cricket Cir., Talcottville, Conn. 06066

Filed Apr. 2, 1990, Ser. No. 503,327
Int. Cl.[5] B65D *19/22, 23/06;* A47G *19/22*
U.S. Cl. 220—23.83 10 Claims



10. In combination with a cup having a generally annularly extending base depending from its bottom, a saucer comprising:

a base integrally formed with a continuous said wall extending about said base, said continuous side wall being disposed upwardly relative to said base at an angle;

a raised central portion integrally formed on said base and being spaced from said continuous side wall about its periphery to define a trough between said raised central portion and said continuous side wall;

said raised central portion having a plurality of substantially planar surfaces facing upwardly therefrom, each of said plurality of substantially planar surfaces being disposed in a common plane with one another above said base;

said plurality of planar surfaces being separated from one another by a plurality of inlaid channels which are configured to be directed radially outwardly and downwardly toward said trough initially from an area on the raised central portion lying generally symmetrically coincident with the center of said saucer, said area being defined by a fixed radius taken from the center of said saucer and being disposed within said common plane such that each of said inlaid channels has a substantially constant width and communicates between said trough and said common plane to allow liquid to pass from said plurality of substantially planar surfaces downwardly through said inlaid channels and into said trough; and

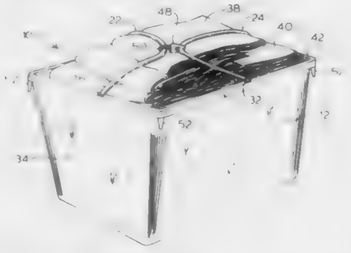
an interrupted rim extending generally circumferentially about said raised central portion and circumscribing a circle about said raised central portion having a diameter slightly larger than the outer diameter of said base of said cup such that said cup is securely supported on said saucer from below and along the sides of said cup base.

4,995,525

OPEN TOP CONTAINER WITH CONTAINMENT MEANS

Lawrence L. Kehrer, Rte. 6, Box 261, Chapel Hill, N.C. 27514

Filed Aug. 9, 1989, Ser. No. 391,450
Int. Cl.[5] B65D *51/26*
U.S. Cl. 220—85 R 18 Claims



1. A container, comprising:

(a) a receptacle having an upper rectangular opening with four edges, four corner areas, and a central area;

(b) a first elongated element and a second elongated element, each of said elongated elements made of flexible, stretchable material having a first end and a second end, the first end of said first elongated element attached to a first edge of the upper rectangular opening and the second end of said first elongated element attached to a second edge of the upper rectangular opening that is perpendicular to the first edge, the first end of said second elongated element attached to a third edge of said upper rectangular opening and the second end of said second elongated element attached to a fourth edge of the upper rectangular opening;

(c) a means for releasably fastening said first elongated means to said second elongated means over the central area of said rectangular opening; and

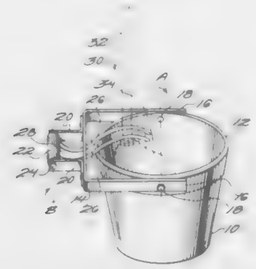
(d) a means for releasably holding each of said elongated elements to the corner area located between the ends of said elongated element.

4,995,526

SCRUBBING PAIL HANDLE

Warren B. Garrison, 6012 Hampton Ridge Rd., Columbia, S.C. 29209

Filed May 10, 1990, Ser. No. 521,735
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—94 R 20 Claims



1. A device for use in lifting a pail, said pail having a handle, and for use with a cleaning tool, said cleaning tool having a shaft and a cleaning head attached to said shaft, said cleaning head having a larger diameter than the diameter of said shaft, said device comprising:

gripping means for gripping said cleaning tool head and holding said cleaning tool head in said pail as said pail is lifted by lifting said shaft of said cleaning tool when said cleaning tool is gripped by said gripping means; and

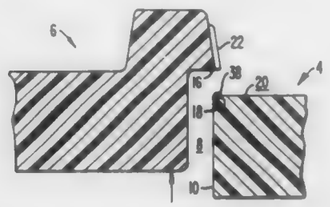
means for attaching said gripping means to said pail.

4,995,527

BREAKOUT PANEL FOR MOLDINGS

John A. Sauder, Watauga, and Harold Larson, Hurst, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Filed Jun. 2, 1989, Ser. No. 360,498
Int. Cl.[5] H02G *3/00*
U.S. Cl. 220—266 12 Claims



1. An improved molded part of the type including a body and a breakout element, the body having first and second surfaces and a third surface extending between the first and second surfaces, the third surface defining a breakout opening within which the element is generally situated, the improvement comprising:

the element having a first region;

the body having a second region;

the first and second regions being adjacent one another and defining a line of intersection having no substantial width thereby forming a zero landed intersecting edge; and

a frangible pad coupling the element and the body, the frangible pad sized to permit the element to be broken away from the body to expose the breakout opening, the frangible pad positioned so that substantially no scar material extends into the breakout opening after removal of the element.

4,995,528

RIBBED STORAGE TANK SYSTEMS WITH INTERIOR WALL SECTIONS FOR ENHANCED STRENGTH

Bruce R. Sharp, 22375 Edgewater Dr., Unit 241, Charlotte Harbor, Fla. 33980

Filed Jan. 19, 1990, Ser. No. 467,208
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—445 8 Claims



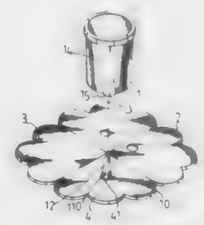
1. A ribbed storage tank system comprising a fibrous reinforced resinous storage tank having a cylindrical-shaped main body and a set of substantially uniformly spaced integral ribs extending circumferentially around the main body such that the exterior of the tank has the ribs protruding therefrom and the interior of the tank is generally contoured with rib recesses which represent the insides of the ribs, further wherein a series of wall sections are spaced laterally and circumferentially around the interior of the tank's cylindrical-shaped main body so as to extend across the rib recesses to cover each recess, each of said wall sections attached at its edges to the interior of the tank's main body and a midportion of the wall section remains at least partially separated from the interior and the rib recess of the tank's main body.

4,995,529

STRUCTURE OF GARBAGE CAN ASSEMBLY

Cheng-Hsien Sher, No. 18, Lane 195, Nan Tai Rd., Kaohsiung City, Taiwan

Filed Mar. 16, 1990, Ser. No. 494,348
Int. Cl.[5] A47F *5/02*
U.S. Cl. 220—475 9 Claims



1. A garbage can assembly comprising a plurality of support plates of similar construction, each of said plates including an upper substantially flat surface and a lower substantially flat surface and a pair of substantially straight sides extending at an angle to one other, each of said plates having a hole formed therethrough and extending between said upper and lower surfaces thereof, said plates being disposed in side-by-side relationship to one another, means for connecting adjacent sides of different plates to one another so that upper and lower surface of the plates are substantially flush with one another, fastening means disposed in the hole of one of said plates and extending upwardly therefrom, a garbage container for receiving garbage, said container including a lower portion having a laterally offset projection thereon, a downwardly facing opening being formed in said projection for receiving said fastening means, said holes being positioned such that when said fastening means is disposed within one of said holes, the container is held in operative position over the center of gavity of the connected support plates.

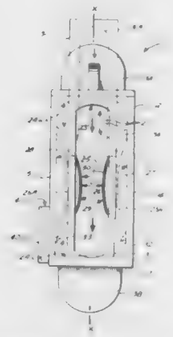
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,530

ADJUSTABLE DISPENSER FOR HOLDING BOXES OF PLASTIC BAGS

Carroll Tabor, 2502 Highway 1, Thibodaux, La. 70301-5843

Filed Dec. 1, 1988, Ser. No. 278,595
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—46 **7 Claims**



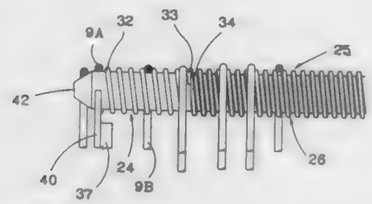
1. An adjustable dispenser container for holding a disposable box of plastic bags stored within the box, to be dispensed from the box via an elongated slot that extends substantially the length of the box, comprising:
(a) a housing having sidewalls, a bottom end wall, a top end wall and a longitudinal axis intersecting the bottom and top defining therewithin a hollow interior;
(b) one of the walls having an elongated dispensing housing opening therein communicating with the interior;
(c) adjusting spring means within the housing for frictionally holding the box with respect to the body in a position which registers the slot of the box with the opening of the housing so that plastic bags can be dispensed through the registered slot and opening; and
(d) the spring means comprising left and right opposed leaf springs, each having inwardly facing surfaces movable with respect to each other so that the width of the interior of the housing varies by automatic displacement laterally of the leaf springs over their length when the box is placed in the housing between the leaf springs, so that boxes of varying sizes can be contained in the housing; and
(e) the leaf springs being fixedly attached at one end portion to the housing and being free to move and displace at the opposite end portion thereof.

4,995,531

RING DISPENSER

Roger L. Summers, Alliance, Ohio, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Jun. 14, 1989, Ser. No. 366,044
Int. Cl.[5] B65G *33/02*
U.S. Cl. 221—75 **12 Claims**



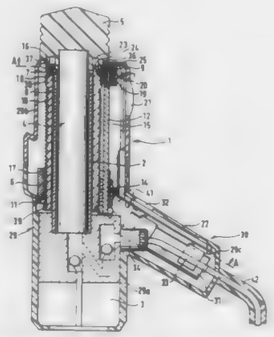
1. A ring dispenser including:
(a) a rod having first and second ends and a helical thread formed thereon for separating and moving a plurality of rings along said rod toward the second end;
(b) means for rotatably supporting the first end of the rod whereby the second end is located generally above a ring receiving member;
(c) a motor for rotating the rod;
(d) sensor means located adjacent the second end of the rod for detecting the arrival of a ring at said second end and for stopping and starting the rotation of the rod to dispense a ring from the second end onto the ring receiving member;
(e) the rings each having a cross-sectional diameter so that the rings are supported between the crests of adjacent threads of the helical thread and are free of contact with the roots of the threads;
(f) a helical coil spring mounted on the rod and located between the second end of the rod and said helical threads; and
(g) the rings having a cross-sectional diameter less than the spacings between the individual convolutions of the coil spring so as to lie on the rod between the convolutions of the spring as the rings move along said rod toward the second end.

4,995,532

FLUID METERING APPARATUS FOR SUPPLYING FLUID OUT OF A STORAGE VESSEL TO A RECEIVER

Erich Knödel, Wertheim am Main, Fed. Rep. of Germany, assignor to Walter Graf u.Co. GmbH & Co., Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 300,978
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 8800844[U]
Int. Cl.[5] G01F *11/04*
U.S. Cl. 222—43 **15 Claims**



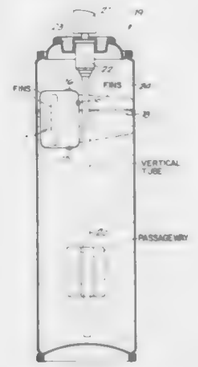
1. A dispenser for precisely dispensing a predetermined volume of fluid from storage vessel into a recipient vessel, said dispenser comprising:
a housing (**29**) formed with a connector portion (**29***a*) having valve chamber with a suction valve and a discharge valve therein;
a cylinder (**2**) mounted on the connector portion of said housing (**29**) and connected in a fluid tight manner to said valve chamber, which valve chamber is connected in a fluid tight manner to both the suction valve and the discharged valve;
a movable piston (**4**) in the cylinder and carrying an operating button (**5**) fixed on its end remote from the valve chamber;
a bush (**8**) threaded on its outer surface and slidably and rotatably mounted in a telescopic manner on the outer surface of the cylinder (**2**), said bush carrying an adjustable stop (**6**) in threaded engagement therewith, means far coupling the bush to the button (**5**) in an axially fixed and freely rotatable manner on the end of the bush remote from the valve chamber;
a counter stop (**7**) fixed to the housing at an end portion remote from the valve chamber to provide an abutment for the adjustable stop; and
connecting means for rotationally coupling the button to the bush upon respective actuation of the connecting means, so that rotatinq the button (**5**) will rotate the bush (**8**) and thus axially displace the adjustable stop (**6**).

4,995,533

PRESSURE CAPSULE FOR SPRAY CAN, AND SPRAY CAN WHICH UTILIZES SUCH A CAPSULE

Alfons Vandoninck, Antwerpen, Belgium, assignor to Jaico C.V., Coöperatieve Vennootschap, Opglabbeek, Belgium

Filed Jun. 27, 1989, Ser. No. 371,842
Claims priority, application Belgium, Jun. 29, 1988, 8800747; Oct. 3, 1988, 8801131
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—54 **32 Claims**



1. In a spray can (**19**) having a liquid (**18**) to be expelled, a pressure capsule freely movable in the spray can during expulsion of the liquid, the capsule comprising first and second chambers (**2**, **3**), the first chamber being filled with a first fluid under a first pressure and the second chamber being filled with a second fluid under pressure approximately equal to an overpressure present in the spray can for expelling the liquid (**18**), the first pressure being higher than the overpressure; a valve (**4**) in a wall of the first chamber (**2**); a membrane (**5**) forming a wall of the second chamber and controlling the valve (**4**); a removable element (**6**) for maintaining the valve (**4**) in a closed position when the removable element is in its nonremoved condition.

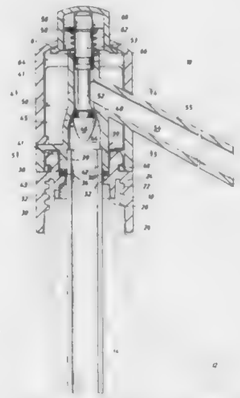
4,995,534

DETACHABLE VOLVED DISPENSING HEAD FOR BOTTLE

Richard O. Norman, San Antonio, Tex., assignor to TexPro, Inc., Burnet, Tex.

Filed Sep. 7, 1989, Ser. No. 404,173
Int. Cl.[5] B67D *5/60*
U.S. Cl. 222—511 **9 Claims**

1. Liquid dispensing apparatus for controllably dispensing pressurized liquid from a container, a discharge opening therefrom being located above the surface of the liquid contained within the container, comprising
an adapter for matingly sealably connecting with the discharge opening of the container, said adapter including a central opening,
an elongate tube insertable through said central opening of said adapter such that the lower end thereof is within the liquid,
an elastomeric resilient O-ring sealing against the outside surface of said tube near its upper end,
said adapter including a shoulder for limiting the downward location of said O-ring,
a dispensing valve housing seatably connectable to the top of said adapter and surrounding the top of said tube,
said housing having a valve chamber contiguous with the top opening of said tube, the walls of said chamber gradually reducing in dimension to form a valve seat at the upper end of said chamber,
said housing having a channel above said valve seat,
an elongate valve plunger having a bulbous lower closure end operably located within said chamber and with an external surface that diverges below said valve seat from



the adjacent wall of said chamber, said closure end having a contact seating surface above its maximum diameter dimension, said plunger having an elongate plunger shaft operating within said channel and connected to said bulbous lower end, said shaft being smaller in diameter than said channel,
bias means connected to said plunger for urging the plunger upward to close its closure end in said valve seat, and
a dispensing spout having an input opening into said channel, wherein downward pressure applied to said valve plunger overcoming said bias means causes the downward descent of said bulbous closure end into said chamber to provide an increasingly larger flow path between said walls of said chamber and said closure end for liquid drawn from the container depending on the increasingly downward position of said valve plunger.

4,995,535

NOZZLE DEVICE FOR DISCHARGING MOLTEN METAL

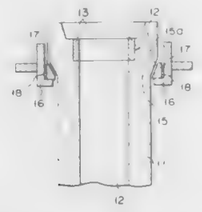
Satoshi Ooya; Sadanobu Sugiura, both of Anjo; Teruhisa Kawashima, Kariya, and Toshio Kawamura, Takahama, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1990, Ser. No. 484,543
Claims priority, application Japan, Apr. 21, 1989, 1-101914
Int. Cl.[5] B22D *37/00*
U.S. Cl. 222—607 **11 Claims**

1. The nozzle device for discharging molten metal comprising:
a nozzle having a tapered portion whose outer diameter decreases toward the lower end;
a metal holder mounted on the tapered portion and supporting the nozzle; and
an annular receiving member consisting of a plurality of parts and interposed between the tapered portion and

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metal holder, the annular receiving member being attached to the inner peripheral surface of the metal holder by an adhesive and having an inner peripheral surface



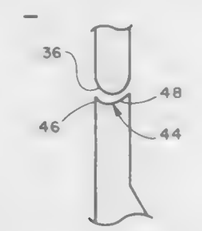
thereof extending along the outer peripheral surface of the tapered portion, and the annular receiving member being formed of Si_3N_4, Al_2O_3, ZrO_2, SiC, Al_2O_3-SiO_2, SiO_2, or MgO-Al_2O_3, or formed by a fine ceramic product.

4,995,536

SEWING NEEDLE WITH A THREADING ASSISTING FEATURE

Domenick Pennestri, 86 Mayloft Ct., Huntington Station, N.Y. 11746

Filed Oct. 17, 1989, Ser. No. 422,512
Int. Cl.[5] D05B *87/00, 85/00*
U.S. Cl. 223—102 **1 Claim**



1. A sewing needle having a body with a point on one end and a head on another end and an eye located adjacent to the head and comprising:

(A) a body outer surface;

(B) a slot extending through said body from said body outer surface into the eye, said body having an inner surface adjacent to said eye, said slot

(1) being continuous and uninterrupted from an entrance section located in said body outer surface to an exit section located in said inner surface in said eye, and

(2) having said entrance section larger than said exit section;

(C) said body including a top wall adjacent to said slot and the needle head and a lower wall adjacent to said slot and below said top wall, said top and bottom walls being in confronting relationship with each other;

(D) said top wall being curved continuously from said outer surface to said inner surface with a single radius of curvature and being convex as viewed from said bottom wall; and

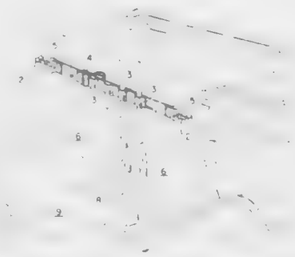
(E) said bottom wall being curved from said outer wall to said inner wall and being concave as viewed from said top wall, said bottom wall including a first curved section and a second curved section with said first curved section intersecting said body outer surface and said second curved section intersecting said body inner surface adjacent to said eye, said first curved section being curved on a radius of curvature which is less than a radius of curvature of said second section, said first curved section intersecting said second curved section at a location that is between said inner surface and said outer surface, each of said bottom wall curved sections being curved to a different degree from each other and to a degree which is different from the curvature of said top wall.

4,995,537

REMOVABLE GUN RACK

T. Mark Thedieck, 203 E. Monroe St., Thomasville, Ga. 31799

Filed Dec. 19, 1989, Ser. No. 452,416
Int. Cl.[5] B60R *7/14*
U.S. Cl. 224—273 **4 Claims**



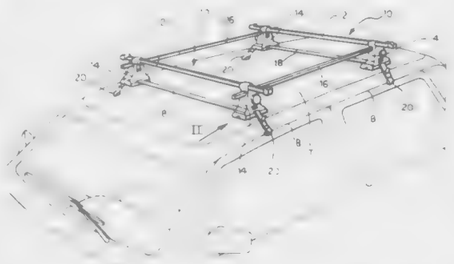
1. A removable gun rack detachably mounted within a vehicle, comprising a belt extending transversely across the interior of the vehicle, first means connected to the belt intermediate the ends thereof for adjusting the length of the belt, to thereby facilitate the fitting of the gun rack to vehicles of various widths, second means connected to each end of said belt for detachably connecting each end of the belt to the vehicle frame above the vehicle floor, a plurality of fixed loops provided in said belt intermediate the ends thereof, and a gun, the barrel of said gun being insertable into a selected loop and the stock of said gun resting on the vehicle floor, whereby a plurality of guns may be transported in a substantially vertical position.

4,995,538

MOTOR VEHICLE ROOF RACK

Osvaldo Marengo, Turin, Italy, assignor to FAPA S.p.A., Turin, Italy

Filed Dec. 5, 1988, Ser. No. 279,631
Claims priority, application Italy, Dec. 4, 1987, 53864 B/87
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—329 **7 Claims**



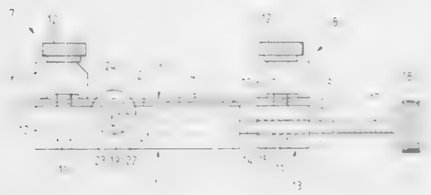
1. A rack for a motor-vehicle roof having edge means comprising a pair of bridges each having a cross member, a pair of box-shaped feet for bearing on the roof and means for hooking and fixing each foot on to said edge means of the roof, said pair of feet having respective outer walls with an opening and upper parts with respective transverse passages, each cross member being slidably inserted in said respective transverse passages and pressure means being associated with each transverse passage for clamping the cross member in an adjusted position, wherein the hooking and fixing means of each said bridge is comprised of an inextensible strap which passes through said opening in said outer wall of each foot and which is provided, outside said outer wall, with a rigid, shaped hook which is replaceable by other similar hooks of different shapes, for hooking on said edge means of the roof and at least one of said pair of feet incorporating tensioning means for tensioning the strap, said tensioning means comprising first and second rollers with longitudinal axes, the first roller being mounted for rotation about a fixed axis, a support mounted for rotation about said fixed axis and the second roller being mounted on said support which is movable transversely with the movement of the support being controlled by an irreversible screw and female thread assembly, said strap extending along an S-shaped path around said first and second rollers.

4,995,539

METHOD AND APPARATUS FOR CLEAVING WAFERS

Heinz Richard, Schutzenmattstrasse 29, CH-8802 Kilchberg, Switzerland

Filed Sep. 13, 1989, Ser. No. 406,943
Claims priority, application European Pat. Off., Oct. 10, 1988, 88810694.5
Int. Cl.[5] B26F *3/00;* **B28D** *5/00*
U.S. Cl. 225—2 **19 Claims**



1. A method for breaking a plate-like workpiece such as a semiconductor wafer, comprising the steps of:

(a) scribing one of a workpiece surfaces with at least one scribing line to define a plane where the workpiece is to be broken;

(b) making a sandwich by placing the workpiece between an upper and a lower elastomeric foil such that an adhesive disposed on the lower foils joins the non-scribed surface of the workpiece to the lower foil, the foils extending beyond the workpiece;

(c) stretching the two foils with the workpiece sandwiched in between, in excess of the limit of elastic deformation of the lower foil and of the upper foil; and

(d) applying an upward force to the non-scribed side of the sandwiched structure sufficiently so as to bend the workpiece, the plane of the radius of the bend being normal to any scribed lines on the convex side of the workpiece, such that the workpiece breaks into individual bars as determined by the scribed lines on the workpiece.

4,995,540

UNIT DOSAGE DISPENSER FOR DENTAL IMPRESSION MATERIALS

Laurence Colin, Box 301, Cross River, N.Y. 10518, and Edward R. Spehar, 49 Orion Way, Neshanic Station, N.J. 08853

Continuation of Ser. No. 129,070, Dec. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 23,838, Mar. 9, 1987, Pat. No. 4,753,536. This application Apr. 7, 1989, Ser. No. 334,817
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—132 **1 Claim**

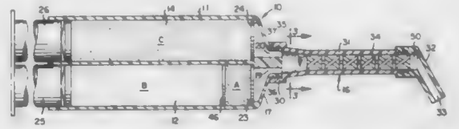
1. Apparatus for dispensing a unit dosage of elastomeric impression material for taking an impression in the oral cavity under aseptic conditions in the preparation of a dental restoration comprising:

a syringe having at least two elongated storage compartments laterally spaced apart with each compartment having a discharge end;

means for simultaneously applying pressure upon the opposite end of each compartment for discharging material from the discharge end of each compartment in common;

a nozzle assembly having a single nozzle for dispensing the materials discharged from said syringe, a head for coupling said nozzle assembly to said syringe, and a static mixing element in said nozzle for intermixing the materials fed to said nozzle;

a first impression material of relative low viscosity located in a first one of said storage compartments;



a second impression material of a substantially higher viscosity relative to the viscosity of said first impression material disposed in tandem with said first impression material in said first storage compartment;

a curing composition for said first and second impression materials located in a second storage compartment; and

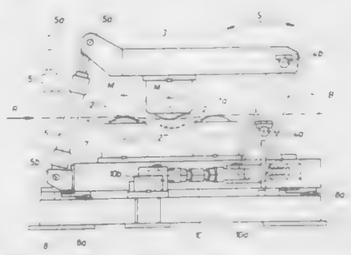
means for separating said first and second impression materials for minimizing intermixing thereof during storage prior to use and during the sequential discharge of each material through said first storage compartment until one of said two impression materials is completely discharged from said storage compartment.

4,995,541

SET OF GUIDE ROLLS FOR GUIDING, POSITIONING AND CONTROLLING MOTION OF BANDS OF MATERIAL FED THROUGH THE ROLLS

Gottfried Seidinger, Graz, Austria, assignor to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Aug. 3, 1989, Ser. No. 389,358
Claims priority, application Austria, Aug. 4, 1988, 1969/88
Int. Cl.[5] B65H *23/26*
U.S. Cl. 226—174 **3 Claims**



1. Guide roll apparatus for guiding, positioning and controlling the motion of metal strips advanced in a direction through said apparatus comprising (1) a base frame having a supporting surface extending in a horizontal plane, (2) a pivotable frame supported by sliding means upon said supporting surface of said base frame and rotatable with respect to said supporting surface of said base frame about a vertical axis, (3) control cylinder means connected to said base frame and said pivotable frame and adapted to provide strip guiding motion transversely to the advancing direction of a strip by rotatably positioning said pivotable frame relative to said base frame, (4) two spatially arranged lower rolls having parallel horizontal axes and being rotably supported by said pivotable frame, (5) a third, upper roll having a corresponding parallel horizontal axis and being rotably supported in a frame that is superposed

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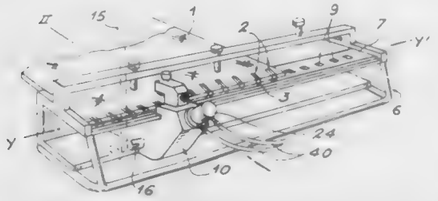
to said pivotable frame by means of articulated uprights at one end thereof and a pivotable pressure cylinder at the other end thereof, the uprights being double-armed levers pivotable about an horizontal axis to said pivotable frame, said pivotable cylinder also being articulated to said pivotable frame, and (6) a pivoting cylinder articulated at one end thereof to the lower end of each of the double-armed levers such that said pivotable axes of said double-armed levers are intermediate the lower ends about which the pivoting cylinders are articulated to the double-armed levers and ends about which the double-armed levers are articulated to the pivotable frame, the other end of each pivoting cylinder being articulated to the pivotable frame, said pivotable pressure cylinder and pivoting cylinders being operable to move said upper roll from a position between said lower rolls to a position directly above one of said lower rolls.

4,995,542

STAPLING APPARATUS FOR FIXING JUNCTION STAPLES ON THE END OF A CONVEYOR BELT OR THE LIKE

Jean-Francois Schick, Paris, France, assignor to GORO S.A., Chelles, France

Filed Apr. 9, 1990, Ser. No. 506,339
Claims priority, application France, Apr. 21, 1989, 89 05325
Int. Cl.[5] B25C *1/04, 5/16*
U.S. Cl. 227—112 **7 Claims**



1. A stapler apparatus for fixing on an end of a conveyor belt a row of junction staples provided with fastener clamps placed in a waiting position, by means of a working head slidably mounted on a guide plate provided for guiding said clamps and comprising on opposite sides of the row of staples having to be fixed a punch for driving-in the clamps and a movable die intended for folding down the clamp spikes, the apparatus further comprising a lead pawl for driving the working head in a stepwise motion in registry with the staples which have to be sequentially fastened, wherein:

the punch (**13**) for driving-in the clamps (**4**) and the bracket (**25**) carrying the movable die (**11**) are actuated by a sliding member (**22**) slidably mounted inside the working head (**10**), said sliding member (**22**) being driven by the piston (**23**) of a pneumatic or hydraulic actuator cylinder (**24**);

said sliding member (**22**) comprises two separate cams (**33** and **36**) for respectively driving the support (**25**) of the movable die (**11**) and the clamp-driving punch (**13**), the arrangement and the profile of said cams being such that the first cam (**33**) will operate at first for driving the movable die (**11**) downward before the second cam (**36**) raises the clamp-driving punch (**13**).

4,995,543

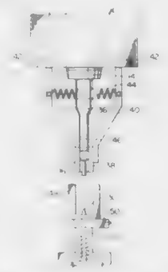
MAGNETIC STEM AND VERTICALLY FIXED POCKET DEVICE FOR A STATIONARY RIVETING MACHINE

Gordon C. Earl, 140 Sydenham St., Ganaoque, Ontario K7G 1C2, Canada

Filed Mar. 23, 1989, Ser. No. 328,133
Int. Cl.[5] B21J *15/10*
U.S. Cl. 227—113 **5 Claims**

1. In a stationary riveting machine, apparatus for setting ferrous rivets having a head portion, a shank portion of smaller cross-section extending therefrom and an axis extending longitudinally of said shank, said apparatus comprising:

a descending riveting stem connectable to a plunger of said riveting machine, said stem having a shank and a riveting tip, at least a portion of the tip region of said being magnetic so as to support one said rivet in a head-up contact therewith; and



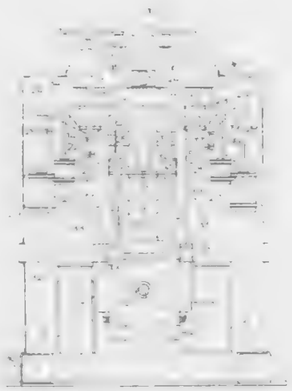
stationary means defining a vertically fixed pocket bore, said bore positioned in relation to said descending stem, for receiving rivets, in succession, from a rivet source, aligning each rivet in the path of said stem and releasing each rivet to said stem before said rivet contacts a pilot of an anvil of said riveting machine.

4,995,544

FRICTION WELDING APPARATUS

John G. Searle, Hednesford, England, assignor to Allwood, Searle & Timney (Holdings) Limited, England

Continuation-in-part of Ser. No. 340,723, Mar. 22, 1989, Pat. No. 4,905,883. This application Feb. 9, 1990, Ser. No. 478,133
Claims priority, application United Kingdom, Dec. 9, 1986, 8629390; Mar. 19, 1987, 8706581; PCT Int'l Appl., Dec. 7, 1987, PCT/GB87/00887
Int. Cl.[5] B23K *20/12*
U.S. Cl. 228—2 **19 Claims**



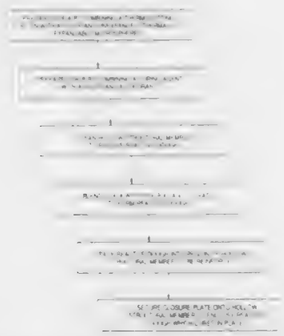
1. Apparatus for use in friction welding a first workpiece to a second workpiece, comprising driving means, reciprocatory means which is driven by said driving means and is operative in use to carry the first workpiece and to cause reciprocation of that first workpiece relative to the second workpiece such as will lead to the generation, between the workpieces, of frictional heat for welding, and balancing means comprising at least one counterweight and associated reversing means connected between the reciprocatory means and the counterweight in such a manner that movement of the reciprocatory means in either direction causes simultaneous movement of the counterweight in the opposite direction, the apparatus being characterised in that said reversing means comprises a pivoted rocker, first linking means connected at one end to the reciprocatory means and at the other to the rocker, and second linking means connected at one end to the counterweight and at the other end to the rocker, and wherein guide means is provided, said guide means being operative to guide said counterweight for reciprocatory movement along a rectilinear path.

4,995,545

METHOD OF REINFORCING A STRUCTURE MEMBER

Joseph Wycech, Grosse Pointe Woods, Mich., assignor to Essex Composite Systems, Roseville, Mich.

Division of Ser. No. 166,282, Mar. 10, 1988. This application Dec. 12, 1988, Ser. No. 282,531
Int. Cl.[5] B29C *67/20*
U.S. Cl. 228—119 **15 Claims**



1. A method of preparing a composition for use in reinforcing a hollow structural member comprising the steps of:

combining a liquid thermosetting resin, a first filler and unexpanded, thermally-expandable microspheres;

blending said combination of said thermosetting resin, said first filler and said unexpanded, thermally-expandable microspheres to form a first dough;

the first dough including from about 5 to 99 percent by weight of the thermosetting resin, from about 0.1 to about 20 percent by weight of the unexpanded thermally-expandable microspheres and from about 0.5 to about 90 percent by weight of the first filler to provide a doughy consistency to the first dough;

combining a liquid curing agent, a colorant, and a second filler; and

blending said combination of said liquid curing agent, said colorant and said second filler to form a second dough;

the second dough including from about 10 to about 90 percent by weight of the curing agent adapted to promote cross-linking polymerization of the thermosetting resin in an exothermic reaction, and from about 0.5 to about 90 percent by weight of the second filler to provide a doughy consistency to the second dough.

7. A method of reinforcing a structural member having a cavity comprising the steps of:

preparing a first dough which includes a thermosetting resin, a first filler and unexpanded, thermally-expandable microspheres;

the first dough including from about 5 to 99 percent by weight of the thermosetting resin, from about 0.1 to about 20 percent by weight of the thermally-expandable microspheres and from about 0.5 to about 90 percent by weight of the first filler to provide a doughy consistency to the first dough;

preparing a second dough which includes a curing agent, a colorant and a second filler;

the second dough including from about 10 to about 90 percent by weight of the curing agent adapted to promote cross-linking polymerization of the thermosetting resin in an exothermic reaction, and from about 0.5 to about 90 percent by weight of the second filler to provide a doughy consistency to the second dough;

blending together said first dough and said second dough to form a reactive third dough; and

packing said reactive third dough in said cavity of said structural member;

wherein said curing agent promotes the cross-linking of said thermosetting resin in a reaction which releases heat, wherein said heat of said reaction causes said unexpanded, thermally-expandable microspheres to expand such that said reactive dough expands, and wherein said cross-linking of said thermosetting resin continues until said thermosetting resin substantially cures to form a rigid body which adheres to and reinforces said structural member.

4,995,546

DEVICE MOUNTING

John C. Regnault, Woodbridge, England, assignor to BT&D Technologies Limited, England

Filed Oct. 18, 1989, Ser. No. 424,236
Claims priority, application United Kingdom, Mar. 31, 1988, 8807729
Int. Cl.[5] H01L *21/60;* **H01S** *3/02;* **B23K** *101/40*
U.S. Cl. 228—123 **12 Claims**

1. A method of manufacturing a semiconductor device having a semiconductor element bonded to a first surface of a first package element and a second surface of the first package element bonded to a second package element, the method comprising:

applying a layer of fusible alloy solder to the first surface of the first package element,

applying a fusible alloy solder layer to at least one of the second surface of the first package element and a second package element surface which is to be bonded to the first package element,

interposing the first package element between the semiconductor element and the second package element, and

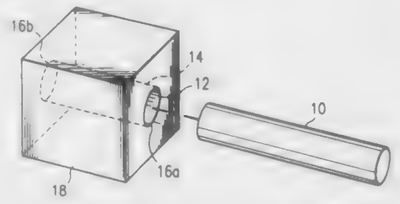
applying heat to melt the fusible alloy solder layers and bond the semiconductor element and second package element to the first package element in a single heating operating.

4,995,547

PROCESS FOR BRAZING A METAL OBJECT TO A CERAMIC SURFACE DEFINING A HOLE FOR RECEIVING THE METAL OBJECT

W. Peter Schubert, Lafayette, and Thomas A. Wilke, Boulder, both of Colo., assignors to Paradygm Science & Technologies, Inc., Boulder, Colo.

Filed Jun. 4, 1990, Ser. No. 532,590
Int. Cl.[5] B23K *1/19, 31/02, 103/16*
U.S. Cl. 228—124 **18 Claims**



1. A method for brazing a piece of metal material to a surface defining a recess in a piece of ceramic material, comprising:

providing a metal object;

providing a ceramic object having a surface that defines a recess for receiving said metal object;

providing brazing material;

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positioning said metal object in said recess of said ceramic object, wherein a space is defined between said metal object and said surface, said space providing substantial resistance to the removal of oxygen therefrom;
positioning said brazing material to substantially fill said space and establish a joint between said metal object and said surface of said ceramic object when said brazing material is heated to its melting point;
positioning a material having an affinity for oxygen adjacent to said space to attract oxygen from said space; and
heating said metal object, said ceramic object, and said brazing material to braze said metal object to said surface of said ceramic object.

4,995,548

PREPARATION PROCESS FOR COEXTRUSION BILLETS WITH MULTIPLE METALLIC CYLINDRICAL LAYERS

Chun T. Wang, Salem, and Robert H. Scanlon, Albany, both of Oreg., assignors to Teledyne Industries, Inc., Albany, Oreg.

Filed Apr. 10, 1989, Ser. No. 335,368
Int. Cl.[5] B23K *20/24*
U.S. Cl. 228—131 **1 Claim**

1. A diffusion bonding process for fabricating unitary seamless tubular articles, which articles comprise at least two concentric metallic layers formed by fitting the surfaces of at least two concentric cylindrical parts together to form an extrusion billet assembly, comprising the following steps in order:
(1) treating the billet assembly consisting of either zirconium or zirconium alloy by hot isostatic pressing at a range of from about 15,000 to about 45,000 psi and temperature of from about 450° C. to about 1250° C. for sufficient time to form a bond between metallic layers, and
(2) heating said billet at a temperature of from about 450° C. to about 1250° C. for a time sufficient to promote diffusion across the bondline of the metallic layers whereby the bonding strength is increased and the occurrence of bondline defects in the finished tubular articles is reduced, and
(3) quenching the heated billet by immersion in a quenchant maintained at a temperature in the range of from about 0° C. to about 100° C.

4,995,549

METHOD AND APPARATUS FOR FORMING AND WELDING THIN-WALL TUBING

Robert R. Hellman, Sr., 35 Hawley Rd., Oxford, Conn. 06483

Continuation-in-part of Ser. No. 278,819, Dec. 1, 1988, Pat. No. 4,905,885. This application Mar. 5, 1990, Ser. No. 488,257
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[5] B23K *5/06, 9/025*
U.S. Cl. 228—147 **17 Claims**



1. An apparatus for welding the longitudinal seam of a tube formed from a flat sheet, comprising:
(a) first support means dimensioned to engage substantially the entire inner periphery of said tube;
(b) second support means, concentric with said first support means, dimensioned to engage substantially the entire outer periphery of said tube, thereby to movably hold said tube in the annulus formed between said first and second support means, at least at the point of welding of said tube;
(c) an opening defined in said second support means adjacent said seam into which opening the edges of said seam protrude in closely spaced apart relationship;
(d) welding means in fixed position relative to said second support means and in welding contact with said seam and adapted for relative movement with said seam, thereby to fill the interstice between the edges of said seam to join said edges; and
(e) water cooled first heat sink means fixedly disposed in said first support means adjacent said seam, and in continuous contact therewith, so as to remove heat from the area of said tube surrounding said seam as said seam is welded.

4,995,550

VALVE METAL/PLATINUM COMPOSITE ELECTRODE

Herbert Appl, Krailing; Michael Gnann, Pfaffenhofen; Wolfgang Jahr, Wolfratshausen, and Erwin Rossberger, Grossdingharting, all of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Jul. 13, 1989, Ser. No. 380,155
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823760
Int. Cl.[5] H01M *4/58;* **B23K** *20/22, 101/36*
U.S. Cl. 228—175 **27 Claims**

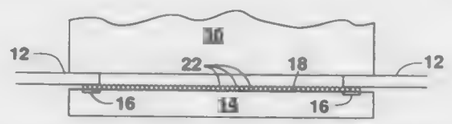
1. A process for the production of a planiform composite electrode comprising a valve metal layer with a platinum layer securely adhering thereto by hot isostatic pressing of said valve metal layer and said platinum layer between separating sheets, wherein the separating sheet which comes in contact with the platinum layer during the hot isostatic pressing consists of a metal having a melting point of at least 100° C. above the hot isostatic pressing temperature.

4,995,551

BONDING ELECTRICAL LEADS TO PADS ON ELECTRICAL COMPONENTS

Colin A. MacKay, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Apr. 24, 1990, Ser. No. 513,504
Int. Cl.[5] H05K *3/32*
U.S. Cl. 228—177 **32 Claims**



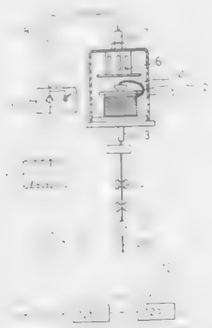
1. A method of bonding a first plurality of electrical leads to a second plurality of electrical pads comprising,
covering each pad with a plurality of electrically conductive particles, wherein the pads are in and aligned with an essentially smooth top surface of an electrical component;
aligning the electrical leads with the particles and pads, wherein portions of the electrical leads extend beyond the outer periphery of the top surface of the electrical component; and
simultaneously bonding the particles to the pads and the aligned electrical leads to the particles.

4,995,552

ANTI-OXIDATION SYSTEM OF A WIRE BONDER USING A COPPER WIRE

Wan-Kyoon Choi, and Jong-Whan Kim, both of Buchun, Rep. of Korea, assignors to SamSung Electronics Co. Ltd., Suweon, Rep. of Korea

Filed May 23, 1989, Ser. No. 356,547
Claims priority, application Rep. of Korea, Jun. 2, 1988, 1988-6623; Jun. 30, 1988, 1988-8038
Int. Cl.[5] H01L *21/60*
U.S. Cl. 228—179 **15 Claims**



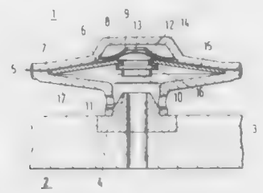
1. An anti-oxidation system of a wire bonder for bonding a wire between a chip pad and a lead frame for a semiconductor device, said wire being an oxidizable material selected from the group including copper or aluminum, comprising:
means for creating an atmosphere of a reduction gas for preventing oxidation of the wire by periodically supplying said reduction gas around a spool wound with said wire,
at least one gas tube for supplying the reduction gas disposed towards at least one of opposite sides of a capillary device drawing out the wire, said gas tube being disposed, just beneath the end of the capillary device, transversely to a direction of passage of the wire through the capillary device, and
a torch disposed facing a lower surface of either said one gas tube and another gas tube, just beneath the capillary device.

4,995,553

THERMALLY CONTROLLED VALVE

Werner Foller, Stuhr, and Holm Klann, Bremen, both of Fed. Rep. of Germany, assignors to GESTRA Aktiengesellschaft, Bremen, Fed. Rep. of Germany

Filed Sep. 7, 1989, Ser. No. 404,276
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831487
Int. Cl.[5] G05D *23/10;* **F16T** *1/10*
U.S. Cl. 236—48 R **2 Claims**



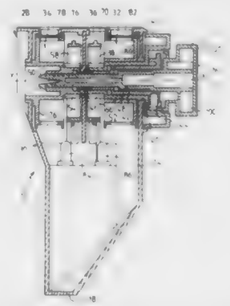
1. A thermally controlled valve, in particular, a condensate drain valve, comprising
a valve seat, a first closure valve associated with said valve seat, an expansion capsule containing an evaporation medium which actuates the closure valve by means of a stroke-displaceable wall part, a spring biasing said closure valve in the opening direction,
said spring being a monostable snap spring, and said monostable snap spring is arranged in such a way that in the closed position of the valve, it occupies a position of stroke lying distant to the force minimum of its force-stroke-characteristic;
said expansion capsule is arranged upstream of said valve seat;
an intermediate chamber is arranged downstream of said valve seat having a second valve seat at a discharge therefrom;
a second closure valve is provided in said intermediate chamber which interacts with said second valve seat; and
coupling means coupling said first and second closure valves so that said second closure valve is, to a limited degree, relatively stroke-displaceable with respect to said first closure valve.

4,995,554

CONTROL UNIT FOR A HEATING, VENTILATING AND/OR AIR CONDITIONING INSTALLATION FOR AN AUTOMOTIVE VEHICLE

Michel Auvity, Velizy, and Patrice Chesnier, Asnieres, both of France, assignors to Valeo, Paris, France

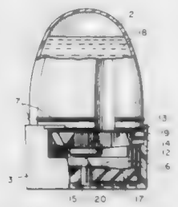
Filed May 15, 1989, Ser. No. 352,028
Claims priority, application France, May 17, 1988, 88 06593
Int. Cl.[5] G05D *23/00*
U.S. Cl. 236—51 **8 Claims**



1. A control unit for an installation for heating, ventilating and/or air conditioning of an automotive vehicle, wherein the control unit comprises: a module in the form of a housing; two control knobs; means mounting the two control knobs to the housing, coaxially with each other with the control knobs projecting rotatably from the outside of the housing, the said mounting means comprising two coaxial shafts, namely an inner shaft and an outer shaft, each connected with a respective one of the two said control knobs for rotation therewith; two transmission members, the said inner shaft having means rotatably coupling it with one said transmission member and the outer shaft having means rotatably coupling it with the other transmission member; and means mounting the transmission members within the housing, the said transmission members being arranged to act respectively on temperature regulating means and on air distribution means for air to be passed into the interior of the vehicle, the control unit further comprising a fixed intermediate sleeve disposed between the two said shafts over at least part of the length of the latter so as to prevent any interaction between the said control knobs.

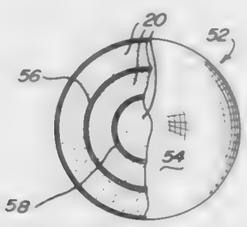
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,555
AIR TREATMENT DEVICE AND METHOD
Keith F. Woodruff, Mountainside, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Nov. 14, 1988, Ser. No. 270,575
Int. Cl.[5] A61L *9/04, 9/12*
U.S. Cl. 239—43 21 Claims



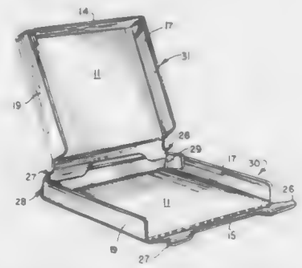
1. An air treating device comprising a liquid reservoir having a mouth opening, a base supporting and surrounding a liquid absorbent material, piercing means extending upwardly from said base and absorbent material, means for attaching said reservoir to said base such that said piercing means is in direct alignment with said mouth opening, and liquid metering control means surrounding said piercing means and between said mouth opening and said absorbent material, whereby said device provides a rate of dispersion which is substantially even over an extended period of time, and wherein said liquid metering control means is an effectively distant ebb height between the bottom of said mouth opening and the top surface of said absorbent material, said effective ebb height being adapted to hydraulically cease flow from said reservoir when said absorbent material is saturated and prevent contact between said absorbent material and said mouth opening.

4,995,556
UNITIZED SODIUM BICARBONATE DEODORIZER
Benjamin L. Arnold, III, 18695 Cambridge Rd., Lathrup Village, Mich. 48076
Filed Jan. 25, 1988, Ser. No. 148,004
Int. Cl.[5] A61L *9/04, 9/12*
U.S. Cl. 239—57 3 Claims



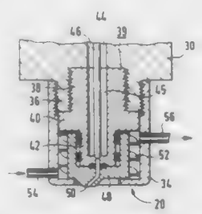
1. An article of manufacture for deodorizing one of selected places comprising:
a preselected amount of a deodorizing compound having odor reducing characteristics;
said deodorizing compound being provided in a substantially pulverized form and housed in a container;
said container having a preselected shape; and
said compound having surface area exposed to the atmosphere through said container;
said container comprising a plurality of at least three concentric, ball-shaped shells of a substantially rigid material;
said concentric shells being provided with a plurality of holes, said holes of one shell being non-aligned with holes of an adjacent shell;
said concentric shells being provided in spaced-apart relation to one another; and
said deodorizing compound is provided in the spaces between said shells.

4,995,557
EAT-IN/CARRYOUT PIZZA BOX
Edwin A. Fremion, Chesterfield, Va., assignor to Westvaco Corporation, New York, N.Y.
Filed Apr. 26, 1990, Ser. No. 514,600
Int. Cl.[5] B65D *5/28*
U.S. Cl. 229—125.29 3 Claims



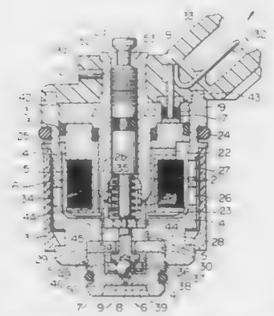
1. A combination cover/tray component for use with another identical cover/tray component, said component being formed from a unitary blank of foldable sheet material, comprising:
(a) a centrally located base panel of generally rectangular shape having a front edge, a rear edge, side edges and front and rear corners at the intersections of said edges, a pair of opposed side walls having inside and outside surfaces and front and rear portions foldably attached to the side edges of the base panel;
(b) a rear wall having ends foldably attached to the rear edge of the base panel; and,
(c) a front wall having ends foldably attached to the front edge of the base panel, the improvement wherein the rear wall includes a glue flap foldably attached along a fold line to each end of the rear wall which is adhered to the inside surface of the rear portion of each adjacent side wall, a pair of slots formed at the rear corners of the base panel along the fold lines connecting the glue flaps to the ends of the rear wall, and a pair of tab elements located at the ends of the front wall was extensions thereof.

4,995,558
APPARATUS FOR APPLYING A THERMOPLASTIC HIGH-POLYMER MATERIAL, IN PARTICULAR AN ADHESIVE, TO A SUBSTRATE
Henning J. Claassen, Lüneburg, Fed. Rep. of Germany, assignor to Nordson Corporation, Westlake, Ohio
Filed Feb. 16, 1989, Ser. No. 311,309
Claims priority, application European Pat. Off., Mar. 23, 1988, 88104676.7
Int. Cl.[5] B05B *7/04*
U.S. Cl. 239—226 5 Claims



1. Apparatus for applying a liquified thermoplastic high-polymer material to a substrate comprising: an application head, at least one feed passage for the liquified material in the application head, a valve arrangement for opening and closing the feed passage, a rotation element rotatably mounted to said application head, a liquified material passage extending through said rotation element, said liquified material passage having one end in communication with the feed passage and another end providing a nozzle-like outlet opening, a fluid power connection for connecting a source of fluid power to said application head, and fluid drive means carried by said rotation element and responsive to said fluid power for rotating said rotation element independently of the supply of liquified material to said application head.

4,995,559
ELECTROMAGNETIC FUEL INJECTION VALVE
Yoshio Okamoto; Yozo Nakamura, both of Ibaraki; Kyoichi Uchiyama, Kashiwa; Haruo Watanabe; Tokuo Kosuge, both of Ibaraki; Akira Onishi, Tsuchiura; Akashi Terasaki; Hiroyuki Ando, both of Katsuta, and Eiji Hamashima, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuda, both of, Japan
Continuation of Ser. No. 211,261, Jun. 24, 1988, Pat. No. 4,887,769. This application Jun. 14, 1989, Ser. No. 366,171
Claims priority, application Japan, Jun. 26, 1987, 62-157527; Sep. 25, 1987, 62-238752; Jan. 13, 1988, 63-3737
The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.
Int. Cl.[5] B05B *1/30, 1/34*
U.S. Cl. 239—493 10 Claims



1. An electromagnetic fuel injection valve comprising:
a valve housing having a fuel passage therein along which a valve seat is formed;
a fuel swirling element supported within said fuel passage of said valve housing upstream of said value seat and having swirl passages therein for imparting a swirling motion to fuel;
a fuel injection port formed in said valve housing downstream of said valve seat;
a ball valve movable toward and away from said valve seat in an axial direction of said valve housing for injecting the fuel, swirled by said fuel swirling element, from said fuel injection port; and
means for setting the stroke amount of said ball valve so as to produce a constant static flow rate of the fuel.

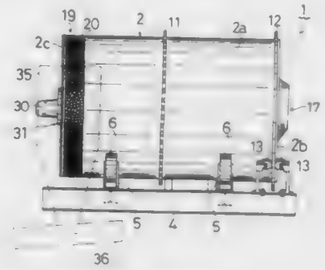
4,995,560
PAINT HOSE EXTENSION FOR ELECTROSTATIC SPRAY GUN
Charles T. Lasley, Toledo, and James J. Gimple, Oregon, both of Ohio, assignors to Illinois Tool Works, Inc., Glenview, Ill.
Filed Jul. 18, 1989, Ser. No. 381,573
Int. Cl.[5] B05B *5/02*
U.S. Cl. 239—708 7 Claims

1. A paint hose extension for insertion between a free end of a paint supply hose and an electrostatic paint spray gun having an electrically grounded handle, a barrel and nozzle assembly for receiving and atomizing paint and a high voltage electrode for imparting an electrostatic charge to the paint, said paint supply hose having a remote end connected to an electrically grounded paint section, said hose extension comprising electrically non-conductive hose means extending between said barrel and nozzle assembly and said paint supply hose for providing a predetermined long electrically insulated paint flow path



between said paint supply hose and said barrel and nozzle assembly, means supporting said hose means at said spray gun from said handle, an electrically conductive layer surrounding said hose means between said support means and said paint supply hose, means electrically connecting said conductive layer to said spray gun handle, and means electrically connecting said conductive layer to paint at said free end of said paint supply hose whereby paint in said supply hose is electrically grounded at both ends of aid supply hose.

4,995,561
GROUND SAND MAKER
Oogawara Yukimi, Tottori, Japan, assignor to Nakaya Jitsugyo Co., Ltd., Tottori, Japan
Filed Oct. 10, 1989, Ser. No. 419,205
Claims priority, application Japan, Feb. 23, 1989, 1-44336
Int. Cl.[5] B02C *17/02*
U.S. Cl. 241—62 4 Claims



1. A ground sand maker comprising:
a grinding drum having a circumferential surface, a first end wall with an end edge, and a second end wall opposed to said first end wall;
a mass of working pebbles placed within said grinding drum;
driving means for rotating said grinding drum, said driving means includiing a plurality of rollers on which said grinding drum is placed for rotation and at least one pair of rollers for holding said end edge between them;
an inlet port provided on said first end wall for supplying rock fragments and water into said grinding drum; and
an outlet sieve provided on said circumferential surface

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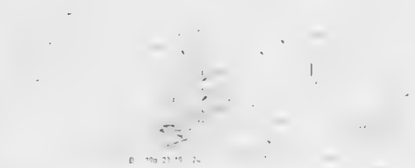
adjacent said second end wall for discharging sand and water.

4,995,562

DEVICE FOR DRAWING A YARN IN A SLIT

Toshiaki Koga, and Yasunori Hatakeyama, both of Shiga, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 1, 1989, Ser. No. 402,222
Claims priority, application Japan, Sep. 2, 1988, 63-115029[U]
Int. Cl.[5] B65H *54/00*
U.S. Cl. 242—35.6 DE **14 Claims**



1. A device for removing yarn from a slit in a bobbin having an axis and a bunch winding of yarn thereon, the device comprising:
- release means for releasing the bunch winding of yarn,
- yarn drawing means for drawing the yarn from the slit,
- a ring body having an axis,
- alignment means for aligning the axis of the bobbin and the axis of the ring body,
- positioning means for positioning the ring body substantially adjacent the bobbin,
- rotation means for rotating the ring body,
- a pawl member associated with the ring body for engaging the yarn drawn from the slit, and
- a capture device associated with the pawl member for capturing the yarn engaged by the pawl member

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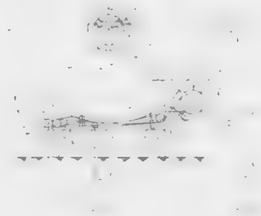
4,995,563

APPARATUS FOR WINDING UP AND UNWINDING PRINTED PRODUCTS INFED AND OUTFED IN AN IMBRICATED FORMATION BY MEANS OF A CONVEYOR

Urs Kälin, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 215,049, Jul. 5, 1988, abandoned. This application Nov. 17, 1989, Ser. No. 440,409
Claims priority, application Switzerland, Jul. 2, 1987, 2524/87
Int. Cl.[5] B65H *63/08, 61/00*
U.S. Cl. 242—59 **9 Claims**

1. An apparatus for winding, especially selectively winding up into a product package and unwinding from a product package printed products, particularly newspapers, magazines and periodicals, in the form of an imbricated stream of such printed products, comprising:
- a winding core for the printed products;
- conveyor means having a predeterminate conveyor velocity for transporting the printed products to and from the winding core;
- a spool for a winding band and having a diameter depending upon the amount of wound-up winding band located thereon;
- said winding band being connected at one end with the winding core;
- a rotatable deflection roll operatively associated with said supply spool;
- said winding band extending between the spool and the winding core and passing over the rotatable deflection roll;
- the winding core being driven or braked and at the same time the spool being braked or driven, respectively;
- an electrical regulation motor operatively connected with the winding core;
- said spool having a core;
- a rotary electrical machine operatively connected with the core of the spool;
- said winding core being bi-directionally rotatable;
- means for tapping off a reference value of the conveyor means, essentially corresponding to the predeterminate conveyor velocity of the conveyor means, in both directions of rotation of the winding core for controlling the rotational speed of the electrical regulation motor;



- means for tapping off an actual value of the circumferential speed of the deflection roll in both directions of rotation of the winding core;
- means for generating a signal indicative of the momentary diameter of said spool;
- control means connected in circuit between said means for generating said signal indicative of the momentary diameter of said spool and said rotary electrical machine for controlling the torque exerted by said rotary electrical machine and operating said rotary electrical machine in one rotational direction with braking slip and in the other rotational direction with drive slip.

4,995,564

REWINDER FOR THIN TAPE

Sandro Zuliani, Bottens, Switzerland, assignor to Bobst SA, Switzerland

Filed Sep. 7, 1989, Ser. No. 403,820
Claims priority, application Switzerland, Sep. 16, 1988, 03474/88
Int. Cl.[5] B65H *18/08, 59/36, 20/24;* **B23Q** *3/14*
U.S. Cl. 242—67.10 R **10 Claims**

5. A rewinder for thin tapes, especially tape-based metallized foils used in machines processing sheet-like material, such as boards and paper, said rewinder device comprising a frame having an upper frame portion connected to a lower chassis, a rewinding appliance unit including a motor assembly with a reduction gear, an axle of said reduction gear carrying a reel carrier hub, said reel carrier hub receiving a terminal wind-up reel, a guide arrangement for said tape including a first and third roller mounted on the upper portion of said frame, means for maintaining a mechanical tension on said tape including a vertically extending slide bar extending between the upper frame and the lower chassis, a dancer movable along said slide bar, a second roller for receiving a loop of said tape being mounted on said dancer to move therewith, an upper switch and a lower switch, said rewinder including means for stopping said rewinder in response to a breakage of the tape including a tape breakage switch positioned along said slide below the lower switch, hoist means including a lifting device for lifting the dancers of the rewinder from the tape breakage position to a desired raised position, said tape for each unit



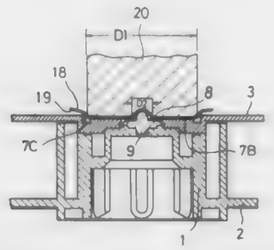
being threaded into said unit over the first roller, around said second roller, to said third roller, and into said reel.

4,995,565

CASSETTE REEL

Kiyoshi Urayama, and Kazuo Ozawa, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,372
Claims priority, application Japan, Nov. 12, 1986, 61-269402
Int. Cl.[5] B65H *75/18;* **G11B** *23/087*
U.S. Cl. 242—71.8 **6 Claims**



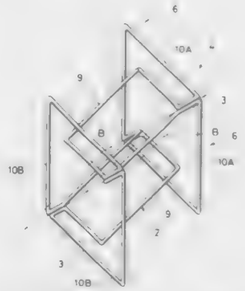
1. A cassette reel for use in a tape cassette of the type having a housing with at least one window therein so that the tape volume wound by the cassette reels can be seen, comprising:
- a cylindrical hub for winding the tape;
- an upper, substantially flat flange attached to the hub and made of a transparent plate for aligning an edge of said tape and for allowing said tape volume to be seen;
- an annular groove formed in one surface of said upper flange coaxially with the longitudinal axis of said hub; and
- a foil, hot stamp deposited on said upper flange which is coextensive with the inner diameter of said groove.

4,995,566

REEL

Katsumi Kotegawa, deceased, late of Katano (by Ikuyo Kotegawa, Tetsuya Kotegawa, Takeshi Kotegawa, Toshiki Kotegawa, heirs); Yoshihiro Okuda, Osaka; Masaru Uera, Neyagawa, and Hirofumi Miki, Daito, all of Japan, assignors to Tsubakimoto Chain Co., Japan

Continuation of Ser. No. 297,163, Jan. 13, 1989, abandoned. This application Apr. 11, 1990, Ser. No. 512,089
Claims priority, application Japan, Jan. 13, 1988, 63-6513
Int. Cl.[5] B65H *75/20*
U.S. Cl. 242—77.2 **4 Claims**



1. A reel for a chain or the like comprising a core portion adapted to have a chain wound around it and a pair of flange portions arranged at opposite ends of the core portion for retaining the chain on the core portion, wherein the reel has an axis of rotation, the core and flange portions are constituted by a pair of bent rods bonded together, wherein the number of bent rods in the reel is limited to two, and wherein each bent rod comprises at least two substantially parallel core-forming elements spaced from each other, the two substantially parallel core-forming elements of each bent rod being spaced from and arranged substantially parallel to the two substantially parallel core-forming elements of the other bent rod, the core-forming elements, proceeding circumferentially around said axis, being in sequence, the two core-forming elements of one rod followed by the two core-forming elements of the other rod, and the four core-forming elements being equally spaced from said axis, whereby the core of the reel comprises at least four substantially parallel, spaced core-forming elements, in which each of said bent rods is closed upon itself to form a continuous closed loop and in which each of said bent rods has flange-forming elements at both ends of the core portion, the flange-forming elements at each end of the core portion connecting one end of one of the core-forming elements to one end of the other core-forming element.

4,995,567

SPRING-LOADED BARREL, IN PARTICULAR FOR A SEAT BELT RETRACTOR

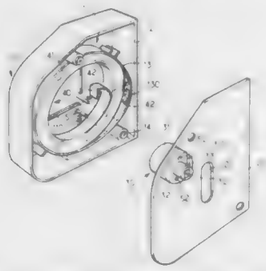
Jean-Noël Ballet, Aillevilliers, France, assignor to Ecia-Equipements et Composants pour l'Industrie Automobile, Audincourt, France

Filed Nov. 27, 1989, Ser. No. 441,307
Claims priority, application France, Nov. 30, 1988, 88 15720
Int. Cl.[5] B65H *75/48;* **F03G** *1/08*
U.S. Cl. 242—107 **15 Claims**

1. Barrel for a pretensioned spiral spring which consists, inter alia, of a casing (10) with a base (11), of a coverplate (20) intended to be placed at a distance from this base (11) in order to define with the latter a chamber (100), of an orifice (21) opening out into this chamber in order to make it accessible, of a hub (30) equipped with a coupling member (320) and which is intended to be housed in this chamber (100) so that its axis (300) is virtually orthogonal to this base (11) and this coverplate (20) and so that this coupling member is perpendicular to this orifice in order to be accessible from the outside, and of a

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spiral spring (40) placed in this chamber (100) and coiled around this hub (30) such that one of its ends (42) is anchored on the hub (30) and the other of its ends is anchored on the casing (10), characterized in that is comprises a device (50) for temporarily immobilizing the hub (30) in this chamber (100)



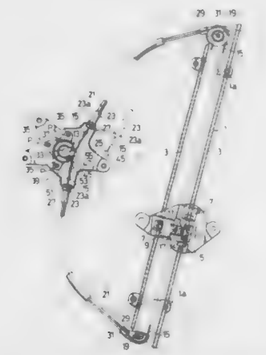
which consists of male (51) and female (52) complementary elements which are intended to be engaged in each other and which are carried by the chamber (100) and the hub (30) where these male elements (51) are fragile and are intended to break as a result of the action exerted upon the hub (30) through the orifice (21) once the spring has been tensioned.

4,995,568

WIRE TERMINAL ATTACHING STRUCTURE OF A DRIVEN ROTARY BODY

Jun Yamagishi; Hiromitsu Nishikawa, and Akihiro Takeda, all of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Dec. 16, 1987, Ser. No. 133,610
Claims priority, application Japan, Jan. 16, 1987, 62-003600
Int. Cl.[5] B65H *75/28*
U.S. Cl. 242—125.1 **19 Claims**



1. A device for controlling a wire of a wire-operated apparatus, comprising:

a cylindrically-shaped rotary body for controlling the motion of the wire, the rotary body having a first and second end;

a base plate for rotatably supporting the first end of the rotary body;

engaging means formed in the rotary body and engageable with a terminal of the wire, the engaging means having a guide groove communicating with a circumferential groove formed in the rotary body for receiving the wire, and an insertion port communicating with the guide groove for receiving the terminal of the wire; and

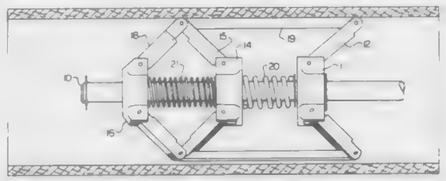
a cover for covering the rotary body and rotatably supporting the second end of the rotary body, the cover being assembled to the base plate and having cut-out portion which exposes the guide groove and the insertion port to allow the wire and the terminal to be inserted through the guide groove for attachment to the rotary body after the cover has been assembled to the base plate.

4,995,569

PACKAGE ADAPTER

James L. Alexander, 1024 N. Tryon St., Charlotte, N.C. 28206

Filed Jan. 16, 1990, Ser. No. 465,441
Claims priority, application Austria, Jan. 20, 1989, PJ2351
Int. Cl.[5] B65H *49/06, 49/20*
U.S. Cl. 242—130 **12 Claims**



1. An apparatus for receiving and engaging a package of strand material would upon a hollow core member having an inner wall and base end and a free end and comprising:

(a) an elongate central shaft means having a base end and free end remote therefrom;

(b) an engaging means mounted on said central shaft means for selective movement between a first, relaxed position and a second, engaging and gripping position in which the inner wall of said hollow core member is engaged and gripped responsive to longitudinal movement of said hollow core member along said central shaft means toward said base end; said engaging means being returned to said first position in which said engaging means is preset for receipt of a new hollow core member when a spent hollow core member is moved in a direction toward said free end;

(c) said engaging means comprising a plurality of connecting link members having base ends and free ends circumferentially spaced about said central shaft means, finger members pivotally connected to said base end, and activating means positioned between and so connecting said finger members together in a linkage set with said central shaft means that said connecting link members are positioned;

(i) in a first relaxed position in which the connecting link members are held along an acute angle path relative to the central shaft means which angle expands radially toward the base end of said central shaft means and at least a portion f said connecting link members are in the path of the hollow core member as it is mounted on said apparatus; and

(ii) in said second, engaging and gripping position in which said base ends of said connecting link members are urged radially inwardly toward said central shaft means, the free ends of said connecting link members are urged radially outwardly toward the inner wall of the hollow core member, and the hollow core member is grippingly engaged along a line extending longitudinally along the inner wall thereof.

4,995,570

REEL BRAKE ASSEMBLY ACTUATED BY LINEAR STEPPER MOTOR

Henry M. Martija, La Verne, Calif., assignor to Datatape Incorporated, Pasadena, Calif.

Filed Mar. 1, 1989, Ser. No. 317,381
Int. Cl.[5] G11B *15/22;* **B65H** *26/04*
U.S. Cl. 242—193 **6 Claims**

6. In magnetic recording/reproducing apparatus, the invention comprising:

a hub for supporting magnetic media;

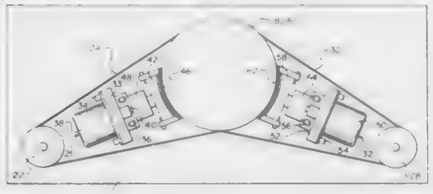
a rotatably mounted shaft upon which said hub is mounted;

a drive pulley mounted on said shaft;

a rotatably mounted motor pulley spaced from said drive pulley;

a belt which is trained about said drive pulley and said motor pulley and which forms spans between said pulleys; and

a brake assembly located between the spans of said belt; said



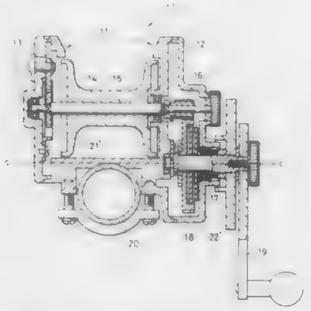
brake assembly including a linear stepper motor having a linearly actuated shaft extending radially of said drive pulley and a brake pad mounted on the end of said shaft adjacent to said drive pulley; wherein actuation of said linear stepper motor causes linear movement of said motor shaft to effect direct radial braking engagement between said brake pad and said drive pulley, said brake pad engaging said drive pulley in the same circumferential region normally contacted by said belt.

4,995,571

LOW TORQUE EFFECT FISHING REEL

Michiki Kawai, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 182,506, Apr. 18, 1988, abandoned.
This application Aug. 11, 1989, Ser. No. 394,318
Claims priority, application Japan, Apr. 17, 1987, 62-58330[U]
Int. Cl.[5] A01K *89/015*
U.S. Cl. 242—249 **3 Claims**



1. A fishing reel comprising:

a fishing rod having a reel mounting surface and a longitudinal axis;

spool means for winding fishing line, said spool means having a longitudinal axis;

handle shaft means operatively coupled to said spool means for rotating said spool means to take up fishing line thereon, said handle shaft means having a central, longitudinal axis;

transmission means for operatively connecting said handle shaft means to said spool means;

frame means for rotatably supporting said spool means and said handle shaft means and for housing said transmission means, said frame means including a rod mounting base portion formed integrally therewith at a lower portion thereof and having a mounting surface for engaging said mounting surface of said fishing rod, said handle shaft means being mounted to said frame means so that the central, longitudinal axis thereof penetrates said mounting surface of said base portion so as to define a means for substantially reducing rotational torque acting on the fishing rod when said handle shaft is rotated relative to said frame means, wherein,

an imaginary perpendicular line extended through said longitudinal axis of said spool means and said central, longitudinal axis of said handle shaft means intersects said longitudinal axis of said fishing rod at substantially a right angle thereto.

4,995,572

HIGH ALTITUDE MULTI-STAGE DATA ACQUISITION SYSTEM AND METHOD OF LAUNCHING STRATOSPHERIC ALTITUDE AIR-BUOYANT VEHICLES

Frank N. Piasecki, Haverford, Pa., assignor to Piasecki Aircraft Corporation, Essington, Pa.

Filed Jun. 5, 1989, Ser. No. 361,274
Int. Cl.[5] B64C *37/02*
U.S. Cl. 244—2 **35 Claims**



1. A two stage stratosphere altitude data acquisition system comprising a first and a second air-buoyant vehicle, said first vehicle comprising lighter-than-air gas containing means, data acquisition means, flight associated items and means supportingly affixing said data acquisition means and associated items to said gas containing means, said gas containing means being expandable to a volume as will displace an amount of air at a stratosphere float altitude equal to the weight of said first vehicle and containing an amount of lighter-than-air gas as will displace said volume of air at said stratosphere float altitude equal to the weight of said first vehicle, said second vehicle comprising a lighter-than-air aircraft having control and propulsive means for controlled flight operations of said aircraft at troposphere altitudes, releasable retaining means for retention of said first vehicle by said aircraft, said retaining means being operable from a vehicle retaining position to a position releasing said first vehicle from retention by and free of said aircraft at a selected troposphere launching altitude, said aircraft propulsive means including means creating vectored thrust forces of directions and amounts as establishes said aircraft in a level flight condition of substantially zero air speed, whereby said first vehicle can be launched from said aircraft into the troposphere under an essentially no wind condition for ascension to said stratosphere float altitude upon establishing said retaining means in said releasing position.

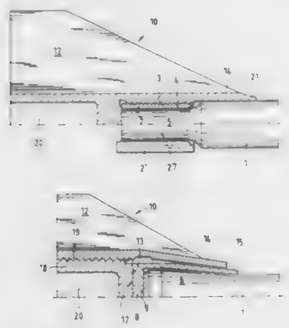
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4,995,573

PROJECTILE EQUIPPED WITH GUIDE FINS

Peter Wallow, Langenfeld, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 22, 1989, Ser. No. 453,288
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843796
Int. Cl.[5] F42B *10/08*
U.S. Cl. 244—3.24 14 Claims



1. A projectile, comprising:
a main body having a smooth end region;
an intermediate sleeve positioned over said smooth end region, said intermediate sleeve having an internal surface and an external thread, said intermediate sleeve being soldered at said internal surface to said smooth end region;
a guide mechanism sleeve at a tail region of the projectile, having an internal thread screwed with said internal thread onto said external thread of said intermediate sleeve; and
guide fins fixed to said guide mechanism sleeve.

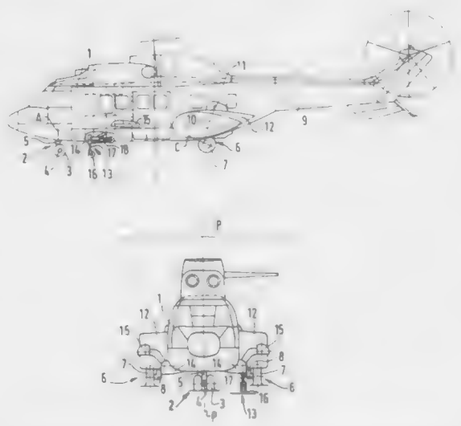
4,995,574

DEVICE FOR INCREASING THE STABILITY OF HELICOPTERS PLACED ON BOARD AND SET DOWN, HAVING A TRICYCLE LANDING GEAR, AND HELICOPTER EQUIPPED WITH SUCH A DEVICE

Louis A. Bernard, Saint Victoret, and René Thomassin, Velaux, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jan. 17, 1989, Ser. No. 297,521
Claims priority, application France, Jan. 15, 1988, 88 00443
Int. Cl.[5] B64C *25/04*
U.S. Cl. 244—17.17 15 Claims

1. A device for increasing the stability of a helicopter having a tricycle landing gear (2, 6) constituted by two main and lateral undercarriages (6) and one auxiliary undercarriage (2) when said helicopter is set down on a moving platform, said device comprising an auxiliary stabilizing gear operative only when said helicopter is landing with a rotor thereof rotating or stopped, said stabilizing gear comprising at least two lateral stabilizers (13), each of said lateral stabilizers comprising a rigid support (17, 27) having an end part which supports at least one stabilizing wheel (16) for contact with said platform, said rigid support (17, 27), at least in position of use, being integral with a stable structure of said helicopter at a lower part of a fuselage (1) of said helicopter, said rigid supports being offset laterally one on each side of a vertical and median longitudinal plane (PP) of said helicopter, in the direction turned towards an auxiliary undercarriage (2) in relation to said main and lateral undercarriages (6) of said tricycle landing gear, in such a manner that said at least one stabilizing wheel (16) is supported on said moving platform, on both sides of said longitudinal and median plane of said helicopter (PP) when



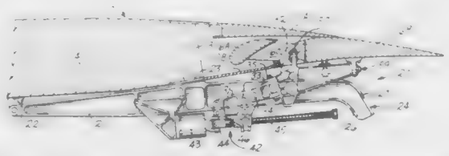
said helicopter rests on said platform with said tricycle landing gear (2, 6).

4,995,575

WING TRAILING EDGE FLAP MECHANISM

Martin F. Stephenson, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 251,042, Sep. 26, 1988, abandoned, which is a continuation of Ser. No. 121,365, Nov. 16, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 365,994
Int. Cl.[5] B64C *9/16*
U.S. Cl. 244—216 23 Claims



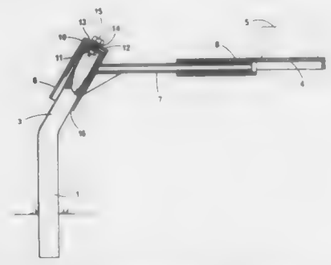
1. Track and carriage means for the support and movement of dual auxiliary airfoils on a main airfoil, comprising:
(a) an elongated beam mounted to said main airfoil and extending generally chordwise thereof;
(b) said track means comprising a first and a second guide track affixed to said elongated beam;
(c) said carriage means comprising a first carriage and a second carriage, said first and said second carriage being pivotably interconnected;
(d) a first and a second pair of rollers mounted on said first carriage for constant engagement with said first guide track;
(e) a third pair of rollers mounted on said second carriage for constant engagement with said second guide track;
(f) said second carriage being affixed to said dual auxiliary airfoils, and
(g) means for actuating said first and second carriages so as to move said dual auxiliary airfoils to an extended position relative to the main airfoil.

4,995,576

MOUNTING FOR ROADSIDE MAILBOX

Carl A. Kieswetter, R.R. 1, St Agatha, Ontario, Canada (N0B 2L0)

Filed Feb. 17, 1987, Ser. No. 15,690
Claims priority, application Canada, Mar. 7, 1986, 503576
Int. Cl.[5] B65D *91/00*
U.S. Cl. 248—145 5 Claims



1. Mounting for a roadside mailbox, wherein:
the mounting includes a mailbox-receiving arm, and a groundpost;
the mounting includes a journal bearing means and a thrust bearing means, for pivoting the arm about a pivot axis relative to the groundpost;
the bearing means are so arranged that the said pivot axis between the arm and the ground post is inclined at a substantial angle to the vertical;
the journal bearing means includes a journal bearing rotor and a journal bearing stator;
the journal bearing stator comprises an upper portion of the said groundpost;
the journal bearing rotor comprises a tube, the tube being unitary with the arm;
the tube has an upper end and a lower end, and includes a cap, which closes off the said upper end of the tube;
the arrangement of the mounting is such that the cap of the tube lies in operative engagement against the top of the groundpost;
the thrust bearing means includes a thrust bearing rotor and a thrust bearing stator;
the thrust bearing means is so disposed and arranged that the weight of the arm is transmitted to the groundpost by direct rubbing contact between the thrust bearing rotor and the thrust bearing stato during pivoting of the arm;
the thrust bearing stator comprises the top of the groundpost;
the thrust bearing rotor comprises the cap;
the lower end of the tube extends a substantial distance down the groundpost from the said thrust bearing means;
the lower end of the tube is in direct rubbing engagement with the groundpost during pivoting of the arm;
and the diameter of the tube is so dimensioned, in relation to the diameter of the post, as to provide a substantial diametral clearance between the lower end of the tube and the post.

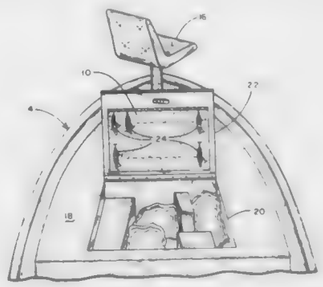
4,995,577

FISHING PLUG ORGANIZER

Barry L. Wood, 140 Hol-Mar Trail, McDonough, Ga. 30253

Filed Aug. 11, 1989, Ser. No. 392,585
Int. Cl.[5] A47B *96/00*
U.S. Cl. 248—205.3 5 Claims

1. An organizer for retaining a plurality of barbed hook-carrying devices, such as fishing lures, in a desired, predetermined orientation relative to one another to prevent tangling thereof, comprising a piece of relatively tough strong, tear-resistant elastomeric material exhibiting a coarse surface texture characterized by a random pattern of surface voids of varying size, the piece being further capable of having one or more barbed hooks of a lure pierce the material to retain the device in the desired position on the piece and be withdrawn from it to



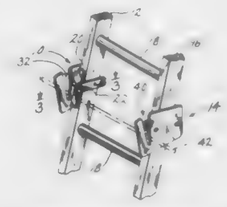
remove the device on a frequency basis without substantially altering the surface appearance of the material of the piece.

4,995,578

APPARATUS AND METHOD FOR SECURING A TUBULAR WORKPIECE IN POSITION ON A SUPPORT

Donald P. Monheim, N22 W28843 Oak La., Pewaukee, Wis. 53072

Filed Apr. 26, 1990, Ser. No. 514,717
Int. Cl.[5] E06C *7/14*
U.S. Cl. 248—210 10 Claims



1. A device for maintaining a workpiece in position on a support, comprising:
a body;
clamping means for affixing said body to said support; and
stationary retainer means provided on said body for engaging said workpiece and fixing the position of said workpiece relative to said support, said retainer means comprising an upwardly facing slot formed in said body and adapted to receive said workpiece therein, said slot being provided with a decreasing transverse dimension toward the lower portion of said body so that downward movement of said workpiece in said slot causes engagement of said workpiece with the walls of said slot.

4,995,579

ANGLE ADJUSTMENT DEVICE IN DISPLAY DEVICE

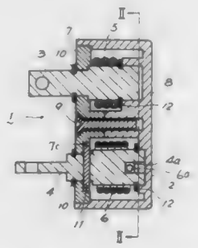
Yoshiharu Kitamura, Komagane, Japan, assignor to NHK Spring Co. Ltd., Yokohama, Japan

Filed Jun. 1, 1989, Ser. No. 359,884
Claims priority, application Japan, Jun. 11, 1987, 62-90215
Int. Cl.[5] H04N *5/64*
U.S. Cl. 248—284 5 Claims

1. An electronic display device comprising a main body, a display unit and an angle adjustment device connected between the main body and the display unit for lifting the display unit from the main body into a viewable position and enabling adjustment of the viewable position, the adjustment device comprising a pivot arm and secured to the main body, a second shaft journalled in the pivot arm in parallel with the first arm and secured to the display unit, a torsion spring connected

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between the pivot arm and the second shaft for urging the second shaft to rotate in a direction raising the display unit from the main body, a stop mechanism in the pivot arm for limiting the amount of rotation of the second shaft in said



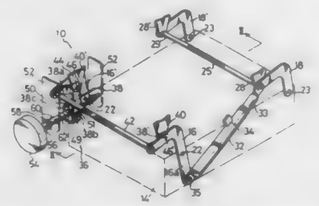
direction, and a lock spring in the pivot arm in frictional engagement with the first shaft allowing rotational adjustment of the pivot arm about the first shaft to provide said adjustment of the viewable position only when the frictional force of the lock spring is overcome.

4,995,580

HEIGHT ADJUSTING DEVICE FOR VEHICLE SEAT

Harutoshi Fujii, Akishima, Japan, assignor to Tachi-S. Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 386,917
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—421 5 Claims



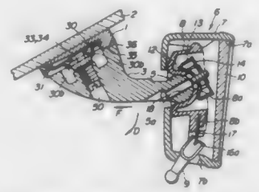
1. A height adjusting mechanism for a vehicle seat, comprising:
- a seat frame;
- a seat base disposed under said seat frame;
- a pair of forward links and a pair of rearward links which are movably provided between said seat frame and seat base;
- a seat height adjusting means provided between said forward and rearward links, said seat height adjusting means being adapted to cause vertical movement of said forward and rearward links in an adjustable manner, thereby adjusting vertical position of said seat frame; and
- a seat surface inclination adjusting means adapted to adjust the inclination of seat surface of said seat, wherein a tilt link is included therein and, with said tilt link, one of said forward and rearward links is raised or lowered, thereby causing adjustable vertical movement of a forward portion of said seat;
- said seat height adjusting means being provided independently of said seat surface inclination adjusting means;
- wherein said seat surface inclination adjusting means comprises a pair of tilt links provided between said seat frame and one of said forward and rearward links, an adjustor nut mounted movably in one of said pair of tilt links, and a drive spindle having a threaded portion formed circumstantially thereof which is threadedly engaged with said adjustor nut, said drive spindle being rotatably attached to said seat frame in a manner being prevented against movement in its longitudinal axial direction and being further at its forward end provided with an operation handle; and
- wherein said seat frame is provided with a pair of forward brackets at its forward portion and a pair of rearward brackets at its rearward portion, wherein said pair of forward brackets are each formed with a horizontally elongated hole, wherein a connecting rod extends between said pair of forward links and between said pair of tilt links, wherein one end respectively of said two tilt links is fixed on said connecting rod, while a central portion respectively of said two tilt links, which is provided with a pin, is movably connected with each of said two forward brackets such that said pins of said tilt links are respectively inserted movably through said horizontally elongated holes, and wherein said pair of forward links are at their respective one end connected rotatably to said connecting rod.

4,995,581

INSIDE REARVIEW MIRROR ASSEMBLY FOR MOTOR VEHICLE

Hideo Koiwai, Saitama; Junichi Yamazaki, Chiba; Kunio Yoshino, and Masaharu Tsuruoka, both of Saitama, all of Japan, assignors to Kabushiki Kaisha Matsuyama Seisakusho, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 278,800
Claims priority, application Japan, Dec. 4, 1987, 62-185240; Jun. 7, 1988, 63-75483; Jun. 7, 1988, 63-75484
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—480 10 Claims



1. An inside rearview mirror assembly for use in the passenger compartment of a motor vehicle, comprising:
- a base adapted to be mounted in the passenger compartment and attached to a body of the motor vehicle;
- a mirror;
- a stay supporting said mirror;
- holder means holding said stay detachably with respect to said base; and
- said base and said stay having respective joint surfaces intimately contacting each other, partly spherical interfitting projection and dimple formed respectively on front ends of said joint surfaces with respect to a longitudinal direction of the motor vehicle, and non-contact surfaces disposed forwardly of said projection and dimple with respect to said longitudinal direction and providing a gap between said stay and said base.

4,995,582

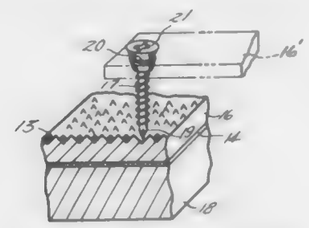
ANTI-SKID REINFORCING PLATE

James T. Ligon, Jr., Almont, Mich., assignor to Ligon Brothers Mfg. Co., Almont, Mich.

Filed Dec. 18, 1989, Ser. No. 451,863
Int. Cl.[5] F16B *5/00*
U.S. Cl. 248—544 3 Claims

1. A reinforcing structure useable in removably securing a fixture to a thin wall sheet surface and comprising; a metal reinforcing plate contoured to match the contour of said thin-walled sheet surface and said reinforcing plate having an outermost surface upset by randomly scattered depressions formed therein selectively locating a penetrating tool; and a resilient adhesive underpad of pressure sensitive adhesive material and a release sheet removable cover to actuate said pressure sensitive adhesive for skid proof engagement with a selected thin

wall surface; and one or more self-tapping screws for penetrating said reinforcing plate at selected of said upsets and said thin



wall surface under a retarding tension-compression load of the threads by said screws and securing said reinforcement structure against release.

4,995,583

DEVICES FOR DAMPING THE VIBRATIONS OF STAY CABLES

Carlos De La Fuente, Nanterre, France, assignor to Freyssinet International (STUP), Boulogne, France

Filed May 15, 1989, Ser. No. 351,226
Claims priority, application France, May 16, 1988, 88 06537
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—636 5 Claims



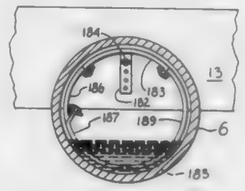
1. Device for damping the vibrations of a stay cable (1) anchored at at least one of its ends in a foundation (5), comprising a first rigid annular member (6) surrounding a section of the cable disposed in the vicinity of said foundation and fast with said section, a second annular member (8) mounted on the first annular member with formation therebetween of an annular cavity (7) so as to be able to move transversely with respect to the first annular member, seals (17) which are practically indeformable interposed between the two annular members so as to seal the annular cavity with respect to the outside, a cushion (9) made from a flowable material, but of constant overall volume, filling the annular cavity, a foundation (12), a rigid structure (11) connecting the second annular member to the foundation (12), the first annular member (6) being comprised of a gutter having in axial half section a radially outwardly open U shape with transverse wings having inner faces, the second annular member (8) being comprised of an annulus having transverse faces housed in the opening of the gutter, grooves (15) formed in the transverse faces of the annulus of the second annular member (8), said seals (17) being interposed between the gutter and the annulus of the second annular member (8), the seals being comprised of annular shoes (17) housed in said grooves (15) formed in the transverse faces of the annulus (8), the shoes being applied axially against the inner faces of the facing transverse wings of the gutter (6), which said inner faces are flat and preferably polished.

4,995,584

CAST-IN-PLACE MANHOLE LINER APPARATUS

Carroll O. Trimble, Springdale, Ark., assignor to Action Products Marketing Corporation, Johnston, Iowa

Continuation of Ser. No. 240,073, Sep. 2, 1988, abandoned, and a continuation of Ser. No. 415,862, Oct. 2, 1989. This application Nov. 30, 1989, Ser. No. 444,033
Int. Cl.[5] E02D *29/12;* E04G *11/20*
U.S. Cl. 249—10 8 Claims



1. A form system for casting cylindrical concrete walls with a substantially vertical axis for sewer manholes comprising
- a plurality of groups of at least three arcuate panels, the panels of each group having flanges on the horizontal edges thereof,
- means for interconnecting said panels of each group to form a smooth solid surface of revolution extending through 360° having a maximum dimension parallel to said vertical axis of less than four feet and for interconnecting said panels of one of said groups and another of said groups along their respective horizontal edges to form an extended solid surface having a dimension substantially parallel to said vertical axis of greater than four feet, each of said groups having at least one panel formed in two separable parts with a vertical dividing line, and
- an insert form for creating an opening in the shape of a cylinder at a sewer pipe connection in one of said walls including
- at least two arcuate members,
- means for interconnecting said members to form a smooth solid open-ended surface in the shape of a cylinder, at least one of said members being formed in two separable parts with a dividing line parallel to the axis of said cylinder,
- one of said parts having a planar edge surface along said dividing line forming an angle of at least 3° with the part's opposite edge surface, said angle diverging in the direction of the center of said solid surface in the shape of a cylinder, at least one of said members, when interconnected, terminating at the intersection of a cylindrical surface of radius greater than said cylinder and with an axis at right angles to the axis of said cylinder, and
- means for securing said insert form to the outer surface of one of said panels with an open end of said insert form extending below a lower edge of said one of said panels, whereby a channel is provided for fluid flow through said form and concrete wall during the casting process.

4,995,585

SANITARY FITTING

Walter Gruber, Stuttgart, and Horst Maag, Schonaich, both of Fed. Rep. of Germany, assignors to Hansa Metallwerke AG, Stuttgart, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,794
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1987, 3731679; May 30, 1988, 3818342
Int. Cl.[5] F16K *31/40;* E03C *1/05*
U.S. Cl. 251—30.03 10 Claims

1. A sanitary fitting which can be controlled to provide continuously variable water flow without physical contact which comprises in combination

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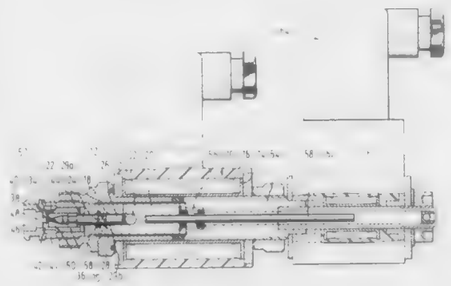
(A) a valve located in the path of water flow through said fitting,
(B) valve moving means operatively connected to said valve so that said valve can be moved from a completely open position to a completely closed position,
(C) at least one sensor operatively connected to said valve moving means so that within a given monitoring area movement will actuate said valve moving means which in turn will change the position of said valve,
the improvement comprising that
(1) said valve being a pilot controlled valve that includes
(a) a membrane (7) and a valve seat (4) which acts in conjunction with the membrane (7), said membrane having a pilot opening (7*a*, 47) and moves relative to the



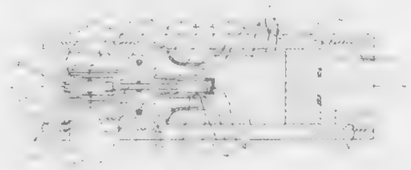
valve seat according to the water pressure on either side of it,
(b) a closing device (8) for said pilot opening (7*a*, 47),
(c) a plunger (9) which is attached to said closing device (8) and which is adapted to move in a linear manner so as to cause said closing device (8) to either allow water flow through said pilot opening (7*a*, 47) or prevent water flow through said pilot opening (7*a*, 47), and
(2) said valve moving means comprising
(a) an electric motor (25, 39) having an output shaft (38) that rotates, and
(b) a device (32, 33, 20) which converts the rotary movement of the output shaft (38) into a linear movement of the plunger (9).

4,995,586
SOLENOID VALVE
Karl Gensberger, St. Ingbert, and Joachim Morsch, Marpingen, both of Fed. Rep. of Germany, assignors to Hydac Technology GMBH, Fed. Rep. of Germany
Filed Oct. 23, 1989, Ser. No. 425,231
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 8813817[U]
Int. Cl.[5] F16K *31/40*
U.S. Cl. 251—30.04 **19 Claims**

1. A solenoid valve, comprising:
a fluid flow passage with a cross section;
an operating magnet;
an armature mounted within said operating magnet for reciprocating movement;
a valve member connected to said armature by a sliding connection permitting limited relative axial movement between said valve member and said armature, movement of said valve member being controlled by said armature;
a valve spring biasing said armature toward a closed position of the valve;
a control member extending from said armature; and
electronic circuit means for controlling the cross section of said fluid flow passage, said circuit means including a coil with an exciter winding, said control member being received and movable in said coil, said circuit means including a switching circuit for proximity switches having a restoring means connected with said coil, and a switching means for producing a switching hysteresis.



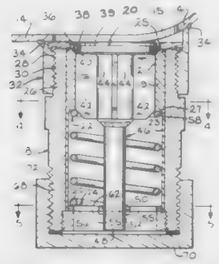
4,995,587
MOTION AMPLIFIER EMPLOYING A DUAL PISTON ARRANGEMENT
Richard C. Alexius, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.
Filed Nov. 3, 1989, Ser. No. 431,272
Int. Cl.[5] F16K *31/04*
U.S. Cl. 251—129.06 **15 Claims**



1. A mechanical motion amplifier useful for controllably converting an input displacement into an amplified output displacement, comprising:
(a) a first piston movable within a predetermined range of travel along an axis in response to said input displacement,
(b) a second piston movable within a predetermined amplified range of travel along an axis,
(c) force transmission means cooperating with said first and second pistons for effecting movement of said second piston in response to movement of said first piston, said force transmission means being an elastomer, and wherein.
(d) the relationship between said first and second pistons is such that movement of said first piston produces amplified movement of said second piston along its axis.

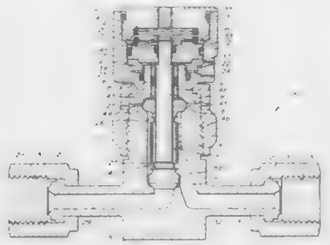
4,995,588
DRY-BREAK DISCHARGE VALVE ASSEMBLY FOR A LIQUID BULK CONTAINER
Dwight E. Nichols, Beatrice, Nebr., assignor to Hoover Group, Inc., Alpharetta, Ga.
Filed Nov. 13, 1989, Ser. No. 435,728
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—144 **3 Claims**

1. A dry break discharge assembly comprising:
a valve member having a stem;
a housing for said valve member, said housing having a seat at its upper end engageable with said valve member to define a closed position for said valve member preventing liquid flow through said housing;
biasing means engaged with said valve member and operable to bias said valve member in one direction toward said seat, said stem being movable in a direction opposite to said one direction to move said valve member away from said valve seat to define an open position in which said valve member is spaced from said seat, and



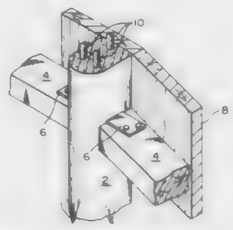
a plurality of outwardly protruding fins on said stem slidably engaged with said housing in both said open and closed positions of said valve member, said plurality of fins being adjacent said seat, and said fins being operable to maintain said valve concentrically within said housing and in a concentric relation with said seat when said valve is moved between said open position and said closed position.

4,995,589
BELLOWS VALVE
David Adishian, Palos Verdes Estates, and Ira J. Silverman, Northridge, both of Calif., assignors to Sequoia Controls Company, Ltd., Carson, Calif.
Filed Jan. 29, 1990, Ser. No. 472,005
Int. Cl.[5] F16K *31/00*
U.S. Cl. 251—335.3 **17 Claims**



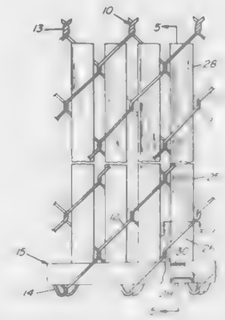
1. A bellows valve comprising:
a metal valve body having an inlet passage, an outlet passage, a valve cavity in fluid communication with said passages, and a valve seat in said cavity interfacing between said passages;
a translatable cylindrical valve stem, on end which is selectively cooperable with the valve seat to control the flow of fluid between the said passages, and another end of which is directly linked to an actuator assembly;
a bellows surrounding a portion of a lower diameter of said stem for isolating and sealing said stem from a system fluid passing through the valve chamber, such that the system fluid exerts an external compressive force on said bellows;
said valve cavity having an open end to accept said stem and said bellows;
wherein said actuator assembly is removably connected to said valve body and directly communicates with said stem and includes a positive linkage including an actuator piston connected to said valve stem and a flat spring of the wave or belleville type abutting an operating surface of said piston to control system fluid flow through the valve seat in one direction by the application of pressure to an actuator inlet port, and in the other direction by a force exerted in a return direction by said flat spring; and
further including guide means for one-piece construction for centering and sealing said stem, said guide means surrounding and spaced from said valve stem and positioned in sealing contact between said valve body and a metal valve bonnet surrounding an upper diameter of said stem.

4,995,590
FENCE POST INSTALLATION
Gregg V. Close, 18915 SE. Petrovitsky Rd., Renton, Wash. 98058
Filed May 15, 1990, Ser. No. 511,190
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—24 **3 Claims**



1. A permanent fence post comprising:
an elongated main body portion fabricated of a permanent material, said main body portion including at least two parallel flat sides and a plurality of elongated reinforcing means extending substantially the entire length thereof, and a pair of spaced parallel rigid straps which extend between and are captured by the reinforcing means and which extend through the posts and extend outwardly thereof on the parallel sides to support an appropriate framework.

4,995,591
RETAINING LOCK FOR CHAIN LINK FENCE SLATS
William D. Humphrey, 909 W. Riverview Ave., Selah, Wash. 98942, and Harold Rothenberger, 1 Dorset Dr., Yakima, Wash. 98902
Continuation of Ser. No. 366,247, May 26, 1989, abandoned, which is a continuation of Ser. No. 229,710, Aug. 8, 1988, abandoned. This application Aug. 25, 1989, Ser. No. 399,419
Int. Cl.[5] B21F *27/00*
U.S. Cl. 256—34 **8 Claims**



1. In chain link fencing employing slats inserted vertically

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through adjacent rows of fencing links, each slat being elongated and having a longitudinal dimension with spaced opposite ends, a width dimension and a thickness dimension less than the width dimension, a means for securing the slats within the fencing, comprising:

a notch formed in each slat near one end thereof, the notch extending across the width dimension and partly through the thickness dimension; and

a channel inserted through the fencing in a horizontal orientation to receive perpendicularly the ends of the slats having the notch formed nearby, the channel having inner surfaces and including a base portion and opposing walls, each of which has terminal edge portions spaced from said base portion, at least one of said terminal edge portions including an inwardly projecting barbed edge, the spacing between the respective terminal edge portions being less than said slat thickness dimension and said at least one barbed edge being engageable within the notch so as to lock the slat to the channel.

4,995,592

PURIFYING MOLTEN METAL

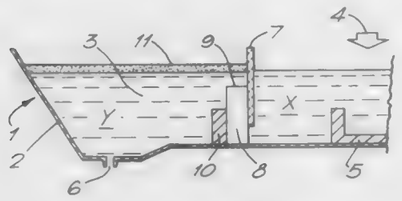
Neil J. Kegan, Birmingham; Ian Hitchens, Middlesborough; Thomas Robertson, Stockton, all of England, and Paul A. Whitehouse, Whyalla Playford, Australia, assignors to Foseco International Limited, Birmingham and British Steel PLC, London, both of, England

Filed Dec. 5, 1989, Ser. No. 446,567

Claims priority, application United Kingdom, Dec. 22, 1988, 8829918; May 20, 1989, 8911682

Int. Cl.[5] C21B *7/14*

U.S. Cl. 266—44 **26 Claims**



1. A method of purifying metal in a tundish comprising passing said metal in molten form between a zone of arrival and an outlet and past baffles located between said zone of arrival and outlet, in which the metal is passed past and between a vertical array of said baffles, the baffles of the array being spaced apart transversely across the tundish whereby flow of the molten metal is restricted to channels between the baffles; and wherein there is positioned immediately upstream of the array of baffles a weir extending transversely across the tundish for at least a substantial portion of its width and under which the metal must flow.

4,995,593

CRUCIBLE HAVING A MOVABLE DROSS COLLECTOR COMPRISING AN INDUCTION COIL

David A. Ford, Bristol; Gordon J. S. Higginbotham, Derby; David R. Pugh, Bristol, and Naresh Kumar, Birmingham, all of England, assignors to Rolls-Royce plc, England

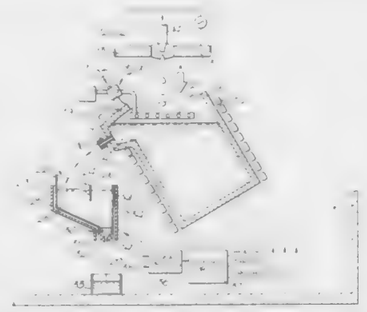
Filed Dec. 20, 1989, Ser. No. 453,999

Claims priority, application United Kingdom, Dec. 20, 1988, 8829889.2

Int. Cl.[5] F27D *11/06*

U.S. Cl. 266—227 **8 Claims**

1. A combined crucible and dross collector comprising a crucible having one side of a top thereof pouring means and movable dross collector, said dross collector comprising an electromagnetic induction coil means located near the top of



the crucible and mounted for movement relative to the crucible at least in a lateral sweeping movement.

4,995,594

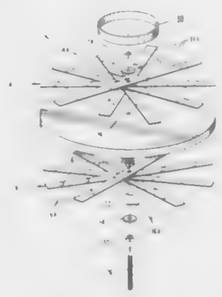
SLAG STOPPING PLUG FOR TAP HOLES OF METAL FURNACES CONTAINING MOLTEN MATERIAL

Robert M. Verbik, Merrillville, Ind., assignor to MPC, Metal Process Control A.B., Nyköping, Sweden

Filed Oct. 13, 1989, Ser. No. 420,894

Int. Cl.[5] C21C *5/48*

U.S. Cl. 266—272 **17 Claims**



1. A plug for temporarily closing a tap hole in a furnace containing molten material, comprising a plug element insertable into a tap hole, biasing means held in a retracted condition by a heat-destructible retaining member during insertion of the plug into the tap hole, said heat-destructible material being destructible by a temperature encountered in the tap hole, said biasing means being releasable in response to thermal destruction of said retaining member for urging said plug element against a surface of the tap hole.

4,995,595

SMELTING CRUCIBLE

Wolfgang Reuter, Niddatal, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,707

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609836

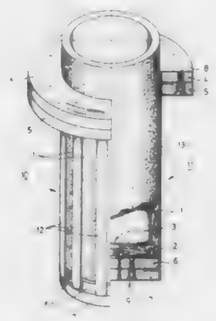
Int. Cl.[5] C21B *3/00*

U.S. Cl. 266—275 **4 Claims**

1. A smelting crucible for smelting down a block of material by electrical heating for making precision castings, comprising:

a thin-walled casing of fibrous, mineral material for making precision castings, and including a base of fibrous, mineral material with a tapping opening therein, the tapping opening being closed during smelting by a metal plate;

a flange at an upper edge of the crucible for mounting the crucible in a holding device; and



reinforcing means which can be stressed in tension and which connects the flange to the base of the crucible, the reinforcing means being so constructed as to allow gas to escape from the casing through the fibrous, mineral material thereof.

4,995,596

APPARATUS FOR REPAIRING A PERFORATED BRICK IN A METALLURGICAL VESSEL

Hans Rothfuss, Taunusstein, and Peter Keutgen, Kreuzau, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 28, 1989, Ser. No. 413,675

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833506

Int. Cl.[5] C21B *7/04*

U.S. Cl. 266—281 **25 Claims**



1. An apparatus for repairing a perforated brick employed in a wall of a metallurgical vessel and having an opening into which is to be fit a gas washing sink for introducing gas into molten metal within the metallurgical vessel, during which the perforated brick becomes worn, said apparatus comprising:

a casing having an outer contour corresponding to the outer contour of the gas washing sink and adapted to be inserted into the opening of the perforated brick upon removal therefrom of the gas washing sink, thereby to form a template defining the contour of the opening in a worn portion of the perforated brick;

a feed pipe, extending through and guided by said casing, for supplying therethrough repair material for repairing the worn portion of the perforated brick; and

a spray head, connected to said feed pipe, for directing the repair material toward the worn portion of the perforated brick, said spray head includes means for discharging the repair material toward the worn portion of the perforated brick in a direction extending from 90° to 180° with respect to the direction of flow of the repair material through said feed pipe.

4,995,597

HYDRAULIC SHOCK ABSORBER WITH TELESCOPIC CASINGS

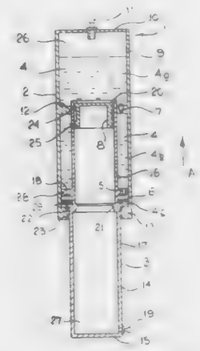
John J. Hatton, Highnam, United Kingdom, assignor to Dowty Rotol Limited, Gloucester, England

Filed May 2, 1989, Ser. No. 347,383

Claims priority, application United Kingdom, May 4, 1988, 8810558

Int. Cl.[5] F16F *9/14, 5/00, 9/06*

U.S. Cl. 267—64.15 **6 Claims**



1. A hydraulic shock absorber including:

a first casing member telescopically and sealingly engaged with a second casing member, said second casing member having a first section of reduced diameter in comparison to a second section;

oil reservoir means defined by the first and second casing members, which is divided into two distinct volumes by a one-way restrictor means attached to the second casing member;

a slidable piston mounted within the second casing member, so as to separate the oil reservoir means from a gaseous capacity; wherein the one-way restrictor means acts to restrict the flow of oil from the volume of the oil reservoir means defined by the first casing member and the second section of the second casing member to the volume of the reservoir means defined by the first casing member and the first section of the second casing member only and the volume of the oil reservoir means defined by the first casing member and the first section of the second casing member is further divided into two sections by a restrictor means.

4,995,598

RESILIENT MOUNTING

Peter L. Ingham, Leamington SPA, England, assignor to Dunlop Limited, United Kingdom

Filed Mar. 29, 1989, Ser. No. 330,135

Claims priority, application United Kingdom, Mar. 31, 1988, 8807658; May 11, 1988, 8811198

Int. Cl.[5] F16F *7/00*

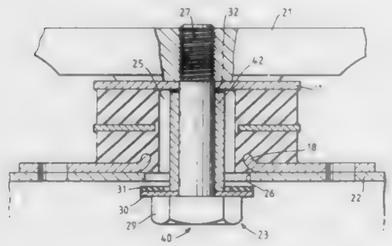
U.S. Cl. 267—293 **7 Claims**

1. A resilient mounting comprising:

a resilient component comprising a substantially tubular body of elastomeric material located between and bonded to generally planar confronting surfaces of a pair of end members, said body of elastomeric material being reinforced by an embedded annular reinforcement element of generally planar form arranged to lie between and substantially parallel with said confronting surfaces of the end

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members, and a first of said end members being of an annular form, a bummer member secured to a second of said members and located within the internal cavity defined by the tubular body to lie spaced from the internal surface of the tubular body when the mounting is an unstressed condition, said buffer member extending axi-



ally over substantially the entire length of said internal cavity, and

a buffer layer of elastomeric material provided between at least the buffer member and each of the reinforcement element and said first end member to prevent direct contact therebetween when the mounting is subject to transverse load.

4,995,599

MACHINIST'S VISE WITH ADJUSTABLE PRESSURE LIMITER

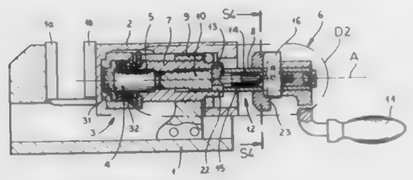
Ludwig Pflüger, Bitburg/Moetsch, Fed. Rep. of Germany, assignor to Carl Ullrich Peddinghaus, Wuppertal-Barmen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 247,109, Sep. 20, 1988, Pat. No. 4,940,216. This application Mar. 20, 1990, Ser. No. 496,983

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732900; Mar. 24, 1989, 3909812

Int. Cl.[5] B23Q *3/08*

U.S. Cl. 269—32 4 Claims



1. A vise comprising:

a stationary jaw;

a movable jaw displaceable axially toward and away from the stationary jaw;

a nut fixed on the stationary jaw;

an outer hollow high-speed spindle threaded in the nut and formed with a radially open entrainment recess;

an inner low-speed spindle threaded in the outer spindle;

a piston-and-cylinder unit on the movable jaw having primary and secondary pistons respectively engaged by the outer and inner spindles;

a hand crank rotationally fixed on the inner spindle;

an entrainment pin displaceable transversely in the inner spindle between an entrainment position engaged in the recess and rotationally coupling the inner and outer spindles to each other and a freeing position clear of the recess and permitting relative rotation of the inner and outer spindles, the entrainment pin being formed with a axially directed camming surface;

a switching piece displaceable on the inner spindle between a high-speed position and a low-speed position;

means including an operating bolt displaceable along the inner spindle and engageable with the entrainment pin and with the switching piece for pressing the operating bolt into the camming surface in the low-speed position of the switching piece and thereby pulling the entrainment pin out of the recess to decouple the spindles and for freeing the operating bolt from the camming surface and coupling the spindles to each other in the high-speed position of the switching piece; and

a stop collar rotatable and axially displaceable on the outer spindle and having a front face engageable directly with the movable jaw and a back face formed with a plurality of pairs of diametrally opposite notches of different depths and complementary to the switching piece, and means for fixing said stop collar relative to said outer spindle, whereby the switching piece is engagable with a selected pair of notches, and whereby the collar limits displacement of the switching piece axially forward toward the movable jaw by different distances depending on which pair of notches the switching piece is engaged in and whereby the different distances correspond to different respective clamping forces.

4,995,600

GENERAL-PURPOSE FOLDING MACHINE

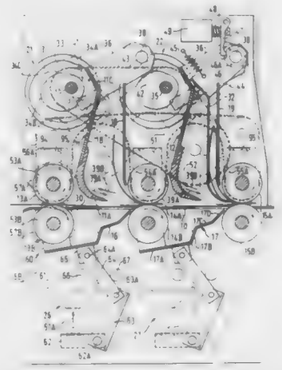
Josip Kovac, Ozoir-la-Ferriere, and André Ferreol-Ragotin, Evry, both of France, assignors to Societe Anonyme dite: Alcatel Satman, Bagneux, France

Filed Jan. 27, 1989, Ser. No. 302,650

Claims priority, application France, Jan. 29, 1988, 88 01063

Int. Cl.[5] B42C *1/00*

U.S. Cl. 270—45 23 Claims



1. General purpose document folding machine for folding a flat document into three folds comprising:

a folding module coupled to an input module receiving documents to be folded on one side and to an output module supplying the folded documents to the opposite side,

means defining a substantially horizontal main path through said modules,

first and second folding blades, means for pivotably mounting said first and second folding blades, one after the other, above said main path in said folding module,

first, second and third pairs of rollers along said main path in said folding module for advancing the documents, said first pair of rollers being mounted upstream of said first blade, said second pair of rollers being mounted between said first and second blades, and said third pair of rollers being mounted downstream of said second blade,

first and second guide flaps, means for substantially vertically mounting said first and second guide flaps above said main path in said folding module, adjacent to said second and third pairs of rollers, respectively, on their upstream sides,

first and second deflector flaps, means for pivotably mounting said first and second deflector flaps, underneath said main path in said folding module, and extending just upstream of said second and third pairs of rollers, respectively, for movement between a nondiversion position below said path and a diversion position within said path to selectively divert documents from said main path against said first and second guide flaps, respectively, when individually actuated to diversion position,

detecting means for detecting the position of each document along the main path in said folding module and for controlling activation of each deflector flap to diversion position from nondiversion position and of each blade in folding position transversely to a diverted document, and

folding blade drive means for driving each blade in folding position having a longitudinal speed component parallel to the main path substantially equal to the speed of the document moving along the main path.

4,995,601

ANTI-SKEW SHEET FEEDING DEVICE FOR IMAGE FORMING APPARATUS AND SHEET STORAGE DEVICE FOR USE THEREIN

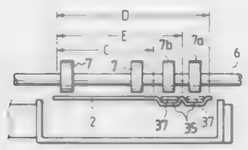
Masashi Ohashi, Tokyo; Yoshikuni Toyama, Yokohama; Kazuo Kagiura, Tokyo; Hiroyoshi Maruyama, Yokohama; Tatsuya Shiratori, Kawasaki; Masanari Shirai, Chigasaki, and Eiichi Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,458

Claims priority, application Japan, Dec. 28, 1987, 62-334072; Feb. 20, 1988, 63-037873

Int. Cl.[5] B65H *1/08*

U.S. Cl. 271—127 10 Claims



1. A sheet feeding device for use in an image forming apparatus provided with plural rotary members arranged respectively at a position opposed to a small sized sheet and at a position opposed to a large sized sheet, side by side axially, for separating and feeding the sheets supported on a sheet support plate, said sheet feeding device comprising:

a sheet support plate for supporting the sheets;

a recessed portion formed on said sheet support plate in a position to the rotary member which is at the position opposed to the large sized sheet;

a detachable auxiliary friction member for said sheet support plate, to be fitted in said recessed portion for forming a plane in feeding the large sized sheet and to be removed from said recessed portion in feeding the small sized sheet; and

a friction member on said sheet support plate in a position opposed to the rotary member which is at the position opposed to the small sized sheet.

4,995,602

FACSIMILE DEVICE

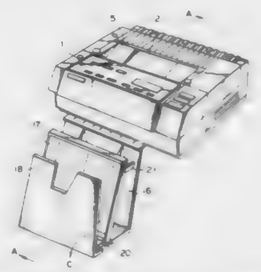
Yoshikazu Nakadai; Daiya Taranishi, both of Atsugi; Koichi Hirokawa, Kawasaki, and Nobuki Matsumoto, Miura, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 216,308, Jul. 8, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 483,276

Claims priority, application Japan, Jul. 10, 1987, 62-171193

Int. Cl.[5] B65H *31/24*

U.S. Cl. 271—207 20 Claims



1. A facsimile device in which both a manuscript and a copied sheet are discharged in a direction outside of a front surface side at an operating portion of a main part of said facsimile device,

said facsimile device comprising:

(a) said main part of said facsimile device,

(b) a copied sheet tray for receiving a copied sheet,

(c) a manuscript tray for receiving a manuscript,

(d) a partition member positioned for separating said copied sheet tray and said manuscript tray from each other,

(e) connection means for unitarily combining bottom portions of said copied sheet tray and said manuscript tray to form a tray assembly, and

(f) junction means for jointing said tray assembly to said facsimile device main part,

wherein both of said manuscript tray and said copied sheet tray are joined to said facsimile device main part together with said partition member so as to be inclined in a substantially vertical direction which is substantially perpendicular to a direction of discharging said copied sheet and wherein said partition member comprises a single member connected with the unitarily combined bottom portions of said copied sheet tray and said manuscript tray, and is commonly usable for both said copied sheet tray and said manuscript tray.

4,995,603

AMUSEMENT SYSTEM INCLUDING RIDING CAPSULE DEVICE

Victoria K. Reed, 1778 Peck La., Cheshire, Conn. 06410

Continuation-in-part of Ser. No. 922,942, Oct. 24, 1986. This application Nov. 17, 1989, Ser. No. 437,753

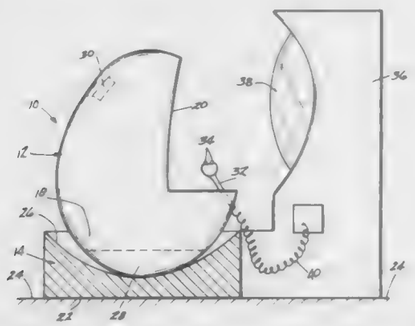
Int. Cl.[5] A63G *31/02*

U.S. Cl. 272—18 6 Claims

1. An amusement system comprising a riding capsule device including a capsule member and a base member, said capsule member engaging said base member, a video screen visible to an occupant of said capsule member and means for displaying scenes on said screen, whereby visual stimuli are provided to the occupant and said capsule member is rotatable and tiltable with respect to said base member as said stimuli are observed,

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wherein said capsule is rotatable and tiltable in a free rolling mode in which the motion of said capsule member will be



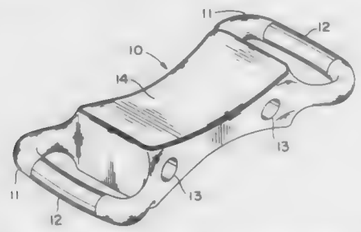
solely the result of reactions of the occupant to observed stimuli.

4,995,604

AEROBIC WATER WEIGHT

Ronald E. Lynch, and Bradley W. Smith, both of 3601-24th Ave. W. #201, Seattle, Wash. 98199

Filed Jan. 25, 1989, Ser. No. 301,651
Int. Cl.[5] A63B *21/072*
U.S. Cl. 272—122 10 Claims



1. A water weight for aerobic water exercise having a generally rectilinear shape, said weight comprising at least one handle, a pair of opposed inwardly curving leg grip surfaces, and one or more externally accessible weight pockets extending substantially across said rectilinear shape for receiving supplemental weights to adjust the buoyancy of said water weight.

4,995,605

PANEL FASTENER CLIP AND METHOD OF PANEL ASSEMBLY

David J. Conville, Hot Springs, Ark., assignor to Conlab Inc., Hot Spring, Ark.

Continuation-in-part of Ser. No. 67,369, Jun. 29, 1987, Pat. No. 4,782,642. This application Jun. 10, 1988, Ser. No. 206,085
Int. Cl.[5] E04B *1/40*
U.S. Cl. 52—770 25 Claims

1. A construction method for securely coupling together adjacent panels of gypsum board, sheet rock, masonite, insulation board, plywood or the like, which panels having abutting finished edges which, during wall assembly, terminate at random positions spaced apart from the wall studs, support columns or the like, said method comprising the steps of:

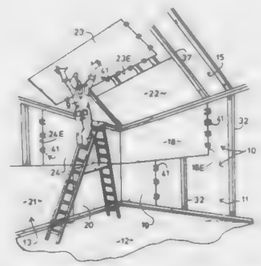
conventionally installing a first panel upon and between spaced apart studs or vertical support columns during assembly with an exposed edge of said first panel randomly positioned apart from the nearest stud or vertical support column over a hollow region of the wall structure;

applying at least one clip to the exposed, finished panel edge to prepare said first panel for coupling to a second panel finished edge, each of said clips comprising:

a generally rectangular and planar, perforated body portion adapted to be blindly penetrated by a self tapping screw, said body portion having a length greater than the thickness of said panel(s), a front, a rear, and a pair of spaced apart sides;

prong-like spring tab means integrally projecting forwardly from said clip body portion at said spaced-apart sides thereof, each of said spring tab means including a vertical portion generally perpendicular to said clip body portion and an integral offset horizontal flange portion oriented generally parallel with said clip body portion adapted to readily frictionally grasp a finished edge of a panel to sandwich same against said clip body; said spring tab flange portions spaced apart from said clip body portion a distance approximately equal to or less than the thickness of said panel;

installing a fastener through said first panel substantially within a region defined between said spring tab means horizontal portions so as to penetratingly engage said clip



body in a substantially random position thus permanently affixing said at least one clip to said first panel;

positioning a second panel having an exposed finished edge immediately adjacent to the exposed finished edge of said first panel over exposed planar portions of said at least one clip with said finished edges of said panels substantially abutting one another;

installing another fastener through said second panel immediately adjacent said spring tab means horizontal portions so as to permanently couple said second panel to said at least one clip body portion whereby said first and second panels are coupled together along their exposed finished edges and the panels are at least temporarily slightly angulated relative to one another by the clip with the clip forming the sole backup structure for the adjacent panels without additional mechanical linkage to a stud, support column or the like; and,

thereafter manually removing said horizontal flange portions of said spring tab means by bending them until breakage occurs along a predefined scored junction, whereby to ultimately construct an unobstructed wall surface for subsequent finishing.

4,995,606

BOARD GAME

Kiyoshi Kashimoto, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 16, 1989, Ser. No. 421,781
Claims priority, application Japan, Dec. 19, 1988, 63-164227[U]
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—1 GG 7 Claims

7. A game comprising:

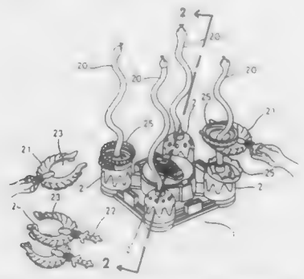
a base having a plurality of supports positioned thereon;

a plurality of first movable members respectively positioned within corresponding ones of said supports;

motor means for providing a drive force;

a linkage mechanism connected between said motor means and each of said first movable members so as to transmit said drive force to and to move each of said movable members;

a plurality of second movable members connectable to respective ones of said first movable members;



a plurality of third movable members having an opening for accepting respective ones of said second movable members; and

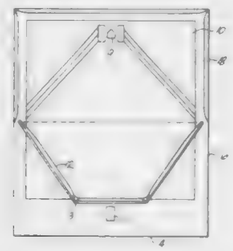
a manipulator including a handle and spaced apart protrusions for accepting a selected one of said third movable members.

4,995,607

INTERACTIVE SPORTS TRAINING DEVICE

Terry B. Whitfield, 2729 Carmar Dr., Los Angeles, Calif. 90046

Continuation of Ser. No. 239,114, Aug. 31, 1988, abandoned. This application Dec. 12, 1989, Ser. No. 453,143
Int. Cl.[5] A63B *69/40*
U.S. Cl. 273—26 R 25 Claims



1. An interactive sports training device comprising;

a screen mountable adjacent a playing area;

means for displaying a prompt to a player in the playing area;

sensor means for detecting the impact of an object hitting the screen and for generating a signal representative of the location of the impact on the screen;

programmable signal processing means, electrically connected to the sensor means and the prompt means, for generating a response signal dependent upon the sensor signal, and the displayed prompt and for adjusting the response signal to simulate an opposing player's ability to respond to an object hitting the screen; and

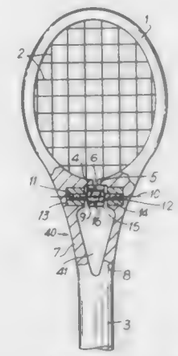
display means electrically connected to the signal processing means for displaying a message dependent upon the response signal.

4,995,608

STRINGED FRAME WITH ADJUSTABLE TENSIONING

Friedrich-Wilhelm von Hackewitz, 8720 Schweinfurt, Lauerweg 2, Fed. Rep. of Germany

Filed Apr. 24, 1989, Ser. No. 342,227
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 3813872
Int. Cl.[5] A63B *51/12*
U.S. Cl. 273—73 E 5 Claims



1. A game racket comprising a head portion joined to a rigid handle portion by way of an intermediate throat portion,

said head portion comprising an annular frame member extending in a plane and comprising where it joins the handle portion a first pair of adjacent brace members which define the sides of an opening in the throat portion and a second pair of end portions at the top of the throat opening and which are spaced from one another to form a gap, stringing connected across the annular frame member, said frame member and said first pair of brace members being slightly resilient and deformable in the said plane such that when the size of the said gap between the end portions is varied the stringing tension is varied,

an elastically deformable shackle member extending into the throat opening between the brace members and joined to and across the end portions, and shackle member being deformable substantially only in the circumferential direction of the frame member, thereby to reduce vibrations of the end portions,

adjusting means in the said gap between the end portions and bearing against the end portions and capable upon actuation to vary the size of the said gap and thereby vary the stringing tension, said adjusting means comprising a wedge having a threaded member and acting in the gap between the two end portions of the frame and pushing the two end portions substantially away from each other when the threaded member is rotated, said wedge being arranged perpendicular to the plane of the frame and being displaceable when the threaded member is rotated.

4,995,609

IRON GOLF CLUB HEADS

Richard E. Parente, Solana Beach; Richard De La Cruz, Pauma Valley, and Richard C. Helmstetter, Carlsbad, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation-in-part of Ser. No. 65,307, Jun. 23, 1987, which is a continuation-in-part of Ser. No. 19,702, Feb. 27, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 204,704
Int. Cl.[5] A63B *53/02*
U.S. Cl. 273—80.2 6 Claims

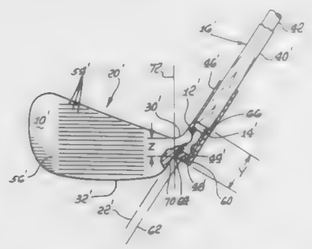
3. The improvement in an iron golf club, comprising:

(a) an iron golf club head having a sole and having a blade with a toe end and a heel end,

(b) said head having a hosel disposed at said heel end of said

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blade in a position juxtaposed to said blade and formed from the same continuous piece of metal as an integral part lapping said heel end from the upper edge of said heel end downwardly, and there being no bridge between said blade and said hosel below said hosel, said hosel extending from a level above the top of said blade down to said sole, said hosel having a through bore of substantially constant diameter extending from the top of said hosel down through said sole, said hosel being solid and inflexible and having a substantially even wall thickness from its lower portion to its top edge,



(c) said hosel having a dog-leg which in bottom view of said club head extends at an obtuse angle forwardly from said heel end of said blade,

(d) the lowermost sole end of said hosel being substantially squared with the longitudinal axis of said hosel forming a step substantially above the plane containing the sole of the club below said lowermost portion of said hosel thereby reducing the weight of metal of said hosel which can be redistributed to said blade, and

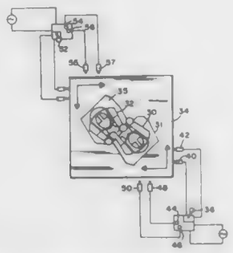
(e) a golf club shaft having a lower portion thereof fixedly secured within said bore; said lower portion of said shaft being inflexible relative to said hosel and extending completely to said lowermost end of said hosel.

4,995,610

ELECTRIC BOXING GAME

George J. Paoletti, 78 Melrose St., Arlington, Mass. 02174

Filed May 16, 1989, Ser. No. 352,260
Int. Cl.[5] A63F *13/06*
U.S. Cl. 273—85 F 20 Claims



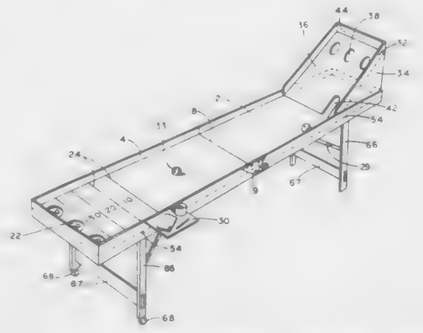
1. In a boxing game, the combination of two opposed doll boxers mounted on a support surface, each said boxer having foldable and extendable arms, electric means for controlling the body movements of at least one boxer and the arm movements of said one boxer against the other boxer, said electric means including an X-axis motor and a Y-axis motor for providing said body movements of said one boxer, manual controls connected to and operative upon said X-axis and said Y-axis motors, for controlling boxer body movement in a plane including said X-axis and said Y-axis and actuator means for controlling each arm extension and retraction of said one boxer.

4,995,611

MULTIMODE GAME BOARD

James F. Goldthorpe, Rte. 3, Box 2559, McMillan, Mich. 49853

Filed Dec. 17, 1987, Ser. No. 134,241
Int. Cl.[5] A63F *7/00*; A63B *39/00*; A47B *85/00*, *57/00*
U.S. Cl. 273—123 R 2 Claims



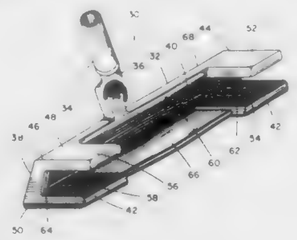
1. A rectangularly shaped, multimode game board comprising at least one generally flat playing surface upon which game pieces can be rolled or slid by one player, said game board being supported by a plurality of legs, and said legs being removable in pairs, whereby said game board can be folded into a comparatively flat configuration for transit and/or storage, a generally triangularly shaped device having an angled front surface usable at a selected location on at least one of said playing surfaces, said angled front surface having a plurality of holes therein, thus forming an opportunity for a player to test his or her skill by causing a game piece to move along at least part of the playing surface, up the angled front surface of said triangularly shaped device, and thence into one of said holes, and a return slot provided in a lower part of said angled front surface, such that the game piece can return under the influence of gravity back along the playing surface to the player.

4,995,612

GOLF CLUBHEAD IN A CORNER-BACK CONFIGURATION

Clifton D. Finney, 1057 Oak Hills Pkwy., Baton Rouge, La. 70810

[*] Notice: The portion of the term of this patent subsequent to Jan. 15, 2007, has been disclaimed.
Continuation-in-part of Ser. No. 289,908, Dec. 27, 1988, Pat. No. 4,898,387. This application May 31, 1989, Ser. No. 359,109
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 19 Claims



1. A golf clubhead comprising:

a. a front together with a back, a top, a sole, a heel, and a toe;

b. a striking means to strike a ball including a ball striking surface toward said front and an external rear surface toward said back;

c. a fastening means to affix a shaft;

d. a head weight means comprising at least one head weight as inertial weight for said clubhead, and a binding means to attach said head weight means to said clubhead;

e. a toe section of said clubhead extending half the length of said clubhead from an extreme of said toe toward said heel to a central boundary defined by a vertical cut-plane positioned perpendicularly to the length line of said clubhead;

f. a toe weight means including at least one tow weight of the portion of said head weight means in said toe section as inertial weight;

g. a configuration of said toe section including:

(i) first and second substantial percentages of said toe weight means as an upper concentration of mass and a lower concentration of mass positioned adjacent said top and said toe and adjacent said sole and said toe, respectively, with each said concentration extending rearward from adjacent said rear surface of said striking means toward said back and between the extreme of said toe and said central boundary; and

(ii) a generally minimal first local width approaching the width of said striking means adjacent said top between said central boundary and said upper concentration, a generally maximal second local width due to said upper concentration extending rearward adjacent said top and said toe, a generally minimal third local width approaching the width of said striking means due to the generally open space between said upper and lower concentrations adjacent said toe, and a generally maximal fourth local width due to the rearward extension of said lower concentration adjacent said sole and said toe; and

(iii) said maximal second local width generally greater than each of said minimal first and third local widths, and said maximal fourth local width also generally greater than said minimal third local width; whereby

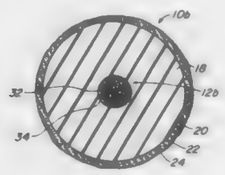
h. polar moments of inertia of said clubhead are enhanced to reduce twisting and loft changes when a golf ball is struck.

4,995,613

PROCESS FOR MANUFACTURING PRACTICE GOLF BALL

Grant W. Walker, Sacramento, Calif., assignor to Spin-Alizer Corporation, Sacramento, Calif.

Division of Ser. No. 284,722, Dec. 15, 1988, Pat. No. 4,886,275. This application Sep. 28, 1989, Ser. No. 413,955
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 C 9 Claims



1. A process of constructing a moderately resilient, energy-absorbing practice golf ball comprising the steps of:

a. binding dense metal into a core;

b. wrapping strips of uncured rubber into a thick layer around said core;

c. pressing the surface of said layer of uncured rubber into a substantially spherical shape;

d. pressing a layer of textile fabric into the surface of said uncured rubber layer, thereby yielding a fabric-covered ball;

e. curing said ball and fusing its layers together with elevated pressure and temperature.

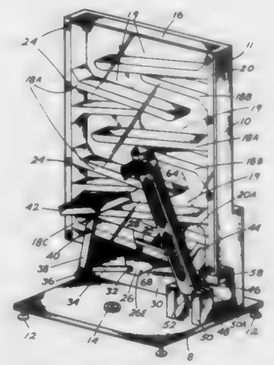
9. A moderately resilient, energy-absorbing practice golf ball constructed in accordance with the process of claim 1.

4,995,614

GOLF BALL DISPENSER AND SETTER

Mark L. Tange, 14991 Coutolenc Rd., Magalia, Calif. 95954

Filed Aug. 13, 1990, Ser. No. 567,165
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—201 6 Claims



1. An improved golf ball dispenser and setter apparatus sufficiently lightweight to be carried by hand, comprising;

a stabilizing base having a golf ball storage housing affixed to a top side thereof, said storage housing being a generally rectangular structure having internal baffles, said storage housing in an upper end thereof having an access opening providing means to allow insertion of golf balls into said storage housing, said storage housing having a ball dispensing opening positioned in a lower end thereof, said internal baffles positioned within said storage housing to form a vertically rising zigzagging open channel extending between said access opening and said ball dispensing opening, said zigzagging open channel sized and structurally arranged to organize and guide golf balls inserted into said storage housing through said access opening into a vertically rising zigzagging single column of golf balls;

a golf ball selector means, said selector means being a movably mounted member extending into said zigzagging open channel at said lower end of said storage housing, at least a portion of said selector means shaped and positioned within said zigzagging open channel to prohibit the passing of golf balls beyond said selector means and out said ball dispensing opening with said selector means in a first position, said selector means further structured to be repositioned into a second position, said selector means having means to select and allow passage of a single golf ball from a zigzagging single column of golf balls within said storage housing with repositioning of said selector means from said first position to said second position, ball directing means to direct a selected golf ball through said ball dispensing opening;

selector positioning means, said selector positioning means being a pivotal lever and linkage arrangement connected to said selector means, said selector positioning means including a pad positioned to allow pressing thereon by a golf club, said selector positioning means having means to reposition said selector means from said first position to said second position upon pressing on said pad;

biasing means of returning said selector means from said second position to said first position;

a ball delivery chute removably and pivotally affixed adjacent said ball dispensing opening, said ball delivery chute positioned to receive a golf ball exiting said storage housing through said ball dispensing opening, said ball delivery chute having means actuated by receipt of a golf ball to pivotally move over a playing surface and to deposit the received golf ball onto the playing surface;

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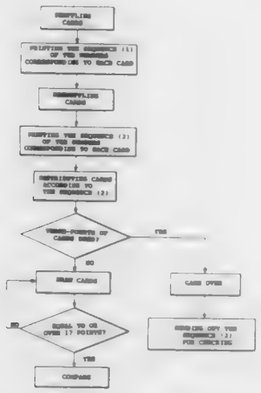
biasing means providing retraction of said ball delivery chute after depositing of a golf ball onto a playing surface; said selector means further having means preventing inadvertent passage of golf balls with said ball delivery chute removed.

4,995,615

METHOD AND APPARATUS FOR PERFORMING FAIR CARD PLAY

Kuan H. Cheng, 7F-1, No. 50, Hou Lung Street, Taichung City, Taiwan

Filed Jul. 10, 1989, Ser. No. 377,072
Int. Cl.[5] A63F *1/00, 9/22*
U.S. Cl. 273—292 **3 Claims**



1. A method for playing a card game involving the random production of cards in a single sequence, wherein all the cards in the sequence are equally likely to be produced so that an assumption of equal likelihood for computing probabilities is valid, said method comprising the steps of: (a) printing out a single random sequence of the cards on a sheet on which the sequence is covered so as not to be visible by players before and during the play; (b) completing the play of the cards by producing them one at a time in the foregoing sequence; and (c) after the play is completed, uncovering the printed sequence so that it can be compared with the produced sequence.

4,995,616

OPTICAL TRANSCEIVER SYSTEM

Dennis W. Davis, 10740 Eland St., Boca Raton, Fla. 33428, and Russell D. Davis, 8905 NW. 28th Dr., Apt. A, Coral Springs, Fla. 33065

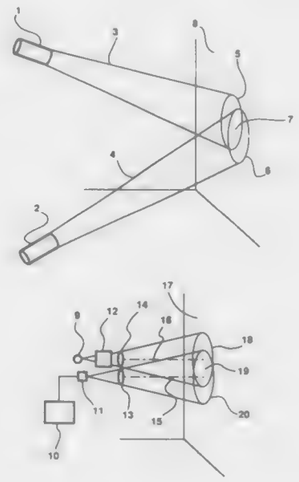
Filed Jan. 23, 1990, Ser. No. 468,686
Int. Cl.[5] F41J *5/08*
U.S. Cl. 273—312 **15 Claims**

1. A system for the projection of light patterns from separate sources onto distant surfaces and the detection of spatial and temporal coincidence of said light patterns on said distant surfaces, said system comprising a multiplicity of transceiver devices, said transceiver device further comprising;

(a) an intensity modulated, visible light-emitting device with said modulation characteristic of particular said transceiver device;

(b) light collecting, image forming and focusing means incident to light emanated from said visible light emitting device for projecting a visible light pattern on a distant surface along a first optical axis;

(c) light collecting, focusing and detector means located along a second optical axis in close proximity and parallel to said first optical axis, with a field-of-view that allows said detector to receive light only from the region of said projected visible light pattern on said distant surface;



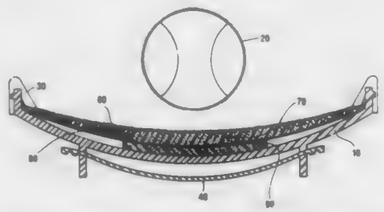
(d) electronic means for processing electronic signals resulting from optical detection of said received light, said processing means responsive to said modulation characteristic of other said transceiver devices.

4,995,617

ARTICLES OF PLAY FOR USE IN THE GAME OF CATCH

Miryoung Lee, 1034 E. Walnut Creek Pkwy., West Covina, Calif. 91790

Filed Mar. 8, 1990, Ser. No. 490,301
Int. Cl.[5] A63B *67/00*
U.S. Cl. 273—346 **4 Claims**



1. Articles of play or sport, for use with the game of catch, comprising:

a missile having substantially all of its surface defined by a multitude of irregular filamentary formations, and

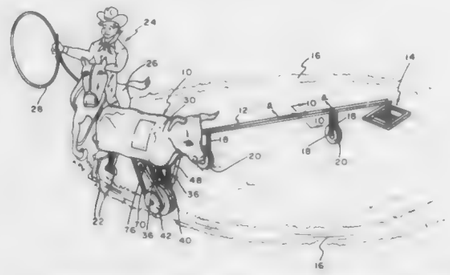
a multi-layer mitt for use by each participant in the game of catching said missile, said multi-layer mitt including a rigid concave rear layer, a first intermediate flexible layer, a second intermediate flexible layer, and a front layer having substantially all of its front surface defined by a multitude of irregular filamentary formations, said first intermediate flexible layer occupying a surface area less than the surface area of said rear layer, and said second intermediate flexible layer occupying a surface area substantially equal to the surface area of said rear layer, said front layer being retained in place by a retaining ring with an inner edge of said retaining ring extending over a portion of said front layer, whereby said front layer is prevented from separating from said second intermediate flexible layer.

4,995,618

MOVEABLE ROPING EXERCISE TARGET

Ty Panzner, Box 961, Dighton, Kans. 67839

Filed Feb. 28, 1990, Ser. No. 486,230
Int. Cl.[5] F41J *9/00*
U.S. Cl. 273—367 **11 Claims**



1. A device animating a steer comprising a pedestal member; a guide arm rotatably secured to said pedestal member; a frame means, connected to said guide arm, for supporting a drive means for driving the frame means; a surface engaging means mounted to said frame member and adapted to effect movement of said frame means along an operating surface; drive means mounted on said frame means and operatively coupled to said surface engaging means for driving same, said drive means includes a power means supported by said frame means for effecting movement of the surface engaging means, a clutch operatively connected to said power means, a first speed reduction assembly engaged releasably to said clutch, and a second speed reduction assembly operatively engaged to said first speed reduction assembly and to said surface engaging means.

4,995,619

SHUTTLECOCK

Kuo H. Hwang, 2F3R, No. 14, Ching Chung St., Tainan, Taiwan

Filed Apr. 17, 1990, Ser. No. 510,032
Int. Cl.[5] A63B *67/18*
U.S. Cl. 273—417 **4 Claims**



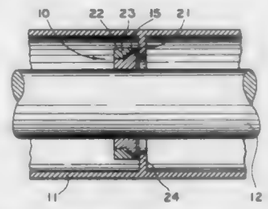
1. A shuttlecock comprising a hollow elastic body shaped as a corrugated cylinder having a closed bottom at one end and able to shrink lengthwise, a head shaped as a curved cone extending up from the other end of the hollow elastic body and having a curved through hole made up of a curved hole face and a flat hole face, the curved through hole having an opening in a proper point of the curved face of the head and communicating with the hollow interior of the hollow elastic body, and a tail having a plurality of feathers or the equivalent and extending up from the head.

4,995,620

SELF-COMPENSATING SEAL FOR A ROTATING SHAFT

Michael J. Zawaski, and Don B. Van Possen, both of Alliance, Ohio, assignors to Westmont Inc., Minerva, Ohio

Filed Jan. 3, 1989, Ser. No. 292,760
Int. Cl.[5] F16J *15/34, 15/54, 15/00*
U.S. Cl. 277—25 **8 Claims**



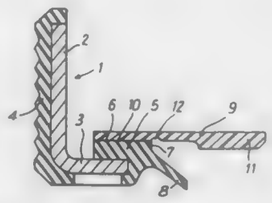
1. A seal for a rotating shaft comprising a seal ring having radially inner and radially outer edges, said seal ring including a plurality of seal sections, each of said seal sections being triangular in shape and being positioned adjacent to another seal section, said seal ring being in the shape of a shell of the zone of a sphere, a ring housing having a channel therein, said ring housing substantially encircling the shaft such that said ring housing has a circumferential surface in direct opposition to the shaft, said ring housing channel engaging said radially inner edge of said seal ring, means to prohibit circumferential movement of said seal ring within said ring housing channel, means to affix said ring housing to the shaft so that said ring housing and said seal ring rotate with the shaft, said means to affix said ring housing including engagement of the shaft with said circumferential surface in direct opposition to the shaft, and a wear plate being disc-like in shape and having a radially extending surface and an axially extending surface and engaging said radially outer edge of said seal ring at said radially extending surface, whereby the centrifugal forces generated by the rotation of the shaft causes said seal sections to move within said ring housing channel in a direction toward said wear plate, so that said engagement between said seal sections and said wear plate is maintained despite wearing of said seal sections.

4,995,621

RADIAL SEAL RINGS

Serge Devouassoux, Langres; Michel Marchiset, Chalindrey, and Michel Saxod, Langres, all of France, assignors to Procal, Langres, France

Filed Jul. 18, 1986, Ser. No. 886,617
Claims priority, application France, Jul. 18, 1985, 85 11007
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—37 **5 Claims**



1. In a radial seal ring comprising:

a metal annular frame;

an intermediate annular flexible elastomeric body, attached to said frame, having a first peripheral surface facing said frame and a second peripheral surface facing away from said frame, and a support surface intersecting said second peripheral surface; and

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a sealing member attached to the support surface of said intermediate body, said sealing member having a first portion with a bonding surface facing the support surface of the intermediate body and adhered thereto, and a second portion, comprising a sealing lip, extending radially from said first portion, away from said frame; the improvement wherein

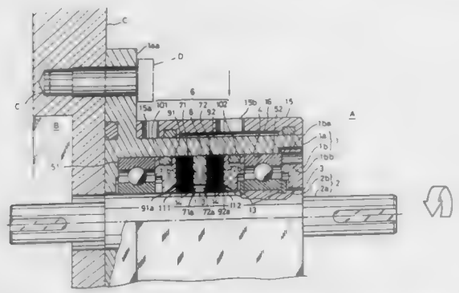
said sealing member has a circumferential axially facing groove between its first and second portions, adjacent said second peripheral surface, whereby said groove provides a predictable locus for bending of said sealing member, thereby avoiding bending at said bonding surface which would tend to result in delamination.

4,995,622

MAGNETIC FLUID SEAL DEVICE

Toshihiko Fuse, Sanda, Japan, assignor to Nippon Pillar Packing Co., Ltd., Osaka, Japan

Filed Feb. 7, 1989, Ser. No. 306,853
Int. Cl.[5] F16J *15/00, 9/00*
U.S. Cl. 277—80 **4 Claims**



1. A magnetic fluid seal device mounted about the circumference of a magnetic rotating element, comprising:

a plurality of sets of pole pieces, each set having at least a first and second magnetic disk of different inside diameters alternately joined together; and

a magnet disposed between adjacent sets of pole pieces, wherein:

the first magnetic disks in each set have an inside diameter smaller than the inside diameter of the second magnetic disks in their respective set;

a gap is formed between the magnetic rotating element and each of the first magnetic disks in each set, in which magnetic fluid is captured, said gap being set to be less than the thickness of the second magnetic disks;

the magnetic flux density in each gap is set larger than the saturation magnetization of the magnetic fluid captured in each gap; and

the thickness of the first magnetic disks in each set is established between 0.02 and 1.0 mm.

4,995,623

SEALING DEVICE FOR RECIPROCATING MEMBER

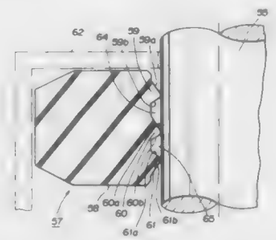
Noriyuki Wada, and Satoshi Yamanaka, both of Fukushima, Japan, assignors to NOK Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,742
Claims priority, application Japan, Sep. 11, 1987, 62-139213[U]; Sep. 17, 1987, 62-142020[U]
Int. Cl.[5] F16F *9/36*
U.S. Cl. 277—208 **1 Claim**

1. A sealing device for use in combination with a reciprocating member having an outer surface, said sealing device comprising:

a sleeve surrounding the reciprocating member, said sleeve having an internal surface facing said reciprocating member, said internal surface having at least two axially spaced apart sealing lips surrounding and projecting towards said reciprocating member, said axial spacing defining a chamber between axially adjacent sealing lips, each sealing lip having a tip in contact with the outer surface of said reciprocating member, and each sealing lip having a first side facing internal fluid and an axially opposite second side facing atmosphere; and

means provided on the sealing lip closest to said internal fluid for introducing internal fluid into said chamber between said sealing lip closest said internal fluid and the next adjacent sealing lip;



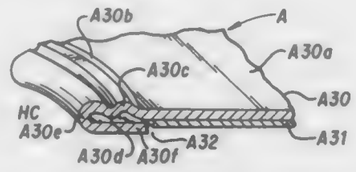
said means including tapered surfaces on the sealing lip closest to said internal fluid, said tapered surfaces being connected to said tip so that the tapered surface adjacent to said internal fluid makes a smaller angle to said reciprocating member than said tapered surface facing the atmosphere does and the sealing lip axially next to said sealing lip closest to said internal fluid also has tapered surfaces, said tapered surface of said axially next sealing lip facing said internal fluid making a greater angle to the surface of said reciprocating member than said tapered surface of said axially next sealing lip facing the atmosphere.

4,995,624

STEEL LAMINATE GASKET WITH WIDE SEALING AREA

Tsunekazu Udagawa, Ichikawa, and Susumu Inamura, Tokyo, both of Japan, assignors to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 243,528, Sep. 12, 1988, Pat. No. 4,938,488. This application Nov. 20, 1989, Ser. No. 439,666
Int. Cl.[5] F16J *15/08*
U.S. Cl. 277—235 B **9 Claims**



1. A steel laminate gasket for an internal combustion engine having at least one hole therein, comprising:

a first plate having at least one first hole therein corresponding to the hole of the engine, said first plate including a base portion, at least one curved portion integrally formed with the base portion to extend laterally with respect to the base portion to define the first hole, at least one flange integrally formed with the curved portion and being located at a side of the base portion to extend substantially parallel to the base portion, at least one side wall formed on one of the base portion and the flange adjacent the curved portion to surround the first hole so that the distance between the flange and base portion inside the side wall is greater than the distance between the flange and base portion outside the side wall, and at least one first bead situated between the side wall and the curved portion to extend toward the other of the base portion and the flange, and

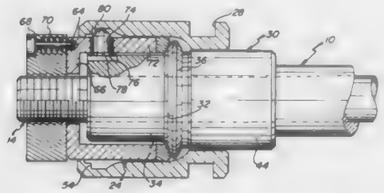
a second plate situated at a flange side of the first plate, said second plate having at least one second hole therein, the diameter of the second hole being larger than the outer diameter of the flange so that when the first and second plates are assembled, the flange is located inside the second hole.

4,995,625

MECHANISM FOR PREVENTING INADVERTENT CHUCK RELEASE

Florian I. Nowak, 16 Dean Dr., Newington, Conn. 06111

Filed Jan. 8, 1990, Ser. No. 461,808
Int. Cl.[5] B23B *31/20*
U.S. Cl. 279—1 C **8 Claims**



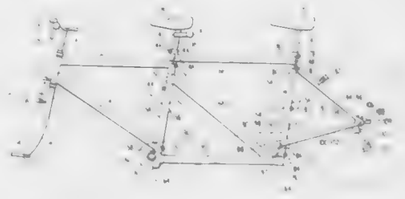
1. In a collet-operating mechanism, including a first part having a longitudinal axis of rotation; a collet-closing member slidably assembled with said first part for limited axial movement relative thereto along said axis of rotation; force-transmitting means operatively interposed between said first part and said closing member for effecting such relative axial movement in one direction; and an operating member slidably assembled with said first part and said closing member for axial movement along said axis of rotation between first and second positions, said operating member being disposed outwardly of at least one of said first part and said closing member and acting upon said force-transmitting means in said first position thereof as to cause said transmitting means to effect such relative movement in said one direction, and permitting such relative movement in the direction opposite to said one direction in said second position thereof, whereby said closing member can effect closure of a collet operatively connected thereto; the improvement wherein said operating member has means defining an inwardly opening recess portion thereon, said means including at least one engagement element; and wherein one of said first part and said closing member has a circumferential outer surface portion thereon, disposed proximate said recess-defining means of said operating member, and has a plurality of engagement components thereon movable, on axes oriented radially with respect to said axis of rotation, alternatively between withdrawn and extended positions with said engagement components disposed, respectively, inwardly of said circumferential surface portion and in protrusion therebeyond said recess portion and said engagement components being so configured and positioned that, with said operating member in said first position and said engagement components in said extended positions thereof, said components can partially enter said recess portion and engage said engagement element so as to inhibit movement of said operating member toward said second position thereof, whereby centrifugal forces generated by rotation of said mechanism can act upon said engagement components to maintain said components in said extended positions to thereby produce such inhibition to movement of said operating member during such rotation.

4,995,626

FOLDABLE TANDEM BICYCLE

Harry D. Montague, 3042 Newark St., N. W., Washington, D.C. 20008

Filed Jan. 13, 1989, Ser. No. 296,732
Int. Cl.[5] B62K *3/12, 15/00*
U.S. Cl. 280—231 **20 Claims**



1. A foldable tandem bicycle frame comprising:

a front frame,

a rear frame,

an integral center frame including

a first seat tube, a second seat tube, said front frame and said center frame foldable with respect to each other about said first seat tube,

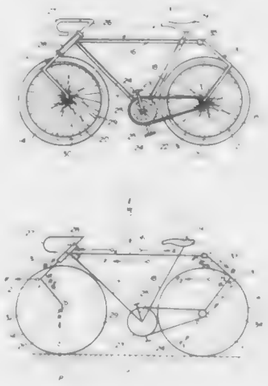
said center frame and said rear frame foldable with respect to each other about said second seat tube, whereby said front and rear frames fold about respective first and second seat tubes to fold said tandem bicycle frame and said center frame is unaltered in configuration irrespective of whether said tandem frame is open or folded.

4,995,627

BICYCLE UTILIZING THE VECTOR SYSTEM

Jae S. Yun, 103 Cambridge La., Glendale Heights, Ill. 60139

Continuation-in-part of Ser. No. 243,834, Sep. 13, 1988, abandoned. This application Mar. 9, 1990, Ser. No. 491,202
Int. Cl.[5] B62K *3/02, 19/00;* **B62M** *1/02*
U.S. Cl. 280—261 **12 Claims**



1. A bicycle having a front steering wheel and a single driven rear wheel which comprises:

a triangular frame, said triangular frame containing a front joint portion, a rear joint portion, and a bottom joint portion,

a front fork with a first end rotatably connected to said front joint portion of the triangular frame, said front fork hav-

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ing a front bent portion with a 90° bend and an extended vertical arm at a second end thereof, said extended vertical arm attached to a front axle of said front steering wheel, whereby the front fork, the front bent portion, and the extended vertical arm are a composite structure so that the front fork is connected to the front steering wheel,

a rear fork outwardly connected to said rear joint portion of the triangle frame, said rear fork having a rear bent portion with a 90° bend opposite to said bent portion of said front fork, and said rear fork being pivotably attached to a rear axle of said single driven rear wheel,

a handle bar extending from said first end of the top of the front fork through said front joint, and

a driven chain engaged with a pedal sprocket which is mounted to said bottom joint of the triangle frame, said driven chain operatively engaged with a rear wheel sprocket which is mounted on said single driven rear wheel, wherein the triangular frame, front fork, and rear fork of the bicycle comprise a vector system including component and resultant forces which collectively provide a forward force when weight is placed on the top of the triangular frame so that the bicycle may be smoothly driven forward with little effort being required by the rider.

4,995,628

STANDING FRAME ASSEMBLY FOR USE WITH WHEELCHAIR

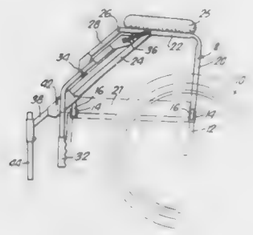
Roger Orpwood, Bath, and Ian D. Swain, Wiltshire, both of England, assignors to Hodgkinson & Corby Limited, London, England

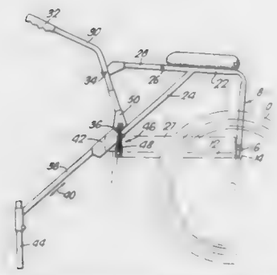
Filed Jun. 23, 1989, Ser. No. 369,498

Claims priority, application United Kingdom, Jun. 23, 1988, 8814979

Int. Cl.[5] A61G *5/14*

U.S. Cl. 280—304.1 **9 Claims**





1. A standing frame assembly for use in conjunction with a wheelchair, said assembly comprising:

an arm-rest frame detachably and fixedly mountable on the wheelchair such that when mounted, said arm-rest frame is restrained from movement relative to the wheelchair;

a holding member mounted to be rotatably movable relative to said arm-rest frame and movable from a lowered retracted position in front of the wheelchair to a raised position in which it is arranged in front of and above the seat of said wheelchair, and in which it may be used to assist the user in standing up from the wheelchair;

a ground engaging member;

a pivotal connection between said ground engaging member and said holding member;

means for mounting said ground engaging member whereby it is slidably movable relative to said arm-rest frame and movable to a retracted position with the holding member to its lower position and it is in a ground engaging position in front of the wheelchair when the holding member is in the raised position;

a locking means provided to prevent any relative rotation of said holding and ground engaging members when the ground engaging member is in the ground engaging position.

4,995,629

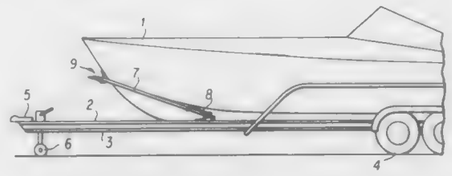
BOAT HULL LATCHING DEVICE HAVING POSITIVE RETENTION MEANS

Ralph Poppell, Vero Beach, Fla., assignor to Float-On Corporation, Ft. Pierce, Fla.

Filed Mar. 7, 1990, Ser. No. 489,955

Int. Cl.[5] B60P *3/10*

U.S. Cl. 280—414.1 **4 Claims**



1. A boat latching device for securing the hull of a boat to a trailer having a bow stop bar mounted thereon, said boat latching device comprising:

a latch-catch member having a substantially U-shape to form a recess for receiving said bow stop bar, said latch-catch member having a first end and a second end, the first end of said latch-catch member being mounted to the hull of said boat;

an overcenter pawl member having camming surfaces and an overcenter portion, said pawl member being pivotally mounted to said second end of said latch-catch member for movement between a locking position in which said pawl member retains said bow stop bar within said recess and an unlocking position in which said pawl member permits the release of said bow stop bar from said recess, said camming surfaces comprising a locking cam surface on one side of said overcenter portion and an unlocking cam surface on another side of said overcenter portion; and

resilient spring means mounted on said latch-catch member, said resilient spring means pressing against said locking cam surface when said pawl member is in said locking position for holding said pawl member in said locking position and pressing against said unlocking cam surface when said pawl member is in said unlocking position for holding said pawl member in said unlocking position.

4,995,630

VIBRATION DAMPER FOR SKI

Yves Piegay, Voiron, France, assignor to Skis Rossignol S. A., Voiron, France

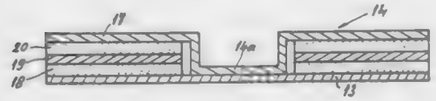
Division of Ser. No. 234,968, Aug. 19, 1988, which is a division of Ser. No. 132,730, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 814,110, Dec. 27, 1985, abandoned. This application Mar. 23, 1989, Ser. No. 328,000

Claims priority, application France, Dec. 27, 1984, 84 20189

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] A63C *5/075*

U.S. Cl. 280—602 **3 Claims**



1. A ski having a length of about 2 m, an upper surface, a turned-up front end, a rear end, a central ski binding and a vibration damper system between 5 cm and 20 cm long and disposed on said upper surface, the vibration damper system comprising

two pairs of viscoelastic sheets sandwiching a damper plate with a high modulus of elasticity between them and secured on said upper surface by raised wings of a top plate having a depressed central region formed with longitudinal slots; and

bolts engaged through the slots with the ski for securing the assembly to the ski with longitudinal adjustability.

4,995,631

MONO-SKI DEEP SIDE CUTS FOR USER STABILITY CONTROL

Kent Hunter, 3017 E. 9400 S., Sandy, Utah 84092

Continuation of Ser. No. 278,560, Dec. 1, 1990, abandoned. This application May 11, 1990, Ser. No. 522,478

Int. Cl.[5] A63C *5/03*

U.S. Cl. 280—607 **2 Claims**



1. A mono-ski having an elongate body to which a skier's boot bindings are intended to be mounted such that a skier's boots are symmetrically mounted along each side of the longitudinal axis of the ski and pointing in the longitudinal direction, comprising

a shovel section separated from a tail section by a waist section, each of said sections having a uniform cross-sectional thickness and a symmetrically orientation along a longitudinal axis which extends along the center of the elongate body, the cross-sectional thickness of said waist section being thicker than the cross-sectional thickness of said shovel and tail sections, said shovel section, waist section and tail section forming a continuous bottom surface of said ski,

said shovel section having a widest portion, measured perpendicularly from said longitudinal axis, which is at least 30 percent wider than a narrowest portion of said waist section and approximately 50 percent wider than the widest portion of said tail section similarly measured perpendicularly from said longitudinal axis, said shovel section also having a front end portion, said front end portion being curved upward in a uniform arching shape which extends away from a plane defined by said bottom surface,

said tail section also having a widest portion measured perpendicularly from said longitudinal axis, which is wider than said narrowest portion of said waist section, and narrower than said widest portion of said shovel section, said tail section also having an end portion, said tail section end portion being curved upward in a uniform arching shape which extends away from the plane defined by said bottom surface, said widest portion of said tail section being spaced away from, so as to be excluded from said end portion of said tail section, and said end portion of said tail section forming an edge which constitutes a perimeter of said tail section end portion, said perimeter edge being semicircular in shape,

whereby when the mono-ski is in contact with a relatively flat sloping surface including covered with snow, rotation of the ski along the ski's longitudinal axis causes shovel and tail contact areas of the ski which contact said flat sloping surface to be concentrated in the shovel section and the tail section in the widest portions thereof and away from the end portion of said shovel section, away from the end portion of said tail section and away from the waist section, said tail section having a smaller contact area than said shovel section, whereby downward force on the tail section of the ski causes greater pressure on the snow at the tail section contact area than a similar force applied to said shovel section.

4,995,632

BINDING DEVICE FOR SKI BOOT

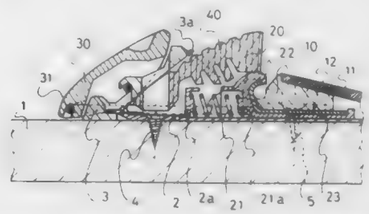
Eric Girault, Seynod, and Paul Arnulf, Alby sur Cheran, both of France, assignors to Salomon S. A., Annecy Cedex, France

Filed Apr. 12, 1990, Ser. No. 508,128

Claims priority, application France, Apr. 12, 1989, 89 05166

Int. Cl.[5] A63C *9/086*

U.S. Cl. 280—615 **8 Claims**

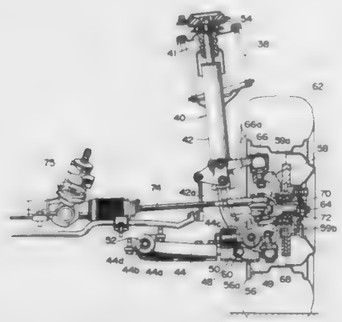


1. A mounting device for a ski boot on a cross-country ski, said ski boot having a transverse hinge pin at its front end, said mounting device comprising a stationary jaw and a moveable locking jaw designed to lock said hinge pin (2) of said ski boot in position while leaving said hinge pin free to rotate, and said moveable locking jaw is capable of being displaced toward said stationary jaw (10) in order to clamp said hinge pin, said stationary jaw (10) delimiting a slide track (12) for a guide piece (23) connected to said movable locking jaw (20), said slide track (12) being arranged between two screws (5) for mounting said device to said cross-country ski, said screws

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having screw heads (5*a*), and said slide track (12) extending transversely beneath at least one part of a support zone (10*a*) of each of said screw heads (5*a*).

4,995,633
STRUT TYPE SUSPENSION
Toshiyasu Santo, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Aug. 31, 1989, Ser. No. 401,878
Claims priority, application Japan, Sep. 5, 1988, 63-220409; Dec. 27, 1988, 63-330582; Feb. 8, 1989, 1-27589
Int. Cl.[5] B60G *3/20*
U.S. Cl. 280—673 9 Claims



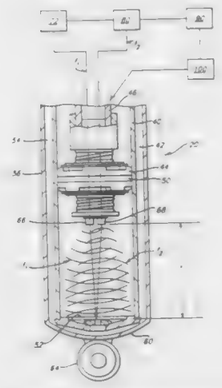
1. A strut type suspension, in which a strut has an upper strut portion and a lower strut portion capable of sliding relative to the upper strut portion, said upper strut portion is swingably connected to a vehicle body, and said lower strut portion is swingably connected to a suspension arm extending in a lateral direction of the vehicle body, comprising:
a wheel carrier having an upper portion located above a rotary axis of a wheel and a lower portion located below said rotary axis, said upper portion being swingably connected to said lower strut portion through a ball joint; and
a control link having one end connected to said suspension arm, said end adapted to be swingable around an axis extending in a longitudinal direction of the vehicle body and the other end swingably connected to said lower portion of said wheel carrier,
wherein the connection point of said control link and said suspension arm is provided in such a position as to be displaced outward in the lateral direction of the vehicle body relative to the connection point of said lower strut portion and said suspension arm as said suspension arm is swung in a bounding direction from a reference condition.

4,995,634
EQUALIZING SUSPENSION ARRANGEMENT FOR TANDEM STEERING AXLES WITH COORDINATED GEOMETRY CONTROL OF NO. 2 STEERING AXLE
Maxwell E. Evans, Queensland, Australia, assignor to Mack Trucks, Inc., Allentown, Pa.
Filed Aug. 11, 1989, Ser. No. 392,557
Int. Cl.[5] B60G *5/00*
U.S. Cl. 280—682 4 Claims



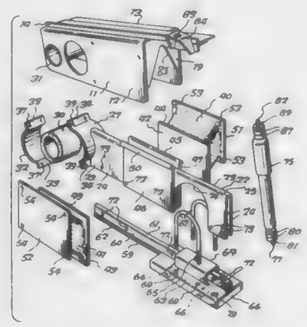
1. In a vehicle having tandem steering axles including a front axle and a rear axle and front and rear springs for mounting said axles, an arrangement for coordinating said axles through the full range of movement thereof, said arrangement comprising
(a) an extended shackle pivotally connected to the front end of said rear spring;
(b) a rocker beam mounted on the frame of the vehicle between the rear end of said front spring and the front end of said rear spring and pivotally connected to said extended shackle; and
(c) means for causing movement of said front end of said rear spring to be controlled to a substantially vertical path.

4,995,635
ULTRASONIC DOPPLER VELOCITY SENSING WITHIN A HYDRAULIC ACTUATOR
Yoram Guy, Ann Arbor, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.
Filed Mar. 21, 1990, Ser. No. 496,673
Int. Cl.[5] B60G *17/08*
U.S. Cl. 280—707 27 Claims



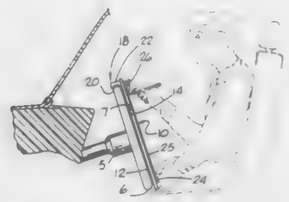
1. A hydraulic actuator connecting the sprung and unsprung portions of a vehicle, said hydraulic actuator operable to measure changes in the relative velocity between the telescopically movable components thereof, said hydraulic actuator comprising:
a cylinder forming a working chamber operable to store damping fluid;
a piston disposed within said cylinder defining a first and a second portion of said working chamber, said piston being movable within said cylinder;
first transducer means for emitting sound waves through damping fluid contained within said second portion of said working chamber;
means for driving said first transducer means so as to cause said first transducer means to emit sound waves;
means for reflecting the sound waves emitted by said first transducer means, said reflecting means being disposed within said cylinder;
second transducer means for receiving sound waves reflected by said reflecting means;
measuring means for determining the change in frequency between the sound waves received by said second transducer means and the sound waves emitted by said first transducer means and generating an output in response thereto; and
means for calculating the relative velocity of said piston within said cylinder in response to said output from said measuring means.

4,995,636
TRAILING ARM MODULAR AXLE SUSPENSION UNIT
Ron E. Hall, Elkhart, Ind., and David E. Heitzmann, Union, Mich., assignors to MOR/ryde, Inc., Elkhart, Ind.
Filed May 26, 1989, Ser. No. 358,006
Int. Cl.[5] B60G *11/62*
U.S. Cl. 180—716 19 Claims



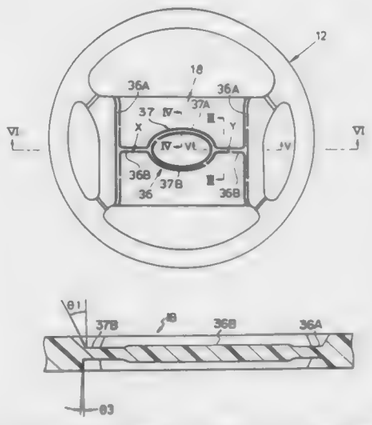
1. A trailing arm modular axle suspension unit comprising a hanger for attachment to a vehicle frame, fore and aft and central portions on said hanger, a trailing arm, fore and aft and central portions on said trailing arm, means for pivotally mounting said fore portion of said trailing arm on said fore portion of said hanger, means for mounting an axle on said aft portion of said trailing arm, shock absorber means between said aft portion of said trailing arm and said aft portion of said hanger, and spring means between said central portion of said hanger and said central portion of said trailing arm, said hanger including spaced sides, and said central portion of said trailing arm being located between said spaced sides, and said trailing arm including opposite sides, and said spring means comprising rubber springs positioned between said opposite sides of said trailing arm and said spaced sides of said hanger.

4,995,637
MOTOR VEHICLE WORK PLATFORM
Noboru Muraishi, P.O. Box 31683, Aurora, Colo. 80041
Filed Dec. 20, 1989, Ser. No. 453,788
Int. Cl.[5] B60P *1/43*
U.S. Cl. 280—727 16 Claims



1. A work platform for mounting on a steering wheel of a motor vehicle wherein the steering wheel has a rounded outer edge and a support surface which generally faces a driver of the moor vehicle, said work platform comprising:
a generally rigid base having a flat underside a top side defining a generally flat writing surface and an edge connecting said underside and said top side; and
securing means for engaging the rounded outer edge of the steering wheel to mount said work platform on said steering wheel, said securing means including a single elongated member projecting outwardly from said underside adjacent said edge of said work platform, said securing means securing said work platform to the steering wheel when said flat underside of said work platform is located against the support surface of the steering wheel with said elongated member located against the rounded outer edge of the steering wheel at the top of the steering wheel.

4,995,638
AIR BAG COVER
Hiroaki Shinto, Toyota; Sumio Sakaguchi, Nagoya, and Katuki Asagiri, Niwa, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, both of, Japan
Filed Dec. 29, 1989, Ser. No. 459,272
Claims priority, application Japan, Dec. 29, 1988, 63-170792[U]
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—731 20 Claims



1. An air bag cover which is used for an air bag apparatus having a bag adapted to be inflated in front of a seat occupant at a sudden deceleration of the vehicle speed and which covers said bag in a folded state, said air bag cover comprising:
a cover body having a predetermined thickness for covering said bag in the folded state;
a first thin-walled portion which is provided in a portion of said cover body and is adapted to break at the time of the expansion of said bag so as to permit said bag to expand toward the seat occupant;
a second thin-walled portion which is formed continuously with said first thin-walled portion and whose longitudinal direction differs from that of said first thin-walled portion; and
a third thin-walled portion provided in a portion connecting together said first and second thin-walled portions and having a smaller thickness than those of said first and second thin-walled portions.

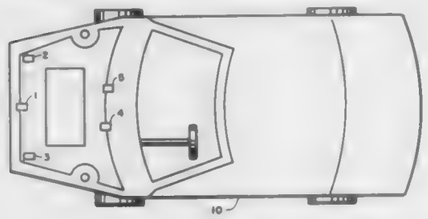
4,995,639
VEHICLE CRUSH ZONE CRASH SENSOR
David S. Breed, Boonton Township, Morris County, N.J., assignor to Automotive Technologies International, Inc., Boonton Township, Morris County, N.J.
Filed Sep. 2, 1988, Ser. No. 241,538
Int. Cl.[5] B60R *21/32*
U.S. Cl. 280—735 21 Claims

1. In a motor vehicle having a forward extremity, a crush zone immediately rearward of said forward extremity, a crash sensor arranged in said crush zone and an occupant restraint system responsive to said crash sensor, the improvement wherein said crash sensor comprises:
means arranged at a given position in said crush zone of the

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vehicle for determining when the vehicle elements in said crush zone have been deformed as far back in the vehicle as said position; and

means responsive to said determining means for actuating said occupant restraint system when a vehicle impact with a barrier causes said vehicle elements in said crush zone to deform as far back as said position;



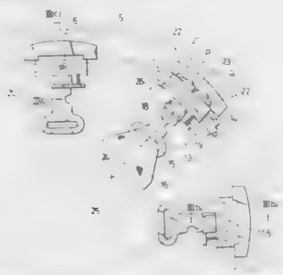
wherein said position is a sufficient longitudinal distance rearward from said forward extremity of the vehicle such that an impact by said forward extremity with a barrier at a vehicle speed below a prescribed threshold value will not actuate said occupant restraint system.

4,995,640

MAGNETIC SENSOR ACTUATION SYSTEM SUITABLE FOR USE IN PASSIVE SEAT BELT SYSTEM

Hiroyuki Saito, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1990, Ser. No. 536,740
Claims priority, application Japan, Jun. 12, 1989, 1-68495[U]
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 **15 Claims**



1. In a magnetic sensor actuation system suitable for use in a passive seat belt system of the type that a slide anchor with a webbing carried thereon travels along a guide rail having at least one bent section, the improvement wherein the actuation system comprises at least one magnetic sensor provided near the guide rail and a magnet provided on the slide anchor to actuate the magnetic sensor; and upon actuation of the magnetic sensor, the magnet is located on a line extending between the center of turning movement of the slide anchor along the bent section of the guide rail and the midpoint of an area of contact between the slide anchor and the guide rail.

4,995,641

NOTE PAD FOR ENTRY INTO PERMANENT RECORDS

John C. Landry, and Michael R. Bourque, both of Farmington, Conn., assignors to Insight Media, Inc., Farmington, Conn.

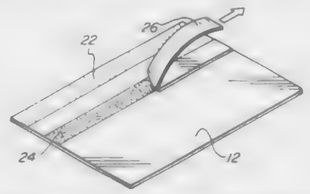
Filed Apr. 24, 1990, Ser. No. 513,838
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—67 **12 Claims**

1. A note pad for use with hard copy record keeping systems comprising:

(a) a multiplicity of stacked flexible sheets each having a top surface for receiving writings;

(b) a first stripe of a first adhesive on the bottom surface of each of said sheets extending substantially across one dimension of said sheets, said first adhesive being adapted to adhere firmly to a record keeping sheet;

(c) a second stripe of a second adhesive on the bottom surface of each of said sheets extending substantially across said one dimension of said sheets, said second



adhesive being a tacky repositionable pressure sensitive adhesive to releasably bond to a record keeping sheet; and

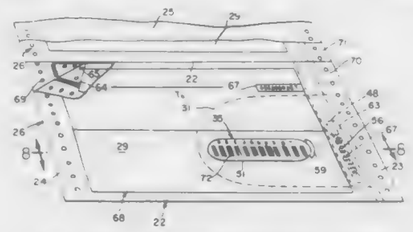
(d) binder means securing said sheets in stacked assembly and permitting removal of individual sheets therefrom, whereby said flexible sheets may be mounted temporarily by said second stripe and mounted permanently on a record keeping sheet by said first stripe.

4,995,642

POCKET LABEL FOR SHIPPING PACKAGE AND METHOD OF MAKING

Joseph J. Juszak, Crystal Lake, and John R. Poplawski, Darien, both of Ill., assignors to Wallace Computer Services, Inc., Hillside, Ill.

Filed May 8, 1989, Ser. No. 349,048
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—105 **12 Claims**



1. A pocket label comprising superposed, generally rectangular top, bottom and release liner plies, said bottom ply having pressure sensitive adhesive on substantially the entire surface thereof confronting said release liner ply, said release liner ply being die cut to form a generally half-elliptical segment projecting inwardly from one side edge of said release liner ply, a closed die cut line in said bottom ply lying within the periphery of said segment and providing a part removable from said bottom ply, and a closed line of perforation in said top ply generally concentric with said bottom ply closed die cut line and providing a portion removable from said top ply, said bottom ply part and said top ply portion being adhesively united whereby said top ply portion and bottom ply part are detachable from said segment as a unit, and identification indicia on said top ply portion.

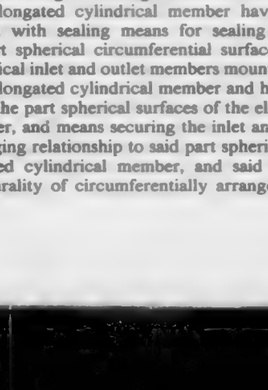
4,995,643

DEVICE FOR FIXING A WATER METER ON TO A BASE AND METHOD RELATING THERETO

Alain Rappart, Lalbenque; Henri Loosdregt, Paris; Paul Pershon, Prechac, and Philippe Persohn, Bazas, all of France, assignors to Manufacture d'Appareillage Electriquie de Cahors, Cahors; Lyonnaise des Eaux, Paris and Persohn S.A., Bazas, all of, France

Filed Sep. 14, 1989, Ser. No. 407,439
Claims priority, application France, Sep. 16, 1988, 88 12095
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—4 **12 Claims**

1. A device for fixing a water meter (1) onto the base (2) of a meter support (3) comprising a water inlet duct (4) and a water outlet duct (5), wherein the contact surfaces of the water meter (1) and the base (2) are each bordered by an annular shoulder (6, 7) forming, when they are in contact, an annular projection, wherein an assembly ring (8) engaged around the meter and the base is provided in order to keep the two annular shoulders (6, 7) in contact with each other, this ring (8) comprising slits (9) extending over a part of its length and separating from each other a series of elastic fingers (10) distributed around the ring, this ring (8) comprising moreover on its inner face an annular groove (11) complementing the two annular shoulders (6, 7) in contact with each other, this groove (11) being formed in the part of the ring having the elastic fingers (10), the end of this part of the ring comprising lugs (12, 13, 14)



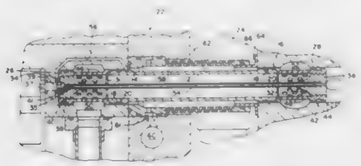
projecting radially outwards and wherein a rigid collar (15) force-fitted onto the part of the ring having the elastic fingers (10) and bearing against the lugs (12) keeps the annular groove (11) formed on the inner face of these fingers (10) against the annular shoulders (6, 7) of the meter (1) and the base (2) which are in contact, and wherein the assembly ring (8) comprises in its non-slitted part opposite the lugs (12, 13, 14) a threaded zone (16) onto which can be threaded a sleeve (17) for retaining the collar (15) on the assembly ring (8) and for pushing the latter towards the lugs (12, 13, 14).

4,995,644

LOAD BALANCED COOLANT FITTING

Donald G. Brown, Newbury Park, and Gary T. Miyata, Simi Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 28, 1989, Ser. No. 401,193
Int. Cl.[5] F16L *53/00*
U.S. Cl. 285—41 **6 Claims**



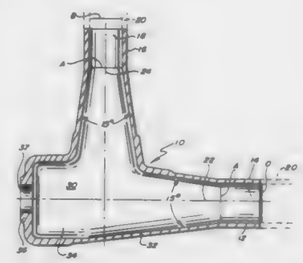
1. A coolant fitting for sealing between two structures comprising an elongated cylindrical member having a passage therethrough with sealing means for sealing at peripheral edges of part spherical circumferential surfaces at opposite ends, cylindrical inlet and outlet members mounted at opposite ends of the elongated cylindrical member and having surfaces that engage the part spherical surfaces of the elongated cylindrical member, and means securing the inlet and outlet members in engaging relationship to said part spherical surfaces of said elongated cylindrical member, and said inlet member having a plurality of circumferentially arranged radial inlet ports therethrough for providing an inlet to the passage of the elongated cylindrical member, and said outlet member having a plurality of circumferentially arranged radial outlet ports therethrough that communicate with the passage of the elongated cylindrical member for allowing fluid to exit there from.

4,995,645

ELBOW CONNECTION FOR PNEUMATIC CONVEYING SYSTEM

Josef Pausch, Hopkins, Minn., assignor to General Resource Corporation, Hopkins, Minn.

Filed Feb. 20, 1990, Ser. No. 481,596
Int. Cl.[5] F16L *45/00*
U.S. Cl. 285—127 **2 Claims**



1. An elbow for changing the direction of flow of material conveyed in conduits in a fluidic or pneumatic material handling conveyor, said elbow comprising:

(a) cylindrical inlet and outlet pipes each having a first end for connection to a conveyor conduit and a second interior end, and each having a continuous cylindrical wall defining an inlet opening in said inlet pipe and an outlet opening in said outlet pipe, said openings having a specific cross-section area;

(b) a generally frusto-conical inlet section and outlet section, each having a narrow end and a wider end, and a continuous frusto-conical wall therebetween, wherein said wall diverges to a region of maximum expansion at said wider end, the small end being continuous with said second interior end of the inlet and outlet pipes; and

(c) a chamber formed at the intersection of the respective wider ends of said frusto-conical inlet section and outlet section, said chamber having a cylindrical extension open to and in communication with said openings and axially aligned with said inlet opening and having an end wall projecting beyond the wider end of said outlet section, the cross-sectional area of said cylindrical extension being between 1.5 and 10 times the cross-sectional area of said inlet opening.

4,995,646

CONNECTOR FOR MULTIPLE LINES

Lonnie E. Johnston, Bedford, Ohio, and Peter C. Homan, Jupiter, Fla., assignors to Crawford Fitting Company, Solon, Ohio

Filed Nov. 28, 1989, Ser. No. 441,991
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—137.1 **11 Claims**

11. A connector assembly for permitting sealed passage of tubular members through a wall comprising:

a first fitting body adapted for connection to said wall and having a passage therethrough with an outwardly open circular mouth;

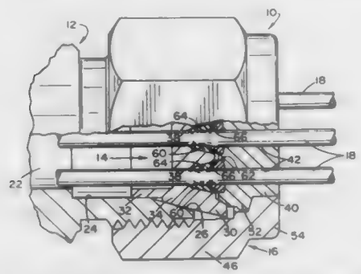
a first rigid disk member received in said mouth and including a circumferentially continuous surface for sealing with said mouth when driven toward said passage, a plurality of openings formed through said first rigid disk member

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for permitting free access of said tubular members through said disk and into said passage;

each said opening formed through said first rigid disk member including a conical chamber formed at the entrance thereto;

ferrule means in each conical chamber for producing a seal



between said first rigid disk member and the tubular member passing through its respective conical chamber when each respective ferrule means is driven into its respective conical chamber; and

clamping means for driving said ferrule means into said conical chambers and driving said first rigid disk into said outwardly open circular mouth.

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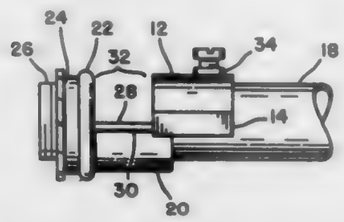
PORTAL SEMICYLINDRICAL ELECTRICAL CONNECTOR

Kevin Carey, Philadelphia, N.Y., assignor to John Mr. & Mrs. Carey, West Stockholm, N.Y.

Filed Jul. 26, 1989, Ser. No. 384,980

Int. Cl.[5] F16L *3/04*

U.S. Cl. 285—161 **3 Claims**



1. An electrical cover connector for securing a pipe to an electrical box comprising:

a unitary one piece main cylindrical frame having at one end an externally threaded cylinder for screw like insertion into the electrical box, about the base of said externally threaded cylinder and unitary therewith is a flange ring, the exterior of which extends above the externally threaded cylinder and serves as a backstop for the main frame when said frame is secured into the electrical box, the flange having an interior ring of similar thickness to the pipe such that said pipe will abut the interior ring preventing entry of the pipe into the externally threaded cylinder and forming a relatively smooth inner wall between and along the pipe and the interior flange ring, extending back from the flange ring and integral therewith is a semicylindrical half sleeve for receiving the pipe which will lie in the half sleeve and may abut the interior ring, said half sleeve of the main frame having means for receiving a detachable semicylindrical half sleeve;

a detachable semicylindrical half sleeve removably securable to said main frame semi-cylindrical half sleeve for enclosing the pipe within said half sleeves, the exterior of the flange also serving as a backstop to prevent forward movement of the detachable half sleeve toward the externally threaded cylinder, said detachable half sleeve being removable from the main frame without detaching said externally threaded cylinder from the electrical box for inspection of the connection without replacement of the pipe or reconnection of the main frame; and

means for securing the half sleeves together and means for securing the pipe within said half sleeves.

4,995,648

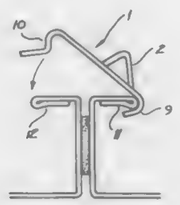
LOCKING FLANGE CLIP

Roy J. Jackson, Mona Vale, Australia, assignor to Bullock Mfg. Pty. Ltd, Rydalmere, Australia

Filed Aug. 29, 1989, Ser. No. 400,090

Int. Cl.[5] F16L *23/00*

U.S. Cl. 285—406 **12 Claims**



1. A locking clip for air conditioning ducting wherein the ducting is of a type which has flanges protruding outwardly and generally at right angles from the ends of the ducting; said flanges adapted to substantially abut adjacent flanges of abutting like ducting; said locking clip comprising an elongate structure comprising a central spine adapted to be positioned over the edges of said flanges and having side ribs adapted to shroud and frictionally bind the outer faces of abutting, adjacent flanges; said central spine further including at least one downwardly extending central rib portion which is forcibly insertable between the inside, abutting faces of said adjacent, abutting flanges so as to frictionally engage therewith when said locking clip binds together said adjacent, abutting ones of said flanges.

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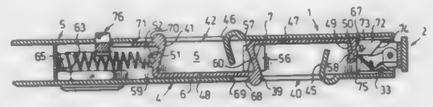
LOCKING DEVICE FOR SLIDING PANELS

Claes Magnusson, Vanadisvägen 43, S-113 23 Stockholm, Sweden

Continuation of Ser. No. 309,291, Feb. 13, 1989, abandoned. This application Mar. 19, 1990, Ser. No. 496,160

Int. Cl.[5] E05C *1/10*

U.S. Cl. 292—175 **9 Claims**



1. A locking device for a sliding panel comprising:

a lock assembly received in a housing adapted to be mounted in a recess in an edge of the sliding panel for contact with a closure member, and

a latch member adapted to be mounted in said closure member; said lock assembly including:

a lock bolt having a first end and a second end and being slidable within said housing and biassed by spring means in a first direction towards said closure member, and

abutment means fixed in said housing and having a first cam surface and a second cam surface,

said first end of said lock bolt and said abutment means defining a space therebetween;

said latch member including first and second cam surfaces and being pivotedly mounted so as to be resiliently urged from an inoperative first position towards an operative second position;

wherein sliding said panel towards a closed position against said closure member causes said first cam surface of said abutment means to initially slidably engage said first cam surface of said latch member to move said latch member to said first position, said latch member in said first position abutting said first end of said lock bolt to force said latch member in a second direction opposite to said first direction, thereby giving said latch member access to said space and enabling said latch member to pivot towards its operative position, said second cam surface of said latch member sliding against said second cam surface of said abutment means, said latch member in the operative position within said space releasing said lock bolt to be spring biassed in said first direction to positively prevent pivoting of said latch member towards the first position, thereby retaining said second cam surface of said latch member in engagement with said second cam surface of said abutment means.

4,995,650

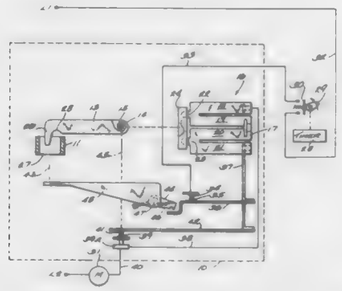
BIMETAL OPERATED LID SWITCH AND LOCK FOR APPLIANCES

Spencer Schantz, Dousman; Ronald J. Janz, Milwaukee; Gary Christiansen, Wauwatosa, and Steven Sager, Greendale, all of Wis., assignors to U.S. Controls Corp., New Berlin, Wis.

Filed Feb. 28, 1989, Ser. No. 316,859

Int. Cl.[5] F05B *17/22*

U.S. Cl. 292—201 **17 Claims**



1. A device for locking the closure lid of an appliance such as a washing means in which there is a moving part and an electric motor for driving said part; said device comprising:

a nonconductive base,

a bimetal element having prongs extending from one end and means for supporting said element at its opposite end in cantilever fashion on said base,

a control switch closable to initiate a closure locking condition and to enable said motor to run, said switch mounted on said base and connected in a series circuit with said bimetal element and said motor so that when said switch is closed electric current conducted through said element heats it and causes said element to deflect in one direction,

a pivotally mounted control lever biased to pivot in one direction and pivotable in an opposite direction in response to closing of said closure so as to close said control switch and heat said bimetal element,

actuator means including a shaft means and bearing means supporting said shaft means for rotation about its axis relative to said base,

arm means extending generally radially from said shaft means and having slot means in which said prongs on said bimetal engage,

a lock lever mounted to said shaft means such that the shaft means or said lever has free-play to rotate through a limited angle relative to the other before one begins to drive the other rotationally,

a torsion spring having opposite ends connected to said shaft means and lock lever for holding said lock lever in a predetermined angular position while said bimetal is too cool to deflect, deflection of said bimetal in one direction because of said bimetal heating due to flow of said electric current causing said shaft to rotate and transmit driving force by way of said spring to said lock lever for engaging said lock lever with said closure, further deflection of said bimetal allowing further rotation of said shaft until said free-play is taken up even if rotation of said lock lever is obstructed.

4,995,651

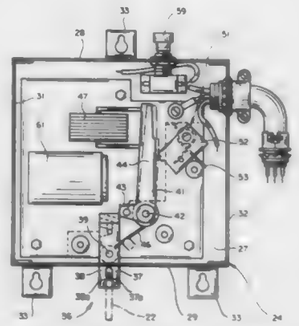
RELEASE MECHANISM AND METHOD

Russell Wardlaw, San Rafael, Calif., assignor to The Cookson Company, San Francisco, Calif.

Filed Dec. 1, 1989, Ser. No. 444,820

Int. Cl.[5] E05B *47/00*

U.S. Cl. 292—201 **7 Claims**



1. In a release mechanism: a retaining member, electrically operated means for holding the retaining member in a holding position when energized and for releasing the retaining member from the holding position when deenergized, a source for supplying an energizing current to the electrically operated means, and means connected to the source and to the electrically operated means for storing a limited amount of energy from the source and delivering an energizing current to the electrically operated means for a limited period of time after interruption of the current from the source.

4,995,652

DOOR LATCH

Frank A. Mugnolo, 10616 Newbury, Westchester, Ill. 60153; Anthony Mugnolo, and Joseph A. Calabrese, both of Westchester, Ill., assignors to Frank A. Mugnolo, Westchester, Ill.

Continuation of Ser. No. 20,567, Mar. 2, 1987, Pat. No. 4,880,262. This application Aug. 18, 1989, Ser. No. 395,748

Int. Cl.[5] E05C *3/14*

U.S. Cl. 292—202 **6 Claims**

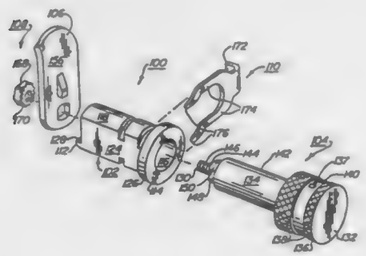
1. A latch for securing a pivoting door, which door defines a door orifice, to a door frame in a door closed position comprising:

a latch bushing which has the general shape of a hollow flanged body having a bushing longitudinal inner end, a bushing longitudinal outer end, a bushing interior surface, and a bushing exterior surface, said bushing including a flange adjacent the bushing outer end which has a cross-sectional area which extends beyond the cross-sectional area of the door orifice, the bushing exterior surface extending longitudinally towards the bushing inner end defining a first longitudinally transverse groove longitudinally disposed towards the bushing inner end from the

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flange and a stop flat extending longitudinally towards the inner end, and the interior surface extending longitudinally between the inner end and the outer end being a journal defined by a smooth cylinder wall;

an operator which has the general shape of a stepped body having an operator longitudinal inner end, an operator longitudinal outer end, and an operator exterior surface partially received within said bushing, said operator including a handle adjacent the operator longitudinal outer end which has a cross-sectional area which extends beyond the cross-section area of the interior surface at the axial outer end of said bushing, the handle including a manipulatable portion adapted to be grasped by fingers being a cylinder which includes a knurled portion of the operator exterior surface to assist rotation of the operator and includes a reduced diameter means for assisting longitudinal movement of said latch to pivot the door, said reduced diameter means bearing an indicia on said operator exterior surface which may be viewed to determine the rotational position of the striker, said operator further including an attachment at the operator inner end and a bearing disposed between the handle and the attachment, the attachment having a connector portion at the operator inner end and at least one latch flat disposed between the connector portion and the bearing, the bearing having a smooth cylindrical surface, the attachment having a cross-sectional area which is less than the minimum cross-sectional area of the interior surface of said bushing and the bearing diameter being slightly less than the diameter of the journal portion of said bushing to allow relative rotation between the bearing and the journal;



a striker, received on said operator, which is a generally elongate and flat body having a proximal end, a distal end, and a striker outer surface of said striker facing the operator axial outer end, said striker defining near the proximal end an attachment orifice having at least one striker flat which is conformal with the latch flat of the attachment of said operator upon which said striker is disposed, a stop adjacent the attachment orifice protruding from the striker outer surface towards the longitudinal outer end of said operator adapted to interfere with said stop flat of said bushing and limit the relative rotation between the journal portion of said bushing and the bearing of said operator, the distal end of said striker extending far enough from the attachment orifice to be brought to bear against the door frame;

connector means adapted to interlock with the connector portion of said operator to secure said striker to said operator by preventing longitudinal movement of said striker on said operator and to bring the striker outer surface against the inner end of said bushing; and

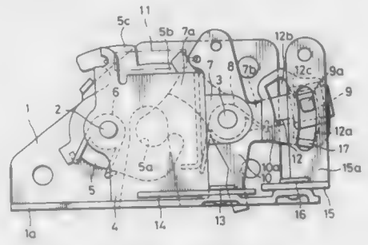
securement means bearing against the door adapted to be partially received within the longitudinally transverse groove of said bushing to restrain movement of said bushing in a direction towards the outer end of said bushing.

4,995,653

DOOR LOCK APPARATUS

Nozomu Torii, Hekinan, Japan, assignor to Aisin Seiki Kabushiki Kaisha and Aisin Hoyo Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 22, 1990, Ser. No. 497,189
Claims priority, application Japan, Mar. 24, 1989, 1-33858
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—216 **2 Claims**



1. A door lock apparatus, comprising:

a base;

a latch pivotally mounted on said base;

a pawl pivotally supported on a pivot shaft, said pivot shaft being mounted to said base; said pawl being engageable with said latch for limiting rotation of the latch;

a release bush slidably mounted on said pawl, said release bush having a projection;

an opening lever pivotally mounted on said pivot shaft, said opening lever having an elongate slot for receiving the projection of the release bush to transmit rotating motion of said opening lever to said pawl for rotating the pawl out of engagement with said latch; and

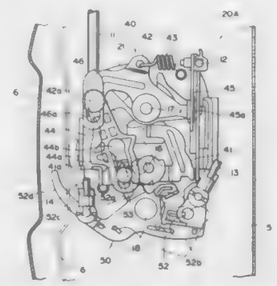
a locking lever, having an arcuate opening with a radius or the arc aligned with said pivot shaft, said release bush projection extending into said arcuate opening for transmitting a turning motion of said locking lever to said release bush, said release bush being slidable upon rotation of said locking lever for disengaging said release bush from said opening lever.

4,995,654

DOOR LOCK APPARTAUS FOR AUTOMOTIVE VEHICLE

Takashi Nishigami, and Michio Kado, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 11, 1989, Ser. No. 420,091
Claims priority, application Japan, Oct. 11, 1988, 63-255310
Int. Cl.[5] F16L *3/06*
U.S. Cl. 292—216 **5 Claims**



1. An automotive vehicle door lock apparatus which is mounted on a base plate disposed between inner and outer door panels of a door of an automotive vehicle for automatically latching said door when said door is closed, unlatching said door by at least an interior door handle operationally coupled to said door lock apparatus by means of a cable extending in a space formed between said inner and outer door panels so as to allow said door to be opened and locking said door by a door lock member operationally coupled to said door lock apparatus by means of a cable so as to prevent said door from being unlatched, said door lock apparatus comprising:

a door latch means comprising a latch pivotally mounted on said base plate which is engaged and turned by a striker secured to a body of said automotive vehicle so as to retain said striker when said door is closed and a detent means pivotally mounted on said base plate which is in cooperation with said latch to hold said latch when said latch is turned to retain said striker, thereby automatically latching said door;

a door unlatch means comprising an unlatching rocker arm pivotally mounted on said base plate and operationally coupled to said interior door handle by said cable and a link pivotally mounted on said unlatching rocker arm at one end thereof by means of a first connecting pin, said unlatching rocker arm being swung by at least said interior door handle to bring said link into engagement with said detent means so as to cause said detent means to release said latch, thereby releasing said striker and unlatching said door;

a door lock means comprising a locking rocker arm pivotally mounted on said base plate and slidably connecting the other end of said link thereto by means of a second connecting pin, said locking rocker arm being swung by said door lock member operationally coupled thereto by means of a cable to swing said link about said first connecting pin so as to disconnect said link from said detent means, thereby locking said door; and

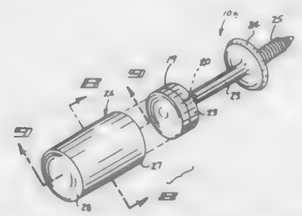
a disconnecting means, cooperating with said one end of said link and extending laterally toward said outer door panel and being moved laterally inward by said outer door panel as a result of crushing of said outer door panel to swing said link about said second connecting pin so as to operationally disconnect said link from said detent means, thereby preventing said door from being opened, and formed as an integral extension of said link formed with a breakable retainer tab for partly and loosely encircling said first connecting pin so as to connect said link to said first connecting pin, said breakable retainer tab being broken by a slightly high shearing force imparted laterally thereto from said first connecting pin when said link is moved laterally inward by said outer door panel as a result of crushing of said outer door panel through said integral extension, thereby allowing said link to swing about said second connecting pin.

4,995,655

MAGNETIC DOOR STOP

Richard A. Freeman, P.O. Box 102, Climax, N.C. 27233

Filed May 7, 1990, Ser. No. 519,812
Int. Cl.[5] E05C *19/16*
U.S. Cl. 292—251.5 **3 Claims**



1. A magnetic door stop apparatus to permit selective securement of a pivotal door relative to a vertical wall, wherein the apparatus comprises,

a base member securable to the wall including an extension rod coaxially and integrally mounted to the base member extending orthogonally thereof, including a bumper means which includes a permanent magnet, and

a magnetically attractive plate member selectively mounted to the door in coaxial alignment with the bumper means to effect attraction of the bumper means to the plate member, and

selectively secure the door in a spaced relationship relative to the wall, and

wherein the plate member includes a cylindrical head defined by a predetermined diameter, and a first threaded shank coaxially and integrally mounted to a rear surface of the cylindrical head extending rearwardly of the cylindrical head for securement to the door, and

wherein the bumper means includes a resilient cylindrical bumper integrally and orthogonally mounted to the extension rod, wherein the resilient bumper is of a diameter equal to the predetermined diameter, and the base member includes a second threaded shank integrally and coaxially aligned with the extension rod extending rearwardly of the base member for securement within the wall, and

wherein the bumper means further includes a magnetic cylindrical head, the magnetic cylindrical head defined by a magnetic cylindrical head diameter equal to the predetermined diameter and includes a third threaded shank orthogonally and coxially mounted to the magnetic cylindrical head extending rearwardly thereof and threadedly received within the resilient bumper coaxially aligned with the extension rod, and the resilient bumper in contiguous coaxially aligned relationship to the magnetic head, and

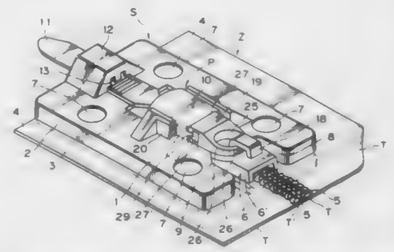
wherein the bumper means further includes a cylindrical sleeve defined by a cylindrical skirt including an internal cylindrical cavity therewithin, wherein the internal cylindrical cavity includes cavity diameter equal to the predetermined diameter, and the cylindrical sleeve includes a cylindrical head member mounted to a forward end of the sleeve, and a cylindrical web mounted interiorly of the cylindrical cavity spaced from the head defining a magnet cavity between the web and the cylindrical head, and a magnet member mounted within the magnet cavity.

4,995,656

SECURITY SEALING MECHANISM

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 441,635
Claims priority, application Japan, Dec. 2, 1988, 63-157410; May 16, 1989, 1-56084; Jun. 22, 1989, 1-73400
Int. Cl.[5] E05B *67/38*
U.S. Cl. 292—307 R **14 Claims**



1. In a slide fastener comprising a pair of fastener stringers each including a fastener tape and a coupling element row mounted along the inner longitudinal edge thereof and a slider mounted reciprocatively on the coupling element rows, the slider including a slider body having an attachment lug

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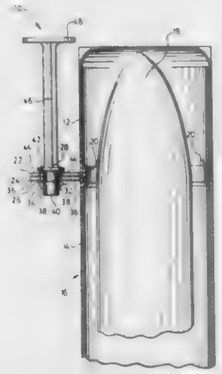
mounted on the upper surface thereof and a link pivotally connected with the attachment lug; a security sealing mechanism comprising a sealing body mounted on that end of coupling element rows to which the slider comes for closing the slide fastener and including an abutting surface disposed at the end thereof contiguous to the coupling element rows for receiving the slider and locking means provided on the upper surface of the sealing body, and a pull tab having one end releasably jointed to the link and having the other end adapted for unreleasable locking engagement with the locking means.

4,995,657

FASTENER FOR SECURING THE CLOSURE OF A CONTAINER

Grant D. Farrell, and Edward Goles, both of Pickering, Canada, assignors to Scepter Manufacturing Company Limited, Toronto, Canada

Filed Jan. 23, 1989, Ser. No. 299,435
Int. Cl.[5] E05B *39/02*
U.S. Cl. 292—327 16 Claims



1. A fastener for securing a closure to a container, in which the closure has a first ring means and the container has a second ring means, such that when the closure and the container are fully engaged, the first and second ring means are coaxially aligned, thereby providing a bore through both the first and second ring means, the fastener comprising:

(a) a body having a longitudinal axis;

(b) the body having first projection means dimensioned such that the body can be inserted through the bore in a first direction along its longitudinal axis but is prevented from moving in a second direction, being 180° to the first direction, by abutting the surface surrounding the bore;

(c) the body having second projection means located at a distance in the second direction from the first projection means, that prevents the body from moving in the first direction by abutting the surface surrounding the bore;

(d) at least one of the projection means is capable of being detached from the fastener by tearing away from the body during removal of the fastener from the container by movement in either the first or second direction;

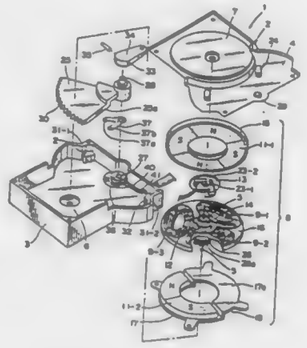
(e) the body comprising a core section surrounded by an outer section to which is attached the first projection means such that during removal of the fastener in a second direction, the outer section is held fast against the surface surrounding the bore by means of the first projection means and the core moves relative to the outer section.

4,995,658

DOOR LOCKING DEVICES

Manabu Shiraki, Yamato, and Osamu Hamaguchi, Nirasaki, both of Japan, assignors to Sicoh Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,093
Claims priority, application Japan, Aug. 4, 1989, 64-201200
Int. Cl.[5] E05B *47/00*
U.S. Cl. 292—336.3 3 Claims



1. A door locking device characterized in that:

first and second field magnets are disposed at respective stationary positions opposite to each other through an axial air gap to provide stators;

the first field magnet has 2P contiguous poles of alternating N and S polarity, wherein P is an integer of at least 2, and is formed in a torus shape;

the second field magnet has n pole(s) each of contiguous and alternating N and S magnetic poles, wherein n is an integer of at least 1 provided that 2P is greater than n, and is formed so as to define a space capable of receiving a swingable driven gear in the plane opposite to a rotatable coreless armature and hence not to become a complete torus form;

an m-phase rotatable coreless armature, wherein m is the number of phases and is an integer of at least 2, composed of k armature coils, wherein k is an integer of at least 2, is rotatably provided between the first field magnet and the second field magnet;

a commutator is provided on the rotatable coreless armature so as to rotate integrally therewith;

brushes coming into movable contact with the commutator are provided on its corresponding stationary side;

a driving gear rotating integrally with the rotatable coreless armature is disposed concentrically with the armature;

a back yoke for the second field magnet is extended and bent so as to face the rotatable coreless armature at the position of the space defined with respect to the second field magnet through a slight air gap to define a swingable driven gear-receiving space on the lower side of the extended and bent portion;

the swingable driven gear, which is fixed to an output gear shaft supported rotatably and provided swingably by a predetermined angle, is engaged with the driving gear in an interlocking relation so that it may be received and disposed in the swingable driven gear-receiving space; and

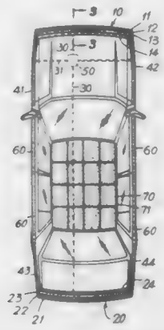
an output lever transmitting a mechanical output on the locking/unlocking side of a door is rotatably attached to the output gear shaft, to which the swingable driven gear has been fixed.

4,995,659

SHOCK ABSORBER FOR A CAR

Heung Jong Park, 410-4 Beon 1-Dong, Dobong-ku, Seoul, Rep. of Korea (132-061)

PCT No. PCT/KR88/00021, § 371 Date Jun. 8, 1989, § 102(e) Date Jun. 8, 1989, PCT Pub. No. WO89/03328, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 15, 1988, Ser. No. 372,341
Claims priority, application Rep. of Korea, Oct. 15, 1987, 17572/1987
Int. Cl.[5] B60R *19/00*
U.S. Cl. 293—107 3 Claims



1. A shock absorber for a car comprising front and rear bumpers, said front and rear bumpers each comprising a bumper member for low pressure shock absorption, medium pressure shock absorption and high pressure shock absorption, each of said bumper members being filled with a gas of predetermined pressure, each of said low, medium, and high pressure shock absorption members of different thickness and gas capacity; an air sheet filled with a gas and conforming to the shape of and mounted to the front and rear left and right side panels of the car, ; an air sheet filled with a gas and conforming to the shape of and mounted to the doors of the car; an air sheet filled with a gas, conforming to the shape of a roof of the car and mounted thereto, a longitudinal gas circulatin tube mounted longitudinally with the body of the car and which interconnect the front bumper members, for medium and high pressure shock absorption with the rear bumper members, for medium and high pressure shock absorption so that the gases of the interior thereof can be circulated; a lateral gas circulation tube mounted laterally within the body of the car so as to intersect said longitudinal gas circulation tube and which interconnects the air sheets for the left and right front side panels so that the gas or the interior thereof can be circulated; and gas circulation control means which controls the gas circulatin by being mounted at a points of intersection of said longitudinal gas circulation tube and said lateral gas circulation tube.

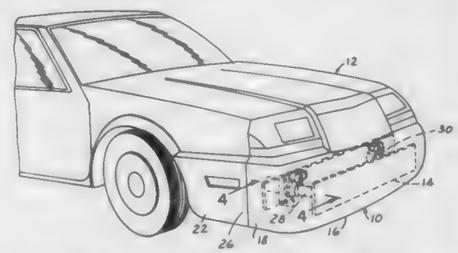
4,995,660

MOUNTING STRUCTURE FOR VEHICLE BUMPER ASSEMBLY

John Horansky, Troy, and Kenneth L. Winalis, Clemens, both of Mich., assignors to Chyrsler Corporation, Highland Park, Mich.

Filed Jun. 7, 1990, Ser. No. 535,001
Int. Cl.[5] B60R *19/26*
U.S. Cl. 293—132 7 Claims

1. In a vehicle bumper assembly comprising a bumper structure for receiving impact forces, at least one energy absorbing device secured between the bumper structure and vehicle support structure to mount said bumper structure, the energy absorbing device including a cylinder detachably fastened to said vehicle support structure, a piston slidably received within the cylinder, the piston being detachably fastened at an outer end thereof to the bumper structure, the improvement comprising mounting structure for detachably fastening the cylinder to said vehicle support structure which compensates for variations in the orientation of the bumper structure with respect to the vehicle support structure, said mounting structure including a cylinder bracket fixedly secured to the cylinder, the cylinder bracket including at least one arm extending outwardly from the cylinder, said arm having an opening therein, a support bracket, the support bracket including a wall, the wall having a first cylinder opening therein of larger diameter than the cylinder, the vehicle support structure having a second cylinder opening therein of larger diameter than the cylinder, means detachably fastening the support bracket to the vehicle support structure with said first and second cylinder openings in substantial registry, the cylinder extending through the first and second cylinder openings at a location



and angle limited by the diameters thereof, the means for detachably fastening the support bracket to the vehicle support structure including said wall having at least one vertically oriented elongated mounting opening therein, said vehicle support structure having at least one bracket opening therein, fastening means extending through said mounting opening and bracket opening to secure the cylinder bracket in place with the mounting opening permitting vertical adjustability of the cylinder bracket, said wall having at least one arm extending outwardly therefrom, said arm having a horizontally oriented elongated mounting opening therein, fastening means extending through the mounting opening in the support bracket arm and the opening in the cylinder bracket arm to secure the cylinder to the support bracket with the mounting opening in the support bracket arm permitting horizontal adjustability of the cylinder.

4,995,661

ANIMAL FECES RETRIEVER

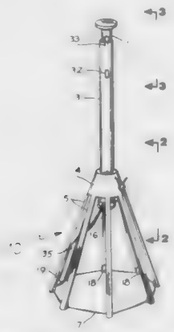
Harold O. Aurness, 5808 Knox Ave. N., Brooklyn Center, Minn. 55430, and Thomas G. Mahler, 3841 Unity Ave. N., Robbinsdale, Minn. 55422

Filed Oct. 10, 1989, Ser. No. 419,506
Int. Cl.[5] A01K *29/00*
U.S. Cl. 294—1.4 8 Claims

1. A device for retrieving, or picking up, animal waste having a set of flexible spring stays extending down and outward in a circular cone shape from a sliding collar mounted on a housing tube, which tube is pulled up through the collar from within the cone of the spring stays, with cooperatinal means between the housing tube and collar to hold the housing tube in an extended, but retractable position and kept from further extension by a flanged end of the housing tube; a sliding tube within the housing tube having a handle at the top with a guide groove on the outside extending from below the handle to the bottom keeping the tube in alignement by a depression at the top of the housing tube riding in the groove when extending or retracting, to guide the sliding tube to holding means; a pull ribbon of a length determined for efficiency slideably connecting through eyelets at the bottom of all the spring stays with both ends extending up through a gathering ring at the bottom of the sliding tube within the housing tube and up to and over a cross member inside the sliding tube and back down through the gathering ring to be anchored to the outside of the sliding

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collar; spring means on the gathering ring cooperating with means in the housing tube to hold the sliding tube in an extended position which holds the bottoms of the spring stays together and which action encloses the faces within a bag



removeably attached by means to the bottom of the housing tube with the open end folded up over the spring stay ends; means for holding the bottoms of the spring stays together for storage.

4,995,662

SUCTION PICK-UP APPARATUS FOR ELECTRICAL OR ELECTRONIC COMPONENTS

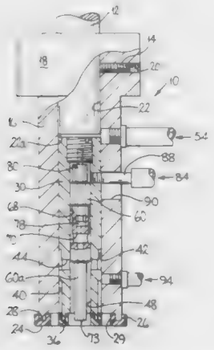
Victor T. Hawkswell, Essex, England, assignor to Emhart Industries, Inc., Hartford, Conn.

Continuation of Ser. No. 207,362, Jun. 15, 1988, Pat. No. 4,852,247. This application Jul. 7, 1989, Ser. No. 376,773

Claims priority, application United Kingdom, Jun. 17, 1987, 8714175

Int. Cl.[5] H05K *3/30;* B25J *15/06;* B65G *47/91*

U.S. Cl. 294—64.1 3 Claims



1. A pick-up head for picking up electronic components comprising

a body having an annular pick-up surface at the bottom thereof defining a first suction area and a vertical blind bore extending upwardly from said first suction area,

a first piston member slidably displacable within said bore between selected upper and lower positions and having top portion for sealing said bore,

a second annular pick-up surface at the bottom thereof defining a second smaller suction area and

a vertical blind bore extending upwardly from said second area,

a second piston member slidably displaceable within said first piston bore between selected upper and lower positions, and having

a top portion for sealing said bore,

a third annular pick-up surface at the bottom thereof defining a third yet smaller suction area and

a vertical blind bore extending upwardly from said third area,

conduit means extending through said body communicating with said body bore above said first piston member and

means for connecting a pressure or vacuum source to said second piston member including

an enlarged opening in said body,

pipe means passing through said enlarged opening and through said first piston member below the top portion thereof and above said second piston member,

said enlarged area having a size selected so that said first piston member carrying said pipe means can be displaced between said first piston member upper and lower positions.

4,995,663

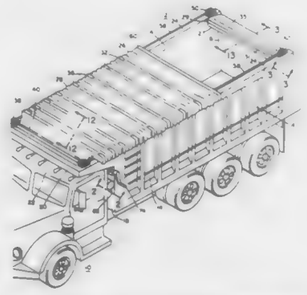
SLIDABLE TRUCK COVER ASSEMBLY

Robert C. Weaver, Rd. #1, Port Matilda, Pa. 16870, and Robert Semion, 1306 Deerfield Dr., State College, Pa. 16803, assignors to Robert C. Weaver, Port Matilda; Robert Semion, State College; John H. Imbt, State College and Marlin K. Gingrich, State College, all of, Pa.

Continuation-in-part of Ser. No. 384,650, Jul. 25, 1989, Pat. No. 4,948,193, which is a continuation-in-part of Ser. No. 139,444, Dec. 30, 1987, Pat. No. 4,858,984, which is a continuation-in-part of Ser. No. 888,001, Jul. 22, 1986, Pat. No. 4,725,090. This application Aug. 28, 1989, Ser. No. 399,264

Int. Cl.[5] B60D *7/04*

U.S. Cl. 296—100 16 Claims



1. A tarpaulin support apparatus for supporting a tarpaulin over a bed of a truck, comprising

a slat having a central portion that extends between a first side wall of the truck and a second side wall of the truck, a first end portion extending from one end of the central portion downwardly over and adjacent to the first side wall of the truck, and a second end portion extending from the other end of the central portion downwardly over and adjacent to the second end wall of the truck,

slat support means for supporting the slat on the side walls of the truck, and

attachment means for attaching the tarpaulin to the slat,

said attachment means including

a lateral tarpaulin support mounted on the end of each slat over the tarpaulin and extending downwardly over and adjacent to the side walls of the truck for holding the tarpaulin close to the side walls of the truck.

4,995,664

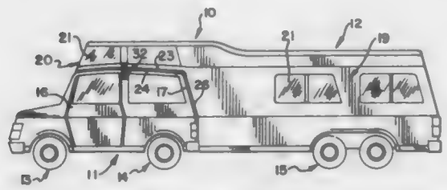
HITCH FOR MOTOR HOME ASSEMBLY

John M. Buday, Toronto, Canada, assignor to Continental Coach Ltd., Toronto, Canada

Continuation-in-part of Ser. No. 89,500, Aug. 26, 1907, Pat. No. 4,848,731. This application Jul. 12, 1989, Ser. No. 378,642

Int. Cl.[5] B60P *3/34*

U.S. Cl. 296—165 16 Claims



1. In a motor home assembly comprising a motor vehicle unit including a rear wall and having steerable front wheels and selectively steerable rear wheels, a motor home trailer unit including at least one pair of wheels and having a front wall positioned adjacent said vehicle unit rear wall, and cooperating coupling means between said vehicle unit and said trailer unit to selectively close-couple said units together as one rigid assembly in sealed relationship one with the other, said cooperating coupling means including two spaced apart and forward projecting connector guide elements adjacent each side of said trailer unit at the bottom and the top of the front wall thereof, and corresponding spaced apart connector receptacles adjacent each side of said vehicle unit at the bottom and the top of the rear wall thereof, said connector guide elements detachably engaging and locked within said connector receptacles by corresponding movable locking elements when said units are coupled in rigid assembly, the improvement which comprises:

(a.) said connector guide elements each including a locking receptacle for receiving a corresponding movable locking element for locking engagement;

(b.) each connector guide element locking receptacle comprising a conical aperture passing through said connector guide element;

(c.) each movable locking element being pivotally mounted on motive means and having a conical forward section;

(d.) each connector guide element locking conical aperture being conically sized and shaped to receive and retain the conical forward section of said corresponding movable locking element in a mated locking engagement upon activation of said motive means; and,

(e.) said motive means including actuator motive means mounted at each side of said vehicle between said top and bottom connector receptacles, and upper and lower actuator means movably connected to said actuator motive means for moving upper and lower locking elements into and out of locking engagement with corresponding connector guide element conical apertures, and means pivotally mounting said movable locking elements to the corresponding actuator means.

4,995,665

SUNROOF STRUCTURE FOR MOTOR VEHICLE

Hisao Ichinose, Atsugi; Yoshimitsu Takeda, Zama; Tsuyoshi Sato, and Hiroshi Imai, both of Tokyo, all of Japan, assignors to Nissan Motor Company, Ltd. and Johnan Seisakusho Co., Ltd., both of, Japan

Filed Feb. 26, 1990, Ser. No. 484,594

Claims priority, application Japan, Feb. 27, 1989, 1-21587[U]; Feb. 27, 1989, 1-21590[U]; Feb. 27, 1989, 1-21588

Int. Cl.[5] B60P *7/05, 7/22*

U.S. Cl. 296—213 12 Claims

1. A sunroof structure for a vehicle having an aperture formed in a roof of the vehicle, said sunroof structure comprising:

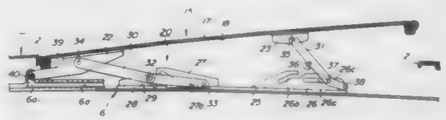
a guide rail extending along each side of said aperture;

a sunroof lid adapted to cover said aperture;

front and rear brackets secured to front and rear portions of said sunroof lid, said front bracket having a portion slidably engaged with said guide rail;

a front guide slidably engaged with said guide rail;

a rear guide device which is located behind said front guide and slidably engaged with said guide rail, said rear guide device including a front sub-guide and a rear guide which are united to move together;



a front link having a front end pivotally connected to said front bracket and a middle portion pivotally connected to said front guide;

a rear link having a front end pivotally connected to said rear bracket;

first guide means on said front sub-guide for guiding a movement of a rear end of said front link with respect to said front sub-guide;

second guide means on said rear guide for guiding a movement of a major portion of said rear link with respect to said rear guide; and

drive means for driving said rear guide device along said guide rail.

4,995,666

SUN ROOF

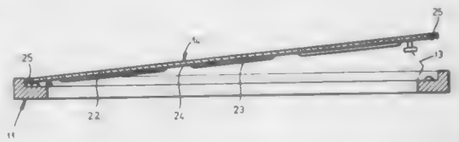
Erich Schürmann, Sendenhorst, Fed. Rep. of Germany, assignor to Gabel BmbH, Schwelm, Fed. Rep. of Germany

Filed Nov. 6, 1989, Ser. No. 433,042

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839403

Int. Cl.[5] B60J *7/08*

U.S. Cl. 296—216 11 Claims



1. An openable sun roof assembly for an automotive vehicle, comprising:

a frame formed in a roof of an automotive vehicle;

a translucent panel movably mounted in said frame, said panel having an inner surface turned toward an interior of said vehicle and having a pair of opposite edges;

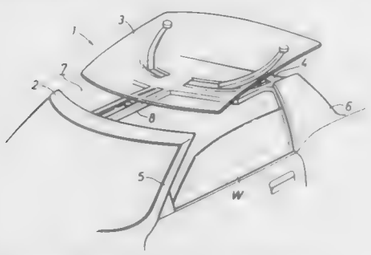
a single hinge mounted on said panel at a midpoint of one of said edges and constituting a sole hinged pivoting articulation between said one edge and said frame;

a panel-closing element for retaining said panel in a closed position located on said panel at a midpoint of the other of said edges whereby said hinge and said panel-closing element lie along a surface centerline of said panel; and

an elongated strip of material fixed to said inner surface along said centerline and formed at one end with said hinge and at an opposite end with said panel-closing element, said strip being adhesively bonded to said inner surface by a layer of an adhesive, and said strip being formed along a length thereof with zones alternating with one another and having different bending stiffnesses.

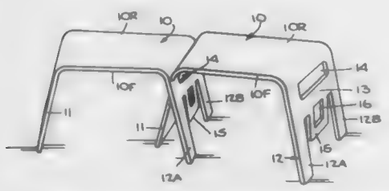
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4,995,667
VEHICLE SLIDING ROOF SYSTEM
Michio Tamura, and Fumio Furuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 1, 1989, Ser. No. 317,323
Claims priority, application Japan, Mar. 3, 1988, 63-50375
Int. Cl.[5] B60J 7/047
U.S. Cl. 296—216 20 Claims



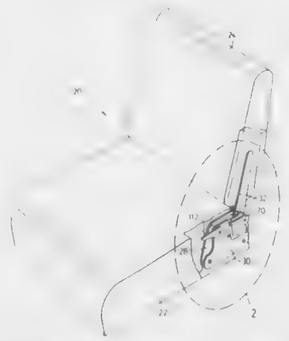
6. A vehicle sliding roof system, comprising:
a fixed front roof having a width;
a fixed rear roof having a width and an upper surface, and located a predetermined longitudinal distance from said fixed front roof;
a movable central roof located between said fixed front roof and said fixed rear roof and defining an area that extends substantially across the width of said fixed front and rear roofs and substantially along the longitudinal distance between said fixed front roof and said fixed rear roof;
said movable central roof being capable of selectively moving into and out of a closed position between said fixed front roof and said fixed rear roof;
a pair of first guide rails located on the upper surface of said fixed rear roof, each said first guide rail extending along one of two predetermined substantially curved paths;
a pair of guide arms each having two ends, a first end of said guide arm pivotally connected to said movable central roof;
first guide shoe means connected to a second end of each said guide arm for slidably engaging each second end of each said guide arm with one of said first guide rails, each said guide arm moving in substantially curved motion and along the pre-determined substantially curved path of said corresponding guide rail; and
drive means for moving said second ends of said guide arms along said first guide rails.

4,995,668
MODULAR STOOL
Bashir Zivari, 266 Washington Ave., C-7, Brooklyn, N.Y. 11205
Filed Jul. 13, 1990, Ser. No. 552,161
Int. Cl.[5] A47C 1/124
U.S. Cl. 297—248 9 Claims



1. A modular stool capable of functioning in a kindergarten or similar facility as an individual seat for a child, which stool when interlinked with like stools can be used for group seating, said stool comprising:
(a) a wedge-shaped seat section whose rear end is broader than its front end;
(b) left and right side sections integral with the seat section and outwardly inclined with respect thereto, said left side section being defined by a broad leg centered with respect to said left and right ends of the seat section, said right side section being defined by left and right narrow legs joined to the front and rear ends of the seat section; and
(c) a cross arm bridging the narrow legs below the seat section to define a transverse slot whose width is substantially equal to that of the broad leg, whereby two stools may be interlinked by inserting the broad leg of one into the slot of the other.

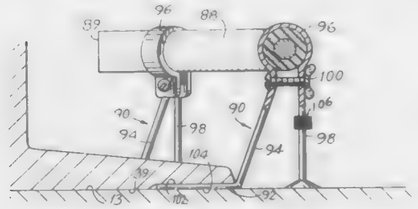
4,995,669
ADJUSTABLE LATCHING DEVICE WITH MEMORY FEATURE FOR VEHICLE SEAT ASSEMBLIES
George Croft, Oakville, Canada, assignor to Canadian A.S.E. Limited, Mississauga, Canada
Filed Dec. 20, 1989, Ser. No. 453,653
Claims priority, application Canada, Dec. 28, 1988, 587172
Int. Cl.[5] B60N 2/02
U.S. Cl. 297—379 11 Claims



1. An adjustable latching device for use with a vehicle seat assembly having a first and a second seat member pivotally foldable relative to one another about a pivot axis between folded and unfolded operative configurations, the device comprising:
a latch pin rigidly mounted on the first seat member so as to define a first concentric arc of movement upon said pivotal folding of the first seat member about said pivot axis;
an idler plate having a generally arcuate gear sector and being mounted for rotation about said pivot axis;
a locking arm rotatably mounted on the idler plate and having a detent portion positioned adjacent one end in spaced relation from the point of rotational movement of the arm so as to be adapted to restrainingly engage the latch pin thereby to cause rotation of the idler plate with the first seat member in at least one rotational direction upon pivotal folding of the first seat member about said pivot axis in said at least one rotational direction;
a first rotational control means for selectively rotating the locking arm into and out of said restraining engagement;
a pawl means, having a head and a tail portion, and being pivotally mounted on the second seat member intermediate said head and tail portions for pivotal movement between a first rotational position whereat said head portion lockingly engages said gear sector to prevent rotation of the idler plate and a second rotational position whereat said head portion is disengaged from said gear sector to allow for said rotation of the idler plate about said pivot axis; and,

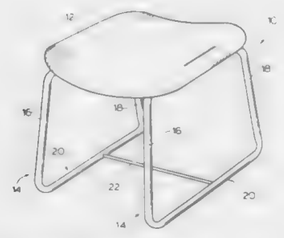
a second rotational control means for selectively rotating the pawl means between said first and said second rotational positions.

4,995,670
HAIRDRESSER FOOT REST
Wilson A. Rodas, R.D. 2 Quannacut Rd., Pine Bush, N.Y. 12566
Continuation of Ser. No. 228,892, Aug. 5, 1988, abandoned. This application Feb. 2, 1990, Ser. No. 474,291
Int. Cl.[5] A47C 7/50
U.S. Cl. 297—423 5 Claims



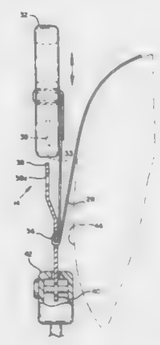
1. A portable footrest for use with a styling chain having a circular base positioned on the floor, an upstanding pedestal projecting from the base and a chair mounted to the upper end of the pedestal, said footrest comprising a circular foot support assembly means substantially encircling the pedestal and adapted to support the foot of the user but not engaging said pedestal, said foot support assembly means comprising at least one independent arcuate segment having vertical support means to provide a non-rotational vertical support and positioning of said foot support assembly means, said foot support assembly means being vertically spaced above said floor to permit the stylist-user to rest a foot thereon without movement to said support assembly; said vertical support means mounted to said foot support assembly and extending downwardly therefrom, said support means including means to removably mount said support means to said chair base, said means to removably mount including a tongue adapted to be inserted between said chair base and the floor for frictional positioning therebetween and having a vertical portion having an adjustable sleeve adapted to receive the arcuate segment, said sleeve having means to removably secure the arcuate segment thereto.

4,995,671
SEAT LEG SYSTEM WITH STABILIZER BAR
Greg Gabourie, Ajax, and Steve Fox, Keswick, both of Canada, assignors to Global Upholstery Co., Ltd., Downsview, Canada
Filed Jan. 31, 1990, Ser. No. 472,861
Claims priority, application Canada, Feb. 9, 1989, 590665
Int. Cl.[5] A47C 16/00
U.S. Cl. 297—439 6 Claims



1. A chair, comprising;
(i) a seat;
(ii) two spaced leg assemblies, each leg assembly comprising two spaced legs and a crossbar extending between said spaced legs and attached at its ends to said spaced legs, the crossbar spaced down from the top ends of said legs, and means attaching said legs at said top ends to said seat;
(iii) a substantially rigid resilient pre-torqued brace having a main axis, extending between the crossbars of said leg assemblies, and having a connection at each end with a crossbar, each connection comprising a shaped end portion inclined at an angle to the main axis and a restricted, transversely extended passage in the crossbar, said shaped end extending obliquely in said passage, wedged across opposed wall portions of the passage.

4,995,672
PRISONER RESTRAINT SYSTEM
Dan E. Corcoran, 8310 SW. Greenway, No. 45, Beaverton, Oreg. 97008
Division of Ser. No. 257,997, Oct. 14, 1988, Pat. No. 4,925,246. This application May 8, 1990, Ser. No. 521,190
Int. Cl.[5] B60R 21/10
U.S. Cl. 297—483 8 Claims



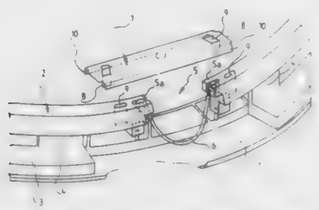
1. A belt restraint assembly comprising:
(a) a belt having a first end portion and a second end portion, said second end portion being secured to a first anchoring point;
(b) first and second mating latching means for selectively engaging each other, said first latching means operatively associated with said belt, said second latching means being secured to a second anchoring point;
(c) said first latching means including cinch means for engaging and tightening said belt;
(d) a cinch handle connected to said first end portion of said belt; and
(e) engagement means, cooperating between said cinch handle and said first latching means, for detachably engaging said cinch handle to said first latching means.

4,995,673
ORNAMENTAL WHEEL HUB CAP
Dominique DuBost, La Celle Saint Cloud, France, assignor to Rapid S.A., Paris, France
Filed Oct. 2, 1989, Ser. No. 415,664
Claims priority, application France, Oct. 24, 1988, 88 13895
Int. Cl.[5] B60B 7/06
U.S. Cl. 301—37 P 4 Claims

1. An ornamental wheel hub cap adapted to be removably secured into a stepped portion of a wheel rim of a vehicle through the medium of a resiliently deformable ring clipped into said stepped portion and split to form at least two free ends connected by at least one resiliently deformable means for causing said ring to be radially deformed, said one resiliently deformable means comprising a wire, wherein the improvement comprises a strap being removably mounted between the

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at least two free ends and exerting a prestress upon the ring against a force exerted by said at least one resiliently deformable means thereby preventing the deformation of the hub



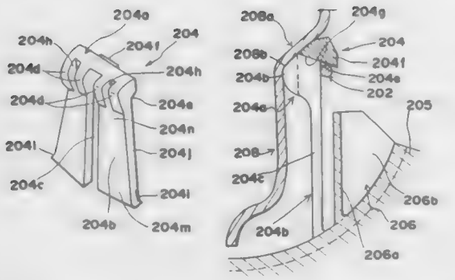
cap-ring assembly before mounting onto the wheel rim and also allowing the mounting of this assembly through clipping onto the rim after removal of the strap.

4,995,674

WHEEL COVER

Noboru Shirai, and Toshiyuki Isogai, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 81,361, Aug. 4, 1987, Pat. No. 4,826,253. This application Jan. 18, 1989, Ser. No. 298,665
Claims priority, application Japan, Aug. 4, 1986, 61-119889; Nov. 20, 1986, 61-179581; Dec. 1, 1986, 61-185728; Dec. 1, 1986, 61-185729; Mar. 31, 1987, 62-49032
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[5] B60B *7/12*
U.S. Cl. 301—37 P 3 Claims



1. A wheel cover for a motor vehicle comprising:

a synthetic-resin-made wheel cover main body having a plurality of holding claws integrally circumferentially formed on a rear surface thereof;

said holding claws being provided with an engaging portion formed on a radial outside surface of a head portion thereof;

a resilient reinforcement ring having approximately the same diameter as a diameter defined by said holding claws;

each of said plurality of holding claws having a projection integrally formed on the radial inside surface of the head portion of said claw, said projection protruding substantially inwardly in the radial direction with respect to the radial inside surface of said head portion and including a wire-ring engaging surface which engages and holds said resilient reinforcement ring;

said resilient reinforcement ring being inserted into said wire ring engaging surface, whereby the wire ring engaging surfaces of each of said holding claws, when said wheel cover is removably fitted to a wheel, are pressed to contact with a rim of the wheel by an inherent resilience of said holding claws and said resilient reinforcement ring; and

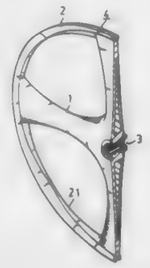
an opening radially penetrating said claw and being positioned under the projection, said opening being formed by insertion of a metal mold within the wheel cover thereby integrally forming the wire ring engaging surface when molding the wheel cover.

4,995,675

BICYCLE WHEEL AND THE MANUFACTURING METHOD

Carlos Tsai, No. 91-4, Sec. 4, Mei Chuan E. Rd., Taichung City, Taiwan

Filed Jul. 12, 1989, Ser. No. 378,830
Int. Cl.[5] B60B *5/02*
U.S. Cl. 301—63 PW 4 Claims



1. A bicycle wheel generally comprising a rim having at least three spokes and a hub formed at a center of said wheel; an annular recess being formed on an outer peripheral surface of said rim for receiving a tire; a compartment being formed within each said spoke for containing foam material; and a rib being formed on an inner peripheral surface of said rim, said rib changing, from a substantial medium position between two adjacent spokes on both directions toward the spokes, from wider to thinner.

4,995,676

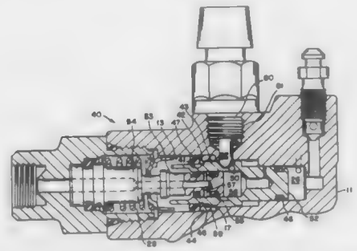
POSITIONING RING FOR A HYDRAULICALLY OPERATED WARNING DEVICE

Donald A. Crumb, Granger, Ind.; Richard A. Zander, Niles, Mich., and Robert F. Gaiser, Stevensville, Mich., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 8, 1989, Ser. No. 450,359
Int. Cl.[5] B60T *13/00*
U.S. Cl. 303—9.63 15 Claims

1. A positioning ring for a hydraulically operated device, the hydraulically operated device comprising a housing having therein a bore communicating with an opening having therein a hydraulically responsive device, pressure movable sleeve means disposed within said bore and having a positioned sleeve portion thereat, the hydraulically responsive device including movable means responsive to the positioned sleeve portion, the sleeve means defining at one end of said bore a portion of a first pressure chamber and at the other end of the bore a portion of a second pressure chamber, the bore including a housing shoulder and the sleeve means including a sleeve shoulder, and stepped positioning ring means disposed about said sleeve means, the stepped positioning ring means engaging the sleeve shoulder and housing shoulder so that the shoulders are non-aligned relative to one another, pressure within the second

pressure chamber exerted upon the sleeve means and ring means in a direction toward the first pressure chamber so that said stepped positioning ring means engages said housing shoulder, such that one of a mis-assembly of said stepped positioning ring means and a failure to place said stepped positioning ring means about said sleeve means permits said sleeve means to be displaced toward said first pressure chamber to cause the movable means to respond to the displacement of the positioned sleeve portion.

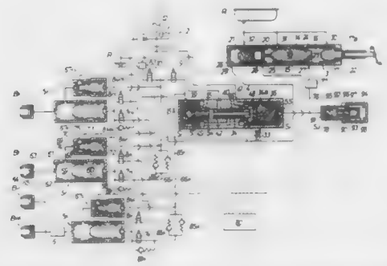


4,995,677

HYDRAULIC BRAKING PRESSURE CONTROL SYSTEM

Shohei Matsuda; Jiro Suzuki; Tsuyoshi Sato, and Kazutoshi Tashima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1990, Ser. No. 492,022
Claims priority, application Japan, Mar. 13, 1989, 1-60243; May 22, 1989, 1-128277
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—113 3 Claims



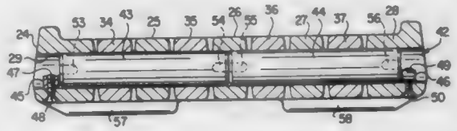
1. A hydraulic braking pressure control system comprising auxiliary hydraulic pressure generating means connected to a brake device for generating a hydraulic pressure depending upon a braking operation by a brake pedal; a hydraulic pressure supply source; hydraulic pressure supply source hydraulic pressure control means capable of controlling the hydraulic pressure from said hydraulic pressure supply source in accordance with the braking operation by said brake pedal; hydraulic pressure transmitting means which is interposed in a hydraulic pressure path extending from said hydraulic pressure supply source via said hydraulic pressure supply source hydraulic pressure control means to said brake device and which is arranged to permit the transmission of the hydraulic pressure output from said hydraulic pressure supply source hyrdraulic pressure control means to said brake device when the hydraulic pressure in said hydraulic pressure supply source is normal and to cut off the flowing of a working fluid from said brake device toward said hydraulic pressure supply source when the hydraulic pressure in said hydraulic pressure supply source is abnormally reduced; and an on-off valve interposed between said auxiliary hydraulic pressure generating means and said brake device, having a pilot chamber leading to an output port of said hydraulic pressure supply source hydraulic pressure control means, and adapted to be closed in response to an increase in the hydraulic pressure in said pilot chamber, wherein said on-off valve is closed by rising of the output hydraulic pressure from said hydraulic pressure supply source hydraulic pressure control means prior to rising of the output hydraulic pressure from said auxiliary hydraulic pressure generating means during a braking operation by said brake pedal.

4,995,678

PROTECTED PIN RETENTION DEVICE FOR CRAWLER TRACK ASSEMBLY

Joseph A. Jinkens, New Albany, Ohio, assignor to Matsuhita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 20, 1988, Ser. No. 287,078
Int. Cl.[5] B62D *55/205*
U.S. Cl. 305—58 R 11 Claims



1. A crawler pad assembly comprising first and second crawler pads;

each of said crawler pads having a leading edge portion and a trailing edge portion, the leading edge portion of each crawler pad having a plurality of spaced apart first hinge knuckles extending parallel to each other, each of said first hinge knuckles having a first bore extending therethrough, the first bores of a respective crawler pad being at least substantially cylindrical and coaxially aligned with respect to each other;

the trailing edge portion of each crawler pad having a plurality of spaced apart second hinge knuckles extending parallel to each other, each of said second hinge knuckles having a second bore extending therethrough, the second bores of a respective crawler pad being at least substantially cylindrical and coaxially aligned with respect to each other, the plurality of spaced apart first hinge knuckles on a respective crawler pad extending parallel to and offset from the plurality of spaced apart second hinge knuckles on the same crawler pad;

the plurality of spaced apart first hinge knuckles of said first crawler pad being engaged in alternating relationship with the plurality of spaced apart second hinge knuckles of said second crawler pad, with the first bores of said first crawler pad being coaxially aligned with the second bores of said second crawler pad to form a substantially cylindrical chamber extending through the thus engaged first and second hinge knuckles;

at least one substantially cylindrical hinge pin positioned in said substantially cylindrical chamber to thereby pivotally connect said first and second crawler pads;

first and second retention elements positioned in said substantially cylindrical chamber such that each said retention element is completely encircled by a hinge knuckle to protect the respective retention element against abrasive contact with the ground during movement of the crawler pad assembly and said at least one hinge pin is located between said first and second retention elements and is retained within said substantially cylindrical chamber by said first and second retention elements, the total longitudinal length of said at least one hinge pin and said first and second retention elements not exceeding the longitudinal length of said substantially cylindrical chamber;

first means for securing said first retention element to a hinge knuckle completely encircling said first retention element;

second means for securing said second retention element to

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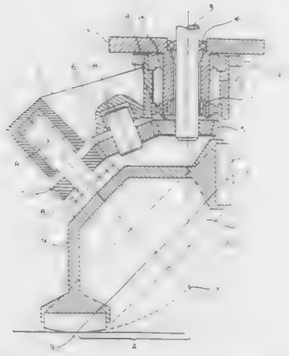
a hinge knuckle completely encircling said second retention element.

4,995,679

WHEEL ASSEMBLY FOR MOVING OBJECTS

Max Segerljung, Pl 7180, S-911 00 Vannas, Sweden

PCT No. PCT/SE87/00520, § 371 Date Jun. 9, 1989, § 102(e) Date Jun. 9, 1989, PCT Pub. No. WO88/03492, PCT Pub. Date May 19, 1988
PCT Filed Nov. 5, 1987, Ser. No. 353,633
Claims priority, application Sweden, Nov. 7, 1986, 8604781
Int. Cl.[5] B60B *33/00*
U.S. Cl. 301—5 R 8 Claims



1. An assembly for moving an object with respect to a surface, said assembly comprising:

a first drive shaft having an axis about which said first drive shaft is adapted to rotate;

a wheel adapted to be assembled to said object and having a periphery defining a rolling plane including a rolling point resting against the surface and being spaced a radial distance from said first drive shaft;

means for mounting said first shaft for rotation about said axis, said mounting means comprising a plate having a sleeve and bearings supporting said first drive shaft for rotation about said axis with respect to said sleeve;

a second drive shaft rigidly connected to said wheel, said second drive shaft having an axis of rotation positioned such that said first drive shaft and said second drive shaft extend from a point o intersection of said axis of said first drive shaft and said axis of said second drive shaft at an angle greater than 0° but no greater than 90°; and

a transmission comprising a first gear wheel fixed for rotational movement with said first drive shaft, a second gear wheel fixed for rotational movement with said second drive shaft, and an intermediary gear wheel for transmitting rotational movement between said first drive shaft and said second drive shaft.

4,995,680

SAFETY DEVICE FOR CONCEALING APPARATUS

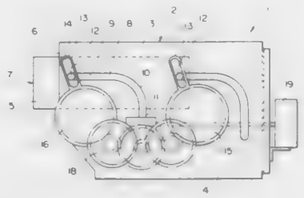
Alberto G. Miruri, Francisco Silvela, 76, 28028 Madrid, Spain

Filed May 2, 1989, Ser. No. 346,526
Claims priority, application Spain, May 4, 1988, 8801381; May 26, 1988, 8801699; Jun. 7, 1988, 8801844
Int. Cl.[5] A47B *81/06*
U.S. Cl. 312—7.1 8 Claims

1. Safety device for concealing apparatus, particularly car radios and the like, comprising:

a case-receptacle for containing the apparatus therein and having two adjacent intercommunicated portions, the first portion, having at least one outward opening and containing the apparatus in an operative conspicuous position, and the second portion which is concealed from the outside, housing the apparatus in a concealed position;

guide means for guiding the apparatus in movement between the first position and the second position; and



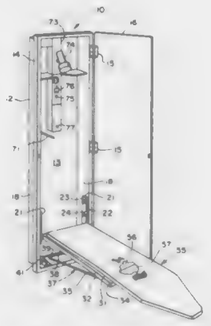
electromechanical drive means operatively coupled to the apparatus for driving the apparatus between the said two positions along the guide means, wherein the apparatus has a casing and the guide means comprises guide slots made in the side walls of the case-receptacle cooperating with stems provided in the apparatus casing.

4,995,681

BUILT-IN IRONING CENTER

Clyde B. Parnell, Godwin, N.C., assignor to Fasco Industries, Inc., Lake Forest, Ill.

Filed Sep. 11, 1989, Ser. No. 405,201
Int. Cl.[5] A47B *5/00*
U.S. Cl. 312—242 8 Claims



1. A built-in ironing center, comprising

a housing disposed to be mounted in a recess in the wall of a room,

an ironing board comprising two interconnected sections,

means mounting said board on said housing for swinging movement into and out of an opening in the front of said housing, and about a first horizontal axis between a collapsed position in which said board is disposed within said housing, and an erected position in which said board is positioned externally of said housing for angular adjustment about a vertical axis,

one of said sections of said board being mounted for swinging movement in a horizontal plane about said vertical axis, when said board is in its erected position, and

means hingedly connecting the other of said sections at one end thereof to one end of said one section for swinging movement about a pair of spaced, parallel hinge axes between a folded position in which said other section overlies and is parallel to said one section, and an unfolded position in which said other section extends beyond said one end of said one section and in coplanar relation with said one section,

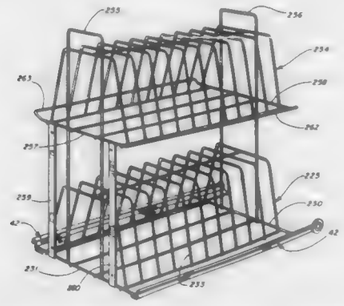
said means hingedly connecting together said sections comprising a first pair of hinge plates each of which is secured to a different one of said sections, and a second pair of plates pivotally connected to said first pair of plates and fixed in spaced, parallel relation to each other.

4,995,682

STORAGE FACILITY FOR VIDEO CASSETTES

Kenneth H. Gutner, 4505 Lindenwood La., Northbrook, Ill. 60062

Filed Jul. 28, 1988, Ser. No. 225,182
Int. Cl.[5] A47B *81/00*
U.S. Cl. 312—311 17 Claims



1. A storage facility for video cassettes comprising a case having storage space for cassettes defined by wall means accessible through front openable means, a pair of horizontally spaced apart guide means on said wall means extending rearwardly from said front opening means, a carrier for said cassettes equipped with horizontally spaced apart slide means in said space with said slide means being mounted in said guide means, said guide means having withdrawal means whereby said carrier can be withdrawn from said space, said carrier including a generally rectangular perimetric frame having said slide means fixed thereto and a plurality of spaced apart, parallel generally U-shaped wire elements extending across said perimetric frame form one side to the other to provide a plurality of slots for receiving a plurality of cassettes in side-by-side relation, each of said wire elements being spaced from an adjacent wire element a distance to receive a boxed video cassette, and straight wire member means secured to the underside of said frame and extending parallel to said slide means for supporting said cassettes, said carrier perimetric frame including four wire members interconnected to form a rectangle, said wire elements being fixed to two opposed wire members, said two opposed wire members being operably associated with said guide means, the other two of said wire members being extended beyond the first mentioned wire members to provide support means for said slide means, and a slide assembly fixed to said support means.

4,995,683

DRAWER PROVIDED WITH GUIDE MEANS

Alfred Albiez, Langen, Austria, assignor to Alfit Gesellschaft m.b.H., Götzis, Austria

PCT No. PCT/AT88/00108, § 371 Date Aug. 2, 1989, § 102(e) Date Aug. 2, 1989, PCT Pub. No. WO89/05109, PCT Pub. Date Jun. 15, 1989
PCT Filed Dec. 6, 1988, Ser. No. 392,937
Claims priority, application Austria, Dec. 7, 1987, 3212/87
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—348.4 13 Claims

1. A drawer comprising

(a) two vertically extending side walls,

(b) a drawer rail affixed to the outside of each side wall,

(c) a guide rail cooperating with each drawer rail for substantially horizontally guiding the drawer rails along the guide rails,

(d) a vertical front plate extending transversely to the side walls,

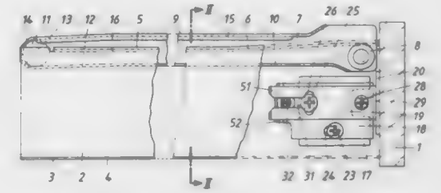
(e) an angle member fixedly securing the front plate to each side wall below the rails, each angle member having

(1) one leg affixed to the front plate adjacent the side walls and

(2) another leg projecting inwardly from the front plate and extending parallel to the side walls,

(f) an intermediate plate carried by each side wall at the outside thereof,

(g) an eccentric adjustment element engaging each intermediate plate and arranged for adjusting the vertical position of the intermediate plates with respect to the side walls and fixing the intermediate plates in the adjusted vertical position,



(h) an adjustment screw extending parallel to the front plate and connected to the other leg of each angle member, the adjustment screw having an axial pivot portion extending parallel to the front plate and pivotally supporting the other angle member leg on the respective intermediate plate for adjusting the inclination of the front plate affixed to the angle members, turning of the adjustment screw causing a lateral adjustment of the front plate with respect to the side walls, and

(i) at least one clamping screw for fixing the front plate in the pivotally and laterally adjusted position, the adjustment element and screws as well as the clamping screws being operable from the outsides of the side walls.

4,995,684

IMPACT RESISTANT AND TEMPERED OPTICAL ELEMENTS

Randal W. Tustison, Lexington; Dennis Montanari, West Townsend; Thomas Varitimos, Norwood, and Bernard diBenedetto, Wayland, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 875,893, Jun. 18, 1986, abandoned.
This application Apr. 20, 1989, Ser. No. 342,605
Int. Cl.[5] G02B *1/10, 5/28;* G32B *18/00, 33/00*
U.S. Cl. 350—1.6 43 Claims



1. An optical element comprising:

a base comprising a first material having an index of refraction at 10 microns in the range of about 2.2 to 3.3, a predetermined optical transmissivity over at least portions of a band of at least about 2 μm to 30 μm and a predetermined resistance to damage caused by high velocity water droplet impact;

means optically transparent over said portion of said band and disposed over said base for increasing the resistance of the base to damage caused by water droplet impact, comprising a second material having an index of refraction less than 2.0 at 10 microns and a physical thickness related to $((2[n]N+1)\lambda/4)/n_o$, when N is an integer, λ is a selected

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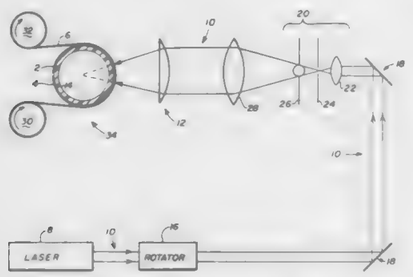
wavelength in the band, and N_c is the refractive index of the second material at the wavelength λ.

4,995,685

METHOD AND SYSTEM FOR MAKING A REFLECTION HOLOGRAM

Mark L. Armstrong, and Daniel J. Mickish, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 16, 1989, Ser. No. 352,505
Int. Cl.[5] G03H *1/02*
U.S. Cl. 350—3.65 25 Claims



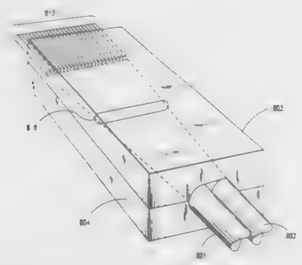
1. A system for making a reflection hologram comprising:
an at least partially reflective or diffractive master having a cylindrical surface symmetric about an axis;
a holographic recording medium coupled to the master cylindrical surface; and
means for directing a reference beam of substantially coherent radiation through the recording medium to the master cylindrical surface, the directing means including means for focusing the radiation so that the angle of incidence of the radiation on the master is substantially constant,
such that when the directing means directs the reference beam through the recording medium, an object beam reflects off the master and passes back through the recording medium interfering with the reference beams forming a reflection hologram in the recording medium.

4,995,686

OPTICAL SPLITTER/COMBINER WITH AN ADIABATIC MIXING REGION

Greg E. Blonder, Summit; Lee L. Blyler, Jr., Basking Ridge, both of N.J., and Gary J. Grimes, Thornton, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 22, 1989, Ser. No. 455,723
Int. Cl.[5] G02B *6/26, 6/28, 6/36*
U.S. Cl. 350—96.15 16 Claims



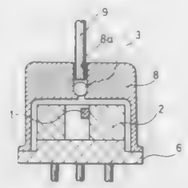
1. An optical device for transmitting optical signals between a first group of optical fibers and said first group of optical fibers are positioned in an linear array having a first cross-sectional shape and a second group of optical fibers and said second group of optical fibers having a second cross-sectional shape and said first cross-sectional shape being different than said second cross-section shape, and comprising:
an optical mixing core;
an optical cladding surrounding said optical mixing core;
a first end of said optical mixing core having an oblately circular shape substantially matching said first cross-sectional shape and said first group of optical fibers being connected to said first end;
a second end of said optical mixing core substantially matching said second cross-sectional shape and said second group of optical fibers being connected to said second end; and
the cross-sectional shape of said optical mixing core gradually changing from said first end to said second end whereby an mixing region is formed for communicating said optical signals.

4,995,687

SEMICONDUCTOR LASER DEVICE AND A METHOD OF PRODUCING SAME

Seiichi Nagai; Mitsuo Ishii, and Kazuyoshi Hasegawa, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 23, 1989, Ser. No. 425,021
Claims priority, application Japan, Nov. 18, 1988, 63-293415
Int. Cl.[5] G02B *6/42*
U.S. Cl. 350—96.2 4 Claims



1. A semiconductor laser comprising a stem having a central portion and a peripheral flange outwardly extending therefrom, a heat sink mounted on said central portion of said stem, a laser diode chip mounted on said heat sink, a cap having a top, a generally cylindrical side wall with an inside dimension larger than said central portion of said stem, and a peripheral skirt transverse to said side wall extending from said side wall and fixedly mounted on said peripheral flange of said stem so that said cap covers said chip, said top of said cap including a penetrating aperture aligned with said laser diode chip, a lens disposed in said penetrating aperture proximate said laser diode chip for collimating light emitted from said laser diode chip, and an optical fiber disposed in the penetrating aperture at a desired depth and fixedly mounted to said cap for guiding the collimated light, whereby said cap and stem can be adjusted relative to each other in a plane before being fixedly mounted to each other and said optical fiber can be adjusted in the penetrating aperture before being fixedly mounted to said cap to achieve a desired coupling of light between said laser diode chip and said optical fiber.

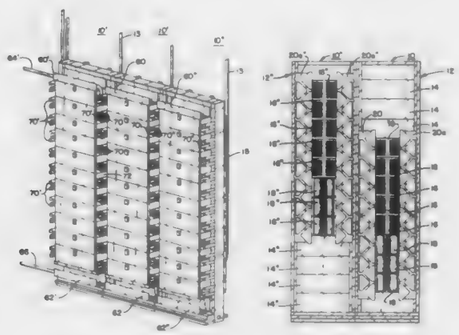
4,995,688

OPTICAL FIBER DISTRIBUTION FRAME

Mark A. Anton, Minneapolis; Jory A. Steinman, Golden Valley; Paul A. Suek, Minneapolis, and Wayne A. Johnson, Rosemount, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Jul. 31, 1989, Ser. No. 388,060
Int. Cl.[5] G02B *6/24*
U.S. Cl. 350—96.10 11 Claims

8. An optical fiber distribution frame comprising:
a frame member having walls defining a frame interior, said frame member having a plurality of cabinet attachment locations;
a plurality of cabinets sized to be received within said interior;
said plurality of cabinets including at least one splice cabinet having means for splicing together optical fibers; and
said plurality of cabinets also including at least one storage cabinet having means for temporarily storing excess lengths of optical fibers;
said plurality of cabinets including at least one connector cabinet having a panel accessible through both a rear and a forward face of said connector cabinet, a plurality of optical fibers connections including at least a first and second design of connectors of differing known dimensions and selected to couple a pair of optical fibers, said connector cabinet including a plurality of adapters each having attachment means for attachment of said adapters to said panel, said plurality of adapters including at least a first and second design selected to receive and retain said first and second connector design, respectively;
said attachment means attaching said adapters to said panel with a first set of fibers connected to first ends of said connectors and extending from a said face and with a second set of fibers connected to second ends of said connectors and extending from said forward face; and
attachment means for releasably attaching said plurality of cabinets to said frame member at said attachment locations.



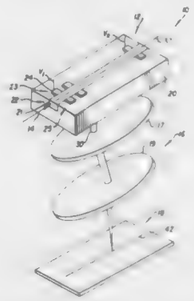
4,995,689

WAVEGUIDE SCANNER

Sanwal P. Sarraf, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1989, Ser. No. 390,956
Int. Cl.[5] G02B *6/10;* G02F *1/29*
U.S. Cl. 350—96.14 13 Claims

1. A scanner comprising:
a substrate formed of an optical material;
a thin film optical channel waveguide formed on said substrate;
a first linear array of electrodes formed on one side of said waveguide and a second linear array of waveguides formed on an opposite side thereof, said electrodes extending in a first direction and the electrodes in each array being generally parallel to each other;



means for regulating a voltage on said electrodes to electro-optically induce a local change in the refractive index of the waveguide across the thickness thereof;
means for coupling a coherent light beam into said waveguide in a second direction transverse to said first direction, said beam propagating in said second direction and being radiated into the substrate under said waveguide upon encountering said refractive index change; and
means for coupling the beam out of said waveguide.

4,995,690

MODULATION INSTABILITY-BASED FIBER INTERFEROMETRIC SWITCH

Mohammed N. Islam, 49 Cresci Blvd., Hazlet, N.J. 07730

Filed Apr. 24, 1989, Ser. No. 342,271
Int. Cl.[5] G02B *6/26, 6/10;* G02F *1/03*
U.S. Cl. 350—96.15 16 Claims



1. An optical switch comprising
an input for a control signal,
an input for a pump signal,
an intermediate waveguide means having first and second separate paths for supporting optical signal transmission on each of said paths,
means for coupling said pump signal input to each of said first and second paths,
means for coupling said control signal input to said first path,
means for combining said first and second optical paths into an output for producing an output signal having first and second states, wherein modulation instability is caused to occur in said first path in the presence of said control signal to produce said output signal in said first state and wherein said output signal is produced in said second state in the absence of said control signal.

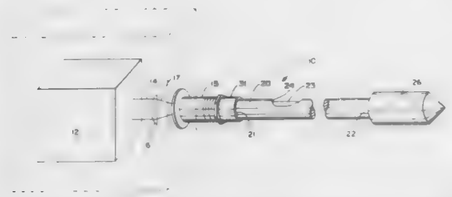
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,691

ANGLED OPTICAL FIBER INPUT END FACE AND METHOD FOR DELIVERING ENERGY

Earl E. Purcell, Jr., Westfield, Mass., assignor to Ensign-Bickford Optics Company, Conn.

Filed Oct. 16, 1989, Ser. No. 421,677
Int. Cl.[5] G02B *6/26*
U.S. Cl. 350—96.15 **18 Claims**



1. A fiber optic probe for use with a laser light source having an axis of light at an output angle with respect to an optical axis of said probe, comprising:

a length of optical fiber having a core and a cladding, said core having a range of available modes determined by a numerical aperture of said core, said core and said cladding each having an index of refraction, said core being selected with a higher index of refraction than said cladding, thereby allowing light to propagate the length of said fiber in the modes of said core;

an output end at one end of said fiber having a diffuser for dispersing the light propagated through said fiber; and

an input end at the other end of said fiber for coupling light from said laser into said fiber, said input end having an end face angle, said end face angle defined as the angle between a plane normal to said optical axis and the plane of the input end face, said end face angle being selected for exciting desired modes of said fiber, thereby producing a desired light distribution dispersed from said diffuser.

4,995,692

FIBER OPTIC STAR COUPLER

Laura K. Diliello; Gregory D. Miller, both of Warren, and Robert E. Steele, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1990, Ser. No. 475,569
Int. Cl.[5] G02B *6/28*
U.S. Cl. 350—96.16 **14 Claims**



1. A fiber optic star assembly for coupling signals between optical fibers comprising:

first and second sets of optical fibers, the sets having contiguous fiber ends arranged in respective parallel linear arrays,

a flexible optical ribbon bent into a non-planar configuration having a curved center portion and closely spaced parallel end portions, the minimum radius of curvature of the curved center portion being sufficiently large to avoid significant optical loss due to curvature, the end portions being spaced by a distance substantially less than the said minimum radius of curvature, the ribbon having a width substantially matching the width of each linear array, and

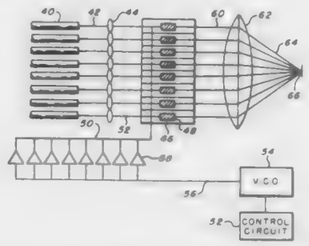
means for holding each linear array of fiber ends in line with the ribbon end portions for coupling between the fibers and the ribbon.

4,995,693

MULTI-POSITION OPTO-ELECTRONIC SWITCH

Mark L. Wilson, Vadnis Heights, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 5, 1988, Ser. No. 228,617
Int. Cl.[5] G02B *6/32*
U.S. Cl. 350—96.18 **8 Claims**



1. An acousto-optic switch for selectively coupling an optical signal from one of a plurality of input terminals to one of a plurality of output terminals, comprising:

means coupled to said input terminals for collimating incident optical signals to provide collimated optical signals,

means for producing an RF control signal at a selectable one of a plurality of preselected frequencies,

a plurality of acousto-optic elements comprised of telurium dioxide crystals arranged in a linear array and positioned to intercept said collimated optical signals for selectively deflecting said collimated optical signals in a plane normal to said array at angles dependent upon the frequency of said RF control signal, the angle of deflection of an optical signal through each element of said array being individually and independently controllable by applying said RF signal to each of said acousto-optic elements and by varying said frequency to a predetermined one of said preselected frequencies,

a scan lens positioned to intercept said deflected optical signals for focussing to focal points in a focal plane that is orthogonal to a plane defined by an optical axis of said lens and a plane of said linear array, and

means for positioning said plurality of output terminals to be coincident with said focal points, whereat any of said optical signals may be coupled to any of said output terminals,

wherein said means for collimating comprises beam forming optics in the path of said light beams for expanding each of said beams, and

wherein said plurality of acousto-optic elements is comprised of Bragg cell elements.

4,995,694

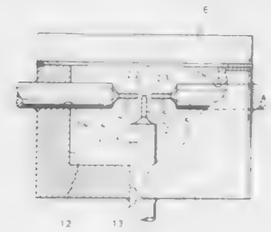
FIBER OPTICAL BEAM SPLITTING DEVICE

Robert Rieger, Ostermüchen, and Bodo Tilly, Grafing, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 494,630
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1989, 3908530
Int. Cl.[5] G02B *6/34*
U.S. Cl. 350—96.19 **8 Claims**

1. A fiber-optical beam splitting device for the coupling in or out of light into or out of an optical fiber from or into different directions of the environment of the optical fiber, wherein at least one front face of the optical fiber is constructed in the

shape of a prism, the angle Y between the longitudinal axis of the fiber and a surface of the prism following the condition



$$\frac{1}{3}\left(180° - \arcsin\frac{n_2}{n_1} - \right.$$

$$\arcsin\frac{n_3}{n_1} \leqq \gamma \leqq \arcsin\frac{n_2}{n_1} - \arcsin\frac{n_3}{n_1}$$

wherein

n_1=the refraction index of the fiber core,

n_2=the refraction index of the fiber cladding,

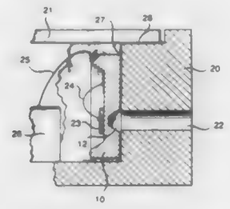
n_3=the refraction index of the medium surrounding the optical fiber.

4,995,695

OPTICAL ASSEMBLY COMPRISING OPTICAL FIBER COUPLING MEANS

Richard J. Pimpinella, Hampton; John M. Segelken, Morristown; King L. Tai, Berkeley Heights, and Ross J. Thompson, Budd Lake, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 17, 1989, Ser. No. 394,911
Int. Cl.[5] G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **16 Claims**



1. An optical assembly comprising

(a) a housing having at least one aperture therein;

(b) at least one optical or elector-optical device (collectively "device") inside the housing; and

(c) optical fiber connector means adapted for sealing the aperture, for receiving the end of an optical fiber, and for maintaining the end of the fiber in optical coupling relationship with respect to the device;

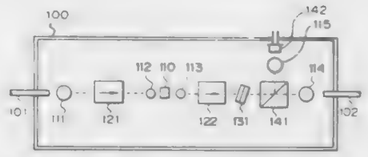
the optical fiber connector means comprise a radiation-transmissive member attached to the housing such that it seals the aperture in the housing; wherein the radiation-transmissive member has a first and a second surface, with the first surface facing outwardly of the housing, the radiation-transmissive member comprising a recess that extends from one of the surfaces towards the other surface, leaving a "septum" of material between the bottom of the recess and the other surface; the device being maintained in predetermined position with respect to the recess; the connector means further comprising means for holding the end of the optical coupling relationship with the device, with the radiation to be transmitted through the septum.

4,995,696

OPTICAL AMPLIFIER MODULE

Eiichi Nishimura, and Yasuaki Tamura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 354,442, May 17, 1989, abandoned.
This application Mar. 15, 1990, Ser. No. 494,852
Claims priority, application Japan, May 20, 1988, 63-121806
Int. Cl.[5] G02B *6/36; G02F 1/00*
U.S. Cl. 350—96.2 **24 Claims**



1. An optical amplifier module comprising:

(a) a package for housing constituent elements;

(b) an input optical fiber disposed on the input side of the module for guiding an input optical signal into the module;

(c) an output optical fiber disposed on the output side of the module for taking out an output optical signal to the outside;

(d) a semiconductor laser chip disposed between the input optical fiber and the output optical fiber for amplifying the input optical signal into the output optical signal;

(e) first collimator means disposed between the input optical fiber and the semiconductor laser chip for collimating the input optical signal and for optically coupling the input optical fiber with the semiconductor laser chip through an input parallel light beam;

(f) second collimator means disposed between the semiconductor laser chip and the output optical fiber for collimating the output optical signal and for optically coupling the semiconductor laser chip with the output optical fiber through an output parallel light beam;

(g) first isolator means disposed on the input side of the semiconductor laser chip; and

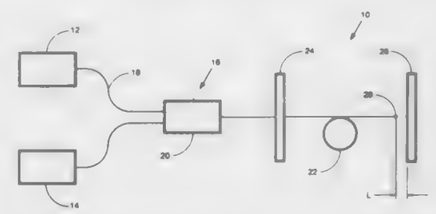
(h) second isolator means disposed on the output side of the semiconductor laser chip.

4,995,697

FIBER OPTIC SENSING SYSTEM

Grigory Adamovsky, Solon, Ohio, assignor to The United States of America as represented by the administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 7, 1989, Ser. No. 404,291
Int. Cl.[5] G02B *6/02, 6/16;* G01B *9/02*
U.S. Cl. 350—96.29 **4 Claims**



1. A fiber optic sensing system responsive to an independent sensed parameter comprising

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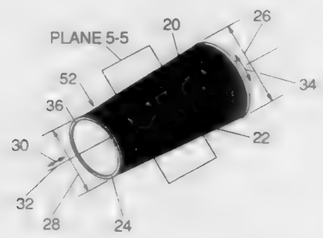
a light source for sending an initial signal intensity modulated at RF frequencies,
an interferometric sensor head for receiving said initial signal, said sensor head having a plurality of arms for splitting said signal and recombining the same thereby forming an interference field,
means for generating changes in the relative intensities of the split signal propagating in said arms in response to alterations in said independent sensed parameter thereby producing variations in said interference field, said means including
sensing elements in at least one of said arms in said interferometric sensor head to generate said changes in said relative intensities of said split signal, said sensing elements being exposed to said sensed parameter,
a photodetector for monitoring said variations, and
a fiber optic link for transmitting said signal between said light source, said interferometric sensor head, and said photodetector.

4,995,698

FIBER OPTIC CANISTER HAVING ORTHOTROPIC, CONTROLLED THERMAL EXPANSION BOBBIN

James R. Myers, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, CA

Filed Dec. 30, 1988, Ser. No. 292,210
Int. Cl.[5] G02B *6/00*
U.S. Cl. 350—96.29 **20 Claims**



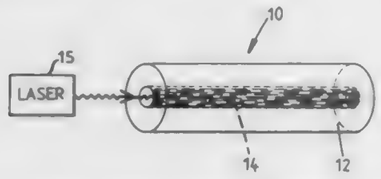
10. A fiber optic canister, comprising:
a bobbin formed at least in part from an orthotropic material, said orthotropic material being a composite material of structural fibers embedded in a polymer matrix; and
an optical fiber wound onto the bobbin.

4,995,699

ELECTRICALLY CONDUCTIVE SOLUTION COMPRISED OF CHARGED BOSON IONS

Shui-Yin Lo, Sherman Oaks, Calif., assignor to Apricot S.A., Notre-Dame, Luxembourg

Filed Nov. 9, 1987, Ser. No. 118,709
Int. Cl.[5] G02B *6/20*
U.S. Cl. 350—96.32 **63 Claims**



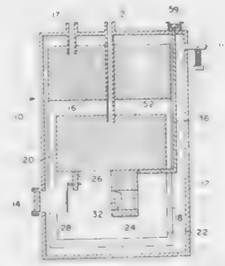
1. An electrical conductor comprising a solution containing charged boson ions, and means confining the solution and permitting application of electric potential thereto for current flow through the solution, said conductor further comprising means for subjecting the solution to electromagnetic waves to render said solution superconducting to said current.

4,995,700

CRYOGENIC SHUTTER

Richard D. Barney, and Thomas J. Magner, both of Laurel, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1989, Ser. No. 331,119
Int. Cl.[5] G02B *26/02, 27/00*
U.S. Cl. 350—266 **14 Claims**



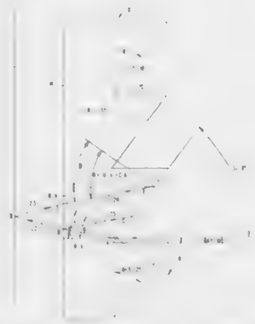
1. A dewar mechanism for decreasing or eliminating temperature gradients in mirrors or detectors operating in a cryogenic or cryogenic zero gravity environment where said mirrors or detectors may be viewed through a window comprising:
a housing having a window;
means for evacuating said housing;
a first reservoir containing a cryogenic element;
a first shroud coupled to said first reservoir;
a second reservoir containing a cryogenic element mounted inside said first shroud;
a second shroud coupled to said second reservoir and mounted within said first shroud;
a cryogenic plate mounted to said second reservoir;
means for mounting a mirror within said second shroud; and
means for shielding said mirror from radiation passing through said window.

4,995,701

ANTI-GLARE FILTER WITH IMPROVED VIEWING AREA

John W. Brown, Sea Girt, N.J., assignor to Qantix Corporation, Flemington, N.J.

Filed Mar. 6, 1989, Ser. No. 319,525
Int. Cl.[5] G02B *27/00*
U.S. Cl. 350—276 R **15 Claims**



1. A filter for reducing the glare of a viewing screen caused by ambient light and increasing the vertical viewing area, comprising a substantially transparent sheet of material having first and second faces, said first face being substantially planar and said second face having a plurality of V-shaped grooves,

each groove being formed by a sloping wall and a substantially horizontal wall, said sloping wall being inclined at an angle with respect to said first face at least equal to or greater than the computed angle θ determined by the equation:

$$\sin(\text{angle } \theta) = \text{I.R.} \times \sin(2 \text{ angle } \theta - \text{C.A.}),$$

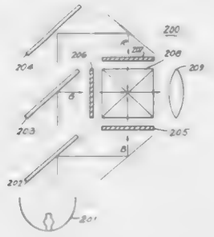
Where:
I.R. = the Index of Refraction of the filter material, and
C.A. = the Critical Angle of the filter material.

4,995,702

PROJECTION-TYPE DISPLAY DEVICE

Shuji Aruga, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,996
Claims priority, application Japan, Oct. 31, 1986, 61-260253; Dec. 23, 1986, 61-307282; Dec. 23, 1986, 61-307283; Jul. 21, 1987, 62-181333
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—331 R **18 Claims**



1. A projection-type display device in which light representative of the image to be projected is produced by a plurality of light valves, comprising:
a first light valve having a first twisted nematic liquid crystal cell with a birefringence Δn_1 and a thickness d_1, the value of Δn_1 being selected for controlling the red wavelength of light incident thereto;
a second light value having a second twisted nematic liquid crystal cell with a birefringence Δn_2 and a thickness d_2, the value of Δn_2 being selected for controlling the green wavelength of light incident thereto;
a third light valve having a third twisted nematic liquid crystal cell with a birefringence Δn_3 and a thickness d_3, the value of Δn_3 being selected for controlling the blue wavelength of light incident thereto; and
synthesizing means for adding the red, green and blue wavelengths of light transmitted through the respective first, second and third light valves prior to projection by the device;
wherein the values of Δn_1, Δn_2 and Δn_3 are unequal.

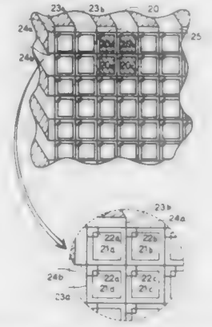
4,995,703

ACTIVE MATRIX LIQUID CRYSTAL COLOR DISPLAY PANEL HAVING SPLIT PIXEL ELECTRODES

Kesao Noguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,214
Claims priority, application Japan, Sep. 26, 1984, 59-200920; Oct. 18, 1984, 59-219039
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—333 **15 Claims**

7. An active matrix liquid crystal display panel comprising:
a plurality of picture elements formed on an insulating substrate in the form of a matrix,
a plurality of scanning lines arranged to define rows of the matrix, and
a plurality of signal lines arranged to define columns of the matrix,
each picture element being divided into a plurality of display electrodes,
each display electrode being connected to one of said plurality of scanning lines and one of said plurality of signal lines through a switching element,
each pair of the adjacent picture elements respectively, belonging to different rows or columns of the matrix are staggered with respect to each other at least a width of one of said display electrodes pieces in a horizontal or vertical direction respectively, and



wherein at least one of the scanning lines and the signal lines connected to one picture element consists of a plurality of sub-lines and said display electrodes are interposed between adjacent sub-lines thereby separating said sub-lines by at least the width of one of said display electrodes.

4,995,704

LIQUID CRYSTAL DISPLAY DEVICE

Tomiaki Yamamoto, Chigasaki; Akio Murayama, Kamakura; Susmu Kondo, Yokosuka; Hitoshi Hato, Yokohama; Shinichi Kamagami, Yokohama, and Shoichi Matsumoto, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Asaki, Japan

Filed Jul. 7, 1989, Ser. No. 376,541
Continuation-in-part of Ser. No. 376,659 and 376,653, both filed Jul. 7, 1989 which is a continuation of Ser. No. 385,535 filed Jul. 25, 1989
Claims priority, application Japan, Jul. 8, 1988, 63-169014; Jul. 8, 1988, 63-169017
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—334 **4 Claims**



1. A liquid crystal display device comprising:
a liquid crystal cell including two substrates which are arranged substantially parallel to each other and have electrodes on opposing surfaces thereof, and a liquid crystal composition being held between said substrates such that the liquid crystal molecules are arranged in a twisted mode of 180° to 360°;
first and second polarizers arranged at both sides of said liquid crystal cell; and
first and second optical delay plates arranged between said liquid crystal cell and said second polarizer, with an optical axis of one delay plate being shifted from an optical axis of the other delay plate;
wherein assuming that a retardation value of said liquid crystal cell is given by:

$$R_0 = \Delta n.d.\cos^2\theta$$

wherein Δn is the optical anisotropy of said liquid crystal composition, d is the distance between said two substrates in said liquid crystal cell, and θ is the tilt angle of said liquid

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crystal composition, and wherein a total of the retardation values of said first and second optical delay plates is $R_0 \times 0.8$ to $R_0 \times 1.2$.

4,995,705

DEVICE, METHOD AND APPARATUS FOR OPTICAL MODULATION USING FERROELECTRIC POLYMER LIQUID CRYSTALS

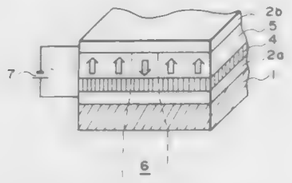
Kazuo Yoshinaga, Machida; Takeshi Miyazaki, Kawasaki; Toshikazu Ohnishi, Tokyo; Yutaka Kurabayashi, Yokohama; Yoshio Takasu, Tama, and Tadashi Kobayashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,797

Claims priority, application Japan, Dec. 17, 1986, 61-300876; Dec. 26, 1986, 61-310826; Dec. 26, 1986, 61-310827; Jul. 7, 1987, 62-169435

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—350 S 48 Claims



1. An optical modulation method, comprising:

writing in a ferroelectric having a spontaneous polarization and a glass transition point by applying an electric field to the ferroelectric heated at or above the glass transition point to orient the spontaneous polarization of the ferroelectric to a prescribed direction, and

holding the prescribed direction of the spontaneous polarization below the glass transition point.

4,995,706

LIQUID CRYSTAL DEVICE WITH A FERROELECTRIC THIN FILM

Takashi Inujima, Atsugi; Shunpei Yamazaki, Tokyo; Toshimitsu Konuma; Toshiji Hamatani, both of Atsugi; Mitsunori Sakama, Hiratsuka; Toshiharu Yamaguchi, Zama, and Ippei Kobayashi, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

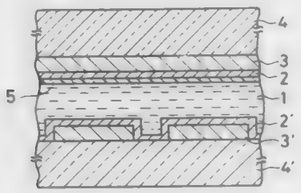
Continuation of Ser. No. 282,850, Dec. 9, 1988, abandoned, which is a continuation of Ser. No. 934,911, Nov. 25, 1986, abandoned. This application Aug. 14, 1989, Ser. No. 394,265

Claims priority, application Japan, Nov. 25, 1985, 60-265333

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—350 S 8 Claims



1. A liquid crystal device comprising:

a pair of substrates;

a ferroelectric liquid crystal layer interposed between said substrates;

at least one first electrode formed on one of said substrates;

a ferroelectric film having a thickness less than 1000 Å and interposed between said first electrode and said liquid crystal layer and made of an organic material comprising fluorine;

at least one second electrode formed on the other substrate located opposing to said one first electrode so that the state of said liquid crystal layer is controlled by an electric field induced by the opposing electrodes where said electric field is applied across said liquid crystal layer and said ferroelectric film in series; and

an organic film interposed between said second electrode and said liquid crystal layer.

4,995,707

VARI-FOCAL LENS SYSTEM

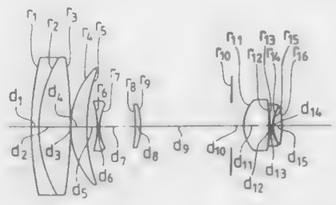
Takeshi Hashimoto, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 299,159

Claims priority, application Japan, Jan. 20, 1988, 63-8379

Int. Cl.[5] G02B *15/14, 13/18*

U.S. Cl. 350—427 28 Claims



1. A vari-focal lens system comprising:

a first lens unit having positive refractive power;

a second lens unit movable for varying focal length and having negative refractive power;

a third lens unit movable for varying focal length and having positive refractive power; and

a fourth lens unit kept fixed during variation of focal length;

said second lens unit and said third lens unit being shifted along an optical axis while varying airspace reserved therebetween for varying focal length and correcting deviation of image position caused by variation of focal length, said second lens unit consisting of a single biconcave lens component having an aspherical surface, said third lens unit consisting of a single lens component having positive refractive power, and said aspherical surface of said second lens unit satisfying the following condition

$$(1)\ 3\times10^{-3}<|\Delta X\cdot r/h\cdot f_w|<5\times10^{-1}$$

wherein the reference symbol r represents a radius of curvature on the standard spherical surface of the aspherical surface used in the second lens unit, the reference symbol h designates distance from the optical axis to the intersection between the ray to attain to the maximum image height and said aspherical surface, the reference symbol Δx denotes deviation of said intersection from the standard spherical surface in the direction along the optical axis, and the reference symbol f_w represents focal length of the vari-focal lens system as a whole at a wide position thereof.

4,995,708

PHOTOGRAPHIC LENS FREE FROM FORMING OF GHOST IMAGE

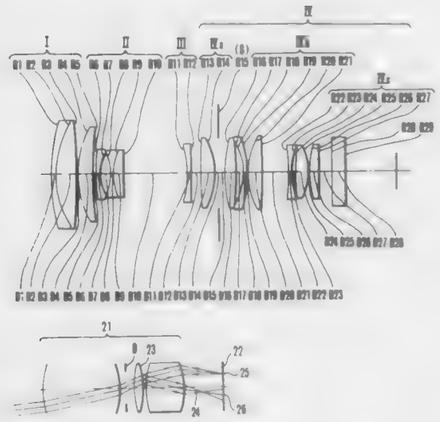
Muneharu Sugiura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 223,108

Claims priority, application Japan, Aug. 5, 1987, 62-196569

Int. Cl.[5] G02B *15/14*

U.S. Cl. 350—427 6 Claims



1. A photographic lens having from the object side a first positive lens unit for focusing, a second negative lens unit movable for varying image magnification, a third negative lens unit movable for compensation of movement of an image plane, a bi-convex lens having a surface of larger curvature on its image side than its surface on the object side, a diaphragm, and front and rear sub-units each composed of a plurality of lenses, said front and rear sub-units each including a negative lens, wherein said bi-convex lens and said front and rear sub-units together comprise a fourth lens unit that is an image forming lens unit located on the image side of said diaphragm and predetermined lens surfaces of said image forming lens unit have shapes so defined that said predetermined lens surfaces reflect rays of light which form an image on a predetermined image plane or thereabout among rays of light which are reflected from the predetermined image plane or a neighborhood thereof, and then return to said photographic lens so that said rays of light reflected from a predetermined lens surface will form an image at a position near said photographic lens relative to the predetermined image plane.

4,995,709

OPTICAL COLLIMATOR

Kazuo Iwata; Takuma Satou, and Satoru Shibata, all of Gunma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 376,413

Claims priority, application Japan, Jul. 15, 1988, 63-175217

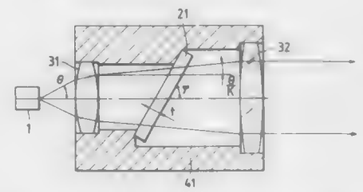
Int. Cl.[5] G02B *27/00*

U.S. Cl. 350—447 10 Claims

1. An optical collimator for converting rays of light outputted by a light source into substantially parallel rays of light, comprising:

front and rear collimator lenses obtained by dividing one collimator lens into two relatively smaller lenses, thereby reducing the angle of divergence of light between said front and rear collimator lenses; and

an inclined transparent parallel flat plate held between said front and rear collimator lenses thereby reducing astigmatism.



whereby an optical collimator structure of reduced size can be provided.

4,995,710

OBJECTIVE LENS FOR OPTICAL DISK

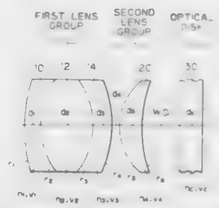
Seizoh Suzuki, Tokyo, and Osamu Endou, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 25, 1990, Ser. No. 528,491

Claims priority, application Japan, May 31, 1989, 1-137806

Int. Cl.[5] G02B *9/06, 21/02*

U.S. Cl. 350—480 5 Claims



1. An objective lens for an optical disk comprising:

a first lens group constructed by joining a negative meniscus lens, a biconvex lens, and a negative meniscus lens sequentially arranged from the side of a light source; and

a second lens group constructed by a positive meniscus lens;

said first and second lens groups being sequentially arranged from the side of the light source toward the side of the optical disk;

a combined focal distance f of the entire lens system, a focal distance f_i of the first lens group, a radius r_i (i=1 to 6) of curvature of an i-th lens face from the side of the light source, and a refractive index n_j and an Abbe number ν_j (j=1 to 4) of a j-th lens from the side of the light source satisfying the following conditions,

(I) $0.7<f^2/|r_2\cdot r_3|<2.0,\ r_2>0,\ r_3<0$

(II) $2.0<[(n_1-1)+(n_3-1)]/(n_2-1)<3.0$

(III) $15<[(\nu_2-\nu_1)+(\nu_2-\nu_3)]<90$

and

(IV) $2.0<(f_1/f)<6.0$.

4,995,711

SLIDE TABLE

Kuninori Imai, Kanagawa; Takeji Shiokawa, Fuchu; Shigeo Kato, Mitaka; Isao Ishikawa, Takasaki; Toshimichi Ikeda, Ushiku, and Kan Otake, Tsuchiura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Construction Machinery Co., Ltd., both of Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,548

Claims priority, application Japan, Dec. 16, 1988, 63-316415

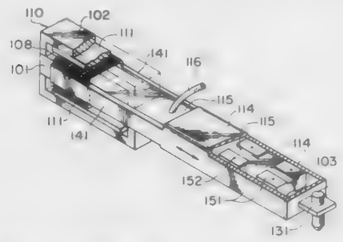
Int. Cl.[5] G02B *21/26, 21/00*

U.S. Cl. 350—529 12 Claims

1. A slide table comprising an inner member a sheath shaped outer member at least partly engaged with said inner member, air bearings provided between at least a part of said inner

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member and said sheath shaped outer member for enabling said sheath shaped outer member to be movable relative to said



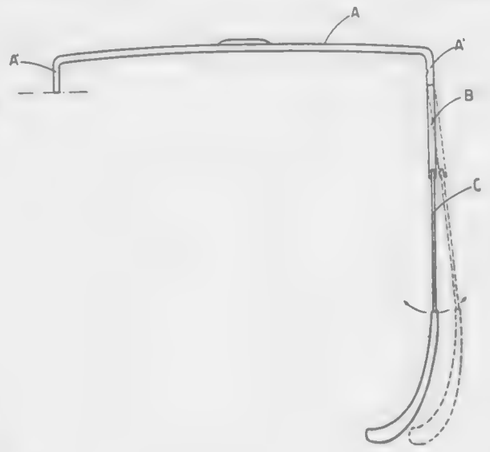
inner member, and motor means for moving said sheath shaped outer member relative to said inner member.

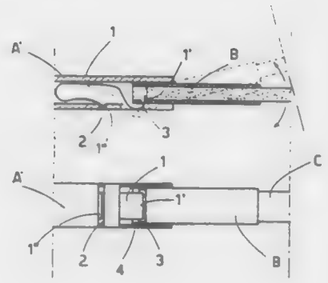
4,995,712
LIGHT RADIATION STAND
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan
Filed Oct. 30, 1989, Ser. No. 429,872
Claims priority, application Japan, Mar. 28, 1989, 1-35235
Int. Cl.[5] G02B *5/08, 7/18*
U.S. Cl. 350—603 1 Claim



1. A light radiation stand comprising a stand base, holding means mounted on said stand base, fiber optic cable means for transmitting solar rays, said holding means holding said cable means on said stand base such that light rays emitted from said cable means are directed in a desired direction, an elongated pole, mounting means removably mounting said pole on said stand base, said elongated pole having a longitudinal axis and an outer end, first mirror means rotatably mounted on said outer end of said pole for rotation about a rotary axis coincident with said longitudinal axis of said pole, said first mirror means having two sides, one of said sides being a concave mirror surface, the other of said sides being a convex mirror surface, a second mirror means, and support means supporting said second mirror means on said pole between said outer end of said pole and said mounting means, said second mirror means being mounted on said pole for rotation about said longitudinal axis.

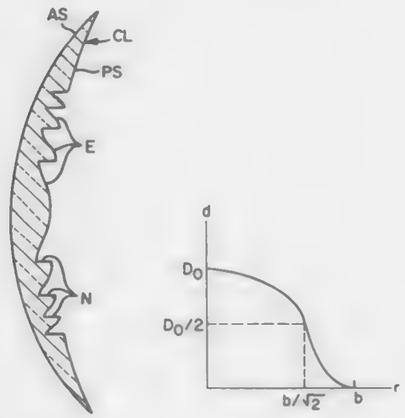
4,995,713
SPECTACLE FRAME
Caterino Curto, and Gianantonio Longo, both of Segusino, Italy, assignors to F.A.O.M.S., Italy
PCT No. PCT/IT87/00032, § 371 Date Apr. 11, 1989, § 102(e) Date Apr. 11, 1989, PCT Pub. No. WO88/02870, PCT Pub. Date Apr. 21, 1988
PCT Filed Apr. 9, 1987, Ser. No. 353,631
Claims priority, application Italy, Oct. 20, 1986, 82585 A/86
Int. Cl.[5] G02C *5/16, 5/14, 5/22*
U.S. Cl. 351—113 4 Claims

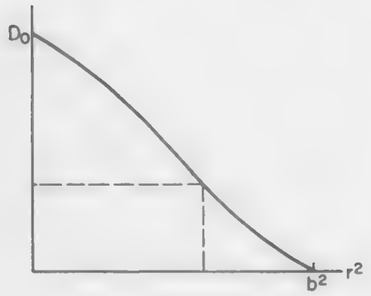




1. A spectacle frame comprising a lens retaining portion (A) with lateral extensions (A') allowing flexible articulation of the side arms (C), characterised in that said extensions (A') are hollow and open in the direction of the side arms (C), each side arm (C) being provided with a connection part (B) having an internal transverse slot (3), and that, for each side arm, an S-shaped spring is situated in the hollow of said extension (A') (1), said spring forming a hook (1', 1'') at each end, and the first end (1') being insertable into said slot (3) of connection part (B) while the other end (1'') is insertable into said hollow extension (A'), said extension (A') being formed to allow articulation of said arms (C).

4,995,714
MULTIFOCAL OPTICAL DEVICE WITH NOVEL PHASE ZONE PLATE AND METHOD FOR MAKING
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233
Continuation of Ser. No. 237,292, Aug. 26, 1988, abandoned.
This application Dec. 22, 1989, Ser. No. 456,228
Int. Cl.[5] G02C *7/04;* G02B *27/44, 3/08;* A61F *2/16*
U.S. Cl. 351—161 17 Claims

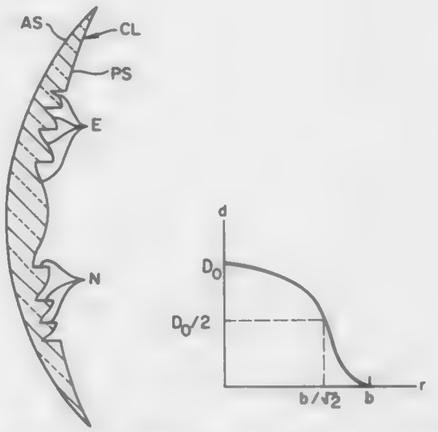




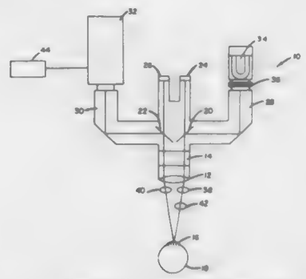
1. A diffractive multifocal optical element comprising a phase zone plate of a Cohen lens design containing rotationally symmetrical, curved repetitive patterns designed to operate at a specific wavelength and which are also curved in r^2 space.

4,995,715
DIFFRACTIVE MULTIFOCAL OPTICAL DEVICE
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233
Continuation of Ser. No. 222,000, Jul. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 863,069, May 14, 1986. This application Dec. 22, 1989, Ser. No. 456,230
Int. Cl.[5] G02C *7/04;* G02B *27/44, 3/08;* A61F *2/16*
U.S. Cl. 351—161 27 Claims

1. A diffractive multifocal optical element comprising a phase zone plate containing a plurality of annular concentric zones which are spaced substantially proportional to $\sqrt{n}$, where n is the zone number, and each of the zones including at least one stepped facet for introducing a discontinuity in optical path length of less than $\lambda/2$, where λ is the design wavelength of the phase zone plate.



4,995,716
METHOD AND APPARATUS FOR OBTAINING THE TOPOGRAPHY OF AN OBJECT
Joseph W. Warnicki, Pittsburgh; Paul G. Rehkopf, Murrysville, both of Pa.; James L. Cambier, Rome, and Salvins J. Strods, Waterville, both of N.Y., assignors to Par Technology Corporation, New Hartford, N.Y.
Filed Mar. 9, 1989, Ser. No. 321,252
Int. Cl.[5] A61B *2/10*
U.S. Cl. 351—212 50 Claims



1. In a system for obtaining the topography of a cornea of an eye of a patient through a rasterstereographic technique, an apparatus comprising:
- a frame positionable generally adjacent to said eye under examination,
- light projection means carried by said frame and arranged generally in a first pathway in line with said eye for illuminating said eye,
- grid means carried by said frame and arranged in said first pathway in the same plane in line with and between said light projection means and said eye for creating a grid pattern projected onto said eye upon operation of said light projection means,

said eye being coated with a substance capable of making

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said eye a nontransparent, light diffusing surface for said creating of said projected grid pattern onto said eye,

electronic camera means carried by said frame and arranged generally in a second pathway in line with said eye and in a different positional plane from that of said grid means for obtaining and producing an image of said grid pattern projected onto said eye whereby said image of said projected grid pattern on said eye is taken directly from the surface of said eye,

said frame having a main body portion, a centerline, and a first and second arm means each extending outwardly from and on opposite sides of said centerline of said frame,

said first and second arm means including means for carrying said light projection means and said grid means on one side of said center line and said camera means on the other side of said centerline and whereby said first and said second pathways converge onto the surface of said eye at an angle relative to said centerline, whereby said grid is projected onto said eye at a first angle relative to said centerline and is imaged off of the surface of said eye at a second angle relative to said centerline; and

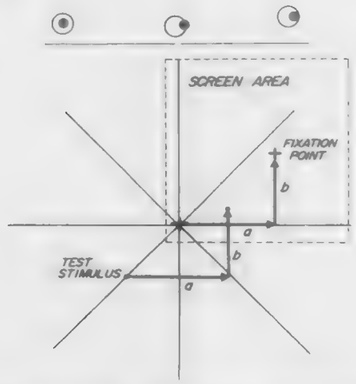
processing means operatively connected to said electronic camera means for instantaneously obtaining data from said image of said grid pattern projected onto said eye for producing quantitative and qualitative analyses of the contour of the entire surface of said eye.

4,995,717

DEVICE FOR MOVING EYE CAMPIMETRY

Bertil E. Damato, Glasgow, Scotland, assignor to The University Court of the University of Glasgow, Glasgow, Scotland

Filed Aug. 22, 1989, Ser. No. 397,139
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—224 **9 Claims**



1. An oculoperimetric device for use in measuring the field of vision of a patient, which comprises

an extended area visual target having a plurality of discrete localised target elements disposed adjacent a reference target element at a plurality of different angular and radial positions relative to the reference target;

means for moving the visual target in a two-dimensional plane so as to keep the patient's attention fixed on the moving reference target element;

follower means movable by the patient to follow the movement of the reference target element;

localised target elements being visible or invisible to the patient, and each target element appearing visibly at least once during a test sequence;

monitoring means operable by the patient dependent on whether or not he sees the appearance of each individual target element as it becomes visible; and

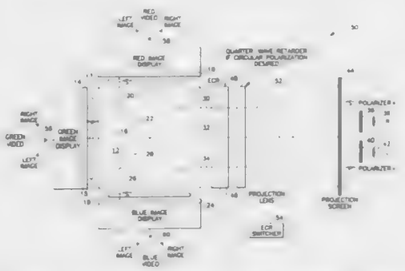
recording means for recording whether or not each target element is seen by the patient, such as to provide a map of the patient's effective field of vision.

4,995,718

FULL COLOR THREE-DIMENSIONAL PROJECTION DISPLAY

Karen E. Jachimowicz, Goodyear, and Ronald S. Gold, Scottsdale, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 15, 1989, Ser. No. 437,488
Int. Cl.[5] G02B *27/28, 27/22*
U.S. Cl. 353—31 **27 Claims**



1. A full-color, three-dimensional single display comprising:

first source means for providing a first light of first imagery having a first color and a first polarization;

second source means for providing a second light of second imagery having a second color and a second polarization;

combining means for combining the first and second lights into a third light;

projection means for projecting the third light on display means;

polarization switching means, situated between said source means and said display means, for switching the first polarization to the second polarization and for switching the second polarization to the first polarization;

first source switching means, connected to said first source means and to said polarization switching means, for switching the first imagery to the second imagery and vice versa coinciding with the switching of said polarization switching means; and

second source switching means, connected to said second source means and to said polarization switching means, for switching the second imagery to the first imagery and vice versa coinciding with the switching of said first source switching means;

wherein:

a viewer looking at said display means with one eye through a first lens having the first polarization and looking at said display means with another eye through a second lens having the second polarization, is enabled to see full-color, three-dimensional third imagery composed of the first and second imageries.

4,995,719

METHOD OF AND AN APPARATUS FOR PROJECTING A SCANNED TWO- OR THREE-DIMENSIONAL MODULATED LIGHT PATTERN ORIGINATING FROM A LIGHT SOURCE

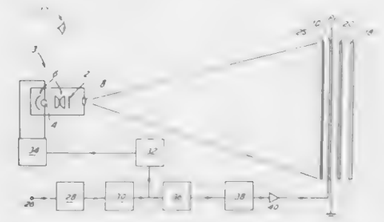
Ian A. Shanks, Penn, England, assignor to Thorn EMI plc, London, England

Filed Oct. 4, 1989, Ser. No. 416,770
Claims priority, application United Kingdom, Oct. 6, 1988, 8823490
Int. Cl.[5] G03B *21/00*
U.S. Cl. 353—122 **22 Claims**

1. A method of projecting a scanned two- or three-dimensional modulated light pattern originating from a light source and represented by a matrix of pixels, the method comprising the steps of:

projecting said pattern onto a defined surface distant from the light source;

operating a plurality of means for modulating light between at least a first mode and a second mode, each of the modulating means being associated with a plurality of pixels; wherein the scanning of the matrix of pixels and the operation of said plurality of modulating means are synchro-



nised so that (a) a respective said modulating means is in said first mode when its associated plurality of pixels are being scanned and (b) a respective plurality of pixels are not being scanned when its associated said modulating means is in said second mode;

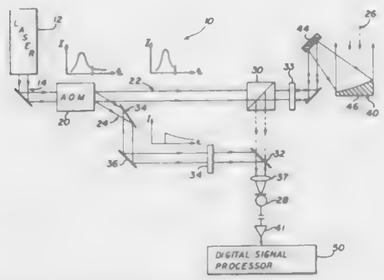
and each of said modulating means in said first mode allows light to be distributed from said defined surface and each of said modulating means in said second mode allows the effect produced by any light incident on said defined surface to be reduced.

4,995,720

PULSED COHERENT DOPPLER LASER RADAR

Farzin Amzajerdian, Newbury Park, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Dec. 12, 1989, Ser. No. 449,975
Int. Cl.[5] G01C *3/08;* **G01P** *3/36*
U.S. Cl. 356—5 **12 Claims**



1. A laser radar apparatus comprising:

a source of propagating coherent wave energy, said energy having a high intensity pulse portion and a substantially lower intensity trailing tail portion;

a switching device upon which said energy is incident wherein substantially all of said pulse portion is directed along a first propagation path toward a target and substantially all of the energy of said tail portion is directed along a second propagation path, said target reflecting said pulse portion as a received signal; and

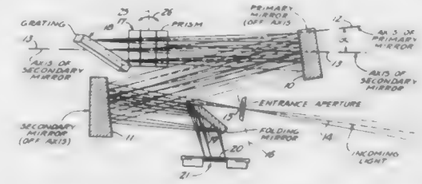
a detector upon which each of said received signal and said tail portion is incident to determine the Doppler shift of said received signal with respect to said tail portion.

4,995,721

TWO-DIMENSIONAL SPECTROMETER

Robert J. Krupa, Leominster, and R. Calvin Owen, Lincoln, both of Mass., assignors to Imo Industries, Inc., Princeton, N.J.

Filed Mar. 5, 1990, Ser. No. 488,293
Int. Cl.[5] G01J *3/18, 3/36*
U.S. Cl. 356—305 **21 Claims**



1. A two-dimensional spectrometer, having an entrance aperture for admission of light along an optical path to a primary mirror via a secondary mirror, and for reflection as a collimated-light beam from said primary mirror to a two-dimensional dispersive optical device effectively normal to the collimated beam, said dispersive optical device producing a reflected cross-dispersed beam back via said primary and secondary mirrors to a focal plane which effectively includes said entrance aperture, and a two-dimensional detector array in said focal plane and with at least some of its detector elements optically adjacent said optical path and optically facing back-reflected two-dimensionally dispersed light.

4,995,722

SYSTEM FOR ASSISTING HOVERING AIRCRAFT TO LAND ON THE PLATFORM OF A VESSEL

Laurent Sutour, Victor Hugo Hauts De Seine, France, assignor to Societe Anonyme De Telecommunications, Paris, France

Filed Sep. 13, 1989, Ser. No. 406,537
Claims priority, application France, Sep. 14, 1988, 88 11962
Int. Cl.[5] G01B *11/26;* **G01C** *1/00*
U.S. Cl. 356—152 **9 Claims**

1. A system for assisting the landing, in its final stage, of a hovering aircraft on the platform of a vessel, comprising:

emitting means on said aircraft for emitting a conical beam;

sensitive means on said platform for being sensitive to the cross-section of said conical beam on said platform;

determining means on said vessel for determining said cross-section with respect to a reference on said platform from said sensitive means and determining landing data for said aircraft from said cross-section; and

display means on said vessel for displaying the landing data from said determining means.

4,995,723

METHOD AND APPARATUS FOR OPTICALLY COUPLING AN ELEMENT ANALYSIS SYSTEM AND A LASER TO LIQUID METAL IN A MELTING VESSEL

Christoph Carlhoff, Willich; Claus-Jürgen Lorenzen, Essen, and Klaus-Peter Nick, Achim, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft Mit Beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 414,387
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1988, 3833621
Int. Cl.[5] G01J *3/443;* **G01N** *21/63*
U.S. Cl. 356—318 **7 Claims**

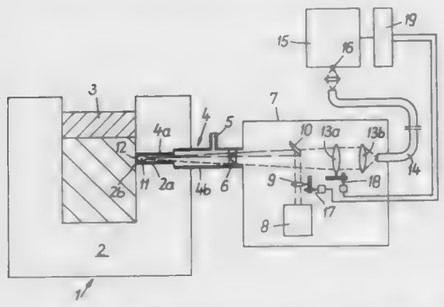
1. A method of analyzing elements of a metal melt contained in a melting vessel, comprising the following steps:

(a) introducing an inert gas at a temperature in excess of 300° C. laterally into a tube passing through a lateral wall of the melting vessel and opening thereinto;

(b) generating a laser beam;

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(c) passing the laser beam through an adjustable first lens system;
(d) reflecting the laser beam by a mirror into said tube through a quartz window closing said tube;
(e) generating a plasma in said tube by focusing the laser beam by said adjustable first lens system onto the surface of the metal melt in said tube by the condition that the relation of the intensities Me_I/Me_{II} is a minimum;



(f) guiding the light generated by the plasma through said quartz window to an adjustable second lens system;
(g) coupling the light by said second lens system with an optical waveguide so that the plasma is focused on the input end of the waveguide; and
(h) introducing the light by the optical waveguide into a spectrometer.

4,995,724

OPTICAL SPECTRUM ANALYZER WITH HIGH PERFORMANCE MEASUREMENT FUNCTION

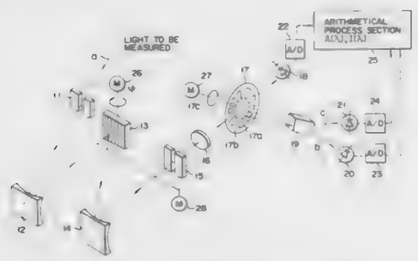
Yoji Sonobe, Machida, and Takao Tanimoto, Sagamihara, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Aug. 14, 1989, Ser. No. 393,805

Claims priority, application Japan, Aug. 18, 1988, 63-205027; Jul. 28, 1989, 1-194057

Int. Cl.[5] G01J *3/18, 3/32*

U.S. Cl. 356—319 **15 Claims**



1. An optical spectrum analyzer comprising:
spectroscope means of the dispersion type for receiving light to be measured and emitting it as dispersed light which corresponds to each of wavelengths to be measured;
optical-path switching means for directing the dispersed light emitted from the spectroscope means to pass through first and second paths;
first photoelectric converter means for receiving the light which is directed to pass through the first path by the optical-path switching means;
polarizing/separating means for polarizing and separating the light, which is directed to pass through the second path by the optical-path switching means, into two polarized lights;
second and third photoelectric converter means for respectively receiving the two polarized lights polarized and separated by the polarizing/separating means; and
arithmetical process means for correcting a first optical spectrum strength according to an output from said first photoelectric converter means with at least a ratio of second and third optical spectrum strengths according to outputs from said second and third photoelectric converter means, to thereby calculate absolute spectrum values of the measured light at every wavelength of the light to be measured.

4,995,725

MONOCHROMATOR ARRANGEMENT

Wolfgang Riedel, Neuenburg; Manfred Knothe; Roland Grisar, both of Freiburg; Helmut Wolf, Merzhausen, all of Fed. Rep. of Germany, and Horst M. Preier, Acton, Mass., assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forshung E.V., Munich, Fed. Rep. of Germany

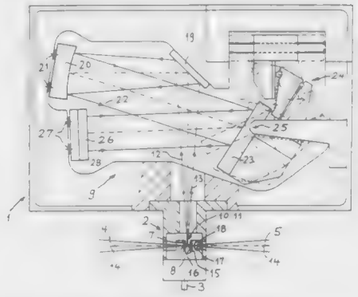
PCT No. PCT/DE87/00528, § 371 Date Jul. 21, 1988, § 102(e) Date Jul. 21, 1988, PCT Pub. No. WO88/04036, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 19, 1987, Ser. No. 237,735

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 3640044

Int. Cl.[5] G01J *3/18*

U.S. Cl. 356—334 **19 Claims**



1. A monochromator apparatus comprising:
a monochromator;
an entrance aperture defining an entrance focus for said apparatus, said entrance aperture located on a first axis which defines the direction of propagation of light rays entering said entrance aperture, said entering light rays defining a first intermediate focus;
an exit aperture defining an exit focus for said apparatus, said exit aperture defining a second axis which is abaxially offset from said first axis by a lateral distance;
a diffraction grid; and
a plurality of reversing mirrors for intercepting light rays which pass through said entrance aperture and for reflecting said rays onto said grid from said through said exit aperture and from the exit aperture to the exit of said monochromator apparatus, said light rays exiting said monochromator apparatus defining a second intermediate focus at the location of said first intermediate focus.

4,995,726

SURFACE PROFILE MEASURING DEVICE UTILIZING OPTICAL HETERODYNE INTERFERENCE

Kazuhiko Fujita, Nagoya, and Yoshinori Bessho, Age, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Sep. 25, 1989, Ser. No. 412,164

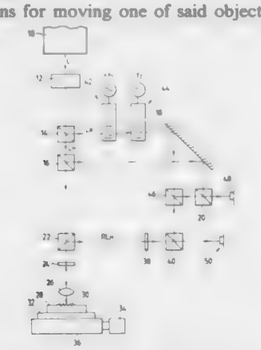
Claims priority, application Japan, Sep. 26, 1988, 63-239941

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—349 **8 Claims**

1. A surface profile measuring device utilizing optical heterodyne interference, comprising:

a laser source for emitting a laser beam;
an object lens for converging the laser beam on the surface of an object to be measured, the laser beam being reflected from the surface of the object while provided with information on a surface profile of the object;
interfering means for allowing the reflected beam from the surface of the object to interfere with a reference beam having a frequency different from that of the reflected beam to form a composite beam of the reflected and reference beams;
driving means for moving one of said object lens and the



object relatively to the other in the direction of the optical axis of the laser beam incident on the surface of the object;
control means for generating a beat signal having the information of the surface profile of the object from the composite beam and controlling said driving means on the basis of the beat signal so that the surface of the object is disposed substantially at a focusing position of said object lens;
surface profile measuring means for measuring the surface profile of the object on the basis of phase variation of the beat signal.

4,995,727

COMPACT DIFFUSION LIGHT MIXING BOX AND COLORIMETER

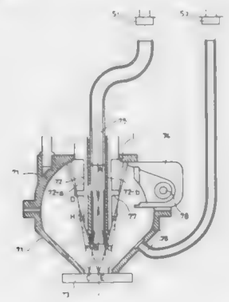
Nobukazu Kawagoe; Masami Sugiyama, and Masahito Inabe, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1988, Ser. No. 195,962

Claims priority, application Japan, May 22, 1987, 62-125365; May 30, 1987, 62-137458; Jun. 5, 1987, 62-141041; Jun. 5, 1987, 62-141042

Int. Cl.[5] G01J *3/51, 1/18*

U.S. Cl. 356—402 **11 Claims**



1. A colorimeter for measuring color of a sample, comprising:
a light source;
a mixing box formed of a non-coated light diffusing surface by molding.sintering white ceramics or white resin for diffusing and reflecting light from said light source to guide the same to said sample;
first light receiving means for receiving light reflected from the sample when light is emitted from said light source; and
second light receiving means for receiving light other than the light directly reflected from the sample when light is emitted from said light source.

4,995,728

CONFIGURATION WITH SEVERAL SPLICING MODULES

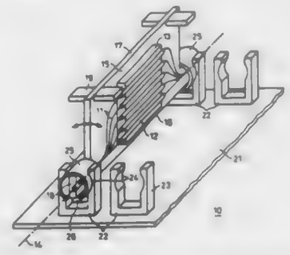
Lothar Finzel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,926

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842904

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **20 Claims**



1. A configuration of light waveguide splicing modules comprising:
(a) a plurality of individually accessible splicing modules;
(b) a plurality of light waveguide connectors deposited on each of said modules;
(c) at least one light waveguide bundle containing a plurality of light waveguides leading to each splicing module, with the light waveguides of said bundles held in said connectors;
(d) a carrier; and
(e) a pivotable connection pivotally supporting each splicing module individually on said carrier along a pivoting axis which extends through the interior of the splicing module and is parallel to the direction of introduction of the light waveguide bundle into the splicing module, the site on which said light waveguide bundle enters into each of said splicing modules lying on the pivoting axis of said splicing module, the pivoting axes of said plurality of splicing modules extending parallel to each other.

4,995,729

MIXING DEVICE FOR MORTAR

Kurt Eberhardt, Bad Hersfeld, and Reinhold Nibrig, Heringen, both of Fed. Rep. of Germany, assignors to Babcock-BSH Aktiengesellschaft, vormals Büttner-Schilde-Haas AG, Krefeld, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,343

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 8711865; Sep. 2, 1987, 3729233

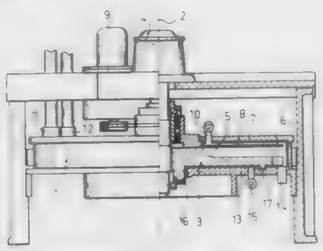
Int. Cl.[5] B01C *7/22*

U.S. Cl. 366—2 **9 Claims**

9. A mixer comprising:
a cylindrical housing having a vertical housing axis and a top cover;
a rotating disk in said housing, rotatable about said axis;
teeth around a periphery of said disk;
at least one water inlet in said top cover of said housing;

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at least one inlet for solid material in said top cover of said housing;
at least one outlet for mixed material in a floor of said housing and near said periphery of said housing, said outlet being located below said teeth;
at least one water inlet in a floor of said housing and within a region defined by said teeth; and



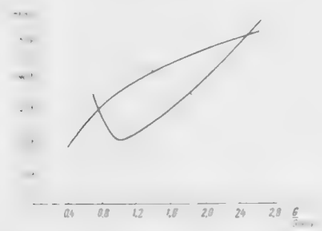
an annular constriction of a clearance between said disk and said floor of said housing, said constriction being formed by an annular groove in said floor and by a ring located on an underside of said rotating disk, said ring penetrating into said annular groove, said constriction being between said water inlet in said floor of said housing and said teeth, said water inlet in said floor of said housing and said constriction providing means for keeping an underside of said disk under constant pressure of flowing water.

4,995,730

METHOD OF ELECTROMAGNETIC WORKING OF MATERIALS

Vladimir A. Abrosimov, ulitsa Krasnoborskaya, 1a, kv. 43; Viktor F. Luzev, ulitsa I Zhilaya, 14, kv. 6.; Vladimir N. Lyapunov, ulitsa Sovetskaya, 57, kv. 138., all of Yaroslavl; Jury N. Kuznetsov, Kashirskoe shosse, 142, korpus 3, kv. 279., Moscow; Vladimir B. Manerov, ulitsa Respublikanskaya, 77, kv. 110., Yaroslavl, and Leon M. Skuinsh, ulitsa Tereshkovoi, 35b, kv. 7., Riga, all of U.S.S.R.

Filed Dec. 22, 1988, Ser. No. 288,235
Int. Cl.[5] B01F *13/08*
U.S. Cl. 366—273 2 Claims



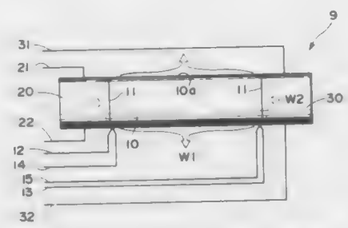
1. A method of electromagnetic working of materials, including:
providing a working zone having an uppermost part and a lowermost part;
producing a variable magnetic field in said working zone;
placing in said working zone a layer of magnetic elements capable of moving chaotically under the action thereupon of said variable magnetic field and measuring a maximum active power consumed by said layer of the chaotically moving magnetic elements;
feeding a continuous stream of a material into said working zone from below upward through said layer of magnetic elements, for said stream of the material to be worked by said magnetic elements; and
maintaining the feed rate of said stream of the material within a range from 0.8 to 2.5 of the feed rate corresponding to the maximum active power consumed by said layer of chaotically moving magnetic elements.

4,995,731

METHOD FOR MEASURING HEAT TRANSFER COEFFICIENT AND SENSOR INCLUDING HEAT TRANSFER ELEMENT AND THERMAL INSULATION ELEMENT

Tomoshige Hori, Kitamoto, and Kensuke Itoh, Kodaira, both of Japan, assignors to Snow Brand Milk Products Co., Ltd., Japan

Filed Feb. 18, 1988, Ser. No. 157,260
Claims priority, application Japan, Mar. 3, 1987, 62-48566; Mar. 4, 1987, 62-49372
Int. Cl.[5] G01N *25/20*
U.S. Cl. 374—43 7 Claims



1. In a method for measuring a heat transfer coefficient between a heat transfer element and a fluid body wherein a calorific value is measured by placing the heat transfer element into said fluid body and charging the heat transfer element with an electric current so as to measure said calorific value, the improvement wherein a measured calorific value is the true calorific value of the entire heat transfer element by heat-transferably contacting a particular surface of said heat transfer element with said fluid body and measuring the calorific value of that particular surface and by rendering the residual surface of said heat transfer element in a thermal insulation state.

4. A sensor comprising a combination of a heat transfer element and a thermal insulation element wherein the said heat transfer element has a particular surface which is heat-transferably contacted with a fluid and said thermal insulation element is a residual surface of said heat transfer element, and means for holding the temperature of said thermal insulation element substantially equal to the temperature of an interface of the said heat transfer element and the said thermal insulation element such that heat cannot be transferred between said heat transfer element and said thermal insulation element.

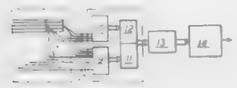
4,995,732

METHOD AND APPARATUS FOR CONTINUOUS MEASUREMENT OF THE TEMPERATURE OF ELECTROCONDUCTIVE MELT AND THE THICKNESS OF REFRACTORY LINING

Nikola A. Lingorski; Mincho B. Hadjiiski; Rumen B. Yovchev; Kamen B. Spassov, and Peter H. Savov, all of Sofia, Bulgaria, assignors to Nis Pri Vissh Chimikotechnologiches Ki Institut, Sofia, Bulgaria

Continuation of Ser. No. 370,232, Jun. 22, 1989, abandoned.
This application Jun. 8, 1990, Ser. No. 535,975
Int. Cl.[5] G01K *1/12*
U.S. Cl. 374—139 3 Claims

3. An apparatus for measuring the temperature of an electroconductive melt and thickness of a refractory lining of a vessel containing said melt, comprising:
a temperature indicator disposed in a refractory lining of a vessel containing an electroconductive melt, said temperature indicator being formed by a plurality of elongated heat-conductive bodies arranged in an array and having ends wetted by said melt;
a pair of plates disposed transverse to said heat-conductive bodies and traversing and contacting said array at a fixed distance from one another beyond a melt-consumable portion of said bodies;
a thermoelectric sensor provided on each of said plates and connected to a computer for determining the melt temperature; and
a thickness indicator disposed in said refractory lining, said thickness indicator being formed by a plurality of elongated electroconductive bodies having ends facing



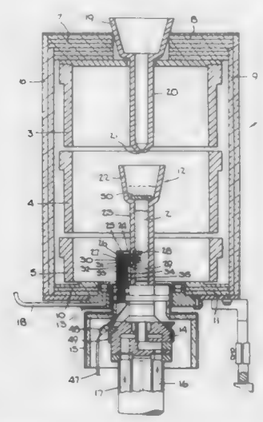
towards said melt and each differing from a preceding end by a fixed constant distance, a longest body of said electroconductive bodies having an end wetted by said melt, said longest body being connected to one pole of a current source, so that as the electroconductive melt erodes said refractory lining, additional ends of said electroconductive bodies become wetted by said melt, establishing an electrical connection between said longest body and the additional exposed bodies, whereby when a connection is provided between another pole of said current source and a contact end of said additional bodies, a closed circuit is established, providing a measurement of the thickness of said refractory lining.

4,995,733

MEASUREMENT SENSOR FOR THE DETECTION OF TEMPERATURES IN METAL OR ALLOY MELTS

Friedrich-Werner Thomas, Gelnhausen; Jürgen Schädlich-Stubenrauch, and Alfred Hediger, both of Aachen, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 193,770, May 13, 1988, abandoned.
This application Dec. 13, 1989, Ser. No. 453,101
Claims priority, application Fed. Rep. of Germany, May 14, 1988, 3716145
Int. Cl.[5] G01K *7/04, 1/08;* H01L *35/02*
U.S. Cl. 374—140 4 Claims



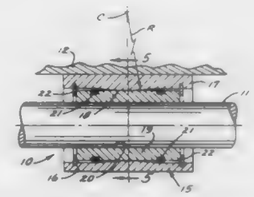
1. The combination of a vacuum furnace and a measurement sensor for the detection of temperatures in metal or alloy melts disposed in a casting mold, comprising: several graphite heating devices, a sprue, a casting dish, insulation surrounding the graphite heating devices, a cooling head provided below the casting dish into which latter said measurement sensor is built, and said measurement sensor comprising a thermocouple having two wire legs and a weld bead at a connection of these legs, and having a high heat-resistant thermal sheath surrounding the thermocouple, the weld bead of the thermocouple being disposed in the direct vicinity of one end of the sheath, the one end being a blind bore sealed with a SiO_2-free filler material exposed directly to the melt outside the sheath, the one end of the sheath being introduced directly into the melt while a second end of the sheath is in connection with a holding means.

4,995,734

PILLOW BLOCK HOUSING FOR A SHAFT-SUPPORTING BEARING

Robert Schroeder, Rockford, Ill., assignor to Pacific Bearing Co., Rockford, Ill.

Filed Apr. 6, 1990, Ser. No. 505,829
Int. Cl.[5] F16C *23/04, 29/12*
U.S. Cl. 384—38 4 Claims



1. The combination of, a shaft having a central longitudinal axis, a bearing for supporting said shaft, and a housing for supporting said bearing, said bearing being of circular cross-section and having a predetermined outer diameter, said bearing having an outer surface which is circumferentially continuous through 360 degrees around said axis, said housing having a bore which receives said bearing, said bore being of circular cross-section, being circumferentially continuous for 360 degrees around said axis and having, in a predetermined radial plane, a diameter which closely approximates the outer diameter of said bearing, the diameter of said bore increasing progressively and symmetrically as said bore proceeds axially a predetermined distance from each side of said plane whereby said bearing may rock within said bore to enable the axis of said shaft to assume a position which is inclined angularly relative to the axis of said bore.

4,995,735

CONTOURED JOURNAL BEARING

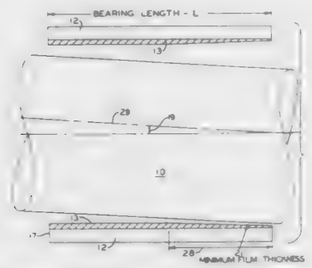
Terence J. Dansdill, 12 Wilson St., Beverly, Mass. 01915

Filed Dec. 22, 1988, Ser. No. 288,745
Int. Cl.[5] F16C *23/02, 17/02*
U.S. Cl. 384—276 9 Claims

1. An improved journal bearing adapted for use in lubricated gear trains under loads sufficient to bend the rotor which is rotatably supported within said bearing comprising:
a bearing shell;
a non-resilient babbitt lining supported within said bearing shell and interposed between said bearing shell and said rotor;
the external surface of said lining being of uniform diameter and in contact with said bearing shell to prevent movement of said lining within said bearing shell;
a portion of the internal surface of said babbitt lining being contoured under no load in a direction along the axis of said rotor and said bearing to conform more closely to the contour of said rotor under load;

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the slope and length of said contour being adequate to maintain an acceptable minimum lubrication film thickness of



said bearing with said rotor over the load profile of said rotor.

4,995,736

RADIAL ROLLING BEARINGS

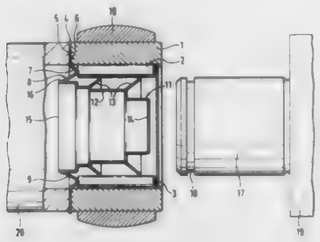
Henry Haase, Leichlingen; Joachim Schneider, Dusseldorf, both of Fed. Rep. of Germany, and Pierre Alber, Reichshoffen, France, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 528,032

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923111

Int. Cl.[5] F16C *41/04*

U.S. Cl. 384—448 **10 Claims**



1. A radial rolling bearing comprising an outer ring in whose bore a set of cylindrical rolling elements is arranged, the rolling elements being retained from falling out inwards by an elastic retaining element inserted into the bore of the bearing and stop flanges being provided at both front faces of the rolling elements for their axial fixing, characterized in that at least one of the stop flanges is formed by a detached flanged disc which is retained in its position by an elastic element.

4,995,737

AXIAL ANTI-FRICTION BEARING

Rainer Moller, Schweinfurt; Manfred Pretscher, Meine, and Anton Schmidt, Hassfurt, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,609

Claims priority, application Fed. Rep. of Germany, May 23, 1989, 8906357[U]

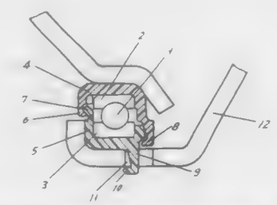
Int. Cl.[5] F16C *33/76, 19/30*

U.S. Cl. 384—607 **8 Claims**

1. An axial anti-friction bearing for the rotatable mounting of a spring pad in the shock-absorber leg of a wheel, the bearing comprising:

first and second axially separated, annular races and a plurality of rolling bodies disposed between the races;

a respective annular cap comprised of plastic material holds each of the races; each cap including a respective cooperating holding nose for cooperating with a holding nose on the other cap for snapping the caps together in sliding and sealing manner, thereby for holding the races in position to guide the rolling bodies between the races;



at least one pin protruding approximately axially of the bearing from at least one of the caps, a respective projection provided on the pin for engaging into and then locking behind a cutout in a spring plate to which the bearing is supported for holding the bearing in snap like manner on the spring plate by means of the pins.

4,995,738

DOCUMENT PROCESSING APPARATUS WITH AUTOMATIC HYPHENATION DURING EDITING

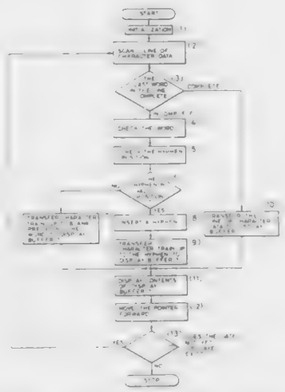
Hideo Shibaoka, c/o Canon Kabushiki Kaisha: 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 170,357, Mar. 18, 1987, abandoned. This application Nov. 21, 1989, Ser. No. 437,782

Claims priority, application Japan, Mar. 23, 1987, 62-65692; Mar. 23, 1987, 62-65693

Int. Cl.[5] B41B *1/04*

U.S. Cl. 400—7 **8 Claims**



1. A document processing apparatus comprising:

memory means for storing document information;

display means for displaying the document information which is stored in said memory means;

display control means for controlling said display means so as to add a hyphen at the end of a line on said display means and to control the display of a word contained in the document information; and

editing means for editing the document information which is displayed by said display means,

wherein said display control means controls said display means in a manner such that when document editing is performed by said editing means, said display control means again controls said display means to add a hyphen at the end of a line on said display means.

4,995,739

TEXT EDITING DEVICE FOR ERASING HYPHENATED WORDS LOCATED ON TWO LINES

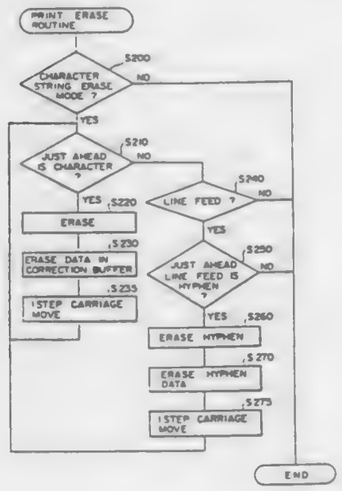
Keiichi Hirata, Kuwana; Yasushi Kawakami, Nagoya; Tomoko Miura, Nagoya; Miyako Mukai, Nagoya; Tomohiro Ban, Iwakura, and Akihiro Furukawa, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 15, 1989, Ser. No. 323,971

Claims priority, application Japan, Mar. 16, 1988, 63-62806

Int. Cl.[5] B41J *5/30*

U.S. Cl. 400—63 **19 Claims**





1. A text editing device for erasing with a single keystroke a word formed of a first character string at the end of a text line and a second character string on a following text line, said device comprising input means for inputting character codes and function codes, memory means for storing the codes, represent means for representing characters corresponding to the codes inputted by said input means, designate means for designating a point on a text line, said text line consisting of a plurality of character strings, said text editing device further comprising:

erase means operable by said single only one word by eliminating keystroke for erasing characters of said second character string successively located behind the point designated by said designate means and for further erasing successive characters of said first character string located on a preceding line, in case that a predetermined character is located at the end of said preceding line and just behind the character erased by said erase means; and

eliminate means operable by said same single keystroke for eliminating the character codes corresponding to the characters erased by said erase means and any line feed code stored with the character codes erased by said erase means.

4,995,740

PRINTING DEVICE WITH SPELLING CHECK THAT CONTINUES PRINTING AFTER A DELAY

Norio Kobayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 22, 1989, Ser. No. 397,745

Claims priority, application Japan, Aug. 24, 1988, 63-209713

Int. Cl.[5] B41J *5/30*

U.S. Cl. 400—63 **9 Claims**



1. A printing device comprising input means for inputting character data, print means including a print head member moveable along a print line on a print sheet, for executing print operations through a print ribbon in response to the inputted character data, said printing device further comprises:

dictionary memory means for storing spelling information of a multiplicity of words;

spelling check means for checking the spelling of a character string defined in a predetermined manner and having been printed on said print sheet, by retrieving the words stored in said dictionary memory means;

first control means for controlling said print means so as to cease the print operation in case that a word whose spelling is equal to the character string checked by said spelling check means is not stored in said dictionary memory means;

memory means for storing the data inputted after said print means is so controlled to cease the print operations by said first control means;

count means for counting a period of time after a detection of misspelling of the character string executed by said spelling check means; and

print control means for controlling said print head member so as to execute print operations in response to the data stored in said memory means in case that a value counted by said count reaches a predetermined value.

4,995,741

THERMAL PRINT-TRANSFER RIBBON

Norbert Mecke, Hanover, and Heinrich Krauter, Neustadt, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,599

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738934

Int. Cl.[5] B41J *2/325*

U.S. Cl. 400—120 **19 Claims**

1. A thermal transfer ribbon for use in a thermal transfer process, comprising:

a carrier band;

a transfer layer on one side of said band and composed of a material melting during said process for transfer to a substrate; and

means for reducing relative reflectivity of said transferred melted material to no higher than about 18% per DIN 67 530, said means including an intermediate layer, said intermediate layer disposed between said transfer layer and

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said band and being composed of a hydrophilic organic substance which is nonmeltable during said process and



has a greater adhesion to said carrier band than to said transfer layer.

4,995,742

NEEDLE PRINTING HEAD

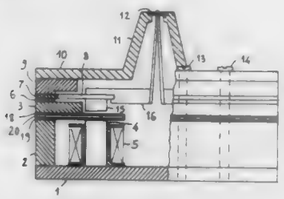
Sergio Cattaneo, Rho, Italy, assignor to Bull HN Information Systems, Inc., Billerica, Mass.

Filed Oct. 2, 1989, Ser. No. 415,811

Claims priority, application Italy, Oct. 18, 1988, 22341 A/88

Int. Cl.[5] B41J *2/27*

U.S. Cl. 400—124 **2 Claims**



1. A needle printing head of the permanent magnet type, wherein a first circular ring of magnetic material is provided with a plurality of elastic leaves, the leaves extending inwardly toward a central axis of the print head, each leave being provided with a post and forming with said post one cantilever armature of a plurality of armatures for printing actuators, each armature having its post attracted towards a corresponding one of a plurality of magnetic poles magnetized by a permanent magnet, the needle printing head further having an actuator damping element, the magnetic damping element comprising:

first and second metal sheets, and

a resilient film, the resilient film being interposed between the first and second metal sheets,

the first and second metal sheets and the resilient film being in the form of circular rings having the same outer diameter as the first circular ring and being interposed between the posts of the plurality of armatures and the plurality of magnetic poles,

the first metal sheet being in contact with the poles and continuously in contact with the resilient film, and

the resilient film being continuously in contact with the second metal sheet.

4,995,743

WIRE PRINTER WITH STEP FORMATION ARMATURE AND METHOD OF ASSEMBLY

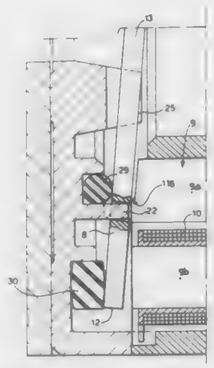
Francesco Bernardis, Chiaverano; Claudio Marangon, Borgofranco D'Ivrea, and Rinaldo Ferrarotti, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Dec. 27, 1988, Ser. No. 289,840

Claims priority, application Italy, Dec. 29, 1987, 68141 A/87

Int. Cl.[5] B41J *3/12*

U.S. Cl. 400—124 **24 Claims**



1. A method for the manufacture of a printer including a plurality of printing needles, a corresponding plurality of electromagnets with respective excitation conductive wires and movable armatures for selectively pushing the needles during printing, a body for housing the electromagnets, and a mass of bistate material for pouring into the housing body in a liquid state and holding the electromagnets in the housing body in a hardened state, wherein the method includes the steps of:

providing a housing body in the form of a generally cup-shaped body with a mouth part for the introduction of the holding mass and a base wall with apertures for the passage through the base wall of the conductive wires for the excitation of the electromagnets,

providing the housing body with an associated closure element provided with generally tubular appendages which extend into the apertures so as to close the apertures and have internal cavities for the passage of the conductive wires surrounded thereby,

inserting the electromagnets in the housing body, the conductive wires of each electromagnet being made to pass through the respective appendages of the closure element,

pouring the holding mass into the housing body in the liquid state, and

hardening the holding mass.

4,995,744

IMPACT PRINTER ACTUATOR USING MAGNET AND ELECTROMAGNETIC COIL AND METHOD OF MANUFACTURE

Michael P. Goldowsky, Valhalla, N.Y.; Teiji Hisano, Fujisawa, Japan; John P. Karidis, Ossining, N.Y.; Hiromi Shibuya, Fujisawa, and Osamu Ueda, Yokohama, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,203

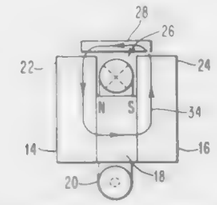
Int. Cl.[5] B41J *2/28*

U.S. Cl. 400—157.2 **19 Claims**

1. A dot matrix printer actuator comprising:

a print armature;

stator means comprising a stator frame having at least two ferromagnetic poles and at least one permanent magnet, said magnet being located between and separating two of said poles, said magnet being magnetized in a line along an axis of said stator means and having a relatively small length, measured between said poles on said axis, and a relatively large combined width and height, measured transversely relative to said axis, said poles each extending transversely from said stator means axis beyond said magnet, said poles each having a magnet contact area, which is an area of contact between said poles and said magnet, and an armature contact area, which is an area of contact between said poles and said armature, wherein the magnet



contact area of said poles are relatively larger than the armature contact areas of the poles; and

coil means comprising at least one electromagnetic coil having a coil axis perpendicular to its wind which is parallel to said stator means axis and, said coil substantially surrounding said magnet with at least a portion of said coil being located between said poles whereby said magnet can produce a magnetic flux through said poles to hold said armature and, said coil can be energized to counteract the magnetic flux from said magnet such that said armature can move.

4,995,745

PRINTER WITH MULTI-FUNCTION PAPER FEEDING MECHANISM

Takeshi Yokoi, Kagamigahara; Shigeo Nakamura, and Hiroshi Yamanaka, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

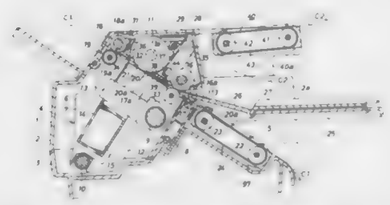
Continuation of Ser. No. 87,827, Aug. 21, 1987, Pat. No. 4,898,488. This application Jul. 31, 1989, Ser. No. 386,692

Claims priority, application Japan, Aug. 22, 1986, 61-197916; Mar. 28, 1987, 62-74980; Apr. 7, 1987, 62-86125

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[5] B41J *11/50*

U.S. Cl. 400—605 **22 Claims**



1. A printer comprising a platen, a print head which faces said platen so as to print out on a sheet of printing paper at a printing position on said platen, a paper guide path for guiding the printing paper through said printing position, and a guide means having a guide plane for inserting a sheet of printing paper in said guide path;

wherein said paper guide path comprises a paper inlet portion at one end thereof for inserting the printing paper thereto and a paper discharge portion at the other end thereof for discharging the printing paper therefrom,

said paper guide path is a substantially flat path extending from said paper inlet portion to said paper discharge portion, and

said guide plane of said guide means is connected with said paper inlet portion of said paper guide path and meets said paper guide path at an obtuse angle, and wherein said paper guide path slants upward in the paper feed direction so that said paper inlet portion is located lower than said paper discharge portion, and wherein said print head is located below said platen so as to print on a lower surface of the printing paper in said paper guide path.

4,995,746

OFFICE MACHINE

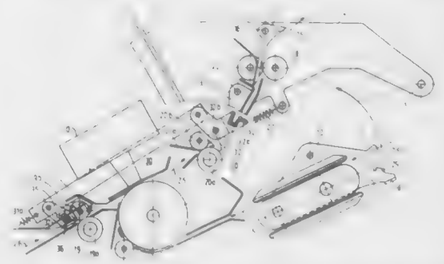
Manfred Rosenthal, Kirchen-Freusburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1989, Ser. No. 317,378

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807809

Int. Cl.[5] B41J *11/32*

U.S. Cl. 400—616.2 **10 Claims**



8. Printer apparatus with endless and sheet paper feed modes comprising:

a housing;

a printing unit secured to the housing;

sheet paper transport means comprising a first pair of rollers rotatably secured to the housing in front of the unit and a second pair of rollers rotatably secured to the housing behind the unit relative to a paper print feed path, each said pairs having a pressure applying mode for feeding said sheet paper and a release mode during feed of said endless paper;

an endless paper feed tractor pivotally secured to said housing for pivoting to a paper pull position and a paper push position; and

means coupled to said tractor, said housing and at least one roller of said first pair and one roller of said second pair for selectively placing said rollers in the release mode in response to the placement of the tractor in one of said pull and push positions and in the pressure mode in response to the placement of the tractor in the other of said pull and push positions.

4,995,747

PAPER STACKING APPARATUS FOR OFFICE MACHINES

Günther Engelhardt, Niederstotzingen; Gerhard Lohrmann, Thalfingen, and Thomas Werner, Neu-Ulm, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,472

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3727070

Int. Cl.[5] B41J *13/048*

U.S. Cl. 400—625 **19 Claims**

1. A paper stacking apparatus for an office machine, said office machine having a forward end and a rear end and including means for sequentially supplying sheets of paper upwardly

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along a generally vertical path, said office machine having opposite sides extending from said forward end to said rear end, said sheets for being disposed transversely in said office machine to extend between said opposite sides of office machine, and said path being located between said front end and said rear end, said paper stacking apparatus comprising:

a support frame rigidly mounted on said office machine;

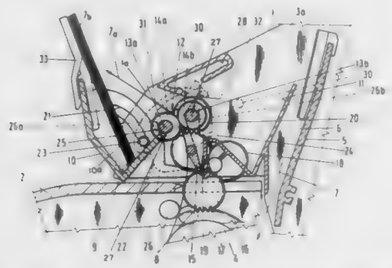
said support frame being located above said means for sequentially supplying said sheets;

a paper guide element pivotally mounted within said support frame in alignment with said path;

a forward stacker pivotally mounted on said support frame forwardly of said paper guide element;

a rear stacker rigidly mounted on said support frame rearwardly of said paper guide element;

said paper guide element being coupled to said forward stacker;



said paper guide element having a forward position and a rear position relative to said support frame;

said paper guide element being coupled to said forward stacker for pivotal movement of said paper guide element relative to said support frame and to said forward stacker between said forward position and said rear position in response to pivotal movement of said forward stacker relative to said support frame;

said forward stacker comprising means for generating pivotal movement of said paper guide element to said forward position for directing said sheets to said forward stacker for forward to rear stacking of said sheets thereon; and

said forward stacker comprising means for generating pivotal movement of said paper guide element to said rear position for directing said sheets to said rear stacker for rear to forward stacking of said sheets thereon.

4,995,748

RECIPROCATING PRINTING CARTRIDGE EXTENDING BEYOND CASING SIDEWALL OPENING

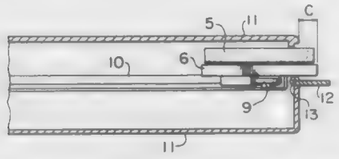
Noriyuki Tajima, Yawata; Shigeto Ueno, Neyagawa, and Tetsuhiro Sano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 12, 1989, Ser. No. 378,911

Claims priority, application Japan, Jul. 18, 1988, 63-177112

Int. Cl.[5] B41J *29/02*

U.S. Cl. 400—691 **8 Claims**



1. An information processing device comprising a serial printer adapted to effect printing through reciprocating movements of a carriage loaded thereon with a printing head and an ink ribbon cartridge, characterized in that said device further comprises an outer casing having an opening portion at least one side surface thereof, whereby, when said carriage has reached a terminal end of its stroke for reciprocating movements, a part of either one, or both, of said carriage and said ink ribbon cartridge is allowed to project outside said outer casing through said opening portion.

4,995,749

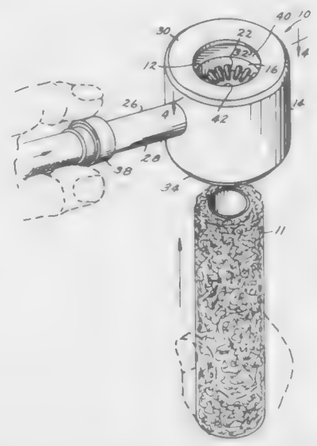
APPARATUS FOR CLEANING A PAINT ROLLER PAD

Robert J. Gornik, 12235 Pacific Ave., #101, Los Angeles, Calif. 90066

Filed Sep. 5, 1989, Ser. No. 402,480

Int. Cl.[5] B08B *3/02;* **A46B** *17/06*

U.S. Cl. 401—9 **9 Claims**



1. Apparatus for cleaning a paint roller pad of predetermined diameter, said apparatus comprising:

a first hollow annular member defining a hollow interior and having an outer surface and a first inner surface, said inner surface defining a plurality of openings in fluid communication with said hollow interior;

a plurality of nozzle elements projecting inwardly from said inner surface and in fluid communication with said openings;

free ends of said nozzle elements positioned to have an interference fit with the nap of a roller pad around the entire circumference of the pad when the pad is placed between said nozzle elements;

means in operative relationship with said hollow interior for introducing liquid into said interior;

an annular sleeve attached to and in substantially coaxial relationship with said first annular member, said sleeve defining a wiping opening defined by a second inner surface having an interference fit with a roller pad, whereby paint and liquid are wiped and wrung from the roller pad as the pad is passed through said sleeve after contact with said nozzle elements; and

a second annular member attached to and in substantially coaxial relationship with said first member for reducing and controlling the amount of spray and splashing of liquid and paint as the roller pad is passed through said apparatus.

4,995,750

CLIP-OPERATED RETRACTION MECHANISM

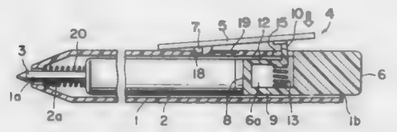
Yukihiro Akita, Honjo, Japan, assignor to Kabushiki Kaisha Pilot, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 515,099

Claims priority, application Japan, Nov. 24, 1989, 64-136377; Jan. 17, 1990, 65-2994

Int. Cl.[5] B43K *24/04, 24/08, 25/00, 7/12*

U.S. Cl. 401—104 **12 Claims**



1. A retraction mechanism for a retractable-tip writing instrument of the type having a reservoir which is mounted within a substantially tubular body for movement between a writing and a retracted position and which is sprung with respect to the body from the writing toward the retracted position, the retraction mechanism comprising:

(a) a push button affixed to the reservoir for joint movement therewith between the writing and the retracted position relative to the body;

(b) a cantilever of resilient material secured at one end to the push button and extending longitudinally of the body;

(c) a fulcrum formed on another end of the cantilever and extending through a clearance slot formed longitudinally in the body;

(d) a pocket clip formed on the fulcrum and disposed outside the body; and

(e) a catch formed on the pocket clip and urged against the body by virtue of the resiliency of the cantilever, the catch being capable of positive engagement with the body when the push button is pressed to move the reservoir form the retracted to the writing position.

4,995,751

DEVICE FOR APPLYING A LIQUID OR SEMI-PASTE SUBSTANCE ON A SURFACE

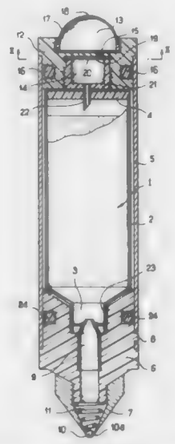
Bertrand Saint Georges Chaumet, 41 Avenue du Chesnay, 78170 La Celle Saint Cloud, France

Filed Oct. 27, 1988, Ser. No. 263,184

Claims priority, application France, Nov. 6, 1987, 87 15439

Int. Cl.[5] B43K *5/14*

U.S. Cl. 401—135 **7 Claims**



1. A device for applying a liquid or semi-paste substance on a surface, comprising a hermetically sealed refill (1), containing said substrate and removably disposed within a body (5) which is intended to be manipulated by hand, said device having at one end a head (7) for application of said substance which is removably fixed at said end, means (9) for putting said application head (7) into communication with the interior of the refill (1), said application head having means (10, 11) for preventing discharge of the substance as long as said head is not applied on the surface, the other end of the body (5) having closure means (12), the refill (1) being sealed-off at its end remote from the application head (7) by a capsule (4) of perforatable material, said closure means (12) for the body (5) carrying a hollow needle (22) which is capable of perforating said capsule (4), said capsule (4) being made from a material such that a leak-tight sealing is provided when it is perforated by said needle when the refill is placed within said body (5), said hollow needle (22) communicating with air pressurization mans (17) which can be actuated by hand and which is carried by said closure means (12), means (19, 20) for closing the communication between the hollow needle (22) and said pressurization means after release of said pressurization means, said pressurization means comprising a manually-actuated mini-pump (17) having a non-return valve (19), said mini-pump generating and maintaining on the downstream side of said valve (19) air under pressure to ensure good flow of the substance, there being a cavity (14) between the non-return valve (19) and the hollow needle (22), said non-return valve (19) being constituted by a resilient washer having a small slit and a periphery, said cavity (14) having a bottom provided with a hole (15) communicating with said mini-pump (17), said washer being applied against said bottom, said hollow needle (22) being mounted in a hollow needle-holder (21) which is screwed into said cavity (14), said hollow needle-holder (21) having a circular end lip applied against the periphery of said washer.

4,995,752

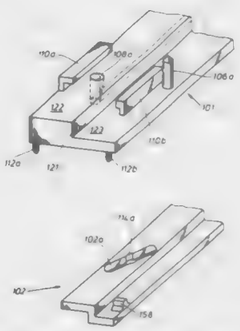
ORDERING MEANS FOR DOCUMENT FILES OR THE LIKE

Jörg Hofmann, Kreuzwertheim, Fed. Rep. of Germany, assignor to Gudrun Hofmann and Raimund Hofmann, both of Kreuzwertheim, Fed. Rep. of Germany

Continuation of Ser. No. 173,974, Mar. 28, 1988, Pat. No. 4,948,286. This application Dec. 7, 1989, Ser. No. 447,953

Int. Cl.[5] B42F *13/24*

U.S. Cl. 402—34 **17 Claims**



1. A filing device for document files comprising:

a base plate having at least two stationary sheet retainers projecting from the base plate;

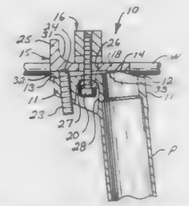
said base plate further having movable sheet retainers being engaged with said base plate;

said base plate further comprising a guide passage being an integral part of said base plate for receiving a locking member and for allowing movement of the locking mem-

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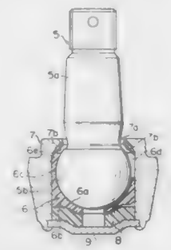
ber with respect to the base plate along two moving directions being opposite to each other;
said guide passage being formed by horizontally offset guiding rails vertically projecting from said base plate;
said locking member being movably arranged above the base plate;
wherein the movable sheet retainers are pivotably supported by said base plate and are pivotably inserted into openings of the base plate such that they are vertically projecting from the base plate;
said locking member having guide slots being inclined with respect to said moving direction and being directly engaged with said movable sheet retainer such that movement of the locking member along said guiding rails opens and closes the movable sheet retainers, whereat the axis of rotation of the movable sheet retainers is arranged along the moving direction of the locking member;
wherein the base plate is plastic and is provided with openings for inserting said movable sheet retainers.

4,995,753
SADDLE SUPPORT FOR BICYCLES, MOTORCYCLES, AND THE LIKE
William B. Shook, Bremen, Ohio, assignor to Thurston, Inc., Columbus, Ohio
Filed Jul. 27, 1990, Ser. No. 560,066
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 7 Claims



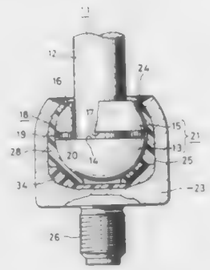
1. A saddle support for bicycles or the like adapted to support a saddle on the upper end of a bicycle frame support post of tubular form comprising a pair of clamping members adapted to grip the wires of the saddle and maintain them in their original relationship, said pair of clamping members including an upper clamping member and a lower cradle support member having a pair of cradles for receiving the wires, said upper member engaging the wires and clamping them in the cradles, said lower cradle support having a downwardly-opening post-receiving socket extending linearly forwardly and rearwardly thereof, said socket having a flat inner wall, a transverse fulcrum formed on said post at its upper end engaging said flat wall, and said socket having forwardly and rearwardly linearly extending side walls which are at sharp angles to the said flat inner wall for cooperating with the sides of the post at said fulcrum to prevent transverse shifting thereof, and means for tilting said lower support member about said fulcrum to thereby tilt the saddle forwardly or rearwardly, said linearly extending side walls of the socket being at obtuse angles relative to the flat inner wall, said upper clamping member being extruded to form a body with depending laterally spaced lugs which engage said wires and hold them in said cradles of said lower member, said means for tilting said lower support comprises a screw carried by the upper end of the post for engaging the flat inner wall of the socket to move it about said fulcrum,
and a bolt carried by the upper end of the post which clamps the upper and lower members together and holds the lower member in contact with said fulcrum for tilting movement.

4,995,754
BALL-AND-SOCKET JOINT
Shoju Ishii, Hamamatsu, Japan, assignor to Rhythm Motor Parts Mfg., Co., Ltd., Shizuoka, Japan
Filed May 4, 1989, Ser. No. 347,041
Claims priority, application Japan, Jun. 6, 1988, 63-75568[U]
Int. Cl.[5] F16C *11/06*
U.S. Cl. 403—132 1 Claim



1. A ball-and socket joint comprising:
a housing having an open end at its upper end, the upper end having an inner peripheral surface which is chambered and inclines upward and radially inward;
a bearing element disposed in said housing;
a ball stud having a ball end retained in said bearing element and a shank portion extending from said ball end freely through said open end of said housing;
an end cover plate secured in a lower end of said housing; and
a resiliently yieldable member compressed between said bearing element and said end cover plate for urging said bearing element against said ball end of said ball stud;
said inner peripheral surface of said open end of said housing being locally hardened by a high frequency hardening so as to have a predetermined hardness to prevent abrasion of said open end of said housing.

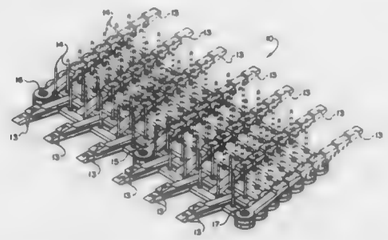
4,995,755
BALL JOINT
Youichi Hyodo, Okazaki; Tadao Muramatsu, Toyota, and Takaji Hattori, Hamamatsu, all of Japan, assignors to Toyota Jishoda Kabushiki Kaisha, Toyota, Japan
Filed May 23, 1989, Ser. No. 355,969
Claims priority, application Japan, May 24, 1988, 63-126684
Int. Cl.[5] F16C *11/00;* F16D *1/12*
U.S. Cl. 403—133 10 Claims



1. A ball joint for connecting the rack side of an automotive steering assembly with a tie rod side of said assembly, said ball joint comprising:
a ball stud said ball stud being connectable to one of said assembly rack side and tie rod side;
a first head member;
said first head member including a first facing surface and a first generally hemispherical surface;

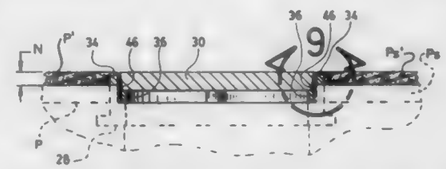
a second head member including a second facing surface and a second generally hemispherical surface;
said first and second facing surfaces facing each other and being spaced apart a predetermined distance apart;
a bearing member disposed in said predetermined distance;
said bearing member including means for permitting relative rotation between said first and second facing surfaces;
a ball seat enclosing said first and second head members;
a socket enclosing said ball seat;
a shank portion connected to said socket and extending generally coaxially with said ball stud, said shank portion being connectable to the other of said assembly rack side and tie rod side;
said first and second generally hemispherical surfaces together forming a generally spherical surface;
said socket including means for resiliently conformably enveloping said ball seat to a substantial portion of said generally spherical surface, whereby a substantial preload is applied to said first and second head members;
said ball stud being affixed to one of said first and second head members;
the other of said first and second head members including a shank hole for accommodating passage of said ball stud therethrough, thereby permitting relative rotation therebetween and;
an elastic member between said socket and said ball seat;
said elastic member being effective for applying a preload in a direction urging said first and second facing surfaces toward each other to compensate for wear in said ball joint.

4,995,756
VEHICLE TIRE DEFLATOR
Donald C. Kilgrow; Linda Kilgrow, both of P.O. Box 844, Monticello, Utah 84535, and Melvin H. Pedersen, 845 Park St., Salt Lake City, Utah 84102
Filed Jan. 29, 1990, Ser. No. 471,608
Int. Cl.[5] E01F *13/00*
U.S. Cl. 404—6 7 Claims



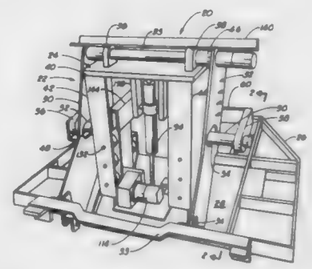
1. A vehicle tire deflator comprising, a plurality of rocker arms; means pivotally interconnecting said rocket arms to allow movement of said rocker arms to a side-by-side folded condition and an end-to-end extended condition; sockets formed in and spaced along each of said rocker arms; hollow spikes each having a base end for insertion into a said socket whereby a pointed end of each said hollow spike projects from said rocker arm; and actuator means connected to extend outwardly and upwardly from said rocker arms when said hollow spikes extend upwardly from the rocker arms, for first contacting a tire rolling thereon.

4,995,757
MANHOLE COVER ANNULAR SUPPORT FOR REPAVED STREET
Alain Prescott, 102 De Gaulle Street, Ville de Lorraine, Canada (J6Z 3Z2)
Filed Apr. 2, 1990, Ser. No. 502,685
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—26 9 Claims



1. In a street manhole defining an elongated manhole duct provided with a rigid collar member at its top mouth, said collar member having a radially inward annular cavity defining a base wall, parallel to the plane of said collar member and a side wall, orthogonal to the base wall, said collar member further defining a top wall parallel to said base wall; wherein a spacer member is provided for raising said cover from said collar base wall, said spacer member defining:
(a) a first rigid annular member, destined to sit on said collar base wall;
(b) a second rigid annular member, diametrally larger than said first annular member and destined to sit on said collar top wall; and
(c) connecting means, for coaxially interconnecting said annular members about spaced planes, said connecting means further including adjustment means to bring said first annular member to sit against said collar base wall and said second annular member to sit against said collar top wall, said adjustment means being responsive to a biasing load being applied transversely to the plane of at least one of said cover member and said second annular member.

4,995,758
CENTER BAR INSERTER
Don W. Smith, Edmond, Okla., assignor to CMI Corporations, Oklahoma City, Okla.
Filed Jul. 31, 1989, Ser. No. 387,946
Int. Cl.[5] E01C *23/04*
U.S. Cl. 404—88 14 Claims



1. An apparatus for inserting a bar into a concrete slab comprising:
a frame having an upper end, a lower end, a first side and a second side;
means for supporting the frame above the concrete slab;
a cage having an upper end and a lower end, wherein the cage is pivotally mounted about a horizontal axis thereof to the frame for rotation between a first position and a second position;
means for inserting the bar into the concrete slab, wherein

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the means is slidably secured within the cage for selective movement between a retracted position and an extended position; and

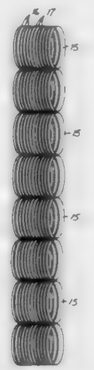
means for supporting at least one bar above the concrete slab adjacent the means for insertion such that when the means for insertion is moved from the retracted position to the extended position in concert with the movement of the cage between the first position and the second position, the bar is driven to a selected depth within the concrete slab by the means for inserting.

4,995,759

DRAINAGE TUBE CONSTRUCTION

Jeffrey D. Plowman, Prinsburg, and Arnold H. Plowman, Willmar, both of Minn., assignors to Multi-Flow Tube, Inc., Prinsburg, Minn.

Filed Nov. 4, 1988, Ser. No. 267,969
Int. Cl.[5] E02B *11/00*
U.S. Cl. 405—43 9 Claims



1. A ground drainage system comprising a relatively narrow, elongated trench disposed along a roadway (or agricultural field); and a drainage tube construction disposed in the trench, said construction including a plurality of longitudinally extending, substantially tangential and generally parallel corrugated tubes oriented with respect to one another in a linear fashion so that in transverse cross-section the portions attaching the tubes to one another define a generally straight line perpendicular t the longitudinal dimension of the tubes, the tubes being generally vertically stacked with respect to one another, each tube except a top tube being attached at a 0° position to the next tube above it at the next tube's approximately 180° position, the corrugations being defined by alternating ribs and valleys, each tube having perforations in the valleys to allow fluid to enter therein and be drained away; the trench being backfilled with drainage soil to cover the drainage tube construction.

4,995,760

SCRAPING DEVICE FOR MAKING A SUBGRADE

Martin Probst, Riedstrasse 37, 7141 Steinheim; Herbert Schaffarzyk, Ellernstrasse 62, and Walter Schaffarzyk, Herman Allmersweg 13, both of 2870 Delmenhorst, all of Fed. Rep. of Germany

Continuation of Ser. No. 167,270, Mar. 11, 1988, Pat. No. 4,895,477. This application Dec. 20, 1989, Ser. No. 453,730
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708249
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] E01C *19/22*
U.S. Cl. 404—119 4 Claims

1. Scraping device adapted to be towable over a subgrade to remove excess subgrade material from the surface thereof, said device comprising

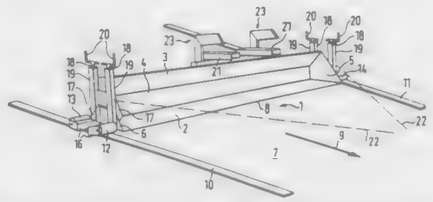
a rectangular lower wall (2) defining a scraping bar for removing excess subgrade material,

a rectangular top wall (3),

a rectangular rear wall (4) upstanding from said lower wall (2) and extending between said top and lower walls (2,3),

opposed side walls (5,6) respectively disposed at opposite ends of said lower, top and end walls (2,3 and 4) and being fastened together to define a bucket-shaped container for collecting removed excess subgrade material,

fastening means (17) attached to outside surfaces of said side walls (5,6),



holding devices (16) secured to each of said fastening means (17),

rollers (12,13) attached to said holding devices (16),

adjustment means (18,19,20) for adjusting said rollers (12,13),

said rollers (12,13) adapted to be rotatably disposed on a bar (10,11) whereby the bucket-shaped container may be moved longitudinally along the bars (10,11) and

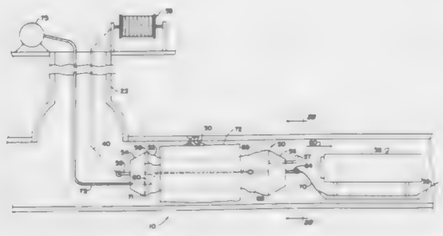
attachment means (21,23) disposed on the outside of the bucket-shaped container and being adapted for lifting and transporting the bucket-shaped container for emptying.

4,995,761

METHOD AND APPARATUS FOR REPAIRING RUPTURES IN UNDERGROUND CONDUITS

Kenneth S. Barton, 3921 Prospect Ave., Naples, Fla. 33942

Filed Aug. 23, 1989, Ser. No. 397,771
Int. Cl.[5] F16L *1/00, 55/18*
U.S. Cl. 405—154 21 Claims



1. Apparatus for repairing ruptures in underground conduits comprising:

an inflatable bladder that is introducible into a generally cylindrical conduit proximate a rupture therein, said bladder having a generally smooth surface in its inflated condition;

a flexible annular sleeve that is wrapped about and directly engageable by at least a portion of said bladder and is sufficient large to cover said rupture; and

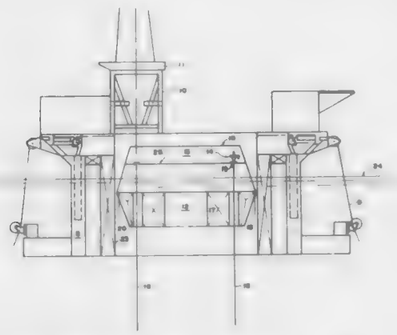
means for inflating said bladder to urge said sleeve into generally conforming engagement with the entire inner circumferential surface of at least a section of said conduit such that said sleeve covers said rupture, said sleeve including an adhesive bonding substance that adheres said sleeve to said conduit and is hardenable to bond said sleeve to said conduit.

4,995,762

SEMISUBMERSIBLE VESSEL WITH CAPTURED CONSTANT TENSION BUOY

Jerome L. Goldman, 935 Gravier St., Suite 2100, New Orleans, La. 70112

Continuation of Ser. No. 221,422, Jul. 19, 1988. This application May 11, 1990, Ser. No. 522,319
Int. Cl.[5] E63B *35/44*
U.S. Cl. 405—195 22 Claims



1. A semi-submersible vessel, comprising:

a first and a second independently floating bodies, the first body being a constant tension buoy having a central well extending vertically through a hull of the buoy and allowing conducting of a well drilling operation, said buoy further comprising a plurality of radially located bays, each well bay being adapted to receive a rise line therein, the second body being a buoyant caisson having a central well extending through a hull of the caisson and wherein the first body is captured inside the central well of the second body and is held under a constant tension through a constant distance connection of the first body to a floor of a body of water independently from said second body and wherein said constant tension buoy is substantially unaffected by wave conditions affecting the buoyant caisson during operation, and wherein effects of wave conditions acting on both bodies are substantially reduced on the constant tension buoy.

4,995,763

OFFSHORE WELL SYSTEM AND METHOD

R. Mark Patteson, Houston, and Samuel C. Lynch, Montgomery, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 26, 1990, Ser. No. 471,191
Int. Cl.[5] E02B *17/00;* F16L *21/00*
U.S. Cl. 405—195 12 Claims

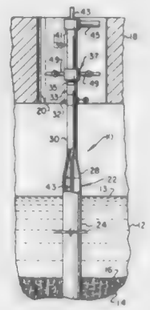
1. An offshore well system for conducting fluids between a point above the surface of a body of water and a point within a subterranean formation below said body of water comprising:

an elongated combination drivepipe and caisson extending from said formation to a point above the water surface:

means forming a landing surface near an upper end of said caisson,

at least a first casing string disposed within said caisson, said first casing string including means forming a casing hanger at an upper end thereof and cooperable with said means forming said landing surface for suspending said casing string in said caisson,

a wellbore fluid diverter secured to said caisson at a point above said landing surface and having an internal diameter large enough to permit insertion of said first casing string and said hanger through said diverter for landing said hanger on said landing surface; and



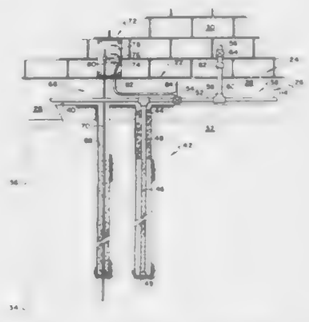
a wellhead body having an elongated pipe string connected thereto and insertable through said diverter for landing on a surface formed on said casing hanger.

4,995,764

TECHNIQUE FOR STABILIZING BUILDING FOUNDATIONS

Daniel P. Connery, 337 Louise Dr., Corpus Christi, Tex. 78404; D. Dexter Bacon, 9649 Paula, Corpus Christi, Tex. 78410, and Stacy K. Blair, 3802 Caravelle #514, Corpus Christi, Tex. 78412

Filed Apr. 13, 1989, Ser. No. 339,596
Int. Cl.[5] E02B *11/00;* E02D *27/00*
U.S. Cl. 405—229 15 Claims



1. A foundation watering system comprising

a building in an area having a shrinking and swelling soil zone and having a foundation supported on the shrinking and swelling soil zone;

means for applying water to the shrinking and swelling soil zone; and

means for detecting movement of the foundation for controlling the water applying means for adding water to the shrinking and swelling soil zone.

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4,995,765

METHOD OF COLLECTING WASTES AND SYSTEM THEREFOR

Tomoya Tokuhiro; Nobutaka Koibuchi; Teruhiko Miyauchi; Koshin Kikuchi; Jun Hirokawa, all of Tokyo; Kunio Yamashiro, Yokohama; Sakae Nishizuka, Yokohama; Ippei Watanabe, Yokohama; Shozo Maruo, Yokohama; Yohichiro Tsutsui, Yokohama, and Sadahito Ishikawa, Yokohama, all of Japan, assignors to Shimizu Construction Co., Ltd., Tokyo and Shinmeiwa Industry Co., Ltd., Nishinomiya, both of, Japan

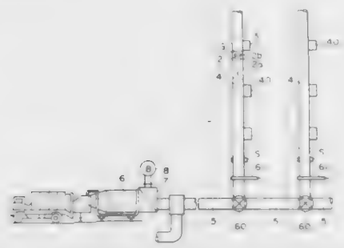
PCT No. PCT/JP87/01015, § 371 Date Apr. 18, 1988, § 102(e) Date Apr. 18, 1988, PCT Pub. No. WO88/04640, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 22, 1987, Ser. No. 207,041

Claims priority, application Japan, Dec. 22, 1986, 61-305991; Jun. 23, 1987, 62-155809; Jul. 8, 1987, 62-170071; Jul. 8, 1987, 62-170075; Jul. 8, 1987, 62-170076; Jul. 8, 1987, 62-170077

Int. Cl.[5] B65G *51/36, 51/42, 51/20, 51/30*

U.S. Cl. 406—117 22 Claims



10. A waste collection system for transporting wastes from various positions in a building to a predetermined waste accumulation area, the waste being contained in a waste container of a predetermined configuration, said waste collection system comprising:

(a) a horizontal transport tube having an inner diameter slightly larger than an outer diameter of said waste container, being laid in an approximately same horizontal plane as said waste accumulation area, and having one end thereof openable at said waste accumulation area;

(b) a blower connected to said horizontal transport tube and which generates an air flow through said horizontal transport tube thereby transporting the waste container through the horizontal transport tube;

(c) a vertical transport tube whose inner diameter is slightly larger than the outer diameter of said waste container, said vertical transport tube being provided in an approximately vertical direction so as to communicate with floors of the building, and being connected to said horizontal transport tube at its lower end, so that said waste container descends therethrough to said horizontal transport tube, the vertical transport tube having means for slowing down the speed of descent of the waste container therethrough, the means for slowing down speed of descent including means for providing upward braking force to the waste container by virtue of pressurized air in the vertical transport tube beneath the waste container;

(d) an input port having an opening which opens towards the inside of the building at a first end thereof, said input port being connected to said vertical transport tube at a second end thereof, so that said waste container thrown in said opening is moved from said opening to said vertical transport tube;

(e) a shutter provided in said horizontal transport tube in the vicinity of the waste accumulation area, for opening/closing an end of the horizontal transport tube;

(f) classification means for identifying and classifying said waste container as it is stopped by said shutter and sending a classification signal; and

(g) moving means for receiving said waste container and selectively carrying the waste containers to plural positions according to said classification signals.

4,995,766

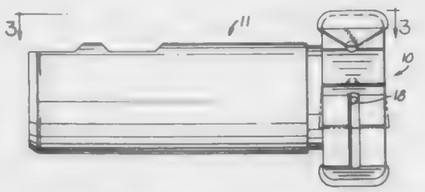
INSERT CUTTER

Robert L. Coleman, Oxford, Mich., assignor to GTE Valenite Corporation

Filed Aug. 14, 1989, Ser. No. 392,875

Int. Cl.[5] B23C *5/00, 5/02*

U.S. Cl. 407—34 12 Claims



1. Replaceable insert cutter comprising a cutting body, a plurality of insert pockets in the periphery of said body, each pocket having an insert back locating wall establishing insert circumferential position, a V-shape support seat establishing a radial and axial position of said insert, and a radial threaded screw hole extending inwardly from the axel of the V-shape support seat, a cutter insert mounted in said pocket having a back surface engaging said back locating wall, a V-shaped base of the insert seated on said support seat, a screw hole and screw extending radially toward the axis of the cutter body through said insert in retaining engagement with said threaded screw hole, and a radially outermost cutting edge facing circumferentially away from said back surface.

4,995,767

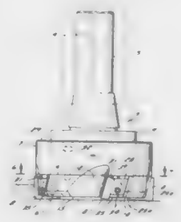
FACE MILLING CUTTER WITH INDEXABLE INSERTS

Arthur R. Segal, Jasper, Ind., assignor to North American Products, Corp., Jasper, Ind.

Continuation of Ser. No. 256,055, Oct. 11, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 502,833

Int. Cl.[5] B26D *1/12*

U.S. Cl. 407—41 3 Claims



1. A cutter body for a face milling cutter that has a predetermined effective diameter and is adapted for rotation about an axis in a predetermined direction; said cutter body being adapted to have a plurality of identical indexable cutting inserts of a predetermined inscribed circle size detachably secured to it at circumferentially spaced intervals around said axis, each said insert having flat relatively large leading and trailing surfaces that are opposite and parallel to one another and having four identical small, flat relief surfaces, each at an acute angle to said leading surface, which intersect said leading surface to define thereon four identical straight edges, each said edge extending at right angles to two of the others and being tangent to an imaginary inscribed circle of said size; said cutter body comprising a front member which is substantially concentric to said axis and which has a front face at a front end thereof that defines a first plane normal to said axis, a rear face which is opposite said front face and is spaced axially rearwardly therefrom, a peripheral surface, and a plurality of identical recesses, one for each insert, that are spaced apart at circumferential intervals and each of which opens radially through said peripheral surface, axially forwardly through said front face and axially rearwardly through said rear face; said cutter body further comprising a rear member separable from said front member and from a spindle by which the cutter body can be carried for rotation, and releasable locking means cooperating with said front and rear members to detachably fix the rear member in concentric axially rearwardly adjacent relationship to the front member and in a predetermined rotational position relative to the front member;

said cutter body being characterized by:

A. said front member

(1) having every portion of its said peripheral surface at a radial distance from said axis that is substantially smaller than one-half of said effective diameter,

(2) having on its said rear face flat rearwardly facing surface areas which are all contained in a second plane normal to said axis that is spaced rearwardly from said first plane by a distance not substantially greater than the diameter of said inscribed circle;

B. each said recess defining on said front member a flat circumferential locating surface against which one of said relatively large surfaces on the insert for the recess is flatwise engageable to establish the circumferential position and rake angles of that insert, said circumferential locating surface

(1) facing substantially in one circumferential direction, and

(2) being oblique to, and having an intersection with, an imaginary plane that contains said axis and extends radially therefrom to that intersection, the inclination of the circumferential locating surface relative to that plane being radially outward and in said direction of rotation for positive radial rake, and axially forward and in said direction of rotation for positive axial rake;

C. each said recess further defining on said front member a flat, elongated radial locating surface which faces away from said axis and against which one of said relief surfaces on the insert is flatwise engageable to establish the radial position of the insert, said radial locating surface

(1) extending lengthwise substantially from said front face to said rear face,

(2) being lengthwise substantially parallel to said axis, and

(3) being spaced from said axis by a radial distance substantially equal to one-half of said effective diameter minus the diameter of said inscribed circle;

D. said rear member having a flat front face which is held engaged against said rearwardly facing surface areas on the front member by said releasable locking means;

E. said rear member further having thereon, at circumferentially spaced intervals therearound, a plurality of abutment elements, one for each said recess, each said abutment element

(1) projecting forwardly beyond said flat front face of the rear member,

(2) having thereon a flat, forwardly facing axial locating surface engageable by another of said relief surfaces on the insert for its recess to establish the axial position of the insert relative to the front member, and

(3) having its axial locating surface contained in a third plane normal to said axis which also contains the axial locating surfaces on the other abutment elements and which is spaced to the rear of said first plane by a distance smaller than the diameter of said inscribed circle;

F. said cutter body further comprising a plurality of insert clamps, one for each of said recesses,

(1) each comprising a screw having threaded engagement with said front member, and

(2) each arranged for forcefully but releasably engaging the other of said large surfaces on the insert for the recess to clampingly confine the insert against the circumferential locating surface defined by its recess, to thus releasably fix the insert relative to the cutter body; and

G. said releasable locking means comprising

(1) one of said body members being annular to have a coaxial central aperture,

(2) the other of said body members having a reduced diameter concentric neck portion projecting therefrom that is received with a close axially slidable fit in said central aperture in said one body member, and

(3) a plurality of further screws that extend parallel to said axis and are disposed at circumferentially spaced intervals around said central aperture and said neck portion, each having engagement with both of said body members.

4,995,768

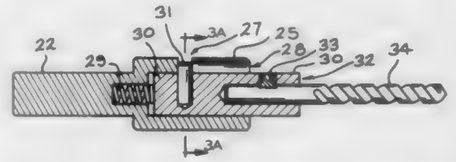
RAPID CHANGE DRILL HOLDER ASSEMBLY

Ralph Craft, 7221 Five Point Hwy., Easton Rapids, Mich. 48827

Filed Jul. 31, 1989, Ser. No. 387,005

Int. Cl.[5] B23B *51/12*

U.S. Cl. 408—239 A 4 Claims



1. In a rapid change drill holder assembly, the combination comprising:

a chuck-engaging adaptor holder having a longitudinally extending chuck-engaging extension provided at one end thereof, said chuck-engaging adaptor holder having a tool holder adaptor receiving portion at the opposite end thereof, said tool holder adaptor receiving portion having an axially extending tool holder adaptor receiving bore longitudinally provided therein, said tool holder adaptor receiving bore provided with a tool holder adaptor engaging biasing spring at the inside terminal end thereof;

a transversely oriented tool holder adaptor peg receiving arcuate slot defined in the wall of said tool holder adaptor receiving portion, said arcuate slot being in open communication with said tool holder adaptor receiving bore, said arcuate slot having a tool holder adaptor peg engaging end wall provided at each end thereof;

a longitudinally extending tool holder adaptor peg receiving groove defined int he wall of said bore so as to extend from the open end of said bore into open communication with said arcuate slot, said peg receiving groove being in open communication with said arcuate slot at a point intermediate the distal ends of said arcuate slot;

a tool holder adaptor for selective operative engagement with said chuck-engaging adaptor holder, said tool holder adaptor having a tool receiving bore at one end thereof for selectively receiving a tool therein, said tool holder adaptor provided with a radially oriented tool-retaining setscrew for fixedly retaining a tool selectively positioned in said tool receiving bore, said tool holder adaptor having a cam follower peg radially extending outwardly from the side thereof, said cam follower peg adapted for selective movement through said tool holder adaptor peg receiving groove into operative alignment with said transversely oriented arcuate slot upon selective insertion of said tool holder adaptor into said tool holder adaptor receiving bore of said chuck-engaging adaptor holder, said tool holder adaptor selectively twisting so as to selectively move said cam follower peg into selective operative engagement with a selected distal end wall of said arcuate slot, said tool holder adaptor in selective biased engagement with said biasing spring so as to maintain said peg in its operative use engagement with said arcuate slot.

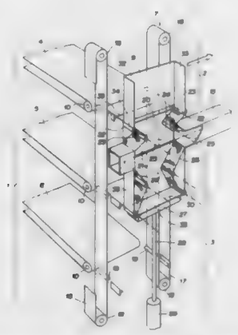
VOL 1123 ISS 4 FE 26 1991 UMI

4,995,769

ROD CONVEYOR AND COMPARTMENT THEREFOR

Maurice Berger, Cortaillod, and Michael Lauenstein, Cormondrèche, both of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Mar. 29, 1989, Ser. No. 330,306
Claims priority, application Switzerland, Apr. 5, 1988, 1349/88
Int. Cl.[5] B65B *19/04*; B65G *65/02, 65/40*
U.S. Cl. 414—403 7 Claims



1. A rod-conveying installation of the type having a conduit for receiving a flow of parallel rods oriented perpendicular to the direction of said conduit, an extractor for extracting rods from said conduit at a first location, a feeder for introducing rods into said conduit at a second location, a plurality of compartments for holding said rods, a compartment-filling means associated with said extractor, a compartment-emptying means associated with said feeder and a system for conveying and storing said compartments, wherein said compartments include an opening bottom, said conveying and storage system comprising two or more elongated and superposed levels for respectively receiving a number of parallel said compartments disposed in a row, and two vertical conveyor tracks interconnecting said levels at the ends thereof, said system being disposed in a vertical plane and arranged for moving said compartments solely in translation along a circuit capable of comprising different routes between said extractor and said feeder or vice versa, and said conduit being oriented in a direction intersecting said vertical plane at a point adjacent to said conveying and storage system.

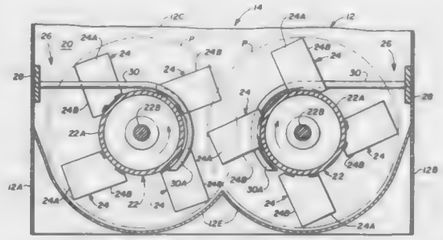
4,995,770

BAG RUPTURING MECHANISM FOR WASTE MATERIAL DEBAGGING APPARATUS

Jack W. Crane, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Dec. 26, 1989, Ser. No. 456,706
The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.
Int. Cl.[5] B65G *65/34*
U.S. Cl. 414—412 2 Claims

1. A material debagging apparatus comprising:
- a receptacle defining a chamber for holding bagged material;
- means for rupturing a bag disposed in said chamber and at least partially filled with material, said rupturing means being carried on said receptacle, said rupturing means including a pair of generally parallel rotatable members with a plurality of teeth mounted thereon;
- drive means coupled to said rotatable members of said rupturing means for transmitting rotary power thereto and being operable to rotate said rotatable members for causing rupturing of the bag by said teeth;
- means mounted on said receptacle for releasably clamping the bag in order to releasable secure the bag to said receptacle;
- said teeth on each rotatable member being disposed in a plurality of circumferential rows spaced from one another axially along each rotatable member; and
- said rupturing means also including a pair of grate-like structures each formed of a plurality of laterally spaced bars disposed above one of said rotatable members for supporting said bag and extending between said circumferential rows of teeth with outer ends of said teeth following circular paths of travel which project above said bars upon rotation of said rotatable members thereby bringing said outer ends of said teeth into engagement with the bag.

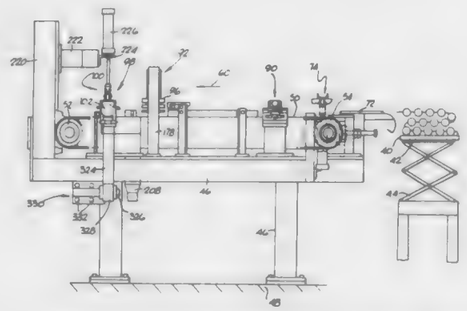


4,995,771

APPARATUS AND METHOD FOR DEBAGGING ARTICLES

William A. Sedgeley, and Ronald L. Moore, both of Golden, Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Jan. 26, 1990, Ser. No. 470,822
Int. Cl.[5] B65B *69/00*
U.S. Cl. 414—412 35 Claims



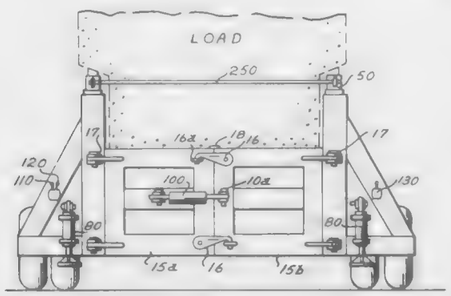
1. Apparatus for removing articles from a plurality of interconnected sealed compartments wherein each sealed compartment has a plurality of articles confined therein comprising:
- a support structure mounted at a fixed location;
- an endless conveyor mounted on said support structure and having an upper run and a lower run;
- moving means for moving said endless conveyor;
- said endless conveyor having a width extending perpendicular to the direction of movement of said endless conveyor;
- dividing means extending in a widthwise direction on said endless conveyor for forming a plurality of holding units on said endless conveyor so that consecutive sealed compartments of said plurality of interconnected sealed compartments are located in consecutive holding units of said plurality of holding units;
- each of said sealed compartments having a plurality of articles confined therein;
- said plurality of interconnected sealed compartments being formed by two continuous webs of flexible material having spaced apart widthwise extending sealing strips and spaced apart, continuous lengthwise extending end sealing strips;
- cutting means mounted on said support structure for cutting said two continuous webs of flexible material at locations between each continuous end sealing strip and said articles in said compartments to form a cut compartment;
- holding means mounted on said support structure for holding said cut compartment at a fixed location;
- first force applying means mounted on said support structure for contacting an end article in said held cut compartment and applying a force thereto to move said plurality of articles out of said held cut compartment;
- a receiving and transferring unit mounted on said support structure for receiving said articles pushed out of said held cut compartment;
- conveying means for conveying said articles to further processing apparatus; and
- transfer means mounted on said receiving and transferring unit for transferring articles from said receiving and transferring unit to said conveying means.

4,995,772

SELF LOADING AND UNLOADING PRE-CAST CONCRETE HAULING UNIT

Richard R. Biggio, Rte. 1, Box 30, 756 River Rd., Lindley, N.Y. 14858

Filed Nov. 16, 1989, Ser. No. 437,264
Int. Cl.[5] B60P *3/00*
U.S. Cl. 414—458 26 Claims



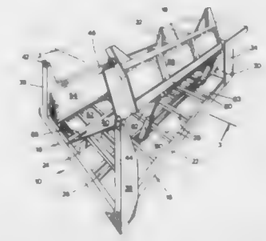
1. A computer automated vehicle with hydraulic control for transporting concrete segments, comprising of:
- a rigid U-shaped chassis;
- a plurality of wheels mounted on said U-shape chassis to support said chassis above a roadway at a clearance height for rolling movement in a travel direction;
- said U-shaped chassis being elongated and including an open end and in the travel direction a closed end, and two longitudinal lattice frames therebetween for defining a right and left side of said chassis, at least two movable beams attached to a top portion of said lattice frames to lift, support, and lower said precast concrete segments;
- a hydraulic lifting system including a series of hydraulic cylinders imbedded vertically in both the right longitudinal lattice frame and left longitudinal lattice frame which cylinders when extended apply a lifting force to said movable beams;
- a vertical locking system including a series of intersliding rectangular steel beams which extend and lock vertically to stabilize and secure said movable beam at a transport height;
- a tailgate assembly mounted at said open end of said chassis, said assembly including at least two steel doors rotatably connected to said right and left lattice frames respectively, said doors open and close and lock through hydraulic control in order to secure both said right and left longitudinal lattice frames and said movable beams holding said concrete segments for transport, and means for fixedly locking said doors closed;
- angular lattice bracing members connected to and protruding outwardly from both sides of said longitudinal lattice frames for reinforcing said chassis to counteract lateral movement of said wheels when rolling in said travel direction; and
- a computer system mounted near said closed end of said chassis to control and monitor lifting, supporting, and lowering of said precast concrete segments, said computer system including a microprocessor controlled analog/-digital input and digital/analog output to control said hydraulic lifting system, said vertical locking system, and said tailgate assembly in order to automatically load, secure for transport, and unload said concrete segments.

4,995,773

SPREADER AND DUMP TRUCK CONSTRUCTION

Guy Lamoureux, Drummondville, and Jean-Marie Bibeau, St. Gabriel de Brandon, both of Canada, assignors to Tenco Machinery Ltd., Quebec, Canada

Filed Jan. 3, 1990, Ser. No. 460,507
Int. Cl.[5] B60P *1/04*
U.S. Cl. 414—489 5 Claims



1. A spreader and dump box for a truck vehicle having a chassis with a rear portion, the dump box comprising a dump box frame pivotally mounted about a lateral axis on the rear portion of the vehicle chassis, the dump box frame further comprising a first sub-frame having longitudinal first and second side frame members and a front bulkhead having a side pillar on either side thereof mounted on the first and second side frame members, a pair of side pillars provided on the first and second side frame members at the rear of the first sub frame, the first sub-frame including at least a pair of longitudinal beam members extending parallel to the first and second side frame members and spaced an equal distance on either side of a central longitudinal axis of the dump box frame, the pair of beam members including a first channel-shaped beam member and a second channel-shaped beam member, the second channel-shaped beam member having an upper flange which is angled, a conveyor including a conveyor frame which has a pair of parallel edge members and a conveyor belt passing over the conveyor frame between the edge members, the conveyor frame being integrated in the first sub-frame between the first side frame member and the second channel-shaped beam member, an edge member of the conveyor frame being connected to the upper, angled flange of the second channel-shaped beam member, the other edge of the conveyor frame being connected to the first side frame member, a second sub-frame hingedly mounted on the first sub-frame member on one side of the conveyor between an edge member of the conveyor frame and the second side frame member, and having a hinge axis parallel and adjacent the conveyor frame edge member, the second sub-frame including a third side frame member coextensive with the second side frame member of the first sub-frame when the second sub-frame is in a lowered position, and a side wall being provided on the third side frame member of the second sub-frame adapted to fit between the side pillar of the bulkhead and the rear pillar on the second frame member of

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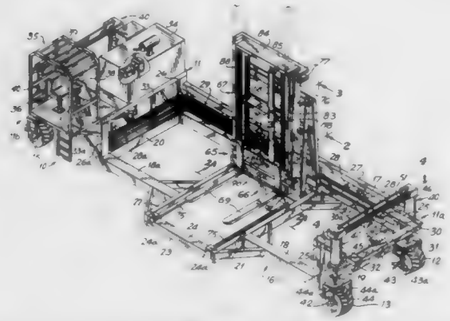
the first sub-frame and within a plane including the pillars, and means for pivoting the second sub-frame away from the first sub-frame about the hinge axis.

4,995,774

SIDE-LOADING FORK LIFT VEHICLE

Howard G. Nusbaum, Brooklyn, N.Y., assignor to Robert R. Gerzel, Orlando, Fla.

Filed Apr. 25, 1989, Ser. No. 342,999
Int. Cl.[5] B62D *1/00*; B66F *9/00*
U.S. Cl. 414—544 9 Claims



1. A side-loading fork lift vehicle for handling a heavy load which is long relative to its width, said vehicle comprising:

a. an elongated vehicle body having front and rear ends and opposite sides, front and rear ground wheels with independent axles, and respective vertical hydraulic piston and cylinder units interposed between said axles and said front and rear ends of said vehicle body for mounting the latter on said wheels;

b. respective motor means for driving said front and rear ground wheels in forward and reverse, and means for controlling the orientations of said front and rear ground wheels through respective 180° arcs composed of 90° arcs to either side of a line parallel to the longitudinal axis of said vehicle body for enabling movement of the vehicle in either straight ahead mode or lateral translation mode or radius turning mode or crabwise mode in either the forward or the reverse direction;

c. said vehicle body including (i) an elevated operator's cab at said rear end, of said vehicle body and (ii) an elongated, substantially rectangular load-carrying frame section arranged between said operator's cab and said front end of said vehicle body, said frame section including respective longitudinal beam means at said opposite sides of said vehicle body and a pair of spaced, parallel transverse beam means in the mid-region of said frame section and extending from one of said longitudinal beam means at one side of said vehicle body past the other of said longitudinal beam means at the other side of said vehicle body so as to have an end region located laterally outwardly of said vehicle body, said longitudinal and transverse beam means being disposed in a plane below that of said operator's cab and below that of said front end of said vehicle body, and said hydraulic piston and cylinder units being operable to maintain said beam means elevated above the ground when the vehicle is to be in motion and to lower said beam means to rest on the ground when the vehicle is to be stationary during an on-loading or off-loading operation;

d. guideway means on said transverse beam means and extending along the latter, a trolley mounted on said guideway means between said transverse beam means for reciprocal movement therealong, and first hydraulic piston and cylinder means mounted on said frame section for moving said trolley along said guideway means; and

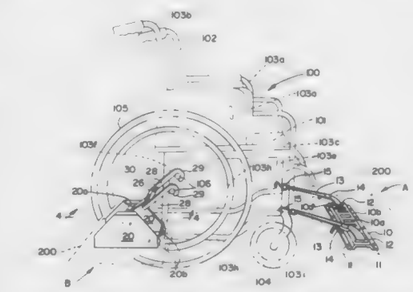
e. load-handling means arranged on said trolley and including a vertical framework carried by said trolley, mast means mounted in said framework for vertical up and down movement relative thereto, second hydraulic piston and cylinder means mounted on said trolley for moving said mast means up and down, and a plurality of fork arms carried by said mast means and extending therefrom in a direction away from said one side of said vehicle body, said fork arms being adapted, upon an appropriate movement of said trolley, to be retracted to a position within the confines of said frame section or protracted to a position outside the confines of said frame section beyond said other longitudinal beam means.

4,995,775

TIE DOWN APPARATUS FOR WHEELCHAIR

Gerald L. Gresham, 30800 Wixom Rd., Wixom, Mich. 48096

Filed Mar. 1, 1990, Ser. No. 486,818
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] B60P *3/06*
U.S. Cl. 410—10 19 Claims



1. An apparatus for securing a wheelchair to the floor of a vehicle wherein the wheelchair has a front and a rear and includes a frame means with front posts mounting spaced apart front wheels on front axle means and rear axle means mounted on the frame means supporting spaced apart rear wheels behind the front wheels which comprises:

(a) a front attachment means for securing the front of the wheelchair to the floor; and

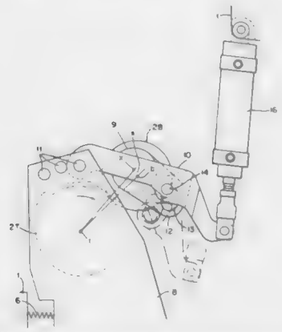
(b) a rear attachment means for securing the rear of the wheelchair to the floor including (i) a rear bar means which can mount on the rear of the frame means of the wheelchair; (ii) a fixed length foldable connection link means formed of rigid members and having opposed ends with a cross member means mounted horizontally at one of the ends and attached to the rear bar means at the other end and with a hinge means intermediate the ends of the link means which folds on a horizontal axis; and (iii) a floor support means with the cross member means secured between upright member means which are secured to the floor, wherein the cross member means with the floor support means, link means and rear bar means hold the wheelchair in position when the wheelchair is pulled in a forward direction and secured by the front attachment means.

4,995,776

OPERATING APPARATUS FOR FEEDING, TAKING UP AND TENSIONING A BINDING STRAP

Kanami Kato, Sakai, Japan, assignor to Signode Corporation, Glenview, Ill.

Filed Apr. 10, 1989, Ser. No. 335,934
Claims priority, application Japan, Apr. 15, 1988, 63-94338
Int. Cl.[5] B65B *13/02*
U.S. Cl. 410—100 10 Claims



1. Apparatus for feeding, taking up, and tensioning a binding strap, comprising:

a traction wheel;

a back-up wheel operatively associated with said traction wheel for defining a gap therebetween within which a portion of said binding strap can be disposed for movement in forward feeding and reversed retraction directions so as to achieve feeding and tensioning binding operations;

a pivotable support plate upon which one of said traction and back-up wheels is mounted;

means for eccentrically mounting the other one of said traction and back-up wheels such that said two wheels can relatively approach and separate from each other so as to retain said binding strap within said gap or permit introduction of said binding strap into said gap, respectively;

connecting link means for connecting said eccentrically mounted wheel to said support plate; and

spring means for biasing said support plate in a direction which will cause said eccentrically mounted wheel to be moved toward said one of said wheels in response to the biasing force of said spring means being transmitted to said eccentrically mounting means through said support plate and said connecting link means.

4,995,777

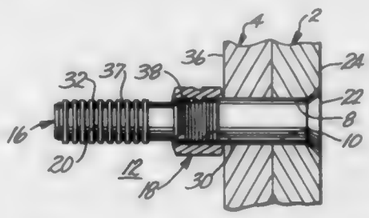
FASTENER WITH SELF-RETAINING COLLAR

John H. Warmington, Culver City, Calif., assignor to VSI Corporation, Culver City, Calif.

Filed Apr. 9, 1990, Ser. No. 506,665
Int. Cl.[5] F16B *19/00*
U.S. Cl. 411—361 17 Claims

1. A dimpled collar adapted for being swaged into locking grooves of a pin, the collar comprising:

a substantially right cylindrical member having a central bore, and an outer surface having a symmetrically located dimple which creates a detent of the collar material extending into the bore, the cylindrical member having an inner diameter slightly greater than an outer diameter of the locking grooves, except that the inner diameter of the cylindrical member at the detent is slightly smaller than the outer diameter of the locking grooves for frictionally engaging at least one of the locking grooves, the cylindrical member and detent being sufficiently resilient for sliding the collar over the locking grooves.

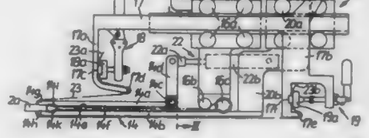


4,995,778

GRIPPING APPARATUS FOR TRANSPORTING A PANEL OF ADHESIVE MATERIAL

Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Krupp Maschinentechnik Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 29, 1989, Ser. No. 460,282
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1989, 3900342
Int. Cl.[5] B66C *19/00*
U.S. Cl. 414—20 11 Claims



1. A gripping apparatus for longitudinally transporting a panel of adhesive material in a first direction comprising:

a supporting frame having a direction-changing point which is stationary relative thereto;

a carriage supported by said frame for movement in said first direction;

release drive means for moving the carriage in said first direction;

holding tongs separated by said carriage and including upper and lower tong arms having mutually facing interior sides;

the upper tong arm pivotally mounted relative to the lower tong arm;

a tensioning frame mounted to said carriage for movement therewith in said first direction;

a continuous adhesion reducing sheet having opposed first and second end sections each secured to said tensioning frame, said sheet traversing a continuous path from said tensioning frame along the interior side of the upper tong arm, around the direction-changing point and thereafter in a second direction opposite to said first direction along the interior side of the lower tong arm, and thereafter around the lower tong arm in said first direction to said tensioning frame; and

a tong drive for pivotally moving said upper tong arm between a closed position, for gripping said panel with said tong arms as covered with said continuous adhesion re-

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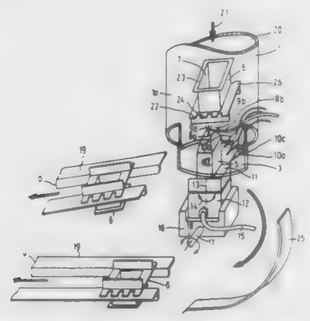
ducing sheet, and a release position in which further movement of said carriage in said first direction releases said panel from said tong arms and said continuous adhesion reducing sheet.

4,995,779

METHOD AND DEVICE FOR ALIGNING AND STORING IN A GIVEN ORDER MOLDINGS HAVING A TUBULAR PERFORATION

Torsten Müller, Hannover, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1989, Ser. No. 302,164
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803811
Int. Cl.[5] B65G *47/248*
U.S. Cl. 414—27 14 Claims



1. A method of aligning and storing in a given order moldings each having a tubular perforation, comprising the steps of:
providing a receiving mandrel profiled for reception in the tubular perforation,
providing an air turbulence space above the mandrel,
successively introducing the individual moldings into the turbulence space above the receiving mandrel,
subjecting each molding to an aligning air turbulence until the perforation is aligned with the mandrel, said turbulence being such that the molding then falls onto the receiving mandrel due to a decrease in air resistance resulting from the alignment,
passing each molding onto a deposition transport rail after reception on the mandrel.

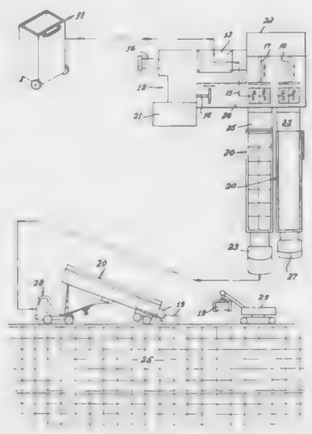
4,995,780

HANDLING METHOD FOR DELIVERING BALED SOLID WASTE TO A BALEFILL

Daniel P. Dietzler, 150 N. Montclair, Glen Ellyn, Ill. 60137

Filed Sep. 15, 1989, Ser. No. 408,144
Int. Cl.[5] B65F *9/00*
U.S. Cl. 414—400 11 Claims

1. A method for handling solid waste in a compacted bale form comprising the steps of:
ejecting a compacted solid waste bale having a length and a width in the lengthwise direction from the bale door of a solid waste baler on to a platform means;
operating a ram means and pushing the bale widthwise and transversely along the platform means to the ejecting direction to one of at least two index positions;
ejecting a compacted second solid waste bale having a length and a width in the lengthwise direction from the bale door of the solid waste baler;
operating said ram means and pushing the second bale widthwise and transversely to the ejecting direction to the position of the first said bale;
displacing said first bale in said transverse direction for a distance substantially equal to the width of the second bale whereby said first and second bales form a pair of bales to be loaded;
operating a second ram means and pushing the pair of bales in the lengthwise direction and transversely to the first mentioned transverse direction into a covered plastic-lined trailer;
ejecting and pushing additional pairs of bales into the trailer until a desired load is reached;
closing door means of said trailer and maintaining said bales in a closed condition inside the trailer;



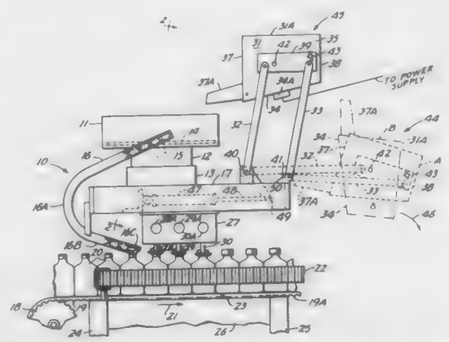
transporting said bales to a balefill site;
opening the door means of said trailer;
tilting the trailer to dump said bales in pairs at said balefill and advancing a rear edge of said trailer in a direction away from a first pair of dumped bales until all said pairs are dumped therefrom; and, picking the bales one at a time by mechanical means and stacking said bales at the balefill site.

4,995,781

MOVABLE AUXILIARY HOPPER

Kenneth J. Herzog, 7 Westerly Ct., Hampton Bays, N.Y. 11946

Filed Nov. 3, 1989, Ser. No. 431,329
Int. Cl.[5] B65G *69/00*
U.S. Cl. 414—680 6 Claims



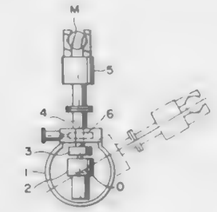
1. The combination of a movably mounted auxiliary hopper a cooperably associated dispensing hopper, and a platform therefor for discharging small articles contained in said auxiliary hopper to said dispensing hopper said dispensing hopper being mounted on said platform and adapted to feed said articles in an oriented position to a cooperably associated chute inclined downwardly to a receiving station,
said auxiliary hopper comprising a container having bottom, side and end walls and an open top for receiving a charge of small articles therein,
said container being adapted to provide gravity flow of said articles by demand to a discharge end of said container,
a U-shaped trough extending from the discharge end of the container and communicating with the interior of said container,
a pair of legs pivotally mounted to one side of said container and a complementary pair pivotally mounted on the other side thereof, and locking means disposed on each side of said container cooperably associated with said mounted legs for lockingly supporting said container in one or another of two home positions,
said legs extending to and being pivotally connected to said platform, such that the container is capable of being moved to an upper position for discharging articles to said dispensing hopper and to a lower accessible home position for charging articles to or to remove residual articles from said container.

4,995,782

APPARATUS FOR ROTATING A WRIST OF A ROBOT

Yasuyuki Suyama, Uji, Japan, assignor to Tsubakimoto Chain Co., Japan

Continuation-in-part of Ser. No. 752,942, Jul. 8, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 21,103
Claims priority, application Japan, Jul. 16, 1984, 59-106385
Int. Cl.[5] B66C *1/00*
U.S. Cl. 414—732 6 Claims



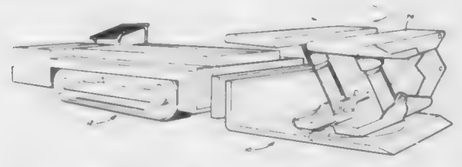
1. Apparatus for rotating the wrist of a robot to selected indexing positions comprising:
a wrist shaft movable to a plurality of indexing positions;
a motor;
a friction coupling connecting the motor in driving relationship with the wrist shaft;
an indexing plate secured to the wrist shaft, the indexing plate having recesses in its periphery at positions corresponding to said indexing positions, the transitions between the outer periphery of the indexing plate and the recesses therein being convexly rounded and smoothly merging with said outer periphery;
a roller having a size such that it is able to engage each recess on both sides of the center thereof when the wrist shaft is in an indexing position;
spring means for pressing the roller against the periphery of the indexing plate;
proximity switch means;
means for actuating the proximity switch means each time the wrist reaches an indexing position;
means for disengaging the roller from the periphery of the indexing plate; and
control means repsonsive to the proximity switch means and to indexing signals corresponding to different selected indexing positions,
for initiating operation of the disengaging means and motor upon receiving any indexing signal other than one corresponding to the current indexing position of the wrist,
for releasing the disengaging means before the selected indexing position is reached, and
for cutting off power to the motor after release of the disengaging means but before the selected indexing position is reached;
whereby the roller is urged against the periphery of the indexing plate before the wrist shaft reaches the selected indexing position so that the action of the roller against the convexly rounded trasition between the periphery of the indexing plate and the recess assists in moving the wrist into the selected indexing position.

4,995,783

MATERIAL HANDLING PLATFORM FOR MATERIAL TRANSPORT VEHICLE

Angelo S. Petitto; Angelo A. Petitto; James L. Petitto, and George W. Marshall, all of Morgantown, W. Va., assignors to Petitto Mine Equipment, Inc., Morgantown, W. Va.

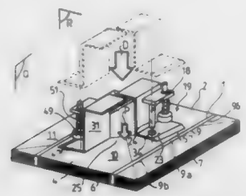
Filed Jul. 26, 1989, Ser. No. 385,695
Int. Cl.[5] B65G *7/00*
U.S. Cl. 414—786 2 Claims



1. The method of placing an additional roof support in position adjacent a long wall type mining machine in an underground mine having a mine face comprising:
positioning a roof support to be transported on a substantially horizontal material handling platform of a material transport vehicle, said roof support positioned in a substantially horizontal position on said platform, said material handling platform having a turntable device that enables said roof support on said platform to be rotated horizontally on said platform relative to the longitudinal axis of said vehicle;
positioning said roof support on said platform so that the longest dimension of said roof support is aligned with the longitudinal axis of said vehicle;
moving said vehicle and said platform with said roof support thereon along said mine face behind said long wall mining machine to a location where said transported roof support is to be positioned;
rotating said turntable and said roof support on said material handling platform 90° about a vertical axis so that the longest dimension of said roof support is perpendicular to said vehicle longitudinal axis and to said mine face;
thereafter removing said transported roof support in said rotated position from said vehicle material handling platform onto the floor of said underground mine so that said longest dimension of said roof support is perpendicular to said mine face; and
said transported roof support is removed from said material handling platform by tilting said platform from said substantially horizontal position to permit said roof support to slide off said platform.

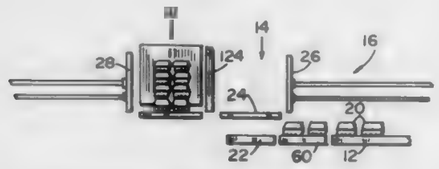
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4,995,784
PROCESS FOR BREAKING AND REMOVING A TIE SURROUNDING A BUNDLE
Jean L. Boisseau, Bucheres, France, assignor to Vega Automation, Saint Luc, France
Filed Jun. 28, 1989, Ser. No. 372,897
Claims priority, application France, Jun. 29, 1988, 8808745
Int. Cl.[5] B65B 69/00
U.S. Cl. 414—786 10 Claims



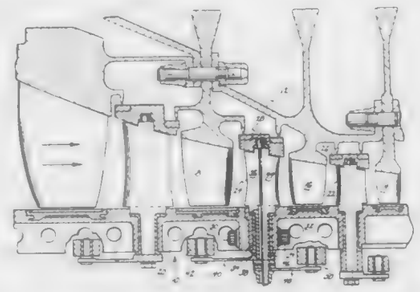
1. A process for breaking and removing a tie surrounding a bundle and arranged in a vertical plane by means of a device comprising means for holding the bundle, means for the transverse breaking of the tie having a plate, means for holding the tie and means for removing the broken tie from the bundle, the process comprising the steps of: holding the bundle with the tie to be broken and removed, creating a transverse spacing between the tie and an upper surface of the bundle by exerting two oppositely directed forces on the bundle to deform the upper surface of the bundle adjacent the tie, then positioning the breaking means into the vicinity of the tie of said bundle with the plate being between the upper surface and tie, and then simultaneously activating the breaking means in order to break the tie transversely, the means for holding and removing the broken tie and ceasing to hold the bundle so that the tie is broken and held as the bundle falls away from the held tie.

4,995,785
EGG CARTON STACKING-LOADING DEVICE AND METHOD
Kornelis Platteschorre, 4273 Mohave Ct., Grandville, Mich. 49418
Division of Ser. No. 907,225, Sep. 12, 1986, Pat. No. 4,787,799.
This application Aug. 10, 1988, Ser. No. 230,749
Int. Cl.[5] B65G 57/00
U.S. Cl. 414—790.3 33 Claims



1. A loading device for stacked packages, comprising:
a frame;
a transfer region and a laterally aligned storage region;
a stacking region laterally aligned with said transfer region;
at least two transfer panels mounted on said frame to be selectively positionable on generally opposite sides of said stacking region, said transfer panels being movably mounted on said frame so as to selectively shift to generally opposite sides of said transfer region, whereby said transfer panels shift a stack of packages from said stacking region to said transfer region;
a support panel and a pusher panel generally normal thereto laterally movably mounted on said frame, said support panel and said pusher panel having a retracted position disposed at said transfer region and an advanced position disposed at said storage region, said support panel having an unloading position in which said support panel slopes downwardly from said pusher panel and a loaded position pivoted from said unloading position to at least a horizontal position;
means for simultaneously advancing said support panel and said pusher panel, and for independently retracting said support panel and said pusher panel; and
means for pivoting said support panel between said loaded and unloading positions, whereby a stack of packages supported on said support panel are moved to said storage region by the simultaneous advance of said pusher panel and said support panel, said support panel is pivoted to said unloading position and independently withdrawn so that said pusher panel forces the stack of packages off said support panel.

4,995,786
DUAL VARIABLE CAMBER COMPRESSOR STATOR VANE
Jerry W. Wheeler, Holland, Pa., and Walter H. Wiley, III, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Sep. 28, 1989, Ser. No. 413,574
Int. Cl.[5] F01D 17/08, 17/12
U.S. Cl. 415—148 6 Claims



1. A compressor stator vane for a gas turbine engine, said vane having a leading edge section and a trailing edge section, each section having a shaftlike portion extending through the outer casing of said engine, a shaftlike projection supporting an inner shroud of said engine, and an airfoil portion between said shaftlike portion and said shaftlike projection, means connected to the shaftlike portion of each edge section for adjusting the position of each edge section, and control means connected to said section adjusting means to actuate said section adjusting means and vary the camber of said vane.

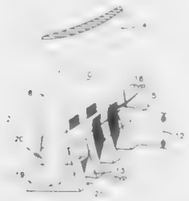
4,995,787
AXIAL FLOW IMPELLER
John F. O'Connor, Torrington, Conn., assignor to Torrington Research Company, Torrington, Conn.
Filed Sep. 18, 1989, Ser. No. 408,744
Int. Cl.[5] B63H 7/00; F01D 5/00
U.S. Cl. 416—228 7 Claims

1. An axial flow air impeller for automotive radiator, heat exchanger use and the like comprising a hub adapted for rotation about an axis and carrying a plurality of integrally formed similar circumaxially spaced and generally radially outwardly projecting air moving blades, each of said blades having a root end portion integral with the hub and a radially outwardly disposed tip end portion with smoothly curving side edges therebetween, said air impeller being adapted for undirectional rotation and said side edges comprising leading and trailing viewed from root end portion to tip end portion, the projected width of each blade thus being at least 40% greater at the tip end portion than at the root end portion, the maximum thickness of each blade varying from a maximum at the root end portion to a minimum at the tip end portion, and the maximum thickness at the tip end portion being at least three times the thickness at the blade trailing edge, and an orifice ring integral



with each blade tip end portion and circumscribing the plurality of blades, said ring having upstream and downstream ends and having a flange at one end with a substantially smooth radius at the junction with the ring portion.

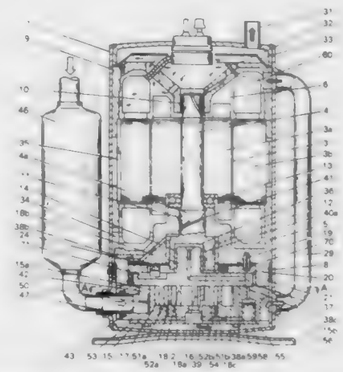
4,995,788
COMPOSITE ROTOR BLADE
Jay E. Turnberg, Longmeadow, Mass., assignor to United Technologies Corporation, Hartford, Conn.
Filed Sep. 8, 1989, Ser. No. 404,545
Int. Cl.[5] F01D 5/14
U.S. Cl. 416—230 13 Claims



1. A composite blade including a spar and a composite material, the spar having a root section and a radially outward extending surface, the composite material being layered on the radially outward extending surface and forming an airfoil surface, the root section installable in a recess in a rotor hub, the root section mateable with a complementary shaped hub recess,
wherein the root section is located radially inward of a blade base plane, said plane being tangent to the outer diameter of the rotor hub and passing through the hub recess,
and wherein the spar includes a spar recess originating and extending from the root section toward the radially outward extending surface, and
wherein the composite material is wrapped in a spanwise fashion in relation to the airfoil along the radially outward extending surface of the spar and about the spar root and captured within the spar recess.

4,995,789
ENCLOSED TYPE ELECTRIC COMPRESSOR
Katuharu Fujio, Shiga, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan
Filed Jun. 26, 1989, Ser. No. 371,471
Claims priority, application Japan, Jun. 28, 1988, 63-159997
Int. Cl.[5] F04C 15/00
U.S. Cl. 417—360 10 Claims

1. An enclosed type electric compressor comprising:
an electric motor including a rotor having a longitudinal axis and a stator having a longitudinal axis, said rotor being mounted for rotation with respect to said stator, said stator further including an outer periphery, a first end and a second end;
a compressor including a drive spindle having a longitudinal axis, a first end and a second end, said drive spindle being fixedly secured to said rotor for rotation therewith, said compressor further including a fixing member having a longitudinal axis and an outer periphery, said fixing member rotatably supporting said first end of said drive spindle and being pressed onto and fixed to said outer periphery of said stator at said first end thereof;



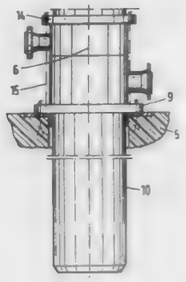
a bearing frame having a longitudinal axis and an outer periphery, said bearing frame rotatably supporting said second end of said drive spindle and being pressed onto and fixed to said outer periphery of said stator at said second end thereof; and
an enclosing vessel for receiving said electric motor, said compressor and said bearing frame therein and including an inner wall, said outer periphery of said fixing member and said outer periphery of said bearing member being pressed onto and fixed to said inner wall of said enclosing member, said rotor, stator, drive spindle, fixing member and bearing frame being concentrically mounted within said enclosed vessel such that said longitudinal axes thereof are aligned.

4,995,790
VERTICAL BARREL PUMP
Jürgen Schill, Weisenheim; Hans F. Heene, Gerolsheim; Rainer Stahl, Frankenthal, and Friedrich Weber, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany
Filed Apr. 24, 1986, Ser. No. 855,884
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515547
Int. Cl.[5] F04B 39/14
U.S. Cl. 417—360 1 Claim

1. A vertical centrifugal pump comprising an annular support; a pump barrel extending through said support and having a peripheral wall defining a shoulder which rests on said support; and means for separably securing said barrel to said support; wherein said peripheral wall includes a first portion

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having a first wall thickness, and a second portion having a second wall thickness smaller than said first wall thickness, said



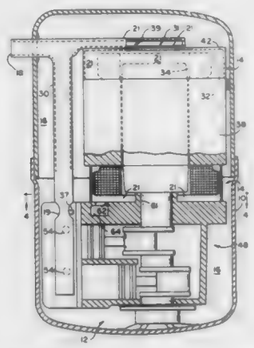
first and second portions cooperating to define said shoulder; wherein said barrel is devoid of flanges.

4,995,791

REFRIGERANT GAS COMPRESSOR UNIT

Joseph F. Loprete, Bristol, Tenn., assignor to Bristol Compressors, Inc., Bristol, Va.

Filed Nov. 25, 1988, Ser. No. 276,020
Int. Cl.[5] F04B *39/06*
U.S. Cl. 417—366 8 Claims



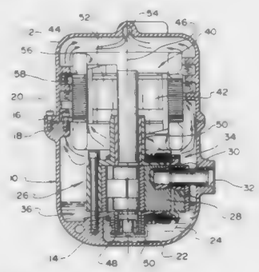
1. A gas compressor unit comprising a casing, an electric motor driven compressor mounted in said casing, a housing containing the inner cavities or passages of the motor, refrigerant suction port means in said casing, primary-feed conduit means connecting said suction means to the intake of said compressor, secondary-feed conduit means including said housing and connecting said suction port means to said primary-feed conduit means, refrigerant flow control means associated with said secondary-feed conduit means for regulating refrigerant flow therethrough, said flow control means provides a pressure drop from said secondary-feed conduit means to said primary-feed conduit means, and refrigerant discharge port means in said casing communicating with the compression chamber of said compressor.

4,995,792

COMPRESSOR SYSTEM WITH SELF CONTAINED LUBRICANT SUMP HEATER

Paul D. Brown; William J. Godecker, and Charles B. Parme, all of San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 28, 1989, Ser. No. 399,261
Int. Cl.[5] F04B *39/02*
U.S. Cl. 417—366 9 Claims



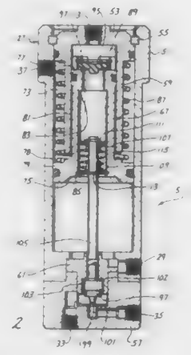
1. A compressor comprising:
a housing;
a compressing mechanism within said housing;
an outlet for compressed gas from said compressing mechanism;
an inlet for gas to be compressed to said compressing mechanism;
a sump within said housing for containing a lubricant for said compressing mechanism and in fluid communication with at least one of said compressing mechanism, said inlet and said outlet; and
means for heating the contents of said sump by exchanging heat from said compressed gas to said lubricant to decrease the solubility of the gas within the lubricant.

4,995,793

REVERSE OSMOSIS SYSTEM AND AUTOMATIC CYCLING BOOSTER PUMP THEREFOR

Donald F. Solomon, Hemet, Calif., assignor to Product Research and Development, Santa Ana, Calif.

Division of Ser. No. 111,697, Oct. 21, 1987, Pat. No. 4,836,924.
This application Apr. 18, 1989, Ser. No. 340,545
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—403 7 Claims



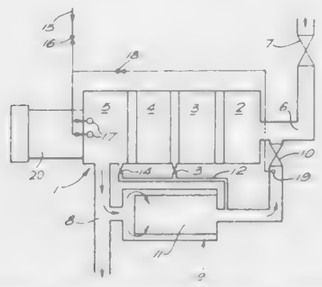
1. A fluid driven pump comprising:
a housing having a cavity, an inlet port and an outlet port;
a differential area piston reciprocable in said housing through pumping and return strokes and dividing the cavity of the housing into an inlet chamber communicating with the inlet port and an outlet chamber communicating with the outlet port, said piston having a first relatively larger area face in said inlet chamber and a second smaller area face in the outlet chamber whereby fluid in the inlet chamber can drive the piston on a pumping stroke and deliver fluid at increased pressure at the outlet port;
means for reversing the piston including a reversing valve openable to initiate the return stroke and closable to initiate the pumping stroke;
means including a portion of the reversing valve for defining a valve chamber on one side of said portion of the reversing valve whereby a pressurized fluid in the valve chamber tends to close the reversing valve;
means defining a bleed passage leading from said valve chamber; and
resilient means energized by the piston for closing the reversing valve after termination of the return stroke and before initiation of the next pumping stroke.

4,995,794

VACUUM PUMPS

Henryk Wycliffe, Crawley, United Kingdom, assignor to The BOC Group, plc, Windlesham, England

Filed Apr. 21, 1989, Ser. No. 341,528
Claims priority, application United Kingdom, Apr. 22, 1988, 8809611
Int. Cl.[5] F04B *25/00, 39/00*
U.S. Cl. 417—431 7 Claims



1. A vacuum pump comprising a pumping chamber having an inlet and an outlet and through which gas from an enclosure connectible to the inlet can be pumped, a conduit, arranged in parallel with the pumping chamber, linking the inlet and the outlet of the pumping chamber, and having a filter, and means for allowing the selective introduction of a flow of recirculating purge gas to a gas circuit including the inlet and the outlet of the pumping chamber, the conduit, the filter and the pumping chamber to effect purging of the pumping chamber.

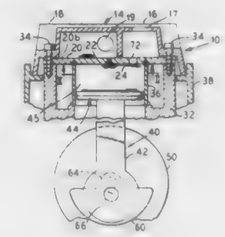
4,995,795

NOISE REDUCING WEAR SHIELD FOR PISTON FACE

Thomas Hetzel, Sheboygan, and Roy J. Rozek, Plymouth, both of Wis., assignors to Thomas Industries Incorporated, Louisville, Ky.

Filed Sep. 28, 1989, Ser. No. 413,596
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—571 18 Claims

1. A gas compressor comprising:
a cylinder;
a piston residing interior of said cylinder and movable along an axis of said cylinder, with a surface facing interior of said cylinder;
a head connected to an end of said cylinder and facing interior of said cylinder;
a valve attached to one of said head and said piston and opening interior of said cylinder;



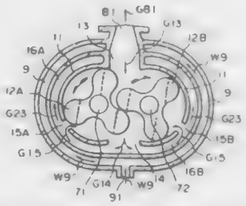
a wear shield secured to a respective other one of said piston and said head, opposite said valve, preventing repetitive contact from said valve onto said respective other one of said piston and said head during operation.

4,995,796

MULTI-SECTION ROOTS VACUUM PUMP OF REVERSE FLOW COOLING TYPE

Shigeharu Kambe, Kawasaki, and Tutomu Higuchi, Yokohama, both of Japan, assignors to Unozawa - Gumi Iron Works, Ltd., Tokyo, Japan

Filed Aug. 31, 1989, Ser. No. 400,993
Claims priority, application Japan, Sep. 5, 1988, 63-220496
Int. Cl.[5] F04C *23/00, 25/02, 29/04*
U.S. Cl. 418—9 1 Claim



1. A multi-section Roots vacuum pump of the reverse flow cooling type having a plurality of pump sections each having rotors fixed to two common shafts, said pump comprising:
a housing in each of said pump sections, said housing comprising an inner circumferential wall, an intermediate circumferential wall, an outer circumferential wall, an inlet and an outlet for a gas to be pumped through said housing, and an inner chamber enclosing rotors, said inner chamber being formed by said housing inner circumferential wall;
peripheral gas passages formed between said inner circumferential wall and said intermediate circumferential wall, said inner circumferential wall comprising a plurality of reverse flow cooling inlets extending between said peripheral gas passages and said inner chamber;
peripheral coolant water passages arranged around said peripheral gas passages and formed between said intermediate circumferential wall and said outer circumferential wall;
wherein the gas flowing through said inlet into said housing and delivered through said outlet is supplied to said peripheral gas passages for cooling, and at least a portion of the cooled gas is returned into said inner chamber through said inner circumferential wall reverse flow cooling inlets, and
the remaining portions of the gas which are not returned into the housing in the pump sections except for the last pump section are supplied to the inlet of the next pump section through said peripheral gas passage.

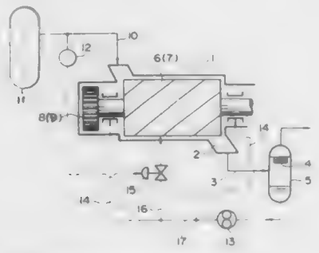
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4,995,797

ROTARY SCREW VACUUM PUMP WITH PRESSURE CONTROLLED VALVE FOR LUBRICATION/SEALING FLUID

Noboru Tsuboi, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 20, 1989, Ser. No. 438,012
Claims priority, application Japan, Apr. 13, 1989, 1-95686
Int. Cl.[5] F04C *18/16, 25/02, 27/02*
U.S. Cl. 418—84 2 Claims



1. A screw vacuum pump comprising:
a pump body having a pair of male and female screw rotors meshing with each other with a small gap defined therebetween, one of said screw rotors being driven,
a pair of rotor shafts mounting said screw rotors,
a pair of synchronizer gears mounted on said rotor shafts and meshing with each other to synchronously rotate both said screw rotors.
a rotor chamber accommodating said screw rotors,
a plurality of lubricating portions including bearing portions for lubricating said rotor shafts
an oil stripper for separating a compressed gas from an oil,
a discharge gas line leading from discharge port of said pump to said oil stripper,
an oil circulation line leading from said oil stripper to said lubricating portions and said rotor chamber in said pump body, said oil circulation line being branched to a first line leading to said lubricating portions and a second line leading to said rotor chamber,
a closing valve provided in said second line, and
a pressure switch comprising means for detecting a suction pressure of said pump body, wherein said closing valve is responsive to the pressure detected by said pressure switch for opening said closing valve when the suction pressure detected by said pressure switch falls below a predetermined value and reaches a high level of vacuum.

4,995,798

APPARATUS FOR WINDSHIELD REPAIR

Stephen L. Ameter, 1715 Linda La., Olney, Ill. 62450

Filed Jun. 30, 1989, Ser. No. 374,946
Int. Cl.[5] B32B *35/00*
U.S. Cl. 425—012 11 Claims

1. An apparatus for repairing laminated glass consisting essentially of
(1) a resin injector member having a tubular tip portion and three telescoping portions having means of engagement for stationary positioning thereof, including, a tubular body portion having openings at each opposed end thereof, a tubular vacuum stem extending outwardly from said body portion, a tubular tip portion positioned in one of the said openings having an opening therein adapted to provide access to said vacuum stem, a tubular mid-portion having an opening at each opposed end thereof and disposed to fit snugly within said body portion, and a cylindrical plunger portion, one end having a slightly enlarged portion adapted for gripping said plunger portion and an opposed end disposed to fit snugly within said mid-portion; and
(2) a support member having a planar base member, at least one leg member for supporting said base member, a suction cup, means of attachment for fixing said suction cup to said base, and an aperture through said base member



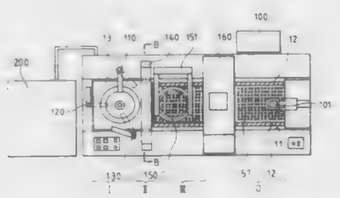
having means for engaging said injector member, wherein said support member and said injector member are removeably engaged and attached by means of said suction cup to a laminated glass surface for repair thereof.

4,995,799

OPTICAL DISC MANUFACTURING APPARATUS

Ryutaro Hayashi, and Noriaki Kaneko, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,351
Claims priority, application Japan, Oct. 15, 1987, 62-259904
Int. Cl.[5] B29D *17/00;* B29C *33/06*
U.S. Cl. 425—111 10 Claims



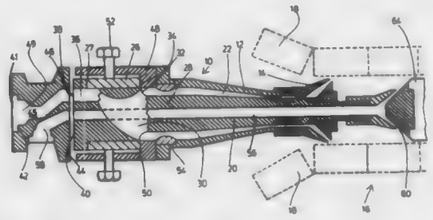
1. An apparatus for manufacturing a substrate having a transfer layer corresponding to an optical pattern by providing a liquid radiation-setting resin between a stamper carrying said optical pattern and said substrate and by setting said radiation-setting resin, comprising:
a frame;
a support member movable on said frame;
a turntable rotatably supported on said support member and including a flat portion carrying said stamper and having a recess at the center of said turntable;
a center boss arranged in said recess and supported on said support member such that said center boss is rotatable on a same axis of rotation as said turntable and is movable with said turntable along said axis of rotation;
push means for pushing the outer circumference of said substrate, after said substrate is placed on said center boss, onto said flat portion of said turntable; and
gas pressure control means communicating with said recess of said turntable for adjusting pressure in said recess.

4,995,800

EXTRUSION DIE ASSEMBLY

Manfred A. A. Lupke, 92 Elgin St., Thornhill, Ontario, Canada (L3T 1W6)

Filed Oct. 2, 1989, Ser. No. 415,586
Claims priority, application Canada, Oct. 11, 1988, 579800
Int. Cl.[5] B29C *47/06*
U.S. Cl. 425—131.1 5 Claims



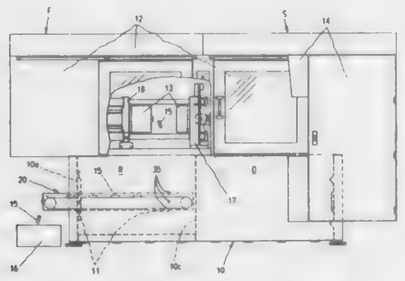
1. An extrusion die assembly for fine adjustment of double walled tubing comprising an extrusion die head including an inner member having first and second parallel side-by-side inlet passages for extrudate leading thereinto, the inlet passages converting into inner end and outer coaxial outlet passages for extrudate leading there out of;
a mandrel projecting from the inner member, an extension passage of the inner passage extending through the mandrel to open at a free end thereof;
an outer member disposed about the inner member having centering means to adjust the position of the inner member and hence the mandrel; and
a generally cylindrical, hollow, extension nozzle positioned about the mandrel, an annular nozzle extrusion passage being defined between the mandrel and the nozzle, one end of the extrusion nozzle being open for delivery of extrudate and the other end communicating the nozzle passage with the outer outlet passage.

4,995,801

INJECTION MOLDING MACHINE PROVIDED WITH A CONVEYOR FOR DELIVERING MOLDING FROM THE MACHINE

Karl Hehl, Arthur-Hehl-Str. 32, D-7298 Lossburg, Fed. Rep. of Germany

Filed Jul. 19, 1989, Ser. No. 382,730
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1988, 3827987
Int. Cl.[5] B29C *45/84*
U.S. Cl. 425—151 17 Claims



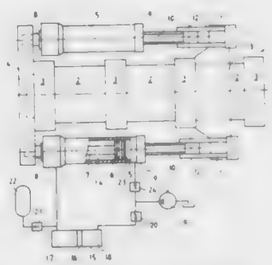
1. In an injection molding machine comprising:
a machine pedestal;
an injection mold mounted on said machine pedestal and adapted to be opened to permit at least one molding to fall out of said mold into said pedestal, said mold having a vertical projection; and
a conveyor comprising a reversing pulley device, a motor for driving said reversing pulley device and a conveying belt, said belt having a vertical longitudinal plane of symmetry and being trained around said reversing pulley device, and said belt having an outwardly facing conveying surface, said conveying surface extending in said pedestal below said mold and arranged to receive moldings which have fallen out of said mold,
the improvement residing in that
said conveying belt comprising a series of slats, which constitute said conveying surface, said slats produced from a material selected from the group consisting of metal and heat-resisting plastics,
said reversing pulley device comprising a chain sprocket apparatus,
said conveyor also comprising first and second link chains, which are trained around and in mesh with said chain sprocket apparatus and extend along said conveying surface on opposite sides thereof and along lines which are approximately symmetrical to said plane of symmetry,
each of said link chains comprising a series of chain links,
each of said slats has a first end and an opposite second end, said first end of each slat being connected to one of said chain links of said first link chain and said second end of each slat being connected to one of said chain links of said second link chain to form a slat-link assembly,
wherein said slat of each of said slat-link assemblies is detachably connected to the chain links, and
wherein each of said slat-link assemblies further comprises two plastic connectors detachably connected to said first and second ends of said slat forming said slat-link assembly and detachably connected to said two chain links forming said slat-link assembly.

4,995,802

APPARATUS FOR EXTRUDING PLASTIC MATERIALS

Dietmar Müller, Karlsruhe; Helmut Bauer, Malgersdorf; Harald Franken, Karlsruhe, and Harry Seiter, Pfinztal, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 386,102
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826641
Int. Cl.[5] C06B *21/00;* B29C *47/96*
U.S. Cl. 425—154 10 Claims



1. Apparatus for extruding plastic explosives or propellants, the apparatus comprising a casing, at least one pressing member movably mounted in said casing, a shaping retainer plate terminating an outlet side of the casing, means for fixing the retainer plate to the casing so as to be automatically raised relative to the casing upon an occurrence of a pressure within the apparatus exceeding a preset pressure, said means for fixing including a pneumatic spring means having a spring force substantially corresponding to said preset pressure, control

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means for applying a first control hydraulic pressure corresponding to the preset pressure on the pneumatic spring means, and hydraulic adjusting means for applying a second control pressure exceeding the preset pressure to the pneumatic spring means in a direction in opposition thereto to enable an arbitrary exceeding of the preset pressure to permit a selective raising of the retainer plate relative to the casing.

4,995,803

APPARATUS FOR CONTINUOUSLY PRODUCING SUBSTANTIALLY PARALLELEPIPEDAL PIECES OF MEAT

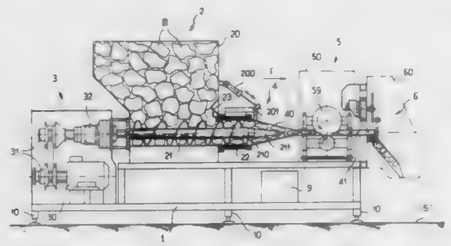
Jean-Claude Champalaune, Merdrignac; Yvon Corveler, Pontivy, and André Coutard, Villers Bocage, all of France, assignors to Kaufler S. A., Loudeac, France

Filed Sep. 12, 1989, Ser. No. 406,014

Claims priority, application France, Sep. 13, 1988, 88 12070

Int. Cl.[5] B29C *47/08*; A23L *1/317*; A23P *1/12*

U.S. Cl. 425—190 **5 Claims**



1. An apparatus for continuously producing substantially parallelepipedal pieces of meat from blocks of meat having larger dimensions than said pieces of meat, said apparatus comprising an Archimedean screw unit for supplying said blocks of meat and, at an outlet of said screw unit, a shaping device comprising a first part in the form of a funnel having an entrance of substantially circular cross-section and an exit of rectangular cross-section and a second part consisting of an extrusion device of parallelepipedal form, said extrusion device having a cross-section substantially identical to that of said exit of said first part, said apparatus also comprising a plurality of longitudinal cutting members in said second part of said shaping device, each of said longitudinal cutting members being movably disposed through a respective pair of longitudinal slots in opposite faces of said second part, means for moving said longitudinal cutting members in order to cut an extruding meat block into a plurality of meat streams, transverse cutting members and means for moving said transverse cutting members in order to cut said meat streams into a plurality of parallelepipedal pieces of meat.

4,995,804

APPARATUS FOR QUANTITATIVELY EXTRUDING FOOD MATERIAL

Koichi Hirabayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Tochigi, Japan

Filed Aug. 30, 1989, Ser. No. 400,798

Claims priority, application Japan, Oct. 4, 1988, 63-130038[U]

Int. Cl.[5] A21C *5/00, 11/16*; B29C *47/00*

U.S. Cl. 425—238 **8 Claims**

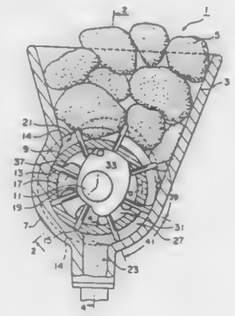
1. An apparatus for quantitatively extruding food material, comprising:

(a) a hopper for food material,

(b) an eccentrically formed cylindrical housing mounted on the bottom of said hopper, having a cylindrical side wall, which is open at the top part that faces the hopper, and two end walls, said housing being provided with a plurality of exit ports positioned away from said hopper and arranged on said cylindrical side wall in the axial direction of said housing,

(c) a rotating hollow cylindrical drum disposed in said housing, operatively connected to an axis, said axis in turn being connected to a motor, said drum having a plurality of slits formed radially through the peripheral body thereof and extending in the axial direction of said peripheral body, said side wall of said housing so formed that the periphery of said drum and the inner surface of said side wall of said housing downstream of said hopper in the direction of rotation of said drum defining a space progressively narrowing in its cross-section toward said exit ports, and slidably engaging each other downstream of said exit parts in the direction of rotation of said drum, said drum further having a plurality of flanges formed on the peripheral body thereof, and extending to engage the inner surface of said housing to divide said space into as many sections as the number of said exit ports, said sections communicating with the respective exit ports,

(d) a plurality of blades, inserted into each of said slits, and of cross-sectional dimensions defined such that they slidably fit in said slits, each said blade being provided with a recess on its trailing surface extending in the radial direction over a distance slightly greater than thickness of the peripheral body of said drum,



(e) an eccentric cylindrical cam mounted on said axis of said drum, the periphery thereof being radially spaced apart from the inner surface of said side wall of said housing by a distance equal to the radial width of said blades, engaging said peripheral body of said drum at the top portion of said drum and being progressively separated from said peripheral body in the direction of rotation of the drum defining an inner chamber together with the end walls of the housing, and enlarging in its cross-section toward said exit ports,

(f) an exit path connecting said inner chamber to said hopper,

wherein each of said blades is slidably movable as said drum rotates along said periphery of said eccentric cam and said inner surface of said side wall of said housing, so that when the rotation brings said blade to face the bottom of said hopper the outward part of said blade is arranged to protrude into said hopper to introduce said food material into each of said sections of said space to said inner chamber for releasing into said inner chamber the air trapped in a compartment formed by said two adjacent blades and the drum, an adjacent pair of said flanges or one said flange and an end wall and the inner wall of said housing, and to retract to a point where the outward end of said blade becomes flush with the periphery of said drum when said blade has moved past said exit ports.

4,995,805

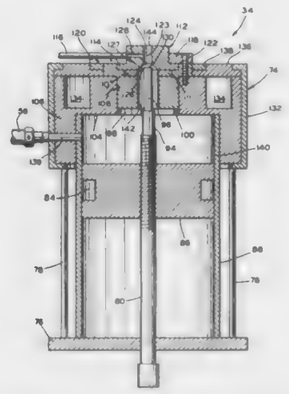
METHOD AND APPARATUS FOR INCREASING RADIANT HEAT PRODUCTION OF HYDROCARBON FUEL COMBUSTION SYSTEMS

John C. Hilliard, Ann Arbor, Mich., assignor to Gas Research Institute, Chicago, Ill.

Filed Feb. 24, 1989, Ser. No. 315,428

Int. Cl.[5] F23Q *3/00*

U.S. Cl. 431—10 **46 Claims**



1. A combustion apparatus, comprising: a pair of spaced electrodes defining a gap; means for conveying an oxidant free fuel through said gap; means for establishing a continuous arc across said gap to pyrolytically form particles dispersed in such conveyed fuel, means for preventing the deposit of such pyrolytically formed particles on one of said electrodes; and means for combining an oxidant with the fuel and dispersed particles to form a combustible mixture having particles dispersed therein.

4,995,806

DEODORIZING DEVICE FOR OIL STOVES

Kenji Akita, Sakai, and Junji Aiga, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 45,283, May 4, 1987, abandoned, Division of Ser. No. 694,840, Jan. 25, 1985, Pat. No. 4,688,546.

This application May 22, 1989, Ser. No. 356,639

Claims priority, application Japan, Jan. 30, 1984, 59-12979[U]; Feb. 1, 1984, 59-13764[U]; Feb. 2, 1984, 59-14221[U]; May 15, 1984; 59-71331[U]; May 15, 1984; 59-71332[U]

2004, has been disclaimed.

Int. Cl.[5] F23N *3/00*

U.S. Cl. 431—30 **5 Claims**

1. An oil stove device comprising:

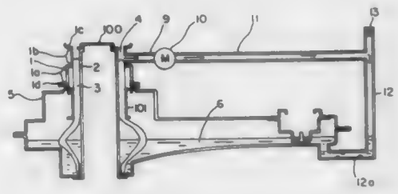
combustion means for burning fuel in response to a switch being moved to a combustion position for the generation of a flame and generating gases from said burning;

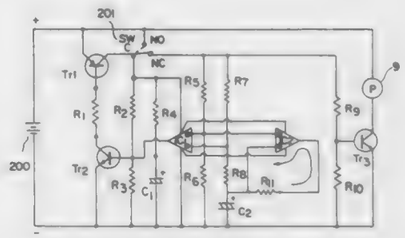
extinguishment means for extinguishing the flame in response to said switch being moved to an extinguishing position;

control means for generating a signal indicative of the position of said extinguishment means in response to the condition of said switch;

suction means for absorbing and removing the gases in proximity to the combustion means in response to the signal generated by said control means; and

timer means for operating the suction means for a predetermined period of time or until said switch is moved to said combustion position to enable the gases to be absorbed and removed in proximity to said combustion means and





resetting said predetermined period of time when said switch is returned to said combustion position.

4,995,807

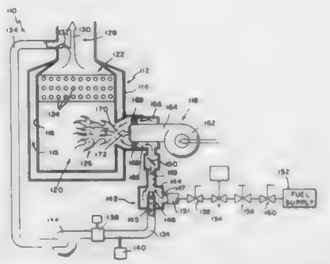
FLUE GAS RECIRCULATION SYSTEM

Thomas N. Rampley, and Paul G. Hoffarth, both of Peru, Ind., assignors to Bryan Steam Corporation, Peru, Ind.

Filed Mar. 20, 1989, Ser. No. 326,161

Int. Cl.[5] F23L *7/00*

U.S. Cl. 431—9 **13 Claims**



13. A method of reducing the amount of nitrogen oxides produced and discharged by a boiler which includes a burner assembly, a combustion chamber, a flue for exhausting combustion product created by the burner assembly from the combustion chamber, and fuel supply means for supplying a fuel gas to the burner assembly, the method comprising the steps of:

providing a housing having a first inlet, a second inlet, and an outlet,

removing a portion of the combustion product from the flue,

introducing the portion of the combustion product removed from the flue into the housing through the first inlet,

introducing a fuel gas into the housing through the second inlet to produce a mixture of combustion product and fuel gas containing at least 30% combustion product,

connecting the output of the housing to the burner assembly to supply the mixture of combustion product and fuel gas to a firing head of the burner assembly,

monitoring the pressure of the portion of the combustion product delivered to the housing from the flue, and

stopping removal of the combustion product from the flue in

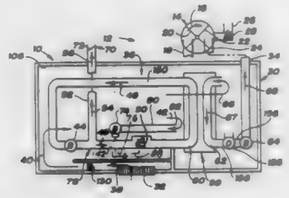
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response to the pressure falling below a predetermined level.

4,995,808
CARBON DESORPTION HEATER

William B. Pink, Birmingham, and William G. Ickes, Warren, both of Mich., assignors to Sheet Metal Industries, Inc., Melvindale, Mich.

Filed Feb. 20, 1990, Ser. No. 481,981
Int. Cl.[5] F23J *15/00*
U.S. Cl. 432—72 15 Claims



1. A carbon desorption heater for use in a system for removing volatile organic contaminants from a carbon filter, the heater comprising:

a housing having an inlet for receiving air to be heated and also having a supply outlet through which heated air is supplied to the carbon filter;

a recirculating heating circuit located within the housing, the heating circuit including a recirculation blower that moves air in a recirculating manner along the heating circuit and also including a burner that heats the air during its recirculating flow, and the heating circuit including an exhaust stack outlet through which a portion of the recirculating air is exhausted during each cycle of flow through the heating circuit;

a heat exchanger located within the housing and having a first flow path that is heated by the recirculating heating circuit, and the heat exchanger having a second flow path that is heated by heat exchange with the first flow path; and

a delivery blower within the housing for moving air through the second flow path of the heat exchanger for heating thereof and for supplying the heated air to the supply outlet of the housing.

4,995,809
BAFFLES FOR TUBE COOLERS, ROTARY TUBULAR KILNS OR THE LIKE

Ralf Filges, Bergisch Gladbach; Fred Klotmann, and Hans J. Wutschke, both of Cologne, all of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

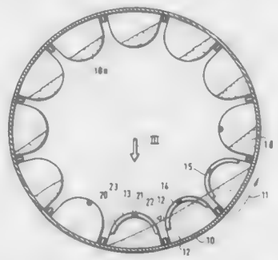
Filed Oct. 27, 1989, Ser. No. 427,505
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1968, 3837607
Int. Cl.[5] F27B *7/14*
U.S. Cl. 432—118 19 Claims

1. A mechanism for improved thermal energy transfer relative to a product within a rotary drum comprising in combination:

a rotary drum for a product subjected to tumbling therein for thermal energy transfer;

shaped baffles extending arcuately into the drum interior mounted on an inner surface of the drum with a concave surface facing outwardly of the drum interior and extending generally axially of the drum to carry the product tumbled within the drum;

said baffles defining a space limited inwardly by the arcuate baffles and outwardly by an interior surface of the drum, this space being permeated by gas within the drum and by lifted granular material product tumbled within the drum;

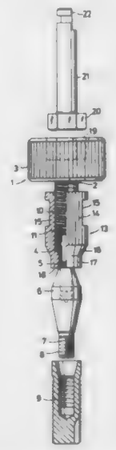


and surface constricting drum edges on the axial ends of the concave surface of the baffles constricting the inner area of the baffles preventing a product from being scattered axially from the baffles.

4,995,810
TOOL FOR A PROSTHETIC PART

Per Olof Söderberg, Stockholm, Sweden, assignor to Astra Meditec Aktiebolag, Molndal, Sweden

PCT No. PCT/SE88/00206, § 371 Date Oct. 20, 1989, § 102(e) Date Oct. 20, 1989, PCT Pub. No. WO88/08283, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 22, 1988, Ser. No. 424,270
Claims priority, application Sweden, Apr. 22, 1987, 8701652
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—141 2 Claims

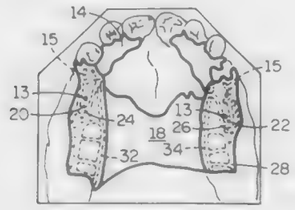


1. A tool for screwing into place a threaded prosthetic part (6), which tool comprises a turning bolt (1) which has an elongated cylindrical core (2) having at one end thereof a head (3) for turning the tool, and having at its opposite end a portion (4) with first threads (5) for fitting into threads in the prosthetic part, and having second threads (11) on a portion (10) thereof between the ends thereof, whereby a sleeve (13) is arranged around the core, said sleeve having threads engaging said second threads, whereby the sleeve may be screwed into contact with the prosthetic part (6) and to locking of the tool in the prosthetic part, characterized in the pitch direction of said second threads is opposite to the pitch direction of the first threads.

4,995,811
COMPONENT PART REMOVABLE PARTIAL DENTURE AND METHOD FOR DESIGNING AND MAKING SAME

Bert T. Cecconi, 3017 Charter Crest, San Antonio, Tex. 782230

Division of Ser. No. 119,659, Nov. 12, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,066
Int. Cl.[5] A61C *13/26*
U.S. Cl. 433—190 23 Claims



1. A method for designing and constructing a component part removable partial denture framework comprising the steps of:

forming a model design of a partial denture in component parts on a master cast;

making a wax pattern of said model design on an investment cast;

forming castings on said wax pattern;

finishing the castings in separate components;

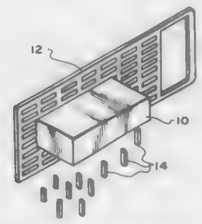
fitting the separate components on the master cast; and

locking the components together to form a single component part removable partial denture framework.

4,995,812
METHOD OF OBTAINING USABLE HYDROCOLLOID IMPRESSION MATERIAL

Fred W. Reynolds, 1516 W. 1st St., #110, San Pedro, Calif. 90733

Filed Nov. 2, 1989, Ser. No. 430,296
Int. Cl.[5] A61C *9/00*
U.S. Cl. 433—214 4 Claims



1. A method of obtaining usable hydrocolloid impression material comprising the steps of:

acquiring a solid block of hydrocolloid at around room temperature;

cutting said block into a mass of individual small parts;

subjecting said parts to microwave energy for a predetermined length of time until said parts are completely melted and intermixed forming a homogeneous liquid mass at an elevated temperature;

pouring said liquid mass into a tray;

tempering said liquid mass to a temperature which would be acceptable to the tissue within the mouth of a human being;

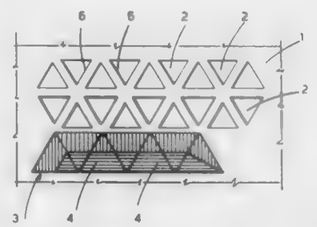
inserting said tempered mass and said tray into the mouth of the human being and applying said tempered mass against a particular area of the mouth to make an impression of the area of the mouth within said tempered mass; and

utilizing of said impression to construct a dental appliance.

4,995,813
SYSTEM OF ELEMENTS FOR THE CREATION OF GRAPHIC COMPOSITIONS

Corrado Francioni, Via Stendha 7/A, 40128 Bologna, Italy

Filed Jun. 6, 1989, Ser. No. 362,101
Claims priority, application Italy, Jun. 9, 1988, 3499 A/88
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—96 11 Claims



1. A system of elements for the creation of graphic compositions, comprising:

a first element affording a plurality of sockets arranged horizontally and a plurality of sockets arranged vertically;

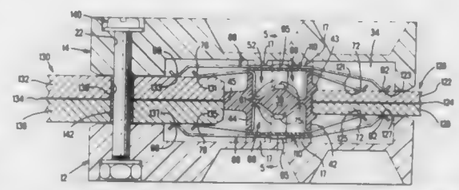
a plurality of second elements provided obversely with a flat face of regular polygon-shape, said polygon-shape defining sides of the face, and reversely with a shank insertable individually in a matching fit in the sockets of the first elements, at least one of said second elements exhibits a flat face uniformly tinted in one of a select range of colors, or of polychrome or monochrome shadings, and wherein at least one other second element exhibits a flat face divided into at least two fields, each of which are uniformly tinted in a color or shading of the same range;

wherein the sockets are arranged to match the geometry of the flat faces and set apart one from the next at a distance such that when the second elements are inserted into the sockets by way of their shanks, the flat faces are brought fully into contact one with the other so that the respective sides are adjoining, with no gaps remaining between them.

4,995,814
CONNECTOR FOR MATING BLADE-SHAPED MEMBERS

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 451,471, Dec. 15, 1989. This application Apr. 27, 1990, Ser. No. 515,400
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—61 9 Claims



1. An electrical connector for mating two blade shaped members, each having opposed first and second sides, said connector comprising:

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a dielectric spacer member having opposed major surfaces extending between opposed first and second ends;

a plurality of discrete electrically isolated first terminal members and a least a plurality of discrete electrically isolated second terminal members secured to each of said opposing major surfaces of said spacer member for electrical interconnection of first and second electrical articles at leading and trailing edges respectively, said plurality of first terminal members being adjacent said spacer member and said plurality of second terminal members disposed outwardly of said first terminal members; and

means insulating associated said first and second terminal members from each other;

each said first terminal member including first and second cantilevered spring contact arms extending outwardly in opposite directions from an intermediate body portion, the plurality of first terminal members defining first and second arrays of contact arms extending from respective said opposed ends of said spacer member, the contact arms of each said first and second arrays of first terminal members extending to free ends outwardly from a plane of respective said intermediate portion toward a corresponding first and second contact arm array of first terminal members along a respective said major surface of said spacer member defining first and second blade receiving receptacles axially outwardly of said first and second spacer member ends;

each second terminal member including first and second cantilevered spring contact arms extending outwardly in opposite directions from an intermediate portion thereof, the plurality of second terminal members defining third and fourth arrays of contact arms extending from respective said opposed ends of said spacer member, said contact arms of both said third and fourth arrays extending to respective free ends outwardly from the plane of a respective said intermediate portion toward a corresponding contact arm array of said second terminal members along said end proximate said major surface of said spacer member, said fourth arrays being proximate and associated with said second arrays;

said spring contact arms of said third and fourth arrays being longer than the corresponding spring contact arms of said first and second arrays such that the free ends of the contact arms of said third arrays are disposed substantially coplanar with those of the associated first arrays and located axially outwardly therefrom thereby extending said first blade-receiving receptacle, and the free ends of the contact arms of said fourth arrays are disposed substantially coplanar with those of the associated second arrays and located axially outwardly therefrom thereby extending said second blade-receiving receptacle; whereby

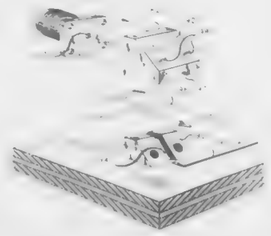
upon mating said connector with first and second blade-shaped members and outward deflection against spring bias of all said contact arms by said blade-shaped members, said first and third spring contact arm free ends engage said first blade-shaped member at a plurality of inner and outer locations along each said first and second sides thereof and said second and fourth spring contact arm free ends engage said second blade-shaped member at a plurality of inner and outer locations along each said first and second sides thereof, and each said first terminal member interconnects one of said first and second sides of said first blade-shaped member with a corresponding one of said first and second sides of said second blade-shaped member establishing a plurality of discrete current paths therealong, and each said second terminal member also interconnected one of said first and second sides of said first blade-shaped member with a corresponding one of said first and second sides of said second blade-shaped member along a plurality of inner and out locations along each said first and second sides thereof, establishing a plurality of isolated current paths therealong, all thereby lowering resistance.

4,995,815

COAXIAL TRANSMISSION LINE TO STRIP LINE COUPLER

W. A. Buchanan, E. Hampstead, N.H., and G. L. Heiter, Andover, Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 26, 1990, Ser. No. 488,819
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—63 **5 Claims**



1. A coupler for coupling a coaxial transmission line to a controlled impedance strip transmission line of a type in which a sheet of dielectric material supports a strip signal conductor on one side and a ground plane on the other, comprising

an inner conductor having a longitudinal axis, a first end section and a second end section, the longitudinal axis of said first end section forming an obtuse angle with the longitudinal axis of the inner conductor,

an annular ring of dielectric material disposed around said inner conductor, and

an outer conducting member disposed around said dielectric material,

said coupler adapted to be coupled to the strip signal conductor side of said sheet of dielectric material intermediate the edges of said sheet of dielectric material,

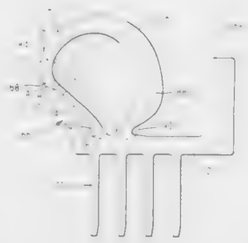
said first end section of said inner conductor projects beyond said annular ring of dielectric material and is adapted to be tangentially aligned with and coupled to said strip signal conductor on said sheet of dielectric material intermediate the edges of said sheet of dielectric material when said coupler is coupled to the strip signal conductor side of said sheet of dielectric material, and said outer conducting member is adapted to be coupled to said ground plane on the sheet of dielectric material.

4,995,816

PIVOTAL ELECTRICAL CONTACT

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1989, Ser. No. 414,561
Int. Cl.[5] H01R *23/72*
U.S. Cl. 439—71 **11 Claims**



1. In a connector for providing an electrical path between a

contacting surface of a mating electrical component and a terminal of the connector, an electrical contact comprising:

(a) a base;

(b) a terminal projecting from said base;

(c) a cantilevered member having first and second ends, said first end projecting from said base through a first pivotal zone to said second end;

(d) a contact associated with said second end of said cantilevered member; and

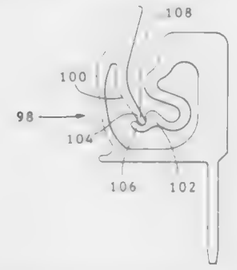
(e) a spring member having a third end and a fourth end, said third end being pivotally associated by means of a second pivotal zone with said second end of said cantilevered member and said fourth end being pivotally associated by means of a third pivotal zone with said base at a point adjacent said first end of said cantilevered member, wherein said third and fourth ends are resiliently urged apart thereby causing said cantilevered member to pivot about said first pivotal zone urging said contact into engagement with said contacting surface.

4,995,817

ELECTRICAL CONTACT

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 395,621, Aug. 18, 1989, Pat. No. 4,959,029.
This application Feb. 26, 1990, Ser. No. 485,337
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—71 **6 Claims**



6. A method for making an electrical contact, characterized by the steps of:

forming from a planar metal sheet a monolithic planar blank having a base, a first beam extending away from the base, a second beam extending from the distal end of the first beam toward the base, a support extending away from the base, and a third beam extending from the distal end of the support toward the base;

bending the first and third beams beyond their elastic limits each in a direction opposite to that in which the respective beams will be stressed when functioning as a contact; and

bending the first and third beams beyond their elastic limits each in the respective direction opposite to that of the preceding bending step so that the second and third beams engage for relative pivotal motion and remain pivotally engaged after the first and third beams are released to allow the electrical contact to resiliently assume its equilibrium position.

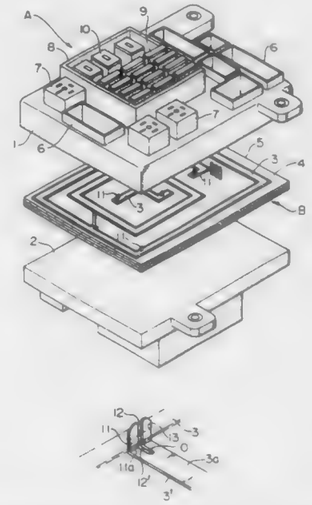
4,995,818

BUS BAR INTERLAYER CONNECTOR STRUCTURE IN JUNCTION BOX

Tetsuro Saimoto, Kosai, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,416
Claims priority, application Japan, Mar. 17, 1989, 1-29782
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—74 **5 Claims**

1. A bus bar interlayer connector structure for use in a junction box, comprising a bus bar in one layer having a tab with a leading end portion formed with a longitudinal slit and bent at the central part of the slit at right angles to the bus bar body, and another bus bar in another layer having an elongated hole formed therein and adapted to be pierced with said tab for fixedly securing the latter, wherein said longitudinal slit ex-



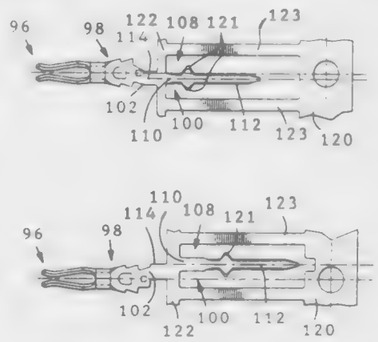
tends past the bent base portion of the tab to a pattern portion of the bus bar in said one layer.

4,995,819

SET OF STRIPS OF ELECTRICAL TERMINALS AND A METHOD OF LOADING AN ELECTRICAL CONNECTOR WITH SAID TERMINALS

William C. Ohl, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 202,167, Jun. 3, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,444
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—79 **3 Claims**



1. A set of eight strips of electrical terminals, the terminals of each strip being identical, connected together in spaced relationship by means of carrier strips, each strip of terminals being stamped and formed from a length of sheet metal stock and each terminal comprising an elongate mating part, having a forward and a rear end, a retention part for retaining the termi-

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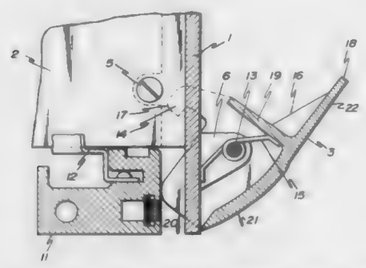
nal in a cavity in an insulating housing and having one end connected to the rear end of the mating part, a terminal leg extending parallel to the mating part and having, intermediate its ends, means for retaining said legs in a recess provided in the housing below said cavity and an arm cranked in the plane of the strip, connecting one end of said leg to said retention part and serving to laterally offset said leg from said mating part, wherein said terminal strips comprise four pairs of terminal strips, the arms of the terminals of each pair of terminal strips laterally offsetting the mating parts of the terminals of said pair from the legs thereof, in opposite directions, the legs of the terminals of a first of the pairs of terminal strips being of a first length, the legs of the terminals of second of the pairs of terminal strips being of a second length which is greater than the first length, the legs of one of the terminals of a third of said pairs being of said second length and the other leg of said third pair being of a fourth length, the legs of the terminals of the fourth of said pairs being of said fourth length which is greater than said third length.

4,995,820

SCREENING EDGE MASK FOR PRINTED CIRCUIT BOARD, WITH WITHDRAWING-RETAINING MECHANISM

Rafael R. Prados, Madrid, Spain, assignor to Telefonica De Espana, S.A., Madrid, Spain

Filed Dec. 18, 1989, Ser. No. 452,102
Claims priority, application Spain, May 10, 1989, 8901600
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—157 **12 Claims**



1. A screened edge mask for a printed circuit board, the mask comprising:

a T-sectioned strip with unequal flanges to which is attachable on one side a printed circuit board edge, and on the other side are mounted two withdrawing and retaining mechanisms for withdrawing or for holding the printed circuit board in an installed position on an equipment frame.

4,995,821

MODULE RETENTION/EJECTION SYSTEM

Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

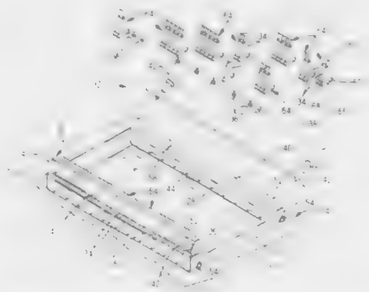
Filed Apr. 17, 1990, Ser. No. 510,371
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—157 **11 Claims**

1. A system for releasably retaining a plurality of modules in an array on a panel, comprising:

a pair of opposing assemblies secured to a panel at an array site, each assembly including at least a base member mounted against and along a surface of said panel, and each base member including a plurality of flange sections extending upwardly having aligned holes extending therethrough along which a shaft member is secured proximate said panel surface;

an array of cam lever members mounted in spaced relationship along said shaft member at each site of a module, said cam lever members each including a shaft-receiving aperture and coextending from said shaft member extending therethrough and away from said panel surface to respective free ends and reciprocally rotatably movable about said shaft member in a direction toward and away from the other said assembly, said cam lever members of both said assemblies being associated in opposing pairs at a said module site, and each said cam lever free end being adapted to be manually engaged to be rotated toward and away from the opposing said assembly between outward and inward positions;

each said cam lever member of each said pair including means for retaining a module in cooperation with retention means of said module laterally therealong when a said module is positioned in said array adjacent and between said pair of cam lever members and said cam lever members of said pair are rotated to respective said inward



positions, with said retaining means and said module retention means cooperating to retain said module in said fully mated condition; and

each said cam lever member of each said pair including a means for ejecting a module in cooperation with ejection means of a said module when said cam lever members of said pair are rotated to respective said outward positions, whereby a said module is retainable in said array by a pair of opposing cam levers independently of other modules separate therefrom in said array and is easily removable from said array while other said cam lever members retain said other separate modules in said array, and is retainable by means alongside said modules and needing only limited height, and said array of modules is retainable adjacent said panel among a plurality of like adjacent arrays, eliminating the need for additional framework and facilitating access to said modules.

4,995,822

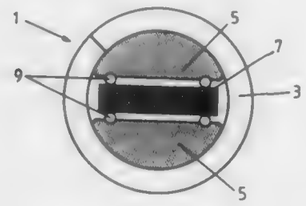
ELECTRICAL CONNECTOR

Thomas E. Borden, San Francisco, Calif.; Charles R. Nestor, Niles, Ohio, and David W. Solano, Troy, Mich., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 26, 1990, Ser. No. 471,161
Int. Cl.[5] H01R *13/24*
U.S. Cl. 439—161 **10 Claims**

1. An electrical connector for making an electrical connection between at least two contacts, comprising:

(a) a driver assembly which comprises a driver which is capable of shrinking radially inwardly and of exerting a radially inward force, the assembly having two internal surfaces of insulating material which face one another and which are forced towards one another when the driver shrinks said insulating material being plated onto the internal surfaces of the driver; and



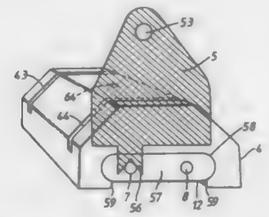
(b) electrical contacts on the inner surface of the insulating material.

4,995,823

LIGHTING STRING

Rendell A. Morales, RZ Arnhem, Netherlands, assignor to Chainlight International S.A., Luxembourg, Luxembourg

Filed Feb. 16, 1989, Ser. No. 310,993
Claims priority, application Netherlands, Feb. 18, 1988, 8800417; Oct. 31, 1988, 8802658
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—226 **19 Claims**



1. A lighting string comprising two insulated electrical wires extending substantially parallel to and spaced from each other, and a plurality of lighting fixtures mounted on and spaced from each other along the length of the electrical wires and adapted to make electric contact with said wires, said fixtures serving to accommodate and electrically connect tubular lamps parallel to the electrical wires, each of said fixtures comprising a mounting block for accommodating said electrical wires and a pair of terminals for the lamps in the form of flat metal plates, the lower part of each terminal plate of each pair being accommodated in a respective mounting block in spaced relation and having means for cutting into the insulation of one of the electrical wires to make electrical contact with said wire, and the upper part of each terminal plate having means for holding and making electrical contact with a lamp.

4,995,824

LINE COUPLING DEVICE

Robert N. Falco, Indianapolis, Ind., assignor to Cabot Corporation, Waltham, Mass.

Filed Oct. 23, 1989, Ser. No. 425,623
Int. Cl.[5] H01R *13/28*
U.S. Cl. 439—290 **10 Claims**

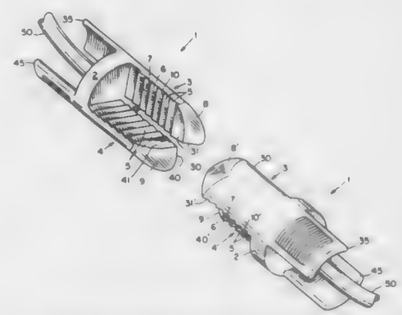
1. A line coupling device comprising two body components, each said body component comprising:

A. a resilient rear wall element;

B. at least two forwardly extending latching members supported by said rear wall element, said members being arranged parallel to and equidistantly spaced along their lengths from the longitudinal centerline of said body component, each of said members having a nose end,

(i) each of said members being of wedge-shaped cross section and defining a pair of convergent surfaces lying on radii of said longitudinal centerline, and

(ii) each said convergent surface having a plurality of latching teeth along the length thereof, the latching members of the one body component being interleavable with respect to the latching members of the other body component with the convergent surfaces of the latching members of the one body component being in at least light interference fit with respect to the corresponding adjacent convergent surfaces of the latching members of the other body component in the interleaved condition, thereby to engage the plural latching teeth of each of said convergent surfaces of the latching members of the one body component in cooperative latching engagement with the plural latching teeth of the corresponding convergent surfaces of the other body component; and



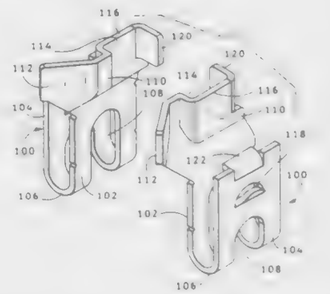
C. means for attaching line means to each said resilient rear wall element.

4,995,825

ELECTRONIC MODULE SOCKET WITH RESILIENT LATCH

Iosif Korsunsky, Harrisburg; Richard C. Schroepfer, Thompsontown, and James A. Leidy, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 19, 1990, Ser. No. 495,886
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—328 **20 Claims**



1. A socket for interconnecting an electronic module to a circuit board, the socket comprising:

an insulative housing;

a plurality of terminals positioned within the insulative housing, the terminals being configured to establish electrical contact with the module upon rotation of the module to a first position, the terminals applying a moment to the module when the module is in the first position; and

means, located on at least one end of the housing, for holding

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the module in the first position and resisting the moment applied to the module by the terminals;

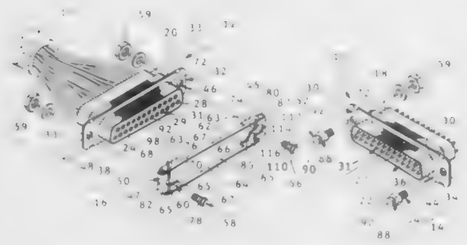
the means for holding the module being characterized in that said means comprises a U-shaped latch positioned within a pocket in the insulative housing, the U-shaped latch having inner and outer legs joined by a bight at the bottom of the U-shaped latch, the inner leg having a wedge shaped projection at its upper end, the outer leg being attached to the housing at a point adjacent the upper end of the U-shaped latch so that upon deflection of the U-shaped latch by engagement of the wedge shaped projection with the module during rotation of the module, the U-shaped latch is stressed between the wedge shaped projection and the point of attachment between the outer leg and the housing thereby forming a compliant spring.

4,995,826

CONNECTOR HAVING AN IMPROVED SLIDE LATCH AND A SLIDE LATCH MEMBER THEREFOR

Stephen B. Schieferly, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 18, 1989, Ser. No. 396,417
Int. Cl.[5] H01R *13/639*
U.S. Cl. 439—347 **15 Claims**



1. A latching member for mounting on a connector having slide latch securing means, the latching member movable laterally between a latched first position and an unlatched second position, the latching member comprising:

a base member defining first and second transverse end portions having side edges, said base member having an aperture adapted to receive a portion of the connector, and slot means proximate said aperture, said slot means adapted to receive the slide latch securing means as the latching member moves between the latched first position and the unlatched second position;

overturned extensions extending from the transverse end portions; and

side rails extending between said first and second transverse end portions and integral with side edges thereof, at least one of said side rails having means for cooperating with at least a respective one of said overturned extensions to prevent relative movement therebetween.

4,995,827

STRAIN RELIEF IDC CONNECTOR

Edward Rudoy, Woodland Hills, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 16, 1990, Ser. No. 553,060
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—405 **8 Claims**

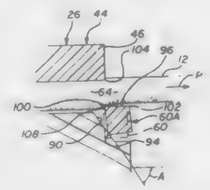
1. An insulation displacement connector for connecting to the conductors of cable wires comprising:

an insulative body having an upper end;

a plurality of contacts with portions lying in said body and with insulation displacement ends projecting from said body upper end;

a cap constructed to be pressed down toward said body upper end, to press the wires of a cable into said contact insulation displacement ends, said cap and body having a latch apparatus for holding said cap on said body;

said cap having a cover part with opposite sides and opposite ends, and at least one elongated cable support lying near a first of said cover part sides and extending parallel to said cover part side, said cable support spaced from said cover part by about the thickness of said wires, so said wires can



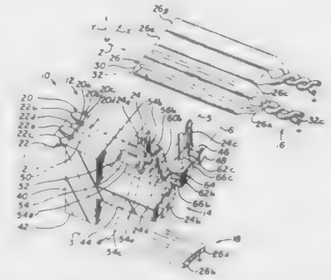
be threaded between said cover part and said cable support and under said cover part, said cable support being supported on said cover part to allow said cable support to be deflected closer to said cover part, and said body having a deflecting surface positioned to engage said cable support and deflect it relative to said cover part to squeeze said wires therebetween, whereby to provide strain relief.

4,995,828

CONNECTOR FOR PAIRED WIRE CABLE

David S. Goodman, Sun City West, Ariz., and Edward Rudoy, Woodland Hills, Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 12, 1990, Ser. No. 508,037
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—405 **6 Claims**



1. In a connector which has a connector mating end portion for mating with another connector by movement along a predetermined mating direction Z, and a wire termination end portion for connecting to two ribbon-like wire groups that have wires extending along said Z direction, with the wires in each group spaced apart along a direction X that is perpendicular to said direction Z and wherein the wires in each group include alternate grounded and signal-carrying wires, and wherein the connector includes a plurality of contacts that each has a wire termination end and a mating end, with the mating ends arranged in first and second rows wherein the contacts whose mating ends lie in the first row carry signals and the contacts whose mating ends lie in the second row are grounded, and wherein said first and second rows are spaced apart largely along a direction Y which is orthogonal to said directions Z and X, the improvement wherein:

said contacts are arranged in groups of four that include first, second, third, and fourth contacts having wire termination ends lying respectively in third, sixth, fourth and fifth rows, and mating ends lying respectively in said first row, first row, second row and second row;

said connector defining an imaginary centerplane that is normal to said Y direction and that has opposite sides, said third and fourth rows lying on one of said sides of said centerplane and being spaced apart along said Z direction, said fifth and sixth rows lying on an opposite side of said centerplane and being spaced apart in said Z direction;

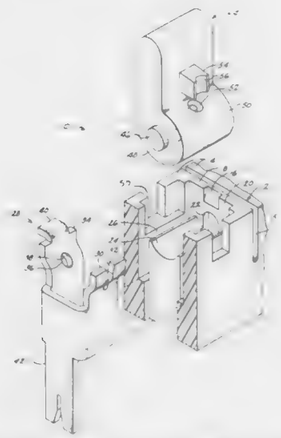
said third and fifth rows being spaced apart largely in said Y direction, and said fourth and sixth rows being spaced apart largely in said Y direction.

4,995,829

WIRE TERMINATION CONNECTOR AND TERMINAL BLOCK

Lawrence E. Geib, Carol Stream; William R. Bailey, Glen Ellyn, and James S. Zielinski, Roselle, all of Ill., assignors to Reed Devices, Inc., Carol Stream, Ill.

Filed Dec. 27, 1989, Ser. No. 457,572
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—409 **31 Claims**



1. An electrical connector for terminating an electrical conductor having a metallic core covered with insulation, comprising:

an insulative base housing comprising

a plurality of walls opposed in pairs, each of a pair of said walls having an angular notch providing a ramp from an upper end surface to an inner surface and a groove on said inner surface substantially the same width as said angular notch,

a support section recessed and intermediately bounded by said plurality of walls forming a terminal receiving cavity,

an electrically conductive terminal comprising

a first contact means for insulation displacement connection of said electrical conductor and a second contact means for feed-through and trimming of said electrical conductor, said first and second contact means joining with a lower-extending member and fitting slidably into said insulative base housing terminal receiving cavity, and

a non-conductive cam lever comprising

a lateral hub protruding from a first end and a second end of said cam lever,

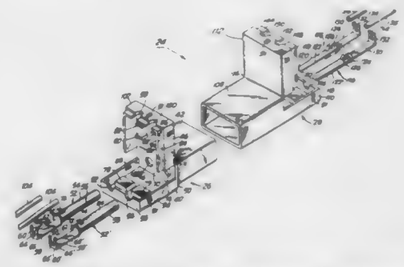
a wire passageway extending through said cam lever substantially perpendicular to said lateral hub, said lateral hub of said first end and said second end of said cam lever mating with said groove on said inner surface of each of a pair of said walls and said wire passageway aligning with said first and second contact means, said cam lever being rotatable from a first position wherein said electrical conductor is installable through said wire passageway and said second contact means to a second position wherein said electrical conductor is trimmed by said second contact means and is connected to said first contact means.

4,995,830

ELECTRICAL WIRE CONNECTORS

Ira Eckhaus, 1006 Neilson St., Far Rockaway, N.Y. 11691

Division of Ser. No. 99,351, Sep. 21, 1987, Pat. No. 4,859,203, Continuation-in-part of Ser. No. 864,435, May 16, 1986, Pat. No. 4,695,113, Continuation-in-part of Ser. No. 656,860, Oct. 2, 1984, abandoned. This application Aug. 20, 1989, Ser. No. 381,851
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—409 **24 Claims**



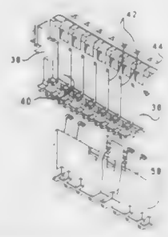
1. An electrical wire connector, comprising a housing assembly having a base portion and a closure portion, a receiving means associated with said housing assembly for receiving an insulated electrical wire, coupling means associated with said base portion for connection to another electrical member, slicing means on said base portion for transversely slicing the insulation so as to make electrical contact with the wire core therebeneath, connecting means for electrically connecting said slicing means with said coupling means whereby closure of said closure portion onto said base portion causes slicing of the insulation on the electrical wire to electrically connect the wire core and the other electrical member, and adjustment means associated with said slicing means for selectively adjusting a slicing opening on said slicing means to accommodate different gauge wires.

4,995,831

ELECTRICAL CONNECTOR SUPPORT

Mario Casagrande, Turin, Italy, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 26, 1989, Ser. No. 358,099
Claims priority, application United Kingdom, Jun. 3, 1988, 8813234
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—557 **5 Claims**



1. An electrical connector adapted to be secured to a surface such as a mounting board or connection support, wherein said connector comprises a housing with at least one major face, one or a row of elongate cavities therein opening to a cover

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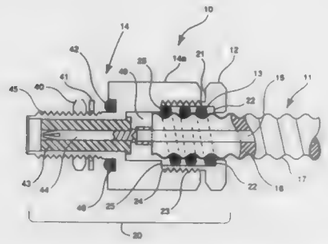
receiving end and a mating end, and a contact member for each said cavity for terminating a conductor, including the provision of a support having means for slidably engaging said major face, and one or more flexible arms, each said arm for engaging the housing through a respective opening along a shoulder portion of said major face adjacent said cover receiving end.

4,995,832

CONNECTOR FOR CONNECTING TO HELICALLY CORRUGATED CONDUIT

Robert L. Thommen, Indianapolis, and Jihan J. Mohammed, Greenwood, both of Ind., assignors to Specialty Connector Company, Inc., Franklin, Ind.

Filed Oct. 26, 1989, Ser. No. 427,585
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—578 **14 Claims**



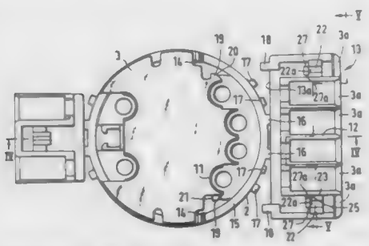
1. A connector for connecting to helically corrugated conduit comprising:
- a bolt member having a passageway therethrough;
- a connector body having a hollow end portion for receiving the bolt member;
- a helical spring within the passageway and adapted to be received within the helical corrugations of the conduit; and
- means for forcing said bolt member into said hollow end portion to squeeze said spring between said bolt member and connector body whereby said spring is axially forced against the corrugations.

4,995,833

ROUND PLUG CASING FOR ELECTRICAL PLUGGING CONTACTS

Frank Drecker, Remscheid, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Jan. 18, 1990, Ser. No. 466,986
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 8900889[U]
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—596 **9 Claims**



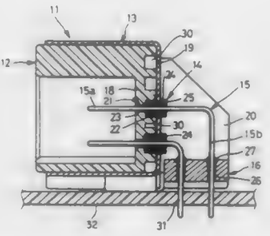
1. Cylindrical round plug casing of plastic with a casing cylinder wall and a face wall, and chambers extending axially parallel in an interior thereof for an electrical plugging contact, the chambers are formed adjacent on a circular arc peripherally or adjacent to the cylinder wall, in which the chambers issue with an opening in the face wall and reach with their oppositely lying opening to about over a longitudinal middle of the round plug casing, and in which chamber walls are longitudinally divided beginning from the face wall to about half its length, a longitudinal half of the chambers is arranged on the cylinder wall and this zone of the cylinder wall is formed by two lateral separating joints extending axially parallel to each other beginning from the face wall, and a separating section extending from the one to the other separating joint, and by externally molded-on hinging strips bridging the separating section and attached to the cylinder wall and a hinged cover-type wall part piece, and supporting and resting means for preventing undesired opening of the wall part piece from the cylinder wall, the supporting means are adjacent the hinging strips and are formed of pin-form projections molded externally on the cylinder wall, overhanging the separating section, and strip-form projections formed laterally internally on a separating section edge of the hinged cover-type wall part piece, overhanging the separating section, gripping behind the cylinder wall internally, and the rest means include in each case a rest strip formed externally on an outer-chamber wall of in each case a last outside chamber of a chamber series arranged on the circular arc, including several chambers, with an interior-side rest edge, which is gripped behind by a rest edge of a rest hook extending from the wall part piece to the interior, characterized in that on the wall part piece (13), there is arranged a counter-bearing strip (27), which in a swinging-to of the wall part piece (13), grips under a counter-bearing surface (19*a*) of the rest strip (19) arranged on the outer chamber wall of in each case the last outside chamber (7) of the chamber series (6) in a zone of the respective separating joint (14), virtually without play.

4,995,834

NOISE FILTER CONNECTOR

Izumi Hasegawa, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 14, 1989, Ser. No. 450,694
Claims priority, application Japan, Oct. 31, 1989, 1-127460[U]
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 **5 Claims**



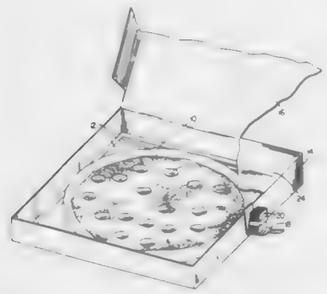
1. An electrical connector, comprising:
- a dielectric housing having a dielectric rear wall through which holes extend, each said hole opening into a recess in said rear wall;
- a metal shield case covering the outside of said housing;
- a metal rear wall extending along the dielectric rear wall and having openings in alignment with the respective holes in said dielectric rear wall;
- capacitors secured in said openings in said metal rear wall in electrical connection therewith with a section of each capacitor being disposed in said recess without engaging the walls of said recess; and
- electrical contacts having contact sections extending through the capacitors in electrical connection therewith and extending through the respective holes in the dielectric rear wall without engaging the walls of said holes and into said housing.

4,995,835

ELECTRICAL HEATER AND PLUG

Paul A. Cunningham, 118 West St., Attleboro, Mass. 02703, and Frederick G. J. Grise, 137 E. Bay Rd., Osterville, Mass. 02655

Continuation of Ser. No. 378,144, Jul. 11, 1989, abandoned, which is a division of Ser. No. 276,376, Nov. 23, 1988, Pat. No. 4,933,534. This application Nov. 27, 1989, Ser. No. 443,797
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—668 **24 Claims**



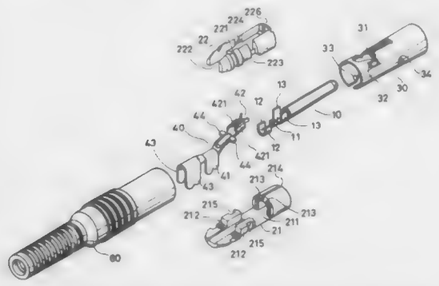
1. An electrical plug to be inserted into an automotive type cigarette lighter socket of the kind having an inner wall of a predetermined diameter and a pair of electrical contacts, comprising
- a flat assembly including a flat substrate having a width corresponding to the predetermined diameter, and
- a pair of flat conductors attached to the substrate for touching the pair of electrical contacts in the socket.

4,995,836

PIN PLUG CONNECTOR

Hisao Toramoto, Kyoto, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan

Filed Nov. 1, 1989, Ser. No. 430,025
Claims priority, application Japan, Dec. 1, 1988, 63-157462[U]
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—675 **3 Claims**



1. A pin plug connector for connecting a coaxial cable having a core conductive line, an insulative layer covering the core line, and an outer conductive line lying outwardly of and around said insulative layer and around said conductive core, comprising:
- a body of an insulative material;
- a cover disposed in surrounding relation to said body and being connectable electrically with said outer conductive line;
- a pin connectable with said core conductive line, said pin comprising a first press fitting means for press fitting around said core conductive line and clamping means for clamping around said insulative layer;
- a terminal connectable with said outer conductive line and said cover, said terminal comprising second press fitting means for press fitting around said outer conductive line, said insulative layer and said core conductive layer and in electrical contact with said outer conductive line, said terminal including connecting end means for connecting with a mating end, of said cover;

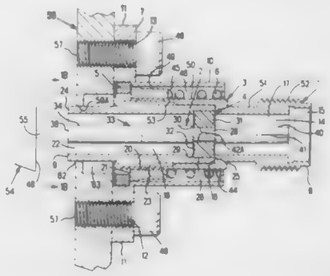
said body comprising means for receiving said pin and said terminal therein such that said cover is slidable over said body for connecting said connecting end means on said terminal with said mating end on said cover.

4,995,837

PRECISION TEST CONNECTOR

William D. Couper, and George W. Michael, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 400,619, Aug. 30, 1989, Pat. No. 4,936,800. This application May 8, 1990, Ser. No. 520,492
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—863 **9 Claims**



1. An electrical precision test connector assembly comprising an electrical conductor with conductive end portions and a hollow shell encircling the electrical conductor;
- wherein the electrical conductor comprises slotted contact end part with flat, opposing electrical contact surfaces and said portion being pinched for a slideable, clamping engagement, above and below, with an inserted tab lead to thereby maintain flat, biased electrical contact above and below a portion of the lead; the hollow shell comprises rear contact surface encircling the slotted contact end portion of the conductor and said rear contact surface having a profile with flat surfaces for fit to corresponding flat surfaces of the port of a fixed plate to prevent rotational movement of said electrical conductor within said port; and the test connector assembly further comprises a spring means positioned against the shell and biasing the shell into complete electrical contact of the rear contact surface with a corresponding body of a component which is to be tested;

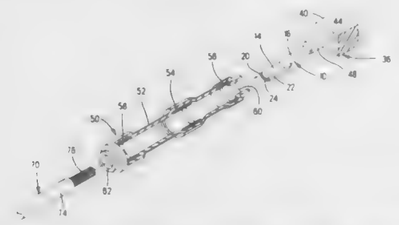
VOL 1123 ISS 4 FEB 26 1991 UMI

4,995,838

ELECTRICAL TERMINAL AND METHOD OF MAKING SAME

Kenneth N. Ayer, Hummelstown, and James P. Scholz, New Cumberland, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 277,094, Nov. 29, 1988, Pat. No. 4,852,252, and a continuation-in-part of Ser. No. 375,787, Jun. 30, 1989. This application Jul. 27, 1989, Ser. No. 385,643
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] H01R *43/02, 4/02*
U.S. Cl. 439—874 6 Claims



1. An electrical terminal of the type including a conductor-terminating portion having a conductor-proximate surface and a conductor-remote surface, with the conductor-proximate surface adapted to facilitate solder termination to a conductive section of an electrical conductor means, the conductor-terminating portion being formed of a low resistance metal having minimal magnetic permeability, characterized in that:

said conductor-remote surface has joined thereto a substrate at least including a layer of magnetic material in a manner assuring good thermal conductivity therebetween, said magnetic material having high electrical resistance and high magnetic permeability, said layer having a thickness approximately equal to one skin depth of said magnetic material corresponding to a frequency of a source for generating a constant amplitude high frequency alternating current of known frequency, defining a self-regulating temperature source capable of being induced by the known-frequency current to generate thermal energy to attain and maintain a selected temperature; and

said joint of said substrate and said conductor-remote surface being a solder joint of solder having a sufficiently high reflow temperature not to be reflowable by said self-regulating temperature source when actuated by said known-frequency current,

whereby said electrical terminal includes an integral self-regulating temperature source defined by said conductor-terminating portion and said substrate soldered thereto to melt solder having a reflow temperature at least lower than said selected temperature to terminate a conductive section of the conductor means to the conductor-terminating portion.

4,995,839

APPARATUS FOR AUTOMATICALLY RAISING AND LOWERING BOAT MOTORS

Felton H. Havins, 300 NE. 6th St., Fort Worth, Tex. 76106

Filed Dec. 13, 1988, Ser. No. 283,587
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—6 18 Claims

1. An apparatus for automatically raising first propulsion means on a boat, said boat having second propulsion means, comprising:

(a) mounting means for mounting said first propulsion means to said boat such that said first propulsion means can move between a submerged position and an unsubmerged position when said boat is in the water;

(b) hydrofoil means for raising said first propulsion means from said submerged position to said unsubmerged position when said boat is being propelled by said second propulsion means, said hydrofoil means being coupled to said mounting means, said hydrofoil means being adapted to be submerged when said first propulsion means is in the submerged position;



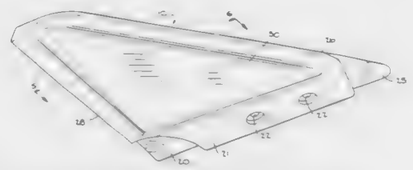
(c) said mounting means providing for movement of said hydrofoil means and said first propulsion means such that said hydrofoil means maintains a relatively constant orientation with respect to a waterline of said boat so as to present minimal drag when said first propulsion means is in the unsubmerged position.

4,995,840

STABILIZING FIN FOR A MOTOR BOAT

Robert Seale, Peekskill; Dennis Rizzuto, Spring Valley, and Harold Satin, New City, all of N.Y., assignors to Hydrofoil International, Inc., Crompond, N.Y.

Filed Aug. 4, 1989, Ser. No. 389,497
Int. Cl.[5] B63H *1/18*
U.S. Cl. 440—66 12 Claims



1. A stabilizing fin for a motor boat comprising

a first side having a longitudinally extending slot for mounting on a cavitation plate on a motor post;

a second side extending angularly of said first side and having a tapered leading edge;

a trailing side extending perpendicularly from said first side and having a thickened trailing edge; and

a recess in a bottom surface extending between said leading edge and said thickened trailing edge.

4,995,841

WATER SKIER'S SAFETY SYSTEM

Donald R. Coffey, 18801 N. 50th Ave., Glendale, Ariz. 85308

Filed Jun. 30, 1989, Ser. No. 373,567
Int. Cl.[5] B63C *9/20*
U.S. Cl. 441—11 9 Claims

1. A water skier safety system comprising:

a multiple section flag pole, the multiple sections of said flag pole being disposed in a minimal dimension for transport, and joined to form a flag pole of extended length;

a signal flag coupled to said flag pole and furled about said flag pole when said flag pole is in its minimal dimension for transport, and displayed from said flag pole when said flag pole is in its extended length, said flag pole in its extended length being hand manipulatable to wave said pole from the end of a person's arm to display said flag above the head of a person;

a holster base for transporting said flag pole and said signal flag when said base is coupled to the limb of a person;

means coupled to said base for coupling said base to the limb of a person;

a holster pocket coupled to said holster base for carrying



said flag pole, in its minimal transport dimension with said furled flag, while said base is coupled to a limb of a person; and

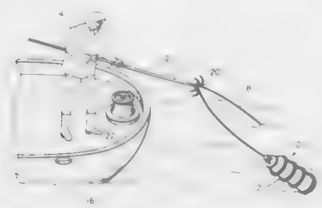
quick release means coupled to said holster base for maintaining said flag pole and said flag carried by said holster pocket during transport on a limb of a person and for quickly releasing said flag pole and said flag from said pocket when a person wishes to manipulated said flag pole in its extended length to display said flag.

4,995,842

BUOY WITH REDUCED DRAG

Knut Beyer-Olsen, 17 Cascade Key, Bellevue, Wash. 98006

Filed Dec. 7, 1988, Ser. No. 280,888
Int. Cl.[5] B63B *22/18*
U.S. Cl. 441—22 10 Claims



10. A buoy attachable to a line for use upon the surface of a body of water, comprising:

an elongated flotational body having an end located upon a longitudinal axis thereof, the end having a hole sized to receive the line therethrough and fixably attach the line to the body, the body having a coefficient of drag when pulled upon the surface of the body of water by the line fixably attached to the body; and

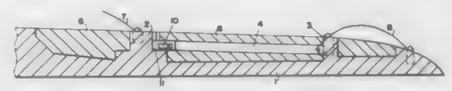
at least one outwardly projecting circumferential rib oriented substantially perpendicular to the longitudinal axis, the rib circumferentially extending substantially continuously about the body and projecting outward an amount sufficient to ruduce the coefficient of drag of the body when pulled upon the surface of the body of water by the line fixably attached to the body.

4,995,843

SURFBOARD

Dirk Englemann, Am Fuchsbau 5, D-1000 Berlin 27, Fed. Rep. of Germany

PCT No. PCT/DE87/00121, § 371 Date Sep. 16, 1988, § 102(e) Date Sep. 16, 1988, PCT Pub. No. WO87/05526, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 19, 1987, Ser. No. 273,816
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3610043; Oct. 17, 1986, 3635802
Int. Cl.[5] A63C *15/00*
U.S. Cl. 441—74 21 Claims



1. A surfboard having an aft region terminating in a flexible tongue having a top, a front and a rear end, said flexible tongue disposed on the underside of said aft region of said surfboard; an elastic covering over the top of said flexible tongue; two supports arranged in succession above said flexible tongue and oriented relative to each other in the longitudinal direction of said tongue, one of said supports being a rear vertical support located proximate the rear end of said tongue and mounted inflexibly against said tongue, the other of said supports being a front vertical support mounted inflexibly to said surfboard; and elastic means including a stringer for elastically inter connecting said two supports, said elastic means operatively cooperating with said tongue for influencing the elastic deformation of said tongue.

4,995,844

BUBBLE BLOWING FIGURE TOY

John P. McNett, Farmington, and Sal Mucaro, Burlington, both of Conn., assignors to Tiger Electronics, Inc., Vernon Hills, Ill.

Filed Dec. 1, 1989, Ser. No. 444,515
Int. Cl.[5] A63H *33/28*
U.S. Cl. 446—021 8 Claims

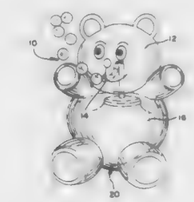
1. A bubble blowing figure toy comprising:

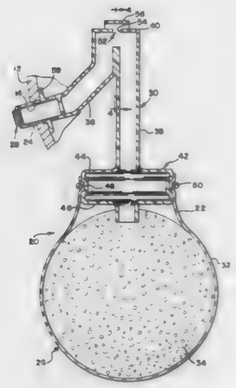
a hollow torso configured with a head portion and a squeezable body portion, said head portion defining a mouth opening; and

bubble blowing means arranged substantially within said hollow torso for generating bubbles from a bubble forming liquid, said bubble blowing means comprising collapsible air bladder means arranged within said hollow torso for generating a stream of air and defining an air supply end of said bubble blowing means, mouthpiece means positioned at the mouth opening of said torso and defining an air discharge end of said bubble blowing means, said mouthpiece means including an apertured mouthpiece defining a series of through-holes at a first end thereof and to which bubble forming fluid is applied, and elongated air duct means connected at a first end to said mouthpiece and at a second end to said air bladder means for directing a stream of air generated by said collapsible air bladder means toward and for positioning and holding said mouthpiece means at the mouth opening of said hollow torso such that it appears that bubbles are being blown from the mouth opening of the doll, said air duct means being configured between the ends thereof to inhibit ingestion of said bubble forming liquid into said air bladder means, and wherein application of said bubble forming liquid to the first end of said mouthpiece produces a meniscus diaphragm of bubble forming liquid across the aperture defined thereby with additional bubble forming liquid being extracted from said through holes by cohesion with the meniscus diaphragm thereby enhancing capacity of the

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meniscus diaphragm to produce either a large bubble or a continuous stream of generally uniform bubbles emanating from the mouthpiece depending upon volume and pressure of the air stream generated by collapsing said air bladder means.



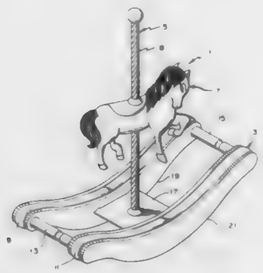


4,995,845

ROCKING DISPLAY ASSEMBLY

Jack Hou, P.O. Box 78-5, Taipei, Taiwan

Filed Jan. 19, 1990, Ser. No. 467,172
Int. Cl.[5] A63H *13/18, 1/06, 13/20*
U.S. Cl. 446—325 2 Claims



1. A rocking display unit comprising:

(a) a cylindrical support rod including a first end and a free second end;

(b) a base assembly including a pair of rocker members having bottom surfaces configured for engaging a support surface and imparting a rocking motion to the base assembly, a pair of cylindrical cross braces secured to opposite ends of the rocker members for maintaining same in a parallel spaced disposition, and a cross plate extending across and secured to the rocker members substantially midway between the opposite ends thereof, the cross plate being provided with a central aperture therethrough;

(c) the first end of the support rod further including a reduced diameter section defining an annular wall section and terminating in a threaded section, the reduced diameter section being disposed through the central aperture, a washer slidably received on the reduced diameter section and disposed in engagement with the annular wall section and cross plate, and a corresponding threaded means disposed in threaded engagement with the threaded section; and

(d) a hollow ornament including a pair of apertures formed in opposed wall portions thereof, lead aperture including a periphery, the support rod being received through both apertures, and the periphery of one aperture being engaged within the annular groove of the grommet.

4,995,846

TOY FIGURE WITH PIVOTAL LOWER TORSO

James F. Mariol, Cincinnati, Ohio, assignor to The Little Tikes Company, Hudson, Ohio

Filed Feb. 2, 1990, Ser. No. 474,570
Int. Cl.[5] A63H *3/46, 3/36*
U.S. Cl. 446—376 12 Claims



1. In a toy figure having upper and lower torso sections pivotally connected along a plane intersecting a longitudinal axis of said figure at a predetermined angle, whereby making said figure convertible from a standing configuration to a sitting configuration by rotating said torso sections 180 degrees with respect to one another, the improvement comprising:

a directionally oriented head component mounted to an upper end of said torso section;

said plane between said upper and lower torsos extending downwardly from a front to a back of said figure in said standing configuration, said bottom torso by directionally configured so that said bottom torso is directionally compatible with said upper torso and said head component when reconfigured to either said standing or said sitting configurations.

4,995,847

BALANCE TYPE MINUTE LENGTHENABLE ADJUSTER

Ying Teh Hwang, No. 220, Ruey Feng St., Kaohsiung, Taiwan

Filed Oct. 20, 1989, Ser. No. 424,737
Int. Cl.[5] A41C *3/00*
U.S. Cl. 450—71 5 Claims

1. A balance type minute lengthenable adjuster comprising:

(a) a left band ring and a right band ring;

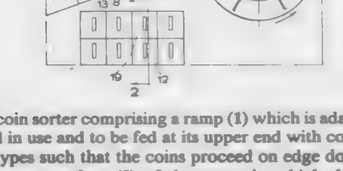
(b) a left band and a right band, each band including a terminal end connected, respectively, to the left band ring and the right band ring;

(c) a continuous adjusting band passing through the left and right band rings, the band including a left end portion and a right end portion;

(d) a band pincher including a short tube having a substantially rectangular cross section for receiving the adjusting band therethrough and a positioning flap pivotally connected to a top edge of the short tube for pinching the adjusting band between the flap and an outer surface of the short tube;

(e) a buckle including a left buckle ring and a right buckle ring, the left buckle ring having a pushing chip at a side thereof, the left end portion of the adjusting band being passed through the short tube and the left buckle ring and folded back onto itself and pinched between the positioning flap and the outer surface of the short tube, and the right buckle ring being secured to the right end portion of the adjusting band; and

(f) whereby when the positioning flap is released from the left end portion of the adjusting band, the latter may either be pulled out through the left buckle ring to shorten the distance between the left and right band rings or released back through the left buckle ring to increase the distance between the left and right band rings, and thereafter secured in a desired position of adjustment by pitching the left end portion between the positioning flap and outer surface of the short tube.

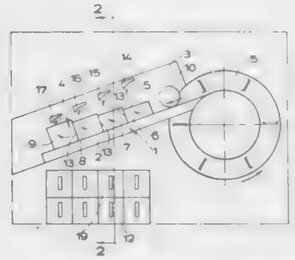


4,995,848

COIN SORTERS

David Goh, Telford, England, assignor to Scan Coin AB of Jagershillgatan 26, S-213, Malmo, Sweden

PCT No. PCT/GB88/00274, § 371 Date Nov. 17, 1989, § 102(e) Date Nov. 17, 1989, PCT Pub. No. WO88/08174, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 8, 1988, Ser. No. 424,223
Claims priority, application United Kingdom, Apr. 9, 1987, [illegible]
Int. Cl.[5] G07D *3/12*
U.S. Cl. 453—3 3 Claims



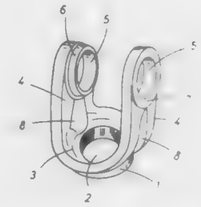
1. A coin sorter comprising a ramp (1) which is adapted to be inclined in use and to be fed at its upper end with coins (10) of mixed types such that the coins proceed on edge down a coin edge support surface (2) of the ramp, in which the ramp is provided with a coin face support surface (3) for supporting one face of the coins as the coins proceed down the ramp, the coin face support surface being provided with aperture means comprising aperture portions (6, 7, 8, 9) of different widths in the direction normal to the direction of the coin edge support surface, the widths increasing towards the lower end of the ramp whereby some coins, depending on their diameters in relation to the transverse dimensions of the aperture portions, will fall through corresponding aperture portions, characterised in that the ramp (1) also comprises a plurality of coin deflecting members (14, 15, 16, 17) spaced apart along the ramp and located at different distances from the coin edge support surface (2), the distances decreasing in the direction from the upper end of the ramp to the lower end of the ramp, the coin deflecting members being so arranged that some coins, in dependence on their diameter, engage with a corresponding deflecting member and are deflected away from the coin face support surface to fall from the ramp.

4,995,849

FORK FOR CARDAN JOINTS AND METHOD OF FORMING SAME

Melchor D. Castellon, Diputacion, 455, 080103 Barcelona, Spain

Continuation of Ser. No. 117,297, Nov. 6, 1987, abandoned. This application Oct. 25, 1989, Ser. No. 427,948
Claims priority, application Spain, Nov. 6, 1986, 86/03090
Int. Cl.[5] F16D *3/26*
U.S. Cl. 464—134 6 Claims



1. A fork for cardan joints, having a single-piece body of stamped sheet metal, comprising:

a cylindrical collar portion;

means on said collar portion for coupling the fork to the end of a corresponding shaft;

a dome portion having an arched generatrix and extending completely around the circumference of the fork, the dome portion being coaxial with said collar portion;

two symmetrical substantially flat and parallel wing-like arms extending from respective diametrically opposite positions of said dome portion without a break, and having free outer ends, said dome portion connecting said arms to said collar portion;

individual circular, mutually aligned flanged apertures through said free outer ends; and

a central longitudinal rectilinear rib of U-shaped cross-section and of large size extending centrally along each of said arms from proximate each aperture thereof and along said dome portion to proximate said collar portion.

4,995,850

HOMOKINETIC COUPLING HAVING A GUIDING DEVICE HAVING A RADIAL SPRING FORCE ACTION

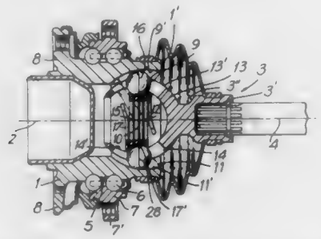
Ernst van der Drift, and Hendrikus J. Kapaan, both of Nieuwegein, Netherlands, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed May 23, 1989, Ser. No. 360,760
Claims priority, application Netherlands, May 31, 1988, [illegible]
Int. Cl.[5] F16D *3/24*
U.S. Cl. 464—143 1 Claim

1. Homokinetic coupling for coupling two components, in particular a rotating drive shaft having a cardioid and a rotatable means to be rotated having a cardioid, in such a manner that said components can be swiveled from a position in which their cardioids are located in each other's extension to a position in which the cardioids are at an angle to one another, in-

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cluding an outside coupling part having the shape of a housing which is connected to one of the two components so that the cardioid of the housing coincides with the cardioid of the rotatable means, and which on one side has a cavity open to the outside and bounded by part of a spherical portion having a wall with a spherical surface, whereby the center of the spherical portion coincides with the point at which the cardioids intersect, and an inside coupling part including a generally spherical end portion located concentrically inside the cavity, which spherical end portion is connected to said two components so that their cardioids coincide, whereby in the wall of the cavity of the outside coupling part a number of grooves are disposed in the direction of the cardioid of the housing the bottoms of which each follow the course of the arc of a circle, whereby the common center of the arcs is located on the extension of the cardioid of the housing at a distance from the center of the spherical surface of the spherical portion, and disposed inside the spherical end portion of the inside coupling part are an equal number of grooves cut in the direction of the cardioid of said inside coupling part, the lower boundaries of



which follow the course of arcs of circles whose common center is located on the extension of the cardioid of the inside coupling part at a distance from the center of the spherical surface of the spherical portion, and wherein an equal number of torque-transferring elements are disposed, in particular balls, which are each disposed partially in a groove in a wall of the spherical portion and disposed partially in a corresponding groove in the spherical end portion, whereby said torque-transferring elements interact with a guiding means so that the centers of the torque elements are disposed in a plane which is perpendicular to the plane of the cardioids, characterized in that the lower ends of the grooves in the spherical end portion are open so that the torque-transferring elements disposed therein project inward, and the guiding means comprises a helical coil tension spring disposed concentrically inside the cavity and mounted inside the spherical end portion shaped to define an annular groove along its circumference for containing the inwardly projecting portions of the torque-transferring elements, the tension spring providing a spring force directed radially outward on said torque elements.

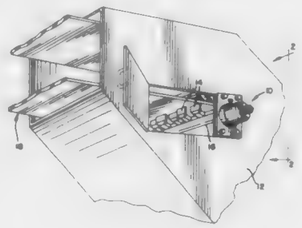
4,995,851

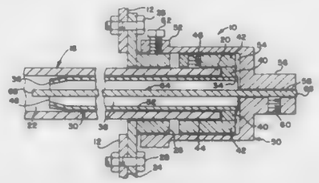
SPRING STEEL TENSIONER

Dennis E. Taylor, Kewanee, Ill., and Larry J. Goldbeck, Comanche, Iowa, assignors to Martin Engineering Company, Neponset, Ill.

Filed Aug. 2, 1990, Ser. No. 561,969
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—101 **6 Claims**

1. A tensioning arrangement for imparting torsional bias to a support shaft rotatable within a fixed frame including biasing means adapted to extend into the shaft for imparting torsional bias thereto, said biasing means having a first end, means for coupling said biasing means and the shaft for conjoint rotation, a hub member connectable to said first end of said biasing means, said hub member being relatively rotatable with respect to the fixed frame such that rotation of said hub member is operative to impart a torsional biasing force on the shaft, and fastening means for selectively connecting said hub member to





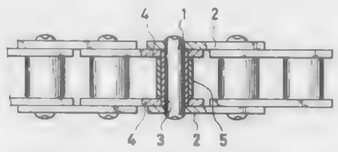
the fixed frame after a torsional biasing force is imparted to said shaft.

4,995,852

SINTERED OIL-RETAINING BUSHED CHAIN HAVING ROLLER

Toshio Takahashi, Osaka; Kazumasa Matsuno, Hyogo; Masaru Morimoto, and Fumio Ochiai, both of Osaka, all of Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Sep. 14, 1988, Ser. No. 245,326
Claims priority, application Japan, Apr. 6, 1988, 63-45729[U]
Int. Cl.[5] F16G *13/08*
U.S. Cl. 474—91 **3 Claims**



1. An improved chain comprising inner link plates, sintered oil-retaining bushings secured to the inner link plates, outer link plates, connecting pins secured to the outer link plates and the pins being rotatable within the bushings, the improvement comprising:

the sintered density of the bushings being in the range of approximately 6.0 g/cm^3 to 7.1 g/cm^3; and,

a roller rotatably supported on each bushing,

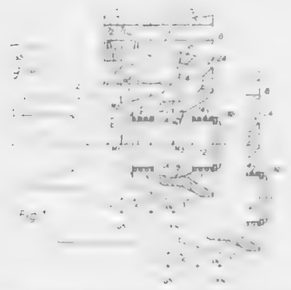
wherein the wall thickness of the bushings is greater than the wall thickness of the rollers by a factor in the range of 110% to 140%.

4,995,853

PLUNGING CONSTANT VELOCITY RATIO UNIVERSAL JOINT

Peter Schwärzler, Glattbach; Hans Wormsbächer, Dreieich, and Rudolf Beier, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Lohr & Bromkamp GmbH

Filed Jun. 8, 1989, Ser. No. 363,152
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819528
Int. Cl.[5] F16D *3/223*
U.S. Cl. 464—144 **18 Claims**



1. A plunging constant velocity ratio universal joint, comprising:

an outer joint member having an internal cylindrical surface provided with a number of tracks spaced circumferentially about a rotational axis of the joint member;

an inner joint member provided with a number of tracks spaced circumferentially about a rotational axis of the inner joint member, facing the tracks in the outer joint member in pairs;

a plurality of balls for torque transmission between the joint members, disposed one in each facing pair of said tracks;

and a cage having an axis and disposed between the joint members and holding the balls so that their centres lie in a ball centre plane, the cage having a first control surface which is in sliding engagement with the internal cylindrical surface of the outer joint member, and is a surface of revolution about the cage axis of a curved line with a centre of curvature axially offset from the ball centre plane, the cage further having a second control surface which is in sliding engagement with a surface associated with the inner joint member and is a surface of revolution about the cage axis of a curved line with a centre of curvature offset from the ball centre plane on the opposite side thereof from the first control surface, the said offset of the first control surface being greater than the said offset of the second control surface;

wherein the first control surface of the cage comprises a first portion, adjacent the ball centre plane, which is part-spherical, and a second portion extending from the first portion towards the end of the cage away from the ball centre plane, on which second portion all points are at distances from the cage axis less than the distances from the cage axis of corresponding points on a theoretical continuation of the first said surface portion towards the end of the cage.

4,995,854

TENSIONER FOR A CHAIN, BELT OR THE LIKE

Juji Ojima, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Nov. 28, 1989, Ser. No. 442,147
Claims priority, application Japan, Dec. 7, 1988, 63-309617
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—111 **9 Claims**

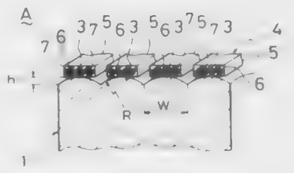
1. A tensioner for a chain, belt or other endless drive member wherein a male screw member and a female screw member are provided within a casing in a screwed state, the male screw member is rotated by a spring force to advance the female screw member in an axial direction, a cap is secured to the top end of the female screw member and said cap has an internal cavity defining an oil sump for storing lubricant oil therein said cavity having a diameter substantially conforming to an inner thread diameter of the male screw number.

4,995,855

FLAT BELT TRANSMISSION

Kanteru Hasebe; Hiroshi Matsuoka, and Kyotaro Yanagi, all of Kobe, Japan, assignors to Bando Chemical Industries, Inc., Kobe, Japan

Filed Aug. 11, 1989, Ser. No. 392,284
Int. Cl.[5] F16H *7/02*
U.S. Cl. 474—167 **6 Claims**



1. A flat belt transmission comprising:

two spaced flat pulleys and a flat belt reeved around said pulleys, said flat belt comprising a belt body having a plurality of endless cores and having at least one trench with a predetermined depth extending in the longitudinal direction of the belt in the inner peripheral surface of said belt body which is in contact with said pulleys and dividing said belt body into belt parts; and

each flat pulley having at least two crowns on the outer periphery thereof each having a cross-section in the shape of an arc in the width direction of the outer periphery of the pulley and spaced in the width direction of the outer periphery of the pulley;

said belt parts engaging corresponding crowns for spreading the bearing stress in said belt parts from a peak value at the center to a low value at the edges.

4,995,856

VENTRICULOSTOMY RESERVOIR

Alfons Heindl; Stephen W. Laguette, both of Goleta, and Leanne M. Lintula, Santa Barbara, all of Calif., assignors to Pudenz-Schulte Medical Research Corporation, Goleta, Calif.

Filed Jun. 14, 1989, Ser. No. 365,906
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—8 **35 Claims**

1. A ventriculostomy reservoir, comprising:

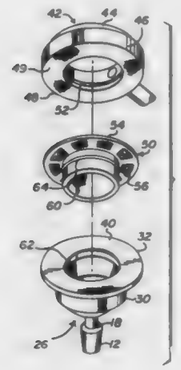
a base configured to provide an internal reservoir well, the base including an inlet and an upwardly extending wall portion formed as a unit with the inlet;

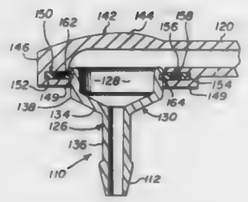
a cap positioned over the base to enclose the reservoir well, which cap, together with the base, defines an internal reservoir, the cap including a dome portion, an outlet and a downwardly extending cap ring which engages the base wall portion to hold the cap to the base; and

means for attaching the cap to the base to form a fluid-tight interference fit between the cap and the base, the attaching means including first means associated with the base for connecting the base to the cap, and second means associated with the cap ring for connecting the base to the cap, the first and second connecting means including a

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detent provided in one of the first and second connecting means, and a protrusion provided on the other of the first and second connecting means, wherein the protrusion and the detent interfit to securely hold the cap to the base.



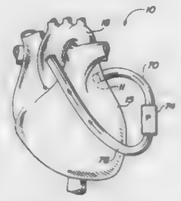


4,995,857

LEFT VENTRICULAR ASSIST DEVICE AND METHOD FOR TEMPORARY AND PERMANENT PROCEDURES

John R. Arnold, 666 Seminole Dr., Winter Park, Fla. 32789

Filed Apr. 7, 1989, Ser. No. 334,934
Int. Cl.[5] A61F *1/24*
U.S. Cl. 600—16 21 Claims



1. A method for relieving the hemodynamic burden on a diseased left ventricle in the heart of a patient, comprising the steps of:

implanting a shunt within the patient's chest cavity between the interior of the patient's left atrium and the patient's major arterial system;

positioning an impeller in said shunt;

implanting a power source within the patient's chest cavity; and

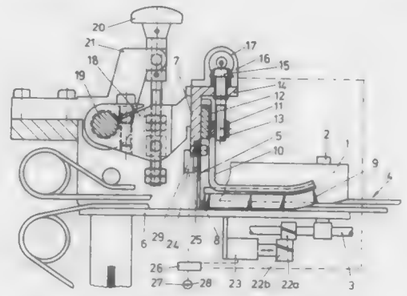
actuating said impeller with the power source so as to effectuate a substantially non-turbulent, non-traumatic flow of blood from the left atrium directly into the patient's arterial system.

4,995,858

DEVICE FOR HALTING SHEET PRODUCTS

Rudolf Stäb, Frankenthal, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jan. 24, 1990, Ser. No. 469,315
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903381
Int. Cl.[5] B65H *9/04*
U.S. Cl. 493—445 9 Claims



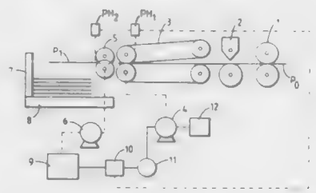
1. A device for halting sheet products conveyed by a conveyor belt defining a conveying plane, comprising an abutment ' ving said conveyor belt extending therethrough, an adjustable braking means arranged before said abutment in the direction of motion of said belt, said braking means being in the form of brush fitted with means for raising and lowering said brush in relation to said conveying plane, a table placed under said brush, a sensing means for sensing the force of the impact of such products on the abutment, and means for resetting the brush in accordance with an output signal of such sensing means.

4,995,859

SHEET MATERIAL STACKING APPARATUS

Mikio Totani, Kyoto, Japan, assignor to Totani Giken Kogyo Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 185,553, Apr. 25, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 443,078
Claims priority, application Japan, Apr. 17, 1986, 61-89354
Int. Cl.[5] B65H *29/68, 29/70*
U.S. Cl. 493—204 6 Claims



1. A sheet material stacking apparatus comprising: heat cut bar means for heating cutting a continuous plastic material, the plastic material being folded in two along its center line, intermittently fed to said heat cut bar means and heat cut by said heat cut bar means to successively produce a number of plastic bags;

upper and lower stacker belt mean disposed downstream of said heat cut bar means and continuously driven, the upper stacker belt means is lowered toward the lower stacker belt means whenever the plastic material is heat cut by said heat cut bar means to clamp the plastic bag between the upper and lower stacker belt means so that the plastic bag is torn from said heat cut bar means by the stacker belt means;

upper and lower clamp rollers disposed downstream of and adjacent the stacker belt means to clamp the plastic bar delivered from said stacker belt means between the clamp rollers, the plastic bag being discharged from said clamp rollers so that its falls down for stacking the plastic bags;

a servo motor operatively connected to said clamp rollers to rotate the same;

a detector disposed upstream of said clamp rollers to detect the position of said plastic bag;

a control device connected to said motor and said detector so that after the plastic bag is completely delivered from said stacker belt means to said clamp rollers and immediately before the plastic bag is completely discharged from said clamp rollers, said control device controls said servo motor to momentarily decrease the number of revolution (R.P.M.) thereof in response to a detection signal from said detector; and

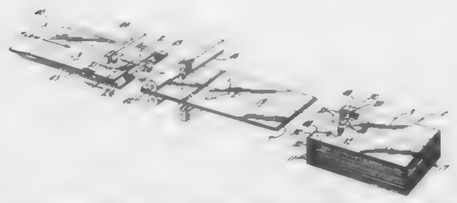
said clamp roller being spaced widthwise of the plastic bag and disposed in upper and lower rows in staggered relation for deforming the plastic bag into wave form between said claim rollers so as to shape the plastic bag into more rigid structure for ease of handling and stacking.

4,995,860

EASY OPENING BAG PACK AND SUPPORTING RACK SYSTEM AND FABRICATING METHOD

Harry B. Wilfong, Jr., Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 472,781, Jan. 31, 1990. This application Apr. 18, 1990, Ser. No. 510,730
Int. Cl.[5] B31B *23/86, 37/86*
U.S. Cl. 493—195 4 Claims



1. A method of fabricating easy opening bag packs in which each of the bags has integrally connected front and rear wall portions and gussetted side wall portions secured together at the bottoms thereof to define a closed bottom and at least partially open at the tops thereof to define a mouth portion and aligned bag mounting apertures cut through all of the wall portions on opposed sides of the bag near the top thereof and an additional cut portion in the front wall portion and the front section of the gussetted side wall portions and in communication with the apertures therein for effectively enlarging the apertures to provide easy opening of the bag when mounted on outwardly extending stub shaft supports of a rack, said method including the steps of:

feeding a generally flat side-gussetted continuous tube of material in a generally linear direction and along flat plates extending into the side gusset folds to separate front and rear sections of the gusset folds;

cutting the top layer and front section of the gusset fold against the flat plates on opposed sides of the continuous flat tube in a desired configuration at spaced intervals as the tube is being fed in the linear direction to form the additional cut portion for effectively enlarging the bag mounting apertures in the bags being fabricated;

thereafter transversely cutting the continuous flat tube at spaced intervals as the tube is being fed in the linear direction and between the cuts formed by the preceding cutting step to form individual bags from the tube and while sealing at least every other transverse cut to form the closed bottoms on the bags; and

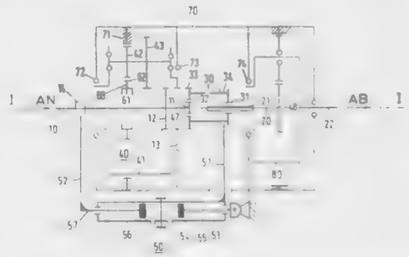
cutting the bag mounting apertures through all of the layers on opposed sides of the bags and to communicate with the additional cut in the top layer and front section of the gusset folds at a desired time in the bag fabricating method.

4,995,861

MECHANICAL SHIFTABLE THREE SPEED PLANETARY TRANSMISSION

Peter Erlbruch, Herdecke, Fed. Rep. of Germany, assignor to Mannesman Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1989, Ser. No. 453,317
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3844166
Int. Cl.[5] F16H *1/46, 3/54*
U.S. Cl. 475—298 10 Claims



1. A mechanically shiftable three speed planetary gear transmission comprising:

a housing;

a driving shaft extending from the housing, said driving shaft having a head thereon within the housing;

said head of said driving shaft having a first portion and a second portion, said first portion being attached to said driving shaft and said second portion being axially spaced apart from said first portion;

a central toothed sun gear attached to said first portion of said head of said driving shaft;

a toothed clutch gear attached to said second portion of said head of said drive shaft;

an opposed axially spaced output shaft coaxial with said driving shaft, said output shaft having external gear teeth provided thereon within the housing;

a gear shift sleeve slideably mounted for axial movement along the output shaft;

said gear shift sleeve having a first set of gear teeth for engagement with the external gear teeth of the output shaft and a second set of gear teeth for engagement with said toothed clutch gear;

a shift device protruding from the housing, and locked to said driving shaft for axially moving said driving shaft, engaged with said gear shift sleeve for sliding the same;

a pinion cage containing variable planetary gears having different diameters;

an internal toothed ring gear in the housing with which one of said planetary gears mesh; and

an internally and externally toothed ring gear concentric

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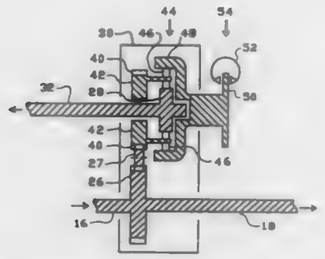
with said central sun gear and selectively engageable with said planetary gears and said central sun gear.

4,995,862

INTERAXLE TRANSFER MECHANISM FOR FOUR WHEEL DRIVE VEHICLES

Henry F. Arocha, 6603 Orion Ave., Van Nuys, Calif. 91406

Filed Aug. 21, 1989, Ser. No. 396,295
Int. Cl.[5] F16H *1/44.5, 1/42*
U.S. Cl. 475—86 9 Claims



1. An interaxle drive transfer mechanism, interposed in an auxiliary motive power path between an engine and an auxiliary driveshaft of a part time four wheel drive vehicle, comprising:

a primary differential gear set having a first gear element rotationally coupled to a power driveshaft receiving motive power from the engine, a second gear element rotationally coupled to the auxiliary driveshaft, and a third gear element;

a braking unit having a rotor rotationally coupled to the third gear element; and

controlling means adapted to select one from at least the following three levels of braking torque and corresponding vehicle drive modes: (1) full braking torque, locking the rotor so as to provide a four wheel front-rear-locked four wheel drive mode, (2) partial braking torque, allowing limited rotor slippage so as to provide a limited-slippage-auxiliary four wheel drive mode, and (3) zero braking torque, allowing free rotor rotation so as to prevent drive power from reaching the auxiliary driveshaft and to thus provide a two wheel drive mode.

4,995,863

CATHETER WITH SLIT VALVE

Colin J. Nichols, Fruit Heights; Gregory N. Nordgren, West Valley City, and Harvey R. Moorehead, Salt Lake City, all of Utah, assignors to Catheter Technology Corporation, Salt Lake City, Utah

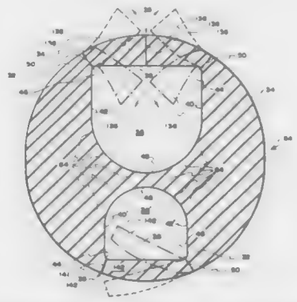
Continuation of Ser. No. 915,474, Oct. 6, 1986, Pat. No. 4,753,640. This application Feb. 25, 1988, Ser. No. 160,473
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—247 56 Claims

1. An indwelling multi-lumen catheter comprising:

a catheter tube made of biocompatible material, the catheter tube comprising a distal end portion having a single smooth exterior surface and ending in a closed distal tip, a proximal end portion, and wall means defining a plurality of independently usable lumens extending substantially the entire length of the catheter tube;

a normally sealed, selectively operable, laterally disposed, three-position slit valve communicating between the distal end of one of the lumens and the exterior surface of the distal end portion, the slit valve affording selective influent and effluent flow control into and out of the lumen associated therewith;

the slit valve comprising a slit extending through the wall, the slit being essentially parallel to and offset from the axis of the catheter tube and being defined by opposed, aligned, normally sealed, parallel first and second edges of respective oppositely disposed first and second slit valve wall segments of the wall between the associated lumen and the exterior surface of the distal end portion, the first slit valve wall segment being pivotably displaceable inwardly and outwardly responsive to predetermined liquid pressure differentials between the pressure in the associated lumen and the pressure exterior to the catheter tube, thereby to pivot the first edge into a spaced-apart spatial



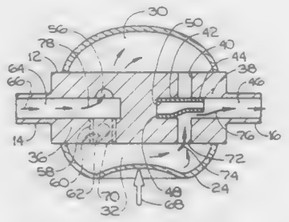
relationship from the second edge, whereby the first edge is capable of selectively opening either outwardly from the normally sealed position to infuse fluid from the one of the lumens into the space exterior to the distal end portion, or inwardly from the normally sealed position to withdraw fluid from the space exterior to the distal end portion into the one of the lumens, the first slit valve wall segment being eccentrically disposed in the slit valve with the slit being asymmetrically disposed between the two slit valve wall segments in offset relation to the center of the slit valve.

4,995,864

DUAL CHAMBER PUMPING APPARATUS

Victor L. Bartholomew, Escondido, and Giorgio di Palma, Ramona, both of Calif., assignors to Imed Corporation, San Diego, Calif.

Filed Aug. 15, 1989, Ser. No. 394,076
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—153 11 Claims



9. A dual chamber pumping apparatus for use in infusing fluids to a patient comprising:

a disk having a fluid inlet and a fluid outlet; and

a first resilient membrane attached to a first side of said disk for establishing a first pumping chamber, and a second resilient membrane attached to a second side of said disk for establishing a second pumping chamber;

said disk having inlet valve means for connecting said fluid inlet in fluid communication with said first pumping chamber and said second pumping chamber, said valve means including a first one-way valve movable between an open position for allowing fluid to flow from said fluid inlet into said first pumping chamber and a closed position for preventing fluid from flowing from said first pumping chamber back into said fluid inlet, said valve means further including a second one-way valve movable between an open position for allowing fluid to flow from said fluid inlet into said second pumping chamber and a closed position for preventing fluid from flowing from said first pumping chamber back into said fluid inlet;

said disk further having outlet valve means connecting said first and second pumping chambers in fluid communication with said fluid outlet, said outlet valve means including a one-way outlet valve for preventing fluid flow from said fluid outlet back into said first and second pumping chambers, and being movable between a first position for allowing fluid to flow from said first pumping chamber into said fluid outlet while preventing fluid from flowing from said second pumping chamber into said fluid outlet, and a second position for allowing fluid to flow from said second pumping chamber into said fluid outlet while preventing fluid from flowing from said first pumping chamber into said fluid outlet.

4,995,865

MULTI-LUMEN CATHETERS

William J. Gahara, Nashua, and Thomas R. Johnson, Milford, both of N.H., assignors to Worldwide Medical Plastics Inc., Nashua, N.H.

Filed Jun. 9, 1989, Ser. No. 364,799
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—43 15 Claims



1. A three-lumen catheter comprising:

an elongated unitary tube having an integral septum extending within the entire length of said tube and dividing the interior of said tube into first, second and third lumens, said integral septum having an approximately T-shaped cross-section;

the outer circumference of said tube converging smoothly at its distal end to form a conical tapered tip;

said first lumen extending from the proximal end of said tube continuously through said conical tapered tip to an opening at the apex of said tip, said first lumen for introducing fluid to a body cavity;

each of said second and third lumens extending continuously from the proximal end of said tube to at least one opening in the sidewall thereof at a location axially spaced from said conical tip, both said second and third lumens for withdrawing fluid from a body cavity; and

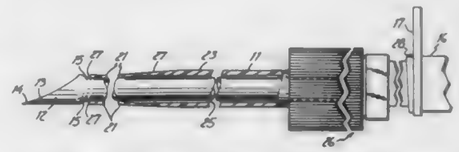
each of said second and third lumens having no opening through the apex of said conical tip.

4,995,866

COMBINED NEEDLE AND DILATOR APPARATUS

Kurt Amplatz, St. Paul, and Frank Kotula, Maple Grove, both of Minn., assignors to Microvena Corporation, Vadnais Heights, Minn.

Filed Dec. 15, 1989, Ser. No. 451,093
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—53 9 Claims



1. A combined needle and dilator apparatus, comprising:

a. A needle with an elongated shaft terminating forwardly in a head having an outer diameter greater than the outer diameter of the shaft adjacent the head and defining a generally rearwardly facing shoulder, the head terminating forwardly in a cutting edge; and

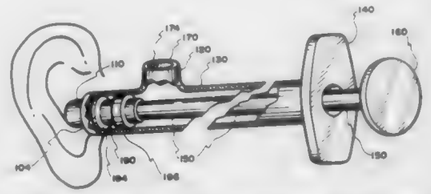
b. A dilating sheath slidably carried about the needle shaft and having a generally cylindrical front portion terminating in a forward rim abutting the shoulder of the needle head, said front portion having a uniform outer diameter substantially equal to the outer diameter of the needle head to define, with the head, a generally smooth surface; the sheath further having a generally cylindrical body portion with an outer diameter greater than the outer diameter of said front portion, and a tapered portion having rearwardly divergent walls and disposed between said front portion and said body portion of the sheath, the tapered portion having an outer surface smoothly merging into the outer surfaces of the front portion and the body portion.

4,995,867

AURAL MEDICATION DISPENSER

Eugene A. Zollinger, 3075 S. State Highway 91, Wellsville, Utah 84339

Filed Jan. 24, 1990, Ser. No. 470,193
Int. Cl.[5] A61M *35/00*
U.S. Cl. 604—54 6 Claims



1. A method for repeatably delivering medication using a single aural medication dispensing device without contaminating source medical fluid comprising the following steps:

(a) provide an aural medical dispensing device comprising:

plunger means for moving and sealing fluid within a syringe barrel means, the plunger means comprising:

rod means of sufficient length to drive substantially all fluid residing within the syringe barrel means through a distal port means of the syringe barrel means;

seal means on the distal end of the plunger means comprising:

seal end means on the distal end of the seal means which can seal and wipe the inner surface of the

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syringe barrel means as it is moved distally to drive fluid toward the distal port means of the syringe barrel means;

seal length means, contiguous with and extending proximal from the seal end means, which provide lateral stability to the seal means and rod means to provide seal integrity as the seal means is moved past an open side port means of the syringe barrel means;

syringe barrel means comprising:

proximal entry port means for the plunger means;

distal effluent port means from which fluid can be dispensed into an external auditory canal; and

side port means into which medical fluid can be introduced without the inserted fluid being contaminated by material on the distal effluent port means and which is positioned sufficiently proximal from the distal effluent port means that a unit dose can be stored and sealed by the plunger seal means without leakage from the distal effluent port means;

(b) pull the plunger means proximally from the distal end of the syringe barrel means until the seal means is clear of the entry space of the side port means of the syringe barrel means;

(c) holding the syringe barrel such that the side port means opens vertically upward and using an eye dropper or the like transfer medication through the side port means into the syringe barrel means;

(d) after a unit dose is contained in the syringe barrel means, move the plunger means distally until the seal means seals the medication from the entry side port means;

(e) place the distal effluent port means at the entry orifice of the external auditory canal and push the plunger means to the distal end of the syringe barrel means discharging the medication dose into the ear;

(f) return to step (b) to repeat as necessary.

4,995,868

CATHETER

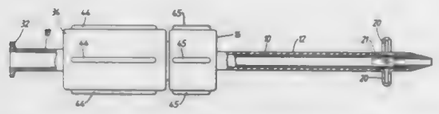
Gary B. Brazier, Great Oakley, United Kingdom, assignor to Bard Limited, Crawley, United Kingdom

Filed Sep. 26, 1989, Ser. No. 412,993

Claims priority, application United Kingdom, Oct. 12, 1988, 8823905; Nov. 28, 1988, 8827751

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—105 18 Claims



1. A catheter comprising an inner tube having a distal end for insertion into a human or animal body, said inner tube having an opening defined therein at or near the distal end thereof to establish a fluid path, and a proximal end to be located outside the body, a hollow connector secured to the proximal end of the inner tube for attachment to a fluid supply or fluid drain; an outer tube concentric with the inner tube and having a distal end secured to the distal end of the inner tube, a proximal end to be located outside the body and an expandable and contractible retention structure adjacent to the distal end; actuating means on the proximal ends of said inner and outer tubes for the expandable retention structure including means for enabling and effecting relative sliding movement of the proximal ends of the tubes and thereby to expand or contract the retention structure and respectively define an expanded condition or a contracted condition, wherein a housing is secured to the proximal end of the outer tube and is so dimensioned that when the retention structure is in a contracted condition, the inner tube connector is located within the housing and when the retention structure is in an expanded condition, the inner tube connector protrudes beyond the housing.

4,995,869

MONO-USE SYRINGE FOR HYPODERMIC INJECTIONS

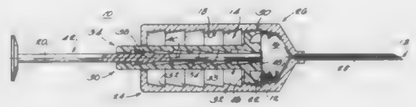
Martin McCarthy, Milan, Italy, assignor to Clyde Fessler, Milwaukee, Wis.

Filed Oct. 10, 1989, Ser. No. 419,022

Claims priority, application Italy, Dec. 21, 1988, 23040 A/88

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 10 Claims



1. A syringe for hypodermic injections having a needle, the syringe comprising

a barrel defining a chamber in fluid communication with the needle,

a guide member disposed within the chamber,

a plunger disposed within the chamber and between the guide member and the needle, the plunger having a stem extending through the guide member,

first ratchet means on the guide member and one the barrel for allowing movement of the guide member and plunger to a remote position relative to the needle and for preventing return movement of the guide member, and

second ratchet means on the guide member and the stem for allowing movement of the plunger relative to the guide member in the direction of the needle and for preventing movement of the plunger relative to the guide member in the direction away from the needle.

4,995,870

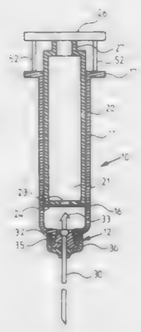
DISPOSABLE SYRINGE WITH RETRACTABLE NEEDLE

Morris J. Baskas, 200 California Rd. #14, Bronxville, N.Y. 107[illegible]

Filed May 9, 1990, Ser. No. 520,733

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 13 Claims



1. A safety syringe for administering medicaments, comprising a barrel having an outlet end, a needle removably supported at the outlet end and having a first portion extending into the barrel and a second portion extending externally, a plunger slidably disposed within the syringe, and means on the first needle portion upon contact with the plunger for connecting to the plunger whereby upon retraction of the plunger the needle after use can be safely retracted and stored for disposable inside the syringe, said safety syringe further comprising a resilient plug mounted at the outlet end and surrounding the needle, and means for compressing the plug to lock the needle to the outlet end.

4,995,871

NEEDLE DETACHER FOR SYRINGE

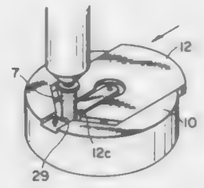
Hirotaka Sasaki, Sayama; Aguri Tanaka, Tokyo; Hiroyuki Inagaki, Kamakura; Tatsuo Suzuki, Tokyo, and Kenji Asakura, Funabashi, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hikkaido, Japan

Filed Jan. 30, 1989, Ser. No. 303,228

Claims priority, application Japan, Feb. 4, 1988, 63-14177[U]; Nov. 16, 1988, 63-149247[U]

Int. Cl.[5] A61M *5/00*; B65D *83/10*

U.S. Cl. 604—110 14 Claims



1. A needle detacher for detaching a needle from a syringe cylinder comprising:

(1) a relatively rigid and elongated container body having an end thereof closed and being configured such that the container body may be firmly grasped by a hand of a user and without substantial deformation of the container body;

(2) a lid assembly, connected to an other end of said container body, having a stationary outer lid and a movable inner lid which is slidable in relation to the outer lid;

(3) spring means associated with said inner lid so as to bias the inner lid such that inner lid portions and outer lid portions are spaced apart and define therebetween an adjustable needle trap opening, and wherein said inner lid is manually movable relative to said outer lid that:

(i) the trap opening may be decreased sufficiently by manual force on the inner lid against said spring means so as to forcibly engage a needle neck of a needle disposed in the trap opening between the said lid portions that a syringe cylinder attached to the needle and the lid assembly may be rotated relative to each other sufficiently to detach the needle from the syringe cylinder; and

(ii) the trap opening may be increased sufficiently by release of said manual force on said inner lid and by action of said spring so as to release the needle neck from between the said lid portions and allow the needle to fall through said needle chute opening into the container body; and

(4) closing means associated with the inner lid such that said trap opening is at least substantially closable after said needle has been received in the container body.

4,995,872

EXPANDABLE CATHETER AND BRIDGE DEVICE

Janice J. Ferrara, 11605 Timberly Waye, Richmond, Va. 23233

Filed Oct. 4, 1989, Ser. No. 416,983

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—280 37 Claims

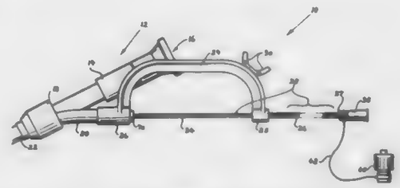
1. An expandable catheter and bridge device for use in combination with endoscopic instruments in catheterization procedures, comprising:

catheter means including

a catheter tube for catheterization use, said catheter tube having a proximal and a distal end,

a longitudinally inextensible section proximate said proximal end,

a longitudinally expandable section proximate said distal end, said inextensible and expandable sections forming a continuous catheter conduit between said proximal and distal ends, said continuous catheter conduit being laterally flexible; and



bridge means of substantially rigid structure for supporting and guiding said catheter tube, and for expanding said longitudinally expandable section, said bridge means including

a bowed section having a proximal catheter-encircling end at one end thereof and a distal catheter-encircling end at another end thereof for guiding said catheter means therethrough, said bowed section having a generally bow-like shape to facilitate manipulation of said catheter tube while said catheter tube is disposed between said proximal catheter-encircling end and said distal catheter-encircling end.

4,995,873

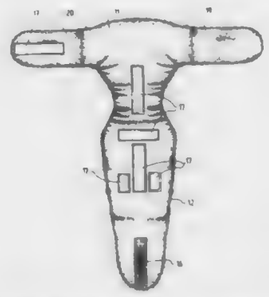
ABSORBENT GARMENT

Jackilyn M. Knight, 30 Tomboola Road, Murwillumbah, New South Wales, Australia (2484)

Filed Jan. 9, 1989, Ser. No. 364,764

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—391 7 Claims



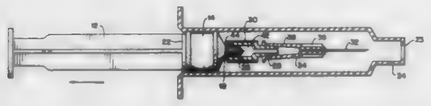
1. An absorbent garment having a cross-piece and an intersecting piece which together form a substantially "T-shaped" configuration when the garment is laid out flat, said cross-piece being a relatively narrow band having opposite ends for encircling the lower trunk of a wearer in an overlapping manner and said intersecting piece being a relatively wider and longer band defining a mid-sectional region and an end region; and

said garment including releasable fastening means fitted to said end region, said mid-sectional region and said opposite ends of said intersecting piece and said cross-piece, respectively; whereby, the end region of the intersecting piece passes under the crotch of the wearer and upwardly and then looped over said cross-piece in front of the

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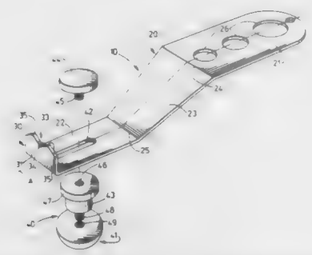
wearer and fastened to the mid-sectional region to produce a loincloth arrangement.

4,995,874
DISPOSABLE SYRINGE DEVICE
H. Allen Strickland, 83 Beach St., Westerly, R.I. 02891
Filed Jun. 23, 1989, Ser. No. 370,718
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—195 6 Claims



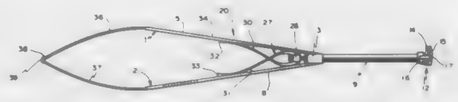
1. A disposable syringe device having a retractable needle, comprising:
a cylinder member having a neck portion at one end thereof;
a plunger mounted for reciprocal movement within said cylinder, said plunger having a threaded portion at one end; a threadbore member mounted within said neck portion in fluid tight engagement therewith, said threadbore member having an inner bore with a threaded portion in said bore for receiving the threaded portion of said plunger; a tapered post member mounted on one end of said threadbore member outwardly of said cylinder, said post member having said needle mounted therein; and a gasket mounted about the circumference of said threadbore member to provide fluid tight engagement between the threadbore member and the neck portion of said cylinder.

4,995,875
FEMORAL ELEVATING TOOL
Cecil Coes, 6830 Elwynn Dr., Cincinnati, Ohio 45236
Filed May 27, 1988, Ser. No. 199,475
Int. Cl.[5] A61F *2/00*
U.S. Cl. 606—90 19 Claims



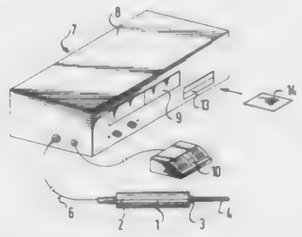
1. A femoral elevating tool for use in hip replacement surgical procedures, said tool comprising a handle having proximal and distal ends and a longitudinal axis along its length, said handle including a bone rest adjacent its distal end and being substantially planar to its perpendicular axis, and a ball means attached to said handle intermediate said proximal and distal ends and extending outwardly from said longitudinal axis for anchoring said tool in an acetabulum to provide a fulcrum for said tool.

4,995,876
NEUROSURGICAL CLIP APPLIER
Ana E. Puig, 308 Hawkeye Court, Iowa City, Iowa 52240
Continuation-in-part of Ser. No. 716,496, Mar. 27, 1985, abandoned. This application Feb. 6, 1986, Ser. No. 826,911
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—142 6 Claims



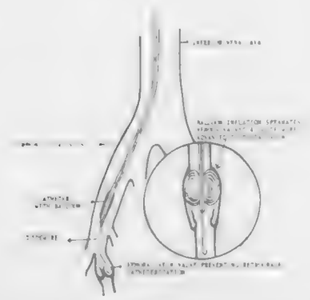
1. A surgical instrument for applying surgical ligating clips onto a blood vessel or tissue in connection with a surgical operation, said instrument comprising a pair of opposed jaws integrally joined to each other but capable of pivoting movement toward and away from each other by elastic bending of the material from which they are formed, a pair of opposed handles integrally joined to each other but capable of pivoting movement toward and away from each other by elastic bending of the material from which they are formed, and actuating member comprising a pair of leg members joined together by a bight portion, the free ends of each of said leg members being rigidly secured to a respective one of said opposed handles, a push rod connecting said bight portion to one of said pair of opposed jaws, said leg members and said bight portion being integrally joined to each other so that no relative motion between the bight portion and either of said leg members is possible at the point of juncture between them whereby pivoting movement of said handles is converted into linear reciprocating movement of said bight portion and of said push rod thereby causing pivoting motion of said one of said pair of opposed jaws.

4,995,877
DEVICE WITH A ROTATIONALLY-DRIVEN SURGICAL INSTRUMENT
Felix Ams, Kämpfelbach; Manfred Baier, Bretten, and Roland Schäfer, Bretten-Diedelsheim, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany
Filed Feb. 17, 1989, Ser. No. 311,758
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805179
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—180 8 Claims



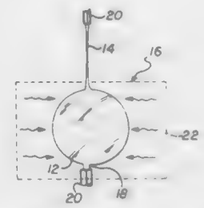
1. A device comprising:
a rotationally driven surgical instrument having a hand-held element;
interchangeable cutting and milling inserts;
a mount rotatably installed in said hand-held element for reception of said interchangeable cutting and milling inserts;
a driving motor for driving the mount receiving the cutting and milling inserts, and;
a control unit for controlling the driving motor including means for setting a rotational speed of the motor and for preselecting a rotational speed range and also an indicator for display of the rotational speed set in each case; said control unit comprising a non-volatile write-read memory for digital storage of user-specific rotational speed data,
a code carrier remote from said cutting and milling inserts and removable from said control unit, said code carrier carrying a reprogrammable encoding corresponding to speed data in said write-read memory, said encoding on said code carrier being reprogrammable by a user to set said surgical instrument to a user selected rotational speed range, and also
a means for coding/decoding said encoding on said code carrier, said means for coding/decoding selectively receiving said code carrier for reading said encoding.

4,995,878
METHOD FOR DESCENDING VENOGRAPHY
Dinker B. Rai, 230-20 53rd Ave., Bayside, N.Y. 11364
Filed Jul. 15, 1988, Ser. No. 219,140
Int. Cl.[5] A61M *25/01*
U.S. Cl. 606—194 9 Claims



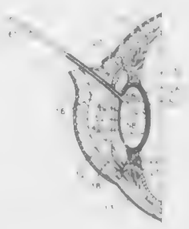
1. A method for the evaluation of all types of chronic venous insufficiency of the lower extremities of the human body comprising the steps of:
introducing an angiocatheter into a superficial vein in the forearm of the body;
inserting a guide wire having a "J"-shaped tip into said angiocatheter and advancing said guide wire within the superficial vein of the forearm;
removing said angiocatheter from the superficial vein in the forearm while leaving the guide wire in place in the vein;
dilating the opening of the superficial vein around said guide wire;
introducing an elongated catheter having a diameter sufficiently small to pass unobstructed through the superficial vein of the forearm, and having a length sufficient to reach the distal thigh;
allowing the guide wire to be introduced from the superficial vein through the heart into the inferior vena cava and into the femoral vein in the groin;
simultaneously advancing said elongated catheter on said guide wire into said femoral vein in the groin of the body to examine the proximal valves of the femoral vein;
injecting an X-ray contrast fluid into said elongated catheter; and
examining and evaluating competency of said valves in the femoral vein under fluoroscopy.

4,995,879
INTRAOCULAR LENS WITH UNITARY DRAWN HAPTICS
Robert R. Dougherty, 830 Greenridge Dr., La Canada, Calif. 91011
Filed Oct. 10, 1989, Ser. No. 419,127
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 11 Claims



6. A method of forming an intraocular lens, comprising the steps of:
forming a lens preform from a polymeric material to include a lens body adapted for shaping with selected optical characteristics and at least one lobe formed integrally with the lens body and protruding outwardly therefrom; and
drawing at least a portion of the lobe into the shape of a support haptic.

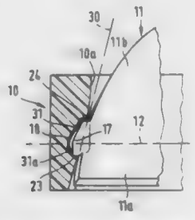
4,995,880
INTRAOCULAR LENS AND METHOD OF SURGICALLY IMPLANTING SAME IN AN EYE
Samuel H. Galib, 104 Morlyn Rd., Bryn Mawr, Pa. 19010
Filed Sep. 26, 1989, Ser. No. 412,487
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 27 Claims



26. An intraocular lens implant for insertion into the surgically-prepare lens capsule of a human eye after the crystalline portion of the natural lens has been removed from said capsule through a small incision in ocular tissue at the front of the eye, said lens implant comprising:
(a) a collapsible and expansible bag that comprises a transparent body portion containing a cavity and an entrance opening to said cavity through which filler material can be introduced into said body portion, and
(b) said body portion being adapted to fit within the surgically-prepared lens capsule of said eye in a position adjacent the posterior wall of the lens capsule when expended by filler material introduced thereinto via said small incision and said entrance opening, and in which said body portion further includes: (i) a flexible posterior face for juxtaposition with the posterior wall of said lens capsule, (ii) a flexible anterior face, and (iii) strands extending between said posterior and anterior faces for limiting the spacing between said faces when the body portion is expanded by filler material introduced therein.

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4,995,881
HEART VALVE PROSTHESIS
Martin Knoch; Helmut Reul, and Günter Rau, all of Aachen, Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany
Filed Jul. 31, 1989, Ser. No. 387,701
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828830
Int. Cl.[5] A61F 2/24
U.S. Cl. 623—2 18 Claims

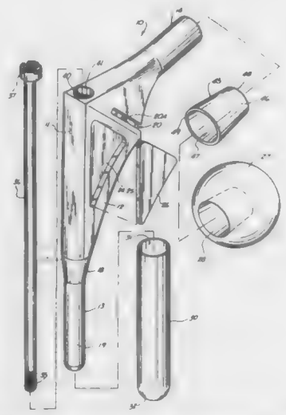


10. A heart valve prosthesis comprising:
a valve ring having a continuously narrowing inner surface, the inner surface having a plurality of recesses,
a closing member having a swivel axis and being provided with a plurality of journal pins, at least one of the plurality of journal pins being configured to engage at least one of the plurality of recesses,
at least one of the plurality of recesses being sectorshaped and having a rounded inner portion and an outer portion,
at least one of the journal pins defining a substantially oblong cross-section and having a first supporting surface configured to engage the rounded inner portion of the recess and a second supporting surface configured to engage the outer portion of the recess,
the first supporting surface defining an axis of curvature,
the swivel axis and the axis of curvature of the first supporting surface being substantially coincident.

4,995,882
RADIOLUCENT BREAST IMPLANT
Judy M. Destouet, St. Louis; John O. Eichling, Marthasville; Louis A. Gilula, St. Louis; Barbara S. Monsees, St. Louis, and Vernon L. Young, St. Louis, all of Mo., assignors to Washington University
Filed Aug. 28, 1989, Ser. No. 399,180
Int. Cl.[5] A61F 2/12
U.S. Cl. 623—8 14 Claims

1. A breast implant having an average radiographic density substantially the same as that of a human breast and being substantially radiolucent throughout its entirety.

4,995,883
MODULAR HIP PROSTHESIS
Michael Demane; Thomas W. Fallin; Steve Garner, all of Memphis, and Jeff Schryver, Cordova, all of Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.
Filed Feb. 8, 1989, Ser. No. 308,205
Int. Cl.[5] A61F 2/34, 2/30
U.S. Cl. 623—23 15 Claims



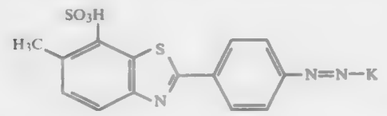
1. An implantable modular hip prosthesis that can be custom fitted to a particular patient by a surgeon prior to surgical insertion, comprising:
(a) a hip prosthesis main body having an upper proximal end portion and a lower stem portion, said proximal upper end portion including a neck portion extending from the main border and adapted to be coupled to a rounded joint head portion that is configured to engage the acetabulum;
(b) the lower stem portion extending distally from the main body and terminating at a rounded tip and having an internal through bore formed therein along the length thereof;
(c) an elongated tubular sleeve terminating at opposite ends and at least a portion of the sleeve being hollowed and opening at one end thereof wherein the hollowed portion is configured in shape for receipt of the stem lower end portion receptive of the stem;
(d) an elongated connecting rod having attachment means at one end thereof for operatively coupling the sleeve to the main body wherein the tubular sleeve is disposed over the lower stem portion and the connecting rod is inserted into the through bore and the attachment means is coupled to the tubular sleeve thereby forming a modular prosthesis that can be custom fitted to a particular patient prior to surgical insertion by interchanging sizes of the various components.

4,995,884
POLYALPHAOLEFIN EMULSIONS FOR FIBER AND TEXTILE APPLICATIONS
Stanley E. Ross, Greer, and AlexSandra C. Nasser, Mauldin, both of S.C., assignors to Henkel Corporation, Ambler, Pa.
Filed Dec. 8, 1989, Ser. No. 447,743
Int. Cl.[5] D06M 11/00, 13/00, 13/241, 23/00
U.S. Cl. 8—115.6 19 Claims

1. A finish composition for fiber and textile materials comprising from about 5 to about 20 weight percent of antistatic agent, from about 25 to about 50 weight percent of an emulsifier, and the balance, a synthetic hydrocarbon oil comprising of an aliphatic polyalphaolefin obtained from the oligomerization of decene—1, based on the weight of said composition.

4,995,885
CONCENTRATED AQUEOUS DYE SOLUTIONS FOR DYEING PAPER
Hans Morawietz, Seewen, Switzerland, assignor to Ciba-Geigy Corp., Ardsley, N.Y.
Filed Nov. 13, 1989, Ser. No. 434,157
Claims priority, application Switzerland, Nov. 15, 1988, 4223/88
Int. Cl.[5] C09B 29/01, 67/26, 69/04
U.S. Cl. 8—527 15 Claims

1. A concentrated aqueous dye solution containing
(a) 7 to 30% by weight of a dye of the formula

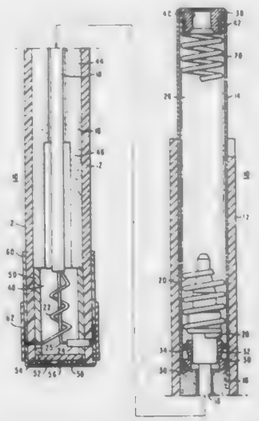


(1)

where K is a coupling component of the acetoacetanilide, pyridone, pyrazolone or pyrimidine series,
(b) 1 to 5 moles of 3-diethylamino-1-propylamine, 2-diethylaminoethanol or 2-(2-aminoethoxy)ethanol per mole of dye of the formula (1) and
(c) further, optional additives.

4,995,886
METHOD OF ASSEMBLING A CONTROLLED SEAL FOR AN EXPULSION FUSE
Frank L. Cameron, and George A. Smith, both of N. Huntingdon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 445,057, Dec. 4, 1989, Pat. No. 4,952,900.
This application Jun. 20, 1990, Ser. No. 540,986
Int. Cl.[5] H01H 69/02
U.S. Cl. 29—623 2 Claims

1. A method of assembling a sealing construction for an electric circuit interrupter, and having a controlled mechanical strength, the steps comprising:
providing a tubular insulating casing with an inner wall, an expulsion end, a fuse end, and a sleeve in said fuse end,
inserting a diaphragm in said expulsion end against said sleeve,
applying a layer of cement around the periphery of said diaphragm between said diaphragm and said inner wall of said tubular insulating casing to affix said diaphragm and to seal said expulsion end,
providing an end cap to enclose said expulsion end, and
prior to placing said end cap onto said expulsion end, applying epoxy cement into said cap in order for said cement to fill the space existing at said expulsion end between said



diaphragm and said end cap and any voids existing between said end cap and said tubular insulating casing.

4,995,887
CUTTING ELEMENTS FOR ROTARY DRILL BITS
John D. Barr, Cheltenham, England, and Thomas A. Newton, Jr., Houston, Tex., assignors to Reed Tool Company Limited, Gloucestershire, England
Filed Apr. 4, 1989, Ser. No. 333,297
Claims priority, application United Kingdom, Apr. 5, 1988, 8807875; Nov. 15, 1988, 8826672
Int. Cl.[5] B24B 1/00
U.S. Cl. 51—295 38 Claims

1. A cutting element for a rotary drill bit comprising a layer of polycrystalline diamond material having a front face and a rear face, a backing layer of less hard material bonded to the rear face of the diamond layer, and a front layer of less hard material bonded to the front face of the diamond layer and extending across at least the major part thereof, the front layer being thinner than the backing layer, at least in the vicinity of the cutting edge, and the backing layer, diamond layer and front layer constituting a preformed structure in which the layers have been bonded together in a high temperature, high pressure press.

4,995,888
SEPARATION OF GAS FROM SOLVENT BY MEMBRANE TECHNOLOGY
Richard F. Beaupre, Darien, Conn., and Dick Y. Jung, Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.
Filed Jul. 5, 1988, Ser. No. 214,983
Int. Cl.[5] B01D 53/22, 71/16
U.S. Cl. 55—16 10 Claims

1. The method of separating a charge rich liquid containing gas dissolved in solvent therefor which comprises
maintaining said charge rich liquid containing gas dissolved in solvent therefore in liquid phase in contact with a gas-permeable, essentially solvent impermeable membrane of pore size of less than about 1000 A and molecular weight cutoff of below about 1,000 selected from the group consisting of cellulose acetate membrane, hydrolyzed cellulose membrane, and polyethyleneimine membrane, and;
maintaining a pressure drop across said gas-permeable essentially solvent-impermeable membrane;
passing said gas from the charge rich liquid containing gas dissolved in solvent therefore at the higher pressure side of said membrane through said membrane thereby form-

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ing lean liquid containing decreased quantities of gas dissolved in solvent on the higher pressure side of said membrane and, on the lower pressure side of said membrane, gas containing decreased quantities of liquid;

recovering lean liquid containing decreased quantities of gas dissolved in solvent from the high pressure side of said membrane; and

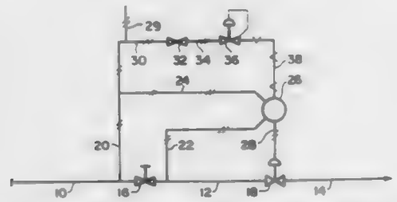
recovering gas containing decreased quantities of liquid from the lower pressure side of said membrane.

4,995,889

CONTROL OF PRODUCT WITHDRAWAL FROM A SORPTIVE SEPARATION SYSTEM

Alan D. Abel, Allentown; William E. Waldron, North Catasauqua, and Theodore F. Wells, Allentown, all of Pa., assignors to Air Products and Chemials, Inc., Allentown, Pa.

Filed Feb. 23, 1990, Ser. No. 484,590
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—21 **18 Claims**



1. A method for maintaining relatively constant flow of product gas from a sorptive gas separation apparatus wherein the product gas withdrawal rate periodically varies on demand over multiple cycles from approximately its design rate to an increased rate above approximately said design rate, comprising:

(a) continuously measuring the pressure drop across a variable or fixed orifice device by sensing the pressure upstream and downstream of said device;

(b) providing a pneumatic signal, which is proportional to the difference between a set desired pressure drop and the measured pressure drop of step (a), to a pneumatically opened control valve in a product gas flow line; and

(c) adjusting the flow of product gas in said product gas flow line by opening or closing said control valve proportional to said pneumatic signal.

9. A flow control means for the product line of a sorptive gas separation apparatus, comprising:

(a) a pneumatically opened control valve connected to the product line of the separation apparatus to control flow of product therethrough,

(b) a variable or fixed orifice device connected to the product line upstream of said control valve;

(c) a differential pressure controller having means to sense pressure upstream and downstream of said orifice device and means to deliver a pneumatic signal to said control valve proportional to the difference between a set desired differential pressure and the differential of the sensed pressures from upstream and downstream of said orifice device; and

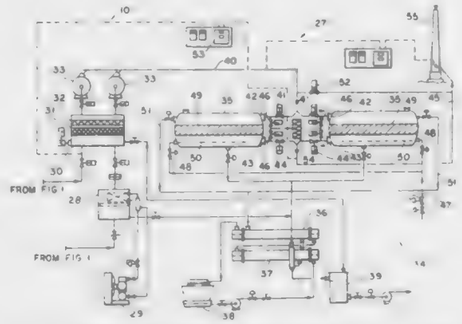
(d) means for providing pneumatic instrument gas at elevated pressure to said controller substantially only during such times as product gas is produced from said sorptive gas separation apparatus.

4,995,890

STORAGE TERMINAL VAPOR EMISSION CONTROL SYSTEM

Gordon R. Croudace, Pennant Hills, Australia, assignor to Croudace Holdings Pty Ltd., New South Wales, Australia

Filed Jan. 25, 1989, Ser. No. 302,768
Claims priority, application Australia, Jan. 27, 1988, PI6432
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—180 **5 Claims**



1. A combination bulk liquid chemical tank storage complex and vapour emission control system comprising:

a plurality of vapour collection ducts;

at least one tank connected to one of said vapour collection ducts;

a flow diverter in said one of said vapour ducts to allow air to enter the duct but prevent vapour reflux;

a header duct communicating with said collection ducts to receive vapour therefrom;

fan means communicating with each collection duct to draw vapour into the collection duct from a vapour source, for delivery into said header duct;

an air plenum connected to said header duct to receive the vapour therefrom, said plenum including heating and cooling coils to heat and cool the vapour passing through said plenum, said plenum having a plenum outlet duct;

low explosion level monitoring means to sense vapour concentration at several locations within the complex;

air delivery means to deliver air into said complex to selectively lower the vapour concentration within the complex in response to said low explosion level monitoring means detecting a high vapour concentration;

a vapour emission control system to receive vapour from said complex, said system including collection duct means to collect vapour from said plenum outlet duct, and an activated carbon adsorption plant communicating with said duct means to receive the vapours therefrom, said plant including:

a pair of adsorber vessels each having an inlet and an outlet and an activated carbon bed positioned between the inlet and outlet so that vapours passing through each adsorber vessel pass through the activated carbon bed thereof;

a common delivery duct to deliver vapours to each adsorber vessel, a first branch duct extending from said common delivery duct to a first one of said vessels, a second branch duct extending from said common delivery duct to the other vessel, a first valve means to selectively close said first and second branch ducts;

an outlet duct means extending from said vessels, a first outlet branch duct extending from the outlet of said one vessel to said outlet duct means, a second outlet branch duct extending from the outlet of said other vessel to said outlet duct means, second valve means to selectively close each of said outlet branch ducts;

desorption piping to deliver to each vessel steam to be passed through each carbon bed to regenerate the carbon bed and convey released vapours and steam from the vessels; wherein said complex further includes:

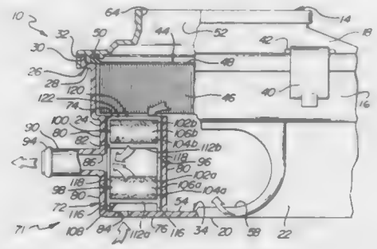
a first transfer duct means connecting the outlet of the first said vessel to the inlet of the second said vessel, a second transfer duct means connecting the outlet of the second said vessel to the inlet of the first said vessel, a third valve means to selectively close said first and second transfer duct means; and wherein said first and second valve means are operable to connect said vessels in series or parallel.

4,995,891

SECONDARY AIR FILTER ASSEMBLY

Alan Jaynes, Ortonville, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 5, 1990, Ser. No. 488,204
Int. Cl.[5] B01D *51/00*
U.S. Cl. 55—419 **17 Claims**



17. A filter cartridge assembly used for filtering air of a crankcase ventilating system of an internal combustion engine, said assembly comprising:

first (**108**) and second (**110**) air permeable filter platforms supporting first (**98**) and second (**100**) filters respectively, each of said first (**108**) and said second (**110**) filter platforms including four interconnected peripheral members (**112**) forming identical square-shaped peripheries having four equal sides and four corners, each of said first (**108**) and said second (**110**) filter platforms including intersecting cross members (**114**) extending diagonally across each of said peripheries between said corners, said first (**108**) and said second (**110**) filter platforms being disposed in parallel planes spaced a predetermined distance from one another to establish a filter spacing between said first (**98**) and said second (**100**) filters;

vertical support columns (**118**) interconnecting said corners of said first (**108**) and said second (**110**) filter platforms;

leg members (**116**) formed as a continuation of said vertical support members (**118**) extending from each of said corners of said first (**108**) filter platform a predetermined extended distance in a direction opposite said first filter (**98**);

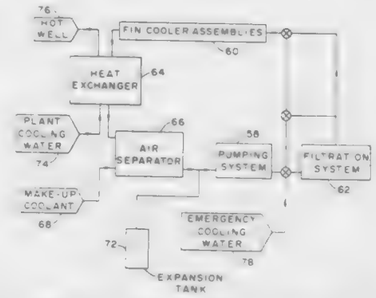
a filter retainer (**120**) including four peripheral members (**122**) equal in length forming a square-shaped periphery having four equal sides and four corners identical in shape to said peripheries of said first (**108**) and said second (**110**) filter platforms, said filter retainer (**120**) being disposed in a horizontal plane above said second filter (**100**) opposite and spaced from said second filter platform (**110**), said vertical support columns (**118**) interconnecting said corners of said filter retainer (**120**) and said second filter platform (**110**), said spacing between said filter retainer (**120**) and said second filter platform (**110**) being greater than said extended distance of said leg members (**116**) and less than said spacing between said first (**108**) and said second (**110**) filter platforms.

4,995,892

PROCESS AND APPARATUS FOR CONTROLLING THE THERMAL ENVIRONMENT OF GLASS FIBER FORMING

Jeffrey L. Garrett, Lexington; Harry Makitka, Clemmons; Richard J. Sanchez, and Gregory W. Shepler, both of Lexington, all of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 19, 1989, Ser. No. 452,866
Int. Cl.[5] C03B *37/02, 37/07*
U.S. Cl. 65—12 **14 Claims**



1. In a method for cooling glass fibers formed from molten glass flowing from a heated fiber glass bushing assembly wherein cooling is accomplished by the transfer of heat to a primary coolant flowing in a primary side of a closed-loop cooling system and subsequently removed to a flow of secondary coolant through at least one heat exchanger having both a primary and secondary side to accommodate the flow of said primary and secondary coolant, the improvement comprising: electronically monitoring the temperature of said primary coolant at a location downstream of said at least one heat exchanger to produce a first electrical signal representative of the temperature of said primary coolant; converting said electrical signal into a measure of temperature; comparing the temperature so measured by means of a programmable controller to a range of pre-programmed temperature limits; and, forwarding a second electrical signal from said programmable controller to a second electronic controller whereby the flow rate of coolant through the secondary side of said at least one heat exchanger is adjusted so as to maintain the temperature of said primary coolant within said prescribed range of pre-programmed temperature limits.

4,995,893

METHOD OF MAKING COATINGS ON GLASS SURFACES

Michael S. Jenkins, Nr. Preston; Andrew F. Simpson, Preston, and David A. Porter, Merseyside, all of England, assignors to Pilkington plc, Merseyside, England

Filed Jun. 22, 1989, Ser. No. 369,739
Claims priority, application United Kingdom, Jun. 23, 1988, 8814922.4
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[5] C03B *19/09*
U.S. Cl. 65—18.2 **10 Claims**

1. A process for forming an underlayer on a glass surface comprising directing on to the hot glass surface at a temperature of 600° C. to 750° C. a gaseous mixture of a silane, an unsaturated hydrocarbon compound and an oxygen-containing gas other than carbon dioxide which does not react chemically with the silane at approximately 20° C. thereby depositing a transparent layer containing silicon and oxygen on the glass surface.

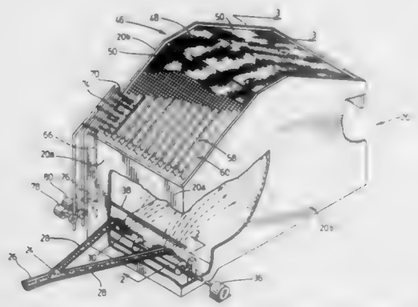
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4,995,894

ENCLOSURES FOR SLAG PELLETIZATION APPARATUS AND METHOD OF OPERATION

Kenneth W. Spencer, Ancaster; David T. Horvat, Hamilton, and Peter A. MacKenzie, Stoney Creek, all of Canada, assignors to National Slag Limited, Hamilton, Canada

Filed May 1, 1989, Ser. No. 345,270
Int. Cl.[5] C03B *19/10, 37/005*
U.S. Cl. 65—19 15 Claims



1. A slag pelletization enclosure in combination with a pelletizer for enabling retention within the enclosure of pellets and airborne particulate material created during the operation of the pelletizer, the enclosure comprising:

an enclosure frame;

air impermeable wall members mounted by the frame constituting the walls of the enclosure and defining an enclosure interior;

an open mesh roof member mounted by the frame and through which gases produced as a result of operation of the pelletizer pass in exiting from the enclosure interior; and

baffle means mounted on the enclosure frame beneath at least a portion of the area of the open mesh roof member above and adjacent the pelletizer, the baffle means permitting passage of gases therethrough while preventing passage of pellets and airborne particulate material which impinge thereon.

11. A method of operating a slag pelletization enclosure so as to retain within the enclosure pellets and airborne fibrous particulate material produced therein from slag material by a slag pelletization process, the enclosure comprising:

an enclosure frame;

air impermeable wall members mounted by the frame constituting the walls of the enclosure and defining an enclosure interior;

an oven mesh roof member mounted by the frame and through which pelletization gases pass in exiting from the enclosure interior; and

a rotary pelletizer mounted within the enclosure for projecting slag material that is impinged thereon upward through the air to form the pellets and the fibrous particulate material therefrom during its passage through the air;

the method including providing in the enclosure between the pelletizer and at least a part of the open mesh roof member above and adjacent to the pelletizer baffle means preventing impingement upon the roof member of upwardly projected pellets while permitting the passage therethrough of the exiting gases;

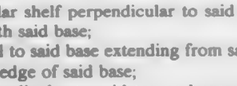
the method also including forming a filter blanket on the open mesh roof member by providing passage through the baffle means of a portion of the airborne fibrous particulate material with the exiting gases so as to deposit on the roof member while removing the remaining portion of the airborne fibrous particulate material from the exiting gases by impingement upon the baffle means and thereby preventing blockage of the open mesh roof member against passage of the exiting gases therethrough.

4,995,895

PROCESS FOR THE MANUFACTURE OF A TOUGHENED AND/OR BENT SHEET OF GLASS WITH A SILVER COATING

Rolf Groth, Bochum, and Thomas Paul, Herne, both of Fed. Rep. of Germany, assignors to Flachglas Aktiengesellschaft, Bayern, Fed. Rep. of Germany

Continuation of Ser. No. 167,655, Mar. 14, 1988, abandoned.
This application Nov. 3, 1989, Ser. No. 431,700
Int. Cl.[5] C03C *17/36;* C03B *23/023*
U.S. Cl. 65—60.2 17 Claims



1. A process for the production of a toughened and/or bent infrared-reflecting sheet of soda lime silicate glass, comprising the steps of:

applying a silver layer on at least one side of an essentially flat glass base;

arranging a metal or metal alloy outer layer outside the silver layer on the side facing away from the glass base, such metal or metal alloy layer being the outermost layer of the total layers applied to the glass base even in such cases in which other layers in addition to the silver layer and the metal or metal alloy layer are applied to the glass base, the metal or metal alloy layer being in direct contact with a surrounding oxygen-containing atmosphere during a toughening and/or bending process; and

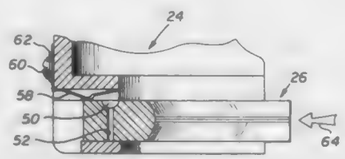
carrying out the toughening and/or bending process at a temperature of from 580° C. to 680° C., whereby the outer metal or metal alloy layer is converted with an increase in volume into an essentially absorption-free metal oxide layer, forming an outermost anti-reflection layer with an index refraction of ≧1.7, or at least forming an outermost layer of a composite anti-reflection layer which includes the outermost anti-reflection layer as the outermost layer.

4,995,896

TAKEOUT JAWS

Michael L. Denney, Denton; Shelby M. Withrow, Paradise, and John M. Delancey, Sr., Fortworth, all of Tex., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 31, 1989, Ser. No. 401,038
Int. Cl.[5] C03B *9/44*
U.S. Cl. 65—260 12 Claims



1. A takeout jaw assembly comprising the combination of

(a) a takeout jaw comprising

a semi-circular base having a wall having front and rear edges;

a semi-circular shelf perpendicular to said wall, forming a pocket with said base;

a top parallel to said base extending from said wall towards said front edge of said base;

a yoke perpendicular to said top and extending therefrom; and

a spring clip attached to the outside of said wall and extending through an opening in said wall formed by cut-outs in said wall, said shelf and said base; and

(b) a non-metallic contact material insert comprising

a semi-circular body having front and rear edges; and

a lug formed at said rear edge of said body by cut-outs therein, said lug having a depression extending substantially parallel to said rear edge of said body;

said spring clip and said depression being in mating relation to retain immovably said insert within said pocket.

4,995,897

METHOD OF MAKING INORGANICALLY CROSSLINKED LAYERED COMPOUNDS

Charles M. Schramm, Cupertino, Calif.; Robert H. Lane, Plano, Tex., and Martin B. Dines, deceased, late of Laguna Beach, Calif. (by Elaine Dines, legal representative), assignors to Occidental Research Corporation, Los Angeles, Calif.

Division of Ser. No. 899,346, Aug. 22, 1986, Pat. No. 4,853,358.
This application Jul. 28, 1989, Ser. No. 345,671
Int. Cl.[5] A01N *25/08;* A61K *47/02;* C05G *5/00*
U.S. Cl. 71—64.11 8 Claims

1. A process for encapsulating an active moiety to hinder the egress of said active moiety into the environment which process comprises the steps of

(a) intercalating an active moiety into the layers of a compound selected from the group consisting of compounds represented by the general formula:

$$M(O_3ZO_xR)_n$$

wherein M is a tetravalent metal selected from the group consisting of Zr, W, U, Ti, Th, Te, Sn, Si, Ru, Pu, Pr, Pb, Os, Nb, Mo, Mn, Ir, Hf, Ge and Ce; Z is a pentavalent atom selected from the group consisting of members of Group V of the Periodic Table of the Elements having an atomic weight of at least 30 ; x varies from 0 to 1; R is a radical selected from the group consisting of hydrogen and organo radicals wherein at least a portion of said R radicals comprise a crosslinkable functional group selected from the group consisting of hydroxyl amino, carboxylic acid, epoxide and sulphonyl groups; and n varies from >1 to 2; said compound being characterized as a layered crystalline material comprising contiguous layers, each of said layers being spaced from and substantially unconnected to its neighboring layer to thereby allow access of said active moiety into the interior of said crystalline materials, and

(b) crosslinking said layers to thereby connect said contiguous layers to neighboring layers and hinder egress of said active moiety from the interior of said crystalline material, by reacting said compound with a hydroxy metal complex of aluminum, zirconium, titanium, chromium, zinc, thorium, antimony or mixtures thereof.

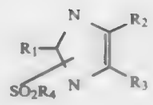
4,995,898

IMIDAZOLE COMPOUNDS AND BIOCIDAL COMPOSITION COMPRISING THE SAME FOR CONTROLLING HARMFUL ORGANISMS

Rikuo Nasu; Terumasa Komyoji; Toshio Nakajima; Kazumi Suzuki; Keiichiro Ito; Takeshi Oshima, and Hideshi Yoshimura, all of Shiga, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Mar. 14, 1988, Ser. No. 168,070
Claims priority, application Japan, Mar. 13, 1987, 62-58451; Apr. 3, 1987, 62-82546; Apr. 30, 1987, 62-106577
Int. Cl.[5] A01N *43/26;* C07D *233/90*
U.S. Cl. 71—90 9 Claims

1. An imidazole compound represented by the following general formula (I):



(I)

wherein:

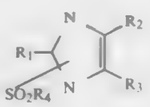
R_1 represents a cyano group or a —CSNHR$_5$ group, wherein R_5 represents a hydrogen atom, a C_{1-4} alkyl group, or a —COR$_6$ group, wherein R_6 represents a C_{1-4} alkyl group, a halogenated C_{1-4} alkyl group, or a phenyl group;

R_2 and R_3 represents a hydrogen atom; a halogen atom; a nitro group; a cyano group; a trimethylsilyl group; a C_{3-6} cycloalkyl group; a naphthyl group; a C_{1-12} alkyl group which is optionally substituted with one or more halogen atoms, hydroxyl groups, acetoxy groups, C_{1-4} alkoxy groups, halogenated C_{1-4} alkoxy groups, phenyl groups, halogenated phenyl groups, or C_{1-4} alkylated phenyl groups; a C_{2-10} alkenyl group which is optionally substituted with one or more halogen atoms; a C_{1-6} alkoxy group which is optionally substituted with one or more halogen atoms; a phenyl group which is optionally substituted with one or more halogen atoms, C_{1-4} alkyl groups, halogenated C_{1-4} alkyl groups, C_{1-4} alkoxy groups, halogenated C_{1-4} alkoxy groups, C_{1-4} alkylthio groups, halogenated C_{1-4} alkylthio groups, nitro groups, cyano groups, or 3,4-methylenedioxy groups; a furyl group which is optionally substituted with one or more halogen atoms or C_{1-4} alkyl groups; a thienyl group which is optionally substituted with one or more halogen atoms or C_{1-4} alkyl groups; a pyridyl group which is optionally substituted with one or more halogen atoms or C_{1-4} alkyl groups; an —SO$_n$R$_7$ group, wherein R_7 represents a C_{1-6} alkyl group, a C_{2-6} alkenyl group, a phenyl group which is optionally substituted with one or more halogen atoms, a benzyl group, a pyridyl group which is optionally substituted with one or more halogen atoms, C_{1-4} alkyl groups, or halogenated C_{1-4} alkyl groups; or an —NR$_8$R$_9$ group, wherein R_8 and R_9 each represents a C_{1-4} alkyl group, and n is 0, 1, or 2; or a —CO(NH)$_m$R$_{10}$ group, wherein R_{10} represents a C_{1-4} alkyl group which is optionally substituted with one or more halogen atoms, a C_{1-4} alkoxy group which is optionally substituted with one or more halogen atoms, or a phenyl group which is optionally substituted with one or more halogen atoms; and m is 0 or 1; and

R_4 represents a C_{1-6} alkyl group which is optionally substituted with one or more halogen atoms; a C_{3-6} cycloalkyl group; a phenyl group; a thienyl group; or an —NR$_{11}$R$_{12}$ group, wherein R_{11} and R_{12} each represents a hydrogen atom, a C_{1-4} alkyl group which is optionally substituted with one or more halogen atoms, a C_{2-4} alkenyl group, of R_{11} and R_{12} are combined with each other together with a nitrogen atom adjacent thereto to form a pyrrolidinyl group, a piperidinyl group, a morpholino group, or a thiomorpholino group, provided that R_{11} and R_{12} are not simultaneously a hydrogen atom;

provided that R_2 and R_3 are not simultaneously a halogen atom.

9. A biocidal composition which comprises an imidazole compound, as an active ingredient, represented by the following general formula (I):



(I)

wherein:

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R_1 represents a cyano group or a —CSNHR$_5$ group, wherein R_5 represents a hydrogen atom, a C_{1-4} alkyl group, or a —COR$_6$ group, wherein R_6 represents a C_{1-4} alkyl group, a halogenated C_{1-4} alkyl group, or a phenyl group;

R_2 and R_3 each represents a hydrogen atom; a halogen atom; a nitro group; a cyano group; a trimethylsilyl group; a C_{3-6} cycloalkyl group; a naphthyl group; a C_{1-12} alkyl group which is optionally substituted with one or more halogen atoms, hydroxyl groups, acetoxy groups, C_{1-4} alkoxy groups, halogenated C_{1-4} alkoxy groups, phenyl groups, halogenated phenyl groups, or C_{1-4} alkylated phenyl groups; a C_{2-10} alkenyl group which is optionally substituted with one or more halogen atoms; a C_{1-6} alkoxy group which is optionally substituted with one or more halogen atoms; a phenyl group which is optionally substituted with one or more halogen atoms, C_{1-4} alkyl groups, halogenated C_{1-4} alkyl groups, C_{1-4} alkoxy groups, halogenated C_{1-4} alkoxy groups, C_{1-4} alkylthio groups, halogenated C_{1-4} alkylthio groups, nitro groups, cyano groups, or 3,4-methylenedioxy groups; a furyl group which is optionally substituted with one or more halogen atoms or C_{1-4} alkyl groups; a thienyl group which is optionally substituted with one or more halogen atoms or C_{1-4} alkyl groups; a pyridyl group which is optionally substituted with one or more halogen atoms or C_{1-4} alkyl groups; an —SO$_n$R$_7$ group, wherein R_7 represents a C_{1-6} alkyl group, a C_{2-6} alkenyl group, a phenyl group which is optionally substituted with one or more halogen atoms, a benzyl group, a pyridyl group which is optionally substituted with one or more halogen atoms, C_{1-4} alkyl groups, or halogenated C_{1-4} alkyl groups; or an —NR$_8$R$_9$ group, wherein R_8 and R_9 each represents a C_{1-4} alkyl group, and n is 0, 1, or 2; or a —CO(NH)$_m$R$_{10}$ group, wherein R_{10} represents a C_{1-4} alkyl group which is optionally substituted with one or more halogen atoms, a C_{1-4} alkoxy group which is optionally substituted with one or more halogen atoms, or a phenyl group which is optionally substituted with one or more halogen atoms; and m is 0 or 1; and

R_4 represents a C_{1-6} alkyl group which is optionally substituted with one or more halogen atoms; a C_{3-6} cycloalkyl group; a phenyl group; a thienyl group; or an —NR$_{11}$R$_{12}$ group, wherein R_{11} and R_{12} each represents a hydrogen atom, a C_{1-4} alkyl group which is optionally substituted with one or more halogen atoms, a C_{2-4} alkenyl group, or R_{11} and R_{12} are combined with each other together with a nitrogen atom adjacent thereto to form a pyrrolidinyl group, a piperidinyl group, a morpholino group, or a thiomorphol group, provided that R_{11} and R_{12} are not simultaneously a hydrogen atom;

provided that R_2 and R_3 are not simultaneously a halogen atom; and adjuvants.

4,995,899

OPTICALLY ACTIVE DIAZABICYCLOALKANE DERIVATIVES AND THEIR USE FOR PROTECTING CROPS FROM THE PHYTOTOXIC EFFECT OF HERBICIDES

Herbert Scholz, Neustadt; Adolf Zeidler, Ludwigshafen; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 3,708, Jan. 15, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,814

Int. Cl.[5] **A01N** *43/54, 43/50;* **C07D** *487/04, 471/04*

U.S. Cl. 71—92 **3 Claims**

1. A method of protecting corn plants from the phytotoxic action of a herbicide selected from the group consisting of 2-chloro-2′,6′-dimethyl-N-(pyrazol-1-yl-methyl)acetanilide and 2-chloro-2′-methyl-6′-ethyl-N-(ethoxymethyl)acetanilide, which method comprises treating corn plants, their seed or the location with an effective amount of optically active R(−)-5-dichloroacetyl-3,3,6-trimethyl-9-oxo-1,5-diazabicyclo[4.3.0-]nonane.

4,995,900

HERBICIDAL AQUEOUS BASED MICROEMULSION COMPOSITIONS

Ian Futcher, Fareham, United Kingdom, assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 30, 1988, Ser. No. 278,302

Int. Cl.[5] **A01N** *43/48*

U.S. Cl. 71—92 **7 Claims**

1. A herbicidal aqueous-based microemulsion comprising on a weight to volume basis about 20% to 40% of a 1,2-dimethyl-3,5-diphenylpyrazolium salt; about 5% to 25% of at least one essentially water insoluble herbicidally active ingredient selected from the group consisting of esters of 2,4-D acid; about 5% to 40% of at least one nonionic surfactant; and 0% to about 25% of adjuvants.

4,995,901

HERBICIDAL SULFONAMIDES

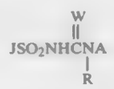
Morris P. Rorer, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 204,556, Jun. 15, 1988, Pat. No. 4,906,282, which is a continuation-in-part of Ser. No. 78,191, Jul. 27, 1987, abandoned. This application Jan. 5, 1990, Ser. No. 461,581

Int. Cl.[5] **A01N** *43/66;* **C07D** *401/12, 403/12, 409/12*

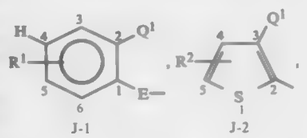
U.S. Cl. 71—93 **22 Claims**

1. A compound having the formula



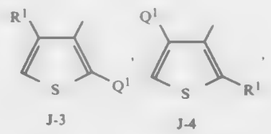
and agriculturally suitable salts thereof wherein:

J is selected from



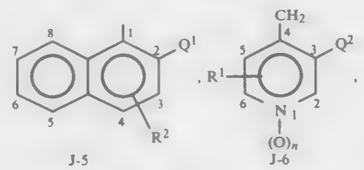
J-1

J-2



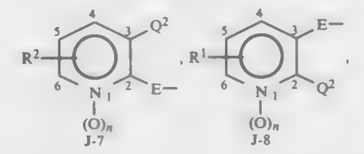
J-3

J-4



J-5

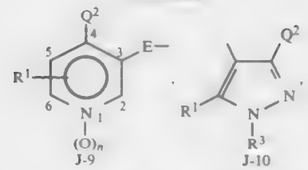
J-6



J-7

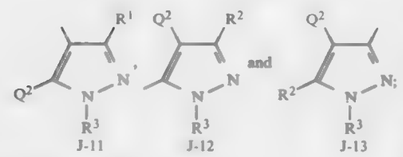
J-8

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J-9

J-10



J-11 J-12 J-13

E is a single bond or —CH$_2$—;

Q^1 is —C(T^1)=N—O—Alk;

T^1 is selected from CN, F, Cl, Br, SCN, N_3, C_1 to C_2 alkoxy, C_1 to C_2 thioalkyl, NH(C_1 to C_2 alkyl), N(C_1 to C_2 alkyl)$_2$, N(OCH$_3$)CH$_3$ and



or 4;

Alk is selected from C_1 to C_3 alkyl, optionally substituted with CN, OCH$_3$, SCH$_3$ or halogen; and CH$_2$CH=CH$_2$;

Q^2 is —C(T^2)=N—O—Alk;

T^2 is selected from H; C_1 to C_3 alkyl optionally substituted with CN, OCH$_3$, SCH$_3$ or halogen; cyclopropyl; F; Cl; Br; CN; SCN; N_3; C_1 to C_2 alkoxy; C_1 to C_2 thioalkyl; NH(C_1 to C_2 alkyl); N(C_1 to C_2 alkyl)$_2$; N(OCH$_3$)CH$_3$ and



or 4;

R^1 is selected from H, C_1 to C_3 alkyl, C_1 to C_3 haloalkyl, halogen, CN, nitro, C_1 to C_3 alkoxy, C_1 to C_3 haloalkoxy, C_1 to C_3 alkylthio, C_1 to C_3 alkylsulfinyl, C_1 to C_3 alkylsulfonyl, SCF_2H, NH_2, $NHCH_3$, $N(CH_3)_2$ or C_1 to C_2 alkyl substituted with one C_1 to C_2 alkoxy, C_1 to C_2 haloalkoxy, SH, SCH_3, CN or OH;

R^2 is selected from H, F, Cl, Br, C_1 to C_2 alkyl, C_1 to C_2 haloalkyl or C_1 to C_2 alkoxy;

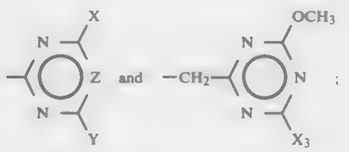
R^3 is selected from H, C_1 to C_3 alkyl, C_1 to C_2 haloalkyl, C_3 to C_4 alkenyl, C_3 to C_4 alkynyl, CH_2CN, phenyl and phenyl substituted by F, Cl, CH_3 or OCH_3;

n is 0 or 1;

R is H or CH_3;

W is O or S;

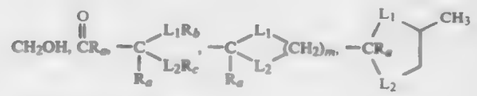
A is selected from



A-1 A-6

X is selected from H, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_2 to C_4 haloalkoxy, C_1 to C_4 haloalkyl, C_1 to C_4 haloalkylthio, C_1 to C_4 alkylthio, C_2 to C_5 alkoxyalkyl, C_2 to C_5 alkoxyalkoxy, amino, C_1 to C_3 alkylamino, di(C_1 to C_3 alkyl)amino or C_3 to C_5 cycloalkyl;

Y is selected from H, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_2 to C_4 haloalkoxy, C_1 to C_4 haloalkylthio, C_1 to C_4 alkylthio, C_2 to C_5 alkoxyalkyl, C_2 to C_5 alkoxyalkoxy, amino, C_1 to C_3 alkylamino, di(C_1 to C_3 alkyl)amino, C_3 to C_4 alkenyloxy, C_3 to C_4 alkynyloxy, C_2 to C_5 alkylthioalkyl, C_1 to C_4 haloalkyl, C_2 to C_4 alkynyl, azido, cyano, C_2 to C_5 alkylsulfinylalkyl, C_2 to C_5 alkylsulfonylalkyl,



and N(OCH$_3$)CH$_3$;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_a is H or C_1 to C_3 alkyl;

R_b and R_c are independently C_1 to C_3 alkyl;

Z is N; and

X_3 is CH_3 or OCH_3;

wherein further:

(i) when W is S, then R is H, A is A-1 and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or 1,3-dioxolan-2-yl;

(ii) when the total number of carbons of X and Y is greater than four, the number of carbon atoms of Q^1 or Q^2 is less than or equal to four; and

(iii) when J is J-6, J-7, J-8 or J-9, and A is A-1, and X and Y are haloalkoxy or haloalkylthio, then T^2 is F, Cl, Br, CN, SCN, N_3, C_1 to C_2 alkoxy, C_1 to C_2 thioalkyl, NH(C_1 to C_2 alkyl), N(C_1 to C_2 alkyl)$_2$, N(OCH$_3$)CH$_3$ or

or 4.

4,995,902

NOVEL HERBICIDES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

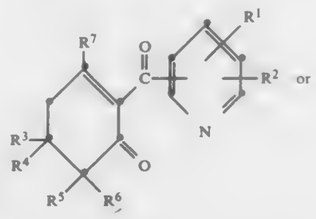
Filed Jul. 11, 1989, Ser. No. 378,119

Claims priority, application Switzerland, Jul. 25, 1988, 2825/88; Jan. 5, 1989, 29/89

Int. Cl.[5] **C07D** *213/50;* **A01N** *43/40*

U.S. Cl. 71—94 **15 Claims**

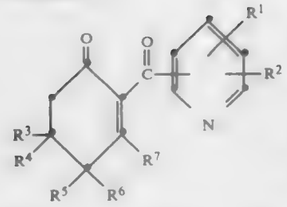
1. A compound of formula I or I′



or

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in which R^1 and R^2 independently of one another are each hydrogen; halogen; nitro; cyano; C_1–C_4alkyl; C_1–C_4alkoxy; C_1–C_4alkyl-$S(O)_n$—; COR^8; C_1–C_4haloalkoxy; or C_1–C_4haloalkyl; R^3, R^4 and R^5 independently of one another are each hydrogen; C_1–C_4alkyl; or phenyl or benzyl each unsubstituted or substituted by up to three identical or different substituents from halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkyl-$S(O)_n$—, C_1–C_4haloalkyl, C_1–C_4haloalkyl-$S(O)_n$— and C_1–C_4haloalkoxy; R^6 is hydrogen; C_1–C_4alkyl; C_1–C_4alkoxycarbonyl; or cyano; R^7 is OH; or $O^{\ominus}M^{\oplus}$; R^8 is OH; C_1–C_4alkoxy; NH_2; C_1–C_4alkylamino; or di-C_1–C_4alkylamino; n is 0, 1 or 2; $M^{\oplus}$ is a cation equivalent of a metal ion or of an ammonium ion that is unsubstituted or substituted by up to three C_1–C_4alkyl, C_1–C_4hydroxyalkyl or C_1–C_4alkoxy-C_1–C_4alkyl groups.

4,995,903

ALKYL-, ALKENYL- AND ALKYNYLNITROGUANIDINES AS CYTOKININ PLANT GROWTH REGULANTS

Albert W. Lutz, Princeton, N.J., and Shirley J. Rodaway, Newtown, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 23,348, Mar. 9, 1987, Pat. No. 4,822,408, which is a division of Ser. No. 759,705, Jul. 29, 1985, Pat. No. 4,667,226. This application Nov. 23, 1988, Ser. No. 275,165
Int. Cl.[5] A01N *33/02*
U.S. Cl. 71—121 4 Claims

1. A method for inhibiting deterioration of fresh, leafy vegetables, ornamental foliage and fresh, green, newly harvested livestock feed, comprising applying thereto a preservative amount of a substituted nitroguanidine compound, wherein the nitroguanidine compound is



wherein

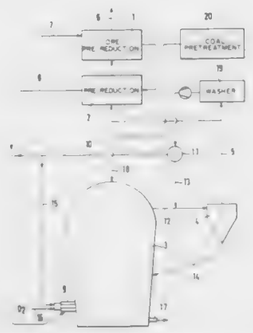
R^1 is C_1–C_6 alkyl, optionally substituted with from one to three OH, halogen or C_1–C_3 alkoxy groups; C_2–C_6 alkenyl optionally substituted with from one to three OH, halogen or C_1–C_3 alkoxy groups or C_2–C_6 alkynl, optionally substituted with from one to three OH, halogen or C_1–C_3 alkoxy groups; or the salts, geometric isoners, optical isomers or tautomers thereof.

4,995,904

METHOD FOR THE PRETREATMENT OF A LUMPY CARBON CARRIER

Rolf Hauk, Düsseldorf, Fed. Rep. of Germany, assignor to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 2, 1988, Ser. No. 266,088
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 3737262
Int. Cl.[5] C21B *11/00*
U.S. Cl. 75—445 7 Claims



1. A process for producing pig iron from iron ore, comprising the steps of:

a. pre-reducing iron ore in at least one reduction step to produce sponge iron,

b. transporting the sponge iron into a melt-down gasifier,

c. pre-treating fine coal having a grain size of less than 1 mm by granulating a mixture of ground fine coal and a binder into lumps to produce a lumpy carbon carrier suitable for the formation of a fluidized bed, the pre-treating step occurring separate from the pre-reducing step,

d. introducing the pre-treated lumpy carbon carrier into the upper part of the melt-down gasifier to form, together with the sponge iron, a fluidized bed and a solid bed of carbon carrier underneath the fluidized bed, and

e. introducing an oxygen-containing gas into the lower part of the melt-down gasifier for finally reducing and fusing the sponge iron with the aid of the lump carbon carrier.

4,995,905

PERMANENT MAGNET HAVING IMPROVED HEAT-TREATMENT CHARACTERISTICS AND METHOD FOR PRODUCING THE SAME

Masato Sagawa, Kyoto, Japan, assignor to Masato Sagawa, Japan

Filed May 23, 1989, Ser. No. 355,759
Claims priority, application Japan, Oct. 6, 1988, 63-250851
Int. Cl.[5] C22C *29/14*
U.S. Cl. 75—244 16 Claims



1. An R—Fe—B magnet comprising 11–18 at % R, wherein

R is one or more rare-earth elements excluding Dy, with the proviso that at least 80 at % and up to 100 at % of the total R are Nd, Pr or mixtures thereof; 6–12 at % B, and the balance is Fe and Co such that Co is 0–25 at % and impurities.

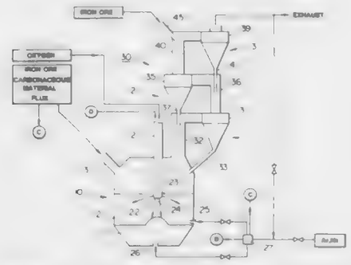
further comprising V in an amount of from 2 to 6 at % and Cu in an amount of from 0.01 to 1 at %, a V—T—B compound minority phase, wherein T is Fe, Co or mixtures thereof, being finely dispersed in the magnet and the magnet exhibiting a maximum energy product (BH) max of 20 MGOe or more and a coercive force (iHc) of 15 kOe or more.

4,995,906

METHOD FOR SMELTING REDUCTION OF IRON ORE

Katsuhiro Iwasaki; Kenji Takahashi; Shigeru Inoue; Haruyoshi Tanabe; Masahiro Kawakami, and Osamu Terada, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 12, 1988, Ser. No. 283,218
Claims priority, application Japan, Dec. 18, 1987, 62-322321; Dec. 18, 1987, 62-322322; Dec. 18, 1987, 62-322328
Int. Cl.[5] C21B *11/00*
U.S. Cl. 75—502 32 Claims



1. A method for smelting reduction of iron ore in a smelting reduction furnace comprising

preheating and prereducing iron ore in at least one preheat and prereduction furnace to achieve up to 30% of the total reduction of said iron ore by contacting said iron ore with a gas exhausted from said smelting reduction furnace;

charging the preheated and prereduced iron ore, carbonaceous material and flux into a smelting reduction furnace containing molten metal in the bottom thereof and a slag layer on said molten metal;

blowing decarburizing oxygen and post-combusting oxygen through a tip of a top blown oxygen lance into the smelting reduction furnace to reduce the preheated and prereduced iron ore to molten metal and to melt the flux into slag, the decarburizing oxygen being blown through decarburizing nozzles placed at a central portion of the tip of the top blown oxygen lance and the post-combusting oxygen being blown through post-combustion nozzles placed at the central portion spaced outwardly from the decarburizing nozzles; the tip of the top blown oxygen lance being positioned between the upper surface and the lower surface of said slag layer;

blowing in stirring gas through at least one side tuyere placed in a side wall of the smelting reduction furnace and at least one bottom tuyere placed in the bottom of the smelting reduction furnace; said stirring gas blown through said at least one bottom tuyere passing upward through said molten metal and causing a portion of the upper surface of said molten metal to swell upwardly, at least part of said stirring gas blown through the at least one side tuyere being directed at said upwardly swollen portion of the molten metal to agitate said molten metal and the slag layer to cause droplets of said molten metal to move into said slag layer;

the stirring gas being at least one gas selected from the group consisting of Ar, N_2, CO, CO_2 and process gas;

controlling flow rates of the post-combusting oxygen and the stirring gas to form an exhaust gas in the smelting reduction furnace which has an oxidation degree of from 0.4 to 0.9, said oxidation degree being determined by the formula:

$$(H_2O+CO_2)/(H_2+H_2O+CO+CO_2);$$

controlling the temperature of said, exhaust gas in the smelting reduction furnace to a temperature of from 300° to 1300° C.;

and cycling said infurnace gas to said preheat and prereduction furnace.

4,995,907

METHOD OF DEOXIDING AND ALLOYING STEEL

Wilfried Pirklbauer, Niederneukirchen, Austria, assignor to Voest-Alpine Industrieanlagenbau Gesellschaft m.b.H., Linz, Austria

Filed Mar. 22, 1990, Ser. No. 497,337
Claims priority, application Austria, Mar. 23, 1989, 687/89
Int. Cl.[5] C21C *7/02*
U.S. Cl. 75—561 5 Claims

1. In a method of deoxidizing and alloying steel by preparing molten crude steel having an oxygen content of at least 200 ppm, adding deoxidizing agents to said molten crude steel, and subsequently adding alloying agents, the improvement wherein FeSi and FeMn are simultaneously added as said deoxidizing agents at a ratio that at least partially yields liquid deoxidation products during deoxidizing.

4,995,908

DICHLOROTRIFLUOROETHANE-CONTAINING MIXTURES

Hans Buchwald, Ronnenberg, and Bolesłaus Raschkowski, Wiedensahl, both of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Sep. 8, 1988, Ser. No. 241,469
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731223
Int. Cl.[5] B28B *7/36*
U.S. Cl. 106—38.22 17 Claims

1. A liquid composition consisting essential a single halogenated hydrocarbon solvent consisting of dichlorotrifluoroethane and from 0.1 to 80% by weight relative to the total mixture of at least one release effective agent selected from the group consisting of waxes, wax derivatives, metal soaps and silicones.

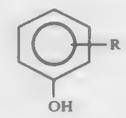
4,995,909

CATIONIC SLURRY SEAL EMULSIFIERS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 334,464, Apr. 7, 1989, abandoned. This application Aug. 28, 1989, Ser. No. 401,551
Int. Cl.[5] C08L *95/00*
U.S. Cl. 106—277 14 Claims

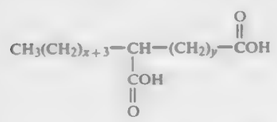
1. A bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an cationic emulsifier comprising the reaction product of (a) an alkyl phenol of the general form



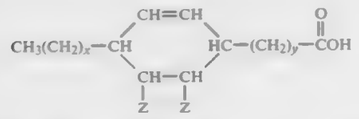
where R represents a linear or branched alkyl group, (b) an aldehyde, and, (c) the reaction product of a polyamine

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and a compound selected from the group of a tall oil fatty acid, a polycarboxylic acid corresponding to the formula



and a polycarboxylic acid corresponding to the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, at least one Z is a carboxylic acid group and any remaining Z is hydrogen, and water to make up 100% by weight.

4,995,910

NON-STICK COATING COMPOSITION AND METHOD FOR THERMOPLASTIC MATERIALS

James B. Krug, Pequea; Ronald S. Lenox, and William J. Stewart, both of Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 186,913, Apr. 27, 1988, abandoned, which is a division of Ser. No. 53,897, May 26, 1987, Pat. No. 4,830,884. This application Aug. 7, 1989, Ser. No. 390,173

Int. Cl.[5] C09K *3/00*

U.S. Cl. 106—287.32 **18 Claims**

1. A coating system on a thermoplastic comprising: a mixture of (1) a salt selected from the group consisting of: (a) a hydroxy alkyl sulfonate salt and (b) an alkyl sulfonate salt and (2) an alkyl sulfate salt; said mixture being a coating on a thermoplastic surface of the thermoplastic, wherein there is a concentration ratio for the sulfonate salt of (1) to the sulfate salt of (2) of at least 1:1, and further that the said mixture is present in an amount that is effective to form a protective coat that gives non-stick protection to the thermoplastic, further providing that the thermoplastic is a material which, in storage, undesirably sticks to another thermoplastic surface.

4,995,911

PROCESS FOR RECOVERING UNREACTED SUCROSE FROM REACTION MIXTURE IN SYNTHESIS OF SUCROSE FATTY ACID ESTERS

Shusaku Matsumoto, Kyoto; Yoshio Hatakawa, Higashiosaka, and Akihiko Nakajima, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jun. 13, 1989, Ser. No. 365,644

Claims priority, application Japan, Jun. 14, 1988, 63-146586

Int. Cl.[5] C13D *3/00, 3/16*

U.S. Cl. 127—48 **10 Claims**

1. A process for recovering unreacted sucrose from the reaction mixture produced in the synthesis of a sucrose fatty acid ester by a reaction of sucrose and a fatty acid alkyl ester in an organic solvent, said reaction mixture containing an unreacted fatty acid alkyl ester, a catalyst, a soap, a fatty acid and a volatile component which comprises steps of:

(a) adjusting the reaction mixture to a substantially neutral pH between 6.2 and 8.2;

(b) adding water, a neutral salt and sucrose to the reaction mixture in amounts satisfying the following equations:

$$\frac{x}{x+y+z} = 0.015 \text{ to } 0.12,$$

-continued

$$\frac{y}{x+y+z} = 0.025 \text{ to } 0.20,$$

and

$$\frac{x}{y} = 0.4 \text{ to } 0.6$$

wherein, x is an amount which is the sum of the neutral salt to be added and the salt formed by neutralization of catalyst used in the synthesis of sucrose fatty acid ester, y is an amount which is the sum of sucrose to be added and the unreacted sucrose present from the beginning, and z is the total amount of water to precipitate the sucrose fatty acid ester;

(c) filtering off the resulting precipitate; and

(d) enriching the recovered sucrose by contacting the filtrate with a reverse osmosis membrane, wherein said membrane has a fractionation molecular weight of 150 to 200 and wherein said filtrate is maintained at a pH of 6.2 and 8.2 and at temperature of 40° to 60° C. during contact with the membrane.

4,995,912

MILL SCALE DE-OILING

Michael Goss, Houston, and John E. Mincy, Richmond, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 29, 1990, Ser. No. 471,344

Int. Cl.[5] C22B *7/00*

U.S. Cl. 134—2 **4 Claims**

1. A process for removing oily contaminants from mill scale containing from 0.1 to about 10 weight percent oily contaminants which process consists essentially of:

(a) suspending oily mill scale in water containing an effective de-oiling amount of a formulation consisting essentially of the ingredients:

Ingredients	Percent
(1) medium aliphatic naphtha	30–60
(2) heavy aromatic naphtha	1–7.5
(3) linear and branched alkyl phenols	5–15
(4) alkoxylated alkyl phenols	5–20
(5) penta ethylene hexamine partial fatty acid amide	0.5–2.0
(6) alkyl and aromatic acid imidazolines	1–5.0

thereby forming an oily mill scale suspension; then

(b) mixing said suspension to achieve dissolution and emulsion suspension of oily contaminants in water, thereby forming a de-oiled mill scale suspended in oily water,

(c) separating the de-oiled mill scale from the oily water, and

(d) optionally water rinsing the de-oiled mill scale to form a rinsed mill scale

(e) treating the oily water to remove oily contaminants from the oily water thereby recovering waste oils and treated fresh water, and then

(f) recycling at least a portion of the treated fresh water to form the oily mill scale suspension of step (a), and recovering the waste oils.

4,995,913

LOW WASH WATER SILVER HALIDE FILM PROCESSOR

Daniel F. Juers, Fairport, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1989, Ser. No. 316,656

Int. Cl.[5] B08B *7/04*

U.S. Cl. 134—13 **7 Claims**

1. A method for processing film in a photographic film processor using a number of wash stages including a first and a last stage in a countercurrent wash arrangement, the method comprising:

a. contacting the film with developer solution;

b. contacting the film with fixing solution containing thiosulfate;

c. determining the number of wash stages (n);

d. selecting a level of residual thiosulfate (R) to be left on processed film;

e. determining concentration of thiosulfate (C_f) in the fixing solution;

f. determining an amount of wash water (V_c) to be circulated through the wash stages;

g. selecting film processing rate (A_r);

h. circulating the wash water through the wash stages and replenishing the wash water with a flow rate (V_r) such that

$$\frac{C_f V_c}{R} = \sum_{k=0}^{n} \left(\frac{V_r}{V_c A_r} \right)^k, \text{ and}$$

i. washing the film with the wash water in the wash stages in a direction generally counter to the circulation of the wash water through the wash stages.

4,995,914

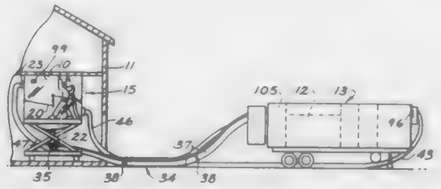
PROCESS FOR REMOVING HAZARDOUS OR TOXIC MATERIAL FROM A STRUCTURE

Bruce W. Teter, 11615 Eastshore Dr., Hayden Lake, Id. 83835

Division of Ser. No. 897,641, Aug. 18, 1986, Pat. No. 4,774,974, which is a continuation-in-part of Ser. No. 720,875, Apr. 10, 1985, abandoned. This application Jul. 20, 1988, Ser. No. 222,012

Int. Cl.[5] B08B *5/04*

U.S. Cl. 134—21 **8 Claims**



1. A process for removing hazardous or toxic materials from a surface comprising the steps of:

establishing a substantially air-tight enclosed area about the materials to be removed;

placing the materials into an intake tube having one end opening into the enclosed area and extending from the enclosed area to a remaining end connected to a separator chamber including a collection tank remote from the enclosed area;

drawing air from the enclosed area through the intake tube and into the separator chamber and thereby moving the materials within the intake tube in a direction of flow to a collection tank within the separator chamber and producing a pressure differential within the enclosed area such that the air pressure within the enclosed area is lower than ambient pressure;

filtering the air received from the intake tube through a submicronic air filter to clear the air by removing materials therefrom; and

returning at least a portion of the filtered air through a return air tube extending from the separator chamber to the enclosed area to provide make-up air to the enclosed area.

4,995,915

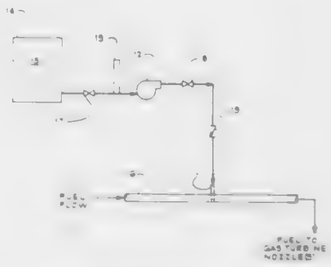
CLEANING GAS TURBINE FUEL NOZZLES

Charles A. Sewell, Lake Jackson, and Robert D. Toles, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 15, 1988, Ser. No. 220,047

Int. Cl.[5] B08B *3/08*

U.S. Cl. 134—22.14 **7 Claims**



1. A process for on-line cleaning of gas turbine fuel nozzles comprising injecting a sufficient amount of a fluid cleaning medium into a fuel system of an operating gas turbine at a rate sufficient to reduce deposits on the gas turbine fuel nozzles.

4,995,916

METHOD OF RECOVERING HAZARDOUS WASTE FROM PHENOLIC RESIN FILTERS

David H. Meikrantz; Gary L. Bourne, both of Idaho Falls, Id.; John N. McFee, Albuquerque, N. Mex.; Bradley G. Burdge, and John W. McConnell, Jr., both of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 30, 1990, Ser. No. 516,936

Int. Cl.[5] B08B *9/00*

U.S. Cl. 134—22.16 **7 Claims**

7. A method of removal and recovery of hazardous material from a phenolic resin filter in a filter cartridge housing comprising:

circulating an aqueous solution of 8 to 12M nitric acid through the housing, said solution being at a temperature of 160° to 190° F.,

maintaining the circulation for a period of time sufficient to solubilize the filter material and release the hazardous material,

removing the solubilized filter material and hazardous material from the housing, and

separating the hazardous material from the solubilized filter material.

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4,995,917

MANUFACTURING PROCESS FOR DIE-CAST LIGHT-METAL WHEELS OF PASSENGER CARS

Amer Dagustany, Munich; Jochen Spriestersbach, Wendelstein; Bernd Günther, Garching, and Gerhard Knall, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

PCT No. PCT/EP88/00675, § 371 Date Mar. 27, 1989, § 102(e) Date Mar. 27, 1989
PCT Filed Jul. 26, 1988, Ser. No. 335,781
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724928
Int. Cl.[5] C22F 1/43
U.S. Cl. 148—3 16 Claims

1. A manufacturing process for diecasting of light-metal wheels of passenger cars, using a known, almost eutectic refined AlSi alloy, which has approximately 9.5% to 12.5% parts by weight of silicon and at least 0.05 to 0.15% parts by weight of magnesium, as well as no more than from 0.00 to 0.05% parts by weight of each other impurity and a total of no more 0.15% parts by weight of such other impurities, comprising the steps of

die-casting the alloy;

allowing the alloy to solidify;

after solidification, removing the wheels casting from the casting die;

immediately quenching the wheel casting in water before the wheel casting reaches a temperature measured at its surface, of at least 380° C. at interior areas and areas with concentrations of mass; and

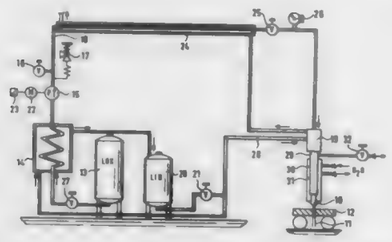
allowing the wheel casting to cool.

4,995,918

PROCESS AND DEVICE FOR AUTOGENOUS CUTTING WITH LIQUID OXYGEN

Paul Grohmann, Maria-Enzersdorf, Austria, assignor to Messer Grieshiem GmbH, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 386,943
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827417
Int. Cl.[5] B23K 7/00
U.S. Cl. 148—9 R 12 Claims



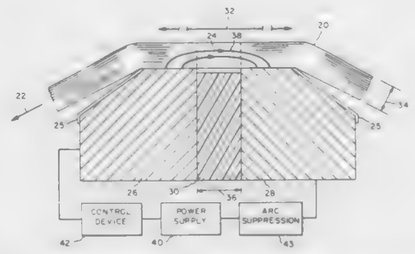
1. In a process for autogenous cutting, in which the oxygen in liquid form is put under high pressure and flows to the cutting site through a liquid jet cutting nozzle, the improvement being in that the liquid oxygen jet emerging from the nozzle is supercooled and has a temperature that lies below the boiling temperature of the oxygen at ambient pressure to increase the cutting speed and the quality level of the liquid oxygen autogenous cutting.

4,995,919

METHOD AND APPARATUS FOR PARTING A DECK OF AMORPHOUS ALLOY RIBBONS

Alan I. Taub, Schenectady, N.Y.; Peter G. Frischmann, Scottsdale, Ariz., and Minyoung Lee, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,039
Int. Cl.[5] B23K 7/00
U.S. Cl. 148—9 R 15 Claims



1. A method for severing a deck of amorphous alloy ribbons along an intended seam, said seam being located within a predetermined zone that traverses said deck in its width and height dimensions; said method comprising:

placing said deck under tension by the application of a tensile force of predetermined direction and magnitude;

placing said deck under compression along said height dimension throughout a region of said deck encompassing said zone to reduce interfacial electrical resistance between said ribbons in said region;

applying a heating current to pass through the deck in said zone to resistance heat said zone while said deck is under said tension and compression; and

controlling the duration and amplitude of said current to heat said zone to a temperature within the range of softening temperatures of said amorphous alloy at a predetermined rate, said heating rate being selected to allow separation of said deck to occur along said seam within a time period less than about one half of one second upon the application of said tensile force.

4,995,920

PROCESS FOR THE PRODUCTION OF ALUMINUM ALLOYS BY SPRAY DEPOSITION

Jean-Francois Faure, Voiron, and Bruno Dubost, Maison Lafitte, both of France, assignors to Pechiney Recherche Groupement D'Interet Economique, Paris, France

Filed Dec. 14, 1989, Ser. No. 450,525
Claims priority, application France, Dec. 19, 1988, 88 17044
Int. Cl.[5] B22F 1/00
U.S. Cl. 148—12.7 A 11 Claims

1. A process for the production of alloys of Al in the series 7000 with a high level of strength and good ductility, comprising the steps of:

(a) forming, by spray deposition, a solid alloy consisting essentially of, by weight:

Zn	from 8.5 to 15.0%
Mg	from 2.0 to 4.0%
Cu	from 0.5 to 2.0%

at least one of the elements selected from the group consisting of Zr, Mn and Cr in the amounts:

Zr	from 0.05 to 0.8%
Mn	from 0.05 to 1.0%
Cr	from 0.05 to 0.8%

with Zr + Mn + Cr ≦ 1.4%

-continued

Fe	up to 0.5%
Si	up to 0.5%
others (impurities)	≦ 0.05% each ≦ 0.15% total
balance Al;	

(b) subjecting said solid alloy to transformation in the hot condition at between 300° and 450° C. and optionally in the cold condition, and

(c) subjecting said transformed alloy to heat treatment by solution treatment, quenching and ageing.

4,995,921

SOLDER PASTES USING ALCOHOL BLENDS AS RHEOLOGICAL AIDS

James L. Davis, Tamarac; Robert W. Pennisi, Boca Raton; Fadia Nounou, Plantation, and Bobby D. Landreth, Davie, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 11, 1990, Ser. No. 521,871
Int. Cl.[5] B23K 35/34
U.S. Cl. 148—22 30 Claims

1. A vehicle for powdered solder for solder pastes comprising:

a low viscosity, monofunctional alcohol solvent, having a room temperature

viscosity of between about 3 and about 20 centipoise; and

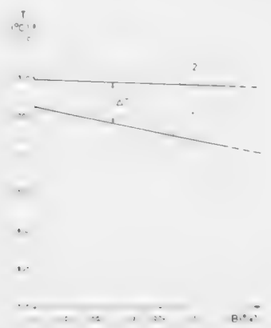
a relatively high viscosity polyfunctional alcohol thickener having at least two hydroxyl groups, and having a room temperature viscosity of between about 20 to about 1500 centipoise.

4,995,922

OXIDE-DISPERSION-HARDENED SUPERALLOY BASED ON NICKEL

Peter Jongenburger, Baden, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jan. 11, 1989, Ser. No. 295,559
Claims priority, application Switzerland, Jan. 18, 1988, 159/88
Int. Cl.[5] C22C 19/05
U.S. Cl. 148—428 19 Claims



1. An oxide-dispersion-hardened superalloy based on nickel which is composed of the following main constituents:

Cr =	5–13.95 percent by weight
Al =	2.5–7 percent by weight
Mo =	0–2 percent by weight
W =	0–15 percent by weight
Ta =	0–7 percent by weight
Hf =	0–1 percent by weight

-continued

Ti =	0–3 percent by weight
Zr =	0.02–0.2 percent by weight
Co =	0–10 percent by weight
C =	0–0.2 percent by weight
Y_2O_3 =	1–2 percent by weight
Ni =	Remainder,

which additionally contains boron in a content of 0.026 to 0.3 percent by weight.

4,995,923

THIN FILM OF AMORPHOUS ALLOY

Kunihiko Mizumoto; Koichi Haruta, and Hirokazu Kajiura, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,721
Int. Cl.[5] H01F 1/153
U.S. Cl. 148—304 21 Claims

1. A thin film of an amorphous alloy consisting essentially of

(i) 2 to 95 atom % of at least one element selected from Fe and Co,

(ii) at least 15 atom % to 94 atom % of at least one element selected form Pt and Pd, and

(iii) 2 to 95 atom % of at least one element selected from

(a) 3*d* transition elements other than Fe and Co,

(b) 4*d* transition elements other than Pd,

(c) 5*d* transition elements other than Pt,

(d) La, Ce, Pr, Nd, Pm, Sm, Eu or mixtures thereof,

(e) Group III B elements,

(f) Group IV B elements,

(g) Group V B elements, and

(h) Group VI B elements,

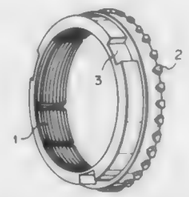
and said film having an easy axis of magnetization perpendicular to its face.

4,995,924

SYNCHRONIZER RING IN SPEED VARIATOR MADE OF COPPER-BASE ALLOY

Hidetoshi Akutsu, Kitamoto, Japan, assignor to Mitsubishi Metal Corporation, Tokyo, Japan

Continuation of Ser. No. 170,911, Mar. 21, 1988. This application Oct. 4, 1989, Ser. No. 416,867
Claims priority, application Japan, Mar. 24, 1987, 62-69879; Mar. 24, 1987, 62-69881; Mar. 24, 1987, 62-69882; Mar. 24, 1987, 62-69880; Mar. 25, 1987, 62-70759; Mar. 25, 1987, 62-70757; Mar. 25, 1987, 62-70758; Mar. 26, 1987, 62-72258
Int. Cl.[5] C22C 9/04
U.S. Cl. 148—433 17 Claims



1. A synchronizer ring made of a Cu base alloy for use in a speed variator that exhibits good initial accommodation by a mating surface and which has high wear resistance, said alloy consisting essentially of an a weight percent basis, 20–40% Zn, 2–8% Al, two components which are intermetallic compound forming components selected from the group consisting of (a) 0.1–3% of one or more elements selected from the group consisting of Ti, Zr and Cr, (b) 0.1–3% Sn, (c) 0.1–6% of one or more elements selected from the group consisting of Fe, Ni and Co, (d) 0.1–5% of Mn and (e) 0.2–2% Si, and optionally at

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least one additional component that differs from said two components and is selected from the group consisting of (i) 0–3% of one or more elements selected from the group consisting of Ti, Zr and Cr, (ii) 0–3% Sn and (iii) 0–5% Mn, and the balance being Cu and incidental impurities, said ring having either an oxide film layer of aluminum oxide base with an average thickness of 0.1–10 μm or a work-hardened layer with an average thickness of 5–300 μformed on at least the surface of the ring where it is to contact a mating member.

4,995,925

BLASTING COMPOSITION

Björn Engsbräten, Örebro, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Feb. 22, 1989, Ser. No. 313,471
Claims priority, application Sweden, Feb. 22, 1988, 8800593
Int. Cl.[5] C06B *31/00*
U.S. Cl. 149—2 **14 Claims**

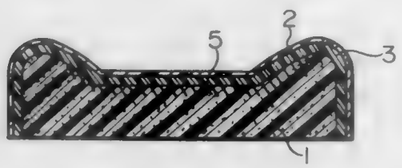
1. A blasting composition of reduced volume strength relative to straight ammonium nitrate/fuel oil (ANFO) compositions, containing particulate oxidizer salt, energy reducing particulate inert and/or density reducing filler and optionally a fuel for modifying the oxygen balance, comprising;
   (a) the particulate oxidizing salt;
   (b) the energy reducing inert and/or density reducing filler in an amount adapted to give the composition a volume strength relative to standard ANFO between 5 and 80%, the standard ANFO consisting of prilled ammonium nitrate with 5.5 percent by weight of fuel oil and tamped to a charge density of 0.95 g/cc; and
   (c) a viscous water-in-oil type emulsion, having a continuous fuel phase and a discontinuous aqueous phase of oxidizing salts, in an amount between 2 and 25% by volume of the total composition bulk volume;
wherein the weight ratio between the emulsion and the particulate oxidizer salt is between 10:90 and 60:40.

4,995,926

METHOD OF MAKING A SEAT

Muneharu Urai, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Division of Ser. No. 179,838, Apr. 11, 1988, abandoned. This application Jul. 19, 1989, Ser. No. 383,232
Int. Cl.[5] B32B *31/06, 5/18*
U.S. Cl. 156—78 **2 Claims**



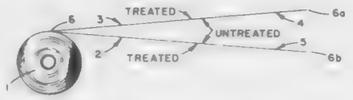
1. A method of forming a seat comprising
   (a) setting at rim cover in a molding cavity of a foaming mold;
   (b) disposing a film of an adhesive material on an area of the trim cover corresponding to a desired bonded area;
   (c) injecting, foaming and molding a polyurethane resin solution onto the trim cover in the mold; and
   (d) fusing the film of adhesive material by the temperature of the mold so as to be melted into the molded polyurethane and the trim cover thereby forming a bonded area which is permeable to air.

4,995,927

PROCESS FOR AND PRODUCT RELATED TO FABRICATING LINKED DUPLEX FILM WITH TRAPPED PRINTING

Arthur D. Garrett, 7136 N. Chimney Rock Pl., Tucson, Ariz. 85718

Filed Mar. 22, 1988, Ser. No. 171,854
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—152 **66 Claims**



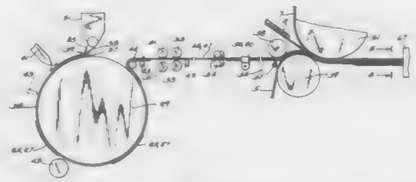
1. A process of preparing linked duplex film with trapped printing, the process comprising:
   obtaining a storage roll of two-ply film with both outside surfaces of the film having been treated for printing or laminating prior to having been wound onto the storage roll;
   feeding the two-ply film from the storage roll;
   printing on one treated surface; and
   rewinding the two-ply film onto a product roll so that the two treated surfaces come into face-to-face contact.

4,995,928

METHOD AND APPARATUS FOR FORMING AND TRANSPORTING ELASTIC RIBBONS

Reinhardt N. Sabee, 728 S. Summit St., Appleton, Wis. 54911

Filed Oct. 31, 1988, Ser. No. 267,303
Int. Cl.[5] B32B *31/08, 31/30*
U.S. Cl. 156—164 **42 Claims**



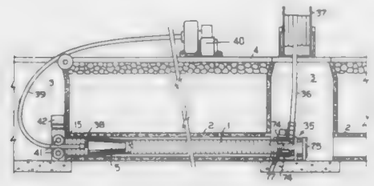
9. A method of continuously forming and transporting elastic ribbon to selected processing stations comprising the steps of:
   (a) extruding a continuous thin stream of a first material onto the periphery of a roll rotating about an axis, the first material being at least partially drawable when cooled;
   (b) intermittently extruding at least one stream of a second material onto the stream of first material, the second material having elastomeric properties when cooled and being self-adhering to the first material;
   (c) cooling the first and second extruded materials to develop the cold drawable and elastomeric properties, respectively, of the first and second material, thereby producing a cold drawable carrier strip with the elastic ribbon bonded thereto; and
   (d) transporting the carrier strip and elastic ribbon to a processing station.

4,995,929

METHOD OF PROTECTING CONDUITS INCLUDING HELICALLY WINDING A STRIP

Stanley W. O. Menzel, Burnside, Australia, assignor to Rib Loc Australia Pty. Ltd., Australia

PCT No. PCT/AU87/00069, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05676, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 12, 1987, Ser. No. 156,927
Claims priority, application Australia, Mar. 19, 1986, PH05111; Jun. 5, 1986, PH06269; Jun. 10, 1986, PH06322
Int. Cl.[5] B29C *53/78, 63/32*
U.S. Cl. 156—187 **11 Claims**



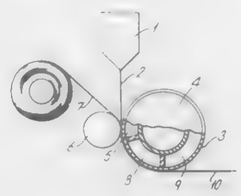
1. A method of protecting conduits comprising helically winding a strip at a first location to slidably interconnect edges of the strip to form a tube with the tube and conduit being arranged one within the other, continuing said step of winding to advance one end of the tube along the conduit to a second location and causing the interconnected edges of the strip to slip one on the other to progressively change the diameter of the tube from said second location toward said first location to place the tube closer to the conduit, and said step of causing including continuing said step of winding.

4,995,930

PROCESS FOR THE PRODUCTION OF A FILM COMBINATION

Winfried Merz, Ebermannstadt, and Theo Schmidt, Forchheim, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,855
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521374
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—209 **1 Claim**



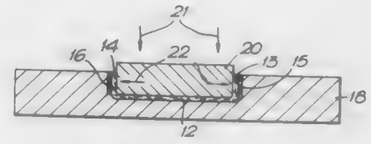
1. A process for producing a film combination comprising a web of porous fibrous material having a plastic film bonded thereto, said process comprising extruding a plastic film, feeding the extruded film while it is still in a thermoplastic condition onto a sievelike rotating surface, applying a web of fibrous material against a face of the plastic film that faces away from the sievelike surface as the film is fed onto the rotating surface and applying a pneumatic vacuum to the resulting film web combination through the sievelike rotating surface so that the film is simultaneously perforated and cooled and bonded to the web.

4,995,931

METHOD FOR FORMING COMPONENTS FROM FIBRE-REINFORCED THERMOPLASTIC MATERIALS

Antony C. Duthie, Semley, England, assignor to Westland Helicopters, Ltd., Yeovil, England

Filed Dec. 19, 1989, Ser. No. 452,409
Claims priority, application United Kingdom, Dec. 22, 1988, 8829993
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—212 **5 Claims**



1. A method for forming a component from fiber reinforced thermoplastic materials and including at least one sheet of material to be formed to final shape and at least one reinforcing sheet, comprising the steps of,
   pre-consolidating individual sheets of fiber reinforced thermoplastic material each incorporating a co-moulded adherent polymer layer in those areas of the individual sheets that are eventually to be joined together,
   locating the reinforcing sheet in a female mould tool part,
   locating the sheet to be formed to shape in register with the female mould tool part,
   locating a male mould tool part in register with the surface of the sheet of material to be formed to shape opposite to the surface in register with the female mould tool part,
   and, with the sheet to be formed to shape at its melt temperature and the mould tool parts at the fusion bonding temperature of the adherent polymer layers, bringing the mould tool parts together to form to shape the said sheet of material to be formed to shape and simultaneously applying pressure to the areas of the sheets incorporating said adherent polymer layers,
   maintaining the temperature of the mould tool parts for a predetermined time to ensure fusion bonding of the sheets, cooling the mould tool parts and removing the component.

4,995,932

METHOD FOR PRODUCTION OF PAVING BLOCKS

Kinoto Yoshida, Saitama; Morizumi Fujii, Aichi; Tokihiro Tsuda; Shigeo Suda, both of Saitama; Osamu Kodama; Kazuro Kuroe, both of Saitama; Takumi Tanikawa; Michihiko Nishimura, both of Aichi, and Hideyuki Munakata, Tokyo, all of Japan, assignors to Chichibu Cement Co., Ltd., Tokyo; Inax Corporation, Aichi and ILB Co., Ltd., Tokyo, all of, Japan

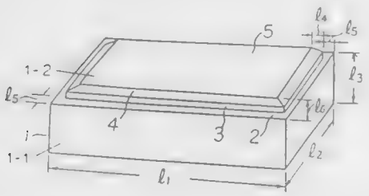
PCT No. PCT/JP88/00698, § 371 Date Mar. 14, 1989, § 102(e) Date Mar. 14, 1989, PCT Pub. No. WO89/00625, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 13, 1988, Ser. No. 360,922
Claims priority, application Japan, Jul. 14, 1987, 62-175450; Jul. 15, 1987, 62-176623; Jul. 15, 1987, 62-176624
Int. Cl.[5] B29C *29/12*
U.S. Cl. 156—242 **16 Claims**

1. A method for producing a paving block comprising a block substrate and a solid top layer selected from the group consisting of a tile layer and a cured cement mortar layer bonded to the upper surface of the block substrate having a thickness in the range of 3 cm to 20 cm, with lateral margins of 1 to 8 mm wide in horizontal distance from the peripheral edges of the substrate to the top layer and with vertical distance of 5 to 50 mm from the surface of the top layer to the peripheral edge of the substrate, said method comprising:

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applying adhesive cement mortar between the back of the top layer and the upper surface of the substrate,

placing the top layer on the substrate with the above-mentioned margins of the substrate surface, and



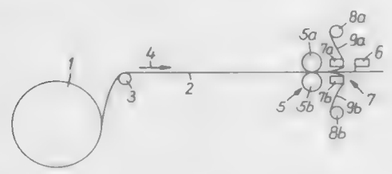
applying vibration and/or pressurization between the top layer and the substrate to firmly bond them and form squeeze-out deposits of the adhesive cement mortar around the top layer.

4,995,933

METHOD OF PRODUCING MAT STRIPS FROM WIDE PANELS OF ADHESIVE MATERIAL COVERED WITH RELEASE LAYERS AND APPARATUS FOR IMPLEMENTING THE METHOD

Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Krupp Maschinentechnik GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 3, 1989, Ser. No. 431,217
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 3838271
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—247 **9 Claims**



1. A method of producing strips from an adhesive sheet covered with release layers on opposite sheet faces, comprising the cyclical steps of

(a) holding a leading end of the sheet with gripping members;

(b) longitudinally advancing the held sheet with the gripping members an incremental distance corresponding to the desired length of the strips;

(c) during the advancing step, longitudinally subdividing the sheet into said strips with a longitudinal cutting means;

(d) during the advancing step, removing the release layers from the sheet with a removal device at a location situated upstream of the longitudinal cutting means, as viewed in the direction of the longitudinal sheet advance;

(e) upon completion of the advancing step, immobilizing the sheet by clamping the sheet by a clamping device upstream of the longitudinal cutting means;

(f) transversely severing the strips from the immobilized sheet with a transverse cutting means, whereby a new leading end of the sheet is obtained; the transverse severing step being performed downstream of said location; and

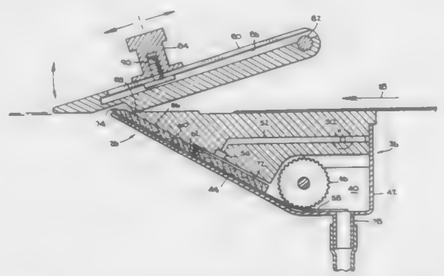
(g) releasing the sheet from the clamping device.

4,995,934

WICKING APPARATUS FOR ENVELOPES

Karel Janatka, Southbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 3, 1989, Ser. No. 374,715
Int. Cl.[5] B43M *5/04, 3/04*
U.S. Cl. 156—441.5 **7 Claims**



1. A wicking apparatus for supplying moisture to a envelope, comprising:

a housing;

a reservoir secured to said housing for storing a supply of water;

a wicking unit secured to said housing, said unit having a lower, inclined surface, an inlet leading to the inside of said units and an interior channel leading from said inlet to said inclined surface;

a wicking material situated on said inclined surface and adjacent said interior channel, said wicking material extending beyond said inclined surface;

means for urging an envelope into contact with said wicking material; and

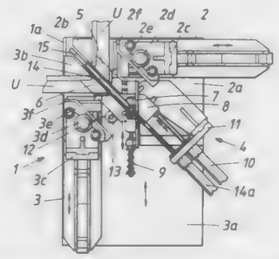
means for directly applying water under pressure to penetrate said wicking material.

4,995,935

WELDING MACHINE FOR BUTT WELDING OF PLASTIC PROFILES

Walter Ganzberger, Ziehbergstrasse 48, A-4053 Haid, Austria

Filed May 4, 1989, Ser. No. 347,497
Claims priority, application Austria, May 4, 1988, 1157/88
Int. Cl.[5] B25B *1/20;* **B29C** *65/20*
U.S. Cl. 156—499 **6 Claims**



1. A welding machine for butt welding of two pairs of superimposed plastic profiles respectively having an upper surface, a lower surface and surfaces extending in parallel planes to be welded together, comprising

(a) two associated clamping units, one clamping unit being capable of sliding relative to the other clamping unit in a first sliding direction, each clamping unit being designed to accommodate a pair of superimposed plastic profiles inserted therein and including

(1) two external weld boundary blades respectively engaging the upper and lower surfaces of the superimposed plastic profiles, and

(2) an intermediate weld boundary blade movable in a second sliding direction aligned parallel to the surfaces to be welded together, the intermediate weld boundary blade being insertable between the superimposed plastic profiles to be welded together and yielding elastically in the direction extending perpendicularly to the upper and lower surfaces, wherein the intermediate weld boundary blade associated with said one clamping unit is fixed relative to the first sliding direction while the intermediate weld boundary blade associated with the other clamping unit is displaceable in said first sliding direction against the bias of a reset spring,

(b) a bearing block connected to one of the two associated clamping units,

(c) a carrier rail for the displaceable intermediate weld boundary blade, the carrier rail being supported on the bearing block,

(d) a spring support arranged between the bearing block and the carrier rail, the spring support biasing the carrier rail for moving the carrier rail in the direction extending perpendicularly to the upper and lower surfaces,

(e) an entrainment lug mounted on the other one of the two associated clamping units and engaging the displaceble intermediate weld boundary blade, and

(f) a heat reflector insertable between the surfaces to be welded together.

4,995,936

CONTINUOUS WEB SPLICING MACHINE

Robert Cohn, 1210 Jackson St., Omaha, Nebr. 68102

Filed Jul. 27, 1989, Ser. No. 385,686
Int. Cl.[5] B65H *19/14, 19/18, 19/20*
U.S. Cl. 156—504 **12 Claims**



1. A continuous web splicing machine comprising:

a base, and a vertical column extending upright from said base;

a splicing station positioned at a top end of said vertical column and having a splicing station therein for splicing a trailing end of a spent roll of sheet material to a leading end of a fresh roll of sheet material in order to supply a continuous output web of sheet material at an output end thereof;

first and second roll supports on said vertical column positioned one above the other between said base and said top end of said vertical column for rotatably mounting first and second rolls holding first and second webs of sheet material thereon, respectively;

first and second guide means for guiding the first and second webs of sheet material from the first and second rolls, respectively, along first and second paths along one lateral side of said vertical column to the splicing station at said top end of said vertical column;

the splicing station including holding means and cutting means and controls for automatically operating the same; and

output guide means for guiding a continuous web of sheet material from said splicing station,

wherein said holding means of said splicing station includes a first holder for holding a leading end of the web of a fresh one of said two rolls of sheet material in a splicing position, said leading end having an adhesive layer thereon facing toward the web of a spent other one of said two rolls of sheet material, and a second holder which is operable to temporarily hold the web of the spent roll in the splicing position facing opposite the leading end of the web of the fresh roll, said cutting means being operable to cut off a trailing end of the web of the spent roll and adhesively join it to the leading end of the web of the fresh roll, and

wherein said output guide means includes a loop holder for holding a loop of the output web of sufficient length so that the web is continuously output even while the web of the spent roll is temporarily held during the splicing operation, said loop holder including a pivotable arm having a pivot end mounted to said vertical column and a free end pivotably movable along an opposite lateral side of said vertical column from that of said first and second paths of said webs of sheet material.

10. A continuous web slicing machine comprising:

first and second roll supports for rotatably mounting first and second rolls holding first and second webs of sheet material thereon, respectively;

first and second guide means for guiding the first and second webs of sheet material from the first and second rolls, respectively, along first and second paths to a splicing station;

the splicing station including holding means and cutting means positioned along a horizontal splicing path for the webs of sheet material running from an upstream end to a downstream end thereof, for splicing a trailing end of the web of a spent roll of sheet material to a leading end of the web of a fresh roll of sheet material entering from the upstream end in order to supply a continuous output web of sheet material at the output end thereof; and

output guide means for guiding a continuous web of sheet material from said splicing station,

wherein said holding means of said splicing station includes:

(a) first and second upstream holders spaced apart in a vertical direction facing opposite each other and having a central stationary plate extending in parallel with said horizontal splicing path so as to define a first web holding path between said first upstream holder and said stationary plate on one side thereof and a second web holding path between said second upstream holder and said stationary plate on an opposite side thereof, wherein each one of said first and second upstream holders is selectively operable for holding an upstream portion of the web of a fresh roll on the corresponding holding path such that a leading end thereof is held at a splicing position, said leading end having an adhesive layer thereon facing toward the web of the spent roll, and, alternatively, for intermittently holding an upstream portion of the web of a spent roll for a splicing operation;

(b) first and second downstream holders for intermittently holding downstream portions of the webs of the two rolls for a splicing operation; and

(c) first and second pressure members located at a splicing position between said upstream and downstream holders, each of said pressure members having a pressure pad at a downstream part thereof and a knife edge at an upstream part thereof which is aligned with a proximate

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end of said stationary plate, said pressure members being spaced apart in the vertical direction facing opposite each other and each being alternately movable to press a trailing end of the web of a spent roll into adhesive contact with the adhesive layer on the leading end of the web of the fresh roll, by the pressure pad thereof being moved into contact with the pressure pad of the other pressure member, and simultaneously to cut the trailing end of the web off from the remainder of the spent roll, by the knife edge thereof moving past the proximate end of the stationary plate.

4,995,937

TAPE APPLYING ARRANGEMENT

Malte Persson, Torup, Sweden, assignor to Forenade Well AB, Torup, Swedea

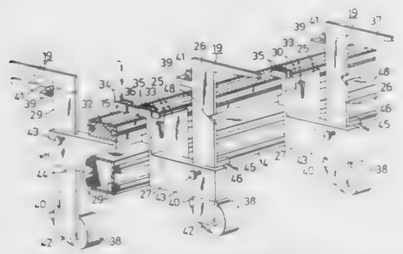
PCT No. PCT/SE87/00568, § 371 Date May 31, 1989, § 102(e) Date May 31, 1989, PCT Pub. No. WO88/04272, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 30, 1987, Ser. No. 360,893

Claims priority, application Sweden, Dec. 1, 1986, 860514

Int. Cl.[5] B32B *31/04;* **B21F** *5/00;* **B65C** *9/25;* **C09J** *5/00*

U.S. Cl. 156—543 **31 Claims**



1. An arrangement for applying relatively narrow tapes onto a moving web, in the direction if its length, comprising a plurality of holders for supporting a respective tape store, and further comprising a plurality of tape applicators for guiding a respective tape arriving from a tape store to a location at which the tape is in contact with the web, wherein said holders and tape applicators are carried by and capable of being adjusted positionally along a beam structure which extends transversely to the direction of web movement, and wherein the tape applicators can be adjusted positionally in relation to an applicator-setting beam, which extends transversely to the direction web movement, and can be locked to said beam in selected positions therealong, and wherein the applicator-setting beam is, in turn, carried for movement in its longitudinal direction by a stationary carrier beam which extends parallel therewith.

4,995,938

SUPPORTING DEVICE FOR ULTRASONIC VIBRATION ASSEMBLY

Kiyohide Tsutsumi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,922

Claims priority, application Japan, Aug. 4, 1988, 63-195226

Int. Cl.[5] B29C *65/08*

U.S. Cl. 156—580.1 **10 Claims**

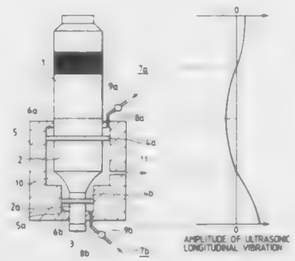
10. A device for supporting an ultrasonic vibration assembly, comprising:

an ultrasonic vibrator having an end portion and extending along an axis;

a vibration transmitter coupled to said end portion of said vibrator coaxially thereto, said vibration transmitter having an outer diameter portion, comprising an outside circumferential surface and two ends, wherein one of said ends of said outer diameter portion of said vibration transmitter has a smaller outer diameter then the other of said ends of said said outer diameter portion of said vibration transmitter;

a tool for ultrasonic machining connected to said end of said smaller outer diameter portion of said vibration transmitter;

two flanges provided integrally on said outside circumferential surface of said transmitter so as to act as pistons; an outer diameter of one of said flanges near said tool being smaller then the outer diameter of the other of said flanges;



a cylinder, having a sidewall portion and two opposite end portions defining an interior, said flanges being fitted in said cylinder so as to be moveable in the axial direction of said cylinder, said cylinder having an opening at the center of said sidewall portion thereof and having a small inner diameter portion in said interior of said cylinder near said tool, said smaller of said flanges being fitted in said small inner diameter portion; and

mechanisms for feeding a pressurized fluid to two spaces defined between said flanges and both ends of said cylinder, said mechanism including feed pipes and control valves.

4,995,939

METHOD AND APPARATUS FOR DETERMINING THE LAYER THICKNESS OF SEMICONDUCTOR LAYER STRUCTURES

György Ferenczi; Katalin Erdélyi; Mária Somogyi; János Boda, all of Budapest; György Füle, Pecel, and Gábor Aszódi, Budapest, all of Hungary, assignors to Magyar Tudomanyos Akademia Muszaki Fizikai Kutato Intezete, Hungary

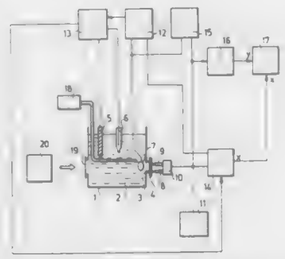
PCT No. PCT/HU88/00030, § 371 Date Feb. 8, 1989, § 102(e) Date Feb. 8, 1989, PCT Pub. No. WO88/09053, PCT Pub. Date Nov. 17, 1988

PCT Filed May 4, 1988, Ser. No. 301,889

Claims priority, application Hungary, May 4, 1987, 1989/87

Int. Cl.[5] G01N *27/46*

U.S. Cl. 156—627 **13 Claims**



1. A method for determining the layer thickness of semiconductor layer structures, in which a multilayer semiconductor sample is examined, comprising the steps of contacting a surface of said sample with an electrolyte, anodically etching said

surface using an etching current, determining, during the etching process, the actual etching depth, by integrating said etching current, said sample being excited by a periodic electrical signal while said sample is being etched and measuring a response to said periodic signal in a manner such that at the frequency of the exciting signal a real component, comprising the conductance of the admittance, of the sample is measured, wherein the extreme values of said component are examined and the etching depth data associated with said extreme values are recorded, said extreme values defining the transitions of the examined layers of the sample.

4,995,940

METHOD FOR FORMING A GAS REMOVING DEVICE FOR AN INK JET SYSTEM

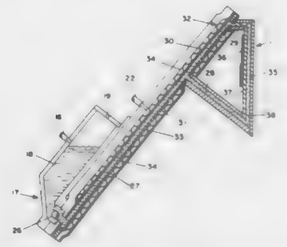
Nathan P. Hine, East Thetford, Vt., and Robert L. Wells, Jr., Hanover, N.H., assignors to Spectra, Inc., Hanover, N.H.

Division of Ser. No. 273,883, Nov. 18, 1988, Pat. No. 4,940,995.

This application May 1, 1990, Ser. No. 517,357

Int. Cl.[5] B44C *1/22;* **B29C** *37/00;* **C03C** *15/00, 25/06*

U.S. Cl. 156—629 **7 Claims**



1. A method for preparing a dissolved-gas removing device for an ink jet system comprising etching a surface of a fluorine-containing membrane, and bonding the etched surface to a support member to provide a wall of an ink-containing element in an ink jet system.

4,995,941

METHOD OF MANUFACTURE INTERCONNECT DEVICE

Gregory H. Nelson, Gilbert, Ariz.; Sanford Lebow, Westlake Village, Calif., and Eugene Nogavich, Gilbert, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed May 15, 1989, Ser. No. 352,112

Int. Cl.[5] B44C *1/22;* **C23F** *1/02;* **B29C** *37/00;* **C03C** *15/00*

U.S. Cl. 156—630 **19 Claims**

1. A method of making an interconnect drive for electronic components comprising the steps of:

forming a release layer on a carrier plate;

forming a conductive pattern of leads on said release layer;

forming registration features on said release layer;

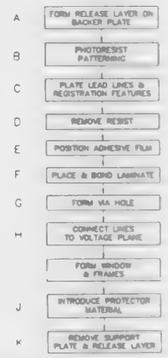
bonding a laminate to said conductive pattern of leads by a layer of adhesive, said laminate including a conductive sheet and a dielectric sheet wherein said dielectric sheet faces said conductive pattern of leads and said conductive sheet faces away from said adhesive layer;

forming via holes in said laminate in a predetermined pattern, said via holes extending through said conductive sheet, dielectric sheet and adhesive layer to expose said leads;

depositing conductive material in said via holes and onto said conductive sheet of said laminate to interconnect said leads to said conductive sheet;

forming at least one window in said device by removing selected parts of said conductive material, said laminate and said adhesive layer, said window extending through said dielectric sheet and adhesive layer to expose said leads; and

forming at least one frame spaced from and surrounding said window in said device by removing selected parts of said conductive material, said laminate and said adhesive layer,



said frame extending through said dielectric sheet and adhesive layer to expose said leads.

4,995,942

EFFECTIVE NEAR NEUTRAL PH ETCHING SOLUTION FOR MOLYBDENUM OR TUNGSTEN

Lawrence D. David, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,845

Int. Cl.[5] B44C *1/22;* **C23F** *1/00;* **C09K** *13/00*

U.S. Cl. 156—642 **21 Claims**

11. A method of effectively etching molybdenum or tungsten from a composite material comprising molydenum or tungsten adhered to a base-sensitive material without damaging the material comprising the steps of:

contacting the composite with a neutral or near neutral pH etching solution comprising:

an aqueous ferricyanide ion solution, a soluble molybdate or tungstate, and an essential compound such that upon combination of said soluble molybdate or tungstate and said essential compound, a heteropoly compound is formed in which said compound ingredient contributes at least one heteroatom to said heteropolycompound.

21. The method of claim 11 further comprising the step of introducing ozone into said etching solution to rejuvenate said solution.

4,995,943

PRETREATMENT OF CELLULOSIC MATERIAL WITH CARBON DIOXIDE

Karl H. Rehberg, P.O. Drawer 2868, Lakeland, Fla. 33806

Continuation-in-part of Ser. No. 814,144, Dec. 27, 1985, abandoned. This application Aug. 4, 1988, Ser. No. 228,142

Int. Cl.[5] D21C *1/00, 1/04*

U.S. Cl. 162—63 **1 Claim**

1. A method of pretreating cellulosic material for subsequent conversion by chemical treatment, comprising the steps of confining the material in an anhydrous environment comprising carbon dioxide in at least major part, and subjecting the material to one or more successive pressure cycles, including

compressing the confined material in said anhydrous environment to superatmospheric pressure and maintaining it at such pressure for a period of minutes, and

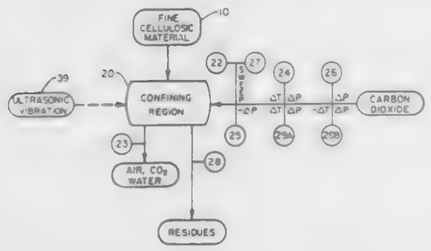
then decompressing the compressed material in said anhydrous environment for a further period of minutes, and

then returning it to atmospheric pressure, wherein

the material is compressed in an atmosphere consisting essentially of carbon dioxide to a pressure of about several

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atmospheres at a temperature of about 25° C. to 35° C. for at least about a dozen minutes, and



then is decompressed to a pressure of a minor fraction of an atmosphere for at least about a half dozen minutes.

4,995,944

CONTROLLING DEPOSITS ON PAPER MACHINE FELTS USING CATIONIC POLYMER AND CATIONIC SURFACTANT MIXTURE

David A. Aston, and Stewart N. Paul, both of Ontario, Canada, assignors to Dearborn Chemical Company Ltd., Mississauga, Canada

Continuation of Ser. No. 323,597, Mar. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 245,852, Sep. 16, 1988, abandoned. This application Aug. 9, 1990, Ser. No. 564,658
Int. Cl.[5] D21F *1/32;* D21H *21/02*
U.S. Cl. 162—199 30 Claims

1. A method of inhibiting the deposit of sticky material on a papermill felt used in processing pulp slurry into sheets, comprising the step of:

applying to said papermill felt an aqueous solution which is substantially free of anionic macromolecules and which contains at least about 2 ppm of a cationic polymer having a molecular weight between about 2,000 and 300,000; and which contains a water soluble cationic surfactant, said surfactant having a molecular weight between about 200 and 800, applied in an amount effective to inhibit the buildup of deposits derived from the cationic polymer and wherein the weight ratio of surfactant to polymer is between about 50:1 to 1:1.

4,995,945

COUNTER-CURRENT GAS-LIQUID CONTACTING DEVICE

Andrew J. M. Craig, Yenda, Australia, assignor to Flavourtech Pty. Ltd., Griffith, Australia

Continuation of Ser. No. 828,381, Feb. 11, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 165,579
Claims priority, application Australia, Feb. 11, 1985, PG9216
Int. Cl.[5] B01D *1/22, 19/00*
U.S. Cl. 202—177 15 Claims

1. A counter-current contacting device comprising:

a housing having a vertical longitudinal axis:

a rotatable shaft at least partially disposed within said housing, so as to extend longitudinally thereof, and which is vertically adjustable relative to said housing;

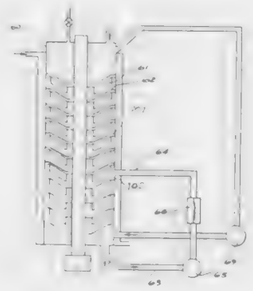
at least one inverted cone mounted on said shaft within said housing and having at least one fin extending outwardly from said shaft and mounted along said cone and extending downwardly from said cone to provide a fin distal border;

said housing having a first lower frustoconical surface over which liquid can pass and extending inwardly from the inner wall thereof and disposed so as to be approximately adjacent to said distal border and adjustable relative thereto by said relative adjustment to provide a selectable gap,

a motor coupled to said shaft to rotate said shaft;

said housing having coupled operatively therewith means to recirculate liquid passing through the device from at least one liquid outlet associated with said housing to approximately above said first lower frustoconical surface through at least one liquid inlet into said housing, said means to recirculate liquid including means to heat said liquid prior to its reintroduction into said housing;

a second lower frustoconical surface below said first lower frustoconical surface and at least two upper frustoconical



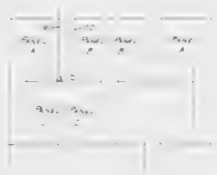
surfaces above said liquid inlet and wherein the spacing between said lower frustoconical surfaces is greater than the spacing between said upper frustoconical surfaces above said liquid inlet to provide for an increased flow volume of a liquid across said lower frustoconical surfaces as compared with the flow volume of liquid across said upper frustoconical surfaces to ameliorate flooding in said device as a result of liquid recirculating into said device by said means to recirculate liquid.

4,995,946

METHOD AND APPARATUS FOR ACHIEVING BALANCED FLOW ON MULTIPASS DISTILLATION TRAYS

Robert G. Auger, Monroeville Borough, Pa., assignor to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1989, Ser. No. 419,557
Int. Cl.[5] B01D *3/26;* B01F *3/04*
U.S. Cl. 203—99 2 Claims



1. Method of constructing a multipass distillation tower having downcomer baffles comprising designing a horizontal set of panels of at least one tray therein with tray areas and gas throughput capacity on each side of each downcomer baffle in predetermined ratios whereby at least weir heights, downcomer clearances, range of viscosities, flow rates, foaming characteristics of a fluid, and volatilities are taken into account, and adjusting only the clearances under the downcomer baffles until the ratio of the flow of liquid to the flow of vapor (L/V) on a horizontal level, or tray is equilibrated.

4,995,947

PROCESS FOR FORMING A METAL COMPOUND COATING ON A SUBSTRATE

Donald J. Sharp; Milton E. Vernon, and Steven A. Wright, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 29, 1988, Ser. No. 213,012
Int. Cl.[5] C25D *15/00;* C22B *60/02*
U.S. Cl. 204—1.5 28 Claims

1. A method of forming a layer of a metal compound on a substrate, wherein said compound is selected from the group consisting of the compounds of uranium, thorium, and plutonium, said method comprising the steps of:

(a) providing an aqueous dispersion of sub-micron-sized particles of a precursor of said metal compound and an electrophoretically active organic colloid within an electrolytic cell containing at least two electrodes;

(b) providing said substrate as an electrode in said cell, said electrode comprising a cathode and an anode;

(c) imposing an electric potential between said cathode and said anode, whereby a layer comprising a mixture of the precursor particles and said organic colloid is deposited on said anode of said substrate;

(d) removing the resulting coated substrate from said electrolytic cell;

(e) drying said coated substrate in air; and

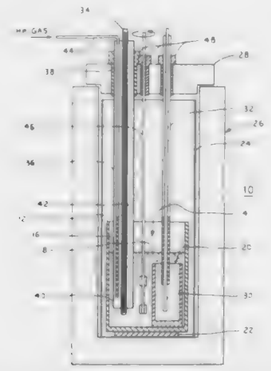
(f) heat-treating said coated substrate at a temperature at which said organic colloid cross-links to form a rigid coating and subsequently pyrolyzes to form carbon.

4,995,948

APPARATUS AND PROCESS FOR THE ELECTROLYTIC REDUCTION OF URANIUM AND PLUTONIUM OXIDES

David S. Poa; Leslie Burris; Robert K. Steunenberg, all of Naperville, and Zygmunt Tomczuk, Orland Park, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 24, 1989, Ser. No. 384,195
Int. Cl.[5] C25C *3/00, 3/08, 3/22*
U.S. Cl. 204—1.5 11 Claims



7. A process for electrolytically reducing metal oxides selected from the group consisting of uranium and plutonium to high-purity solid metal comprising:

providing an electrolytic cell having a first container, a relatively smaller second container within the first container, an electrolyte in the cell filling both containers, the level of the electrolyte in the first container being above the top of the second container, an anode in the electrolyte in the first container, means in the electrolyte for passing a sparging gas over the anode, a cathode in the electrolyte in the second container, stirring means in the first container for stirring and mixing the electrolyte and for circulating the electrolyte between the two chambers,

heating the electrolyte to a temperature between 900 degrees C and the melting temperature of the metal to be produced,

adding the metal oxide to the heated electrolyte in the first chamber,

electrolytically reducing the metal oxide to metal while stirring and mixing the electrolyte in the first container and circulating the electrolyte containing the dissolved oxides between the chambers, whereby high-purity metal forms as a solid on the cathode within the second chamber.

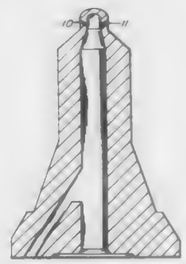
8. The method of claim 7 wherein the electrolyte consists of one or more members selected from the group consisting of LiF, KF, NaF, CaF_2, BaF_2, and MgF_2, and also contains UF_4.

4,995,949

ORIFICE SIZING USING CHEMICAL, ELECTROCHEMICAL, ELECTRICAL DISCHARGE MACHINING, PLATING, COATING TECHNIQUES

Lawrence J. Rhoades, Pittsburg, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.

Continuation-in-part of Ser. No. 842,285, Mar. 21, 1986, abandoned. This application Nov. 2, 1988, Ser. No. 265,934
Int. Cl.[5] B23H *3/00, 9/14;* C25D *5/02*
U.S. Cl. 204—15 13 Claims



1. The method of attaining a specific flow resistance of a fluid through an orifice in a structure by processing said orifice with a process utilizing a processing fluid, said process selected from the group consisting of chemical machining, electrochemical machining, electrical discharge machining, electroplating, electroless plating and vapor deposition, wherein said processing fluid is caused to flow through said orifice by a mechanical pump, said method comprising:

A. Determining a target flow resistance of said processing fluid at a constant applied pressure as will provide said specific flow resistance of said fluid;

B. Pumping said processing fluid through said orifice with said mechanical pump to process said orifice while maintaining said constant applied pressure with said mechanical pump;

C. Measuring the dynamic flow resistance of said processing fluid through said orifice while said processing fluid is being pumped therethrough, and permitting the volumetric flow rate of said processing fluid to change in direct proportion to the processing effected on said orifice for the purpose of maintaining said constant applied pressure with said pump; and

D. Stopping the processing of said orifice when said dynamic flow resistance is equal to said target flow resistance.

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4,995,950

PREPARATION OF ALKALI METAL NITRATES

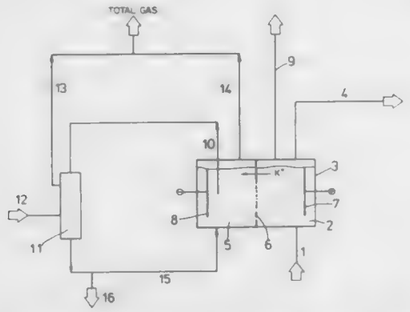
Wolfgang Kochanek, Weisenheim, and Bernd Leutner, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,446

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729669

Int. Cl.[5] C25B *1/14*

U.S. Cl. 204—91 **5 Claims**



1. A process for preparing an alkali metal nitrate by electrolysis of an alkali metal chloride solution supplied to the anode space of an electrolysis cell, separated from the cathode space by a perm-selective cation exchange membrane, with nitric acid being supplied to the cathode space, which comprises supplying the cathode space with a nitric acid/alkali metal nitrate solution whose alkali metal nitrate concentration is not less than 25% by weight and whose HNO_3 concentration is of from 0.1 to 10% by weight and withdrawing from the cathode space a solution whose pH does not exceed 5.

4,995,951

BRIGHTENING METHOD

Peter Venn, Wuppertal, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 528,058

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917184

Int. Cl.[5] C25F *3/20*

U.S. Cl. 204—129.95 **10 Claims**

1. A method for brightening aluminum or aluminum alloy parts, comprising treating said parts in an alkaline electrolyte, subjected to direct current, said alkaline electrolyte comprising trisodium phosphate, disodium carbonate, aluminum phosphate, and beechwood extracts.

4,995,952

ELECTROLYSIS OF WATER USING HYDROGEN SULFIDE

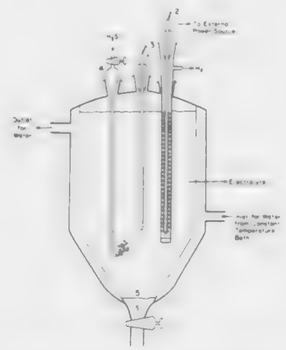
Balasubramaniam Dandapani, 2808-700 Dominik Dr., and John O'M. Bockris, Rt. 3, Box 286, both of College Station, Tex. 77840

Filed Apr. 30, 1987, Ser. No. 44,068

Int. Cl.[5] C25B *1/04*

U.S. Cl. 204—129 **5 Claims**

1. An electrolytic process, comprising electrolyzing hydrogen sulfide in an aqueous alkaline solution at a temperature above about 65° C., the solution having an alkali concentration of between about 1M and about 6M, the solution being substantially free of organic solvents, the electrolysis being performed by contacting the solution with an anode and a cathode and connecting the anode and the cathode to an external power source; whereby substantially pure hydrogen gas is generated continuously at the cathode; whereby sulfur is generated continuously at the anode without substantially passivating the anode, the sulfur being spontaneously dissolved in the solution as polysulfide and ultimately precipitating in the form of substantially pure sulfur; and whereby substantially no gaseous oxygen is generated at the anode.



4,995,953

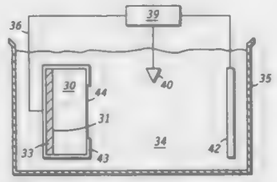
METHOD OF FORMING A SEMICONDUCTOR MEMBRANE USING AN ELECTROCHEMICAL ETCH-STOP

Renwin J. Yee, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 30, 1989, Ser. No. 428,580

Int. Cl.[5] C25F *3/12, 3/14*

U.S. Cl. 204—129.3 **18 Claims**



1. A method of forming a membrane, comprising the steps of:

providing a semiconductor substrate of a first conductivity type, having a first and a second surface;

providing a conductive layer on said first surface of said semiconductor substrate;

applying a voltage to said conductive layer, thus creating a depletion region which extends from said first surface into said semiconductor substrate; and

etching a portion of said second surface of said semiconductor substrate with an electrochemical, anisotropic etch solution, wherein etching terminates at said depletion region, thus forming said membrane having a thickness defined by said depletion region.

4,995,954

POROUS SILICONFORMATION AND ETCHING PROCESS FOR USE IN SILICON MICROMACHINING

Terry R. Guilinger; Michael J. Kelly; Samuel B. Martin, Jr.; Joel O. Stevenson, and Sylvia S. Tsao, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 12, 1990, Ser. No. 478,376

Int. Cl.[5] C25F *3/12*

U.S. Cl. 204—129.75 **8 Claims**

1. A reproducible process for uniformly etching silicon from

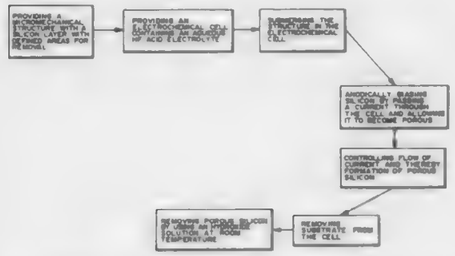
a series of micromechanical structures used in electrical devices comprising the steps of

(a) providing a micromechanical structure having a silicon layer with defined areas for removal thereon;

(b) providing an electrochemical cell containing an aqueous hydrofluoric acid electrolyte;

(c) submerging said micromechanical structure in said electrochemical cell;

(d) anodically biasing said defined areas of said silicon layer by passing a current through said electrochemical cell for a time period sufficient to cause said defined areas of said silicon layer to become porous;



(e) regulating the depth of formation of said porous silicon by controlling the total charge passed through said electrochemical cell;

(f) removing said micromechanical structure from said electrochemical cell and then submerging said micromechanical structure in a hydroxide solution to remove said porous silicon; and

(g) subsequently repeating the process for each of said series of micromechanical structures to achieve a reproducibility better than ±0.3%.

4,995,955

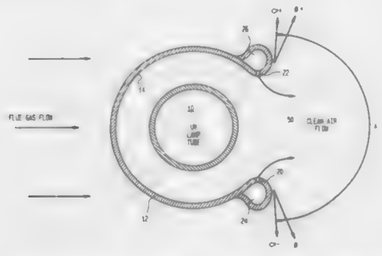
OPTICALLY-ASSISTED GAS DECONTAMINATION PROCESS

Yong W. Kim, Bethlehem, and William A. Frederick, Allentown, both of Pa., assignors to Lehigh University, Bethlehem, Pa.

Continuation of Ser. No. 407,689, Sep. 14, 1989, abandoned, which is a continuation of Ser. No. 107,867, Oct. 8, 1987, abandoned, which is a continuation of Ser. No. 775,449, Sep. 12, 1985, abandoned. This application Apr. 26, 1990, Ser. No. 517,408

Int. Cl.[5] B01D *53/32;* C01B *17/00, 21/00*

U.S. Cl. 204—157.3 **11 Claims**



1. A process for the removal of sulfur and nitrogen oxides from gas mixtures containing those compounds, together with oxygen and water, comprising the steps of:

exposing said gas mixture to an ultraviolet light source having a wavelength of below 200 nanometers with sufficient intensity to dissociate molecular oxygen into ground state atomic oxygen;

permitting said ground state atomic oxygen to oxidize said sulfur and nitrogen oxides;

permitting said oxidized sulfur and nitrogen oxides to react with water and thereby forming hydrated reaction products;

removing said hydrated reaction products directly from said gas mixture;

all of said steps being conducted in the absence of ammonia.

4,995,956

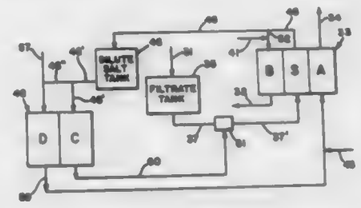
METHOD AND APPARATUS TO CONTROL A SALT STREAM TO BE TREATED IN AN ELECTRODIALYTIC WATER SPLITTER

Krishnamurthy N. Mani, Basking Ridge, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 6, 1989, Ser. No. 335,171

Int. Cl.[5] B01D *13/02*

U.S. Cl. 204—182.4 **21 Claims**



21. A method of converting salt in a raw stream to acid and base in a water splitter comprising a salt compartment, an acid compartment, and a base compartment comprising:

feeding the salt feed stream to the salt compartment of the water splitter;

withdrawing a dilute salt stream from the salt compartment;

withdrawing an acid stream from the acid compartment;

withdrawing a base stream from the base compartment;

feeding the dilute salt stream to an electrodialysis unit having a diluting compartment and a concentration compartment, at least part of the dilute salt solution being fed to the concentration compartment;

withdrawing an electrodialysis product stream from the concentration compartment; and

controlling the pH of the salt feed stream by combining the salt feed stream with a stream selected from the group consisting of the acid stream, the base stream, and the dilute salt stream.

4,995,957

DEVICE AND METHOD FOR THE ELECTROPHORETIC SEPARATION OF MACROMOLECULES

Andreas Ziegler, Steinweg 37, 3550 Marburg, and Karl-Heinz Geiger, Weissdornweg 13, 7400 Tübingen, both of Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,689

Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715170

Int. Cl.[5] G01N *27/26;* B01D *57/62*

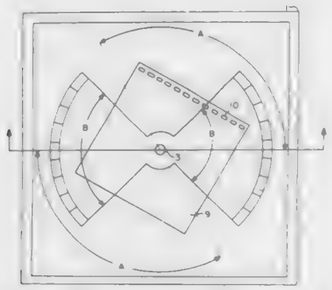
U.S. Cl. 204—182.8 **19 Claims**

1. Electrophoretic separation apparatus suitable for the separation of macromolecules, comprising:

electrode means for generating an electric field for acting on at least one specimen;

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electrode carrier means for holding said electrode means; and



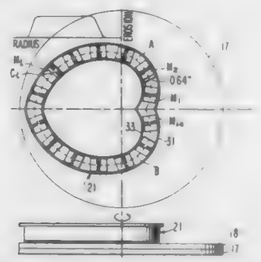
rotating driving means for rotating said carrier means and said electrode means with respect to the at least one specimen.

4,995,958

SPUTTERING APPARATUS WITH A ROTATING MAGNET ARRAY HAVING A GEOMETRY FOR SPECIFIED TARGET EROSION PROFILE

Robert L. Anderson, and John C. Helmer, both of Palo Alto, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 22, 1989, Ser. No. 355,713
Int. Cl.[5] C23C *14/35*
U.S. Cl. 204—298.200 9 Claims



1. A magnetron sputter apparatus comprising:
a vacuum chamber;
means for holding a target having a front surface in said vacuum chamber; and
rotatable magnetic means for generating a moveable magnetic field over said front surface of said target,
said magnetic means being configured so that at least a first portion of the normalized centerline of said magnetic means is describable by an equation of the form

$$\theta = \int_1^r \frac{\sqrt{(\xi^2(u)u^2 - 1}}{u} du + C$$

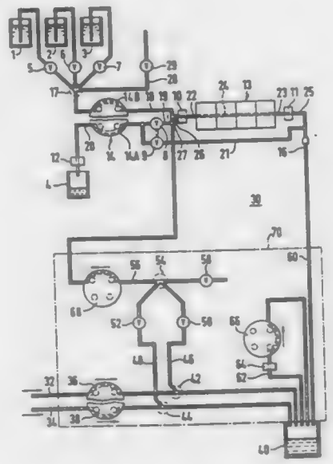
where $\xi(u)$ is a preselected normalized erosion profile to be generated in said target during rotation of said magnetic means, C is a selected constant, and θ has a selected range.

4,995,959

MEASURING APPARATUS FOR DETERMINATION OF THE ACTIVITY OR OF THE CONCENTRATION OF IONS IN SOLUTIONS

Klaus Metzner, Friedrichsdorf, Fed. Rep. of Germany, assignor to Fresenius, AG, Bad Homburg, Fed. Rep. of Germany

Filed Sep. 20, 1989, Ser. No. 410,123
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832528
Int. Cl.[5] G01N *27/27*
U.S. Cl. 204—411 8 Claims



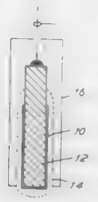
1. In a measuring device for determination of the activity or the concentration of ions in solution comprising;
a flow channel having a reference electrode and at least one measuring electrode, said flow channel having a first end and a second end;
a first line connecting said first end of said flow channel to at least one calibrating liquid container through first valve means;
first pumping means interpose din said first line between said first valve means and said first end of said flow channel
a discharge line connected to said first line adjacent said first end of said flow channel, said discharge line having second pumping means;
a sample feed line connected to said second end of said flow channel for providing a sample to said flow channel
first and second sensors arranged in said first and second ends of said flow channel, respectively, for detecting the flowing fronts of liquids, said sensors being capable of discriminating between the presence and absence of liquids; and
control means coupled to said sensors, pumping means, and valve means for controlling said pumping means and valve means;
the improvement comprising a connection line branching off from said exit line of said second pump, said connection line exiting into said flow channel in the vicinity of said second end, said connecting line, being provided with a first valve and in said exit line, between the juncture of said lines and at mixing point and the point of connection of connection line to said exit line, a second valve is provided.

4,995,960

ELECTROCHEMICAL ELECTRODES

Martin C. Wiles; David J. Schiffrin, both of Southampton, and David J. Clarke, Salisbury, all of Great Britain, assignors to Public Health Laboratory Service Board, England

PCT No. PCT/GB88/00992, § 371 Date Sep. 25, 1989, § 102(e) Date Sep. 25, 1989, PCT Pub. No. WO89/04958, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 14, 1988, Ser. No. 381,665
Claims priority, application United Kingdom, Nov. 24, 1987, 8727497
Int. Cl.[5] G01N *27/30, 27/333*
U.S. Cl. 204—418 17 Claims



1. An electrochemical reference element in combination with an organic liquid, comprising a metal electrode and a solid electrolyte in contact with the electrode, the electrolyte comprising a salt of an organic anion with a metal cation of the electrode, the salt being substantially insoluble in said organic liquid and the anion being soluble in said organic liquid to form a solution maintaining reversible equilibrium between the anion in the electrolyte and the anion in solution in the organic liquid.

3. An electrochemical reference element comprising a metal conductor coated with a tetraphenyl borate salt of said metal.

6. An ion selective electrode comprising an electrochemical reference element according to claim 3 with an ion selective membrane containing tetraphenyl borate ion and establishing direct contact with said coating.

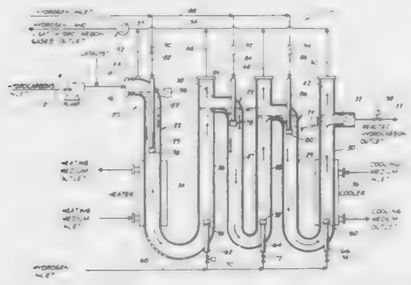
15. An ion selective electrode comprising a metal electrode, a solid electrolyte coating on the metal electrode, the electrolyte comprising a salt of an organic anion with the metal cation of the electrode and an ion selective membrane in direct contact with the solid electrolyte coating, the membrane including said organic anion.

4,995,961

PROCESS AND APPARATUS FOR HYDROGENATING HYDROCARBONS

George E. Hays, Bartlesville, Okla., and Theodore M. Classen, Liberty, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 19, 1988, Ser. No. 234,316
Int. Cl.[5] C10G *47/02*
U.S. Cl. 208—108 14 Claims



1. A process of hydrogenating a stream of hydrocarbons at elevated pressure and temperature comprising the successive steps of:
passing said stream of hydrocarbons into two or more serially connected hydrogenation reaction zones, each zone providing a downward or an upward path and said two or more zone being connected whereby said stream is caused to flow along successive downward and upward paths therein;
dispersing hydrogen in said stream of hydrocarbons as said stream passes through said reaction zones so that said hydrocarbons are hydrogenated; and the
cooling the resulting hydrogenated stream of hydrocarbons.

4,995,962

WAX HYDROISOMERIZATION PROCESS

Thomas F. Degnan, Jr., Morristown, and Michael E. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 459,154
Int. Cl.[5] C10G *47/20*
U.S. Cl. 208—110 6 Claims

1. A process for hydroisomerizing petroleum wax or synthetic paraffin wax, thereby reducing its pour point, said process comprising contacting said wax with a hydroisomerization catalyst under sufficient hydroisomerization conditions, said catalyst comprising a layered titanate containing interspathic polymeric oxide, said catalyst further comprising a hydrogenating component selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, and Pt.

4,995,963

CRYSTALLINE GALLIOSILICATE WITH THE ZEOLITE L TYPE STRUCTURE AND ITS USE IN CHEMICAL CATALYTIC CONVERSIONS

Mario L. Occelli, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 274,621, Nov. 22, 1988, Pat. No. 4,919,907, which is a continuation-in-part of Ser. No. 945,092, Dec. 22, 1986, abandoned. This application Jan. 16, 1990, Ser. No. 466,006
Int. Cl.[5] C10G *11/05;* C07C *1/04, 2/12, 4/06*
U.S. Cl. 208—111 24 Claims

1. A process for the acid catalyzed chemical conversion of a feedstock containing organic compounds into reaction products which process comprises contacting said feedstock under acid catalyzed conversion conditions with a catalyst comprising a catalytically active, galliosilicate molecular sieve, wherein said molecular sieve (1) comprises silicon, gallium and oxygen, (2) has an X-ray powder diffraction pattern characteristic of the zeolite L structure and (3) contains less than about 0.20 weight percent alumina.

4,995,964

MIDBARREL HYDROCRACKING PROCESS EMPLOYING RARE EARTH PILLARED CLAYS

Frank P. Gortsema, Pleasantville, N.Y.; John R. McCauley, Louisville, Md.; Regis J. Pellet, Croton on Hudson, N.Y.; James G. Miller, Pearl River, N.Y., and Jule A. Rabo, Armonk, N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 21,972, Mar. 5, 1987. This application Feb. 26, 1988, Ser. No. 154,834
The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.
Int. Cl.[5] C10G *47/00, 47/12*
U.S. Cl. 208—112 69 Claims

1. In a process for hydrocracking hydrocarbons boiling above about 700° F. to midbarrel fuel products boiling between about 300° F. and about 700° F. which includes contacting said hydrocarbons with hydrogen under effective hydrocracking conditions in the presence of a catalyst composition comprising at least one hydrogenation component and at least one

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cracking component, the improvement which comprises utilizing as said cracking component an expanded clay including pillars comprising (a) at least one pillaring metal, (b) at least one rare earth element and (c) oxygen located between the sheets of at least one clay mineral or synthetic analogue thereof.

4,995,965

CALCIUM CARBONATE BENEFICIATION

Joseph L. Mehaffey, Lockport, and Thomas C. Newman, Hinsdale, both of Ill., assignors to Akzo America Inc., New York, N.Y.

Division of Ser. No. 206,247, Jun. 13, 1988, Pat. No. 4,892,646. This application Oct. 25, 1989, Ser. No. 427,154

Int. Cl.[5] B03D *1/01, 1/02*

U.S. Cl. 209—166 **2 Claims**

1. A process for purifying calcium carbonate ore containing silicate impurities comprising grinding and forming an aqueous slurry of said ore, adding an effective amount of a collector selective for said silicate impurities to said slurry comprising methyl-bis(2-hydroxypropyl)cocoammonium methyl sulfate, and subjecting said slurry containing said silicate impurity collector to froth flotation thereby floating the silicate impurities away from a resultant slurry containing purified calcium carbonate.

4,995,966

SIFTER-SCREENING MACHINE FOR BULK MATERIAL

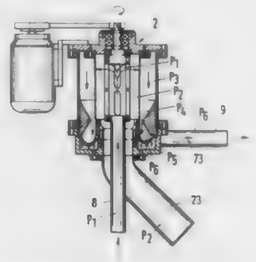
Maximilian Ofner, Leonberg, Fed. Rep. of Germany, assignor to Firma IBV, Leonberg, Fed. Rep. of Germany

Filed Nov. 3, 1989, Ser. No. 431,602

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837346

Int. Cl.[5] B07B *1/00*

U.S. Cl. 209—240 **15 Claims**



1. In a sifter-screening machine for loose material, including inlet means for said material, downstream thereof a screen through which said material is conveyed along a conveying route via an air stream, and downstream thereof an outlet means for screened material, the improvement wherein:

disposed in the conveying route of said material, downstream of said screen, is a zone of reduced static pressure followed in the conveying direction by a conveying zone having an increasing cross-sectional configuration;

disposed downstream of said conveying zone is an air-permeable means for supplying said material to said outlet means with a supply of compressed air being delivered below said air-permeable means; and

the weight of said material just upstream of said outlet means is at least nearly equal to the oppositely directed pressure of said compressed air below said air-permeable supply means.

4,995,967

SEPARATOR FOR CELL-CONTAINING LIQUIDS

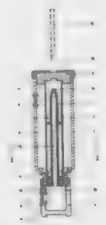
Petrus J. D. M. van Driessche, St. Jansteen, Netherlands, assignor to Akzo N.V., Netherlands

Filed Oct. 24, 1988, Ser. No. 261,326

Claims priority, application Netherlands, Nov. 6, 1987, 8702652

Int. Cl.[5] B01D *69/08*

U.S. Cl. 210—94 **5 Claims**



1. A device for separating a cellcontaining liquid into a cell-containing fraction and a cell-free fraction, which device comprises an essentially elongated housing at one end of which there is provided a closable inlet, which housing contains a first area for receiving the cell-containing fraction, a second area located adjacent an opposite sealed end of said housing for receiving the cell-free fraction, and a membrane separator, which membrane separator comprises an enclosed narrow feed channel which is at one end in flow communication with the closable inlet for introduction of the cell-containing liquid and at the other end with the first area for receiving the cell-containing fraction which lies between said enclosed narrow feed channel and said housing, said membrane separator contains one or more hollow fibers which pass through said sealed end of the housing and at their open ends are in flow communication with the second area for receiving the cell-free fraction.

4,995,968

FILTERS

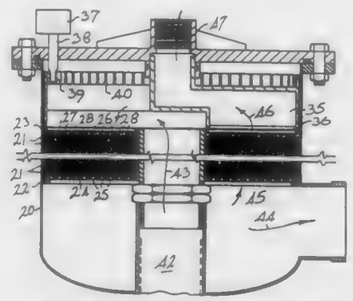
Peter J. Snelling, Unit 1, 14 Cocos Grove, West Lakes, Australia

Continuation of Ser. No. 96,607, Jul. 20, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 341,256

Claims priority, application Australia, Nov. 21, 1985, PH3513

Int. Cl.[5] B01D *25/00, 29/38*

U.S. Cl. 210—108 **5 Claims**



1. A back flushable filter comprising a plurality of filter members, each filter member being generally annular in shape and being located in an adjoining cooperating relationship with other of the filter members to form a stack, each of the filter members including a plurality of divisions dividing each of said filter members into a plurality of radial sectors and within each sector a plurality of filter parts, each filter part in each sector being located and being shaped so as to provide in cooperation with and between filter parts of adjoining cooperating filter members, a plurality of filter apertures in each sector having a shape defining converging sides to a narrowest gap wherein said converging sides are formed from adjoining cooperating filter members, the filter members in the stack defining for each thus formed converging filter aperture and within each sector a plurality of supply conduits connecting to a widest end of each filter aperture, said supply conduits coupled to a source and the filter members defining a plurality of exit conduits within each sector connecting to a narrowest end of each filter aperture and means to connect a back flow to said exit conduits in one or more selected sector to effect a back flush through said plurality of filter apertures within said one or more selected sector.

4,995,969

TREATMENT SYSTEM FOR LANDFILL LEACHATE

Ronald L. LaVigne, P.O. Box 578, Leeds, Mass. 01053

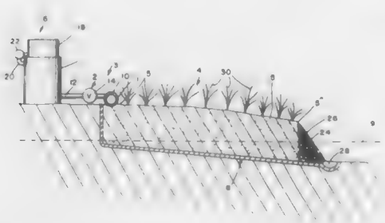
PCT No. PCT/US87/00145, § 371 Date Aug. 29, 1988, § 102(e) Date Aug. 29, 1988

Continuation of Ser. No. 822,125, Jan. 24, 1986, Pat. No. 4,678,582. This PCT application Jan. 22, 1987, Ser. No. 250,599

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.[5] C02F *3/32, 3/04*

U.S. Cl. 210—150 **10 Claims**



1. A system for treating landfill leachate comprising:

(a) a leachate supply source,

(b) a water impervious treatment basin which slopes from a high end to a low end,

(c) a layer of treatment medium means which is selected from the group consisting of peat moss and a mixture of peat moss and sand for providing a substantially large surface area for enhancing the fixation and proliferation of microbes and for supporting plants for growth,

(d) leachate tolerant plants growing in the treatment medium means,

(e) inlet flow control means operatively connected to the leachate supply source and the treatment basin for introducing leachate to the upper portion of the treatment medium means at the high end of said treatment basin which allows the leachate to penetrate and flow vertically and horizontally through the treatment medium means, and

(f) outlet flow control means for draining the treated leachate from the treatment medium means at the low end of the basin and for collecting the drained treated leachate at a point below said treatment medium means, said outlet flow control means comprising a drainage medium means for draining the landfill leachate, said drainage medium means being horizontally adjacent to said layer of treatment medium means, whereby the landfill leachate is first treated by said treatment medium means after which said treated landfill leachate flows through said drainage medium means.

4,995,970

STEERING FORCE CONTROL APPARATUS FOR POWER STEERING SYSTEM

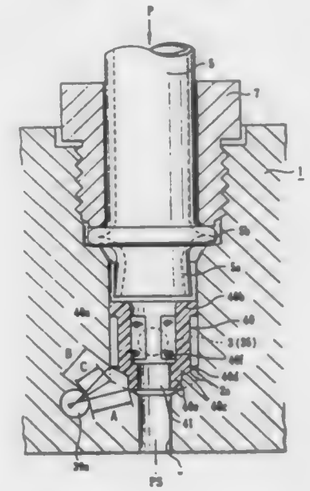
Hiroshi Ohsakai, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 381,217

Claims priority, application Japan, Jul. 29, 1988, 63-189849

Int. Cl.[5] B01D *35/02*

U.S. Cl. 210—167 **5 Claims**



1. A steering force control apparatus for a power steering system, comprising:

a main hydraulic path hole extending from a pump to a power steering side, said main hydraulic path hole having a tapered stepped outlet portion;

a branch path hole having one end open to said said main hydraulic path hole midway along said main hydraulic path hole and extending to a hydraulic reaction mechanism; and

a cylindrical filter located along the main hydraulic path hole, said filter having a through bore and a mesh portion for filtering pressurized oil, said mesh portion being formed at a first portion of said filter at which said main hydraulic path hole communicates with said branch path hole,

said filter having a tapered portion located along said main hydraulic path hole downstream of said branch path hole, and

said filter having upper and lower ring frame members joined by said first filter portion, said upper ring frame member having an outer diameter sized so as to provide a press fit within said main hydraulic path hole wherein the portion of the through bore in the vicinity of the lower ring frame member constitutes a filter outlet portion, said lower ring frame member and said first filter portion having an outer diameter smaller than that of said upper ring frame member to form an elongated annular space located between said mesh portion and said main hydraulic path hole, and said tapered portion of said lower ring frame member being positioned in registration with the tapered stepped outlet portion of said main hydraulic path hole so that said filter permits some of the pressurized oil to flow along said main hydraulic path hole through said filter through bore to the outlet portion thereof and the remainder of the pressurized oil to pass through said mesh portion and the annular space to said branch path hole.

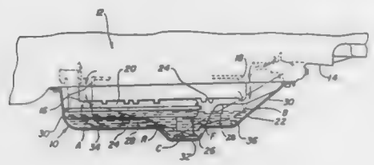
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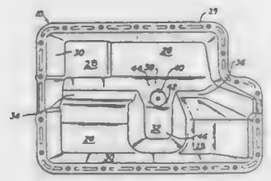
4,995,971

DUAL PURPOSE AUTOMATIC TRANSMISSION OIL PAN

Timothy A. Droste, Howell; Jerome J. Middione, Livonia, and Himat B. Kher, Troy, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 7, 1989, Ser. No. 390,022
Int. Cl.[5] F01M *11/06*
U.S. Cl. 210—168 14 Claims





1. An oil pan in combination with an automatic transmission of a vehicle utilizing oil including a transmission case adapted for movement with the vehicle in predetermined angular orientations when negotiating normal grades and having spaced oil drain openings, a filter cartridge having an inlet port, and a plurality of valve body components, said filter cartridge and valve body components defining a lower surface, the oil pan comprising:

a unitary member having a basewall and sidewalls adapted to be secured to the transmission case to cover the filter cartridge and valve body components;

said basewall being spaced from the lower surface and contoured to correspond to the shape of said lower surface, said basewall having a sump portion located intermediate the spaced drain openings, said sump portion adapted to receive the inlet port of the filter cartridge;

a first drainback channel defined in the basewall and extending from the one of said drain openings to the sump;

a second drainback channel defined in the basewall and extending from the other of said drain openings to the sump;

said first and second drainback channels being spaced further from said lower surface than said basewall, said first and second drainback channels open into said sump in a manner to form a confluence region therewith so that oil flowing through the first and second drainback channels drains onto a surface of the sump; and

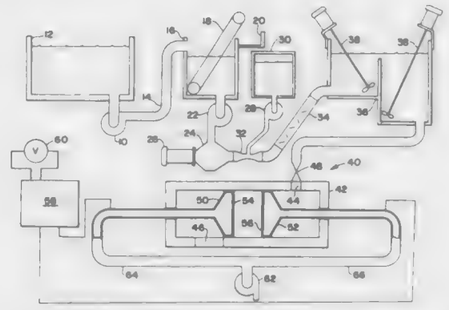
said sump portion being spaced further from said lower surface than both of said first and second drainback channels and cooperating with said drainback channels to maintain said inlet port submerged when said unitary member is secured to the transmission case.

4,995,972

METHOD AND APPARATUS FOR REMOVING LIQUID FROM PERMEABLE MATERIAL

Timothy A. Kramer, 606 Bay Ave., Pt. Pleasant Beach, N.J. 08742, and Kent M. Kramer, 7 Williams St., Rumson, N.J. 07760

Division of Ser. No. 173,811, Mar. 3, 1988, Pat. No. 4,818,415. This application Nov. 14, 1988, Ser. No. 270,699
Int. Cl.[5] B01D *17/00, 25/12, 33/22*
U.S. Cl. 210—179 40 Claims



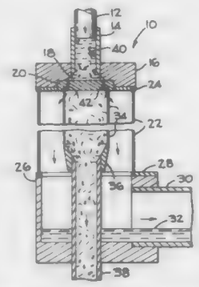
1. Apparatus for removing liquid from a permeable material, comprising means for enabling vaporized liquid, as it expands, to force at least some of the remaining unvaporized liquid through at least one surface which is permeable to the liquid contained in the material, said means including constraining means for constraining the material such that the material interfaces with said at least one surface, and heating means for repeatedly heating the material at at least one location remote from said at least one surface to a temperature sufficiently high to cause the in situ vaporization of the liquid in the vicinity of said at least one location.

4,995,973

MODULAR LONGITUDINAL SPRAY FINISHER

William Ballenger; Wayne Sherman, and Michael Suter, all of Lakeland, Fla., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 6, 1989, Ser. No. 319,021
Int. Cl.[5] B01D *35/22*
U.S. Cl. 210—209 6 Claims



1. A filter means for separating a liquid slurry into a clarified component and a reduced liquid component, said filter means having a housing, said filter means comprising:

an inlet port for receiving said liquid slurry;

orifice plate means in communication with said inlet port and having orifice means for directing said liquid slurry;

screen means positioned outboard of said orifice means, said screen means providing an interior chamber having angled walls, said angled walls from an angle of less than ninety degrees, in said filter means housing contingent with said orifice plate means in the path of said liquid slurry being directed at said screen means by said orifice means;

manifold means for receiving said clarified component outside said screen means chamber, and

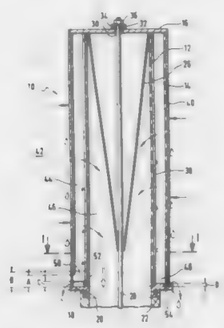
a discharge line means for receiving said reduced liquid component from said interior chamber of said screen.

4,995,974

SEPARATOR ELEMENT

Manfred Lorey, Gänsgasse 9, D-6456 Langenselbold, and Karl Pötz, Oberursel, both of Fed. Rep. of Germany, assignors to Manfred Lorey, Langenselbold, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 334,043
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1988, 3811441
Int. Cl.[5] B01D *29/15*
U.S. Cl. 210—247 13 Claims



1. A separator element for use in a device for separating water and contaminants from fluids, wherein said device includes a coalescing element, comprising a hollow filter body arranged within the coalescing element and having a first hydrophobic filter layer surrounding an inner flow chamber, said layer being spaced from and surrounded by the coalescing element to provide an outer flow chamber, one end face of the filter body being closed and the other end thereof being provided with a flow opening, a second hydrophobic filter layer upstream of the first filter layer as respects incoming flow, and said filter layers being arranged to provide an interspace between them.

4,995,975

UNITARY WATER COOLER FILTER

William E. Jacquot, Morgan Hill; Richard L. Tettman, Los Gatos, and Melvin D. Davis, Santa Clara, all of Calif., assignors to Western Temco, Inc., Los Gatos, Calif.

Continuation of Ser. No. 282,465, Dec. 9, 1988, abandoned. This application Jun. 20, 1990, Ser. No. 540,858
Int. Cl.[5] B01D *24/08*
U.S. Cl. 210—266 6 Claims

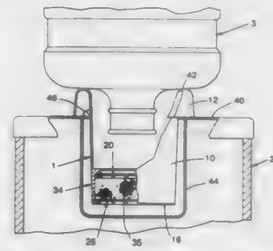
1. A filter device for use in a water cooler, said cooler having a base, a water outlet, a generally planar upper surface having a circular orifice of receiving the neck of an inverted water bottle and a reservoir chamber for receiving water from said inverted bottle prior to dispensing said water, wherein said filter device is adapted for fitment within said circular orifice and wherein it comprises

a unitary hollow cylindrical housing having an open top end and an open bottom end, said housing including

a hollow cylindrical canister body formed of a water-impervious material and having an outer diameter small enough to fit within the circular orifice of the cooler and an axial length dimensioned to fit within the said reservoir chamber and an axial length and an inner diameter large enough to receive the neck portion of the inverted water bottle, said canister body at its open top end continuously flaired outwardly and then downwardly to form.

a downwardly facing circular flange, said flange being hollow with an inner wall, a top surface and a downwardly depending outer wall and open at its bottom surface, said flange being coaxial with the canister body and having an diameter for its downwardly depending outer wall which exceeds the diameter of the circular orifice such that when the canister body of the device is inserted into the circular orifice, the open bottom surface of said flange rests upon the upper surface of the water cooler, said flange being made of the same material as the canister body and being of a thickness and rigidity in its top surface and outer wall which is adequate to support the inverted water bottle and transmit the weight of the water bottle to the upper surface of the water cooler and

a perforated baffle continuous with said canister body and



extending radially across the hollow canister body at a position below the distance to which the neck of the inverted water bottle extends;

a lower retaining means capable of passing water while retaining a filter medium, positioned within said housing at the lower end thereof;

a silver-impregnated activated carbon filter medium capable of removing chlorine and absorbable organic chemicals from potable water, positioned on the upper surface of said lower retaining means; and

an upper retaining means capable of passing water and excluding particulate matter, and capable of retaining said filter medium, positioned on the upper surface of said filter medium;

wherein the distance between said upper perforated panel and said flange, and the inner diameter of said housing, are selected to provide for a flow rate of at least 0.03 oz/sec through said filter device when said filter device is inserted into a water cooler and the neck of a water-containing water bottle placed inverted in the top end of said housing.

4,995,976

WATER PURIFICATION STRAW

Sheldon A. Vermes, Shoreview; David M. Botts, Spring Park, and Charles A. Peterson, Hopkins, all of Minn., assignors to Water Technologies Corporation, Plymouth, Minn.

Filed May 31, 1990, Ser. No. 531,125
Int. Cl.[5] B01D *24/08*
U.S. Cl. 210—266 16 Claims

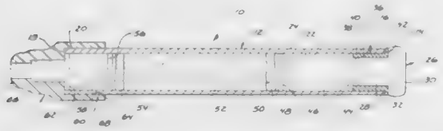
12. An orally usable filter straw for the purification of water by forced movement of water through the straw including:

an elongated tubular passageway having an inlet at a distal end thereof and an outlet at a proximal end thereof, with the following materials retained within the passageway:

an inlet filter removably mounted at the inlet of the passageway, the filter being retained within the passageway by a retention ring surrounding the filter and of size to frictionally engage in inner surface of the passageway;

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a first porous spacer of a plurality of porous spacers positioned within the passageway, the first porous spacer proximally adjacent to the retention ring, the porous spacers having a pore size larger than the filter pore size;
a purification material proximal to the first porous spacer filling the passageway between the first spacer and a second porous spacer proximally adjacent to the purification material;
a first resilient foam layer of a pair of resilient foam layers, the first foam layer proximally adjacent to the second porous spacer;
activated carbon material proximal to the first foam layer



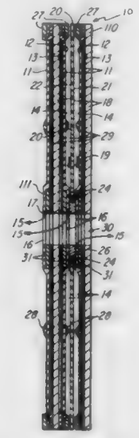
filling the passageway between the first foam layer and a second foam layer proximally adjacent to the carbon material, the foam layers exerting a small compression force on the activated carbon and permitting the carbon particles to expand;
a third porous spacer proximally adjacent to the second foam layer;
a bactericide material proximal to the third porous spacer filling the passageway between the third porous spacer and a fourth porous spacer proximally adjacent to the bactericide material; and
a tubular mouthpiece mounted at the outlet of the passageway.

4,995,977

APPARATUS FOR FILTERING AND SEPARATING FLOW MEDIUM

Walter Hilgendorff, Tespe; Gerhard Kahn; Jürgen Kaschemekat, both of Geesthacht, all of Fed. Rep. of Germany, assignors to GKSS- Forschungszentrum Geeshtacht GmbH, Geesthacht, Fed. Rep. of Germany

Filed Feb. 9, 1989, Ser. No. 308,853
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803886
Int. Cl.[5] B01D *65/04*
U.S. Cl. 210—321.69 9 Claims



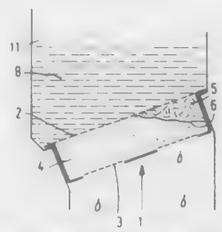
1. In an apparatus for filtering and separating flow medium by reverse osmosis, ultrafiltration, and microfiltration, with a plurality of essentially sheet-like filter elements being disposed next to, and spaced from, one another in such a way as to form respective flow chambers for the flow medium, and with filtrate that is produced being withdrawn at the end face of at least one hole formed in a filter element and disposed essentially at right angles to the planar surface of that filter element, the improvement comprising:
a plurality of sheet-like, self-supporting, filter element carriers that are successively arranged and have opposite sides, upon each interior one of which is disposed essentially laminarly a respective one of said filter elements, with said carriers being spaced from one another by such a distance that when said filter elements are disposed thereon, one of said flow chambers is formed between each two facing filter elements; and
disposed in each flow chamber, between two facing filter elements, a respective disk that imparts turbulence to said flow medium in said flow chamber, with a given one of said disks being disposed between two filter elements in such a way that said disk essentially does not contact said two filter elements and also is movable in at least one axis of freedom.

4,995,978

HOLDER FOR INCLINING A COFFEE CARTRIDGE

Harold P. Van de Gang, Groningen, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 118,091, Nov. 15, 1987, abandoned.
This application Sep. 12, 1989, Ser. No. 406,823
Claims priority, application Netherlands, Nov. 12, 1986, 8601163
Int. Cl.[5] B01D *29/085*
U.S. Cl. 210—474 11 Claims



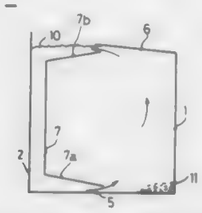
1. A filter device comprising a coffee-cartridge holder constructed to receive a coffee cartridge having two facing walls made of a filter material, one of said walls being flat and adapted to receive water for making coffee, the device also comprising means which ensure that, when the holder contains a coffee cartridge and is in the operating position, the wall of the filter material to which water is supplied is inclined at an angle between 15° and 90° to the horizontal, and wherein the coffee cartridge comprises a housing, the facing wall of a filter material constituting the upper and the lower wall of the housing and being interconnected by an upright peripheral wall, the upright peripheral wall being provided with a projecting supporting rim which is inclined relative to the filter wall to which water is supplied.

4,995,979

SETTLING DEVICE FOR SEPARATING TRUB FROM HOT WORT

Christiaan W. Versteegh, Delft, Netherlands, assignor to Heineken Technisch Beheer B.V., Amsterdam, Netherlands

Division of Ser. No. 103,516, Oct. 1, 1987, Pat. No. 4,861,608.
This application Aug. 28, 1989, Ser. No. 399,167
Claims priority, application Netherlands, Oct. 2, 1986, 8602488
Int. Cl.[5] B01D *21/02*
U.S. Cl. 210—521 12 Claims



1. A setting device for separating trub from hot wort liquid, which device includes a container having filling and drain means, a bottom wall, at least one side wall, a top, and an upstanding partition wall dividing the interior of the container into a smaller first space for accommodating a first column of the wort liquid and a larger second space for accommodating a second column of the wort liquid, said partition wall having an upper end in the region of the top of said container and a lower end separated from said bottom wall by a first gap establishing communication between said first and second spaces near the bottom of the container;
wherein the improvement comprises:
(a) a top wall member arranged in overlying relation to said second space and said upper end of said partition wall and forming means to screen the surface of the second column of wort liquid against heat loss;
(b) the underside of said top wall member being spaced from said upper end of said partition wall to define thereat a second gap establishing communication between said first and second spaces adjacent the top of said container; and
(c) the top of said container over said first space being open to permit heat loss from the uncovered surface of the first column of wort liquid;
(d) whereby the wort liquid in said first space becomes heavier than the wort liquid in said second space and a gravity-induced circulation of the wort liquid is affected from said first space through said first gap into said second space and from the latter through said second gap into said first space to cause settled trub in said second space to be swept together on said bottom wall of said container.

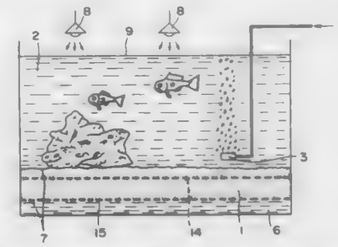
4,995,980

SYSTEM FOR BIOLOGICAL PURIFICATION OF WATER CONTAINING ORGANIC MATERIALS AND DERIVATIVE PRODUCTS

Jean M. Jaubert, Parc Coromandel, 18 Ave. Gravier, 06100 Nice, France

Filed Feb. 8, 1989, Ser. No. 307,613
Claims priority, application France, Feb. 8, 1988, 88 01553
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—602 15 Claims

1. A process for biologically purifying aquarium water and aquaculture ponds water as well as fresh water or salt water carrying solid organic substances or dissolved organic substances or dissolved mineral substances from the degradation of said organic substances which process comprises:
(a) flowing water to be purified through at least one path;
(b) stirring and contacting said water to be purified, in said path, with oxygen or with an oxygen rich gas, to provide aerobic conditions in said water to be purified;
(c) filling a confined volume with oxygen impoverished water to provide anaerobic conditions and linking, through a porous connector, said confined oxygen impoverished water with said water to be purified:
(i) creating in the thickness of said connector, one aerobic zone in contact with said water to be purified, and one anaerobic zone in contact with said confined water, and
(ii) establishing between said water to be purified and said confined oxygen-impoverished water, gradients of concentration of dissolved mineral substances that compel said mineral substances to diffuse throughout said porous connector according to said gradients of concentration;
(d) introducing unicellular aerobic microorganisms in said porous connector aerobic zone in contact with said water to be purified, to transform into mineral substances, solid as well as dissolved organic substances carried by said water to be purified; said aerobic microorganisms comprising bacteria that transform organic nitrogen into NH_4^+, then NH_4^+ into NO_2^-, then NO_2^- into NO_3^-;
(e) introducing unicellular anaerobic microorganisms in said porous connector anaerobic zone in contact with said confined water, to reduce said mineral substances; said



anaerobic microorganisms comprising heterotrophic denitrifying bacteria which transform into molecular nitrogen and oxygen nitrites and nitrates that diffuse from said porous connector aerobic zone to said porous connector anaerobic zone;
(f) substantially preventing light from reaching said porous connector anaerobic zone to prevent any photosynthetic oxygen release in said porous connector anaerobic zone; and
(g) introducing in the thickness of said porous connector pluricellular burrowing detritus-eating animals that supply said heterotrophic denitrifying bacteria with organic carbon; said organic carbon coming from organic substances carried by said water to be purified and being incorporated into said porous connector anaerobic zone by the excretion as well as by the biostirring activity of said burrowing detritus-eating animals; said biostirring activity being sufficiently low to maintain in said porous connector an oxygen-impoverished zone having an oxygen content not exceeding about 1.5 mg/l and an oxygen-rich zone having an oxygen content greater than said oxygen-impoverished zone.

4,995,981

PROCESS FOR ANAEROBICALLY DEGRADING HIGHLY LOADED PROCESS WASTE WATERS

Erich Gött, Lahr, Fed. Rep. of Germany, assignor to Reiflock-Umwelttechnik Margot Reichmann, Baden-Baden, Fed. Rep. of Germany

Filed Jan. 24, 1990, Ser. No. 469,169
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902867
Int. Cl.[5] C02F *3/28*
U.S. Cl. 210—603 1 Claim

1. A process for the anaerobic degradation of highly concen-

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trated chemical process waste waters in which the CBS constant is up to 10^6 mg/l or greater, comprising the steps of:

inducing putrefication of a putrefactive sludge in at least one decomposition tank zone at about 34° C;

mixing said putrefactive sludge by continuous circulation by withdrawing from the bottom zone of said decomposition tank and adding inoculation sludge in the top zone of the decomposition tank by a sludge pump through a circulation conduit external to said tank;

simultaneously admitting putrefactive water at different levels of the decomposition tank in order to assure constant and thorough mixing of the contents of the decomposition tank;

feeding oxygen into the decomposition tank in small amounts for preventing H_2S formation;

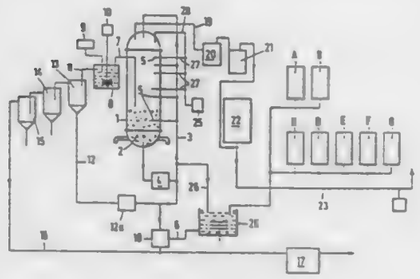
after initally including said putrefaction, stopping the adding of any additional communal sewage sludge;

providing a source of chemical process waste waters;

separating said chemical process waste waters into individual tank zones, analyzing said chemical process waste waters;

passing said waters from said tanks continuously into a mixing tank zone;

premixing said chemical process waste waters and said sludge in the mixing tank to a premixed selected composition depending on the putrefactive sludge and waters;



passing said premixed composition into said decomposition tank zone;

passing said putrefactive sludge downstream from said decomposition tank zone to a flocculating tank zone connected thereto;

providing a source flocculating agent;

adding an exactly metered amount of said flocculating agent into said flocculating tank to said sludge and thoroughly mix said agent with said sludge to produce a flocculated putrefactive sludge;

recycling said flocculated putrefactive sludge from a second tank zone into the external circulation for recirculating the putrefactive sludge back into the decomposition tank zone;

displacing part of the sludge from the flocculating tank zone and causing the settling of the coarse sludge to take place in said second tank zone connected downstream of said flocculating tank zone to produce a cloudy water;

feeding said cloudy water into a third or last tank zone for settling the portions of sludge still present;

displacing the cloudy water in the last tank and transferring it through a buffer tank to a biological stage or recycling it into the decomposition tank zone;

said decomposition tank zone generating a gas and passing said generated gas from said decomposition tank into a gas tank zone; and

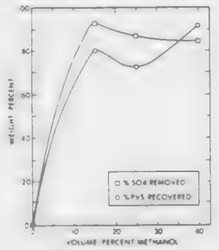
withdrawing said gas from the process.

4,995,982

PROCESS FOR RECOVERING AND PURIFYING A HIGH MOLECULAR WEIGHT SULFONATE

Richard T. Barthorpe, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Nov. 1, 1989, Ser. No. 430,849
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 **14 Claims**



1. A process for recovering and purifying a polymeric sulfonate containing aqueous solution consisting essentially of:

(a) adding to an aqueous solution having a polymeric sulfonate and deleterious by-products of sulfonation dissolved therein a solfonate selected from methanol, ethanol, acetone or dipropylene glycol monomethyl ether, in a first amount of from about 7.5 to about 40 volume percent of said aqueous solution, said aqueous solution to which said solvent has been added in said first amount forming a first upper phase and a first lower aqueous phase;

(b) separating said first upper phase from said first lower aqueous phase;

(c) adding water to said first lower aqueous phase in an amount sufficient to obtain a volume of said first lower aqueous phase which is approximately equal to the volume of said aqueous solution;

(d) adding said solvent to said first lower aqueous phase in a second amount of from about 7.5 to about 40 volume percent of the volume of said aqueous solution thereby forming a second upper phase and a second lower aqueous phase; and

(e) separating said second lower aqueous phase from said second upper phase, said second lower aqueous phase having a majority of said polymeric sulfonate dissolved therein while said first and said second upper phases having a majority of said deleterious by-products of sulfonation dissolved therein.

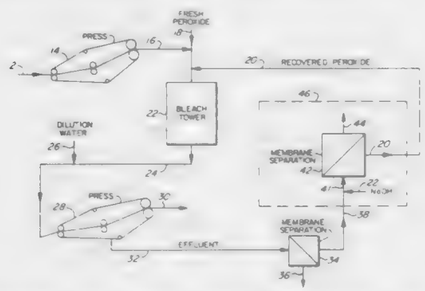
4,995,983

MEMBRANE SEPARATION PROCESS

Donald T. Eadie, North Vancouver, and Thomas M. Fyles, Victoria, both of Canada, assignors to MacMillan Bloedel Limited

Filed Mar. 21, 1990, Ser. No. 496,576
Int. Cl.[5] B01D *61/16*
U.S. Cl. 210—639 **12 Claims**

4. A method of recovering residual peroxide in the manufacture of cellulose pulp comprising separating an effluent containing residual peroxide and contaminants from said pulp, separating said effluent into a first retentate and a first permeate by a first separation membrane, said first permeate containing a major portion of said residual peroxide and a smaller portion of said contaminants than to said retentate, increasing the pH of said first permeate to convert said residual peroxide in said first permeate into an ionized form, separating said first permeate via a reverse osmosis membrane into a second retentate and a second permeate, said second permeate having a lower concentration of said peroxide in ionized form than said first permeate and said second retentate having a higher concentration of said peroxide in ionized form than said first permeate.



4,995,984

SUPPORTED HETEROPOLYCYCLIC COMPOUNDS IN THE SEPARATION AND REMOVAL OF LATE TRANSITION METALS

Aaron Barkatt, Silver Spring, Md., assignor to Pedro B. Macedo, Bethesda and Theodore Aaron Litovitz, Annapolis, both of, Md.

Division of Ser. No. 101,920, Sep. 28, 1987, Pat. No.
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—670 **27 Claims**

1. A process for removing one or more transition metal ions selected from the group consisting of one or more ions of the elements of Groups Va, VIa, VIIa, VIII, Ib and IIb of the Periodic Table from a liquid containing said transition metal ions which comprises passing said liquid over a composition including an activated carbonaceous porous support having interconnected pores wherein said support has an internal surface which contains a heteropolycyclic moiety capable of forming a stable compound or complex with said transition metal ions, said heteropolycyclic moiety containing a bipyridyl structure or a phenanthroline structure said heteropolycyclic moiety being present in an amount effective to form a compound or complex with said transition metal ions.

4,995,985

GEL BEAD COMPOSITION FOR METAL ADSORPTION

Charles D. Scott; Charlene A. Woodward, and Charles H. Byers, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 333,064, Apr. 4, 1989. This application Apr. 25, 1990, Ser. No. 514,067
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—679 **4 Claims**

1. A process for removing metals from an aqueous stream comprising: mixing an aqueous stream containing metals with gel beads of propylene glycol alginate and bone gelatin thereby trapping said metals within said beads.

4,995,986

WASTEWATER TREATMENT USING MAGNESIUM SILICATE

Michael F. Mohn, Levittown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,647
Int. Cl.[5] C02F *1/56*
U.S. Cl. 210—717 **9 Claims**

1. A method for removing contaminants from wastewater comprising generating amorphous precipitated magnesium silicate therein by adding to said wastewater a sufficient amount for the purpose of an aqueous solution of magnesium chloride and a sufficient amount for the purpose of an aqueous solution of sodium silicate.

4,995,987

ENHANCEMENT OF THE EFFICACY OF ANTIMICROBIALS BY THE ADDITION OF ANIONS CAPABLE OF INTERFERING WITH MICROBIAL ELECTROCHEMICAL REACTIONS

Wilson K. Whitekettle, Conroe, Tex., and John T. Conlan, Ventura, Calif., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 21, 1989, Ser. No. 410,765
Int. Cl.[5] C02F *1/50*
U.S. Cl. 210—754 **12 Claims**

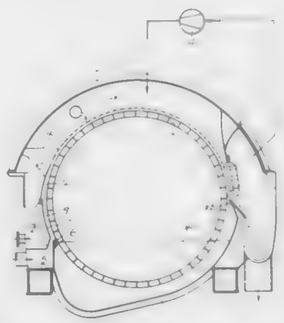
1. A method of enhancing the efficacy of an anti-microbial compound selected from the group consisting of chlorine, chlorine dioxide, bromochlorine, ozone, bromo substituted hydantoins, chloro substituted hydantoins and halogenated triazines which is added to an aqueous medium to inhibit the growth of sulfate reducing bacteria comprising adding to said aqueous medium an anion compound selected from the group consisting of molybate, tungstate, selenate, chromate, dichromate, nitrate and phosphate in combination with said anti-microbial compound.

4,995,988

METHOD AND APPARATUS FOR THICKENING A SLURRY USING A COMPRESSION PLATE

Aaro Ahlgren, Pori, Finland, assignor to Sunds Defibrator Rauma Oy, Rauma, Finland

Filed Dec. 14, 1988, Ser. No. 286,386
Claims priority, application Finland, Nov. 11, 1988, 885228
Int. Cl.[5] B01D *33/044*
U.S. Cl. 210—784 **6 Claims**



1. A method for thickening of slurry and for its treatment with liquid, comprising the steps of:

passing the slurry to be thickened onto a filter face of a drum revolving in a basin covered by a hood so as to form a space surrounding the drum;

passing the treatment liquid through the pulp web formed on the drum; and

increasing the consistency of the pulp web by pressing a flexible compression plate against the pulp web by means of a pressure acting upon the face of the flexible compression plate facing away from the drum, said pressure arising solely from at least one of hydrostatic pressure of the treatment liquid and overpressure of a gas within said space.

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4,995,989

SEPARATING LIQUIDS

Noel Carroll, Sassafras, and Charles M. Kalnins, Malvern, both of Australia, assignors to Conoco Specialty Products Inc., Houston, Tex.

PCT No. PCT/AU89/00069, § 371 Date Dec. 15, 1989, § 102(e) Date Dec. 15, 1989, PCT Pub. No. WO89/07490, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 20, 1989, Ser. No. 455,402
Claims priority, application Australia, Feb. 19, 1988, 6870/88; Mar. 20, 1988, 7509/88; May 17, 1988, 8278/88; Sep. 19, 1988, 0509/88; Oct. 14, 1988, 0942/88
Int. Cl.[5] B01D *21/26*
U.S. Cl. 210—788 18 Claims



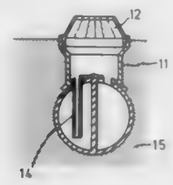
1. A method of separating components of a liquid mixture comprising passing the mixture to a cyclonic device from which the components of the mixture are taken via one outlet and then together passed to a separating device from which the separated components are separately taken.

4,995,990

AIR AND WATER DISTRIBUTION CONDUIT

Philip A. Weston, Newbury, Great Britain, assignor to PWT Projects Limited, Great Britain

Filed Apr. 6, 1989, Ser. No. 334,716
Claims priority, application United Kingdom, Apr. 7, 1988, [redacted]
Int. Cl.[5] B01D *29/62*
U.S. Cl. 210—793 9 Claims



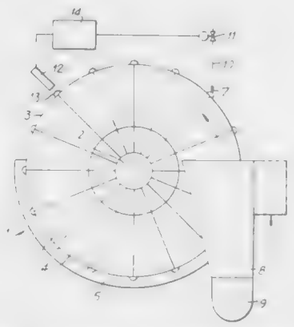
9. A method of supplying a combined air scour and water backwash to a granular media filter by incorporating therein and using an underdrain system comprising perforated lateral conduits arranged for the distribution of air and water for scouring and backwashing of the filter, each conduit being in the form of a single linear conduit containing two or more separate axially parallel ducts separated by one or more internal wall(s), the improvement consisting in that each duct has an external wall in common with its conduit, which external wall is provided with axially spaced apertures for emission of water or air, said axially spaced apertures located in an upper position in at least one of the ducts projecting downwards into the duct as an inwardly extended duct, and in that in each conduit at least one duct is arranged for the distribution of air and at least one duct is arranged for the distribution of water, there being no air and water intercommunication between the ducts.

4,995,991

METHOD AND APPARATUS FOR IMPROVING THE OPERATION OF A DISC FILTER

Risto Ljokkoi, Karhula; Tapani Niiranen, Savonlinna, both of Finland; Pekka Purho, Tokyo, Japan; Erkki Savolainen, Haapakallio, and Jari Siitonen, Jyväskylä, both of Finland, assignors to Ahlstrom Corporation, Noormarkku, Finland

Filed Mar. 21, 1989, Ser. No. 326,311
Claims priority, application Finland, Mar. 22, 1988, 881348
Int. Cl.[5] B01D *33/26, 29/76*
U.S. Cl. 210—797 15 Claims



1. A method of detaching pulp cakes from the surface of a rotating disc filter that is divided into a plurality of segments which are sequentially immersed in a basin containing fiber suspension to pick up said fiber from said suspension to form pulp cakes on said segments, said method comprising:

directing a jet of pressurized fluid at a portion of the boundary between the filter surface and the pulp cake for dislodging said pulp cake from the filter for a time beginning when the leading edge of each of said pulp cakes registers with said jet and discontinuing said jet prior to each of said pulp cakes moving out of register with said jet and allowing the remainder of said pulp cake to fall from the filter by action of gravity.

4,995,992

APPARATUS FOR HEATING AND DEMOISTURIZING DIESEL FUEL

Erwin E. Hurner, 920 Belsly Blvd. South, Moorhead, Minn. 56560

Filed Feb. 13, 1989, Ser. No. 309,105
Int. Cl.[5] B01D *21/00*
U.S. Cl. 210—803 8 Claims

1. A process for treating fuel wherein said fuel is introduced into an apparatus comprising the steps of:

Providing an apparatus comprising;

means defining a settling chamber having a side wall, top and bottom,

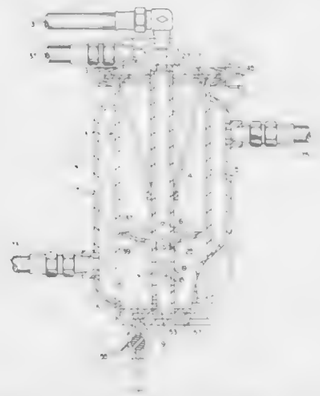
first conduit means passing through said top of said chamber and extending to a lower portion of said chamber, said conduit means defining a fuel inlet int he lower portion of said chamber,

second conduit means passing through said top of said chamber defining a fuel outlet in an upper portion of said chamber, and

buoyant valve means within said first conduit means to permit fuel to flow in said inlet towards said outlet but to prevent fuel from flowing out of said inlet, said buoyant valve means movable within said first conduit means from a point below said inlet to a point above said inlet near said top of said settling chamber;

introducing said fuel into first conduit means, said fuel forcing said buoyant valve means to travel down said first conduit means past said inlet to permit said fuel to flow through said inlet;

stopping the flow of said fuel thereby permitting said buoyant valve means to float up said first conduit means past said inlet to an upper portion thereof to close off said first



conduit means to fuel flow upon said buoyant valve means contacting a restriction in said first conduit means;

sediment within said first conduit means settling to the bottom of settling chamber during the flotation of said buoyant valve means toward said restriction in said first conduit means.

4,995,993

PROCESS FOR PREPARING OVERBASED METAL SULFONATES

Brian L. Papke, Wappingers Falls, and Leonard S. Bartley, Jr., Newburgh, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 18, 1989, Ser. No. 452,140
Int. Cl.[5] C10M *135/10*
U.S. Cl. 252—25 6 Claims

1. A method of preparing an amorphous overbased calcium sulfonate detergent for lubricants, said method comprising;

(a) mixing a solution of a calcium sulfonate in a volatile hydrocarbon solvent with CH_3OH and $Ca(OH)_2$ solids;

(b) stirring and heating said sulfonate mixture;

(c) adding to said stirred sulfonate mixture a sufficient amount of CO_2 to react with up to 80% of the $Ca(OH)_2$;

(d) adding an activates solid adsorbent to said CO_2 treated mixture to remove at least 35% of the water generated in the entire carbonation reaction;

(e) continuing addition of CO_2 until the total amount of CO_2 added exceeds 90–105% of the amount required to react with the $Ca(OH)_2$ solids;

(f) filtering said adsorbent-treated sulfonate mixture to separate the adsorbent and any unreacted $Ca(OH)_2$ solids from an amorphous calcium sulfonate product;

(g) stripping said sulfonate product of said volatile hydrocarbon solvent; and

(h) recovering the amorphous overbased calcium sulfonate product.

4,995,994

LUBRICANT

Haimi N. Singer, deceased, late of Parktown, South Africa (by Tamara Singer, executor), assignor to Singer & Hersch Industrial Development, South Africa

Filed Apr. 17, 1989, Ser. No. 339,547
Claims priority, application South Africa, Apr. 20, 1988, [redacted]
Int. Cl.[5] C10M *173/02*
U.S. Cl. 252—28 13 Claims

1. A lubricant composition comprising:

(i) a substantially oil-free, aqueous, emulsion-free water-based lubricant comprising a major amount of water, a minor but extreme pressure agent-effective amount of at least one substantially water-insoluble, oil-soluble functional additive stably dispersed therein, and a minor amount of at least one substantially water-soluble, liquid organic dispersing agent which dissolves and disperses the functional additive in the lubricant;

(ii) a particulate solid lubricant suspended in the water-based lubricant and uniformly dispersed therethrough; and

(iii) a thixotropic thickener which maintains the solid lubricant in suspension in the water-based lubricant.

4,995,995

LUBRICANT COMPRISING AN OIL-IN-WATER EMULSION, A PROCESS FOR THE PREPARATION THEREOF AND THE USE OF THE LUBRICANT

Michael J. Garvey, Heswall; Ian C. Griffiths, Bebington, and Ian Thompson, Chester, all of Great Britain, assignors to Unilever Patent Holdings B.V., Netherlands

Filed Sep. 20, 1988, Ser. No. 247,090
Claims priority, application European Pat. Off., Sep. 21, 1987, 87201792.6
Int. Cl.[5] C10M *125/26, 173/00*
U.S. Cl. 252—28 18 Claims

1. A lubricant consisting essentially of an oil-in-water emulsion and solid particles of partially hydrophobic silica, in which the oil is a lubricating material, characterized in that the oil droplets are stabilized by a surface coating of the partially hydrophobic silica particles having a size of less than 1 micrometer.

4,995,996

MOLYBDENUM SULFUR ANTIWEAR AND ANTIOXIDANT LUBE ADDITIVES

Catherine L. Coyle, Mendham, N.J.; Mark A. Greaney, Upper Black Eddy, Pa.; Edward I. Stiefel, Bridgewater, N.J.; James N. Francis, Maplewood, N.J., and Morton Beltzer, Westfield, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 14, 1989, Ser. No. 450,751
Int. Cl.[5] C10M *135/14*
U.S. Cl. 252—42.7 9 Claims

1. A lubricating composition comprising: a major amount of an oil of lubricating viscosity; and, a minor amount of an additive having the formula Mo_2L_4 wherein L is a ligand selected from a xanthate and mixtures of xanthates.

4,995,997

ANTIBACTERIAL WATER-SOLUBLE CUTTING FLUID RESISTANT TO YEAST-LIKE FUNGI

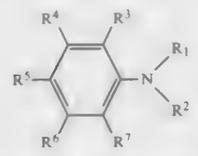
Masahiro Noda; Masaharu Fuchigami, and Akira Akagawa, all of Kanagawa, Japan, assignors to Yushiro Chemical Industry Co., Ltd., Japan

Filed Feb. 14, 1990, Ser. No. 479,570
Claims priority, application Japan, Mar. 16, 1989, 1-62288
Int. Cl.[5] C10M *173/02*
U.S. Cl. 252—49.5 4 Claims

1. In an antimicrobial water-soluble cutting fluid comprising a mineral oil and/or fatty oil, an extreme-pressure additive and a surfactant, the improvement wherein said fluid further com-

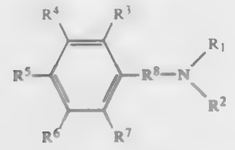
VOL 1123 ISS 4 FE 26 1991 UMI

prises an amine or amine derivative represented by the following formula (I):



(I)

or by the following (II):



(II)

wherein R^1 through R^7 individually mean a hydrogen atom, a substituted or unsubstituted alkyl, alkenyl, cycloalkyl, alkylaryl, aralkyl, aryl, hydroxyalkyl or alkoxyl group, or a nitrogen-containing heterocyclic group having up to 10 carbon atoms, R^1 and R^2 may be coupled together into a nitrogen-containing heterocyclic group along with the nitrogen atom to which R^1 and R^2 are bonded, or R^3 through R^7 individually mean a hydroxyl, amino, substituted amino, aminocarbonyl or aliphatic acyl group, and R^8 denotes an alkylene group having 1–4 carbon atoms.

4,995,998

SURFACTANT MIXTURES AS COLLECTORS FOR THE FLOTATION OF NON-SULFIDIC ORES

Wolfgang von Rybinski, and Rita Koester, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 359,061

Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818482

Int. Cl.[5] B03D *1/14;* **C23B** *1/00;* **C11D** *1/12;* **C09K** *3/00*

U.S. Cl. 252—61 **11 Claims**

1. A composition for the flotation and collection of non-sulfidic ores, said composition comprising a mixture of

(a) at least one alkyl or alkenyl polyethylene glycol ether terminally locked by hydrophobic radicals, and

(b) at least one cationic or ampholytic surfactant, wherein the ratio by weight of component (a) to component (b) is in the range from about 1:20 to about 3:1.

4,995,999

METHOD OF PRODUCING MAGNETIC CARBON BLACK

Toshio Nakada; Fumio Takemura; Yoshihito Sema, and Kazuhito Katsoka, all of Gotenba, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 328,395, Mar. 24, 1989, abandoned, which is a division of Ser. No. 154,259, Feb. 10, 1988, Pat. No. 4,900,465. This application May 21, 1990, Ser. No. 527,688

Claims priority, application Japan, Feb. 13, 1987, 62-29543; Feb. 23, 1987, 62-37886; Aug. 12, 1987, 62-199906; Oct. 7, 1987, 62-251699

Int. Cl.[5] C04B *35/52*

U.S. Cl. 252—62.55 **3 Claims**

1. A method of producing magnetic carbon black, comprising carbon black and magnetic fine particles dispersed and immobilized therein, comprising:

(A) burning a fuel to form a high temperature combustion gas stream;

(B) feeding, as a starting material for producing said carbon black, a hydrocarbon into said high temperature combustion gas stream at two downstream locations, the hydrocarbon being converted to carbon black at these locations;

(C) feeding at least one transition metal compound of at least one member selected from the group consisting of iron, nickel, and cobalt, into said high temperature combustion gas stream at a location intermediate said two downstream locations to effect formation of particulate magnetic carbon black;

(D) cooling the resulting mixture and separating the particulate magnetic carbon black therefrom; and

(E) heating the separated particulate magnetic carbon black to a temperature of about 400 to 900° C. in a non-oxidizing atmosphere sufficient to reduce metal oxides contained therein, and to thereby improve the magnetic characteristics thereof.

4,996,000

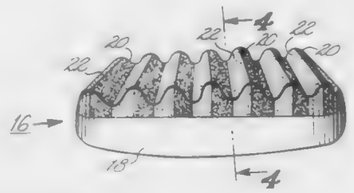
MULTILAYER CLEANSING BAR

Dale R. Redeker, 2914 Doncrest, Kalamazoo, Mich. 49007

Filed Feb. 3, 1989, Ser. No. 306,331

Int. Cl.[5] C11D *9/20, 17/00*

U.S. Cl. 252—92 **4 Claims**



1. A two layered cleansing bar comprising:

a first layer of a first solid, substantially nonabrasive, cleansing material;

a second layer of different solid cleansing material inseparably joined to said first layer along a substantially centrally located plane;

said second layer having undulations with each undulation having two halves and each half of each said undulation having different abrasiveness.

4,996,001

PUFFED BORAX AS AN AGGLOMERATING AID

Raymond T. Ertle, Pompton Plains, and Robert P. Arbaugh, Westampton, both of N.J., assignors to Capital City Products Company, Columbus, Ohio

Filed Jan. 23, 1989, Ser. No. 300,476

Int. Cl.[5] C11D *7/38, 7/00;* **C09K** *3/00*

U.S. Cl. 252—99 **8 Claims**

1. In a process for agglomerating a particulate mixture which includes predominantly one or more hydratable or hydrated inorganic salts; wherein the particulate mixture is sprayed while being agitated with an alkali metal silicate solution as a binder solution to form agglomerates which include the said salts, and the resulting agglomerates are subjected to an aging/drying step; the improvement which comprises using puffed borax in admixture with said particulates as an agglomerating aid to reduce aging/drying time, the puffed borax comprising from about 2% to about 90% of the total particulate initial feed mixture before addition of the silicate solution.

4,996,002

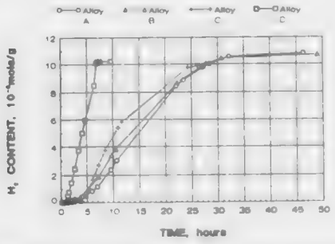
TOUGH AND PORUS GETTERS MANUFACTURED BY MEANS OF HYDROGEN PULVERIZATION

Gary D. Sandrock, Ringwood, and Winfred L. Woodard, III, Midland Park, both of N.J., assignors to Ergenics, Inc., Wyckoff, N.J.

Division of Ser. No. 126,750, Nov. 30, 1987, Pat. No. 4,839,085. This application Jun. 12, 1989, Ser. No. 365,182

Int. Cl.[5] H01J *7/18;* **C22C** *16/00;* **C01B** *6/24*

U.S. Cl. 252—181.6 **4 Claims**



1. A tough porous non-evaporable getter product produced according to steps as follows:

providing a solid alloy body of Zr, V and E wherein E consists of more than one of Fe, Ni, Mn and Al such that the proportions of each species are in weight percent

E from 4 to 5,

V from 10 to 16 and

Zr balance to make 100 and from 79 to 86,

introducing the body into a chamber and removing the air therefrom,

charging the body with hydrogen for hydride formation to induce spontaneous pulverization of the body into the hydride powder and/or granules, forming the powder and/or granules into a desired getter shape, and

sintering the shape under a dynamic vacuum or flowing inert gas at a temperature in the range of 900° to 1200° C. but below its melting temperature.

4,996,003

TITANIUM ACTIVATED HAFNIA AND/OR ZIRCONIA HOST PHOSPHOR CONTAINING A SELECTED RARE EARTH

Philip S. Bryan, Webster; Patrick M. Lambert; Christine M. Towers, both of Rochester, and Gregory S. Jarrold, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 436,855, Nov. 15, 1989, Ser. No. 437,140, Nov. 16, 1989, Ser. No. 437,141, Nov. 16, 1989, Ser. No. 437,142, Nov. 16, 1989, Ser. No. 437,143, Nov. 16, 1989, Ser. No. 437,228, Nov. 16, 1989, Ser. No. 437,423, Nov. 16, 1989, Ser. No. 437,465, Nov. 16, 1989, and Ser. No. 437,868, Nov. 16, 1989, each is a continuation-in-part of Ser. No. 305,222, Feb. 3, 1989. This application Jun. 29, 1990, Ser. No. 546,220

Int. Cl.[5] C09K *11/67*

U.S. Cl. 252—301.40 F **21 Claims**

1. A phosphor capable of absorbing X-radiation and emitting longer wavelength radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide and/or zirconium dioxide host consisting essentially of oxygen and combined elements satisfying the relationship

$$DTi_uM_yL'_w$$

wherein

D is at least one of zirconium and hafnium ions;

M is at least one alkali metal;

L' is at least one of yttrium, ytterbium, and lutetium;

w is in the range of from 1×10^{-6} to 1×10^{-3};

x is in the range of from 3×10^{-4} to 1.0; and

y is up to 1;

the phosphor exhibiting reduced afterglow when excited above X-radiation as compared to the phosphor as defined above absent L'.

4,996,004

PREPARATION OF PHARMACEUTICAL OR COSMETIC DISPERSIONS

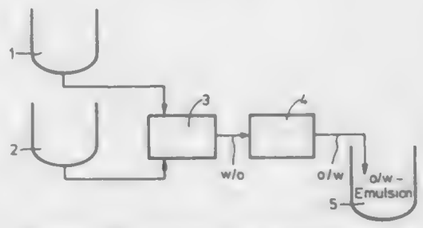
Manfred Bücheler, Overath; Hans Gehringer, Cologne; Bernd Klinksiek, and Bernd Koglin, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 518,902, Aug. 1, 1983, abandoned. This application Mar. 15, 1989, Ser. No. 324,985

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1983, 3230289

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—314 **6 Claims**



1. Process for the preparation of fine-particled, stable, pharmaceutical or cosmetic dispersions consisting of an aqueous phase and an organic oily phase which is insoluble or not completely soluble in water, characterized in that a pre-emulsion is pumped through a jet disperser which consists of one or more jets, which are designed as capillary bores with a diameter of 0.5 to 0.8 mm and have a length to diameter ratio of 1.5 to 2 the temperature, the proportions of the aqueous phase and the organic phase and the pressure at the jet disperser being adjusted so that phase inversion of the emulsion is effected in the jet disperser at the same time as homogenization and fine dispersion, and in the course of which all the pressure energy is consumed in the dispersing zone and the dispersion leaves the dispersing zone as a non-directional stream.

4,996,005

CONDUCTIVE COMPOSITION AND METHOD FOR MANUFACTURING PRINTED CIRCUIT SUBSTRATE

Mitsuru Saito; Satoru Matsumora, and Yasushi Watanabe, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,439

Claims priority, application Japan, Sep. 25, 1987, 62-241309

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—512 **16 Claims**

1. A conductive composition comprising:

conductive particles which comprise copper, wherein said copper particles are coated with particles of silver, said silver particles being present in an amount at least to coat said copper particles sufficiently to minimize oxidation of said copper;

a binder which comprises diglycidyl ether of bisphenol A epoxy resin, wherein said binder has a molecular weight of from 1,600 to 5,500, said binder being present in said composition in a ratio to said conductive particles capable of at least dispersing said conductive particles before said binder is cured; and

a hardener selected from the group consisting of diaminodiphenolsulfon, diaminodiphenylmethane, and 2-ethyl-4-methylimidazole, wherein said hardener is present in an amount sufficient to cause said binder to cure.

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4,996,006

SOLID SHAMPOO COMPOSITION IN COMPACT NEEDLE FORM WITH WATER AS A BINDER

Margaret J. Constantine, Poole, and Stanislaw Krysztal, Richmond, both of England, assignors to Constantine & Weir Ltd., Poole, England

Filed Feb. 21, 1989, Ser. No. 313,241

Claims priority, application United Kingdom, Feb. 23, 1988, 8804138

Int. Cl.[5] C11D *1/12, 1/755*

U.S. Cl. 252—550 **10 Claims**

1. A solid shampoo bar (comprising) consisting essentially of 70% to 90% detergent in the form of compacted solid needles and 1% to 10% water as a binder, the structure of the bar having the form of compacted needles.

4,996,007

PROCESS FOR THE OXIDATION OF ALCOHOLS TO ALDEHYDES/ACIDS/ESTERS

Kuo-Hua Chao; Tamal K. Dutta, both of Houston, and Lynn H. Slaugh, Cypress, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 19, 1990, Ser. No. 467,118

Int. Cl.[5] C11C *3/02, 1/00;* **C07C** *69/02, 69/66*

U.S. Cl. 260—410.9 R **7 Claims**

1. A process for oxidation of primary saturated alcohols to a product consisting of aldehydes, acids, esters and mixtures thereof which comprises contacting a primary alcohol and molecular oxygen with a catalyst selected from the group consisting of ruthenium, rhodium, platinum, palladium, rhenium and mixtures thereof, optionally a cocatalyst comprising a quaternary alkyl ammonium bromide wherein the alkyl moieties have carbon numbers ranging from 1 to about 20 and an oxygen activator selected from the group consisting of dihydrodihydroxynaphthalene, dihydrodihydroxyanthracene and mixtures thereof, and subsequently separating from the reaction mixture the product aldehydes, acids and esters.

4,996,008

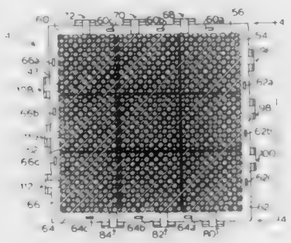
COOLING TOWER LIQUID CONTACT PLATE SUPPORT SYSTEM

Charles A. Peterson, 2201 Lord Ashley Dr., Sanford, N.C. 27330

Filed Jan. 22, 1990, Ser. No. 467,959

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—111 **6 Claims**



1. A liquid cooling tower construction, comprising:

(a) a housing formed for receiving air at one location and exhausting air at another location;

(b) a plurality of liquid contact plates in each of a series of vertically spaced horizontal tiers and positioned within the housing so as to permit air to contact liquid flowing through said plates while said liquid trickles downwardly from the upper to the lower of said tiers;

(c) said liquid contact plates being constructed and arranged so that the sides of each liquid contact plate are in substantially abutting relation with the sides of all adjoining liquid contact plates and are detachably secured thereto by snap fitted connecting means formed integral with the respective sides of the liquid contact plates in such abutting relationship; and

(d) wherein each of the sides of said liquid contact plates are formed with a right angle cross sectional shape with respective vertical and horizontal leg portions, and support means on each of said sides adapted to engage and support the vertical leg portion of an abutting side of another liquid contact plate, and securing means extending from one abutting side engaging holes in the other abutting side in a snap fit relation.

4,996,009

PREPARATION OF CARBON MICROBALLOONS

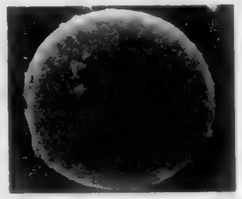
Kazuhiro Hasegawa, Chiba, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Continuation-in-part of Ser. No. 256,073, Oct. 7, 1988, abandoned, which is a continuation of Ser. No. 22,525, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 748,613, Jun. 25, 1985, abandoned. This application Feb. 8, 1989, Ser. No. 307,614

Claims priority, application Japan, Jun. 26, 1984, 59-131767

Int. Cl.[5] C01B *31/02;* **B29B** *9/10*

U.S. Cl. 264—5 **4 Claims**



100μ(=12cm)

1. Process for preparing carbon microballoons, consisting of the steps of:

admixing a pitch with a low-boiling organic solvent to form a pitch-solvent mixture in which the solvent is present in an amount of 0.5 to 20% by weight;

said pitch containing 40 to 65% by weight of BI (benzene insoluble) components and up to 0.1% by weight of QI (quinoline insoluble) components. and having a softening point in the range of 60° to 320° C.;

forming said pitch-solvent mixture containing 0.5 to 20% by weight solvent into irregularly-shaped particles having a granulometry comprised between 4 mesh (4,760 μm) and 425 mesh (32 μm);

flash heating said irregularly-shaped particles containing 0.5 to 20% by weight solvent at a temperature higher than the boiling point of said low-boiling organic solvent but below said softening point to cause foaming, whereby expansion pressure of said solvent and surface tension of said particles coact to form hollow, spherical pitch microballoons;

treating said microballoons with an oxidizing gas or liquid to make them infusible; and

sintering the infusible microballoons in a non-oxidizing atmosphere for carbonization.

4,996,010

METHODS AND APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY

Borzo Modrek, Azusa, Calif., assignor to 3D Systems, Inc., Valencia, Calif.

Filed Apr. 18, 1988, Ser. No. 183,016

Int. Cl.[5] B29C *35/08*

U.S. Cl. 264—22 **17 Claims**

1. A method for forming a three-dimensional object from a medium capable of selective physical transformation upon exposure to synergistic stimulation, comprising the following steps:

selectively exposing said medium to first synergistic stimulation whereupon said medium selectively transforms into a preliminary object comprising a substantially closed surface of substantially transformed medium surrounding at least enclosed medium that is not substantially transformed;

generally surrounding said substantially closed surface by a substance which conducts heat away from said surface; and

exposing said preliminary object to second synergistic stimulation while the surface is generally surrounded by said substance whereupon said enclosed medium is substantially transformed.

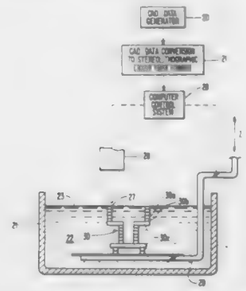
12. An apparatus for forming a three-dimensional object from a medium capable of selective physical transformation upon exposure to synergistic stimulation, comprising:

at least one computer programmed to form a building representation of the object which deviates from a corresponding object representation by inclusion of a deviation specifying a substantially closed surface of substantially transformed medium surrounding at least enclosed medium that is not substantially transformed;

means coupled to said at least one computer for receiving said building representation and for selectively exposing said medium to first synergistic stimulation according to said building representation whereupon said medium selectively transforms into a preliminary object comprising said substantially closed surface of substantially transformed medium surrounding at least said enclosed medium that is not substantially transformed;

means for generally surrounding said substantially closed surface by a substance which conducts heat away from said surface; and

means for exposing said preliminary object to second synergistic stimulation while the surface is generally surrounded by said substance whereupon said enclosed medium is substantially transformed.



4,996,011

PRODUCTION OF POLYETHYLENE MATERIALS HAVING IMPROVED STRENGTH AND MODULUS QUALITIES

Akira Sano, Kawasaki; Hirofumi Kamifshi, Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 374,981

Claims priority, application Japan, Jul. 9, 1988, 63-171195

Int. Cl.[5] B29C *35/02*

U.S. Cl. 264—28 **15 Claims**

1. A process for producing polyethylene materials of high mechanical strength and high elastic modulus, which comprises compressing particulate polyethylene of ultrahigh molecular weight at a temperature lower than the melting point thereof, extruding or rolling the compressed polyethylene while in a solid phase to form a molded product, and subsequently stretching the molded product, said particulate polyethylene having an intrinsic viscosity of from 5 to 50 dl/g at 135° C. in decalin and being prepared by a reaction process that includes at least the following two stages of polymerization:

(a) a first stage wherein ethylene is polymerized in a reactor in the presence of a composite catalyst comprising a solid component containing magnesium and titanium or magnesium and vanadium and an organometallic compound and in the presence of hydrogen, to form from 0.1 to 15 parts by weight of an ethylene polymer having an intrinsic viscosity of from 0.1 to 2 dl/g at 135° C. in decalin; and

(b) a second stage wherein fresh ethylene is polymerized in the same reactor containing the catalyst and in the presence of hydrogen at a concentration of from 0 to one lower than in the first stage to form from 85 to 95.9 parts by weight of an ethylene polymer having an intrinsic viscosity of from 8 to 50 dl/g at 135° C. in decalin.

4,996,012

PROCESS AND SYSTEM FOR MOLDING SOLES ON TO SHOE UPPERS

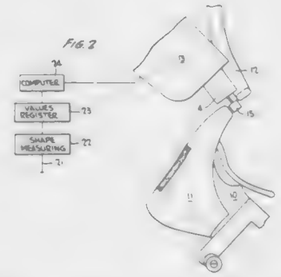
Fritz Gierschewski; Claus D. Koster, both of Bremen, and Joachim Lähr, Schwarme, all of Fed. Rep. of Germany, assignors to Klöckner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,005

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815013

Int. Cl.[5] B29C *37/02, 45/76;* **A43B** *119/00*

U.S. Cl. 264—40.1 **14 Claims**



1. A process for molding soles onto last supported shoe uppers, comprising the steps of: providing a shoe molding apparatus at each of a plurality of equally spaced apart shoe molding stations on a circular turntable installation, each said apparatus comprising a last supported shoe upper, a movable bottom stamp, and a mold cavity delimited by the bottom stamp and a pair of opposing lateral side mold elements closed against the periphery of the shoe upper; measuring, at one of said stations, the peripheral curvature of a first shoe upper having a predetermined shape by determining and storing a curved line of spatial coordinates and angles of curvature starting at a first preselected null point at the first shoe upper in the region of the lateral side mold elements; incrementally rotating the turntable for positioning another last supported shoe upper, having a different shape, at said one station; scanning, at said one station, selected points at the periphery of the other shoe upper, in the region of the side mold elements, for comparing the selected points to the stored spatial coordinates and angles of curvature and adapting any deviation therefrom to a second preselected null point; processing the shoe upper by guiding a tool along the curved line starting at the second null point, and injection molding low viscosity material into the mold cavity for molding a sole on to the shoe upper.

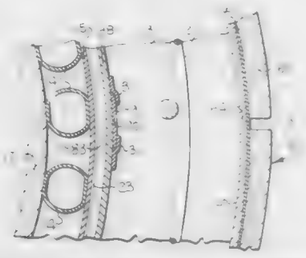
VOL 1123 ISS 4 FEB 26 1991 UMI

4,996,013

METHOD FOR RAPID MOLDING OF ELONGATE CONCRETE ARTICLES

Graeme R. Hume, 29 Clark Road, Ivanhoe, Victoria, Australia

Continuation-in-part of Ser. No. 44,846, May 14, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 311,593
Claims priority, application Australia, Jun. 18, 1985, 1089
Int. Cl.[5] B28B *1/26, 7/32, 21/08, 21/20*
U.S. Cl. 264—86 5 Claims



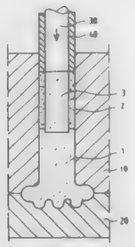
1. A method for forming an elongate molded hollow article made from concrete and comprising the sequential steps of forming a mold defining an inner and an outer surface corresponding to opposed surfaces of the molded article formed therein, said mold being arranged whereby said inner surface is movable relative to said outer surface, filling said mold with concrete, compressing the concrete by movement of said inner surface relatively towards said outer surface to remove surplus liquid from the concrete such that the concrete is given the characteristic of being at least partially cured, maintaining said compression and applying inward pressure over the outer surface of the concrete to remove surplus surface liquid from the outer surface while maintaining said compression, releasing said outer surface pressure and moving said inner surface relatively away from said outer surface to release the molded hollow article from said mold, and separating said mold from the molded hollow article.

4,996,014

METHOD FOR MANUFACTURE OF SPIKE RIVITS

Erkki Suvanto, Porvoo, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI89/00167, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO90/02619, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 5, 1989, Ser. No. 469,489
Claims priority, application Finland, Sep. 7, 1988, 884122
Int. Cl.[5] B29C *43/20, 43/14;* B32B *1/10*
U.S. Cl. 264—113 11 Claims



1. A method for the manufacture of a rivet for a fixed spike or for a sleeve-mounted spike, respectively, by pressing in a mold, said method comprising the following steps:

the cavity space in the mold, corresponding to the shape of the spike to be manufactured, is filled to the desired extent with a first material to form the body part of the spike,

a first punch, whose diameter is substantially smaller than the diameter of the cavity space in the mold, is fitted into the cavity space concentrically with the cavity space, and the annular space between said first punch and the cavity space is filed with a second material so as to form the wear-resistant surface layer for the spike,

the first punch is removed, and the space remaining after said punch is removed is filled with a third material,

the spike is pressed to the desired shape and density, whereinafter the spike is removed from the mold,

after the second material, which forms the surface layer, has been fitted into the mold, an intermediate pressing is carried out to compact at least said second material and the intermediate pressing is carried out by pressing by means of the first and a second punch, at the same time.

4,996,015

METHODS OF PRODUCING CERAMIC HONEYCOMB STRUCTURES

Masafumi Yoshimoto, Sakai; Tadao Nakatsuji, Kashibacho, and Noriaki Sato, Takaishi, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Filed May 16, 1989, Ser. No. 353,328
Claims priority, application Japan, May 20, 1988, 63-124756
Int. Cl.[5] B29C *47/00*
U.S. Cl. 264—177.11 4 Claims

1. A method of producing ceramic honeycomb structures which comprises:

(a) preparing a ceramic plastic composition which comprises admixing and kneading a ceramic material and an organic binder with water in amounts of about 85–50% by weight and a polyalkylene glycol monoether selected from the group consisting of diethylene glycol monoether and triethylene glycol monoether in amounts of about 15–50% by weight based on the total of the water and the polyalkylene glycol monoether, respectively;

(b) extruding the ceramic plastic composition into a wet green mold of a honeycomb structure having openings extending therethrough;

(c) passing air having a relative humidity of 90–70% and a temperature of about 10° to 40° C. through the openings at a velocity of not less than about one meter per second to evaporate a substantial amount of the water in the green mold;

(d) passing air having a temperature of about 60°–150° C. through the openings at a velocity of not less than about one meter per second to evaporate the polyalkylene glycol monoether from the green mold to provide a dried mold; and

(e) calcining the dried mold.

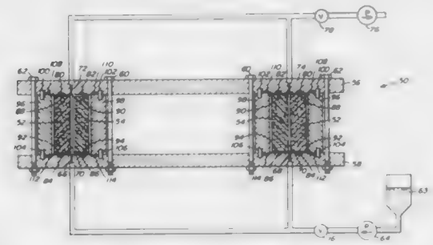
4,996,016

METHODS FOR MAKING REINFORCED COMPOSITE FLYWHEELS AND SHAFTS

W. Alan Walls; Elvin Estes; Steve M. Manifold; Michael L. Spann, and John H. Gully, all of Austin, Tex., assignors to Board of Regents University of Texas System, Austin, Tex.

Filed Dec. 7, 1988, Ser. No. 281,188
Int. Cl.[5] B29C *43/20, 43/36;* B32B *31/06*
U.S. Cl. 264—229 15 Claims

1. A method of forming an assembly of an annulus and a cylinder disposed in said annulus in which the annulus and cylinder are radially prestressed, said method comprising the steps of placing the cylinder within said annulus to define an interface between the annulus and the cylinder, injecting a bonding agent under pressure into the interface between the annulus and the cylinder, said bonding agent thereafter solidifying, and maintaining the bonding agent under pressure while the bonding agent solidifies.

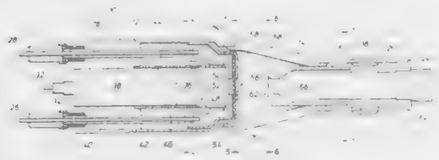


4,996,017

NEUTRON GENERATOR TUBE

D. Ray Ethridge, Houston, Tex., assignor to Halliburton Logging Services Inc., Houston, Tex.

Continuation of Ser. No. 353,832, Mar. 1, 1982, abandoned. This application May 3, 1985, Ser. No. 730,254
Int. Cl.[5] G21B *1/02*
U.S. Cl. 376—116 12 Claims



1. A neutron generator tube comprising:

(a) a hermetically sealed housing containing an ionizable gas;

(b) an axial recess in one end of said housing adapted to receive a magnet;

(c) a ring anode axially oriented within said housing adjacent to said recessed end for accepting said magnet;

(d) an axially oriented thermal conductor cathode penetrating through the other end of said housing wherein the inner surface of said cathode contains a target;

(e) an ion screen ensemble near said anode ring and between said anode ring and cathode target wherein said ion screen ensemble contains an axially positioned gridded aperture wherein said aperture is substantially smaller than said anode ring and target and wherein said ion screen ensemble further comprises:

(i) a highly polished thin-walled cover on the cathode side,

(ii) a magnetic metal disc on the anode side, and

(iii) a thin metal grid sandwiched between said cover and disc such that an electrical potential may be externally superimposed on said ion screen ensemble and be varied relative to the potentials of said ring anode and cathode such as to assist in the extraction of ions from the ion source; and

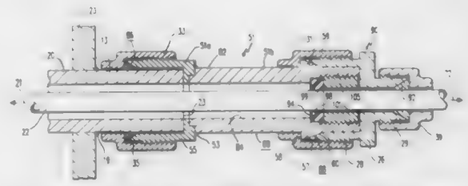
(f) an electron shield near said cathode target and between said ion screen ensemble and cathode target wherein said electron shield contains an axially positioned aperture.

4,996,018

HIGH PRESSURE THIMBLE/GUIDE TUBE SEAL FITTING WITH BUILT-IN LOW PRESSURE SEAL ESPECIALLY SUITABLE FOR FACILITATED AND MORE EFFICIENT NUCLEAR REACTOR REFUELING SERVICE

Pankaj N. Bhatt, Plum Boro, and Ronald M. Blaushild, Export, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1989, Ser. No. 340,187
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—203 7 Claims



1. A HP/LP seal arrangement for an elongated guide tube and an elongated thimble disposed therein, said guide tube and thimble extending outwardly from the core of a nuclear reactor to a seal table where said guide tube is welded to the seal table to provide a high pressure seal relative thereto, said seal arrangement comprising:

a tubular seal fitting disposed in alignment with said guide tube with said thimble extending therethrough on the low pressure side of the seal table;

first high pressure sealing means coupling one end of said fitting to an end of said guide tube to prevent leakage from within said guide tube;

inwardly facing thread means disposed adjacent the other and outer end of said seal fitting;

a nut having an opening through which said thimble extends and further having outwardly facing threading in mating engagement with said fitting thread means;

said fitting having a seal seat spaced longitudinally inwardly from said thread means and facing said fitting outer end and further disposed annularly about the inner surface of said fitting;

deformable ring seal means disposed about said thimble and between said nut and said fitting seal seat and having respective surfaces in engagement with the radially outwardly facing surface of said thimble, the radially inwardly facing surface of said fitting and said fitting seal seat to provide a low pressure seal between said fitting and said thimble; and

second releasable high pressure sealing means coupling said thimble to the outer end portion of said guide tube.

4,996,019

STORAGE CONTAINER FOR RADIOACTIVE WASTE

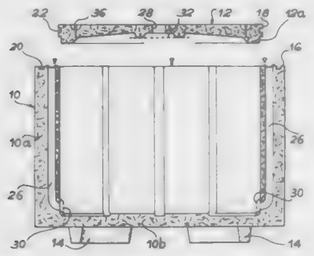
Louis Catalayoud, Cherbourg, and Michel Gerard, Tourlaville, both of France, assignors to Cogema Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, France

Filed Dec. 11, 1989, Ser. No. 448,553
Claims priority, application France, Dec. 12, 1988, 88 16337; Jun. 16, 1989, 89 08050
Int. Cl.[5] G21C *19/00*
U.S. Cl. 376—272 20 Claims

1. A storage container for radioactive waste comprising a drum provided with an opening for introducing the waste and a cover for tightly sealing said opening, said container being totally made from concrete reinforced by metal fibers, said container including a junction zone between the cover and the drum, said junction zone having, around said opening, at least one keying groove, said container also having at least one

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filling passage by which metal fiber-reinforced concrete can be injected around waste contained in the container wherein the



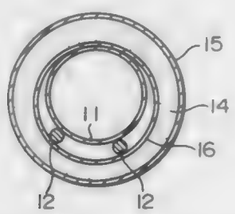
filling passage is formed within a side wall of the drum and issues in the vicinity of the bottom of the latter.

4,996,020

A SYSTEM FOR RESTRAINING DIFFUSION OF TRITIUM

Shigehiro Shimoyashiki, and Ryuhei Kawabe, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 409,589
Claims priority, application Japan, Sep. 21, 1988, 63-235027
Int. Cl.[5] G21C *19/42*
U.S. Cl. 376—313 8 Claims



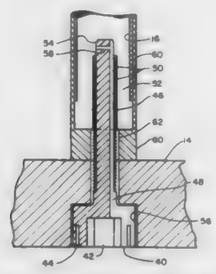
1. A system for restraining diffusion of tritium, comprising a heat reserving means which is mounted to a device of a fast breeder reactor and which includes a hydrogen-absorbing metal.

4,996,021

BOTTOM NOZZLE TO GUIDE TUBE CONNECTION

William J. Bryan, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 29, 1990, Ser. No. 529,406
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—446 9 Claims



1. In a nuclear fuel assembly which includes an upper end fitting and a lower end fitting spaced therefrom and connected thereto by a plurality of elongated guide tubes of one alloy having an open upper end and a closed lower end with spaced fuel element retaining grids mounted on the guide tubes therebetween, the closed lower ends of said guide tubes including a threaded central passageway and the attachment of said guide tubes to said lower end fitting of another alloy being characterized by:

an externally threaded bolt with a first end threadably received in said threaded central passageway of the lower end of said guide tube and a head at the other end on the side of the lower end fitting opposite said guide tube;

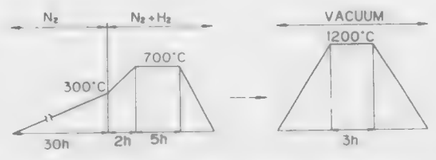
an interruption in the external threads of said bolt which forms a groove which communicates the interior of the guide tube with the side of the lower end fitting opposite said guide tube and enhances its frictional engagement with said threaded central passageway, thereby to hold and attach said guide tube and lower end fitting firmly together, even through a series of temperature cycles.

4,996,022

PROCESS FOR PRODUCING A SINTERED BODY

Norikazu Shindo; Tomoyuki Sekine, both of Chofu; Yoshikatsu Nakamura, Omiya, and Takashi Kawamoto, Urawa, all of Japan, assignors to Juki Corporation and Nippon Piston Ring Co., Ltd., both of Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,972
Claims priority, application Japan, Jul. 14, 1989, 1-181748; Jul. 14, 1989, 1-181749
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—2 13 Claims



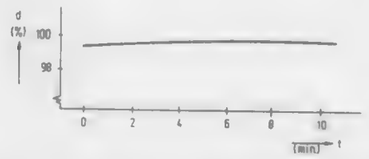
1. In a process for producing a sintered body comprising the steps of mixing one or more metal powder particles with an organic binder, injection-molding the mixture to form a green body of a predetermined shape, removing the binder from the green body to form a porous body substantially composed of the metal powder, and heating the porous body to a sintering temperature and holding it at that temperature to produce a sintered body, the improvement wherein the binder is removed through the sequence of the following steps: preheating the green body in an inert gas atmosphere in a temperature range that creates open pores in it; placing the green body, in which open pores have started to form, in a hydrogen gas atmosphere optionally mixed with an inert gas; holding the green body in a temperature range where the metal powder is not carburized and where the open pores will be maintained, so that the greater part of the binder is removed to form a porous body that is substantially made of the metal powder alone; and further holding said porous body at said heating temperature for a sufficient period of time to vaporize the carbon in the small amount of residual binder in the porous body through reaction with hydrogen.

4,996,023

METHOD OF MANUFACTURING A PERMANENT MAGNET

Abraham R. Flipse; Peter J. Kay, both of Eindhoven, Netherlands, and Ewoud Rozendaal, Southport, Great Britain, assignors to U.S. Philips Corp., New York, N.Y.

Filed Oct. 16, 1989, Ser. No. 421,863
Claims priority, application Netherlands, Oct. 17, 1988, [redacted]
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—12 8 Claims



1. A method of manufacturing a permanent magnet which comprises a hard magnetic material having a tetragonal phase of the $RE_2Fe_{14}B$ type, wherein RE is at least one element selected from the group consisting of the rare earth metals having atomic number 57 up to and including 71 and Yttrium, the method comprising the following steps

(a) forming an alloy comprising 8–30 at. % RE, 2–28 at. % B and 42–90 at. % Fe

(b) pulverizing the alloy into a powder

(c) compressing the powder, into a shaped body, and

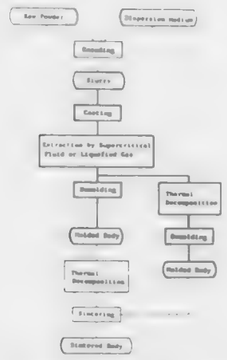
(d) sintering the shaped body in the temperature range from 900°–1200° C., wherein the shaped body is sintered to at least 95% of the theoretical maximum density by means of induction heating in a single sintering treatment.

4,996,024

METHOD FOR CASTING POWDER

Hiroaki Nishio, and Akira Kato, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Aug. 14, 1989, Ser. No. 393,622
Claims priority, application Japan, Sep. 2, 1988, 63-218300
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—40 6 Claims



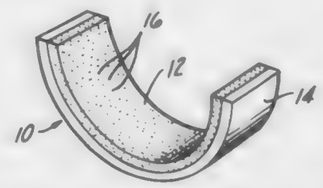
1. A method for casting a metal or ceramic powder which comprises casting a slurry of the metal or ceramic powder suspended in a dispersion medium containing at least 10 wt. of a liquid extractable with a supercritical fluid or a liquefied gas and excluding a binder into a porous mold, keeping the slurry placed in the porous mold at a temperature not lower than the melting point of the dispersion medium, and extracting at least 10 wt. % of the dispersion medium with the supercritical fluid or liquefied gas to impart a formability to the extracted body.

4,996,025

ENGINE BEARING ALLOY COMPOSITION AND METHOD OF MAKING SAME

George C. Pratt, Ann Arbor, and Warren J. Whitney, Jr., Ypsilanti, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Jan. 23, 1986, Ser. No. 821,716
Int. Cl.[5] C22C *21/00*
U.S. Cl. 420—554 3 Claims



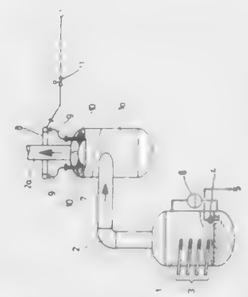
1. An aluminum-lead bearing alloy with a lead content ranging from about 4.0% by weight to about 15% by weight in which the lead phase consists of uniformly distributed spherical particles less than 10 microns in diameter and predominantly 1 to 5 microns in diameter, and wherein the content of any other constituents totals not more than 10% by weight.

4,996,026

SEPARATION SYSTEM AND REDUCING THE EMISSION OF SOLIDS IN PRESSURE RELIEF PROCESSES IN HIGH PRESSURE POLYMERIZATION REACTORS

Friedrich Kanne, 3 Antoniusstrasse, 5047 Wesseling; Klaus Pfleger, 6 Otto-Strasse, 5047 Wesseling; Hans Glomb, 22 Ulmenstrasse, 5047 Wesseling; Gerhard Arnold, 4 Weisedornweg, 5047 Wesseling; Klaus Boettcher, 5 Antoniusstrasse, 5047 Wesseling, and Siegfried Kursawe, 4 Fasanenweg, 5047 Wesseling, all of Fed. Rep. of Germany

Continuation of Ser. No. 104,228, Oct. 5, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 328,791
Int. Cl.[5] C08F *2/00*
U.S. Cl. 422—106 8 Claims



1. An apparatus for reducing the emission of solids during pressure relief processes of reaction mixtures present in tube reactors or autoclaves used for the polymerization of ethylene or copolymerization of ethylene with ethylenically unsaturated comonomers in the presence of an initiator under 500 to 4,000 bar and from 150° to 350° C. comprising:

a first separating container and at least one additional downstream separating container arranged in series,

inlet means through which the reaction mixture let down is fed into the first separating container, said inlet means

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tangentially entering the side of said first separating container and directed downward,

valve means for maintaining a constant water level in said first separating container,

connection pipe means located at the top of said first separating container and passing to said additional downstream separating container, said connecting means entering the side of said downstream separating container laterally and tangentially,

outlet means located at the top of said additional separating container,

dish shaped baffle means located at the top of said additional separating container and upstream of said outlet means, the diameter of said baffle means being smaller than the diameter of said additional separating container, and

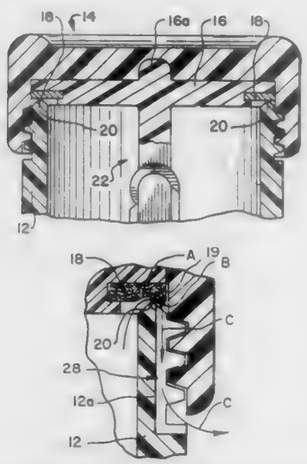
at least four nozzle means for producing a water film, said nozzle means entering the top of said additional separating container and located between the edge of said baffle means and the inner walls of said additional separating container.

4,996,027

CONTACT LENS CASE HAVING PRESSURE VENTING GASKET

Rowland W. Kanner, Guntersville, Ala., assignor to Ciba Vision Corporation, Atlanta, Ga.

Filed Apr. 7, 1989, Ser. No. 334,940
Int. Cl.[5] A61J 1/00; G05G 15/00
U.S. Cl. 422—113 20 Claims



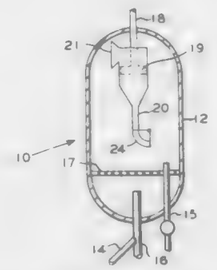
13. An appliance for containing and venting fluid, comprising: a container body including an opening; closure means for closing said opening; an self-reseating, unitary gasket means disposed to form a normally tight seal between said container body and said closure means wherein said self-reseating, unitary gasket means comprises a composition sufficiently resilient to at least partially unseat from said container body while an engaged surface of said cap means remains stationary upon said container body upon exertion against said self-reseating, unitary gasket means of fluid pressure within said container body, so that said pressurized fluid is vented past said unseated gasket means which forms a vent passageway between said closure means and said container body, after which said self-reseating, unitary gasket means deflects to reseat and seal against said container body in order to prevent any subsequent leakage of fluid therefrom.

4,996,028

TRICKLE VALVE

Arvid M. Danielsen, Sparta, and Donald F. Shaw, Denville, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 15, 1989, Ser. No. 310,985
Int. Cl.[5] F27B 15/02; F16K 15/03
U.S. Cl. 422—147 9 Claims



5. In a fluid solids contacting apparatus having at least one cyclone in the apparatus for gas-solids separation and including a trickle valve operatively connected to the dipleg of the cyclone for stabilizing the level of solids therein, the improvement wherein the trickle valve comprises:

a curved tubular body having a first end connected to the cyclone and a second end defining a valve seat, the tubular body having a diameter, D, and a radius of curvature in the range of from about 1½ times to 2½ times the diameter, D, of the tubular body;

a flapper plate having two faces; and

means for pivotably mounting the flapper plate for one of the two faces to engage the valve sert when the valve is in a closed position and to disengage and move away from the valve seat when the valve is in an open position.

4,996,029

HEAT-EXCHANGER REACTOR

Frédéric Martin, Creteil, and Georges Crozat, Perpignan, both of France, assignors to Fauveley Entreprises, Saint-Ouen, France

PCT No. PCT/FR88/00257, § 371 Date Jan. 17, 1989, § 102(e) Date Jan. 17, 1989, PCT Pub. No. WO88/09469, PCT Pub. Date Dec. 1, 1988
PCT Filed May 20, 1988, Ser. No. 314,069
Claims priority, application France, May 22, 1987, 87 07211
Int. Cl.[5] B01J 8/02; F28D 7/10
U.S. Cl. 422—188 3 Claims

1. A heat-exchanger reactor comprising a cylindrical metal containment for receiving a solid chemical substance, this containment having passing axially through it a metal tube for the circulation of a heat-exchange fluid, the tube and an interior of the cylindrical containment being in heat exchange relation with each other, wherein the tube has first radial fins each extending substantially over the entire height of the cylindrical containment and extending over the entire radial distance between the tube and an inner surface of the cylindrical containment, an outer surface of the cylindrical containment having second radial fins each extending substantially over the entire height of said cylindrical containment, and the assembly composed of the cylindrical containment including said first radial fins and the tube including said second fins being a one-piece unit, opposite ends of the cylindrical containment being each closed by an end flange welded to said ends, and between one of said end flanges of the cylindrical containment and an adjacent end of said first radial fins of the tube there being a toroidal hollow body centered on an axis of the tube, a fluid delivery pipeline opening into said hollow body, and said hollow body having a series of orifices uniformly distributed



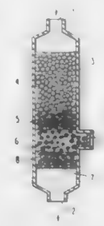
around the tube and each arranged opposite a respective one of compartments delimited by the first radial fins of the tube.

4,996,030

METHOD FOR CLEANING EXHAUST GASES

Koichi Kitahara; Takashi Shimada; Noboru Akita; Tadashi Hiramoto, and Kohhei Sasaki, all of Kanagawa, Japan, assignors to Japan Pionics, Ltd., Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 200,886
Claims priority, application Japan, Jun. 1, 1987, 62-134932; Jun. 1, 1987, 62-134931
Int. Cl.[5] B01D 53/34
U.S. Cl. 423—210 6 Claims



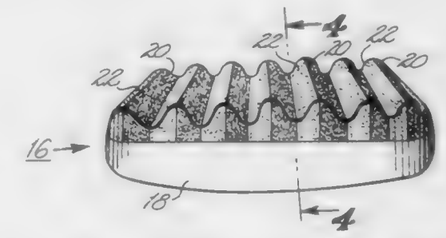
1. A method for cleaning an exhaust gas comprising a base gas and at least one toxic component selected from the group consisting of arsine, phosphine, diborane and hydrogen selenide, which comprises contacting the exhaust gas at an inlet exhaust gas temperature between −20° and 40° C. with a molded cleaning agent having a composition consisting essentially of (1) cupric oxide, (2) manganese dioxide, and (3) at least one metal oxide selected from the group consisting of silicon oxide, aluminum oxide and zinc oxide and having a density of from 0.6 to 1.5 g/ml, said composition having a metal atomic ratio M/(M+Cu +Mn) in the range of from 0.03 to 0.55 and a metal atomic ratio Cu/(Cu+Mn) in the range of from 0.2 to 0.8, wherein Cu represents a number of gram atom of copper; Mn represents a number of gram atom of manganese; and M represents a total number of gram atom of silicon, aluminum and/or zinc, to remove the toxic component from the exhaust gas.

4,996,031

CATALYST SUPPORT MATERIAL CONTAINING LANTHANIDES

James P. Spooner, Willow Grove, Pa., and Alvin B. Stiles, Wilmington, Del., assignors to Rhone-Poulenc Inc., Monmouth Junction, N.J.

Division of Ser. No. 136,279, Dec. 22, 1987, Pat. No. 4,868,150.
This application Sep. 15, 1989, Ser. No. 407,931
Int. Cl.[5] B01D 53/36
U.S. Cl. 423—213.2 20 Claims



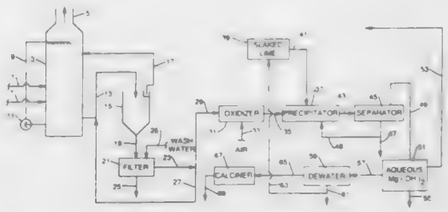
1. A method of oxidizing or reducing gases comprising contacting said gases at an elevated temperature of about 100° C. to about 1300° C. with a catalyst support material comprising a plurality of stable, highly porous, co-precipitated microcrystallite particulates consisting essentially of an integral admixture of alumina and at least one lanthanide oxide, wherein said lanthanide oxide comprises at least 1% cerium oxide, and wherein about 20 to 30% of the pores have a pore diameter within the range of about 200 to 400 Angstroms.

4,996,032

PROCESS FOR REMOVING SULFUR DIOXIDE FROM FLUE GASES

Donald H. Stowe, Jr., Beaver, and Lewis B. Benson, Coraopolis, both of Pa., assignors to Dravo Lime Company, Pittsburgh, Pa.

Filed Dec. 21, 1989, Ser. No. 454,271
Int. Cl.[5] C01B 17/00; C01F 1/00, 5/14, 11/02
U.S. Cl. 423—242 11 Claims



1. In a process for removing sulfur dioxide from flue gases in a wet scrubber, wherein an aqueous slurry formed from calcium hydroxide and magnesium hydroxide is contacted in said wet scrubber with said flue gases, and said slurry, after said contact, contains calcium sulfite solids and dissolved magnesium sulfite, and is discharged from said wet scrubber and passed to a thickener wherein a thickened aqueous sludge containing calcium sulfite solids is separated from an overflow liquor, the improvement comprising:

returning at least a portion of the overflow liquor to the wet scrubber;

concentrating said thickened aqueous sludge by removal of a sulfite solution, comprising water containing dissolved magnesium sulfite, therefrom;

returning a first portion of said sulfite solution to said thickener;

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oxidizing magnesium sulfite in a second portion of said sulfite solution to form a sulfate solution containing magnesium sulfate;

adding lime to said sulfate solution following said oxidation, to precipitate calcium sulfate and form an aqueous magnesium hydroxide suspension; and

separating precipitated calcium sulfate from said aqueous magnesium hydroxide suspension.

4,996,033

CATALYTIC METHOD FOR CONCENTRATING ISOTOPES

Ralph A. Gardner-Chavis, Cleveland, and Michael P. May, North Canton, both of Ohio, assignors to Molecular Technology Corporation, Canton and JC Technology, Inc., Dover, both of, Ohio

Continuation of Ser. No. 176,248, Mar. 31, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,485

Int. Cl.[5] C01B *4/00. 5/00*

U.S. Cl. 423—249 **46 Claims**

1. A method for concentrating a desired isotrope of a chemical element from a starting admixture comprising the desired isotope and an undesired isotope of the chemical element which comprises:

reacting the starting admixture with one or more reactants in the presence of a catalyst to catalyze a reaction selectively with the desired isotope to form reaction products where the concentration of the desired isotope relative to the concentration of the undesired isotope in the reaction products is at least about two times greater than the concentration of the desired isotope relative to the concentration of the undesired isotope in the starting admixture.

4,996,034

PROCESS FOR PREPARING SILICON SUBSTITUTED ZEOLITE COMPOSITIONS

Gary W. Skeels, Brewster, N.Y., assignor to UOP, Des Plaines, Ill.

Filed Dec. 22, 1989, Ser. No. 455,490

Int. Cl.[5] C01B *33/28*

U.S. Cl. 423—328 **7 Claims**

1. The process for substituting silicon into the crystal lattice of zeolites in place of extracted lattice aluminum atoms to achieve zeolite products of higher silicon content which comprises:

(a) providing a starting aluminosilicate zeolite having a framework SiO_2/Al_2O_3 molar ratio of at least 2 and pore diameters of at least 3 Angstroms;

(b) contacting said starting zeolite at a temperature of 25° C. to 95° C. with an aqueous solution of a fluorosilicate salt containing from 0.5 to 1.5 moles per liter of said fluorosilicate salt dissolved therein, the proportions of zeolite and fluorosilicate salt being at least 0.1 moles of salt per 100 grams of anhydrous zeolite;

(c) maintaining contact between the zeolite and the salt solution for a period not in excess of 5 hours;

(d) removing from contact with the zeolite the liquid medium containing at least 90 percent of the by-product fluoroaluminate salt produced by the reaction of the fluorosilicate salt with the zeolite.

4,996,035

PREPARATION OF NITROSYL FLUORIDE

Nickolas J. Stepaniuk, Chesterfield, and Bruce J. Lamb, St. Charles, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 316,024, Feb. 27, 1989, Pat. No. 4,908,270. This application Feb. 5, 1990, Ser. No. 474,905

The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.

Int. Cl.[5] C01B *21/083*

U.S. Cl. 423—386 **12 Claims**



1. A process for the preparation of nitrosyl fluoride, comprising separately introducing and blending nitrite and hydrogen fluoride into nitrosyl fluoride solution so as to form a reaction mixture within which the nitrite and the hydrogen fluoride react so as to produce additional nitrosyl fluoride, wherein said hydrogen fluoride is introduced into said reaction mixture spaced away from where said nitrite is introduced into said reaction mixture so that the hydrogen fluoride and the nitrite independently mix into said nitrosyl fluoride solution and are diluted therein before mixing with each other, thereby avoiding a violent reaction between the hydrogen fluoride and the nitrite.

4,996,036

ABATEMENT OF NO_X FROM HYDROXYLAMINE DISULFONATE PROCESS

William B. Fisher; Lamberto Crescentini, and Laszlo J. Balint, all of Chester, Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 26, 1988, Ser. No. 291,089

Int. Cl.[5] C01B *21/093, 21/20, 21/00*

U.S. Cl. 423—388 **7 Claims**

1. A process for the production of hydroxylamine disulfonate diammonium salt (DS) comprising reacting ammonium nitrite with ammonium bisulfite and sulfur dioxide in an absorption reactor whereby emission gases comprising NO_x, particularly NO, are released as a result of side reactions, the process comprising treating said emission gases to reduce the concentration of NO_X comprising adding NO_2 to the emission gases and contacting the mixture of NO_2 and emission gases with an aqueous alkali solution sufficiently to form nitrite and nitrate ions in said alkali solution, thereby reducing the concentration of NO_x in said emission gas.

4,996,037

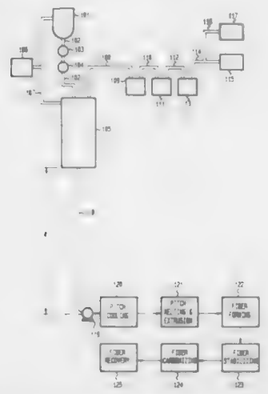
PROCESSES FOR THE MANUFACTURE OF ENRICHED PITCHES AND CARBON FIBERS

Donald C. Berkebile, 2675 Iroquois Ave., Ashland, Ky. 41101; Donald M. Lee, 92 S. Altamont Rd., Huntington, W. Va. 25701; Larry D. Veneziano, 2690 Velma Ct., Simi, Calif. 93065; Joseph J. Lauer, 421 Bellefonte Princess, Ashland, Ky. 41101; Roy E. Booth, P.O. Box 630003, Dallas, Tex. 75265-1003, and William P. Hettinger, 203 Meadowlark Rd., Russell, Ky. 41101

Division of Ser. No. 776,176, Sep. 13, 1985. This application Mar. 12, 1986, Ser. No. 839,231

Int. Cl.[5] D01F *9/145*

U.S. Cl. 423—447.4 **20 Claims**



1. An improved process for the production of carbon fibers, which process comprises:

(A) treating a petroleum pitch in a system comprising a wiped-film evaporator and a means for recovering enriched pitch to obtain an enriched pitch;

(B) delivering said enriched pitch to the inlet of said means for recovering enriched pitch at a pressure equivalent to a vertical distance between the outlet of said wiped-film evaporator and said inlet of about 10 feet to about 40 feet;

(C) maintaining the wiped-film evaporator at operating conditions that will provide enriched pitch;

(D) melting said enriched pitch to form a melted pitch;

(E) converting said melted pitch into a filament, roving, or mat of pitch fibers;

(F) stabilizing said filament, roving, or mat of pitch fibers by contacting said filament, roving, or mat of pitch fibers with an oxidant at an elevated temperature to form a stabilized product; and

(G) carbonizing said stabilized product by heating it in an inert atmosphere to a temperature within the range of about 900° C. (1,652° F.) to about 3,000° C. (5,432° F.).

4,996,038

HEAT RECOVERY FROM CONCENTRATED SULFURIC ACID

Donald R. McAlister, Ballwin, Mo., and Steven A. Ziebold, Waterloo, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 669,971, Nov. 9, 1984, Pat. No. 4,670,242, and a continuation-in-part of Ser. No. 510,527, Jul. 5, 1983, Pat. No. 4,576,813. This application Sep. 19, 1986, Ser. No. 909,708

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[5] C17B *17/98;* **C01B** *17/74, 17/48;* **C22C** *38/40*

U.S. Cl. 423—522 **23 Claims**

1. In a process for the manufacture of sulfuric acid, comprising the catalytic oxidation of sulfur dioxide to sulfur trioxide, absorption of the sulfur trioxide in sulfuric acid, and cooling the sulfuric acid in a heat exchanger by transfer of heat to another fluid, the improvement which comprises:

contacting a gas comprising sulfur trioxide with sulfuric acid in a primary absorption zone in a heat recovery tower, said sulfuric acid having a concentration between 98% and 101% and a temperature of at least 120° C.; contacting the gas exiting from said primary absorption zone with sulfuric acid in a secondary absorption zone positioned above said primary absorption zone in said heat recovery tower, the inlet temperature of the sulfuric acid to the secondary absorption zone being at least 10° C. cooler than the inlet temperature of the sulfuric acid to the primary absorption zone; and removing said heat of absorption in useful form from the sulfuric acid exiting said primary absorption zone by transfer of heat to another fluid, and thereby heating said another fluid to a temperature greater than 120° C.

4,996,039

PRODUCTION OF HYDROGEN PEROXIDE

Christian Pralus, Saint-Cyr-Au-Mont-D'Or, and Jean-Pierre Schirmann, Oullins, both of France, assignors to Atochem, Puteaux, France

Filed Oct. 12, 1989, Ser. No. 420,514

Claims priority, application France, Oct. 12, 1988, 88 13671

Int. Cl.[5] C01B *15/01*

U.S. Cl. 423—584 **11 Claims**

1. A process for the production of hydrogen peroxide, comprising (a) intimately contacting a gaseous phase comprising gaseous hydrogen at superatmospheric pressure with an inorganic aqueous reaction medium which comprises a catalytically effective amount of a platinum group metal catalyst, (b) next diminishing the amount of hydrogen in said gaseous phase to a value under the explosive/flammable limits of admixture thereof with the gaseous oxygen introduced in step (c), and (c) intimately contacting said aqueous reaction medium and diminished gaseous phase with a source of gaseous oxygen, the hydrogen contacted with said source of gaseous oxygen being that fraction coexisting with said aqueous medium resulting from step (b), wherein the gaseous phase of hydrogen and oxygen resulting from step (c) is neither flammable nor explosive.

4,996,040

CELLS STAINED WITH A DIAZO DYE

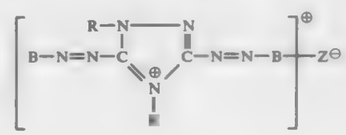
Lawrence Kass, Hinckley, Ohio, assignor to Cytocolor, Inc., Hinckley, Ohio

Continuation-in-part of Ser. No. 148,668, Jan. 26, 1988, Pat. No. 4,853,210, which is a continuation-in-part of Ser. No. 604,741, Apr. 27, 1984, abandoned. This application Jun. 29, 1989, Ser. No. 373,269

Int. Cl.[5] G01N *33/48*

U.S. Cl. 424—3 **10 Claims**

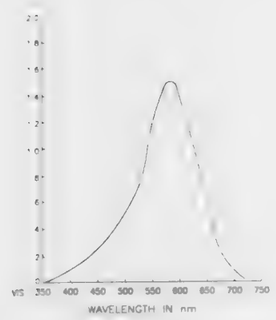
1. A plurality of cells of hematopoietic origin stained with an effective amount of a water-soluble cationic heterocyclic diazo dye: said stained cells having color characteristics permitting the differentiation, identification, and enumeration of the stained cells among a plurality of cells: said cationic heterocyclic diazo dye having the formula I or II:



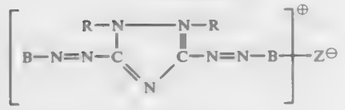
I.

or

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-continued



wherein R is a lower alkyl or benzyl radical, $Z\ominus$ is an anion, and B is a radical having the formula:



wherein A is a phenylene radical and R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl radicals.

4,996,041

METHOD FOR INTRODUCING OXYGEN-17 INTO TISSUE FOR IMAGING IN A MAGNETIC RESONANCE IMAGING SYSTEM

Toshiyuki Arai, 26-46 Nishifukunokawa-cho, Okazaki, Sakyo-ku, Kyoto 606, Japan; Pradeep M. Gupte, 3 Larissa Ct., Tallman, Monsey, N.Y. 10952, and Sigmund E. Lasker, 531 Main St., New York, N.Y. 10044

Filed Aug. 19, 1988, Ser. No. 234,339
Int. Cl.[5] G01N *24/00;* **A61B** *6/00*
U.S. Cl. 424—9 **13 Claims**

1. A method for the non-invasive and visual estimation of the spacial distribution of $H_2{}^{17}O$ in the tissue of a subject, said method comprising administering to said subject an effective imaging amount of a diagnostic imaging agent comprised of a complex of oxygen-17 and a biologically acceptable liquid carrier, and wherein said complex has an ionic composition essentially equal to that of blood, and an average particle size of less than about 0.6 microns, and measuring the production of $H_2{}^{17}O$ in said tissue by means of a proton magnetic resonance imaging system.

4,996,042

TOOTHPASTE

Helmar R. Wagner, Darmstadt, Fed. Rep. of Germany, assignor to Blendax GmbH, Mainz, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 336,156
Int. Cl.[5] A61K *9/16, 9/22*
U.S. Cl. 424—54 **2 Claims**

1. A toothpaste being basically free from compounds releasing calcium ions, characterized by containing a combination of

(a) an anticalculus agent selected from the group consisting of an alkali metal pyrophosphate sufficient to provide about 1% to about 5% pyrophosphate ions based on the total composition, ethane 1-hydroxy-1,-1,-diphosphonic acid or its water soluble salts sufficient to provide about 0.2 to about 2.0% of phosphonic acid based on the total composition and mixtures thereof and

(b) a water-soluble salt of 3-pyridylmethanol in a quantity of 0.05 to 0.5% by weight (calculated on 3-pyridylmethanol), related to total composition.

4,996,043

ADVANCED EQUINE HOOF PREPARATION

Marina Adamich-Saltman, Townsend, Del., assignor to Equus Scientific Labs, Inc., West Coast Office, Woodside, Calif.

Filed Jul. 21, 1986, Ser. No. 889,409
Int. Cl.[5] A61K *7/04, 31/715*
U.S. Cl. 424—61 **20 Claims**

1. A composition for the veterinary prophylaxis and treatment of ungular keratinous tissue to ameliorate dry hoof condition, said composition being an aqueous dispersion consisting essentially of:

(a) 20 to 90 percent by weight of water;

(b) 0.1 to 3 percent by weight of polysaccharide;

(c) 7 to 79.1 percent by weight of triglyceride;

(d) at least 30 percent by weight of the fatty acid of said triglyceride is oleic acid, and the ratio oleic acid:linoleic acid is equal to or greater than 1;

(e) said composition exhibiting properties when applied to keratin-containing non-skin, non-hair ungular tissue of:

(i) a non-sticky surface to reduce adhesion of moisture-absorbing substances such as dirt and sawdust;

(ii) restoring moisture;

(iii) simulating periople moisture barrier;

(iv) aiding in prevention of stress cracks and brittleness

(v) non-drying; and

(vi) not permanently retarding lipid film development; and

(f) whereby application to complex composite ungular keratin-containing tissue structures restores them to and maintains them in a healthy water-balanced condition.

4,996,044

LIPSTICK FORMULATION AND METHOD

Clara G. Mercado, Aberdeen, and Ann M. Krog, Red Bank, both of N.J., assignors to Revlon, Inc., New York, N.Y.

Continuation of Ser. No. 881,162, Jul. 2, 1986, abandoned, which is a continuation of Ser. No. 714,646, Mar. 21, 1985, abandoned. This application Jul. 12, 1989, Ser. No. 378,506
Int. Cl.[5] A61K *7/025*
U.S. Cl. 424—64 **8 Claims**

1. A lipstick formulation comprising 50–70% of a base intermediate, containing by weight of the total composition, 10–14% candelilla wax, 2–6% cetyl alcohol, 1.5–10% ozokerite, 7–20% lanolin alcohol, 0.5–5% beeswax, 3–6% hydrogenated vegetable oil, 1.5–12% petrolatum white, 4–8% lanolin oil, 4–8% mineral oil, and 7–15% oleyl alcohol; 10–35% of a color intermediate, containing by weight of the total composition, 20–30% pigments and castor oil dispersant in a range of 1:4 to 1:1 wherein the pigments are 0.2–0.9% based upon total weight of color intermediate, of organic high staining dyes, and 1–20% based upon total weight of color intermediate of organic dyes; 6–20% by weight of the total composition of castor oil; 1–3% by weight of the total composition of acrylates copolymer dispersant in a range of 1:4 to 4:1; and 0.1–0.8% by weight of the total composition of fragrance.

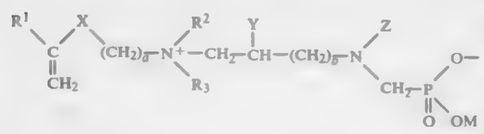
4,996,045

HAIR FIXATIVE COMPOSITIONS CONTAINING ALPHA-AMINOMETHYLENE PHOSPHONATE BETAINES

John Leighton, Flanders, and Carmine Iovine, Bridgewater, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Nov. 16, 1988, Ser. No. 272,572
Int. Cl.[5] A61K *7/06, 7/11*
U.S. Cl. 424—70 **14 Claims**

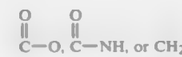
1. A hair fixative composition comprising a solvent and a hydrocarbon propellant and a functional amount of an alpha-aminomethylenephosphonphonate betaine copolymer prepared from at least 5% of a betaine monomer of the formula:



where

R^1 is hydrogen or methyl;

X is



a is 0, 1, 2, or 3, with the condition that when X is



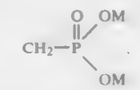
that a be greater than 1;

R^2 and R^3 are independently C_1–C_6 alkyl, aryl, benzyl, or cyclohexyl;

Y is hydrogen or hydroxyl;

b is 0, 1, 2, or 3;

Z is C_1–C_6 alkyl, aryl, benzyl, cyclohexyl, or



and

M is hydrogen, metallic cation, or ammonium ion;

and up to 95% by weight of an ethylenically unsaturated copolymerizable comonomer.

4,996,046

INFRARED TREATMENT FOR PSORIASIS

Thelma G. Warshaw, 519 E. Broad St., Westfield, N.J. 07090, and Jacob Horowitz, 10 Black Birch Rd., Scotch Plains, N.J. 07076

Filed Nov. 24, 1989, Ser. No. 440,675
Int. Cl.[5] A61K *31/74, 7/42*
U.S. Cl. 424—78 **6 Claims**

1. A method for treating psoriasis which comprises covering the affected area with a material containing an infrared absorbing amount of at least one infrared radiation blocking compound, said amount of said at least one blocking compound being sufficient to substantially reduce the escape of body heat via infrared radiation.

4,996,047

SUSTAINED RELEASE DRUG-RESIN COMPLEXES

William J. Kelleher, Storrs, and Anthony E. Carpanzano, Sherman, both of Conn., assignors to Richardson-Vicks, Inc., Shelton, Conn.

Filed Nov. 2, 1988, Ser. No. 265,910
Int. Cl.[5] A61K *31/74, 9/14, 9/52*
U.S. Cl. 424—79 **16 Claims**

1. An oral pharmaceutical composition in unit dosage form consisting essentially of irregularly shaped ion-exchange resin particles with an ion-exchange capacity of less than about 6 meq/gram having particle sizes ranging from about 10 to about 500 microns, said particles having a pharmacologically active drug bound thereto wherein said rug comprises more than about 38% by weight of the drug-resin complex, the ratio of pharmacologically-active drug to resin ranging from about 0.5:1 to about 1.5:1 and wherein said drug-resin complex particles have been subsequently coated with from about 1.5% to about 25% by weight of the drug-resin complex of a water-permeable diffusion barrier and wherein said composition provides controlled release of said active drug.

4,996,048

STABILIZING PACKAGED IODOPHOR AND MINIMIZING LEACHING OF IODINE THROUGH PACKAGING

Dileep Bhagwat, Peekskill; Oliver Iny, Little Neck, and Frank Pedi, Jr., Yorktown Heights, all of N.Y., assignors to Euroceltique, S.A., Luxembourg, Luxembourg

Filed Nov. 30, 1988, Ser. No. 278,197
Int. Cl.[5] A61K *31/79;* **A01N** *59/12;* **B65D** *81/00;* **B29D** *23/00*
U.S. Cl. 424—80 **14 Claims**

1. A stable packaged iodophor solution comprising polyethylene walled container through which walls, iodine from the iodophor solutions containing iodide ions leach in a maximum amount of up to 6.6% according to U.S. Pharmacopeia XXII, said container containing a microbicidal effective iodophor solution containing iodide ions in an amount greater than said U.S. Pharmacopeia maximum amount of 6.6% and sufficient to minimize leaching of iodine from said iodophor solution through the walls of said container.

4,996,049

BIOLOGICAL CONTROL OF CORN SEED ROT AND SEEDLING BLIGHT

Douglas M. Haefele, Newton; Jonathan C. Lamptey, and Joseph L. Marlow, both of West Des Moines, all of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Dec. 19, 1988, Ser. No. 286,032
Int. Cl.[5] C12R *1/425, 1/39;* **A01N** *63/00*
U.S. Cl. 424—93 **6 Claims**

1. A method of protecting corn plants in a growing medium from seed blight and seed rot, comprising:

placing in the growth medium in the immediate vicinity of the corn plant a small but plant protecting effective amount of a bacteria which produces emulsifiers and surfactants that can reduce the surface tension of water in the growing media by at least 40%, which are selected from the group consisting of *Pseudomonas fluorescens* strain 6519E01 having an ATCC accession number of 53860, *Pseudomonas fluorescens* strain 6133D02 having an ATCC accession number of 53859, and *Serratia plymuthica* strain 6109D01 having an ATCC accession number of 53858 and the genetic equivalents thereof which provide effective biological control of pathogens causing corn seed rot and corn seed blight and mixtures of said strains.

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4,996,050

FIBRINOLYTIC ACTIVITY ENHANCER

Minoru Tsukada, Osaka; Kenji Tanaka, Nara, and Yoshiro Iga, Osaka, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Oct. 3, 1988, Ser. No. 252,468
Claims priority, application Japan, Oct. 1, 1987, 62-248937
Int. Cl.[5] A61K *37/547*
U.S. Cl. 424—94.2 12 Claims

1. A fibrinolytic activity enhancer for single-chain pro-urokinase which comprises single-chain pro-urokinase in an amount to provide a dose of approximately 300 to 36,000 UK/kg of body weight (in terms of urokinase) and plasminogen as an active ingredient in an amount effective to enhance the fibrinolytic activity of single-chain pro-urokinase without causing systemic fibrinolysis, and a pharmaceutically acceptable carrier.

4,996,051

LOW CALORIE, HIGH FIBER LAXATIVE

E. Harvey Meer, Cresskill; Frank Mountain, Ridgewood, and Herbert V. Schultz, Jersey City, all of N.J., assignors to Meer Corporation, North Bergen, N.J.

Filed Nov. 23, 1988, Ser. No. 275,714
Int. Cl.[5] A61K *35/78*
U.S. Cl. 424—195.1 14 Claims

1. A natural fiber laxative consisting essentially of:
psyllium husk, apple fiber, fructose, gum arabic and flavorants,
said psyllium husk and said apple fiber constituting together at least 75% by weight of said composition,
said psyllium husk being between 40% to 58% by weight of said composition, and
said apple fiber being between 23% and 40% by weight of said composition.

4,996,052

MICROBIOCIDAL FABRIC HAVING PHOSPHATE DERIVATIVES AND METHOD OF PREPARATION THEREOF

Robert H. McIntosh, Greensboro, N.C., assignor to Interface Research Corporation, Atlanta, Ga.

Division of Ser. No. 47,561, Apr. 27, 1987, which is a continuation-in-part of Ser. No. 781,710, Oct. 2, 1985, Ser. No. 635,728, Jul. 30, 1984, abandoned, Ser. No. 658,695, Oct. 9, 1984, abandoned, Ser. No. 713,445, Mar. 19, 1985, abandoned, Ser. No. 736,652, May 21, 1985, Ser. No. 744,916, Jun. 13, 1985, and Ser. No. 744,730, Jun. 13, 1985, abandoned, each and Ser. No. 635,728, and Ser. No. 658695, and Ser. No. 713,445, and Ser. No. 736,652, and Ser. No. 774,916, and Ser. No. 774,730, is a continuation-in-part of Ser. No. 570,952, Mar. 8, 1984, which is a continuation of Ser. No. 523,734, Aug. 16, 1983, abandoned, which is a continuation of Ser. No. 226,006, Jan. 19, 1981, abandoned, which is a continuation of Ser. No. 930,879, Aug. 4, 1978, abandoned. This application Jan. 31, 1990, Ser. No. 472,743
Int. Cl.[5] A01N *25/34;* A61K *31/14;* C07F *9/02*
U.S. Cl. 424—404 18 Claims

1. A method for preparing a microbiocidal composition comprising the steps of:
(a) reacting phosphorous pentoxide with 3 moles or more of a C_1 to C_{24} hydroxy alkyl, aryl, aralkyl, or alkaryl compound per mole of phosphorous pentoxide at a temperature of between approximately 60° C. and 120° C. to form a phosphoric acid derivative with at least one free hydroxyl group; and
(b) reacting the product of step (a) with between approximately 0.5 and 1.5 moles of a tertiary amine of the formula $N(R_1)_2R_2$, wherein R_1 is a hydroxy alkyl group of from 1 to 18 carbon atoms, and R_2 is an alkyl group of from 8 to 18 carbon atoms.

4,996,053

BAIT FOR CONTROLLING DARKLING BEETLES, LESSER METAL WORMS AND HIDE BEETLES

Richard P. Hatcher, P.O. Box 60, Watkinsville, Ga. 30677

Filed Nov. 22, 1989, Ser. No. 440,200
Int. Cl.[5] A01N *25/08*
U.S. Cl. 424—410 16 Claims

1. An insecticidal composition comprising a mixture of:
from about 55.5% to about 75.5% by weight of a ground cereal grain;
from about 20% to about 40% by weight of powdered boric acid,
from about 1% to about 5% by weight of an edible oil from the class consisting of corn oil and soy cil, and
from about 1% to about 5% by weight of silica gel.

4,996,054

ANTITHROMBOGENIC, NON-CALCIFYING MATERIAL AND METHOD OF MAKING ARTICLES FOR MEDICAL PURPOSES

Hanns Pietsch; Holger Kartheus; Hans-Joachim Holtzmann, all of Hamburg; Günther Sachau, Quickborn, and Helmut Reul, Düren, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 933,003, Nov. 20, 1986, Pat. No. 4,831,065. This application Oct. 19, 1988, Ser. No. 240,998
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1985, 3541478
Int. Cl.[5] A61F *2/02*
U.S. Cl. 424—422 11 Claims

1. A method of forming a shaped article comprising shaping a composition comprising a polyurethane, a fatty acid ester and, as a cross-linking agent, an alkoxysilyl compound that contains at least two methoxysilyl, ethoxysilyl, propoxysilyl, or butoxysilyl groups and at least one amino group, and thereafter cross-linking the shaped mass through the action of water or humidity.

4,996,055

DEODORIZED BACTERIA COMPOSITION

Morio Kurasawa, Tokyo, Japan, assignor to Kurasawa Optical Industry Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,443
Int. Cl.[5] A61K *39/02;* A23K *00/00*
U.S. Cl. 424—442 9 Claims

1. A composition for deodorizing animal, fish and bird excrements comprising a deodorizing effective amount of a synergistic combination consisting essentially of at least one butyric acid producing bacteria and at least one bacteria from the genus *Bacillus subtilis* mixed with a carbon containing growth substrate wherein there is 0.1 to 10% by weight of said synergistic combination of bacteria wherein the ratio of the bacteria from the genus *Bacillus Subtilis* to the butyric acid-producing bacteria is between about 1:3 to 3:1.

4,996,056

DENTAL FLOSS AND TAPE

Jacob M. Blass, London, England, assignor to Westone Products Limited, London, England

Filed Aug. 14, 1989, Ser. No. 393,370
Claims priority, application United Kingdom, Aug. 22, 1988, [illegible]
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—443 10 Claims

1. A dental floss or tape comprising a multi-filament yarn and a binder between the individual filaments holding the filaments together in the yarn, and fluorocarbon polymer powder particles in said binder, said powder particles being present in an amount of up to 80% by weight based on the weight of the binder and having an average particle size in the range of 1 to 50 μm.

4,996,057

COMPOSITION FOR LOCALLY TREATING THE EPIDERMIS, ESPECIALLY THE SCALP

Nadine Schoeff, 12, Boulevard d'Andilly "Les Atlantes", 95160 Montmorency, and Jean-Pierre Poujol, deceased, late of Saint-Ouen, both of France (by Raymonde Poujol), assignors to Nadine Schoeff, Montmorency, France

PCT No. PCT/FR88/00147, § 371 Date Jan. 24, 1989, § 102(e) Date Jan. 24, 1989, PCT Pub. No. WO88/07363, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 21, 1988, Ser. No. 328,221
Claims priority, application France, Apr. 3, 1987, 87 04737
Int. Cl.[5] A61K *7/06*
U.S. Cl. 424—451 6 Claims

1. A composition for the local treatment of the scalp of a subject comprising from 0.1 to 10 mg/ml of proteinic compounds from human placental tissue and from 10^{-3} to 1 mg/ml of a condensation product of N-methyl-p-methoxyphenethylamine with formaldehyde.

4,996,058

COVERED RETARD FORMS

Joel Sinnreich, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 12, 1988, Ser. No. 242,833
Claims priority, application Switzerland, Sep. 18, 1987, 3621/87
Int. Cl.[5] A61K *9/58*
U.S. Cl. 424—462 5 Claims

1. A film coated or capsule dosage form which effects delayed release of an active pharmaceutical ingredient in the stomach which comprises:
(a) at least one component that expands on contact with gastric juice and contains an agent capable of releasing carbon dioxide or nitrogen, a pharmaceutically active ingredient or a combination thereof and, optionally, a pharmaceutically acceptable hydrophilic swelling agent selected from the group consisting of lower alkyl ethers of cellulose, starches, water-soluble aliphatic or cyclic poly-N-vinylamides, polyvinyl alcohols, polyacrylates, polymethacrylates, polyethylene glycols and mixtures thereof and further pharmaceutical formulation adjuncts used for the manufacture of oral dosage forms,
(b) at least one hydrophilic membrane in the form of a sachet which contains component (a), is expansible by inflation and floating on the aqueous phase in the stomach and permeable to gastric juice and,
(c) a film coating or capsule form which contains components (a) and (b) and which disintegrates without delay in the stomach under the action of gastric juice.

4,996,059

COMPOSITION FOR THE TREATMENT OF KERATIN FIBERS, BASED ON AMPHOTERIC POLYMER AND CATIONIC POLYMER

Jean F. Grollier, and Claire Fiquet, both of Paris, France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 517,565, Jul. 28, 1983, abandoned, which is a continuation of Ser. No. 210,620, Nov. 26, 1980, abandoned. This application Mar. 26, 1990, Ser. No. 498,490
Claims priority, application France, Nov. 28, 1979, 79 29318
Int. Cl.[5] A61K *7/075, 7/08, 7/09;* C11D *3/37*
U.S. Cl. 424—71 2 Claims

1. Process for the treatment of keratin fibres, which comprises applying in a first stage, a composition containing a cationic polymer selected from the group consisting of:
(1) a quaternised or unquaternised vinylpyrrolidone polymer,
(2) a quaternised guar gum derivative,
(3) a cationic polymer having the formula:

—A—Z—A—Z— (VI)

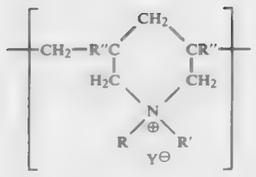
in which A denotes a radical containing two functional amino groups, and Z denotes the symbol B or B', B and B', which are identical or different, denoting a linear or branched alkylene radical which is unsubstituted or substituted by one or more hydroxyl groups and optionally one or more chain oxygen, nitrogen or sulphur atoms and 1 to 3 aromatic and/or heterocyclic rings, or having the formula:

—A—Z_1—A—Z_1— (VII)

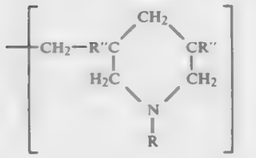
in which A is as defined above and Z_1 denotes the symbol B_1 or B'_1 and denotes B'_1 at least once, B_1 being a linear or branched alkylene or hydroxyalkylene radical and B'_1 being a linear or branched alkylene radical which is unsubstituted or substituted by one or more hydroxyl radicals and contains one or more chain nitrogen atoms, the nitrogen atom being substituted by an alkyl chain which optionally contains a chain oxygen atom and optionally contains one or more hydroxyl groups, or a product resulting from the alkylation with an alkyl or benzyl halide or lower alkyl tosylate or mesylate, of a polymer of formula (VI) or (VII), or a product resulting from the oxidation of a said polymer,
(4) a polyaminoamide,
(5) a crosslinked polyaminoamide selected from:
(a) a water-soluble crosslinked and optionally alkylated polyaminoamide obtained by crosslinking a polyaminoamide, prepared by the polycondensation of an acid compound with a polyamine, with a crosslinking agent which is an epihalogenohydrin, diepoxide, dianhydride, unsaturated anhydride or a bis-unsaturated derivative, in an amount from 0.025 to 0.35 mol per amine group of the polyaminoamide;
(b) a water-soluble crosslinked polyaminoamide obtained by crosslinking a polyaminoamide as defined under (a) with a crosslinking agent selected from:
(I) a bis-halogenohydrin, bis-azetidinium compound, bis-halogenoacyldiamine or alkylene dihalide,
(II) an oligomer obtained by reacting a compound of group I, or an epihalogenohydrin, diepoxide or bis-unsaturated derivative, with a difunctional compound which is reactive towards said compound, and
(III) a product resulting from the quaternisation of a compound of group I or an oligomer of group II and containing one or more tertiary amine groups which can be totally or partially alkylated, with an alkylating agent, the crosslinking being carried out using 0.025 to 0.35 mol of crosslinking agent per amine group of the polyaminoamide; and
(c) a water-soluble polyaminoamide derivative resulting from the condensation of a polyalkylene-polyamine with a polycarboxylic acid, followed by alkylation with a difunctional agent, said derivatives being a adipic acid/dialkylaminohydroxyalkyl-dialkylenetriamine copolymer,
(6) cationic non-ether cellulose polymer,
(7) polyamine containing two primary amine groups and at least one secondary amine group, with a diglycolic acid or a saturated aliphatic dicarboxylic acid having 3 to 8 carbon atoms, the molar ratio of the polyalkylene-polyamine to the dicarboxylic acid being from 0.8: to 1.4:1, and reacting the resulting polyamide with epichlorohydrin in a molar ratio of epichlorohydrin to the secondary amine groups of the polyamide of 0.5:1 to 1.8:1,
(8) a homo- or co-polymer containing, as the main constituent of the chain, units corresponding to the formula VIII or VIII':

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(VIII)



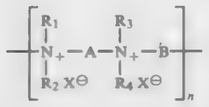
(VIII')



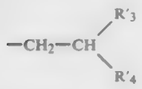
in which formulae R'' denotes hydrogen or methyl, R and R' independently denote an alkyl group having from 1 to 22 carbon atoms, a hydroxyalkyl group, or a lower amidoalkyl group, or R and R', together with the nitrogen atom to which they are attached, denote a heterocyclic group,

(9) a poly-(quaternary ammonium) compound of the formula:

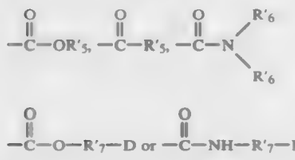
(IX)



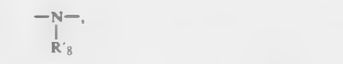
in which R_1, R_2, R_3 and R_4, which are identical or different, represent an aliphatic, alicyclic or arylaliphatic radical containing a maximum of 20 carbon atoms, or a lower hydroxyaliphatic radical or alternatively R_1 and R_2, and R_3 and R_4, together or separately denote with the nitrogen atoms to which they are attached, a heterocyclic ring which optionally contains a second hetero-atom other than nitrogen, or alternatively R_1, R_2, R_3 and R_4 represent a group of the formula



in which R'_3 denotes hydrogen or lower alkoxy and R'_4 denotes —CN, or a group



R'_5 denoting lower alkyl, R'_6 denoting hydrogen or lower alkyl, R'_7 denoting alkylene and D denoting a quaternary ammonium group, A and B independently represent polymethylene groups containing from 2 to 20 carbon atoms, which is linear or branched and saturated or unsaturated and optionally contain one or more chain aromatic rings or one or more groups —CH_2—Y—CH_2—, in which Y denotes O, S, SO, SO_2, —S—S—,

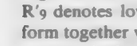


in which X_1^- denotes an anion derived from a mineral or organic acid, R'_8 denoting hydrogen or lower alkyl and R'_9 denotes lower alkyl, or alternatively A, R_1 and R_3 form together with the two nitrogen atoms to which they are attached a piperazine ring; and, additionally, if A denotes a linear or branched, saturated or unsaturated aliphatic or hydroxy-aliphatic radical, B can also denote a group:

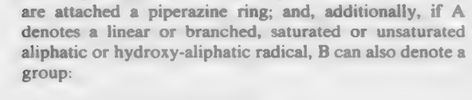


in which D denotes:

(a) a glycol residue of the formula



in which Z denotes a linear or branched hydrocarbon radical or a group corresponding to the formula:



in which x and y independently denote an integer from 1 to 4,

(b) a bis-primary diamine residue of the formula:

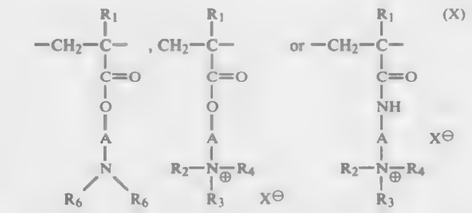
in which Y denotes a linear or branched hydrocarbon radical or the divalent radical —CH_2—CH_2—S—S—CH_2—CH_2—; or

(c) a ureylene group of the formula

n is such that the molecular weight of the compound is from 1,000 to 100,000; and X—denotes an anion;

(10) a homopolymer or copolymer containing the recurring unit of formula:

(X)



in which R_1 is H or CH_3, A is a linear or branched alkyl group having up to 6 carbon atoms or a hydroxyalkyl

group having 1 to 4 carbon atoms, R_2, R_3 and R_4, which are identical or different, denote an alkyl group having 1 to 18 carbon atoms or a benzyl group, R_5 and R_6 denote H or alkyl having 1 to 6 carbon atoms, and X— denotes an anion

(11) a polyalkyleneimine

(12) a polymer containing chain vinylpyridine or vinylpyridinium units

(13) a product resulting from the condensation of a polyamine and epichlorohydrin

(14) a quaternary polyureylene compound

(15) a chitosan derivative and in a second stage, a composition containing at least one amphoteric polymer containing units A and B distributed in the polymer chain, where A denotes a unit derived from a monomer containing at least one basic nitrogen atom and B denotes a unit derived from an acid monomer containing one or more carboxyl or sulphonyl groups, or, alternatively, A and B denote a group derived from a zwitterionic carboxybetaine monomer; or A and B denote a cationic polymer chain containing secondary or tertiary amine groups or quaternary ammonium groups, in which chain at least one of the amine groups carries a carboxyl or sulphonyl group joined via a hydrocarbon radical, or A and B form part of a polymer with alpha, beta-dicarboxyethylene units, in which one of the carboxyl groups has been reacted with a polyamine containing one or more primary or secondary amine groups; said amphoteric and cationic polymers being present in an amount of 0.01 to 10% by weight and said amphoteric and cationic polymers having a molecular weight of 500 to 2,000,000, and said composition containing essentially no anionic polymer.

2. Process according to claim 1 in which the first composition further contains a reducing agent and the second composition further contains a neutralising agent.

4,996,060

DEVICE COMPRISING LINER FOR PROTECTING FLUID SENSITIVE MEDICAMENT

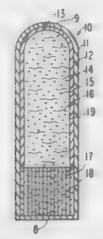
James B. Eckenhoff, Los Altos; Judy A. Magruder, Mt. View; Richard Cortese, Cupertino; John R. Peery, Palo Alto, and Jeremy C. Wright, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 173,209, Mar. 25, 1988, Pat. No. 4,855,141. This application Apr. 6, 1989, Ser. No. 334,251

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] **A61R** *9/24*

U.S. Cl. 424—473 **10 Claims**



1. A device for delivering a beneficial agent to an environment of use, wherein the device comprises:

(a) a wall comprising in at least a part a composition permeable to the passage of aqueous fluid, which wall surrounds;

(b) an internal space;

(c) a beneficial agent in the internal space;

(d) a pharmaceutically acceptable carrier for the beneficial agent in the internal space;

(e) a liner comprising a composition substantially impermeable to the passage of aqueous fluid, said liner in the internal space that surrounds the area initially occupied by the beneficial agent for substantially preventing the passage of fluid into the internal space whereby the beneficial agent is substantially shielded from fluid contact;

(f) means in the internal space for displacing the beneficial agent from the device; and,

(g) means in the wall connecting the exterior of the device with the internal space for delivering the beneficial agent to the environment of use.

4,996,061

PHARMACEUTICAL COMPOSITION FOR PIPERIDINOALKANOL-DECONGESTANT COMBINATION

Norval E. Webb, Middletown, and Gregory V. Hammer, West Chester, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 379,728, Jul. 14, 1989, abandoned, which is a continuation of Ser. No. 211,308, Jun. 24, 1988, abandoned, Continuation-in-part of Ser. No. 105,939, Oct. 7, 1987. This application Dec. 28, 1989, Ser. No. 438,966

Int. Cl.[5] **A61K** *9/36*

U.S. Cl. 424—475 **12 Claims**

1. A pharmaceutical composition in the form of a multiple-compression tablet comprising

(a) a discrete zone made with Formulation (A) which comprises a carrier base material combined with a therapeutically effective decongestant amount of a sympathomimetic drug, or a pharmaceutically acceptable salt thereof, the carrier base material begin a mixture of (I) one or more pharmaceutically acceptable water-soluble nonionic cellulose ethers in an amount from about 18% to about 50% by weight of Formulation (A), (ii) one or more pharmaceutically acceptable anionic surfactants in an amount from about 2% to about 20% by weight of Formaulation (A), and (iii) one or more other pharmaceutically acceptable excipients, wherein said carrier base material provides a sustained release of the sympathomimetic drug, and

(b) a discrete zone made with Formulation (B) which comprises a second carrier base material combined with a therapeutically effective antihistaminic amount of a piperidinoalkanol, or a pharmaceutically acceptable salt thereof, the second carrier base being a mixture of (i) calcium carbonate in an amount from about 0.5% to about 25% by weight of Formulation (B), (ii) one or more pharmaceutically acceptable nonionic surfactants in an amount from about 1% to about 10% by weight of Formulation (B), and (iii) one or more other pharmaceutically acceptable excipients, wherein Formulation (B) optionally also contains a therapeutically effective decongestant amount of a sympathomimetic drug, or a pharmaceutically acceptable salt thereof, and wherein said second carrier base material provides an immediate release of the piperidinoalkanol and of any sympathomimetic drug.

4,996,062

GLUCOSE OXIDASE FOOD TREATMENT AND STORAGE METHOD

Paavo Lehtonen, Niittypolku; Pirkko Aaltonen, Konalantie, and Ulla Karilainen, Porvoonkatu, all of Finland, assignors to Stabra AG, Zug, Switzerland

Filed Oct. 28, 1988, Ser. No. 263,811

Int. Cl.[5] **A23B** *4/22*

U.S. Cl. 426—8 **7 Claims**

1. A method for extending the shelf life of a food product comprising: treating the product with a first preparation of substantially pure glucose oxidase and a second preparation of catalase, wherein the ratio of glucose oxidase to catalase is selected so as to maximize the anti-microbial effect of the peroxide produced by reaction of the glucose oxidase prior to its destruction by said catalase; and packaging the treated product in a sealed package, wherein the amount of glucose

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oxidase added is sufficient to reduce the level of oxygen in the package to under about 1% within 5 days.

4,996,063

METHOD FOR MAKING A SOLUBLE DIETARY FIBER COMPOSITION FROM OATS

George F. Inglett, Peoria, Ill., assignor to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 373,978
Int. Cl.[5] A23L *1/105*
U.S. Cl. 426—21 10 Claims

1. A method for producing a water-soluble dietary fiber composition comprising treating an aqueous dispersion of a gelatinized, milled, oat substrate with an α-amylase under conditions which will hydrolyze the substrate and yield a soluble fraction and an insoluble fraction, separating said soluble fraction from said insoluble fraction, and recovering from said soluble fraction said water-soluble dietary fiber substantially free of water-insoluble fiber.

4,996,064

FOODSTUFF FROM SOYMILK AND METHOD FOR PRODUCTION THEREOF

Hirofumi Akano; Takeshi Sato; Hajime Okumura; Yoshiya Kawamura, all of Aichi, and Kyo Shimada, Mie, all of Japan, assignors to Nakano Vinegar Co., Ltd., Aichi, Japan

Filed Aug. 22, 1989, Ser. No. 396,662
Claims priority, application Japan, Aug. 24, 1988, 63-208287; May 18, 1989, 1-125268
Int. Cl.[5] A23L *1/20*
U.S. Cl. 426—46 14 Claims

1. A method for the production of a foodstuff, which comprises treating soymilk with a milk-coagulating enzyme produced by a milk-coagulating system enzyme-producing microorganism selected from the group consisting of *Aspergillus sojae* (IFO- 4241), *Aspergillus sojae* (IFO-4386), *Aspergillus sojae* (IFO-4403), *Aspergillus sojae* 5119 FERM BP-2520 (FERMP-10220), *Mucor* sp. strain 5121 FERM BP-2521 (FERMP-10221) and *Rhizopus* sp. strain 5120 FERM BP-2522 (FERMP-10222), said enzyme possessing a protease activity (B) and a milk-coagulating activity (A) such that the ratio of (A)/(B) is larger than 0.1, and collecting a resultant coagulated material.

4,996,065

MOLASSES-FREE CHEMICALLY REACTIVE BINDER FOR ANIMAL FEED

Richard H. Van de Walle, Columbia, Md., assignor to Martin Marietta Magnesia Specialties Inc., Hunt Valley, Md.

Continuation of Ser. No. 300,106, Jan. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 819,323, Jan. 16, 1986, abandoned. This application Jul. 16, 1990, Ser. No. 554,950
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—72 10 Claims

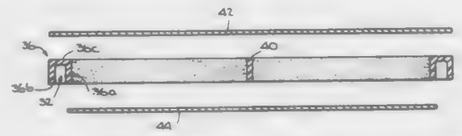
1. A molasses-free pelletized and compressed animal feed composition consisting essentially of a dry mixture of feed ingredients and a binder therefor, said binder consisting essentially of from about 0.1 percent to about 5.0 percent by weight of the total feed formulation of a reactive phosphate source selected from the group consisting of phosphate acid, ammonium polyphosphate, monoammonium phosphate, diammonium phosphate, monopotassium phosphate, dipotassium phosphate, monosodium phosphate, monocalcium phosphate, disodium phosphate, and combinations thereof, and from about 0.25 percent to about 5.0 percent by weight of the total feed formulation of a reactive metal source selected from the group consisting of magnesium oxide, aluminum oxide, potassium oxide, calcium oxide, magnesium calcium oxide, magnesium hydroxide, aluminum hydroxide, potassium hydroxide, calcium hydroxide, calcium sulfate, magnesium potassium sulfate, magnesium sulfate, potassium sulfate, calcium chloride, magnesium chloride, magnesium carbonate, and combinations thereof whereby pellet durability index is increased and percent of recycled fines is reduced.

4,996,066

BEVERAGE FLAVORING CASSETTE

Graham Love; Karl Schellhaass; Bärbel Rathjen, all of Bremen, and Jürgen Schwarz, Bremerhaven, all of Fed. Rep. of Germany, assignors to Hag GF Aktiengesellschaft, Bremen, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 351,736
Int. Cl.[5] B65D *85/00;* B65B *29/02;* A47J *31/00*
U.S. Cl. 426—77 9 Claims



1. A cassette for flavoring a liquid and for use with a liquid receptacle, said liquid receptacle having an interior for receiving liquid and having a bottom portion defining a bottom opening for passing the liquid outward from said interior, said liquid receptacle further including an internal locking flange adjacent to and around said bottom opening and said flange extending upward from said bottom portion, the cassette comprising:

(a) a ring defining an interior and having a bottom surface and a top surface, the ring including

(i) an inside annular leg,

(ii) an outside annular leg radially spaced from and concentric with the inside annular leg, and

(iii) a shoulder portion connected to and extending between the inside and outside annular legs; the inside and outside annular legs and the shoulder portion define a bottom annular groove to receive said locking flange on said liquid receptacle, said cassette including said annular groove being dimensioned and shaped such that when said cassette is placed in said liquid receptacle with said annular groove positioned down onto said locking flange, the cassette is held securely in place while a liquid flows through it and a liquid seal is formed between said cassette and the bottom of the receptacle extending around said opening to prevent liquids from leaking out from the interface between said cassette and said liquid receptacle;

(b) a plurality of ribs connected to and extending across said ring and separating the interior thereof into a multitude of at least 3 sections;

(c) particles disposed in said sections for flavoring a liquid; and

(d) a bottom filter and a top filter secured to the ring and extending across the bottom and the top, respectively, of the interior of said ring to hold the flavoring particles therein.

4,996,067

FEED ADDITIVE FOR RUMINANTS

Takaaki Kobayashi, Yokohama; Takahumi Tosa, Kawasaki; Hiroyuki Sato, Yokohama; Hiroyoshi Okada, Machida; Masao Miyake, and Kenji Mori, both of Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation and Ajinomoto Co., Inc., both of Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 381,837
Claims priority, application Japan, Jul. 19, 1988, 63-178256; Jul. 19, 1988, 63-178257; Jul. 19, 1988, 63-178258
Int. Cl.[5] A23D *1/00*
U.S. Cl. 426—96 21 Claims

1. A feed additive for ruminants, which consists essentially of cores containing an acid salt of a basic amino acid, and effective amounts to attain the protection of the core material in a pH region corresponding to the rumen and to attain the release of the core material in a pH region corresponding to the abomasum of a first coating layer and a second coating layer coated sequentially on the surface of each core, wherein said first coating layer contains at least one first coating agent selected from the group consisting of a neutral or weakly acidic organic substance, a substantially neutral fine powder of inorganic substance, a non-ionic hydrophilic polymer substance and an anionic hydrophilic polymer substance and being physiologically acceptable to the ruminants, and the second coating layer contains as a second coating agent a polymer solube or swellable in water in an acidic region of a pH of at most 5.5.

4,996,068

METHODS FOR TREATING FOOD AND A DEOXODIZER PACKAGE IN A MICROWAVE OVEN

Hidetoshi Hatakeyama, and Takashi Kashiba, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Japan

Filed Nov. 30, 1988, Ser. No. 278,363
Claims priority, application Japan, Dec. 2, 1987, 62-303281; Dec. 2, 1987, 62-303282; Dec. 2, 1987, 62-303283
Int. Cl.[5] A23L *1/025, 3/34, 3/36;* C09K *15/02*
U.S. Cl. 426—234 6 Claims

1. A method of freeze-storing and thawing a food, comprising the steps of:

placing a food having a water content of 8% or more and a deoxidizer package in a pack container made of a material having an oxygen permeability of 200 ml/m^2 24 hr atm or less, said deoxidizer package including a deoxidation composition containing iron powder, a metal halide, and a material to dissipate heat generated in said iron powder upon irradiation with microwaves comprising a powder filler having a water solubility of about zero, a particle size of 60 mesh or finer and a specific surface area of 50 m^2/g or less, said powder filler being contained in amount of 100 volume parts or more for 100 volume parts of said iron powder, said deoxidizer package further including a gas permeable packaging material containing said deoxidation composition and having a gas permeability of 1,000 seconds/100 cc or less in terms of Gurley gas permeability;

sealing and freeze-storing said pack container containing said food and said deoxidizer package; and

subjecting said container to a microwave irradiation so as to thaw said food.

4,996,069

PROCESS FOR THE PREPARATION OF FLAVOR AND FRAGRANCE MATERIALS

Johannes T. de Hey, Hilversum; Harrie Renes, Blaricum, and Jan Visser, Huizen, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Nov. 15, 1989, Ser. No. 436,801
Claims priority, application Netherlands, Nov. 18, 1988, 8802848
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—248 11 Claims

1. A process for the preparation of a product which is useful as a flavor or fragrance material which comprises oxidizing a solution of carotene in an aprotic solvent with oxygen under the influence of ultraviolet light and subsequently substantially removing the aprotic solvent from the product.

4,996,070

NATURAL FRUIT FLAVOR EXTRACTS

Karim Nafisi-Movaghar, Walnut Creek, Calif., assignor to Del Monte Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 369,149, Jun. 21, 1989, and a continuation-in-part of Ser. No. 155,611, Feb. 12, 1988, Pat. No. 4,948,609. This application Jan. 11, 1990, Ser. No. 463,502
Int. Cl.[5] A23L *2/02*
U.S. Cl. 426—330.5 34 Claims

1. A process for preparing a fruit flavored, aqueous extract solution comprising the steps of:

(a) immersing a fruit in an aqueous infusion solution containing a reducing agent, an acid and at least one disaccharide and infusing the fruit at a temperature of about 120° F. to about 212° F. for a time sufficient to infuse the fruit and extract an effective amount of flavor components from the fruit and to produce a fruit-flavored solution;

(b) separating the fruit from the solution; and

(c) recovering the solution, wherein the solution contains fruit flavors, sugars, and extracted components from the fruit.

4,996,071

METHOD FOR PACKAGING PERISHABLES

Laurence D. Bell, 12440 Saddle Way, Carmel Valley, Calif. 93924

Continuation of Ser. No. 43,427, Apr. 28, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 238,962
Int. Cl.[5] A23B *7/00;* B65B *25/02*
U.S. Cl. 426—415 20 Claims

1. A method for optimizing the shelf life of at least one respiring perishable in a package made of packaging material that transmits oxygen and carbon dioxide comprising the following steps:

(1) determining the respiration rate (R) of said perishable;

(2) selecting a packaging material for said respiring perishable that has known or ascertainable transmissibility to oxygen and carbon dioxide;

(3) preparing a first plurality of packages, each package containing said perishable in said packaging material, and each of said first plurality of packages having a different permeant factor (G) and different atmosphere quotient value (AQ) from the other packages in said first plurality, where G is equal to: the are (A) of said packaging material required to enclose a given weight of said perishable in a gaseous atmosphere that includes oxygen, multiplied by the permeability (P) of said packaging material to carbon dioxide or oxygen, and divided by the weight (W) of said perishable to be enclosed in said package; and wherein AQ is equal to G divided by R and said different permeant factors result from varying at least one of A, P or W in each package of said first plurality;

(4) subjecting each of said packages in said first plurality containing said perishable to the same given, known temperature and pressure over a known period of time; observing the quality, appearance and marketability of said respiring perishable in each of said packages after the gaseous atmosphere in each of said packages reaches equilibrium; and, based on these observations, determining which of said packages has optimum shelf life;

(5) repeating, as necessary, steps (3) and (4) with at least one additional plurality of packages, each of said additional packages having permeant factors different from the packages in said first plurality and different from the other packages in said additional plurality until an AQ value representing optimum shelf life for said perishable has been determined;

(6) from the atmosphere quotient values determined in steps (3), (4) and (5), deriving the equivalent permeant factors G for those packages which have optimum shelf life as determined in step (4), in accordance with the formula AQ equals G divided by R; and

(7) using said equivalent permeant factors G, preparing an

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optimum package containing said perishable from said packaging material by varying one or more of the variables A, P and/or W while maintaining said equivalent permeant factor G to achieve and maintain the optimum atmosphere shelf life for said perishable in said optimum package.

4,996,072

PHYSICAL PROCESS FOR THE DEODORIZATION AND/OR CHOLESTEROL REDUCTION OF FATS AND OILS

Steven S. Marschner, Minneapolis, Minn., and Jeffrey B. Fine, Harrisburg, Pa., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 20,613, Mar. 2, 1987, Pat. No. 4,804,555. This application Feb. 13, 1989, Ser. No. 310,536
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[5] A23D *5/00*; C11B *3/14*
U.S. Cl. 426—417 22 Claims

1. A method for deodorizing and/or reducing cholesterol level of fats and oils comprising the steps of:

A. providing an oil having a native cholesterol and/or odoriferous material level;

B. heating said oil to a temperature of about 400° to 550° F.;

C. flash vaporizing said heated oil to vaporize said oil or a portion thereof and at least a portion of the cholesterol and/or odoriferous materials to realize a par-treated oil liquid phase and a loaded vaporous phase and wherein the temperature is maintained at about 400° to 550° F.;

D. thin-film steam stripping the par-treated oil in a stripper having an evaporative surface at a pressure of about 1 to 7 mmHg with a countercurrent steam feed to strip a portion of the cholesterol and/or odoriferous material from said par-treated oil to provide a clean oil having a cholesterol content less than its native level and a loaded steam feed containing said stripped cholesterol and/or odoriferous material;

E. removing the loaded vaporous phase and the loaded steam feed; and

F. cooling the clean oil to a temperature of less than about 100° F.

4,996,073

METHOD AND COMPOSITION FOR REMOVING OXYGEN FROM SOLUTIONS CONTAINING ALCOHOLS AND/OR ACIDS

James C. Copeland, Ashland, Ohio; Howard I. Adler, Oak Ridge, and Weldon D. Crow, Knoxville, both of Tenn., assignors to Oxyrase, Inc., Ashland, Ohio

Filed Aug. 29, 1989, Ser. No. 399,870
Int. Cl.[5] C12G *1/00*; C12H *1/00*
U.S. Cl. 426—487 18 Claims

1. A method for removing oxygen from a food stuff or beverage solution containing alcohol comprising the steps of:

(a) providing a food stuff or beverage solution containing alcohol; and,

(b) adding to the solution a sufficient amount of oxygen scavenging membrane fragments to reduce the oxygen present in the solution to water.

4,996,074

TAILORED BETA-PRIME STABLE TRIGLYCERIDE HARDSTOCK

Paul Seiden, and Robert L. White, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 14, 1988, Ser. No. 270,314
Int. Cl.[5] A23D *9/00*
U.S. Cl. 426—601 29 Claims

1. A beta-prime stable tailored triglyceride hardstock comprising:

(a) from about 45% to about 98% 2-Stearoyldipalmitin (PSP) triglycerides;

(b) from about 2% to about 55% 1-Palmitoyldistearin (PSS) triglycerides;

(c) less than about 7% tripalmitin (PPP) triglycerides;

(d) less than about 7% tristearin (SSS) triglycerides;

(e) less than about 3% diglycerides;

(f) less than about 10% total PPP and SSS triglycerides; and

(g) less than about 10% of the fatty acids of the total triglycerides and diglycerides being unsaturated;

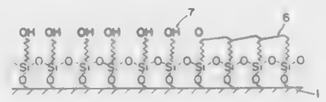
wherein P=palmitic acid and S=stearic acid.

4,996,075

METHOD FOR PRODUCING ULTRATHIN METAL FILM AND ULTRATHIN-THIN METAL PATTERN

Kazufumi Ogawa, Hirakata; Hideharu Tamura, Katano, and Norihisa Mino, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1988, Ser. No. 287,090
Claims priority, application Japan, Dec. 21, 1987, 62-323103; Sep. 28, 1988, 62-243008
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—12 15 Claims



1. A method for producing an ultrathin metal film which comprises:

a. depositing a monomolecular thin film having reactive groups capable of reacting with a metal salt to form a metal, on a substrate,

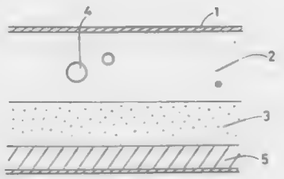
b. contacting the surface of said monomolecular thin film with a solution of said metal salt, whereby an ultrathin metal film is deposited on the surface of said thin film.

4,996,076

FILM FORMING METHOD

Toshiharu Nakaya; Satoru Nagahata, both of Osaka; Sakuichi Konishi, Nara, and Koichi Kuwano, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 24, 1989, Ser. No. 334,207
Claims priority, application Japan, Mar. 24, 1988, 63-71148
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 3 Claims



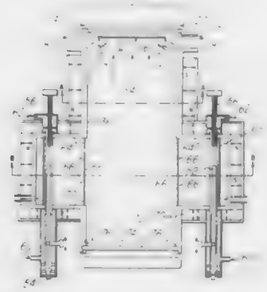
1. A method for forming a coating having a surface layer portion mainly composed of a water insoluble resin and a center portion mainly composed of a water soluble or dispersible resin on a hydrophobic surface of a substrate by using an aqueous coating composition characterized by subjecting a hydrophobic surface having a surface tension of 35 dyne or less to a dry surface treatment selected from a vacuum plasma treatment, a corona discharge treatment or an ozonization treatment, coating the thus-treated surface with a dispersion type aqueous coating composition varnish of at least one aqueous resin whose 1 wt. % deionized water solution has a surface tension of 51 dyne/cm or less and which has a water tolerance of 4 or more, and a water insoluble resin uniformly dispersed in fine particles in said varnish, said water insoluble resin having an SP value which is 1.0 to 2.2 lower than that of said aqueous resin, and baking the coating.

4,996,077

DISTRIBUTED ECR REMOTE PLASMA PROCESSING AND APPARATUS

Mehrdad M. Moslehi, and Steve S. Huang, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 7, 1988, Ser. No. 255,208
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 65 Claims



1. A distributed electron cyclotron resonance remote plasma processing apparatus, comprising:

(a) a processing chamber;

(b) a main transfer chamber in fluid communication with the processing chamber;

(c) a plurality of peripheral magnet bars substantially surrounding the main transfer chamber;

(d) a plurality of electron cyclotron resonance plasma formation regions peripherally distributed around the periphery of, remote from, and in fluid communication with the main transfer chamber; and

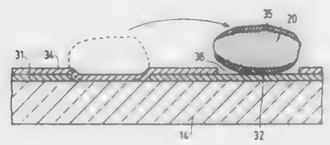
(e) a plurality of magnet bars substantially surrounding external surfaces of said plasma formation regions.

4,996,078

METHOD OF REMOVING PARTICLES FROM SUBSTRATE SURFACES

Horst-Christian Langowski, Hanover, Fed. Rep. of Germany, assignor to 501 Philips & Du Pont Optical Company, New York, N.Y.

Filed Jan. 26, 1990, Ser. No. 471,184
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902862
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 12 Claims



1. A method for the vacuum-coating of a substrate bearing adhering particles, said particles being of a size sufficient to cause holes, visible in transmission, to occur upon PVD coating of the particle-bearing substrate and displacement of said particles, said method comprising;

(a) introducing said particle-bearing substrate into a vacuum coating arrangement and providing, by a first PVD process in a vacuum a coating on said substrate and said adhering particles,

(b) displacing resultant coated particles form their initial positions while said substrate is in said vacuum coating arrangement and
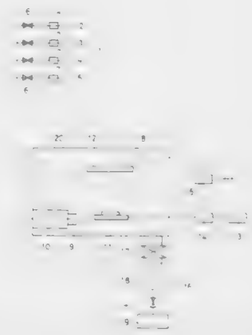
(c) providing an additional coating, on said substrate, of a thickness sufficient to cover any hole caused by particle displacement, by a second PVD process while said substrate is in said vacuum-coating arrangement.

4,996,079

METHOD OF DEPOSITING THIN FILMS CONSISTING MAINLY OF CARBON

Kenji Itoh, Zama, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1989, Ser. No. 311,845
Claims priority, application Japan, Feb. 26, 1988, 63-43414; Mar. 2, 1988, 63-50397
Int. Cl.[5] B05D *5/12*; C23C *16/26*, *16/50*
U.S. Cl. 427—39 10 Claims



1. A method for forming an amorphous carbon coating comprising the steps of:

placing an object in a reaction chamber;

introducing a reaction gas comprising carbon into said reaction chamber;

inputting an rf power to a pair of electrodes in order to decompose said reaction gas wherein said object is placed on one of said electrodes;

inputting a DC bias voltage to at least one of said pair of electrodes; and

depositing said amorphous coating on said object,

wherein said DC bias voltage is continuously changed in order that the hardness of said amorphous coating continuously changes with respect to the thickness of the coating.

4,996,080

PROCESS FOR COATING A PHOTORESIST COMPOSITION ONTO A SUBSTRATE

Ivan S. Daraktchiev, Louvain, Belgium, assignor to Olin Hunt Specialty Products Inc., Cheshire, Conn.

Filed Apr. 5, 1989, Ser. No. 333,519
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—57 18 Claims

1. A process for applying a film of uniform thickness of photoresist solids onto a substrate comprising the steps of:

(a) forming a liquid photoresist composition comprising photoresist solids in a solvent; the solids content of said

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photoresist composition being in the range from about 10% by weight to about 22% by weight;
(b) forming atomized spray droplets of said liquid photoresist composition;
(c) allowing said atomized spray droplets to settle by gravity onto a substrate surface, thereby forming a photoresist coating on that surface; and
(d) spinning said coated substrate at a pre-determined spin speed and for a pre-determined time to remove substantially all of said solvent from said photoresist coating and to form a film of uniform thickness of photoresist solids on the substrate.

4,996,081

METHOD OF FORMING MULTIPLE NITRIDE COATING ON SILICON

Joseph P. Ellul, 27 Burnbrook Crescent, Nepean, Ontario, Canada (K2H 9A6), and Sing P. Tay, 12 Vanessa Terrace, Nepean, Ontario, Canada (K2J 2J8)

Continuation of Ser. No. 693,490, Jan. 22, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 848,609
Int. Cl.[5] B05D *5/12*; C23C *16/30*
U.S. Cl. 427—96 15 Claims



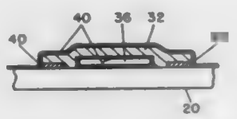
1. A method of forming a composite nitsinitride dielectric layer comprising in a first nitridation step, thermally growing a first silicon nitride layer on a silicon substrate, depositing a non-single crystal silicon layer on the silicon nitride, and, in a second nitridation step, thermally growing a second silicon nitride layer on the deposited silicon such that said first silicon nitride layer, said non-single crystal silicon layer and said second silicon nitride layer form a nitsinitride dielectric layer.

4,996,082

SEALED CAVITY SEMICONDUCTOR PRESSURE TRANSDUCERS AND METHOD OF PRODUCING THE SAME

Henry Guckel, and David W. Burns, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 174,821, Mar. 29, 1988, Pat. No. 4,853,669, which is a division of Ser. No. 855,806, Apr. 24, 1986, Pat. No. 4,744,863, which is a continuation-in-part of Ser. No. 727,909, Apr. 26, 1985, abandoned. This application May 11, 1989, Ser. No. 350,571
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—99 12 Claims



1. A method of sealing a structure on a substrate defined by a layer of material over a central cavity and at least one channel of a substantially lower height than the cavity which extend outwardly from the cavity to communication with the ambient atmosphere at peripheral positions, comprising: placing the structure in an ambient gas phase which can react to deposit solid material and reacting the gas phase to deposit solid material from the gas phase into the channels therein for a period of time sufficient to seal the channels with the deposited material so that atmospheric gases cannot enter or exit the cavity through the channels and such that the material from the gas phase trapped in the cavity is deposited on the walls of the cavity.

4,996,083

METHOD FOR DEPOSITION OF ELECTROCHROMIC LAYERS

Frank H. Moser, and Niall R. Lynam, both of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

Division of Ser. No. 16,663, Feb. 19, 1987, Pat. No. 4,855,161. This application Jun. 12, 1989, Ser. No. 365,216
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—108 47 Claims

1. A method for preparing transition metal coating solutions which are suitable for preparing electrochromic layers and the like, comprising:
forming a first solution by reacting an anhydrous halide for an electrochromically active transition metal with a C_1 to C_5 carbon anhydrous at 0 to 80 degrees C., and
blending in a coating solution, in alcohol, comprising about 5% to about 10% tetraethyl orthosilicate, the ratio of said tetraethyl orthosilicate coating solution to said solution being about 10:90 to about 75:25.

4,996,084

COLLOIDAL SILICA WATER BASED SLURRY SYSTEM FOR INVESTMENT CASTING SHELL BACKUP COATS

Ahmed A. Elkachouty, Wayne, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Jun. 30, 1989, Ser. No. 373,418
Int. Cl.[5] B05D *3/00*
U.S. Cl. 427—133 4 Claims

1. A water based slurry for use as a backup coat on a wax model utilized in the lost wax investment casting technique, the wax model having at least one prime coat, the water based slurry backup coat comprising a mixture of:
colloidal silica binder;
a latex glue;
ammonium alginate;
a wetting agent;
milled zircon;
tabular alumina; and
glass rock, said slurry having a viscosity of 10–14 sec. as measured by a #5 Zahn cup.

4. A method for coating a wax model to form a shell utilizable in a lost wax investment casting technique, comprising the steps of:
coating the wax model with at least one prime coat of a water based slurry containing a colloidal silica binder, milled zircon and tabular alumina;
covering said at least one prime coat with a stucco of alundum sand;
drying the at least one prime coat for at least four hours;
coating the dried prime coat with a first backup coat of a water based slurry having a viscosity of 10–14 sec. as measured by a #5 Zahn cup, and containing a colloidal silica binder, milled zircon, tabular alumina and glass rock;
drying the first backup coat for at least 5 hours;
covering at least the first backup coat with tabular alumina;
applying at least two additional backup coats of a water based slurry having a viscosity of 10–14 sec. as measured by a #5 Zahn cup, and containing a colloidal silica binder, milled zircon, tabular alumina and glass rock; and
covering a first of the at least two additional backup coats with tabular alumina, and allowing at least 5 hours drying time between the application of a second of the said at least two backup coats.

4,996,085

REPAIR COMPOSITION AND METHOD

G. Kelly Sievers, 1605 W. Magnolia Blvd., Burbank, Calif. 91506

Continuation of Ser. No. 74,955, Jul. 17, 1987, abandoned. This application Nov. 30, 1989, Ser. No. 443,448
Int. Cl.[5] B32B *35/00*
U.S. Cl. 427—140 8 Claims

8. Method of coating pumps, including applying to a pump surface to be coated a composition comprising a hardenable epoxy resin, a resin-reinforcing effective amount of reinforcing filler and a composition surface coefficient of friction reducing amount of a friction reducing agent comprising, fluorinated carbon, curing said composition in adhering relation to said surface, and finishing to a desired dimension.

4,996,086

METHOD FOR THE FABRICATION OF A MULTI-OVENABLE, RETORTABLE CONTAINER APPARATUS

Leonard E. Gerlowski; John R. Kastelic, both of Katy, and William H. Korcz, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1990, Ser. No. 488,930
Int. Cl.[5] B05D *1/18, 1/02*
U.S. Cl. 427—421 5 Claims

1. A process for the formation of a shelf stable, dimensionally heat stable, impact resistant, retortable, hot fillable container which is suitable for oven use, said process comprising the steps of:
providing a shaped first material layer having a first thickness formed from a linear alternating polymer of carbon monoxide, ethylene and propylene, which has the empirical formula,

$$[C{-}CH_2{-}CH_2]_x{-}[C{-}C_3H_6]_y$$

and
coating a copolymer of vinylidene chloride material on at least one side of said first material layer to form a cooperatively-shaped second material layer having a second thickness; wherein the first thickness of said first material layer and the second thickness of said second material layer are selected such that the water percent weight loss per year of any contents stored in said container is less than 3% per year.

4. The process of claim 1 wherein the step of coating said copolymer on at least one untreated side of said first material is done by impact spraying said copolymer on said first material layer.

4,996,087

PERSONALIZED ORNAMENT HAVING A DESIGN OUTLINE

Roland B. Rebstock, 1642 Nie Parkway, New Orleans, La. 70114

Filed Jul. 11, 1989, Ser. No. 378,316
Int. Cl.[5] A47G *33/08*
U.S. Cl. 428—11 3 Claims



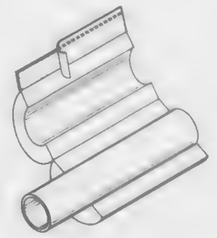
1. A decorative ornament, comprising:
a core having a smooth exterior surface and a coating suitable for receiving a multi-color drawing;
an indicia disposed upon said coating, said indicia including a one-color outline of a design imprinted on said coating, a non-colored space within the outline forming coloring space for subsequent coloring by an individual.

4,996,088

STORAGE STABLE ADHESIVE AND ITS LAMINATES

Gerald H. Knittel, Brecksville; Stanley D. Smith, Northfield; Richard C. Spector, Akron, and Jack M. McClintock, Stow, all of Ohio, assignors to Morgan Adhesives Co., Stow, Ohio

Filed Sep. 26, 1988, Ser. No. 249,119
Int. Cl.[5] A61F *13/02*
U.S. Cl. 428—40 6 Claims



1. A laminate comprising two surfaces spaced apart by an adhesive composition and held in that relationship by a bond between said surfaces and said adhesive, which comprises a mixture on a weight basis of an acrylic adhesive composition, 1 to 10 percent of an organic tin compound and 1 to 10 percent of an organic silicone of the formula



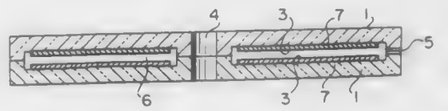
where R^1 and R are alkyl, cycloalkyl and aryl groups with the proviso that R^1 and R groups can be the same or different and N has a value of about 10 to 10,000.

4,996,089

OPTICAL DATA RECORDING MEDIUM

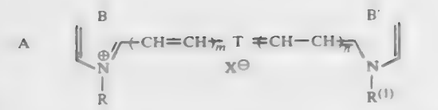
Osamu Saito, Takatsuki; Hisamitsu Kamezaki; Masashi Suenaga, both of Ibaraki; Ryo Nagai, Hirakata; Shinichiro Iuchi, Ibaraki; Hitoshi Watanabe, Ibaraki, and Hideo Fujiwara, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 17, 1989, Ser. No. 380,295
Claims priority, application Japan, Jul. 18, 1988, 63-177138; Jul. 23, 1988, 63-182793; Mar. 23, 1989, 1-69265
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 16 Claims

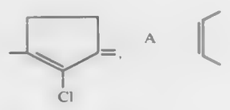


1. An optical data recording medium, comprising a recording layer containing an organic dye, wherein said organic dye has the following formula:

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wherein is a carbon chain or ring to form a methyne chain, composed of —CH=CH—CH= or

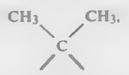


may be equal to or different from



and at least one represents a benzene ring or monochlorobenzene ring,

B may be equal to or different from B' and at least one represents



R may be equal to or different from R(1), in which each represents CH_3, C_2H_5, C_3H_7, C_5H_7 or C_5H_{11},

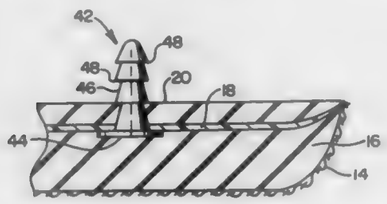
m and n each represents 0 or an integer of from 1 to 3, respectively, and have a relationship of $m+n \leqq 3$, associated with an anion selected from hexafluoro-phosphate ion (PF_6-), trifluoromethane sulfonate ion (CF_3SO_3-) or thiocyanate ion (SCN—), as the anion in an indol cyanine dye having a methyne chain.

4,996,090

DOOR PANEL

David M. Steinke, Baltimore; Michael Blankenship, Pataskala; Marshall G. Satterfield, Johnstown, and Philip D. Gardner, Sr., Findlay, all of Ohio, assignors to Process Bonding, Inc., Johnstown, Ohio

Filed Nov. 20, 1989, Ser. No. 439,172
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—71 20 Claims



1. A composite panel comprising, a series of layers bonded together having two faces and an edge periphery,

one face comprising a layer of decorative material, said one face being substantially planar except adjacent said periphery, adjacent said periphery said decorative material curving toward a second face to define a convex surface terminating at said periphery,

said decorative material being bonded to one side of a first foamed resin layer by an adhesive impregnating said foam, said foam being open celled and the adhesive being cured to fill the open cells,

the other side of said first foamed resin layer being bonded to a fiber glass layer,

said fiber glass layer being bonded to a second open celled foamed layer,

means adhered to said composite panel for connecting the panel to a substrate and

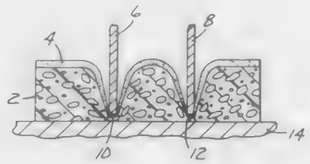
the periphery of said panel being compressed to a minimal thickness with the decorative material terminating substantially at said second face.

4,996,091

PRODUCT COMPRISING SUBSTRATE BEARING CONTINUOUS EXTRUDED FIBER FORMING RANDOM CRISSCROSS PATTERN LAYER

Frederic S. McIntyre, Wellesley, Mass., assignor to Acumeter Laboratories, Inc., Marlboro, Mass.

Division of Ser. No. 198,689, May 24, 1988, Pat. No. 4,891,249, which is a continuation of Ser. No. 36,254, May 26, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 278,712
Int. Cl.[5] B32B *5/08*
U.S. Cl. 428—113 10 Claims



1. A product having a substrate upon which a single continuous fiber has been extruded in a random nondescript laterally criss-cross pattern layer at each of selected regions thereof.

4,996,092

SHAPED FOAM

David J. Francis, and David R. Bastow, both of Atherstone, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 5, 1990, Ser. No. 475,116
Claims priority, application United Kingdom, Feb. 20, 1989, 8903779; Oct. 20, 1989, 8924121
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—157 24 Claims

1. A foam article formed of a cold-weldable foam, the article being in the form of an elongate strip comprising a curved surface, the strip having at least one welded seam along its longitudinal length which maintains the configuration of the curved surface.

4,996,093

THERMAL TRANSFER RECORDING MEDIUM

Kunihiro Koshizuka; Takao Abe; Tatsuichi Machashi, and Yoshihiro Inaba, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 49,042, May 8, 1987, abandoned, which is a continuation of Ser. No. 792,260, Oct. 28, 1985, abandoned. This application Dec. 7, 1989, Ser. No. 449,246
Claims priority, application Japan, Nov. 6, 1984, 59-232424; Nov. 6, 1984, 59-232425
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—212 16 Claims



1. A thermal transfer recording medium comprising a support and on said support:

(a) two coloring agent layers disposed successively on said support; or

(b) said two coloring agent layers with an intermediate layer positioned between said support and the coloring agent layer closest to said support; or

(c) said two coloring agent layers with an intermediate layer positioned between said coloring agent layers;

a first of said coloring agent layers containing a first heat-fusible wax selected from the group consisting of animal wax, plant wax, mineral wax, petroleum wax, and synthetic hydrocarbon wax and an adjacent layer to said first of said coloring agent layers containing a second heat-fusible substance which is immiscible with said first heat-fusible wax, said adjacent layer being (i) a second said coloring agent layer or (ii) said intermediate layer.

4,996,094

ONE-SIDED CLING/ONE-SIDED SLIP STRETCH WRAP FILMS

William M. Dutt, Pittsford, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 26, 1988, Ser. No. 249,525
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—212 18 Claims

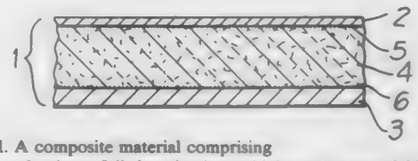
1. In a stretch wrap film having one cling surface and one noncling surface, the noncling surface capable of providing a slip property exhibited when the noncling surface is in contact with a like surface of itself with relative motion therebetween, the improvement comprising at least one region positioned between the cling and noncling surfaces of the film, said region being of a polyolefin material selected to provide barrier properties sufficient to maintain the cling and noncling properties of the cling and noncling surfaces.

4,996,095

COMPOSITE MATERIAL OF ALUMINUM AND GLASS FIBER MAT, METHOD FOR ITS PRODUCTION, AND METHOD FOR UTILIZATION AS INSULATOR FOR VEHICLES

Hans Behdorf, Alfter; Thomas Singe, Swisttal, and Gerhardt Söllner, St. Augustin, all of Fed. Rep. of Germany, assignors to Vereinigte Aluminum Werke A.G., Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,681
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721715; Jul. 1, 1987, 3721717
Int. Cl.[5] B32B *7/02, 15/08*
U.S. Cl. 428—215 13 Claims



1. A composite material comprising

an aluminum foil sheet having a thickness between 0.05 and 0.25 mm,

a fiberglass mat having a thickness of between 3 and 10 mm joined to one side of said foil by a bonding agent, and

an aluminum sheet having a thickness of between 0.4 and 0.8 mm joined to the other side of said glass mat by said bonding agent,

said bonding agent comprising a heat sealing lacquer comprising an ionomer resin layer having a weight of between 3 and 13 grams per square meter and

said composite material being flexible and deformable.

4,996,096

COEXTRUDED MATTE FILM

Jimmy S. Dew, Union City, Calif., assignor to James River II, Inc., Oakland, Calif.

Filed Oct. 17, 1988, Ser. No. 259,547
Int. Cl.[5] B32B *27/08*
U.S. Cl. 428—216 7 Claims

1. In a coextruded film having a nonembossed matte surface layer having a gloss of less than ten percent, the improvement wherein the matte surface layer consists essentially of a blend of from about ten to forty percent polyisobutylene, fifty to ninety percent high density polyethylene, and zero to forty percent propylene homopolymer, the polyisobutylene having a molecular weight of at least 50,000, and the matte surface layer has a coefficient of friction with itself of between about 0.2 and 0.7.

4,996,097

HIGH CAPACITANCE LAMINATES

Paul Fischer, Wilmington, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Mar. 16, 1989, Ser. No. 324,832
Int. Cl.[5] B32B *27/00, 27/32*
U.S. Cl. 428—220 7 Claims

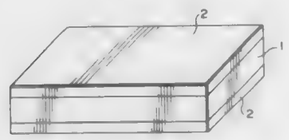
1. A laminate comprising:

(a) a thin film of filled polytetrafluoroethylene that:

1. contains 25–85 volume percent particulate filler having a high dielectric constant,

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2. has a film thickness of between 0.0001 and 0.005 inches,
3. is substantially free of visual pinholes, and
4. has a matrix tensile strength of at least 2600 psi, and



(b) a film of conductive metal attached to at least one side of the film defined in Part (a).

4,996,098

COATED CATION EXCHANGE FABRIC AND PROCESS

Stephen A. Perusich, Newark, and James T. Keating, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1989, Ser. No. 316,635
Int. Cl.[5] B05D *3/06, 3/10;* C25B *1/16, 11/20;* D06M *14/10, 14/28, 15/256, 101/22*
U.S. Cl. 428—229 22 Claims

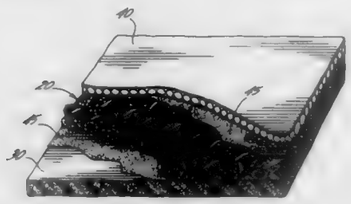
1. A cation exchange fabric comprising:
(a) a fabric base comprising interengaged yarns of a hydrolyzed fluorinated cation exchange copolymer having a mole ratio of non-functional to functional monomer of about 2.8–11.8:1 oriented at least 1× and
(b) coating on at least one surface of the fabric base or on the surface of the individual yarns comprising the fabric base, or peripheral surface areas of the yarns comprising the fabric base having been superficially converted to melt-processible form prior to their being made into the fabric base, said coating or peripheral areas comprising a melt-fabricable form of a fluorinated cation exchange copolymer having a mole ratio of non-functional:functional monomer differing from that of the fabric base copolymer by no more than 3 units.

4,996,099

FIRE-RESISTANT FABRIC

William M. Cooke, Charlotte, N.C.; James E. Hendrix, Spartanburg, and Thomas W. Tolbert, Fort Mill, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Oct. 27, 1989, Ser. No. 427,738
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—245 6 Claims



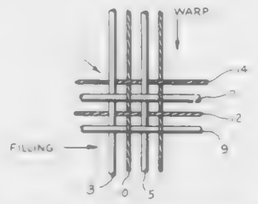
1. A fire-resistant laminate comprising an underlying flammable layer and a flame barrier fabric overlying said underlying flammable layer, said flame barrier fabric comprising a flame durable textile fabric substrate formed of corespun yarns, said yarns comprising a core of a flame resistant fiber and a sheath of modacrylic intumescent staple fibers which swell and form a char on exposure to flame.

4,996,100

FABRIC OF MIXED YARNS

N. Ronald Druckman, 4 Woodbridge Cir., Evans, Ga. 30809

Filed Feb. 13, 1989, Ser. No. 310,302
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—259 6 Claims



1. A woven fabric comprising alternating warp yarns of a hard and a soft yarn; and
alternating filling yarns of a hard and a soft yarn;
said soft yarn being selected from the group consisting of acrylic fibers, polypropylene yarns, polyethylene and polyester.

4,996,101

PROCESSIBLE POLYIMIDE BLENDS

Abraham L. Landis, Northridge, and Kreisler S. Y. Lau, Alhambra, both of Calif., assignors to Lockheed Corporation, Calabassas, Calif.

Filed Aug. 8, 1988, Ser. No. 229,584
Int. Cl.[5] B32B *27/04;* D03D *3/00*
U.S. Cl. 428—272 39 Claims

1. In the process of making a semi-interpenetrating polyimide network wherein a linear polymer is combined and blended with ac ross-linkable oligomer and the resulting blend is cured, the improvement wherein the linear polymer comprises a thermoplastic polyisoimide and the cross-linkable oligomer comprises a thermosetting imide or isoimide oligomer having unsaturated terminal groups.

4,996,102

COMPOSITE NON-WOVEN FABRIC MATERIAL

Hirofumi Kyutoku, Ikoma; Hiroyuki Matsuoka, Mie, and Yoshihisa Otani, Himeji, all of Japan, assignors to Osaka Gas Company, Limited, Osaku, Japan

Filed Jun. 27, 1989, Ser. No. 371,752
Claims priority, application Japan, Jun. 30, 1988, 63-164298
Int. Cl.[5] B32B *15/00*
U.S. Cl. 428—285 21 Claims



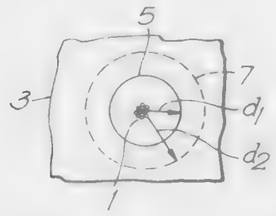
1. A composite non-woven fiber material comprising at least one stainless steel fiber layer and at least one carbon fiber layer, said at least one stainless steel fiber layer and said at least one carbon fiber layer being alternately intimately interlocked to form integrated composite material, at least one surface layer of said integrated composite material being a stainless steel fiber layer.

4,996,103

COMPOSITE ELEMENTS HAVING IMPROVED RESISTANCE AGAINST STRESS CRACKING CORROSION, MOST PREFERABLY FOR LOW TEMPERATURE HOUSING COMPARTMENTS

Rolf Henn, 7 Adolf-Engelhardt-Strasse, 6900 Heidelberg, and Reinhard Leppkes, 2 Eschkopfstrasse, 6712 Bobenheim-Roxheim, both of Fed. Rep. of Germany

Filed Mar. 30, 1990, Ser. No. 502,189
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—305.5 10 Claims



1. Composite elements having improved resistance against stress cracking corrosion, comprising:
(A) at least one top layer of polystyrene; and
(B) a layer of polyurethane foam, wherein the polyurethane foam is prepared while using difluorochloromethane as a blowing agent.

4,996,104

TEMPERATURE-SENSITIVE MATERIALS AND DEVICES

Beatrice M. Nicholas, Tring; Alan Mosley, Berkhamsted; Cyril Hilsum, Pinner, and Michael G. Clark, Gerrards Cross, all of England, assignors to The General Electric Company, p.l.c., England

Continuation of Ser. No. 61,701, Jun. 12, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 327,559
Claims priority, application United Kingdom, Jun. 18, 1986, 8614839
Int. Cl.[5] G01K *11/06*
U.S. Cl. 428—323 18 Claims

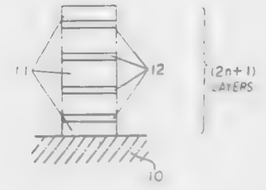
1. A temperature-sensitive device for monitoring a commodity to determine whether a total amount of time during which the commodity has been subjected to a temperature exceeding a predetermined temperature value is greater than an acceptable amount, the device comprising: a support member on which is deposited by printing at a first position a quantity of fracturable microcapsules containing a temperature-sensitive colored first medium which has a liquid state above said predetermined temperature value and which changes to a solid state at said predetermined temperature value; said microcapsules being fracturable while the medium is at a temperature above said predetermined temperature value to activate said device so that said colored first medium flows across the support member by a first distance forming a colored region having a size which is dependent upon a period of time elapsing between activation of the device and reduction of the temperature of the commodity below said predetermined value; said first medium responding to any subsequent rise in temperature above said predetermined temperature value by flowing further across said support member, thereby enlarging the colored region, which region provides a permanent irreversible indication as to whether said acceptable total amount of time has been exceeded.

4,996,105

TRANSPARENT LAMINATED PRODUCT

Takuji Oyama; Koichi Suzuki, and Mamoru Mizuhashi, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 125,236, Nov. 25, 1987, Pat. No. 4,859,532. This application Jul. 11, 1989, Ser. No. 377,953
Claims priority, application Japan, Nov. 27, 1986, 61-280644; Nov. 27, 1986, 61-280645; Nov. 27, 1986, 61-280646
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—336 2 Claims



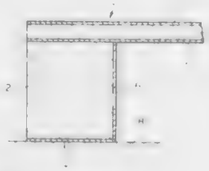
1. A transparent laminated product comprising a transparent substrate and a 5-layered transparent coating composed of a first transparent oxide layer formed on the substrate, a second Ag layer formed on the first transparent oxide layer, a third first transparent oxide layer formed on the second layer, a fourth Ag layer formed on the third transparent oxide layer and a fifth transparent oxide layer formed on the fourth layer, and having a visible ray transmission of at least 60%, wherein the thickness of each Ag layer is from 60 to 250 Å, and each transparent oxide layer comprises a material selected from the group consisting of SnO_2, $Sn_{1-x}Zn_xO_y$, and TiO_2.

4,996,106

PELLICLE

Hiroaki Nakagawa, Iwakuni, and Hitomi Matsuzaki, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,380
Claims priority, application Japan, Nov. 5, 1987, 62-279627
Int. Cl.[5] B32B *7/12, 27/32*
U.S. Cl. 428—343 2 Claims



1. A pellicle comprising:
(a) a pellicle frame:
(b) a transparent pellicle film spread on one side face of said pellicle frame, said pellicle film having a refractive index, said pellicle film having an inner side face and an outer side face; and
(c) a tacky substance layer formed on said inner side face of said pellicle film, said tacky substance layer composed of tacky polyfluoro (meth)acrylate having a fluorine content of 50% by weight or more, having a high light transmittance and having a refractive index not higher than that of said pellicle film.

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4,996,107

INK RESERVOIR CONTAINING MODIFIED POLYESTER FIBERS

Peter W. Raynolds, and Shriram Bagrodia, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 299,904, Jan. 23, 1989, Pat. No. 4,954,398, which is a division of Ser. No. 157,551, Feb. 16, 1988, Pat. No. 4,842,792. This application Jan. 29, 1990, Ser. No. 471,444

Int. Cl.[5] B32B *3/30*; B34K *5/02*; D02G *3/00*

U.S. Cl. 428—400 16 Claims



1. An ink reservoir for use with a writing instrument comprising a plurality of fibers wherein one or more individual fibers of said plurality of fibers is a fiber comprising a polyester material wherein said fiber has formed therein and extending along the length thereof at least one continuous groove, wherein the mean EB Roughness at the bottom of said groove is about 10% to about 600% higher than the mean EB Roughness outside said groove and the EB Roughness outside said groove is about 0.06μto about 0.20μ, and wherein said fiber has $L_1/L_2 > 1.2$, where L_1 and L_2 are the respective major and minor axes of the cross-section.

4,996,108

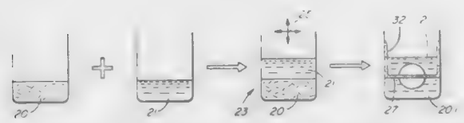
SHEETS OF TRANSITION METAL DICHALCOGENIDES

W. M. Ranjith Divigalpitiya; Robert F. Frindt, both of Vancouver, and S. Roy Morrison, Burnaby, all of Canada, assignors to Simon Fraser University, Burnaby, Canada

Filed Jan. 17, 1989, Ser. No. 297,464

Int. Cl.[5] B05D *1/18*

U.S. Cl. 428—411.1 26 Claims



1. A process for forming sheet-like compositions of the formula:

$MX_2{:}Y$

wherein MX_2 is a layer-type transition metal dichalcogenide, M is a metal selected from the group consisting of niobium, tantalum, molybdenum and tungsten, X is a chalcogen selected from the group consisting of sulfur and selenium and Y is a material located between layers of MX_2, which comprises the steps of:

(a) forming a suspension of MX_2 in a body of water;

(b) adding a non-metallic liquid which is immiscible with water to the suspension;

(c) agitating the mixture to form a temporary emulsion;

(d) allowing the emulsion to rest until the water and the immiscible liquid separate with an interface therebetween and a sheet-like composition of $MX_2{:}Y$ forms at said interface.

4,996,109

HARD FOAM CORES FOR LAMINATES

Manfred Krieg, Darmstadt; Norbert Rau, Sulzbach, and Werner Ude, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,931

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 3826469

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—304.4 9 Claims

1. A rigid foamed polymethacrylimide synthetic resin comprising from 0.1 to 10 percent by weight of electrically conductive particles.

9. A laminate comprising a core layer of a rigid foamed polymethacrylimide synthetic resin as in claim 1 and at least one further layer bonded to at least one side of said core layer.

4,996,110

WHITE BOARD

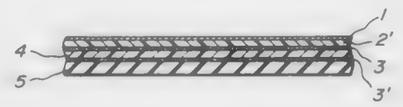
Itsuo Tanuma, Sayama; Hiromi Otsuru, and Toshio Honda, both of Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 897,951

Claims priority, application Japan, Sep. 20, 1985, 60-206644

Int. Cl.[5] B43L *1/00*

U.S. Cl. 428—343 7 Claims



1. A white board comprising; a front surface layer composed of a colored polyester film having undergone a hard coat treatment to provide a hard coat layer and, a rear surface layer composed of a magnetic sheet comprising a magnet in which a magnetic pressure sensitive adhesive composed of a pressure sensitive adhesive composition containing a ferromagnetic material is formed in a sheet, wherein said hard coat treatment is a treatment by which a surface of said transparent polyester film is treated with a hard coat treating agent consisting essentially of polysiloxane.

4,996,111

PROCESS FOR THE PRODUCTION OF A SOLDER COATING ON METALLIZED MATERIALS

Tha Do-Thoi, Röthenbach, and Klaus Popp, Nürnberg, both of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 382,892, Jul. 20, 1989. This application Jan. 12, 1990, Ser. No. 464,021

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1988, 3824900

Int. Cl.[5] B32B *15/00*

U.S. Cl. 428—432 7 Claims

1. A metallized ceramic part with an applied hard solder layer comprising a ceramic body on which there are successively located

(a) a thin metallizing layer of titanium, molybdenum or tungsten,

(b) a first layer selected from the group consisting of a layer of nickel or copper having a thickness of 0.5 to 5 μm and a layer of silver having a thickness of 1 to 70 μm, followed by

(c) at least one further layer of copper or silver having a thickness of 1–70 μm and having good adhesion, wherein the layers positioned side-by-side comprise in each case different metals, the layers located on the metallizing layer have a total layer thickness of 15–150 μm and the total amount of silver/copper is in the ratio 5:100 to 100:0.

4,996,112

STORAGE-STABLE ORGANOPOLYSILOXANE COMPOSITIONS MOISTURE-CURABLE INTO ELASTOMERIC STATE

Patrice Perrin, Lyons, and Andre Pierron, Lozanne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 7, 1989, Ser. No. 334,691

Claims priority, application France, Apr. 7, 1988, 88 04849

Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—447 12 Claims

1. An organopolysiloxane composition of matter that is storage-stable under anhydrous conditions, but curable into elastomeric state in the presence of moisture, which comprises

(A) 100 parts by weight of at least on α, ω-dihydroxy-diorganopolysiloxane polymer having a viscosity of 700 to 1,000,000 mPa.s at 25° C., comprising recurring diorganosiloxy structural units of the formula T_2Sio, in which the T radicals, which may be identical or different, are hydrocarbon radicals having from 1 to 10 carbon atoms, at least 50% of the number of such T radicals being methyl radicals;

(B) 0.5 to 20 parts by weight of at least one crosslinking agent comprising at least one ketiminoxysilane;

(C) 0.1 to 10 parts by weight of a bonding agent comprising admixture, or interreaction product of:

(i) an aminoorganosilicon compound C_1 bearing at least one amino functional group and comprising a primary amine substituent; and

(ii) an organosilicon compound C_2 bearing at least one epoxy functional group and having from 4 to 20 carbon atoms, in a ratio of 0.5 to 4 gram-equivalents of primary amino group in C_1 per one gram-equivalent of epoxy functional group in C_2;

(D) 5 to 250 parts by weight of inorganic filler material; and

(E) 0.0004 to 3 parts by weight of a metal curring catalyst.

4,996,113

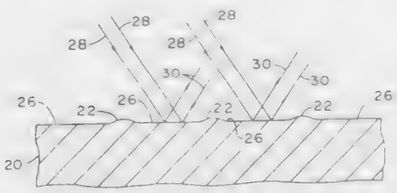
BRIGHTNESS ENHANCEMENT WITH TEXTURED ROLL

Louis G. Hector, Monroeville, and Shen S. Sheu, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 24, 1989, Ser. No. 342,300

Int. Cl.[5] B21D *53/00*; B21B *27/02*; B23K *26/00*

U.S. Cl. 428—600 28 Claims



1. In a method of rolling material between rotating rolls utilizing a lubricant and having an anisotropic working surface on at least one roll which comprises a topography of smooth bearing areas that roll the material under boundary lubrication conditions, said bearing areas being spaced apart by at least one micron size groove extending around and along the surface of the roll in the general direction of rolling to receive and conduct lubricant therealong, the method comprising:

polishing the working surface of said roll to a mirror finish before the groove is provided in the working surface of said roll,

providing said groove in said working surface,

removing material deposits from the working surface and banks of the groove by a second polishing operation without disturbing the topography of the groove,

coating the working surface and groove with a hard, dense material,

directing the material through the rotating rolls,

compressing the material between said rolls, and

imparting a reverse topography corresponding to the one roll to one surface of a product rolled from said material by said rolls.

4,996,114

ABRASION-RESISTANT COATING

David S. Darrow, Portville, N.Y., assignor to The Dexter Corporation, Windsor Locks, Conn.

Division of Ser. No. 231,155, Aug. 11, 1988. This application Jun. 13, 1989, Ser. No. 365,657

Int. Cl.[5] B05D *1/06*

U.S. Cl. 428—610 3 Claims

1. A process for preparing a coated substance comprising the steps of

applying a coating comprising abrasion-resistant particles protruding from the surface of a metal matrix to a substrate under conditions sufficient to bond said coating to said substrate; and

hardening said surface of said metal matrix surrounding said particles by treating said surface to form a boride, carbide, nitride, or carbonitride of said metal.

4,996,115

COMPOSITE STRUCTURE

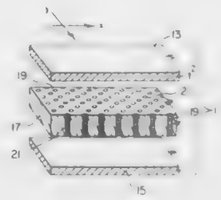
Thijs Eerkes, Oakville; Carlos M. Diaz, Mississauga, and James A. E. Bell, Oakville, all of Canada, assignors to Inco Limited, Toronto, Canada

Continuation-in-part of Ser. No. 462,624, Dec. 20, 1989, abandoned. This application Apr. 2, 1990, Ser. No. 502,990

Claims priority, application Canada, Dec. 23, 1988, 587036

Int. Cl.[5] B32B *3/24*, *15/20*

U.S. Cl. 428—614 4 Claims



1. A composite structure having a linear thermal coefficient of expansion of about 5 to 12 ppm/°C. and comprising a thin metallic body extended in at least one of width or length comprising two outer layers of metal of high electrical and heat conductivity sandwiching a thin, coextensive inner layer of low coefficient of thermal expansion metal, said inner layer having a multiplicity of essentially uniformly distributed paths of said metal of high electrical and heat conductivity extending therethrough and connected to and integral with said two outer layers of said metal of high electrical and heat conductivity, said composite structure being so constructed and arranged that

(A) the paths of said metal of high electrical and heat conductivity through said inner layer comprise about 15 to 40 volume percent of said inner layer,

(B) the thicknesses of said outer layers of said metal of high electrical and heat conductivity (K) being controlled to provide thermal and electrical conductivity along said length and breadth (x—y) of said composite related to said conductivities across the thickness of (z) said composite such that

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$$\frac{K_{x-y}}{K_z} = 0.9 \text{ to } 2.0 \text{ and}$$

(C) the overall volume fraction of said metal of high electrical and heat conductivity in said composite is such to provide a linear coefficient of thermal expansion within the aforesaid range,

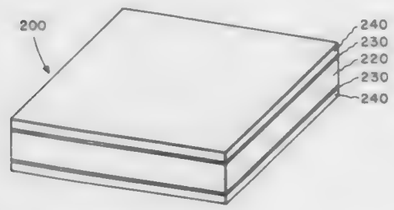
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4,996,116

ENHANCED DIRECT BOND STRUCTURE

Harold F. Webster, Scotia; Constantine A. Neugebauer, and James F. Burgess, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1989, Ser. No. 454,547
Int. Cl.[5] B32B *15/00, 15/04*
U.S. Cl. 428—627 **49 Claims**



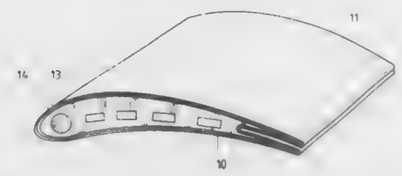
1. In combination:
a substrate;
a eutectic/substrate-wetting enhancement layer selected from the group consisting of platinum, palladium, gold and platinum, palladium or gold containing mixtures or alloys adhered to said substrate;
a metal-metal compound eutectic selected from the group consisting of copper-copper oxide, nickel-nickel oxide, cobalt-cobalt oxide, iron-iron oxide and copper-copper sulfide bonded to said eutectic/substrate-wetting enhancement layer.

4,996,117

HIGH TEMPERATURE PROTECTIVE COATING

Wing F. Chu, Leimen, and Franz J. Rohr, Absteinach, both of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft, Brown, Boveri & Cie, Baden, Switzerland

Continuation of Ser. No. 183,388, Apr. 13, 1988, abandoned, which is a continuation of Ser. No. 939,565, Dec. 9, 1986, abandoned. This application Sep. 25, 1989, Ser. No. 412,583
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543802
Int. Cl.[5] B32B *18/00;* **C04B** *35/48*
U.S. Cl. 428—633 **4 Claims**



1. A structural component consisting essentially of a super alloy having a high temperature protective coating, said coating, essentially consists of a ceramic material of 93–42 mole % of the oxide of zirconium, mixed with 2–8 mole % of yttrium oxide, for forming a stabilized zirconium oxide crystal combination, said combination, additionally being mixed with 5–50 mole % of zirconium silicate, said mixture being ground and sintered at a temperature between 1450° C. and 1500° C. to form a corrosion-resistant envelope around the stabilized zirconium oxide crystals and coated onto said super alloy substrate.

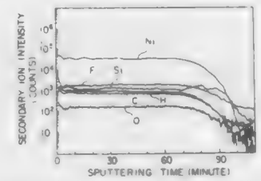
4. A structural component consisting essentially of a super alloy having a high temperature protective coating, essentially consisting of a ceramic material of 92–55 mole % zirconium oxide, mixed with 3–15 mole % of magnesium oxide, for forming a stabilized zirconium oxide and magnesium oxide combination, said combination being additionally mixed with an amount of corrosion-resistant aluminum titanate, wherein the amount of Al_2O_3 is between 3 and 18 mole % and the amount of TiO_2 is between 2 and 12 mole %, and being sufficient to impart corrosion resistance to said combination said mixture being ground and sintered at a temperature between 1450° C. and 1500° C. to form a corrosion-resistant envelope substantially surrounding said stabilized zirconium oxide combination and coated onto said super alloy substrate.

4,996,118

COMPOSITE METAL PLATED ARTICLE EXCELLENT IN MOLD-RELEASABILITY

Akiyoshi Okado; Masaki Abe; Hiroshi Kagechika, and Shinichi Kagaya, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed May 25, 1990, Ser. No. 528,935
Claims priority, application Japan, Jun. 22, 1989, 1-159892
Int. Cl.[5] B32B *15/00, 15/01, 15/04*
U.S. Cl. 428—639 **7 Claims**



1. In a composite metal plated article excellent in mold-releasability, which comprises an article to be plated and a composite metal plating layer, formed on at least one surface of said article to be plated, in which particles of a synthetic resin as a mold-releasing agent are uniformly dispersed,
the improvement characterized in that:
said synthetic resin comprises a modified silicone oil having a structure in which a plurality of repeated units of a fluorine atoms substituted olefin are combined with silicone oil.

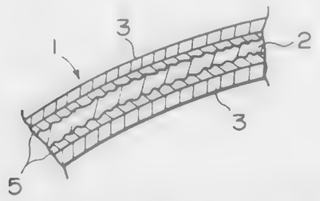
4,996,119

SPEAKER CONE PLATE AND METHOD OF FORMING

Yutaka Mae; Yoichi Yaguchi, both of Tokyo, and Masakatsu Sakamoto, Hachiohji, all of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Continuation-in-part of Ser. No. 129,910, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 768,342, Aug. 22, 1985, abandoned. This application Mar. 17, 1989, Ser. No. 325,040
Claims priority, application Japan, Aug. 27, 1984, 59-176599; Aug. 27, 1984, 59-176600
Int. Cl.[5] B32B *15/04;* **G10K** *13/00;* **B29C** *43/10;* **B05D** *3/02*
U.S. Cl. 428—469 **8 Claims**

1. A speaker diaphragm comprising a laminate treated by a hot isostatic press, including an inorganic surfacial hard layer on at least one face of a metal diaphragm substrate which has a higher density and a higher resultant effective ratio of E/ρ than would an unpressurized and unheated laminate composition, wherein said inorganic surfacial hard layer is selected from the group consisting of carbides, borides, or phosphides and is reinforced together with said metal diaphragm substrate by hot isostatic pressing; said surfacial hard layer being formed



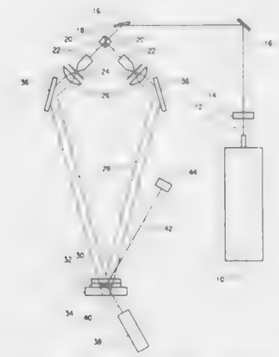
on said metal diaphragm substrate by plasma thermal spraying of an inorganic material, said inorganic material containing whiskers of silicon nitride or silicon carbide.

4,996,120

HOLOGRAPHIC PHOTOPOLYMER COMPOSITIONS AND ELEMENTS CONTAINING A RING-OPENING MONOMER

William K. Smothers, Hockessin; Bruce M. Monroe, and Dominic M. Chan, both of Wilmington, all of Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 291,582, Dec. 19, 1988. This application May 16, 1990, Ser. No. 524,228
Int. Cl.[5] G03H *1/04*
U.S. Cl. 430—2 **29 Claims**



1. A substantially solid composition that contains a volume reflection hologram formed by exposing to actinic radiation a composition consisting essentially of:
(a) 25 to 75% of a solvent soluble, thermoplastic polymeric binder;
(b) 5 to 60% of a monomer capable of addition polymerization, said monomer having a boiling point above 100° C. and polymerizing via free radical ring-opening sigma-bond cleavage; and
(c) 0.1 to 10% of a photoinitiator system that activates free radical polymerization of said monomer on exposure to actinic radiation;
wherein said percentages are weight percentages of the total composition.

16. An element comprising a substrate that supports a volume reflection hologram formed by exposing to actinic radiation a substantially solid, photopolymerizable composition consisting essentially of:
(a) 25 to 75% of a solvent soluble, thermoplastic polymeric binder;
(b) 5 to 60% of a monomer capable of addition polymerization, said monomer having a boiling point above 100° C. and polymerizing via free radical ring-opening sigma-bond cleavage; and
(c) up to 25% of a plasticizer; and
(d) 0.1 to 10% of a photoinitiator system that activates free radical polymerization of said monomer on exposure to actinic radiation;
wherein said percentages are weight percentages of the total composition.

4,996,121

ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR CONTAINING RESIN HAVING HYDROXY GROUP FORMING FUNCTIONAL GROUP

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 4, 1989, Ser. No. 293,400
Claims priority, application Japan, Jan. 6, 1988, 63-265; Jan. 27, 1988, 63-14577
Int. Cl.[5] G03G *5/087*
U.S. Cl. 430—87 **10 Claims**

1. An electrophotographic lithographic printing plate precursor comprising a conductive support having provided thereon at least one photoconductive layer containing photoconductive zinc oxide and a resin binder, wherein said resin binder comprises at least one resin (A) containing at least one functional group capable of forming at least one hydroxyl group upon decomposition by treatment with an oil-desensitizing solution or dampening water and at least one member selected from group (B) consisting of a heat- and/or photo-curable resin (B) and a crosslinking agent (B).

4,996,122

METHOD OF FORMING RESIST PATTERN AND THERMALLY STABLE AND HIGHLY RESOLVED RESIST PATTERN

Richard M. Lazarus, Mission Viejo; Edward J. Reardon, Laguna Niguel, Calif., and Sunit S. Dixit, Mission Viejo, all of Calif., assignors to Morton International, Inc., Chicago, Ill.

Division of Ser. No. 376,971, Jul. 6, 1989, Pat. No. 4,943,511, which is a continuation of Ser. No. 229,088, Aug. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 175,706, Mar. 31, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 496,240
Int. Cl.[5] G03F *7/023, 7/30*
U.S. Cl. 430—17 **17 Claims**

1. A method of forming a resist pattern on a substrate comprising:
1. coating said substrate with a layer of a positive photoresist composition;
2. exposing said layer patternwise to actinic radiation; and
3. removing the exposed portion of said layer with an aqueous alkaline developer for the exposed resist composition to uncover the areas of the substrate beneath the exposed portions; said positive photoresist comprising, prior to exposure, an admixture of a 1,2-naphthoquinonediazide photosensitizer and a bindingly effective amount of a novolak resin wherein:
A. said photosensitizer comprises an admixture of
2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid triester;
2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid diester, and
2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid monoester in the following relative amounts:
triester—about 50 wt % to about 75 wt %
monoester and diester—balance, in a monester/diester weight ratio of about ⅓, said wt % being based on the total weight of the mono-, di-, and triester; and
B. said novolak resin comprises a resin selected from the group consisting of:
1. a resin prepared by condensing an aliphatic aldehyde,

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aromatic aldehyde or mixture thereof with a phenolic component comprising a mixture of p-cresol and m-cresol containing at least about 60 weight percent p-cresol, based on the total weight of p-cresol and m-cresol, and a sufficient amount of m-cresol to render said novolak resin soluble in a aqueous, alkaline solution, said phenolic component being essentially free of o-cresol; and

2. a novolak resin which is the condensation product of (a) a mixture of m-cresol and p-cresol and (b) a mixture of formaldehyde or a formaldehyde precursor and a monohydroxy aromatic aldehyde selected from the group consisting of
2-hydroxybenzaldehyde,
3-hydroxybenzaldehyde and
4-hydroxybenzaldehyde.

10. A substrate coated with a thermally stable and highly resolved, exposed resist pattern, said resist pattern being formed from a positive photoresist composition which, prior to exposure to actinic radiation, comprises:

A. a photosensitizer comprising an admixture of
2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid triester;
2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid diester, and
2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid moester in the following relative amounts:
triester—about 50 wt % to about 75 wt %
moester and diester—balance, in a moester/diester weight ratio of about ¼, said weight being based on the total weight of the mono-, di-, and triester; and

B. a novolak resin comprising a resin selected from the group consisting of:

1. a resin prepared by condensing an aliphatic aldehyde, aromatic aldehyde or mixture thereof with a phenolic component comprising a mixture of p-cresol and m-cresol containing at least about 60 weight percent p-cresol, based on the total weight of p-cresol and m-cresol, and a sufficient amount of m-cresol to render said novolak resin soluble in an aqueous, alkaline solution, said phenolic component being essentially free of o-cresol; and

2. a novolak resin which is the condensation product of (a) a mixture of m-cresol and p-cresol and (b) a mixture of formaldehyde or a formaldehyde precursor and a monohydroxy aromatic aldehyde selected from the group consisting of 2-hydroxybenzaldehyde, 3-hydroxybenzaldehyde and 4-hydroxybenzaldehyde.

4,996,123

OPTICALLY ORIENTED PHOTORESIST PATTERN FORMING METHOD USING ORGANIC CRYSTAL IN PHOTORESIST LAYER WITH SPECIFIED REFRACTING INDICES FORMULA

Nobora Nomura, Kyoto; Atsushi Ueno, Hirakata; Kazuhiko Hashimoto, Moriguchi, and Satoshi Kinoshita, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 72,120, Jul. 10, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 326,414

Claims priority, application Japan, Jul. 11, 1986, 61-164052; Jul. 11, 1986, 61-164053; Jul. 11, 1986, 61-164054; Jul. 11, 1986, 61-164055

Int. Cl.[5] G03F *7/30*

U.S. Cl. 430—20 **7 Claims**

1. A resist pattern forming method comprising the steps of:

disposing an optically oriented photoresist layer on a substrate in such a manner that orientation of said photoresist layer is normal to a surface of said substrate, said optically oriented photoresist being composed of an organic polymer with a refractive index n_p, an organic crystal with a refractive index n_x, and a photosensitizer, wherein the relationship between said refractive indices n_x and n_p is expressed by the formula $n_x^2-n_p^2>(NA_o)^2$ for the numerical aperture NA_o of a projection lens employed for photolithographic exposure;

irradiating said surface of said photoresist layer with incident light through a photomask, whereby said incident light is propagated through said photoresist layer to the bottom of said layer without scattering; and

developing said photoresist layer to form a resist pattern.

5. A resist pattern forming method comprising the steps of:

disposing an optically oriented photoresist layer on a substrate in such manner that orientation of said resist is normal to a surface of said substrate, said optically oriented photoresist being composed of a low molecular organic crystal with a refractive index n_x, a high molecular organic crystal with a refractive index n_p, and photosensitizer, wherein the relationship between said refractive indices n_x and n_p is expressed by a formula $n_x^2-n_p^2>(NA_o)^2$ for a numerical aperture NA_o of a projection lens employed for photolithographic exposure;

irradiating said surface of said oriented photoresist layer with incident light through a photomask, whereby said incident light is propagated through said photoresist layer to the bottom of said layer without scattering; and

developing said photoresist layer to form a resist pattern.

4,996,124

PHOTOCONDUCTOR ELEMENT, REGENERATING METHODS AND ELEMENTS USEFUL THEREIN

Albert V. Buettner, Rochester; Rodney R. Bucks, and Lawrence E. Contois, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 16, 1989, Ser. No. 437,490

Int. Cl.[5] G03G *5/047*

U.S. Cl. 430—59 **6 Claims**

1. A photoconductor element of interbonded successive layers comprising:

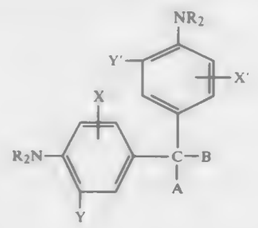
(a) a substrate;

(b) an electrically conductive, hole injecting layer;

(c) a charge transport layer comprising at least one organic photoconductor dissolved in a binder polymer; and

(d) a charge generating layer comprising a dye sensitized photoconductor dissolved in a binder polymer;

wherein said organic photoconductor is selected from the class of compounds having the formula:



wherein

R is selected from the group consisting of alkyl, aralkyl and substituted and unsubstituted aryl;

X and X', which may be the same or different, are selected from the group consisting of hydrogen, alkyl, alkoxy, hydroxy, NO_2 and halogen;

Y and Y', which may be the same or different, are selected from the group consisting of hydrogen, alkyl, alkoxy, hydroxyl, halogen and NO_2;

A and B, when taken alone may be the same or different, are selected from the group consisting of hydrogen, alkoxy, hydroxyl, halogen, substituted or unsubstituted aryl, alkyl, cycloalkyl having four to ten carbon atoms, and cycloalkenyl having four to eight carbon atoms; or

A and B, when taken together, represents sufficient atoms to form together with the carbon to which they are attached a substituted or unsubstituted carbocyclic ring having from 4 to 10 carbon atoms;

wherein each said organic photoconductor may be present in said layer up to the limit of its solubility int he binder; and

wherein A and/or B in at least one of said photoconductors is substituted or unsubstituted aryl.

4,996,125

ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING A FLUORINE LUBRICATING AGENT LAYER

Yasuo Sakaguchi; Ichiro Takegawa; Makoto Takemoto, and Masanori Murase, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1989, Ser. No. 293,282

Claims priority, application Japan, Jan. 7, 1988, 63-000725

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—66 **7 Claims**

1. An electrophotographic photoreceptor comprising an electrically conductive substrate having thereon a photosensitive layer, wherein a fluorine-containing lubricating agent layer comprising a fluorine-containing lubricating agent selected from perfluoroalkyl polyether or a derivative thereof and having a thickness in the range of from 100 to 5000 angstroms is provided on the surface of said photosensitive layer, said perfluoroalkyl polyether or derivative thereof having at least one functional group at the end carbon atom, said functional group being a member selected from the group consisting of $-COOR^2$ (R^2 being an alkyl group having from 1 to 5 carbon atoms); -COOH; $-CH_2OH$; and $-CONH-C_6H_3(CH_3)-NCO$, and said perfluoroalkyl polyether or derivative thereof having a molecular weight in the range of from 1,500 to 7,500 is represented by the formula (I):

$$-(CFR^1-CF_2-O)_n- \quad (I)$$

in which R^1 represents F, CF_3 or CH_3, and n represents an integer.

4,996,126

DEVELOPER HAVING SPECIFIC SPHERIODICITY

Masahiro Anno, and Eiichi Sano, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 18, 1989, Ser. No. 299,551

Claims priority, application Japan, Jan. 20, 1988, 63-10246

Int. Cl.[5] G03G *9/093, 9/107*

U.S. Cl. 430—106.6 **19 Claims**

1. A two-component developer containing toner particles and carrier particles wherein the toner particles have spheroidicity of 150 or less, mean particle size of 14 μm or less and coefficient of variation of 15% or less, and the carrier particles have at least one of mean particle size of between 20 μm and 70 μm and spheroidicity of 140 or more, said coefficient of variation defined as: coefficient of variation (%)=(σ/x)×100 wherein a standard deviation value (σ) is represented by the following formula:

$$\sigma = \sqrt{\frac{(x_1-\bar{x})^2+(x_2-\bar{x})^2+\cdots+(x_n-\bar{x})^2}{n-1}} = \sqrt{\frac{1}{n-1}\left[\Sigma x_i^2-\frac{(\Sigma x_i)^2}{n}\right]}$$

wherein x_1, x_2---, x_n represent respective particle sizes of sample particles, x represents the mean value of the n particle sizes.

4,996,127

TONER FOR DEVELOPING AN ELECTROSTATICALLY CHARGED IMAGE

Yukinobu Hasegawa; Hiroyoshi Shimomura, both of Hiratsuka; Koichi Murai, Fujisawa; Masatoshi Maruyama, and Toyokichi Tange, both of Hiratsuka, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00073, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/05930, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 29, 1988, Ser. No. 261,829

Claims priority, application Japan, Jan. 29, 1987, 62-17378; May 15, 1987, 62-116797; May 15, 1987, 62-116798

Int. Cl.[5] G03G *9/00, 5/00*

U.S. Cl. 430—109 **20 Claims**



1. A toner for developing an electrostatically charged image, composed of associated particles of secondary particles comprising primary particles of a polymer having an acidic or basic polar group and particles of a coloring agent and optionally a charge controlling agent.

4,996,128

RECHARGEABLE BATTERY

Julio A. Aldecoa, Santa Cruz County, and Lawrence F. Miller, Santa Clara County, both of Calif., assignors to Nova Manufacturing, Inc., Scotts Valley, Calif.

Filed Mar. 12, 1990, Ser. No. 492,995

Int. Cl.[5] H01M *2/00*

U.S. Cl. 429—153 **19 Claims**

1. A rechargeable battery comprising:

a first plate formed of a first sheet of substantially solid metallic foil;

a second plate formed of a second sheet of substantially solid metallic foil;

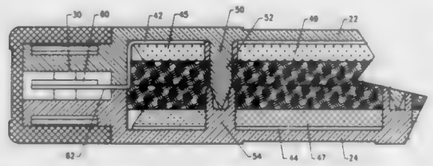
a first active paste material applied to said first plate;

a second active paste material applied to second to said second plate, the second paste material being charged opposite the first paste material;

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a separator for isolating the first and second paste materials; and

reinforcing means for maintaining a substantially constant spacing between said plates during operation and recharging of the battery; and a casing for enclosing said plates, separator and active materials, the casing providing support for said plates and wherein said reinforcing means includes a plurality of pins extending between opposite sides of said casing through said foil plates.



4,996,129

BATTERY

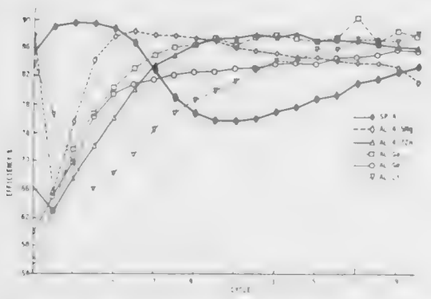
Clive D. S. Tuck, Banbury, England, assignor to Alcan International Limited, Montreal, Canada

Filed Dec. 29, 1988, Ser. No. 291,743

Claims priority, application United Kingdom, Jan. 5, 1988, 8800082

Int. Cl.[5] H01M 4/04, 10/40

U.S. Cl. 429—194 9 Claims



1. A lithium battery having a lithium-based anode of aluminium alloy containing 3–25 volume % of dispersed particles with an average size in the range 0.05–2 microns.

4,996,130

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shuzo Suga; Masaki Satake, and Senzo Sasaoka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 284,010, Dec. 13, 1988, abandoned. This application Mar. 13, 1990, Ser. No. 492,212

Claims priority, application Japan, Dec. 15, 1987, 63-316972

Int. Cl.[5] G03C 1/08, 1/04

U.S. Cl. 430—264 4 Claims

1. A negative type silver halide photographic material which comprises:

a support having thereon at least one silver halide emulsion layer and at least one other hydrophilic colloidal layer, wherein

said at least one said silver halide emulsion layer or said at least one said other hydrophilic colloidal layer contains a hydrazine derivative and a

polyacrylamide derivative, wherein said polyacrylamide derivative has a weight average molecular weight of 2,000 to 50,000 and is present in an amount of from 0.1 to 1.5 g per m^2 of said photographic material and said hydrazine is present in an amount of from 1×10^{-5} to 2×10^{-2} mol per mol of silver halide.

4,996,131

OFFSET PLATE WITH THIN CHROMIUM LAYER AND METHOD OF MAKING

Jean-Marie Nouel, 67 rue Miromesnil, 75008 Paris, France (75008)

Continuation of Ser. No. 245,658, Sep. 15, 1988, Pat. No. 4,857,436, which is a continuation of Ser. No. 138,289, Dec. 28, 1987, abandoned, which is a continuation of Ser. No. 481,766, Apr. 4, 1983, abandoned, which is a continuation of Ser. No. 168,003, Jul. 14, 1980, abandoned. This application May 23, 1989, Ser. No. 356,379

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] G03C 1/77

U.S. Cl. 430—276 16 Claims

1. A method of manufacturing an offset printing plate, comprising:

providing a hard, hydrophilic supporting base material of steel;

depositing a layer of dull, porous, ink-rejecting chromium directly onto the surface of the steel base material, said chromium layer having a thickness no greater than one micron and being sufficiently thin and porous to permit the desirable properties of hardness and hydrophilicity of the subjacent steel base material to manifest themselves through the chromium layer during printing, and sufficiently thin to permit removal of the chromium layer from a selected area of the offset printing plate by scraping to expose the subjacent surface of the steel base material; the step of depositing comprising the steps of:

immersing the hydrophilic steel base material in an electrolytic chromium plating solution for an initial period of time without applying a plating current;

maintaining the temperature of the plating solution at a temperature between 25° and 35° C.;

subsequently applying a plating current; and

cutting the current to produce the dull and porous chromium deposit having a thickness no greater than one micron; and

applying a layer of photosensitive resist material to the plate, said photosensitive resist material being hydrophobic and ink-receptive after insolation and being of sufficient thickness to substantially prevent oxidation of the steel base material through the porous chromium layer during the normal storage period of the offset printing plate prior to use.

4,996,132

HEAT-RESISTANT PHOTOSENSITIVE RESIN COMPOSITION

Kenji Tazawa; Akira Iwata; Tomoki Horigome, and Hiroyuki Tohda, all of Kanagawa, Japan, assignors to Toyko Ohka Kogyo Co. Ltd., Kanagawa, Japan

Filed Feb. 23, 1988, Ser. No. 159,622

Claims priority, application Japan, Feb. 25, 1987, 62-40140; Sep. 30, 1987, 62-243674

Int. Cl.[5] G03F 7/031

U.S. Cl. 430—286 21 Claims

1. A heat resistant photosensitive resin composition which consists essentially of:

(a) a copolymer obtained by the copolymerization of a monomer mixture comprising from 10 to 30% by weight of an ethylenically unsaturated amide compound represented by the general formula

$$CH_2{=}CX{-}CO{-}NH{-}Y{-}OZ$$

in which x is a hydrogen atom or methyl group, Y is an alkylene group having 1 to 4 carbon atoms and Z is an alkyl group having 1 to 4 carbon atoms or a benzyl group as a first essential monomer; from 10 to 30% by weight of an ethylenically unsaturated compound having at least one carboxyl group in a molecule as a second essential monomer; and 40 to 80% by weight of a third essential monomer of an ethylenically unsaturated compound selected from the group consisting of styrene, α-methyl styrene, methyl acrylate, methyl methacrylate, butyl acrylate, butyl methacrylate, hydroxymethyl acrylate, hydroxymethyl methacrylate, hydroxypropyl acrylate and hydroxypropyl methacrylate;

(b) an esterified resin which is a reaction product of a novolac-type epoxy resin and an ethylenically unsaturated carboxylic acid in an amount of above 0.8 to 1.1 equivalents relative to the epoxy groups in the novolac-type epoxy resin to esterify said resin so that the resultant product contains essentially no unreacted epoxy groups;

(c) a photopolymerizable monomer;

(d) a photopolymerization initiator; and

(e) a solid powder as a filler.

4,996,133

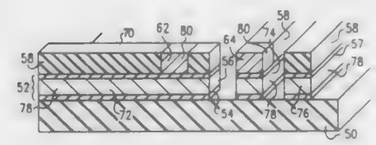
SELF-ALIGNED TUNGSTEN-FILLED VIA PROCESS AND VIA FORMED THEREBY

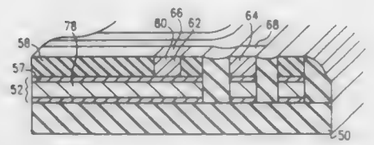
Jeffrey E. Brighton, Katy, and Douglas P. Verret, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 80,116, Jul. 31, 1987, Pat. No. 4,842,991. This application Dec. 23, 1987, Ser. No. 137,389

Int. Cl.[5] G03C 5/00

U.S. Cl. 430—313 19 Claims





1. A method for fabricating a via through an insulator layer to a conductor, comprising the steps of:

forming a conductor layer on a support layer;

forming an insulator layer on the conductor layer;

opening an orifice in the insulator layer to the conductor layer;

filling the orifice with a conductive material such that an outer surface of the conductive material :s substantially coplanar with an outer surface of the insulator layer;

etching the insulator layer, the conductive material and the conductor layer to define a conductor that laterally intersects the orifice; and

insulating all surfaces of the conductor laterally outside of a via formed by the area of lateral intersection of the conductor and the orifice.

4,996,134

CONJUGATED DIENE COPOLYMER, A PROCESS FOR PRODUCING THE COPOLYMER, AND A PHOTOSENSITIVE COMPOSITION COMPRISING THE COPOLYMER

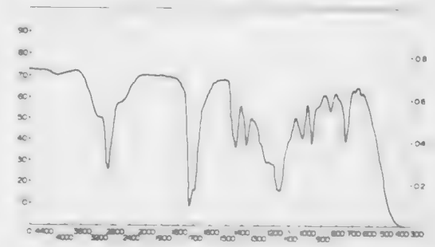
Hiroji Enyo, Suzuka; Shin-ichiro Iwanaga, and Yasuhiko Takemura, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,206

Claims priority, application Japan, Apr. 13, 1984, 59-74546; Oct. 17, 1984, 59-216367

Int. Cl.[5] C08F 265/02, 265/06, 265/08, 2/50

U.S. Cl. 430—286 26 Claims



1. A photosensitive composition, comprising a random copolymer (I), a photopolymerizable unsaturated monomer (ii), and a photosensitizer (III);

wherein said random copolymer (I) is a conjugated diene random copolymer comprising:

(A) 10–60 mole % of a conjugated diene compound unit;

(B) 5–50 mole % of an α,β-ethylenically unsaturated carboxylic acid unit;

(C) 0.1–20 mole % of a non-conjugated polyfunctional alkenyl compound unit which is (C_1) ethylene glycol dimethacrylate, ethylene glycol diacrylate, trimethylolpropane trimethacrylate, propylene glycol dimethacrylate, or propylene glycol diacrylate, (C_2) divinylbenzene or (C_3) a trivinylbenzene;

(D) 0–10 mole % of a non-conjugated diene compound unit having cyclic carbon-carbon double bonds; and

(E) 0–80 mole % of a monoolefinically unsaturated compound unit other than one from (B) above, wherein the sum of the amount of (A), (B), (C), (D) and (E) is 100 mole %, and said random copolymer has an intrinsic viscosity of 0.01 to 3.0 dl g^{-1} as measured at 30° C. in dimethylformamide.

4,996,135

DESENSITIZING GUM LITHOGRAPHIC PLATE FINISHER

Tadao Toyama; Kenji Kunichika, both of Shizuoka; Norio Hishiki, and Masahiro Nishida, both of Osaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Oct. 23, 1989, Ser. No. 425,034

Claims priority, application Japan, Oct. 24, 1988, 63-267543

Int. Cl.[5] G03F 7/00

U.S. Cl. 430—309 20 Claims

1. A gumming-up process comprising applying to an imagewise exposed and developed presensitized plate, a desensitizing gum lithographic plate finish which comprises water-soluble starch modified with urea-phosphoric acid, containing 0.01 to 3% by weight of bound phosphorus and having a viscosity determined on 20% by weight aqueous solution at 30° C. ranging from 15 to 300 cps.

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4,996,136

RADIATION SENSITIVE MATERIALS AND DEVICES MADE THEREWITH

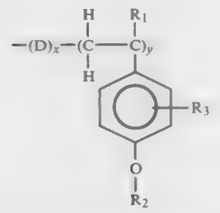
Francis M. Houlihan, North Plainfield; Elsa Reichmanis, Westfield, and Larry F. Thompson, Millington, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 160,368, Feb. 25, 1988, abandoned. This application Feb. 24, 1989, Ser. No. 316,051

Int. Cl.[5] G03C *5/58*

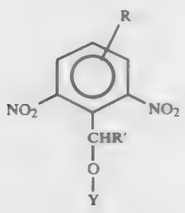
U.S. Cl. 430—313 **21 Claims**

1. A process for fabricating a device comprising the steps of forming a radiation sensitive region on a substrate, exposing said region to said radiation to form a pattern, developing said pattern, and employing said pattern to define areas of said device, characterized in that said radiation sensitive region comprises a material including (1) a polymer composition represented by the formula:

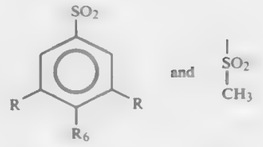


where R_1 is chosen from the group consisting of H, lower alkyl ad lower alkyl derivatives, where D comprises a backbone scission inducing moiety located in said backbone, where R_3 is chosen from the group consisting of H, Cl, Br, lower alkyl, and lower alkyl derivatives, where R_2 is chosen such that the O—R_2 bond cleaves in the presence of acid to form a carbonium ion that is sufficiently stable to eliminate an available α-hydrogen, and where x and y indicate the relative proportions of said scission moiety to chain moiety without implying ordering of moieties in the chain, and (2) a composition that results in generation of an acidic moiety as a result of irradiation with said radiation.

18. A process for fabricating a device comprising the steps of forming a radiation sensitive region on a substrate, exposing said region to said radiation to form a pattern, developing said pattern, and employing said pattern to define areas of said device, characterized in that said radiation sensitive region comprises a material including (1) a material that undergoes a reaction in response to an acidic moiety and (2) an acid generating material represented by the formula

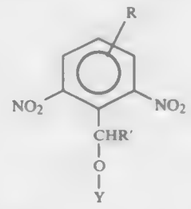


where R is not acidic, R' comprises a member of the group consisting of H and CH_3 and Y comprises a member of the group consisting of



where R_6 comprises a member chosen from the group consisting of H and CH_3.

20. A process for fabricating a device comprising the steps of forming a radiation sensitive region on a substrate, exposing said region to said radiation to form a pattern, developing said pattern, and employing said pattern to define areas of said device, characterized in that said radiation sensitive region comprises a material including (1) a material that undergoes a reaction in response to an acidic moiety and (2) an acid generating material represented by the formula



where R is not acidic, R' comprises a member of the group existing of H and CH_3 and Y is chosen such that it requires a temperature of at least 75° C. to cause its removal from the remainder of said acid generator.

4,996,137

METHOD FOR FORMING A DIRECT POSITIVE IMAGE

Noriyuki Inoue; Katsumi Hirano, and Mitsuo Saitou, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 236,100, Aug. 24, 1988, abandoned. This application Jun. 21, 1990, Ser. No. 541,170

Claims priority, application Japan, Aug. 24, 1987, 62-208241

Int. Cl.[5] G03C *5/24*

U.S. Cl. 430—378 **15 Claims**

1. A method for forming a direct positive image comprising the step of developing with a surface developer an imagewise exposed photosensitive material comprising a support having thereon at least one photosensitive emulsion layer containing unprefogged silver bromide core/shell grains capable of forming an internal latent image; said at least one photosensitive emulsion layer comprising hexagonal tabular silver bromide core/shell grains in an amount of at least 30 wt %, based on the total silver amount of silver bromide grains therein; said hexagonal tabular grains having two parallel hexagonal faces, the ratio of the longest side to the shortest side of the hexagon being at most 2; the aspect ratio of said hexagonal tabular grains being from 2 to 8; and said hexagonal tabular grains having a monodisperse size distribution.

4,996,138

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kazuhiro Murai, Odawara; Yasuhiko Kawashima, Hino; Shun Takada, Odawara, and Nobuaki Kagawa, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 414,711

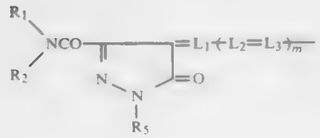
Claims priority, application Japan, Oct. 4, 1988, 63-250713

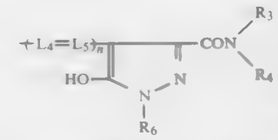
Int. Cl.[5] G03C *1/06*

U.S. Cl. 430—522 **10 Claims**

1. A silver halide photographic light-sensitive material comprising a support and photographic layers containing at least one silver halide emulsion layer thereon, wherein at least one silver halide emulsion layer contains silver halide grains having a silver chloride content of not less than 90 mol% and silver bromide content of not less than 0.05 mol% and at least one of said photographic layer contains a compound represented by the following Formula (I)

Formula (I)





wherein R_1, R_2, R_3, R_4, R_5, and R_6 each represents a hydrogen atom, a substituted alkyl group, an unsubstituted alkyl group, a substituted aryl group, an unsubstituted aryl group, a substituted alkenyl group, an unsubstituted alkenyl group, a substituted heterocyclic group, or an unsubstituted heterocyclic group, provided that R_1 and R_2 are not a hydrogen atom at the same time, and provided that R_3 and R_4 are not a hydrogen atom at the same time, and at least one of R_1, R_2, R_3, R_4, R_5, and R_6 is a group having a water-soluble group or a group having a substituent having a water-soluble group, and L_1, L_2, L_3, L_4 and L_5 each represents a substituted methine group or an unsubstituted methine group and, m and n each is an integer of 0 or 1.

4,996,139

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING NOVEL CYAN COUPLER

Toyoaki Masukawa; Takashi Uchida, and Noritaka Nakayama, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,168

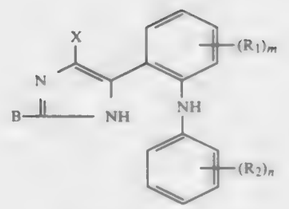
Claims priority, application Japan, Aug. 12, 1988, 63-202270

Int. Cl.[5] G03C *7/32, 1/10*

U.S. Cl. 430—558 **6 Claims**

1. A silver halide photographic light-sensitive material comprising a support and provided thereon a silver halide emulsion layer containing a cyan coupler represented by the following formula I:

(I)



wherein B is an organic group comprising a carbon atom, nitrogen atom, oxygen atom or sulfur atom directly bonded to the imidazole ring; R_1 and R_2 each are a substituent; m is an integer of 0 to 4, n is an integer of 0 to 5, provided that the groups represented by said R_1 or R_2 are respectively allowed to be the same with or different from each other when m or n is 2 or more,; and X is a group capable of being split off upon coupling reaction with the oxidation product of a color developing agent.

4,996,140

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tomoyuki Nakayama; Hiroyuki Hoshino; Hirofumi Ohtani, and Syoji Matsuzaka, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,126

Claims priority, application Japan, Jun. 8, 1988, 63-140785

Int. Cl.[5] G03C *1/035, 1/10*

U.S. Cl. 430—569 **22 Claims**

1. A silver halide photographic material having silver halide emulsion layers, at least one of which contains a silver halide emulsion that has been prepared in such a way that a spectral sensitizing dye is added after 85 wt % of the soluble silver salt in solution that is to be added during ripening of silver halide emulsion has been added but before the start of a desalting step, and that a spectral sensitizing dye which may be the same or different from the first added dye is added during said desalting step wherein at least 50% of the total amount of the spectral sensitizing dye is added during the desalting step.

4,996,141

MONOMETHINE COMPOUNDS

Geoffrey E. Ficken, Wilmslow; Douglas J. Edwards, Warrington; Clive W. Mowforth, Wilmslow; Trevor J. Maternaghan, Knutsford, all of England; Rolf Steiger, Praroman, Switzerland, and Victor W. Dolden, Wilmslow, England, assignors to Ilford Limited, Cheshire, England

Filed Jan. 11, 1989, Ser. No. 295,795

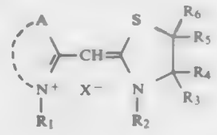
Claims priority, application United Kingdom, Jan. 13, 1988, [redacted]

Int. Cl.[5] G03C *1/16*

U.S. Cl. 430—583 **10 Claims**

1. A photographic silver halide negative working emulsion which comprises a monomethine compound of the general Formula I:

(I)



where A represents the atoms necessary to complete a benzoxazole or naphthoxazole ring which is optionally substituted, R_1 and R_2 are each alkyl, hydroxyalkyl or alkoxy alkyl groups wherein the alkyl moiety comprises 1 to 4 carbon atoms, R_3,

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R_4, R_5 and R_6 are each hydrogen atoms or alkyl groups having 1 to 4 carbon atoms or phenyl groups, and X is an anion.

4,996,142

NON-RADIOACTIVE NUCLEIC ACID HYBRIDIZATION PROBES

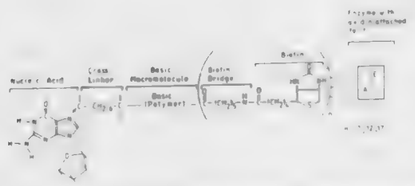
Ali H. Al-Hakim, and Roger Hull, both of Norwich, England, assignors to Agricultural Genetics Company Limited, Cambridge, England

Filed Sep. 4, 1987, Ser. No. 94,133

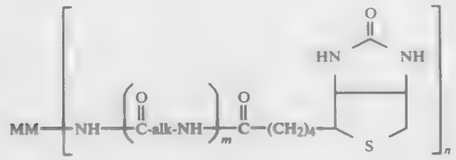
Claims priority, application United Kingdom, Sep. 4, 1986, 8621337

Int. Cl.[5] **C12Q** *1/68;* **C07D** *495/04;* **C08H** *1/02;* **A61K** *31/415*

U.S. Cl. 435—6 **6 Claims**



1. An adduct of a basic macromolecule and biotin having the formula:



wherein MM is the residue of a basic macromolecule selected from the group consisting of cytochrome C, histone and polyethyleneimine, formed by substituted the H-atom of one or more primary or secondary amino groups; alk represents an alkylene group having from 1 to 10 C-atoms; m is 0 or 1, and n is a positive integer from 1 to 30, with the proviso that, where MM represents cytochrome C or histone, m is not zero.

4,996,143

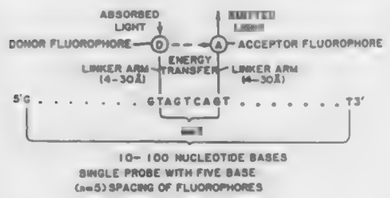
FLUORESCENT STOKES SHIFT PROBES FOR POLYNUCLEOTIDE HYBRIDIZATION

Michael J. Heller, Poway, and Edward J. Jablonski, San Diego, both of Calif., assignors to Syngene, Inc., San Diego, Calif.

Continuation of Ser. No. 315,218, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 812,111, Dec. 23, 1985, abandoned. This application Apr. 13, 1990, Ser. No. 511,834

Int. Cl.[5] **C12Q** *1/68*

U.S. Cl. 435—6 **29 Claims**



1. The spectroscopy method for detecting a target single-strand polynucleotide sequence in a polynucleotide sample in which either (i) a fluorescent polynucleotide single probe sequence complementary to said target sequence is hybridized thereto, or (ii) a plurality of probes of such sequences complementary to sequentially adjacent portions of said target sequences are hybridized thereto, wherein the improvement comprises having present in said single probe or in said plurality of probes at least one pair of fluorescent moieties connected by linker arms to nucleic acid base units, said fluorescent moieties comprising respectively donor and acceptor moieties selected so that the emission spectrum of the donor moiety overlaps the excitation spectrum of the acceptor moiety to permit non-radioactive energy transfer with efficient fluorescent emission by the acceptor fluorophores, the wavelength maximum of the emission spectrum of the acceptor moiety being at least 100 nm greater than the wavelength maximum of the excitation spectrum of the donor moiety, said linker arms having lengths of 4 to 30 Angstroms, the donor and acceptor moieties being connected to non-contiguous base units in said single probe or to base units in said plural probes other than 3′ and 5′ and units thereof, when said single probe or said plural probes are hybridized to the target sample the base units to which said donor and acceptor moieties are connected being paired through hybridization to base units of said target sequence which are separated by 2 to 7 intervening nucleotide base units of the target sequence.

4,996,144

MICROASSAY FOR DETECTION OF DNA AND RNA

Anne Crossway, Davis, and Catherine M. Houck, Vacaville, both of Calif., assignors to Calgene, Inc., Davis, Calif.

Filed Jan. 25, 1985, Ser. No. 694,715

Int. Cl.[5] **C12Q** *1/68*

U.S. Cl. 435—6 **7 Claims**

1. A method for detecting a nucleic acid sequence present in a cell population of fewer than 500 cells, said method comprising:

transferring an aqueous polyol suspension of cells to a paraffin oil and removing any excess of said aqueous polyol;

solubilizing said cells with a proteinase;

adding a phenolic extractant to extract cell debris away from the nucleic acid containing aqueous layer and into the phenolic layer;

adding an alkanolic chloroform solution, whereby the phenolic layer becomes dispersed into the paraffin oil;

transferring the remaining aqueous drop containing the nucleic acid to a substrate; and

detecting any of said aqueous bound to said substrate.

4,996,145

METHOD FOR DETECTING IMMUNE-MEDIATED CYTOTOXICITY

Larry M. Weisenthal, Huntington Beach, Calif., assignor to Oncotech Incorporated, Irvine, Calif.

Filed Oct. 27, 1987, Ser. No. 114,085

Int. Cl.[5] **G01N** *33/53, 33/577;* **C12Q** *1/28, 1/18*

U.S. Cl. 435—7.23 **20 Claims**

1. A method for evaluating in vitro the response of tumor cells from a human subject to the presence of an immune effector substance to predict response of the tumor cells in vivo to treatment with the effector substance, which method comprises:

(a) obtaining a sample from a subject containing fresh tumor cells and non-tumor cells including endogenous effector cells;

(b) exposing a portion of said sample of tumor and nontumor cells in vitro to an immune effector substance for a time effective to evaluate the response of said tumor cells to the presence of said effector substance by determining whether the tumor cells are killed and leaving a portion of said sample as a control untreated by said effector substance;

(c) adding an internal standard to each of said samples to verify that similar numbers of total cells are present;

(d) adding a dye excluded by living cells to stain cells killed by said immune effector substance;

(e) counterstaining said cells with a stain that indicates living cells to indicate the remaining living tumor cells from non-tumor cells in the sample exposed to said effector substance; and

(f) comparing the number of individual tumor cells surviving in the presence of the effector substance, with the numbers of individual tumor cells surviving in the absence of said effector substance, by counting cells able to exclude said dye excluded by living cells, and normalizing to said internal standard distinguishable from said tumor cells, whereby the number of tumor cells killed in response to the presence of said effector substance in vitro is determined and is used to predict the response in vivo of the tumor cells of said subject to said effector substance.

4,996,146

RAPID STERILIZATION ENZYMATIC PROCESS WITH PERSISTENCE

Jack H. Kessler, 23 Carriage House Path, Ashland, Mass. 01721

Continuation of Ser. No. 17,224, Feb. 20, 1987, abandoned. This application Mar. 5, 1990, Ser. No. 488,507

Int. Cl.[5] **C12Q** *1/28, 1/18;* **A01N** *25/00;* **C12N** *7/06*

U.S. Cl. 435—28 **7 Claims**

1. A method for sterilizing an aqueous-based medium containing pathogens consisting essentially of the steps of: selecting four components including a source of peroxide, a peroxidase selected from the class contained in the E.C. #1.11.1.7, a salt of iodide, and buffering means selected to render the pH of said aqueous-based medium between a pH of about 6.5 and 4.0; storing said four components in a nonreacting state and admixing the four components in said aqueous-based medium under conditions and for a time sufficient to cause a catalyzed reaction for generating sterilizing agents from said source of iodide to sterilize said aqueous-based medium.

4,996,147

PROCESS FOR PRODUCING L-THREONINE BY FERMENTATION

Satoru Furukawa, and Toshihide Nakanishi, both of Hofu, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,385

Claims priority, application Japan, Jul. 31, 1987, 62-192303

Int. Cl.[5] **C12P** *13/08, 15/00;* **C12N** *1/20*

U.S. Cl. 435—115 **3 Claims**

1. A process for producing L-threonine by fermentation which comprises culturing in a medium *Escherichia coli* FERM BP-1411 having resistance to rifampicin, lysine, methionine, aspartic acid and homoserine and an ability to produce L-threonine, until L-threonine is accumulated in the culture, and recovering L-threonine therefrom.

4,996,148

A80407 ANTIBIOTICS

Lawrence E. Doolin; Richard M. Gale, both of Indianapolis; Otis W. Godfrey, Greenwood; Robert L. Hamill, Greenwood; David F. Mahoney, Indianapolis, and Raymond C. Yao, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 13, 1987, Ser. No. 72,323

Int. Cl.[5] **C12P** *17/18, 1/06, 21/04;* **C12N** *1/20*

U.S. Cl. 435—119 **9 Claims**

1. A process for producing antibiotic A80407 which comprises cultivating *Kibdelosporangium philippinensis* NRRL 18198 or NRRL 18199, or an A80407-producing mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A80407 is produced, and separating antibiotic A80407 from the culture medium.

4,996,149

MICROBIOLOGICAL HYDROXYLATION PROCESS OF QUININE, QUINIDINE AND DERIVATIVES THEREOF

Francois X. Jarreau, Versailles; Robert G. Azerad, Ris Orangis, and Thierry P. Ogerau, Voisins-le-Bretonneux, all of France, assignors to Nativelle S.A., Issy-les-Moulineaux Cedex, France

PCT No. PCT/FR86/00260, § 371 Date May 21, 1987, § 102(e) Date May 21, 1987, PCT Pub. No. WO87/00552, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 22, 1986, Ser. No. 37,351

Claims priority, application France, Jul. 23, 1985, 85 11221

Int. Cl.[5] **C12P** *17/16, 17/12;* **C12N** *1/14*

U.S. Cl. 435—119 **5 Claims**

1. A process for the regiospecific and stereospecific hydroxylation of a compound selected from the group consisting of quinine, quinidine dihydroquinine, and dihydroquinidine, in position 3S, comprising incubation of said compound with the microorganism *Mucor plumbeus.*

4,996,150

BIOCATALYST IMMOBILIZATION IN A GEL OF ANIONIC POLYSACCHARIDE AND CATIONIC POLYMER

John J. Joung; Cavit Akin, both of Naperville, and Garfield P. Royer, Warrenville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 665,750, Oct. 29, 1984, abandoned. This application Apr. 25, 1988, Ser. No. 186,062

Int. Cl.[5] **C12P** *7/06;* **C12N** *11/10, 11/12, 11/08*

U.S. Cl. 435—161 **19 Claims**

1. A method of making a biocatalyst system which comprises the steps of:

mixing a biocatalytic entity with the reaction product of a homogeneous dispersion of an anionic polysaccharide polymer with a cationic polymer to form a polymer-biocatalyst dispersion;

mixing said polymer biocatalyst dispersion with an oil phase to form beads, and mixing a powder with the beads in the oil phase wherein the powder comprises a water soluble and oil insoluble multivalent cation salt and said powder acts to gell and dehydrate the beads and to prevent the beads from adhering to one another until individual bead surfaces become hardened whereby said biocatalyst system is provided aim.

4,996,151

METHOD FOR PRODUCING THE EAG I RESTRICTION ENDONUCLEASE AND METHYLASE

Joan E. Brooks, and Laura A. Szuyter, both of Beverly, Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed May 19, 1988, Ser. No. 195,882

Int. Cl.[5] **C12N** *15/54, 75/55, 1/20*

U.S. Cl. 435—172.3 **10 Claims**

1. Isolated DNA coding for the EagI restriction endonuclease, wherein the isolated DNA is obtainable from the vector pEagRM2.9.

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4,996,152

AVIAN HERPESVIRUS AMPLICON AS A EUCARYOTIC EXPRESSION VECTOR

Jeanne K. Carter, Cincinnati, Ohio, and Robert F. Silva, Okemos, Mich., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 4, 1987, Ser. No. 128,836
Int. Cl.[5] C12N *15/03*
U.S. Cl. 435—172.3 **12 Claims**

10. A method for amplifying a foreign gene comprising transfecting cells in the presence of a helper virus with a recombinant DNA vector comprising a substantially biologically pure amplicon derived from a Marek's disease virus and said foreign gene, wherein said amplicon contains all cis-acting functions required for DNA replication, and in the presence of helper virus, said amplicon infects host cells and replicates, thereby forming high molecular weight concatemers of DNA.

4,996,153

HEAT-STABLE, SALT-TOLERANT MICROBIAL XANTHANASE

Martin C. Cadmus, and Morey E. Slodki, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 192,083, May 10, 1988, Pat. No. 4,886,746.
This application Aug. 29, 1989, Ser. No. 400,316
Int. Cl.[5] C12P *39/00*; C12N *9/42, 1/20*; C12R *1/01*
U.S. Cl. 435—209 **3 Claims**

1. A heat stable, salt-tolerant xanthanase contained in, or recovered from, a fermentation broth of a culture of NRRL B-18445 and characterized by the property of retaining approximately 100% of its original activity upon being heated at 55° C. for 20 minutes.

4,996,154

METHOD FOR GROWING CELLULAR TISSUE

Joseph E. Gabriels, Jr., Brighton, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed May 4, 1989, Ser. No. 347,448
Int. Cl.[5] C12N *5/06, 5/08*
U.S. Cl. 435—240.241 **15 Claims**

1. A method of producing tissue from keratinocyte cells, comprising the steps of:

a. contacting a collagen coated polymeric microporous substrate suitable for growing cells with growth factor specific for growth of said keratinocyte cells in vitro, wherein the collagen comprises activated sites for attaching the growth factors thereto;

b. subsequently seeding keratinocyte cells onto the microporous substrate; and

c. maintaining the seeded microporous substrate under conditions suitable for cell growth to thereby produce a confluent monolayer of tissue or uniformly differentiated multilayer tissue.

4,996,155

BACILLUS THURINGIENSIS GENE ENCODING A COLEOPTERAN-ACTIVE TOXIN

August J. Sick, and Thomas E. Gilroy, both of San Diego, Calif., assignors to Mycogen Corporation, San Diego, Calif.

Filed Mar. 4, 1988, Ser. No. 164,044
Int. Cl.[5] A01N *63/00*; C12N *1/13, 1/15, 1/21*
U.S. Cl. 435—252.3 **23 Claims**

1. Essentially pure DNA encoding a *B.t.* toxin having the amino acid sequence shown in FIG. 2.

4,996,156

PREPARATION OF SPORE-FREE, CONCENTRATED PROTEIN PREPARATIONS FROM *BACILLUS THURINGIENSIS* SEROVAR, *ISRAELENSIS*, WHICH IS TOXIC FOR GNATS, A MICROORGANISM FOR THEIR PREPARATION, AND THE ISOLATION OF THE MICROORGANISM

Hans Zaehner, 13 Im Hopfengarten; Konrad Bernhard, 132 Jessinger Hauptstrasse, both of 7400 Tuebingen, and Harald Weisser, 80 Bruggerstrasse, 7210 Rottweil, all of Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,830
Int. Cl.[5] C12R *1/07*; C12P *21/00*; A01N *63/00*; C12N *15/01*
U.S. Cl. 435—252.5 **4 Claims**

1. *Bacillus thuringiensis* serovar. *israelensis* SM 3439.

2. *Bacillus thruingiensis* serovar. *israelensis* SM 3440.

4,996,157

BIOLOGICAL CONTROL OF PHYTOPHTHORA BY TRICHODERMA

Victoria L. Smith; Wayne F. Wilcox, and Gary E. Harman, all of Geneva, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 14, 1988, Ser. No. 271,143
Int. Cl.[5] C12N *1/14*; A01N *63/04*
U.S. Cl. 435—254 **5 Claims**

1. A biocontrol agent effective against *Phytophthora cactorum* selected from the group consisting of:

Gliocladium virens, 031 (ATCC 20903);

Gliocladium virens, 035 (ATCC 20904); and

Gliocladium virens, 041 (ATCC 20906).

4,996,158

OPTICAL RESOLUTION OF RACEMIC ALCOHOLS

Junichi Oda, 18, Shichiku Ushiwaka-cho, Kita-ku, Kyoto; Masaki Amano, 7-22, Higashiyama 2-chome, Chiba-ken, Kashiwa-shi; Haruhiko Toda, 15-1-118, Masago 2-chome, Chiba-ken, Chiba-shi, and Toshiyuki Koyagi, 241, Kamihirama, Nakahara-ku, Kanagawa-ken, Kawasaki-shi, all of Japan

Filed Dec. 21, 1988, Ser. No. 287,043
Claims priority, application Japan, Dec. 26, 1987, 62-330678; Mar. 16, 1988, 63-60568
Int. Cl.[5] C12P *7/02, 7/62*
U.S. Cl. 435—280 **7 Claims**

1. A method for resolving a racemic secondary alcohol into its two antipodes, comprising the steps of:

reacting a racemic secondary alcohol selected from the group consisting of 2-heptanol, 2-octanol, 2-nonanol, 2-decanol, (R,S)-3-chloro-1-p-toluenesulfonyloxy-2-propanol, (R,S)-1-phenylethanol, (R,S)-1-phenyl-2-chloroethanol, (R,S)-mandelonitrile and phenylethylene glycol with an esterifying agent selected from the group consisting of an acid anhydride and an enol ester of a carboxylic acid in an organic solvent in the presence of a hydrolase to esterify one of the antipodes of the racemic secondary alcohol with the esterifying agent, so that a reaction mixture containing the esterified antipode and unreacted antipode is formed; and

separating either the esterified antipode or unreacted antipode from said reaction mixture.

4,996,159

NEOVASCULARIZATION INHIBITORS AND METHODS FOR THEIR PRODUCTION AND USE

Bert M. Glaser, Owings Mills, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation of Ser. No. 706,259, Feb. 26, 1985, abandoned.
Jan. 26, 1990, Ser. No. 471,024
Int. Cl.[5] C12P *21/00*; C07K *3/00, 15/06*; A61K *37/02*
U.S. Cl. 435—70.3 **13 Claims**

1. A process for producing a neovascularization inhibitor comprising the steps of:

culturing retinal pigment epithelial cells to produce a culture medium containing said neovascularization inhibitor; and

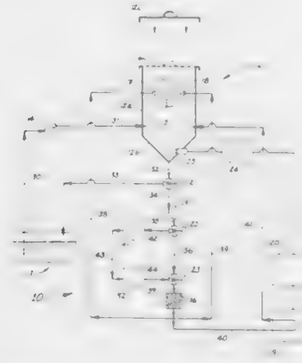
purifying said neovascularization inhibitor from said medium wherein said neovascularization inhibitor has a molecular weight of approximately 57,000±3,000 and an isoelectric point of approximately 4.6±0.3 and is stable in an environment with a pH of approximately from 2 to 3.

4,996,160

METHOD AND APPARATUS FOR QUANTITATIVE MEASUREMENT OF IONIC AND ORGANIC CONTAMINANTS REMAINING ON CLEANED SURFACES

Andrea J. Hausman Hazlitt, and Warren F. Richey, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 9, 1987, Ser. No. 60,136
Int. Cl.[5] G01N *21/27, 21/51, 31/00*
U.S. Cl. 436—2 **37 Claims**



1. A method for determining ionic contamination and organic contamination on an electronic circuit assembly (ECA) comprising:

(a) contacting a previously defluxed ECA with a solvent adapted for removing ionic contaminant species and organic contaminant species on the surface of the ECA,

(b) substantially simultaneously measuring

(i) the spectral absorbance, in the ultraviolet or the visible wavelength range of about 190 nm to about 800 nm, of the organic contaminant species in the solvent contacted with the ECA and

(ii) the conductivity or resistivity of the ionic contaminant species in the solvent contacted with the ECA, and

(c) comparing the resultant absorbance measurement to a standard prepared for such comparison and comparing the conductivity measurements to a standard prepared for such comparison.

17. An apparatus for determining the ionic contamination and organic contamination of an electronic circuit assembly (ECA) comprising, in operable combination:

(a) a means for contacting a previously defluxed ECA with a solvent adapted for removing organic contaminant species on the surface of the ECA,

(b) a means for measuring the spectral absorbance, in the ultraviolet or the visible wavelength range of about 190 nm to about 800 nm, of the organic contaminant species in the solvent contacted with the ECA and substantially simultaneously measuring the conductivity of the ionic contaminant species in the solvent, and

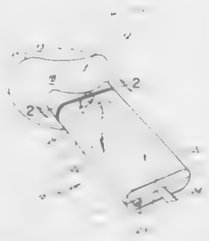
(c) a means for comparing the resultant absorbance units to a standard prepared for such purpose and the conductivity measurements to a standard prepared for such purpose.

4,996,161

BREATH ALCOHOL TESTING SYSTEM

Patrick J. Conners, Montgomery; Lawrence R. Stevens, Mason; Don R. Gaiser, Dayton, and Frank C. Pennypacker, Loveland, all of Ohio, assignors to Guardian Technologies, Inc., Denver, Colo.

Filed Oct. 16, 1987, Ser. No. 109,815
Int. Cl.[5] G01N *33/98*
U.S. Cl. 436—132 **27 Claims**



1. A breath alcohol testing system particularly suitable for unsupervised breath alcohol testing of a subject comprising:

a face mask having an internal surface, an external surface and an edge therebetween, said internal surface further defining a breath tube to convey a breath sample to means for testing said sample, said edge shaped for at least partially enclosing a portion of the face of a subject during delivery of said breath sample into said breath tube;

means responsive to the performance of an identity confirming act performed by said subject to verify the identity of said subject, said performance responsive means at least partially disposed within said face mask; and

means partially disposed in said face mask for insuring that the same subject performs both said confirming act and said delivery of said breath sample wherein said insuring means monitors the location of the face with respect to the mask.

4,996,162

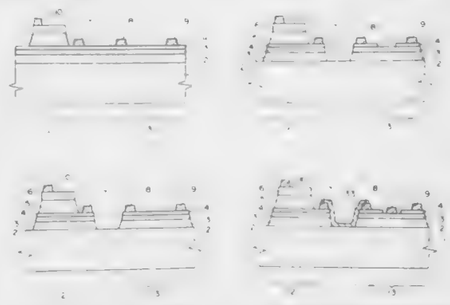
Patent Not Issued For This Number

4,996,163

METHOD FOR PRODUCING AN OPTO-ELECTRONIC INTEGRATED CIRCUIT

Goro Sasaki, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 22, 1989, Ser. No. 313,507
Claims priority, application Japan, Feb. 29, 1988, 63-46901; Feb. 29, 1988, 63-46902
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—5 **4 Claims**



1. A method for producing an opto-electric integrated circuit having a field effect transistor as an electronic device and

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a photo-diode as an optical device both formed on an InP substrate, comprising:

a first step of forming a first epitaxial layer of GaInAs, a second epitaxial layer of n-AlInAs, a third epitaxial layer of n-InP, a fourth epitaxial layer of undoped GaInAs and a fifth epitaxial layer of p-GaInAs formed on an InP substrate in the stated order;

a second step of partially removing the fifth and the fourth epitaxial layers, leaving a p-electrode region in a photo-diode region so as to expose the third epitaxial layer;

a third step of forming an anode of said photo-diode on the fifth epitaxial layer and a cathode thereof on the third epitaxial layer in the photo-diode region, and forming a source electrode and a drain electrode of the field effect transistor on the the third epitaxial layer in a field effect transistor region;

a fourth step of removing the third, the second and the first epitaxial layers between the photo-diode and the field effect transistor, so as to electrically separate both regions;

a fifth step of etching the third epitaxial layer between the source electrode and the drain electrode in the field effect transistor region to expose the second epitaxial layer so as to form a gate electrode on the exposed second epitaxial layer; and

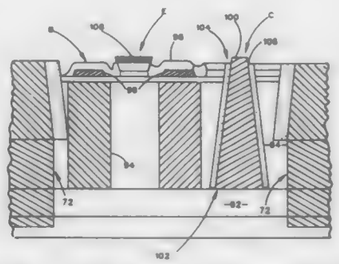
a sixth step of forming a wiring for electrically connecting the thus formed photo-diode and field effect transistor.

4,996,165

SELF-ALIGNED DIELECTRIC ASSISTED PLANARIZATION PROCESS

Mau-Chung F. Chang, and Peter M. Asbeck, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 21, 1989, Ser. No. 341,464
Int. Cl.[5] H01L *21/331, 21/31*
U.S. Cl. 437—31 **11 Claims**



7. A method of manufacturing a heterojunction bipolar transistor, comprising the steps of:

providing a heterojunction bipolar semiconductor wafer having a first layer of a first conductivity type, a second layer of a semiconductor of second conductivity type on the first layer, a third layer of a semiconductor of an opposite conductivity type to the second layer being positioned on the second layer forming a p-n junction, and a fourth layer of a semiconductor of the second conductivity type on the third layer forming a second p-n junction, at least one of the p-n junctions being a heterojunction;

forming a photoresist pattern on the wafer with an opening which defines a transistor location;

etching the third and fourth layers through an opening in the photoresist pattern down to the second layer and a portion of the second layer toward the first layer;

depositing a dielectric material on the second layer through the opening;

removing remaining photoresist material and dielectric material deposited thereon from the wafer;

depositing a thin layer of polymer on said wafer and into gaps between said dielectric and said second, third, and fourth layers;

forming a photoresist pattern on the wafer with a second opening which defines a base location for the heterojunction bipolar transistor;

implanting N dopant material at a second power and second dosage into said implant region;

forming a P type emitter region at least partially within said implant region; and

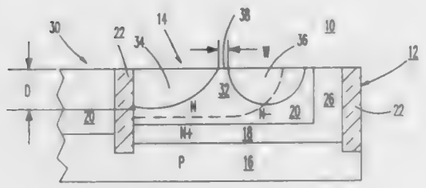
forming a P type collector region at least partially within said implant region such that an intrinsic base region is defined within said implant region proximate the surface of said body of semiconductor material.

4,996,164

METHOD FOR FORMING LATERAL PNP TRANSISTOR

Peter A. Habitz, Wappingers Falls; Chang-Ming Hsieh, Fishkill, and Yi-Shiou Huang, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1989, Ser. No. 317,877
Int. Cl.[5] H01L *21/22*
U.S. Cl. 437—31 **13 Claims**



1. A process of forming a lateral PNP transistor, said process comprising the steps of:

providing a body of semiconductor material including an isolated N- device region;

implanting N dopant material at a first power and first dosage into a selected implant region of said device region;

etching the fourth layer through the second opening to the third layer;

depositing base contact metal on the third layer through the opening;

depositing a second dielectric on the base contact metal and on the sidewalls of the second opening;

lifting off the photoresist with overlying second dielectric and metal while maintaining dielectric on the sidewalls;

defining a location for emitter contact metal on the fourth layer;

depositing emitter contact metal on the emitter contact location;

providing a passage through said fourth, third and second layers to the first layer; and

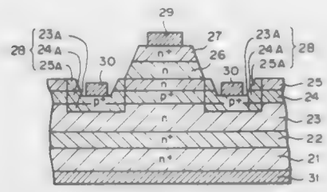
depositing collector contact metal on the first layer through the passage.

4,996,166

PROCESS FOR FABRICATING A HETEROJUNCTION BIPOLAR TRANSISTOR

Toshio Ohshima, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 262,241, Oct. 20, 1988, Pat. No. 4,294,283, which is a continuation of Ser. No. 832,896, Feb. 26, 1986, abandoned. This application Jan. 17, 1990, Ser. No. 466,646
Claims priority, application Japan, Feb. 28, 1985, 60-039120
Int. Cl.[5] H01L *21/331*
U.S. Cl. 437—31 **2 Claims**



1. A process for fabricating a bipolar transistor comprising the steps of:

(a) forming a first semiconductor layer of a first conductivity type;

(b) forming a second semiconductor layer of a second conductivity type, opposite to the first conductivity type, on the first semiconductor layer;

(c) forming a third semiconductor layer of the first conductivity type on the second semiconductor layer, the third semiconductor layer comprising a semiconductor forming a heterojunction with the second semiconductor layer and having a bandgap wider than that of the second semiconductor layer;

(d) selectively removing a portion of the third semiconductor layer so that a portion of the second semiconductor layer is exposed and out overlaid by the third semiconductor layer;

(e) doping an impurity into a region of the third semiconductor layer extending along an entire boundary between the third semiconductor layer and the exposed portion of the second semiconductor layer to convert the conductivity type of that region into the second conductivity;

(f) forming a first electrode electrically connected with the first semiconductor layer;

(g) forming a second electrode above and in contact with the second semiconductor layer in the exposed region; and

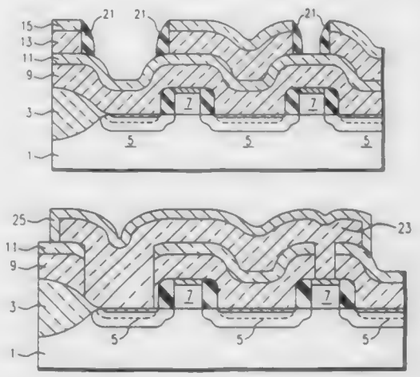
(h) forming a third electrode above the third semiconductor layer.

4,996,167

METHOD OF MAKING ELECTRICAL CONTACTS TO GATE STRUCTURES IN INTEGRATED CIRCUITS

Min-Liang Chen, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 29, 1990, Ser. No. 546,131
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—40 **9 Claims**



1. A method of integrated circuit manufacture comprising the steps of making a plurality of field-effect transistors, each comprising source and drain regions and a gate structure, and being disposed on a common substrate and making an electrical contact to at least said gate structure of at least one of said field effect transistors, said step of making an electrical contact comprising the further steps of forming first, second, third, and fourth insulating layers having first, second, third, and fourth compositions, respectively, over said plurality of said field-effect transistors, adjacent layers having different etching characteristics;

patterning a resist over said fourth layer to expose selected portions of said fourth layer, at least one of said portions being generally over at least said gate structure of a first transistor;

etching said exposed portions of said fourth and third layers to form windows which expose portions of said second layer;

forming sidewalls on said windows;

etching said exposed portions of said second and first layers using said sidewalls and said second layer, respectively, as etch masks to expose at least said gate structure; and,

forming a patterned conductor region contacting at least gate structure of said first transistor.

4,996,168

METHOD FOR MANUFACTURING P TYPE SEMICONDUCTOR DEVICE EMPLOYING DIFFUSION OF BORON GLASS

Hiroji Ozaki, and Shigeo Nagao, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,448
Claims priority, application Japan, Nov. 7, 1987, 62-281729
Int. Cl.[5] H01L *21/223, 21/225, 21/383, 21/385*
U.S. Cl. 437—164 **11 Claims**

1. A method for manufacturing a P-type semiconductor device, comprising

preparing a semiconductor substrate having a main surface and a region having a predetermined N-type impurity concentration;

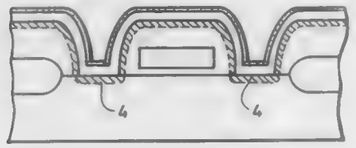
forming a conductor layer having an upper portion and opposite end portions on the main surface of the semiconductor substrate, and an insulating film on portions spaced

VOL 1123 ISS 4 FE 26 1991 UMI

at predetermined intervals apart from the opposite portions of a predetermined width of the main surface of the semiconductor substrate;

forming a diffusion preventing layer on the upper and opposite end portions of the conductor layer and on the spaced apart portions of the insulating layer, and on portions spaced at predetermined intervals apart from the opposite end portions of the conductor layer of the main surface contiguous to the conductor layer and the insulating layer;

forming a first layer comprising polysilicon or silicon oxide



on the diffusion preventing layer and on the region of the main surface of said semiconductor substrate where the diffusion preventing layer is not formed for a boron glass to be formed on the main surface of the semiconductor substrate;

forming a first boron glass by depositing first boron nitride on the first layer of polysilicon or silicon oxide; and

forming a first P-type diffusion layer by diffusing the first boron glass to thereby form a shallow P-type diffusion layer in the substrate on the region where the diffusion preventing layer does not exist.

4,996,169

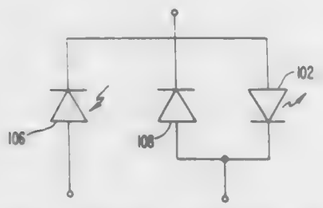
SEMICONDUCTOR LASER ASSEMBLY

Wai-Hon Lee, Cupertino, Calif., assignor to Pencom International Corp., Sunnyvale, Calif.

Division of Ser. No. 313,691, Feb. 21, 1990. This application May 18, 1990, Ser. No. 525,525

Int. Cl.[5] H01L *25/16*

U.S. Cl. 437—209 10 Claims



1. A method of forming a semiconductor laser assembly, comprising the steps of:

forming a heatsink having first and second orthogonal surfaces;

mounting a first semiconductor photodetector on said first surface of said heatsink;

mounting first and second conductive blocks on said first surface of said heatsink, said conductive blocks being electrically isolated from each other and said first photodetector, each of said conductive blocks having first and second surfaces parallel to said first and second surfaces of said heatsink, respectively, each of said first and second surfaces of said first and second conductive blocks being of sufficient size to act as a wire bonding pad;

mounting a semiconductor chip on said second surface of said heatsink, including a second semiconductor photodetector and a conductive region having first and second surfaces parallel to said first and second surfaces of said heatsink, respectively, said first surface of said conductive region being of sufficient size to act as a wire bonding pad; and

mounting a semiconductor laser to said second surface of said conductive region.

4,996,170

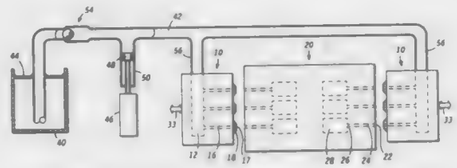
MOLDING PROCESS FOR ENCAPSULATING SEMICONDUCTOR DEVICES USING A THIXOTROPIC COMPOUND

John Baird, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 30, 1990, Ser. No. 559,922

Int. Cl.[5] H01L *21/56, 23/28*

U.S. Cl. 437—219 7 Claims



1. A molding process for encapsulating semiconductor devices, comprising the steps of:

providing a manifold in which a thixotropic compound is disposed, the manifold having at least one feed runner for expelling the thixotropic compound therethrough wherein the feed runner is closed;

providing a mold having at least one mold cavity, and having a subrunner extend from each mold cavity to the exterior of the mold placing a semiconductor device in each mold cavity and closing the mold;

transferring the thixotropic compound from a feed pot to the manifold, and into each feed runner;

holding the manifold at a temperature in which the thixotropic compound is not cured;

holding the mold at a temperature at which the thixotropic compound is cured;

engaging the manifold with the mold, such that each feed runner communicates with each subrunner;

opening each feed runner of the manifold;

transferring the thixotropic compound from the manifold to the mold through each feed runner of the manifold to each subrunner of the mold and into the mold cavity; and

separating the manifold and the mold, drawing the thixotropic compound near the exit of each feed runner into the manifold, thus making a clean separation.

4,996,171

SILVER-FILLED GLASS

Nigel M. Davey, Wargrave, and Gordon G. Ferrier, Reading, both of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, England

Filed Dec. 22, 1988, Ser. No. 288,640

Claims priority, application United Kingdom, Dec. 24, 1987, 8730196

Int. Cl.[5] C03C *8/18*

U.S. Cl. 501—19 5 Claims

1. In a silver-filled glass bonding paste for the electronics industry, the improvement wherein a lead phosphate glass consisting essentially of lead oxide, phosphorus oxide and at least one further oxide selected from the oxides of magnesium, calcium, strontium, barium, cadmium, boron, silicon and vanadium and wherein said lead phosphate glass has a softening temperature in the range of 150°–400 ° C. is the glass component of the paste.

4,996,172

RARE EARTH-CONTAINING ZINC PHOSPHATE GLASSES

George H. Beall, Big Flats; James E. Dickinson, Jr., and Candace J. Quinn, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 29, 1989, Ser. No. 372,764

Int. Cl.[5] C03C *3/16, 3/17*

U.S. Cl. 501—45 4 Claims

1. A glass exhibiting a transition temperature below 350° C., a working temperature below 450° C., and exceptional resistance to attack by mild aqueous alkaline solutions consisting essentially, expressed in terms of mole percent on the oxide basis, of:

LiO_2O	0–25	P_2O_5	28–45
Na_2O	0–25	Al_2O_3	0–4
K_2O	0–25	SnO	0–35
$Li_2O + Na_2O + K_2O$	10–35	PbO	0–35
ZnO	30–55	SnO + PbO	0–35

Y_2O_3 and/or at least one rare earth metal oxide (RE_2O_x) 0.5–5 wherein at least two alkali metal oxides are present.

4,996,173

OPTICAL GLASS

Kazuo Tachiwana, Akishima, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,360

Claims priority, application Japan, Feb. 29, 1988, 63-47117

Int. Cl.[5] C03C *3/062, 4/00*

U.S. Cl. 501—73 3 Claims

1. An optical glass having a refractive index nd of at least 1.70 and an Abbe's number νd of at most 30 consisting essentially, in percent by weight based upon the total composition, of:

SiO_2	5–30%
GeO_2	0–25%
the sum of SiO_2 and GeO_2	5–30%
Na_2O	0–19%
K_2O	0–19%
the sum of Na_2O and K_2O	10–19%
P_2O_5	10–35%
Nb_2O_5	18–49%
TiO_2	0–14%
Ta_2O_5	0–20%
ZrO_2	0–10%
WO_3	0–5%
PbO	0–20%
ZnO	0–10%
Bi_2O_3	0–20%
the sum of Nb_2O_5, Ta_2O_5, ZrO_2, WO_3, PbO, ZnO and Bi_2O_3	18–49%
B_2O_3	0–15%
Al_2O_3	0–5%
and further comprising As_2O_3	0.3% by weight based on the total amount of the above components.

4,996,174

PRODUCTION OF CERAMIC MATERIALS

James D. Birchall, Mouldsworth, Nr. Chester; Mary J. Mockford, Upton, and David R. Stanley, Knutsford, all of England, assignors to Imperial Chemical Industries Plc, London, England

Filed Mar. 18, 1987, Ser. No. 27,270

Claims priority, application United Kingdom, Mar. 27, 1986, 8607687; May 20, 1986, 8612285

Int. Cl.[5] C04B *35/56, 35/58*

U.S. Cl. 501—87 23 Claims

1. A process for the production of a ceramic material which process comprises reacting a first reactant which comprises at least one compound of a metallic or non-metallic element having two or more groups reactive with hydroxyl groups with a second reactant which comprises at least one organic compound having two or more hydroxyl groups to produce an oxygen containing polymeric product, heating the oxygen-containing polymeric product in an inert atmosphere to produce a coked product containing carbon and an oxide of the metallic or non-metallic element, and heating the coked product to effect a carbothermic reaction between the oxide of the metallic or non-metallic element and the carbon to produce a ceramic, in which the proportion of the first and second reactants is chosen such that in the coked product the proportion by weight of carbon to the oxide of the metallic or non-metallic element is in the range from 50 to 150% of the proportion which is theoretically required to produce the ceramic material.

4,996,175

REFRACTORY COMPOSITION AND METHOD FOR METAL CASTING

David H. Sturgis, Gladstone, Oreg., assignor to Precision Castparts Corp., Portland, Oreg.

Filed Jan. 25, 1988, Ser. No. 148,010

Int. Cl.[5] C04B *35/50*

U.S. Cl. 501—126 19 Claims

1. A method for producing a casting flour usable in a reactive metal casting slurry, the method comprising:

forming a mixture which consists essentially of Y_2O_3 casting refractory powder as the predominant ingredient, V_2O_5 in an amount sufficient that said mixture has a lower sintering temperature than said powder, and a fugitive binder in an amount sufficient to maintain the mixture in a homogeneous state;

applying heat to said mixture in an amount sufficient to sinter said mixture; and

grinding the sintered mixture to form a casting flour.

4,996,176

RESERVOIR FEED METHOD OF MAKING CERAMIC COMPOSITE STRUCTURES AND STRUCTURES MADE THEREBY

Marc S. Newkirk, Newark; H. Daniel Lesher; Ratnesh K. Dwivedi, both of Wilmington, and Robert C. Kantner, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Division of Ser. No. 908,067, Sep. 16, 1986, Pat. No. 4,900,699. This application Sep. 28, 1989, Ser. No. 414,195

Int. Cl.[5] C04B *35/10, 35/18*

U.S. Cl. 501—127 20 Claims

1. A self-supporting ceramic-surfaced metal structure comprising (a) a substrate comprising a parent metal and a ceramic surface formed integrally with said substrate and comprising a filler embedded by an oxidation reaction product of said parent metal with an oxidant.

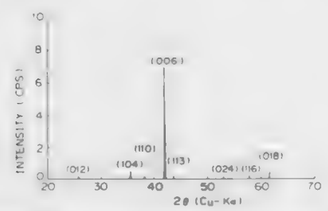
VOL 1123 ISS 4 FE 26 1991 UMI

4,996,177

SINTERED ALUMINA ARTICLE WITH HIGH FLEXURAL STRENGTH AND PROCESS FOR PRODUCING SAME

Shigehide Takagi, Narashino; Hideo Yano, Tokorozawa; Takashi Oku, Funabashi; Keijiro Shigeru, Funabashi; Yoshifumi Kuboto, Funabashi, and Tsutomu Shishikura, Chiba, all of Japan, assignors to Sumitomo Cement Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,976
Claims priority, application Japan, Jul. 27, 1987, 62-185539
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—153 5 Claims



1. A sintered alumina article consisting essentially of sintered plate crystalline corundum particles which are a product of hydrothermal treatment of gibbsite ($Al(OH)_3$) particles having a size of 10 μm or less, at a temperature of 350° C. to 800° C. under a pressure of 100 atmospheres or less, wherein said plate crystalline particles have two parallel cleavage surface planes, and wherein said plate crystalline particles have been accumulated on and bonded to each other such that the cleavage surface planes of the accumulated plate crystalline particles are substantially parallel to each other and wherein said crystalline particles have a major dimension of the cleavage surface planes thereof of from 0.05 to 10 μm and a thickness thereof of 0.01 to 1 μm; said sintered alumina article having a flexural strength of at least 5800 kg/cm^2.

4,996,178

LOW TEMPERATURE SYNTHESIS OF CONDENSATION POLYMERS

Naoya Ogata, Tokyo, Japan, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio

Division of Ser. No. 344,160, Apr. 27, 1989, Pat. No. 4,923,839, which is a division of Ser. No. 180,924, Apr. 11, 1988, Pat. No. 4,843,053, which is a division of Ser. No. 11,464, Feb. 5, 1987, Pat. No. 4,804,730. This application Jan. 8, 1990, Ser. No. 461,941
Int. Cl.[5] B01J *31/06*
U.S. Cl. 502—159 13 Claims

1. A catalyst system which is particularly useful in synthesizing condensation polymers which is comprised of (1) at least one polymeric agent having bound acid acceptor groups and (2) at least one triphenylphosphine dihalide.

4,996,179

MALEIC ANHYDRIDE CATALYSTS AND PROCESS FOR THEIR MANUFACTURE

Muin S. Haddad, Naperville; Bernard L. Meyers, Wheaton, and William S. Eryman, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 297,329, Jan. 17, 1989, Pat. No. 4,933,312. This application Feb. 22, 1990, Ser. No. 484,342
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] B01J *27/198*
U.S. Cl. 502—209 41 Claims

1. A catalyst for the production of maleic anhydride by the oxidation of a feedstock comprising a member selected from the group consisting of benzene, n-butane, butenes, butadiene and mixtures thereof, which catalyst comprises a phosphorus-vanadium mixed oxide and exists in the form of geometric shapes, said catalyst in the form of said geometric shapes having been heated in an inert atmosphere at a temperature within the range of about 343° C. (650° F.) to about 704° C. (1,300° F.) prior to being exposed to an oxygen-containing atmosphere at an elevated temperature wherein said phosphorus-vanadium mixed oxide catalyst has an atomic ratio of vanadium-to-phosphorus in the range of about 0.5:1 to about 1.25:1.

4,996,180

CATALYST OF COPPER OXIDE AND CERIA

Alan F. Diwell; Christopher Hallett, both of Reading; Graham Pansell, Wokingham, and John W. Hayes, Reading, all of United Kingdom, assignors to Johnson Matthey Public Limited Company, United Kingdom

Filed Dec. 8, 1988, Ser. No. 281,406
Claims priority, application United Kingdom, Dec. 11, 1987, 8729096
Int. Cl.[5] B01J *23/10, 23/72*
U.S. Cl. 502—304 12 Claims

1. A catalyst for use in a method of treating gaseous effluents in order to combat air pollution by contacting the gaseous effluents with the catalyst, in which the catalyst consists essentially of an intimate mixture of copper oxide and ceria, the weight of the copper oxide being less than the weight of the ceria.

4,996,181

AGGLOMERATE ABSORBENTS COMPRISING COPPER AND ZINC USEFUL FOR SULPHUR COMPOUNDS REMOVAL

Patrick J. Denny, Darlington, and Peter Wood, Stockton-On-Tees, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 39,070, Apr. 16, 1987, Pat. No. 4,871,710. This application Aug. 24, 1989, Ser. No. 398,275
Claims priority, application United Kingdom, Apr. 25, 1986, 8610196
The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.
Int. Cl.[5] B01J *21/08, 20/06, 27/232;* B01D *53/02*
U.S. Cl. 502—414 4 Claims

1. Agglomerates capable of absorbing carbonyl sulphide, mercaptans, and hydrogen sulphide, and comprising particles of metal compounds bound together by a binder, whereby said agglomerates have

a size in the range of 1 to 10 mm;

a BET surface area of at least 80 $m^2 \cdot g^{-1}$;

a calcined density of not more than 1.5 $g \cdot cm^{-3}$, as determined by measuring the density of a sample of said agglomerates after calcination for 4 hours at 350° C.; and

a porosity of not less than 0.6;

said agglomerates comprising an intimate mixture of

(a) at least one copper compound and at least one zinc compound; and

(b) at least one element X compounds, wherein element X is selected from aluminum, silicon, and metals of Groups IIIA, IVA, VA, VIA, and VIIIA of the Periodic Table, and wherein said copper, zinc, and element X compounds are in the form of oxides, hydroxides, carbonates and/or basic carbonates; and

said copper, zinc and element X compounds are in such proportions that

(i) said copper atoms form greater than 30%, the zinc atoms form at least 5%, and the element X atoms form 5–20% of the total number of copper, zinc and element X atoms in said agglomerates; and

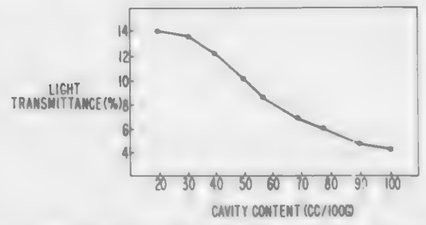
(ii) after ignition of said agglomerates at 900° C. thereby forming an ignited composition consisting of the constituents of said agglomerates in oxide form, the cupric oxide plus zinc oxide content of the ignited composition is at least 80% by weight.

4,996,182

HEAT-SENSITIVE RECORDING MATERIAL

Takeshi Matsui; Takehiko Watanabe, both of Osaka; Katsunori Miyazaki, Inuyamaa, and Hiroo Hayashi, Takatsuki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1989, Ser. No. 312,916
Claims priority, application Japan, Jun. 8, 1988, 63-140911
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—200 5 Claims



1. A heat-sensitive recording material which comprises a substrate and a heat-sensitive recording layer formed thereon, said substrate having as a constituent element a synthetic resin film layer containing minute cavities, said synthetic resin film layer being biaxially oriented and comprising a mixture of a polyolefin or a polyester and a particulate substance in miscible with the polyolefin or polyester, wherein a content of cavities in said synthetic resin film layer is 40 to 100 cc/g.

4,996,183

THERMOSENSITIVE RECORDING MATERIALS

Masaaki Otani; Shigetoshi Hiraishi, and Kenji Hyodo, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Limited, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,766
Claims priority, application Japan, May 27, 1988, 63-131273
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—208 6 Claims



X 10,000

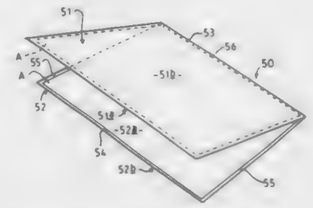
1. A thermosensitive recording material comprising a support having provided thereon a thermosensitive color forming layer comprising a dye cursor, a color developer for said dye precursor, a sensitizer, a dispersing agent and a binder, a softening point of a mixture of said dispersing agent and said binder being at least 70° C.; said dispersing agent being present in an amount of 1 to 7% by weight based on total weight of said dye precursor, color developer and sensitizer and said binder being present in an amount of 7 to 20% by weight based on total weight of said dye precursor, color developer and sensitizer, and said binder being present in an amount of 7 to 20% by weight based on total weight of said dye precursor, color developer and sensitizer, respectively.

4,996,184

SHEET MATERIAL FOR USE IN A METHOD FOR NON-IMPACT PRINTING, PHOTOCOPYING AND LIKE REPROGRAPHIC PROCESSES

Leonard N. Bevan, Warwickshire; Colin R. Moore, Worcestershire, and Victor G. Atkinson, Birmingham, all of United Kingdom, assignors to Carrs Paper Limited, Solihull, United Kingdom

Filed Mar. 30, 1989, Ser. No. 330,692
Claims priority, application United Kingdom, Mar. 30, 1988, 8807596
Int. Cl.[5] B41M *5/22*
U.S. Cl. 503—226 4 Claims



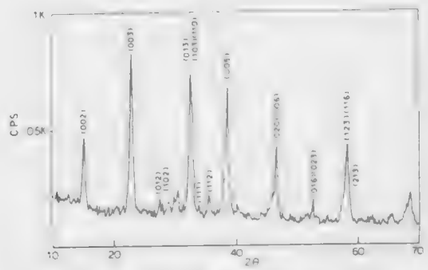
1. A stack of sheets of material wherein each sheet has one face thereof provided with a CB coating for a carbonless copy system and another face thereof free of said CB coating, and the sheets are arranged in pairs with said CB coatings thereof arranged in face-to-face relation, the two sheets of each pair being connected together at least at one edge thereof and the neighboring sheets of superposed pairs in the stack being unconnected with one another.

4,996,185

CERAMIC SUPERCONDUCTING THIN FILM

Naoji Fujimori; Keizo Harada; Shuji Yazu, and Tetsuji Jodai, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 31, 1988, Ser. No. 200,206
Claims priority, application Japan, May 31, 1987, 62-136939; May 31, 1987, 62-136940; Jun. 4, 1987, 62-140611; Jun. 4, 1987, 62-140613
Int. Cl.[5] B05D *5/12, 5/06*
U.S. Cl. 505—1 13 Claims



1. A superconducting thin film comprising a compound oxide represented by the general formula

$$Ln_1Ba_2Cu_3O_{7-\delta}$$

in which Ln is an element selected from a group consisting of Y, La, Gd, Ho, Er, Tm, Yb, Nd, Sm, Eu and Lu, and δ is a number between zero and one, wherein said thin film is deposited on a single crystal substrate and the X-ray diffraction chart of said thin film possesses at least one crystal face of (00n) plane having an intensity J_{00n} in an X-ray diffraction pattern which satisfies the following relation:

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$J_{00n}/J_{MAX} \geq 2(I_{00n}/I_{MAX})$

in which

(00n) is an index of a crystal face of said thin film, wherein "n" is an integer;

I_{MAX} is an intensity of the most intense peak in a powder X-ray diffraction chart measured in a powder sample of a compound oxide represented by a formula $Y_1Ba_2Cu_3O_7$ used as a reference;

I_{00n} is an intensity of the (00n) plane in said powder X-ray diffraction chart;

J_{MAX} is an intensity of a crystal face having the most intense peak in said powder X-ray diffraction chart and is observed in an X-ray diffraction chart measured in said thin film; and

J_{00n} is an intensity of the (00n) plane in said X-ray diffraction chart measured in said thin film.

4,996,186

FLUX METHOD FOR PRODUCING CRYSTALS OF SUPERCONDUCTING $YBa_2CU_3O_7$

Zhao Z. Wang, Princeton, and Nai-Phuan Ong, Belle Mead, both of N.J., assignors to Princeton University, Princeton, N.J.

Filed Aug. 5, 1988, Ser. No. 228,979
Int. Cl.[5] H01L *39/12*; C30B *9/06*; C01F *17/00*
U.S. Cl. 505—1 **8 Claims**

1. A method for producing single crystals of $YBa_2Cu_3O_7$ which undergo a transition to the superconducting state above 90K, comprising:

(a) preparing a flux composition by mixing BaO_2 and CuO powders in the molecular weight ratio of approximately 1:1, layering on top of the mixture powdered $YBa_2Cu_3O_7$ in an amount up to approximately 20% of the total weight of the BaO_2-CuO mixture, firing the mixture in air at approximately 930° C.–950° C. for approximately 15 hours or longer to thereby form $BaCuO_{2+x}$ where x=0.10 to 0.20, and thereafter raising the temperature from 930° C.–950° C. to 980° C.–1040° C. within ½ hour to melt the $BaCuO_{2+x}$ to form a flux;

(b) maintaining the temperature of the flux of step (a) at 980° C.–1040° C. for an amount of time sufficient to dissolve the $YBa_2Cu_3O_7$ into the molten $BaCuO_{2+x}$;

(c) cooling thereafter the flux to approximately 1020° C.–980° C.:

(d) providing an oxygen gas flow to the flux when the temperature is approximately 1020° C.–980° C.;

(e) maintaining the flux in an oxygen gas flow at approximately 980° C. for approximately at least 30 minutes; and

(f) cooling thereafter the flux slowly to room temperature in continuing oxygen gas flow.

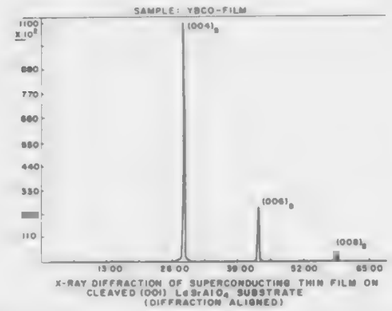
4,996,187

EPITAXIAL BA-Y-CU-O SUPERCONDUCTOR FILM

Bruce H. T. Chai, Bridgewater, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 17, 1988, Ser. No. 258,916
Int. Cl.[5] H01L *39/12*
U.S. Cl. 505—1 **10 Claims**

1. A superconducting structure comprising, in combination, a crystal substrate having a superconducting film epitaxially deposited thereon, wherein wherein the substrate is a crystal selected from the group consisting of $SrLaAlO_4$, $SrLaGaO_4$, $SrPrGaO_4$, $SrNdGaO_4$, $SrSmGaO_4$, $SrEuGaO_4$, $CaLaGaO_4$,



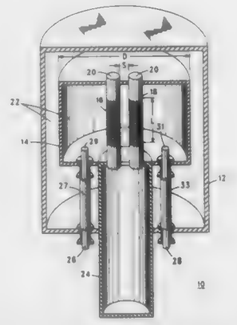
$CaPrGaO_4$ and $CaNdGaO_4$, and wherein the superconducting film is a Ba-Y-Cu-O type superconductor.

4,996,188

SUPERCONDUCTING MICROWAVE FILTER

Richard S. Kommrusch, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1989, Ser. No. 387,548
Int. Cl.[5] H01B *12/00*; H01P *1/20*
U.S. Cl. 505—1 **7 Claims**



1. In a microwave cavity filter comprised of an evacuated substantially cylindrical housing with an RF input terminal and an RF output terminal, the cavity filter preferentially coupling RF energy at at least one preferred frequency to the RF output terminal, an improvement comprising:

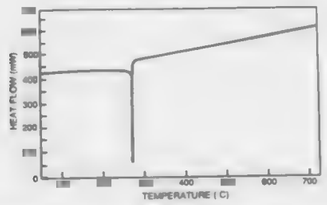
at least one dielectric cylinder mounter within said evacuated substantially cylindrical housing, said dielectric cylinder having a superconducting material coating at least a portion of the exterior of said dielectric cylinder, coolant for said superconducting material being transported through only the interior of said cylinder, said dielectric cylinder and superconducting material thereon forming a superconducting resonator element within said substantially cylindrical housing coupling RF energy from the RF input terminal to the RF output terminal, said at least one superconducting resonating element establishing the resonant frequency of the filter, the filter frequency response, and RF power coupling between the RF input and the RF output terminals.

4,996,189

METHOD OF PRODUCING MIXED METAL OXIDE MATERIAL, AND OF PRODUCING A BODY COMPRISING THE MATERIAL

Kostantinos Kourtakis, Summit, and Murray Robbins, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 24, 1988, Ser. No. 261,656
Int. Cl.[5] C01F *17/00*; H01L *39/12*
U.S. Cl. 505—1 **9 Claims**



1. A method of producing an article that comprises a body comprising a mixed metal oxide of nominal composition $M_xM'_y \ldots O_z$ wherein M, M' . . . are metal elements and at least each of x, y and z is greater than zero, the method comprising

(a) forming an intimate mixture comprising at least one salt each of M, M' . . . such that the mixture contains M, M' . . . in essentially the ratio x:y: . . . ; with the salts chosen such that at least one of the salts is an oxidizing agent with respect to at least one of the other salts (to be referred to as the reducing agent);

(b) heating the mixture at least to a reaction temperature less than about 300° C. such that an exothermic oxidation-reduction occurs and a precursor material of the mixed metal oxide is formed from the mixture, the precursor material consisting essentially of M, M' . . . and, optionally of oxygen;

(c) heating the precursor material in an oxygen-containing atmosphere such that the mixed metal oxide is formed from the precursor material; and

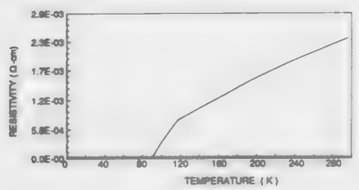
(d) carrying out one or more further steps towards completing the article.

4,996,190

SUPERCONDUCTING THIN FILM AND A PROCESS FOR DEPOSITING THE SAME

Kenjiro Higaki; Keizo Harada; Naoji Fujimori; Hideo Itozaki, and Shuji Yazu, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 19, 1989, Ser. No. 367,732
Claims priority, application Japan, Jun. 17, 1988, 63-149414
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 **3 Claims**



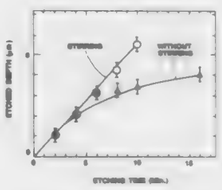
1. A superconductor comprising a substrate and a superconducting thin film of a superconducting compound oxide containing bismuth (Bi) deposited on the substrate, characterized in that said superconducting thin film is deposited on {110} plane of a single crystal of magnesium oxide (MgO).

4,996,191

METHOD FOR ETCHING SUPERCONDUCTOR MATERIALS

Takeshi Kobayashi, Osaka; Masayoshi Tonouchi, Toyonaka, and Yoshiyuki Sakaguchi, Osaka, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,662
Claims priority, application Japan, Jun. 17, 1988, 63-149783
Int. Cl.[5] C09K *13/06*
U.S. Cl. 505—1 **11 Claims**



1. A method of chemically etching a barium-copper-oxygen or calcium-copper-oxygen high-temperature superconductor material, comprising:

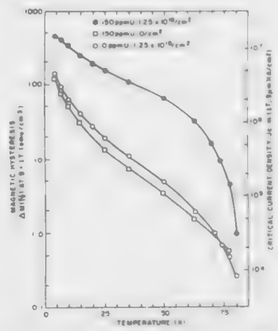
etching the superconductor material with an etchant comprising 1-hydroxy-ethane-1,1-diphosphonic acid.

4,996,192

Y-BA-CU-O SUPERCONDUCTOR CONTAINING RADIOACTIVE DOPANTS

Robert L. Fleischer, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 17, 1989, Ser. No. 380,966
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 **17 Claims**



1. A process for producing a superconductive body which comprises providing a matrix-forming powder of oxides or precursor therefor wherein the oxide composition corresponds to the matrix composition comprised of $YBa_2Cu_3O_{7-y}$ where y ranges from zero to about 1, providing an oxide additive or precursor therefor selected from the group consisting of natural uranium dioxide, uranium-235 dioxide, plutonium -239 dioxide and mixtures thereof, all of the uranium component of said additive and all of the plutonium-239 component of said additive providing dopant atoms, said natural uranium dioxide providing dopant atoms comprised of natural uranium which includes the uranium-235 isotope, forming a mixture of said matrix-forming powder and said additive or precursor therefor, heating said mixture to a reaction temperature ranging from greater than about 800° C. to below the melting point of said oxides to produce a reaction product comprised of said matrix composition and said dopant atoms wherein said dopant atoms being substituted in said matrix composition in an

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amount ranging to their solubility limit therein, said precursors decomposing below said reaction temperature producing said oxides, comminuting said reaction product to produce a sinterable powder, forming said sinterable powder into a compact, sintering said compact in an oxidizing atmosphere at a temperature ranging from about 900° C. to below the melting point of said sinterable powder producing a sintered polycrystalline body having an open porosity ranging from zero to about 20% by volume of said body, cooling said body in an oxidizing atmosphere at a rate which produces a superconductive body and irradiating said superconductive body with thermal neutrons causing a sufficient number of said uranium-235 and/or plutonium-239 dopant atoms to undergo fission to produce from about 2.5×10^{14} to about 50×10^{14} fission events per cubic centimeter of the resulting irradiated superconductive body, said uranium-235 and/or plutonium-239 dopant atoms being present in an amount sufficient to produce said fission events.

4,996,193

COMBINED TOPICAL AND SYSTEMIC METHOD OF ADMINISTRATION OF CYCLOSPORINE

Charles W. Hewitt, Orange, and Kirby S. Black, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 3, 1989, Ser. No. 318,676
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—11 **22 Claims**

1. A method for treating T-cell mediated immune processes, allograft rejection, inflammations, autoimmune conditions or cyclosporin-responsive conditions in animals, comprising: topically applying a formulation containing cyclosporin in pharmaceutically effective amounts to the affected tissue; and systemically administering a formulation containing cyclosporin in pharmaceutically effective amounts in conjunction with said topical application.

4,996,194

PRESSURE TREATED AUTOIMMUNE SPECIFIC T CELL COMPOSITIONS

Irun R. Cohen, and Meir Shinitzky, both of Rehovot, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 648,802, Sep. 7, 1984, Pat. No. 4,634,590. This application Sep. 23, 1986, Ser. No. 910,876
Claims priority, application Israel, Sep. 11, 1983, 69686
Int. Cl.[5] A61K *39/39, 41/00, 45/05*
U.S. Cl. 514—21 **34 Claims**

1. A preparation for preventing or treating an autoimmune disease, comprising T-lymphocyte cells which have developed specificity for the autoimmune disease specific antigen and which cells have been activated either by incubating in the presence of the autoimmune disease specific antigen or by incubating with a mitogen capable of inducing an immune response by the T-lymphocyte cells, following which said cells have been pressure treated by means of hydrostatic pressure of sufficient pressure and time to cause augmented antigenicity of the T-lymphocyte cells without substantial loss of membrane proteins from the cells.

4,996,195

DERIVATIVES OF α,D-GLUCOFURANOSE OR α,D-ALLOFURANOSE AND INTERMEDIATES FOR PREPARING THESE DERIVATIVES

Bruce Ronsen, River Forest; Sudershan K. Arora, Westchester, and Albert V. Thomas, Niles, all of Ill., assignors to Greenwich Pharmaceuticals Inc., Ft. Washington, Pa.

Filed Jan. 9, 1989, Ser. No. 294,838
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—23 **32 Claims**

1. A monosaccharide compound selected from the group consisting of:

1,2:3,5-Di-O-isopropylidene-6-deoxy-6-thio-3'(N',N'-dimethylamino-n-propyl)-α,D-glucofuranose;
1,2-O-isopropylidene-3-O-n-heptyl-α,D-glucofuranose;
1,2-O-isopropylidene-3-deoxy-3-amino-3'-(propan-1'-ol)-α,D-allofuranose; and
1,2:3,5-Di-O-isopropylidene-6-O-2'-(N'-ethylpyrrolidyl)-α,D-glucofuranose.

4,996,196

NOVEL DESICCANT AND DEHYDRATION THEREWITH

Masakazu Mitsuhashi; Shuzo Sakai, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Division of Ser. No. 870,132, Jun. 3, 1986, Pat. No. 4,870,059. This application Jul. 21, 1989, Ser. No. 382,945
Claims priority, application Japan, Nov. 27, 1985, 60-266559; Dec. 11, 1985, 60-278634
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.
Int. Cl.[5] A23G *3/00;* **A61K** *7/00, 7/06, 31/70*
U.S. Cl. 514—53 **10 Claims**

1. A dehydrated product containing crystalline β-maltose hydrate obtained by the method comprising incorporating anhydrous maltose as a desiccant into a hydrous matter to convert the anhydrous maltose into crystalline betamaltose hydrate, and dehydrating the hydrous matter.

4,996,197

PHARMACEUTICAL AND/OR COSMETIC COMPOSITION FOR LOCAL USE CONTAINING RHAMSAN GUM

Claude Mazuel, Riom, France, assignor to Laboratoires Merck Sharp & Dohme-Chibret, Paris, France

Filed Jul. 25, 1988, Ser. No. 223,572
Claims priority, application France, Jul. 20, 1987, 87 10211
Int. Cl.[5] A61K *31/715*
U.S. Cl. 514—54 **3 Claims**

1. An ophthalmic composition comprising Rhamsan gum and at least one ophthalmic pharmacologically active substance.

4,996,198

ANTICOCCIDIAL COMPOSITION

Eugene G. Schildknecht, Hacketts Town, and Govind G. Untawale, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 11, 1988, Ser. No. 217,488
Int. Cl.[5] A61K *31/505, 31/635, 34/00*
U.S. Cl. 514—157 **4 Claims**

1. A composition for combating coccidiosis in animals, which comprises sulfadimethoxine, ormetoprim and lasalocid, wherein these ingredients are present in amounts which in combination are synergistically effective in combating at least one coccidiosis-causing strain of Eimeria.

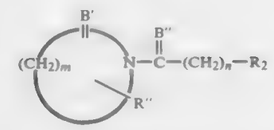
4,996,199

PENETRATION ENHANCERS FOR TRANSDERMAL DELIVERY OF SYSTEMIC AGENTS

Gevork Minaskanian, Irvine, and James V. Peck, Costa Mesa, both of Calif., assignors to Whitby Research, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 179,144, Apr. 8, 1988. This application Jun. 20, 1988, Ser. No. 199,801
Int. Cl.[5] A61K *31/56, 31/59*
U.S. Cl. 514—167 **1 Claim**

1. A method for topically administering systemically active agents through the skin or mucosal membranes of humans and animals, which method comprises the topical administration of effective amounts of a systemically active steroid and a membrane penetration enhancer having the structural formula



wherein
R_2 is $-CH_3$, wherein R' is $-(CH_2)_yCOOR_1$, wherein Y is zero and R_1 is hydrogen;
wherein B' represents oxygen;
wherein B'' represents two hydrogen radicals; and
wherein m is 3 and n is 10.

4,996,200

USE OF ZN-PROTOPORPHYRIN FOR HEPATITIS TREATMENT

Yasuhiro Nishimura, Fujiidera; Motoko Suzuki, Ibaraki, and Yozo Fukuda, Toyonaka, all of Japan, assignors to Hamair Chemicals, Ltd., Osaka, Japan

Continuation of Ser. No. 150,397, Jan. 29, 1988, abandoned. This application Oct. 18, 1989, Ser. No. 423,700
Claims priority, application Japan, Feb. 6, 1987, 62-26776
Int. Cl.[5] A61K *49/00;* **A61F** *31/585*
U.S. Cl. 514—185 **4 Claims**

1. A method for suppressing the increase of glutamic-oxaloacetic transaminase and glutamic-pyruvic transaminase in the serum of a patient suffering from hepatitis, which comprises administering orally a therapeutically effective amount of protoporphyrin IX-Zn(II) complex to said patient exhibiting said elevated levels of glutamic-oxaloacetic transaminase and glutamic-pyruvic transaminase in said serum.

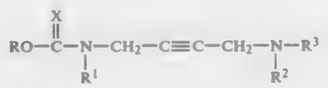
4,996,201

4-(N-SUBSTITUTED AMINO)-2-BUTYNYL-1-CARBAMATES AND THIOCARBAMATES AND DERIVATIVES THEREOF AS CENTRALLY ACTING MUSCARINIC AGENTS

Stephen C. Bergmeier; Jeffrey A. Kester; Walter H. Moos; Haile Tecle, and Anthony J. Thomas, all of Ann Arbor, Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

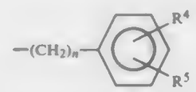
Filed Aug. 2, 1989, Ser. No. 388,777
Int. Cl.[5] A61K *31/395;* **C07D** *223/04*
U.S. Cl. 514—212 **6 Claims**

1. A compound of formula I

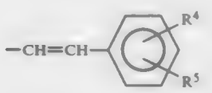


I

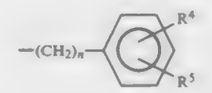
wherein
R is
alkyl of from one to six carbon atoms,
alkyl of from one to six carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
alkenyl of from two to six carbon atoms,
alkenyl of from two to six carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
alkynyl of from two to six carbon atoms,
alkynyl of from two to six carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
cycloalkyl of from three to six carbon atoms,



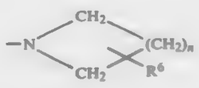
wherein n is zero or an integer of one to eight and R^4 and R^5 are independently hydrogen, fluorine, chlorine, bromine, hydroxy, alkyl of from one to three carbon atoms, or alkoxy of from one to four carbon atoms, or



wherein
R^4 and R^5 are as defined above;
X is oxygen or sulfur;
R^1 is
alkyl of from one to six carbon atoms,
alkyl of from one to six carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
alkenyl of from three to six carbon atoms
alkenyl of from three to six carbon atoms substituted with hydroxy or alkoy of from one to four carbon atoms,
alkynyl of from three to six carbon atoms,
alkynyl of from three to six carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
cycloalkyl of from three to six carbon atoms, or

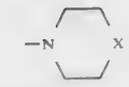


wherein n, R^4 and R^5 ar as defined above;
R^2 and R^3 are each independently
hydrogen,
alkyl of from one to twenty carbon atoms,
alkyl of from one to twenty carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
alkenyl of from three to twenty carbon atoms,
alkenyl of from three to twenty carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
alkynyl of from three to twenty carbon atoms,
alkynyl of from three to twenty carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms,
cycloalkyl of from three to eight carbon atoms,
phenyl,
phenyl substituted with alkyl of from one to four carbon atoms, alkyl of from one to four carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms, alkoxy of from one to four carbon atoms, chlorine, bromine, hydroxy, nitro or trifluoromethyl or
R^2 and R^3 are taken together with the nitrogen atom to which they are attached to form a ring denoted by

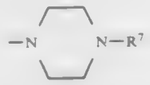


wherein R^6 is hydrogen, alkyl of from one to ten carbon atoms, alkyl of from one to ten carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms, alkenyl of from two to ten carbon atoms, alkenyl of from two to ten carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms, alkynyl of from two to ten carbon atoms or alkynyl of from two to ten carbon atoms substituted with hydroxy or alkoxy of from one to four carbon atoms and n is as defined above,

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wherein X is as defined above or



wherein R^7 is hydrogen or alkyl of from one to six carbon atoms, or

a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating the symptoms of cognitive decline in an elderly patient comprising a cholinergically effective amount of a compound according to claim 1.

4,996,202

1,2,4,5 TETRAHYDRO BENZAZEPINE-3 COMPOUNDS AND ANTIPSYCHOTIC USE THEREOF

Joel G. Berger, Cedar Grove; Wei K. Chang, Livingston; Elijah H. Gold, West Orange, all of N.J., and Arthur J. Elliott, Sloatsburg, N.Y., assignors to Schering Corporation, Kenilworth, N.J.

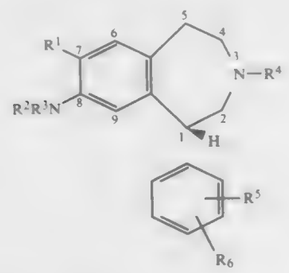
Continuation-in-part of Ser. No. 522,948, Aug. 12, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 788,274

Int. Cl.[5] C07D *223/16, 413/04, 403/04;* A61K *31/55*

U.S. Cl. 514—213 35 Claims

1. A compound having the structural formula:

I



wherein

R^1 is hydrogen, halogen, alkyl, alkoxy, or trifluoromethyl;

R^2 is hydrogen, alkyl, arylalkyl or $COXR^a$ (wherein R^a is hydrogen or alkyl and X is a bond or NH);

R^3 is hydrogen or alkyl;

R^4 is alkyl, $—CH_2CH=CH_2$ or



R^5 and R^6 are the same or different and are independently selected from hydrogen, alkyl, trifluoromethyl, halogen, OR^a (wherein R^a is defined above) or together R^5 and R^6 form $—OCH_2O—$; and the pharmaceutically acceptable salts thereof.

4,996,203

2,5-DIARYL TETRAHYDROFURANS AND ANALOGS THEREOF AS PAF ANTAGONISTS

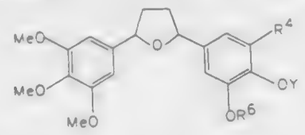
Tesfaye Biftu, Parlin; Robert L. Bugianesi, Colonia; Nirindar N. Girotra, Parlin; Mitree M. Ponpipom, Branchburg; Soumya P. Sahoo, Edison, and Chan H. Kuo, South Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 135,862, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 852,607, Apr. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 725,687, Apr. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 551,666, Nov. 11, 1983, Pat. No. 4,539,332. This application Jun. 8, 1989, Ser. No. 362,915

Int. Cl.[5] C07D *405/12, 413/12;* A61K *31/54, 31/495*

U.S. Cl. 514—231.5 17 Claims

1. A compound of the following structural formula:



wherein:

R^4 is $S(O)_nR^2$, in which n is 0, 1 or 2, and R^2 is selected from the group consisting of

(a) C_{1-6} alkyl,

(b) substituted C_{1-6} alkyl wherein the substituent is selected from the group consisting of hydroxy, and amino,

(c) C_{2-6} alkenyl,

(d) C_{1-6} alkylcarbonyl-C_{1-6} alkyl,

(e) N-substituted C_{1-6} aminoalkyl, wherein the substituents is C_{1-6} alkyl, and

(f) N,N-di-substituted C_{1-6} aminoalkyl, wherein the substituents each independently represent C_{1-6} alkyl;

Y is selected from the group consisting of

(a) C_{1-12} alkyl,

(b) substituted C_{1-8} alkyl, wherein the substituent is selected from the group consisting of hydroxy, and amino,

(c) C_{1-6} alkoxy-C_{1-6} alkyl,

(d) C_{2-6} alkenyl,

(e) C_{1-6} alkyl, $S(O)_m$-C_{1-6} alkyl in which m is 0, 1 or 2;

R^6 is selected from the group consisting of

(a) morpholinyl-C_{1-6} alkyl,

(b) pyrrolidinyl-C_{1-6} alkyl,

(c) piperidinyl-C_{1-6} alkyl,

(d) thiazolinyl$_{1-6}$ alkyl,

(e) morpholinyl-C_{1-6} hydroxyalkyl,

(f) piperazinyl-C_{1-6} alkyl, and

(g) N/substituted piperazinyl-C_{1-6} alkyl, wherein the substitutent is C_{1-4} alkyl.

4,996,204

PYRIDO[2,3-D]PYRIDAZINONES AS ALOOSE REDUCTASE INHIBITORS

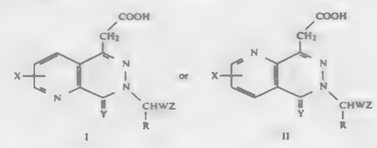
Banavara L. Mylari, Waterford, and William J. Zembrowski, Oakdale, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 11, 1989, Ser. No. 350,417

Int. Cl.[5] A61K *31/50;* C07D *471/04*

U.S. Cl. 514—248 22 Claims

1. A compound of the formula:



I II

or a C_1–C_6 alkyl ester thereof, or a base salt of said formula I or II acid with a pharmacologically acceptable cation, wherein R is hydrogen or methyl;

W is $—(CH_2)—$ wherein n is zero or one; or

R and W, when taken together with the central carbon atom to which they are attached to form RCHW, complete a vinylene group;

X is hydrogen, fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C alkylthio;

Y is oxygen or sulfur; and

Z is phenyl, benzothiophen-2-yl, benzoxazol-2yl, benzothiazol-2-yl or phenyl-1,2,4-oxadiazol-3-yl, wherein said phenyl, benzothiophenyl, benzoxazolyl, benzothiazolyl and phenyloxadiazolyl groups are each optionally monosubstituted or disubstituted on the benzene ring, the substituents for monosubstitution being selected from fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy and hydroxy and the substituents for disubstitution being identical or non-identical, with said identical substituents being selected from fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4 alkyl and C_1–C_4 alkoxy and said non-identical substituents being selected from fluorine, chlorine, bromine, trifluoromethyl, methyl, methoxy and hydroxy.

4,996,205

COMPOSITION AND METHOD OF USE OF PYRIDO[3,4-F]PYRROLO[1,2-B][1,2,5]TRIAZEPINES

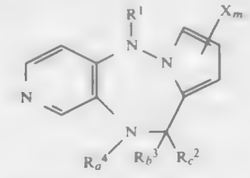
Richard C. Effland, Bridgewater; Larry Davis, Sergentsville; Kevin J. Kapples, Little York, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 397,922, Aug. 24, 1989, Pat. No. 4,914,103, which is a division of Ser. No. 223,847, Jul. 25, 1988, Pat. No. 4,879,382. This application Jan. 19, 1990, Ser. No. 468,402

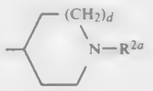
Int. Cl.[5] A01N *43/58*

U.S. Cl. 514—250 4 Claims

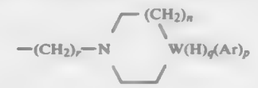
1. A pharmaceutical composition which comprises an effective memory enhancing amount of a compound of the formula:



wherein R^1 is loweralkyl, arylloweralkyl, or aminoloweralkyl; R^2 is hydrogen, loweralkyl, arylloweralkyl, aminoloweralkyl, aryl or a group of the formula



wherein d is an integer having a value of zero or 1 and R^{2a} is hydrogen, loweralkyl, arylloweralkyl or aminoloweralkyl; R^3 is hydrogen or loweralkyl, or together with R^2 constitutes a radical of the formula=O; R^4 is hydrogen, loweralkyl, arylloweralkyl, aminoloweralkyl, formyl, loweralkylcarbonyl, aminocarbonyl, arylaminocarbonyl, or a group of the formula



wherein W is carbon or nitrogen, Ar is aryl, q is an integer having a value from zero to 2, inclusive, p is an integer having a value of zero or 1, with the proviso that the sum of p and q is 1 when W is nitrogen and 2 when W is carbon, n is an integer having a value of zero or 1, and r is an integer having a value from 2 to 4, inclusive; X is halogen, loweralkyl, loweralkenyl, formyl or loweralkanol; m is an integer having a value of zero or 1; the dotted line is an optional bond; and a, b, and c, are integers having values of zero or one with the proviso that in the presence of said optional bond a is zero and the sum of b plus c is one, and in the absence of said optional bond a, b, and c each have a value of 1; and a suitable carrier therefor.

4,996,206

N-(PYRROLO[2,3-D]PYRIMIDIN-3-YLACYL)-GLUTAMIC ACID DERIVATIVES

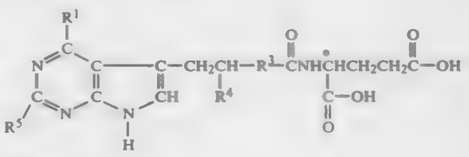
Edward C. Taylor, Princeton, N.J.; Dietmar G. Kuhnt, Leverkusen, Fed. Rep. of Germany; Chuan Shih, and Gerald B. Grindey, both of Indianapolis, Ind., assignors to The Trustees of Princeton University, Princeton, N.J.

Continuation-in-part of Ser. No. 448,742, Dec. 11, 1989, abandoned. This application May 24, 1990, Ser. No. 528,805

Int. Cl.[5] A61K *31/505;* C07D *487/04*

U.S. Cl. 514—258 15 Claims

1. A compound of the formula:



in which:

R^1 is -OH or $-NH_2$;

R^3 is 1,4-phenylene or 1,3-phenylene unsubstituted or substituted with chloro, fluoro, methyl, methoxy, or trifluoromethyl; thienediyl or furanediyl unsubstituted or substituted with chloro, fluoro, methyl, methoxy, or trifluoromethyl; cyclohexadiyl; and alkanediyl of two to four carbon atoms;

R^4 is hydrogen, methyl, or hydroxymethyl; and

R^5 is hydrogen or alkyl of 1 to 6 carbon atoms; the configuration about the carbon atom designated * is S; and

the pharmaceutically acceptable salts thereof.

4,996,207

THREE NEW NON-POLYGLUTAMATABLE DEAZAAMINOPTERINS

Madhavan G. Nair, 7005 Charleston Oaks Dr., Mobile, Ala. 36695, and Ann Abraham, 375 Hillcrest Rd., E-101, Mobile, Ala. 36608

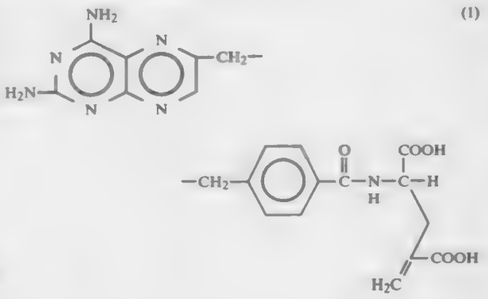
Filed Jan. 18, 1990, Ser. No. 467,025

Int. Cl.[5] C07D *475/08*

U.S. Cl. 514—258 9 Claims

1. 4-Amino-4-deoxy-10-deazapteroyl-Y-methyleneglutamic acid having the formula:

(1)



VOL 1123 ISS 4 FE 26 1991 UMI

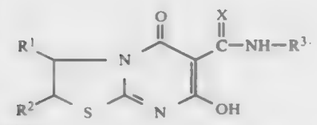
4,990,338

PESTICIDAL THIAZOLOPYRIMIDINE DERIVATIVES

Werner Lindner, Cologne, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 19, 1989, Ser. No. 367,820
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821711
Int. Cl.[5] A61K *31/495;* C07D *495/04*
U.S. Cl. 514—258 9 Claims

1. A thiazolopyrimidine derivative of the formula



(I)

in which

R^1 stands for hydrogen or for straight-chain or branched alkyl having 1 to 6 carbon atoms,

R^2 stands for hydrogen, for straight-chain or branched alkyl having 1 to 6 carbon atoms or for phenyl which is optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy having 1 to 4 carbon atoms, halogenoalkoxy having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkylthio having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylsulphinyl having 1 to 4 carbon atoms, halogenoalkylsulphinyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylsulphonyl having 1 to 4 carbon atoms and halogenoalkylsulphonyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms,

R^3 stands for straight-chain or branched alkyl which has 1 to 6 carbon atoms and which is optionally substituted by halogen, cyano or alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy radical, for cycloalkyl which has 3 to 6 carbon atoms and which is optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, cyano and alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy radical, or for phenyl, phenylcarbonyl or phenylsulphonyl each of which is optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, phenyl, phenoxy (which is optionally substituted by a trifluoromethyl group and/or one to 3 halogen atoms), alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy having 1 to 4 carbon atoms, halogenoalkoxy having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkylthio having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylsulphinyl having 1 to 4 carbon atoms, halogenoalkylsulphinyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylsulphonyl having 1 to 4 carbon atoms and/or halogenoalkylsulphonyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, or for phenyl which is fused to a benzo group or to an alkanediyl group which has up to 4 carbon atoms and which is optionally interrupted once or twice by oxygen and/or a carbonyl group, and

X stands for oxygen or sulphur.

4,996,209

OPHTHALMIC ANTIINFLAMMATORY COMPOSITIONS COMPRISING S(+)-FLURBIPROFEN

K. Roger Aoki, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 208,449, Jun. 20, 1988, abandoned.
This application Jun. 4, 1990, Ser. No. 532,482
Int. Cl.[5] A01N *43/90, 43/42;* A61K *31/52, 31/44*
U.S. Cl. 514—263 3 Claims

1. An ophthalmic, antiinflammatory composition for topical application to the eye consisting essentially of a therapeutically effective amount of S(+)-flurbiprofen substantially free of R(−)-flurbiprofen, and a pharmaceutically acceptable vehicle therefor.

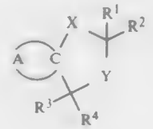
4,996,210

HETEROCYCLIC SPIRO COMPOUNDS AND METHODS FOR PREPARING THE SAME

Shin-ichi Tsukamoto; Hitoshi Nagaoka, both of Tokyo; Shinji Usuda, Ibaragi; Masatomi Harada, Saitama, and Toshinari Tamura, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 254,375, Oct. 5, 1988, Pat. No. 4,940,795.
This application Jan. 25, 1990, Ser. No. 470,091
Claims priority, application Japan, Oct. 5, 1987, 62-252104; Nov. 12, 1987, 62-286297; Apr. 5, 1988, 63-84327
Int. Cl.[5] A61K *81/445;* C07D *491/07*
U.S. Cl. 514—278 9 Claims

1. A compound of the formula:



(I)

wherein



represents a piperidine ring of which the nitrogen atom may have substituent(s) selected from lower alkyl, lower alkanoyl or lower alkoxycarbonyl, and of which the nitrogen atom in the piperidine ring may be connected to any position carbon (which is not the common carbon atom of the spiro structure) via lower alkylene,

X represents an oxygen atom,

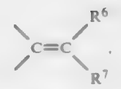
Y represents a carbonyl group



a thiocarbonyl group



a group of the formula >CH—R^5, a group of the formula



or a group of the formula



R^1, R^2 and R^3, which are the same or different, each represents a hydrogen atom or a lower alkyl group,

R^4 represents a hydrogen atom, a lower alkyl group, a carboxy group, a lower alkoxycarbonyl, or a lower alkanoyl,

R^5 represents a halogen atom, a hydroxyl group, a mercapto group, a lower alkoxy group, a lower alkylthio group, a lower alkanoyloxy group, or a lower alkanoylthio group,

R^6 and R^7, which are the same or different, each represents a hydrogen atom or a lower alkyl group,

Z_1 and Z_2, which are the same or different, each represents an oxygen atom or a sulfur atom,

Alk represents a lower alkylene group; or a salt of the formula (I) compound, with the proviso that when



represents methylpiperidyl, R^2-R^4 represent hydrogen, and R^1 represents lower alkyl, then Y does not represent carbonyl or vinylidene.

9. A pharmaceutical composition useful for activating cholinergic function in the central nervous system, said composition comprised of from about 0.001 mg to about 500 mg of the compound of claim 1 and a pharmaceutically acceptable carrier.

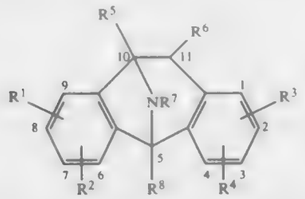
4,996,211

SUBSTITUTED DIBENZOCYCLOHEPTENIMINES

Raymond Baker, Much Hadham; Paul D. Leeson, Cambridge, both of England, and Susan F. Britcher, Norristown, Pa., assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

Filed Aug. 12, 1988, Ser. No. 231,295
Claims priority, application United Kingdom, Aug. 13, 1987, 8719195
Int. Cl.[5] C07D *221/22;* A61K *31/44*
U.S. Cl. 514—289 11 Claims

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein one of R^1, R^2, R^3 and R^4 represents a hydrocarbon having up to 18 carbon atoms, a group of formula —CO_2R or substituted hydrocarbon wherein the substituent is selected from the group consisting of halogen, C_{1-6} alkyl, phenyl, C_{1-6} alkoxy, halo(C_{1-6})alkyl, hydroxy, amino, nitro, cyano, carboxy, C_{1-6} alkoxycarbonyl, C_{1-6} alkoxycarbonyl (C_{1-6})alkyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylcarbonyl and groups of formula —$CONR^aR^b$ and —NR^a. COR^b in which R^a and R^b independently represent hydrogen or hydrocarbon having up to 18 carbon atoms and the remaining groups R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen, hydrocarbon, substituted hydrocarbon wherein the substituents are as defined above, —CO_2R, halogen, hydroxy and C_{1-6} alkoxy or R^1 and R^2 or R^3 and R^4, when present on adjacent carbon atoms, may together represent the residue of a carbocyclic ring, the R_1/R^2 or R^3/R^4 carbon chain comprising from 2–6 carbon atoms; R represents a hydrocarbon having up to 18 carbon atoms or substituted hydrocarbon group wherein the substituents are as defined above; R^5 and R^6 are independently selected from the group consisting of hydrogen, hydrocarbon having up to 18 carbon atoms, hydroxy and fluoro; R^7 represents hydrogen of C_{1-3} alkyl; and R^8 represents methyl or ethyl.

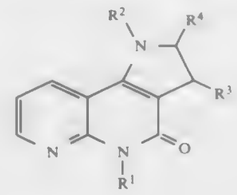
4,996,212

ANTIINFLAMMATORY AND ANTI-HYPERPROLIFERATIVE COMPOUNDS

Timothy Duelfer, Morris Plains, and David J. Blythin, North Caldwell, both, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 21, 1989, Ser. No. 454,658
Int. Cl.[5] C07D *471/14;* A61K *31/435*
U.S. Cl. 514—293 18 Claims

1. A compound having the structural formula I



I

or a pharmaceutically acceptable salt or solvate thereof, wherein:

R^1 is selected from H, alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 15 carbon atoms, alkenyl having from 3 to 10 carbon atoms, benzyl, substituted alkyl having from 1 to 10 carbon atoms substituted aryl having from 6 to 15 carbon atoms, or substituted benzyl;

R^2 is selected from H, alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 15 carbon atoms, alkenyl having from 3 to 10 carbon atoms, benzyl, substituted alkyl having from 1 to 10 carbon atoms, substituted aryl having from 6 to 15 carbon atoms, substituted benzyl, —O(CO)—R^8, —D—NR^5R^6, —D—OR^7 or —D—(CO)—OR^8 wherein D is alkanediyl having from 1 to 8 carbon atoms or a covalent bond; 'R[3] and R^4 are the same or different and each is independently selected from H, alkyl having from 1 to 10 atoms, aryl having from 6 to 15 carbon atoms or heteroaryl selected from the group consisting of pyridyl, furyl, thienyl, thiazolyl, imidazolyl, pyrimidinyl, pyrazinyl, pyridazinyl, 1,2,4-triazinyl, benzofuranyl, indolyl, pyrazolyl, and oxazolyl having from 2 to 14 carbon atoms;

R^5 and R^6 are the same or different and each is independently selected from H or alkyl having from 1 to 10 carbon atoms or together represent alkanediyl having from 1 to 8 carbon atoms;

R^7 is selected from H, alkyl having from 1 to 10 carbon atoms or aryl having from 6 to 15 carbon atoms; and

R^8 is selected from alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 15 carbon atoms benzyl or substituted benzyl.

VOL 1123 ISS 4 FEB 26 1991 UMI

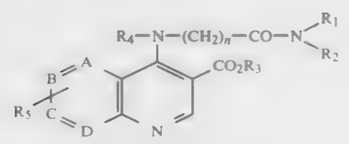
4,996,213

DERIVATIVES OF 4-AMINO 3-CARBOXY NAPHTHYRIDINES AND THEIR PHARMACEUTICAL COMPOSITIONS

Etienne Mendes, Toulouse; Jean-Claude Vernieres; Jacques Simiaud, both of Muret, and Peter E. Keane, Portet-Sur-Garonne, all of France, assignors to SANOFI, Paris, France

Filed Jun. 6, 1989, Ser. No. 362,104
Claims priority, application France, Jun. 9, 1988, 88 07723
Int. Cl.[5] A61K *31/44;* C07D *471/04*
U.S. Cl. 514—300 4 Claims

1. A compound of formula I:



I

in which R_1 and R_2 are independently selected from hydrogen, C_1–C_6 alkyl, phenyl optionally substituted by at least one group selected from the class consisting of $C_{1\text{-}6}$ alkyl, $C_{1\text{-}6}$ alkoxy, trifluoromethyl, nitro, and halogen, or benzyl optionally substituted by at least one group selected from the class consisting of $C_{1\text{-}6}$ alkyl, $C_{1\text{-}6}$ alkoxy, trifluoromethyl, nitro, or halogen, or R_1 and R_2 may form together with the nitrogen atom to which they are attached a C_4–C_8 saturated heterocycle, R_3 and R_4 are independently selected from hydrogen or C_1–C_6 alkyl, R_5 is selected from hydrogen or halogen, or C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro or trifluoromethyl, n is 1, 2 or 3, and one of the symbols A, B, C or D represents N and the others represent CH, as well as the N-oxides of the heterocyclic nitrogens and their addition salts with pharmaceutically acceptable acids and bases.

4. Pharmaceutical composition containing as active ingredient a compound according to claim 1 and an excipient.

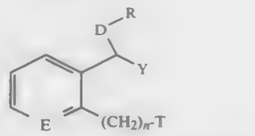
4,996,214

QUINOLINYL SUBSTITUTED PHENYL/THIOALKANOIC ACID SUBSTITUTED PROPIONIC ACIDS AND LEUCOTRIENE ANTAGONIST USE THEREOF

Russell D. Cousins, Oxford, Pa.; James S. Frazee, Sewell, N.J.; John G. Gleason, Downington, and Ralph F. Hall, Villanova, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Jun. 28, 1990, Ser. No. 545,258
Int. Cl.[5] A61K *31/41, 31/47;* C07D *401/06, 215/14*
U.S. Cl. 514—311 20 Claims

1. A compound of formula I



I

or a pharmaceutically acceptable salt thereof wherein
E is CH or N;
D is O or $S(O)_q$ is 0, 1 or 2;
R is $—(CH_2)_nA$, $—(CH_2)_nArA$ or ArA where n is 1–4, Ar is phenyl or substituted phenyl, thienyl, pyridyl, imidazolyl, tetrazol-5-yl or thiazolyl and A is $—(CH_2)_nR_2$, $—R_2$, —CN, $—SO_3H$, $—SO_2NH_2$, $NHSO_2R_6$, $—CH(NH_2)COR_4$, or $—CONHCH_2COR_4$;
Y is R_2, $CH(R_3)(CH_2)_mR_2$, $CH(R_3)$-tetrazol-5-yl, or tetrazol-5-yl;
m is 0, 1, and 2;
R_3 is hydrogen, C_1 to C_4 alkoxy, fluoro or hydroxy;
R_2 is $—COR_4$ where R_4 is —OH, —OE where E is a pharmaceutically acceptable cation or a pharmaceutically acceptable ester-forming group, R_2 is $—CON(R_5)_2$ where R_5 is H, C_1 to C_6 alkyl, phenylC_1–C_6-alkyl, or the two R_5 groups are combined to form a cyclic group having 3 to 5 carbons, $—SO_3H$, $—SO_2NH_2$, $NHSO_2R_6$, $—CH(NH_2)COR_4$, or $—CONHCH_2COR_4$;
R_6 is C_1 to C_{10}-alkyl, phenyl, or phenylC_1 to C_3-alkyl.
n is 4–11; and
T is halosubstituted quinolyl.

18. A method of treating a pulmonary disease in which leukotrienes are a factor in a subject in need thereof comprising administering to such subject an effective amount of a compound of claim 1 either alone or in combination with a pharmaceutically acceptable excipient.

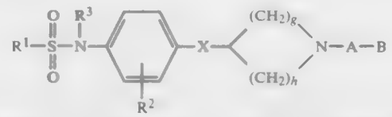
4,996,215

PIPERIDINE DERIVATIVE AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

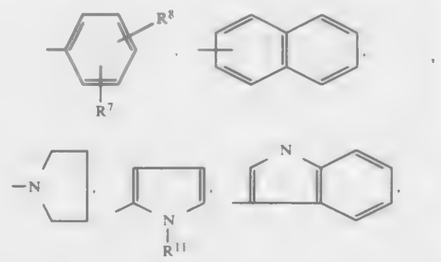
Hitoshi Oinuma, Ibaraki; Motosuke Yamanaka, Abiko; Kazutoshi Miyake, Ushiku; Tomonori Hoshiko, Tsuchiura; Norio Minami, Sakura; Tadao Shoji, Kukizakimachi; Yoshiharu Daiku, Sakuramura; Kohei Sawada, Toride, and Kenichi Nomoto, Tsuchiura, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 16,035, Feb. 18, 1987, Pat. No. 4,876,262.
This application Sep. 15, 1989, Ser. No. 408,106
Claims priority, application Japan, Feb. 26, 1986, 61-39270
Int. Cl.[5] A61K *31/40, 31/435;* C07D *207/09, 211/28*
U.S. Cl. 514—316 9 Claims

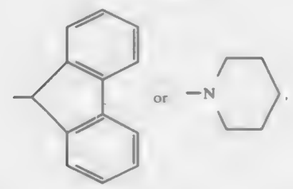
1. A compound having the formula



in which R^1 is a lower alkyl or a tolyl; R^2 is hydrogen, hydroxyl, a lower alkoxy or a lower alkyl; R^3 is hydrogen, a lower alkyl, a lower alkenyl, a cycloalkyl or a cycloalkylalkyl; X is —CO—, $—CH_2—$ or —CHOH—; g is an integer of 1, 2 or 3; h is an integer of 1, 2 or 3, with the proviso that the sum of g plus h equals the integers 3 or 4; A is (1) alkylene having 1 to 5 carbon atoms, (2) straight-chain alkylene having 1 to 5 carbon atoms in the chain and substituted with lower alkyl, phenyl or hydroxyl, (3) straight-chain alkenylene having 2 to 5 carbon atoms, (4) $—(CH_2)_k—S—$, wherein k is an integer of 2 to 5, or (5) $—(CH_2)_pCO—$, wherein p is an integer of 1 to 4, and B is



-continued



where R^7 and R^8 each are hydrogen, a halogen, a lower alkyl, a lower alkoxy or methanesulfonamido and R^{11} is hydrogen or a lower alkyl, or pharmaceutically acceptable salts thereof.

9. A pharmaceutical composition which comprises a pharmacologically effective amount of the compound defined in claim 1 or a pharmacologically acceptable salt thereof and a pharmacologically acceptable carrier.

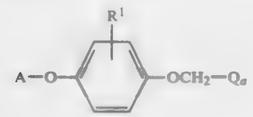
4,996,216

PHENOXYALKYL-SUBSTITUTED HETEROAROMATICS AND THEIR USE FOR CONTROLLING PESTS

Joachim Leyendecker, Ladenburg; Hans-Juergen Neubauer, Muenster-Hiltrup; Uwe Kardorff, Mannheim; Christoph Kuenast, Otterstadt; Peter Hofmeister, Neustadt, and Wolfgang Krieg, Weingarten, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

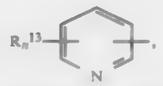
Filed Aug. 4, 1989, Ser. No. 389,815
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826681; Aug. 5, 1988, 3826682
Int. Cl.[5] C07D *401/10;* A01N *43/50, 43/52, 43/56*
U.S. Cl. 514—338 7 Claims

1. A compound of the formula



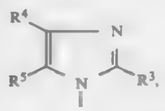
(Ia)

wherein A is



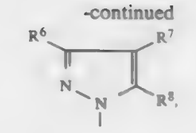
wherein each R^{13} is independently selected from the group consisting of hydrogen halogen, $C_{1\text{-}4}$-alkyl, C_1–C_3-haloalkyl, C_1–C_4-alkoxy, C_1–C_3-haloalkoxy, C_3–C_6-cycloalkyl, cyano and nitro and n is 1 to 4; R^1 is selected from the group consisting of hydrogen, halogen and C_1–C_3 alkyl; and

Qa is a member selected from the group consisting of

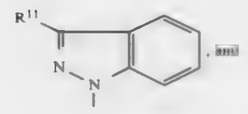


(IIa)

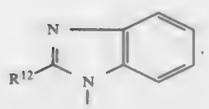
-continued



(IIb)



(IId)



(IIe)

wherein R^3 to R^8 and R^{11} to R^{12} are selected from the group consisting of hydrogen, halogen, C_1–C_8 alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_3–C_{10}-cycloalkyl or aryl which is unsubstituted or mono- to trisubstituted by halogen, C_1–C_3-haloalkoxy.

7. A process for combating pests, wherein the pests, or the areas or spaces to be kept free from pests are treated with a pesticidally effective amount of a phenoxyalkyl-substituted heteroaromatic compound of the formula Ia as set forth in claim 1.

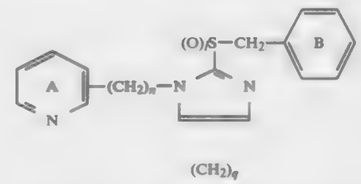
4,996,217

PYRIDYL-SUBSTITUTED IMIDAZOLES, COMPOSITIONS CONTAINING SAME AND METHODS OF USE THEREOF

Yasushi Honma, Ageo; Hajime Tamaki, Sakado; Tetsuo Magaribuchi, Urawa, and Mine Takido, Tokyo, all of Japan, assignors to Tanabe Seiyaku Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 122,286, Nov. 18, 1987, abandoned. This application Jun. 28, 1989, Ser. No. 372,534
Claims priority, application Japan, Dec. 2, 1986, 61-287512; Mar. 31, 1987, 62-80475; Aug. 28, 1987, 62-215813
Int. Cl.[5] A61K *31/44;* C07D *401/04*
U.S. Cl. 514—338 25 Claims

1. An imidazole derivative of the formula:



wherein Ring A is a 2-, 3- or 4-pyridyl group which may be unsubstituted or have one or two substituent(s) selected from the group consisting of halogen, lower alkyl group, lower alkoxy group, phenyl-lower alkoxy group, nitro group, amino group, lower alkanoylamino group, N-lower alkyl-N-lower alkanoylamino group, mono- or di (lower alkyl) amino group, lower alkanoyloxy group, cyano group, trihalogeno-lower alkyl group, trihalogeno-lower alkoxy group, lower alkenyloxy group and hydroxy group; Ring B is phenyl group which may be unsubstituted or have a substituent selected from the group consisting of a nitro group, amino group, mono- or di (lower alkyl) amino group, lower alkanoylamino group, phenylamino group, cycloalkylamino group of 3 of 6 ring

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carbon atoms, N- (tri-lower alkylphenyl) sulfonylamino group, N-lower alkyl-N-(tri-lower alkylphenyl) sulfonylamino group, N-lower alkyl-N-phenylamino group, di (lower alkyl) amino-lower alkyl group, N-lower alkyl-N-lower alkanoylamino group, lower alkylsulfonylamino group, formylamino group, lower alkoxy group, benzoylamino group, and lower alkoxycarbonylamino group; l is 0, 1, or 2 and n is 0, 1 or 2; and q is 3 or 4 or a salt thereof.

4,996,218

CHLOROANILINE DERIVATIVES

Lawrence H. C. Lunts, Broxbourne, England, assignor to Glaxo Group Limited, London, England

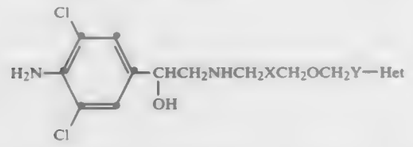
Filed Aug. 10, 1988, Ser. No. 230,358

Claims priority, application United Kingdom, Aug. 11, 1987, 8718939

Int. Cl.[5] **A61K** *31/395, 31/50, 31/505, 31/53, 31/54, 31/38, 31/435, 31/44, 31/47;* **C07D** *413/04, 277/24, 277/34, 277/38, 277/42, 277/44, 251/18, 251/48*

U.S. Cl. 514—365 **11 Claims**

1. A compound of the formula (I)



or a physiologically acceptable salt or solvate thereof, wherein X represents —$(CH_2)_3$— or —$(CH_2)_4$—, Y represents —(CH_2)— or —$(CH_2)_2$—, and Het represents a thiazolyl group, optionally substituted by one or two groups selected from C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, halogen, —NR^3R^4 and —COR^8, wherein R^3 and R^4 each represent a hydrogen atom or a C_{1-4} alkyl group or —NR^3R^4 forms a pyrrolidino, piperidino, hexamethyleneimino, piperazino, N-methylpiperazino, morpholino, homomorpholino, or thiomorpholino group; and R^8 represents hydrogen, C_{1-4} alkoxy or —NR^3R^4.

4. A pharmaceutical composition for therapy or prophylaxis of a disease associated with reversible airways obstruction, which comprises an effective amount of alleviate said disease of at least one compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof, together with a physiologically acceptable carrier or excipient.

4,996,219

IMIDAZOLIDINE DERIVATIVES AS IMMUNOSUPPRESSIVES

Christos Tsaklakidis; Elmar Bosies, both of Weinheim; Michael Schultz, Mannheim; Rainer Haag, Ladenburg; Dieter Herrmann, Heidelberg, and Wulf Pahlke, Bensheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

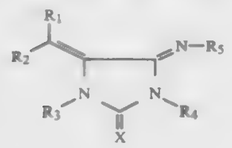
Filed Dec. 13, 1989, Ser. No. 448,129

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1988, 3841879

Int. Cl.[5] **A61K** *31/44;* **C07D** *401/00, 409/00, 233/30*

U.S. Cl. 514—341 **33 Claims**

1. A compound of the formula



(I)

wherein

R_1 and R_2, which can be the same or different, are a hydrogen atom, a C_1–C_5 alkyl radical, a C_3–C_5 alkenyl radical, a phenyl radical, or R_1 and R_2, together with the carbon atom to which they are attached, form a saturated or unsaturated hydrocarbon C_3–C_7 ring;

R_3 and R_4, which can be the same or different, are a hydrogen atom, a straight chained or branched C_1–C_{10}alkyl radical, a straight-chained or branched C_3-C_7 alkenyl radical, a C_3-C_7 cycloalkyl radical, a C_3-C_7 cycloalkenyl radical, phenyl radical, a C_6-C_{10}-aryl-C_1-C_6-alkyl radical, or a hetaryl-C_1-C_6- alkyl radical wherein the hetaryl group is selected from the consisting of picolyl, thienyl or furfuryl;

R_5 is a hydrogen atom or a lower alkyl radical; and

X is an oxygen or sulfur atom or an imino group.

20. A method of producing an immunosuppressive effect in a patient in need of said effect, said method comprising administering to said patient an immunosuppressive effective amount of a compound of claim 1.

4,996,220

METHOD OF PRODUCING A CLATHRATE COMPOUND

Ayako Sekikawa; Hideo Sugi, and Ryoichi Takahashi, all of Tokyo, Japan, assignors to Kurita Water Industries Ltd., Tokyo, Japan

Division of Ser. No. 295,628, Jan. 10, 1989. This application Apr. 9, 1990, Ser. No. 506,066

Claims priority, application Japan, Jan. 25, 1988, 63-13800

Int. Cl.[5] **A01N** *25/08, 25/34, 33/26, 43/80*

U.S. Cl. 514—372 **5 Claims**

1. A method of producing a clathrate compound, comprising:

preparing an aqueous solution containing a microbicide,

preparing a host compound in the form of a powder, said host compound, when reacted with said microbicide, forming a clathrate compound together with said microbicide,

adding said powdery host compound into the solution containing the microbicide to react the powdery host compound with the microbicide so that the clathrate compound formed of the host compound and the microbicide is formed, and

separating the formed clathrate compound from the solution.

4,996,221

HISTAMINE DERIVATIVES AS IMMUNE MODULATORS

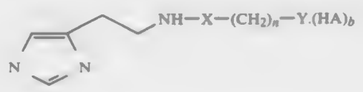
Kenneth L. Melmon, Woodside; Murray Goodman, La Jolla; Manzoor M. Khan, San Carlos; Debra Marr-Leisy, Los Alamitos, and Michael Verlander, Rancho Palos Verdes, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jan. 13, 1987, Ser. No. 2,781

Int. Cl.[5] **A61K** *31/415;* **C07D** *233/64*

U.S. Cl. 514—399 **16 Claims**

4. Histamine derivatives having binding specificity for H_1 or H_2 receptors of lymphocytes and of the formula



wherein:

X is CO or CHR, where R is an alkyl group of from 1 to 3 carbon atoms;

n is an integer of from 2 to 6;

Y is CH_3 or CONHZ, wherein Z is H; $(CH_2)_mCH_3$, where m is 1 to 4; substituted phenyl, where the substituent is methyl or trifluoromethyl;

A is a physiologically acceptable counterion; and

b is an integer of from 0 to 2.

13. A method of modulating an immune response of lymphocytes, which comprises contacting said lymphocytes with an immunomodulating amount of a compound according to claim 4.

4,996,222

PHARMACEUTICAL FORMULATIONS

Brian A. C. Carlin, Baldock; John N. C. Healey, Hitchin; Graham S. Leonard, St. Albans, and Geoffrey D. Tovey, Harpenden, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

Continuation of Ser. No. 79,198, Jul. 29, 1987, abandoned. This application Mar. 9, 1990, Ser. No. 490,851

Int. Cl.[5] **A61K** *31/415*

U.S. Cl. 514—400 **16 Claims**

1. A stable pharmaceutical composition suitable for oral administration comprising a suspension of an effective histamine H2-antagonist amount of particulate cimetidine in an aqueous phase wherein substantially all of the cimetidine present is of the polymorphic B form.

4,996,223

NEW ORGANIC COMPOUNDS HAVING OPIOID PROPERTIES

John M. H. Rees, Knutsford; Brian Robinson, Glossop, both of United Kingdom, and Brian Cox, Montclair, N.J., assignors to The Victoria University of Manchester, Manchester, United Kingdom

PCT No. PCT/GB87/00457, § 371 Date Feb. 9, 1989, § 102(e) Date Feb. 9, 1989, PCT Pub. No. WO88/00193, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 30, 1987, Ser. No. 295,037

Claims priority, application United Kingdom, Jul. 2, 1986, 8616089

Int. Cl.[5] **C07D** *487/06;* **A61K** *31/40*

U.S. Cl. 514—410 **8 Claims**

1. Echiboline derivatives, useful as opiates, having the structure of a 6-hydroxy-9-methyl-echiboline with a hydrocarbon substituent of up to 4 carbon atoms in the 10-position, and salts thereof.

8. Use as an opioid of a compound as claimed in any one of claims 1 to 6 or a composition as claimed in claim 7.

4,996,224

1-BENZYL-4- OR 5-PYRROLIDINOMETHYL-PYRROLIDIN-2-ONES AND NOOTROPIC METHOD OF USE THEREOF

Karl-Heinz Weber, Gau-Algesheim; Gerhard Walther, Bingen/-Rhein; Claus Schneider, Ingelheim/Rhein; Dieter Hinzen, Bingen/Rhein; Franz J. Kuhn, Gau-Algesheim, and Erich Lehr, Waldalgesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

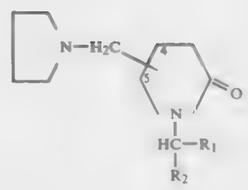
Continuation of Ser. No. 199,291, May 26, 1988, Pat. No. 4,833,140, which is a division of Ser. No. 878,828, Jun. 26, 1986, Pat. No. 4,767,759, which is a continuation-in-part of Ser. No. 657,219, Oct. 3, 1984, abandoned. This application May 11, 1989, Ser. No. 350,597

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336024

Int. Cl.[5] **C07D** *403/06;* **A61K** *31/40*

U.S. Cl. 514—424 **6 Claims**

1. A compound of the formula



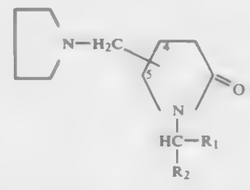
wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms; and

R_2 is phenyl or mono- or di-substituted phynyl, where the substituents are each individually alkoxy of 1 to carbon atoms, fluorine, chlorine, bromine, trifluoromethyl, alkyl or 1 to 4 carbon atoms, hydroxyl or nitro;

where the pyrrolidinomethyl substituent is attached to the 4- or 5position of the pyrrolidien ring, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. The method of alleviating conditions of impaired cerebral performance in a warm-blooded animal in need therof, which comprises perorally or parenterally administering to said animal an effective nootropic amount of a compound of the formula



wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms; and

R_2 is phynyl or mono- or di-substituted phenyl, where the substituents are each individually alkoxy of 1 or 2 carbon atoms, fluorine, chlorien, bromine, trifluormethyl, alkyl of 1 to 4 carbon atoms, hydroxyl or nitro; where the pyrrolidinomethyl substituent is attached to the 4- or 5-position of the pyrrolidien ring, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,996,225

TRI-PHENYL ALKANE DERIVATIVES AND THEIR OESTROGENIC, ANTI-OESTROGENIC AND PROGESTANIC USES

Reijo J. Toivola; Arto J. Karjalainen; Kauko O. A. Kurkela; Marja-Liisa Soderwall, all of Oulu; Lauri V. M. Kangas, Turku; Guillermo L. Blanco, Oulu, and Hannu K. Sundquist, Kaarina, all of Finland, assignors to Farmos Group Ltd., Turku, Finland

Division of Ser. No. 90,724, Aug. 28, 1987, which is a continuation-in-part of Ser. No. 823,856, Jan. 29, 1986, Pat. No. 4,696,949, which is a continuation of Ser. No. 497,813, May 25, 1983, abandoned. This application Oct. 12, 1989, Ser. No. 420,437

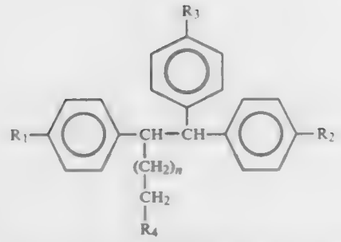
Claims priority, application United Kingdom, Jun. 25, 1982, 8218414

Int. Cl.[5] **A61K** *31/40;* **C07D** *207/08*

U.S. Cl. 514—428 **7 Claims**

1. A compound of the formula:

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where n is 0 to 4, R_1, and R_2, which can be the same or different, are H or OH, R_3 is $—O—(CH_2)_m—CH_2—NR_6R_7$ in which m is 1 to 2, R_6 and R_7, which can be the same or different, are H or an alkyl group of 1 to 4 carbon atoms or $—NR_6R_7$ can form a pyrrolidinyl group and R_4 is halogen, or a non-toxic, pharmaceutically acceptable salt or N-oxide thereof.

6. A method of producing an oestrogenic, anti-oestrogenic or progestanic effect in a subject in which such an effect is desired which comprises administering to said subject a compound according to claim 1 or a non-toxic pharmaceutically acceptable salt thereof, in an amount sufficient to produce the desired effect.

4,996,226

METHOD AND COMPOSITIONS FOR TREATMENT OF PARKINSONISM SYNDROME IN MAMMELS

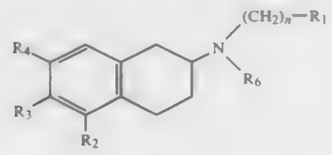
Alan S. Horn, Noordorn, Netherlands, assignor to Whitby Research, Inc., Richmond, Va.

Division of Ser. No. 206,193, Jun. 13, 1988, Pat. No. 4,885,308, and a continuation-in-part of Ser. No. 640,685, Aug. 13, 1984, Pat. No. 4,564,628, and a continuation-in-part of Ser. No. 811,768, Dec. 20, 1985, Pat. No. 4,657,925. This application Sep. 26, 1989, Ser. No. 397,749

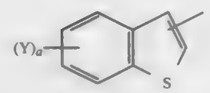
Int. Cl.[5] A61K *31/38*

U.S. Cl. 514—438 29 Claims

1. A method for treating the symptoms of parkinsonism in a mammal comprising administering to said mammal an effective amount of one or more compounds selected from a group consisting of optically active or racemic compounds wherein an amount of a negative isomer present therein is an amount effective to treat parkinsonism, said optically active or racemic compounds being represented by the formula:



wherein R_1 is



X is sulfur, and Y is hydrocarbyl,

R_2, R_3 and R_4 are each selected from the group consisting of H and OA, A is H or is selected from the group consisting of hydrocarbyl radicals,



R_5 is selected from the group consisting of hydrocarbyl radicals; n is an integer between 1 and 3; and R_6 is an alkyl chain having between 1 and 3 carbon atoms with the provision that at least one of R_2, R_3 and R_4 is H, that at least one of R_2, R_3 and R_4 is not H, and that R_2 and R_4 are not both OA, and pharmaceutically acceptable salts thereof.

4,996,227

3-(HETEROARYLALKYENE)- AND 3-(ARYLALKYLENE)-2,4(3H,5H)-HETEROCYCLIC DIONES AS CANCER CHEMOTHERAPY DRUGS

Hans W. Zimmer, Cincinnati, Ohio; Orlando J. Martelo, Plattsburg, N.Y., and Robert S. Franco, Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Continuation-in-part of Ser. No. 878,811, Jun. 26, 1986, abandoned. This application Feb. 24, 1989, Ser. No. 316,591

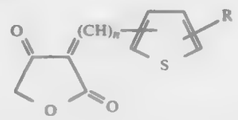
Int. Cl.[5] A61K *31/38*

U.S. Cl. 514—444 4 Claims

1. A method of treating mammal having cancerous tumor cells with at least one 3-(heteroarylalkylene) 2,4 (3H,5H) furandione for inhibiting or reducing the growth of said cancerous tumor cells, comprising:

injecting or administering orally a 3-(heteroarylalkylene) 2,4 (3H, 5H) furandione into a mammal having cancerous tumor cells at an effective dosage amount for a sufficient time period to inhibit or reduce said growth of said cancerous tumor cells.

wherein said at least one 3-(heteroarylalkylene) 2, 4 (3H, 5H) furandionehas the general formula:



where R represents hydrogen or alkyls containing 1 to 3 carbon atoms or halogens such as chlorine, fluorine, bromine and iodine; and n is 1 or 3.

4,996,228

MACROLIDE ANTIBIOTICS

Derek R. Sutherland, Chalfont St Giles; Michael V. J. Ramsay, South Harrow; John B. Ward, Bushey; Neil Porter, Pinner; Hazel M. Noble, Burnham; Richard A. Fletton, Ruislip, and David Noble, Burnham, all of England, assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 11, 1987, Ser. No. 24,681

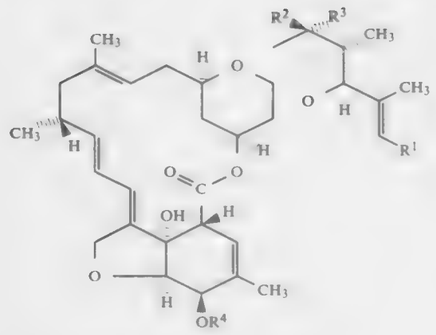
Claims priority, application United Kingdom, Mar. 12, 1986, 8606105

The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/335;* C07D *313/00*

U.S. Cl. 514—450 8 Claims

1. A compound of formula (I)



(I)

wherein

R^1 is a methyl, ethyl or isopropyl group;

R^2 is a C_{1-4} alkyl group, optionally substituted by a group CO_2R^5 where R^5 is a hydrogen atom or a C_{1-4} alkyl group; a C_{2-6} alkenyl group; phenyl or phenyl C_{1-3} alkyl group; R^3 is a hydroxy group; and OR^4 is a hydroxy or substituted hydroxy group which is a group $—OCOR^7$, $—OCO_2R^7$ or $—OCSOR^7$, where R^7 is C_{1-8} alkyl, C_{1-8} alkyl substituted by one or more halogen atoms, C_{1-4} alkoxy, phenoxy or silyloxy substituents, C_{2-8} alkenyl, C_{2-8} alkynyl, C_{3-12} cycloakyl, phenylalkyl in which the alkyl portion has 1–6 carbon atoms, or phenyl; a formyloxy group; a group $—OR^8$ where R^8 is as defined above for R^7; a group $—OSO_2R^9$, where R^9 is a C_{1-4} alkyl or toluyl; a silyloxy group; a tetrahydropyranyloxy group; a group $—OCO(CH_2)_nCO_2R^{10}$ where R^{10} is a hydrogen atom or a group as defined for R^7 above and n represents zero, 1 or 2; or a group $OCONR^{11}R^{12}$ where R^{11} and R^{12} each independently represent a hydrogen atom or a C_{1-4} alkyl group.

4,996,229

SCYTOPHYCINS

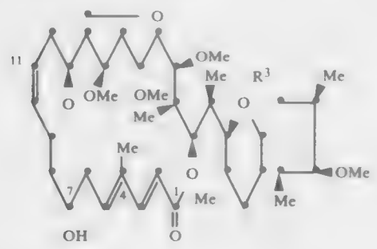
Richard E. Moore; Eiichi Furusawa; Ted R. Norton; Gregory M. L. Patterson, all of Honolulu, Hi., and Jon S. Mynderse, Indianapolis, Ind., assignors to University of Hawaii, Honolulu, Hi. and Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 865,499, May 21, 1986, Pat. No. 4,863,955, which is a continuation-in-part of Ser. No. 741,776, Jun. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 741,778, Jun. 6, 1985, abandoned. This application Aug. 31, 1989, Ser. No. 401,353

Int. Cl.[5] A61K *31/365;* C07D *303/12, 313/08*

U.S. Cl. 514—450 5 Claims

1. A compound of the formula



wherein R^3 represents —CHO or $—CH_2OH$, or a C_1–C_6-alkanoyl or benzoyl or halo-, hydroxyl- or C_1–C_3-alkoxy-substituted C_1–C_6-alkanoyl or benzoyl ester derivative thereof.

or a pharmaceutically acceptable base addition salt thereof, wherein

Y is —CO—, —C(=NOH)—, —CHOH—, $—CH_2—$, or $—C(=CH_2)—$;

A is —O—;

one of R_1 and R_2 is hydrogen and the other of R_1 and R_2 is $—CH_2CH_2COOH$;

p is 1–16; and

Z is —H or —G—Q where

G is a bond, —O—, $—S(O)_t—$, —NH—, —CH=CH—, or —C≡C—,

Q is phenyl or phenyl substituted with one or two substituents selected from the group consisting of halo, C_1–C_3 alkyl, C_1–C_3 alkoxy, acetyl, nitro, amino, trifluoromethyl, hydroxy, and $—S(O)_t—(C_1$–C_3 alkyl), and

each t is independently 0–2.

6. A method of treating a mammal suffering from or susceptible to any condition characterized by an excessive release of leukotrienes, which comprises administering to said mammal a leukotriene antagonizing amount of a compound of claim 1 or a pharmaceutically acceptable base addition salt thereof.

4,996,230

LEUKOTRIENE ANTAGONISTS

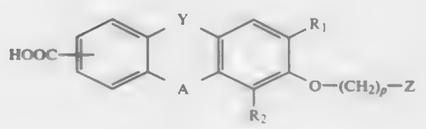
D. Mark Gapinski, Lebanon, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 16, 1990, Ser. No. 481,413

Int. Cl.[5] A61K *31/35;* C07D *311/80*

U.S. Cl. 514—454 14 Claims

1. A compound of the formula I



I

or a pharmaceutically acceptable base addition salt thereof, wherein

Y is —CO—, —C(=NOH)—, —CHOH—, $—CH_2—$, or $—C(=CH_2)—$;

A is —O—;

one of R_1 and R_2 is hydrogen and the other of R_1 and R_2 is $—CH_2CH_2COOH$;

p is 1–16; and

Z is —H or —G—Q where

G is a bond, —O—, $—S(O)_t—$, —NH—, —CH=CH—, or —C≡C—,

Q is phenyl or phenyl substituted with one or two substituents selected from the group consisting of halo, C_1–C_3 alkyl, C_1–C_3 alkoxy, acetyl, nitro, amino, trifluoromethyl, hydroxy, and $—S(O)_t—(C_1$–C_3 alkyl), and

each t is independently 0–2.

6. A method of treating a mammal suffering from or susceptible to any condition characterized by an excessive release of leukotrienes, which comprises administering to said mammal a leukotriene antagonizing amount of a compound of claim 1 or a pharmaceutically acceptable base addition salt thereof.

4,996,231

TRIYNE CYCLIC CARBONATES

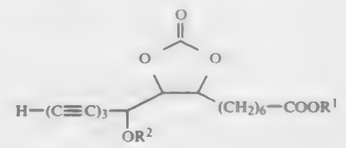
Michael N. Chang, Westfield; Yuan-Ching P. Chiang, Piscataway; James V. Heck, Scotch Plains, and Michael D. Lewis, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 156,107, Feb. 16, 1988, abandoned. This application Aug. 8, 1989, Ser. No. 391,769

Int. Cl.[5] A61K *31/335;* C07D *317/24*

U.S. Cl. 514—467 3 Claims

1. A compound of the formula:



wherein R^1 is:

(a) hydrogen;

(b) C_1–C_6 alkyl; or

(c) a pharmaceutically acceptable cation; and

R^2 is C_1–C_6 alkyl.

3. A pharmaceutical composition useful in the treatment of fungal diseases comprising a therapeutically effective amount of at least one compound according to claim 1, together with one or more non-toxic pharmaceutically acceptable carriers.

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4,996,232

REDUCING BACTERIAL CONTENT IN WATER

Michael Gracey, Wembley; Frank Hopkins, Glenfield; Jennifer Robinson, Floreat Park, and Stephen Snow, Bargo, all of Australia, assignors to Cadbury Schweppes Proprietary Limited, Melbourne, Australia

Continuation of Ser. No. 196,822, May 19, 1988, abandoned, which is a continuation of Ser. No. 920,672, Oct. 20, 1986, abandoned. This application Sep. 22, 1989, Ser. No. 412,545

Claims priority, application Australia, Oct. 25, 1985, PH3095; May 8, 1986, PH5813

Int. Cl.[5] A61K *31/34, 31/19*

U.S. Cl. 514—474 8 Claims

1. A dry composition useful for its antibacterial activity when dissolved in water, said composition consisting essentially of the following ingredients in amounts that will deliver the specified number of grams per 100 ml when dissolved in water:

(a)	Ascorbic acid or pharmaceutically-acceptable salts thereof	0.001–1.0
(b)	Malic acid or pharmaceutically acceptable salts thereof	0.01–1.0
(c)	At least one of sodium saccharin and calcium saccharin	up to 0.1
(d)	Sodium benzoate or benzoic acid	0.001–0.34

4,996,233

METHOD OF REDUCING PORPHYRIN TOXICITY USING FATTY ACIDS

David F. Horrobin, Guildford, England, assignor to Efamol Limited, Guildford, England

Continuation of Ser. No. 903,469, Sep. 4, 1986, abandoned. This application Feb. 14, 1990, Ser. No. 480,375

Claims priority, application United Kingdom, Sep. 13, 1985, [illegible]

Int. Cl.[5] A61K *31/20, 31/40*

U.S. Cl. 514—560 2 Claims

1. A method of reducing the skin-sensitizing effects of porphyrins administered therapeutically, said method comprising systemically administering to a person to whom porphyrins are being therapeutically administered from 1 mg to 500 g of a polyunsaturated fatty acid of the n-6 series or its metabolites and an essential fatty acid of the n-3 series or its metabolites, alone or in an acceptable pharmaceutical diluent or carrier.

4,996,234

HMG-COA REDUCTASE INHIBITORS

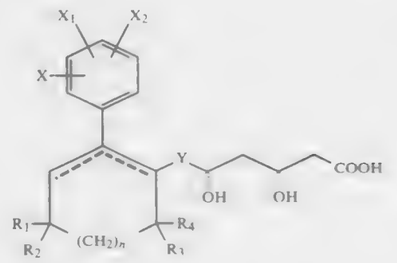
John R. Regan, Princeton, N.J., and Kent W. Neuenschwander, Ambler, Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Fort Washington, Pa.

Division of Ser. No. 328,836, Feb. 13, 1990, Pat. No. 4,900,754, which is a continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Dec. 5, 1989, Ser. No. 446,358

Int. Cl.[5] A61K *31/19, 31/20;* C07C *62/30, 62/04*

U.S. Cl. 514—563 8 Claims

1. Hydroxy acids and pharmaceutically acceptable salts thereof of a compound of the formula



wherein

Y is

—CHR—,

—CHRCHR—,

—CHRCHRCHR—, or

—RC=CR—;

X, X_1 and X_2 are independently:

R,

NO_2,

NH(CO)R,

$N(R)_2$,

$S(O)_mR$,

F,

Cl or

Br;

R_1 is OR;

R_2 is R;

R_3 and R_4 are independently:

H or

lower alkyl;

R is

H or

lower alkyl;

n is 0–2; and

m is 0–2.

4,996,235

3,4-DIPHENYLBUTANAMINES

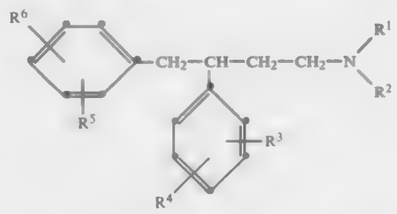
David W. Robertson, Greenwood, and David T. Wong, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 25, 1987, Ser. No. 125,512

Int. Cl.[5] A61K *31/135;* C07C *211/00*

U.S. Cl. 514—649 32 Claims

1. A compound of the formula



wherein:

R^1 and R^2 are each independently hydrogen or methyl;

R^3, R^4, R^5, and R^6 are each independently hydrogen, halo, trifluoromethyl, C_1–C_4 alkyl, $_1$–C_3 alkoxy or C_2–C_4 alkenyl; or

a pharmaceutically acceptable acid addition salt thereof.

4,996,236

THERAPEUTIC COMPOSITION FOR HEPATIC ENCEPHALOPATHY

Nobuto Nakamura; Hiroshi Satoh, both of Osaka; Matsuo, Kyoto, all of Japan, and Misael U. Esquivel, Tlalpan, Mexico, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

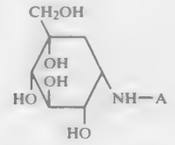
Filed May 15, 1989, Ser. No. 351,462

Claims priority, application Japan, Jun. 22, 1988, 63-153845

Int. Cl.[5] A61K *31/13, 31/44, 31/38*

U.S. Cl. 514—659 2 Claims

1. A method for the treatment of hyperammonemia which comprises administering to a subject in need thereof an effective hyperammonemia-reducing amount of a valiolamine compound of the formula



wherein A means an acyclic hydrocarbon group of 1 to 10 carbon atoms which may optionally be substituted by hydroxy, phenoxy, thienyl, furyl, pyridyl, cyclohexyl or optionally substituted phenyl; a 5- or 6-membered cyclic hydrocarbon group which may optionally be substituted by hydroxy, hydroxymethyl, methyl, or amino; or a saccharide residue or a pharmaceutically acceptable salt thereof.

4,996,237

COMBRETASTATIN A-4

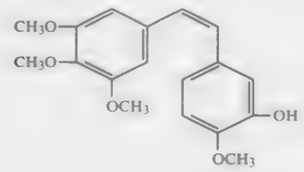
George R. Pettit, Paradise Valley, and Sheo B. Singh, Tempe, both of, assignors to Arizona Board of Regents, Tempe, Ariz.

Continuation-in-part of Ser. No. 590, Jan. 6, 1987. This application Feb. 22, 1988, Ser. No. 158,866

Int. Cl.[5] A61K *31/075*

U.S. Cl. 514—720 3 Claims

1. A compound denominated combretastatin A-4 and for inhibiting tubulin polymerization having the structural formula:



4,996,238

METHOD OF TREATING DIAPER RASH

Peter Matravers, San Marino, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.

Division of Ser. No. 245,660, Sep. 16, 1988. This application Jun. 25, 1990, Ser. No. 543,100

Int. Cl.[5] A61K *31/00*

U.S. Cl. 514—865 1 Claim

1. A method of treating an infant with an area of diaper rash comprising applying to said area of diaper rash a preparation containing, in weight percent, from about 1 to 10 percent C_{18}–C_{36} aliphatic wax, from about 1 to about 20 percent anhydrous hydrophobic silicone, and a pharmacologically acceptable carrier, said wax and said silicone being dispersed in said carrier.

4,996,239

WATER RESISTANT CREAM CONDITIONER

Peter Matravers, San Marino, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.

Filed Sep. 16, 1988, Ser. No. 245,660

Int. Cl.[5] A61K *7/48, 9/07*

U.S. Cl. 514—873 4 Claims

1. An anhydrous topical composition of matter for water proofing mammalian skin containing a pharmacologically acceptable carrier selected from the group consisting of mineral oil, vegetable oil, and an aliphatic/branched chain ester and, in weight percent, from about 1 to about 10 percent C_{18}–C_{36} saturated synthetic fatty acid wax and from about 2 to about 20 percent anhydrous hydrophobic silicone, said wax and said silicone being dispersed in said carrier.

4,996,240

SYNTHETIC POLYMER PROPELLANT SYSTEMS

Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011; Dorothea C. Marra, 107 Fernwood Rd., Summit, N.J. 07901, and J. George Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480

Division of Ser. No. 867,580, May 28, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 230,680

Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—78 7 Claims

1. Polymer-propellant compositions that form coherent foamed structures from which aqueous solutions can be expressed consisting of about 5 to about 40% by weight of polymer selected from the group consisting of acrylic and methacrylic homopolymers and copolymers, from about 25 to 60% by weight of an aqueous solution containing from 0 to 60% alcohol, from about 25 to about 60% by weight of propellant based on the weight of the composition, where the useful range over which such coherent foam structures can form are extended at least to the range of 15 C. to 32 C., by employing a propellant mixture that contains a first propellant component in an amount from about 50 to 98% by weight of one or more propellants that are pool solvents for the polymer and have low vapor pressures in the range of 10 to 35 psig at 20 C. and which are selected from the group consisting of n-butane, isobutane and 1,2 dichlorotetrafluoroethane, and at least 2% by weight of a second propellant component which comprises one or more propellants that are good solvents for the polymer and which are selected from the group consisting of dimethyl ether and 1-chloro-1,1-difluoroethane and any remainder being a third liquid propellant component in an amount required to make 100% by weight of propellant mixture, 0 to 3% by weight of an insoluble fine particle solid that does not pack, the total amount of alcohol and/or fine particle solid being in an amount sufficient to enable a coherent foam structure to form upon expulsion of the polymer-propellant composition.

4,996,241

POLYISOCYANURATE RIGID FOAMS

Berend Eling, Wezembeek-Oppem, and Colin R. Tweedale, Overijse, both of Belgium, assignors to Imperial Chemical Industries PLC, Millbank, London, England

Continuation of Ser. No. 196,158, May 19, 1988, abandoned. This application Oct. 17, 1989, Ser. No. 414,824

Claims priority, application United Kingdom, May 26, 1987, [illegible]

Int. Cl.[5] C08G *18/18, 18/22, 18/76*

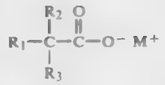
U.S. Cl. 521—107 3 Claims

1. In paragraph (b) delete the formula

"$R^1R^2R^3C—CO_2M$"

and substitute therefore the following structure:

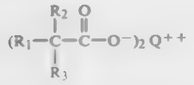
VOL 1123 ISS 4 FE 26 1991 UMI



in paragraph (c) delete the structure:

"$[R^1R^2R^3C—CO_2]_2—Q$"

and substitute therefore the structure:



4,996,242

POLYURETHANE FOAMS MANUFACTURED WITH MIXED GAS/LIQUID BLOWING AGENTS

Chung Y. Lin, Orange, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1989, Ser. No. 355,539
Int. Cl.[5] C08K 5/00
U.S. Cl. 521—131 11 Claims

1. A mixed blowing agent comprising: (1) from about 2 to about 25 percent by weight of at least one halocarbon blowing agent having a boiling point below about 10° C.; (2) from about 30 to about 90 percent by weight of at least one halocarbon blowing agent having a boiling point of from about 20° C. to about 35° C.; and (3) from about 8 to about 45 percent by weight of an inert organic liquid having a boiling point from about 35° C. to about 125° C., and provided at least one of said components (1), (2), or (3) contains at least one hydrogen atom.

4,996,243

CURABLE ACRYLAMIDO OLIGOMER COMPOSITIONS WITH INITIATOR, AND CURED PRODUCTS

Jerald K. Rasmussen, Stillwater; Steven M. Heilmann, Afton, both of Minn., and Frederick J. Palensky, Tokyo, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 233,218, Aug. 17, 1988, Pat. No. 4,914,223, which is a continuation-in-part of Ser. No. 316,234, Oct. 29, 1981, Pat. No. 4,777,276. This application Jan. 16, 1990, Ser. No. 465,041
Int. Cl.[5] C08F 2/50, 20/58, 20/60
U.S. Cl. 522—99 11 Claims

1. A composition of matter comprising

(a) an acrylamido- or methacrylamido-acyl oligomer having the general formula:

$$A_p(HX)_{n-p}R$$

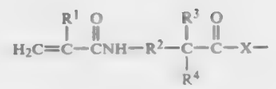
wherein

R is an organic group having a valence of n and is the residue of a nucleophilic group-substituted oligomer, $(HX)_nR$, said oligomer being selected from the group consisting of polyoxyalkylene, polyalkyleneimine, organic polyester, polyacrylic acid ester, polysiloxane, and polyolefin oligomers having one or more hydroxyl, amino, or thiol groups and having a molecular weight of 200 to 20,000;

n is a positive number of at least one and represents the valence of R;

p is a positive number in the range of 1 to n;

A is an acrylamido-acyl group or a methacrylamido-acyl group having the formula



wherein

R^1 is hydrogen, chlorine, or a methyl group;

R^2 is a single bond or a methylene or ethylene group that can be substituted by an alkyl group having 1 to 6 atoms or phenyl;

R^3 and R^4 are independently hydrogen, an alkyl or cycloalkyl group having 1 to 12 carbon atoms, phenyl or alkyl-substituted phenyl having 6 to 12 carbon atoms, or R^3 and R^4 taken together with the carbon atom to which they are attached form a 5- to 12-membered carbocyclic ring; and

X is



—O—, or —S—,

in which R^5 is (a) hydrogen, (b) a group selected from an alkyl or cycloalkyl group having 1 to 12 carbon atoms optionally substituted by a cyano, hydroxyl, or an alkoxy group having 1 to 4 carbon atoms, or A;

with the proviso that when R^5 is an alkyl or cycloalkyl group, then at least one of R^3 and R^4 is hydrogen, and

(b) an amount of a thermally or photochemically activatable free radical generator sufficient to initiate polymerization of said composition.

4,996,244

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Roger W. Avakian, Parkersburg, W. Va., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 136,608, Dec. 22, 1987, Pat. No. 4,880,854, which is a division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Oct. 20, 1989, Ser. No. 425,618
Int. Cl.[5] C08K 5/3492
U.S. Cl. 523—136 1 Claim

1. A method for sterilizing an aromatic carbonate polymer, said method comprising:

(i) imparting enhanced stability against sterilizing radiation to an aromatic carbonate polymer by admixing an effective amount of an ester compound therewith effective to inhibit yellowing upon exposure to sterilizing radiation, said ester compound formed from esterifying 3,5di-tert-butyl-4-hydroxyhydrocinnamic acid triester with 1,3,5-tris(2-hydroxy-ethyl)-s-triazine-2,4,6(1H,3H,5H)-trione.

4,996,245

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 136,602, Dec. 22, 1987, Pat. No. 4,880,856, which is a division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Oct. 20, 1989, Ser. No. 424,800
Int. Cl.[5] C08K 5/34
U.S. Cl. 523—136 1 Claim

1. A method for sterilizing an aromatic carbonate polymer, said method comprising:

(i) imparting enhanced stability against sterilizing radiation to an aromatic carbonate polymer by admixing an effective amount of a thiol compound effective therewith to inhibit yellowing upon exposure to sterilizing radiation, said thiol being selected from the group consisting of 2-mercaptobenzothiazol and 2,5-dimercapto-1,3,4-thiadiazone, and

(ii) exposing said aromatic carbonate polymer to sterilizing radiation.

4,996,246

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Frilinglei, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 136,607, Dec. 22, 1987, Pat. No. 4,880,853, which is a division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 16, 1984, abandoned. This application Oct. 20, 1989, Ser. No. 424,431
Int. Cl.[5] C08K 5/07
U.S. Cl. 523—136 1 Claim

1. A method for sterilizing an aromatic carbonate polymer, said method comprising:

(i) imparting enhanced stability against sterilizing radiation to an aromatic carbonate polymer by admixing therewith an effective amount of a diketone compound effective to inhibit yellowing upon exposure to sterilizing radiation, said diketone being 2–4 pentanedione, and

(ii) exposing said aromatic carbonate polymer to sterilizing radiation.

4,996,247

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 136,609, Dec. 22, 1987, Pat. No. 4,880,855, which is a division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Oct. 20, 1989, Ser. No. 424,494
Int. Cl.[5] C08K 5/41
U.S. Cl. 523—136 1 Claim

1. A method for sterilizing an aromatic carbonate polymer, said method comprising:

(i) imparting enhanced stability against sterilizing radiation to an aromatic carbonate polymer, comprising admixing an effective amount of a sulfone compound effective to inhibit yellowing upon exposure to sterilizing radiation said sulfone compound having the general formula $R^5—SO_2—R^6$, wherein R^5 and R^6 are the same or different, and R^5 and R^6 are selected from the group consisting of alkyl and aryl, and

(ii) exposing said aromatic carbonate polymer to sterilizing radiation.

4,996,248

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 136,682, Dec. 22, 1987, Pat. No. 4,876,309, which is a division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Oct. 20, 1989, Ser. No. 424,489
Int. Cl.[5] C08K 5/15
U.S. Cl. 523—136 1 Claim

1. A method for sterilizing an aromatic carbonate polymer, said method comprising:

(i) imparting enhanced stability against sterilizing radiation to an aromatic carbonate polymer, comprising admixing an effective amount of a pyran compound effective to inhibit yellowing upon exposure to sterilizing radiation, said pyran compound is selected from the group consisting of hydrogenated pyran, non-hydrogenated pyran and substituted pyran wherein said substituted pyran has a substituent selected from the group consisting of alkyl, aryl, alkoxy and aryloxy, said substituent being positioned on any carbon atom in the pyran ring, and

(ii) exposing said aromatic carbonate polymer to sterilizing radiation.

4,996,249

METHOD TO IMPROVE FLOWABILITY OF RESIN COATED SAND

Calvin K. Johnson, Lockport; Richard C. Cooke, North Riverside, and Kwok-Tuen Tse, Chicago, all of Ill., assignors to Acme Resin Corporation, Westchester, Ill.

Filed Apr. 27, 1989, Ser. No. 344,132
Int. Cl.[5] C08K 5/524, 5/41, 5/06; C08L 61/06
U.S. Cl. 523—144 34 Claims

1. A process for improving the flowability of sand coated with a resin binder selected from the group consisting of alkaline phenolic resole resin binders and acid-curable resin binders which comprises incorporating in the mixture of sand and resin binder fluorosurfactant in an amount from about 0.01 percent to about 5 percent by weight of the resin binder

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4,996,250

WATER-DILUTABLE AIR-DRYING PROTECTIVE COATING COMPOSITIONS

Rami-Raimund Awad; Gert Dworak; Bertram Zäckert, and Walter Weger, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Australia

Filed Aug. 30, 1989, Ser. No. 400,787
Claims priority, application Austria, Aug. 31, 1988, 2131/88
Int. Cl.[5] C08L 67/08
U.S. Cl. 523—500 7 Claims

1. Water-dilutable, air-drying protective coating compositions, comprising

(A) 4% to 95% by weight of a water-dilutable alkyd resin which contains from about 30% to 70% of oxidatively drying fatty acids and in which at least 80% of the free carboxyl groups corresponding to an acid number of 25 to 70 mg KOH/g originate from methacrylic acid units which are grafted onto at least part of the fatty acids, together with additional vinyl and/or (meth)acrylic monomers,

(B) 4% to 95% by weight of an aqueous polymer dispersion based on (meth)acrylic acid esters and/or butadiene and/or styrene copolymers, and/or an aqueous polyurethane dispersion, and

(C) 1% to 30% by weight of an adduct of maleic acid anhydride with drying oils and/or with the unsaturated fatty acids which are synthesized from such oils and/or with synthetically produced esters of such fatty acids with diols

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or polyols, the anhydride structures of the adduct being opened by water and/or a monoalcohol having from 1 to 10 carbon atoms, and which has an acid number of between about 40 and 280 mg KOH/g, the sum of the percentages of components (A) to (C) being 100.

4,996,251

POLYMERIC COMPOSITIONS AND THEIR PRODUCTION

David Farrar; Peter Flesher, both of West Yorkshire, and Peter R. B. Lawrence, London, all of Great Britain, assignors to Allied Colloids Ltd., Great Britain

Filed Feb. 9, 1989, Ser. No. 308,836

Claims priority, application United Kingdom, Feb. 10, 1988, 8803064; Feb. 10, 1988, 8803066

Int. Cl.[5] C02C *1/02, 5/10;* C08F *6/00, 20/56*

U.S. Cl. 524—17 17 Claims

1. A dispersion in non-aqueous liquid of particles of acrylamide polymer at least 50% by weight below 30 μm, wherein the water content of the dispersion is below 15 by weight based on the total weight of the dispersion and the dispersion also contains an amidase that is effective, when the dispersion is dispersed into water for 2 hours at 25° C., to reduce the content of acrylamide monomer.

4,996,252

INK COMPOSITION CONTAINING A BLEND OF A POLYESTER AND AN ACRYLIC POLYMER

Hieu D. Phan, Kingsport; Gary W. Carrier, Bristol; Rebecca R. Stockl, Kingsport; Frank J. Tortorici, Kingsport, and R. Gary Wulf, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,520

Int. Cl.[5] C08L *67/02, 31/02, 77/00;* C08K *5/34*

U.S. Cl. 524—88 30 Claims

1. A polymer blend comprising:

(A) a linear water-dissipatible polymer having carbonyloxy linking groups in the linear molecular structure wherein up to 80% of the linking groups are carbonylamido linking groups, the polymer having an inherent viscosity of from about 0.1 to about 1.0 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of 0.25 gram of polymer in 100 mL of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole %) to hydroxy and amino equivalents (100 mole %), the polymer comprising the reaction products of reactants selected from (1), (2), (3), and (4), or the ester forming or esteramide forming derivatives thereof, as follows, wherein all stated mole percentages are based on the total of all acid, hydroxyl and amino equivalents being equal to 200 mole %:

(1) at least one difunctional dicarboxylic acid;

(2) from about 4 to about 25 mole % of at least one difunctional sulfomonomer containing at least one metallic sulfonate group or nitrogen-contained non-metallic sulfonate group attached to an aromatic or cycloaliphatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;

(3) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —CH_2—OH groups of which

(a) at least 15 mole % is a poly(ethylene glycol) having the structural formula

$$H—OCH_2—CH_2)_nOH,$$

being an integer of from 2 to about 20, or

(b) of which from about 0.1 to less than about 15 mole % is a poly(ethylene glycol) having the structural formula

$$H—OCH_2—CH_2)_nOH,$$

n being an integer of between 2 and about 500, and with the proviso that the mole % of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range; and

(4) from none to about 40 mole % of difunctional reactant selected from hydroxycarboxylic acids having one —$C(R)_2$—OH group, aminocarboxylic acids having one —NRH group, and amino—alcohols having one —$C(R)_2$—OH group and one —NRH group, or mixtures of said difunctional reactants;

wherein each R in the (3) and (4) reactants is a hydrogen atom or an alkyl group of 1 to 4 carbons; and

(B) an acrylic polymer in an amount of about 10 to 55 percent, based on the total weight of Components (A) and (B), said acrylic polymer being compatible with the water-dissipatable polyester at an acrylic polymer concentration of about 30 weight percent of the total acrylic/polyester polymer solids, which will not gel or have a significant increase in viscosity after being held at 120° F. (48.89° C.) for 24 hours or at room temperature for 14 days.

4,996,253

UV-LIGHT STABILIZED POLYOXYMETHYLENE MOLDING COMPOSITIONS

Bruce M. Mulholland, Union, Ky., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 10, 1988, Ser. No. 269,408

Int. Cl.[5] C08K *5/3477, 5/3492*

U.S. Cl. 524—91 20 Claims

1. A molding composition exhibiting ultraviolet light stability comprising, based on the total weight of the composition:

(a) an oxymethylene copolymer;

(b) between about 0.015 to about 0.4 percent by weight of 2,4,6-triamino-sym-triazine;

(c) between about 0.25 to about 1.0 percent by weight of 2-(2-hydroxy-5-t-octylphenyl)-benzotriazole;

(d) between about 0.25 to about 1.0 percent by weight of 3,5-di-tert-butyl-4-hydroxyhydrocinnamic acid triester with 1,3,5-tris(2-hydroxyethyl)-s-triazine-2,4,6(1H, 3H, 5H)-trionc; and

(e) between about 0.25 to about 1.0 percent by weight of bis(2,2,6,6-tetramethyl-4-piperdinyl)sebacate; wherein

(f) said composition exhibits a color difference, as calculated in CIELab units under illuminant "D-65" according to ASTM Standard D-2244, of less than about 3.5 when exposed to 1240.8 Kj/sq.m irradiation in a Xenon arc weatherometer operated according to SAE J1885.

4,996,254

PRODUCTION OF ELECTRONIC COATINGS BY SPIN COATING A PARTIALLY FLUORINATED POLYAMIC ACID COMPOSITION

Allan A. Eisenbraun, and Wesley C. Blocker, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 11, 1988, Ser. No. 255,609

Int. Cl.[5] C08G *69/32, 73/10, 73/12*

U.S. Cl. 524—104 19 Claims

1. A partially fluorinated polyamic acid composition especially adapted for use in spin coating wafers of semiconductive materials which composition comprises a solution of (i) a 2,2-bis(3,4-dicarboxyphenyl)hexafluoropropane dianhydride/2,2-bis[4-(aminophenoxy)phenyl]hexafluoropropane polyamic acid polymer having an inherent viscosity in the range of about 0.2 to about 1.5 dL/g (as measured in N-methylpyrrolidone at 25° C. at a concentration of 0.5 g/dL) in (ii) a solvent containing at least 10% by weight of a cycloaliphatic ketone or mixture of cycloaliphatic ketones, such that the solution (a) contains on a weight basis from about 5% to about 40% of such polyamic acid and (b) does not undergo precipitate formation during spin coating in an atmosphere of up to at least about 55% relative humidity.

4,996,255

FLAME RETARDANT, HALOGEN FREE AROMATIC POLYCARBONATE COPOLYMER BLENDS

Gary C. Davis, Albany, and Larry N. Lewis, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,096

Int. Cl.[5] C08K *5/54*

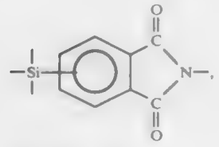
U.S. Cl. 524—261 6 Claims

1. A flame retardant halogen-free aromatic polycarbonate comprising

(A) an aromatic polycarbonate copolymer consisting essentially of aromatic carbonate units condensed with 0.5 to 5 mole % of silarylene units based on the total moles of the aromatic carbonate units and silylarylene units selected from the class consisting of silylarylenecarbonyl units of the formula



silylaryleneimide units of the formula



and mixtures thereof and,

(B) an amount of a triarylsilicon material having the formula

$$(R^2)_3SiY$$

which is effective for imparting sufficient flame retardancy to provide a 1/16" or greater injection molded test sample capable of satisfying the V-O requirements of UL-94, where the unsatisfied valence bonds of the silicon atoms of the silylaryl carbonyl units and the silylaryleneimide units, can be satisfied by $C_{(1-13)}$ monovalent organic radicals, oxygen atoms or mixture thereof, R^2 is selected from $C_{(6-13)}$ monovalent aromatic organic radicals and Y is a member selected from $—C_2H_3$,—H,—$Si(R^2)_3$ and —$OSi(R^2)_3$.

4,996,256

FREE-FLOWING POLYARYLENE SULFIDES CRYSTALLIZING WITH DELAY

Hans-Detlef Heinz; Burkhard Köhler; Rolf-Volker Meyer, all of Krefeld; Klaus Reinking, Wermelskirchen, and Alexa Sommer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,065

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819479

Int. Cl.[5] C08K *5/32*

U.S. Cl. 524—112 7 Claims

1. Composition comprising free-flowing arylene sulfide polymers which crystallize with delay, optionally additionally display improved resistance to UV radiation, and are prepared by mixing 75 to 99% by weight of one or more arylene sulfide polymers in the melt with 1 to 25% by weight of one or more aromatic mononitro compounds which do not contain any sulfonate salt groups and has a boiling point of at least 200° C.

4,996,257

SURFACE-TREATED POLYORGANOSILSESQUIOXANE FINE POWDER

Kenji Saito, and Hiroshi Kimura, both of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 340,509

Claims priority, application Japan, Apr. 19, 1988, 63-94548

Int. Cl.[5] C08K *5/24*

U.S. Cl. 524—262 3 Claims

1. A polyorganosilsesquioxane fine powder which is contacted with an organosilicon compound containing a quaternary ammonium group, so that the surface of the polyorganosilsesquioxane is covered with the organosilicon compound, wherein the organosilicon compound is represented by the formula (I) or (II):

$$[R^1R^2R^3N^+Q^1Si(R^4)_a(OR^5)_{3-a}]\ X^- \quad (I)$$

$$[R^1R^2R^3N^+Q^2NHQ^1Si(R^4)_a(OR^5)_{3-a}]\ X^- \quad (II)$$

wherein R^1 represents an alkyl group, a substituted or unsubstituted aralkyl group, or a group represented by $(C_nH_{2n}O)_mZ$ wherein Z represents a hydrogen atom or an alkyl group, symbol n is an integer of 2 to 4, and symbol m is an integer of 1 to 20; R^2 and R^3 each independently represents a hydrogen atom, an alkyl group or a hydroxyalkyl group; Q^1 and Q^2 each independently represents an alkylene group; R^4 represents an alkyl group or a phenyl group; R^5 represents an alkyl group having 1 to 4 carbon atoms; X represents an anion; and symbol a is an integer of 0 to 3.

4,996,258

HYDROFORMYLATED THERMAL OILS

Lawson G. Wideman, and Paul H. Sandstrom, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 5, 1989, Ser. No. 402,407

Int. Cl.[5] C08L *93/04*

U.S. Cl. 524—274 18 Claims

1. A hydroformylated thermal oil prepared according to a process comprising reacting decarboxylated rosin acid having an acid number ranging from about 2 to about 62 with carbon monoxide and hydrogen under hydroformylation conditions in the presence of a hydroformylation catalyst and organic reaction solvent for a time sufficient until from about 0.1% to 5% of the decarboxylated rosin acid is functionalized.

4,996,259

PREPARATION OF AQUEOUS SYNTHETIC WAX DISPERSIONS

Gernot Koehler, Worms; Juergen Schmidt-Thuemmes, Ludwigshafen; Norbert Hasenbein, Dirmstein; Lothar Schlemmer, Maxdorf, and Wolfram Dietsche, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 23, 1989, Ser. No. 397,879

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1988, 3830535

Int. Cl.[5] C08J *3/02;* C08L *23/00, 91/00*

U.S. Cl. 524—276 6 Claims

1. A process for the preparation of an aqueous synthetic wax dispersion having a mean particle size of from 0.05 to 0.3 μm which contain, as an essential component of the solid substance, a partially or completely neutralized copolymer (I) which is composed of

(A) 75–95% of a C_2–C_4-olefin and

(B) 5–25% by weight of an unsaturated mono- or dicarboxylic acid or dicarboxylic anhydride or a mixture of these monomers, by neutralization and dispersion of the solid substance in an aqueous medium at above the melting

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point of the copolymer (I), wherein the processes of neutralization and of dispersion are carried out in one extruder or in a plurality of extruders connected in series.

4,996,260

COMPOSITIONS OF NON-FILM FORMING POLYSULFIDE, LATEX EMULSION AND HYDROCARBON RESIN

Daniel O'Connell, Crystal Lake, Ill., assignor to Morton International, Inc., Chicago, Ill.

Filed Dec. 7, 1989, Ser. No. 447,281
Int. Cl.[5] C08K *5/05*
U.S. Cl. 524—381 8 Claims

1. A binder composition comprising emulsified and/or dispersed binder solid in an aqueous medium, said binder solids comprising:

(A) between about 10 and about 70 wt. percent relative to total binder solids of a film-forming latex emulsion,

(B) between about 10 and about 70 wt. percent relative to total binder solids of a non-film forming liquid polysulfide dispersion, said liquid polysulfide being —OH terminated and having a number average molecular weight of between about 100,000 and about 300,000, and

(C) between about 10 and about 50 percent relative to total binder solids of emulsified bydrocarbon resin, said hydrocarbon resin having a Ring and Ball softening point of between about 60° C. and about 150° C. a number average molecular weight of between about 350 and about 1200 and an iodine number of between about 10 and about 70,

said binder composition containing sufficient surfactant to maintain said binder solids emulsified and/or dispersed.

4,996,261

ANTI-FOULING CASTABLE POLYMERS AND ANTI-FOULING POLYURETHANES AND SIMILAR MATERIALS

Alexander Lebovits, Baltimore; William L. Yaeger, Queen-Anne; William B. Mercer, Annapolis, and Timothy L. Dapp, Bowie, all of Md., assignors to The United States of America as represented by the secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 916,597, Oct. 8, 1986, abandoned. This application Sep. 1, 1988, Ser. No. 239,351
Int. Cl.[5] C08L *45/100*
U.S. Cl. 525—131 16 Claims

1. A process for preparing a structural antifouling polymeric composition consisting of:

(a) purifying an organotin compound selected from the group consisting of bis (tri-alkyltin) oxide, bis (tri-aryltin) oxide, bis (tri-cycloalkyltin) oxide, and tri-cycloalkyltin hydroxide by distillation or other suitable process to at least about 98% purity,

(b) synthesizing a copolymer by the copolymerization of monomers selected from the group consisting of esters of acrylic acid and esters of methacrylic acid with monomers selected from the group consisting of acrylic acid and methacrylic acid,

(c) reacting the organotin compound of (a) with the copolymer of (b) to form a polymeric tin-containing ester and choosing the proportions of (a) and (b) so that a small percentage of the carboxyl groups of (b) remain unreacted,

(d) mixing the reaction product of (c) with (1) isocyanates selected from the group consisting of multifunctional monomeric isocyanates, multifunctional monomeric thioisocyanates, and mixtures thereof, wherein multi means more than one and multifunctional means as having in the same molecule more than one functional group capable of reacting with more than one group selected from the group consisting of hydroxyl groups, amino groups and a combination thereof, and

(e) multifunctional compounds capable of reacting with isocyanates and thioisocyanates by means of active hydrogen containing groups, said active hydrogen containing groups being selected from the group consisting of hydroxyl, amine, carboxyl, hydrogen of water, hydrogen of atmospheric moisture and mixtures thereof, wherein multi means more than one and multifunctional means as having in the same molecule more than one functional group capable of reacting with more than one group selected from the group consisting of isocyanate groups, thioisocyanate groups and a combination thereof, and said mixing being done with an amount of reaction product of (c) to impart antifouling properties to the final composition.

4,996,262

POLYESTER REINFORCED RUBBER

James B. Pyke, Akron; Richard G. Bauer, Kent, and Donald J. Burlett, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 27, 1989, Ser. No. 329,214
Int. Cl.[5] C08L *23/30, 15/00*
U.S. Cl. 525—177 18 Claims

1. A process for preparing a rubber composition having a high modulus which comprises reacting at least one epoxidized rubber containing double bonds and which is comprised of repeat units which are derived from conjugated diene monomers and/or nonconjugated diene monomers with from about 20 phr to about 100 phr of at least one polyester elastomer having a melting point of less than about 240° C. at a temperature which is within the range of about 140° C. to about 300° C.

4,996,263

HIGH MODULUS RUBBER COMPOSITION

James B. Pyke, Akron; Richard G. Bauer, Kent; Martin P. Cohen, and Pawan K. Handa, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 6, 1988, Ser. No. 253,839
Int. Cl.[5] C08L *77/00*
U.S. Cl. 525—178 15 Claims

1. A process for preparing a rubber composition having a high modulus which comprises reacting maleic anhydride with at least one polydiene rubber selected from the group consisting of polybutadiene, styrene-butadiene rubber, synthetic polyisoprene, natural rubber, isoprene-butadiene rubber, isoprene-butadiene-styrene rubber, nitrile rubber, and carboxylated nitrile rubber and at least one nylon wherein an electrocyclic reaction mechanism is utilized in reacting the maleic anhydride with the rubber.

4,996,264

THERMOPLASTIC AND ELASTOMERIC COMPOSITION

Mitsuyoshi Aonuma, Tokyo; Tatsunosuke Suzuki, Warabi; Satoru Isomura, and Koichi Nishimura, both of Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1988, Ser. No. 235,863
Claims priority, application Japan, Aug. 24, 1987, 62-209488
Int. Cl.[5] C08L *77/00*
U.S. Cl. 525—179 6 Claims

1. A thermoplastic and elastomeric composition comprising 25 to 60% by weight of a polyamide resin and 75 to 40% by weight of a rubber component; said rubber component comprising 20 to 80% by weight of a hydrogenated nitrile group-containing rubber and 80 to 20% by weight of an acrylic rubber, said rubber component being dispersed in the form of crosslinked particles in said polyamide resin; said hydrogenated nitrile group-containing rubber being a hydrogenated copolymer containing 10 to 60% by weight of a vinyl nitrile, 15 to 90% by weight of a conjugated diene and 0 to 75% by weight of a monomer copolymerizable with vinyl nitrile and said conjugated diene, said hydrogenated nitrile-group containing rubber having an iodine value of 120 or less; said acrylic rubber being a copolymer of at least one acrylate selected from the group consisting of an alkyl acetate and an alkoxy-substituted alkyl acrylate with at least one compound selected from the group consisting of a nonconjugated diene, a conjugated diene, a dihydrodicyclopentadienyl group-containing (meth)acrylate, an epoxy group-containing ethylenically unsaturated compound, an active halogen-containing ethylenically unsaturated compound and a carboxyl group-containing ethylenically unsaturated compound.

4,996,265

PROCESS FOR PREPARATION OF MONODISPERSE POLYMER PARTICLES HAVING INCREASED PARTICLE SIZE

Masayoshi Okubo, Kobe, and Masami Tsujihiro, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 25, 1989, Ser. No. 301,103
Claims priority, application Japan, Jan. 29, 1988, 63-17321
Int. Cl.[5] C08F *2/00*
U.S. Cl. 525—242 18 Claims

1. A process for the preparation of monodisperse polymer particles having an increased particle size, which comprises:

(i) preparing a solution or dispersion of a monomer, an oil-soluble polymerization initiator and a dispersion stabilizer in a mixture of (a) a water-miscible organic solvent capable of dissolving the monomer therein but incapable of dissolving a polymer of the monomer therein and (b) water;

(ii) dispersing a seed polymer having a swelling property to the monomer into said solution or dispersion to form an emulsion;

(iii) reducing the solubility of said monomer in said mixture of water-miscible organic solvent and water thereby causing said monomer and said polymerization initiator to be absorbed in said seed polymer to form swollen spherical particles having an increased particle size; and

(iv) selectively polymerizing the monomer absorbed in said seed polymer particles.

4,996,266

METHOD OF MAKING CONDENSED PHASE POLYMERS

William R. Bronn; Spencer F. Silver, and Eugene G. Joseph, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 107,262, Oct. 9, 1987, Pat. No. 4,857,615. This application Mar. 24, 1989, Ser. No. 328,533
Int. Cl.[5] C08F *4/00*
U.S. Cl. 525—271 9 Claims

1. A method of preparing a multi-arm copolymer having condensed phase copolymer arms, said method comprising the steps of

(A) preparing an elastomeric anionically terminated living copolymer having a condensed phase structure wherein polymer branches occur along a polymer backbone by reacting, under polymerization conditions, the following:
(a) hydrocarbyl lithium initiator;
(b) at least one anionically polymerizable compound; and
(c) a condensing agent having the general formula

$$CH_2{=}C(R')QY(R)_n(X)_m$$

wherein
Y is tetravalent Si, Ge, Sn, or Pb;
X is H,-OR'', Cl, Br, or F, wherein R'' is a monovalent lower alkyl group having from 1 to 6 carbon atoms;
R is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;
Q is phenylene;
R' is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;
m is an integer of 1, 2 or 3; and
n is an integer equal to 3−m; and

(B) contacting the resulting anionically terminated living copolymer with a multifunctional linking agent under reactive conditions thereby forming a multi-arm copolymer having condensed phase copolymer arms wherein the mole ratio of (a) to (c) is about (1+m):1 and the mole percentage of the condensing agent in each copolymer segment containing said condensing agent is in the range of about 0.01% to about 5%.

4,996,267

HEAT-CURABLE RESIN MIXTURE OF MONOCYANATE, POLYCYANATE AND REACTIVE THERMOPLASTIC

Dale Gerth, Ludwigshafen, Fed. Rep. of Germany; Peter Ittemann, Fort Mill, S.C., and Helmut Tesch, Birkenheide, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,868
Int. Cl.[5] C08L *79/08, 81/06*
U.S. Cl. 525—423 1 Claim

1. A heat-curable resin mixture containing

(A) 100 parts by weight of a polyfunctional aromatic cyanic ester,

(B) from 2 to 100 parts by weight of a monofunctional aromatic cyanic ester,

(C) from 5 to 100 parts by weight of a hydroxyl terminated polysulfone or polyether sulfone thermoplastic having an average molecular weight Mn of from 5,000 to 20,000; polymer having a glass transition temperature above 100° C.,

(D) from 0 to 50 parts by weight of an optional bismaleimide, and

(E) from 0 to 50 parts by weight of an optional epoxy resin.

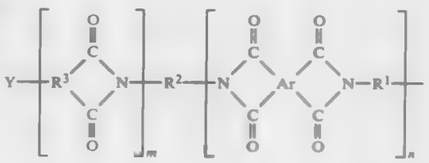
4,996,268

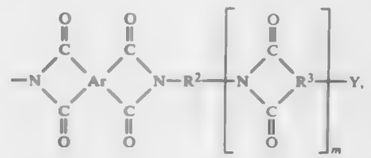
CARBINOL-CONTAINING POLYIMIDE OLIGOMERS TERMINATED WITH EPOXIDE-REACTIVE GROUPS

Jules E. Schoenberg, Scotch Plains, N.J., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 880,884, Jul. 1, 1986, Pat. No. 4,820,779. This application Feb. 17, 1989, Ser. No. 312,106
Int. Cl.[5] C08G *73/10, 73/14, 73/16*
U.S. Cl. 525—434 7 Claims

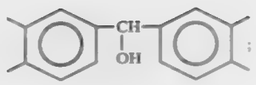
1. A carbinol-containing polyimide oligomer terminated with epoxide-reactive end groups, which has the structure





wherein Ar is

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R^1 and R^2 are independently divalent organic radicals; R^3 is a trivalent organic radical; Y is an epoxide-reactive group selected from the group consisting of a phenol or thiol m is 0 and 1 and n is 0–10.

4,996,269

POLYESTER COMPOSITION WHICH IS PARTICULARLY SUITABLE FOR USE IN THERMOFORMING THIN WALLED ARTICLES

Donald E. Richeson, North Canton, and Judith A. Tweedie, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 13, 1987, Ser. No. 25,708
Int. Cl.[5] C08L 67/02; B29C 51/00
U.S. Cl. 525—444 6 Claims

1. A thermoformed, non-oriented, heat-set, thin walled article which consists of (1) from about 94 to about 99 weight percent polyethylene naphthalate, (2) from about 1 to about 6 weight percent of at least one polyester elastomer, and (3) an effective amount of a heat stabilizer.

4,996,270

VINYL ESTER RESINS

Bernhard Czauderna, Hirschberg; Juergen Nieberle, Wachenheim; Roland Peter, Ludwigshafen, and Dietmar Nissen, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 868,703, May 30, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 267,714
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520113
Int. Cl.[5] C08F 283/10
U.S. Cl. 525—531 4 Claims

1. A vinylester resin having unsaturated terminal groups produced by a process which comprises: reacting a polyphenol selected from the group consisting of 2,2,3,3,-tetrakis-(4-hydroxyphenyl)-butane, 2,2,4,4,-tetrakis-(4-hydroxyphenyl)-pentane and 2,2,5,5,-tetrakis-(4-hydroxyphenyl)-hexane with epichlorohydrin, and thereafter reacting the formed epoxy product with an unsaturated carboxylic acid.

4,996,271

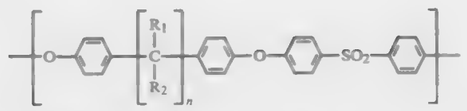
METHOD OF MANUFACTURING HALOGENATED AROMATIC POLYSULFONE COMPOUNDS AND THE COMPOUNDS SO PRODUCED

Michael D. Guiver, Ottawa, and Oleh Kutowy, North Gower, both of Canada, assignors to National Research Council of Canada/Conseil de Recherches Canada, Ottawa, Canada

Filed Dec. 7, 1988, Ser. No. 281,041
Claims priority, application Canada, Dec. 11, 1987, 554118
Int. Cl.[5] C08C 75/00; C08F 283/00; C08L 81/00
U.S. Cl. 525—537 9 Claims

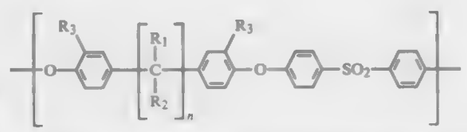
1. A method of manufacturing a halogenated aromatic polysulfone compound, comprising:

(a) forming a solution of the polysulfone compound with halogenated solvent, the polysulfone compound having repeating units of the general formula,



wherein n is one or zero, and when n is one R_1 and R_2 each represent alkyl or aryl groups,

(b) adding sufficient halogen to the solvent to halogenate the polysulfone compound to the desired degree so as to form a halogenated compound having repeating units of the general formula,



wherein R_1, R_2 and n are as previously defined and at least one R_3 per polymer chain is a halogen substitution of a hydrogen atom, and

(c) separating the halogenated polysulfone compound from the solvent.

4,996,272

RESIN USED FOR MAGNETIC RECORDING MEDIA AND A METHOD FOR THE PRODUCTION OF THE SAME

Takeshi Nakachi; Akio Hata, both of Shinnanyo, and Yoshihisa Watanabe, Uji, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 236,350, Aug. 22, 1988, Pat. No. 4,861,683, which is a continuation of Ser. No. 30,457, Mar. 25, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 371,400
Int. Cl.[5] C08F 2/06
U.S. Cl. 526—62 4 Claims

1. A method for the production of a resin used for magnetic recording media, comprising:

polymerizing an organic solvent solution containing vinyl chloride, vinyl monomers with hydroxyl groups and vinyl monomers with quaternary ammonium salt groups in a reacting apparatus to thereby precipitate a vinyl chloride copolymer, the interior surface of said reacting apparatus, which comes into contract with said organic solvent solution, being coated with a fluororesin, wherein

said organic solvent dissolves vinyl chloride, vinyl monomers with hydroxy groups, and vinyl monomers with quaternary ammonium salt therein, and separates the produced copolymer therefrom.

4,996,273

ANIONIC POLYMERIZATION CATALYST COMPOSITIONS

Adriaan A. Van Der Huizen, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 24, 1990, Ser. No. 527,922
Claims priority, application United Kingdom, Dec. 21, 1989, 8928955
Int. Cl.[5] C08F 4/52
U.S. Cl. 526—177 8 Claims

1. Anionic polymerization processes comprising the steps of:

contacting at least one conjugated diene with a catalyst composition which contains an organolithium compound, a barium, strontium or calcium alcoholate or thiolate, and a trialkylaluminum compound having at least 13 carbon atoms per molecule, and

recovering a conjugated diene polymer or copolymer.

4,996,274

POLYCARBOXYLIC ACIDS WITH HIGHER THICKENING CAPACITY AND BETTER CLARITY

Chin C. Hsu, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

Filed Feb. 19, 1988, Ser. No. 157,685
Int. Cl.[5] C08F 2/00
U.S. Cl. 526—208 7 Claims

1. A polymer which has viscosity of at least 15,000 cps in absence of salt when measured in a 2.0% by weight mucilage in water with pH adjusted to 7–8 with 18% NaOH solution, said polymer comprising at least 85% by weight of polymerized units of at least one carboxyl monomer selected from unsaturated carboxylic acids of 3 to 5 carbon atoms, salts thereof, and mixtures thereof, and up to 15% by weight of polymerized units of at least one copolymerizable comonomer, and said polymer is prepared in a mixed reaction medium consisting essentially of at least one organic solvent and at least one hydrocarbon solvent, wherein said organic solvent is selected from ketones, esters, ethers, and alcohols having solubility parameter in the range of 8 to 15 and wherein said hydrocarbon solvent is selected from aliphatic and cyclic aliphatic alkanes containing 4 to 12 carbon atoms and non-benzene aromatics of 7 to 9 carbon atoms.

4,996,275

FLUORINE CONTAINING POLYMERIC COMPOSITIONS USEFUL IN CONTACT LENSES

Edward J. Ellis, and Jeanne Y. Ellis, both of Lynnfield, Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation of Ser. No. 270,796, Nov. 10, 1988, abandoned, which is a continuation of Ser. No. 46,132, May 4, 1987, abandoned, which is a continuation of Ser. No. 786,846, Oct. 11, 1985, Pat. No. 4,686,267. This application Dec. 12, 1989, Ser. No. 449,565
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[5] C08F 30/08
U.S. Cl. 526—245 7 Claims

1. A contact lens formed from polymerization of a monomeric mixture of bis(1,1,1,3,3,3-hexafluoro-2-propyl) itaconate, bis(methacryloxypropyl)1,1,3,3-tetrakis (trimethyl siloxy) disiloxane, tris(trimethylsiloxy) silylpropyl methacrylate, n-vinyl pryyolidone, methacrylic acid and a cross linking agent.

4,996,276

PROCESS FOR THE POLYMERIZATION OF PENTABROMOBENZYLESTER MONOACRYLATE

Theodor-Morel Fishler, 29 Oren Street, Haifa; Michael Peled, 17 Hatzav Street, Beer Sheva, and Leonard M. Shorr, 39 Palmach Street, Haifa, all of Israel

Filed Jun. 1, 1989, Ser. No. 359,997
Claims priority, application Israel, Jun. 2, 1988, 86605
Int. Cl.[5] C08F 18/20
U.S. Cl. 526—2927.5 5 Claims

1. A process for the thermal bulk homopolymerization of pentabromobenzylester monoacrylate and the co-polymerization of pentabromobenzylester monoacrylate with compatible monomer(s), wherein the monomer(s) is (are) brought to melting conditions and heated to a temperature comprised between 120° C. and 290° C., for a period of time comprised between about 0.5 minutes and about 30 minutes.

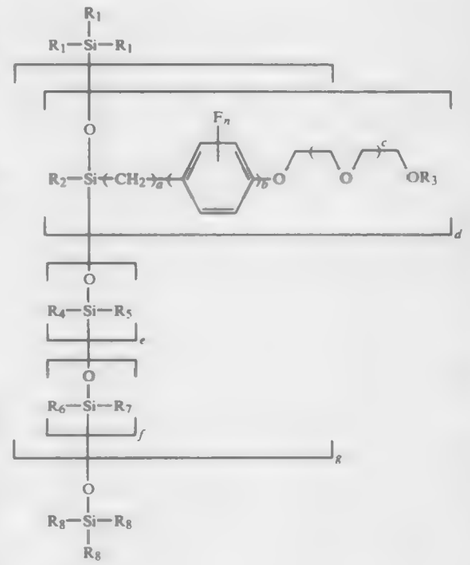
4,996,277

NOVEL OLIGOETHYLENE OXIDE-CONTAINING ALKENES, ALKOXYSILANES, AND POLYSILOXANES

Jerald S. Bradshaw, 1616 Oaklane, Provo, Utah 84604; Milton L. Lee, 2400 N. 180 W., Pleasant Grove, Utah 84062, and Karin E. Markides, 794 S. 700 East, Springville, Utah 84663

Filed Feb. 8, 1988, Ser. No. 153,369
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—15 15 Claims

1. A compound of formula



wherein;

a is an integer from 0 to about 14; b is an integer of 1 or 2; c is an integer from 0 to about 10; d is an integer from 1 to about 100; e is an integer from 0 to about 100. f is an integer from 0 to about 12; and g is an integer from 1 to about 50;

R_1 and R_8 are selected from the group consisting of lower alkyl, lower alkenyl, lowerhaloalkyl and phenyl;

R_3 is hydrogen, alkyl of 1–22 carbon atoms; fluorinated alkyl of 1–22 carbon atoms; aryl selected from the group consisting of phenyl, naphthyl, biphenyl, pyridyl, furyl, thienyl and pyrryl and the lower alkyl, lower alkoxy, cyano, nitro, fluoro, chloro, bromo, lower alkylsulfonyl, lower alkyl carboxyl, lower alkylamindo, lower dialkylamino and lower perhaloalkyl substituents thereof; or lower aralkyl;

R_2, R_4, R_5 and R_6 are members selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl substituted loweralkyl, loweralkyl substituted phenyl, lower alkoxy substituted phenyl and halosubstituted phenyl;

R_7 is a member selected from the group consisting of alkyl of 1 to 12 carbon atoms, alkenyl of 2 to 8 carbon atoms, phenyl substituted loweralkyl and loweralkyl substituted phenyl;

F is hydrogen, alkyl of 1 to 10 carbon atoms, fluorinated alkyl of 1 to 10 carbon atoms, alkoxy of 1 to 10 carbon atoms, phenyl, thienyl, furyl, pyridyl, pyrryl, nitro, cyano, chloro, bromo, fluoro, or $-(OCH_2CH_2)_m-OR_9$ wherein m and n are integers of 1 to 4 and R_9 is methyl or ethyl.

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4,996,278

NOVEL POLYIMIDESILOXANES AND METHODS FOR THEIR PREPARATION AND USE BASED ON DIAMINES WITH PENDANT FLUORINE GROUPS

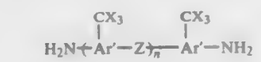
Chung J. Lee, E. Amherst, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 153,898, Feb. 9, 1988, Pat. No. 4,853,452, Ser. No. 154,168, Feb. 9, 1988, Pat. No. 4,829,131, Ser. No. 205,412, Jun. 10, 1988, Pat. No. 4,956,437, Ser. No. 270,920, Nov. 14, 1988, Pat. No. 4,957,993, and Ser. No. 239,372, Sep. 1, 1988, Pat. No. 4,973,645, which is a continuation-in-part of Ser. No. 32,272, Mar. 31, 1987, abandoned. This application Feb. 7, 1989, Ser. No. 307,016

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—26 **71 Claims**

1. In a substantially fully imidized polyimidesiloxane comprising the reaction product of an organic dianhydride, a difunctional siloxane monomer, and an organic amine, the improvement wherein the organic amine has the formula

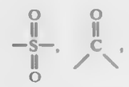


(I)

wherein

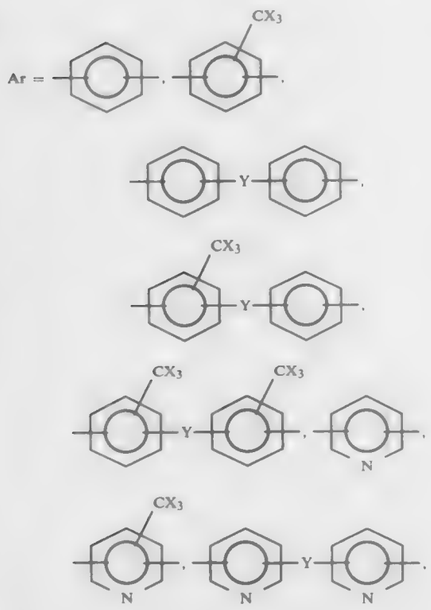
X is fluorine or combinations of fluorine with hydrogen

Z=—O—, —S—

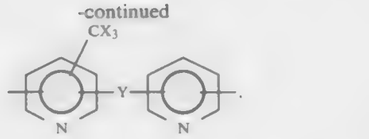


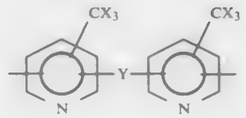
$>C(CX_3)_2$, — or —Y—Ar—Y—,

Ar′ is an aromatic radical of 6 to 10 carbon atoms,

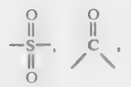


-continued





Y=—O—, —S—,



$>C(CX_3)_2$, $C(CH_3)_2$, or —,

N=0 or 1.

4,996,279

DISSYMMETRIC POLYMER MATERIALS

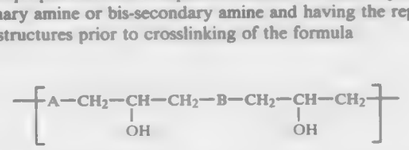
Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 7, 1988, Ser. No. 255,086

Int. Cl.[5] C08G *59/00, 59/02*

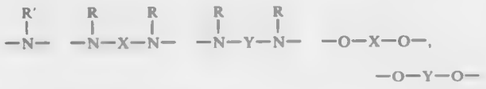
U.S. Cl. 528—27 **30 Claims**

1. A polymer composition consisting essentially of lightly crosslinked dissymmetric linear thermoplastic polymer molecules prepared from a diepoxide and at least one diphenol, primary amine or bis-secondary amine and having the repeating structures prior to crosslinking of the formula



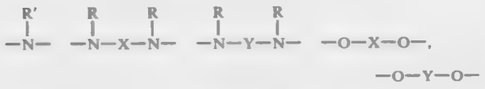
wherein said thermoplastic polymer molecules have substantially no epoxy functionality prior to crosslinking, and wherein

(a) A is selected from the group consisting of



and mixtures thereof, and

B is selected form the group consisting of



(b) R and R′ are independently selected from the group consisting of unsubstituted or inertly substituted C_1–C_{20} aliphatic, cycloaliphatic or aralkyl groups, and each R′ also is independently selected from the group of R plus any unsubstituted or inertly substituted aryl groups;

(c) said repeating structures are lightly crosslinked such that between 1 and 50 of said repeating structures per 100 total repeating structures are crosslinked to repeating structures of other molecules;

(d) X and Y each independently is a segment comprising stiff units (SU and SU′, respectively) and flexible units (FU and FU′, respectively), which stiff units and flexible units are interconnected, with the proviso that in about 50% or more of the segments X plus Y the stiff and flexible units are interconnected to form a segment which is dissymmetric along its linear chain axis;

(e) said stiff units, SU and SU′, are independently selected from the groups consisting of unsubstituted and substituted aryl, and non-interfering heterocyclic rings;

(f) said flexible units, FU and FU′, are independently selected form the group of



and

(g) the ratio of the number of stiff units to flexible units in said X segment (SU/FU) is equal to or greater than the ratio of the number of stiff units to flexible units in said Y segment (SU′/FU′).

4,996,280

POLYORGANOSILOXANE COMPOUNDS WITH AMINO GROUP

Takahiro Saho; Yoshinori Akutsu; Takaharu Nakano, and Nobumasa Ohtake, all of Yokohama, Japan, assignors to Chisso Corporation, Japan

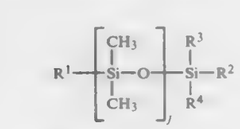
Filed Aug. 1, 1989, Ser. No. 387,768

Claims priority, application Japan, Aug. 1, 1988, 63-192317

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **10 Claims**

1. A polyorganosiloxane compound represented by the following general formula (I):

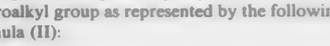


(I)

in which

j is an integer from 2 to 2,000;

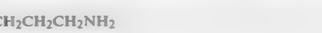
R^1 is a pentafluorophenyl group or a linear or branched fluoroalkyl group as represented by the following general formula (II):



(II)

(wherein a is an integer from 3 to 18 and b is 0 or 2a;

R^2 is a substituent as represented by formula (III):



(III)

; and

R^3 and R^4 are independently each an alkyl group having from 1 to 4 carbon atoms or a phenyl group.

4,996,281

POLYMERS CONTAINING AMIDE MOIETIES AND A PROCESS FOR THEIR PREPARATION

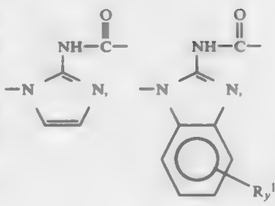
Ying H. So, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

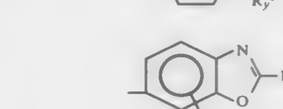
Filed Sep. 29, 1989, Ser. No. 414,847

Int. Cl.[5] C08G *18/60*

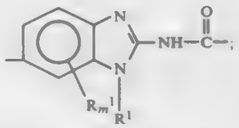
U.S. Cl. 528—73 **15 Claims**

1. A polymer comprising a backbone portion containing at least one of the following units:









wherein each R^1 is a C_{1-4} alkyl moiety, y is a whole number from 1 to 4, and m is a whole number from 1 to 3.

4,996,282

CATIONICALLY CURABLE POLYURETHANE COMPOSITIONS HAVING VINYL ETHER FUNCTIONALITY

Gerry K. Noren, Hoffman Estates; John J. Krajewski, Wheeling, and Edward J. Murphy, Mt. Prospect, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 172,430, Mar. 24, 1988, abandoned, and Ser. No. 251,782, Oct. 3, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 404,652

Int. Cl.[5] C08G *18/04*

U.S. Cl. 528—75 **38 Claims**

1. A cationically curable polyurethane composition comprising the reaction product of an organic polyisocyanate with a transvinylation polyhydric alcohol mixture containing hydroxy groups that is the transvinylation reaction product of (1) at least one vinyl ether and (2) at least one polyhydric alcohol having an average of more than 2 hydroxy groups per molecule, with the polyisocyanate consuming substantially all of the available hydroxy groups of the transvinylation mixture.

4,996,283

REACTIVE HOT MELT COMPOSITION

Alberto Greco, Dresano; Sergio Giordano, Peschiera Borromeo; Enrico Pozzi, Milan, and Patrizia Biasioli, Biassono, all of Italy, assignors to Enichem Synthesis S.p.A., Palermo and Boston S.p.A., Milan, both of, Italy

Filed Nov. 6, 1989, Ser. No. 431,911

Claims priority, application Italy, Nov. 18, 1988, 22653 A/88

Int. Cl.[5] C08G *18/44*

U.S. Cl. 528—80 **14 Claims**

1. A hot melt composition cross-linkable by the action of environmental humidity or heat to form cross-linked products having high degradation resistance, comprising the product of the reaction between:

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(A) an aliphatic or aromatic diisocyanate, and
(B) a mixture of the following diols:
(1) a crystalline polycarbonate diol having a number-average molecular weight (Mn) of between 1,000 and 10,000, a glass transition temperature (Tg) of less than −50° C., and a ΔH of crystallization equal to or greater than 80 J/g, prepared by a transesterification reaction between an organic carbonate and one or more HO—$(CH_2)_x$—OH aliphatic diols, where x is a whole number equal to or greater than 8,
(2) an elastomeric polycarbonate diol or an elastomeric polycarbonate copolyester diol, having a number-average molecular weight (Mn) of between 1,500 and 6,000 and a glass transition temperature of between −35° and −60° C., said elastomeric polycarbonate diol being prepared by a transesterification reaction between an organic carbonate and one or more HO—$(CH_2)_y$—OH aliphatic diols, where y is a whole number less than 8, or said elastomeric polycarbonate copolyester diol being prepared by a transesterification reaction between an organic carbonate, one or more HO—$(CH_2)_y$—OH aliphatic diols, where y has the aforesaid meaning, and a lactone or an aliphatic polyester diol oligomer, and
(3) a vitreous polycarbonate diol or a vitreous polycarbonate copolyester diol having a number-average molecular weight (Mn) of between 600 and 6,000 and a glass transition temperature (Tg) of between −10° and 50° C., said vitreous polycarbonate diol being prepared by a transesterification reaction between an organic carbonate and a cycloaliphatic diol or mixture of cycloaliphatic and aliphatic diols, said vitreous polycarbonate copolyester diol being prepared by reaction between an organic carbonate, a cycloaliphatic diol or mixture of cycloaliphatic and aliphatic diols, and an aromatic polyester diol oligomer,

wherein for each part by weight of the sum of (1), (2) and (3), component (1) is present in a quantity of between 30 and 70 parts by weight, component (2) is present in a quantity of at least 20 parts by weight, and component (3) is present in a quantity of between 0 and 50 parts by weight, and the ratio of NCO groups of component (A) to OH groups of component (B) exceeds 1.

4,996,284

NOVEL EPOXY SULFONAMIDE-BASED RESINS, A PROCESS FOR THEIR PREPARATION AND USE OF SAME

Leo X. Mallavarapu, 32 Tamarack La., Pomona, N.Y. 10970

Filed Apr. 24, 1989, Ser. No. 342,170
Int. Cl.[5] C08G *59/44*
U.S. Cl. 528—92 **6 Claims**

1. A process for the preparation of a thermoplastic sulfonamide-based epoxy resinous composition, comprising the step of:

reacting a sulfonamide compound with a resinous composition, at a temperature of, at least, approximately 140° C. containing a plurality of epoxide groups in the presence of a Lewis acid.

4,996,285

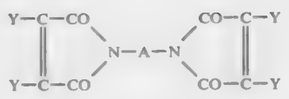
IMIDE/EPOXY THERMOSETTING COMPOSITIONS

Rene Arpin, Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

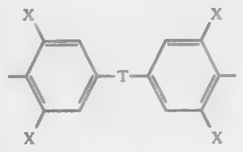
Continuation of Ser. No. 141,718, Jan. 11, 1988, abandoned. This application Oct. 11, 1989, Ser. No. 420,723
Claims priority, application France, Jan. 9, 1987, 87 00299
Int. Cl.[5] C08G *59/44, 73/12*
U.S. Cl. 528—117 **13 Claims**

1. A thermosetting composition of matter comprising a copolymerizate of:

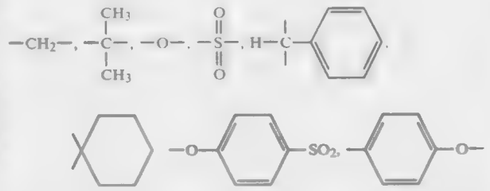
(a) an N,N'-bisimide of the formula:



in which Y is H, CH_3 or Cl;
A is cyclohexylene, phenylene, 4-methyl-1,3-phenylene, 2-methyl-1,3-phenylene. 5-methyl-1,3-phenylene, 2,5-diethyl-3-methyl-1,4-phenylene, or a radical of the formula:



in which T is a single valence bond or a group:



and the symbols X, which are identical or different, are each a hydrogen atom or a methyl, ethyl or isopropyl radical;

(b) a diprimary diamine of the formula:

$$H_2N—B—NH_2 \quad (II)$$

in which the symbol B is one of the divalent radicals represented above by the symbol A, with the proviso that the symbols A and B present in the same polymer may be identical or different; and

(c) a chlorinated or brominated epoxy resin having an epoxy equivalent weight ranging from 100 to 500 said resin being taken by itself or mixed with an unchlorinated or unbrominated epoxy resin having an epoxy equivalent weight ranging from 100 to 500, with the proviso that the quantity of chlorine or of bromine contributed by the epoxy resin or the mixture of epoxy resin, expressed as the weight percentage of elemental chlorine or elemental bromine relative to the combined mixture of bisimide, diamine and epoxy resin, is not more than 6%, wherein said copolymerizate is the reaction product formed in a continuous process at a temperature ranging from about 90° C. to about 200° C. by introducing bisimide (a) into a mixer with an extruder screw, separately introducing diamine (b) into the mixer downstream from the introduction of bisimide (a), and separately introducing epoxy resin (c) into the mixer downstream from the introduction of diamine (b).

4,996,286

TRIHYDRAZIDE LATENT CURING AGENT FOR EPOXY RESINS

Kiyomiki Hirai, Kawasaki; Koji Takeuchi, Yokohama; Nobuo Ito, Oiso, and Masahiro Abe, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,307
Claims priority, application Japan, Feb. 25, 1984, 59-34867
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[5] C07C *241/04*; C08G *59/44*
U.S. Cl. 528—123 **5 Claims**

1. A compound of the formula (I):

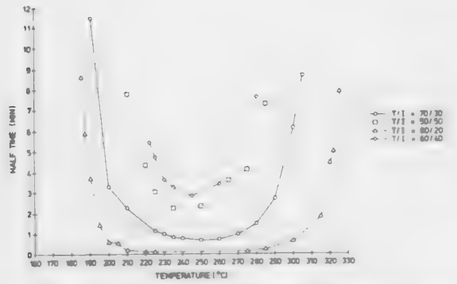
$$(NH_2NHCOCH_2CH_2)_2N(CH_2)_{11}CONHNH_2 \quad (I)$$

4,996,287

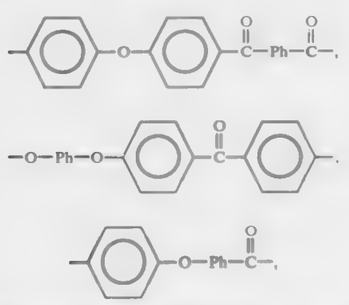
THERMOFORMABLE POLYARYLETHERKETONE SHEET

Joy S. Bloom, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1988, Ser. No. 283,695
Int. Cl.[5] C08G *8/02*
U.S. Cl. 528—125 **20 Claims**



1. A polyaryletherketone sheet having a thickness of about 625 to 5000 micrometers, wherein the polyaryletherketone has a crystallinity of less than about 5% and consists essentially of repeating units selected from the group represented by the following formulas I, II, or III:



wherein Ph is either the 1,4-phenylene or the 1,3-phenylene group provided that the 1,4-phenylene to 1,3 phenylene isomer ratio is 70:30 to 0:100.

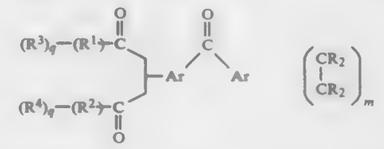
4,996,288

CYCLOBUTARENE KETOANHYDRIDE AND KETOCAG21XY MONOMERIC AND POLYMERIC COMPOSITIONS

Kenneth J. Bruza, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 46,368, May 6, 1987. This application Feb. 8, 1989, Ser. No. 307,720
Int. Cl.[5] C07D *213/00, 213/62*; C08G *2/18, 16/00*
U.S. Cl. 528—220 **14 Claims**

1. A cyclobutarene of the formula:



wherein

R is separately and independently in each occurrence a hydrogen atom, an electron donating moiety or an electron withdrawing moiety;

Ar is an aryl moiety or an aryl moiety having atoms other than carbon atoms in its nucleus, which aryl moieties may be substituted with electron-withdrawing substituents or electron-donating substituents; with the proviso that the carbons of the cyclobutene ring connected to the R groups



are also bonded to adjacent carbon atoms on the same aromatic ring of Ar;

R^1 and R^2 are separately and independently in each occurrence a nitrogen atom, an oxygen atom, or a sulphur atom;

R^3 and R^4 are separately and independently in each occurrence a hydrogen atom, an alkyl moiety having less than 10 carbon atoms, an aryl moiety, or an aryl moiety having atoms other than carbon atoms in its nucleus;

m is an integer of 1 or 2; and

q is an integer of 1 or 2 provided that q is 2 only when R^1 or R^2 is a nitrogen atom.

4,996,289

CONTINUOUS PREPARATION OF AQUEOUS MELAMINE/FORMALDEHYDE PRECONDENSATE SOLUTIONS

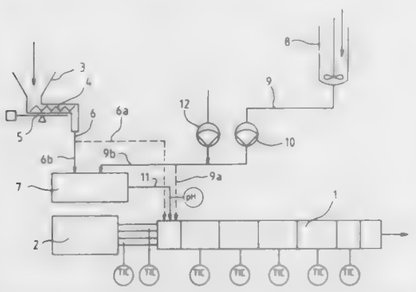
Heinz Berbner, Moerlenbach; Klaus Ebel, Mutterstadt; Michael Kuczaty, Heidelberg; Bernhard Seid, Frankenthal; Frank P. Woerner, Wachenheim, and Hans D. Zettler, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 394,936
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828793
Int. Cl.[5] C08G *12/32*
U.S. Cl. 528—230 **9 Claims**

1. A process for the continuous preparation of an aqueous melamine/formaldehyde precondensate solution, which comprises; metering melamine and aqueous formaldehyde or mela-

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mine and formaldehyde in a solid form together with water into a continuous mixer to produce a homogeneous mixture,



passing the homogeneous mixture into a single-screw or twin-screw extruder, at elevated temperatures.

4,996,290

POLYESTER AMIDES CONTAINING IMIDE GROUPS, PROCESS FOR THEIR PRODUCTION AND THEIR USE AS HOT-MELT ADHESIVES

Manfred Bolze, Bergkamen-Oberaden, and Manfred Drawert, Fröndenberg, both of Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 28, 1990, Ser. No. 486,523

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3909051

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **8 Claims**

1. Polyester amide imides produced by condensation of

(1) from 0.1 to 0.95 equivalent of a dimerized fatty acid, and optionally

(2) from 0 to 0.85 equivalent of straight-chain aliphatic and-/or aromatic dicarboxylic acids having from 6 to 13 carbon atoms,

(3) from 0.05 to 0.5 equivalent of trimellitic anhydride,

(4) from 0.5 to 0.7 equivalent of even-numbered aliphatic diamines having from 2 to 12 carbon atoms, and

(5) from 0.3 to 0.6 equivalent of either a mixture of isomers of 3,8-dihydroxymethyltricyclo[5.2.1.$0^{2,6}$]decane 3,9-dihydroxymethyltricylo[5.2.1.$0^{2,6}$]decane 4,9-dihydroxymethyltricyclo[5.2.1.$0^{2,6}$]decane, 4,8-dihydroxymethyltricyclo[5.2.1.^{2,6}]decane and/or 1,4-dihydroxymethylcyclohexane.

4,996,291

THERMO-SHRINKABLE POLYESTER FILM

Yasuo Yoshinaka; Katsuaki Kuze, both of Shiga; Tsutomu Isaka, Komaki; Toshihiro Yamashita, Inuyama; Yujiro Matsuyama, Otsu; Koichiro Nakamura, Shiga; Tsuyoshi Matsunaga, Fukui, and Osamu Makimura, Ogaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

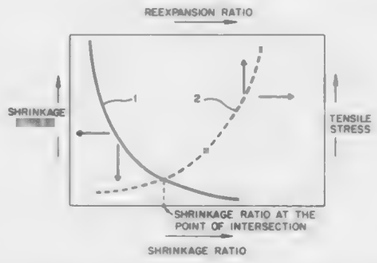
Continuation of Ser. No. 134,742, Dec. 18, 1987, abandoned. This application Sep. 8, 1989, Ser. No. 405,107

Claims priority, application Japan, Dec. 19, 1986, 61-305083; Dec. 29, 1986, 61-313318; Jun. 25, 1987, 62-159412; Nov. 25, 1987, 62-296890; Nov. 25, 1987, 62-296891; Dec. 18, 1987, 62-322217

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **9 Claims**

1. A thermo-shrinkable polyester film obtained from a composition that comprises acid components including terephthalic acid and glycol components including ethylene glycol, wherein a film prepared from said composition is stretched in a certain direction by a stretching ratio of 4.0 or more, so that the resulting thermo-shrinkable polyester film has a heat-shrinkage ratio of 30% or more in said direction at 100° C. and a shrinkage ratio of 5% or more at the point of intersection of a curve showing the internal shrinkage stress of said thermo-



shrinkable film and a curve showing the tensile stress of said thermo-shrinkable film.

4,996,292

SELF-SEALING ARTIFICIAL SKIN COMPRISING COPOLY-ALPHA-AMINO ACID

Sidney W. Fox, 707 S. Valley Rd., Carbondale, Ill. 62901, and Peter R. Bahn, R.R. 1, Box 261, Woodlawn, Ill. 62898

Filed Jun. 30, 1989, Ser. No. 373,503

Int. Cl.[5] C08G *69/10*

U.S. Cl. 528—328 **5 Claims**

1. A self-sealing artificial skin consisting of copolyamino acids thermally polymerized from a mixture of the following alpha amino acids: aspartic acid, glutamic acid, lysine, alanine, arginine cysteine, glycine, histidine, isoleucine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, and valine.

4,996,293

COMPOSITION COMPRISING POLYIMIDE RESIN FROM DIPHENYL SULFONE -3,3',4,4'-TETRACARBOXYLIC ACID DIANHYDRIDE

Ikeda Tsuyoshi, Neyagawa, Japan, assignor to New Japan Chemical Co., Ltd., Kyoto, Japan

PCT No. PCT/JP88/00145, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988

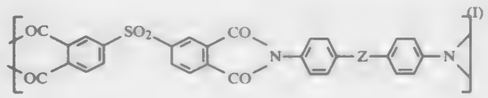
PCT Filed Feb. 12, 1988, Ser. No. 275,176

Claims priority, application Japan, Feb. 13, 1987, 62-32030; Jul. 17, 1987, 62-179752

Int. Cl.[5] C08G *73/10*; C08L *79/08*

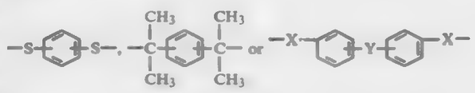
U.S. Cl. 528—352 **15 Claims**

1. A polyimide resin composition which comprises at least one polyimide having a repeating unit of the general formula



(I)

wherein Z is —S—,



in which X is —O—, —S—, or



Y is a single chemical bond or Y represents a bivalent group selected from the group consisting of —O—, —S—, —SO_2—,



and —CO—, and R^1 and R^2 are the same or different and each independently is a hydrogen atom, a halogen atom or a lower alkyl group optionally substituted by a halogen atom or atoms, and having an inherent viscosity (η_{inh}) measured in an N-methyl-2-pyrrolidone solvent at a concentration of 0.5 g/100 ml and at a temperature of 30±1° C. of about 0.3— about 5.0 dl/g, said polyimide being dissolved in an organic solvent.

4,996,294

PREPARATION OF AMINOTETRAMINES

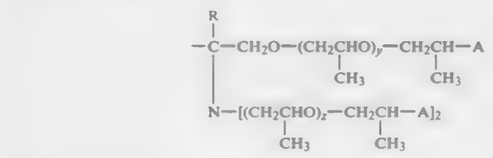
Michael Cuscurida; Wei-Yang Su, and George P. Speranza, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 31, 1989, Ser. No. 429,673

Int. Cl.[5] C08G *65/28, 65/32*

U.S. Cl. 528—421 **4 Claims**

1. A compound of the formula:



wherein:

R is an alkyl of from 1 to 5 carbon atoms,

x, y, and z each range from 2 to about 50,

A is $—NH_2$ or —OH, and wherein at least one of the A substituents is $—NH_2$.

4,996,295

AMIDE LINKED ROSIN ACID DERIVATIVES

Lawson G. Wideman, and Paul H. Sandstrom, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 25, 1989, Ser. No. 411,972

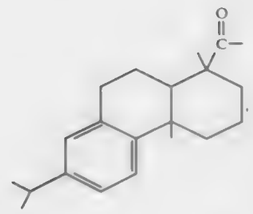
Int. Cl.[5] C09F *1/04*

U.S. Cl. 530—221 **10 Claims**

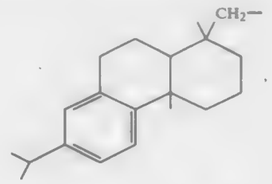
1. A composition comprising an amide linked rosin acid derivative of the formula:

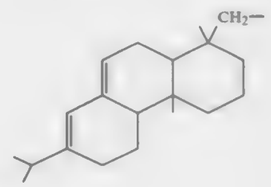


wherein R^1 is of the formula comprising:



or mixtures thereof an R^2 is of the formula comprising:





or mixtures thereof.

4,996,296

CROMOLYN BINDING PROTEIN IN HIGHLY PURIFED FORM, AND METHODS FOR THE ISOLATION THEREOF

Israel Pecht, Rehovot, Israel, and Stefan Hemmerich, Konstanz, Fed. Rep. of Germany, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 843,912, Mar. 20, 1986, Pat. No. 4,683,135, which is a continuation of Ser. No. 517,843, Jul. 27, 1983, abandoned. This application Jul. 27, 1987, Ser. No. 78,134

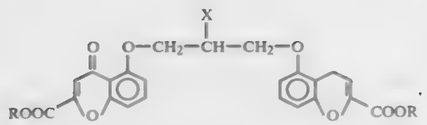
Int. Cl.[5] C07K *15/06, 3/20, 15/14*

U.S. Cl. 530—350 **10 Claims**

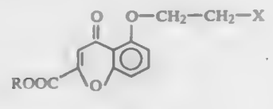
1. A method of purifying cromolyn binding protein, comprising:

preparing a chromatography column packed with an insoluble matrix having bound thereto a cromolyn derivative of the general formula

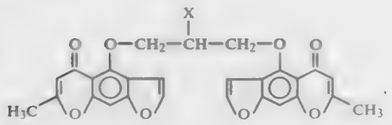
VOL 1123 ISS 4 FEB 26 1991 UMI



(I)

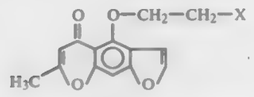


(II)



(III)

or



(IV)

wherein R is hydrogen or C_{1-5} alkyl and X is amino or an amino derivative;

lysing cells in which cromolyn binding protein is naturally occurring or solubilizing the plasma membrane of said cells;

separating any cromolyn binding protein contained in said lysed cells or solubilized membranes from the non-desired contaminants by passing said lysed cells or solubilized membranes through said column, whereby any cromolyn binding protein is retained on the column while non-desired contaminants pass through; and

eluting the cromolyn binding protein bound to said immobilized cromolyn derivative.

4,996,297

RECOMBINANTLY EXPRESSED RABBIT ZONA PELLUCIDA POLYPEPTIDES

Bonita S. Dunbar, Houston, Tex., assignor to Zonagen, Inc., The Woodlands, Tex.

Filed Oct. 7, 1987, Ser. No. 106,087

Int. Cl.[5] C07K *15/14*; A61K *37/02*

U.S. Cl. 530—395 **6 Claims**

1. A substantially pure polypeptide product of expression of a purified and isolated DNA sequence encoding a rabbit species zona pellucida protein, the DNA sequence being selected from the group consisting of a rabbit cDNA insert present in lambda bacteriophage designated A.T.C.C. #40377, A.T.C.C. #40378, or A.T.C.C. #40672, wherein said expressed polypeptide

(a) is specifically bound by antibodies which bind to an epitope present on a native rabbit zona pellucida protein selected from the group consisting of rabbit zona pellucida proteins having an approximate deglycosylated molecular weight of 50 kD, 75 kD, or 85 kD; and

(b) induces production of antibodies which bind specifically to zona pellucida proteins from different species of mammals when said polypeptide is used to immunize said different mammalian species.

4,996,298

MARKER FOR COLORECTAL CARCINOMA AND METHODS OF DETECTING THE SAME

Ronald R. Salem, Brookline; Peter Thomas, Pembroke, and Glenn Steele, Swampscott, all of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Division of Ser. No. 184,079, Apr. 20, 1988, Pat. No. 4,921,789.

This application Jan. 22, 1990, Ser. No. 448,673

Int. Cl.[5] C07K *15/14*; C12P *21/06*

U.S. Cl. 530—395 **3 Claims**

1. An isolated, partially purified colorectal carcinoma (CC) glycoprotein, said glycoprotein being characterized by:

(a) a molecular weight of approximately 160,000 daltons as determined by electrophoresis on polyacrylamide gels containing sodium dodecyl sulfate;

(b) reacting with an antibody which binds undifferentiated colorectal carcinoma cells;

(c) being located on the surface of a colorectal carcinoma cell;

(d) not cross-reacting with antibodies which bind carcinoembryonic antigen (CEA);

(e) not cross-reacting with antibodies which bind sialyated Lewis a antigen;

(f) not cross-reacting with antibodies which bind alpha-1-acid glycoprotein;

(g) not cross-reacting with antibodies which bind nonspecific cross-reacting antigen (NCA);

(h) not cross-reacting with antibodies which bind any of blood group substances A, B, or H; and

(i) not found on cancerous pancreatic or lung cells.

4,996,299

METHOD FOR PREPARING PERTUSSIS TOXIN TOXOID USING HCHO AND AMINO ACIDS

Akihiro Ginnaga, Kumamoto; Kazunori Morokuma, Houtaku; Katsutoshi Aihara, Kamoto, and Mitsuo Sakoh, Kumamoto, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Filed Nov. 28, 1989, Ser. No. 442,148

Claims priority, application Japan, Nov. 29, 1988, 63-303767

Int. Cl.[5] A61K *39/10*; C12N *9/12*; C07K *3/08, 15/04*

U.S. Cl. 530—409 **6 Claims**

1. A method for preparing pertussis toxin toxoid by a treatment of pertussis toxin with formaldehyde, which comprises carrying out said treatment in the presence of lysine or glycine in combination with one or more of amino acids selected from the group consisting of N-acetyl-DL-triptophan, N-acetyl-D-triptophan and N-acetyl-L-triptophan.

4,996,300

PREPARATION OF RARE EARTH ALKOXIDES USING CATALYST

Carl C. Greco, Garnerville, and Johst H. Burk, Mohegan Lake, both of N.Y., assignors to Akzo America Inc., New York, N.Y.

Filed May 31, 1988, Ser. No. 200,471

Int. Cl.[5] C07F *5/00*

U.S. Cl. 534—15 **10 Claims**

1. A catalytic process for the manufacture of rare earth alkoxides by the reaction of a rare earth metal and an alcohol in the presence of a catalytically effective amount of a zinc-containing catalyst for the reaction.

4,996,301

POLYFUNCTIONAL α-DIAZO-β-KETO ESTERS AND THEIR USE IN LIGHT-SENSITIVE COMPOSITIONS

Peter Wilharm, Wiesbaden; Hans-Joachim Merrem, Seeheim-Jugenheim, and Georg Pawlowski, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

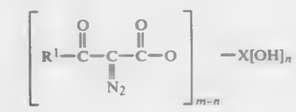
Filed Jan. 12, 1990, Ser. No. 464,003

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1989, 3900735

Int. Cl.[5] C07C *245/18, 245/14*; C07F *5/02*

U.S. Cl. 534—556 **30 Claims**

1. A polyfunctional α-diazo-β-keto ester which has the general formula I



(I)

in which

R^1 denotes an aliphatic, cycloaliphatic or araliphatic or aromatic radical having 4 to 20 carbon atoms, in which individual CH_2 groups can be replaced by divalent atoms or divalent groups selected from the group consisting of oxygen, sulfur, NH and carbonyl, and individual CH groups can be replaced by —N—,

X denotes an at least divalent aliphatic, cycloaliphatic, carbocyclic, heterocyclic or araliphatic radical having 2 to 22 carbon atoms, in which individual CH_2 groups can be replaced by oxygen or sulfur atoms or by the groups

$-NR^2-$, $-C(O)-O-$, $-C(O)-NR^2-$,

$-NR^2-C(O)-NR^3-$, $-O-C(O)-NR^2-$,

$-O-C(O)-\underset{|}{N}-$ or $-O-C(O)-O-$ or

CH groups can be replaced by —C(O)—Ń— or —Ń—,

in which R^2 and R^3 independently of one another represent hydrogen or an aliphatic, carbocyclic or araliphatic radical having 1 to 15 carbon atoms,

m denotes an integer from 2 to 10 and

n denotes an integer from 0 to 2,

wherein

$m-n \geq 2$.

4,996,302

PROCESS FOR THE PREPARATION OF POLYAZO DYES

Horst Langfeld, Grenzach-Wyhlen, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1988, Ser. No. 280,802

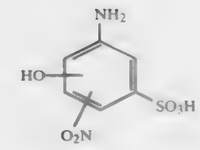
Claims priority, application Switzerland, Dec. 16, 1987, 4923/87

Int. Cl.[5] C09B *33/24, 33/18, 45/24, 45/01*

U.S. Cl. 534—582 **14 Claims**

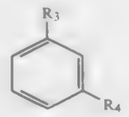
1. A process for the preparation of polyazo dyes, wherein

(a) a compound of the formula



(1a)

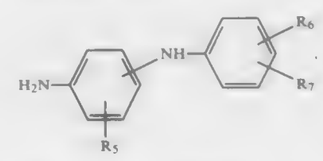
is diazotized and coupled onto a compound of the formula



(2)

in which R_3 and R_4, independently of one another, are hydroxyl or amino,

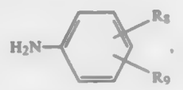
(b) a compound of formula



(3)

in which R_5 and R_6, independently of one another, are hydrogen or sulfo and R_7 is nitro, C_1–C_4alkyl, C_1–C_4alkoxy or halogen, is diazotized and coupled onto the product obtained according to (a),

(c) a compound of the formula



(4)

in which R_8 is hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxy or sulfo and R_9 independently has the meaning of R_8 or is nitro, is diazotized and coupled onto the product obtained according to (b),

(d) a further compound of the abovementioned formula (3) is diazotized and coupled onto the product obtained according to (c), and

(e) the product obtained according to (d) is metallized with an iron, cobalt, nickel, chromium or copper compound, wherein the total amount of the compound of formula (3) used in steps (b) and

(d) is 0.7 to 1.5 moles per mole of the compound of formula (2) and 15 to 50% of which are used in step (b) and the remaining amount, that is 85 to 50%, is used in step (d).

4,996,303

PREPARATION OF 1:2 METAL COMPLEX DYES BY COUPLING IN THE PRESENCE OF A METAL DONOR IN AN INERT GAS ATMOSPHERE

Alois Püntener, Rheinfelden, Switzerland, and Daniel Parisot, Saint-Genis-Laval, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

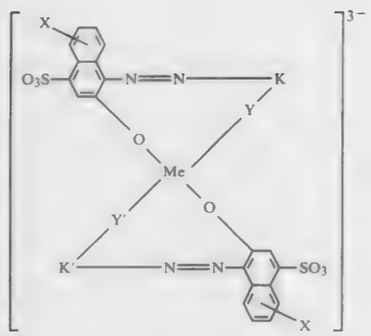
Filed Nov. 22, 1988, Ser. No. 275,240

Int. Cl.[5] C09B *45/01, 45/16, 45/20*

U.S. Cl. 534—602 **22 Claims**

1. A process for the preparation of a 1:2 metal complex azo dye of the formula

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(1)

$3Ka^+$,

wherein each X is hydrogen, halogen or nitro, K and K' are each independently of the other a benzene, naphthalene or pyrazolone coupling component, which is unsubstituted or substituted by C_1–C_6alkyl, C_1–C_6alkoxy, C_2–C_6alkanoylamino, C_2–C_6alkanoyl, C_1–C_6alkoxycarbonylamino, phenyl, halogen, hydroxy, sulfo, $—SO_2NH_2$, $—SO_2NH—C_1$–C_6alkyl, $—SO_2N(C_1$–C_6alkyl$)_2$, phenylaminosulfonyl, which is unsubstituted or substituted in the phenyl nucleus by sulfo or carboxy, $SO_2—C_1$–C_6alkyl or phenylsulfonyl, Y and Y' are each —O— or —N(R), wherein R is hydrogen, C_1–C_4alkyl or phenyl, Me is chromium or cobalt and Ka is a cation, and Y and Y' are attached to K and K' adjacent to the azo group, by coupling and metallizing, which process comprises coupling in an inert gas atmosphere, in aqueous solution, a diazo component of formula



(2)

wherein X is as defined for formula (1), in the presence of the 5- to 30-fold molar amount of sodium chloride and/or potassium chloride, based on the molar amount of diazo component, and in the presence of a compound that donates a chromium or cobalt atom, to coupling components of formulae

HK—YH and HK'—Y'H (3),

wherein K', Y and Y' are as defined for formula (1).

4,996,304

REACTIVE DISAZO DYES CONTAINING FLUORO-CHLOROPYRIMIDYL GROUPS AND VINYL SULFONYL GROUP

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

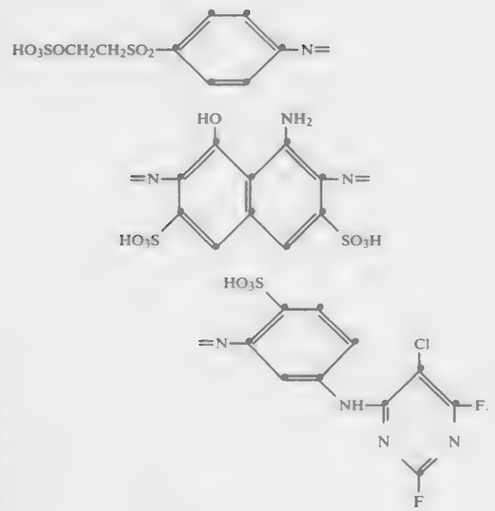
Continuation of Ser. No. 116,900, Nov. 5, 1987, abandoned, which is a division of Ser. No. 636,363, Jul. 30, 1984, Pat. No. 4,746,732. This application Feb. 23, 1990, Ser. No. 488,373

Claims priority, application Switzerland, Jul. 29, 1983, 4170/83

Int. Cl.[5] C09B *62/03, 62/05, 62/513;* **D06P** *1/38*

U.S. Cl. 534—637 **1 Claim**

1. The reactive dye of the formula



4,996,305

PROCESS FOR PRODUCING THE ANTIBIOTIC AND ANTITUMOR AGENTS LL-E33288ε-I AND LL-E33288ε-BR

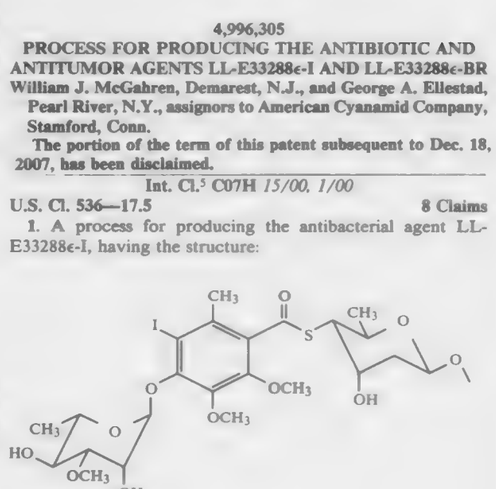
William J. McGahren, Demarest, N.J., and George A. Ellestad, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

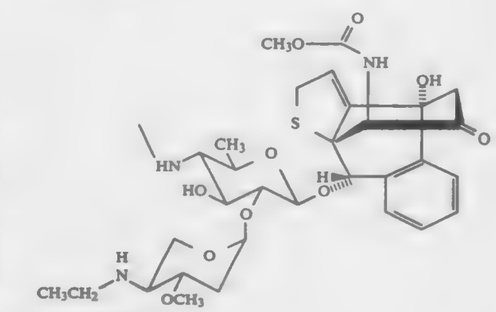
The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.

Int. Cl.[5] C07H *15/00, 1/00*

U.S. Cl. 536—17.5 **8 Claims**

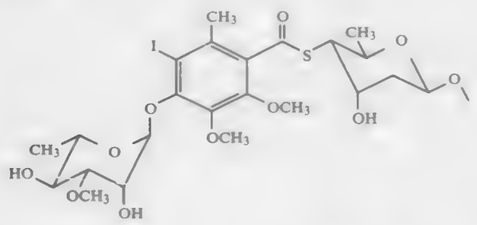
1. A process for producing the antibacterial agent LL-E33288ε-I, having the structure:

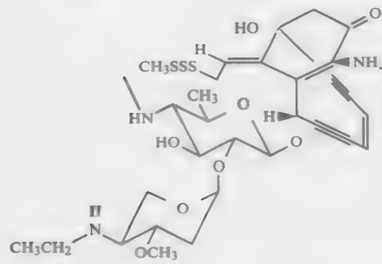




LL-E33288$_\epsilon$-I

which comprises reacting LL-E33288γ_1-I having the structure:





LL-E33288$_{\gamma 1}$-I

with triphenylphosphine or a sulfhydryl-containing reagent in a solvent, followed by chromatographic separation and purification of the LL-E33288ε-I.

4,996,306

GLYCOSIDE PREPARATION DIRECTLY FROM AQUEOUS SACCHARIDE SOLUTIONS OR SYRUPS

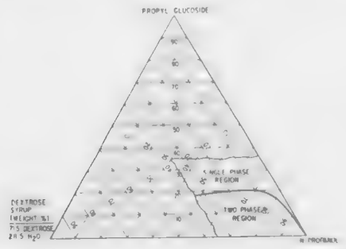
Robert S. McDaniel, Jr., Decatur, Ill., and Donald L. Johnson, Muscatine, Iowa, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 5, 1988, Ser. No. 178,047

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[5] C07G *3/00;* **C07H** *1/00;* **C08B** *37/00*

U.S. Cl. 536—18.6 **19 Claims**



1. A process for preparing a glycoside product by reacting a water soluble monosaccharide or oligosaccharide reactant with a C_7 to C_{30} alcohol reactant, which process comprises:

a. admixing said alcohol reactant with the aqueous solution of said monosaccharide or oligosaccharide reactant to form a homogeneous, single phase aqueous reaction medium which comprises said monosaccharide or oligosaccharide reactant, the alcohol reactant and water and which is free of any, distinct, substantially alcohol reactant-free aqueous monosaccharide or oligosaccharide solution phase; and

b. reacting said monosaccharide or oligosaccharide reactant with said alcohol reactant to thereby form said glycoside product by contacting said homogeneous aqueous reaction medium with an acid catalyst at an elevated temperature while removing water from the reaction mixture at a rate sufficient to prevent the formation of a separate and distinct, substantially alcohol reactant-free aqueous phase during the course of said reaction.

4,996,307

PREPARATION OF WATER-SOLUBLE ACYLATED CHITOSAN

Hiroshi Itoi, Kamagaya; Hiroshi Sano, Narashino, and Kenichiro Shibasaki, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,340

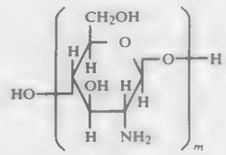
Claims priority, application Japan, Jun. 28, 1985, 60-142710

Int. Cl.[5] C07H *5/04;* **C08B** *37/08*

U.S. Cl. 536—20 **18 Claims**

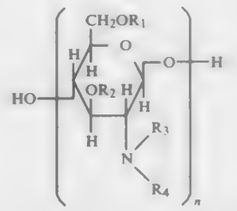
1. A process for preparing an amorphous water-soluble acylated chitosan which is a copolymer of a substance having the formula:

(3)



and a substance having the formula:

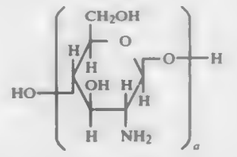
(4)



wherein R_1, R_2, R_3, and R_4 are independently selected from the group consisting of a hydrogen atom and an acyl group of the formula COR' where R' is selected from the group consisting of an alkyl group having 1 to 5 carbon atoms and a phenyl group, with the provisos that at least one of R_1, R_2, R_3 and R_4 is an acyl group, $m+n \geqq 15$ and a degree of acylation represented by the formula $m/(m+n)=0.35$ to 0.65, comprising the steps of:

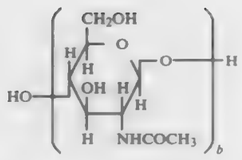
dissolving a water-insoluble chitosan which is a random copolymer of a substance having the formula:

(1)



and a substance having the formula:

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(2)

wherein
a+b≧15 and a/(a+b)=0.7 to 1, in an aqueous acid solution;
diluting the solution with water or a water-miscible solvent; and
adding an acylation agent to the diluted solution in an amount sufficient to form a homogeneous solution of said amorphous water-soluble acylated chitosan having a degree of acylation of 0.35 to 0.65 so that the solution is prevented from gelatinizing.

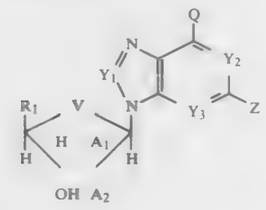
4,996,308

DERIVATIVES WITH UNSATURATED SUBSTITUTIONS FOR THE 5'-HYDROXYMETHYL GROUP

Michael L. Edwards, Cincinnati; James R. McCarthy, West Chester, and Nellikunja J. Prakash, Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

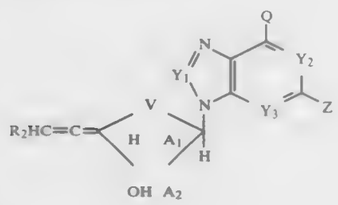
Filed Mar. 25, 1988, Ser. No. 173,782
Int. Cl.[5] C07H *19/167, 19/173*
U.S. Cl. 536—26 25 Claims

1. A compound of the formula



wherein
V is oxy,
R_1 is ethynyl or cyano,
A_1 and A_2 are each independently hydrogen or hydroxy with the provisos that where A_1 is hydroxy, A_2 is hydrogen, and that where A_2 is hydroxy, A_1 is hydrogen,
Y_1 is nitrogen or a CH group,
Y_2 and Y_3 are each independently nitrogen or a CH group,
Q is NH_2 or $NHCH_3$, and
Z is hydrogen;
and pharmaceutically-acceptable salts thereof.

2. A compound of the formula



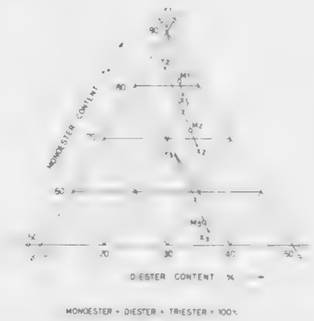
wherein
V is oxy
R_2 is hydrogen or C_1–C_4 alkyl,
A_1 and A_2 are each independently hydrogen or hydroxy with the provisos that where A_1 is hydroxy, A_2 is hydrogen, and that where A_2 is hydroxy, A_1 is hydrogen,
Y_1 is nitrogen or a CH group,
Y_2 and Y_3 are each independently nitrogen or a CH group,
Q is NH_2 or $NHCH_3$, and
Z is hydrogen;
and pharmaceutically-acceptable salts thereof.

4,996,309

PROCESS FOR PREPARING SUCROSE FATTY ACID ESTER POWDER

Shusaku Matsumoto, Kyoto; Yoshio Hatakawa, Higashiosaka, and Akihiko Nakajima, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Oct. 3, 1989, Ser. No. 416,611
Claims priority, application Japan, Nov. 14, 1988, 63-287208
Int. Cl.[5] C07H *1/00, 13/00, 11/00*
U.S. Cl. 536—119 23 Claims



1. A process for preparing a powder of sucrose fatty acid esters, which comprises reacting sucrose with a fatty acid alkyl ester in an aqueous reaction system containing a catalyst to produce a sucrose fatty acid ester, adjusting the resulting reaction mixture to a neutral pH region, adding water and a neutral salt to the reaction mixture to precipitate the sucrose fatty acid ester product, separating the resulting precipitate from the liquid phase, washing the precipitate with an acidic water, subjecting the washing liquid to ultrafiltration, spray drying the resulting concentrate in the form of an aqueous solution, and recovering the unreacted sucrose by subjecting the liquid phase to reverse osmosis.

4,996,310

POLYOL-POLYETHER WITH HIGH CONTENT OF ETHYLENE OXIDE AND LOW VISCOSITY

Roberto M. Acosta, Toluca, Mexico, assignor to Polioles, S. A. de C.U., Col. Condesa, Mexico

Filed Mar. 10, 1989, Ser. No. 321,786
Int. Cl.[5] C07H *15/00, 1/00, 3/00;* C07C *43/00;* A61K *31/00*
U.S. Cl. 536—120 12 Claims

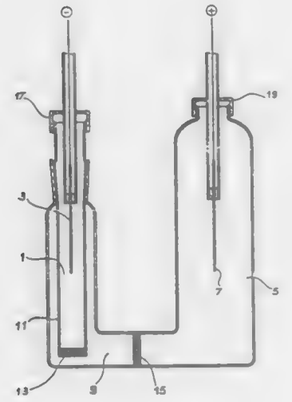
1. A polyol-polyether having a molecular weight between 400 and 900, a viscosity between 500 and 3500 centipoises at 25 degrees C., and a content of ethylene oxide between 40% and 75% by weight, prepared by a process which comprises the steps of:
(a) forming a suspension of sucrose in a triol;
(b) reacting the mixture obtained in the prior step with propylene oxide in the presence of a catalyzer;
(c) suspending sucrose in the mixture obtained in the prior step;
(d) oxyethylizing the mixture of step (c); and
(e) eliminating the volatile components of the mixture and the catalyzer, thus obtaining the desired polyol-polyether.

4,996,311

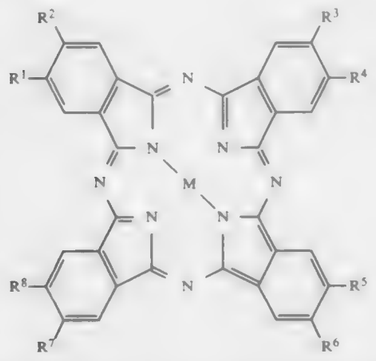
OCTASUBSTITUTED LITHIUM PHTHALOCYANINES, THEIR METHOD OF PREPARATION AND THEIR USE IN EPR (ELECTRONIC PARAMAGNETIC RESONANCE) MAGNETOMETRY

Mehdi Moussavi, and Liliane Secourgeon, both of Saint Egreve, France, assignors to Commissariat A. L'Energie Atomique, Paris, France

Filed Jul. 14, 1989, Ser. No. 379,980
Claims priority, application France, Jul. 20, 1988, 88 09831
Int. Cl.[5] C09B *47/04*
U.S. Cl. 540—139 6 Claims



1. Octasubstituted lithium phthalocyanine corresponding to the formula :



(I)

in which R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8, which are identical or different, represent an alkoxy or alkyl radical having from 1 to 3 carbon atoms, optionally substituted by one or more fluorine atoms, and M represents Li.

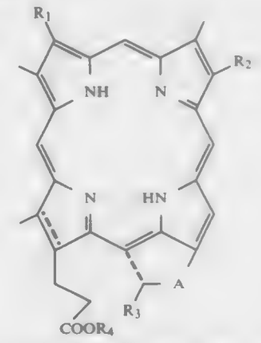
4,996,312

PORPHYRIN DERIVATIVES, AND THEIR PRODUCTION AND USE

Isao Sakata, Okayama; Susumu Nakajima, Ashahikawa; Koichi Koshimizu, Nara; Natsuki Samejima, Ashahikawa; Kazumi Inohara, Fukuyama; Hiroyuki Takata, Okayama; Hirohiko Yamauchi; Nobuo Ueda, both of Chiba, and Masaaki Hazue, Amagasaki, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo and Toyo Hakka Kogyo Co., Ltd., Okayama, both of, Japan

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Continuation of Ser. No. 922,492, Oct. 23, 1986, Pat. No. 4,849,207. This application Apr. 19, 1989, Ser. No. 340,549
Claims priority, application Japan, Oct. 23, 1985, 60-235322; Oct. 23, 1985, 60-235323
Int. Cl.[5] C07D *487/22*
U.S. Cl. 540—145 5 Claims

1. A condensation product of (a) a porphyrin compound of the formula:



(I)

wherein R_1 and R_2 are each —CH=CH_2, —CH_2CH_3, —CH(O-lower alkanoyl)CH_3, —CH(OR)CH_3 or —CH(O-lower alkylene-OR)CH_3; R_3 is —H, —COOH, —COO-lower alkyl, —COO-lower alkylene-OR or —COO-lower alkylene-OOC-Z; R_4 is —H, -lower alkyl or -lower alkylene-OR; R is —H or -lower alkyl; Z is a residue of the compound of the formula (I) excluding R_3 therefrom; A is —CH_2 or —CO; and the dotted line from the gamma-position indicates no bonding or a single direct bond; the dotted line between the 7- and 8-positions indicates the presence of a single bond or a double bond; when R_3 is other than —COOH, at least one of R_1, R_2, R_3 and R_4 being a group containing R=—H; and when R_3 is —COO-lower alkylene-OOC-Z, R_1 being capable of representing 1-iodoethyl in addition to said meanings; with (b) a polyfunctional carboxyl compound, wherein the compound (b) is condensed with the side chain at the 6- or 7-position of the compound (a), the compound (b) is an amino acid and the condensation is made between a carboxyl group in the compound (a) and an amino group in the compound (b) through a carbonamide linkage.

4,996,313

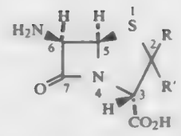
PENICILLINS

Jack E. Baldwin, Oxford, England, assignor to National Research Development Corporation, England

Continuation of Ser. No. 933,535, Nov. 21, 1986, abandoned.
This application Nov. 17, 1989, Ser. No. 438,622
Claims priority, application United Kingdom, Nov. 26, 1985, 8529063
Int. Cl.[5] C07D *499/42;* A61K *31/43*
U.S. Cl. 540—312 9 Claims

1. A compound of formula II:

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(II)

wherein R is hydrogen or an alkyl group of 1 to 5 carbon atoms and R' is an alkoxy group of 1 to 5 carbon atoms, and pharmaceutically acceptable salts and esters thereof.

4,996,314

6-(DISUBSTITUTED AMINO)CARBAPENEM COMPOUNDS

Takeo Yoshioka, Ayase; Noritaka Chida, Sagamihara; Azuma Watanabe, Yokohama; Yasuo Fukagawa, Kamakura, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku Incorporated, Japan

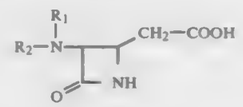
Division of Ser. No. 24,160, Mar. 10, 1987, Pat. No. 4,812,563. This application Sep. 19, 1988, Ser. No. 246,071

Claims priority, application Japan, Mar. 11, 1986, 61-51556

Int. Cl.[5] C07D *205/085, 403/04, 487/04*

U.S. Cl. 540—364 **5 Claims**

1. A compound of the formula



wherein

R_1 represents C_1–C_6 alkyl or C_1 –C_6 haloalkyl, and

R_2 represents (1) C_1 –C_6 alkyl, (2) C_1–C_6 haloalkyl, (3) benzyl, (4) phenethyl, (5) —$COOR_4$ or (7) —SO_2R_5 wherein R_4 represents (1) C_1–C_6 alkyl, (2) benzyl, (3) phenethyl or (4) dibenzyl in which the armomatic rings of the groups (2), (3) or (4) are unsubstituted or are substituted by halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro or amino, and R_5 represents (1) C_1–C_6 alkyl, (2) phenyl or (3) naphthyl in which the aromatic rings of the groups (2) and (3) are unsubstituted or are substituted by halogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_1 –C_6 alkoxy, nitro or amino.

4,996,315

SYNTHESIS OF CYCLIC COMPOUNDS

George P. Speranza, Austin, and Jiang-Jen Lin, Houston, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

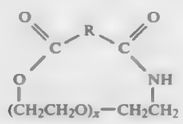
Filed Jan. 16, 1990, Ser. No. 465,682

Int. Cl.[5] C07D *269/00*

U.S. Cl. 540—454 **18 Claims**

1. A method of producing novel cyclic ester-amides by reacting polyalkylene glycol monoamines with dicarboxylic acids and esters thereof in a molar ratio of about 1:1.

17. Novel cyclic ester-amides having the formula:



where R is an alkyl group having from 3 to 5 carbon atoms, and x ranges from 2 to 6.

4,996,316

PROCESS FOR THE PREPARATION OF TERTIARY N, N-DIMETHYLAMINES

Jürgen Weber, Oberhausen; Detlef Kampmann, Bochum, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 24, 1988, Ser. No. 281,801

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741726

Int. Cl.[5] C07C *209/26*

U.S. Cl. 544—1 **60 Claims**

1. A process for the preparation of tertiary N,N-dimethylamine comprising a reaction among a mixture of at least one primary amine, formaldehyde, and hydrogen as starting materials at elevated temperature and pressure in the presence of a hydrogenation catalyst consisting essentially of nickel as a catalytically active metal, said catalyst being in a liquid form suspended in a solvent, the concentration of said nickel being 0.1% to 10% by weight based on said primary amine, said catalyst containing at least 10% nickel by weight, said primary amine and said formaldehyde being separately and simultaneously supplied to said reaction at 80° to 150 ° C. and under a pressure of 1 to 15 MPa, whereby said tertiary N,N-dimethylamine is formed in a single reaction step.

4. The process of claim 1 wherein said primary amine is taken from the class consisting of aliphatic amines, cycloaliphatic amines, araliphatic amines, aromatic amines, heterocyclic amines having 4 to 20 carbon atoms and containing at least one atom of oxygen, sulfur, or nitrogen, and mixtures thereof.

4,996,317

CAFFEINE RECOVERY FROM SUPERCRITICAL CARBON DIOXIDE

Michael J. O'Brien, Port Monmouth; Jean E. Spence, Bogota; Ronald H. Skiff, Edison, all of N.J.; Gerald J. Vogel, Carrollton, Tex., and Ravi Prasad, Midlothian, Va., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Aug. 5, 1988, Ser. No. 229,369

Int. Cl.[5] A23F *5/18*

U.S. Cl. 544—274 **8 Claims**

1. A process for the extraction of caffeine from supercritical carbon dioxide where separation efficiency is improved and is comparable to packed column performance for similar extraction systems which comprises countercurrently contacting water with caffeine-containing supercritical carbon dioxide in a column which is substantially open from end to end.

4,996,318

AMINO-9,10-SECOSTEROIDS USEFUL FOR TREATING HEAD INJURY, SPINAL CORD TRAUMA OR STROKE

Martin Gall, Kalamazoo, Mich., and Robert I. Higuchi, Palo Alto, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

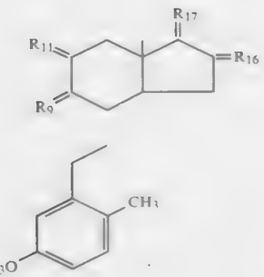
PCT No. PCT/US88/00817, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/07527, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 18, 1988, Ser. No. 438,480

Int. Cl.[5] C07D *405/00, 403/00, 279/12, 413/00, 253/00, 239/02, 241/00, 241/02, 413/00, 277/04, 209/04;* **C07C** *221/00*

U.S. Cl. 544—295 **18 Claims**

1. An amino-9,10-secosteroid of formula I



(I)

where:

R_3 is —H or —CO—$R_{3\text{-}1}$ where $R_{3\text{-}1}$ is C_1–C_4 alkyl or phenyl optionally substituted with 1 or 2 $R_{3\text{-}2}$ where $R_{3\text{-}2}$ is —CH_3, —OCH_3, —F and —Cl; where:

(C-I) R_9 is $R_{9\text{-}1}$:$R_{9\text{-}2}$ and R_{11} is $R_{11\text{-}1}$:$R_{11\text{-}2}$, where one of $R_{9\text{-}1}$ and $R_{9\text{-}2}$ is —H and the other taken together with one of $R_{11\text{-}1}$ and $R_{11\text{-}2}$ to form a second bond between C_9 and C_{11} and the other of $R_{11\text{-}1}$ and $R_{11\text{-}2}$ is —H;

(C-II) R_9 is —H;—H and R_{11} is =O;

(C-III) R_9 is —H:—H and R_{11} is α-$R_{11\text{-}3}$:β-$R_{11\text{-}4}$ where one of $R_{11\text{-}3}$ and $R_{11\text{-}4}$ is —H or —OH and the other is —H;

(D-I) R_{16} is $R_{16\text{-}1}$:$R_{16\text{-}2}$ and R_{17} is $R_{17\text{-}1}$:$R_{17\text{-}2}$, where one of $R_{16\text{-}1}$ and $R_{16\text{-}2}$ is —H or —CH_3 and the other taken together with one of $R_{17\text{-}1}$ and $R_{17\text{-}2}$ forms a second bond between C_{16} and C_{17}, and the other of $R_{17\text{-}1}$ and $R_{17\text{-}2}$ is —C(=Z)—$(CH_2)_n$—$NR_{21A}R_{21B}$, where Z is =O, =CH_2 or $R_{20\text{-}1}$:—H where $R_{20\text{-}1}$ is —H or —CH_3, where n is 0 through 6, where

(A) R_{21A} is

(1) —$(CH_2)_m$—$NR_{21\text{-}1}$—heteroaryl, where m is 2, 3, or 4, where $R_{21\text{-}1}$ is —H or C_1–C_3 alkyl, where heteroaryl is:

(a) pyridin-2- (F-1), 3- (F-2) or 4-yl (F-3) or the N-oxide thereof optionally substituted by 1 or 2 $R_{21\text{-}2}$, being the same or different, where $R_{21\text{-}2}$ is

(i) —F,

(ii) —Cl,

(iii) —Br,

(iv) C_1–C_5 alkyl,

(v) —CH_2—CH=CH_2,

(vi) —aryl, where aryl is phenyl optionally substituted with 1 through 2 —F, —Cl, —Br, C_1–C_3 alkoxy, —COOH, —NH_2, C_1–C_3 alkylamino, di(C_1–C_3)alkylamino, where the alkyl groups are the same or different, 1-pyrrolidinyl-, 1-piperidinyl, 1-hexamethylenimino—, 1-heptamethylenimino—, C_2–C_4 acylamino and —NH—CHO

(vii) —$NR_{21\text{-}3}R_{21\text{-}3}$ where the $R_{21\text{-}3}$s are the same or different and are —H, C_1–C_3 alkyl or —CH_2—CH=CH_2,

(viiiα) *CH_2—$(CH_2)_q$—CH_2—N*— where the atoms marked with an asterisk (*) are bonded to each other resulting in the formation of a ring, where q is 1 through 5,

(viiiβ) *CH_2—CH_2—$(CH_2)_c$—G—$(CH_2)_d$—CH_2—CH_2—N*— where the atoms marked with an asterisk (*) are bonded to each other resulting in the formation of a ring (F-4), where G is —O—, —S—, —SO—, —SO_2— or —$NHR_{21\text{-}4}$, where $R_{21\text{-}4}$ is —H, C_1–C_3 alkyl, or aryl as defined above, where c and d are the same or different and are 0 through 2 with the proviso that the total number of ring carbon atoms is 4, 5 or 6,

(ix) 3-pyrrolin-1-yl, (F-5)

(x) pyrrol-1-yl optionally substituted with C_1–C_3 alkyl, (F-6)

(xi) piperidin-1-yl optionally substituted with 1 or 2 C_1–C_3 alkyl, (F-7)

(xii) 1,2,3,6-tetrahydropyridin-1-yl, (F-8)

(xiii) 1-hexamethyleneimino containing a 3- or 4- double bond or 3- and 5- double bonds, (F-9)

(xiv) 1,4-dihydro-1-pyridinyl substituted in the 4 position by two C_1–C_3 alkyl being the same or different, (F-10)

(xv) —OH,

(xvi) C_1–C_3 alkoxy,

(xvii) —$NR_{21\text{-}7}$-$(CH_2)_e$-Q where Q is 2-pyridinyl where $R_{21\text{-}7}$ is —H or C_1–C_3 alkyl and e is 0 through 3,

(xviii) pyridin-2-, 3- or 4-yl,

(xix) —CF_3

(xx) —CCl_3

(b) 1,3,5-triazin-2-yl or the N-oxide thereof optionally substituted at the 4- and/or 6- position with $R_{21\text{-}2}$ where $R_{21\text{-}2}$ is as defined above, (F-11)

(c) pyrimidin-4-yl or the N-oxide thereof optionally substituted at the 2- and/or 6- and 5- and/or 6- position with $R_{21\text{-}2}$ where $R_{21\text{-}2}$ is as defined above, (F-12)

(d) pyrimidin-2-yl optionally substituted at 4-and/or 6-position with 1 or 2 $R_{21\text{-}2}$ as defined above, (F-13)

(e) pyrazin-2-yl optionally substituted with 1 or 2 $R_{21\text{-}2}$ as is defined above, (F-14)

(f) imidazol-2-yl optionally substituted in the 1 position with C_1–C_3 alkyl or -aryl, where aryl is as defined above, and further optionally substituted with 1 or 2 $R_{21\text{-}2}$ as defined above, (F-15)

(g) 1,3,4-triazol-2-yl optionally substituted in the 1 position with C_1–C_3 alkyl or -aryl, where aryl is as defined above, and further optionally substituted with $R_{21\text{-}2}$ as defined above, (F-16)

(h) imidazol-4- or 5-yl optionally substituted in the 1 position with C_1–C_3 alkyl or -aryl, where aryl is as defined above, and further optionally substituted with 1 or 2 $R_{21\text{-}2}$ as defined above, (F-17)

(i) benzo[b]thien-2-yl, (F-18)

(j) indol-2-yl, (F-19)

(k) benzo[b]thiazol-2-yl, (F-20)

(l) benzimidazol-2-yl, (F-21)

(m) 4-[2-[4-[2,6-bis(1-pyrrolidinyl)-4-pyrimidinyl]-1-piperazinyl]ethyl]piperazinyl, (F-22)

(n) 1,2,4-triazin-3-yl optionally substituted at the 5- and/or 6- position with $R_{21\text{-}2}$ as is defined above, (F-23)

(2) (1-piperazinyl)-(C_2–C_4)alkyl optionally substituted in the 4- position with -aryl or -heteroaryl as defined above, (F-24)

(3) -heteroaryl, as defined above,

(4) —$(CH_2)_m$—X_4 where m is as defined above and where X_4 is

(a) —O—CH_2CH_2—Y, where Y is C_1–C_3 alkylamino, di(C_1–C_3)alkylamino where the alkyl groups are the same or different, C_3–C_6 alkyleneimino, optionally substituted with 1 or 2 C_1–C_3 alkyl,

(b) —$NR_{21\text{-}5}CH_2CH_2$—Y, where $R_{21\text{-}5}$ is —H or C_1–C_3 alkyl and Y is as defined above,

(c) —$(CH_2)_g$—N($R_{21\text{-}5}$)-heteroaryl, where g is 2, 3 or 4, and where $R_{21\text{-}5}$ and heteroaryl are as defined above,

(6) —$(CHCH_3)_b$—$(CH_2)_f$—$R_{21\text{-}9}$, where b is 0 and f is 1 through 3 or b is one and f is 0 through 3, where $R_{21\text{-}9}$ is phenyl substituted with 1 through 3 —OH, C_1-C_3 alkoxy, —$NR_{21\text{-}10}R_{21\text{-}11}$ where $R_{21\text{-}10}$ and $R_{21\text{-}11}$ are the same or different and are —H, C_1–C_3 alkyl or are taken together with the attached nitrogen atom to form a C_4–C_7 cyclicamino ring,

(7) -$(CH_2)_i$-heteroaryl, where i is 1 through 4 and heteroaryl is as defined above,

(8) (1-piperazinyl)acetyl substituted in the 4- position by heteroaryl where heteroaryl is as defined above, (F-25)

(9) (1-piperazinyl)carbonylmethyl substituted in the 4-position by -heteroaryl where heteroaryl is as defined above, and (F-26)

(B) R_{21B} is

(1) —H,

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(2) C_1–C_3 alkyl,
(3) C_5–C_7 cycloalkyl,
(4) —$(CH_2)_m$—$NR_{21\text{-}1}$-heteroaryl, where m, $R_{21\text{-}1}$ and heteroaryl are as defined above,
(5) (1-piperazinyl)-(C_2–C_4)alkyl optionally substituted in the 4- position with -aryl or -heteroaryl as defined above, (F-24)
(6) —$(CH_2)_m$—X_4, where m and X_4 are as defined above,
(7) —$(CH_2)_m$—$NR_{21\text{-}6}R_{21\text{-}8}$, where m, $R_{21\text{-}6}$ and $R_{21\text{-}8}$ are as defined above,
(8) —$(CHCH_3)_b$—$(CH_2)_f$—$R_{21\text{-}9}$, where b, f and $R_{21\text{-}9}$ are as defined above,

(C) R_{21A} and R_{21B} are taken together with the attached nitrogen atom to form a heterocyclic ring selected from the group consisting of
(1) 2-(carboxy)-1-pyrrolidinyl optionally as the C_1–C_3 alkyl ester or as a pharmaceutically acceptable salt, (F-27)
(2)2-(carboxy)-1-piperidinyl optionally as the C_1–C_3 alkyl ester or as a pharmaceutically acceptable salt, (F-28)
(3) 2-(carboxy)-1-hexamethyleneimino optionally as the C_1–C_3 alkyl ester or as a pharmaceutically acceptable salt, (F-29)
(4) 2-(carboxy)-1-heptamethyleneimino optionally as the C_1–C_3 alkyl ester or as a pharmaceutically acceptable salt, (F-30)
(5) 1-piperazinyl substituted in the 4- position with $R_{21\text{-}12}$—CO—$(CH_2)_j$— where $R_{21\text{-}12}$ is —heteroaryl, —$NR_{21\text{-}13}$heteroaryl and 2-furanyl, where $R_{21\text{-}13}$ is —H or C_1–C_3 alkyl, where j is 0 through 3 and aryl is as defined above, (F-31)
(6) 1-piperazinyl substituted in the 4- position with heteroaryl-$(CH_2)_j$-, where heteroaryl and j are as defined above, (F-32)
(7) 1-piperazinyl substituted in the 4- position with aryl-$(CH_2)_j$-, where aryl and j are as defined above, (F-33)
(8) 4-hydroxy-1-piperidinyl substituted in the 4- position with aryl as defined above, (F-34)
(9) 1-piperazinyl substituted in the 4- position with heteroaryl-$NR_{21\text{-}13}$-CO-$(CH_2)_i$-, where heteroaryl, $R_{21\text{-}13}$ and i are as defined above; (F-35)

(D-II) R_{16} is α-$R_{16\text{-}3}$:β-$R_{16\text{-}4}$ where one of $R_{16\text{-}3}$ and $R_{16\text{-}4}$ is —H and the other is —H, —F, —CH_3 or —OH, and R_{17} is =CH—$(CH_2)_p$—$NR_{21A}R_{21B}$, where p is 1 or 2, where R_{21A} and R_{21B} are as defined above;

(D-III) R_{16} is α-$R_{16\text{-}5}$:β-$R_{16\text{-}6}$ and R_{17} is α-$R_{17\text{-}5}$:β-$R_{17\text{-}6}$, where $R_{16\text{-}5}$ is —H, —OH, —F or —CH_3 and $R_{16\text{-}6}$ is —H, —OH, —F, or —CH_3, with the proviso that at least one of $R_{16\text{-}5}$ and $R_{16\text{-}6}$ is —H, where $R_{17\text{-}5}$ is —H, —OH, —CH_3, —CH_2CH_3, C_2–C_7 alkanoyloxy or —O—CO—aryl, where aryl is as defined above, and $R_{17\text{-}6}$ is —C(=Z)—$(CH_2)_n$—$NR_{21A}R_{21B}$, where Z, n, R_{21A} and R_{21B} are as defined above;

(D-IV) the 16,17-acetonide of a compound where $R_{16\text{-}5}$ is —OH, $R_{16\text{-}6}$ is —H, $R_{17\text{-}5}$ is —OH and $R_{17\text{-}6}$ is —C(=Z)—$(CH_2)_n$—$NR_{21A}R_{21B}$, where Z, n, —R_{21A} and R_{21B} are as defined above;

(D-V) R_{16} is α-$R_{16\text{-}7}$:β-$R_{16\text{-}8}$ and R_{17} is α-C(=Z)—$(CH_2)_n$—N—$R_{21A}R_{21B}$:β-H where Z, n, R_{21A} and R_{21B} are as defined above, where $R_{16\text{-}7}$ is —H, —OH, —F or —CH_3 and $R_{16\text{-}8}$ is —H, —OH, —F, or —CH_3, with the proviso that at least one of $R_{16\text{-}5}$ and $R_{16\text{-}6}$ is —H

and pharmaceutically acceptable salts thereof,
and hydrates and solvates thereof.

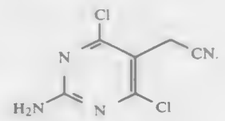
4,996,319

-2-AMINO-4,6-DICHLORO-5-(2-CYANOMETHYL-2-AMINO-5(CYANOMETHYL)-4,6-DICHLORO PYRIMIDINE

Thomas C. Malone, Canton, and Jagadish C. Sircar, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 354,312, Mar. 13, 1989, Pat. No. 4,921,858, which is a continuation of Ser. No. 002,727, Oct. 19, 1987, which is a continuation of Ser. No. 86,231, Aug. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 923,521, Oct. 24, 1986, abandoned. This application Feb. 1, 1990, Ser. No. 473,493
Int. Cl.[5] C07D *239/30, 239/42*
U.S. Cl. 544—330 **1 Claim**

1. A compound of the formula (X)



X

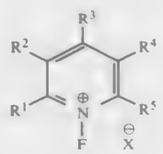
4,996,320

N-FLUOROPYRIDINIUM SALT AND PROCESS FOR PREPARING SAME

Teruo Umemoto; Kyoichi Tomita, both of Sagamihara; Kosuke Kawada, Hon, and Ginjiro Tomizawa, Wako, all of Japan, assignors to Sagami Chemical Research Center, Japan

Continuation of Ser. No. 22,275, Mar. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 870,010, Jun. 3, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 296,411
Claims priority, application Japan, Jun. 3, 1985, 60-118882; Mar. 7, 1986, 61-48450
Int. Cl.[5] C07F *9/58;* C07D *491/048, 219/04, 213/55*
U.S. Cl. 546—9 **5 Claims**

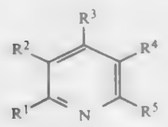
1. A N-fluoropyridinium salt having the general formula:



wherein:
(a) R^1 through R^5 are each a group selected from the class consisting of hydrogen, halogen, and methyl;
(b) when at least two of each of R^1 through R^5 are hydrogen, then the remaining one through three groups of R^1 through R^5 can each be selected from the class consisting of:
phenylcarbonyloxy substituted methyl,
a mixture of at least one fluoro substituted methyl group and at least one group selected from the class consisting of methyl, trifluoromethyl and halogen, and
tertiary butyl or a mixture of methyl and t-butyl provided that, when at least two of each of R^1 through R^5 are tertiary butyl, said tertiary butyl groups are not adjacent;
(c) when at least three of each of R^1 through R^5 are hydrogen, then the remaining one or two groups of R^1 through R^5 can each be selected from the class consisting of:
phenyl,
acetyl,
alkoxycarbonyl containing a total of 2 through 5 carbon atoms wherein said alkyl substituent contains a total of 1 through 4 carbon atoms,
nitro,
cyano,

alkoxy containing 1 through 10 carbon atoms, and acyloxy wherein said acyl group contains 1 through 4 carbon atoms;
(d) when R^3 is hydrogen, then R^1 and R^2 taken together and R^4 and R^5 taken together can each form a six-membered carbocyclic ring which is inclusive of two adjacent carbon atoms of the pyridine ring; and
(e) when R^3 through R^5 are each hydrogen, then R^1 and R^2 taken together can form a five-membered heterocyclic ring which contains one oxygen atom, which is inclusive of two carbon atoms of the pyridine ring, and which has an oxo oxygen atom substituted on each ring carbon atom adjacent said ring oxy oxygen atom; and
(f) X is a conjugate base of a Brϕsted acid except for halides.

3. A process for making an N-fluoropyridinium salt comprising reacting fluorine, a Brϕnsted acid containing a conjugate base except for haldies, and a pyridine compound in a reaction solvent, said pyridine compound having the general formula:



wherein:
(a) R^1 through R^5 are each a group selected from the class consisting of hydrogen, halogen, and methyl;
(b) when at least two of each of R^1 through R^5 are hydrogen, then the remaining one through three groups of R^1 through R^5 can each be selected from the class consisting of:
phenylcarbonyloxy substituted methyl,
a mixture of at least one fluoro substitutedmethyl group and at least one group selected from the class consisting of methyl, trifluoromethyl and halogen, and
alkyl containing two through four carbon atoms, provided that when each of two of R^1 through R^5 are tertiary butyl, said tertiary butyl groups are not adjacent; and
(c) when at least three of R^1 through R^5 are each hydrogen, then the remaining one or two groups of R^1 through R^5 can each be selected from the class consisting of:
phenyl,
acetyl,
alkoxycarbonyl containing a total of 2 through 4 carbon atoms wherein said alkyl substituent contains a total of 1 through 4 carbon atoms,
nitro,
cyano,
alkoxy containing 1 through 10 carbon atoms, and
acyloxy wherein said acyl group contains 1 through 4 carbon atoms;
(d) when R^3 is hydrogen, then R^1 and R^2 taken together and R^4 and R^5 taken together can each form a six-membered carbocyclic ring which is inclusive of two adjacent carbon atoms of the pyridine ring; and
(e) when R^3 through R^5 are each hydrogen, then R^1 and R^2 taken together can form a five-membered heterocyclic ring which contains one oxygen atom, which is inclusive of two carbon atoms of the pyridine ring, and which has an oxo oxygen atom substituted on each ring carbon atom adjacent said ring oxy oxygen atom.

4,996,321

DIBENZO[A,D]CYCLOHEPTENYLIDENE COMPOUNDS

John J. Baldwin, Gwynedd Valley, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 26, 1990, Ser. No. 484,963
Int. Cl.[5] C07D *211/70*
U.S. Cl. 546—194 **1 Claim**

1. The compound which is:
4-amino-5-chloro-2-methoxy-N-((5-(1-methyl-4-piperidinylidene)-5H-dibenzo[a,d]cycloheptene-3-yl)-methyl)benzamide;
3,4,5-trimethoxy-N-((5-(1-methyl-4-piperidinylidene)-5H-dibenzo[a,d]cycloheptene-3-yl)methyl)benzamide; or
diethyl 1,4-dihydro-2,6-dimethyl-4-(5-(1-methyl-4-piperidinylidene)-5H-dibenzo-[a,d]cycloheptene-3-yl)-pyridinedicarboxylate
or pharmaceutically acceptable acid addition salt thereof.

4,996,322

SEPARATION OF AMIDES WITH MOLECULAR SIEVES

Ronald Pierantozzi, Orefield; Mildred A. Miller, N. Catasauqua; Mark L. Listemann, Whitehall; Thomas R. Gaffney, Allentown, and Charles G. Coe, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 15, 1989, Ser. No. 351,987
Int. Cl.[5] C07C *233/03*
U.S. Cl. 564—216 **19 Claims**

1. A process for separating amides from each other which comprises forming a solution containing at least two amides of different molecular weights or different heats of adsorption wherein one amide has from 1 to 3 carbon atoms per molecule and a second amide has from 1 to 10 carbon atoms per molecule, contacting said solution with a molecular sieve selected from the group consisting of zeolites A, X, Y, chabazite, mordenite and mixtures thereof, having a preponderance of cations other than protons and having pore openings of a size sufficient to admit at least one of said amides, thereby selectively sorbing the amide having the lower molecular weight or the larger heat of adsorption.

4,996,323

PROCESS FOR THE PREPARATION OF 3,5,6-TRICHLOROPYRIDIN-2-OL

R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 12, 1989, Ser. No. 350,961
Int. Cl.[5] C07D *213/64*
U.S. Cl. 546—250 **10 Claims**

10. An improved process for the preparation of 3,5,6-trichloropyridin-2-ol which comprises the following steps:
(a) contacting trichloroacetyl chloride with acrylonitrile in the presence of a catalytic amount of copper or a cuprous salt to produce 2,2,4-trichloro-4-cyanobutanoyl chloride under reflux conditions to remove HCl;
(b) contacting the 2,2,4-trichloro-4-cyanobutanoyl chloride in an inert organic solvent with anhydrous HCl under pressure at a temperature from ambient to about 100° C. to cyclize the butanoyl chloride to 3,3,5,6-tetrachloro-3,4-dihydropyridin-2-one; and
(c) treating the 3,3,5,6-tetrachloro-3,4-dihydropyridin-2-one with chloride ion in an inert organic solvent to produce the 3,5,6-trichloropyridin-2-ol.

4,996,324

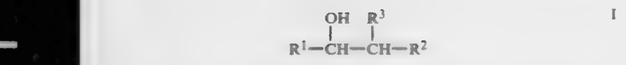
PREPARATION OF ALKANOLS WHICH ARE SUBSTITUTED IN THE 1 POSITION BY AROMATIC OR HETEROCYCLIC RADICALS

Kaspar Bott, Wachenheim; Herwig Hoffmann, Frankenthal; Walter Scheidmeir, Limburgerhof, and Horst Trapp, Plankstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 937,822, Dec. 4, 1986, abandoned. This application Oct. 26, 1988, Ser. No. 266,270
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546016
Int. Cl.[5] C07D *213/28;* C07C *33/22, 33/34*
U.S. Cl. 546—339 **15 Claims**

1. A process for the preparation of an alkanol of the formula

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I

where R^1 is a member selected from the group consisting of phenyl, pyridyl and phenyl substituted by alkyl of 1 to 4 carbon atoms; R^2 is a straight-chain or branched alkyl of 1 to 15 carbon atoms and R^3 is hydrogen, methyl or ethyl, which process comprises:

reacting a secondary alcohol of the formula



II

with a primary alcohol of the formula R^2OH (III) where R^1, R^2 and R^3 have the above meanings, in the presence of an alkali metal hydroxide at from 150° to 300° C.

4,996,325

PESTICIDES

Haukur Kristinsson, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

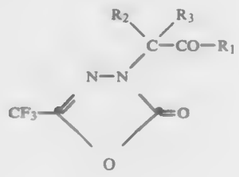
Division of Ser. No. 255,684, Oct. 11, 1988, Pat. No. 4,931,439. This application Mar. 13, 1990, Ser. No. 492,704

Claims priority, application Switzerland, Oct. 16, 1987, 4061/87

Int. Cl.[5] C07D *271/07*

U.S. Cl. 548—132 **4 Claims**

1. Compounds of formula IV



(IV)

wherein

R_1 is hydrogen, C_1–C_{12}alkyl, C_3–C_6cycloalkyl, C_1–C_4alkoxy-C_1–C_6alkyl, C_1–C_2haloalkyl, phenyl, benzyl, phenethyl, phenpropyl, phenbutyl or phenpentyl, or a phenyl, benzyl, phenethyl, phenpropyl, phenbutyl or phenpentyl radical that is mono- or di-substituted by halogen, C_1–C_5alkyl, C_1–C_2haloalkyl, methoxy and/or by ethoxy,

R_2 is hydrogen, C_1–C_6alkyl or C_3–C_6cycloalkyl, or is phenyl that is unsubstituted or substituted by C_1–C_{12}alkyl, halogen or by C_1–C_{12}haloalkyl, or R_1 and R_2 together form a saturated or unsaturated 3- to 7-membered carbocycle, and

R_3 is hydrogen or C_1–C_6alkyl.

4,996,326

2-(2-HYDROXYPHENYL)-BENZOTRIAZOLE DERIVATIVES, SUBSTITUTED BY BRANCHED LONG CHAIN ALKYL GROUPS CONTAINING ESTER MOIETIES

David G. Leppard, Marly; Mario Slongo, Taffers, and Jean Rody, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

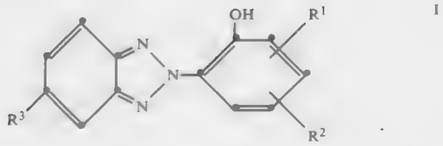
Continuation-in-part of Ser. No. 285,680, Dec. 16, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 464,477

Claims priority, application Switzerland, Dec. 28, 1987, 5075/87

Int. Cl.[5] C07D *249/20*

U.S. Cl. 548—261 **4 Claims**

1. A compound of formula I



I

in which R^1 is located in the ortho-position or para-position relative to the OH group and is a group of formula IIa



IIa

in which R^6 is C_6–C_{18}-alkyl which is unsubstituted or substituted by —OH, C_8–C_{30}-alkyl or C_9–C_{30}-hydroxyalkyl each of which is interrupted by one or more —O— groups, or is C_6–C_{12}-cycloalkyl, C_2–C_{18}-alkenyl, C_7–C_{15}-aralkyl, glycidyl or furfuryl,

R^2 is C_1–C_{12}-alkyl, cyclohexyl or a group of formula IIa, or a group of formula IV

(IV)

in which p is 1 or 2, and

R^3 is hydrogen or chlorine.

4,996,327

PREPARATION OF PYRAZOLE AND ITS DERIVATIVES

Hans R. Merkle, Ludwigshafen, and Erich Fretschner, Neckarsteinach, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 7, 1990, Ser. No. 534,270

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3918979

Int. Cl.[5] C07D *231/12*

U.S. Cl. 548—373 **5 Claims**

1. A process for the preparation of pyrazole



and its derivatives by dehydrogenation of 2-pyrazoline



or its derivatives, wherein the reaction is carried out using sulfuric acid in the presence of iodine or of an iodine compound at from 50° to 250° C.

4,996,328

BIS-(INDOLYL)ETHYLENES

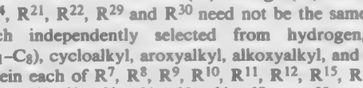
Ponnampalam Mathiaparanam, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 8, 1989, Ser. No. 320,642

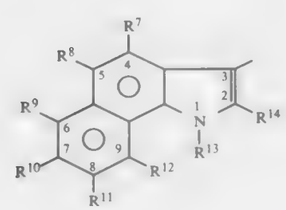
Int. Cl.[5] C07D *209/14*

U.S. Cl. 548—427 **7 Claims**

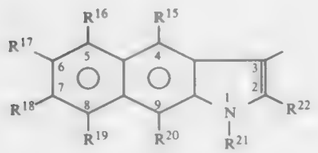
1. Chromogenic bis-(indolyl)ethylene of the formula



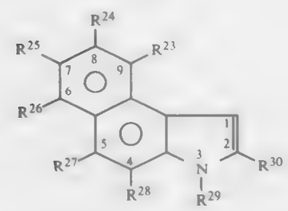
wherein each L^1 and L^2 is the same or different and is each independently selected from indole moieties (J2) through (J4),



(J2)



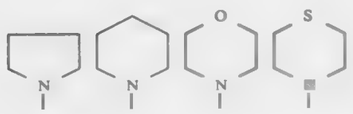
(J3)



(J4)

wherein in each of formulae (J2) through (J4) each of R^{13}, R^{14}, R^{21}, R^{22}, R^{29} and R^{30} need not be the same and is each independently selected from hydrogen, alkyl (C_1–C_8), cycloalkyl, aroxyalkyl, alkoxyalkyl, and aryl,

wherein each of R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{23}, R^{24}, R^{25}, R^{26}, R^{27} and R^{28} need not be the same and is independently selected from hydrogen, alkyl (C_1–C_8), cycloalkyl, aryl, halogen, alkoxy (C_1–C_8), aroxy, cycloalkoxy, dialkylamino including symmetrical and unsymmetrical alkyl groups with one to eight carbons, alkylcycloalkylamino, dicycloalkylamino,



wherein Z is selected from the group consisting of hydrogen, alkyl (C_1–C_8), aryl, aralkyl, aroxyalkyl, alkoxyalkyl and halogen.

4,996,329

DERIVATIVES OF 1,4-DIDEOXY-1,4-IMINO-D-MANNITOL AND A PROCESS FOR THEIR PREPARATION

George W. J. Fleet, Oxford; Bryan Winchester, London, and Neil M. Carpenter, Oxford, all of England, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 424,628, Oct. 20, 1989. This application Jan. 8, 1990, Ser. No. 461,859

Int. Cl.[5] C07D *207/12*

U.S. Cl. 548—453 **3 Claims**

1. 6-Fluoro-1,4-imino-1,4,6-trideoxy-D-mannitol.

2. 6-Fluoro-1,4-imino-2,3-O-isopropylidene-1,4,6-trideoxy-D-mannitol.

3. A method for the synthesis of 6-fluoro-1,4-imino-1,4,6-trideoxy-D-mannitol of claim 1 comprising:

(a) Reacting 4,5-anhydro-1-azido-1-deoxy-2,3-O-isopropylidene-6-O-trifluoromethanesulfonyl-D-talitol with fluoride ion to give an epoxide derivative,

(b) catalytically hydrogenating the epoxide derivative to give a fluoride derivative, and

(c) removing the isopropylidene protecting group in the fluoride derivative to give 6-fluoro-1,4-imino-1,4,6-trideoxy-D-mannitol.

4,996,330

CHIRAL SUBSTITUTED TARTARIMIDES

Günter Scherowsky, Berlin, and Peter Schreiber, Berlin, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

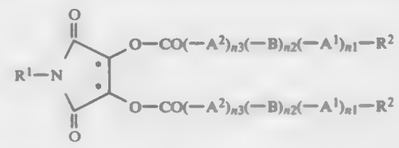
Filed Jun. 28, 1989, Ser. No. 373,179

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3822121

Int. Cl.[5] C07D *207/416*

U.S. Cl. 548—544 **5 Claims**

1. A chiral substituted tartaric acid derivative which is substituted by mesogenic radicals on the hydroxyl groups and has the formula (I)



(I)

in which

R^2 is linear (C_4–C_{12}) alkyl, it being possible for the CH_2 group bonding to the next radical to be replaced by O,

A^1 and A^2 independently of one another are 1,4-phenylene, diazine-2,5-diyl or 1,4-cyclohexylene,

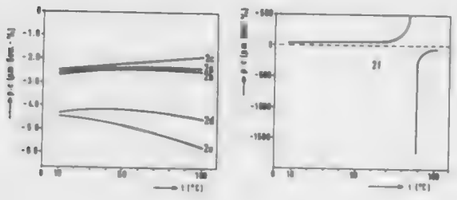
B is CO-O, C-CO, OCH_2 or CH_2O,

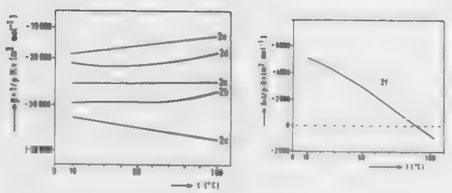
n1, n2, n3 independently of one another are zero or 1, n1 and n3 not being zero at the same time,

R^1 is linear (C_1–C_{12})-alkyl or R^3-$(A^1$-$)_{n1}(A^2$-$)_{n3}$ in which

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R^3=H or R^2; A^1 and A^2=1,4-phenylene or 1,4-cyclohexylene and n1 and n3=zero or 1.





4,996,331

NOVEL BIPHENYL DERIVATIVE AND PREPARATION AND USE THEREOF

Masayuki Kimura; Kunio Hosaka; Shigehumi Takeda, and Hiroshi Mitsuhashi, all of Tokyo, Japan, assignors to Tsumura & Co., Tokyo, Japan

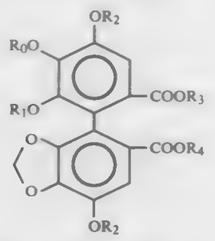
Division of Ser. No. 156,939, Jan. 19, 1988, Pat. No. 4,849,448. This application Apr. 24, 1989, Ser. No. 341,813

Claims priority, application Japan, May 27, 1986, 61-120129; Jun. 13, 1986, 61-136261; Sep. 30, 1986, 61-229767

Int. Cl.[5] C07D *317/64*

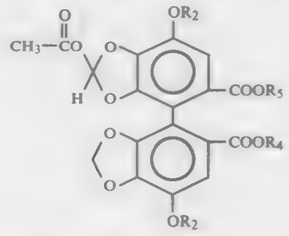
U.S. Cl. 549—229 **4 Claims**

1. A process for the preparation of a biphenyl derivative represented by the following formula (I):



(I)

in which R_0 and R_1 together form 0=C<, R_2 stands for an alkyl group having 1 to 3 carbon atoms, R_3 is a hydrogen atom and R_4 is a lower alkyl group, said process comprising reacting a compound represented by the following formula (II):



(II)

wherein R_2 stands for an alkyl group having 1 to 3 carbon atoms and R_4 stands for a lower alkyl group and R_5 stands for an alkyl group, with acetic acid.

4,996,332

OPTICAL INDICATOR COUMARINS AND METHODS FOR THEIR PREPARATION AND USE

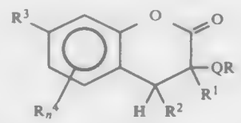
Robert T. Buckler, Edwardsburg, Mich., and Robert P. Hatch, Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Division of Ser. No. 540, Jan. 5, 1987, Pat. No. 4,778,893. This application Jun. 13, 1988, Ser. No. 205,732

Int. Cl.[5] C07D *311/02*

U.S. Cl. 549—285 **15 Claims**

1. A compound of the formula:



wherein Q is sulfur or selenium; R is alkyl or aryl; R^1 is hydrogen, cyano, carboxyl, alkyl, alkenyl, aryl, carboalkoxy, carboaryloxy, or carboxamide; R^2 is hydrogen, alkyl, alkenyl, or aryl; R^3 is —OR^5 where R^5 is hydrogen or lower alkyl, or —NR^6R^7 where R^6 and R^7, which can be the same or different, are hydrogen, alkyl, alkenyl, or aryl; n is an integer from 0 through 3; and R^4, which can be the same or different when n=2 or 3, is halo, alkyl, alkenyl, alkoxy, or aryl.

4,996,333

CONVERSION OF ACETIC ACID INTO DIKETENE AND WATER USING DIMETHYLSULFOXIDE AND PELARGONIC ACID

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Jul. 23, 1990, Ser. No. 557,601

Int. Cl.[5] C07D *305/12*

U.S. Cl. 549—328 **1 Claim**

1. A method for converting acetic acid into diketene which comprises heating acetic acid in a mixture of dimethylsulfoxide and pelargonic acid for about a half hour at a temperature in the range of 120–150° C., distilling the resulting product to recover the diketene and the water as overhead products and recovering the dimethylsulfoxide, pelargonic acid and unconverted acetic acid from the stillpot.

4,996,334

SORBITOL DERIVATIVES

Mitsumasa Kaitoh, and Shoichiro Mori, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

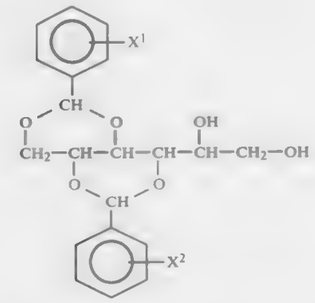
Filed Feb. 3, 1989, Ser. No. 305,646

Claims priority, application Japan, Feb. 5, 1988, 63-25434; Jun. 10, 1988, 63-143059; Aug. 2, 1988, 63-193266

Int. Cl.[5] C07D *319/04*

U.S. Cl. 549—364 **6 Claims**

1. A dibenzylidenesorbitol derivative represented by the formula (I):



(I)

wherein one of X^1 and X^2 represents —$COOR^1$ and the remainder represents —$COOR^1$, or —$CONR^2R^3$, wherein R^1 represents a hydrocarbon group having 1 to 20 carbon atoms, and R^2 and R^3 are identical or different and each independently represents a hydrogen atom, and alkyl group, an aryl group or an aralkyl group.

4,996,335

SOFT STEROIDS HAVING ANTI-INFLAMMATORY ACTIVITY

Nicholas S. Bodor, 7211 SW. 97th La., Gainesville, Fla. 32608, assignor to Nicholas S. Bodor, Gainesville, Fla.

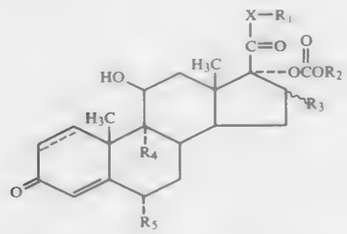
Continuation of Ser. No. 626,535, Jun. 29, 1984, abandoned, which is a continuation of Ser. No. 418,458, Sep. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 265,785, May 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 168,453, Jul. 10, 1980, abandoned. This application Dec. 9, 1985, Ser. No. 807,034

Int. Cl.[5] C07J *3/00*; A01N *43/50*

U.S. Cl. 552—610 **113 Claims**

1. A compound selected from the group consisting of:

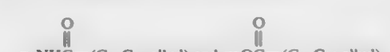
(a) a compound of the formula



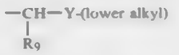
(I)

wherein:

R_1 is C_1–C_{10} alkyl; C_2–C_{10} (monohydroxy or polyhydroxy-)alkyl; C_1–C_{10} (monohalo or polyhalo)alkyl; or —CH_2COOR_6 wherein R_6 is unsubstituted or substituted C_1–C_{10} alkyl; C_3–C_8 cycloalkyl, C_3–C_8 cycloalkenyl or C_2–C_{10} alkenyl, the substituents being selected from the group consisting of halo. lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,



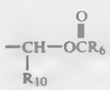
or R_6 is unsubstituted or substituted phenyl or benzyl, the substituents being selected from the group consisting of lower alkyl, lower alkoxy, halo, carabamoyl, lower alkoxycarbonyl, lower alkanoyloxy, lower haloalkyl, mono(lower alkyl)amino, di(lower alkyl)amino, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl; or R_1 is —$CH_2CONR_7R_8$ wherein R_7 and R_8, which can be the same or different, are each hydrogen, lower alkyl, C_3–C_8 cycloalkyl, phenyl or benzyl, or R_7 and R_8 are combined such that —NR_7R_8 represents the residue of a saturated monocyclic secondary amine; or R_1 is unsubstituted or substituted phenyl or benzyl, the substituents being selected from the group of phenyl and benzyl substituents defined hereinabove with respect to R_6; or R_1 is



wherein Y is —S—, —SO—, —SO_2— or —O— and R_9 is hydrogen, lower alkyl or phenyl, or R_9 and the lower alkyl group adjacent to Y are combined so that R_1 is a cyclic system of the type

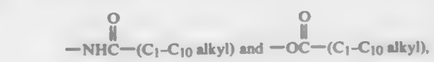


wherein Y is defined as above and the alkylene group contains 3 to 10 carbon atoms, of which at least 3 and no more than 6 are ring atoms; or R_1 is



wherein R_6 is defined as hereinabove and R_{10} is hydrogen, lower alkyl, phenyl or halophenyl;

R_2 is unsubstituted or substituted C_1–C_{10} alkyl, C_3–C_8 cycloalkyl, C_3–C_8 cycloalkenyl or C_2–C_{10} alkenyl, the substituents being selected from the group consisting of halo, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,



or R_2 is unsubstituted or substituted phenyl or benzyl, the substituents being selected from the group consisting of lower alkyl, lower alkoxy, halo, carbamoyl, lower alkoxycarbonyl, lower alkanoyloxy, lower haloalkyl, mono(lower alkyl)amino, di(lower alkyl)amino, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl;

R_3 is hydrogen, α-hydroxy, β-hydroxy, α-methyl, β-methyl, =CH_2, or α- or

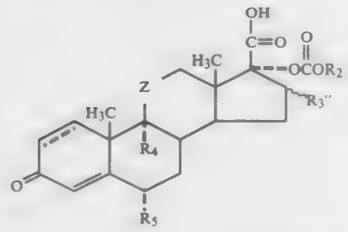


VOL 1123 ISS 4 FEB 26 1991 UMI

wherein R_2 is identical to R_2 as defined hereinabove;
R_4 is hydrogen, fluoro or chloro;
R_5 is hydrogen, fluoro, chloro or methyl;
X is —O— or —S—;
and the dotted line in ring A indicates that the 1,2 linkage is saturated or unsaturated;

(b) a quaternary ammonium salt of a compound of formula (I) wherein at least one of R_1 and R_2 is a halo-substituted alkyl group;

(c) a compound of the formula



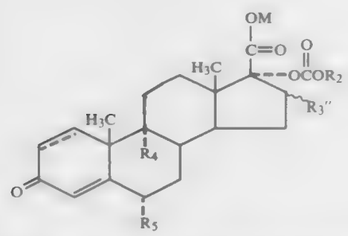
(III)

wherein R_2, R_4, R_5, and the dotted line in ring A are as defined in (a) above, Z is carbonyl or β-hydroxymethylene and R_3'' is hydrogen, α-methyl, β-methyl, $=CH_2$ or α- or



wherein R_2 is identical to R_2 above;

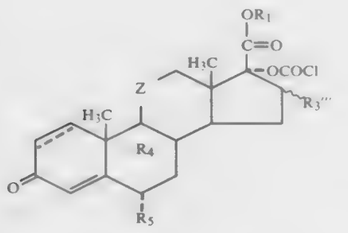
(d) a compound of the formula



(IV)

wherein M is alkali metal, thallium, alkaline earth metal/2 or NH_4 and R_2, R_3'', R_4, R_5, Z and the dotted line in ring A are as defined in (a) and (c) above;

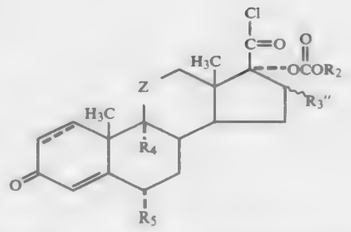
(e) a compound of the formula



(VII)

wherein R_3''' is hydrogen, α-methyl, β-methyl, α-OCOCl or β-OCOCl, and R_1, R_4, R_5, Z and the dotted line in ring A are as defined in (a) and (c) above;

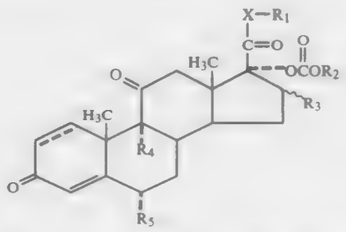
(f) a compound of the formula



(VIII)

wherein R_2, R_3'', R_4, R_5, Z and the dotted line in ring A are as defined in (a) and (c) above; and

(g) a compound of the formula



(IX)

wherein R_1, R_2, R_3, R_4, R_5, X and the dotted line in ring A are as defined in (a) above.

4,996,336

CROSS-LINKING TITANIUM & ZIRCONIUM CHELATES & THEIR USE

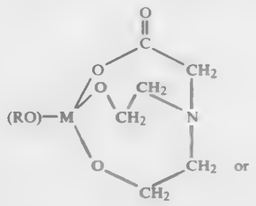
Donald E. Putzig, Newark, and Kenneth C. Smeltz, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 242,111, Nov. 9, 1988, abandoned, which is a division of Ser. No. 31,921, Mar. 10, 1987, Pat. No. 4,808,739. This application Nov. 28, 1989, Ser. No. 442,275

Int. Cl.[5] **C07F** *7/28, 7/00*

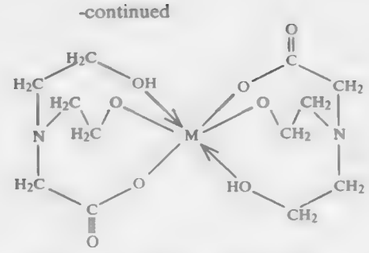
U.S. Cl. 556—55 **10 Claims**

1. A process for preparing a metal chelate which comprises reacting between one and two molar equivalents of N,N-bis-(2-hydroxyethyl)-glycine with a titanium halide, titanium oxyhalide, zirconium halide, zirconium oxyhalide, tetraalkoxy zirconate or a tetraalkoxy (2-hydroxyethyl)glycine/metal chelate which can be represented by the formula:



or

-continued



wherein R is H or alkyl of 1 to 12 carbon atoms and M is Ti or Zr.

4,996,337

SYNTHESIS OF CISPLATIN ANALOGS

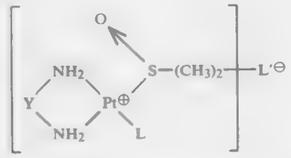
Panayota Bitha, Pomona; Joseph J. Hlavka, Tuxedo Park, and Yang-I Lin, Tappan, all of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Division of Ser. No. 281,376, Dec. 8, 1988, Pat. No. 4,937,358, which is a division of Ser. No. 65,441, Jun. 23, 1987, Pat. No. 4,808,730. This application Mar. 13, 1990, Ser. No. 493,043

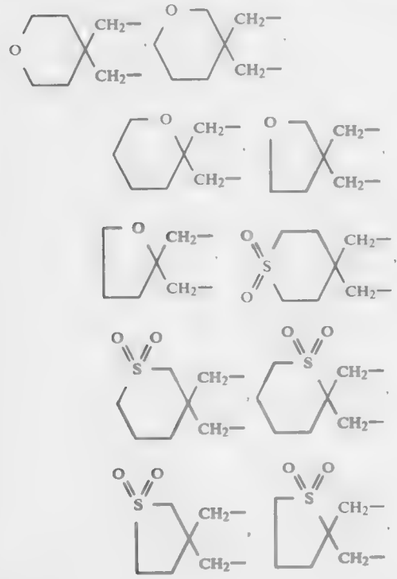
Int. Cl.[5] **C07F** *17/02;* **A61K** *31/555, 31/28*

U.S. Cl. 556—137 **2 Claims**

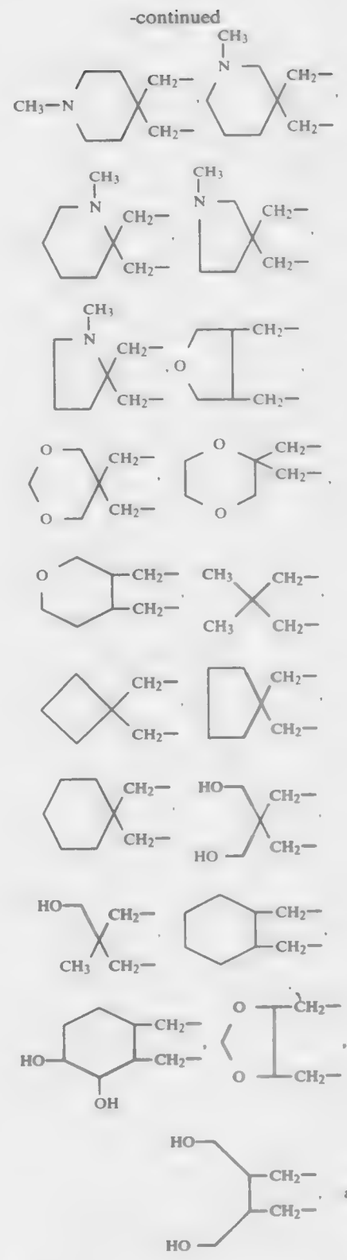
1. A compound of the formula:



wherein Y is selected from the group consisting of

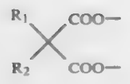


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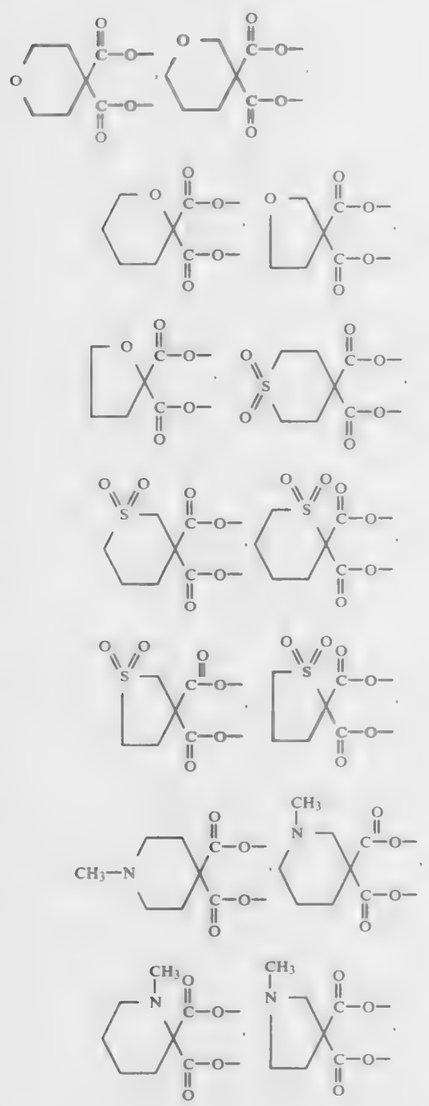


and L and L′ are monobasic carboxylates selected from the group consisting of acetate, hydroxyacetate and propionate, or L and L′ taken together are a dibasic carboxylate selected from the group consisting of

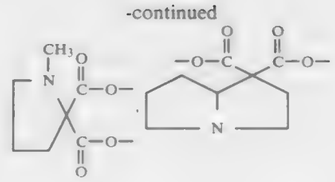
VOL 1123 ISS 4 FE 26 1991 UMI



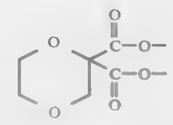
where R_1 and R_2 are hydrogen or lower alkyl(C_1–C_5) or R_1 and R_2 taken together is $-(CH_2)_n-$ where n is 2 to 5 and moieties of the structure:



-continued



and



4,996,338

PROCESS FOR PREPARATION OF ALUMINOXANE

Hiroshi Maezawa, and Norio Tomotsu, both of Ichihara, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jan. 29, 1990, Ser. No. 471,865
Claims priority, application Japan, Feb. 16, 1989, 1-35149
Int. Cl.[5] C07F 5/06
U.S. Cl. 556—179 17 Claims

1. A process for preparing aluminoxane which comprises reacting an organoaluminum compound and water in a solvent having a higher boiling point than that of the organoaluminum compound, and condensing the resulting reaction mixture under atmospheric pressure or reduced pressure.

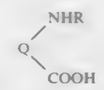
4,996,339

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Akihiro Tada, Osaka; Takashi Kiriu, Kyoto, and Motoomi Arakawa, Osaka, all of Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 206,472, Jun. 13, 1988, Pat. No. 4,855,208.
This application Jun. 6, 1989, Ser. No. 362,068
Claims priority, application Japan, Jul. 9, 1987, 62-172573
Int. Cl.[5] C07F 5/06
U.S. Cl. 556—181 18 Claims

1. An aluminum compound of aromatic o-aminocarboxylic acid, the aromatic o-aminocarboxylic acid being represented by the formula



[I]

wherein Q is a benzene nucleus which is optionally substituted with at least one nuclear substituent or napthalene nucleus which is optionally substituted with at least one nuclear substituent, R is hydrogen, alkyl (C_1–C_{18}), aryl or nuclear substituted aryl (C_6–C_{18}), aralkyl or nuclear substituted aralkyl (C_7–C_{18}), or —COR′, wherein R′ is alkyl (C_1–C_8), aryl (C_6–C_8), alkoxy (C_1–C_8) or amino.

4,996,340

INTRAMOLECULAR MIGRATION REACTIONS

Joseph A. Miller, Santa Rosa, Calif., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 8, 1989, Ser. No. 433,323
Int. Cl.[5] C07F 5/06; C07C 2/76
U.S. Cl. 556—190 31 Claims

1. A process for production of a compound of the formula $[RHC{=}CR'AlR'_2(OR'')]^-M^+$ in which the alkenyl group is predominantly (E) in structure, which comprises reacting a compound of the formula MOR″ with a compound of the formula $[RHC{=}C(X)AlR'_3]^-M^+$ in which the alkenyl group is predominantly (E) in structure in a non-protonic polar solvent

wherein R, R′ and R″ are the same or different and each is an inert carbon-bonded organic group; X is a halogen atom; and M is an alkali metal atom; such that one R′ group undergoes 1,2-migration to the carbon atom of the alkenyl group.

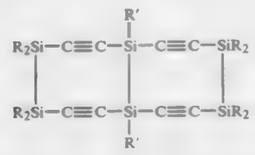
4,996,341

CONDENSED BICYCLIC DISILANYLENE-ACETYLENE COMPOUND AND METHOD FOR PREPARING THE SAME

Takahisa Iwahara, Kobe, Japan, and Robert C. West, Madison, Wis., assignors to Kanegafuchi Chemical Industry Co., Ltd., Japan

Filed Jul. 5, 1990, Ser. No. 548,231
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—406 21 Claims

1. A condensed bicyclic disilanylene-acetylene compound having the following formula (II):



(II)

wherein R and R′ are each a univalent hydrocarbon group having 1 to 20 carbon atoms.

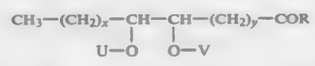
4,996,342

VICINAL DISUBSTITUTED CARBOXYLIC ACIDS AND SILYLATED DERIVATIVES

Ta Y. Ching, Novato, and Lon-Tang W. Lin, Vallejo, both of Calif., assignors to Henkel Research Corporation, Santa Rosa, Calif.

Filed Feb. 8, 1989, Ser. No. 308,786
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—437 15 Claims

1. A compound of the formula



(I)

wherein R is: (a) OH; (b) OM wherein M is a metal ion selected from the group consisting of Li^+, Na^+, K^+, Mg^{+2}, Ca^{+2}, or Ba^{+2}; (c) an alkoxyl, oralkenoxyl group having from 1 to 6 carbon atoms; (d) a polyethoxy group having the formula $O(CH_2CH_2O)_a$—H wherein a is an integer having a value of from 1 to 20; (e) $-NR^2R^3$ wherein R^2 is H, CH_3, $-CH_2CH_3$, $-CH_2CH_2OH$, $-CH_2CH_2N(CH_3)_2$, or $-(CH_2CH_2NH)_bH$ wherein b is an integer having a value of from 1 to 4, and R^3 is H, CH_3, $-CH_2CH_3$, $-CH_2CH_2OH$, $-CH_2CH_2N(CH_3)_2$; (f) $ON(R^9)_4$ wherein R^9 is hydrogen, $-CH_3$, $-CH_2CH_3$, $-CH_2CH_2OH$; U is hydrogen, or G—R_c wherein G is a bivalent radical derived from a linear or branched alkane or alkene having from 3 to 10 carbon atoms; R_c is (a) $Si(OR^5)_3$ wherein R^5 is an alkyl group having from 1 to 4 carbon atoms or (b) $Si(R^6)_3$ wherein R^6 is an alkyl group having from 1 to 3 carbon atoms; V is hydrogen, or G—R_c wherein G is a bivalent radical derived from an linear or branched alkane or alkene having from 3 to 10 carbon atoms; R_c is (a) $Si(OR^5)_3$ wherein R^5 is an alkyl group having from 1 to 4 carbon atoms or (b) $Si(R^6)_3$ wherein R^6 is an alkyl group having from 1 to 3 carbon atoms, with the proviso that [U or V is hydrogen] only one of U or V may be hydrogen; and wherein xi is an integer having a value of from 0 to 10 and y is an integer having a value of from 0 to 10.

4,996,343

STABLE SILICA-BASED ETHER BONDED PHASES FOR BIOPOLYMER SEPARATIONS

Barry L. Karger, Chestnut Hill; Binyamin Feibush, Needham; Neil T. Miller, West Newton, and Alvaro Figueroa, Boston, all of Mass., assignors to Northeastern University, Boston, Mass.

Division of Ser. No. 609,272, May 11, 1984, Pat. No. 4,778,909.
This application Oct. 13, 1988, Ser. No. 257,740
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—445 9 Claims

1. A chromatographic packing material comprising:
a silyl ether compound having the formula

$$(RO)_3Si-(CH_2)_m-O-(CH_2CH_2O)_n-(CH_2)_pCH_3$$

wherein
R is alkyl of from one to five carbons;
m is an integer from 2 to 5;
n is an integer from 1 to 5;
p is an integer from 0 to 10; and
a particulate silica-based chromatographic support;
said silyl ether being chemically bonded to said chromatographic support.

4,996,344

FLUORINE-CONTAINING ORGANOSILICON COMPOUND AND PROCESS FOR PREPARING THE SAME

Hiroshi Inomata, Takasaki; Hirofumi Kishita, Annaka, and Akira Yoshida, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 308,466
Claims priority, application Japan, Feb. 12, 1988, 63-32474
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—448 4 Claims

1. A fluorine-containing organosilicon compound having the formula (I):



(I)

wherein R′ represents a monovalent hydrocarbon group having 1 to 10 carbon atoms, m is an integer of 0 to 2, n is an integer of 3 or 4, q is an integer of 1 or 2, and r is an integer of 0 or 1.

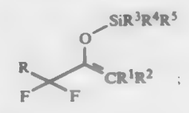
4,996,345

DIFLUOROKETONES FROM DIFLUOROACYLSILANES

Peter A. McCarthy, Pawcatuck, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 21, 1989, Ser. No. 369,161
Int. Cl.[5] C07F 7/18
U.S. Cl. 556—485 15 Claims

1. A silyl ether of the formula

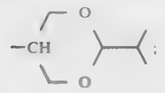


(IV)

wherein
R is (C_1–C_{20})alkyl or (C_2–C_{20})alkenyl, or one of said groups substituted by phenyl or (C_1–C_{20})alkoxyl;
R^1 and R^2 are each independently hydrogen, (C_1–C_{20})alkyl,

VOL 1123 ISS 4 FEB 26 1991 UMI

(C_2–C_{20})alkenyl, phenyl or (C_7–C_{20})phenylalkyl; or R^1 is hydrogen and R^2 is



and

R^3, R^4 and R^5 are each independently (C_1–C_{20})alkyl, (C_2–C_{20})alkenyl, phenyl or (C_7–C_{20})phenylalkyl;

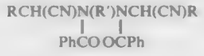
4,996,346

FORMATION OF ACYCLIC BIS (REISSERT COMPOUNDS)

Harry W. Gibson, and Yajnanarayana H. R. Jois, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Oct. 6, 1989, Ser. No. 418,365
Int. Cl.[5] C07C *255/29*
U.S. Cl. 558—392 **5 Claims**

1. A process for the formation of a bis Reissert compound of the formula



where R is alkyl, R′ is alkylene, and Ph is phenyl which comprises reaction of

RCH(CN)NH(R′)NHCH(CN)R

with benzoyl chloride in the presence of pyridine as amine acid acceptor.

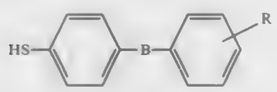
4,996,347

NOVEL BETA-D-PHENYLTHIOXYLOSIDES, THEIR METHOD OF PREPARATION AND THEIR USE AS THERAPEUTICS

Soth Samreth, Longvic; Francois Bellamy, Saulon La Chapelle, and Jean Millet, Saulon La Rue, all of France, assignors to Fournier Innovation et Synergie, Paris, France

Division of Ser. No. 185,422, Apr. 25, 1988, Pat. No. 4,877,808.
This application Jun. 27, 1989, Ser. No. 371,775
Claims priority, application France, May 4, 1987, 87 06237
Int. Cl.[5] C07C *321/26*
U.S. Cl. 558—411 **1 Claim**

1. A thiophenol compound selected from the group consisting of compounds that have formula:



(VII)

wherein

R is a NO_2 or CN group; and

B is a CH_2, CHOH, or CO group.

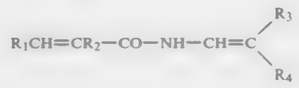
4,996,348

N-ALKENOYL ENAMIDES, THEIR PREPARATION AND THE USE THEREOF

Martin Kuhn, Dornach, Switzerland, and Philippe Ouziel, Riedisheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,405
Claims priority, application Switzerland, Jul. 29, 1987, 2911/87
Int. Cl.[5] C07C *255/07, 255/09, 255/10, 255/34*
U.S. Cl. 558—445 **4 Claims**

1. A N-alkenoyl enamide of the formula



wherein

R_1 is hydrogen or methyl,

R_2 is hydrogen, C_1–C_4alkyl or halogen, and at least one of R_3 and R_4 is CO—R_5, benzoyl, phenyl or cyano, wherein

R_5 is C_1–C_4alkyl and

R_4 can also be hydrogen.

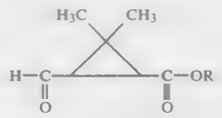
4,996,349

ENANTIOSELECTIVE PROCESS

Alain Krief, Wepion, and Willy Dumont, Salet, both of Belgium, assignors to Roussel Uclaf, Paris, France

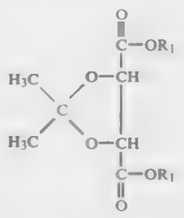
Continuation of Ser. No. 235,093, Aug. 22, 1988, abandoned.
This application Feb. 21, 1990, Ser. No. 482,647
Claims priority, application France, Aug. 24, 1987, 87 11849
Int. Cl.[5] C07C *69/74*
U.S. Cl. 560—124 **5 Claims**

1. A process for the preparation of racemates or optically active isomers of a compound of the formula



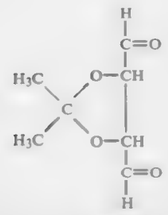
I

with cis or trans structures wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and aryl of 6 to 12 carbon atoms comprising reacting a diester of the formula



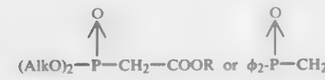
II

in racemic form or as resolved isomers wherein R_1 is selected from the group consisting of alkyl of 1 to 4 carbon atoms, aryl of 6 to 12 carbon atoms and aralkyl of 7 to 8 carbon atoms with a reducing agent to obtain a precursor of a compound of the formula

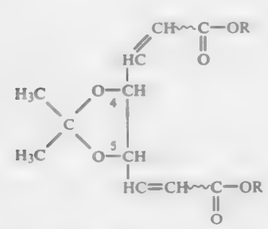


III

reacting the latter with a reagent of the formula

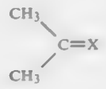


wherein R has the above definition, Alk is alkyl of 1 to 4 carbon atoms and ϕ is phenyl to obtain a compound of the formula

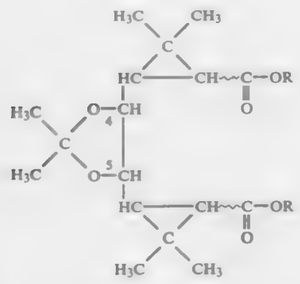


IV

wherein R is as defined above and the wavy lines indicate the cis or trans configuration, reacting the latter with a gem-dimethyl cyclopropanation reagent of the formula

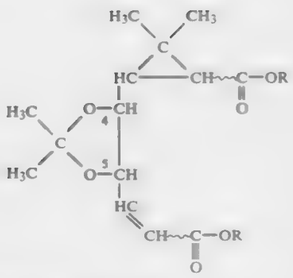


wherein X is $P(Ar)_3$, $S(Ar)_2$, or



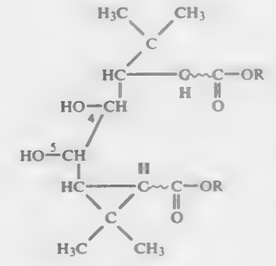
V

Ar is phenyl and R_2 is hydrogen or alkyl of 1 to 4 carbon atoms to obtain a compound of the formula



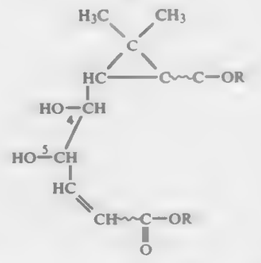
Va

or a compound of the formula



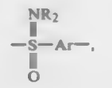
VI

or



VIa

wherein R and the wavy lines have the above definitions, optionally reacting the latter with a gem-dimethyl cyclopropanation agent to obtain the compound of formula V, the product of formula V or Va is either subjected to hydrolysis of the dioxolane group to obtain a compound respectively of the formula



wherein R and the wavy lines have the above definitions and then cleaving the 4,5-bond with an oxidizing agent to obtain a compound of formula I or simultaneously hydrolyzing the dioxolane group and cleaving the 4,5-bond with an oxidizing agent to obtain the compound of formula I.

VOL 1123 ISS 4 FE 26 1991 UMI

4,996,350

METHOD FOR THE PREPARATION OF DIALKYL DICHLOROSUCCINATES

Albert A. Cevasco, Belle Mead, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 101,454, Oct. 1, 1987, abandoned. This application Nov. 17, 1989, Ser. No. 483,917

Int. Cl.[5] C07C *67/307, 69/63*

U.S. Cl. 560—192 6 Claims

1. A method for the preparation of dialkyl dichlorosuccinates, said method consisting essentially of reacting dialkyl maleate with chlorine in the presence of a catalytic amount of a C_1–C_4 alkyl alcohol at a temperature range of about 20° C. to 75° C. for sufficient period of time to complete said reaction.

4,996,351

PROCESS FOR REDUCING THE QUANTITY OF HYDROLYZABLE CHLORIDES IN ISOCYANATES

John L. Nafziger, and Mark J. Hazelrigg, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1987, Ser. No. 7,317

Int. Cl.[5] C07C *249/00*

U.S. Cl. 560—352 4 Claims

1. A process for removing volatile impurities from a crude isocyanate compound which is prepared in the phosgenation of a primary amine, comprising heating said crude isocyanate compound to a temperature sufficient to volatilize said volatile impurities in the presence of an acidic material containing a plurality of strong acid groups, wherein the acidic material is an organic polymer which is coated onto or forms part of the packing of a distillation apparatus.

4,996,352

ENANTIOMERS OF β-[(2-AMINO-1-NAPHTHALENYL) THIOL]-α-HYDROXY-4-METHOXYBENZENE PROPANOIC ACID

Erno Mohacsi, Summit, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 192,252, May 10, 1988, Pat. No. 4,864,058. This application Jun. 29, 1989, Ser. No. 373,741

Int. Cl.[5] C07B *57/00;* C07C *323/30*

U.S. Cl. 562—401 2 Claims

1. The compound (+)-β-[(2-amino-1-naphthalenyl)thio]-α-hydroxy-4-methoxybenzenepropanoic acid in substantially optically pure form.

4,996,353

PROCESS FOR THE PREPARATION OF PARA,PARA'-POLYPHENYLDICARBOXYLIC ACID

Guo-shuh J. Lee; Kenneth A. Burdett, and Joseph J. Maj, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 16, 1989, Ser. No. 352,575

Int. Cl.[5] C07C *51/215*

U.S. Cl. 562—412 14 Claims

1. A process for the preparation of para,para'-polyphenyldicarboxylic acid which comprises contacting para,para'-diisoalkyl- or dialkyl-polyphenyl or an oxidation intermediate thereof with oxygen under reaction conditions sufficient to form para,para'-polyphenyldicarboxylic acid.

4,996,354

PREPARATION OF 2,4-DIHYDROXYBENZOIC ACID

Peter Neumann, Mannheim, and Ulrich Eichenauer, Frankfurt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 1, 1989, Ser. No. 401,941

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1988, 3832076

Int. Cl.[5] C07C *57/15*

U.S. Cl. 562—424 4 Claims

1. A process for preparing 2,4-dihydroxybenzoic acid in a solids mixer by reacting resorcinol with an alkali metal bicarbonate, alkali metal carbonate or a mixture thereof in a carbon dioxide atmosphere, which comprises using as the alkali metal bicarbonate or alkali metal carbonate a mixture of the corresponding sodium salts and 20–60% of the potassium salts.

4,996,355

NOVEL INTERMEDIATES FOR THE PRODUCTION OF 2,4,5-TRIFLUOROBENZOYL FLUORIDE

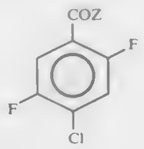
Narayanasamy Gurusamy, Ballwin, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 14, 1989, Ser. No. 338,162

Int. Cl.[5] C07C *63/04*

U.S. Cl. 562—493 7 Claims

1. A compound of the formula



wherein Z is OH, Cl or F.

4,996,356

CARBOXYLIC ACIDS AND METHODS OF PREPARING THE SAME

Hiroshi Takahashi, Uji; Atushi Ohta, Kyoto, and Sayumi Akasaki, Uji, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed May 6, 1988, Ser. No. 190,851

Claims priority, application Japan, May 13, 1987, 62-116399; May 13, 1987, 62-116400

Int. Cl.[5] C07C *59/10*

U.S. Cl. 562—587 3 Claims

1. Carboxylic acids represented by the general formula:

$$\begin{array}{l} RCHCH_2OX_1 \\ | \\ OX_2 \end{array} \qquad (I)$$

wherein R is a linear or granched alkyl or alkenyl group containing from 8 to 16 carbon atoms; one of X_1 and X_2 is a $-(CH_2)_n-COOM$ group, and the other is a hydrogen atom; M is a hydrogen atom, an alkali metal, an alkaline earth metal, ammonium, a lower alkanol amine cation, a lower alkylamine cation or a basic amino acid cation; and n is 1 or 2.

4,996,357

PROCESS FOR PREPARING ACETIC ACID

Hidetaka Kojima, and Takaaki Fujiwa, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 29, 1985, Ser. No. 717,629

Claims priority, application Japan, Apr. 5, 1984, 59-68212

Int. Cl.[5] C07C *51/12, 51/353, 53/08*

U.S. Cl. 562—607 13 Claims

1. A process for preparing acetic acid from a starting material selected from the group consisting of (i) methyl formate and (ii) a mixture of formic acid and a methyl carboxylate, which comprises: heating said starting material in the presence of (1) carbon monoxide, (2) a metal accelerator selected from the group consisting of beryllium, metals belonging to groups IIIA, IVB, VB and actinide metals, (3) a rhodium catalyst and (4) an iodine compound, under conditions effective to convert said starting material to acetic acid.

4,996,358

HYDROXYLAMINE BEARING AMINO ACID DERIVATIVES AS COLLAGENASE INHIBITORS

Balraj K. Handa, Welwyn Garden City; William H. Johnson, Hitchin, and Peter J. Machin, London, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

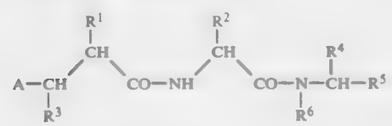
Continuation of Ser. No. 14,957, Feb. 17, 1987, abandoned. This application Apr. 11, 1989, Ser. No. 336,264

Claims priority, application United Kingdom, Mar. 11, 1986, 8605977; Dec. 12, 1986, 8629712

Int. Cl.[5] A61K *31/16, 31/85;* C07C *259/04, 259/06*

U.S. Cl. 562—621 36 Claims

1. A compound of the formula



I

wherein

A is a group of the formula HN (OH)—CO— or HCO—N-(OH)—;

R^1 is C_2–C_5-alkyl;

R^2 is isopropyl, isobutyl, benzyl, p-hydroxybenzyl, p-methoxybenzyl, hydroxymethyl, 1-hydroxyethyl, protected hydroxymethyl or 1-hydroxyethyl, mercaptomethyl, protected mercaptomethyl, 2-(methylthio) ethyl, carboxymethyl, 2-carboxyethyl, protected carboxymethyl or 2-carboxyethyl, 3-quanidinoproyl, 4-aminobutyl or protected 3-quanidinopropyl or 4-aminobutyl;

R^3 is hydrogen, amino, hydroxy, mercapto, C_1–C_6-alkyl, C_1–C_6-alkyl, C_1–C_6-alkylamino, C_1–C_6-alkylthio, aryl-(C_1–C_6), amino-(C_1–C_6-alkyl), protected amino-(C_1–C_6-alkyl), hydroxy-(C_1–C_6-alkyl), protected hydroxy-(C_1–C_6-alkyl), mercapto-(C_1–C_6alkyl), protected mercapto-(C_1–C_6-alkyl), carboxy-(C_1–C_6-alkyl) or protected carboxy-(C_1–C_6-alkyl);

R^4 is hydrogen or methyl;

R^5 is C_1–C_6-alkoxy-C_1–C_6-alkyl, di (C_1–C_6-alkoxy)-methylene, carboxyl, (C_1–C_6-alkyl)carbonyl, (C_1–C_6-alkoxy)-carbonyl, arylmethy oxycarbonyl, (C_1–C_6-alkyl-)aminocarbonyl or arylaminocarbonyl group; and

R^6 is hydrogen or methyl or

R^2 and R^4 together represent a group of the formula $-(CH_2)_n$ in which n stands for a number from 4 to 11; or R^4 and R^6 together represent trimethylene; or a pharmaceutically acceptable salt of a compound which is acidic or basic, and wherein the hydroxy protecting group is selected from the group consisting of tert.butyl, benzyl and tetrahydropyranyl;

the mercapto protecting group is selected from the group consisting of tert.butyl and benzyl;

the amino protecting group is selected from the group consisting of tert.butoxycarbonyl, benzyloxycarbonyl, formyl, trityl, trifluoroacetyl, 2-(biphenylyl)-isopropoxycarbonyl isobornyloxycarbonyl and an acyl group derived from phthalic acid, terephthalic acid, glycine or alanine;

the protected carboxy group is a carboxy group protected in the form of a methyl, ethyl, tert.butyl or benzyl ester or in the form of an amide, N-(C_1–C_6-alkyl)amine, N,N-di(C_1–C_6-alkyl) amide, N-arylamide, N-(carboxymethyl)amide or N-(1-carboxyethyl) amide; and

aryl is selected from the group consisting of unsubstituted phenyl and phenyl substituted with one or more substituents selected from the group consisting of C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen and trifluoromethyl.

4,996,359

PROCESS FOR THE PREPARATION OF AROMATIC BIS DIALKYL UREAS

Haven S. Kesling, Jr., Drexel Hill; Edward T. Shawl, Wallingford, and John G. Zajacek, Devon, all of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

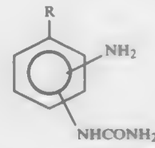
Filed Mar. 14, 1988, Ser. No. 167,922

Int. Cl.[5] C07C *275/40, 273/18*

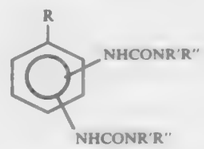
U.S. Cl. 564—50 11 Claims

1. A process for the preparation of aromatic bis dialkyl ureas comprising:

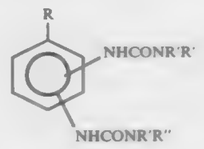
(a) reacting one or more aromatic diamines having the formula:



with isocyanic acid at a temperature of from about −30° C. to about 200° C. in the presence of an inert solvent to convert said aromatic diamines to one or more aromatic bis ureas having the formula:



(b) reacting said aromatic bis ureas with a dialkyl amine having the formula HNR'R" at a temperature of from about 50° C. to about 200° C. in an inert solvent to produce one or more aromatic bis dialkyl ureas of the formula:



where R is hydrogen, an alkyl group having from 1 to 10 carbons, a halogen, an ether group, or a nitro group, and R' and R" are alkyl groups independently having from 1 to 8 carbons corresponding to R' and R" of said dialkylamine.

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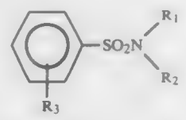
4,996,360

PREPARATION OF ARYLSULFONYL (ALKYL) AMIDES

Raymond Commandeur, Vizille, and Elie Ghenassia, Grenoble, both of France, assignors to Atochem, Puteaux, France

Filed Mar. 15, 1989, Ser. No. 323,857
Claims priority, application France, Mar. 17, 1988, 8803477
Int. Cl.[5] C07C *303/38*
U.S. Cl. 564—90 10 Claims

1. A process for the preparation of an arylsulfonyl(alkyl)amide having the formula:



wherein R_1 is a hydrogen atom or an alkyl radical having from 1 to 10 carbon atoms, R_2 is an alkyl radical having from 1 to 10 carbon atoms, and R_3 is one or more hydrogen atoms or halogen atoms or lower alkyl substituents, comprising (a) intimately contacting an arylsulfonyl halide with a stoichiometric excess of both an alkylamine and an alkaline agent, said alkaline agent being present in aqueous solution, (b) eliminating water and excess alkylamine from the organic phase produced in stage (a) by distillation conducted at a temperature from 130° to 170° C., and (c) separating final product arylsulfonyl(alkyl)amide from the residual organic phase remaining after stage (b).

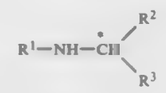
4,996,361

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE SECONDARY ARYLAMINES

William R. Cullen, Vancouver, Canada; Michael D. Fryzuk, Kaiserslautern, Fed. Rep. of Germany; Brian R. James, Vancouver, Canada; Guo-Jun Kang, Vancouver, Canada; James P. Kutney, Vancouver, Canada; Roberto Spogliarich, Trieste, Italy, and Ian S. Thorburn, Vancouver, Canada, assignors to The University of British Columbia, Vancouver, Canada

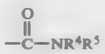
Filed Jul. 30, 1987, Ser. No. 79,625
Int. Cl.[5] C07C *57/00*
U.S. Cl. 564—304 12 Claims

1. A process for the preparation of optically active secondary N-arylamines of the formula I

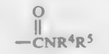


(I),

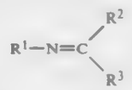
in which R^1 is C_6–C_{12}-aryl or C_4–C_{11}-heteroaryl which is attached via a ring C atom and contains 1 to 2 ring hetero atoms which can be substituted by C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-alkylthio, C_1–C_6-halogenoalkyl, halogen, —OH, —CN, C_6–C_{12}-aryl, C_6–C_{12}-aryloxy, C_6–C_{12}-arylthio or C_7–C_{16}-aralkyl, C_7–C_{16}-aralkoxy or C_7–C_{16}-aralkylthio, the aryl moieties of which radicals in turn may be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, halogen, —OH, —CN, —$CONR^4R^5$ or —$COOR^4$, or by secondary amino having 2 to 24 C atoms,



or —$COOR^4$, R^4 and R^5 independently of one another being C_1–C_{12}-alkyl, phenyl or benzyl or R^4 and R^5 together being tetramethylene or pentamethylene or 3-oxapentylene; R^2 and R^3 are different from one another and are C_1–C_{12}-alkyl or cycloalkyl having 3–8 ring C atoms which are unsubstituted or substituted by —OH, —CN, halogen, C_1–C_{12}-alkoxy, phenoxy, benzyloxy, secondary amino having 2 to 24 C atoms,

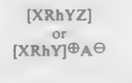


or —$COOR^4$, or are C_6–C_{12}-aryl or C_7–C_{16}-aralykl which are unsubstituted or substituted like R^1, or are or —$CONR^4R^5$ or —$COOR^4$ in which R^4 and R^5 are as defined above; or R_1 is as defined above and R^2 and R^3 together are alkylene which has 2 to 5 C atoms and which can be interrupted by i 1 or 2 —O—, —S— or —NR^4- groups and/or can be substituted by =O or substituted as above for R^2 and R^3 when they are alkyl, and/or is fused with benzene, furan, thiophene or pyrrole, or R^2 is as defined above and R^3 is alkylene which has 2 to 5 C atoms and is attached to R^1 and can be interrupted by 1 or 2 —O—, —S— or -NR^4- groups, and/or can be substituted by =O or substituted as above for R^2 and R^3 when they are alkyl, and/or is fused with benzene, furan, thiophene or pyrrole, and * means predominantly the R-configuration or S-configuration, by asymmetrically catalyzed hydrogenation of N-arylated, prochiral ketimines of the formula II



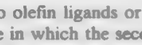
(II)

in which R^1, R^2 and R^3 are as defined above, in the presence of complex salts of a noble metal containing chiral ligands, which comprises carrying out the hydrogenation at a temperature from −40 to 80° C. and under hydrogen pressure of 10^6 Pa to 10^8 Pa and adding to the reaction mixture catalytic amounts of a rhodium compound of the formula III or IIIa



(III)

or



(IIIa)

in which X is two olefin ligands or one diene ligand, Y is a chiral diphosphine in which the secondary phosphine groups are linked by 2–4 C atoms and which, together with the Rh atom, forms a 5-membered, 6-membered or 7-membered ring, or Y is a chiral disphosphinite in which the phosphinite groups are linked via 2 C atoms and which, together with the Rh atom, forms a 7-membered ring, Z is Cl, Br or I and A⊖ is the anion of an oxygen acid or complex acid.

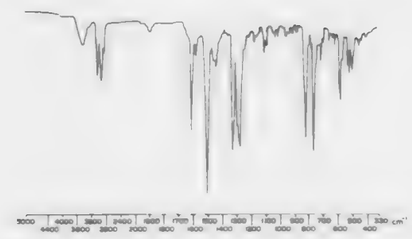
4,996,362

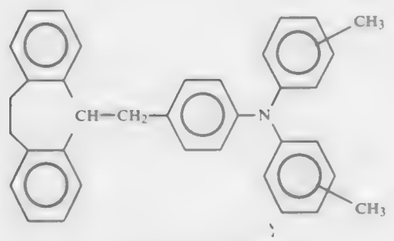
5-[(4-N,N-DITOLYLAMINO)BENZYL]-5H-DIBENZO[A,D]-CYCLOHEPTANE DERIVATIVES

Masaomi Sasaki, Susono, and Tamotsu Aruga, Mishima, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 3, 1990, Ser. No. 520,066
Claims priority, application Japan, May 31, 1989, 1-140106
Int. Cl.[5] C07C *211/54*
U.S. Cl. 564—315 2 Claims

1. 5-[(4-N, N-ditolylamino)benzyl]-5H-dibenzo[a,d]-cycloheptane derivatives having formula (I):





4,996,363

CATALYTIC REFORMING OF ALKYLENEAMINES TO LINEARLY-EXTENDED POLYALKYLENEPOLYAMINES

Robert G. Bowman; David C. Molzahn, and George E. Hartwell, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1988, Ser. No. 287,189
Int. Cl.[5] C07C *209/64, 211/14;* C07D *295/13, 295/023*
U.S. Cl. 564—470 23 Claims

1. A process of reforming amines comprising contacting an alkyleneamine or mixture thereof with a catalytic amount of a catalyst consisting essentially of a Group IIA metal silicate, with the proviso that the silicate is essentially free of aluminum, the contacting occurring under reaction conditions such that a mixture of polyalkylenepolyamines is formed which is enriched in linearly-extended homologues.

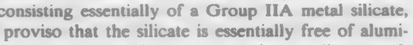
4,996,364

USE OF ALKALINE EARTH SALTS OF POLYCARBOXYLIC ACID MONOESTERS AS ALKOXYLATION CATALYSTS

Ansgar Behler, Bottrop, and Uwe Ploog, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,157
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812168
Int. Cl.[5] C07C *213/00*
U.S. Cl. 564—475 8 Claims

1. The process of ethoxylating or propoxylating a compound containing an active hydrogen atom, said compound being selected from a fatty alcohol, fatty amine, and an amine which on ethoxylation or propoxylation forms a nonionic surfactant, comprising contacting said compound with an alkaline earth salt of a polycarboxylic acid monoester corresponding to general formula I



(I)

in which

R is a radical selected from the group consisting of a linear or branched C_1–C_{22} alkyl or C_3–C_{22} alkenyl, phenyl, alkylphenyl containing to 3 C_1–C_{15} alkyl groups, benzyl and phenethyl,

A is a saturated or unsaturated, acyclic or cyclic C_2–C_6 hydrocarbon radical with two or three bonds or a benzene group with two or three bonds,

M is an alkaline earth metal selected from the group consisting of Ca, Ba and Sr;

m is the number 2 or 3;

n is a number from about 1 to about 20;

o is the number 1 and p is the number 2, or o is the number 2 and p is the number 1.

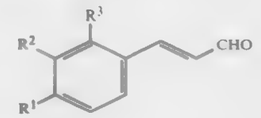
4,996,365

PREPARATION OF ALKYL-SUBSTITUTED CINNAMALDEHYDES

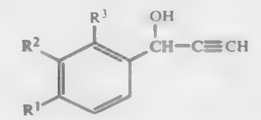
Gerald Lauterbach; Frank F. Pape, both of Ludwigshafen, and Walter Gramlich, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 31, 1989, Ser. No. 401,241
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831713
Int. Cl.[5] C07C *45/00*
U.S. Cl. 568—427 2 Claims

1. A process for preparing an alkyl-substituted cinnamaldehyde of the formula I



where one or more of R^1, R^2 and R^3 is alkyl of from 1 to 8 carbon atoms and non-alkyl R^1, R^2 and R^3 are each hydrogen, which comprises refluxing a mixture of an acetylene alcohol of the general formula II



where R^1, R^2 and R^3 are each as defined above, and from 55 to 98% strength aqueous formic acid.

4,996,366

PROCESS FOR THE CATALYTIC HYDROFORMYLATION OF OLEFINS

Laura Tinucci, Cervignano D'Adda, and Edoardo Platone, Asti, both of Italy, assignors to Enitricerche S.p.A, Milan, Italy

Filed Jan. 23, 1990, Ser. No. 468,855
Claims priority, application Italy, Jan. 27, 1989, 19225 A/89
Int. Cl.[5] C07C *45/50*
U.S. Cl. 568—454 17 Claims

1. Process for the catalytic hydroformylation of olefins to produce aldehydes and/or alcohols by means of the reaction of linear or branched alpha-olefins or internal olefins of from 5 to 24 carbon atoms with hydrogen and carbon monoxide, which process is carried out by operating at a temperature ranging from 70° to 150° C. and at a pressure ranging from 3 to 100 bar in a liquid, aqueous-organic reaction medium, in the presence of a water-soluble complex catalyst containing a metal active in the hydroformylation selected from the group consisting of cobalt, ruthenium, rhodium, palladium, osmium, iridium and platinum, characterized in that said aqueous-organic medium is, during at least a substantial portion of the hydroformylation reaction time, in the form of a microemulsion containing an oil

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phase, an aqueous phase, a surfactant and a co-surfactant, with said oil phase constituting the external phase and said aqueous phase constituting the internal phase of said microemulsion.

4,996,367

PROCESS FOR MAKING 4,4'-DIHYDROXYDIPHENYL SULFONE

Andreas B. Ernst, Glen Ellyn, and Gunter Caspari, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 20, 1989, Ser. No. 453,664
Int. Cl.[5] C07C 315/00
U.S. Cl. 568—33 5 Claims

1. A batch process to produce a dihydroxydiphenyl sulfone product from phenol and concentrated sulfuric acid in greater than 95 wt. % yield based upon said sulfuric acid, said product containing at least 90 wt. % of the 4,4'-dihydroxydiphenyl sulfone isomer, comprising:

reaction of said sulfuric acid and said phenol in an organic solvent mixture containing a lower-boiling and a higher-boiling hydrocarbon, said phenol and said sulfuric acid being employed in a mol ratio of about 2 to 1;

removal of reaction-produced water, hydrocarbon, and phenol from said reaction by azeotropic distillation and the formation of a condensed phase therefrom which separates into at least two immiscible layers, one layer of which is rich in phenol; and

return of at least the rich-in-phenol layer to said reaction at a rate which keeps the mol ratio of phenol to sulfuric acid in the reaction at least 2 to 1.

4,996,368

PROCESS FOR THE PURIFICATION AND STABILIZATION OF PERFLUOROPOLYETHERS

Thomas Gries, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 29, 1990, Ser. No. 471,867
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1989, 3902803
Int. Cl.[5] C07C 41/34
U.S. Cl. 568—601 11 Claims

1. A process for the stabilization and purification of a perfluoropolyether of the general formulae (I) or (II)

$$R[CF_2OCF]_n[CFOCF_2]_mR' \quad (I)$$
$$\quad\quad\quad

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4,996,377

PREPARATION OF ALIPHATICALLY SUBSTITUTED FLUOROBENZENES

Jochen Wild, Deidesheim; Albrecht Harreus, Ludwigshafen, and Norbert Goetz, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

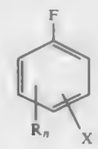
Filed Feb. 21, 1990, Ser. No. 482,646

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3909486

Int. Cl.[5] C07C *17/22, 25/13, 25/18*

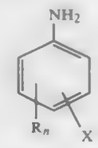
U.S. Cl. 570—141 **4 Claims**

1. A process for the preparation of an aliphatically substituted fluorobenzene of the formula I



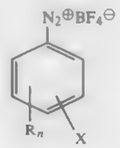
I

where R is an aliphatic or cycloaliphatic radical, n is 2, 3 or 4 and X is hydrogen, fluorine, chlorine or bromine, by diazotization of the corresponding aniline derivative of the formula II



II

in the presence of tetrafluoboric acid and decomposition of the resulting diazonium tetrafluoborate of the formula III



III

wherein the decomposition reaction is carried out simultaneously with the diazotization reaction, in the presence of elemental copper and/or copper(I) and/or copper(II) salts and at from −15° to 80° C.

4,996,378

PROCESS FOR PRODUCTION OF 1,1-DICHLORO-1-FLUOROETHANE AND/OR 1-CHLORO-1,1-DIFLUOROETHANE

Danny W. Wright, Hickory, and Barry L. Wagner, Benton, both of Ky., assignors to Atochem North America, Inc., Philadelphia, Pa.

Filed Jul. 13, 1989, Ser. No. 379,518

Int. Cl.[5] C77C *17/20*

U.S. Cl. 570—164 **13 Claims**

1. A process for the production of 1,1-dichloro-1-fluoroethane and/or 1-chloro-1,1-difluoroethane comprising:

(a) treating 1,1,1-trichloroethane in a first reaction zone with hydrogen fluoride in a molar ratio of hydrogen fluoride to 1,1,1-trichloroethane of at least about 20:1 for a period of time to selectively form 1,1-dichloro-1-fluoroethane over 1-chloro-1,1-difluoroethane;

(b) forming first and second 1,1-dichloro-1-fluoroethane-containing streams from the first reaction zone effluent;

(c) cooling the first 1,1-dichloro-1-fluoroethane-containing stream to separate said stream into a hydrogen fluoride-rich liquid phase and a 1,1-dichloro-1-fluoroethane-rich liquid phase, and separating the two phases;

(d) treating the second 1,1-dichloro-1-fluoroethane-containing stream with hydrogen fluoride in a second reaction zone in a molar ratio of at least about 20:1 of hydrogen fluoride to 1,1-dichloro-1-fluoroethane in the second 1,1-dichloro-1-fluoroethane-containing stream for a period of time sufficient to form 1-chloro-1,1-difluoroethane; and

(e) cooling the effluent from the second reaction zone to separate said effluent into a hydrogen fluoride-rich liquid phase and a 1-chloro-1,1-difluoroethane-rich liquid phase, and separating the two phases.

4,996,379

METHOD OF PREPARING 1,1,1,2-TETRAFLUOROETHANE FROM 1,1-DICHLORO-1,2,2,2-TETRAFLUOROETHANE

Hideki Oshio, Omiya; Sadaharu Mishumi, Kawagoe; Kiyoshi Yagii, Fujimi; Satoshi Yoshikawa, Saitama, and Katsuyoshi Murata, Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 26, 1989, Ser. No. 357,291

Claims priority, application Japan, May 30, 1988, 63-132395; Dec. 19, 1988, 63-320077; Dec. 23, 1988, 63-324998; Jan. 13, 1989, 1-7056

Int. Cl.[5] C07C *17/10, 19/08, 17/08*

U.S. Cl. 570—176 **14 Claims**

1. A method of preparing 1,1,1,2-tetrafluoroethane, comprising reacting 1,1-dichloro-1,2,2,2-tetrafluoroethane with hydrogen gas in the presence of a palladium-on-active alumina catalyst at a temperature lower than 200° C. and not lower than 120° C.

4,996,380

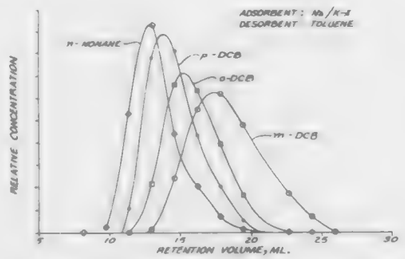
PROCESS FOR EXTRACTING META-DICHLOROBENZENE FROM ISOMER MIXTURES WITH MIXED ALKALI METAL EXCHANGED X ZEOLITE ADSORBENTS

Beth McCulloch, Barrington, and Michael G. Gatter, Elk Grove Village, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 8, 1989, Ser. No. 433,500

Int. Cl.[5] C07C *17/38*

U.S. Cl. 570—211 **6 Claims**



1. A process for separating m-dichlorobenzene from feed mixtures of m-dichlorobenzene and at least one other isomer of dichlorobenzene which process comprises contacting said feed mixture at adsorption conditions, including a temperature of from about 20° C. to about 250° C. and a pressure sufficient to maintain liquid phase with an adsorbent comprising an X-type zeolite exchanged with a mixture of sodium and potassium ions at the cation exchange sites at a weight ratio of sodium to potassium in the range from 0.65:1 to 2:1, selectively adsorbing said m-dichlorobenzene more strongly than said other isomers, removing the relatively non-adsorbed portion of the feed mixture from contact with the adsorbent, and thereafter recovering m-dichlorobenzene from the adsorbent by contacting said adsorbent, at desorption conditions, including a temperature of from about 20° C. to about 250° C. and a pressure sufficient to maintain liquid phase, with an alkylbenzene desorbent.

4,996,381

INCREASED CONVERSION OF C_2–C_{12} ALIPHATIC HYDROCARBONS TO AROMATIC HYDROCARBONS USING A HIGHLY PURIFIED RECYCLE STREAM

John L. Pickering, Jr., Kingswood, Tex., and Margaret Nemet-Mavrodin, Cherry Hill, N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,556

Int. Cl.[5] C07C *15/00*

U.S. Cl. 585—413 **8 Claims**

1. A process for converting an aliphatic C_2–C_{12} hydrocarbon feedstream to a predominately aromatic product stream comprising the steps of:

(a) heating a feedstream comprising C_2–C_{12} hydrocarbons;

(b) contacting said heated feedstream with a zeolite catalyst in a reaction zone under conversion conditions;

(c) withdrawing a product stream from said reaction zone;

(d) separating said product stream into a gas stream comprising hydrogen and C_4− hydrocarbons and a liquid stream comprising aromatic hydrocarbons and C_5+ aliphatic hydrocarbons;

(e) further separating said liquid stream of step (d) into an aromatic product and a heavy aliphatic recycle stream;

(f) mixing said heavy aliphatic recycle stream with said feedstream of step (a);

(g) further separating said gas stream of step (d) into an off-gas stream comprising methane and hydrogen and a light aliphatic recycle stream containing less than 0.5 wt. % hydrogen; and

(h) mixing said light aliphatic recycle stream with said feedstream of step (a).

4,996,382

PROCESS FOR PREPARATION OF HYDROCARBONS

Ikuya Matsuura, Toyama, and Yasushi Yoshida, Yamaguchi, both of Japan, assignors to Ube Industries, Ltd., Japan

Filed Dec. 5, 1988, Ser. No. 279,753

Claims priority, application Japan, Dec. 11, 1987, 62-312127

Int. Cl.[5] C07C *2/00*

U.S. Cl. 585—500 **19 Claims**

1. A process for a preparation of hydrocarbons having at least two carbon atoms, which comprises bringing a methane-containing gas maintained at a temperature of 500° to 1500° C. into contact with an oxygen-containing gas in the presence of a catalyst to effect oxidative coupling, wherein the catalyst comprises (1) a single-crystal, high-purity, and ultra-fine powdery magnesium oxide obtained by a gas-phase oxidation method, and (2) an alkali metal oxide.

4,996,383

INERT PURGE IN CATALYTIC DIMERIZATION OF OLEFINS

Jeffrey R. Burkinshaw, Bartlesville, and Leo L. Gingerich, Nowata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 26, 1990, Ser. No. 503,599

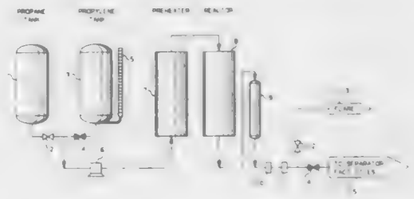
Int. Cl.[5] C07C *2/04*

U.S. Cl. 585—516 **12 Claims**

1. A method for catalytic dimerization using a dimerization catalyst comprising the steps of:

(a) purging said dimerization catalyst during startup of said dimerization with an aliphatic hydrocarbon having 2 to 5 carbon atoms; and

(b) thereafter substituting a dimerizable organic compound for said aliphatic hydrocarbon and flowing said dimeizable organic compound into contact with said dimerization catalyst.



4,996,384

REGENERATION OF REDUCED METAL OXIDE OLIGOMERIZATION CATALYST

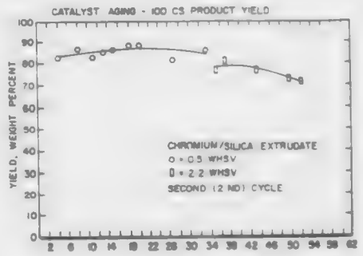
Bruce P. Pelrine, Trenton, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 282,362, Dec. 9, 1988, Pat. No. 4,926,004. This application Feb. 20, 1990, Ser. No. 481,279

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[5] C07C *2/10*

U.S. Cl. 585—530 **15 Claims**



1. In a process for the preparation of olefin oligomers from alpha-olefin feedstock containing 6 to 20 carbon atoms, or mixtures of such olefins, comprising contacting said olefins under oligomerization conditions, at a reaction temperature between −20° to 250° C., and with a reduced chromium catalyst on a porous support, which catalyst has been treated by oxidation at a temperature of 200° to 900° C. in the presence of an oxidizing gas and then by treatment with a reducing agent at a temperature and for a time sufficient to reduce said catalyst to a lower valence state, to produce an olefin oligomer composition comprising C_{30}–$C_{10,000}$ hydrocarbons, said composition, having a branch ratio of less than 0.19, number average molecular weight between 420 and 45,000, weight average molecular weight between 420 and 200,000, and a molecular weight distribution between 1 and 5, while deactivating the catalyst the improvement comprising:

regenerating the deactivated chromium catalyst under regenerating conditions in a process comprising the steps of:

(a) stripping the deactivated catalyst with inert gas at an elevated temperature and for a time sufficient to strip unreacted olefin and oligomer product;

(b) contacting the deactivated, stripped catalyst with a stream of oxidizing gas while heating to an elevated temperature at a rate and for a time sufficient to oxidize the chromium of the catalyst and remove carbonaceous deposits from the catalyst;

(c) cooling the oxidized catalyst and contacting it with a stream of reducing gas in an amount sufficient and at a

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temperature and for a time sufficient to reduce the chromium of the oxidized catalyst to essentially lower valent chromium.

4,996,385

USE OF SILICA-TITANIA HYDROCARBON CONVERSION CATALYST IN HYDROCARBON CONVERSION PROCESSES

Leonard A. Cullo, Greensburg, and Francis J. Shiring, III, Hampton Township, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 286,909, Nov. 17, 1988, Pat. No. 4,906,793, which is a continuation-in-part of Ser. No. 923,502, Oct. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 796,136, Nov. 8, 1985, Pat. No. 4,711,869. This application Dec. 18, 1989, Ser. No. 451,833

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] **C07C** *1/24*

U.S. Cl. 585—640 **3 Claims**

1. Method of conducting an acid catalyzed reaction selected from the group consisting of alkylation, isomerization, cracking, dealkylation, disproportionation, dehydration, oligomerization, polymerization, and cyclization comprising contacting an organic compound with a calcined crystalline titania-magnesia-silica catalyst having the molar ratios 0.015 to 0.04 TiO_2 and 0.08 to 0.17 MgO to 1.0 SiO_2 and an X-ray diffraction pattern characterized by peaks as follows:

2θ	d(A)	I/Io × 100
7.75	11.39	49
8.30	10.64	13
8.70	10.16	100
13.70	6.46	13

at a temperature of from about 300°–450° C., a pressure of about 1 to about 5 atmospheres and at a rate of feed no greater than about 1.5 grams of feed per gram of catalyst per hour, and recovering an organic compound product which has undergone such reaction.

4,996,386

CONCURRENT ISOMERIZATION AND DISPROPORTIONATION OF OLEFINS

David M. Hamilton, Jr., Houston, and Richard A. Kemp, Stafford, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1989, Ser. No. 454,244

Int. Cl.[5] **C07C** *6/00, 5/23*

U.S. Cl. 585—646 **18 Claims**

1. A process for the concurrent isomerization and disproportionation of olefinic hydrocarbons having carbon numbers ranging from C_2 to about C_{100} which comprises contacting said olefins with a catalyst prepared by incorporating cobalt, a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, and a ferrierite compound into an alumina hydrogel and subsequently calcining to prepare said catalyst.

4,996,387

DEHYDROGENATION PROCESS

Bruce W. Gerhold, and Richard L. Anderson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 20, 1989, Ser. No. 382,453

Int. Cl.[5] **C07C** *5/34*

U.S. Cl. 585—654 **10 Claims**

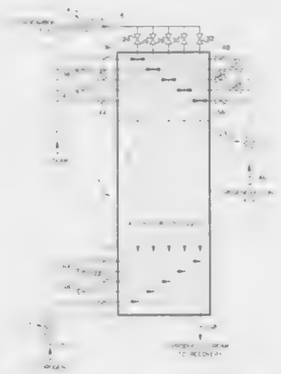
1. A continuous process for dehydrogenating dehydrogenatable hydrocarbons comprising the steps of:

(a) feeding an admixture of said dehydrogenatable hydrocarbon and a diluent to at least two catalyst-containing tubes within a furnace chamber of a reactor;

(b) contacting said admixture with catalyst contained in said at least two catalyst-containing tubes in said furnace chamber under endothermic dehydrogenating conditions so as to establish at least two product-producing tubes;

(c) combining the effluent from each of said at least two product-producing tubes so as to form a common product stream;

(d) cyclically discontinuing the flow of said dehydrogenatable hydrocarbon and initiating flow of a free-oxygen containing gas under regeneration conditions while continuing the flow of diluent to at least one of said at least two product-producing tubes so as to establish at least one



regenerating tube having a free-oxygen containing effluent and at least one product-producing tube;

(e) adding a free hydrogen-containing gas to the effluent of said at least one regenerating tube prior to combining the effluent of said at least one regenerating tube with the effluent of said at least one product-producing tube; and

(f) wherein a sufficient quantity of hydrogen-containing gas is added to the effluent of said at least one regenerating tube in step (e) so as to react at least a portion of free oxygen contained in the effluent of said at least one regenerating tube with free hydrogen added in step (e) before the oxygen-containing effluent of said at least one regenerating tube is combined with the effluent of said at least one product-producing tube.

4,996,388

SEPARATION OF ETHYLTOLUENE ISOMERS

Michael M. Olken; Guo-shuh J. Lee, and Juan M. Garces, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 26, 1990, Ser. No. 558,355

Int. Cl.[5] **C07C** *7/13*

U.S. Cl. 585—828 **22 Claims**

14. A process comprising (a) contacting a mixture of the ortho, meta and para isomers of ethyltoluene with a first adsorbent bed comprising ferrierite under conditions such that the ortho and meta isomers are not significantly adsorbed while the para isomer is selectively adsorbed, (b) collecting a mixture of the ortho and meta isomers leaving the adsorbent bed, (c) removing the para isomer from the first adsorbent bed by varying the conditions of the adsorbent bed such that the para isomer is removed, (d) contacting the mixture of the ortho and meta isomers with a second adsorbent bed comprising silicalite under conditions such that the ortho isomer is not significantly adsorbed while the meta isomer is selectively adsorbed, (e) collecting the ortho isomer, and (f) removing the meta isomer from the second adsorbent bed by varying the conditions in the bed such that the meta isomer is removed.

4,996,389

ALGAL STRAIN FOR AGAR PRODUCTION

Kimon T. Bird, Vero Beach, Fla., assignor to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Filed Aug. 1, 1988, Ser. No. 226,814

Int. Cl.[5] **A01H** *13/00;* **A01G** *33/00*

U.S. Cl. 800—200 **1 Claim**

1. The biologically pure somaclonal variant designated G-16S of the species *Gracilaria verrucosa.*

4,996,390

NOVEL INTERSPECIFIC MUSHROOM STRAINS

Kurt R. Dahlberg, Napoleon, Ohio, assignor to Campbell Soup Company, Camden, N.J.

Filed Jan. 19, 1989, Ser. No. 298,727

Int. Cl.[5] **A01H** *15/00*

U.S. Cl. 800—220 **2 Claims**



1. A strain of the genus Agaricus which has the distinguishing characteristics of the strain deposited with the American Type Culture Collection under accession number 20916.

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4,996,391

PRINTED CIRCUIT BOARD HAVING AN INJECTION MOLDED SUBSTRATE

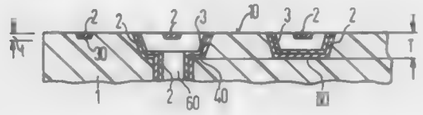
Hans Schmidt, Eurasburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 3, 1989, Ser. No. 388,818

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833353

Int. Cl.[5] **H05K** *1/00, 3/10*

U.S. Cl. 174—255 **15 Claims**



1. A printed circuit board comprising:

an injection molded substrate having a surface;

a pattern of interconnect traces, through-connections and connecting pads recessed in said substrate surface formed by a trench-shaped depression in the region of each interconnect trace and by a planar depression in at least one of (a) the region of each through-connection and (b) the region of each connecting pad; and

said planar and trench-shaped depressions having a conductive metal coat, the depth of each trench-shaped depression being dimensioned less than the depth of each planar depression, so that, as a result of the difference in depth between each trench-shaped depression and each planar depression, said metal coat fills each trench-shaped depression to the surface of the substrate, and in each planar depression a distance remains between the metal coat and the surface of the substrate.

5. A method for manufacturing a circuit board comprising:

generating a pattern of recesses in a surface of a substrate by forming a trench-shaped depression in the region of an interconnect trace and by forming a planar depression in at least one of (a) the region of a through-connection or (b) the region of a connecting pad, with the depth of said trench-shaped depression being less than the depth of said planar depression; and

applying a metal coat to said substrate so that, as a result of the difference in depth between said trench-shaped depression and said planar depression, said metal coat fills said trench-shaped depression to said surface of said substrate and in said planar depression a distance remains between the metal coat and said surface of said substrate.

4,996,392

SUPERCONDUCTOR MAGNETIC IMAGE DETECTION DEVICE

Takao Tagawa, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1989, Ser. No. 324,686

Claims priority, application Japan, Mar. 18, 1988, 63-66310

Int. Cl.[5] **G08C** *21/00*

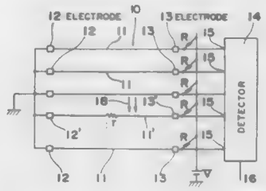
U.S. Cl. 178—18 **22 Claims**

1. A magnetic image detection device comprising:

one or more superconductor bodies provided on a nonmagnetic dielectric substrate;

each superconducting body is elongated to form a single stripe, and a first electrode and second electrode are alternatively provided at even intervals and on top of each superconducting body; and

a detection circuit which detects separately electrical resistance between the first electrode and the second electrode of each superconductive body;



whereby a distribution in the first dimension of magnetism acting upon the superconducting body is detected by the detection circuit.

4,996,393

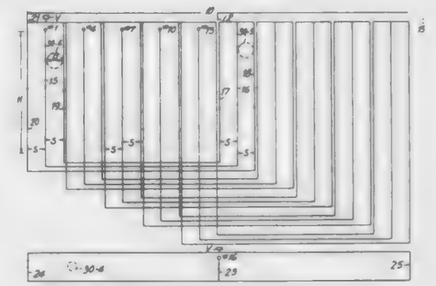
DIGITIZER TABLET WITH SPLIT-CURRENT CONDUCTOR ARRAY

Thomas C. Zalenski, Killingworth, and Jamie L. Barbetti, Milford, both of Conn., assignors to Summagraphics Corporation, Seymour, Conn.

Filed Apr. 3, 1990, Ser. No. 503,537

Int. Cl.[5] **G08C** *21/00*

U.S. Cl. 178—19 **34 Claims**



1. An electromagnetic digitizer tablet having an electrode array under an active tablet area and a pointing device having an inductor, the combination when energized with the pointing device over the electrode array will generate electrical signals representative of the pointing device location over the array with respect to at least one tablet coordinate,

said electrode array comprising a plurality of individual elongated conductors capable of selective excitation or selective signal detection, each array conductor comprising at least three active parallel conductor portions distributed under the active tablet area,

means interconnecting the active parallel conductor portions of each array conductor such that the current flowing in one of the parallel conductor portions is divided among the other parallel conductor portions,

means selectively connectable to each array conductor such that excitation or induced currents flow simultaneously in all its parallel portions.

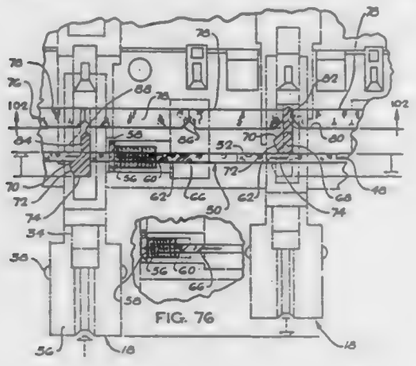
VOL 1123 ISS 4 FEB 26 1991 UMI

4,996,394

PUSH BUTTON VACUUM-ELECTRIC AIR CONTROL DEVICE FOR AUTOMOTIVE VEHICLES

John G. Cummings, Cary, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 293,370, Jan. 4, 1989, Pat. No. 4,926,014.
This application Mar. 9, 1990, Ser. No. 491,080
Int. Cl.[5] H01H 9/26
U.S. Cl. 200—5 E 5 Claims



1. A control device for vacuum-electric switching or the like, said control device comprising

a housing,

an array of push buttons including a plurality of push buttons mounted in said housing for generally parallel sliding movement between extended and depressed positions,

resilient means for biasing said push buttons toward their extended positions,

latching means for latching any selected one of said push buttons in its depressed position while unlatching the other push buttons,

and a lockout mechanism for preventing simultaneous movement of more than one of said push buttons to the depressed position,

said lockout mechanism comprising an array of transversely slidable lockout blocks,

said housing having guide means for guiding said lockout blocks for sliding movement in a transverse direction relative to the direction of sliding movement of said push buttons,

said guide means including stop means for limiting the sliding movement of said lockout blocks and thereby producing a predetermined limited clearance between any two of said lockout blocks,

each of said push buttons having a clearance-penetrating member for penetrating and occupying the clearance in a corresponding location along the array of said lockout blocks,

each of said clearance-penetrating members being dimensioned for substantially occupying said clearance so that said clearance is available for only one of said clearance-penetrating members at any particular time,

and resilient takeup means acting along said array of said lockout blocks for resiliently taking up said clearance to avoid looseness and rattling of said lockout blocks,

said lockout blocks including endmost pairs thereof at opposite ends of said array thereof,

said blocks of said endmost pairs having spring-receiving means,

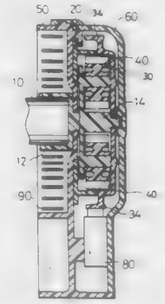
said resilient takeup means comprising a pair of takeup springs for engaging said spring-receiving means and compressively acting between said blocks of said endmost pairs thereof.

4,996,395

SEAT BELT RETRACTION AND SWITCH WITH PERIPHERAL INTERNAL GEARING AND PLANETARY GEARING ASSEMBLY

Tatsuo Tada, Kanagawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,407
Claims priority, application Japan, Jul. 6, 1988, 63-168156
Int. Cl.[5] B65H 75/00; F16H 57/00; H01H 3/16
U.S. Cl. 200—61.58 B 6 Claims



1. A retractor with a means for detecting the amount of a webbing wound on a retractor shaft supported rotatably on a base, said means being of the type that the amount of the webbing wound on the retractor shaft is determined on the basis of the number of revolutions which the retractor shaft has undergone, comprising:

first and second internal gears having different numbers of teeth and arranged side by side in the direction of an axis of the retractor shaft, said first internal gear being provided on the base, and said second internal gear being rotatably supported on the base;

a rotary plate fixed on the retractor shaft and having a support portion at a position deviated from the center axis of the retractor shaft; and

at least one planetary gear rotatably supported on the support portion of the rotary plate, said planetary gear having a number of teeth which are formed in an outer periphery of said planetary gear and which are in meshing engagement with both the first and second internal gears.

3. The retractor as claimed in claim 1, further comprising:

a switch provided on the base; and

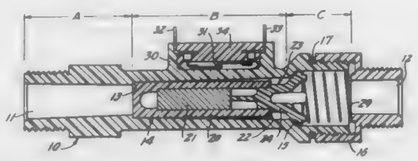
switch actuator means for actuating said switch, said switch actuator means being formed on said second internal gear.

4,996,396

FLOW SWITCH

Ronald J. Smith, Shelton, Conn., assignor to Imo Industries, Inc., Princeton, N.J.

Filed Oct. 30, 1989, Ser. No. 428,933
Int. Cl.[5] H01H 35/38
U.S. Cl. 200—81.9 M 15 Claims



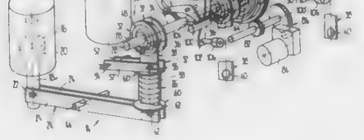
1. A magnetically operated flow switch, comprising a tubular body of magnetically-transparent material and having an elongate bore extending downstream between an inlet port and an outlet port, a piston guided for longitudinal displaceability in a first longitudinal portion of said bore, said piston containing a permanent-magnet element and having at least one longitudinally continuous flow-channel formation in its outer surface, said bore having a second longitudinal portion that is downstream from said first longitudinal portion, said second longitudinal portion being enlarged with respect to said first longitudinal portion, and said bore being stepped between said first and second longitudinal portions, said piston having plural angularly spaced radially outward lug formations at its downstream end for limiting upstream displaceability of said piston beyond lug interference with the stepped portion of said bore, compressionally preloaded spring means retained within said second longitudinal portion and engaged to the downstream end of said piston to continuously urge the same toward a limit of upstream displaceability at lug engagement with the stepped portion of said bore, and a sealed magnetic-reed switch fixedly carried by said body at a longitudinal location having actuable relation to the field of said magnet in the course of its range of displaceability downstream from its said limit of upstream displaceability.

4,996,397

SPRING-FORCE DRIVE FOR A POWER SWITCH

Max Kuhn, Unterentfelden, and Rudi Schmidt, Kolliken, both of Switzerland, assignors to Sprecher Energie AG, Oberentfelden, Switzerland

Filed Feb. 22, 1990, Ser. No. 482,919
Claims priority, application Switzerland, Mar. 3, 1989, 00805/89
Int. Cl.[5] H01H 33/66
U.S. Cl. 200—144 B 12 Claims



1. A spring-force drive for a power switch, in particular a vacuum switch for medium-high voltage, said spring force drive comprising,

a drive shaft,

drive means for driving the drive shaft by a spring arrangement for switching on and off the power switch in the same direction of rotation of the drive shaft,

support means for releasably impeding the drive shaft from turning in a switch-off and a switch-on position,

at least one disk of a cam disk arrangement with a control cam mounted on the drive shaft acting with a pushing force on a reciprocating member connected operatively to at least one movable switch contact, the at least one disk being fixed in terms of rotation to move the reciprocating member to and fro between two final positions,

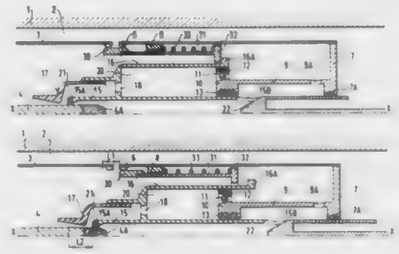
the at least one disk having at least one groove forming the control cam running around the drive shaft and being open in the direction of the drive shaft for acting on the reciprocating member with a pulling force.

4,996,398

MEDIUM TENSION CIRCUIT BREAKING HAVING HIGH NOMINAL CURRENT

Denis Dufournet, Bron, and Michel Perret, Tramole, both of France, assignors to GEC Alsthom SA, Paris, France

Filed May 21, 1990, Ser. No. 525,589
Claims priority, application France, May 19, 1989, 89 06554
Int. Cl.[5] H01H 33/88
U.S. Cl. 200—148 A 4 Claims



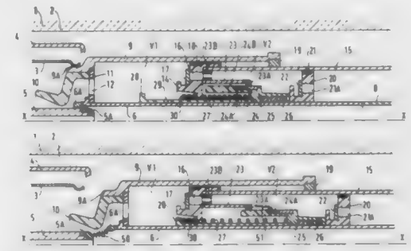
1. A dielectric blast gas circuit breaker comprising a main fixed contact, a main arcing contact, and moving equipment including, in particular, a moving arcing contact and blast means, wherein the circuit breaker includes a moving main contact which is disunited from said moving equipment and which is implemented by means of a short cylindrical element associated with means communicating a speed thereto during circuit breaking which is lower than the speed of the moving equipment.

4,996,399

HIGH OR MEDIUM TENSION CIRCUIT BREAKER

Edmond Thuries, Pusignan; Denis Dufournet, Bron, and Michel Perret, Tramole, all of France, assignors to GEC Alsthom SA, Paris, France

Filed Jul. 3, 1990, Ser. No. 547,276
Claims priority, application France, Jul. 4, 1989, 89 08975
Int. Cl.[5] H01H 33/88
U.S. Cl. 200—148 A 4 Claims



1. A circuit breaker for high and medium tension including insulation by means of a dielectric gas a puffer arc blasting, the circuit breaker comprising a gastight insulating casing, containing:

a fixed assembly comprising, in particular, a fixed main contact and a fixed arcing contact;

a moving assembly driven by a drive rod and including, in particular, a moving main contact and a moving arcing contact;

a first blast volume extended by a blast nozzle;

a blast piston; and

first and second secondary contacts disposed inside a second volume and designed to strike a secondary arc;

wherein the first secondary contact is fixed relative to the

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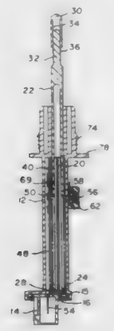
fixed assembly, the second secondary contact being semi-moving relative to the moving assembly, possessing its own source of energy for displacing it during a circuit breaker disengagement operation, and being provided with means for conferring a shorter stroke thereto than the stroke of the moving assembly.

4,996,400

SELF ADJUSTING SWITCH

Richard J. Ricci, and Wallace E. Gebhardt, both of Logansport, Ind., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Oct. 23, 1989, Ser. No. 425,545
Int. Cl.[5] H01H *13/02*
U.S. Cl. 200—345 **5 Claims**



1. A self adjusting switch having a stroke length which is adjusted and set automatically during installation, comprising:
a housing,
a plunger slidably fitted within said housing,
installation engagement means provided on said housing for selectively engaging said plunger and preventing axial movement of said plunger with respect to said housing during installation of said switch,
an adjustable cap fitted on an end portion of said plunger, said cap being axially adjustable in a single direction upon selective engagement of said engagement means with said plunger so as to adjust and set said stroke length; and
switch contact means operatively associated with said plunger.

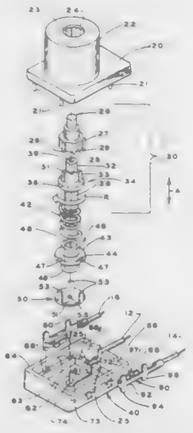
4,996,401

SWITCH

Sung-Taek Park, Inchon, Rep. of Korea, assignor to Prince Corporation, Holland, Mich.

Filed Jun. 29, 1989, Ser. No. 373,181
Int. Cl.[5] H01H *19/62*
U.S. Cl. 200—527 **14 Claims**

7. A push-button switch comprising:
a switch housing comprising an upper housing part and a lower housing part;
plunger means mounted in said housing for sliding movement along a first axis and including means for converting said sliding movement of a portion of said plunger means to a rotary movement around said axis;
a cylindrical contact holder receiving a moveable switch contact element, said contact holder including means for slideably receiving a portion of said plunger means and means for keying said holder to said position of said plunger means for rotation therewith, a first fixed contact member having a portion located below said contact holder; said moveable switch contact element including a first portion extending laterally from said first axis for continuous contact with said first fixed contact member below said cylindrical contact holder, said moveable contact element having a second end portion extending in an axial direction generally parallel to said first axis and adjacent the periphery of said cylindrical contact holder;
at least one second fixed contact member mounted in said housing on an inner wall of at least one of said upper and lower housing parts and in position to be selectively engaged by said second end portion of said contact element at a predetermined rotational position of said moveable contact element, said second fixed contact member being generally shaped to provide one leg of said second fixed contact member abutting the inner wall of said housing and another leg having a portion thereof spaced radially inwardly from said wall to engage said contact holder and selectively engage said second end portion of said move-



able contact element when aligned therewith; a spring located between said plunger means and said contact holder for biasing said laterally extending end portion against said first fixed contact element, and said other leg of said fixed second contact being resilient to bias and wipe said other leg over said second end portion of said contact member as said contact holder is rotated by pushing on said plunger means whereby a clean make-and-break connection is made between said second end portion of said contact element and said other leg of said second fixed contact member and a continuous biased electrical connection is made between said laterally extending first portion of said moveable contact element and said first fixed contact member.

4,996,402

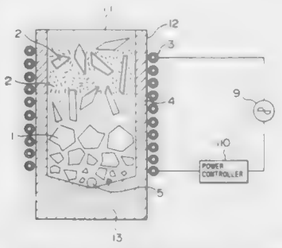
METHOD AND APPARATUS FOR CONTINUOUSLY MELTING MATERIAL BY INDUCTION HEATING

Hideo Hashida; Hideki Kanno, both of Tochigi; Senri Okada, Tokyo; Kokichi Nakamura, Tondabayashi, and Haruyoshi Sumimoto, Kyoto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,840
Claims priority, application Japan, Feb. 28, 1989, 01-045399
Int. Cl.[5] H05B *6/10*
U.S. Cl. 219—10.41 **25 Claims**

1. A method of continuously heating and melting a material, comprising the steps of:
forming a layer of one of a carbon material and an electrically conductive refractory material on a bottom of a furnace which is provided with a melt outlet adjacent said bottom and an inlet for said one of said carbon material and said electrically conductive refractory material in an upper portion of said furnace;
heating said layer by electromagnetic induction heating;

feeding the material to be melted onto the thus heated layer and heating and melting the material to be melted by electromagnetic induction heating;
substantially inhibiting air flow in said furnace during at least a part of the heating and melting of the material to be melted;
causing a melt of said material to flow out of said furnace through said melt outlet; and



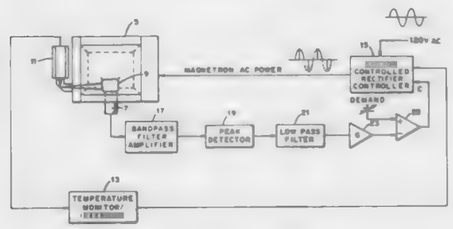
determining a value of a ratio between the quantities of heat to be supplied by said electromagnetic induction heating to said layer and said material to be melted, which value of said ratio is necessary to obtain a desired temperature of a melt of said material to be melted flowing out of said furnace; and
controlling said heat supplied by said electromagnetic induction heating so that said ratio is substantially equal to said determined value.

4,996,403

ACOUSTIC EMISSION FEEDBACK CONTROL FOR CONTROL OF BOILING IN A MICROWAVE OVEN

Terry L. White, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 5, 1990, Ser. No. 474,906
Int. Cl.[5] H05B *6/68*
U.S. Cl. 219—10.55 B **8 Claims**



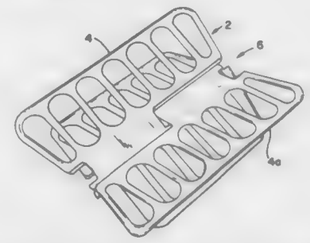
1. A system for controlling the boiling level of a liquid medium in a microwave applicator comprising:
a microwave applicator for microwave energy heating of a liquid medium contained therein to be boiled by means of microwave heating;
an acoustic emission sensing means for sensing the acoustic emissions from said liquid medium correlated with surface boiling thereof and generating a feedback signal having an amplitude proportional to the level of boiling of the medium;
a control signal generating means for comparing the amplitude of said feedback signal with the amplitude of a selected demand signal corresponding to a selected boiling level of said liquid to generate a control signal which varies with the difference in amplitude between said demand and said feedback signal; and
a power control means responsive to said control signal for automatically and continuously varying the power applied to said applicator to control the boiling level of said liquid medium contained within the applicator at said selected level corresponding to said demand signal.

4,996,404

COOKING APPARATUS FOR ROASTING FOOD

Robert B. Skerker, Buffalo, N.Y., and William Prindle, Santa Barbara, Calif., assignors to Robinson Knife Manufacturing Co., Inc., Springville, N.Y.

Filed Mar. 13, 1990, Ser. No. 493,139
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **13 Claims**



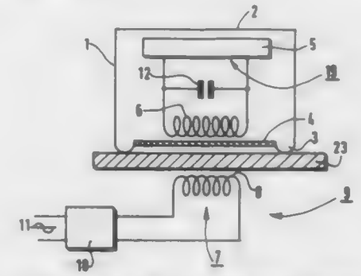
1. An apparatus for suspending a food product while cooking comprising at least two substantially planar grids and means for reversibly interlocking said grids together so as to form a trough for suspending the food product wherein each of the grids comprises a forward portion and a rearward portion, said portions being separated by said interlocking means, wherein when the grids are interlocked the rearward portions form the trough and the forward portions form a base supporting the trough.

4,996,405

INDUCTIVE HEATED PORTABLE HOT PLATE

Michel Poumey, Ecully, and Jacques Charvet, Voiron, both of France, assignors to Cableco and Etablissements Jean Charvet, both of, France

Filed Apr. 17, 1990, Ser. No. 510,048
Claims priority, application France, Apr. 18, 1989, 89 05378
Int. Cl.[5] H05B *6/12*
U.S. Cl. 219—10.493 **8 Claims**



1. A portable inductively heated electric hotplate and an inductive heating power source comprising, in combination,
a power source primary induction coil member connected to a source of AC electric power,
a glass ceramic plate mounted adjacent said primary induction coil to form a surface on the power source for receiving thereon a portable electric hotplate;
a portable electric hotplate having an outer heat conductive hotplate casing;
a casing top member forming a heating surface;
a base member made of an electrically insulating material;
at least one electrical resistor mounted adjacent said top

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casing member connected to a secondary electric circuit formed within said portable hotplate, said secondary electric circuit having a secondary induction coil member mounted adjacent said base member, connected in parallel with a capacitor;

said primary and secondary induction coil members being adapted to form a magnetic circuit for transfer of electromagnetic energy when said portable hotplate is positioned on said power source glass ceramic plate; and

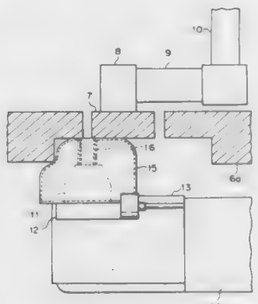
the values for the inductance of the secondary-inductance coil and for the capacitance of the capacitor in the secondary circuit being selected such that the oscillating circuit thus defined in the secondary circuit has a resonant frequency higher than that of the primary induction circuit of the heating power source.

4,996,406

CORE RETAINING APPARATUS FOR WIRE-CUT ELECTRO-DISCHARGE MACHINE

Yoshiro Nakayama, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 497,176
Claims priority, application Japan, Mar. 31, 1989, 1-80573
Int. Cl.[5] B23H *7/02*
U.S. Cl. 219—69.12 **11 Claims**



11. A wire-cut electro-discharge machine for machining a workpiece by virtue of an electro-discharge occurring between a wire electrode and said workpiece, said machine characterized in comprising:

a lower fluid supply nozzle disposed under said workpiece with said wire electrode passed therethrough for supplying a dielectric fluid between said wire electrode and said workpiece,

means movable between a machining area above said workpiece and a non-machining area for carrying out a core cutout of said workpiece from said machining area,

core retaining means disposed in the vicinity of said lower dielectric fluid supply means for retaining said core so that said core does not fall, said core retaining means being elastic and having a space therein, and

pressure control means for controlling the pressure inside said space to a desired value to hold said core in place.

4,996,407

PLASMA ARC TRANSFER CONTROLLER

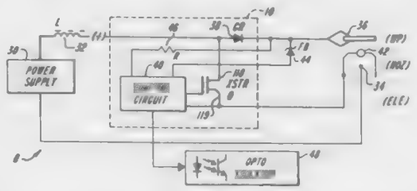
John C. Traxler, Sarasota, Fla., assignor to HyperPower, Inc., Sarasota, Fla.

Filed Apr. 3, 1989, Ser. No. 332,591
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.54 **28 Claims**

1. An apparatus for controlling transfer of a plasma arc originating at a cathode between a first and a second anode, said apparatus comprising:

means for providing an electrical current to said first anode, means for sensing a voltage difference between said first and said second anode, and

transfer control means, responsive to said voltage differential, for providing (a) all current to said first anode when said voltage differential is less than a specified value X, (b) all current to said second anode when said voltage differential exceeds a specified value Y, where Y is greater than X, (c) an increasing portion of said current to said second anode as said voltage difference increases between X and Y, and (d) an increasing portion of said current to said first anode as said voltage differential decreases between X and Y.

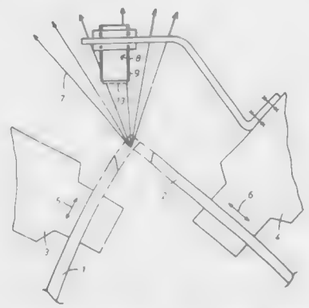


4,996,408

PROXIMITY SWITCH FOR USE IN WELDING FACILITIES

Werner Turck, Halver, and Hans Schumacher, Werdohl, both of Fed. Rep. of Germany, assignors to Werner Turck GmbH & Co., KG, Halver, Fed. Rep. of Germany

Filed Nov. 1, 1989, Ser. No. 430,014
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908821; Apr. 8, 1989, 3911598
Int. Cl.[5] B23K *9/10*
U.S. Cl. 219—130.01 **5 Claims**



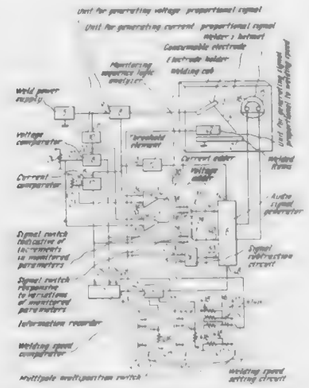
1. An electronic proximity switch means adapted to be operated in a non-contact mode for use in a welding zone of a welding means, the electronic proximity switch means including a brass housing, a ceramic disc provided on a responsive-sensitive end face of said switch means, and a coating of anti-stick material provided on a surface of the ceramic disc facing the welding means and on at least a front area of the housing facing the welding means for preventing a formation of a layer of material resulting from a welding operation on the ceramic disc and at least a front area of the housing.

4,996,409

ARC-WELDING MONITOR

Boris E. Paton, ulitsa Chkalova, 41a, kv.26; Vsevolod V. Vasiliev, prospekt 40-letia Oktyabrya, 82, kv.60; Valentin A. Bogdanovsky, Laboratorny pereulok, 22, kv.10; Konstantin V. Shelekhov, Saratovskaya ulitsa, 14/9, kv.31; Viktor M. Gavva, prospekt Marshala Koshevogo, 22, kv.117, all of Kiev; Vladimir D. Bigdash, Vasilkovsky raion, poselok Glevakha, Lesnaya ulitsa, 73, Kievskava oblast; Ivan A. Tabunschik, prospekt Chubarya, 36b, kv.12., and Andrei P. Ilchishin, pereulok Schorsa, 5a, kv.2, both of Kiev, all of U.S.S.R.

Filed Aug. 25, 1989, Ser. No. 398,829
Int. Cl.[5] B23K *9/095*
U.S. Cl. 219—130.01 **37 Claims**



1. An arc-welding monitor comprising:

a weld power supply having an output;

an audio-signal generator having first, second, third and fourth inputs and an output and generating audio signals dependent on arc-welding parameters;

a unit for generating a signal proportional to welding current, which has an output and an input connected to said output of said weld power supply;

a welding current comparator having a first input, a second input and an output; said first input connected to said output of said unit for generating a signal proportional to welding current; said second input receiving welding current setting signals;

a unit for generating a signal proportional to welding voltage, which has an output and an input connected to said output of said weld power supply;

a welding voltage comparator having a first input, a second input and an output; said first input connected to said output of said unit for generating a signal proportional to welding voltage; said second input receiving welding voltage setting signals;

a monitoring sequence logic analyzer having a group of inputs, first and second outputs; said group of inputs of said logic analyzer connected to said output of said welding current comparator and to said output of said welding voltage comparator; said logic analyzer comprising:

a first signal switch responsive to variations of monitored parameters, having a group of inputs serving as said inputs of said logic analyzer and an output serving as said first output of said logic analyzer and connected to said first input of said audio-signal generator;

a second signal switch responsive to incremental changes in monitored signals, having a group of inputs and an output serving as said second output of said logic analyzer and connected to said second input of said audio-signal generator;

a welding current adder having a first input connected to said output of said unit for generating a signal proportional to welding current, a second input combined with said second input of said welding current comparator, and an output connected to one of said group of inputs of said second signal switch;

a welding voltage adder having a first input connected to said output of said unit for generating a signal proportional to welding voltage, a second input combined with said second input of said welding voltage comparator, and an output connected to one of said g.oup of inputs of said second signal switch;

a first threshold element having an input connected to said output of said unit for generating a signal proportional to welding current, and an output connected to said third input of said audio-signal generator;

an information recorder having a first input connected to said output of said welding current comparator, a second input connected to said output of said welding voltage comparator, a third input and a fourth input; said recorder receiving signals indicative of variations of monitored parameters and of incremental changes in arc-welding parameters;

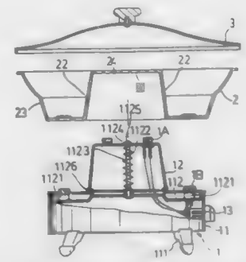
a welding operator's helment provided with a playback means connected to said output of said audio-signal generator and receiving, concurrently with said recorder, audio signals to effect audio monitoring of the arc-welding process.

4,996,410

DUAL PURPOSE CHAFING POT

Chung-Kuo Ho, 6th Floor, No. 137-6, Yu Hsi St., Yungho, Taipei Hsien, Taiwan

Filed Feb. 27, 1990, Ser. No. 485,912
Int. Cl.[5] F27D *11/00*
U.S. Cl. 219—432 **4 Claims**



1. An electric chafing pot having a base portion to provide heat and a pan for containing food detachable from said base portion, comprising:

a lower heating plate formed on said base;

a convex structure movably mounted in the center of said base;

an upper heating plate formed atop said convex structure;

said pan for containing food formed as a ring having a concavity formed in the middle of a bottom surface thereof to receive said convex structure of said base portion, said concavity having a top plate, said convex structure being biased by a spring support to tightly hold said top plate of said concavity to said upper heating plate enabling the pan to be supported by the upper and lower heating plates simultaneously.

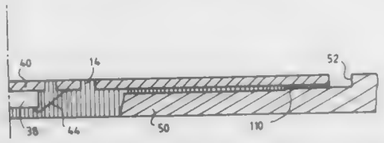
VOL 1123 ISS 4 FE 26 1991 UMI

4,996,411

METHOD OF MANUFACTURING A CARD HAVING ELECTRONIC MEMORY AND A CARD OBTAINED BY PERFORMING SAID METHOD

Alain Rebjock, Cergy, France, assignor to Schlumberger Industries, Montrouge, France

Filed Jul. 20, 1987, Ser. No. 75,485
Claims priority, application France, Jul. 24, 1986, 86 10753
Int. Cl.[5] G06K *19/02*
U.S. Cl. 235—488 **12 Claims**



1. The method of manufacturing an electronic memory card, comprising the steps of:
(a) providing a solid sheet element of electrically conductive material having a substantially planar set of electrical conductors which will be used to define electrical connections and external contact tabs for said memory card, said substantially planar set of electrical conductors having a first face and a second face;
(b) forming slots through said sheet element in order to define and separate conductive zones forming said electrical connections and said external contact tabs from one another, while leaving material which forms interconnecting bridges at the periphery of said sheet element between said conductive zones in order to hold said conductive zones together;
(c) fixing a semiconductor chip directly to said first face of said substantially planar set of electrical conductors in order to form an electronic module;
(d) providing a card body having a first main face and a second main face, said main faces being substantially mutually parallel, said card body having a housing which opens out at least into said first main face, said housing having a size and shape which is suitable for receiving said electronic module;
(e) placing said electronic module into said housing so that said second face of said substantially planar set of electrical conductors lies substantially in the same plane as said first main face of said card body;
(f) fixing said electronic module to said card body; and
(g) cutting said interconnecting bridges in order to electrically isolate said conductive zones from one another.

4,996,412

OPTICAL SYSTEM FOR WAVEFRONT COMPENSATION

David Anafi; John H. Mitchell, both of West Palm Beach, and Harold B. Schall, Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 7, 1989, Ser. No. 447,317
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.9 **5 Claims**



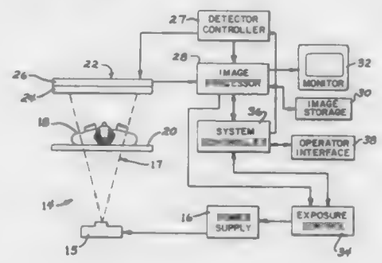
1. An optical system for controlling an optical beam train that transports a laser beam from a laser and directs said laser beam through the atmosphere at a target, comprising a first deformable mirror, disposed along a sample beam path of a first sample beam from said laser beam, for modifying said first sample beam, a laser beam sensor disposed to receive said first sample beam after reflection from said first deformable mirror, for detecting a phase front representative of said laser beam, an incoming beam sensor for detecting a phase front representative of an incoming beam entering said optical system after passage through the atmosphere, laser beam control means coupled to said laser beam sensor and to said first deformable mirror for controlling said first deformable mirror to compensate for errors in said phase front of said laser beam, and incoming beam control means coupled to said incoming beam sensor and to a second deformable mirror for controlling said second deformable mirror to compensate said laser beam for perturbations in the atmosphere;
in which optical system, beam sampling means for deflecting said first sample beam from said laser beam and a second sample beam from said incoming beam combine to direct both said first and said second sample beams on said first deformable mirror and thence to said laser beam sensor and said incoming beam sensor respectively, whereby said laser beam sensor and said incoming beam sensor both detect radiation reflected from and modulated by said first deformable mirror; and
said laser beam control means adjusts said first deformable mirror to compensate for errors in said laser beam, thereby impressing a compensating configuration on said first deformable mirror and a corresponding modulation on said second sample beam, so that said incoming beam control means controls said second deformable mirror in response to both said second sample beam and to said corresponding modulation.

4,996,413

APPARATUS AND METHOD FOR READING DATA FROM AN IMAGE DETECTOR

David L. McDaniel, Dousman, and Scott W. Petrick, New Berlin, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 27, 1990, Ser. No. 485,661
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 **19 Claims**



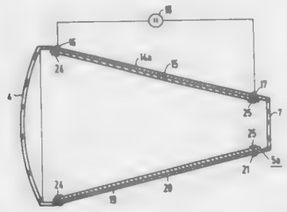
1. A method for reading image data from an array of photodetectors arranged in rows and columns comprising:
(a) sensing signals from the photodetectors in at least one row substantially at the center of the array;
(b) sensing signals from the photodetectors in at least one row on one side of a row from which signals were sensed during step a;
(c) sensing signals from the photodetectors in at least one row on the other side of a row from which signals were sensed during step a; and
(d) repeating steps b and c until signals from all of the rows of photodetectors have been sensed.

4,996,414

X-RAY IMAGE INTENSIFIER WITH ELECTRON OPTICS COATING

Richard Frank, Erlangen, and Fritz-Walter Hofmann, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 413,744
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 8812346[U]
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 VT **5 Claims**



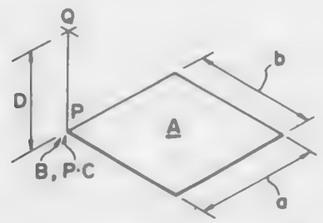
1. An x-ray image intensifier comprising:
an input luminescent screen with a photocathode,
an output luminescent screen;
a one-piece electrode substrate disposed between said input luminescent screen and said output luminescent screen and being attached vacuum tight thereto to form a vacuum vessel; and
electrode for an electron optics system consisting of electrical resistance material and forming a coating on a circumferential interior surface of said electrode substrate, said coating completely covering an area between said input luminescent screen and said output luminescent screen over the entire circumference of said interior surface and adapted for connection to a voltage source so that a potential field generated in a region in said vessel between said input luminescent screen and said output luminescent screen and said output luminescent screen continuously increases with increasing distance from said input luminescent.

4,996,415

APPARATUS FOR DETECTING THE PRESENCE AND POSITION OF AN OBJECT

Hirokazu Tanaka; Kiyomitsu Ishikawa, and Tohru Tanabe, all of Tokyo, Japan, assignors to Stanley Electric Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,849
Claims priority, application Japan, Sep. 22, 1987, 62-236209
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 **7 Claims**



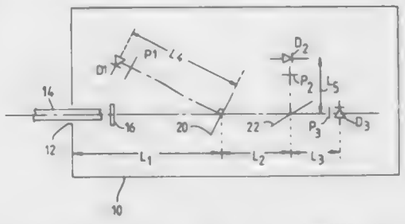
1. A photoelectric detector comprising first and second light sources having, respectively, different light emitting areas, and disposed to illuminate a common region of an object to be detected, photoelectric transducer means adapted to receive the light emitted from said first and second light sources and then reflected by the object, and a signal processing circuit functioning to separately process electric signals corresponding to said first and second light sources from an output of said photoelectric transducer means and to compare these two separately processed electric signals to each other so that presence or absence, and a position, of the object are detected on the basis of such comparison of said two electric signals, wherein each electric signal has a value representative of the intensity, at said transducer means, of light emitted by a respective light source and reflected by the object, and said signal processing circuit compares the intensity-representing values of the two signals.

4,996,416

OPTICAL DETECTION SYSTEM WITH MEANS FOR EQUALIZING AMBIENT LIGHT LEVELS AT MULTIPLE DETECTORS

Raymond J. Chaney, Berkeley, United Kingdom, assignor to Renishaw plc, United Kingdom

PCT No. PCT/GB88/00628, § 371 Date Mar. 24, 1989, § 102(e) Date Mar. 24, 1989, PCT Pub. No. WO89/01612, PCT Pub. Date Feb. 23, 1989
PCT Filed Jul. 29, 1988, Ser. No. 340,420
Claims priority, application United Kingdom, Aug. 7, 1987, 8718803
Int. Cl.[5] G01J *9/02*
U.S. Cl. 250—225 **8 Claims**



1. An optical detection system for providing information from a coherent light beam, comprising an ambient light limiting enclosure housing a plurality of photo-detectors and having an aperture in a wall thereof for receiving the coherent light beam, wherein the detectors are positioned at different places within the enclosure and an acceptance cone angle of light from said aperture is the same for each detector whereby a proportion of ambient light to coherent light reaching each detector is equalized.

4,996,417

COLOR FILTER DEVICE

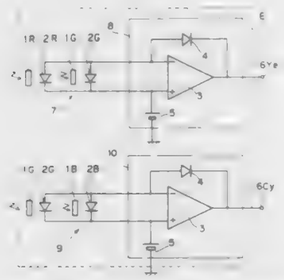
Kohji Shinomiya, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 403,878
Claims priority, application Japan, Jun. 13, 1989, 1-150883
Int. Cl.[5] G01J *3/50*
U.S. Cl. 250—226 **10 Claims**

1. A color filter device comprising,
a plurality of color filter elements each of which has individual filtering characteristic,
a photoelectric transfer circuit having a plurality of photodiodes electrically connected in paralled in pairs with said plurality of color filter elements, for synthesizing photoelectric currents caused by photoelectric transfer of the

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photodiodes and for outputting a resultant photoelectric current,



a current-voltage transfer circuit for transferring a current of a signal outputted from said photoelectric transfer circuit into a voltage thereof.

4,996,418

WIDE RANGE FIBER OPTICAL DISPLACEMENT SENSOR

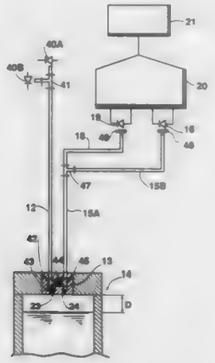
Katsuharu Iwamoto, Yokohama; Osamu Kawakami, Yokosuka, and Hideo Miyagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 127,983, Dec. 3, 1987. This application Aug. 28, 1989, Ser. No. 399,113

Claims priority, application Japan, Jan. 7, 1987, 62-000501; Dec. 27, 1988, 63-327901

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.11 **18 Claims**



1. A fiber optical displacement sensor for measuring displacement of a surface to be measured, comprising:

at least one light source means for providing a projection beam to be projected onto the surface to be measured and a reference beam which carries no information related to the displacement to be measured;

at least one projecting optical fiber for transmitting the projection beam to a vicinity of the surface to be measured and the reference beam;

at least one receiving optical fiber for transmitting a reflected beam resulting from reflection of the projection beam by the surface to be measured which carries information related to the displacement to be measured;

collimation means, attached to ends of the projecting and receiving optical fibers, for collimating the projection beam to be emitted from an end of the projecting optical fiber facing toward the surface to be measured and the reflected beam to be received by an end of the receiving optical fiber facing toward the surface to be measured;

at least one beam conversion means for converting the reflected beam and the reference beam into corresponding electrical signals; and

means for deriving the displacement to be measured in accordance with the corresponding electrical signals.

4,996,419

DISTRIBUTED MULTIPLEXED OPTICAL FIBER BRAGG GRATING SENSOR ARRANGEEMENT

William W. Morey, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 26, 1989, Ser. No. 456,441

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.18 **13 Claims**



1. An arrangement for determining the magnitudes of selected physical quantities at a multitude of spaced locations, comprising

an elongated optical fiber having a waveguiding core and including a multitude of separate longitudinally spaced Bragg sensing gratings of substantially identical initial periodicity for all of said sensing gratings, each of said sensing gratings being situated at a different one of the locations;

means for applying to said optical fiber longitudinal stresses the magnitude of which at each of the locations is dependent on the extent of deviation of the magnitude of the respective physical quantity being monitored at that particular location from its initial value, with attendant change in said periodicity;

means for launching light pulses into said core for propagation longitudinally thereof and for return from any of said sensing gratings of a detectable light echo at a central wavelength determined by instantaneous value of said periodicity of the respective sensing grating when the wavelength of the light reaching said respective sensing grating at least momentarily coincides with said central wavelength thereof;

means for so controlling the wavelength at which said launching means issues light as to coincide, at different times of a detection cycle, with at least all of said central wavelengths at which said sensing gratings return said echoes within the range of longitudinal stresses expected to be applied to said gratings by said applying means;

means for conducting said light echoes to a detecting location spaced from said optical fiber;

means for detecting said light echoes as they arrive at said detecting location and for issuing a series of detection signals in response thereto; and

means for allocating said detection signals to the respective sensing gratings on the basis of time intervals elapsed between the issuance of the respective light pulses and the arrival of said echoes responsive thereto at said detecting means, and to the respective longitudinal stresses applied by said applying means to said respective sensing gratings on the basis of the respective wavelengths of said light pulses in response to which said respective gratings return said echoes.

4,996,420

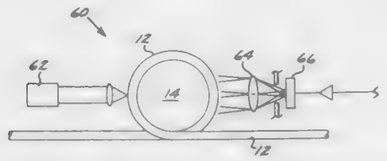
MEASUREMENT OF OPTICAL ATTENUATION ALONG THE LENGTH OF BENT OPTICAL FIBERS

Gary R. Redford, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 5, 1989, Ser. No. 417,370

Int. Cl.[5] H01J *5/16;* **G01N** *21/00*

U.S. Cl. 250—227.24 **15 Claims**



8. A process for simulating and measuring the optical signal attenuation of an optical fiber resulting from the introduction of curvature into the optical fiber during use, comprising the steps of:

bending a segment of a length of an optical fiber in a curved shape;

measuring the loss of transmitted light energy resulting from the curvature produces by the bending;

passing the length of the optical fiber progressively over the curved shape to bend successive segments of the optical fiber, while continuing to measure the loss of light energy from the optical fiber.

4,996,421

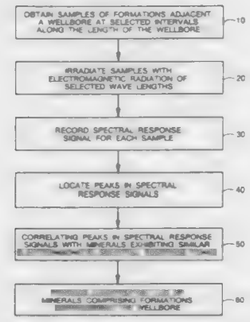
METHOD AND SYSTEM OF GEOPHYSICAL EXPLORATION

Chandra S. Rai, and Carl H. Sondergeld, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 264,926

Int. Cl.[5] G01N *21/35*

U.S. Cl. 250—255 **14 Claims**



1. A method of evaluating the composition of minerals comprising the formations surrounding a wellbore, comprising the steps of:

(a) obtaining a plurality of core samples of the earth's formations at selected intervals, corresponding to the minimum resolution interval of a selected geophysical method of survey, along the wellbore length;

(b) irradiating a portion of each core sample with electromagnetic radiation and recording a spectral absorption response signal representative of the electromagnetic radiation absorbed by said portion of each core sample;

(c) locating peaks in each spectral absorption response signal;

(d) identifying minerals in each core sample by correlating the peaks in each spectral absorption response signal with minerals exhibiting similar electromagnetic characteristic peaks; and

(e) producing a composition log of the minerals comprising the formations surrounding a wellbore along its length.

4,996,422

MASS SPECTROMETER

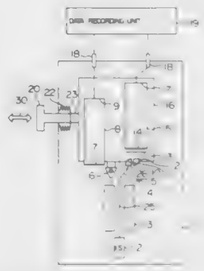
Yasuhiro Mitsui, Fuchu; Keiji Hasumi, Iruma; Shinichiro Watase; Katsumi Kuriyama, both of Koganei, and Kazuo Nakano, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Tokyo Electronics Co., Ltd., Ome, both of, Japan

Filed Jun. 1, 1989, Ser. No. 360,107

Claims priority, application Japan, Jun. 1, 1988, 63-132765

Int. Cl.[5] H01J *44/06*

U.S. Cl. 250—281 **11 Claims**



2. A mass spectrometer comprising:

mass separation means for separating ions in accordance with the mass of the ions and emitting the separated ions, wherein the emitted ions comprise at least one of positive ions and negative ions;

electron-multiplier means for detecting positive ions emitted from the mass separation means; and

photo-multiplier means for detecting negative ions emitted from the mass separation means;

wherein the electron-multiplier means detects the positive ions emitted from the mass separation means at an optimum positive ion detecting position; and

wherein the photo-multiplier means detects the negative ions emitted from the mass separation means at an optimum negative ion detecting position;

the mass spectrometer further comprising:

ion deflection means for deflecting the positive ions emitted from the mass separation means to the optimum positive ion detecting position, and for deflecting the negative ions emitted from the mass separation means to the optimum negative ion detecting position.

4,996,423

CHOP MODE OPERATED MASS SPECTROMETER FOR REDUCING THE EFFECT OF LINE SIGNALS

David A. Hanna, Boulder, Colo., assignor to Paradygm Science & Technologies, Inc., Boulder, Colo.

Filed Jun. 4, 1990, Ser. No. 532,448

Int. Cl.[5] H01J *49/02*

U.S. Cl. 250—281 **14 Claims**

1. A chop mode mass spectrometer comprising:

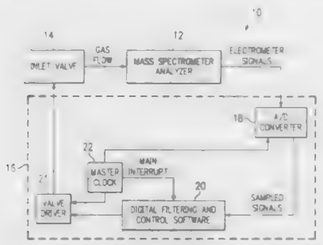
an analyzer body for processing a sample of a gas and providing a signal representative of the degree to which at least one type of molecule is present in said sample;

a valve for admitting said sample into said analyzer body, said valve being capable of periodic operation;

means for driving said valve at a first defined frequency, wherein said first defined frequency is a sub-multiple of a line frequency; and

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means for processing said signal to detect the component of said signal corresponding to said sub-multiple of a line frequency and reject the component corresponding to said line frequency.

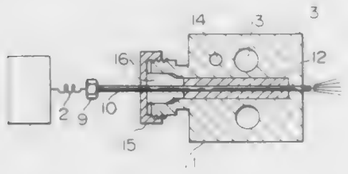


4,996,424

ATMOSPHERIC PRESSURE IONIZATION MASS SPECTROMETER

Tadao Mimura, Katsuta, and Yoshiaki Kato, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1990, Ser. No. 531,247
Int. Cl.[5] H01J *49/04*
U.S. Cl. 250—288 **8 Claims**



1. An atmospheric pressure ionization mass spectrometer, comprising:

an atomization section for heating and atomizing a sample carried by a mobile phase;

an ionization section for ionizing the atomized sample; and

a mass spectrometric analysis section for determining a mass of the ionized sample; and

said atomization section including a sample introducing pipe means provided therein with a plurality of thin holes for introduction of the sample for atomization, said thin holes extending along an axis of said sample introducing pipe means.

4,996,425

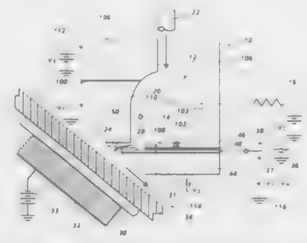
METHOD AND APPARATUS FOR INCREASING CORONA EFFICIENCY IN AN IONOGRAPHIC IMAGING DEVICE

Oscar G. Hauser, Rochester; Robert W. Anderson, Fairport, and Lawrence M. Hart, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 10, 1989, Ser. No. 391,742
Int. Cl.[5] H01T *19/00*
U.S. Cl. 250—325 **19 Claims**

1. In an ionographic imaging device including an ionographic head for depositing an image pattern of ions on an imaging surface, the ionographic head including an ion source held within an ion chamber formed in the head, a modulation channel extending generally from the ion chamber towards the imaging surface, through which ions pass in a stream for imagewise modulation prior to deposit on the imaging surface, and means for enhancing the efficiency of said ion source to increase the proportion of ions generated at the ion source that are directed through said modulation channel, said enhancing means comprising:

means for segmenting the head into a plurality of head regions, each region forming a portion of the ion chamber;



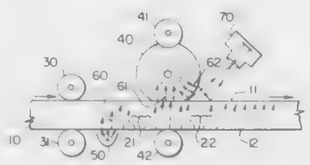
means for providing a voltage potential on each region, the voltage on each region selected so that the magnitude of an electric field extending outwardly from the ion source within the ion chamber is greatest in the direction of the modulation channel.

4,996,426

DEVICE FOR SUBSURFACE FLAW DETECTION IN REFLECTIVE MATERIALS BY THERMAL TRANSFER IMAGING

Paolo G. Cielo, Montréal; Xavier Maldague, Ste-Foy, and Jean C. Krapez, Longueuil, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Sep. 11, 1989, Ser. No. 407,160
Int. Cl.[5] G01N *25/72*
U.S. Cl. 250—330 **20 Claims**



1. A thermal-imaging apparatus for the non-destructive detection in a continuously moving workpiece of sheet material comprising:

means to change the temperature of a portion of a surface of the workpiece to a temperature different from its initial equilibrium temperature,

a continuously recyclable thermal transfer device having a movable surface, which movable surface has a high infrared emissivity and a low infrared reflectivity,

a device to press said thermal transfer device against said portion to provide good thermal contact between said movable surface and said portion whereby a thermal image of said portion is transferred to said movable surface, and

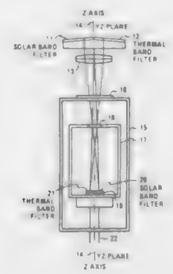
means to produce a thermal image of said portion from said movable surface of said thermal transfer device.

4,996,427

IMAGER FOR SIMULTANEOUSLY OBTAINING TWO IMAGES OF DIFFERING COLOR BANDS USING A SINGLE PHOTODETECTOR AREA ARRAY

Milton L. Noble, Liverpool, and Albert F. Milton, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 26, 1989, Ser. No. 456,498
Int. Cl.[5] H01L *31/00*
U.S. Cl. 250—332 **2 Claims**



1. An IR imager for simultaneously obtaining images of differing color bands of the same object field using a single two dimensional photodetector array, comprising:

(A) optical means at ambient temperature, comprising:

(1) a biprism positioned upon the Z axis of said imager, mutually orthogonal X and Y axes being orthogonal to said Z axis, said biprism upon which IR radiation from an object field of view impinges having on one face a plane surface and on the opposite face, two aperture halves with inclined surfaces separated by the YZ plane, the angles thereof being selected to converge IR radiation from each aperture half toward the YZ plane by a predetermined amount,

(2) a first pair of IR transmission filters, one filter for selecting IR radiation of a first color band from the radiation passing through a biprism aperture half on the first side of said YZ plane, and the other filter for selecting IR radiation of a second color band from radiation passing through a biprism aperture half on the second side of said YZ plane,

(3) an objective lens arranged upon said imager (Z) axis for forming an image of the object field in said first and second color bands on a photodetector array disposed in the focal plane, and

(B) a cryogenically cooled evacuated dewar enclosing the focal plane of said objective lens, and having an IR transparent window arranged upon said imager (Z) axis for admitting IR radiation into said dewar, said dewar containing

(1) a "cold shield" having a cold aperture arranged upon said imager (Z) axis between said objective lens and said focal plane,

(2) a second pair of IR transmission filters, the first filter which intercepts radiation impinging on the portion of the photodetector array lying on the second side of the YZ plane for selecting IR of said first color band and the second filter intercepting radiation impinging on the portion of the photodetector array lying on the first side of the YZ plane for selecting IR of said second color band; and

(3) a single two dimensional IR photodetector array arranged upon said imager (Z) axis in said focal plane, with the YZ plane bisecting said array, one pair of sides of which are aligned parallel to the X coordinate dimension,

the predetermined amount of convergence displacing said color band images in mutually opposite senses by one quarter of the X coordinate dimension of said photodetector array,

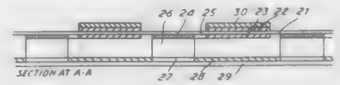
said array responding to IR radiation impinging thereon after convergence and after selection by said first and second pairs of filters, the first array half on the first side of the YZ plane responding to said object field in said second color and the second array half on the second side of the YZ plane responding to said object field in said first color.

4,996,428

THERMAL IMAGING DEVICE

Roger Voles, London, England, assignor to Thorn Emi Electronics Limited, Hayes, England

Filed Jun. 1, 1989, Ser. No. 359,881
Claims priority, application United Kingdom, Jun. 1, 1988, [illegible]
Int. Cl.[5] G01J *5/06, 5/02*
U.S. Cl. 250—332 **9 Claims**



1. A thermal imaging device comprising a layer of pyroelectric material and having first and second major surfaces; an array of interconnected electrodes on the first major surface of the layer; an array of discrete electrodes on the second major surface of the layer, a plurality of electrically conductive regions on the second major surface of the layer, each discrete electrode being separated from, but not substantially surrounding, a respective one of the electrically conductive regions, a plurality of elongate strips of electrically conductive material for electrically connecting respective discrete electrodes and electrically conductive regions on the second major surface; and a plurality of pillars, each extending from a respective electrically conductive region, for supporting the layer and for providing an electrically conductive path between the discrete electrodes and an electrical signal processing means via respective elongate strips and electrically conductive regions.

4,996,429

POCKET MEASURING INSTRUMENT FOR MEASURING IONIZING RADIATION

Werthmann Günter, Hemer, Fed. Rep. of Germany, assignor to Nokia Unterhaltungselektronik, Pforzheim, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 429,563
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 8813940[U]
Int. Cl.[5] G01T *1/16*
U.S. Cl. 250—336.1 **2 Claims**

1. An instrument, which can be carried in the pocket of a garment, for measuring ionizing radiation acting upon a person wearing the garment, said instrument comprising:

a longitudinally extending housing portion adapted to fit in a pocket;

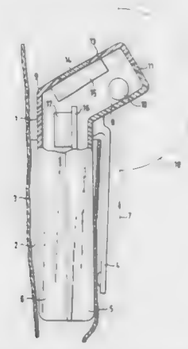
a forwardly projecting housing portion attached to the longitudinally extending housing portion and extending forwardly at a predetermined angle from the longitudinally extending housing portion in a direction away from the person;

a radiation detector located in a forwardmost portion of the forwardly projecting housing portion;

a display unit mounted in an upwardly facing wall of one of said housing portions and facing in a direction to be readable by the person when the instrument is carried in the

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pocket of a garment worn by the person, whereby the radiation detector is positioned in a forwardmost location



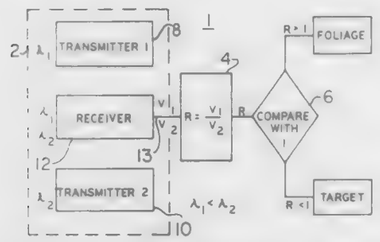
so as to receive radiation from a wide angle, unobstructed by the display unit or components in the housing.

4,996,430

OBJECT DETECTION USING TWO CHANNEL ACTIVE OPTICAL SENSORS

Neelam Gupta, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 2, 1989, Ser. No. 416,197
Int. Cl.[5] G01S *17/02*
U.S. Cl. 250—339 **12 Claims**



1. An apparatus for detecting objects which exhibit ratios of reflectance values at two separate wavelengths that are less than a predetermined value comprising:

means for transmitting a first signal having a wavelength lambda-1 along a first path;

means for transmitting simultaneously with the first signal a second signal having a wavelength lambda-2 where lambda-2 is different than lambda-1 along a second path which substantially intersects the first path at a single predetermined region along the first path;

means for sensing the first signal and second signal reflected off an object when the object becomes located substantially at the single predetermined region; and

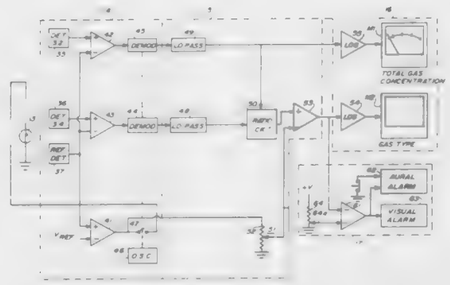
means for indicating when the object has a ratio of reflectance values calculated from the reflected first and second signals that is less than the predetermined value.

4,996,431

SELECTIVE GAS DETECTING APPARATUS

Ulrich Bonne, Hopkins, and Robert J. Matthys, Minneapolis, both of Minn., assignors to Gas Research Institute, Chicago, Ill.

Filed Feb. 10, 1989, Ser. No. 308,468
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.
Int. Cl.[5] G01N *21/61*
U.S. Cl. 250—343 **20 Claims**



1. A selective gas detecting apparatus for determining a concentration and type or average type of hydrocarbon gas in a gas sample based upon absorption of infrared radiation by the gas sample, comprising: means for passing infrared radiation through the gas sample, infrared radiation detecting means for detecting infrared radiation passed through the gas sample and producing in a first signal channel a first measurement signal indicative of a first wavelength absorbed by the gas sample, and producing in a second signal channel a second measurement signal indicative of a second wavelength absorbed by the gas sample, processing circuit means including first circuit means responsive to said first measurement signal for providing a first output signal corresponding to a first total concentration of hydrocarbons in the gas sample, second circuit means responsive to said second measurement signal for providing a second output signal corresponding to a second total concentration of hydrocarbons in the gas sample, ratio determining means responsive to said first and second output signals for providing a ratio signal corresponding to the ratio of said first and second output signals, said ratio signal being indicative of the type or average type of hydrocarbon gas, and display means responsive to said first output signal and said ratio signal for providing an indication of the concentration and type or average type of hydrocarbon gas in the gas sample, respectively.

4,996,432

RADIATION DETECTOR

Satoshi Saitou, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

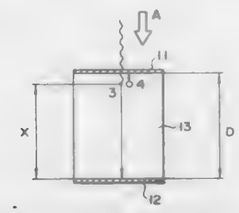
Filed Sep. 29, 1987, Ser. No. 102,489
Claims priority, application Japan, Sep. 30, 1986, 61-233470
Int. Cl.[5] G01T *1/24*
U.S. Cl. 250—370.01 **8 Claims**

1. A radiation detector comprising:

a semiconductor block made of semiconductor crystal material for converting incident photons into electrical charges, which has a first surface and a second surface, the second surface disposed opposite the first surface;

a first electrode fixed to the first surface, said first electrode being at least partially transparent to incident photons and means for connection to a ground for allowing the photons to pass therethrough into the semiconductor block; and

a second electrode fixed to the second surface, said second electrode including means for connection to a positive high voltage, and wherein



a distance D between said first and second electrodes is determined by $D>>1/\mu_i$;

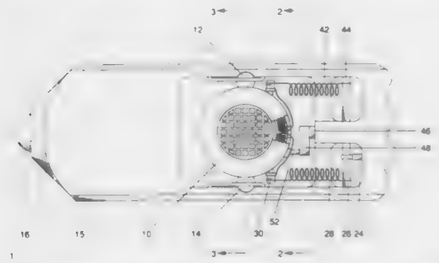
where μ_i is absorption coefficient of the detector.

4,996,433

SPECIMEN HEATING HOLDER FOR ELECTRON MICROSCOPES

Joseph S. Jones, Pleasanton, and Peter R. Swann, Diablo, both of Calif., assignors to Gatan, Inc., Pleasanton, Calif.

Filed Nov. 6, 1989, Ser. No. 431,402
Int. Cl.[5] H01J *37/20*
U.S. Cl. 250—443.1 **4 Claims**



1. An electron microscope specimen heating holder including:

(a) a specimen cradle within an orifice in the tip of the holder,

(b) bearing means retaining said specimen cradle within said orifice,

(c) tilting means whereby said specimen cradle may be tilted about an axis perpendicular to the long axis of the holder,

(d) a heater in good thermal contact with said specimen cradle, said heater being electrically connected to a first electrically isolated bushing and to a second electrically isolated bushing, the bushings being mounted on said specimen cradle,

(e) means to supply electrical current to a pair of electrically isolated pins mounted in the tip of the holder adjacent to said specimen cradle,

(f) a first spring having a first end hooked over one of the electrically isolated pins and a second end hooked over said first electrically isolated bushing, the length of said first spring being such that it is always in tension, and

(h) a second spring having a first end hooked over the second of the electrically isolated pins and a second end hooked over said second electrically isolated bushing, the length of said second spring being such that it is always in tension,

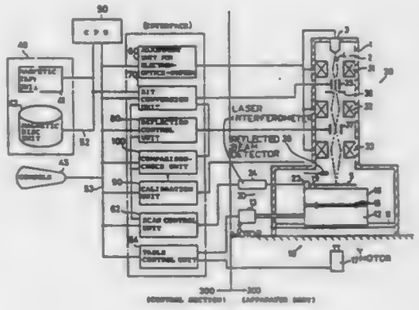
whereby when said specimen cradle is tilted by said tilting means the connections between the springs and the bushings, and the between the springs and the pins slide freely while maintaining good electrical contact thereby avoiding bending of the springs.

4,996,434

ELECTRON-BEAM LITHOGRAPHIC APPARATUS

Katsuji Tanaka, Numazu, Japan, assignor to Toshiba Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 71,037, Jul. 8, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 341,259
Claims priority, application Japan, Jul. 9, 1986, 61-161709
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.3 **12 Claims**



1. An electron-beam lithographic apparatus for exposing a plate to an electron beam which is selectively blanked on the basis of a set of design data, thereby writing a predetermined pattern over said plate to form a mask, and for checking the resultant mask, comprising:

image pattern data generating means for generating design pattern data indicative of a desired pattern for said plate;

means for exposing said plate using said design pattern data;

image detecting means for detecting electrons reflected from a mask disposed in place of said plate to pick up an image of a pattern formed on said mask;

picked up image data detecting means for receiving multiple bit digital picked-up image data from an output of said image detecting means in correspondence with said design pattern data; and

comparison-check means for automatically detecting a defect in said pattern formed on said mask, by comparing said design pattern data with said picked-up image pattern data, so that said mask is checked while said electron beam is being scanned,

wherein said comparison-check means includes:

multiple-bit pattern data generating means, storing sensitivity characteristic data which is indicative of a sensitivity of said image detecting means, for superimposing said design pattern data and said sensitivity characteristic data and generating multiple-bit digital design pattern data,

an image memory for storing therein multiple-bit image pattern data supplied from said picked-up image data detecting means; and

comparator means for comparing bits of said multiple bit digital design pattern data from said multiple bit pattern data generating means and said multiple bit digital picked-up image data from aid image memory, and for determining that no defect exits when said bits of said multiple bit digital design pattern data and said bits of said multiple bit digital picked-up image data agree.

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4,996,435

OPTICAL SYSTEM FOR TRANSMITTING DATA BETWEEN A STATIONARY PART AND A ROTATING PART

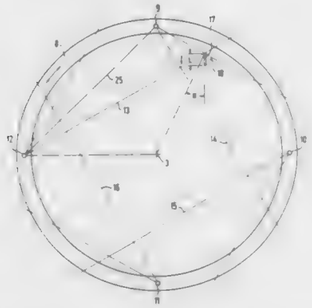
Walter Keller, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 451,800

Claims priority, application European Pat. Off., Feb. 6, 1989, 89101953

Int. Cl.[5] G02B *27/00*

U.S. Cl. 250—551 **3 Claims**



1. An optical data transmission system for transmitting data between a rotating part and a stationary part comprising:

a plurality of light transmitters arranged on a circle on said rotating part, each light transmitter emitting a thin, fan-shaped light-beam in a fan plane disposed in a plane defined by said circle or a plane parallel thereto, and each of said fan-shaped light beams having a central ray defining an angle with a radius of said circle intersecting an associated light transmitter; and

a light receiver disposed on said stationary part relative to said light transmitters so that light from at least one light transmitter is incident on said receiver at every position of said rotating part so that, given constant transmitted signals from said light transmitters during rotation of said rotating part, said light receiver generates a constant output signal.

4,996,436

AUTOMATIC APPARATUS FOR CONTROLLING THE SIZE OF WAFER-SUPPORTING BOATS

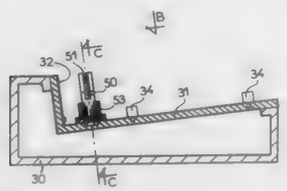
Jean P. Doeuvre, and Guy Mascarin, both of Meylan, France, assignors to French State represented by the Minister of Post, Telecommunications and Space, France

Filed Mar. 6, 1990, Ser. No. 487,899

Claims priority, application France, Mar. 7, 1989, 89 03422

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—560 **8 Claims**



1. An apparatus for controlling the size of a wafer-supporting boat such that the wafers maintained by the boat have to be positioned at predetermined distances from at least two specific utmost faces of said boat, comprising:

a slanted plane surface (31),

two reference surfaces (32),

guiding means (34) arranged in order that, when the boat is laid on said slanted plane surface, it may slide on it in such a way that said utmost faces normally abut against said reference surfaces,

at least one plane (50) provided with at least one reference groove portion (51) arranged so as to prolong according to their plane grooves supporting a wafer at a determined position,

whereby, when the utmost faces are abuting against said reference surfaces, a wafer can be inserted in its supporting grooves, and in the reference groove only if the size of the boat corresponds to a standard determined by the relative distances between the reference surfaces and the reference groove.

4,996,437

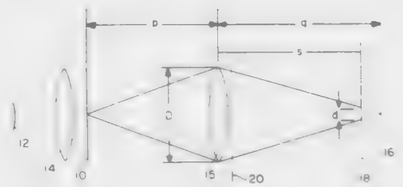
OPTICAL CLUTTER SCENE SIMULATOR

Roy W. Hendrick, Jr., Goleta, Calif., assignor to Mission Research Corporation, Santa Barbara, Calif.

Filed Oct. 25, 1988, Ser. No. 262,510

Int. Cl.[5] G01D *18/00*

U.S. Cl. 250—252.1 **17 Claims**



1. A system for generating a scene representing optical clutter of an atmospheric disturbance for testing the efficiency of object detecting sensors comprising:

a display source scene means;

means for projecting said display source scene means;

means focusing the projected display source scene means at a focal plane;

correlation function control means for producing an optical clutter display from said display source scene means on a plane displaced from said focal plane, whereby the effects of noise in generating said optical clutter display are substantially eliminated.

4,996,438

LINE IMAGE SENSOR WITH CONTROLLED PHOTOSENSITIVITY

Tatsuya Nagata, Niihari; Michihiro Watanabe, Tsuchiura; Eiichi Hara, and Takehiko Yamada, both of Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 393,955

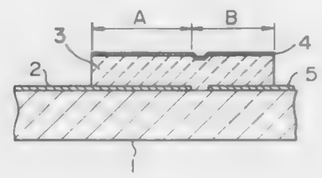
Claims priority, application Japan, Aug. 24, 1988, 63-208391

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—211 R **4 Claims**

1. A photoelectric transfer element comprising a substrate, a bottom electrode provide don said substrate, a photoconductive film provided on said bottom electrode, and a top transparent electrode provided on said photoconductive film, wherein

an electric field control electrode is provided to which is applied a voltage identical to the voltage applied to either said top transparent electrode or said bottom electrode which is used for photoelectric current detection.



4,996,439

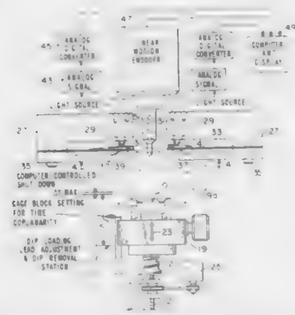
COPLANARITY INSPECTION MACHINE

Frank V. Linker, Springfield, Pa., assignor to American Tech Manufacturing, Corp., Glenolden, Pa.

Filed Oct. 27, 1989, Ser. No. 427,797

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **32 Claims**



1. A signal device for operation on a path, comprising:

a moveable reflector aligned to move along said path;

a light source and light detector positioned to provide a signal when light from source is reflected by said reflector to said detector at a predetermined location on said path; and

comparator means for comparing the location on said path of separate signals from an object and a reference object on said path.

4,996,440

DEVICE FOR MEASURING DIMENSIONS

Andreas Nordbryhn, Nilserudkleiva, Norway, assignor to Tomra Systems A/S, Asker, Norway

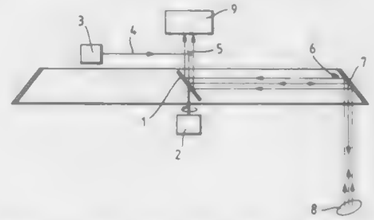
Filed Jun. 5, 1990, Ser. No. 533,360

Claims priority, application Norway, Jun. 22, 1989, 892596

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **18 Claims**

1. A device for measuring the distance to one or a plurality of regions of an object in order to be able to determine one or a plurality of dimensions of said object, a means for directing a light beam towards said object, a means for intercepting the light beams that are reflected from said object, and a means for calculating the travelling time of the beams to and from said object, characterized in a means causing the light beam to sweep across said object normally to a fixed reference plane during the entire sweeping operation, and with relative movement between the device and the object(s) to be measured, the light reflected by said object going back to an intercepting means, via said light beam sweeping means.



4,996,441

LITHOGRAPHIC APPARATUS FOR STRUCTURING A SUBJECT

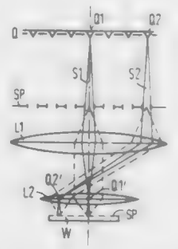
Burkard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 21, 1989, Ser. No. 395,976

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831526

Int. Cl.[5] H01V *37/317*

U.S. Cl. 250—492.2 **14 Claims**



1. A lithographic apparatus for structuring a subject with a plurality of particle probes, said apparatus comprising a beam generator composed of a plurality of sources for particle beams arranged in a line, and a first telecentric unit for focussing the particle beams to form particle probes onto the subject.

4,996,442

COMBINATION HOODSCOOP AND TACHOMETER

Mark Wayne, 29436 Briarbank Ct., Southfield, Mich. 48034

Continuation-in-part of Ser. No. 201,328, May 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 4,616, Jan. 20, 1987, abandoned. This application Feb. 9, 1989, Ser. No. 308,810

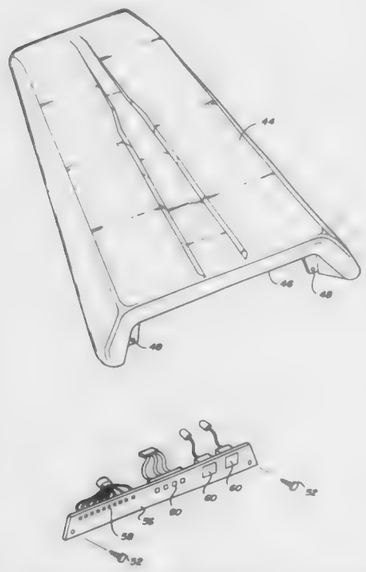
Int. Cl.[5] B60K *11/00, 37/00*

U.S. Cl. 307—10.100 **23 Claims**

1. In combination, a motor vehicle having a hood and a driver locus;

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a plastic hoodscoop affixed to said hood having a rear-facing portion visible from said locus; and



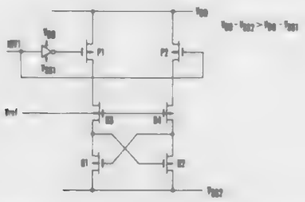
a removably insertable plate extending over substantially the entire rear-facing portion.

4,996,443

INTEGRATED CIRCUIT FOR LEVEL SHIFT

Tetsuya Tateno, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,813
Claims priority, application Japan, Mar. 7, 1988, 63-051545
Int. Cl.[5] H03K *17/10, 17/16, 17/687, 3/356*
U.S. Cl. 307—264 **10 Claims**



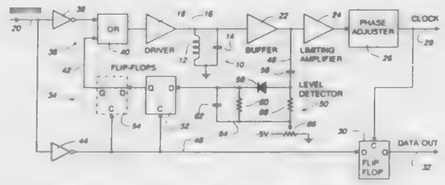
1. An integrated circuit for level shift, comprising a first series-connected circuit including a first MOS FET (P1) of one conductive type, a third MOS FET (N3) of another conductive type and a first MOS FET (N1) of the other conductive type which are connected in series in this order, and a second series-connected circuit including a second MOS FET (P2) of the one conductive type, a fourth MOS FET (N4) of the the other conductive type and a second MOS FET (N2) of the other conductive type which are connected in series in this order, said first series-connected circuit and said second series-connected circuit being connected in parallel to each other to constitute a parallel-connected unit, a gate of said first MOS FET of the one conductive type and a gate of said second MOS FET of the one conductive type being connected respectively to the output side and the input side of an inverter (INV1) connected to a low voltage electric power source, a gate of said third MOS FET of the other conductive type and a gate of said fourth MOS FET of the other conductive type both being connected to a reference voltage source (Vref), a gate of said first MOS FET of the other conductive type being connected to a common junction point of said fourth MOS FET of the other conductive type and said second MOS FET of the other conductive type, a gate of said second MOS FET of the other conductive type being connected to a common junction point of said third MOS FET of the other conductive type and said first MOS FET of the other conductive type, said parallel-connected unit being for connection to a high voltage electric power source (V_{DD}).

4,996,444

CLOCK RECOVERY CIRCUIT

Robert M. Thomas, Nepean, and Joseph P. R. M. Pigeon, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 21, 1989, Ser. No. 410,376
Int. Cl.[5] H03K *5/08;* **H04D** *9/00*
U.S. Cl. 307—269 **6 Claims**



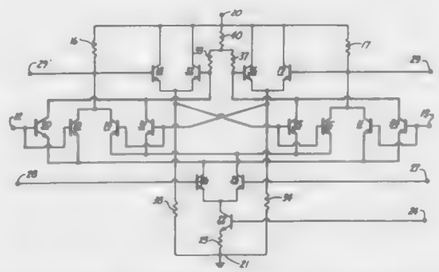
1. A clock recovery circuit comprising:
a resonant circuit for oscillation at a clock frequency;
output means, coupled to the resonant circuit for deriving a clock signal from the resonant circuit;
drive means coupled to the resonant circuit responsive to a data signal for driving the resonant circuit; and
inhibit means, coupled between the output means and the drive means, for inhibiting the drive to the resonant circuit in dependence upon an oscillation amplitude of the resonant circuit.

4,996,445

DISTURBANCE RESISTANT DATA STORAGE CIRCUIT

Stephen C. Y. Lin, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Ind.

Filed Jul. 13, 1989, Ser. No. 379,395
Int. Cl.[5] G11C *11/00;* **H03K** *3/29, 19/20*
U.S. Cl. 307—272.3 **11 Claims**



1. An improvement for a data storage circuit having first and second inputs, and first and second outputs, said data storage circuit also having first and second initial receipt control bipolar transistors, first and second initial complement control bipolar transistors, a receipt load means and a complement load means, said first initial receipt control bipolar transistor base being electrically coupled to said first input, said first and second initial receipt control bipolar transistors each having an emitter thereof electrically coupled to a first current determination means, said receipt load means electrically connected between a first terminal means suited for electrical coupling to a first source of voltage and both collectors of said first and second initial receipt control bipolar transistors which together are electrically coupled to said second initial complement control bipolar transistor at its base, said first initial complement control bipolar transistor base being electrically coupled to said second input, said first and second initial complement control bipolar transistors each having an emitter thereof electrically coupled to said first current determination means, said complement load means electrically connected between said first terminal means and both collectors of said first and second initial complement control bipolar transistors which together are electrically coupled with said second initial receipt control bipolar transistor at its base, said improvement comprising:
a first receipt drive bipolar transistor having both its collector and its base electrically coupled to said first terminal means;
a first complement drive bipolar transistor having both its collector and its base electrically coupled to said first terminal means;
first and second supplementary receipt control bipolar transistors with said first supplementary receipt control bipolar transistor having its base electrically coupled to said first input and said second supplementary receipt control bipolar transistor having its base electrically coupled to said first complement drive transistor at its emitter, said first and second supplementary receipt control bipolar transistors each having a collector thereof electrically coupled to said first receipt drive bipolar transistor at its base, and said first and second supplementary receipt control bipolar transistors each having an emitter thereof electrically coupled to said first current determination means; and
first and second supplementary complement control bipolar transistors with said first supplementary complement control bipolar transistor having its base electrically coupled to said second input and said second supplementary complement control bipolar transistor having its base electrically coupled to said first complement drive transistor at its emitter, said first and second supplementary complement control bipolar transistors each having a collector thereof electrically coupled to said first complement drive bipolar transistor at its base, and said first and second supplementary complement control bipolar transistors each having an emitter thereof electrically coupled to said first current determination means.

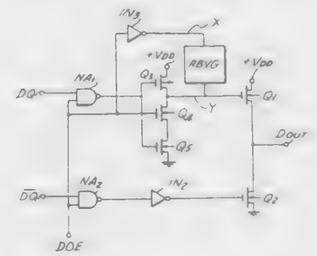
4,996,446

SEMICONDUCTOR DEVICE HAVING A REVERSE BIAS VOLTAGE GENERATOR

Kazuhiro Nakada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 27, 1989, Ser. No. 413,336
Claims priority, application Japan, Sep. 27, 1988, 63-242724
Int. Cl.[5] H03K *3/01, 17/16;* **G11C** *11/00*
U.S. Cl. 307—296.2 **9 Claims**

1. An output circuit comprising means for receiving a first input data signal; means for receiving a second input data signal complementary to said first input data signal; means for receiving an output enable signal taking one of first and second logic levels; a first output field effect transistor having a gate and a drain-source current path connected between a power voltage terminal and an output terminal, said power voltage terminal receiving a power voltage of a first polarity; a second output field effect transistor having a gate and a drain-source current path coupled between said output terminal and a reference voltage terminal receiving a reference voltage; a first gate circuit receiving said first input data signal and said output enable signal and having a first control node coupled to a gate of said first transistor, said first control node assuming one of logic levels corresponding to said first input data signal when said output enable signal is at said first level and a high impedance state when said output enable signal is at said second level; a second gate circuit receiving said second input data signal and said output enable signal and having a second control node coupled to a gate of said second transistor, said second control node assuming one of the logic levels corresponding to said second input data signal when said output



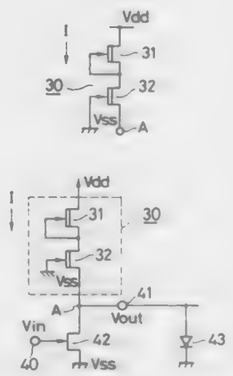
enable signal is at said first level and an inactive level making said second transistor non-conductive when said output enable signal is at said second level; and a reverse bias voltage generating circuit having a control node receiving said output enable signal and coupled to the gate of said first transistor and a bias output node, said bias output node being set at a bias voltage when said output enable signal is at said second level and at a high impedance state when said output enable signal is at said first level, said bias voltage being of the opposite polarity with respect to that of said power voltage.

4,996,447

FIELD-EFFECT TRANSISTOR LOAD CIRCUIT

Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 285,522, Dec. 16, 1988, abandoned.
This application Aug. 13, 1990, Ser. No. 568,521
Claims priority, application Japan, Dec. 18, 1987, 62-320647
Int. Cl.[5] H03K *3/353, 19/017*
U.S. Cl. 307—304 **12 Claims**



1. A field-effect transistor load circuit for use in an electronic circuit having a supply voltage terminal, a ground terminal, and a drive node for connection to a driving circuit, said field-effect transistor load circuit comprising:

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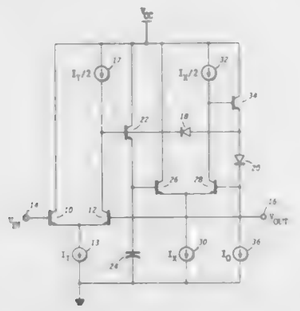
a first field-effect transistor of a normally-on type having gate and source electrodes coupled together; and
a second field-effect transistor of a normally-on type having a gate electrode connected to the ground terminal;
wherein said first field-effect transistor and said second field-effect transistor are connected in series between the supply voltage terminal and the drive node; and
wherein a transistor gain coefficient of said first field-effect transistor is less than a transistor gain coefficient of said second field-effect transistor.

4,996,448

LOW POWER PEAK DETECTOR/BUFFER WITH FAST CHARGE-UP TIME

Behrooz L. Abdi, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 27, 1989, Ser. No. 442,272
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—351 **8 Claims**



1. A circuit for providing an output signal at an output representing a most positive voltage level of an input signal applied at an input, comprising:
comparator means having a first input coupled to the input and a second input coupled tot eh output of the circuit for providing a current at an output thereof whenever the voltage of said first input exceeds a voltage appearing at said second input;
amplification means coupled to said output of said comparator means for amplifying said current of said comparator means;
capacitive means responsive to said amplification means for charging to the most positive voltage level appearing at the input of the circuit; and
buffer means coupled to said capacitive means for transforming a voltage developed across said capacitive means to the output of the circuit, said buffer means to a voltage substantially equal to a voltage appearing at the output of the circuit whenever the voltage level of the applied input signal is less than the voltage level of the output signal.

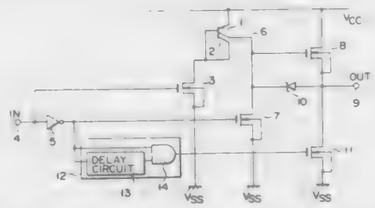
4,996,449

OUTPUT CIRCUIT HAVING HIGH SPEED OPERATION AND LOW POWER DISSIPATION

Masaji Ueno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1989, Ser. No. 380,335
Claims priority, application Japan, Jul. 19, 1988, 63-179682
Int. Cl.[5] H03K *19/02*
U.S. Cl. 307—446 **3 Claims**

1. An output circuit comprising:
a first MOS transistor, a source-drain path of which is connected between a first potential and an output terminal;
a level shift bipolar transistor connected between said first potential and a gate of said first MOS transistor;
a second MOS transistor, a source-drain path of which is connected between a control terminal of said bipolar transistor and a second potential, and a gate of which receives a first control signal;
a constant voltage element connected between the gate of said first MOS transistor and said output terminal;
a third MOS transistor having an element size smaller than that of a fourth MOS transistor, a source-drain path of said third MOS transistor being connected between a node of said gate of said first MOS transistor, a first collector of



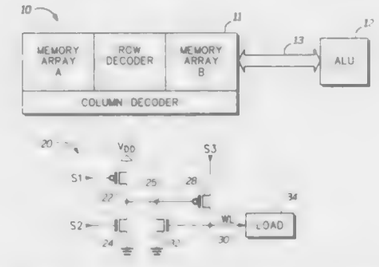
said bipolar transistor, and said constant voltage element, and said second potential, and a gate of said third MOS transistor receiving a second control signal which is an inversion of the first control signal; and
the fourth MOS transistor, a source-drain path of which is connected between said output terminal and said second potential, and a gate of which receives a third control signal obtained by delaying the second control signal by a predetermined period of time.

4,996,450

DATA PROCESSOR CIRCUIT AND METHOD FOR CONTROLLING VOLTAGE VARIATION OF A DYNAMIC NODE

Lloyd P. Matthews, Buda, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1990, Ser. No. 486,443
Int. Cl.[5] H03K *3/013, 3/353, 17/10, 19/046*
U.S. Cl. 307—449 **8 Claims**



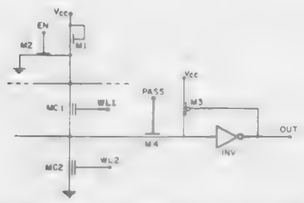
1. In a data processing system comprising an arithmetic unit for performing predetermined arithmetic operations, a memory for communicating operands with the arithmetic unit via a coupled communications bus, a circuit within the memory for controlling the voltage variation of a dynamic node, comprising:
a first transistor having a first current electrode coupled to a first voltage terminal, a control electrode for receiving a first control signal, and a second current electrode coupled to the dynamic node;
a second transistor having a first current electrode coupled to the second current electrode of the first transistor at the dynamic node, a control electrode for receiving a second control signal, and a second current electrode coupled to a second voltage terminal;
a third transistor having a first current electrode for receiving a third control signal, a control electrode coupled to the second current electrode of the first transistor at the dynamic node, and a second current electrode coupled to an output terminal for providing an output drive signal; and
a fourth transistor having a first current electrode coupled to the control electrode of the third transistor at the dynamic node, a control electrode coupled to the output terminal, and a second current electrode coupled to the second voltage terminal.

4,996,451

PROGRAMMABLE STATIC SELECTION CIRCUIT FOR PROGRAMMABLE DEVICES

Antonio Chiriatti, Reggio Calabria, and Marco Masini, Milan, both of Italy, assignors to SGS-Thomson Microelectronics srl, Milan, Italy

Filed Sep. 25, 1989, Ser. No. 411,661
Claims priority, application Italy, Oct. 6, 1988, 22219 A/88
Int. Cl.[5] H03K *17/22*
U.S. Cl. 307—468 **8 Claims**



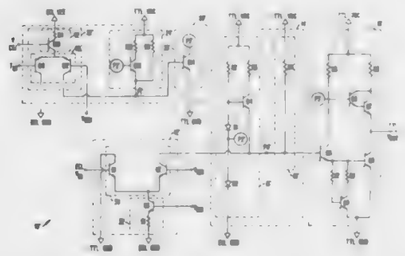
1. Programmable static selection circuit for programmable devices, characterized in that it comprises a pair of programmable cells connected in series, one of said cells conducting, the other being open, with one free terminal connected to the ground and the opposite free terminal coupled to a supply voltage; a threshold circuit having an input connected to the node between said two programmable cells, a switching threshold lower than the difference between said supply voltage and the threshold voltage of one of said programmable cells, and an output for assuming one of two logic levels depending on whether the voltage on the input is higher or lower than said threshold; and a first transistor connected between the ground and said opposite terminal of the pair of programmable cells, said transistor being normally off and having a gate which can be driven to make it conduct, wherein load means are connected between said opposite terminal of the pair of programmable cells and said supply voltage.

4,996,452

ECL/TTL TRISTATE BUFFER

Loren Yee, Milpitas, and Nguyen X. Sinh, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 15, 1989, Ser. No. 436,846
Int. Cl.[5] H03K *19/02*
U.S. Cl. 307—475 **14 Claims**



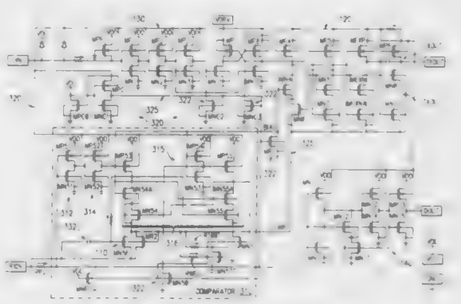
14. A circuit for translating tristate signals, which have a high voltage state and a low voltage state, and ECL level input signals, which have a high voltage state and a low voltage state, to TTL level output signals, which have a high voltage state, a low voltage state, and a high impedance state, the circuit comprising:
(a) ECL input means, responsive to the ECL level input signals, for generating an intermediate voltage signal corresponding to the ECL level input signals;
(b) a level shifter, coupled to the ECL input means, for maintaining the intermediate voltage signal in a desired range of voltages;
(c) TTL output means, coupled to the level shifter, responsive to the intermediate voltage signal, for generating TTL level output signals corresponding to the intermediate voltage, thereby providing TTL level output signals corresponding to ECL level input signals; and
(d) a tristate controller, coupled to the level shifter and the TTL output means, responsive to the tristate signal, for causing the TTL output means to enter a high impedance state, the tristate controller including:
(i) a tristate signal input circuit, responsive to the tristate input signals, for generating an intermediate tristate voltage signal corresponding to the tristate input signals;
(ii) a tristate control circuit, coupled to the tristate signal input circuit, responsive to the intermediate tristate voltage signal, for causing the TTL output means to enter a high impedance state; and
(iii) a tristate pull-up circuit coupled to the tristate control circuit, for preventing the intermediate tristate voltage signal from entering a constant low state.

4,996,453

POWER DOWN CIRCUIT FOR LOW-POWER CIRCUIT WITH DUAL SUPPLY VOLTAGES

Gary V. Zanders, Dallas, and Robert D. Lee, Denton, both of Tex., assignors to Dallas Semiconductor, Dallas, Tex.

Filed Jul. 28, 1989, Ser. No. 387,546
Int. Cl.[5] H03K *19/092*
U.S. Cl. 307—475 **21 Claims**



1. A low-power integrated circuit, comprising:
first, second, and third nodes for receiving first, second, and third power supply voltages, respectively, wherein said third node is connected to provide a common voltage, and wherein the difference between said first and third voltages is expected to be at least as large as the difference between said second and third voltages;
a first logic circuit coupled to said second and third nodes and to provide a digital output which
remains in a first state as long as a substantial difference exists both between said first and third voltages and also between said second and third voltages, but
assumes a second state if said second voltage approaches said third voltage while a substantial difference still exists between said first and third voltages;

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additional logic elements; and

a plurality of node-clamping transistors,

connected between said first logic circuit and said additional logic elements and to receive said digital output of said first logic circuit,

and to drive a respective plurality of nodes of said additional logic elements to respectively known voltages if said digital output of said first logic circuit assumes said second state.

4,996,454

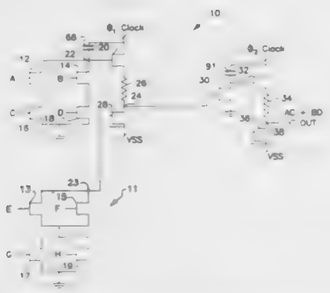
HOT CLOCK COMPLEX LOGIC

Andrezj Peczalski, Brooklyn Park; Julio C. Costa, and Jeffrey S. Conger, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1989, Ser. No. 374,196

Int. Cl.[5] H03K *19/017, 19/02*

U.S. Cl. 307—480 **12 Claims**



1. A very high frequency hot clock logic circuit that functions solely on power from clock signals and performs logic operations at rising edges of the clock signals, comprising:

first switching means, connectable to reference means, for receiving input signals for said logic circuit;

second switching means, connected to said first switching means and connectable to first clock means, for receiving signals from said first switching means;

first coupling means, connected to said second switching means and connectable to the first clock means, for coupling clock signals to said first switching means;

first variable attenuating means, connectable to second clock means, for receiving clock signals,

third switching means, connected to said second switching means and first variable attenuating means, and connectable to the reference means, for receiving signals from said first variable attenuating means; and

first output means, connected to said second and third switching means, for outputting signals from said second and third switching means.

4,996,455

INDUCTIVE ENERGY CONVERTER WITH SPACED WINDING CONTACTS

Markus Löffler, Unterluss, and Ulrich Braunsberger, Lengende, both of Fed. Rep. of Germany, assignors to TZN Forschungs- und Entwicklungszentrum Unterluss GmbH, Unterluss and Rheinmetall GmbH, Düsseldorf, both of, Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 480,500

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905059

Int. Cl.[5] F41E *1/00;* **G05B** *24/02;* **H02K** *3/04*

U.S. Cl. 310—12 **18 Claims**

1. An inductive energy converter, comprising:

a coil assembly having coil windings, at least some of said coil windings respectively having a plurality of spaced contact regions;

a contact bar disposed within said coil assembly and insulated from said coil windings; and

a conductive body which is in electrical contact with said contact bar and which is movably supported by said coil



assembly, wherein movement of said conductive body brings it into electrical contact with consecutive ones of said plurality of spaced contact regions to complete an electrical circuit between a respective one of said windings and said contact bar.

4,996,456

AXIAL RETAINERS FOR COATED ELECTROMAGNETIC ROTOR

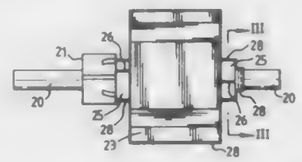
Georg Strobl, Repulse Bay, Hong Kong, assignor to Johnson Electric S.A., La Chaux de Fonds, Switzerland

Filed Dec. 1, 1989, Ser. No. 444,201

Claims priority, application United Kingdom, Dec. 2, 1988, 8828162

Int. Cl.[5] H02K *15/02;* **F16B** *2/00*

U.S. Cl. 310—261 **15 Claims**



1. A rotor for an electric motor, the rotor comprising a shaft of the motor and a laminated armature stack on the shaft and a collar mounted on the shaft, the collar abutting one end of the armature stack, wherein the collar is split radially on one side along its axial length and is formed from a cylinder having an internal diameter equal to or slightly less than the outer diameter of the shaft, whereby a space is formed between the shaft and collar, and a structural coating fills the space and glues the collar to the shaft.

4,996,457

ULTRA-HIGH SPEED PERMANENT MAGNET AXIAL GAP ALTERNATOR WITH MULTIPLE STATORS

Robert A. Hawsey, Oak Ridge, and J. Milton Bailey, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 28, 1990, Ser. No. 500,353

Int. Cl.[5] H02K *1/28, 21/24*

U.S. Cl. 310—268 **19 Claims**

1. An ultra-high speed, permanent magnet, axial-gap alternator for supplying a load, which comprises:

a rotatable shaft having an axis;

means for rotating said shaft around said axis at a selected speed;

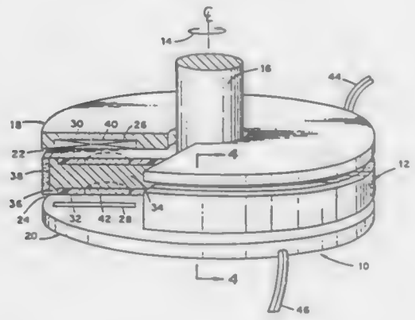
a disk-type rotor member fixedly attached to said shaft so as to rotate with said shaft, said rotor member having first and further parallel surfaces perpendicular to said axis, said rotor member fabricated from laminated disk-type layers having

a. a central disk-shaped layer of a magnetic material extending from proximate said shaft to a peripheral edge,

b. a first layer of a non-magnetic material joined to a first surface of said central layer, said first layer of non-magnetic material defining said first surface of said rotor member,

c. a second layer of non-magnetic material joined to a second surface of said central layer, said second layer of non-magnetic material defining said second surface of said rotor member,

d. a first set of an even number of magnets positioned within said first layer of non-magnetic material and arranged at a first common radius from said shaft, said magnets of said first set extending substantially from said first surface of said rotor member to said central layer of said rotor member, and



e. a second set of an even number of magnets positioned within said second layer of non-magnetic material and arranged at a second common radius from said shaft, said magnets of said second set extending substantially from said further surface of said rotor member to said central layer of said rotor member;

a first disk-type stator member positioned at close proximity to said first surface of said rotor member, said first stator member having a surface, facing said first surface of said rotor member, provided with equally-spaced radially extending slots, said slots containing winding members each electrically connected to a first output cable for said first stator member to connect said first stator member to a load 7; and

a second disk-type stator member positioned at close proximity to said further surface of said rotor member, said second stator member having a surface, facing said further surface of said rotor, provided with equally-spaced radially extending slots, said slots containing winding members each electrically connected to a second output cable for said second stator member to connect said second stator member to a load.

4,996,458

SHADOW MASK ASSEMBLY FOR COLOR CATHODE RAY TUBE

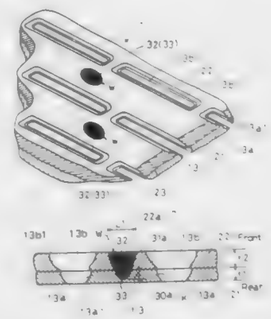
Atsushi Hattori, Nagaokakyo; Mabito Hanajima; Masaharu Moriyasu, both of Amagasaki; Toshikazu Iwamoto, and Kazuhiko Matsumoto, both of Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 366,179

Claims priority, application Japan, Jun. 17, 1988, 63-150509; Aug. 6, 1988, 63-196890; Aug. 6, 1988, 63-196891; Sep. 21, 1988, 63-237107; Oct. 31, 1988, 63-276814; Dec. 23, 1988, 63-327111

Int. Cl.[5] H01J *29/07*

U.S. Cl. 313—402 **10 Claims**



1. A laminated shadow mask assembly for use in a color picture tube including an evacuated envelope having a longitudinal axis and also having a phosphor deposited screen lying generally perpendicular to the longitudinal axis, which assembly comprises:

a finely perforated, laminated shadow mask having a plurality of apertures defined therein in a predetermined pattern;

a support frame for the support of the laminated shadow mask; and

expansion compensating couplings disposed around the support frame for connecting the support frame in position within the evacuated envelope with the laminated shadow mask held generally parallel to the phosphor deposited screen, said expansion compensating couplings being operable to compensate for a thermal expansion of the laminated shadow mask assembly thereby to compensate for a color displacement;

said finely perforated, laminated shadow mask comprising at least two perforated metal sheets each having a perforated area having minute holes defined therein and also having a non-perforated area, said minute holes in both of the perforated metal sheets forming the apertures in the finely perforated, laminated shadow mask when combined together;

said perforated metal sheets being connected together by means of plurality of weld deposits formed at least within the perforated areas thereof to connect said perforated metal sheets firmly together.

4,996,459

CATHODE RAY TUBE FOR COLOR DISPLAY

Hiroo Kobayashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaishi, Tokyo, Japan

Continuation of Ser. No. 803,507, Nov. 29, 1985, abandoned, Continuation of Ser. No. 543,620, Oct. 20, 1983, abandoned. This application Mar. 23, 1987, Ser. No. 29,341

Claims priority, application Japan, Oct. 29, 1982, 57-191203

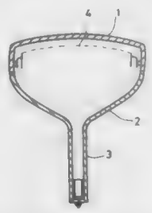
Int. Cl.[5] H01J *29/20, 29/86*

U.S. Cl. 313—467 **8 Claims**

1. A color cathode-ray tube for a color display, comprising

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a face glass coated with a plurality of phosphors different in luminescent color, said face glass containing a colorant imparting a selective absorption characteristic for absorbing light in wavelength regions between the luminescent wavelength regions of said phosphors, and a colorant suppressing the light transmittance in the visible region, wherein the light transmittances in those of the luminescent wavelength regions of said phosphors which are shorter than the highest-visibility wavelength region are at least about 5% lower than the light trans-



mittance in said highest-visibility wavelength region, while the light transmittances in the luminescent wavelength regions longer than said highest-visibility wavelength region are higher than the light transmittance in said highest-visibility wavelength region, said light transmittance in the highest-visibility wavelength region being suppressed to lie within the range of about 55–65%, said light transmittance in the luminescent wavelength region longer than said highest-visibility wavelength region being about 70%.

4,996,460

DC TYPE PLASMA DISPLAY PANEL

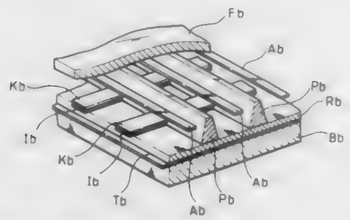
Dae-il Kim, and Woo-hyun Hwang, both of Suwon, Rep. of Korea, assignors to Samsung Electron Devices Ltd., Rep. of Korea

Filed Aug. 25, 1989, Ser. No. 398,439

Claims priority, application Rep. of Korea, Jul. 28, 1989, 89-10751

Int. Cl.[5] H01J *17/34*

U.S. Cl. 313—586 **2 Claims**



1. A plasma display panel comprising:
- a front plate and a rear plate spaced to provide a discharge space,
- a plurality of cathodes and anodes arranged between said plates in an X-Y matrix, said anodes being in proximity to said front plate and said cathodes being in proximity to said rear plate,
- a trigger electrode which triggers main discharges between said cathodes and said anodes, said trigger electrode being between said cathodes and said rear plate,
- a resistance layer on a surface of said trigger electrode and positioned such that a surface of said resistance layer is exposed to the discharge space, and
- an insulation layer between said resistance layer and said cathodes.

4,996,461

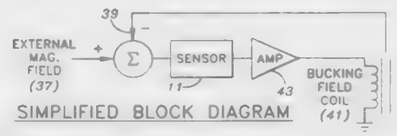
CLOSED LOOP BUCKING FIELD SYSTEM

Robert Bentley, Hacienda Heights, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 7, 1989, Ser. No. 404,147

Int. Cl.[5] H01J *29/06*

U.S. Cl. 315—8 **18 Claims**



1. A system for improving the operation of a cathode ray tube (CRT) by reducing interference caused by external electromagnetic fields comprising:
- a CRT having a CRT magnetic shield housing
- at least one electromagnetic field sensor disposed adjacent to an inner surface of the CRT magnetic shield, said sensor being formed to generate a reference electromagnetic field and to generate a sensor output signal in response to detection of both the reference field and an external field as sensed within the shield;
- a bucking field coil drive circuit in electrical communication with said field sensor, the bucking field drive circuit being operative to generate a bucking field drive signal responsive to said field sensor output signal; and
- a bucking field coil disposed circumferentially about said CRT and driven by said bucking field coil drive signal to generate a bucking electromagnetic field in opposition to the sensed external magnetic field, to oppose and reduce the degrading effects of the sensed external magnetic field on the operation of the CRT.

4,996,462

ELECTRONIC BALLAST FOR FLUOROSCENT LAMPS

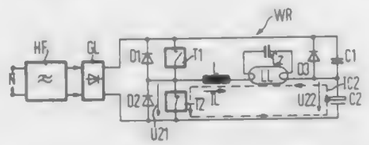
Peter Krummel, St. Georgen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 2, 1989, Ser. No. 360,782

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825513

Int. Cl.[5] H05B *37/02, 39/00;* **H02M** *7/5387*

U.S. Cl. 315—209 R **5 Claims**



1. An electronic ballast for fluorescent lamps, having an inverter that has its input side connected to an AC line via a series connection of a harmonic filter and a rectifier and that has its output side connected to at least one load circuit composed of a series circuit of an inductor and a parallel circuit composed of a capacitor and of a fluorescent lamp, whereby the inverter is fashioned as a switch bridge arrangement having two switch branches and two capacitor branches whose bridge terminals forming the output of the inverter are formed by the common junction of the two switch branches and by the common junction of the two capacitor branches, and whereby the two switch branches are composed of electronic switches having freewheeling diodes connected in parallel with the electronic switches, the switches being opened and closed in a push-pull fashion with a switching frequency that is high in comparison to the AC line frequency , comprising a storage capacitor required for the smoothing of the AC rectified line

voltage connected in one of the capacitor branches of the switch bridge arrangement; the storage capacitor having a value such that it is not fully charge-reversible at the line AC frequency, whereas another capacitor in the other capacitor branch has a freewheeling diode connected parallel thereto and is only of such a size that is fully charge-reversible at the switching frequency of the switches.

4,996,463

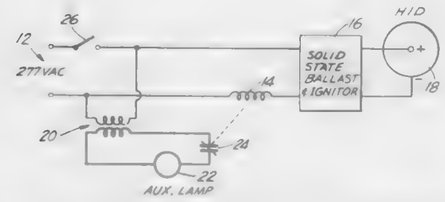
AUXILIARY LIGHTING SYSTEM FOR HIGH INTENSITY DISCHARGE LAMP

Victor Horowitz, 3359 Ocean Ave., Oceanside, N.Y. 11572

Filed Aug. 21, 1989, Ser. No. 396,552

Int. Cl.[5] H05B *41/14*

U.S. Cl. 315—250 **5 Claims**



1. In a high intensity discharge lamp control system having a solid state ballast and power input terminals, the auxiliary lighting arrangement for cold start and hot interrupt comprising:
- an auxiliary lamp, and
- auxiliary input terminals adapted to provide power to said auxiliary lamp,
- a relay having a coil and a pair of normally closed contacts,
- said relay contacts being in electrical series between said auxiliary lamp and said auxiliary input terminals to provide power to said lamp from said auxiliary input terminals,
- said coil being electrical series between said power input terminals and the input terminals to said solid state ballast,
- said relay contacts opening in response to the magnitude of input current to said ballast rising above a predetermined threshold to cut off power to said lamp from said auxiliary input terminals,
- said relay contacts remaining closed when the magnitude of input current to said ballast is at a relatively low level.

4,996,464

IGNITOR DISABLER

Peter G. Dodd, Scarborough, and Franklyn Harrison, Oakville, both of Canada, assignors to Cooper Industries, Inc., Houston, Tex.

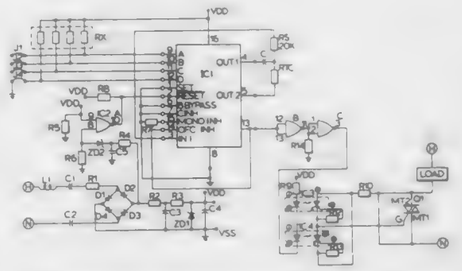
Filed Jun. 30, 1989, Ser. No. 374,647

Claims priority, application Canada, May 26, 1989, 600879

Int. Cl.[5] H05B *41/14*

U.S. Cl. 315—289 **11 Claims**

1. An ignitor disabler for use with a circuit for igniting a lamp, including an ignitor portion, wherein the lamp has a characteristic voltage which may vary during phases of lamp operation and wherein the lamp has a nominal operating voltage between 52 volts and 100 volts, comprising:
- (a) a bi-directional triode thyristor or triac which is connected in series with the common line and the ignitor connection point in such a manner that when the triac is turned off it prevents the ignitor from functioning;
- (b) a circuit connected between a power supply portion and the reset pin of an oscillator chip, the circuit including a zener diode biased such that its breakdown voltage exceeds the voltage at the input of the circuit under normal lamp operating conditions, the circuit being designed to generate an output voltage corresponding to a logic 0 upon sensing conduction by the zenner diode;
- (c) trigger means comprising:
  - (i) an oscillator chip with pin connections and associated circuit components such that an input voltage corresponding to a logic 0 at the reset pin of the oscillator chip causes an output voltage corresponding to a logic 1 to appear at the output pin of the oscillator chip after a predetermined period of time;
  - (ii) a buffer stage with input connected to the output pin of the oscillator chip; and
  - (iii) an opto-isolator circuit with input connected to the output of the buffer stage in such a manner that a logic 1 voltage generated at the output of the buffer stage when fed to the emitter side of the opto-isolator results in the opto-isolator circuit being turned off thereby engaging the disabling means.
- (d) a circuit with output connected to the reset pin of the oscillator chip, the circuit being designed to generate an output voltage corresponding to a logic 1 upon sensing lamp ignition being accomplished;
- (e) a power supply portion comprising:



  - (i) a first stage series resonant circuit connected across the lamp terminals designed to attenuate the high frequency harmonics generated by the high voltage starting pulses, from the lamp voltage and to reduce the voltage;
  - (ii) a second stage full-wave rectifier to receive the output from the first stage designed to generate a substantially direct current type, the voltage equivalent of which is dependent upon the lamp operating voltage, this substantially direct voltage signal forming the input signal for both the threshold establishing circuit and a third stage of the power supply;
  - (iii) a filtering third stage to receive the output from the second stage and designed to generate a signal which more closely approximates a direct current type signal;
  - (iv) a voltage regulating fourth stage to receive the output signal from the third stage and to generate a signal which more closely approximates a direct voltage-type signal;
  - (v) a filtering fifth stage to receive the output signal from the fourth stage and to generate a final signal in which substantially all of the alternating type components have been attenuated.

4,996,465

VARIABLE COLOR LIGHTING DEVICE

Tadao Uetsuki, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Jun. 22, 1989, Ser. No. 370,252

Claims priority, application Japan, Jun. 27, 1988, 63-158465; Nov. 16, 1988, 63-290781

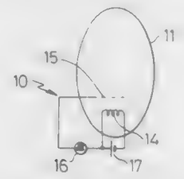
Int. Cl.[5] H01J *17/36*

U.S. Cl. 315—358 **3 Claims**

1. A variable color lighting device comprising:
- a light permeable tube, mercury vapor and neon gases having different ionization potentials V_1 and V_2, respectively, sealed in said tube,

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a thermionic emission type cathode disposed in said tube,
a heat source connected to said cathode for heating said cathode and causing electrons to be thermionically emitted from said cathode,
an electron permeating type anode also disposed in said tube spaced from said cathode by several mm to several cm,
a variable voltage power source means connected to said cathode and anode for applying voltages to said cathode and anode to impart varying accelerating energy to the



electrons and to ionize the respective gases in said tube to emit light of different color, said gases having a light-emission ratio which varies in accordance with the voltages applied to said cathode and anode to generate variable color light, p1 said variable voltage power source means being adjusted to apply a relatively higher voltage V_H and a relatively lower voltage V_L to said cathode and anode, the applied voltages V_H and V_L being in such relationship to the ionization potentials V_1 and V_2 of said gases that $V_1<V_L<V_2$ and $V_H>V_2$.

4,996,466

CIRCUIT FOR CONTROLLING A TAPE TENSION DURING SEARCH MODE

Hyun-Joon Su, Seoul, Rep. of Korea, assignor to SamSung Electronics, Ltd., Suweon, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,105

Claims priority, application Rep. of Korea, May 18, 1988, 1988-7366

Int. Cl.[5] B65H *59/38*

U.S. Cl. 318—6 **23 Claims**



1. A circuit for controlling a tape tension upon a search mode in a reel motor driving circuit which drives a reel motor in the search mode by receiving frequency generating signals according to a rotation of a take-up and a supply reel, said circuit comprising:
first multiplexor means for selectively outputting a frequency generating signal depending on the rotation of the take-up reel or the supply reel selected respectively by a forward signal or a reverse signal;
control means for synthesizing a unidirectional voltage from the frequency generating signal output by said first multiplexor means and a minimum bias voltage capable of driving said reel motor;
phase locked means for receiving and phase-locking the frequency generating signal from said first multiplexor means and generating a phase-locked output;
comparator means for comparing the synthesized unidirectional voltage generated by said control means with a predetermined reference voltage, and outputting a first control signal or a second control signal;
second multiplexor means for selecting the synthesized unidirectional voltage from said control means when the first control signal is output from said comparator means and for selecting the phase-locked output from said phase locked means when the second control signal is output from said comparator means; and
motor driver means for receiving the output from said second multiplexor means and for driving the reel motor.

4,996,467

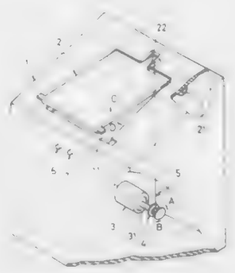
GARBAGE CONTAINER

Jong-Yih Day, 5F No. 5-1, Alley 62, Lane 166, Shih-Pai Rd., Taipei, Taiwan

Filed Dec. 22, 1989, Ser. No. 454,993

Int. Cl.[5] E05F *15/20*

U.S. Cl. 318—480 **2 Claims**



1. A garbage container comprising:
a container body having an opening;
a cover for covering said opening; a motor mounted on said container body, having an output shaft capable of rotating in both clockwise and counterclockwise directions;
a rotor fixed on said output shaft of said motor;
a control rope with one end fixed on said cover and the other end fixed and partially wound on said rotor;
an infrared ray transmitter for transmitting infrared ray to detect the presence of a user;
An infrared ray receiver for receiving the infrared ray reflected back and sending out a first signal and a second signal;
a first actuating circuit for receiving said first signal from said infrared ray receiver to actuate said motor to rotate said output shaft in a clockwise direction;
a second actuating circuit for receiving said second signal from said infrared ray receiver to actuate said motor to rotate said output shaft in a counterclockwise direction; a delay circuit connecting said infrared ray receiver and said second actuating circuit for delaying said second signal received from said infrared ray receiver so that when a user is present in front of said garbage container, said cover will open automatically and will close automatically after a predetermined time of the departure of the user.

4,996,468

AUTOMATED GUIDED VEHICLE

Bruce F. Field, Minneapolis, and Joseph G. Kasper, Golden Valley, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 222,894, Jun. 22, 1988, Pat. No. 4,846,297, which is a division of Ser. No. 101,508, Sep. 28, 1987, Pat. No. 4,790,402. This application Mar. 13, 1989, Ser. No. 322,103

Int. Cl.[5] G05D *1/03*

U.S. Cl. 318—587 **9 Claims**



1. A guided vehicle comprising drive means, steering means, a plurality of targets mounted along a desired path of the vehicle, manual control means connected to the vehicle and manipulable by an operator for controlling the drive and steering means, fault detection means for sensing conditions which preclude continued safe operation of the vehicle and controlling the drive and steering means in response thereto, computer control means for controlling the drive and steering means so as to cause the vehicle to traverse a programmed path and sighting means on the vehicle for successively sensing one of the targets and controlling the drive and steering means to maintain a specified relationship between the vehicle and the targets, the manual control means, fault detection means, computer control means and sighting means defining command types which are connected in a command hierarchy, in that order, wherein each command type can automatically take control away from any type following it.

6. A method of automatically guiding a vehicle to cause it to traverse a predetermined path, comprising the steps of placing a plurality of targets along the path, transmitting a light beam from the vehicle, detecting at the vehicle transmitted light reflected from one of said targets and defining a target-in-view signal when such light is detected, controlling the angle of elevation of the transmitted light beam, with reference to a horizontal plane, so as to maintain the target-in-view signal substantially continuously as the vehicle moves, detecting the direction from which reflected light is received, defining a reference line, comparing the detected light direction to the reference line to determine an heading error angle, steering the vehicle, when a target-in-view signal is present, so as to reduce the heading error angle to zero, and steering the vehicle in a straight line when no target-in-view signal is present, regardless of the heading error angle.

8. An automated guided vehicle having a frame, first and second drive wheels mounted on the frame, first and second motors for driving the wheels, a guidance system for guiding the vehicle along a predetermined path, the guidance system comprising a plurality of targets mounted along the path, sighting means on the vehicle for successively sensing at least one of the targets and its direction relative to the sighting means, and control means for steering the vehicle in response to the sighting means such that the vehicle maintains a specified relationship to the targets, the control means including first and second ramp circuits associated with the first and second motors, respectively, each ramp circuit having a plurality of selectable ramps for altering the motor speed at different rates depending on vehicle speed to provide two-wheel differential steering which makes prompt steering corrections without hunting.

4,996,469

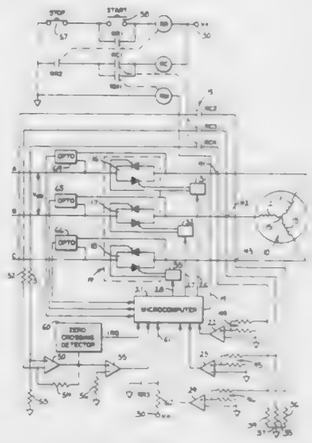
ELECTRIC MOTOR CONTROLLER WITH BYPASS CONTACTOR

Robert J. DeLange, St. Francis, and John C. Merrison, Wauwatosa, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Mar. 16, 1990, Ser. No. 495,018

Int. Cl.[5] H02P *3/18;* **H02D** *5/40*

U.S. Cl. 318—757 **11 Claims**



10. A method for controlling the speed of an electric motor which is selectively coupled to a three-phase source of alternating electricity by a contactor and three thyristor switch means, said method comprising:
activating the contactor to couple the motor to the source;
deactivating the contactor in response to a command to stop the motor;
thereafter triggering the thyristor switch means;
detecting the first one of the triggered thyristor switch means to become non-conducting;
retriggering the first one of the thyristor switch means; and
thereafter, sequentially triggering each of the thyristor switch means in a pattern which reduces the speed of the motor.

4,996,470

ELECTRIC MOTOR SPEED CONTROL APPARATUS AND METHOD

Timothy M. Rowan, and John C. Merrison, both of Wauwatosa, Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jul. 14, 1989, Ser. No. 380,050

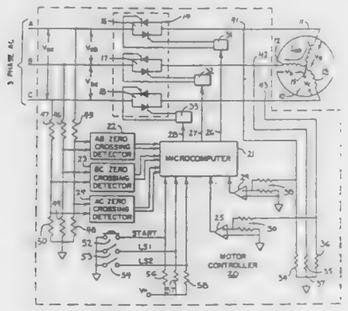
Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—772 **19 Claims**

1. An apparatus for controlling the speed of an electric motor which is supplied by a three-phase source of alternating electricity, the voltage of which has a frequency f, said apparatus comprising:
three bidirectional switch means, each coupling one of the phases of the source to a winding of the electric motor;
a brake means for reducing the speed of the motor to a predetermined level;
first means for detecting when the speed of the motor is below the predetermined level; and
first means for activating said switch means to apply electricity from the source to the motor in response to the

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speed of the motor being below the predetermined level, the activation producing a periodic pattern of current pulses which produce an effective alternating current



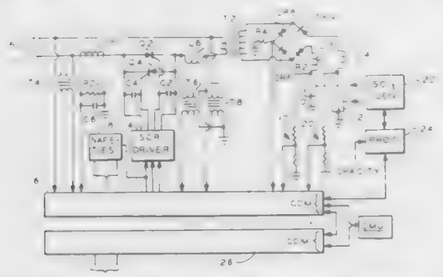
through the motor at a fundamental frequency component of the source voltage frequency, which is equal to $f/(6n+1)$ where n is a positive integer.

4,996,471

CONTROLLER FOR AN ELECTROSTATIC PRECIPITATOR

Frank Gallo, 188 Crescent Rd., Wanaque, N.J. 07465

Filed Feb. 28, 1990, Ser. No. 486,107
Int. Cl.[5] G05F *1/455*; B03C *3/68*
U.S. Cl. 323—241 **59 Claims**



1. A controller for controlling a precipitator, comprising:

a power modulator having a control terminal and being coupled to said precipitator, said power modulator being adapted to be powered by an alternating current, said power modulator being operable to regulate the drive to said precipitator in response to a control signal on said control terminal;

measurement means coupled to said precipitator for providing a plurality of measurement signals corresponding to a plurality of operating parameters of said precipitator; and

processing means having a program and being coupled to said measurement means and said power modulator for producing said control signal and for regulating said power modulator in response to said measurement signals, said processing means including:

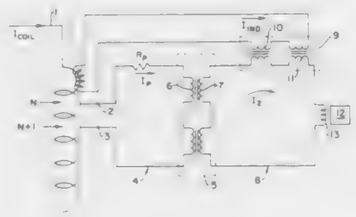
spark concurrence means responsive to at least one of said measurement signals for spark synchronously storing a sparktime signal having a magnitude corresponding to a given one of said operating parameters, said sparktime signal being distinctly stored and designated as a signal occurring during a spark, said processing means being operable to vary said control signal in response to said sparktime signal.

4,996,472

PASSIVE SUPERCONDUCTING QUENCH DETECTION SENSOR

George T. Mallick, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1989, Ser. No. 401,589
Int. Cl.[5] G01N *27/00*
U.S. Cl. 324—71.6 **23 Claims**



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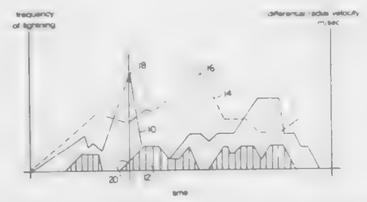
1. A passive superconducting sensor for detecting a quench in a superconducting coil having a plurality of voltage taps comprising: a first circuit having electrically connected in series two voltage taps of the superconducting coil, a series resistive element R_p, and a primary of a first transformer; a second circuit of superconducting elements having connected in series a secondary of the first transformer and a readout coil such that the second circuit is magnetically coupled to the first circuit by the first transformer, a readout device magnetically coupled to the readout coil for measuring a change in a current flow therein; and a second transformer having a superconducting secondary in series with the second circuit and being magnetically coupled to a primary winding in a loop circuit which detects flux changes in the superconducting coil.

4,996,473

MICROBURST/WINDSHEAR WARNING SYSTEM

Ralph J. Markson, Weston, Mass., and Bruce E. Anderson, Londonberry, N.H., assignors to Airborne Research Associates, Inc., Weston, Mass.

Continuation-in-part of Ser. No. 244,092, Sep. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 116,482, Nov. 2, 1987, Pat. No. 4,901,564, said Ser. No. 244,092, is a continuation of Ser. No. 897,214, Aug. 18, 1986, Pat. No. 4,801,942. This application May 17, 1989, Ser. No. 353,390
Int. Cl.[5] G01W *1/00, 31/02*
U.S. Cl. 324—72 **18 Claims**



1. A system for predicting the occurrence of microburst-/windshear comprising:

a. one or more sensors responsive to signals from a thunderstorm to generate sensor signals;

b. one or more data processors in communication with said sensors for processing the sensor signals to produce data;

c. a warning device responsive to the data produced by one or more of said data processors for warning a user that a microburst/windshear will occur within a defined number of minutes at a location defined by the data, when the data

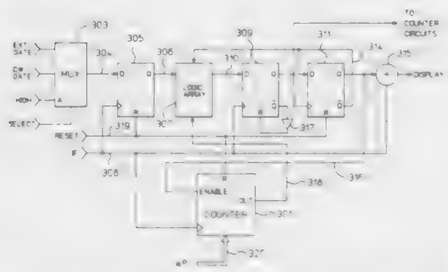
indicate that the lightning rate exceeds a first threshold value, the time rate of lightning increase exceeds a second theshold value and there is a peak in the lightning rate.

4,996,474

DIGITAL GATE GENERATION FOR A SIGNAL MEASUREMENT INSTRUMENT

Atul Tambe, San Jose; David Chu, Woodside, and Lee D. Cosart, III, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Pal Alto, Calif.

Filed Jul. 31, 1989, Ser. No. 388,214
Int. Cl.[5] G01R *23/02*
U.S. Cl. 324—78 D **10 Claims**



1. A circuit for providing a series of measurement gates relative to a repetitive input signal being measured, for performing a series of measurements to profile the frequency of the input signal, comprising:

logic means for providing an arming signal for arming the circuit to make a measurement;

means for generating a gate start signal in response the arming signal and to a signal indicative of the input signal being measured, the gate start signal synchronized to a selected event of the indicative signal;

means for generating a gate close signal in response to a signal indicative of the input signal being measured, a programmable integral number of indicative signal events after the gate start signal; and

means for sequentially incrementing the integral number after a measurement and signaling the arming means to provide an arming signal for performing another measurement.

4,996,475

ELECTRO-OPTIC VOLTAGE DETECTOR HAVING A TRANSPARENT ELECTRODE

Hironori Takahashi; Shinichiro Aoshima, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

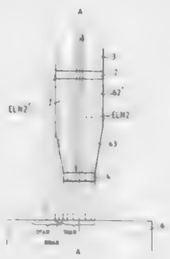
Filed May 31, 1988, Ser. No. 200,575
Claims priority, application Japan, May 31, 1987, 62-137055; Jun. 5, 1987, 62-142062
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—96 **8 Claims**

1. A voltage detector for detecting a voltage developing in a selected area of an object to be measured, comprising:

a light source for emitting a light beam;

a voltage sensing part including an electro-optic material whose refractive index changes according to said voltage developing in said selected area of said object, a reflection means disposed on a first side surface of said electro-optic material for reflecting an input light beam, said reflection means being a mirror made of a multi-layered dialectric film, and a transparent electrode disposed on a second side surface of said electro-optic material opposite to said first side surface;

splitting and extracting means for extracting a light beam with a first predetermined polarized component from a light beam introduced from said light source, said light beam being launched into said electro-optic material as said input light, and for extracting an output light beam with a second predetermined polarized component from an output light beam emerging from said electro-optic material after reflecting from said reflection means; and



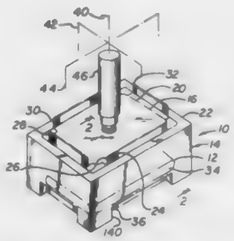
detection means for determining said voltage developing in said selected area of said object on the basis of intensity of said output light beam with said second predetermined polarized component.

4,996,476

TEST CLIP FOR SURFACE MOUNT DEVICE

Marik Balyasny, Burbank, and Kenneth B. Baldwin, Alta Loma, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Nov. 6, 1989, Ser. No. 432,093
Int. Cl.[5] G01R *31/02*; H01R *13/629, 23/72*
U.S. Cl. 324—158 F **8 Claims**



1. A test clip which can test an integrated circuit device having a body with an upper portion of predetermined size, a bottom that can rest substantially on face of a circuit board, and a plurality of leads extending outwardly largely away from said body from each of a plurality of said body sides, and that each have an outer lead part extending primarily vertically downwardly toward the circuit board over which said body lies, with said downwardly-extending lead parts having outer surfaces, comprising:

a clip housing with recess walls forming a recess that closely receives the upper portion of said circuit device body to locate said housing both horizontally and vertically with respect to said device body, said housing having contact-locating outer surfaces that lie slightly inward of said outer surfaces of said leads; a plurality of contacts mounted on said clip housing and having lower portions that each includes a first contact part that is biased inwardly against one of said contact-locating outer surfaces and a second contact part that extends below the corresponding contact-locating outer surface and that is positioned to be outwardly deflected by a corresponding outer lead surface as the clip housing receives the upper portion of said device housing, with the inner side of the bottom of each contact second part being tapered so it is outwardly deflected by a corresponding outer lead part.

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4,996,477

APPARATUS AND METHOD FOR TESTING ELECTRICALLY CONTROLLED MOTOR

Randall W. Keeler, and James L. King, both of Troy, Ohio, assignors to A.O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 26, 1989, Ser. No. 427,795
Int. Cl.[5] G01R *15/00, 15/12*
U.S. Cl. 324—158 MG 26 Claims



20. A motor fault unit for testing a motor having a controller selectively connecting said motor winding to an incoming power supply, said controller having an electrical operator for a controller connecting means between said motor winding and said power supply, comprising a separate power supply unit having a first line and a second line, a power switch unit having a first switch in said first line and a second switch in said second line, a power switch indicator energized with said switch closed, a control state indicator connected to said first line downstream of said power switch, a test connector including a first power connector and a second power connector and a control test connector connected to said control state indicator, and said test connector having first connection means connecting said first and second lines directly to said motor winding for operating said motor from said separate power supply unit, and said test connector having a second connection means connecting said first and second lines directly to said controller for energizing said operator and connecting said control state indicator in circuit with the first connecting means across said first and second lines for monitoring the state of said controller.

4,996,478

APPARATUS FOR CONNECTING AN IC DEVICE TO A TEST SYSTEM

Keith A. Pope, Milwaukie, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 5, 1990, Ser. No. 461,160
Int. Cl.[5] G01R *1/06;* H01P *1/04;* H01R *17/04*
U.S. Cl. 324—158 P 22 Claims

1. A coaxial probe mounting system comprising:
a circuit board having conductive runs thereon;
a frame member disposed adjacent to the circuit board and a coaxial probe assembly including:
a connector disposed within one end of the frame aperture and having a central conductor coaxially disposed with and electrically insulated from a cylindrical outer conductor by an insulating material, the cylindrical outer conductor and the central conductor at one end of the connector electrically connected to individual conductive runs on the circuit board and the other end having a portion of the insulating material removed forming a sleeve into which the central conductor extends, the cylindrical outer conductor having a rib formed therein extending into the sleeve; and
a removable coaxial probe disposed within the other end of the frame aperture and having a central conductor coaxially disposed with and electrically insulated from a cylindrical outer conductor by an insulating material, the outer conductor and the central conductor at one end of the



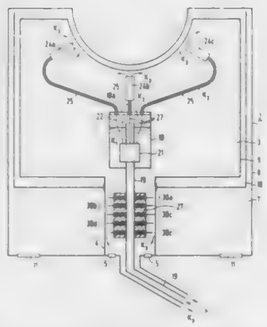
coaxial probe forming a coaxial probing tip and the other end having a notch formed in the cylindrical outer conductor for engaging the rib of the cylindrical outer conductor of the connector for securing the coaxial probe in the connector, the cylindrical outer conductor and the central conductor of the coaxial probe electrically contacting the respective outer conductor and central conductor of the connector.

4,996,479

MAGNETOMETER DEVICE WITH A DEWAR VESSEL FOR MEASURING WEAK MAGNETIC FIELDS

Eckhardt Hoenig, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 408,108
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831545
Int. Cl.[5] G01R *33/035;* A61B *5/05;* F17C *13/02*
U.S. Cl. 324—248 19 Claims



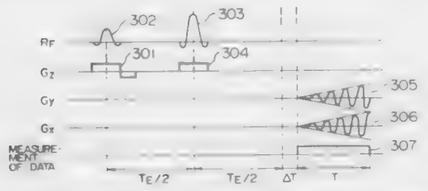
1. A magnetometer device for measuring weak magnetic fields, of at least one field source comprising:
a Dewar vessel arranged below or laterally to the at least one field source and having an interior region and a neck, said interior region being accessed via said neck;
an insertion vessel disposed in the interior region of the Dewar vessel in which liquid refrigerant can be retained;
a plurality of superconducting gradiometers and associated SQUIDs arranged in the interior region of the Dewar vessel, the SQUIDs being positioned in or at the insertion vessel;
a pipeline terminating in said insertion vessel and extending through the neck feeding liquid refrigerant through the neck from outside the Dewar vessel;
at least one hose line extending from the insertion vessel to the superconducting gradiometers feeding gaseous refrigerant to said gradiometers; and
a throttling device positioned in the neck for inhibiting warmer gaseous refrigerant from flowing back into the interior region, said pipeline extending through said throttling device.

4,996,480

IMAGE RECONSTRUCTING DEVICE FOR USE IN MAGNETIC RESONANCE IMAGING APPARATUS

Akira Maeda, Gardena, Calif.; Koichi Sano, Sagamihara, Japan; Tetsuo Yokoyama, Tokyo, Japan, and Hideaki Koizumi, Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 262,282, Oct. 25, 1988, Pat. No. 4,901,021. This application Oct. 6, 1989, Ser. No. 418,224
Claims priority, application Japan, Nov. 6, 1987, 62-279217; Oct. 7, 1988, 63-251762
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 8 Claims



1. An image reconstructing device included in a magnetic resonance imaging apparatus, the device comprising:
a plurality of magnetic field generating means for generating a static magnetic field, gradient magnetic fields and a high-frequency magnetic field, the static, gradient and high-frequency magnetic fields being applied to an object to be inspected;
means for controlling the output of each of the magnetic field generating means in accordance with a predetermined procedure;
means for measuring a resonance signal at a predetermined time while applying a gradient magnetic field whose strength varies with time, to the to-be-inspected object;
means for constructing a plurality of tomograms by carrying out image reconstruction processing peculiar to each of a plurality of chemical shift components, for the measured resonance signal; and
means for estimating tomograms corresponding to the chemical shift components from the constructed tomograms.

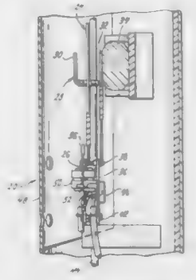
4,996,481

MAGNETIC RESONANCE RF PROBE WITH ELECTROMAGNETICALLY ISOLATED TRANSMITTER AND RECEIVER COILS

Joseph J. H. Ackerman, and Wei Chen, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Filed Aug. 7, 1989, Ser. No. 390,176
Int. Cl.[5] G01R *33/30*
U.S. Cl. 324—318 32 Claims

1. A probe for transmitting RF energy in an externally generated magnetic field and sensing a magnetic field induced in a sample by said transmitted RF energy, said probe comprising a transmitter coil and a receive coil mounted non-orthogonally thereto, each of said coils having a near field radiation pattern of a well defined RF magnetic field, and said coils having a specific geometric orientation such that no significant coupling



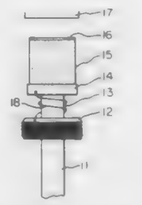
occurs therebetween as the coils radiate in each other's field and in the presence of said sample.

4,996,482

CAPACITOR STICK FOR NMR PROBE

Teruaki Fujito, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Sep. 20, 1989, Ser. No. 410,092
Claims priority, application Japan, Sep. 22, 1988, 63-124247[U]
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 2 Claims



1. In a sample coil arrangement for a nuclear magnetic resonance device wi&.h a capacitor stick arranged adjacent the sample and constituting part of the tuning circuit for the observation frequency, the improvement comprising:
(a) said capacitor stick having a chip capacitor spaced from a base electrode by an insulating means, and
(b) a compensating coil connecting the base electrode and the chip capacitor, said chip capacitor and compensating coil forming a series resonant circuit such that the resonant frequency corresponds to an NMR decoupling high frequency.

4,996,483

SPINNING ANGLE OPTICAL CALIBRATION APPARATUS

Stephen K. Beer, and Harold R. Pratt, II, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

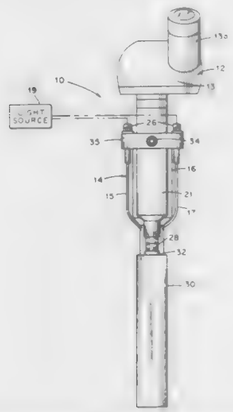
Filed Sep. 12, 1989, Ser. No. 406,004
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—321 16 Claims

1. An apparatus for enabling reproducing of spinning magic angles in nuclear magnetic resonance spectroscopy applications, said apparatus comprising:
(a) a spinning angle cross-polarization probe including a sample holder means for holding spinning test samples, said holder means including a reference mark thereon;
(b) positioning means connected to said sample holder means

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for enabling the angular position of the sample holder means to be varied; and

(c) viewing means, including at lest one reference, for permitting viewing of the reference mark of the sample



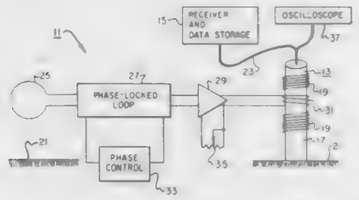
holder means relative to said at least one reference for the position of the sample holder means corresponding to the magic angle of the sample so that the sample holder means can later be returned to said position corresponding to the magic angle of the sample.

4,996,484

METHOD AND APPARATUS FOR CANCELLING POWERLINE NOISE IN GEOPHYSICAL ELECTROMAGNETIC EXPLORATION

Brian R. Spies, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1988, Ser. No. 291,687
Int. Cl.[5] H01Q *23/00*; G01V *3/08*
U.S. Cl. 324—334 **22 Claims**



1. An apparatus for cancelling a narrow band noise of known frequency in geophysical electromagnetic receiving equipment having a sensing antenna for receiving electromagnetic signals including said narrow band noise, comprising:

(a) a cancelling antenna located in proximity to said sensing antenna such that said cancelling antenna can create an electromagnetic field that is of equal amplitude to said narrow band noise as detected by said sensing antenna;

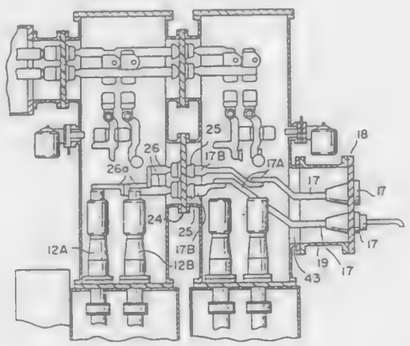
(b) alternating current means connected to said cancelling antenna for generating an alternating current in said cancelling antenna, said generated alternating current being of the same frequency as said narrow band noise, said generated alternating current in said cancelling antenna creating an electromagnetic field that is 180 degrees out of phase and of equal amplitude to said narrow band noise as detected by said sensing antenna.

4,996,485

GAS INSULATED SWITCH DEVICE

Kosaku Itai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 12, 1989, Ser. No. 448,859
Claims priority, application Japan, Dec. 14, 1988, 63-316926
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—415 **4 Claims**



1. A gas insulated switch device for electrically disconnectably connecting systems of line cables to a main line, comprising:

a first hollow cylindrical closed container having a window formed on a side wall thereof, the first container being filled with an electrically insulating gas;

a second hollow cylindrical closed container disposed adjacent and axially parallel to the first container and having a window formed on a portion of a side wall thereof opposing said window of the first container, said window of the second container being coupled and sealed to said window of the first container, the second container being filled with an electrically insulating gas, wherein the second container has a second window formed on another portion of the side wall thereof, said second window being closed by a detachable closure plate under a service condition and adapted to be coupled to a test tank including at least one test conductor;

a first system of line cables including at least one line cable having an end portion extending into said first container;

a second system of line cables including at least one line cable having an end portion extending into said second container;

disconnector means for electrically disconnectably connecting the line cables of said first and second systems of line cables to the main line;

connection conductor means for electrically connecting the line cables of said first and second systems of line cables; and

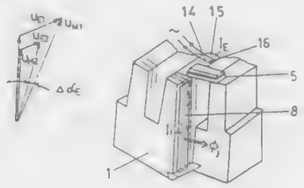
at least one branch conductor disposed within the first container and having one end projecting from the first into the second container via said windows of the first and second containers coupled to each other, the other end of the branch conductor being capable of being electrically coupled to the line cable of the first system of line cables, wherein said one end of the branch conductor projecting into the second container is adapted to be electrically coupled to the test conductor of the test tank when the test tank is coupled to the second window of the second container.

4,996,486

METHOD AND APPARATUS FOR INSPECTING LAMINATED IRON CORE STACKS FOR INTERLAMINATION SHORTS

Zlatimir Posedel, Neuenhof, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed May 30, 1989, Ser. No. 358,638
Claims priority, application Switzerland, May 30, 1988, 2043/88
Int. Cl.[5] G01R *31/06*
U.S. Cl. 324—545 **7 Claims**



1. A method of inspecting a laminated core stack of an electric machine for interlamination shorts, in which method the core stack is magnetized by means of an auxiliary winding and the laminated surface is scanned by means of a measuring coil arrangement with a downstream measuring instrument, which method comprises determining, by means of at least two electrically separated, radially spaced, but mechanically interlinked measuring coils of said measuring coil arrangement, the radial distribution of the magnetic field of the current (I_E) due to the interlamination short from at least on of the phase difference and the change in amplitude of the voltages (U_{M1}, U_{M2}) induced in the at least two measuring coils.

4,996,487

APPARATUS FOR DETECTING FAILURE OF THERMAL HEATERS IN INK JET PRINTERS

Ray A. McSparran, Charlotte; William S. Moore, Mooresville, and James R. Wooden, Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,058
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—549 **15 Claims**



1. Apparatus for detecting failure of a thermal jet printing device wherein said printing device includes a plurality of electrically actuated printing jets, each of said printing jets including electrical resistance heating elements to generate a bubble,

and wherein there is provided electrical means including power supply means to supply current to said resistance heating elements,

and control means to selectively connect said resistance heating elements to the power supply means in preselected arrays;

the improvement which comprises;

signal generating and detecting means nonlinearly coupled to said resistance heating elements in continuous active circuit relationship therewith, said generating and detecting means including means to generate a signal responsive to a detected resistance heating element which varies from a given value when said resistance heating elements are connected to said power supply means,

said control means being operably connectable to each of said resistance heating elements to selectively connect said resistance heating elements to the power supply for a selected test period of time;

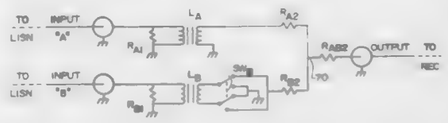
whereby either the failure or operation of a resistance heating element can be detected by the detection of a signal indicating increased resistance.

4,996,488

MEASURING AND LIMITING EMI WITH A SELECTABLE MODE REFLECTION NETWORK

Mark J. Nave, 11833 93rd Ave. North, Seminole, Fla. 33542

Continuation-in-part of Ser. No. 356,074, May 24, 1989, and a continuation-in-part of Ser. No. 103,398, Oct. 1, 1987, Pat. No. 4,849,685. This application Sep. 22, 1989, Ser. No. 411,276
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] G01R *27/00*
U.S. Cl. 324—613 **11 Claims**



1. Selectable mode rejection network (SMRN) useful in the measurement of electromagnetic interference (EMI) from electrical equipment powered from electrical transmission lines through respective line impedance stabilization networks (LISNs), by means of an EMI receiver (REC), such measurement being useful in the design of filters for limiting EMI conducted emissions (CE) to such lines, comprising

a pair of first circuit elements, each having a given first resistive impedance, adapted to connect in series between the respective transmission line LISNs and ground, and

a like pair of second circuit elements, each having a given resistive impedance unlike the first, connected respectively in series between such first circuit elements and a junction between them and the REC lead, and

another such second circuit element connected in series between such junction and such REC lead; and

phase-switching means between one of such first circuit elements and such junction adapted to switch between two positions,

being effective in one position to add CM CE from both lines and to cancel out DM CE from both lines, and

being effective in the other position to add DM CE from both lines and to cancel out CM CE from both lines.

4,996,489

LABORATORY TECHNIQUE FOR MEASURING COMPLEX DIELECTRIC CONSTANT OF ROCK CORE SAMPLES

Paul L. Sinclair, Clear Lake Shores, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Mar. 31, 1989, Ser. No. 331,332
Int. Cl.[5] G01R *27/04*
U.S. Cl. 324—639 **14 Claims**

1. A method of measuring the complex dielectric constant of a core sample obtained from a formation of interest comprising the steps of:

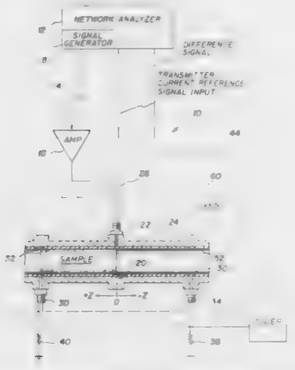
(a) placing a cylindrical core sample from a formation of interest in a first cavity at a specified temperature and pressure;

(b) positioning along a cylindrical wave guide

(1) a transmitter coil for forming an electromagnetic wave in the wave guide;

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(2) a first receiver coil spaced along the wave guide from the transmitter coil;
(3) a second receiver coil spaced along the wave guide from the transmitter coil;
(4) wherein the first receiver coil and transmitter coil define a first cavity; and
(5) wherein the second receiver coil is spaced oppositely the first receiver coil and defines a second cavity opposite the first cavity;



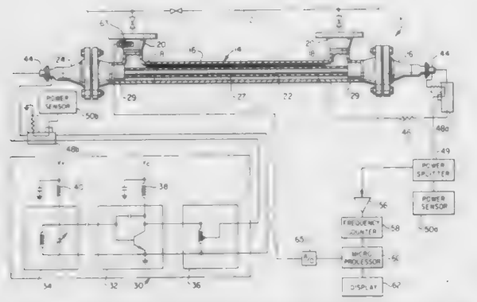
(c) transmitting a signal from the transmitter coil along the wave guide;
(d) forming first and second received signals at the first and second receiver coils; and
(e) responding to the first and second received signals to encode a dielectric measurement in the signal as a function of materials in the cavities.

4,996,490

MICROWAVE APPARATUS AND METHOD FOR MEASURING FLUID MIXTURES

Bentley N. Scott, Richardson, and Y. Sam Yang, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 932,068, Nov. 18, 1986, Pat. No. 4,862,060. This application Jul. 7, 1989, Ser. No. 376,782
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[5] G01R *27/04;* **G01N** *22/00*
U.S. Cl. 324—639 **17 Claims**



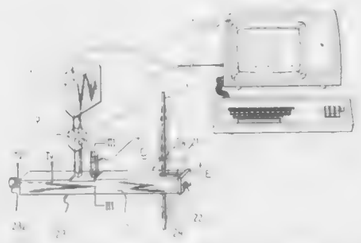
1. Apparatus for measuring the concentration of one fluid such as water in a fluid mixture which includes another fluid such as oil using the alteration of microwave energy characteristics, said apparatus comprising:
means forming a measurement section including means forming a coaxial microwave transmission line including an outer conductor comprising a conduit for said fluid mixture and a center conductor extending within said conduit;
means forming a sheath around said center conductor and having a low dielectric loss tangent so as to minimize the termination of an electrical field being propagated through the transmission line due to the conductivity of said fluid mixture; and
an oscillator circuit operably connected to said transmission line for generating microwave energy for propagation through said measurement section at an operating frequency which changes with a change in the complex impedance of the oscillator load which includes the properties of said fluid mixture in said measurement section.

4,996,491

MEASUREMENT OF THE POSITION OF AN ELONGATED ELEMENT

John Vandorpe, Zulte, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Jun. 7, 1989, Ser. No. 363,259
Claims priority, application European Pat. Off., Jul. 19, 1988, 88201564.7
Int. Cl.[5] G01N *22/00*
U.S. Cl. 324—644 **7 Claims**



1. A method for measuring the linear position of an elongated electrically conductive element, comprising the steps of:
(1) providing a transmission medium, the transmission medium comprising a microwave circuit having an emitter of microwaves and a receiver of microwaves, the medium having a pair of ends, the elongated element being positioned at a first end and a movable short being positioned at a second end;
(2) generating an asymmetrical standing wave by reflecting microwaves on the movable short and on the elongated element, the standing wave having a saw-tooth form with two substantially linear flanks, one flank being longer than the other; and
(3) determining the position of the elongated element by measuring with the receiver the amplitude of the longer flank.

4,996,492

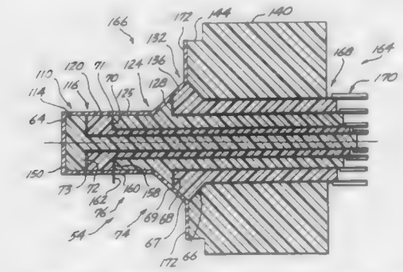
PROBE FOR INSPECTING COUNTERSUNK HOLES IN CONDUCTIVE BODIES

Patrick L. Anderson, Bellevue; Dennis P. Sarr, Kent, and Mark B. Simpson, Everett, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 7, 1989, Ser. No. 320,314
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—687 **24 Claims**

1. A probe for inspecting holes in conductive bodies, said probe comprising:
(a) a housing;
(b) a dielectric body attached to said housing for insertion into a hole having a selected diameter, said body having an outer surface with a diameter less than the selected diameter;

(c) at least one measuring electrode mounted in said body, said at least one measuring electrode having a tip located on the outer surface of said dielectric body suitable for forming a fringe field capacitor electrode;
(d) a dielectric shell covering said dielectric body including said at least one measuring electrode tip, said shell having a thickness such that the diameter of the outer surface of



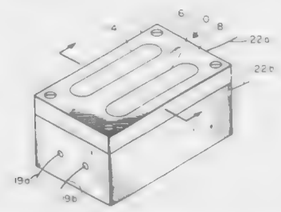
said shell is substantially equal to said selected diameter; and,
(e) a grounding electrode mounted in said dielectric body, said grounding electrode including a conductive element extending through said dielectric body and said dielectric shell for establishing a conductive path to a conductive body when said probe is mounted in a hole of said selected diameter formed in said conductive body.

4,996,493

INSTANTANEOUS ICE DETECTION SYSTEM

Seymour M. Monat, 4 Hollis Ct., Centerport, N.Y. 11721, and Robert A. Monat, 9011 Butternut Ct., Indianapolis, Ind. 46260

Filed Aug. 21, 1989, Ser. No. 396,074
Int. Cl.[5] G01R *27/22;* **G08B** *19/02*
U.S. Cl. 324—699 **9 Claims**



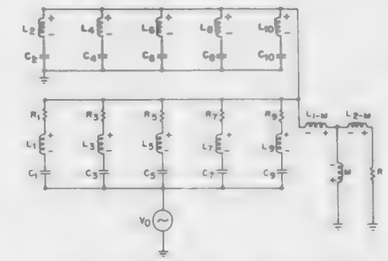
1. Apparatus for the early detection of ice on an instantaneous basis on a surface comprising sensor means embedded in said surface, said sensor means comprising a block of non-conductive material containing a pair of spaced electrodes of conductive, metallic material and having surfaces contiguous with or elevated slightly above the surface of said block and the surrounding surface, means for measuring instantaneously the electrical resistance between said electrodes, means for measuring electrode temperature to indicate the temperature of said surface, and means responsive to said measuring means for producing a signal indicating instantaneously the presence of ice when both said electrode temperature and said resistance simultaneously undergo a discontinuity indicating the freezing of water.

4,996,494

DROOP COMPENSATED PFN DRIVEN TRANSFORMER FOR GENERATING HIGH VOLTAGE, HIGH ENERGY PULSES

Peter M. Ranon, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 15, 1989, Ser. No. 366,944
Int. Cl.[5] H03K *3/01*
U.S. Cl. 328—65 **16 Claims**



11. A droop compensated pulse forming network driven transformer system which receives a voltage signal from a source, and which outputs a transformed droop compensated rectangular pulse to a variably resistive load, said transformed droop compensated rectangular pulse having a selected voltage level, a selected current value, a selected pulse width, and droop compensated rectangular pulse shape which remains a constant power pulse as it is output to said variably resistive load, said droop compensated pulse forming network driven transformer system comprising:
a means for producing a rectangular pulse, said rectangular pulse producing means being electrically connected between said voltage source and said variably resistive load so that it receives and processes said voltage signal from said voltage source to output a droop compensated rectangular pulse with said selected pulse width T, at a PFN (pulse forming network) frequency F, with a first voltage level and a first current value wherein said rectangular pulse producing means comprises a first bank of inductor and capacitor elements which are electrically connected between a common electrical ground and said transformer, said first bank of inductor and capacitor elements including a plurality of strings which each contain an inductor and a capacitor which are electrically connected in a series circuit between said ground and said transformer such that each inductor in said first bank has an inductance value given by $L_n=\frac{1}{4}RT/L_2$ where R equals an average impedance of said variably resistive load, T equals said pulse width, and L_2 is the self inductance value of said secondary inductor of said transformer, and wherein each capacitor in said first bank has a value given by $C_n=2RT/L_2)n^2\pi^2$ where n is an even integer which begins with 2 and increases for each string in said first bank; and
a second bank of inductor and capacitor elements which are electrically connected between said voltage source and said transformer at a point where said first bank is electrically connected with said transformer, said second bank of inductor and capacitor elements including a plurality of strings which each contain an inductor, a capacitor and a resistor which are electrically connected in a series circuit between said voltage source of said transformer such that each inductor in said second bank has an inductance value given by $L_n=\frac{1}{4}+2(RT/L_2)$ and wherein each capacitor in said second bank has a value given by $C_n=(2RT/L_2)/n^2\pi^2$ where n is an odd integer which begins with 1 and which increases for each string in said second bank; and

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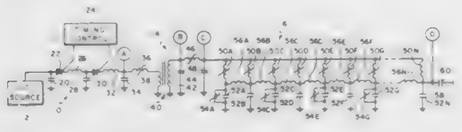
a means for transforming said droop compensated rectangular pulse from said first voltage level and said first current value into said selected voltage level and said selected current value while retaining said selected pulse width and said PFN (pulse forming network) frequency to produce thereby said transformed droop compensated rectangular pulse, said transforming means electrically connected said producing means with said variably resistive load, wherein said transforming means comprises a clock spring wound transformer which is electrically connected between said producing means and said variably resistive load, and which contains a primary inductor with a self inductance of L_1, and a secondary inductor with a self inductance value of L_2, said clock spring wound transformer having a ratio of winding turns between said secondary inductor and said primary inductor that is selected in order to transform said first voltage level and said first current value of said producing means respectively into said selected voltage level and said selected current value.

4,996,495

METHOD AND APPARATUS FOR GENERATING PULSED RF POWER

Daniel L. Birx, Oakley, Calif., assignor to Science Research Laboratory, Inc., Somerville, Mass.

Filed Dec. 2, 1988, Ser. No. 278,810
Int. Cl.[5] H03K *3/01*
U.S. Cl. 328—65 **27 Claims**



1. A pulsed RF power source comprising:
means for generating a DC pulse signal;
means for compressing said DC pulse signal to increase its power to a predetermined level;
a multistage frozen-wave generator, each stage of said generator having a capacitive element and an inductive element, the values of said elements determining the RF frequency of said source;
means operative when the output from the compressing means reaches a predetermined level for rapidly charging the capacitive elements of said frozen-wave generator, said means including means for causing the charge on the capacitive elements for alternative ones of said stages to be different from the charge on the capacitive elements for the remaining stages;
means, including said induction elements, for propagating the charges stored in the capacitors of said frozen-wave generator through said generator to the last stage thereof; and
means for taking the RF output signal at the output from the last stage of the frozen-wave generator.

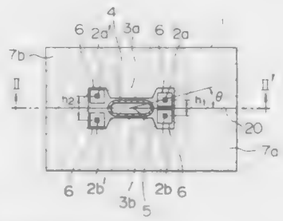
25. A method of generating a pulsed RF power signal comprising the steps of:
generating a DC pulse signal;
compressing said DC pulse signal to increase its power to a predetermined level;
utilizing the output of said compressing step to charge a multistage frozen-wave generator, said charging step including the step of causing the level and/or polarity of alternate stages of said generator to be different from the level and/or polarity of the remaining stages;
propagating the stored charges through the generator to the last stage thereof; and
taking the RF output signal at the output from the last stage of the frozen-wave generator.

4,996,496

BENDING MAGNET

Masashi Kitamura; Takashi Kobayashi; Shunji Kakiuchi; Kiyoshi Yamaguchi; Hiroshi Tomeoku, all of Hitachi; Naoki Maki, Ibaraki; Jyoji Nakata, Kawasaki, and Yasumichi Uno, Isehara, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Corp., both of Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,126
Claims priority, application Japan, Sep. 11, 1987, 62-226362
Int. Cl.[5] H05H *13/04*
U.S. Cl. 328—228 **10 Claims**



1. A bending magnet comprising:
a core which is substantially sectoral or semi-circular in horizontal sectional configuration and in which opposed magnetic poles are formed and a gap is formed between said opposed magnetic poles for disposing a vacuum chamber for storage of a charged particle beam; and
a pair of upper and lower exciting coils for generating a bending magnetic field in the gap, said pair of exciting coils having a vertical sectional configuration, as viewed along a plane vertical to an orbit of the charged particle beam, which is unchanged over a whole length of the bending magnet in a direction of said orbit and asymmetrical with respect to a line vertically intersecting with a line of said orbit, a vertical distance between said upper and lower exciting coils measured at an outer circumference side of said orbit in said vertical sectional configuration being larger than that measured at an inner circumference side of said orbit, so as to make uniform the distribution of the magnetic flux over the whole length of the bending magnet.

4,996,497

CABLE COMPENSATION CIRCUIT

Glenn C. Waehner, New Canaan, Conn., assignor to American Dynamics Corporation, Orangeburg, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,404
Int. Cl.[5] H03F *1/00;* **H03H** *5/00*
U.S. Cl. 330—151 **14 Claims**



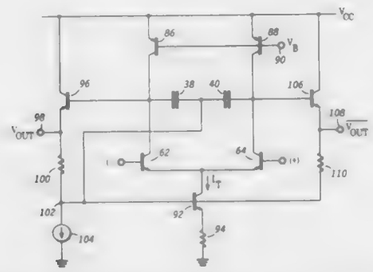
1. Circuitry for compensating an input signal comprising:
a network, responsive to the input signal, having a network transfer function of the form AKG(s), where A is a gain factor, K represents a selected portion of the input signal and G(s) represents a function of complex frequency s characterized by at least two finite zeros (a, c) and at least one finite pole (b) with a<b<c; and
a summation device having as inputs both the input signal and an output providing said network transfer function from said network,
wherein the circuitry has an overall transfer function, obtained at an output of said device, characterized by poles that are the poles of said network and zeros that are determined by A, K and said at least two zeros, and wherein A, K, said at least two finite zeros and said at least one finite pole are chosen to provide variations in the input signal over pre-determined frequency regions of the input signal.

4,996,498

COMMON MODE COMPENSATION FOR DIFFERENTIAL INTEGRATING FILTER

John E. Hanna, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1990, Ser. No. 460,481
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—258 **7 Claims**



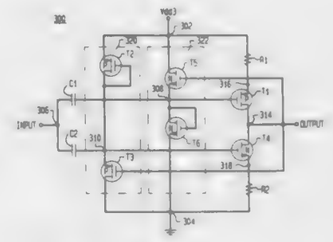
6. A filter cell having common mode compensation for use in a differential differentiating filter, comprising:
a transconductance amplifier that includes:
a. first and second transistors each having a base, and emitter and a collector, said bases being coupled respectively to first and second inputs of the filter cell and said emitters being interconnected;
b. first current supply means coupled to said collectors of said first and second transistors for providing current thereto;
c. a third transistor having a base, an emitter and a collector, said collector being coupled to said interconnected emitters, said emitter being coupled to a power supply conductor;
d. first circuit means for coupling said collector of said first transistor to a first output of the amplifier;
e. second circuit means for coupling said collector of said second transistor to a second output of the amplifier;
f. first and second resistors coupled between a circuit node and said first and second outputs of the amplifier respectively;
g. second current supply means coupled between said circuit node and said power supply conductor; and
h. means for coupling said base of said third transistor to said circuit node;
first and second capacitors series coupled between said collectors of said first and second transistors; and
means for coupling the base of said third transistor to the interconnection between said first and second capacitors.

4,996,499

AMPLITUDE STABILIZED OSCILLATOR AMPLIFIER

Seyed R. Zarabadi, Columbus, Ohio, and Linh N. Pham, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Sep. 15, 1989, Ser. No. 407,842
Int. Cl.[5] H03F *3/26, 3/16*
U.S. Cl. 330—264 **19 Claims**



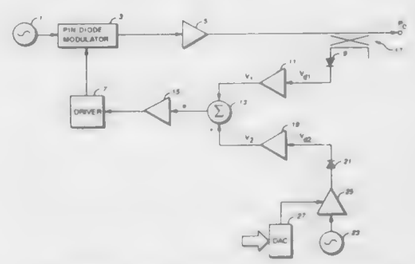
1. An amplifier comprising:
first and second complementary output transistors; and
first and second independent negative feedback circuit means coupled to the first and second transistors, respectively, for independently controlling the operating voltages of said output transistors
said feedback circuit means each comprising transistor circuit which are physically proportioned relative to their respective output transistors to achieve substantially equal sensitivity control at upper and lower limits of amplitude of an amplifier output signal
each of said output transistors having a first output terminal respectively connected to first and second potential sources via compensating resistors having a negative temperature coefficient.

4,996,500

AUTOMATIC CONTROL SYSTEM

Ronald K. Larson, Mountain View, and John L. Imperato, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 24, 1989, Ser. No. 426,637
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—279 **9 Claims**



1. An automatic control system for controlling the output power level of a signal generator across a wide range of temperatures, comprising:
dual monolithic logarithmic amplifier means connected for logarithmically amplifying reference level signals and the output signals of a signal generator, respectively;
first and second detector means coupled to respective ones of the dual logarithmic amplifier means for detecting the power level of the signal generator and of the reference level signals, respectively, with the first and second detectors being of substantially identical design and construc-

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tion and, further, being in thermal contact with one another;

summing means connected to sum output signals from each of the dual monolithic logarithmic amplifier means; and

modulating means responsive to output signals from the summing means for modulating the output of the signal generator to maintain constant output power.

4,996,501

AMPLIFIER CIRCUIT HAVING GAIN CONTROL

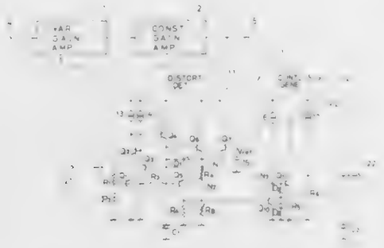
Yoshiaki Sano, Yokohama; Toshio Hanazawa, Kasugai, and Yoshiro Yoshino, Nagoya, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed Dec. 19, 1988, Ser. No. 286,610

Claims priority, application Japan, Dec. 18, 1987, 62-320817

Int. Cl.[5] H03G *3/30*

U.S. Cl. 330—279 **12 Claims**



1. An amplifier circuit comprising:

variable gain amplifier means having a variable gain, for amplifying an input signal by the variable gain in accordance with a control signal, and for providing an output responsive to the variable gain amplification;

constant gain amplifier means having a constant gain, for amplifying a signal responsive to the signal outputted from said variable gain amplifier means and for providing an output responsive to the constant gain amplification; and

gain control circuit means, responsive to the signal outputted from said control constant gain amplifier means, for supplying the control signal to said variable gain amplifier means during a time period in which a level of the output signal of said constant gain amplifier means is higher than a reference level which is a predetermined value lower than a peak value of the output signal of said constant gain amplifier means, and for adjusting said reference level based on the output of said constant gain amplifier means.

4,996,502

ULTRASONIC ATOMIZER CIRCUIT HAVING PLURAL OSCILLATORS

Shinichi Endo, Chiba, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 415,102

Claims priority, application Japan, Oct. 1, 1988, 63-128015[U]

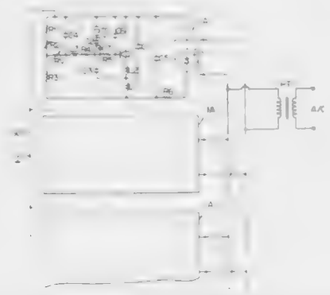
Int. Cl.[5] H03B *5/36;* **B05B** *17/06*

U.S. Cl. 331—46 **4 Claims**

1. An ultrasonic atomizer circuit comprising a plurality of unit oscillation circuits each coupled commonly with a secondary winding of a single common transformer (PT) through a rectifier circuit (DS),

each of said unit oscillator circuit comprising a transistor (Q1) with a grounded collector, a piezo-electric vibration element (TD) coupled across said collector and a base of said transistor, a capacitor C1 coupled across an emitter and said collector of said transistor (Q1), and a capacitor (C3) coupled across said base and said emitter of said transistor (Q1),

wherein the improvement comprises another capacitor (C7) coupled between a junction point of one end of said vibration element (TD) and one end of said capacitor (C3), and the base of said transistor (Q1), so that said capacitor (C3) is separated from said base circuit of the transistor (Q1) for DC current.



4,996,503

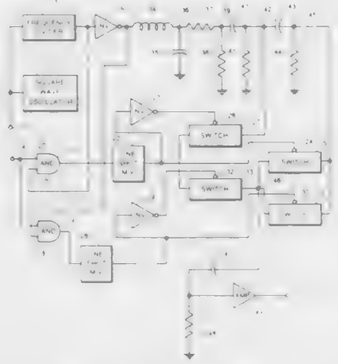
PHASE MODULATOR CIRCUIT FOR ENCODING TWO BINARY DIGITS PER CYCLE OF SINE WAVE CARRIER

William Hotine, 633 Ramona Ave. #23, Los Osos, Calif. 93402

Filed Jun. 21, 1990, Ser. No. 541,825

Int. Cl.[5] H04L *27/20;* **H03C** *3/00*

U.S. Cl. 332—104 **3 Claims**



1. A phase modular circuit for encoding two binary digits per cycle of carrier frequency comprising:

a square wave oscillator having an output at the clock frequency;

a frequency divider receiving the clock frequency output of said oscillator and having a square wave output of one-half said clock frequency;

a first inverter receiving the output of said frequency divider and having an output of an inverted half clock frequency:

a first AND gate receiving the square wave output of said frequency divider at its first input;

a second AND gate receiving the output of said first inverter at its first input;

externally generated serial binary digital data clocked by said clock frequency driving the second inputs of said first and second AND gates;

a first one shot multivibrator triggered by the output of said first AND gate and having a pulse output driving a second inverter;

a second one shot multivibrator triggered by the output of said second AND gate and having a pulse output driving a third inverter;

a low pass filter circuit for converting the square wave output of said first inverter to a sine wave carrier;

a first phase shift circuit for synchronizing the phase of the sine wave carrier with the square wave half clock frequency;

a second phase shift circuit receiving said carrier and having a phase shifted carrier output;

a first semiconductor bilateral switch having a control terminal driven by the output of said second inverter and with its input receiving said carrier frequency;

a second semiconductor bilateral switch having a control terminal driven by the output of said third inverter, with its input receiving the output of said first semiconductor bilateral switch and with its output coupled to an output circuit;

a third semiconductor bilateral switch having a control terminal driven by the output of said first one shot multivibrator with its input receiving the output of said second phase shift circuit and with its output coupled to an output circuit;

a fourth semiconductor bilateral switch having a control terminal driven by the output of said second one shot multivibrator, with its input receiving the output of said second phase shift circuit and with its output coupled to an output circuit and

said AND gates receiving serial binary digital data at their second inputs and being enable alternately by said half clock frequency and its inversion to control said semiconductor bilateral switches in a manner to connect said carrier or pulsed phase deviations of said carrier to said output circuit whereby successive input serial binary digits are encoded at the successive zero crossing points of the carrier.

4,996,504

MONOLITHICALLY INTEGRATABLE MICROWAVE ATTENUATION ELEMENT

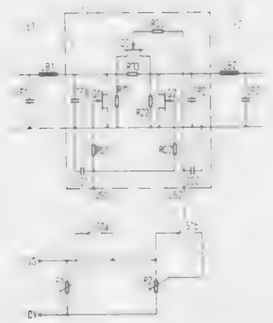
Jakob Huber, Beyharting, and Wolfgang Meier, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 407,736

Claims priority, application European Pat. Off., Sep. 30, 1988, 88116232.5

Int. Cl.[5] H03H *11/28*

U.S. Cl. 333—81 R **17 Claims**



1. A monolithically integratable microwave attenuation element that has at least three field effect transistors (Q1, Q2, Q3) arranged in a PI structure, the PI structure having at least two terminal ports for a signal path and having control terminals, comprising drain-source paths of the field effect transistors (Q1, Q2, Q3) arranged in a PI configuration; a respective resistor (R11, R22, R33) connected parallel to each of the drain-source paths of the field effect transistors (Q1, Q2, Q3) arranged in the PI configuration; and a capacitor (CP1, CP2) connected in parallel with each of the terminal ports, the respective capacitor forming a line simulation of concentrated elements together with inductances (LB1, LB2) of leads connected to the terminal ports and together with external capacitors (CE1, CE2) connected to the terminal ports.

4,996,505

FREQUENCY TRIPLICATOR FOR MICROWAVES

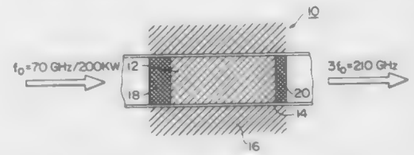
Fritz Keilmann, Stuttgart, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 330,332

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811116

Int. Cl.[5] H02M *5/20;* **H03B** *19/14*

U.S. Cl. 333—218 **8 Claims**



1. A frequency triplicator for microwaves comprising a body of a nonlinear material having an input end, adapted to receive microwave energy of a base frequency, and an output end, said microwave energy interacting with the material of said body so that electromagnetic energy containing microwave energy of three-times said base frequency emerges from said output end, wherein said base frequency is more than 30 GHz and the nonlinear material is a semiconductor material having a carrier concentration less than 10^{13} cm^{-3}

4,996,506

BAND ELIMINATION FILTER AND DIELECTRIC RESONATOR THEREFOR

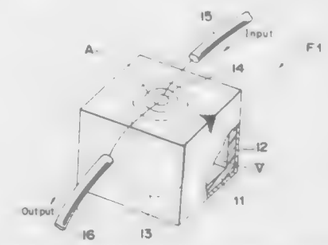
Youhei Ishikawa, Kyoto; Toshiro Hiratsuka, Muko; Hirotsugu Abe, Yokaichi; Hisashi Takagaki, and Sadao Yamashita, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 28, 1989, Ser. No. 414,133

Claims priority, application Japan, Sep. 28, 1988, 63-243173; Sep. 28, 1988, 63-126591[U]

Int. Cl.[5] H01P *7/10, 1/20*

U.S. Cl. 333—219.1 **13 Claims**



1. A dielectric resonator which comprises a ceramic casing having at last one dielectric column disposed in a cavity thereof and said casing having an electrically conductive film formed over its outer surface, an electrode constituted by a metallic film formed on the outer surface of said ceramic casing, separated from said electrically conductive film by a gap, and opposing an end of said dielectric column through a por-

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tion of said casing, and connecting lines for connecting said electrode with an external circuit.

4,996,507

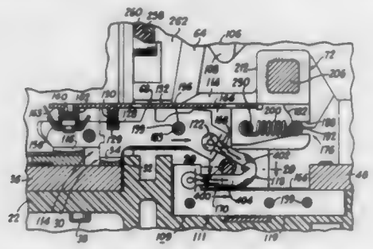
CT QUICK CHANGE ASSEMBLY AND FORCE TRANSMITTING SPACER

Jere L. McKee, New Castle; Glenn R. Thomas, Beaver; Lance Gula, Aliquippa, and William E. Beatty, Jr., Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 226,648, Aug. 1, 1988. This application Oct. 11, 1989, Ser. No. 420,088

Int. Cl.[5] H01H *53/02, 9/44*

U.S. Cl. 335—195 20 Claims



1. A circuit breaker comprising:

one or more pairs of separable contacts each defining a stationary contact and a movable contact, each pair of separable contacts defining a pole;

one or more line side conductors, each line side conductor electrically connected to said stationary contact;

one or more load-side connectors;

one or more flexible shunts electrically connected between each of said movable contacts and said load-side conductors;

each of said shunts formed as V-shaped members defining a bight portion, a first depending leg, connected to said movable contact and a second depending leg connected to said load-side conductor, defining a first parallel current path between said first depending leg and said second depending leg and a second parallel current path between said second depending leg and said load-side conductor, said second parallel current path causing compression of said first depending leg with respect to said second depending leg at a predetermined magnitude of current; and

reducing means cooperable with said depending legs for reducing compression of said shunts during overcurrent conditions.

4,996,508

TEMPORAL AND SPATIAL CONTROL OF FIELD TOPOLOGIES IN SOLENOIDS

Aharon Z. Hed, Nashua, N.H., assignor to International Superconductor Corp., Riverdale, N.Y.

Filed Mar. 21, 1989, Ser. No. 334,583

Int. Cl.[5] H01F *7/22*

U.S. Cl. 335—216 19 Claims

1. An apparatus for producing a topologically modifiable magnetic field, comprising:

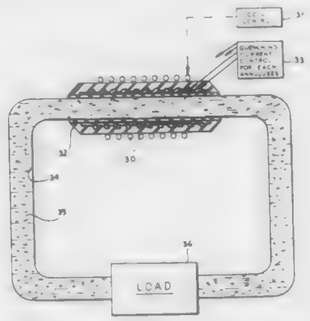
a solenoid coil;

a multiplicity of superconducting annuluses disposed within said coil and axially spaced apart therein;

means for at least selectively cooling said annuluses to a temperature below the critical temperature for superconductivity of said annuluses;

means for electrically energizing said coil to produce a magnetic field; and

means for selectively quenching superconductivity of said annuluses so that certain of said annuluses can be rendered nonsuperconductive while at least one of said



annuluses is in a super conductive state to modify the topology of the magnetic field produced by said coil.

4,996,509

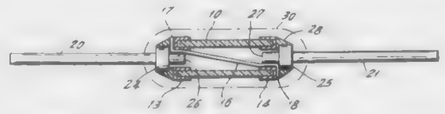
MOLDED CAPLESS FUSE

Elliot Bernstein, Ridge Rd., Glen Cove, N.Y. 11542

Filed Aug. 25, 1989, Ser. No. 398,616

Int. Cl.[5] H01H *85/16*

U.S. Cl. 337—232 14 Claims



1. A capless electric fuse comprising:

an electrically non-conductive, hollow sleeve, the sleeve having opposite ends; at least one of the ends of the sleeve being metallized;

a fusible element extending through the sleeve and having a length so as to have first and second ends which are engageable with the ends of the sleeve;

a respective lead for attachment to the metallized end of the sleeve, said lead having an end portion, and the lead being attached to the respective metallized end in the vicinity of the end portion of the lead; and

the end portion, and the respective first end of the fusible element, and the respective metallized end of the sleeve being soldered together, said lead and said first end of said fusible element being secured to each other and to said metallized end of said sleeve by said soldering, no end cap being present on the sleeve.

4,996,510

METAL OXIDE VARISTORS AND METHODS THEREFOR

Paul Becker, San Francisco; Carol Powers, Redwood City, and Mark S. Thompson, San Carlos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 8, 1989, Ser. No. 447,748

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—21 15 Claims

1. A varistor comprising a primary varistor metal oxide, aluminum in an amount of about 1 to about 30 parts per million (ppm), about 0.1 to about 0.5 mole % bismuth, about 0.1 to about 1.5 mole % antimony, about 0.1 to about 1 mole % chromium, about 0.1 to about 1.0 mole % manganese, about 0.1 to about 2.0 mole % cobalt, and about 0 to about 1.0 mole % boron, each of said elements being present in the form of its oxide and said varistor having a DC leakage current at 80% of $V_{1ma/cm2}$ of less than 1.0×10^{-7} amp/cm^2.

4,996,511

PRESSURE-SENSITIVE RESISTANCE ELEMENT

Kazuhiro Ohkawa, Gunma, and Taro Yamazaki, Kanagawa, both of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,088

Claims priority, application Japan, May 9, 1988, 63-112203

Int. Cl.[5] H01C *10/10*

U.S. Cl. 338—114 13 Claims



1. A pressure-sensitive resistance element comprising a first contact electrode formed on a first electrically insulating base plate, a second contact electrode formed on a second electrically insulating base plate disposed facing the first contact electrode, a pressure-sensitive electrically conductive layer formed on the whole surface of at least one of the first and second contact electrode regions, and a pressure-sensitive electrically conductive pattern formed on at least one of the pressure-sensitive electrically conductive layers or the pressure-sensitive electrically conductive layer and the contact electrode having no pressure-sensitive electrically conductive layer thereon.

4,996,512

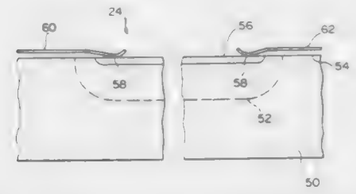
OVERVOLTAGE RESISTOR AND METHOD FOR ITS MANUFACTURE

Bruce E. Byrkett, King County, Wash., assignor to Seattle Silicon Corporation, Bellevue, Wash.

Filed Apr. 13, 1989, Ser. No. 338,080

Int. Cl.[5] H01C *1/012, 1/02, 7/12*

U.S. Cl. 338—306 13 Claims



1. A resistance element for placement in an integrated circuit formed near a surface of a substrate material of a first conductivity type, the integrated circuit being connected to one or more supply voltages, comprising:

a well formed in the substrate material, said well having a conductivity type opposite to the first conductivity type and being electrically isolated from the supply voltages; and

a resistive layer made from a material of the first conductivity type and formed in said well.

11. A method for forming a resistance element near a surface of a substrate material of a first conductivity type, comprising the steps of:

a. forming an electrically-isolated well in the substrate material, said well having a conductivity type opposite to the first conductivity type; and

b. forming a resistive layer in said well, said resistive layer being made from a material of the first conductivity type.

4,996,513

CARRIER STABILITY ERASURE FILLING SYSTEM FOR COMMUNICATIONS OVER ELECTRICITY DISTRIBUTION NETWORK

Sioe T. Mak; Richard L. Maginnis, and Kevin J. Franzen, all of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 20, 1990, Ser. No. 481,247

Int. Cl.[5] H04M *11/04;* H04J *1/12*

U.S. Cl. 340—310 R 20 Claims



1. In a communication system using the current waveform of an electricity distribution network as a carrier a signal being present as composite binary digits, each composite binary digit being defined by a pulse pattern at preselected positions on the voltage waveform, the pulses being spaced along the waveform so that they are ordered in time, the pulse pattern for a binary "1" being complementary to the pulse pattern for a binary "0", a system for identifying said binary digits comprising:

sampling the current waveform at the preselected positions to obtain an ordered set of waveform values, the magnitudes of the values corresponding to a binary digit pulse pattern being larger, in a noise-free system, when the binary digit corresponding to that pulse pattern is present than when it is absent;

examining the ordered waveform values for each bit to determine if the values fall within preset criteria indicative of a stable carrier;

when the ordered waveform values for a particular bit all fall within the preset criteria, identifying that particular bit as having the binary value corresponding to its sampled pulse pattern;

when at least some of the ordered waveform values for a particular bit fall outside the preset criteria, labelling that particular bit as suspect;

for each suspect bit, testing the ordered values of that bit and of adjacent bits to determine whether a series of a first predetermined number of successive values meets the preset stability criteria, said series including at least a second predetermined number of successive values from the suspect bit and at least the second predetermined number of successive values from an adjacent bit; and

identifying the binary value, if any, of the suspect bit based upon said second predetermined number of successive values from the suspect bit when the test of the testing step is met, otherwise labelling the suspect bit as uncorrectable.

4,996,514

CAR THEFT PROOFING SYSTEM

Sadakatsu Sunami, 8-3, Asukanokita 3-chome, Ikoma-shi, Nara-ken, Japan

Filed Aug. 11, 1989, Ser. No. 392,791

Claims priority, application Japan, Nov. 18, 1988, 63-293411

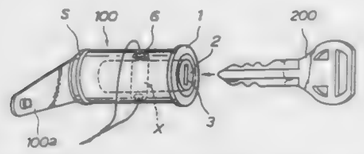
Int. Cl.[5] B60R *25/10*

U.S. Cl. 340—426 9 Claims

1. A car theft proofing system comprising a sensor disposed within a cylinder lock for detecting insertion into the cylinder lock of a door key or other article, an alarm device for giving an alarm, alarm drive means to output a signal for driving the alarm device, control means to cause the alarm device to give

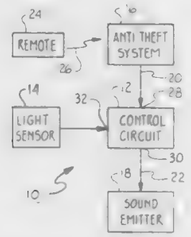
VOL 1123 ISS 4 FE 26 1991 UMI

the alarm in response to a signal received from the sensor and the signal received from the alarm drive means, and a radio transmitter for detecting insertion of the article and transmitting a radio wave, wherein said alarm drive means includes a



portable remote control transmitter and a receiver disposed on a car body, said remote control transmitter including abnormality alarm means for transmitting a theft signal in response to the radio wave transmitted from said radio transmitter.

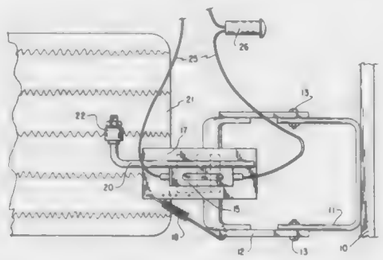
4,996,515
APPARATUS FOR SUPPRESSING AUTOMOBILE ANTI-THEFT ARM/DISARM SYSTEM
Michael Schaffer, 5061 63rd St., San Diego, Calif. 92115, and Gerald J. Teudt, 5447 Por Techo Ct., San Diego, Calif. 92124
Filed Apr. 18, 1990, Ser. No. 510,603
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—426 **8 Claims**



1. An apparatus for automatically suppressing the audible arm and disarm signal of an automobile anti-theft system, comprising:
circuit means having an input terminal for receiving an alarm signal from an alarm signal generating portion of said automobile anti-theft system, and having an output terminal for providing a modified alarm signal to a sound emitting device; and
light sensing means coupled to said circuit means for generating a light level signal for indicating whether ambient light intensity is above or below a predetermined threshold level;
said circuit means including bypass means responsive to said light level signal being above said threshold level for connecting said input terminal to said output terminal for allowing an alarm signal to energize said sound emitting device;
said circuit means further including suppression means responsive to said light level signal being below said threshold level for disconnecting said input terminal from said output terminal for a predetermined period of time.

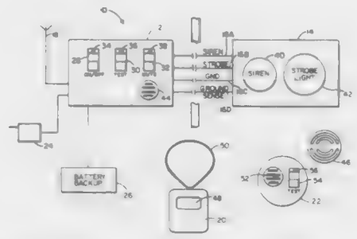
4,996,516
INDICATOR OF UNDER INFLATED TIRE
L. Dale Mason, P.O. Box 131, Buffalo, S. Dak. 57720
Filed Nov. 13, 1989, Ser. No. 435,595
Int. Cl.[5] B60C *23/06*
U.S. Cl. 340—443 **6 Claims**

1. For use on a vehicle having a frame and using pneumatic tires, an indicator of tire problems comprising bracket means for attachment to said frame adjacent said tire, switch means mounted to said bracket means, engagement means connected to said switch means extending toward but normally not enaged with said tire, said engagement means adapted to sense



an increase in the diameter of said tires caused by centrifugal force, and indicator means connected to said switch means to indicate the contact of said tire with said engagement means.

4,996,517
HOUSEHOLD ALARM SYSTEM
Dale E. Kringen, and Thomas D. Culhane, both of Sioux Falls, S. Dak., assignors to Assist, Inc., Sioux Falls, S. Dak.
Filed Apr. 6, 1989, Ser. No. 334,722
Int. Cl.[5] G08B *29/00*
U.S. Cl. 340—506 **7 Claims**
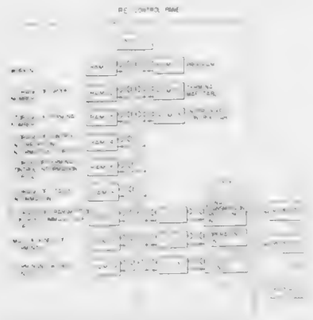


1. An alarm system for a structure comprising:
means for generating coded radio trigger signals;
alarm controller means responsive to coded radio trigger signals for generating alarm actuation signals;
alarm signals generating means for generation of alarm signals in response to the alarm actuation signals;
an alarm actuation signals transmission line connected between the alarm controller means and the alarm signals generating mans; and
means connected to the alarm actuation signals transmission line for determining integrity of the transmission line.

4,996,518
FIRE ALARM SYSTEM
Kaoru Takahashi; Akio Tsumiji, and Ryuji Shutoku, all of Tokyo, Japan, assignors to Nohmi Bosai Co., Ltd., Tokyo, Japan
Filed Jan. 23, 1990, Ser. No. 468,866
Claims priority, application Japan, Jan. 31, 1989, 1-20985
Int. Cl.[5] G08B *26/00*
U.S. Cl. 340—518 **21 Claims**

1. A fire alarm system comprising:
a receiver unit connected to a plurality of terminal unit groupings, each of the terminal unit groupings comprised of a plurality of terminal units, each of the terminal units including at least one of a fire sensor and a remote control means for controlling a remote object;
said receiver unit and said plurality of terminal units including means for operating in a system polling mode wherein

all of said plurality of terminal units of said terminal unit groupings are polled, wherein a terminal unit grouping response period is provided for each of said terminal unit groupings, and wherein a group response signal is transmitted from a terminal unit having a change of status to said receiver unit during the terminal unit grouping response period of the terminal unit grouping which includes the terminal unit having a change of status;
said receiver unit and said plurality of terminal units further comprising means for operating in a point polling mode wherein all of the terminal units of the terminal unit grouping from which the group response signal was transmitted during the system polling mode are polled, wherein



a terminal unit response period is provided for each of the terminal units of said terminal unit grouping from which the group response signal was transmitted group the system polling mode, and wherein a terminal unit response signal is transmitted from the terminal unit having a change of status to the receiver unit during the terminal unit response period of the terminal unit having a change of status;
said receiver unit and said plurality of terminal units further comprising means for operating in a selecting mode wherein status information is transmitted to said receiver unit from said terminal unit from which the terminal unit response signal was transmitted during the point polling mode.

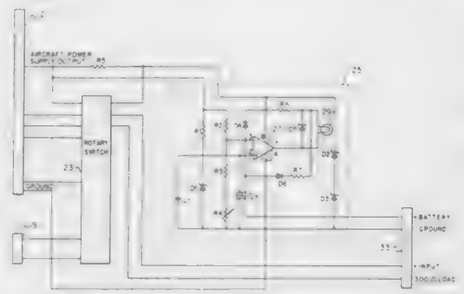
4,996,519
METHOD AND APPARATUS FOR MONITORING AN AMPLIFIER
Michael J. D'Antonio, Salem; Irving A. Gibbs, Roanoke; Lawrence J. Lane, Salem, and Rodney A. Lawson, Fincastle, all of Va., assignors to General Electric Company, Salem, Va.
Filed Sep. 25, 1989, Ser. No. 411,977
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—653 **27 Claims**

11. A system for stabilizing a polyphase synchronous generator providing an output voltage and an output current, through excitation control to dampen generator oscillations comprising:
(a) a power system stabilizer means responsive to generator operating parameters to develop an oscillation signal having an instantaneous magnitude proportional to said generator oscillations;
(b) means to develop a plurality of voltage signals representing, respectively, phase output voltages of said generator with respect to neutral;
(c) means to multiply each of said voltage signals by said oscillation signal to yield a corresponding plurality of modulation signals;
(d) an amplifier for each phase of said generator, each of the amplifiers having a prescribed gain and being responsive, respectively, to the sum of a corresponding one of said modulation signals and a one of said voltage signals to provide an associated control signal to control the excitation of said generator; and
(e) means to continuously monitor the operational status of each of the amplifiers including:
(i) means to generate an additional signal by multiplying a selected one of the associated control signal and said modulation signal by a factor representing said prescribed gain;



(ii) means to combine said additional signal and the other of the associated control signal and said modulation signal to yield an error signal; and,
(iii) means responsive to said error signal to provide an alarm signal when said error signal has a value outside a predetermined boundary.

4,996,520
OVERVOLTAGE DETECTION TEST APPARATUS FOR MILITARY AIRCRAFT WEAPONS SYSTEMS
Robert A. Williams, and Stephen Tye, both of Fort Worth, Tex., assignors to Williams Instruments, Inc., Fort Worth, Tex.
Filed Jun. 17, 1988, Ser. No. 208,732
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—662 **6 Claims**



1. A test apparatus for detecting overvoltage conditions in a power supply that is contained within a military aircraft, said power supply has an output that provides power to missiles mounted on said aircraft, said missiles having a maximum voltage limit, comprising:
(a) electrical connector means for interfacing the test apparatus with said aircraft power supply while said aircraft is on the ground and before said missiles have been loaded onto said aircraft,
(b) electrical comparator means for comparing inputs comprising first and second inputs and an output, said first

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input being clamped to a voltage which is representative of said maximum voltage limit, said second input being tied to said aircraft power supply output so as to vary with said power supply output such that said second input voltage exceeds said first input voltage when said power supply output exceeds said maximum voltage limit, said comparator means output connected to warning means, said warning means being activated by said comparator means when said second input voltage exceeds said first input voltage, wherein an overvoltage condition of said aircraft power supply is indicated,

(c) self-test switch means, said self-test switch means when activated connecting said second input to a larger voltage than is connected to said first input, wherein the operation of said comparator means and said warning means can be tested,

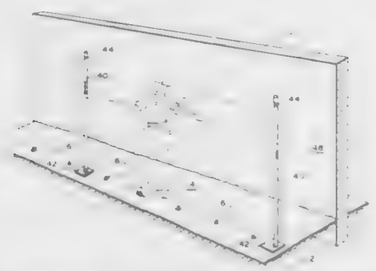
(d) test power supply means separate from said aircraft power supply, said test power supply means being connected with said first and second inputs through said self-test switch means.

4,996,521

INTRUSION DETERRENT APPARATUS

Thomas E. Hollow, 721 Brossard Dr., Thousand Oaks, Calif. 91360

Filed Dec. 20, 1989, Ser. No. 453,693
Int. Cl.[5] G08B *3/00*
U.S. Cl. 340—691 **2 Claims**



1. In combination with a fixed structure, a specific area abutting and including said fixed structure, an intrusion deterrent apparatus mounted in close proximity to said fixed structure, said intrusion deterrent apparatus comprising:

a spraying device capable of spraying water, said spraying device being located within said specific area, said specific area comprising ground, said spraying device comprising a sprinkler mounted on said ground; and

a sensor for detecting the presence of an animal within said specific area, said sensor causing activation of said spraying device thereby encouraging the animal to leave said specific area.

4,996,522

FOLDING ELECTRONIC DEVICE

Hironori Sunano, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 18, 1989, Ser. No. 408,274
Claims priority, application Japan, Sep. 26, 1988, 63-125472[U]
Int. Cl.[5] G09G *3/00*
U.S. Cl. 340—700 **8 Claims**

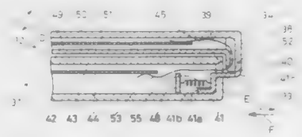
1. A folding electronic device comprising a body containing an electric circuit; a cover member containing another electric circuit; a hinge rotatably connecting a rear end portion of said body with a rear end portion of said cover member for providing said body and said cover member to be freely opened/-closed; and an interconnection member electrically connecting said electric circuit contained in said body with said electric circuit contained in said cover member,

said cover member being brought into a forward position about a rotation axis of said hinge to vertically overlap with said body thereby to obtain a closed state of said electronic device,

said cover member being brought into a rear position about said rotation axis of said hinge to obtain an opened state of said electronic device,

said cover member being provided on its rear end portion with a rear wall extending in the same direction as said rotation axis of said hinge and downwardly projecting toward said body,

said body being provided on its rear end portion with a rear



wall extending in the same direction as said rotation axis of said hinge and upwardly projecting toward said cover member,

said rear wall of said cover member being rearwardly displaced beyond said rear wall of said body, a lower end of said rear wall of said cover member being positioned downwardly beyond an upper end of said rear wall of said body in said closed state of said electronic device,

said body further including:

a closing member displaceably provided to rearwardly project from said rear wall of said body to come into contact with said rear wall of said cover member, and

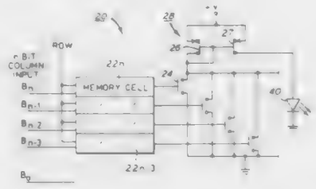
urging means for urging said closing member to retain said closing member in contact with said rear wall of said cover member.

4,996,523

ELECTROLUMINESCENT STORAGE DISPLAY WITH IMPROVED INTENSITY DRIVER CIRCUITS

Cynthia S. Bell, Webster, and Michael J. Gaboury, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 20, 1988, Ser. No. 260,103
Int. Cl.[5] G09G *3/30*
U.S. Cl. 340—781 **7 Claims**



1. An electroluminescent storage display with improved intensity driver circuits comprising:

an electroluminescent element;

a plurality of memory elements;

a current source connected in circuit to said electroluminescent element;

a plurality of elements, corresponding in number to said plurality of memory elements, each connected to a respective memory element and responsive to the signals stored therein for causing an incremental current to flow from said current source to said electroluminescent element; and

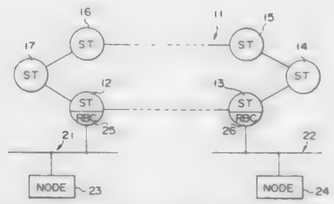
means for applying signals to said memory elements indicative of the intensity desired from said electroluminescent element.

4,996,524

ADDRESS INFORMATION REGISTERING/SEARCHING SYSTEM IN NETWORK SYSTEM

Akihiko Tojima, Tachikawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1989, Ser. No. 373,054
Claims priority, application Japan, Jun. 30, 1988, 63-160816
Int. Cl.[5] H04B *1/00*
U.S. Cl. 340—825.02 **20 Claims**



1. An address information registering/searching system in a network system in which a plurality of stations are connected to a trunk network, at least one branch network is connected to each station, and at least one node is connected to each branch network, a node address being assigned to each node, and a branch address being assigned to each branch network, suitable for transmitting data between a first node connected to a first branch network of a first station and a second node connected to a second branch network of a second station, first and second node address being assigned to said first and second nodes, and first and second branch addresses being assigned to said first and second branch networks, comprising:

first and second address table means each for storing a plurality of pieces of address information, each piece of address information including a node address assigned to a certain mode, a branch address assigned to a branch network to which said node is connected, and frequency data representing a search frequency of the address information, said first address table means storing address information having a high reference frequency relative to a first predetermined reference frequency and said second address table means storing address information having a low reference frequency relative to a second predetermined reference frequency;

reading means for receiving a branch frame transmitted from said first node onto said first branch network, the branch frame including a first node address assigned to said first node as a source node address, a second node address assigned to said second node as a destination node address, and data, reading out the source node address from the branch frame and generating a first search command, and reading out the destination node address from the branch frame and generating a second search command;

searching means for referring to said first address table means and selectively referring to said second address table means to search for first object address information in response to the first search command, the first object address information including the first node address and the first branch address, and referring to said first address table means and selectively referring to said second address table means to search for second object address information in response to the second search command, the second object address information including the second node address and the second branch address; and

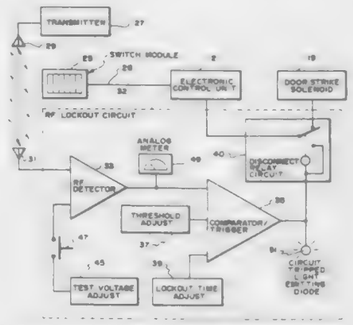
trunk transmitting means for generating a trunk frame including the first branch address written in the first object address information as a source branch address, the second branch address written in the second object address information as a destination branch address, and the branch frame and transmitting the generated trunk frame onto said trunk network.

4,996,525

R. F. LOCKOUT CIRCUIT FOR ELECTRONIC LOCKING SYSTEM

Earl M. Becker, Jr., Camarillo, and Allen Miller, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1989, Ser. No. 440,950
Int. Cl.[5] H04Q *1/00;* **G06F** *15/20*
U.S. Cl. 340—825.31 **14 Claims**



1. An electronic circuit for preventing a door strike solenoid connected to an electronic control unit from being falsely energized by an electrical signal supplied thereto by said electronic control unit, said electronic control unit supplying said electrical signal in response to radio frequency signals generated by a transmitter located near said electronic control unit, said electronic control unit comprising:

means for receiving the radio frequency signals generated by said transmitter;

detector circuit means having an input connected to said receiving means and an output for converting said radio frequency signals to a first direct current voltage having an amplitude indicative of the field strength of said radio frequency signals;

means having an output for generating a reference direct current voltage;

trigger circuit means having a first input connected to the output of said detector circuit means, a second input connected to the output of said generating means and an output for producing a second direct current voltage when the amplitude of said first direct current voltage exceeds said reference direct current voltage;

a switching transistor having a base connected to the output of said trigger circuit means, an emitter connected to ground and a collector;

relay circuit means having a normally closed contact connected between said electronic control unit and said door strike solenoid and a coil with one end of said coil being connected to the collector of said switching transistor and the opposite end of said coil being connected to said electronic control unit, the coil of said relay circuit means being energized by the electrical signal from said electronic control unit when said switching transistor is turned on by the second direct current voltage from said trigger circuit means, the normally closed contact of said relay circuit means being opened by said energized coil thereby preventing the electrical signal supplied by said electronic control unit from falsely energizing said door strike solenoid.

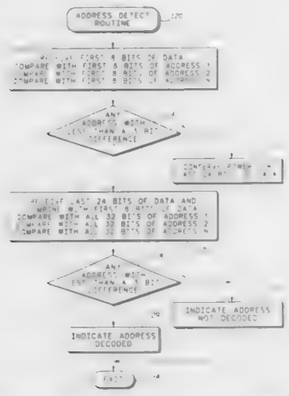
VOL 1123 ISS 4 FEB 26 1991 UMI

4,996,526

POWER CONSERVATION METHOD AND APPARATUS FOR A PORTION OF A SYNCHRONOUS INFORMATION SIGNAL

Michael J. DeLuca, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1988, Ser. No. 278,520
Int. Cl.[5] G08B 5/22
U.S. Cl. 340—825.44 16 Claims



1. A reduced power receiver for receiving a transmitted signal comprising a synchronization signal and a plurality of information signals, each information signal having a plurality of portions comprising at least one binary bit signal, the receiver comprising:

synchronization means responsive to the transmitted signal for detecting the synchronization signal and for generating a timing signal indicative of the occurrence of one of said plurality of information signals;

decoding means for decoding a first portion of said plurality of portions of said one of said plurality of information signals and generating a first digital word comprising at least one bit therefrom;

memory mean: for storing at least one predetermined digital word, each of said at least one predetermined digital word having a plurality of portions comprising at least one bit;

comparison means responsive to the timing signal for comparing said first digital word to corresponding first portions of each of said at least one predetermined digital word and for generating a first undetect signal if said first digital word comprises more than N bits differing from corresponding bits of said first portions of each of said at least one predetermined digital word, where N is an integer greater than zero; and

power conservation means responsive to the first undetect signal for reducing the power consumption of the receiver for subsequent portions of said one of said plurality of information signals.

4,996,527

PIPELINED RESIDUE TO MIXED BASE CONVERTER AND BASE EXTENSION PROCESSOR

Theodore L. Houk, Seattle, and R. Aaron Falk, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1989, Ser. No. 414,019
Int. Cl.[5] H03M 7/18
U.S. Cl. 341—83 20 Claims

1. An information processor receiving a residue number as an input, said information processor comprising:

a plurality of arithmetic units arranged in a plurality of sequentially arranged stages, odd stages of said plurality of stages performing first arithmetic operations in parallel, even stages of said plurality of stages performing second arithmetic operations in parallel;

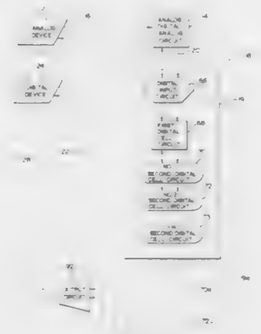
said odd and even stages alternately performing said first operations and said second operations to generate at least one mixed base digit corresponding to said residue number.

4,996,528

APPARATUS HAVING SHARED MODULAR ARCHITECTURE FOR DECIMATION AND INTERPOLATION

Safdar M. Asghar, and John G. Bartkowiak, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1989, Ser. No. 434,271
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] H03M 7/00
U.S. Cl. 341—110 12 Claims



1. An apparatus adaptable for use with an analog-digital-analog conversion device for effecting communications between an analog device and a digital device, said analog-digital-analog conversion device being operatively connected to said analog device and to the apparatus and converting incoming analog signals received from said analog device into incoming digital signals representative of said incoming analog signals, said analog-digital-analog conversion device also converting interpolated digital signals received from the apparatus into outgoing analog signals representative of said interpolated digital signals and being provided to said analog device, the apparatus comprising:

a decimator-interpolator means for decimating incoming digital signals provided by said analog-digital-analog conversion device and providing decimated incoming digital signals representative of said incoming signals to said digital device, and for interpolating outgoing digital signals received from said digital device and providing interpolated digital signals to said analog-digital-analog conversion device;

said decimator-interpolator means comprising a first decimator-interpolator module, and an output means for providing digital outputs, said first decimator-interpolator module comprising a digital input circuit, a first digital cell circuit, and a second digital cell circuit;

said digital input circuit selectively receiving said incoming digital signal from said analog-digital-analog conversion device and producing an incoming clocked input to said first digital cell circuit, or receiving said outgoing digital signal from said digital device and producing an outgoing clocked input to said first digital cell circuit;

said first digital cell circuit selectively producing a first iteration decimated digital signal to said second digital cell circuit in response to reception of said incoming clocked digital signal, or producing a first iteration interpolated digital signal to said second digital cell circuit in response to reception of said outgoing clocked input;

said second digital cell circuit selectively producing a second iteration decimated digital signal in response to reception of said first iteration decimated digital signal, or producing a second iteration interpolated digital signal in response to reception of said first iteration interpolated digital signal;

the products of said second digital cell circuit being the outputs of said first decimator-interpolator module; said second digital cell circuit being operatively connected to provide its respective outputs to said output means;

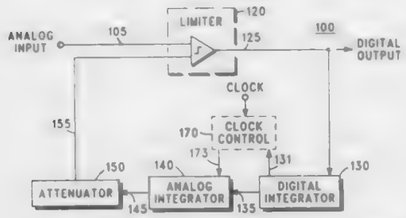
said output means selectively providing said interpolated digital signal to said analog-digital-analog conversion device or providing said decimated incoming digital signal to said digital device.

4,996,529

AUTO-ZEROING CIRCUIT FOR OFFSET CANCELLATION

Lawrence E. Connell, Naperville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1989, Ser. No. 335,628
Int. Cl.[5] H03M 1/06
U.S. Cl. 341—118 36 Claims



1. A means for biasing an amplifier having an analog input signal, an amplified output signal, and a bias control port for adjusting the DC bias of the output signal, said biasing means comprising:

first means for integrating said amplified output signal, and for producing a first control signal indicative of the time when the integrated output signal exceeds a predetermined positive or negative threshold, and for producing a second control signal indicative of the polarity of the threshold exceeded;

second means for integrating said second control signal in response to said first control signal, thereby providing a third control signal; and

means for coupling said third control signal to said bias control port.

4,996,530

STATISTICALLY BASED CONTINUOUS AUTOCALIBRATION METHOD AND APPARATUS

Howard E. Hilton, Snohomish, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 27, 1989, Ser. No. 442,379
Int. Cl.[5] H03M 1/08
U.S. Cl. 341—120 26 Claims

1. In a subranging analog-to-digital converter that includes:

first and second analog-to-digital converters (ADCs);

a digital-to-analog converter (DAC);

each of said converters having an input and an output;

an analog subtraction circuit having first and second inputs and a difference output;

an analog signal input connected to the first input of the subtraction circuit;

said first ADC having its input connected to the analog signal input and having its output connected to the input of the DAC;

said DAC having its output connected to the second input of the subtraction circuit;

said second ADC having its input connected to the difference output of the subtraction circuit; and

means for combining the outputs of the first and second ADCs to provide a digital output signal;

an improvement wherein the DAC comprises:

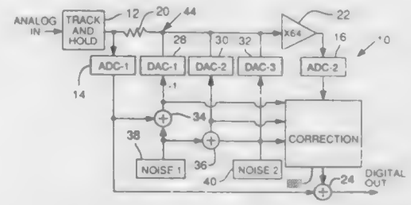
first, second and third DACs, each having an input and an output;

first and second digital noise sources, each having an output;

first and second adders, each having two inputs and an output; and

a correction circuit having a plurality of inputs and an output;

said first adder having its first input coupled to the output of the first noise source and having its second input coupled



to the output of the first ADC, said adder having its output coupled to the input of the first DAC to provide the negated sum of the first noise source output and the first ADC output thereto;

said second adder having its first input coupled to the output of the first noise source and having its second input coupled to the output of the second noise source, said adder having its output coupled to the input of the second DAC to provide the sum of the first and second noise source outputs thereto;

said third DAC having its input coupled to the output of the second noise source for receiving a negated noise output therefrom;

said first, second and third DACs having their outputs coupled to the second input of the analog subtraction circuit;

said correction circuit having a first input coupled to the output of the second ADC, a second input coupled to the output of the first adder, a third input coupled to the output of the second adder, and a fourth input coupled to the output of the second noise source; said circuit including means for compensating the digital output signal for conversion errors in the first, second and third DACs.

4,996,531

DIGITAL OPTICAL CONVERSION MODULE

Dale K. Kotter, North Shelley, and Richard A. Rankin, Ammon, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 19, 1988, Ser. No. 221,394
Int. Cl.[5] H03M 1/60
U.S. Cl. 341—157 14 Claims

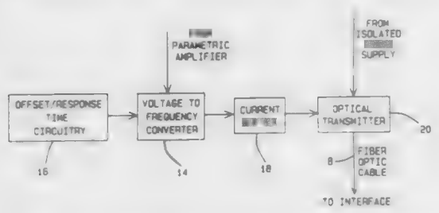
1. An apparatus for providing high resolution linkage of an analog output device to a digital computer system comprised of:

a voltage-to-frequency converter coupled to the analog output device, said voltage-to-frequency converter capable of producing a train of pulse signals whose frequency is directly related to the analog output of the analog out-

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put device, response time circuitry means connected to said voltage-to-frequency converter to offset the output of said voltage-to-frequency converter to a midrange frequency, means for eliminating the loading effects on said output of the voltage-to-frequency converter where said eliminating means is coupled to said voltage-to-frequency converter.

an optical transmitter means connected to said eliminating



means where said optical transmitter means is capable of converting the signal from said voltage-to-frequency converter to an optical signal,

means for sending said optical signal to an optical interface where said optical interface is capable of converting said optical signal to an electrical signal compatible with the digital computer system, and

means for sending said electrical signal to the digital computer system.

4,996,532

DIGITAL BEAM FORMING RADAR SYSTEM

Tetsuo Kirimoto; Takahiko Fujisaka, and Yoshimasa Ohashi, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 450,290

Claims priority, application Japan, Dec. 16, 1988, 63-317772

Int. Cl.[5] G01S *7/36, 7/42*

U.S. Cl. 342—81 **17 Claims**



1. A radar system having improved interference resistant characteristics comprising:

an oscillation means capable of generating a plurality of different frequencies;

a transmitting antenna means connected to said oscillation means for transmitting an electric wave generating one of the frequencies in different directions in a predetermined sequence to allow a desired area to be scanned;

a control means for causing said oscillation means and said transmitting antenna means to be operated in any one, or a combination of, at least three transmission modes including a first transmission mode in which the operation timing of said oscillation means and said transmitting antenna means is synchronized and said transmission frequency is changed every time one scanning operation is completed, a second transmission mode in which the transmission frequency is changed in a predetermined order every time the transmission direction is changed during the respective scanning period and a third transmission mode in which the transmission frequency is changed at random every time the transmission direction is changed during the respective scanning period; and

a receiving means capable of simultaneously forming a plurality of reception beams within the scanning range and converting received signals to corresponding digital signals to output signals indicating the directions and frequencies of the received signals, whereby the transmission mode may be changed depending on the directions and the frequencies of the incoming signals.

4,996,533

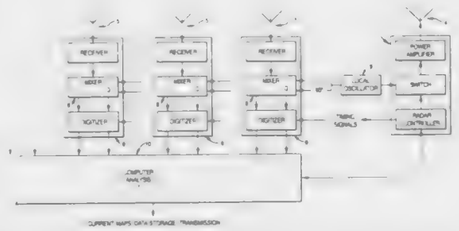
SINGLE STATION RADAR OCEAN SURFACE CURRENT MAPPER

Peter T. May, Longmont; Richard G. Strauch, and Bob L. Weber, both of Boulder, all of Colo., assignors to Univ. of Colo. Foundation, Inc., Boulder, Colo. and The United States of America as represented by the Secretary of the Commerce, Washington, D.C.

Filed Sep. 15, 1989, Ser. No. 408,007

Int. Cl.[5] G01S *13/58, 13/00;* **B21B** *21/00*

U.S. Cl. 342—108 **3 Claims**



1. A method for measurement of ocean currents using a single radar scanning the ocean surface with a directional beam and using spatially separated antenna arrays, comprising the steps of

calculating the spectrum for each range and antenna,

forming beams by summing spectra including phase offsets for beam steering,

calculating radial velocity using the spectral offset of the first order Bragg lines,

calculating correlation functions using fast Fourier transforms of mean power spectrum and cross-spectrum,

calculating transverse current components from parameters τ' and τ_x on correlation functions, where T' is the position of the maximum of the cross-correlation function, and T_x is the lag such that the auto-correlation function falls to the maximum value of cross-correlation, and

combining the observations of the radial and transverse current components at all ranges and directions to generate current maps.

4,996,534

PROCESSING OF CONCATENATED RADAR MEASUREMENTS TO RE-ESTABLISH SIGNAL PHASE COHERENCE

Robert A. Grubbs, Riverside, Calif., and Gregory P. Brown, Celeste, Tex., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 21, 1989, Ser. No. 456,017

Int. Cl.[5] G01S *7/30*

U.S. Cl. 342—195 **16 Claims**

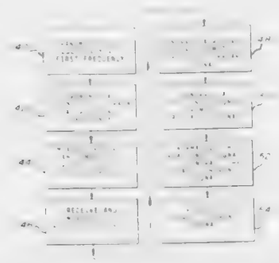
1. A method of signal processing for re-establishing frequency, phase and amplitude coherence for radar samples generated by multiple frequency transmitter pulses directed towards, modulated by and reflected from airborne objects having radial and ambiguous velocities wherein said multiple frequency transmitter pulses radiate from an antenna array

rotating at a constant rate and wherein the phase, amplitude scale and frequency of said reflected radar samples received at said antenna array are compared with a given reference phase, amplitude scale and frequency, said method comprising the steps of:

(a) generating a first pulse train at a first transmitter frequency for transmitting said first pulse train towards said airborne object;

(b) generating a second pulse train at a second transmitter frequency for transmitting said second pulse train towards said airborne object;

(c) measuring the radial velocity of said airborne object;



(d) receiving and measuring said reflected radar samples resulting from said first pulse train at said first transmitter frequency and said second pulse train at said second transmitter frequency;

(e) rescaling said reflected radar samples to said given reference frequency for generating a rescaled signal;

(f) realigning said rescaled signal to said given reference phase for generating a realigned signal;

(g) normalizing said realigned signal to said given reference amplitude scale for generating a phase coherent signal; and

(h) processing said phase coherent signal for identifying said reflected radar samples.

4,996,535

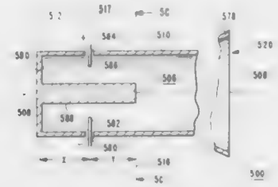
SHORTENED DUAL-MODE HORN ANTENNA

Charles E. Profera, Jr., Cherry Hill, N.J., assignor to General Electric Company, East Windsor, N.J.

Filed Sep. 8, 1988, Ser. No. 241,671

Int. Cl.[5] H01Q *13/00*

U.S. Cl. 343—786 **7 Claims**



1. A horn antenna arrangement, comprising:

a hollow waveguide including a conductive peripheral wall arrangement centered on a longitudinal axis;

a conductive short circuiting plate connected to said peripheral wall arrangement at a first plane transverse to said axis;

an elongated conductor connected at one end to said short circuiting plate and extending within said waveguide and centered on said axis to an abrupt termination at a second plane transverse to said axis, said elongated conductor being electrically isolated from said conductive peripheral wall arrangement at transverse planes other than said first plane;

push-pull feed means coupled to said hollow waveguide at a third transverse plane lying between said first and second transverse planes, for transducing a signal with said waveguide with first and second antiphase electric poles at diametrically opposite sides of said axis; and

a radiation aperture centered on said axis and defined at an extension of said hollow waveguide said radiation aperture being separated by a predetermined distance from said second plane which is selected to provide a phase difference of 180° between a fundamental waveguide mode and a higher-order waveguide mode at said radiating aperture for tending to equalize the radiation patterns in two orthogonal planes.

4,996,536

RADAR REFLECTORS

Jeffrey C. Broadhurst, Branston, England, assignor to Woodville Polymer Engineering Limited, Ross-en-Wye, England

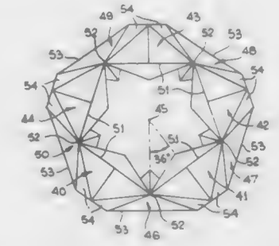
PCT No. PCT/GB89/00137, § 371 Date Oct. 19, 1989, § 102(e) Date Oct. 19, 1989, PCT Pub. No. WO89/07840, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 16, 1989, Ser. No. 424,235

Claims priority, application United Kingdom, Feb. 19, 1988, 8803871; Aug. 15, 1988, 8819356.0

Int. Cl.[5] H01Q *15/20*

U.S. Cl. 343—912 **14 Claims**



1. An array of reflectors of electromagnetic waves comprising a plurality of trihedral reflectors each comprising three radar reflective panels with right-angled corners meeting at a vertex and each panel meeting the other two panels along two sides leaving a third side defining a triangular opening with a major axis detected outwards from said vertex through said opening and defined by the intersection of planes normal to and bisecting said panels, said plurality of trihedral reflectors being arranged about a vertical axis with said major axis of each reflector directed outwards and upwardly away from said vertical axis and with a said third side of alternate reflectors disposed uppermost and arranged horizontally and a said third side of intermediate alternate reflectors disposed lowermost and arranged horizontally, and additional radar reflective panels each disposed between the triangular openings of adjacent reflectors and bridging between adjacent downwardly diverging said third sides of panels of said reflectors.

4,996,537

METHOD OF AND APPARATUS FOR RECORDING IMAGE

Kazutomo Kishimi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 28, 1989, Ser. No. 399,060

Claims priority, application Japan, Aug. 31, 1988, 63-219554

Int. Cl.[5] G01D *15/10;* **G03C** *5/16*

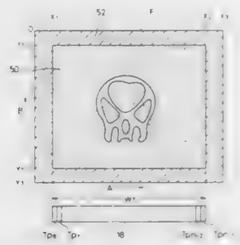
U.S. Cl. 346—1.1 **6 Claims**

3. An apparatus for recording an image on a heat sensitive recording material, said image having a high density level of dark portions therein, said recording material comprising a

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support coated with a coating solution which makes an unheated area colored and a heated area transparent in a colorless or light colored manner, said apparatus comprising:

negative-positive reversal means for processing input image data through negative-positive reversal, wherein a majority of said input image data corresponds to dark image [illegible]



a thermal head having a plurality of heating elements energizable by the processed image data for recording an image on the heat sensitive recording material held against the thermal head based on said processed image data, wherein said majority of image data corresponding to dark areas in said image is processed so that little or no heat energy is produced by said thermal head when said majority of image data is applied thereto.

4,996,538

APPARATUS FOR SEPARATING AND RECOVERING SOLID DEVELOPER PARTICLES TRANSPORTED BY A GASEOUS FLOW

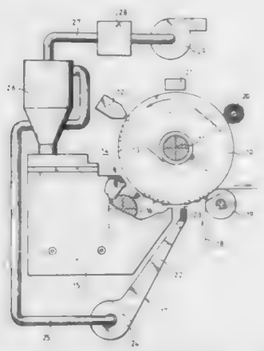
André Brecy, Hericourt, and Philippe Poinsot, Belfort, both of France, assignors to Bull S.A., Paris, France

Filed Nov. 28, 1989, Ser. No. 442,201

Claims priority, application France, Nov. 29, 1988, 88 15595

Int. Cl.[5] G11B *9/00*

U.S. Cl. 346—74.3 **19 Claims**



1. An apparatus for separating and recovering solid developer particles transported by a gaseous flow comprising:

a separation chamber (40) having an axis of revolution (45) disposed substantially vertically, the chamber having in its upper portion an admission conduit (43) for admitting gas into the chamber (40) and arranged so as to create a turbulent flow for a gaseous flow, laden with solid developer particles, and an escape conduit (44) disposed axially of the chamber to enable the evacuation of the gaseous flow, from which the particles have been removed, the chamber further including, in its lower portion, an outlet opening (46) communicating with a discharge conduit (47) having a section smaller than that of the separation chamber, said conduit being closed at its lower end by a movable shutter (49) to provide a box for recovery of particles, the chamber being arranged such that the developer particles, after being separated from the gaseous flow int he chamber, are urged by gravity toward the discharge conduit and into the box;

and a helical device (52) disposed in the discharge conduit (47) and in proximity with the outlet opening (46), the helical device having a surface the helical edge (53) of which is in contact with the internal wall of the discharge conduit, and the inclination of which with respect tot he horizontal has a value between 3° and 10° and is oriented in the same direction as that of the helical path of the solid particles to be transported by the gaseous flow, to prevent particles arriving in the recovery box from being re-aspirated by the rising gaseous flow which circulates above said helical device and finally escapes via the escape conduit.

4,996,539

LABEL PRINTER

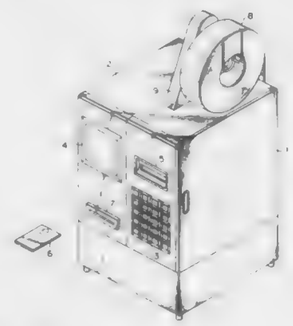
Koichi Haraga, Numazu; Kazuhide Takahama, Shizuoka, and Mitsuo Uchimura, Numazu, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 211,423, Jun. 24, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 465,517

Claims priority, application Japan, Jun. 30, 1987, 62-161058

Int. Cl.[5] G01D *15/10;* **B41J** *45/00;* **G06K** *7/10*

U.S. Cl. 346—76 PH **7 Claims**



1. A label printer comprising:

input means for inputting printing data;

a built-in memory including at least one standard printing format stored therein;

an inlet port for receiving memory cards each of which includes at least one optional printing format stored therein, said memory cards being selectively and detachably connectable to said inlet port;

printing means for printing the printing data input from the input means on a label; and

control means including means for selecting one of the printing formats stored in the built-in memory and a received memory card, means for driving the printing means to print the input printing data in the selected printing format, and means for inhibiting an optional printing format from being selected by said selecting means when it is detected that no memory card is received in and connected to said inlet port.

4,996,540

RECORDER WITH LIGAMENT SUPPORTED SCAN MIRROR AND RESILIENT OPTICAL SYSTEM SUPPORT

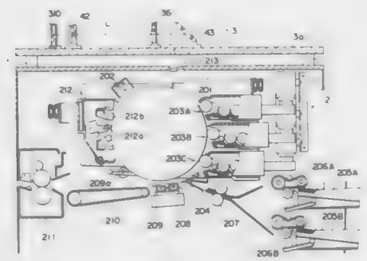
Toshihiro Motoi; Toshihiko Nakazawa; Toshihiro Takesue; Satoshi Takahashi, and Takashi Murahashi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,242

Claims priority, application Japan, Jan. 29, 1988, 63-20225; Mar. 31, 1988, 63-79907

Int. Cl.[5] H04N *1/21;* **G02B** *26/08*

U.S. Cl. 346—108 **4 Claims**



1. In an image recording apparatus comprising an image forming portion including an image retainer, and a beam scanning optical system including a deflector having a deflecting member with a frame, a reflecting mirror, a drive coil and ligaments molded into one piece, the improvement wherein a resilient member is interposed between said optical system and said image forming portion, said resilient member having the characteristic of

$$i<2.8\% \text{ and } i=\{1/(f/fn)^2-1\}\times 100\%$$

wherein i is the theoretical value of oscillation transmissibility of said resilient member, fn is the intrinsic frequency (Hz) of said optical system including said resilient member, and f is the oscillation frequency (Hz) of said image forming portion.

4,996,541

FILM CONVEYING APPARATUS

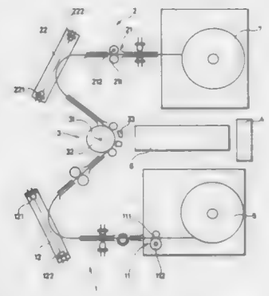
Shinichi Mori; Akiyoshi Hamada; Mitsutoshi Yagoto, and Masanori Murakami, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 18, 1990, Ser. No. 510,577

Claims priority, application Japan, Apr. 19, 1989, 1-99665; Apr. 19, 1989, 1-99666

Int. Cl.[5] G01D *15/14;* **B41J** *2/47*

U.S. Cl. 346—108 **15 Claims**



1. A film conveying apparatus, comprising:

film feeding means for feeding a film;

film drawing means for drawing said fed film;

slack detecting means including a light emitting element and a light receiving element for optically detecting slack of said film formed between said film feeding means and said film drawing means; and

controlling means for stopping, when said slack detecting means detects slack of said film, emission of light from said light emitting element for a prescribed time period.

4,996,542

APPARATUS FOR SCANNING SHEET-SHAPED RECORDING MEDIUM BETWEEN EDGE ROLLERS

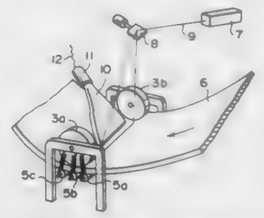
Makoto Ohgoda, and Kaoru Tamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 34,954, Apr. 6, 1987, abandoned, which is a division of Ser. No. 673,443, Nov. 20, 1984, Pat. No. 4,712,009. This application Sep. 6, 1989, Ser. No. 402,995

Claims priority, application Japan, Nov. 21, 1983, 68-219312

Int. Cl.[5] G01D *15/16*

U.S. Cl. 346—108 **5 Claims**



1. An apparatus for scanning a sheet-shaped recording medium (6), the apparatus comprising:

(i) a conveyance means comprising a conveying roller and a plurality of nip rollers (5*a*, 5*b*, 5*c*) for forming nips for conveying the sheet-shaped recording medium in a conveyance direction in cooperation with said conveying roller by contacting the surface of said conveying roller, and

(ii) a scanning optical system for scanning the sheet-shaped recording medium, which is conveyed by said conveyance means, by a light beam in a scanning direction approximately normal to the conveyance direction of the sheet-shaped recording medium,

(iii) said conveying roller being fabricated as a pair of edge rollers (3*a*, 3*b*), said edge rollers having opposing faces int eh scanning direction, and said edge rollers contacting said nip rollers only near both end portions of said nip rollers such that the sheet-shaped recording medium is bent to fit a circumferential surface of each of said edge rollers to thereby form a bent portion,

(iv) said scanning optical system being positioned on the same side of the sheet-shaped recording medium as said edge rollers for scanning the sheet-shaped medium along said bent portion between the opposing faces of said pair of edge rollers.

4,996,543

PRECISION MEDIUM HANDLING SYSTEM AND METHOD FOR A RECORDER

Michel Moulin, and Marcello Baseggio, both of c/o Versitec S.A., Avenue des Baumettes 17, CH-1020 Renens, Switzerland

Filed Jan. 5, 1990, Ser. No. 461,345

Claims priority, application United Kingdom, Feb. 10, 1989, [illegible]3051

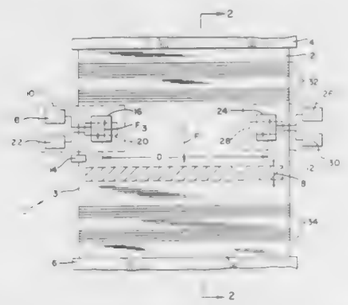
Int. Cl.[5] B41B *19/00*

U.S. Cl. 354—5 **39 Claims**

1. A precision transport system for accurately moving a photosensitive medium, said system comprising, in combination, drive means for moving said photosensitive medium in a predetermined alignment relative to a first reference line, detection means for detecting the position of a second reference

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line on said medium and producing corresponding electrical signals, and correction means responsive to said electrical



signal for correcting the direction of travel of said medium relative to said first reference line.

4,996,544

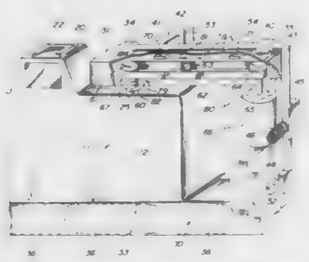
AUTOWINDER FOR UNDERWATER AND ALL WEATHER CAMERA

John H. Fiorda, 3074 Van Buren Ave., Costa Mesa, Calif. 92626

Filed Jan. 11, 1990, Ser. No. 463,520

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—64 **10 Claims**



1. For use in combination with a camera having a film advance mechanism and shutter release, an autowinder comprising:

a sealed housing having an interior cavity and an exterior;

a trigger arm pivotally coupled to said housing exterior having a first end capable of being positioned proximate the shutter release of the camera and a second end;

a magnet secured to said second end;

a bidirectional motor within said housing;

circuit means within said housing operatively coupled to said motor having first magnetic sensing means responsive to said magnet to initiate energizing of said motor in a first direction;

drive means for coupling said motor to the film advance mechanism of the camera; and

limit means cooperating with said circuit means and said drive means to cause operation of the film advance mechanism of the camera through a winding cycle once motor operation is initiated.

4,996,545

APPARATUS FOR CORRECTING BLURRED IMAGE OF CAMERA USING ANGULAR ACCELERATION SENSOR AND ANGULAR ACCELERATION SENSOR

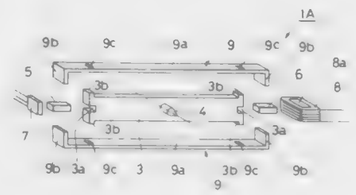
Shigeo Enomoto, and Taminori Odano, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,885

Claims priority, application Japan, Apr. 3, 1989, 1-84318; Jan. 19, 1990, 2-3623[U]

Int. Cl.[5] G03B *39/00;* **G01P** *15/08*

U.S. Cl. 354—70 **21 Claims**



1. An apparatus for correcting a blurred image comprising:

a blurred image correcting lens which constitutes at least a part of a photographing lens of a camera and which is supported so as to move in a direction substantially perpendicular to the optical axis of the photographing lens;

a driver for driving the correcting lens;

an angular acceleration sensor adapted to detect the angular acceleration applied to said camera to send a drive signal to said driver to cancel movement of the optical axis of the photographing lens;

said angular acceleration sensor comprising a rotatable sensor arm having a rotational shaft centrally positioned along the length of said sensor arm and permanent magnets at the opposite ends of said sensor arm, a magnetic sensor which is mounted opposite one of said permanent magnets, a coil which is mounted opposite to the other said permanent magnet, said coil comprising a winding intersecting the magnetic flux of said other permanent magnet;

whereby the blurred image correcting lens is driven in accordance with the output of said coil.

10. An angular acceleration sensor comprising a rotatable sensor arm having a rotational shaft centrally positioned along the length of said sensor arm and permanent magnets at the opposite ends of said sensor arm, a magnetic sensor which is opposite one of said permanent magnets, and a coil which is opposite the other of said permanent magnets and comprising a winding intersecting the magnetic flux of the other said permanent magnet.

4,996,546

CAMERA APPARATUS FOR MAGNETICALLY RECORDING ON FILM

Daniel M. Pagano, Henrietta, and Robert P. Cloutier, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 420,657, Oct. 11, 1989, abandoned, which is a continuation of Ser. No. 254,908, Oct. 7, 1988, abandoned. This application Jun. 20, 1990, Ser. No. 541,177

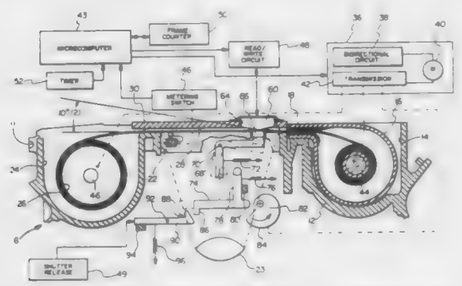
Int. Cl.[5] G03B *17/24*

U.S. Cl. 354—76 **18 Claims**

1. A photographic still camera for transporting a photographic film over an exposure opening to expose frames of the film, the film having a magnetic surface on one side for magnetically recording information on the film, said camera comprising:

a camera body having an exposure opening;

a film platen supported to engage the film and retain it in an exposure plane adjacent said opening; and



a magnetic head mounted at said platen to engage the magnetic surface of said film in said plane.

4,996,547

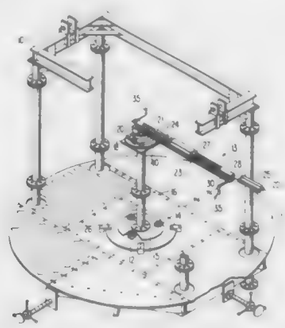
RADIAL ARM STRIKE RAIL

Mark H. McKeown, Golden, and Steven C. Beason, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 31, 1989, Ser. No. 401,390

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—81 **2 Claims**



1. Apparatus for aligning a geologic bearing or direction measuring device to a target point comprising:

a shaft mapping platform having a lower pedestal attached to a level adjusting plate adapted to be centered and leveled,

an upper pedestal mounted on said lower pedestal,

a rotary indexing table mounted on said upper pedestal,

a strike rail mounted on said rotary indexing table, said strike rail having a first pulley and crank mounted on a first end, a second pulley and crank mounted on a second end, and an indicating scale located on a top surface,

an extension arm adapted to be slidably movable from a center position along said strike rail to an outer position,

a cog belt mounted on said adapted to be driven by said first and second pulleys, said cot belt being fastened to said extension arm and adapted to move said extension arm,

a scale affixed to an outer surface of said cog belt; and

a pointer mounted vertically on said second end of said strike rail and adapted to indicate radial distance of horizontal movement of said scale and said extension arm.

4,996,548

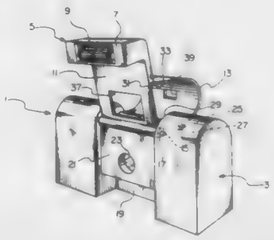
CAMERA WITH FLIP-UP FLASH UNIT

Joseph J. Schappler; David J. Glogan, both of Rochester, and William L. Burnham, Leroy, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1990, Ser. No. 478,910

Int. Cl.[5] G03B *15/03, 13/04*

U.S. Cl. 354—149.11 **11 Claims**



1. A photographic camera comprising (a) a camera housing and (b) a flip-up flash unit including a head part having a flash emission window and at least one supporting part for said head part pivotally connected to said camera housing to permit swinging movement of said flash unit to a folded storage position in which the head part and said supporting part cover respective portions of the camera housing and to a non-folded operative position in which the head part and the supporting part are elevated from the camera housing with said flash emission window substantially facing a subject to be photographed, is characterized in that:

said supporting part of said flash unit has a viewfinder opening for viewing a subject to be photographed through said viewfinder opening when the flash unit is in the non-folded position; and

a cover part is connected to said camera housing separately from said flash unit to permit movement of said cover part to completely cover said viewfinder opening when the flash unit is in the folded position.

4,996,549

FILM FEEDING CONTROL DEVICE FOR CAMERA

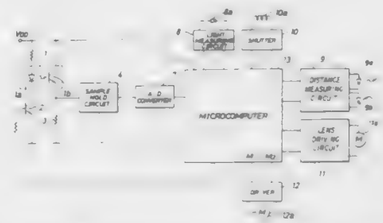
Kohichi Yamaguchi, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,067

Claims priority, application Japan, Sep. 13, 1988, 63-227465

Int. Cl.[5] G03B *1/18, 17/36*

U.S. Cl. 354—173.11 **3 Claims**



1. A film feeding control device for a camera in which film perforations are arranged so as to pass through a detecting section of a photointerrupter during film feeding, which detects presence of perforations by comparing an output signal from the photointerrupter when the perforations pass through the detecting section with a predetermined threshold limit value and which detects film feeding conditions according to

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the variation of the output signal, characterized in that said device comprises:

calculating means for calculating an average value from maximum and minimum values of the output signal from said photointerrupter;

judging means for establishing said average value as the threshold limit value and for discriminating the film feeding condition by comparing the output signal from said photointerrupter with said threshold limit value; and

controlling means for controlling the feed of film according to the judged result by said judging means.

4,996,550

SHUTTER SPEED CONTROL DEVICE

Hideki Matsui, Yokohama; Nobuyoshi Hagiuda, Kawasaki; Norikazu Yokonuma, Tokyo; Hiroshi Sakamoto, Kawasaki, and Yoshikazu Iida, Chigasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,179

Claims priority, application Japan, Apr. 8, 1988, 63-86387

Int. Cl.[5] G03B *7/00, 15/03*

U.S. Cl. 354—420 **7 Claims**



1. A camera system capable of flash photography, comprising:

shutter means for opening and closing an exposure opening to thereby start and terminate the exposure of a film;

means for generating a synchronizing signal for triggering light emission for said flash photography, said generating means having a first synchro control mode in which said synchronizing signal is generated when said exposure is started, and a second synchro control mode in which said synchronizing signal is generated when said exposure has begun termination;

means for arbitrarily selecting a control mode from said first synchro control mode and said second synchro control mode; and

shutter control means for making possible the driving of said shutter means at shutter speeds up to a first limit speed as long as said first synchro control mode is selected, and making possible the driving of said shutter means at shutter speeds up to a second limit speed as long as said second synchro control mode is selected, said second limit speed being lower than said first limit speed.

4,996,551

EXPOSURE CONTROL APPARATUS

Masaharu Kanai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 20, 1990, Ser. No. 486,875

Claims priority, application Japan, Feb. 29, 1989, 1-39605; Feb. 20, 1989, 1-39606

Int. Cl.[5] G03B *7/08*

U.S. Cl. 354—432 **10 Claims**

1. An exposure control apparatus for controlling the opening and closing of a shutter blade, comprising:

first photometry means for measuring a plurality of divisional areas of a field of views when said shutter blade is closed;

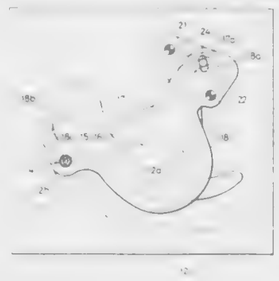
calculating means for calculating the correct exposure time for a central area of said field of view by using a plurality of signals obtained by measuring said plurality of areas with said first photometry means;

second photometry means for measuring light from said field of view;

a light-receiving aperture formed in said shutter blade, said light-receiving aperture progressively opening said second photometry means upon progressive opening of said shutter blade;

integrating means for integrating an output signal from said second photometry means; and

means for outputting a signal to close said shutter blade when the value integrated by said integrating means reaches a value corresponding to said correct exposure time.



4,996,552

IMAGE EXPOSURE DEVICE FOR EXPOSING PHOTOSENSITIVE RECORDING MEDIUM TO COLOR IMAGE LIGHTS

Kazuo Sangyoji, Nagoya, and Hiroshi Kawahara, Aichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Apr. 9, 1990, Ser. No. 506,467

Claims priority, application Japan, Apr. 7, 1989, 1-89485

Int. Cl.[5] G03B *27/00*

U.S. Cl. 355—1 **6 Claims**



1. An exposure device used in an image forming apparatus for exposing a photosensitive recording medium carrying microcapsules on one surface thereof to color image lights produced in accordance with color image data representing an original image to form a latent image corresponding to the original image, comprising:

exposing means having plural exposing surfaces for producing the color image lights in accordance with the color image data and selectively exposing the photosensitive recording medium to the color image lights to form the latent image on the photosensitive recording medium, said exposing surfaces being disposed in such a manner as to confront the other surface of the photosensitive recording medium; and

control means for driving and controlling said exposing means to produce the color image lights in accordance with the image data inputted thereto and expose the color image lights to the photosensitive recording medium.

4,996,553

METHOD FOR PRODUCING GLOSS IMAGE ON IMAGE RECORDING MEDIUM AND APPARATUS FOR MAKING THE GLOSS IMAGE ON THE MEDIUM

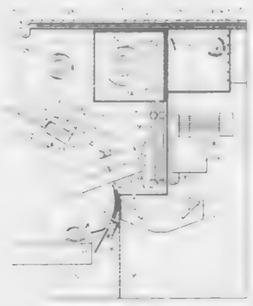
Osamu Takagi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 28, 1989, Ser. No. 398,979

Claims priority, application Japan, Aug. 31, 1988, 63-217486

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **8 Claims**



1. A method for forming a glossy output image on an image recording medium, the image recording medium having one surface carrying an output image, the method comprising the steps of:

heating and pressing the image recording medium by means of a pressure contact member for meltingly smoothening the one surface of the image recording medium;

cooling the one surface during travel of the image recording medium while maintaining a surface contact between the pressure contact member and the image recording medium; and

separating the image recording medium from the pressure contact member.

4,996,554

PRESSURE DEVELOPING DEVICE

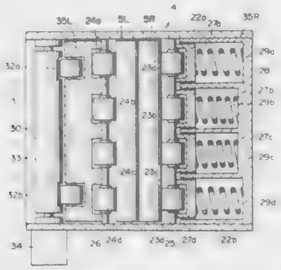
Hayakawa Kiyoharu, Ama, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 20, 1989, Ser. No. 369,044

Claims priority, application Japan, Jun. 21, 1988, 63-82195[U]; Jul. 5, 1988, 63-89764[U]

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **2 Claims**



1. A pressure developing device having a pair of pressure rollers being adapted to be brought into and out of contact with each other for pressurizing an exposed recording sheet containing a plurality of photo-sensitive microcapsules each containing a component to change the rupture strength thereof when exposed to light and a developing sheet coated with a developer material to develop a visible image thereon in an overlapped state, said pressure developing device further comprising:

a plurality of elastic spring members arranged along one of said pair of rollers from edge to edge for generating a push force, said elastic spring members being arranged in such a manner that the push force of the elastic spring members located at a central portion of said one of said pair of pressure rollers is stronger than that of the elastic spring members located at said edges; and

a plurality of backup rollers for respectively transmitting the push force generated by each of said elastic spring members to said one of said pair of rollers.

4,996,555

OPTICAL SYSTEM FOR USE WITH A VIEWFINDER

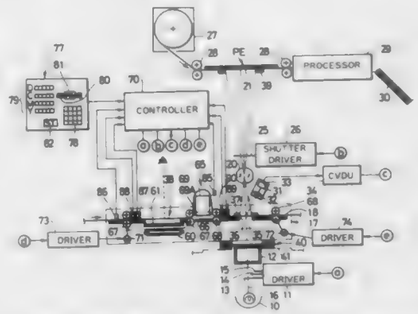
Satoru Takemoto; Rokusaburo Kaneko; Matsuyuki Miwa, and Seiji Makino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 12, 1990, Ser. No. 464,063

Claims priority, application Japan, Jan. 13, 1989, 1-6757; Jun. 9, 1989, 1-147165; Nov. 22, 1989, 1-304486

Int. Cl.[5] G03B *13/24*

U.S. Cl. 355—44 **20 Claims**



1. A photographic film carrier attached to a photographic printer for defining a film exposing window in which frames of a negative film are placed to expose each frame to create a latent image on a photographic paper, said photographic film carrier comprising:

a film viewing window, formed close to said film exposing window in said photographic film carrier, for allowing an operator to inspect each said frame positioned therein for exposure; and

looping means, disposed between said film viewing window and film exposing window, for forming a loop in said negative film between said film viewing window and said film exposing window, said looping means comprising:

a guide plate;

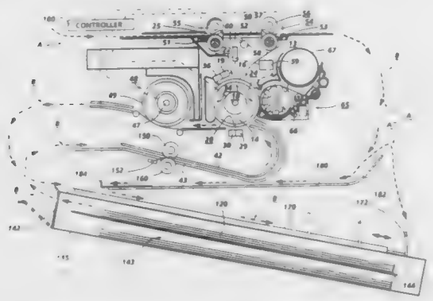
a pair of rollers, disposed adjacent to each of said film viewing window and film exposing window, for forming a loop in said negative film above said guide plate;

a movable guide plate, disposed on said guide plate, for guiding a leading end of said negative film to said pair of rollers provided in association with said film viewing window, said movable guide plate then being swung up for forming a space above said guide plate wherein a loop is formed; and

control means for controlling rotation of said pairs of rollers provided in association with said film viewing window and film exposing window.

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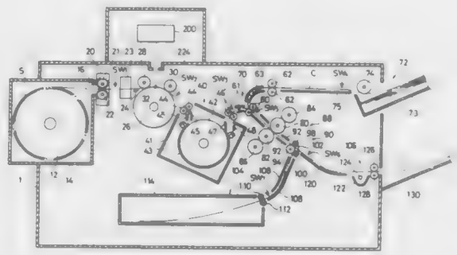
4,996,556
LARGE DOCUMENT COPYING SYSTEM
Gerald A. Gray, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 3, 1989, Ser. No. 389,094
Int. Cl.[5] G03B *27/50*
U.S. Cl. 355—50 8 Claims

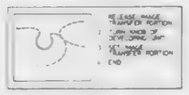


1. A system for copying large documents on a large document copier having a large document sheet feeder and a large copy sheet or web feeder with improved convenience and efficiency comprising the steps of:
inserting the leading edge of said large document into said document feeder from the front of said large document copier,
automatically initially feeding said large document away from the front of said large document copier with said large document feeder,
pausing said feeding of said large document by said large document feeder in a position wherein a trailing portion of said large document is retained by said document feeder and a substantial portion of said large document is removed from the front of said large document copier so that the front of said large document copier is unobstructed by said large document,
inserting a copy sheet or web into said large document copier from the front thereof for copying,
activating said large document copier to copy said large document onto said copy sheet or web after said copy sheet or web has been inserted,
and, in response to said copying activation, first automatically rapidly feeding said large document back in a reverse direction with said large document feeder with out copying, to a position wherein a leading portion of said large document is retained by said document feeder, and then, promptly thereafter, automatically again reversing the direction of feeding said large document with said large document feeder and moving said large document away from the front of said large document copier at a copying speed synchronized with movement of said copy sheet or web for copying said large document onto said copy sheet or web.

4,996,557
JAM DETECTING AND DISPLAYING DEVICE IN AN IMAGE RECORDING APPARATUS
Atsushi Takagi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 181,353, Apr. 14, 1988, Pat. No. 4,908,655. This application Oct. 5, 1989, Ser. No. 417,620
Claims priority, application Japan, Apr. 14, 1987, 62-89824
Int. Cl.[5] G03G *15/00;* B65H *7/06*
U.S. Cl. 355—50 2 Claims

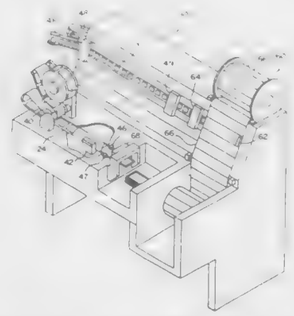
1. A jamming detecting and displaying device in an image recording apparatus, having jamming clearing members including a plurality of knobs and levers, which comprises:
jamming detecting means for detecting the jamming of an image recording material in sa'd image recording apparatus;
jamming displaying means for displaying the position where jamming occurs and information concerning procedures for eliminating said jamming; and
control means responsive to said detecting means for determining a procedure for eliminating said jamming and controlling said jamming displaying means to display





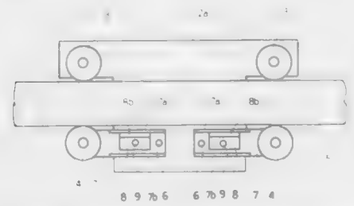
information concerning said procedure, wherein said displaying means displays information concerning said procedure in a manner comprising simultaneously displayed sentences to identify the sequence and combination in which said plurality of knobs and levers should be operated, wherein said displaying means is positioned such that an operator of the image recording apparatus can observe said displaying means when a front door of the image recording apparatus is opened.

4,996,558
COLLATING DEVICE
Kanji Tokuda; Yoshihiko Saeki; Kiichiro Sakamoto, all of Kanagawa, and Fumio Matsumoto, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 11, 1988, Ser. No. 217,210
Claims priority, application Japan, Jul. 30, 1987, 62-191188; Jul. 30, 1987, 62-191186
Int. Cl.[5] G03B *27/48*
U.S. Cl. 355—50 14 Claims



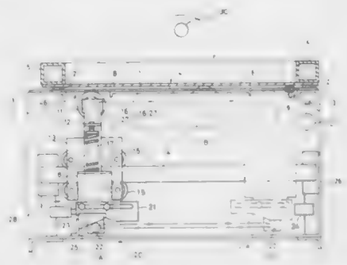
1. In a collating device for collating images on a photographic film with those printed on a printing paper from said photographic film while conveying said film and said printing paper, an improvement comprising:
a reading device for reading a unique frame number recorded on said film for identifying each frame image; and
a printing device for printing each unique frame number which has been read by said reading device on the printing paper on which has been printed the image of said film which corresponds to that frame number.

4,996,559
OPTICAL SYSTEM SUPPORTING MECHANISM FOR AN IMAGE PROCESSING EQUIPMENT
Naoki Sakamoto, Japan, and Itakiyo Masanori, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Oct. 24, 1989, Ser. No. 426,739
Claims priority, application Japan, Oct. 28, 1988, 63-141429[U]
Int. Cl.[5] G03G *15/28*
U.S. Cl. 355—56 1 Claim



1. An optical system supporting mecahnism of an image processing equipment comprising:
at least two first guide members which move along a guide shaft and pusher rollers which are respectively placed corresponding to the first guide members, with the guide shaft therebetween, said at least two first guide members and said pusher rollers being provided on a moving unit which supports an optical system that can move along the guide shaft,
arms rotatable around a shaft provided at a right angle to an axis of the guide shaft, said arms being provided on the moving unit, corresponding to the pusher rollers,
the pusher rollers being attached to the end portions of the arms, and
the arms being so biased that the pusher rollers are pushed against the guide shaft, and characterized by that:
a slot which is provided at nearly a right angle to the axis of the guide shaft is formed in the arm,
an engaging portion is formed at the edge at the guide shaft side of the arm,
a mounting hole is formed in a plate spring at an edge of the guide shaft side which is brought into contact with the engaging portion of the arm,
the plate spring is elastically pushed toward the moving unit through the arm by means of a screw which passes through the mounting hole of the plate spring and the slot of the arm,
when the screw is loosened, the guide shaft is so composed that it can be put between the first guide members and the pusher rollers by means of the plate spring, and
when the screw is tightened, the guide shaft is integrally tightened in a body between the first guide members and the pusher rollers which are integrally combined as one body by the screw through the moving unit.

4,996,560
APPARATUS FOR EXPOSING AN IMAGE OF AN ORIGINAL FILM ON A PHOTOSENSITIVE MATERIAL IN VACUUM CONTACT WITH THE ORIGINAL FILM, AND METHOD THEREFOR
Seiji Nanri; Masatoshi Ueno, and Takashi Ohno, all of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Oct. 31, 1989, Ser. No. 429,813
Claims priority, application Japan, Oct. 31, 1988, 63-276568; Dec. 12, 1988, 63-160449; Jun. 29, 1989, 1-169263
Int. Cl.[5] G03B *27/20, 27/02*
U.S. Cl. 355—91 18 Claims



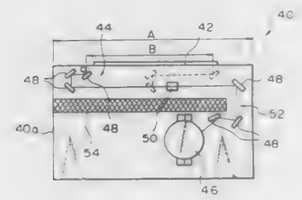
1. A vacuum contact printing apparatus, comprising:
a plate and a flexible sheet;
evacuating means for evacuating air from between said plate and said flexible sheet;
air forcing means for forcing air toward an edge of a composite which is supported between said plate and said flexible sheet, said composite including an original film and photosensitive material, said air forcing means including:
(a) moving means for moving a squeegee toward said edge of said composite while pressing said squeegee against said flexible sheet, and
(b) controlling means for controlling said moving means according to the position of said squeegee with respect to the position of said edge of said composite; and
means for printing an image of said original film on said photosensitive material by supplying light through said plate.

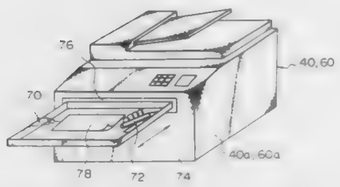
4,996,561
IMAGE FORMING APPARATUS WITH A DOCUMENT IMAGE EDITION FUNCTION
Tsuyoshi Yoshimura, Tokyo, and Takeshi Yamakawa, Fujisawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 3, 1989, Ser. No. 416,484
Claims priority, application Japan, Oct. 5, 1988, 63-130731[U]
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—202 4 Claims

1. An image forming apparatus having an image carrier for carrying a latent image thereon, original document support means, optics for steering an imagewise reflection from an original document to said image carrier to form a latent image, and a body accommodating said image carrier and said optics, said apparatus comprising:
a space defined in said body between the optics and the image carrier and dimensioned sufficiently greater than the maximum original document size applicable to said image forming apparatus;
a housing constituting the body and formed with an opening through a part of said housing; and
an editor supported so as to be insertable into, and removable from, said body via said opening for editing a document image, said editor having a substantially flat rigid surface separated from said original document support

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means and sufficiently greater than the maximum original document size, wherein said editor is accommodated in





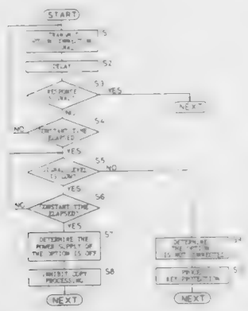
the space of the body and pulled out of said space through said opening as needed.

4,996,562

CONTROL DEVICE IN IMAGE FORMING APPARATUS

Kazuhiro Mizude, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 8, 1990, Ser. No. 461,748
Claims priority, application Japan, Jan. 14, 1989, 1-7157
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—205 2 Claims



1. A control device used in an image forming apparatus whose main body is connected to one or more options through two-way serial lines comprising feeding and receiving lines, comprising:

response signal determining means for determining whether or not a predetermined response signal is sent back from an option with respect to a signal outputted from the main body of the image forming apparatus;

signal level determining means, when said response signal determining means determines that the response signal is not sent back, for determining that a signal level on the receiving serial line for sending a signal to the main body from the option is a reference level or more or less, over a predetermined constant time period, said reference level being set lower than a first signal level on the receiving serial line in a case where the option is not connected to the main body of the image forming apparatus so that one end of the receiving serial line is opened, and said reference level being set higher than a second signal level on the receiving serial line in a case where the option is connected to the main body of the image forming apparatus but the power supply of the option is off, and

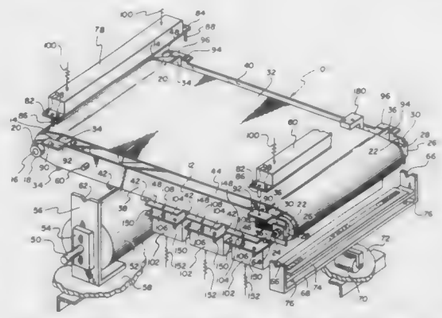
state determining means responsive to an output of said signal level determining means for determining whether the main body of the image forming apparatus and the option are not connected or not, or the power supply of the option is off or not.

4,996,563

SUPPORT MEANS FOR ELECTROPHOTOGRAPHIC FILM CORE AND ASSOCIATED ELEMENTS

Douglass L. Blanding, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1989, Ser. No. 420,078
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—212 5 Claims



1. In an electrophotographic machine having a frame, a film core carrying an endless photoconductor belt engaged with at least two rollers and a plurality of stations cooperative with said photoconductor belt, the improvement comprising support means supporting said film core to said frame, said support means incorporating the principle of three-point suspension to maintain said film core in predetermined spatial relation to said frame while preventing distortion of said frame from imparting force to said film core through said support means, and said support means comprising first and second support members supported from said frame in spaced relation to each other and respectively engaging opposite sides of said film core and a third support member comprising a two-ended yoke engaged at its opposite ends with respective opposite sides of said film core and supported from said frame between said opposite sides of said film core, with one of said stations comprising a write-head adjustable supported by said yoke.

4,996,564

CONTROLLABLE DRIVE OF OPTICS OF A COPIER

Kouji Shirasugi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,870
Claims priority, application Japan, Jun. 24, 1988, 63-156326
Int. Cl.[5] G03G *15/28*
U.S. Cl. 355—235 6 Claims

1. A method for controlling the driving of a scanner over a glass platen in a photocopier during an exposure and a return, comprising the steps of:

providing a motor for driving said scanner;

generating movement signals in response to the movement and direction of said scanner;

selecting the speed and direction of the motor in accordance with said movement signals and manually input information including a mode input;

switching between a high speed return and a low speed return according to said manually input information;

selecting a low speed return for a particular mode, in which a first image forming operation and a subsequent second image forming operation are performed on a paper sheet, such that a low speed return is selected in said first image forming operation, and a high speed return for other modes; and

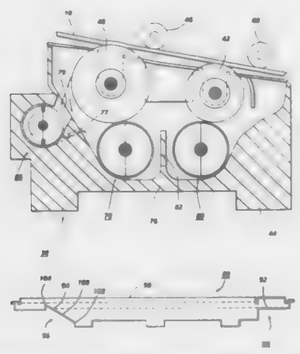
generating motor driving signals to drive said motor in accordance with the selected speed and direction.

4,996,565

DEVELOPER MATERIAL MIXING APPARATUS

James A. Herley, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1989, Ser. No. 373,129
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 4 Claims



1. An electrophotographic printing machine of the type in which an electrostatic latent image recorded on a photoconductive member is developed with a developer material, wherein the improvement includes,

a housing defining a chamber storing a supply of developer material therein;

first means for transporting the developer material in a first direction from one region of the chamber of said housing to another region thereof;

second means for transporting the developer material in a second direction opposed to the first direction;

means, disposed, at least partially in the chamber of said housing, for developing the electrostatic latent image recorded on the photoconductive member with developer material, said developing means receiving developer material from said first means and said second means; and

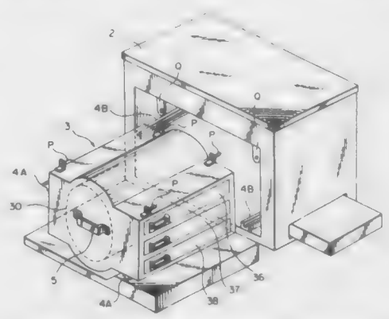
means for separating said first means from said second means, said separating means having an aperture in at least one portion thereof configured to allow developer material to gently move between said first means and said second means and adapted to reduce back up of developer material and flow unevenness, said separating means comprising a generally planar member having a sloped surface and being mounted in said housing between said first means and said second means to define a substantially vertical wall therebetween with said housing and the sloped surface of said planar member defining, in one marginal region, a slot progressively increasing in size in a direction along said planar member toward one end thereof.

4,996,566

MULTICOLOR IMAGE FORMING APPARATUS WITH SEPARATELY REMOVABLE AND INSERTABLE ASSEMBLY UNITS

Shizuo Morita, Tachikawa; Shunji Matsuo, Hino; Satoshi Haneda, Tachikawa; Masakazu Fukuchi, and Hisashi Shoji, both of Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 30, 1989, Ser. No. 428,902
Claims priority, application Japan, Nov. 1, 1988, 63-278205; Dec. 16, 1988, 63-318934
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 15 Claims



1. A multicolor image forming apparatus comprising:

means for carrying an image;

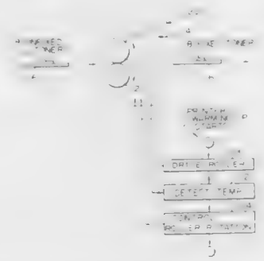
a plurality of developing devices of differing colors for developing a latent image formed on said image carrying means into a color toner image;

a process cartridge for housing the image carrying means and the plurality of developing devices, the process cartridge adapted to be detachably mountable in said multicolor image forming apparatus,

each of the plurality of developing devices being detachably mountable substantially in the process cartridge and each having means for indicating when its replacement is necessary due to toner consumption.

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4,996,567
METHOD OF CONTROLLING FUSER UNIT OF IMAGE FORMING APPARATUS
Shinichi Watarai, Yokohama; Megumi Yasuda, Kawasaki; Yoji Hoki, Tokyo, and Makoto Inoue, Ono, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed May 9, 1989, Ser. No. 349,312
Claims priority, application Japan, May 17, 1988, 63-119878
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—290 12 Claims

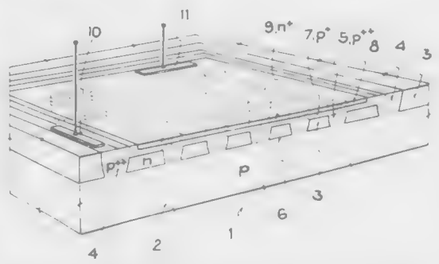


1. A method of controlling a fuser unit of an image-forming apparatus including a heat roller having a heater and backup roller, wherein a sheet medium is nipped between the heat roller and the backup roller so that a toner image carried on the sheet medium is fixed, comprising the steps of:
(a) starting the energization of substantially at the same time as commencement of an initialization process of mechanical and electrostatic conditions of the apparatus while rotating the heat roller and the backup roller;
(b) stopping the rotation of the rollers after the initialization process has been completed;
(c) monitoring a surface temperature of the heat roller for a first predetermined period after completion of the initialization process, while keeping the heat roller and the backup roller stationary;
(d) determining that the fuser unit is ready for operation when the surface temperature has reached a set value within the first predetermined perion; and
(e) restarting rotation fo the heat roller and the backup roller until the set value is reached, when the set value is not reached within the first predetermined period and unless a second predetermined period has expired subsequent to expiration of the first predetermined period.

4,996,568
AUTOMATIC DOCUMENT FEEDER PROVIDED FOR COPYING APPARATUS
Wataru Hamakawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Sep. 29, 1988, Ser. No. 250,746
Claims priority, application Japan, Sep. 30, 1987, 62-248954
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—308 4 Claims

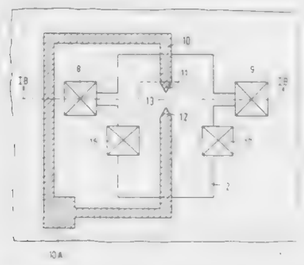
1. An automatic document feeder capable of transporting two documents to a specified position on a platen and arranging the documents in series at the position, which comprises:
means for receiving a plurality of documents loaded in a stack;
means for feeding documents loaded on said receiving means;
means for transporting fed documents onto said platen;
means, provided at one end of said platen, for stopping a first transported document on said platen by interfering with a leading end of the document;
means for detecting a fed document;
means for measuring a distance between the first transported document and a subsequently fed document, based on the signal output from said detecting means; and
control means for stopping said transporting means during the transportation of said subsequently fed document, based on the value measured by said measuring means, in order to position the subsequently fed document on said platen adjacent the first transported document.

4,996,569
INTEGRATED CIRCUIT
Reinhold Kaiser, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany
Filed Nov. 2, 1988, Ser. No. 266,081
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740302
Int. Cl.[5] H01L *29/92, 27/04, 27/02*
U.S. Cl. 357—14 12 Claims



1. An integrated circuit array having a capacitance formed by a first pn-junction and separated from other components by a further pn-junction comprising:
a substrate of one conductivity type; an epitaxial layer of the opposite conductivity type formed on a surface of said substrate; a first semiconductor zone of said one conductivity type formed in said epitaxial layer and extending from the surface of said epitaxial layer only partially through said epitaxial layer; a second semiconductor zone of said opposite conductivity type disposed in said first semiconductor zone at said surface of said epitaxial layer and forming said first pn-junction with said first semiconductor zone; and a plurality of areas of said one conductivity type extending from said first semiconductor zone through said epitaxial layer to said substrate and electrically connecting said first semiconductor zone to said substrate.

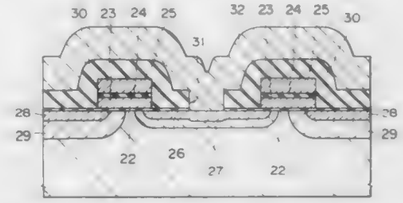
4,996,570
SEMICONDUCTOR STRUCTURE HAVING A CONDUCTIVE CHANNEL
Hendrik Van Houten, Croton-on-Hudson, N.Y., and Bart J. Van Wees, Delft, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Dec. 20, 1988, Ser. No. 288,063
Claims priority, application Netherlands, Dec. 23, 1987, 8703119
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 20 Claims



1. An element for use in an electric circuit comprising a layer structure, in which a multi-dimensional charge carrier gas is formed during operation and in which first and second regions are situated, which communicate with each other via a channel for transport of charge carriers, further comprising means for maintaining the electrical properties of said element at least substantially independent of changes in ambient parameters and manufacturing process parameters, said means comprising providing the channel with a length between said first and second regions which is smaller than the mean free path of the charge carriers in the charge carrier gas, and providing the channel with a width in a direction orthogonal to its length which is of the same order of magnitude as the wavelength of the charge carriers at the Fermi level, as a result of which, during operation at such a temperature that the charge carrier gas is at least substantially completely degenerated, quantization of the conductance of the channel occurs.

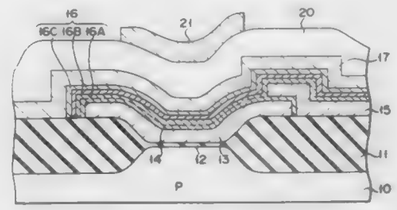
4,996,571
NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE ERASING OPERATION
Hitoshi Kume, Musashino; Yoshiaki Kamigaki, Tokorozawa; Tetsuo Adachi, Hachioji; Toshihisa Tsukada, Musashino; Kazuhiro Komori, Higashikurume; Toshiaki Nishimoto, Tama; Tadashi Muto, Iruma, and Toshiko Koizumi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Ltd., Chiba, both of, Japan
Filed Jul. 6, 1989, Ser. No. 375,956
Claims priority, application Japan, Jul. 8, 1988, 63-168855
Int. Cl.[5] H01L *29/68;* G11C *11/34, 7/00*
U.S. Cl. 357—23.5 4 Claims

1. A non-volatile semiconductor memory device comprising:
a gate insulating layer disposed on a principal surface of a semiconductor substrate;
a floating gate electrode disposed on said gate insulating layer;
a control gate electrode disposed on said floating gate electrode through an interlayer insulating layer;
a source region and a drain region disposed in said semiconductor substrate near said principal surface and being spaced-apart from each other, at least one of which has a portion which has superposed thereon said floating gate electrode through said gate insulating layer;
a channel region being effected between said source region and said drain region, the part of said gate insulating layer which is on the superposed portion and that which is on said channel region adjacent thereto have a thickness which is substantially the same;
means for erasing electrically positive or negative information charge held in said floating gate electrode, said erasing being effected by applying a predetermined electric field to said gate insulating layer so as to transfer by tunneling said information charge from said floating gate electrode to one of said source and drain regions; and



means for substantially preventing occurrence of charge injection, of charge having a polarity opposite to that of said information charge, from said source region to said gate insulating layer upon occurrence of an electrical erase operation, the injection preventing means including,
means for applying a predetermined voltage to one of said source and drain regions, said predetermined voltage having such a polarity that said region is reversely biased with respect to said semiconductor substrate,
means for applying a voltage having the same polarity as said predetermined voltage, but with a relatively smaller absolute value therefrom, to said one of said source and drain regions before the application of said predetermined voltage thereto, and
means for grounding said control electrode.

4,996,572
SEMICONDUCTOR MEMORY DEVICE
Shinichi Tanaka, Tokyo; Masayuki Hori, Yokohama, and Noriyoshi Tozawa, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 166,564, Mar. 10, 1988, abandoned.
This application Dec. 11, 1989, Ser. No. 449,333
Claims priority, application Japan, Mar. 13, 1987, 62-58110
Int. Cl.[5] H01L *29/78, 29/34, 29/04*
U.S. Cl. 357—23.5 4 Claims



1. A semiconductor memory device comprising:
a first conductive semiconductor substrate;
a floating gate formed on the semiconductor substrate with a first insulating film inserted between said first conductive semiconductor substrate and said floating gate, said floating gate being made of polycrystal silicon which includes an impurity at a density of less than $6\times10^{20}/cm^3$;
a silicon oxide film formed on said floating gate and having a number of irregularities on its top surface;

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an erase gate formed on the first insulating film and formed on part of said silicon oxide film so as to overlap part of the floating gate, said erase gate being made of polycrystal silicon which includes an impurity at a density of at least $6\times10^{20}/cm^3$;

a second insulating film formed on the silicon oxide film over the floating gate and the erase gate, said second insulating film comprising a three-layered structure made of a first silicon oxide film, a silicon nitride film and a second silicon oxide film; and

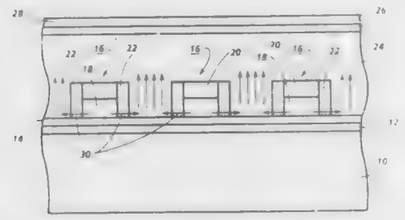
a control gate formed on the second insulating film, over the floating gate and the erase gate, said control gate being made of polycrystal silicon which includes an impurity at a density of at least $6\times10^{20}/cm^3$.

4,996,573

VERTICAL THIN FILM TRANSISTOR AND OPTICAL SENSOR HAVING LEAKAGE CURRENT SUPPRESSION ELEMENTS

Michael Hack, Mountain View; John G. Shaw, Portola Valley, both of Calif., and Michael Shur, Charlottesville, Va., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1989, Ser. No. 428,814
Int. Cl.[5] H01L *27/01, 27/12, 29/48, 29/10*
U.S. Cl. 357—23.700 **14 Claims**



1. A thin film transistor and sensor device comprising a substrate upon which is supported gate electrode means, gate dielectric means, source electrode means comprising source electrode fingers overlying said gate dielectric means, non-single crystal semiconductor means overlying said gate dielectric means and surrounding said source electrode means, drain electrode means contiguous with said semiconductor means, barrier means positioned adjacent said source electrode means and separated from and cooperating with said gate electrode means for preventing a drain field from reaching said source electrode means, the improvement comprising

an electrically conductive electrode through which optical energy may pass to said semiconductor means between said fingers, and wherein said source electrode means includes means for establishing an electric field between adjacent source electrode fingers, and whereby said device selectively may be operated as a transistor or as a sensor.

4,996,574

MIS TRANSISTOR STRUCTURE FOR INCREASING CONDUCTANCE BETWEEN SOURCE AND DRAIN REGIONS

Masahiro Shirasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

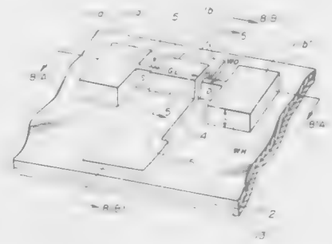
Filed Jun. 30, 1989, Ser. No. 374,293
Claims priority, application Japan, Jul. 1, 1988, 63-164152
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.7 **13 Claims**

1. A metal-insulator-semiconductor transistor, comprising:

a substrate having a main surface;

a semiconductor body provided on the substrate and having first and second regions doped to a first conductivity type and defining respective source and drain regions and a third region extending in a first direction between and electrically interconnecting the first and second regions and doped to a second conductivity type, opposite to the first conductivity type, the third region defining a channel region for conduction of carriers between the source and drain regions, the third, channel region of the semiconductor body having spaced side wall surfaces extending generally transversely to the main surface of the substrate and an upper surface extending in a plane substantially parallel to the main surface of the substrate, the channel region having a width W_O between the sidewalls measured in a second direction, transverse to the first direction, and a sidewall height of W_H;

a gate insulator film formed on the upper and sidewall surfaces of the third, channel region of the semiconductor body; and



a gate electrode, of a conducive material, formed on the gate insulator film in conformance with the upper surface and sidewall surfaces of the channel region as covered by the gate insulator film, a gate voltage applied to the gate electrode creating a depletion region in the channel region and wherein, where W_{MAX} defines the maximum extension of the depletion region, in an inward direction from each of the sidewall and upper surfaces of the channel region and in a plane transverse to the first direction and parallel to the second direction, and determined as a function of the impurity concentration level in the channel region, the width W_O of the third channel region is less than the height W_H of the sidewalls thereof and sufficiently smaller than the maximum extension W_{MAX}, as so determined, such that the channel region is fully depleted.

4,996,575

LOW LEAKAGE SILICON-ON-INSULATOR CMOS STRUCTURE AND METHOD OF MAKING SAME

Alfred C. Ipri, Princeton, and Louis S. Napoli, Hamilton Square, both of N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Aug. 29, 1989, Ser. No. 400,204
Int. Cl.[5] H01L *27/01, 27/13, 29/78, 27/12*
U.S. Cl. 357—23.7 **7 Claims**



1. A complimentary metal oxide semiconductor (CMOS) device comprising:

a substrate of a semiconductor material having a lower portion of a first conductivity type;

a layer of a dielectric material over the lower portion of said substrate;

a first island of a semiconductor material of a first conductivity type over a first portion of said dielectric layer, spaced regions of the second conductivity type in said first island forming the source and drain regions of a first MOS transistor of a second conductivity type over a first portion of said dielectric layer;

a region of a second conductivity type in said substrate immediately below a second portion of said dielectric layer remote from said first portion to provide a field shield;

a second island of a semiconductor material of said second conductivity type over said second portion of said dielectric layer, spaced region of the first conductivity type in said second island forming the source and drain regions of a second MOS transistor of said first conductivity type over said second portion of said dielectric layer;

said second island being located wholly within a vertical projection of said field shield region through said second portion of said dielectric layer;

a first electrode of a conductive material electrically connected to said substrate for receiving a first bias voltage for compensating for any charge in said dielectric layer below said first MOS transistor; and

a second electrode of a conductive material electrically connected only to said field shield region for receiving a second bias voltage compensating for any charge in said dielectric layer below said second MOS transistor.

4,996,576

RADIATION-SENSITIVE DEVICE

William T. Lynch, Summit, and Lalita Manchanda, North Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 933,913, Nov. 24, 1986, abandoned. This application May 15, 1989, Ser. No. 355,053
Int. Cl.[5] H01L *29/78, 31/10*
U.S. Cl. 357—29 **7 Claims**



1. In combination,

a p-channel depletion-mode MOS device adapted to be interposed in a path of non-particle ionizing radiation,

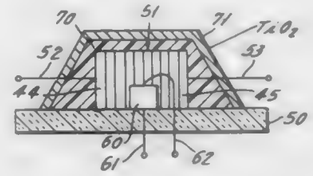
and means for determining, for a given gate voltage applied to said device, the change in source-to-drain current that results from irradiation of said device with said non-particle ionizing radiation thereby to provide a measurement of the non-particle radiation dose to which said device was exposed wherein said device comprises a gate pattern including an insulating layer of said gate having a conductive gate layer thereon, said conductive gate layer comprising n^+polysilicon.

4,996,577

PHOTOVOLTAIC ISOLATOR AND PROCESS OF MANUFACTURE THEREOF

Daniel M. Kinzer, Riverside, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Continuation of Ser. No. 573,305, Jan. 23, 1984, abandoned. This application Jan. 29, 1990, Ser. No. 474,625
Int. Cl.[5] H01L *27/14, 31/00*
U.S. Cl. 357—30 **43 Claims**



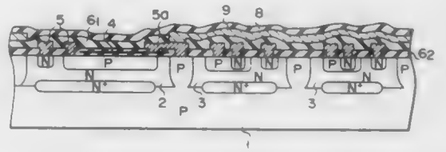
1. A photovoltaic isolator comprising, in combination: an LED radiation source; a photovoltaic stack having the form of a rectangular parallelepiped and which has series connected junctions extending to the vertical side of said stack; and a housing for containing said LED and photovoltaic said stack; said LED being spaced from said photovoltaic stack by greater than about 20 mils to obtain a desired dielectric isolation between said LED and said photovoltaic stack; said LED being positioned at the center of one vertical side of said stack and arranged to illuminate at least said one vertical side of said stack; said stack having a relatively short height, less than about 150 mils to improve uniformity in illumination of said at least one vertical side of said stack by said LED.

4,996,578

SEMICONDUCTOR DEVICE

Hideaki Motojima, and Keiji Kamasaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1988, Ser. No. 288,182
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **4 Claims**



1. A semiconductor device including a photodetector and semiconductor elements in a semiconductor substrate, wherein said photodetector is formed on a first surface of said semiconductor substrate and converts an optical signal into an electrical signal, and said semiconductor elements are formed in a second surface of said semiconductor substrate and receive and process said electrical signal, said semiconductor device further comprising:

a first insulating film having optical transmissibility formed on said first and second surfaces of said substrate;

an optical transmissible conductive film buried in a portion of said first insulating film and electrically connected to a constant potential line of said substrate, said portion being positioned on said photodetector;

a wiring layer for connecting said optical transmissible conductive film to said substrate;

a second insulating film formed on said first insulating film and having optical transmissibility; and

an optical shielding film formed on a portion of said second insulating film, said portion being positioned over said semiconductor elements.

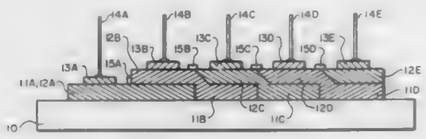
VOL 1123 ISS 4 FE 26 1991 UMI

4,996,579

DESIGN FOR ELECTRONIC SPECTRALLY TUNABLE INFARED DETECTOR

Tak-Kin Chu, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1983, Ser. No. 464,100
Int. Cl.[5] H01L *27/14, 31/00*
U.S. Cl. 357—30 3 Claims



1. An infrared detector comprising:
an infrared light transpartent substrate;
a plurality of successively adjacent optically responsive infrared semiconductor materials deposited on the substrate; with means to selectively transmit radiation and where each successive infrared semiconductor material is adapted to absorb different wave lengths of infrared light; each infrared semiconductor material forming a layer being a single uniform chemical composition and a comprising a lower filter portion and an upper detector portion; said lower portion deposited directly on the substrate with said upper portion overlying the lower portion of an adjacent infrared semiconductor material layer; whereby infrared light may pass through the substrate without absorption, in the infrared semiconductor material defining the lower portion be absorbed in respective frequency ranges, and transmitted to the upper portion of the following adjacent infrared semiconductor material layer for causing an electrical signal to be generate therein as an optical response; and ohmic and non-ohmic contacts on each upper portion of a layer whereby the magnitude of the electrical signal between said ohmic and non-ohmic contacts is responsive to the magnitude of the infrared light of frequencies in the range not absorbed in the lower portion of the previous adjacent infrared semiconductor material layer and hence transmitted to the upper portion of the optically responsive infrared semiconductor material layer;
provided that the cutoff wavelength of the following infrared semiconductor layer is longer than the cutoff wavelength of the previous infrared semiconductor material layer.

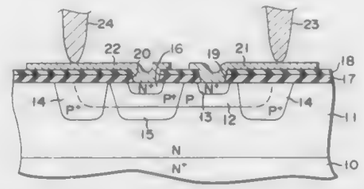
4,996,580

BIPOLAR SEMICONDUCTOR DEVICE

Takashi Kimura, Yokohama, and Mie Kato, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 13, 1988, Ser. No. 256,662
Claims priority, application Japan, Oct. 14, 1987, 62-258661
Int. Cl.[5] H01L *27/04*
U.S. Cl. 357—34 3 Claims

1. A semiconductor device comprising:
a semiconductor body of a first conductivity type;
a first semiconductor region of a second conductivity type, formed in said semiconductor body;
a second semiconductor region of the first conductivity type, formed in a surface region of said first semiconductor region;
a third semiconductor region of the second conductivity type, formed in said first semiconductor region and containing an impurity having a concentration higher than that of said first semiconductor region;
a fourth semiconductor region of the first conductivity type, formed in said third semiconductor region;
an insulating film formed on said semiconductor body and having first and second openings at positions respectively corresponding to said second and fourth semiconductor regions;



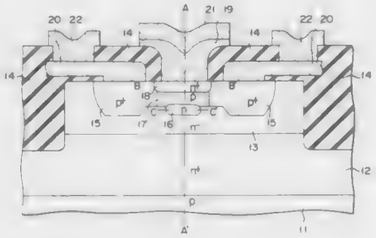
a first polysilicon semiconductor layer connected to said second semiconductor region through said first opening of said insulating films and containing an impurity of the first conductivity type; and
a second polysilicon semiconductor layer connected to said fourth semiconductor region through said second opening of said insulating films and containing an impurity of the first conductivity type.

4,996,581

BIPOLAR TRANSISTOR

Toshihiko Hamasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 2, 1989, Ser. No. 305,026
Claims priority, application Japan, Feb. 3, 1988, 63-23010
Int. Cl.[5] H01L *21/225, 21/265, 21/20*
U.S. Cl. 357—34 6 Claims



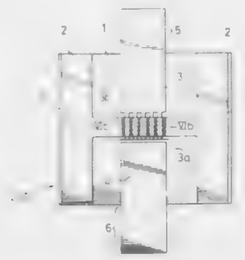
1. A bipolar transistor comprising:
an emitter region of a first conductivity type, having a predetermined width;
an inner base region of a second conductivity type, formed below said emitter region and contacting said emitter region, thus forming a PN junction;
an outer base region of a second conductivity type, having a high impurity concentration, set in contact with the side face of said inner base region and surrounding said inner base region;
an inner collector region of the first conductivity type, formed below said inner base region and contacting the bottom face of said inner base region, thus forming a PN junction; and
an outer collector region of the first conductivity type, set in contact with the bottom face of said inner collector region, contacting the bottom face of said outer base region, thus forming a PN junction, and surrounding said inner collector region,
wherein said inner collector region has a higher impurity concentration than said outer collector region; the side edge of said inner collector region is located right below, or inner than, the side edge of said emitter region; and the top face of said inner collector region is higher and closer to said emitter region, than the top face of said outer collector region.

4,996,582

FIELD EFFECT TRANSISTOR FOR MICROSTRIP MOUNTING AND MICROSTRIP-MOUNTED TRANSISTOR ASSEMBLY

Kohki Nagahama, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha

Filed Sep. 8, 1989, Ser. No. 404,636
Claims priority, application Japan, Sep. 14, 1988, 63-230939; Jul. 26, 1989, 1-193134
Int. Cl.[5] H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 357—69 12 Claims



1. A field effect transistor chip for connection to a microstrip transmission line comprising:
a semiconductor substrate having first and second generally opposed surfaces;
a field effect transistor formed in said semiconductor substrate including a gate, a source, and a drain, all accessible from said first surface;
opposed drain and gate electrodes of substantially the same width respectively electrically connected to said drain and gate and disposed on said first surface;
a source electrode electrically connected to said source disposed partially on said first surface and forming an air bridge so that said source electrode crosses over and is electrically insulated from said gate electrode; and
a gate beam lead and a drain beam lead respectively electrically connected to said gate and drain electrodes, each beam lead including an extension extending beyond said semiconductor substrate for connection to microstrip transmission line conductors wherein said gate and drain beam leads each have widths transverse to the extension of said gate and drain beams leads beyond said substrate and the widths of said gate electrode and said gate beam electrode, and of said drain electrode and said drain beam electrode, are substantially equal, respectively.

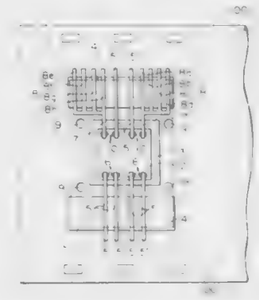
4,996,583

STACK TYPE SEMICONDUCTOR PACKAGE

Kenzo Hatada, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 9, 1990, Ser. No. 477,542
Claims priority, application Japan, Feb. 15, 1989, 1-036822
Int. Cl.[5] H01L *23/48, 23/54*
U.S. Cl. 357—70 5 Claims

1. A semiconductor device, comprising:
an outer lead region connected to an inner lead which is connected to an electrode terminal of a semiconductor chip, said outer lead region comprising plural divided leads each connected to said inner lead; a circuit board; a plurality of TAB packages, said semiconductor chip being packaged in said TAB packages, said TAB packages being stacked in plural layers; said stacked TAB packages being mounted on said circuit board; at least one of said plural divided leads being provided at each of said stacked layers



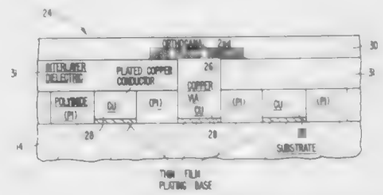
and a predetermined number of said plural divided leads being cut out of each of said stacked layers.

4,996,584

THIN-FILM ELECTRICAL CONNECTIONS FOR INTEGRATED CIRCUITS

Peter L. Young, South Barrington; Jay Cech, Elmhurst, and Kin Li, Lombard, all of Ill., assignors to Gould, Inc., Eastlake, Ohio

Continuation of Ser. No. 180,653, Apr. 11, 1988, abandoned, which is a continuation of Ser. No. 891,079, Jul. 31, 1986, abandoned, which is a division of Ser. No. 697,092, Jan. 31, 1985, Pat. No. 4,705,606. This application Oct. 13, 1988, Ser. No. 257,171
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 7 Claims



7. A device for connecting semiconductor integrated circuit chips, each chip including integrated circuit formed on a chip substrate, said device comprising:
a mounting substrate having a fist substantially planar surface; and
an interconnect signal plane formed on top of said first substantially planar surface of said mounting substrate and including a substantially planar pattern of metallic interconnect lines, each lien being in the range of 1 to 10 microns thick and 5 to 20 microns wide, and a dielectric material separating said interconnect lines, said dielectric material and said pattern of metallic interconnect lines forming a second substantially planar surface in spaced relation above said first substantially planar surface, wherein said substantially planar pattern of metallic interconnect lines is an integral portion of said second substantially planar surface, said chips being connected to said interconnect lines of said pattern.

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4,996,585

ELECTRONIC PACKAGE

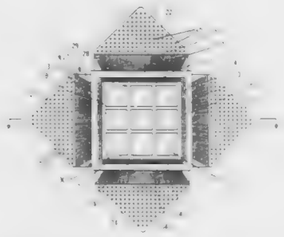
Harald Gruber, Herrenberg; Kurt Hinrichsmeyer, Sindelfingen; Heinz G. Horbach, Gechingen, and Ewald E. Stadler, Herrenberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1989, Ser. No. 381,334

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824654

Int. Cl.[5] G11C *5/04*; H01L *23/02*

U.S. Cl. 357—74 8 Claims



1. An electronic package comprising:

a substantially planar substrate having a plurality of conductors located thereon, said substrate of a predetermined shape and having a plurality of sides;

a plurality of integrated circuit chips located on said planar surface, said chips being electrically and mechanically connected to said conductors located on said substrate;

a plurality of pin plate members each including an electrically insulating material having a plurality of connector pins located therein, each of said pin plate members being foldable with respect to one of said sides of said substrate and of a preestablished shape different than said shape of said substrate, said pin plate members combining to form shape substantially similar in configuration and size as said substrate when so folded;

a plurality of connector elements each electrically coupling a respective one of said pin plate members to said integrated circuit chips, each of said connector elements including a flexible carrier and electrical conductors located thereon to thereby form a flexible connection between each of said pin plate members and said substrate, each of said flexible carriers being secured to said substrate along a respective one of said sides thereof; and

at least one base plate member defining a recess within one surface thereof for receiving said planar substrate and said integrated circuit chips therein and a plurality of openings within an opposite surface thereof each designed for accommodating a respective one of said connector pins therein when said pin plate members are folded.

4,996,586

CRIMP-TYPE SEMICONDUCTOR DEVICE HAVING NON-ALLOY STRUCTURE

Hideo Matsuda; Takashi Fujiwara, both of Yokohama; Yoshio Yokota; Mitsuhiko Kitagawa, both of Tokyo; Masami Iwasaki, and Kazuo Watanuki, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 17, 1989, Ser. No. 422,900

Claims priority, application Japan, Oct. 19, 1988, 63-263455

Int. Cl.[5] H01L *27/02, 23/54, 29/08*

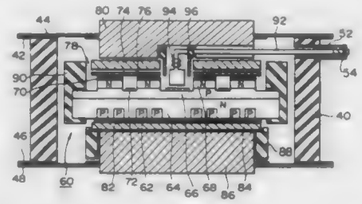
U.S. Cl. 357—74 15 Claims

1. A crimp-type semiconductor device comprising:

a semiconductor pellet having first and second major surfaces and having main electrodes formed on said first and second major surfaces, and a control electrode formed on at least one of said first and second major surfaces, said main electrodes and said control electrode being arranged on one of said major surfaces so as to alternately staggered with each other;

first and second electrode members, each having first and second opposing surfaces, arranged such that said first opposing surfaces are not bonded to but crimped in contact with said first and second major surfaces, respectively, each of said first opposing surfaces being formed to cover the entire surface of said main electrode;

first and second electrode post means, arranged to be not bonded to but crimped in contact with said second opposing surfaces of said first and second electrode members,



respectively, for crimping said main electrodes formed on said first and second major surfaces via said first and second electrode members, respectively, the entire surfaces of said first and second electrode post means being covered with said second opposing surfaces of said first and second electrode members, respectively; and

positioning guide means, arranged close to at least one of an inner periphery and an outer periphery of at least one of said first and second electrode members with respect to at least one of said first and second electrode post means crimped against said electrode member.

4,996,587

INTEGRATED SEMICONDUCTOR CHIP PACKAGE

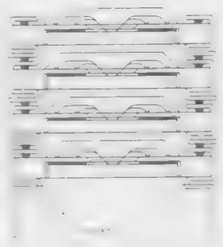
Kurt Hinrichsmeyer, Sindelfingen; Werner Straehle, Dettenhausen, both of Fed. Rep. of Germany; Gordon A. Kelley, Jr., Essex Junction, and Richard W. Noth, Fairfax, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1990, Ser. No. 498,134

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1989, 3911711

Int. Cl.[5] H01L *23/02, 23/12*

U.S. Cl. 357—74 9 Claims



8. A stack of packages wherein each package comprises

a chip carrier with substantially parallel top and bottom surfaces,

a recess in the bottom surface,

at least one slot in the top surface substantially smaller than said recess communicating with the recess in the bottom surface,

electrical conductors arranged at least on the top surface of said carrier,

an integrated semiconductor chip having a major surface and contact pads on said major surface arranged in the recess of said carrier with said contact pads positioned in the region of said slot, and

lead wires passing through said slot in connecting the contact pads on the chip to the conductors on the top side of the carrier.

4,996,588

DEVICE FOR INTERCONNECTION AND PROTECTION OF A BARE MICROWAVE COMPONENT CHIP

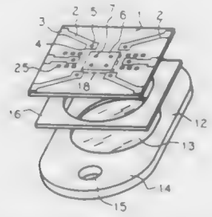
Serge Malbe, Gif sur Yvette; Evelyne Da Silva, Massy, and Alain Fouché, Paris, all of France, assignors to Thomson Hybrides et Microondes, Paris, France

Filed Mar. 21, 1989, Ser. No. 326,646

Claims priority, application France, Mar. 25, 1988, 88 03950

Int. Cl.[5] H01L *23/02, 23/12, 39/02*

U.S. Cl. 357—80 11 Claims



1. A device for interconnection and protection of a bare chip of microwave semiconductor component formed of group III-V materials, in which the interconnection circuit is located on the first face of a ceramic substrate and the semiconductor component is located on the second face of said substrate, the connection between interconnection circuit and semiconductor component being established through the substrate by means of plugged metallized holes, wherein:

the substrate is of square or rectangular shape and is adapted to carry a network of microstrip lines on its first face, a first end of said microstrip lines being in close proximity to a central pad and a second end of said microstrip lines being located on one of the two opposite edges of the substrate, the second face of said substrate being adapted to carry a ground-plane metallization having a central pad formed between reserves which are necessary for insulation of said plugged metallized holes, said central pad being of sufficient size to permit attachment thereon of at least one bare chip of semiconductor component whose terminals are connected to the plugged metallized holes by means of wires or metallic strips,

a metallic sole-piece, the central portion of which has the same dimensions as the substrate and has a portion of reduced thickness forming a compartment for housing the bare chip of semiconductor component, said sole-piece being fixed on the substrate by means of its ground plane metallization, said sole-piece being also provided on two opposite sides with two metallic end-pieces each pierced with a hole, the end-pieces being placed with respect to the substrate on the two other edges opposite to those which carry the second ends of the microstrip lines, thus making said interconnection device cascadable.

4,996,589

SEMICONDUCTOR MODULE AND COOLING DEVICE OF THE SAME

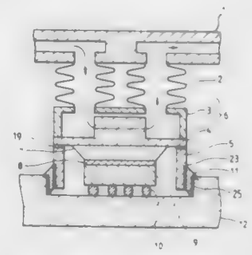
Ryoichi Kajiwara; Takao Funamoto, both of Hitachi; Mituo Kato, Hitachioota; Hiroshi Wachi, and Tomohiko Shida, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,609

Claims priority, application Japan, Oct. 21, 1987, 62-263856; Nov. 11, 1987, 62-283318; Mar. 23, 1988, 63-67436

Int. Cl.[5] H01L *25/04*

U.S. Cl. 357—82 11 Claims



1. A cooling device for a semiconductor module having a number of semiconductor elements mounted on a wiring substrate, comprising:

(a) a cooling fin soldered on each of the semiconductor elements for cooling the semiconductor elements;

(b) a plurality of bellows each forming a channel for conducting a flow of a cooling medium, one open end of each bellows being fixed to a cooling fin;

(c) a flange connected mechanically to the other open end of each of said bellows;

(d) a housing having a channel for conducting a flow of said cooling medium, said flanges being mounted on said housing so that the channel in said housing communicates with the channels in said bellows; and

(e) a plurality of O-rings which are inserted between said flanges and said housing for sealing air-tightly said flanges to said housing, wherein said O-rings comprise a plurality of first O-rings having a first diameter for sealing air-tightly each channel for conducting the flow of said cooling medium therethrough, and at least one second O-ring having a second diameter larger than said first diameter and arranged to enclose a number of the first O-rings inside the second O-ring in the same place.

4,996,590

CIRCUITRY FOR PREVENTING DOMING PHENOMENON IN A TELEVISION RECEIVER AND A PREVENTING METHOD THEREOF

Toshikazu Okamoto, Osaka, and Fukashi Inoue, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 7, 1989, Ser. No. 390,329

Claims priority, application Japan, Aug. 11, 1988, 63-201628

Int. Cl.[5] H04N *9/16*

U.S. Cl. 358—74 17 Claims

1. Circuitry for preventing a doming phenomenon in a television receiver for producing a video signal, said television receiver having a screen on which a picture is reproduced, said circuitry comprising:

a decision means, responsive to a luminance signal included in said video signal, for deciding whether or not a high luminance portion not less than a predetermined area exists on said screen, said decision means includes

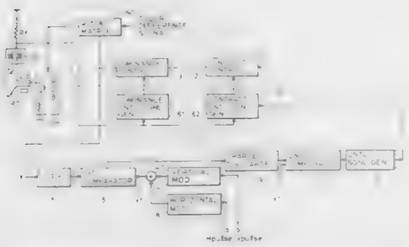
first comparison means for comparing said luminance signal with a first reference voltage,

area detection means responsive to an output of said com-

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parison mean for detecting the area of the high luminance portion on said screen, and

area decision means for comparing an output of said area detecting means with a second reference voltage and for deciding whether or not said detected area is not less than a predetermined area; and



luminance/contrast reduction means, responsive to a signal for detecting the presence of the high luminance portion not less than said predetermined area from said decision means, for gradually reducing at least one of the luminance and contrast of said screen.

4,996,591

METHOD OF AND APPARATUS FOR PROCESSING COLOR IMAGE

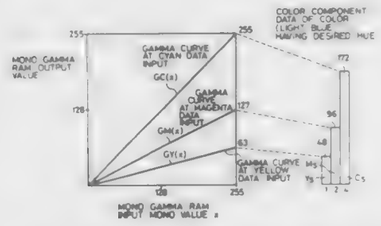
Toshihiro Kadowaki; Tetsuya Ohnishi; Koichi Katoh, all of Yokohama; Yasumichi Suzuki, Tokyo, and Toshio Honma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1988, Ser. No. 193,936

Claims priority, application Japan, May 15, 1987, 62-119305; May 15, 1987, 62-119306

Int. Cl.[5] G03F *3/08*; H04N *1/46*

U.S. Cl. 358—80 **33 Claims**



1. An image processing apparatus comprising:

(a) hue appointing means for appointing a hue to be obtained after a conversion processing of an original image data having a gradation;

(b) density appointing means for appointing a specific density level in said original image data; and

(c) conversion means for converting, in accordance with the hue appointed by said hue appointing means and the density level appointed by said density appointing means, said original image data into a converted image data having a density level proportional to the density level of said original image data and the hue appointed by said hue appointing means.

4,996,592

VIDEO COMMUNICATION APPARATUS CAPABLE OF ELECTRONICALLY ADJUSTING THE FIELD OF VIEW OF A VIDEO FRAME

Tetsuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 391,877

Claims priority, application Japan, Aug. 12, 1988, 63-200121

Int. Cl.[5] H04N *3/22, 7/15*

U.S. Cl. 358—85 **9 Claims**



1. A video communication apparatus for converting an analog video signal representative of a scene being picked up by a video camera into a digital signal, encoding the digital signal, and transmitting the encoded signal, said apparatus comprising:

signal generating means for generating, in response to a synchronizing signal synchronous to the video signal, output signals representative of a predetermined pick-up area to be encoded which is smaller than an entire pick-up area being picked up by the video camera, and for shifting a position of said predetermined pick-up area within said entire pick-up area;

memory means for storing video data associated with the predetermined pick-up area; and

control means for controlling, in response to the output signals of said signal generating means, writing and reading operations of said memory means to selectively write only the video data associated with the predetermined pick-up area in said memory means and read the video data from said memory means;

said control means electronically adjusting the position of the predetermined pick-up area to be encoded in response to the output signals of said signal generating means.

4,996,593

A METHOD OF AND APPARATUS FOR COMPARING THE LOCATION OF AN EXTENDED FEATURE WITHIN A FIELD OF VIEW WITH A STANDARD LOCATION

Brian M. Hopkins, Ennis, Ireland, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 1, 1989, Ser. No. 444,655

Claims priority, application Ireland, Dec. 1, 1988, 3601/88

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—101 **9 Claims**

1. A method of comparing the location of an extended feature within a field of view with a standard location, comprising scanning the field of view to obtain a binary video signal representing the feature, processing the feature signal so obtained, including delaying it by an integral number of line scan intervals and deriving from the delayed signal an end-of-feature-boundary pulse, gating the end-of-feature-boundary pulse with a stretched inverted feature signal, thereby producing a single

feature position pulse when scanning of the feature has been completed, determining the scan co-ordinates of the feature



position pulse, and comparing the co-ordinates with those corresponding to the standard location.

4,996,594

DYNAMIC IMAGE TRANSMISSION SYSTEM

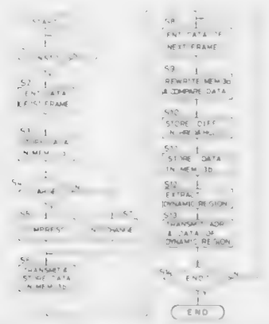
Noboru Murayama, Machida, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jul. 7, 1989, Ser. No. 376,862

Claims priority, application Japan, Jul. 8, 1988, 63-168960

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—136 **20 Claims**



1. A dynamic image transmission system comprising:

input means for inputting image data of an input image;

memory means for storing the image data successively input from said input means and for storing transmitting image data which is to be transmitted;

extracting means for extracting a dynamic region which is a portion of the input image and contains a change in image data from that of a previous frame by comparing image data of two successive frames stored in said memory means;

transmission means for transmitting the image data stored in said memory means to a transmission path as the transmitting image data; and

control means for controlling operations of said extracting means and said transmission means during an image transmission mode so that image data related to a first frame of the input image is transmitted as the transmitting image data but only the image data within the extracted dynamic region is transmitted as the transmitting image data with respect to second and subsequent frames;

said transmitting means including means for subjecting only the image data within the extracted dynamic region using both a predetermined interlace and a predetermined data compression before transmission to the transmission path.

4,996,595

FLICKER REDUCTION APPARATUS

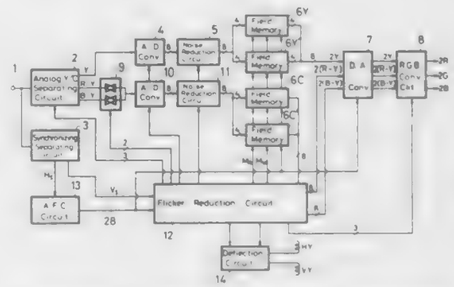
Hidefumi Naito, Kanagawa; Toshio Sarugaku, Chiba, and Masaharu Tokuhara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 11, 1989, Ser. No. 419,901

Claims priority, application Japan, Oct. 13, 1988, 63-258290; Oct. 21, 1988, 63-265784; Jan. 30, 1989, 1-20431

Int. Cl.[5] H04N *5/06, 3/00*

U.S. Cl. 358—150 **22 Claims**



1. Apparatus for generating intermediate vertical synchronizing signals which occur between vertical synchronizing signals normally included in a conventional video signal, comprising:

a source of clock signals synchronized with horizontal synchronizing signals normally included in the conventional video signal;

a source of vertical synchronizing signals normally included in the conventional video signal;

first counter means supplied with said clock signals and said vertical synchronizing signals for providing a count representing the number of clock signals present in one-half of a field interval of said conventional video signal;

temporary storage means for storing the count provided by said first counter means during a second preceding field interval;

second counter means supplied with said clock signals and said vertical synchronizing signals for counting the number of clock signals present in said field interval; and

comparator means for comparing the count of said second counter means with the stored count for generating an intermediate vertical synchronizing signal when the compared counts are substantially equal.

4,996,596

PHASE SYNCHRONIZING CIRCUIT IN VIDEO SIGNAL RECEIVER AND METHOD OF ESTABLISHING PHASE SYNCHRONIZATION

Yoshichika Hirao, Osaka, and Nobukazu Hosoya, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 1, 1989, Ser. No. 401,691

Claims priority, application Japan, Sep. 2, 1988, 63-220806; Apr. 7, 1989, 1-89114

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—158 **15 Claims**

1. A circuit for providing a signal synchronized in phase with a horizontal synchronization signal included in a video signal, comprising:

oscillation circuit means, said oscillation circuit means including an oscillator having an oscillation frequency thereof controllable, and frequency dividing means for frequency dividing an output of said oscillator in a predetermined frequency dividing ratio;

separating/extracting means for separating and extracting at

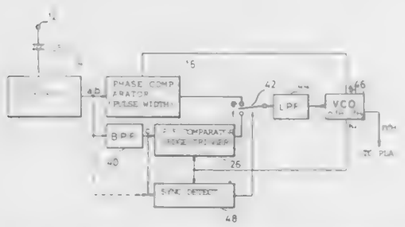
VOL 1123 ISS 4 FE 26 1991 UMI

least said horizontal synchronization signal from said video signal;

first comparing means, connected to said oscillation circuit means and separating/extracting means, for comparing a phase of said horizontal synchronization signal from said separating/extracting means with a phase of an output of said frequency dividing means, said first comparing means having an output characteristic with a plurality of S curves;

bandpass means, connected to said separating/extracting means, for passing therethrough a signal of a predetermined frequency band out of an output of said separating-/extracting means, said predetermined frequency band including a frequency of said horizontal synchronization signal;

second comparing means, connected to said bandpass means



and said oscillation circuit means, for comparing at least a frequency of an output of said bandpass means with that of said frequency dividing means output, said second comparing means having an output characteristic with a single S curve;

synchronization detecting means, connected to said oscillation circuit means and said separating/extracting means, for detecting synchronization/non-synchronization of the horizontal synchronization signal extracted from said separating/extracting means with said frequency dividing means output; and

selecting means responsive to an output of said synchronization detecting means, for selecting one of the outputs of said first and second comparing means to apply the selected one to said oscillator, an output of said selecting means controlling at least the oscillation frequency of said oscillator.

4,996,597

USER PROGRAMMABLE SWITCHING ARRANGEMENT

David J. Duffield, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 20, 1989, Ser. No. 340,980
Int. Cl.[5] H04N *5/268, 5/50*
U.S. Cl. 358—181 **16 Claims**

1. A signal switching arrangement for a television receiver, comprising:

a first input terminal for receiving a first signal from one of a plurality of external signal sources:

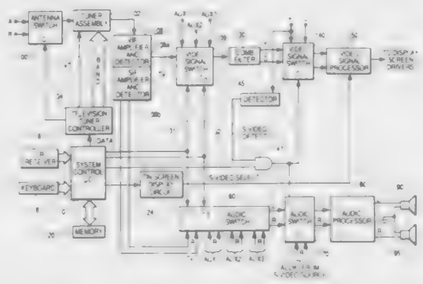
a second input terminal for receiving a second signal from another of said plurality of external signal sources;

means for entering data defining the association of one of a plurality of external signals sources with one of said input terminals in response to activation by a user, and for receiving control signals for controlling ones of said plurality of external signal sources;

memory means for storing said data;

switch means having a first input coupled to said first input terminal for receiving said first signal, a second input coupled to said second input terminal for receiving said second signal, a control terminal for receiving a switching control signal, and an output for developing a signal selected from said first and second signals in response to said switching control signal; and

control means coupled to said switch means, said memory means, and said means for entering data and receiving control signals, and having an output for developing said



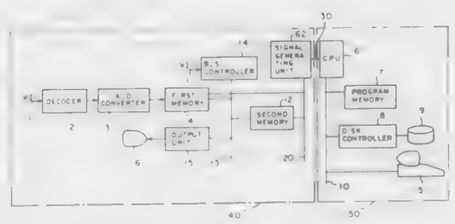
switching control signal in response to the detection of said control signals for controlling said ones of said plurality of external signal sources, and in response to said stored data defining the association of said one of said plurality of external signal sources with said one of said input terminals.

4,996,598

APPARATUS FOR PROCESSING VIDEO SIGNAL

Zenichiro Hara, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 381,945
Claims priority, application Japan, Nov. 2, 1988, 63-276070
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—183 **5 Claims**



1. An apparatus for processing a video signal comprising:

a first memory for storing video image data obtained from a video signal;

a second memory for storing graphic image data such as characters and patterns;

a first bus connecting both said first and said second memories to a display and allowing for selective transmission of image data read from either of said first and said second memories to said display;

a second bus, connected to both said first and said second memories, for transmitting said graphic image data stored in said second memory and control command data relating to processing said image data using time-division multiplex transmission; and

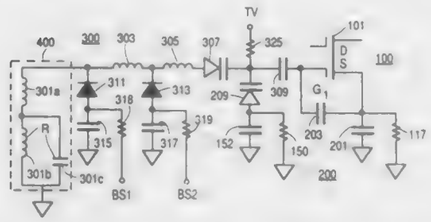
a signal generating means for synchronously controlling the time-division multiplex transmission of data over said second bus such that said graphic image data are transmitted to said second memory during the scanning period of said video signal and said control command data are transmitted to said first memory during the flyback period of said video signal.

4,996,599

TELEVISION TUNER OSCILLATOR WITH THREE POINT TRACKING

William D. Anderson, Fox River Grove, Ill., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 14, 1989, Ser. No. 339,576
Int. Cl.[5] H04N *5/50;* **H04B** *1/26;* **H03J** *1/10*
U.S. Cl. 358—191.1 **11 Claims**



1. In a television receiver tuner, an oscillator having a tailored tuning response comprising:

an amplifying device having a conduction path terminated in first and second electrodes and a control electrode for controlling the condition of said conduction path,

a capacitive feedback path coupled between said first electrode and said control electrode for conditioning said amplifying device to oscillate,

tuning control means for generating a tuning voltage,

a first inductive element and a first varactor diode responsive to said tuning voltage coupled in series between said control electrode and a point of reference potential,

output means for developing an output signal of said oscillator at said second electrode, and

tailoring means comprising a second inductive element coupled with a capacitance element forming a reactance network, said reactance network coupled with said first inductive element for tailoring the frequency of oscillation vs tuning voltage transfer characteristic of said oscillator.

4,996,600

TWO DIMENSIONAL SOLID STATE IMAGE SENSING DEVICE

Yasuaki Nishida; Yoshiki Iino; Hiroshi Ohtake; Masahide Abe; Shigeo Yoshikawa, all of Tokyo; Yukio Endo. Yokohama; Yoshiyuki Matsunaga, Kamakura, and Nozomu Harada, Yokohama, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Jun. 8, 1989, Ser. No. 363,085
Claims priority, application Japan, Jun. 8, 1988, 63-139519
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.22 **15 Claims**

1. A solid state image sensing device comprising:

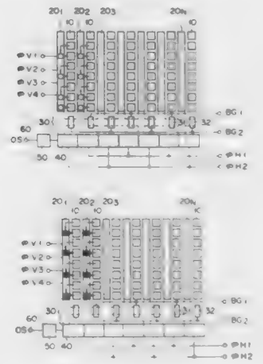
a great number of light receiving elements arrayed in matrix form and including vertically arrayed light received element;

a plurality of first charge transfer means coupled to said vertically arrayed light receiving elements for verticaliy transferring signal charges sensed thereby

second charge transfer means for horizontally transferring signal charges transferred from said plurality of first charge transfer means;

adder means for adding together signal charges sensed by a predetermined number of light receiving elements adjoining vertically and horizontally to provide one added signal charge, and providing a plurality of added signal charges for all of said receiving elements in each field; and

field switching means for introducing into said adder means signal charges obtained from said light receiving elements



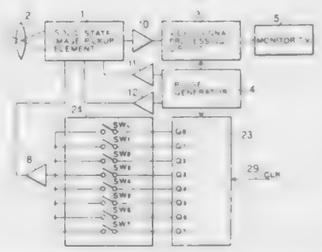
shifted by at least one light receiving element in alternate fields.

4,996,601

VARIABI E-DELAY SIGNAL GENERATING APPARATUS FOR DRIVING SOLID-STATE IMAGE PICK-UP DEVICE

Iwao Arimori, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1989, Ser. No. 372,818
Claims priority, application Japan, Sep. 5, 1988, 63-224116
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.31 **3 Claims**



1. An apparatus for driving a solid-state image pickup device comprising:

signal generating means for generating a driving signal to be supplied to the solid-state image pickup element, electrically converting a light image, to read the converted output signal therefrom;

video signal processing means for processing the output signal from the solid-state image pickup element to convert it to a video signal;

a shift register for shifting the driving signal to be supplied to the solid-state image pickup element using a clock signal having a shorter period than the period of the driving signal and outputting the driving signal with different delay times at its plural stages; and

selecting means for selecting a driving signal with a desired delay time out of the output signal at the plural stages of the shift register to supply the selected signal to the solid-state image pickup element.

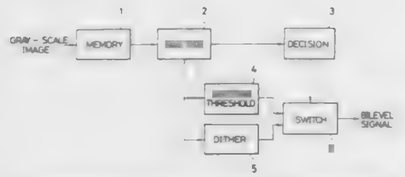
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4,996,602

IMAGE-PROCESSING APPARATUS

Fumitaka Ono, and Takayoshi Semasa, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,345
Claims priority, application Japan, May 23, 1988, 63-126108
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—457 30 Claims



1. An image-processing apparatus for converting an input image having pixels with multiple gray levels to a bilevel output signal, comprising:

gray-scale image memory means for storing said input image;

maximum-minimum detection means for reading said stored input image from said gray-scale image memory means, testing respective blocks of plural pixels centered on respective pixels of said stored input image, finding the maximum and minimum gray levels therein, and furnishing said maximum and minimum gray levels as output;

decision means for receiving said maximum and minimum gray levels, deciding therefrom whether respective pixels are gray-scale pixels or bilevel pixels, and generating a control signal accordingly;

uniform-threshold binarizing means for receiving said stored input image read by said maximum-minimum detection means, thresholding it against a uniform threshold, and thereby generating a first bilevel signal;

dither-matrix binarizing means for receiving said stored input image read by said maximum-minimum detection means, thresholding it using a dither matrix, and thereby generating a second bilevel signal; and

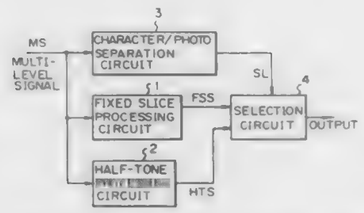
switch means for selecting said first bilevel signal or said second bilevel signal, according to said control signals, as said bilevel output signal.

4,996,603

IMAGE PROCESSING SYSTEM

Norio Kanemitsu; Yoshio Tabata, both of Kawasaki, and Masaru Wakabayashi, Ishikawa, all of Japan, assignors to Fujitsu Limited, Kawasaki and PFU Limited, Ishikawa, both of, Japan

Filed Jun. 28, 1989, Ser. No. 372,453
Claims priority, application Japan, Jun. 28, 1988, 63-159621
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—462 7 Claims



1. An image processing system for obtaining a binary signal from a multi-level signal read by an image scanner from an original document including mixed characters, ruled lines, and photos, and then obtaining a reproduced image from said binary signal, said image processing system comprising;

fixed slice processing means for receiving said multi-level signal, for slicing said multi-level signal by a predetermined fixed threshold level, and for outputting said binary signal sliced by said fixed threshold level;

half-tone processing means for receiving said multi-level signal, for slicing said multi-level signal by a plurality of threshold levels defined by a dither method, and for outputting said binary signal sliced by said plurality of threshold levels defined by said dither method;

character/photo separating means for receiving said multi-level signal, for detecting a pattern of said multi-level signal, for separating either a character portion or a photo portion based on said pattern and for outputting a selection signal, said character/photo separating means comprises a successive gray color detection circuit for receiving said multi-level signal, and for obtaining binary signals after slicing said multi-level signal based on said fixed threshold level, and detecting a number of said binary signals occurring in succession within one line of said binary signal; and a fine line detection circuit for receiving said multi-level signal, and for detecting a change of density level of said multi-levels signal between adjacent lines; and

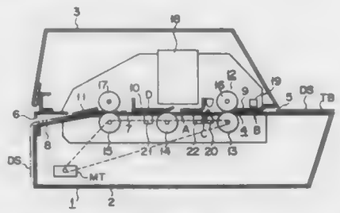
selection means for selecting either said fixed slice processing means or said half-tone processing means based on said selection signal from said character/photo separating means.

4,996,604

IMAGE SCANNER

Izumi Ogawa, Shizuoka; Kazuyoshi Kurihara, Numazu; Seigo Uchida, Shizuoka, and Takashi Nishijima, Numazu, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,983
Claims priority, application Japan, Jul. 31, 1987, 62-193233; May 16, 1988, 63-64336[U]
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—474 5 Claims



1. An image scanner comprising:

a convey path for a document sheet, said convey path having first and second ends, one of said ends including a document sheet inserting and collecting region;

a plurality of convey rollers for moving the document sheet along said convey path;

image sensing means, disposed at a position between the first and second ends of said convey path, for reading an image from said document sheet while said document sheet passes in front of said image sensing means; and

driving means for driving said convey rollers to move the document sheet toward the second end of said convey path and past said image sensing means when the document sheet is initially set at said inserting and collecting region of said convey path, and for driving said convey rollers and to move the document sheet back past said image sensing means and back to said inserting and collecting region of said convey path after the document sheet has passed said image sensing means;

said plurality of convey rollers including a pair of rollers disposed at a position between said image sensing means and the second end of said convey path and cooperatively coupled with each other to prevent an idle movement of said document sheet;

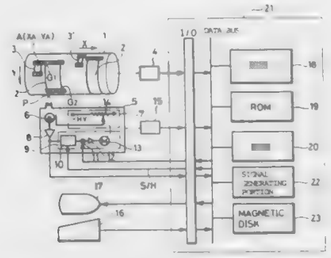
said driving means including control means for causing a rotational direction of said convey rollers to be reversed while a trailing edge of said document sheet is moved between said image sensing means and the pair of said rollers.

4,996,605

METHOD AND APPARATUS FOR IMAGE SCANNING INPUT FOR AN IMAGE SCANNING RECORDING APPARATUS

Yoshihiro Taniguchi, and Hideaki Hashimoto, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Continuation of Ser. No. 225,048, Jul. 27, 1988, abandoned. This application Mar. 22, 1990, Ser. No. 497,834
Claims priority, application Japan, Jul. 30, 1987, 62-190973
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—474 15 Claims



1. A method of efficiently and precisely reading a plurality of originals, comprising the steps of:

(a) locating at least a first reference portion, a first original, a second reference portion and a second original on a holder, said first reference portion, said first original, said second reference portion and said second original being successively arranged in a sub-scanning direction, said first reference portion being immediately adjacent to said first original, and second reference portion being immediately adjacent to said second original;

(b) subsequently, moving said scanning means in said sub-scanning direction until said scanning means is in position to receive light from said first reference portion, and then calibrating said scanning means as a function of light received by said scanning means from said first reference portion;

(c) subsequently, moving said scanning means in said sub-scanning direction and using said scanning means to optically read said first original;

(d) subsequently, moving said scanning means in said sub-scanning direction until said scanning means is in position to receive light from said second reference portion, and then calibrating said scanning means as a function of light received by said scanning means from said second reference portion; and

(e) subsequently moving a scanning means in said sub-scanning direction and using said scanning means to optically read said second original;

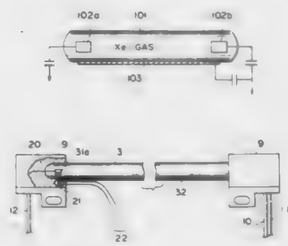
wherein said holder is moved continuously in said main scanning direction during and between steps (b) through (e).

4,996,606

LIGHT EMITTING DEVICE AND ORIGINAL READING APPARATUS HAVING THE DEVICE

Tatsundo Kawai, Hiratsuka; Makoto Ogura, Yokohama; Koji Tomoda, Atsugi; Hiroo Ichihashi, Chigasaki; Shinichi Seitoh, Atsugi; Yasuo Kuroda, Sagamihara, and Hiroyuki Noguchi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,511
Claims priority, application Japan, Nov. 14, 1987, 62-288198; Dec. 28, 1987, 62-201506[U]; Dec. 28, 1987, 62-201507[U]; Dec. 28, 1987, 62-201508[U]; Dec. 28, 1987, 62-201509[U]; Dec. 29, 1987, 62-200536[U]
Int. Cl.[5] H01J *61/16, 61/54;* H04N *1/04*
U.S. Cl. 358—475 33 Claims



1. An image reading apparatus comprising:

a light emitting device for illuminating an original, said light emitting device having a xenon glow lamp and a light source for illuminating a vicinity of a main electrode of the glow lamp;

an image sensor for converting optical information from the original into an electric signal;

a controller for controlling an operation of reading an image of the original; and

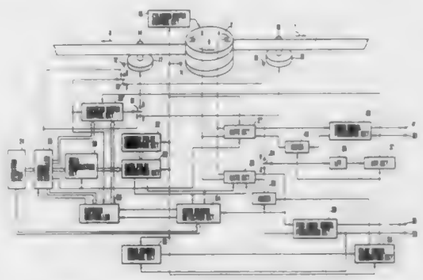
a driven for driving the xenon glow lamp and the light source, said driver being operated by said controller.

4,996,607

AUDIO SIGNAL RECORDING APPARATUS

Motokazu Kashida, Tokyo; Toshiyuki Masui, Kanagawa; Tsutomu Fukatsu, Kanagawa; Masahiro Takei, Kanagawa; Kouji Takahashi, Kanagawa, and Tomohiko Sasatani, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 816,425, Jan. 6, 1986, abandoned. This application Aug. 11, 1989, Ser. No. 392,476
Claims priority, application Japan, Jan. 17, 1985, 60-6281; Jan. 18, 1985, 60-7119; Jan. 19, 1985, 60-7696
Int. Cl.[5] G11B *20/10, 27/19*
U.S. Cl. 360—18 8 Claims



1. An audio signal recording apparatus, comprising:

(a) detecting means for detecting a silent part of an incoming

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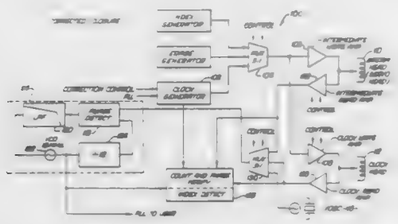
audio signal within said audio signal corresponding to less than a threshold volume and generating a detection signal;
(b) means for generating a reference signal of a predetermined frequency;
(c) modulating means for modulating said incoming audio signal to produce a modulated audio signal;
(d) superimposing means for superimposing said reference signal on said modulated audio signal in response to said detection signal to produce a recording signal; and
(e) recording means for recording said recording signal on a record bearing medium.

4,996,608

DISK DRIVE CLOCK WRITER

Douglas F. Widney, Camarillo, Calif., assignor to Data Exchange Corporation, Camarillo, Calif.

Filed Nov. 1, 1988, Ser. No. 265,788
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—51 **10 Claims**



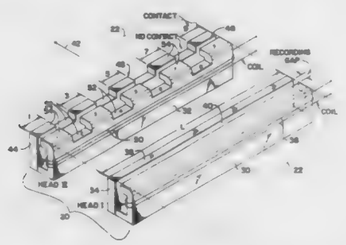
1. A disk drive clock writer for writing a clock pattern having a predetermined number of clock pulses around a clock track of a magnetic memory disk, comprising:
means for writing a preliminary clock pattern on the disk, said preliminary clock pattern having a number of clock pulses approximately equal to the predetermined number of clock pulses; and
means for reading the preliminary clock pattern to verify the actual number of clock pulses; and
means responsive to the reading means for writing a second clock pattern on the disk, which includes means for generating a source signal in phase with the preliminary clock pattern and correction means for advancing or retarding the phase of selected individual pulses of the source signal so that the second clock pattern has said predetermined number of clock pulses.

4,996,609

MAGNETIC HEAD RECORDING MULTITRACK SERVO PATTERNS

Kyriacos Joannou, Wayland, Mass., assignor to Pericomp Corporation, Natick, Mass.

Filed Feb. 22, 1989, Ser. No. 313,719
Int. Cl.[5] G11B *5/02*
U.S. Cl. 360—57 **34 Claims**



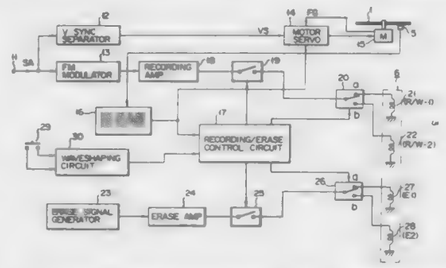
1. Apparatus for prerecording track positioning signals on a magnetic recording medium so as to accurately and simultaneously predefine a plurality of space apart recording tracks on said recording medium across the recording width of said medium, said apparatus comprising:
magnetic head means for simultaneously writing a track positioning signal pattern across the recording width of said magnetic recording medium so as to simultaneously define the positions of said tracks on said medium as a function of the locations of said signals on said medium, said magnetic head means comprising (a) a first write head for recording a first signal pattern on said recording medium, and (b) a second write head, spaced from first write head, for recording a second signal pattern on said recording medium recorded over portions of said first signal pattern so that said first and second signal patterns combine to create said track positioning signal pattern of n alternating steps of said first and second signal patterns so as to define at least n-1 of said recording tracks;
means for moving said magnetic recording medium relative to said first and second write heads so that said track positioning signal pattern is recorded on said medium; and
means, coupled to said first and second write heads, for generating said first and second signal patterns as said recording medium is moved relative to said magnetic head means.

4,996,610

DISK-TYPE MAGNETIC RECORDING APPARATUS WITH VIDEO SIGNAL DISCRIMINATION MEANS

Yutaka Yunoki, Vira Kunitachi 402, 23–11 Higashi 4-chome, Kunitachi-shi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 166,875, Mar. 11, 1988, abandoned, which is a division of Ser. No. 796,573, Oct. 28, 1985, Pat. No. 4,742,404. This application Oct. 20, 1989, Ser. No. 425,505
Claims priority, application Japan, Mar. 13, 1984, 59-47865; Mar. 13, 1984, 59-47866; Mar. 13, 1984, 59-47867; Mar. 13, 1984, 59-47868; Mar. 13, 1984, 59-47869; Mar. 13, 1984, 59-47870
Int. Cl.[5] G11B *5/012*
U.S. Cl. 360—61 **26 Claims**



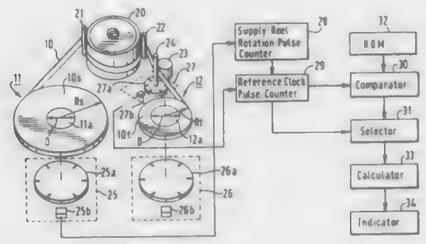
1. A magnetic recording apparatus using a rotatable magnetic disc as a recording medium, comprising:
magnetic head means for erasing and recording data with respect to said magnetic disk;
discriminating means for discriminating whether or not image data is supplied to said apparatus as recording data to be recorded on said magnetic disk via said magnetic head means;
first sync signal generating means for generating a first sync signal based on a sync signal extracted from a supplied image data to be recorded;
second sync signal generating means for generating a second sync signal based on a sync signal extracted from data other than image data which is supplied to said magnetic head means to be recorded;
means for generating a rotational state detecting signal for said magnetic disk, which indicates a rotational state of said magnetic disk;
phase-servo control means for establishing a regular rotation speed and phase of said magnetic disk corresponding to a type of data to be recorded based on both a timing signal supplied thereto and a rotational state detecting signal for said magnetic disk;
means for selectively supplying one of said first sync signal and said second sync signal to said phase-servo control means as said timing signal in response to a discrimination result of said discriminating means; and
means for selectively supplying the image data or the data other than image data to said magnetic head means in response to a discrimination result of said discriminating means.

4,996,611

TAPE POSITION DATA INDICATING APPARATUS FOR CASSETTE TAPE PLAYER

Masahiro Ito, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 30, 1988, Ser. No. 238,220
Claims priority, application Japan, Aug. 31, 1987, 62-216648
Int. Cl.[5] G11B *15/18*
U.S. Cl. 360—72.3 **18 Claims**



1. A tape position data indicating apparatus for a cassette tape player wherein a tape is wound between a supply reel and a take-up reel comprising:
reel driving means for rotating the take-up reel for transporting the tape from the supply reel to the take-up reel;
detecting means for detecting a rotation period of either of the reels;
calculating means responsive to the rotation period detected by the detecting means for obtaining an approximated tape position data according to a prescribed linear equation;
means for indicating the approximated tape position data;
means for storing prescribed constants associated with the linear equation; and
means for supplying the prescribed linear equation constants stored in the storing means to the calculating means.

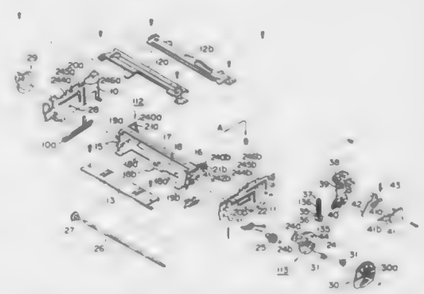
4,996,612

CASSETTE LOADING APPARATUS HAVING OPTIMUM ERROR PROTECTION DEVICE

Kenichi Suda, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1989, Ser. No. 457,959
Claims priority, application Japan, Dec. 28, 1988, 63-333606
Int. Cl.[5] G11B *5/008*
U.S. Cl. 360—96.5 **3 Claims**

1. A cassette loading apparatus comprising:
a cassette holder which houses a cassette to be loaded and is arranged to be movable along a substantially horizontal moving path;
cassette detecting means which is arranged on said cassette holder and is set at an operative position and a nonoperative position in accordance with the presence/absence of the cassette;
loading means for selectively driving said cassette holder so as to load the cassette from an insertion position to a driving position and to unload the cassette from the driving position to an ejecting position;
a plurality of lock means, arranged on the moving path of said cassette holder at predetermined intervals, for locking said cassette detecting means by using one of said lock means when said cassette detecting means is set at the nonoperative position; and



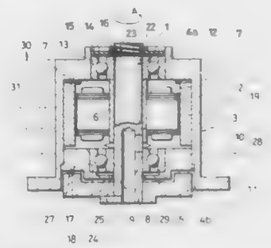
control means for allowing said loading means to perform loading in response to insertion of the cassette, allowing said loading means to perform unloading in response to an ejecting operation, and switching a loading operation of said loading means to an unloading operation when one of said plurality of lock means locks said cassette detecting means during execution of loading by said loading means.

4,996,613

SPINDLE MOTOR WITH NON-CONTACT SEAL

Noriaki Hishida, Kyoto, Japan, assignor to Nippon Densan Corporation, Kyoto, Japan

Filed Nov. 15, 1988, Ser. No. 271,434
Claims priority, application Japan, Nov. 25, 1987, 62-179170[U]
Int. Cl.[5] G11B *17/02*
U.S. Cl. 360—99.08 **10 Claims**



1. A spindle motor comprising:
stationary means including a stator for generating a rotating magnetic field;
rotary means rotatably supported on said stationary means by a pair of axially spaced bearings and electromagnetically rotated by said rotating magnetic field, said rotary means including a hub for supporting at least one article to be rotated therein:
a small annular clearance associated with at least one of said bearings, said clearance being located on the side of said one bearing axially away from the other bearing to communicate with the exterior of the spindle motor, said clearance being formed between a pair of opposed cylin-

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drical surfaces of said stationary means and said rotary means; and

at least one helical groove formed at said annular clearance on at least one of said cylindrical surfaces for forming an air flow along said helical groove toward said one bearing when said rotary means is rotated in a predetermined rotational direction relative to said stationary means.

4,996,614

MAGNETIC RECORDING APPARATUS HAVING DUST REMOVING SURFACE FEATURE

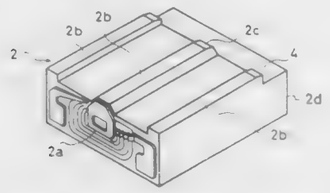
Naohiro Okutsu, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,562

Claims priority, application Japan, Dec. 8, 1988, 63-310656

Int. Cl.[5] G11B *5/60*

U.S. Cl. 360—103 **19 Claims**



1. A magnetic recording apparatus comprising a magnetic disk rotated by drive means, a magnetic head having a front end, an upper and lower surface, the lower surface located over the magnetic disk, and a slider affixed to the lower surface of the magnetic head, said slider held floated and defining a gap relative to the disk, the gap created by an air stream generated with the rotation of said magnetic disk, said magnetic head being provided at the front end with a stepped portion extending laterally across substantially the entire front end thereof to promote dust removal from beneath the magnetic head.

4,996,615

HEAD ASSEMBLY

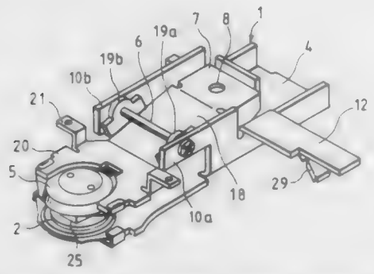
Atsushi Iwanaga, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 239,161

Claims priority, application Japan, Dec. 4, 1987, 62-184317[U]; Jan. 9, 1988, 63-839[U]; Jan. 12, 1988, 63-2273[U]; Jan. 14, 1988, 63-3524[U]; Jan. 19, 1988, 63-4199[U]; Jan. 19, 1988, 63-7642[U]

Int. Cl.[5] G11B *5/54, 21/21*

U.S. Cl. 360—104 **4 Claims**



1. A head assembly including a carriage bearing a lower head unit and an arm bearing an upper head unit, said carriage being transported along a guide shaft in a radial direction on a surface of a recording disk, comprising an improvement wherein:

said arm includes a pivot shaft position located at a center of gravity of said arm including said upper head unit, and said arm is supported directly on said carriage at the pivot shaft position;

wherein said arm has no attached balance weight and is not supported by a spring; and

wherein said shield plate defines in an upper surface thereof a positioned hole for adjusting the position of the magnetic head.

4,996,616

HEAD SUSPENSION LOAD BEAM WITH REINFORCING RIBS

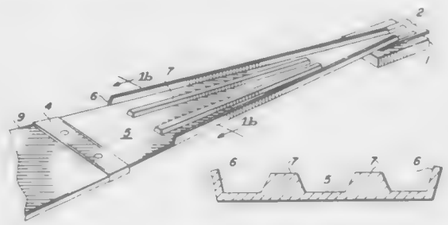
Akihiko Aoyagi, Yamato; Tatsuya Endo, Fujisawa, and Hiroshi Terashima, Fujisawa, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1989, Ser. No. 340,335

Claims priority, application Japan, Apr. 22, 1988, 63-98477

Int. Cl.[5] G11B *5/48, 5/60*

U.S. Cl. 360—104 **1 Claim**



1. A head suspension load beam including a flat thin base portion secured to a head actuator arm at one end and supporting a head at the other end, said load beam being reinforced by (a) bending opposite side margin portions in a longitudinal direction of said base portion at substantially right angles to a plane of said base portion, and (b) providing a pair of reinforcing ribs on said base portion, each reinforcing rib having a trapezoidal cross section and being not higher than said side margin portions and substantially parallel to a respective one of said side margin portions, whereby a desired spring constant and degree of rigidity can be achieved with side margin portions and reinforcing ribs of reduced height.

4,996,617

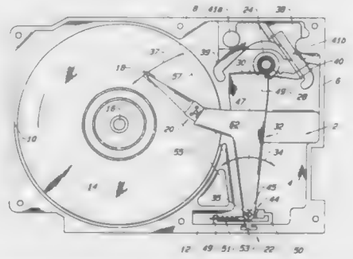
DISC DRIVE SAFETY LATCH USING SHAPE MEMORY METALS

John R. Yaeger, Sunnyvale, and Suzanne R. Wilkins, Capitola, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jan. 23, 1989, Ser. No. 299,400

Int. Cl.[5] G11B *5/54, 21/22*

U.S. Cl. 360—105 **15 Claims**



1. In a data storage device including a frame and one or more rotating discs, at least one data transducer positioned in close proximity to a major surface of each said disc which has a data storage region comprising a plurality of adjacent data storage tracks for writing and reading data on said surface and a rest position for its respective transducer, a transducer supporting arm for supporting and moving each said data transducer relative to said surface, and drive means for moving said arm;

an improved safety latch for locking each said transducer at said rest position in the absence of disc rotation comprising

a flexible spring arm mounted horizontally adjacent said transducer supporting arm, and

a shape memory alloy element operatively connected between said frame and said flexible arm,

said shape memory alloy element having a martensitic phase and an austenitic phase,

said shape memory alloy element in one of the martensitic and austenitic conditions cooperating with said flexible arm to elastically deform said flexible arm to allow said transducer supporting arm to position said transducer relative to said disc,

said shape memory alloy element in the other of the martensitic and austenitic conditions operating in a tensile mode and cooperating with the flexible arm to capture said transducer supporting arm and hold each said transducer at said rest position, and

bias means for actively causing said shape memory alloy to change from said martensitic to said austenitic condition.

4,996,618

MAGNETIC DISK APPARATUS HAVING ADDITIONAL CARRIAGE ADAPTED TO PREVENT ADSORPTION OF MAGNETIC HEAD

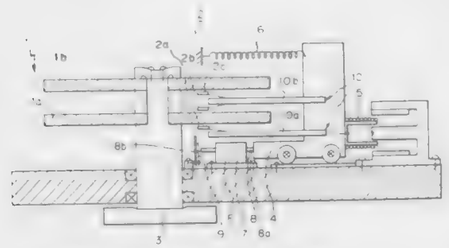
Masatoshi Kakuda, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,577

Claims priority, application Japan, Jan. 26, 1988, 63-15598

Int. Cl.[5] G11B *5/55, 21/08*

U.S. Cl. 360—106 **8 Claims**



1. A magnetic disk apparatus comprising:

a magnetic disk adapted to have information recorded thereon and including an information recording portion and means defining separate predetermined and stand-by positions, said predetermined and stand by positions both being locations free of normal recording and reproducing information;

means for rotating said magnetic disk;

magnetic head means for recording and reproducing the information onto and from said magnetic disk;

carriage means for moving and positioning said magnetic head;

wherein, when the rotation of said magnetic disk is started, said magnetic head means rises from the predetermined position on said magnetic disk, and when the rotation of said magnetic disk is stopped, said magnetic head means comes to rest at said predetermined position;

and control means for enabling said magnetic head to move between said predetermined position and the standby position and including means for moving the magnetic head from said predetermined position to said standby position once the rotation of said magnetic disk is stopped, and means for moving the magnetic head from said standby position to said predetermined position after initiation of said means for rotating but prior to the rotation of said magnetic disk whereby the tendency of said magnetic head to be affected by adsorption phenomenon is inhibited.

4,996,619

APPARATUS FOR ADJUSTABLY SUPPORTING A HEAD CARRIAGE

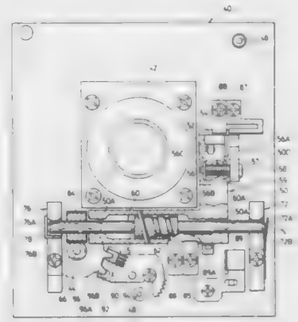
Kenji Negishi; Hidemi Sasaki, and Takeshi Fujishiro, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 149,237, Jan. 27, 1988, Pat. No. 4,873,598. This application Sep. 6, 1989, Ser. No. 403,433

Claims priority, application Japan, Feb. 5, 1987, 62-25431; Feb. 5, 1987, 62-25432; Feb. 10, 1987, 62-30038; Feb. 10, 1987, 62-30039; Mar. 26, 1987, 62-73676

Int. Cl.[5] G11B *21/24, 5/56*

U.S. Cl. 360—109 **6 Claims**



1. A method of supporting a head carriage, adhesively bonded to a magnetic head and being movable in the radial direction of a rotating magnetic disc to magnetically record or reproduce from said magnetic disc, the movement of the head carriage being along a guide shaft for guiding said head carriage, the guide shaft defining an axial direction and being supported at its opposite ends by a respective bearing, the method comprising:

allowing at least one of said bearings to be moveable freely in a direction perpendicularly intersecting the axial direction of said guide shaft, and,

after said magnetic head is adhesively bonded to said head carriage, moving said freely movable bearing to thereby parallelly move or incline said head carriage within a plane parallel to a magnetic recording/reproducing surface so as to adjust the azimuth shift of said magnetic head.

4,996,620

ELECTROMAGNETIC TRANSDUCERS HAVING E-SHAPED CORES AND SHIELDING THEREBETWEEN

Gregory A. Orton, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 116,110, Oct. 30, 1987, Pat. No. 4,894,738. This application Nov. 9, 1989, Ser. No. 434,670

Int. Cl.[5] G11B *5/265, 5/115*

U.S. Cl. 360—121 **3 Claims**

2. An erase-write-read magnetic transducer structure comprising: said transducer structure comprising a pair of transducers, each transducer including

an E-shaped magnetically permeable core member having central, back and outer arms and having a first coil linked with the central arm and having the back and outer arms passing around the outside of said first coil and defining

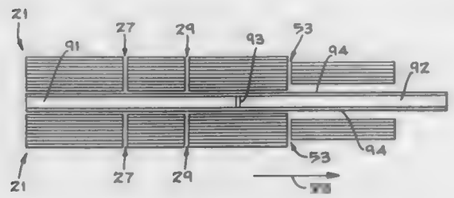
VOL 1123 ISS 4 FE 26 1991 UMI

with the central arm two pairs of confronting pole piece portions constituting a pair of erasing transducing gaps of low magnetic permeability, and

said core member also having a magnetically-permeable C-shaped extension portion and a second electrically-conducting coil passing around the outside therof and defining a pair of confronting pole piece portions constituting a read-write transducing gap of low magnetic permeability;

said pair of transducers being mounted in close parallel relationship for tracing adjacent tracks in movement with respect to a recording medium;

a unitary, one-piece magnetic shielding member mounted in parallel with and between said transducers of said pair for minimizing cross-talk between said transducers;



said shielding member having an erase shield portion and a read-write shield portion in the same plane between and parallel to said transducers and said portions being made of different materials; the erase shield portion being disposed between the erase gaps of said respective transducers, and the read-write shield portion being disposed between the read-write gaps of said respective transducers, said shield portions having a joint therebetween located intermediately of each read-write gap and the adjacent erase gaps; and

a pair of generally planar web members arranged in sandwiching relation to said erase and read-write shield portions and bonded thereto to form a unitary one-piece shield construction.

4,996,621

SUPERCONDUCTING DEVICE FOR READING INFORMATION FROM A MAGNETIC RECORDING MEDIUM

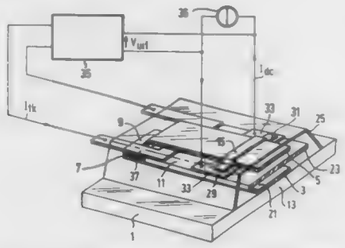
Jacobus J. M. Ruigrok; Victor Zieren, both of Eindhoven; Ulrich E. Enz, Geldrop, and Willem F. Druyvesteyn, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1988, Ser. No. 265,362

Claims priority, application Netherlands, Nov. 2, 1987, 8702607

Int. Cl.[5] G11B *5/147*

U.S. Cl. 360—126 17 Claims



1. A device for reading information from a magnetic recording medium, which device comprises a transducing element and the magnetic yoke co-operating with the transducing element, the yoke being provided with a first flux guide and a second flux guide spatially separated locally therefrom, said device also having a face for magnetic flux coupling of the transducing element with the magnetic recording medium, characterized in that the transducing element is constituted by a superconducting quantum interference device (SQUID), provided with connection means for connecting the SQUID to a detection circuit.

4,996,622

MAGNETIC DISK WITH TEXTURED AREA ON PART OF DISK

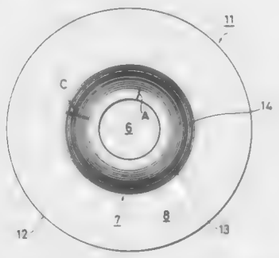
Nobuyuki Takatsuki, Yokkaichi, and Kyoichi Shukuri, Yokohama, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 18, 1989, Ser. No. 451,789

Claims priority, application Japan, Mar. 16, 1988, 63-34816

Int. Cl.[5] G11B *5/82*

U.S. Cl. 360—135 10 Claims



1. A magnetic disk comprising a glass substrate with an opening in a central portion, an undercoating film formed on said glass substrate, a magnetic recording film formed on said undercoating film, and a protective film formed on said magnetic recording film, wherein a texture is formed in a first region spaced apart from said opening by a predetermined distance, and a lubricant is coated on only said texture.

4,996,623

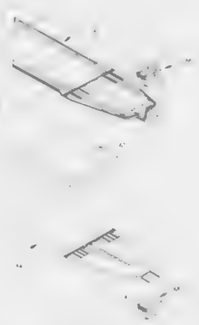
LAMINATED SUSPENSION FOR A NEGATIVE PRESSURE SLIDER IN A DATA RECORDING DISK FILE

A. David Erpelding; Darrell D. Palmer, and Richard K. Wilmer, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1989, Ser. No. 390,558

Int. Cl.[5] G11B *5/48*

U.S. Cl. 360—104 13 Claims



1. A suspension for use in a data recording disk file of the type having a disk with a data surface of concentric data tracks, means for rotating the disk about an axis generally

perpendicular to the disk, a transducer for writing data to or reading data from the data tracks, the transducer being attached to a negative pressure air-bearing slider maintained adjacent the data surface, means for actuating the slider generally radially relative to the disk so as to permit the transducer to access the data tracks, a support arm attached to the slider actuating means, and a suspension connecting the support arm to the slider, the suspension being a laminate structure comprising:

a flat, flexible sheet of nonconductive material, the sheet having an arm portion for attachment to the support arm, a slider portion for attachment to the slider, and a link portion connecting the arm portion and the slider portion;

a first metal layer secured to one side of the sheet, the first metal layer having an arm portion for attachment to the support arm and a link portion spaced from the arm portion so as to define a first hinge region of the flexible sheet; and

a second metal layer secured to the other side of the sheet, the second metal layer including electrical conductor portions extending from the arm portion of the sheet to the slider portion of the sheet for electrical connection to the transducer and a first hinge portion adjacent to and extending across the first hinge region of the sheet for providing a spring force to the slider, wherein a disk loading force is applied to the slider when the slider is attached to the slider portion of the sheet, the arm portions of the sheet and first metal layer are attached to the support arm, and the slider is positioned on a disk surface.

4,996,624

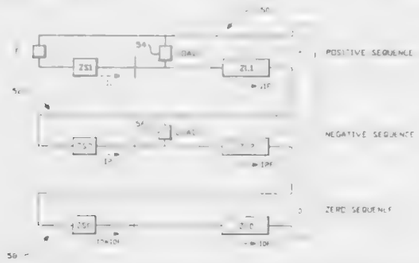
FAULT LOCATION METHOD FOR RADIAL TRANSMISSION AND DISTRIBUTION SYSTEMS

Edmund O. Schweitzer, III, Whitman County, Wash., assignor to Schweitzer Engineering Laboratories, Inc., Pullman, Wash.

Filed Sep. 28, 1989, Ser. No. 413,839

Int. Cl.[5] H02H *3/26*

U.S. Cl. 361—63 4 Claims



1. A method for determining the positive-sequence impedance to a fault comprising:

measuring the phase-to-ground voltage of the faulted line and the zero-sequence component of the fault current;

determining the residual current and

using the residual current (IR) and the residual current compensation factor (k) to determine the positive-sequence impedance by dividing said phase-to-ground voltage by IR×(1+k).

4,996,625

POWER SOURCE UNIT FOR IMAGE RECORDING APPARATUS

Utami Soma; Yasufumi Koseki, and Minoru Asakawa, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,500

Claims priority, application Japan, Sep. 2, 1988, 63-220755

Int. Cl.[5] H02H *3/08*

U.S. Cl. 361—87 6 Claims



1. In an image recording apparatus having a central processing unit (CPU) which controls operation sequences of a load during respective operation cycles of the image recording apparatus, a power source unit for supplying power to the load, comprising:

means defining a power supply path to said load;

current sensing means which senses a load current;

current interrupting means connected to said power supply path for interrupting said power supply path;

means which stores in advance a plurality of predetermined current limit values at least one said value corresponding to each operation cycle to be performed by said image recording apparatus; and

control means in said CPU operating said current interrupting means for interrupting said power supply path to said load when said CPU determines that the load current sensed by said current sensing means exceeds said predetermined current limit value for the corresponding operation cycle being performed by said image recording apparatus.

4,996,626

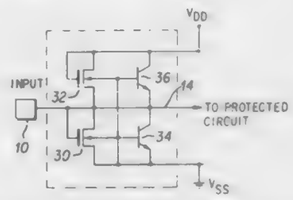
RESISTORLESS ELECTROSTATIC DISCHARGE PROTECTION DEVICE FOR HIGH SPEED INTEGRATED CIRCUITS

Quincy Say, Santa Clara, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Oct. 14, 1988, Ser. No. 257,756

Int. Cl.[5] H01L *27/02*

U.S. Cl. 361—91 11 Claims



1. An electrostatic discharge protection circuit for an integrated circuit containing a signal line, supply line and ground line comprising:

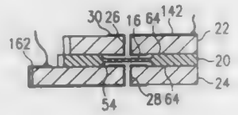
first and second MOS transistors each with gate, drain and source terminals; wherein

said first MOS transistor gate and drain terminals are connected to said signal line, and said source terminal is connected to said ground line; and

said second MOS transistor gate and drain terminals are connected to said supply line, and said source terminal is connected to said signal line.

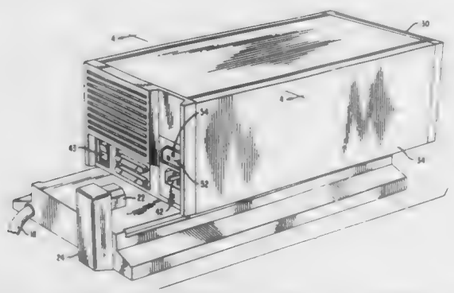
VOL 1123 ISS 4 FEB 26 1991 UMI

4,996,627
HIGH SENSITIVITY MINIATURE PRESSURE TRANSDUCER
Arthur R. Zias, Los Altos; Barry Block, Los Altos Hills; Kenneth W. Mapes, San Jose; Norman L. Nystrom, Sunnyvale, and Robert M. Cadwell, Los Altos, all of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Jan. 30, 1989, Ser. No. 304,344
Int. Cl.[5] H01G 7/00; G25F 3/12; B44C 1/22; H01L 29/84
U.S. Cl. 361—283 292 Claims



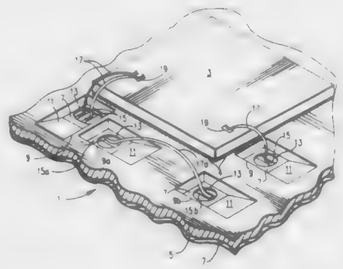
85. A transducer, comprising:
a conductive capacitor plate;
a semiconductor diaphragm defining a deflectable capacitor plate spaced apart from said fixed capacitor plate; and
a support structure encircling said semiconductor diaphragm and attached thereto for maintaining said deflectable diaphragm radially tensioned a predefined amount.

4,996,628
BASE FOR STACKABLE ASSEMBLIES
Robert T. Harvey, Wichita, Kans., and David C. White, Cincinnati, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Oct. 19, 1989, Ser. No. 423,914
Int. Cl.[5] H05K 7/00
U.S. Cl. 361—393 9 Claims



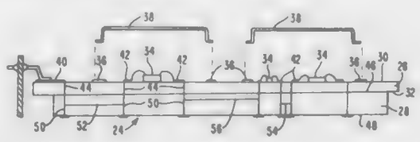
1. An apparatus for switching a flow of AC power to an electronic assembly, comprising:
a base having a front face, rear face and a pedestal portion;
track means formed on said pedestal portion for slidably engaging an electronic assembly;
track means formed on said pedestal portion for slidably engaging an electronic assembly;
a first electronic assembly having means for slidably engaging said track means;
said slidably engaging means being engaged with said track means;
power input means attached to said base for receiving AC power from an external source;
a plug attached to said rear face for slidably engaging and electrically connecting said first electronic assembly to said base;
a switch attached to said front face for ON/OFF switching the flow of AC power from said power input means via said plug to said first electronic assembly; and
a second electronic assembly slidably engaged atop said first electronic assembly and electrically connected to said first electronic assembly for receiving AC power therefrom, such that said switch switches a flow of AC power to said second electronic assembly in the same manner that it switches the flow of AC power to said first electronic assembly

4,996,629
CIRCUIT BOARD WITH SELF-SUPPORTING CONNECTION BETWEEN SIDES
Robert A. Christiansen, Salvisa, and Joel A. DiGirolamo, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 14, 1988, Ser. No. 271,242
Int. Cl.[5] H05K 7/02
U.S. Cl. 361—400 22 Claims



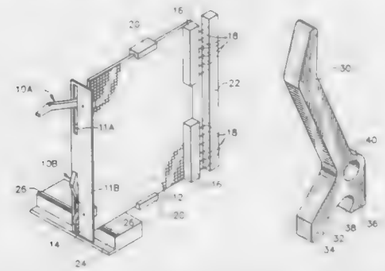
1. A circuit board populated on opposite sides comprising a supporting layer having two sides and holes between said two sides, a conductive circuit pattern supported on one of said sides, said conductive circuit pattern crossing said holes and defining a bottom of each of said holes, circuit elements supported on the other of said sides and wires or other self-supporting conductors electrically connected to said circuit elements, extending through said holes, and bonded to said conductive pattern on the side of said conductive pattern facing said holes where said conductive pattern crosses said holes, and not extending past said bottom of said holes.

4,996,630
HYBRID MODULE ELECTRONICS PACKAGE
Ralph Liguori, Oakland; Kurt R. Goldhammer, West Milford, and Lothar Laermer, Paramus, all of N.J., assignors to Plessey Electronic Systems Corp., Wayne, N.J.
Filed Sep. 27, 1989, Ser. No. 413,432
Int. Cl.[5] H05K 1/11
U.S. Cl. 361—412 8 Claims



1. A hybrid module of electronic circuitry comprising:
a first substrate having hermetic properties, said first substrate having generally planar parallel first and second surfaces;
a plurality of electronic components mounted on the first surface of said first substrate, said plurality of components being grouped within discrete regions of said first surface;
enclosure means for providing a plurality of hermetic enclosures on said first surface, each of said hermetic enclosures surrounding the components within a respective discrete region;
a second substrate having organic properties, said second substrate having generally planar parallel first and second surfaces, the first surface of said second substrate being in intimate contact with and electrically interconnected to the second surface of said first substrate; and
interconnection means for providing connections between said plurality of electronic components through said second substrate so that testing of said electronic components can be effected without invasion said hermetic enclosures.

4,996,631
INJECTOR/EJECTOR SYSTEM FOR RACK MOUNTED PLUG-IN MODULES WITH FRONT PANELS
Eugene G. Freehauf, Ontario, Calif., assignor to Canoga Industries, Inc., San Diego, Calif.
Filed Oct. 30, 1989, Ser. No. 428,860
Int. Cl.[5] H05K 7/14
U.S. Cl. 361—415 21 Claims



1. A unit for injecting and ejecting a plug-in unit within a card cage having an ejection bearing surface and an injection member separate from the ejection bearing surface, said injection member having an injection bearing surface, the injecting-/ejecting unit comprising:
a handle portion adapted for operating the injecting/ejecting unit;
a pivot portion having an upper outward portion that is integrally connected to a lower inward portion of the handle portion, said pivot portion defining a configuration permitting interconnection of the pivot portion to the plug-in unit, and permitting pivotal movement of the handle portion about said interconnection to the plug-in unit:
an ejection finger extending from said lower outward portion of the pivot portion and integrally connected thereto, said ejection finger defining an ejecting surface on an inward end thereof for contacting the ejection bearing surface of the card cage during extraction of the plug-in unit from the card cage; and
an injection finger extending from said lower inward portion of the pivot portion that is separate from the lower outward portion of the pivot portion, and integrally connected to said lower outward portion, said injection finger defining an injecting surface on a lower end thereof for contacting the injection bearing surface of the card cage during insertion of the plug-in unit into the card cage, such that when said injecting/ejecting unit is used with the plug-in unit, said injecting/ejecting unit is positioned entirely adjacent a side of the plug-in unit that is opposite to a side upon which electronic components are secured.

4,996,632
MULTI-COLOR ILLUMINATING SYSTEM
Wallace R. Aikens, Plano, Tex., assignor to Gulton Industries, Inc., Plano, Tex.
Filed Oct. 7, 1988, Ser. No. 255,062
Int. Cl.[5] F21V 5/00; G09F 13/00
U.S. Cl. 362—32 39 Claims

1. An elongated light-producing arrangement comprising:
a light source for emitting light;
an elongated tube having a hollow interior, said tube having a light-transmissible portion extending along the length of said tube and extending only partially around the circumference of said tube, said tube also having a reflective surface for propagating light within and along the axis of the tube, said light source being arranged outside of said tube so as to expose said interior to the light emitted from said light source for reflection by said surface;
a diffusing medium arranged in said tube extending longitudinally and only partially around the circumference of said tube, substantially diametrically opposite said light-transmissible portion, to diffuse light striking said diffusing medium both directly and by reflection from said reflective surface, said light-transmissible portion, said diffusing medium and said reflective surface in the aggregate extending over substantially the entire surface of said tube, whereby light in said tube impinging on said diffusing medium causes light from the diffusing medium to pass outwardly through said light-transmissible portion.

4,996,633
ROTARY TYPE CLOCK ORNAMENT LAMP CIRCUIT STRUCTURE
Wang C. Fu, 3th, Floor, No. 10 Alley 7, Lane 185, Sec. 3, Shing Long Road, Taipei, Taiwan
Filed May 14, 1990, Ser. No. 522,935
Int. Cl.[5] F21V 21/30
U.S. Cl. 362—35 3 Claims



1. A rotary type clock ornament lamp circuit strcture, comprising:
a turner being a forward-acting or forward-backward type of motorized or electro-magnetic turning device, having a transmission shaft thereon;
a conductive seat being a circular cylinder having a higher vertical wall portion and a lower vertical wall portion, said higher vertical wall portion and said lower vertical wall portion having each a bolt hole on its topmost edge and an unitary lug at its outer side;
a positive pole conductive member being substantially a

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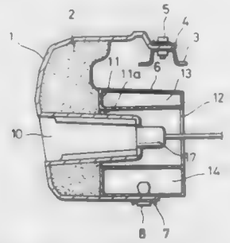
copper ring having an unitary U-shaped projection transversely projecting outward and three projecting strips transversely projecting inward;
a negative pole conductive member being substantially a copper ring in size smaller than the copper ring of said positive pole conductive member and having an external projection and three internal projecting strips;
a positive pole distribution member comprising a cylindrical body having a distribution board on its top and a through-hole transversely through its periphery;
an insulator comprised of a cylindrical post having an expanded insulating board on its top and a through-hole transversely through its periphery;
a negative pole distribution member comprising a cylindrical body having a distribution board on its top and a bolt hole transversely through its periphery;
a plurality of sockets; and
a plurality of lamp bulbs being respectively mounted on said sockets by means of plug-in connection.

4,996,634

BUMPER REINFORCEMENT FOR AUTOMOTIVE VEHICLES

Shinichi Haneda, Aichi; Haruhiko Terada, Obu; Kazunari Azuchi, Himi, and Kiyohito Gyobu, Toyama, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Keikinzoku Kabushiki Kaisha, both of, Japan

Filed Mar. 30, 1990, Ser. No. 501,926
Claims priority, application Japan, Mar. 31, 1989, 1-36336[U]
Int. Cl.[5] B60Q *1/28*
U.S. Cl. 362—82 **3 Claims**



1. A vehicular bumper reinforcement for having a rear portion of a bumper shell mounting a lamp fixedly secured thereto, comprising:
a vertical front wall having a cut-out portion through which a mounting portion of the lamp is passed;
a vertical rear wall having a cut-out portion through which the lamp is capable of moving at the time of a collision; and
flanges provided above and below the cut-out portions and spaced apart from each other by a distance somewhat greater than the height of the lamp mounting portion; said flanges being connecting integrally both said walls,
at least one hollow portion formed integral with the reinforcement and provided above and below each of said flanges.

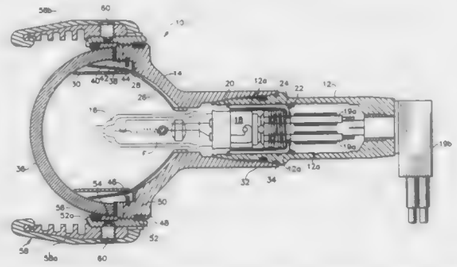
4,996,635

DEEP SUBMERSIBLE LIGHT ASSEMBLY WITH DRY PRESSURE DOME

Mark S. Olsson, San Diego; Samuel B. Parker, Venice, and Douglas G. Rimer, San Diego, all of Calif., assignors to Deepsea Power & Light, Inc., San Diego, Calif.

Filed Oct. 13, 1989, Ser. No. 420,909
Int. Cl.[5] F21V *29/00*
U.S. Cl. 362—267 **9 Claims**

1. A deep submersible light assembly comprising:
a generally funnel-shaped main light body;
means for supporting a lamp inside a rear neck portion of the main light body including a socket assembly;
a dome-shaped lens sized to extend across a front flared portion of the main light body;
means including a plurality of rings for providing a water-tight seal between a peripheral rear lip of the lens and a shoulder of the flared portion of the main light body;



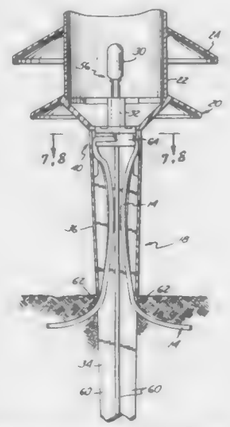
a reflector mounted inside the flared portion of the main light body; and
a spring seated on an inner shoulder of the flared portion of the main light body and engaging the reflector to hold it in position.

4,996,636

LOW VOLTAGE LIGHT FIXTURE

Robert H. Lovett, Eden Prairie, Minn., assignor to The Brinkmann Corporation, Dallas, Tex.

Filed Mar. 1, 1990, Ser. No. 486,966
Int. Cl.[5] F21S *1/10*
U.S. Cl. 362—431 **21 Claims**



1. In a low voltage light fixture for use with a multi-conductor wire, having a base, a lens supported by the base, a pair of electrical conductors supported by the base and forming a light bulb receptacle at upper ends and wire engaging prongs at lower ends, and having a support for supporting the base, the improvement comprising:
a first twist lock connector attached to a bottom surface of the base which includes a first pair of spaced connector elements, the first connector elements defining a first channel between them in which the wire is received and held and in which the prongs extend, and being positioned diagonally with respect to the first channel; and
a second twist lock connector attached to the upper end of the stake which includes a second pair of connector elements, the second pair of elements defining a second channel between them and positioned diagonally with respect to the second channel, wherein

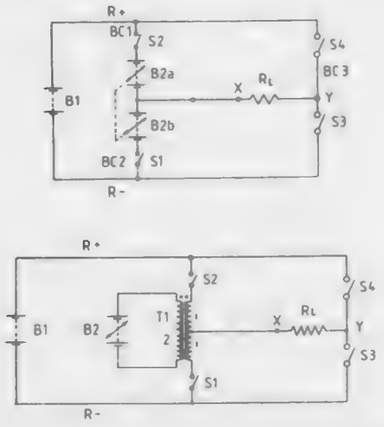
(a) the second pair of spaced connector elements engage the first pair of spaced connector elements,
(b) a passage, through which the wire extends, is formed by the first and second channels and maintained, and
(c) the prongs electrically engage the wire, when the stake and base are rotated relative to one another.

4,996,637

ELECTRICAL CONVERTER UTILIZING SWITCHED UNI-DIRECTIONAL AND BI-DIRECTIONAL ENERGY SOURCES

John J. Piechnick, Hazelwood Park, Australia, assignor to Power Reflex Pty. Ltd., The Levels, Australia

Filed Dec. 20, 1989, Ser. No. 453,510
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—16 **18 Claims**



1. A converter device comprising a uni-directional electrical energy source having two ends and a bi-directional energy source having two ends and a centre tap, a pair of conductor rails extending from the uni-directional energy source,
a first bridging conductor having two portions extending between said ends of the bi-directional energy source and respective said rails,
a second bridging conductor extending between the rails,
a first pair of switches one in each said first conductor portion,
a second pair of switches in the second bridging conductor portion,
an electrical load connected between the centre tap and an electrical conductor between the switches of the second pair,
so arranged that, upon selective opening and closing of the switches, current flow in the first said energy source is uni-directional, and in the second said energy source is bi-directional.

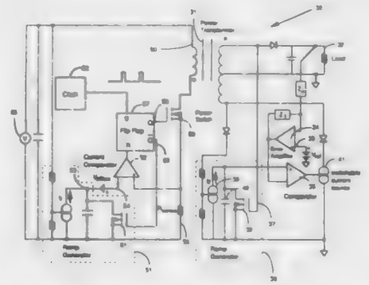
4,996,638

METHOD OF FEEDBACK REGULATING A FLYBACK POWER CONVERTER

Raymond K. Orr, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 15, 1990, Ser. No. 480,392
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—21 **7 Claims**

1. In a flyback power converter, having a primary and a secondary, a method of regulating voltage at an isolated output load, comprising the steps of:
(a) comparing the voltage across said load with a reference to obtain an error signal;
(b) comparing said error signal with a ramp signal to obtain a perturbation signal which varies in time according to the amplitude of said error signal;
(c) feeding said perturbation signal to said secondary so that it becomes induced at said primary, said perturbation signal being summed to the magnetizing current of said primary to provide a control signal when said primary is energized;
(d) detecting at the primary, the presence of said perturbation signal on said control signal; and
(e) regulating the voltage at said primary according to the presence in time of said perturbation signal on said control signal to thereby compensate for voltage variations at the output load.

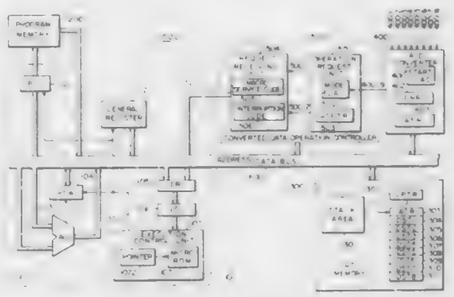


4,996,639

DATA PROCESSOR INCLUDING AN A/D CONVERTER FOR CONVERTING A PLURALITY OF ANALOG INPUT CHANNELS INTO DIGITAL DATA

Satomi Ishimoto; Osamu Matsushima, and Hajime Sakuma, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,970
Claims priority, application Japan, Nov. 27, 1987, 62-300614
Int. Cl.[5] G06F *5/00, 13/12*
U.S. Cl. 364—200 **9 Claims**



1. A data processor comprising:
(a) a program memory storing a program,
(b) a central processing unit including a program counter indicating an address of said program to be executed and a status register storing information representative of an execution state of said central processing unit and executing said program utilizing said program counter and said status register,

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(c) an analog-to-digital converter supplied with a plurality of analog inputs and including
(1) first storage means for temporarily storing data for selecting one of said analog inputs,
(2) selecting means, coupled to said first storage means, for selecting one of said analog inputs in response to data stored in said first storage means,
(3) converting means, coupled to said selecting means, for converting a selected analog in[illegible] into digital data, and
(4) generating means, coupled to said converting means, for generating a completion signal representative of completion of analog-to-digital conversion,
(d) second storage means for temporarily storing designation data for designating one or more of said analog inputs to be converted, said designation data including a plurality of bits which respectively correspond to said analog inputs, [illegible] e or more bits corresponding to designated one or more analog inputs set to a first state and any remaining bits reset to a second state, and
(e) signal means, responsive to said completion signal, for supplying a macro service operation request to said central processing unit,
(f) said central processing unit further including execution means, responsive to said macro service operation request, for suspending execution of said program and for executing said macro service operation while holding a contents of said program counter and said status register unchanged without saving said contents and without accessing said program memory,
(g) said execution means including
(1) transfer means, operatively coupled to said converting means, for transferring said digital data to a predetermined designation area,
(2) detecting means, operatively coupled to said second storage means, for detecting a position of bits of said designation data which are set to said first state in and for producing selection data for selecting another one of said analog inputs, to be next converted, in accordance with a detected bit position,
(3) set means, operatively coupled to said first storage means, for setting said selection data into said first storage means to cause said analog-to-digital converter to convert another analog input into corresponding digital data, and
(4) release means for allowing said program counter and said status register to change such that said central processing unit resumes operation of said program.

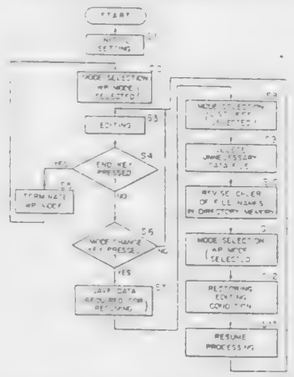
4,996,640

DATA PROCESSING SYSTEM

Shiro Yamada, Kasugai; Keiichi Hirata, Kuwana; Minoru Oishi, Nagoya; Yoshinari Morimoto, Nagoya; Akihiro Furukawa, Nagoya, and Atsuko Kawasumi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 21, 1987, Ser. No. 111,692
Claims priority, application Japan, Oct. 24, 1986, 61-254323
Int. Cl.[5] G06F 3/14
U.S. Cl. 364—200 21 Claims

1. A data processing system having a plurality of data processing operation modes and a text memory for storing a plurality of data files comprising:
mode select means for selecting an operation mode;
mode changing means for interrupting a processing being executed under a data input/edit mode and changing modes to enable processing in a selected mode;
data memory means for saving required data to permit the interrupted processing to continue in said data input/edit mode at the point of interruption, said data memory means comprising:
a data file name memory for saving a data file name of a currently processed data file under said data input/edit mode;
a start address memory for saving a start address of said currently processed data file in said text memory, and
an edit condition memory for saving editing conditions being executed under said data input/edit mode; and



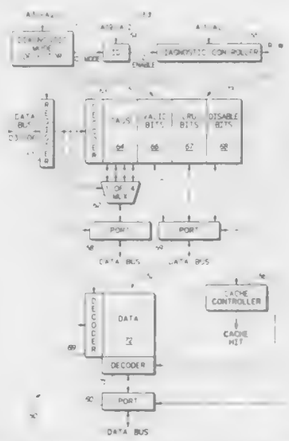
resuming means for resuming the interrupted processing in said data input/edit mode based upon said data saved in said data memory means when said data input/edit mode is reselected by said mode select means after said processing executed under said selected mode.

4,996,641

DIAGNOSTIC MODE FOR A CACHE

Yoav Talgam, Tel-Aviv, Israel; Paul A. Reed, Austin, Tex.; Elie Haddad, Austin, Tex., and James A. Klingshirn, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 15, 1988, Ser. No. 181,856
Int. Cl.[5] G06F 11/10, 11/22
U.S. Cl. 364—200 6 Claims



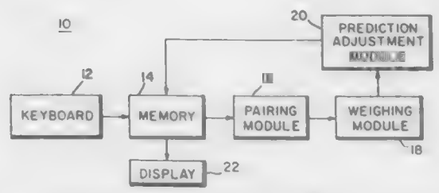
1. A cache having an address bus for receiving addresses from a processor requesting data, and a data bus for providing requested data to the processor, comprising:
a TAG memory, coupled to the address bus, having a plurality of valid bits, a plurality of disable bits, and a plurality of TAG locations for storing a plurality of TAG addresses, each TAG location having a valid bit of the plurality of valid bits and a disable bit of the plurality of disable bits associated therewith;
a data memory, coupled to the data bus, having a plurality of storage locations for storing data, wherein said stored data may be invalid and wherein said storage locations may be defective, each storage location corresponding to a TAG location of the plurality of TAG locations, a valid bit of the plurality of valid bits for indicating if data stored in the storage location is invalid, and a disable bit of the plurality of disable bits for indicating if the storage location is defective;
TAG memory decoder means for selecting a first subset of TAG locations and disable bits which correspond thereto in response to a first portion of the address provided onto the address bus;
register means. coupled to the data bus and the TAG memory decoder, for storing information received from said data bus and selecting the first subset of TAG locations; and
control-bit port means, coupled to the disable bits and the data bus, for coupling the disable bits which correspond to the first subset of TAG locations to the data bus.

4,996,642

SYSTEM AND METHOD FOR RECOMMENDING ITEMS

John B. Hey, Concurd, Mass., assignor to Neonics, Inc., Concord, Mass.

Continuation-in-part of Ser. No. 103,848, Oct. 1, 1987, Pat. No. 4,870,579. This application Sep. 25, 1989, Ser. No. 411,857
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.
Int. Cl.[5] G09B 19/00; A63F 9/18
U.S. Cl. 364—419 28 Claims



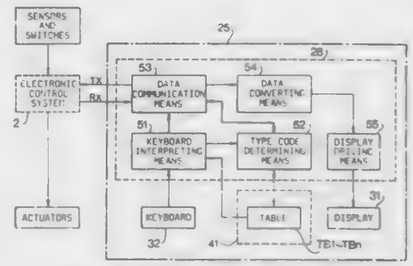
1. A method of selectively recommending, for a user selected from a group of users, items sampled by one or more users in the group but not sampled by the selected user, the recommendations being based on other items previously sampled by that user and on the availability of the items from a source, the method comprising:
defining, for each item sampled by the selected user, a scalar rating representing the reaction of the selected user to that item;
successively pairing the selected user with other users in the group for whom have been defined scalar ratings for at least some of the items sampled by the selected user to determine the difference in ratings for items sampled by both members of that pair, and generating for each pair an agreement scalar representing the overall rating agreement between the members of each successive pair;
designating a plurality of the other users as recommending users and converting, for each of the recommending users, the agreement scalar into a weighting value;
applying the weighting values to items not yet sampled by the selected user to proportionally alter the difference between a rating previously established for each item not yet sampled by the selected user and the ratings of that item by the recommending users to adjust the recommendations for the selected user to more closely anticipate the actual reaction of the user to that item; and
selecting at least one item to be presented to the selected user based on a predetermined criterion and on the availability of the item from the source.

4,996,643

DIAGNOSIS SYSTEM FOR A MOTOR VEHICLE

Masanori Sakamoto; Kunihiro Abe, and Tomoya Kobayashi, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 306,892
Claims priority, application Japan, Feb. 18, 1988, 63-036422
Int. Cl.[5] G01M 15/00; F02D 41/26; F02P 17/00
U.S. Cl. 364—424.03 5 Claims



1. In a diagnosis system for an electronic control system mounted on a motor vehicle having sensing means for detecting operating conditions of the vehicle and for producing input data, and means for storing an identification code corresponding to type of the vehicle and for storing the input data from said sensing means and for providing control data for controlling the vehicle, the diagnosis system being responsive to at least one of said data for diagnosing said at least one of said data and for providing diagnosis data, the diagnosis system comprising display means for displaying said diagnosis data, and a keyboard for inputting a code into said diagnosis system and for producing a corresponding code signal, a detachable memory cartridge detachably connected to said diagnosis system for storing a plurality of programs to diagnose said at least one data, connecting means for connecting said diagnosis system with said electronic control system and said detachable memory cartridge which have different types of data signals being transmitted in response to a demand signal, the improvement in the diagnosis system which comprises:
data converting means responsive to said diagnosis data for converting said diagnosis data and for producing a corresponding driving signal for display of the converted diagnosis data on said display means;
keyboard interpreting means responsive to the code signal corresponding to a vehicle type code inputted into said keyboard for generating a corresponding type code signal; and
type code determining means responsive to said type code signal and said identification code, respectively, for retrieving a corresponding of said programs for the diagnosing.

4,996,644

AIR-FUEL RATIO CONTROL SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

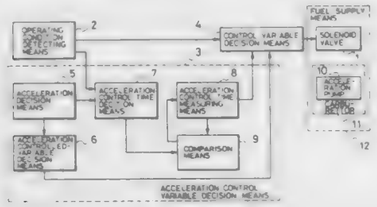
Hiroshi Fukuchi, Kyoto; Mitsuaki Ishii, and Masaaki Miyazaki, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 146,943, Jan. 22, 1988, abandoned. This application Aug. 14, 1989, Ser. No. 393,869
Claims priority, application Japan, Jan. 22, 1987, 62-12775; Jan. 22, 1987, 62-12776
Int. Cl.[5] F02M 7/00
U.S. Cl. 364—431.05 6 Claims

1. An air-fuel ratio control system for use in an internal combustion engine, said system comprising fuel supply means equipped with a carburetor incorporating an acceleration pump for supplying fuel to said internal combustion engine and at least one duty-controlled solenoid valve for supplying fuel

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to said internal combustion engine and being adapted to control the air-fuel ratio; operating condition detecting means for detecting an operating condition of said internal combustion engine; acceleration control variable decision means for detecting an acceleration condition of said internal combustion engine, and for setting a predetermined acceleration controlled-variable for said solenoid valve during different accel-



eration control times determined in accordance with the detected operating condition and the detected acceleration condition; and controlled variable decision means for determining the controlled duty of said solenoid valve according to data from said operating condition detecting means and when a controlled variable is given by said acceleration control variable decision means at the time of acceleration, according to the acceleration controlled-variable.

4,996,645

VEHICLE NAVIGATION DEVICE WITH REPRODUCTION OF A SELECTED MAP ELEMENT ACCORDING TO A PREDETERMINED REPRESENTATION STANDARD

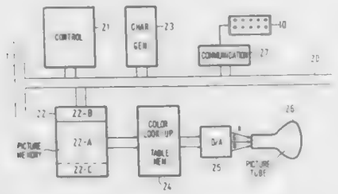
Ingrid A. C. Schneyderberg Van Der Zon, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,890

Claims priority, application Netherlands, Sep. 4, 1987, 8702087

Int. Cl.[5] G08G *1/0969*

U.S. Cl. 364—449 **18 Claims**



1. A vehicle navigation device comprising:
(a) a storage memory for storing road map data;
(b) a character generator;
(c) a reproduction unit having:
(i) a picture memory; and
(ii) a display screen for displaying maps in color and having an input coupled with the picture memory;
(d) a map element selector for selecting map elements from the road map data;
(e) a control unit, including a picture composition unit for:
(i) loading a road map selected from the road map data into the picture memory, in response to the map element selector, which selected road map represents an area around a selected map element;
(ii) loading a name, generated for the selected map element by the character generator, into a predetermined segment of the picture memory;
(iii) superposing a pattern, within at least one first shape which corresponds to a shape of the selected map element, for display according to a predetermined representation standard, on data which represents the selected map element, which predetermined representation standard is distinct from standards used for displaying other map elements; and
(iv) superposing the pattern, within at least one second shape which corresponds to a shape of either the segment or the generated name, for display according to the predetermined representation standard, on data which represents either the segment or the generated name.

4,996,646

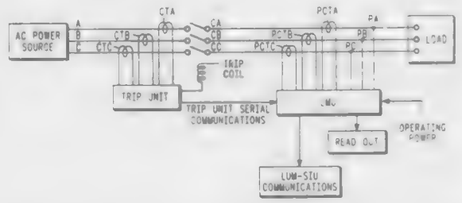
MICROPROCESSOR-CONTROLLED CIRCUIT BREAKER AND SYSTEM

Ronald L. Farrington, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Mar. 31, 1988, Ser. No. 175,992

Int. Cl.[5] G06F *15/56*; G01R *19/00*

U.S. Cl. 364—483 **17 Claims**



1. A tripping system for interrupting electric current flowing through at least one conductor from a source of electrical energy to a load, comprising:
a tripping unit having
a current sensor for measuring the current, and
processing means, responsive to the current sensor, for disconnecting the load from the source if the measured current exceeds a predetermined threshold and for transmitting data representing the status of the tripping unit,
said processing means including means for dividing data to be transmitted into a more critical data set and a less critical data set and for transmitting said more critical data set more frequently than said less critical data set;
a data path, coupled to the tripping unit, for carrying the transmitted data from the tripping unit; and
a peripheral device, coupled to the data path, for receiving the data transmitted by the tripping unit.

4,996,647

DIGITAL STATISTICAL PROCESSING FOR SIGNAL PARAMETER DETERMINATION

Ernest S. Gasser, Earlysville, Va., assignor to Sperry Marine Inc., Charlottesville, Va.

Filed Mar. 27, 1989, Ser. No. 328,843

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—484 **8 Claims**

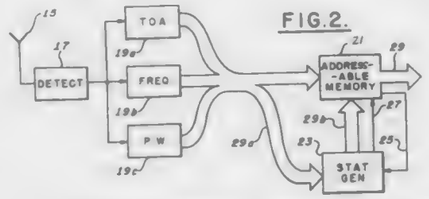


FIG.2.

1. An apparatus for determining parameters of a received signal, the parameters including time of arrival, pulse width, and frequency comprising:

means for providing parameter representative signals for said received signal;
comparing means coupled to receive said parameter representative signals of said received signal for comparing said parameter representative signals to respective upper threshold signals and respective lower threshold signals and for providing said parameter representative signals of said received signal when all said parameter representative signals of said received signal are less than said respective upper threshold signals and greater than said respective lower threshold signals; and
processing means enabled by said comparing means to receive said parameter representative signals of said received signal when all said parameter representative signals of said received signals are bounded by said respective upper and lower threshold signals for processing said parameter representative signals of said received signal with previously received parameter representative signals of said received signal to establish statistical parameters and for adjusting said upper and lower threshold signals in accordance with said statistical parameters.

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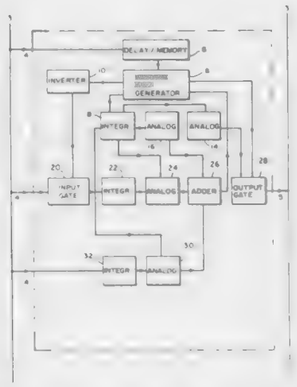
NEURAL NETWORK USING RANDOM BINARY CODE

Alexander N. Jourjine, P.O. Box 425, Cambridge, Mass. 02142

Filed Oct. 27, 1987, Ser. No. 113,636

Int. Cl.[5] G11C *27/00*; G06F *13/00*; H03K *19/08*

U.S. Cl. 364—513 **7 Claims**



1. A method of analog, parallel hardware implementation of neural networks with changeable connectivity pattern and changeable long term memory traces comprising:
arranging a plurality of processors into a two dimensional array comprising:
linear arrays of processors; pipeline buses common to one or more of said linear arrays; means for access of input signals; means for retrieval of output signals; means for access of control signals to each processor;
arranging said processors of said linear arrays to absorb and to emit energy in the form of modulated energy emissions from and into one or more pipeline buses common to at least a part of said linear arrays, binary modulation of energy emissions depending on analog characteristics of absorbed energy;
arranging advantageous delay and duration of activation of a random code generator, said binary modulation being a function of a random output from the random code generator;
using averages of the binary codes of said processors' energy emissions as short term memory traces of a neural network;
using the ratios of second correlations of pairs of codes to the products of their averages as long term memory traces of a neural network.

4,996,649

IMAGE PROCESSOR CAPABLE OF STORING CHARACTER IMAGES AND GRAPHIC IMAGES IN A MEMORY AND INCLUDING A TIMER FOR ENSURING IMAGE PROCESSING OPERATIONS ARE CARRIED OUT IN A PREDETERMINED TIME PERIOD

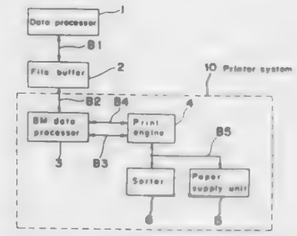
Nobuo Kamei, and Yoshikazu Ikenoue, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1988, Ser. No. 230,482

Claims priority, application Japan, Aug. 11, 1987, 62-200308; Sep. 11, 1987, 62-228875

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—518 **8 Claims**



1. An image processor which receives data indicating particular characters and/or graphic patterns and which converts the data into bit images of actual dot patterns to be outputted to an external apparatus, comprising:
memory means for storing said bit images;
imaging means for conducting an imaging operation in which the received data is converted into bit images and for writing the converted bit images into said memory means;
timer means for clocking a predetermined time period from a time when said imaging operation is started; and
control means for forcibly stopping the imaging operation of said imaging means if the imaging operation has not yet been completed at a time when said timer means reaches or exceeds said predetermined time period.

4,996,650

PRINT CONTROL SYSTEM

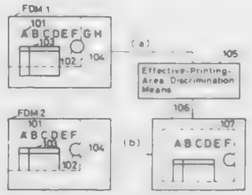
Nobumitsu Kenbo, Hadano, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Aug. 23, 1989, Ser. No. 397,198

Claims priority, application Japan, Sep. 12, 1988, 63-227687

Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—519 **12 Claims**



1. A print control system in which an object to be printed is developed in the form of dots on a full-dot memory having an area corresponding to a maximum size of printing paper to provide data in the form of dots and the data read out in a serial form from the full-dot memory are transmitted to a printing

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section, allowing the data to be printed on different size of printing paper, comprising:

means for discriminating data read out from the full-dot memory by determining whether the position of the data being printed is within an effective printing area set according to the size of the printing paper or not; and

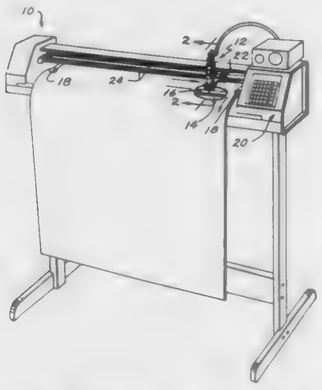
means for inhibiting the read out data from being transmitted to the printing section whose position is determined as being out of the effective printing area.

4,996,651

CUTTING INSTRUMENT IMPROVEMENT FOR X-Y PLOTTER

William L. Wells, 1208 Fleming Rd., Cordele, Ga. 31015

Filed Dec. 22, 1989, Ser. No. 454,980
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—520 **29 Claims**



1. In a computer controlled X-Y plotter including means for detachably receiving and controlling a laminated sheet including a layer of display material adhered to a layer of release material, an instrument carrying member having means for detachably receiving and holding an instrument thereon in fixed centered relation, a carriage having means for mounting said instrument carrying member thereon (1) for biased movement into an operative position wherein an instrument received and held in fixed centered relation by said instrument receiving and holding means is disposed in operative relation with a laminated sheet received and controlled by said laminated sheet receiving and controlling means and (2) for controlled movement from said operative position against the bias thereof into an inoperative position wherein an instrument received and held by said instrument receiving and holding means is disposed in spaced relation with a laminated sheet received and controlled by said laminated sheet receiving and controlling means, and means for mounting said laminated sheet receiving and controlling means and said carriage for relative movements with respect to each other such that relative movements along both an X axis and a Y axis can be effected between an instrument received and held in fixed centered relation by said instrument receiving and holding means and a laminated sheet received and controlled by said sheet receiving and controlling means with the instrument carrying member either in an operative or inoperative position, the improvement which comprises

an electric motor having a housing,

a rotor mounted in said housing for rotation about an axis fixed with respect to said housing at a relatively high speed in response to the connection of said motor with a source of electric current,

means on said motor housing for cooperating with said instrument receiving and holding means to enable the latter to hold said motor housing in fixed centered relation on said instrument carrying member for controlled movement with said instrument carrying member into said inoperative position and biased movement with said instrument carrying member into said operative position,

a cutting tool detachably fixed to said rotor for rotation therewith and having a sharp point disposed on said rotational axis when said instrument carrying member is in said operative position for relative X and Y axis movements with respect to a laminated sheet received and controlled by said laminated sheet receiving and controlling means, and

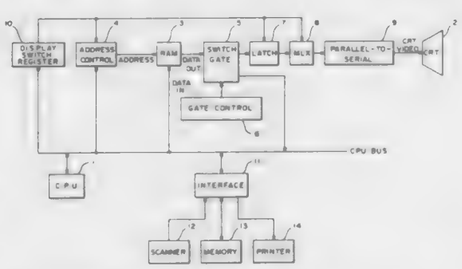
adjustable spring means acting between said motor housing and said carriage for resiliently supporting a selected portion of the weight of said electric motor and cutting tool on said carriage in such a way as to accommodate the controlled movement of said electric motor and cutting tool with said instrument carrying member into said inoperative position and (2) facilitate the biased movement of said electric motor and cutting tool with said instrument carrying member into said operative position so as to enable said cutting tool to cut the layer of display material during relative X and Y axis movements without severing the layer of release material.

4,996,652

SYSTEM FOR DISPLAYING IMAGE OF EXTENDED AREA

Toshiya Morita; Sumio Kita, and Hiroshi Kamada, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 185,144
Claims priority, application Japan, Apr. 22, 1988, 62-100862
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—521 **6 Claims**



1. A display system comprising

memory means for sequentially storing an original image to be displayed as image data at addresses corresponding to positions in horizontal line and vertical column directions,

retrieving means which serves to retrieve selectably every Mth line of said image data, M being an integer greater than or equal to 1,

converting means for sequentially and temporarily storing those of said image data retrieved in units of lines by said retrieving means, said converting means serving to convert said retrieved image data into serial data by extracting selectably every Nth one of said retrieved image data sequentially so as to generate a serial video signal for a reduced display, N being also an integer greater than or equal to 1 such that a display of an extended area of said original image can be effected, said converting means including a latch circuit for temporarily storing said image data and a multiplexer for selecting according to a display switch signal a plurality of said image data temporarily stored in said latch circuit,

a display device for receiving and displaying said serial data, and

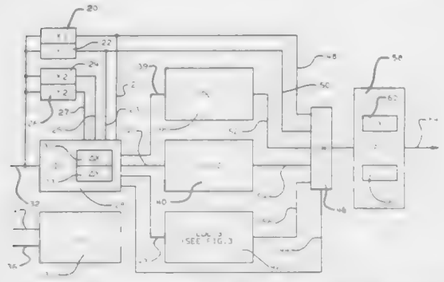
a display switch register for storing and transmitting said display switch signal to said latch circuit and to said multiplexer.

4,996,653

LINE GENERATION IN A DISPLAY SYSTEM

Nicholas D. Butler, Romsey; Adrian C. Gay, Fareham, both of United Kingdom, and Jack E. Bresenham, Chapel Hill, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,241
Claims priority, application United Kingdom, Jul. 30, 1987, 8719074
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—521 **17 Claims**



1. A line generator for determining the individual pixels to be plotted for a line to be drawn on a display device in a display system, said display device having a plurality of discrete display points ("pixels") that are drawn by being illuminated in response to electrical control signals, said line generator comprising:

line definition means for determining pixels to plot, said line definition means including:

(a) a line definition table having a plurality of discrete entries representing a set of lines, in each of which is stored a coded representation of a respective one of said set of lines, the coded representation of each individual line comprising a series of data items representing transitions between adjacent pixels to be plotted for drawing said individual line;

(b) address logic for accessing an appropriate entry in the line definition table for the coded representation of a line to be drawn in response to a line drawing order; and

means for generating electrical control signals for causing pixels to be drawn on said display device, said electrical control signals generated in response to said coded representation of said line to be drawn.

4,996,654

METHOD OF DISPLAYING ACQUIRED DATA

Barry L. Rosenow, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 22, 1988, Ser. No. 289,660
Int. Cl.[5] G06F *15/74, 15/00*
U.S. Cl. 364—521 **4 Claims**

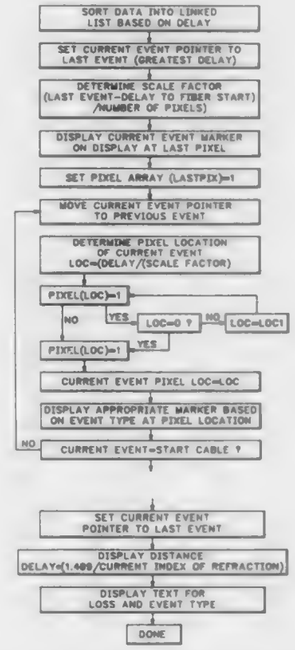
1. An improved method of displaying optical time domain reflectometry data wherein the data represents events occurring within a fiber under test with each event having a type of event component, a delay time component, and a signal loss component, the steps comprising:

determining a total time delay between a start event and and end event for calculating a scale factor for a full screen base line display, the scale factor being a function of the total time delay and length of the base line display;

determining a location on the full screen base line display for a first event using the delay time component for the first event and the calculated scale factor;

determining a location on the full screen base line display for a second event using the delay time component for the second event and the calculated scale factor;

offsetting the second event location from the first event location if the locations coincide on the display; and



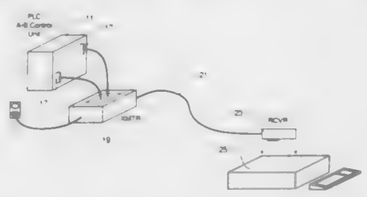
displaying at the determined event locations on the full screen base line display a graphical symbol representative of the type of event component for each event.

4,996,655

REAL TIME MONITORING OF REMOTE SIGNALS IN AN INDUSTRIAL ENVIRONMENT

Gary L. Chadwick, and Joe F. Johnson, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 16, 1989, Ser. No. 312,595
Int. Cl.[5] G05B *23/00*
U.S. Cl. 364—550 **24 Claims**



1. An apparatus for sampling signal timing states of equipment which has a signal output of operational states, and the signal output occurs in a substantially real time relationship to the operational states, comprising:

(a) a monitor interface for monitoring the signal output of the operational states and providing signals representative of the operational states;

(b) the monitor being electrically isolated from signals on the

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equipment which are being monitored and requiring no extra strobes or setup data from the equipment;

(c) a data latch for receiving the signals representative of the operational states in a parallel format and transmitting a latched output in response to a latch enable signal;

(d) a serial transmitter receiving signals from the data latch and providing corresponding signals in a serial format;

(e) timing and control circuitry for controlling a timing sequence of the latch enable signal and the receipt by the serial transmitter of the signals;

(f) a receiver circuit connected to a computer processing unit and having a data register which is addressable by the computer processing unit, wherein said receiver circuit receives the signals in the serial format and provides signals representative of said signal output of the operational states in a format which may be addressed by the computer processing unit; and

(g) means to clock the receipt by the serial transmitter of the signals and for providing signals of said signal output of the operational states in the computer addressable format, the means to clock being independent of a clock speed of the computer processing unit.

4,996,656

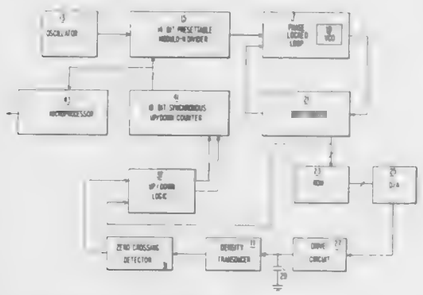
DENSITOMETER WITH REMOTELY DISPOSED CONTROL ELECTRONICS

Geoffrey S. M. Hedrick, Malvern, Pa., assignor to Innovative Solutions & Support, Incorporated, Malvern, Pa.

Filed Sep. 2, 1988, Ser. No. 241,017

Int. Cl.[5] G01N *9/00*

U.S. Cl. 364—558 9 Claims



9. A densitometer, comprising:

a vibrating cylinder type density transducer, designed for immersion in a liquid, having input means for receiving an excitation signal and output means for generating a pick-up signal responsive to the excitation signal and to the density of the liquid; and

excitation and measurement electronics coupled to the density transducer, comprising:

an oscillator for generating a pulse train output;

a modulo-N divider having two inputs and one output, one said input receiving the pulse train output of the oscillator and the other said input receiving a signal from an up/down counter;

a phase locked loop including a voltage controlled oscillator, having an output coupled to a read-only memory counter and an input coupled to the output of the modulo-N divider, the read-only memory counter having one input and two outputs;

a read-only memory having an input coupled to an output of the read-only memory counter;

a digital-to-analog converter having an input coupled to the output of the read-only memory;

a drive circuit having an input coupled to the output of the digital-to-analog converter, and having an output coupled to the input of the density transducer, the drive circuit being arranged to provide an excitation signal to the density transducer;

a zero crossing detector having an input coupled to the output of the density transducer and arranged to receive said pick-up signal from the density transducer, and having an output coupled to one input of an up/down logic circuit, a second input of the up/down logic circuit being coupled to one of the outputs of the read-only memory counter, the up/down circuit further having two outputs; and

an up/down counter having two inputs coupled to the outputs of the up/down logic circuit and having two outputs, one of which outputs is coupled to the input of the modulo-N divider and the other of which outputs is coupled to an input of a programmed microprocessor;

the excitation and measurement electronics serving to provide an excitation signal to the density transducer and to measure the pick-up signal of the density transducer so as to maintain the density transducer in resonance, and to generate a signal corresponding to the frequency of resonance of the density transducer, which signal frequency is indicative of the density of the liquid;

whereby the densitometer is capable of accurately measuring fluid density despite wide physical separation between the density transducer and the excitation and measurement electronics.

4,996,657

STEERING ANGLE DETECTING SYSTEM FOR AUTOMOTIVE VEHICLES

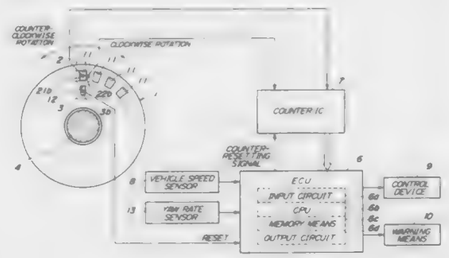
Shuji Shiraishi; Takashi Nishihara; Hironobu Kiryu, and Naoki Omomo, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 324,234

Claims priority, application Japan, Mar. 18, 1988, 63-36116[U]; Mar. 18, 1988, 63-36117[U]; Mar. 18, 1988, 63-36118[U]

Int. Cl.[5] G06F *15/50, 11/00*

U.S. Cl. 364—559 12 Claims



1. A steering angle detecting system for a vehicle having a steering member, comprising:

angular pulse generating means responsive to rotation of said steering member for generating angular pulses corresponding in number to a steering angle by which said steering member has been operated;

reference pulse generating means for generating a predetermined reference pulse at a predetermined angle of said steering member;

a counter for counting said angular pulses from said angular pulse generating means and generating a counted value output representing said steering angle; and

abnormality determining means connected with said reference pulse generating means and said counter output for determining that said steering angle detecting system is abnormal when the counted value generated by said counter is not within a predetermined value range when said predetermined reference pulse is generated.

4,996,658

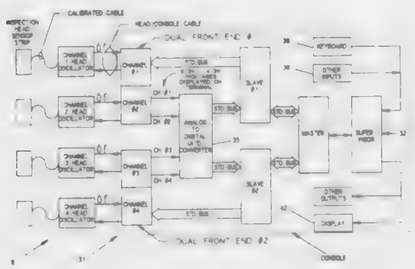
SELF-CALIBRATING GLASS CONTAINER INSPECTION MACHINE

Russ J. Baker, Horseheads, N.Y., assignor to Emhart Industries, Inc., Towson, Md.

Filed Aug. 31, 1989, Ser. No. 401,105

Int. Cl.[5] G01R *35/00;* G06G *15/46;* B07C *5/00*

U.S. Cl. 364—571.04 3 Claims



1. A glass container inspection machine comprising

sensing means for providing a voltage signal representative of the thickness of the wall of a glass container,

means for presenting a glass container to said sensing means,

means for storing at least two voltage signals provided by said sensing means representative of the thickness of the wall of the glass container at at least two selected locations,

means for inputting the actual thickness of the wall of the sensed container corresponding to each of said at least two selected locations, and

calibration means for equating said at least two voltage signals with said inputted corresponding actual thicknesses and for generating a curve representing actual thickness as a function of sensed voltage.

4,996,659

METHOD OF DIAGNOSING INTEGRATED LOGIC CIRCUIT

Noboru Yamaguchi, Higashiyamato; Hideo Nakamura, Tokyo; Yoshimune Hagiwara; Tsukasa Sato, both of Hachioji, and Haruo Koizumi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 12, 1987, Ser. No. 84,153

Claims priority, application Japan, Aug. 20, 1986, 61-192884; Sep. 19, 1986, 61-219169

Int. Cl.[5] G01R *31/28*

U.S. Cl. 364—579 6 Claims

2. A method of diagnosing an integrated logic circuit, comprising the steps of:

(a) detecting a train of logical values of an output signal appearing at a predetermined measuring point within said integrated logic circuit by the use of a contactless probing device;

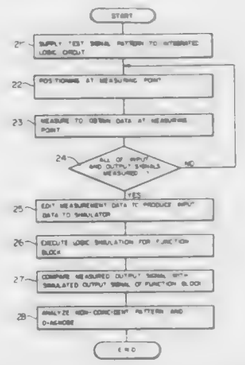
(b) detecting a faulty signal by comparing a train of logical values of an expected output signal, at said predetermined measuring point, derived by logic simulation of said integrated logic circuit, with said detected train of logical values of said output signal;

(c) finding an input signal supplied to a function block delivering said faulty signal, by referring to a file of logic connection information;

(d) positioning a measuring point at a location of said found input signal;

(e) detecting a train of logical values of a signal at said location by use of said contactless probing device;

(f) detecting another faulty signal by comparing a train of logical values of an expected signal, at said location, derived by logic simulation, with said detected train of logical values of said signal;



(g) finding a function block whose output signal is faulty and whose input signal is not faulty by repeating steps (c)–(f); and

(h) determining that said detected function block is faulty.

4,996,660

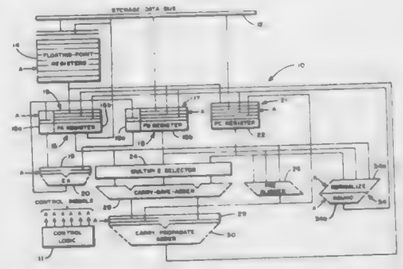
SELECTION OF DIVISOR MULTIPLIERS IN A FLOATING POINT DIVIDE CIRCUIT

Thomas J. Beacom, Pine Island, and Donald L. Freerksen, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,268

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—748 4 Claims



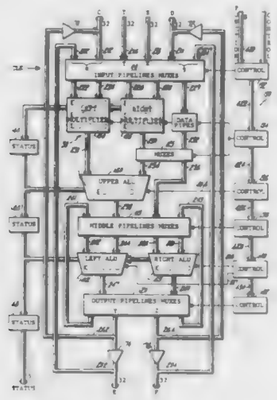
1. In a floating point divide circuit of the type using a 2-bit, non-restoring division method, the improvement comprising a multiplier selection circuit having means for selecting a divisor multiple as a function of the most significant bits of the divisor and dividend, said multiplier selection circuit further comprising a semiconductor circuit having a selectable matrix of signals representative of possible divisor multipliers, none of said divisor multipliers being equal to three-fourths the value of the dividend divided by the divisor for all values of dividend and divisor within the range of most significant bits of interest.

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4,996,661
SINGLE CHIP COMPLEX FLOATING POINT NUMERIC PROCESSOR

Roger G. Cox; Michael W. Yeager, both of Colorado Springs, and Lance L. Flake, Boulder, all of Colo., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 5, 1988, Ser. No. 253,826
Int. Cl.[5] G06F *7/38, 15/40, 15/00*
U.S. Cl. 364—748 15 Claims



1. An integrated circuit for processing floating point numbers and having a pipelined data structure in which data passes sequentially in a series of pipeline cycles having a latency of a predetermined number of circuit clock cycles through a set of processing stages in one of a set of predetermined controllably selected data paths and is manipulated under sequentially decoded control from a set of control registers containing stored control data and corresponding to said set of processing stages and comprising;

an input section including a first set of registers and multiplexers for connecting at least two of at least four data input/output means to input ports of two multipliers that are connected in parallel to said first set of registers and multiplexers and further including controlled storage means for storing data for at least one clock cycle, controlled bypass means for bypassing a storage means and controlled multiplexing means for directing data in at least two paths, so that data for a predetermined arithmetic operation may enter said integrated circuit in at least two configurations that are transformed within said first set of registers and multiplexers to a predetermined standard configuration,

a first ALU connected to output ports of both of said two multipliers for operating an output data therefrom,

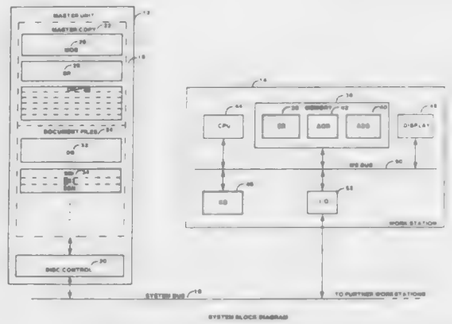
a second set of registers and multiplexers connected to said first ALU, to an alternate data path from said first set of registers and multiplexers that avoids both of said two multipliers, and to two feedback data paths from a third set of registers and multiplexers, and

two ALUs connected in parallel between said second and third sets of registers and multiplexers, each of said two ALUs being connected on a data path from a portion of said second set of registers and multiplexers through said each of said two ALUs, a portion of said third set of registers and multiplexers and back to said second set of registers and multiplexers such that said each of said two ALUs has an accumulator mode, employing a register from one of said second and third sets of registers and multiplexers, to accumulate output data from a predetermined one of said two multipliers.

4,996,662
METHOD FOR GENERATING DOCUMENT USING TABLES STORING POINTERS AND INDEXES

James L. Cooper, and Marc D. San Soucie, both of Tyngsboro, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Oct. 3, 1983, Ser. No. 538,644
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—900 9 Claims



1. In a document processing system including processing means and storage means a method for generating a document in the processing means and storing the document in the storage means comprising the steps of:

generating and storing a document table for storing pointers by means of which the processing means locates a plurality of indexes including pointers;

generating adaptive indexing block means locatable by the pointers in the document table for storing the indexes;

receiving information to be incorporated into the document in the processing means;

generating an information item block means for the received information;

copying the received information into the generated information item block means;

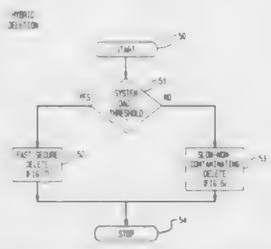
placing a pointer by means of which the processing means locates the generated information item block means in an index of the plurality of indexes according to the function of the received information in the document; and

storing the information item block means and the adaptive indexing block means.

4,996,663
METHODS AND APPARATUS FOR DECONTAMINATING HASH TABLES

Richard M. Nemes, Brooklyn, N.Y., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 2, 1988, Ser. No. 151,638
Int. Cl.[5] G06F *12/00*
U.S. Cl. 364—900 6 Claims



1. An information storage and retrieval system using hashing techniques to provide rapid access to the records in the storage space of said system and utilizing a linear probing technique to store records with the same hash address, said system comprising

load determining means for determining the load on said system

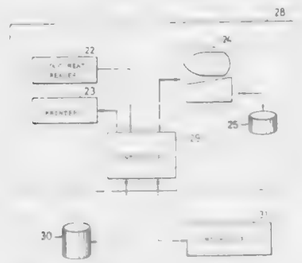
a first record deletion means, automatically responsive to said load determining means indicating heavy loads on said system, for marking records to be deleted from said system as deleted but leaving said deleted records in place to provide a link to other records in said system, and

a second record deletion means, automatically responsive to said load determining means indicating periods of lighter load on said system, for deleting records by moving another record with the same hash address, if any, into the portions of said storage space used for said deleted record, thereby to remove previously marked ones of said deleted records left in place during said heavy loads on said system.

4,996,664
FILE SYSTEM

Takutoshi Fujiwara, Tokyo, and Motofumi Konishi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 734,276, May 3, 1985, abandoned. This application Sep. 6, 1988, Ser. No. 240,466
Claims priority, application Japan, Sep. 22, 1983, 58-174120
Int. Cl.[5] G06F *15/40*
U.S. Cl. 364—900 17 Claims



1. A file system comprising:

first storage means for storing a plurality of retrievable image information in advance;

second storage means for storing a plurality of retrievable image information, said second storage means being of a different storing type from said first storage means;

input means for inputting retrieval information associated with desired image information; and

retrieval means for retrieving image information from said first or second storage means on the basis of common retrieval information from said input means,

wherein said retrieval means automatically selects one of said first and second storage means on the basis of the common retrieval information in order to output desired image information.

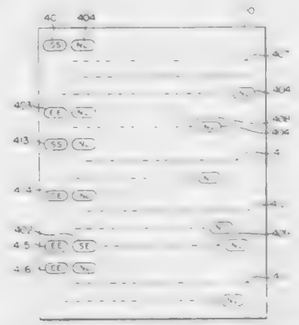
4,996,665
METHOD AND DEVICE FOR EDITING A DOCUMENT HAVING A PLURALITY OF HEADINGS

Takaaki Nomura, Yokohama, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,653
Claims priority, application Japan, Aug. 5, 1987, 62-194470
Int. Cl.[5] G06F *7/28, 7/10*
U.S. Cl. 364—900 4 Claims

1. A document editing device for editing a document having a plurality of headings, said document being divided into a plurality of elemental documents of a hierarchical structure, each elemental document including a parent elemental document in a first hierarchical level and child elemental documents included in said parent elemental document, said child elemental documents being in a second hierarchical level which is lower than said first hierarchical level, each of the elemental documents having a heading with a heading number, the device comprising:

a first memory for storing text data with control characters including first control characters, second control characters, and new line characters, said first control characters indicating transition of the first hierarchical level of said parent elemental document changes to said second hierarchical level of said child elemental document by a position of the first control character, and said second control characters indicating that a parent elemental document immediately ahead of said second control character ends at the position of the second control character, the new line characters each indicating that a new line in said parent or child elemental document is to be started from said new line character, said control characters being located at positions in the text data corresponding to the headings;



a second memory for storing management information including (i) a sequence of characters of each heading and (ii) data indicative of the heading number corresponding to each of the hierarchical levels of said elemental documents; and,

a processor including:

a first means comprising a means for reading the text data with control characters from said first memory and a means for detecting each control character included within the read text data with control characters, and

a second means which is initiated in response to the detection of each control character by the means for detecting for determining the heading number of the heading corresponding to each control character and for replacing each control character with the corresponding heading including the corresponding heading number and the character sequence by referring to the management information stored in the second memory,

such that the processor outputs the text data with the corresponding heading to an output device.

4,996,666
CONTENT-ADDRESSABLE MEMORY SYSTEM CAPABLE OF FULLY PARALLEL MAGNITUDE COMPARISONS

Jerome F. Duluk, Jr., 304 Emerson St., Palo Alto, Calif. 94306

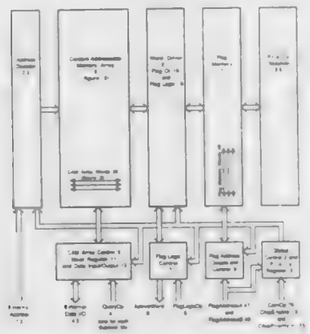
Filed Aug. 12, 1988, Ser. No. 231,717
Int. Cl.[5] G11C *13/00, 15/00*
U.S. Cl. 365—49 25 Claims

1. A content-addresable memory including means for storing a plurality of words, each of said words comprising a plurality of data subfields, each of said data subfields being divided into a plurality of data bits,

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means for providing an input field comprising a plurality of input subfields matching some of said data subfields, and each said input subfield divided into input bits so as to have a one-to-one bit correspondence to the said data bits in said data subfields in said words,

query means for simultaneously comparing said plurality of input subfields to all said words, with simultaneous sub-



field comparisons such that each said data subfield is compared to its corresponding said input subfield, and generation of a one bit query result for each said word which is true when all said data subfields within said word which are compared to one of said input subfields compare favorably to each corresponding said input subfield,

flag memory means for storing a flag bit equal to said query result for each of said words.

4,996,667

ELECTRON BEAM ADDRESSIBLE RECORDING DEVICE UTILIZING FERROELECTRIC RECORDING MATERIAL

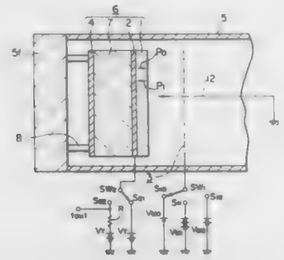
Kanji Murano, Tokyo, and Senri Miyaoka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 187,295, Apr. 28, 1988, abandoned. This application Feb. 5, 1990, Ser. No. 480,362

Claims priority, application Japan, Apr. 29, 1987, 62-105766

Int. Cl.[5] G11C *11/22, 7/00*

U.S. Cl. 365—117 **3 Claims**



1. An electron beam addressable writing and reading device for storing binary information utilizing ferroelectric material comprising: a recording layer with one surface and another surface and formed of ferroelectric material which has secondary electron emissivity δ greater than 1, an electrode disposed on said one surface of said recording layer to which is selectively applied first or second electrical potentials which are used respectively for writing and reading said binary information, an electron gun generating an electron beam which is scanned on said another surface of said recording layer which is opposite to said one surface, means for selectively controlling the electrical potential of said another surface of said recording layer to third, fourth or fifth electrical potentials wherein said third and fourth electrical potentials are respectively higher and lower than said fifth electrical potential so that a binary one is written in said ferroelectric material when said third electrical potential is applied and a binary zero is written in said ferroelectric material when said fourth electrical potential is applied and it is scanned with said electron beam, and said third and fourth electrical potentials are selectively applied to selectively write said binary information when said first electrical potential is applied and said binary information is read when said fifth electrical potential and said second electrial potential are selectively applied.

4,996,668

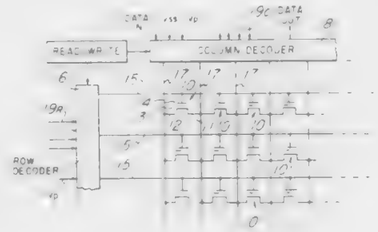
ERASABLE PROGRAMMABLE MEMORY

James L. Paterson, Richardson, and Michael C. Smayling, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 230,280, Aug. 9, 1988, Pat. No. 4,912,676. This application Feb. 20, 1990, Ser. No. 482,432

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—185 **8 Claims**



1. A nonvolatile memory cell, comprising:

a first field insulating region on a first portion of the surface of said substrate;

a first doped region in said substrate beneath said first field insulating regions, said first doped region providing a bit line connectable to other cells in a column;

a second field insulating region in a second portion of said substrate, said second field insulating region being separated from said first insulating region by a channel region;

a second doped region under said second field insulating region;

a gate insulator on said channel region;

a floating gate extending over said first field insulating region and onto said gate insulator;

an interlevel insulating layer on said floating gate; and

a control gate on said interlevel insulator, said control gate being connectable to other cells in a row.

4,996,669

ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH NAND MEMORY CELL STRUCTURE

Tetsuo Endoh, Yokohama; Riichiro Shirota, Kawasaki; Masaki Momodomi, Yokohama; Tomoharu Tanaka, Yokohama; Fujio Masuoka, Yokohama, and Shigeyoshi Watanabe, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 7, 1990, Ser. No. 489,967

Claims priority, application Japan, Mar. 8, 1989, 1-55472; Aug. 31, 1989, 1-225425

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—185 **20 Claims**

1. A non-volatile semiconductor device comprising:

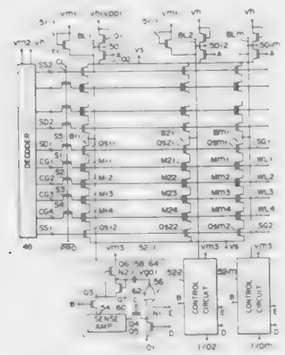
a semiconductive substrate;

parallel bit lines formed above said substrate;

parallel word lines which are provided above said substrate and intersect with said bit lines to form crossing points;

memory cells provided at the crossing points, said memory cells comprising NAND cell blocks each of which has a series-circuit of a preselected number of memory cell transistors having drain layers, carrier storage layers and control gates respectively, said word lines being connected to said control gates;

voltage controller means connected to said bit lines and word lines, for writing data into a selected memory cell transistor of a certain NAND cell block by applying specific voltages of selected potential levels to said bit



lines and said word lines in such a manner that charge carriers are moved by tunneling from the drain layer to the charge storage layer of said selected memory cell transistor; and

said voltage controller means providing a backbiasing condition for a parasitic transistor which is defined between said selected memory cell transistor and a neighboring memory cell transistor contained in a NAND cell block positioned adjacent to said certain NAND cell block, whereby leak current is decreased which tends to flow in the parasitic transistor and lower than the "H" level voltage.

4,996,670

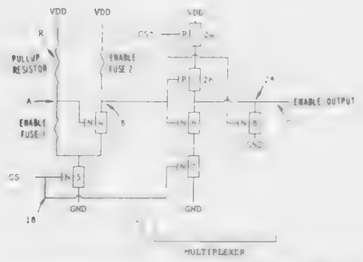
ZERO STANDBY POWER, RADIATION HARDENED, MEMORY REDUNDANCY CIRCUIT

Michael K. Ciraula; Christopher M. Durham, both of Manassas, and Derwin L. Jallice, Reston, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1989, Ser. No. 414,889

Int. Cl.[5] G11C *7/00, 11/40, 11/407*

U.S. Cl. 365—200 **3 Claims**



1. A radiation hardened redundancy circuit for a memory having low power dissipation characteristics, comprising:

a first N channel FET device having its drain connected to a first node and its source connected to ground potential and its gate connected to a chip select signal;

a first enabling fuse connected between said first node and a second node;

a pullup impedance device connected between said second node and a positive potential;

a second N channel FET device having its drain connected to a third node, its source connected to said first node and its gate connected to said second node;

a second enabling fuse connected between said third node and said positive potential;

a multiplexer circuit having a data input connected to said third node, a control input connected to said chip select signal and having an output node coupled to a redundant storage element in a memory array, for selectively substituting said redundant storage element for a failing storage element in said memory array;

whereby a redundancy circuit is provided having no floating potential nodes and a reduced power dissipation characteristic.

4,996,671

SEMICONDUCTOR MEMORY DEVICE

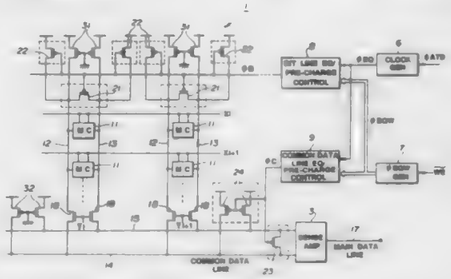
Hiroyuki Suzuki, and Shigeo Araki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 481,057

Claims priority, application Japan, Feb. 18, 1989, 64-39039; Feb. 21, 1989, 64-39410

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—203 **16 Claims**



5. A memory device comprising

a semiconductor substrate having a major surface,

a plurality of memory cells arranged on said major surface in a matrix configuration and composed of flipflop circuits for data storage,

a plurality of pairs of bit lines formed on said major surface and coupled to each column of said memory cells for handling complementary read-out data or write data,

a plurality of word lines formed on the major surface and provided for each row of each said memory cell for selecting the rows of said memory cells,

a plurality of pairs of common data lines formed on said major surface and connected in common to a specified number of pairs of bit lines for handling complementary readout data or writing data,

a sense amplifier connected to each pair of common data lines on said major surface and adapted for amplifying the voltage across each pair of the common data lines,

precharging means formed on said major surface and operating transiently prior to selection of said memory cell by said word line for precharging an associated pair of said common data,

precharging control means formed on said major surface for setting the operating time interval of said precharging means,

signal generating means formed on said major surface and responsive to address signals supplied for selection of said bit lines to generate a signal actuating said precharging control means, and

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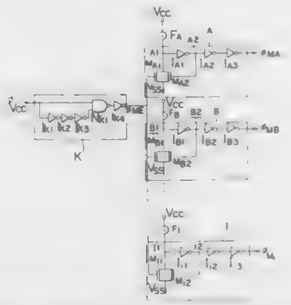
second signal generating means formed on said major surface and adapted for detecting the transition from the writing to readout to actuate said precharging control means at the time said transition is detected.

4,996,672

SELECTING CIRCUIT FOR A MEMORY OPERATING MODE

Moon G. Kim, Sihung-dong, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 28, 1988, Ser. No. 290,990
Claims priority, application Rep. of Korea, Apr. 23, 1988, [redacted]
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—225.7 2 Claims



1. A selecting circuit for a memory operating mode comprising: a mode enable pulse generator;

a plurality of mode selecting clock generators arranged to receive a mode enable pulse from said mode enable pulse generator; and a plurality of fuses connected, one by one, to each of the mode selecting clock generators, each of said mode selecting clock generators comprising three inverters and two nodes in which a first of said nodes is connected to the corresponding fuse and to a first inverter of said three inverters and to a pair of transistors, the second of said nodes being connected to the second transistor of said pair of transistors, and the first of said transistors of said transistor pair being connected to receive a mode enable pulse.

4,996,673

UNDERWATER CONTROL SYSTEM

John Brooke, Halifax, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines & Resources, Ottawa, Canada

Filed Jun. 18, 1990, Ser. No. 539,892
Claims priority, application Canada, Jul. 18, 1989, 605989
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—131 11 Claims

1. An underwater control system for controlling the movement in a body of water of a submersible vehicle relative to a central unit, comprising;

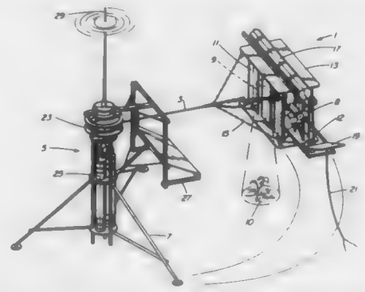
the said central unit which includes anchoring means thereon for fixedly placing the said central unit on the floor of the said body of water,

a metering drum having a predetermined circumference provided on the said central unit,

a tether to be wound and unwound about the said drum and having one end attached thereto,

the said submersible vehicle connected to the other end of the said tether for travelling in the said body of water in a substantially spiral path about the said central unit as the said tether winds or unwinds,

the said vehicle comprising propelling means for propelling the said submersible vehicle in the said body of water and a plurality of vertical wings to generate an outward force onto the said vehicle to maintain the said tether taut so



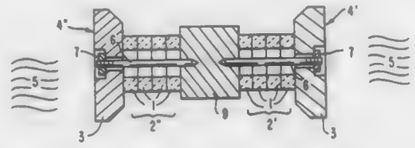
that the said vehicle travels in the said substantially spiral path.

4,996,674

DOUBLE PISTON ACOUSTIC TRANSDUCER WITH SELECTABLE DIRECTIVITY

Stephen C. Thompson, Euclid, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 745,184, Jun. 14, 1985, abandoned.
This application Dec. 21, 1987, Ser. No. 135,477
Int. Cl.[5] H04R *17/00, 17/10*
U.S. Cl. 367—158 11 Claims



1. A double mass loaded transducer, comprising:

first and second head masses in contact with an acoustic medium;

first and second independently drivable active transducer elements respectively abutting said first and second head masses; and

center mass means, abutting said first and second transducer elements, for transferring vibration between said first and second transducer elements, and allowing vibration by one of said first or second head masses to be enhanced or nullified by the vibration of the other of said first or second head masses.

4,996,675

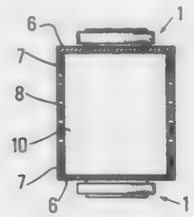
SIGNAL SENSOR INSENSITIVE TO STATIC PRESSURE VARIATIONS

Claude Beauducel, Henonville, France, assignor to Institut Francais du Petrole, Rueil-Malmaison Cedex, France

Filed Dec. 22, 1989, Ser. No. 454,973
Claims priority, application France, Dec. 23, 1988, 88 17205
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—162 13 Claims

1. Signal sensor, wherein said insensitive to variations of static pressure prevailing in a medium in which the signal sensor is placed, the signal sensor comprising a rigid case open to said medium, at least one plate having a central flexible portion, a sensitive element in the form of a disk fixed against a first face of said plate, and filtering means for shielding the opposite face of each plate from the dynamic variations of the pressure of the medium, wherein said filtering means comprise

a volume of substantially incompressible absorbent material contained in the rigid case and adapted for transmitting the



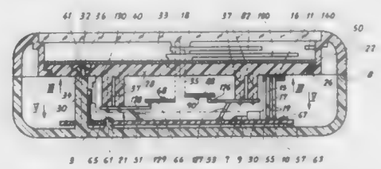
variations of the static pressure of the medium to said opposite face.

4,996,676

MINIATURE ELECTRIC CLOCK

Pierre-André Noirjean, Courfaivre, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches, Grenchen, Switzerland

Filed May 25, 1989, Ser. No. 356,362
Claims priority, application Switzerland, May 26, 1988, 01997/88
Int. Cl.[5] G04B *23/02;* G04C *21/16*
U.S. Cl. 368—73 6 Claims



1. A miniature electric clock including a base plate surmounted by a dial, time displaying hands, a back cover-caseband, a crystal and fastening means for uniting the base plate with the back cover-caseband, the base plate bearing a motor provided with a winding and a going train driven by said motor, said going train driving in turn the time displaying hands, the back cover-caseband having a printed circuit mounted thereon including electrical and electronical elements necessary for controlling the motor and first contact tracks, said winding including terminals partially formed by first spring blades, said first spring blades being brought into contact with said first tracks when the back cover-caseband is united with the base plate.

4,996,677

MULTICHANNEL MAGNETIC AND OPTICAL LINEAR HEAD

Seishi Naito, and Masaaki Hayashi, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Mar. 14, 1988, Ser. No. 167,841
Claims priority, application Japan, Mar. 13, 1987, 62-36820[U]
Int. Cl.[5] G11B *5/29, 5/127*
U.S. Cl. 369—14 13 Claims

1. A multichannel type magnetic head comprising plural magnetic cores arranged in a row which are wound with primary coils and secondary coils respectively, at least one cancellation core which is wound with a primary coil for cancellation and with a secondary coil for cancellation, and a member which integrally connects said plural magnetic cores and said at least one cancellation core, wherein detection portions of said plural magnetic cores are arranged opposed in a row with respect to an object of detection and wherein said at least one cancellation core is disposed differently from said



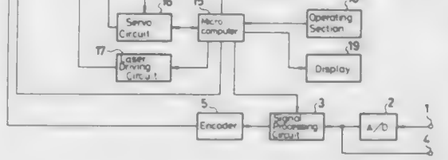
plural magnetic cores so as to be unresponsive to said object of detection.

4,996,678

APPARATUS FOR REWRITING AN OPTICAL DISC WHILE UPDATING ITS TABLE OF CONTENTS AND WITHOUT LEAVING GAPS

Yasuaki Maeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 2, 1988, Ser. No. 189,113
Claims priority, application Japan, May 25, 1987, 62-127369
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 8 Claims



1. An apparatus for recording and/or reproducing an optical disc, said apparatus comprising:

an optical disc on which information signals are optically recorded and reproduced, said optical signals are rewritable so that information signals can be recorded and re-recorded thereon;

an optical pickup mounted in such a manner as to be freely movable in the radial direction of the optical disc;

operating means whereby a user can command recording and reproducing of information signals; and

control means connected to said operating means for controlling said optical pickup so that said optical pickup records information signals on the optical disc and reproduces information signals recorded on the optical disc in response to commands received from said operating means;

the optical disc having a signal recording region including a first recording region in which first information signals are recorded and a second recording region in which second information signals based on said first information signals are recorded, wherein said control means controls the operation of said optical pickup so that, when a first information signal is re-recorded in said first recording

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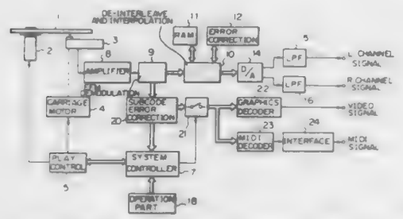
region by said optical pickup from a beginning point to a final recording terminating point that depends on the length of said first information signal as re-recorded, information written in said second recording region corresponding to the final recording terminating point is rewritten, whereby said final recording terminating point serves as a reference position for beginning further recording or re-recording in said first recording region.

4,996,679

SUBCODE INFORMATION AND BLOCK IDENTIFICATION SYSTEM FOR A DISC PLAYER

Junichi Yoshio, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 14, 1989, Ser. No. 379,647
Claims priority, application Japan, Jan. 30, 1989, 1-21000
Int. Cl.[5] G11B *27/10*
U.S. Cl. 369—33 **3 Claims**



1. A disc playing apparatus for playing a disc on which a digital information signal divided into blocks is recorded as a subcode together with a block identification signal for identifying the blocks, in addition to a code information signal, comprising:

a reading means for reading said coded information signal and said subcode from said disc;

a decoding means for decoding the subcode and producing an information signal;

a repeating means for repeating the subcode read out by said reading means to said decoding means in response to a repeat command; and

a control means for controlling said reading means and said repeating means, wherein said control means generates, in response to a command, a jump command for moving an information reading point of said reading means across M (M is a natural number) tracks in a direction retracing a reading direction every time a predetermined time period corresponding to the relative position of the information reading point in a radial direction of the disc elapses; detects, during a period between issuing of the jump command and issuing of the next jump command, an N-block period, in which N (N is a natural number) blocks of the subcode are read out, by means of a block identification signal obtained from an output signal of the reading means; and supplies a repeating command to the repeating means only during the N-block period.

4,996,680

AUTOMATIC CHANGING APPARATUS FOR A RECORDING MEDIUM

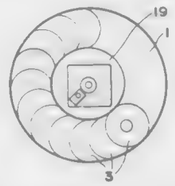
Marcel J. H. Staar, Brussels, Belgium, assignor to Starr Development Company, S.A., Belgium

Filed May 23, 1989, Ser. No. 355,656
Claims priority, application Belgium, Jun. 3, 1988, 08800627
Int. Cl.[5] G11B *17/24*
U.S. Cl. 369—37 **20 Claims**

1. A changing apparatus for a recording medium comprising:

an annular storage magazine having top and bottom sides and having a plurality of storage slots for storing recording media formed therein, the storage slots being sloped with respect to the top and bottom sides of the magazine and overlapping one another in the circumferential direction of the magazine;

an information transfer device for reading information from or writing information onto a recording medium; and



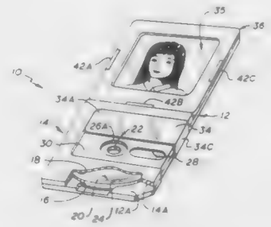
a loading device for transferring a recording medium between one of said storage slots in said magazine and a location where said information transfer device can read from or write onto the recording medium.

4,996,681

INTEGRAL CARD FOR PROTECTIVELY ENCLOSING AN OPTICAL DISK AND A VISUAL INFORMATION BEARING AREA

Vincent L. Cocco, Wakefield, and Donald L. Grimes, Milford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1989, Ser. No. 341,909
Int. Cl.[5] G11B *3/70, 33/02*
U.S. Cl. 369—273 **4 Claims**



1. An integral data storage disk card comprising:

a substantially planar thin rectangular base member;

a substantially planar thin rectangular or square cover member coextensively overlying one end portion of a major surface of said base member in fixed connection thereto, said overlying portions of said base member and said cover member cooperatively defining a substantially flat thin cavity therebetween;

an optical data storage disk disposed within said cavity for rotation therein, said disk having a central hub aperture and a surrounding data storage portion, said cover or base member including a hub access aperture therethrough overlying said data disk hub aperture and an elongated data access aperture overlying a radially extending part of said data storage portion;

a shutter member disposed for sliding movement with respect to said cover and base members between a first nonoperative position in which said cover overlies said hub access aperture and said data access aperture and a second operative position in which said cover unblocks said hub access aperture and said data access aperture; and

a visually discernible information bearing layer in machine or human readable form disposed in overlying fixed relation to the other end portion of said major surface of said base member wherein said other end portion of said major surface of said base member includes an integral frame coextensive with the periphery thereof for framing said

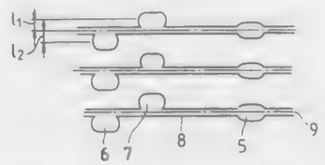
information bearing layer, said frame being pivotally connected with respect to one edge of said other end portion of said major surface of said base member for movement between an open position in which said frame is spaced apart from said other end portion of said major surface of said base member to accommodate the unobstructed placement of said information bearing layer in overlying relation to said other end portion of said major surface of said base member and a closed position in which said frame overlies the periphery of said information bearing layer so as to hold said information bearing layer in fixed overlying position with respect to said other end portion of said major surface of said base member.

4,996,682

OPTICAL INFORMATION MEDIUM HAVING PAIRED WOBBLE PITTS WITH CONTINUOUS GROOVE THEREBETWEEN

Hitoshi Yanagihara, Kamakura, and Nobuhiro Tokushuku, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,387
Claims priority, application Japan, Nov. 7, 1987, 62-280300
Int. Cl.[5] G11B *7/24, 7/007*
U.S. Cl. 369—275.4 **14 Claims**



1. In an optical information medium having a clock pit disposed on the center line of an imaginary track and at least a pair of wobble pits disposed on both sides of said imaginary track center line, wherein an optical head traces over the imaginary track center line to record or reproduce information, the improvement characterized in that a continuous groove is formed between said paired wobble pits along said imaginary track center line in a certain area of the optical information medium so that said continuous groove contacts each of said paired wobble pits when said paired wobble pits are properly disposed with respect to said imaginary track center line in a normal condition.

4,996,683

OPTICAL TRANSMISSION DEVICE

Tsuyoshi Yamashita, Nagoya; Goro Kobayashi, Okazaki; Hisanori Nakamura; Youichi Shibata, both of Toyota, and Toshihiro Mori, Takatsuki, all of Japan

Filed Oct. 12, 1989, Ser. No. 420,373
Claims priority, application Japan, Oct. 13, 1988, 63-258139; Dec. 12, 1988, 63-313153
Int. Cl.[5] H04B *10/02*
U.S. Cl. 370—4 **11 Claims**

1. An optical transmission device, comprising:

a receiver for receiving an electrical signal propagated over a half duplex transmission line;

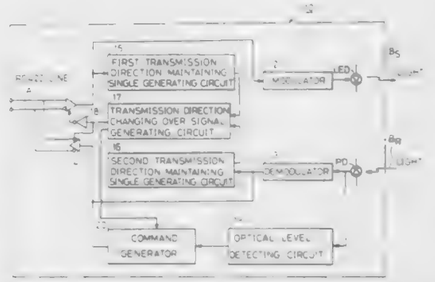
an optical transmitting circuit for modulating the electrical signal received by said receiver, converting the thus modulated electrical signal into an optical signal, and transmitting the optical signal into an optical full duplex transmission line;

an optical signal receiving circuit for receiving an optical signal propagated over said full duplex transmission line, converting the received optical signal into an electrical signal, and demodulating the electrical signal;

a driver for transmitting the electrical signal given from said optical signal receiving circuit into said half duplex transmission line;

a first transmission direction maintaining signal generating circuit for detecting a start bit of a data block of the electric signal received by said receiver and generating a maintaining signal to maintain the same transmission direction for a predetermined period of time during which at least the data block can be transmitted after such detection of the start bit;

a second transmission direction maintaining signal generating circuit for detecting a start bit of a data block of the



electric signal given from said optical signal receiving circuit and generating a maintaining signal to maintain the same transmission direction for a predetermined period of time during which at least the data block can be transmitted after such detection of the start bit; and

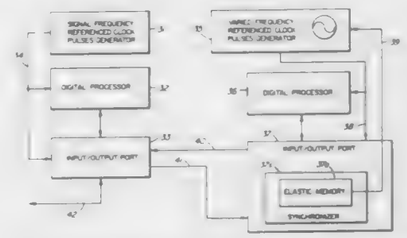
a transmission direction changing over signal generating circuit responsive to the maintaining signals given from said first or second transmission direction maintaining signal generating circuit for transmitting to said driver and said receiver a changeover controlling signal to control passage or stopping of signals by said driver and said receiver to change over the transmission direction.

4,996,684

ELECTRONIC SYSTEMS AND EFFECTIVE REDUCTION OF ELECTROMAGNETIC INTERFERENCE ENERGY PROPAGATION FROM ELECTRONIC SYSTEMS

Robert S. Morley, Ottawa; Roland A. Smith, Nepean, and Paul D. Sayre, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 6, 1989, Ser. No. 376,105
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—100.1 **2 Claims**



1. An electronic telephone system, for selectively coupling telephone station sets and the like, in communication one with another as directed by a central processing means including a digital processor for directing call progresses between ports of a time division multiplex switching network wherein one of said ports is a digital port for receiving communications signals from a digital signals communication path, the electronic telephone system comprising:

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clock signal source means for generating clock signal pulses at a predetermined frequency of occurrence being less than a maximum frequency of occurrence;

dither means, connected to the clock signal source means for causing the frequency of occurrence to be varied about the predetermined frequency of occurrence such that an average of the frequency of occurrence corresponds to the predetermined frequency of occurrence;

sequence signal generating means for generating channel and frame timing signals for regulating switching and transmission operations of the time division multiplex switching network, in response to the clock signal pulses, whereby a radiated electromagnetic energy byproduct, associated with the normal operation of the electronic telephone system, is dispersed over a wider frequency spectrum than would otherwise be so; and

a synchronizing means being connected between the time division multiplex switching network and the digital port, the synchronizing means being responsive to the clock signal pulses from the clock signal source and to timing information associated with the received communication signals, for transferring information contained therein to the time division multiplex switching network, the synchronizing means comprising:

an elastic memory of a predetermined memory capacity, the elastic memory including;

a write port for receiving the information content of the received communications signals from the digital port, in synchronism with said timing information;

a read port for transmitting the information content having been received at the write port, to the time division multiplex switching network, in synchronism with said clock signal pulses, and

means for generating an overflow signal in an event of more than a maximum fraction of the predetermined memory capacity becoming occupied by the information content from the digital port; and

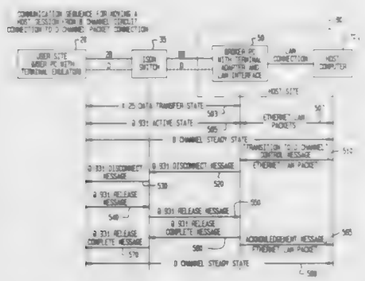
wherein the dither means is operable for causing the frequency of occurrence to be momentarily increased, in response to an occurrence of the overflow signal, to reduce the fraction of memory capacity being occupied.

4,996,685

TECHNIQUE FOR DYNAMICALLY CHANGING AN ISDN CONNECTION DURING A HOST SESSION

Thomas R. Farese, Spring Lake, and Kenneth E. Ferrere, Howell, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 10, 1989, Ser. No. 335,542
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—58.1 **16 Claims**



1. Apparatus for dynamically changing an access path having a plurality of different communication performance attributes between a first connection having one set of said attributes and a second connection having a different set of said attributes during an ongoing host session carried over said access path in order to provide the particular one of said first and second connections that is most suited to the current communication needs of said session, said apparatus comprising:

means for connection to one end of said access path and to a host computer for instructing a communication system that provides said access path to change a connection provided over said access path between said first and second connections in response to a command received from the host computer during execution of said host session, said instructing means comprising:

means for establishing an interface to the host computer to begin said host session and for maintaining the interface substantially throughout the remainder of the host session; and

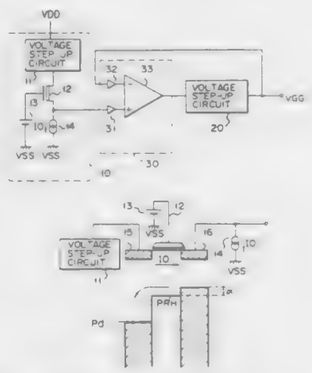
means, responsive to said interface and for connection to said one end of the access path, for receiving a command over said interface from said host computer requesting a change in the connection provided over the access path between said first and second connections and for supplying the command over said access path in a pre-defined form as an instruction to said communication system so as to effectuate said requested change.

4,996,686

CHARGE TRANSFER DEVICE WITH RESET VOLTAGE GENERATING CIRCUIT

Shin-ichi Imai, and Tatsuya Yoshie, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 20, 1988, Ser. No. 196,532
Claims priority, application Japan, May 21, 1987, 62-124611; Feb. 12, 1988, 63-30418
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] H01L *29/78;* G11C *19/28*
U.S. Cl. 377—60 **2 Claims**



1. A charge transfer device comprising:

a floating diffusion region formed on a semiconductor substrate, signal charged being transferred to said floating diffusion region from a charge transfer section;

a drain region for discharging unnecessary charges when receiving a reset voltage;

a reset gate electrode for controlling the discharge of the stored charges of said floating diffusion region into said drain region, in accordance with a reset pulse;

voltage generating means for generating a voltage having a potential which is lower by "α" volts than a potential formed under said reset gate electrode when the stored charges of said floating diffusion region are discharged into said drain region, wherein "α" is a value equal to a difference between the potential of said drain region and the potential formed under said reset gate electrode when the stored charges of said floating diffusion region are discharged into said drain region;

voltage set-up means for stepping up a predetermined voltage and for supplying the stepped-up voltage as said reset voltage to said drain region; and

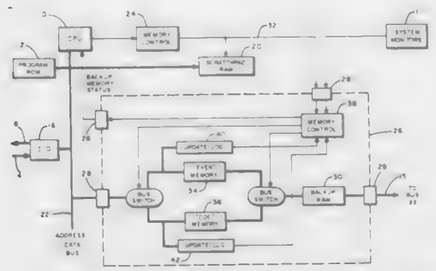
comparison/control means for generating an error voltage equal to a difference between the output voltage of said voltage generating means and said stepped-up voltage, and for controlling the voltage step-up operation by said step-up means in accordance with said error voltage.

4,996,687

FAULT RECOVERY MECHANISM, TRANSPARENT TO DIGITAL SYSTEM FUNCTION

Richard F. Hess, Glendale; Kurt A. Liebel, and Larry J. Yount, both of Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 11, 1988, Ser. No. 256,060
Int. Cl.[5] G06F *11/14, 11/16*
U.S. Cl. 371—10.1 **7 Claims**



1. In a digital computing system of the type including a central processing unit having an address/data bus coupled thereto, a main RAM, means coupled to said address/data bus for storing digital words comprising computational frames at addressable locations therein, main memory control means for effecting the writing of digital words comprising said computational frames into said main RAM at or from addresses originating at said central processing unit, apparatus for maintaining the integrity of the words comprising said computational frames stored in said main RAM in spite of system upsets due to external transient noise conditions impacting on said system, comprising:

(a) supplemental memory control means;

(b) first and second supplemental RAMs;

(c) first switching means controlled by said supplemental memory control means for alternatively coupling said first and second supplemental RAMs to said address/data bus on successive ones of said computational frames, such that the same digital words comprising a given frame being written in said main RAM are simultaneously copied into one or the other of said first and second supplemental RAMs;

(d) a backup RAM coupled to said address/data bus;

(e) second switching means controlled by said supplemental memory control means for coupling said backup RAM to said first and second supplemental RAMs such that during the time words are being copied into said first supplemental RAM, selected words stored in said second supplemental RAM during an immediately preceding computational frame are transferred into said backup RAM and during the time words are being entered into said second supplemental RAM, selected words stored in said first supplemental RAM during the immediately preceding computational frame are transferred into said backup memory means;

(f) means coupled to said supplemental memory control means for sensing system upsets due to transient noise; and

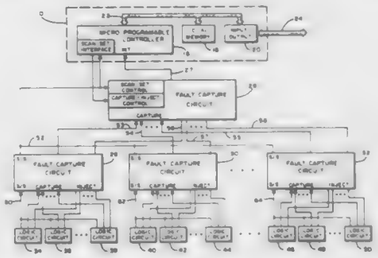
(g) means controlled by said supplemental memory control means following the sensing of a system upset for transferring the contents of said backup RAM to said main RAM.

4,996,688

FAULT CAPTURE/FAULT INJECTION SYSTEM

Larry L. Byers, Apple Valley; Kwisook Tsang, Shoreview; James H. Scheuneman, St. Paul, and Penny Svenkeson, Forest Lake, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 19, 1988, Ser. No. 246,512
Int. Cl.[5] G01R *31/28;* G06F *11/00*
U.S. Cl. 371—16.5 **4 Claims**



1. In a digital electronic system, apparatus for detecting and isolating faulty operation comprising, in combination:

(a) fault indication means associated with a predetermined grouping of logic circuits for producing a fault signal indicative of a fault or error condition in said grouping of logic circuits;

(b) fault capture means coupled to a plurality of fault indication means for providing a group fault output signal indicative that at least one of said fault indication means has produced said fault signal, said fault capture means including:

(i) first register means for capturing said fault signals,

(ii) error latch means set upon a first fault signal being captured in said first register means for producing said group fault output signal,

(iii) logic means responsive to said grouping fault output signal for inhibiting capture of fault signals subsequent to said first fault signal,

(iv) second register means for storing mask data, said mask data being the cumulative fault signals propagated to said first register means,

(v) means for selectively inhibiting inputs to said first register means conditional upon the state of said second register means, and

(vi) third register means connected to receive the contents of said first register means,

(c) programmable controller means including

(i) interrupt means coupled to receive said group fault signal,

(ii) capture control means for

(a) transferring the contents of said first register to said third register, and

(b) resetting said error latch means,

(iii) memory means for logging cumulative fault events occurring in said logic circuits, and

(iv) data communication means for transferring data from said third register to said memory means.

4,996,689

METHOD OF GENERATING TESTS FOR A COMBINATIONAL LOGIC CIRCUIT

Muhammad A. Samad, Sunnyvale, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 1, 1989, Ser. No. 305,449
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—22.2 **9 Claims**

1. A method of generating tests for a combinational logic circuit having a plurality of logic circuits of one type and a plurality of logic circuits of another type, said combinational logic circuit having a plurality of inputs which are supplied to

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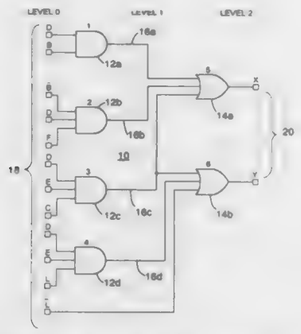
said plurality of logic circuits of one type as input thereto, said plurality of logic circuits of one type producing a plurality of first outputs which are supplied to said plurality of logic circuits of another type as inputs thereto, said plurality of logic circuits of another type producing a plurality of outputs which are the outputs of said combinational logic circuit, said method comprising the steps of:

(a) selecting one of said inputs to said combinational logic circuits and setting said one input to a logic state;

(b) determining a list of the logic circuits of one type affected by the input selected by step (a);

(c) choosing one of the logic circuits of one type from the list of step (b);

(d) setting other inputs to the logic circuit of one type chosen in step (c), to a logic state such that only the logic state of the one input of step (a) is propagated therethrough;



(e) determining a list of the logic circuits of another type affected by the first output of the logic circuit of one type from step (c);

(f) choosing one of the logic circuits of another type from the list of step (e);

(g) setting the other inputs to the logic circuit of another type chosen, to a logic state such that only the logic state of the first output of step (e) is propagated therethrough;

(h) choosing another logic circuit of another type from the list of step (e), if step (g) results in conflicting logic states, and returning to step (g);

(i) choosing another logic circuit of one type from the list of step (b), if all of the logic circuits of the another type on the list of step (e) results in conflicting logic states, and returning to step (d); and

(j) choosing another input to said combinational logic circuit and setting said another input to a logic state and returning to step (b).

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WRITE OPERATION WITH GATING CAPABILITY

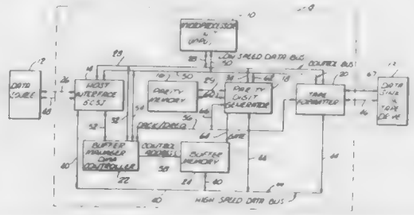
Glen A. George, Pasadena, and Douglas L. Whiting, S. Pasadena, both of Calif., assignors to STAC Electronics, Carlsbad, Calif.

Filed Aug. 26, 1988, Ser. No. 237,394
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.1 **18 Claims**

1. A method for generating parity digits of digital information (data) in a digital communication system, said communication system for transferring a plurality of intervals of said data from an originating data source to a data sink, each said data interval comprising one or more blocks of said data and each said block comprising one or more bytes of said data, said communication system including a data transfer bus for transferring said data intervals to and from said data source to and from a temporary storage means for holding said data intervals for a limited period, said temporary memory means located between said data source and said data sink, and said data transfer bus for transferring said data to and from said temporary storage means to and from said data sink, said method comprising the steps of:

transferring one or more of said data intervals from said data source to said temporary storage means over said data transfer bus and storing said one or more data intervals in said temporary storage means,

transferring one of said data intervals from said temporary storage means to said data sink over said data transfer bus,



during said transfer of said data interval to said data sink, calculating said parity digits associated with said data interval and storing said parity digits for further processing,

gating said data transfer bus to halt any further transfers of said data intervals between said temporary storage means and said data sink, and

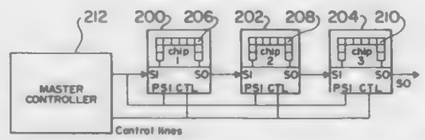
during said gating, sending said stored parity digits over said data transfer bus to said data sink.

4,996,691

INTEGRATED CIRCUIT TESTING METHOD AND APPARATUS AND INTEGRATED CIRCUIT DEVICES FOR USE THEREWITH

Philip S. Wilcox, Nepean; Benoit Nadeau-Dostie, Aylmer, and Vinod K. Agarwal, Brossard, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 21, 1988, Ser. No. 247,258
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—68.1 **11 Claims**



5. A system for testing at least two integrated circuits each having a plurality of memory devices connectable in series between an input port and an output port of the circuit, said system comprising:

(i) means interconnecting the output port of one integrated circuit to the input port of the other integrated circuit,

(ii) means for effecting interconnection of said plurality of memory devices in series between an input port and an output port;

(iii) means for initializing each series by passing a binary vector therethrough;

(iv) means for clocking each said circuit at least once in its normal operating mode;

(v) means for extracting the binary vector resulting from such clocking from each of said series;

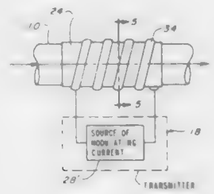
(vi) means for comparing the binary vector extracted from one of said integrated circuits with the binary vector extracted from the other of said integrated circuits and indicating any differences.

4,996,692

LASER COMMUNICATION SYSTEM WITH WIDE BAND MAGNETROSTRICTIVE MODULATION

Lawrence T. Kabacoff, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1989, Ser. No. 408,337
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—26 **12 Claims**



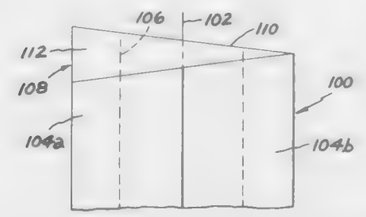
1. In combination with apparatus for modulation of laser beam radiation conducted along an optical path extending through a transmitting medium having an outer periphery, means for applying a magnetic field to the medium along a portion of said optical path and magnetostrictive means covering the outer periphery of the medium along said portion of the optical path for dimensionally changing the medium, the improvement residing in signal encoding means operatively connected to the magnetic field applying means for controllably modulating the magnetic field within a modulation bandwidth defined between limiting frequencies of a preselected band, said magnetostrictive means comprising a sheathing having a thickness that is an inverse function of said modulation bandwidth enabling bandwidth enlargement by thickness reduction of the magnetostrictive means.

4,996,693

INPUT/OUTPUT PORTS FOR A LASING MEDIUM

Allen W. Case, Jr., Amsterdam, and Carl M. Penney, Saratoga Springs, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1989, Ser. No. 376,096
Int. Cl.[5] H01S *3/06*
U.S. Cl. 372—66 **20 Claims**



1. A port for a solid state lasing medium, the medium having a longitudinal axis, said port comprising:

an end surface integral said medium;

a first port surface integral said end surface, said first port surface being optically planar and substantially perpendicular to a first plane normal to said longitudinal axis;

whereby each ray of a beam of electromagnetic radiation impinges on said first port surface at substantially equal angles with respect to said first port surface and whereby said port provides more symmetric pumping and cooling geometries thereby improving thermal and mechanical symmetry of the medium.

4,996,694

METHOD AND APPARATUS FOR MELTING IRON AND STEEL SCRAP

Sven Santén, Hofors, Sweden, and Jerome Feinman, Grand Junction, Colo., assignors to SKF Plasma Technologies AB, Hofors, Sweden

Continuation of Ser. No. 183,578, Apr. 19, 1988, abandoned.
This application May 12, 1989, Ser. No. 352,646
Int. Cl.[5] H05B *7/00*
U.S. Cl. 373—22 **10 Claims**



4. Apparatus for melting iron and steel scrap, comprising a shaft furnace having a melting zone in the lower part thereof and a preheating zone in the upper part thereof, means for producing a hot reducing gas, means for introducing the hot reducing gas into the melting zone, and means for introducing oxygen containing gas into the preheating zone for combustion of the reducing gas to preheat the scrap, characterized by openings for introducing oxygen containing gas at a plurality of positions along the flow path of the reducing gas in the preheating zone, means to measure the scrap temperature and the oxygen potential of the reducing gas at said positions, and means for balancing the introduction of the oxygen containing gas to maintain the gas composition in said preheating zone in a reducing condition relative to the metal scrap at a temperature above 1000° C.

4,996,695

ARRANGEMENT FOR ACCESSING AND TESTING TELECOMMUNICATION CIRCUITS

David G. Dack, Kirkcaldy; Eric P. Huckett, Linlithgow, both of Scotland, and David W. Macintosh, Inverkeithing, United Kingdom, assignors to Hewlett-Packard, Pinewood, Calif.

Continuation of Ser. No. 418,925, Oct. 6, 1989, abandoned, which is a continuation of Ser. No. 303,002, Jan. 26, 1989, abandoned, which is a continuation of Ser. No. 177,812, Apr. 8, 1988, abandoned, which is a continuation of Ser. No. 928,225, Oct. 9, 1986, abandoned. This application Apr. 2, 1990, Ser. No. 503,129
Claims priority, application United Kingdom, Feb. 15, 1985, 8504024
Int. Cl.[5] H04M *3/24*; H01J *3/14*
U.S. Cl. 375—10 **8 Claims**

1. Apparatus for selectively accessing and testing a digital telecommunications circuit comprising:

(a) an access unit (10) through which digital telecommunications data is arranged to pass via input and output ports (13,14) of the access unit; and,

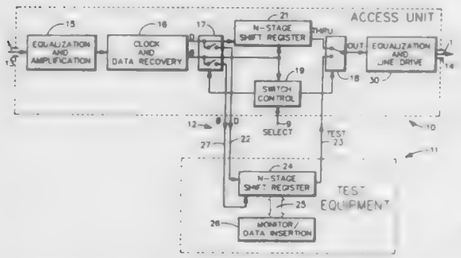
(b) test equipment (11) for coupling to the access unit via a serial communication means (12), the test equipment having a test circuit path including first N-stage shift register means (24) through which the digital telecommunications data is arranged to be self-synchronously clocked when the test equipment is coupled to the access means;

said access unit (10) comprising a circuit portion including

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second N-stage shift register means (21) and switch means (17,18,19) for selectively setting a route of the digital telecommunications data between the input and output ports (13,14) of the access unit, the switch means (17,18,19) being settable into (i) a first state in which the digital telecommunications data is routed directly from the input port through the second N-stage shift register means (21) and to the output port, and (ii) a second state in which, when the test equipment is coupled to the access unit, the digital telecommunications data is routed from the input port and via the connection means (12) through the test circuit path of the test equipment (11) to the output port, and also through the second N-stage shift register means (21);

the access unit (10) further comprising a clock extraction circuit (16) for generating, from the digital telecommunications data, a clock signal in synchronism with the digital telecommunications data, the clock signal being fed to the



second N-stage shift register means (21) of the access unit to clock the digital telecommunications data therethrough, and, when the test equipment is coupled to the access unit and the switch means is set in said second state, the clock signal also being fed to the first N-stage shift register means (24) to clock the digital telecommunications data therethrough;

the test equipment (11) further comprising testing means coupled to the first N-stage shift register means (24) for monitoring and altering digital telecommunications data routed therethrough when the test equipment is coupled to the access unit and the switch means is set in said second state;

the first and second N-stage shift register means (21,24) each imposing a delay of substantially equal duration on digital telecommunications data routed therethrough so that no portion of the digital telecommunications data is lost or repeated when the setting of the switch means is changed between the first and second states.

4,996,696

WAVEFORM ENCODER

David J. McCabe, Winchester, England, assignor to Shaye Communications Limited, Winchester, England

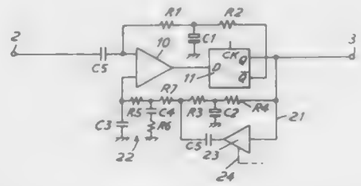
Filed Mar. 1, 1989, Ser. No. 317,665

Claims priority, application United Kingdom, Mar. 1, 1988, [redacted]

Int. Cl.[5] H04B *14/06*

U.S. Cl. 375—30 18 Claims

1. A waveform encoder apparatus in which the encoder comprises a comparator for comparing an analogue input signal to be decoded with an estimate signal representative of an estimate of the input signal. means for digitising the output of said comparator to provide a digital output signal representative of the analogue input signal and variable gain feedback means connected to the output of said digitising means for generating from the digital output signal said estimate signal, said feedback means including digital gain control means for adjusting the gain of said feedback means in dependence upon certain predetermined characteristics of said digital output signal; wherein two of said feedback means are provided from the output of the digitising means to the input of the comparator means: a first feedback means comprising an AC coupled circuit operable to pass the frequencies of the signal being



encoded; and a second feedback means comprising a low pass filter circuit operable to pass the necessary dc bias levels, but passing signals without any significant effect thereon in the range of the frequencies of the signal being encoded.

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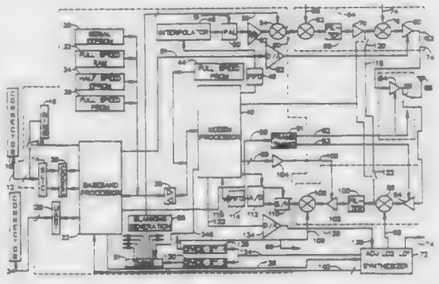
DEGLITCHING MEANS FOR DIGITAL COMMUNICATION SYSTEMS

David N. Critchlow; Graham M. Avis; Sandra J. K. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givataiim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to International Mobile Machines Corporation, King of Prussia, Pa.

Division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448.
This application Oct. 12, 1988, Ser. No. 256,416

Int. Cl.[5] H04B *1/10*

U.S. Cl. 375—104 1 Claim



1. A deglitching system for removal of glitch spikes occurring during the transition periods from digital signals to analog signals comprising a timing system, a detecting means for detecting the transition periods in order to control said timing system, mixing means coupled to the output of a D/A converter to mix a blanking signal from said timing system with the analog signal received from said D/A converter during said transition periods, whereby the output of the mixer is returned to an intermediate reference level.

4,996,698

CLOCK SIGNAL RESYNCHRONIZING APPARATUS

Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 23, 1989, Ser. No. 425,637

Int. Cl.[5] H04L *7/033, 7/10*

U.S. Cl. 375—118 8 Claims

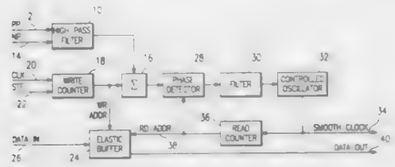
1. Apparatus for smoothing elastic buffer read/write phase hits of multiple bits comprising, in combination:

elastic buffer first means, including data, write address and read address inputs and a data output, for storing data input written to an address provided until output in response to a provided read address;

summation second means, including first and second input means and output means, for summing the inputs to a combined output;

write counter third means, connected to said first and second means, for supplying write address outputs to said first and second means;

phase detector fourth means, connected to said output means of said second means and including feedback means and



apparatus clock output means, for providing a smoothed clock output means in response to differences between signals received via said feedback means and from said summation second means; and

read counter fifth means, connected between said apparatus clock output means of said fourth means and both the read input of said elastic buffer first means and the feedback input of said fourth means, for supplying a continuous count of the clock signal appearing at the apparatus clock output the fifth means and the fourth means providing the function of a phase locked loop.

4,996,699

DIGITALLY SETTABLE FREQUENCY DIVIDER, ESPECIALLY FOR A FREQUENCY SYNTHESIZER

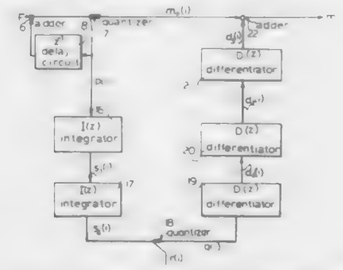
Georg Rudolph, Eningen, Fed. Rep. of Germany, assignor to Wandel & Goltermann GmbH & Co., Eningen, Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 378,387

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1988, 3826006

Int. Cl.[5] G06F *7/60*

U.S. Cl. 377—49 15 Claims



1. In a frequency divider method for generating a frequency f_T from a given frequency f_O with a frequency divider settable only to whole-number divisor factors m and wherein on the average for a whole or fractional frequency division ratio is realized by a new setting of m to correspond to a frequency-setting information datum, a control circuit being provided which includes a phase accumulator applied with the fractional component of the frequency-setting datum and clocked by the divider output signal f_T or a signal synchronous therewith and for each frequency-division cycle a new value m is supplied, the sequence of frequency-divider factors m being calculated in real time or read from a memory when the sequence is periodic and the terms of the sequence each have two components of which a first component is constituted of the sum of the whole parts of the frequency-setting information F and is a transfer from the phase accumulator, a second of said components being calculated from the stored contents of the phase accumulator, the improvement which comprises calculating the second component, in order to reduce the spectral part of the phase perturbations falling in the vicinity of f_T in consideration of the more remote spectral parts and an increase in the absolute value of the phase perturbations to greater than $2(n-1)$ periods $1/f_O$ measured peak-to-peak, with the following steps:

integrating the contents of the phase accumulator n times, where $n=2, 3, \ldots$, in digital integrators with the input x and the output y defined by the recursion formula $y(i)=y(i-1)+x(i)$ to provide an integrated result;

cutting off said integrated result to yield an integer value; and

differentiating the integer value $n+1$ times in digital differentiators with the input x and the output y defined by the formula $y(i)=x(i)-x(i-1)$, the integrators, the differentiators and the phase accumulator being operated synchronously with the same computing cycle.

4,996,700

IRRADIATION EQUIPMENT FOR APPLYING SYNCHROTRON RADIATION

Yoshimi Yamashita, Sagamihara, and Kei Horiuchi, Zama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1989, Ser. No. 441,616

Claims priority, application Japan, Dec. 8, 1988, 63-310422

Int. Cl.[5] G21K *1/00, 1/04;* H05H *7/00*

U.S. Cl. 378—145 24 Claims



1. Irradiation equipment for applying synchrotron radiation, one end of the irradiation equipment is coupled to a synchrotron, a work chamber is disposed at another end of the irradiation equipment and a synchrotron radiation beam is transmitted through the irradiation equipment, comprising:

a first multistage axial flow turbine, comprising a plurality of stators and rotors arranged alternately in an axial direction, each of said stators having vanes and a beam transmission hole, each of said rotors having vanes and gaps between adjacent vanes, said beam transmission holes are aligned in a beam direction of the synchrotron radiation beam, and said gaps of adjacent rotors are aligned in said beam direction.

4,996,701

METHOD AND DEVICE FOR SLIT RADIOGRAPHY

Ronald J. Geluk, Nootdorp, Netherlands, assignor to B. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Continuation of Ser. No. 63,176, Jun. 17, 1987. This application Oct. 5, 1989, Ser. No. 417,567

Claims priority, application Netherlands, Jun. 26, 1986, [redacted]

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

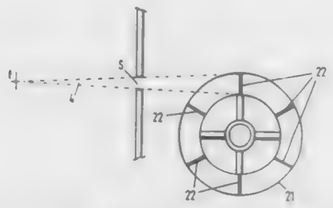
Int. Cl.[5] G21K *5/10*

U.S. Cl. 378—146 40 Claims

1. Method for slit radiography using an X-ray source and a slit diaphragm placed in front of the X-ray source to form a fan-shaped X-ray radiation beam for scanning a body to be

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investigated to form an X-ray shadow image on an X-ray detector placed behind the body, which fan-shaped X-ray radiation beam is formed by number of sectors situated next to each other, and in which transmitted X-ray radiation is controlled instantaneously for each sector during the scanning movement by means of controllable beam sector attenuators



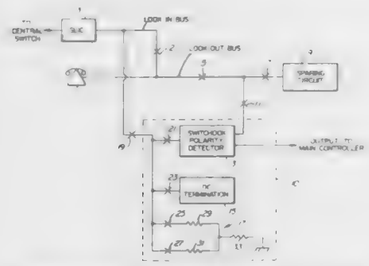
acting in conjunction with the slit diaphragm, characterized by cyclically modulating said X-ray radiation beam in a predetermined manner for all the sectors simultaneously and individually controlling said controllable beam sector attenuators to control cyclically X-ray beam radiation in each sector in synchronization with the predetermined cyclic modulation of X-ray radiation beam.

4,996,702

APPARATUS FOR TESTING SPARE LINE CIRCUITS IN A COMMUNICATION SYSTEM

Thomas Gray, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Mar. 23, 1990, Ser. No. 498,102
Claims priority, application Canada, Jun. 28, 1989, 604279
Int. Cl.[5] H04M *1/24*
U.S. Cl. 379—1 **14 Claims**



11. A communication system comprised of line circuits, at least one sparing line circuit, means for substitution of the sparing line circuit in place of a faulty one of the line circuits, and automatic means for testing the operability of the sparing line circuit prior to said substitution.

4,996,703

REMOTE SUPERVISORY MONITORING AND CONTROL APPARATUS CONNECTED TO MONITORED EQUIPMENT

William F. Gray, Ste. 204, 203 Eldon St., Herdon, Va. 22074

Continuation-in-part of Ser. No. 853,893, Apr. 21, 1986, Pat. No. 4,748,654. This application Jan. 28, 1988, Ser. No. 149,671
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] H04M *11/00, 11/04*
U.S. Cl. 379—40 **3 Claims**

1. A monitoring and control apparatus including an apparatus connected to equipment components at a work site, said apparatus comprising:

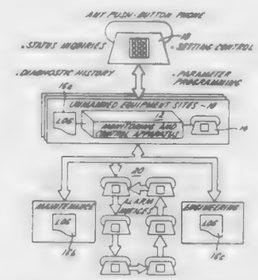
monitoring means connected to said components for sensing parameters representing equipment conditions at monitored points in said components and for producing data signals representing the sensed parameters;

programmable means including a microprocessor means having input and output ports;

said programmable means having a memory means storing programs which operate said microprocessor means to receive at said input ports and store status signals from said monitoring means, to process control commands derived from a first source when in an operator-controlled mode and from a second source when in an automatic mode, and to produce at said output ports control signals of different form to control the monitored equipment in response to control commands from one of the sources, a first form of control signal producing a first type of equipment response and a second form of control signal producing a second type of equipment response to control equipment conditions;

telephone interface means for transmitting over a public telephone network a predetermined sequence of dual-tone multi-frequency (DTMF) signals, for transmitting synthesized voice signals to an operator of an off-hook telephone, and for receiving operator-generated DTMF signals representing the first source of control commands to control equipment conditions;

voice synthesizer means operated by said microprocessor means to produce and transmit over the telephone network via said interface means oral announcements of component conditions based upon the status signals;



said programmable means also having memory means storing programs which provide the second source of control commands when in the automatic mode and:

(a) recognize the source of control commands as operator-generated DTMF signals if the apparatus is in operator-controlled mode or as signals produced by preprogrammed operation of said programmable means responsive to a particular condition in said components if the apparatus is in automatic mode; and

(b) define the response to the control commands represented by the form of the control signals supplied to at least one of the output ports of said microprocessor means;

an equipment component including a motor having a rotor connected to a parameter-adjusting element;

switch means connected to said at least one of said output ports for receiving the control signals and to said motor for energizing said motor;

wherein a program stored in said memory means defines a response to a control command in the form of control signals which actuate said switch to energize said motor to shift said parameter-adjusting element to a desired state and thereby incrementally adjust the parameter; and

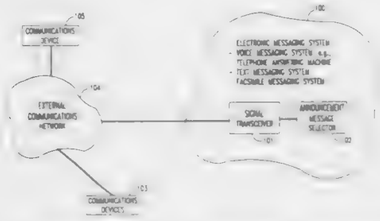
wherein said microprocessor means is operative to produce the control signals at said at least one of said output ports in accordance with a control command from one of said sources.

4,996,704

ELECTRONIC MESSAGING SYSTEMS WITH ADDITIONAL MESSAGE STORAGE CAPABILITY

Gordon R. Brunson, Broomfield, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 29, 1989, Ser. No. 414,884
Int. Cl.[5] H04M *3/50, 11/00*
U.S. Cl. 379—67 **20 Claims**



17. A method for use in an electronic messaging system which interfaces with a communications network, said system providing announcement messages for incoming communications from calling parties to at least one system subscriber, said method comprising the steps of

receiving an incoming communication destined for a given system subscriber, said communication including an identification of communications equipment being utilized by a calling party, and

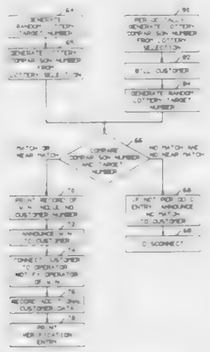
selecting a particular one of said announcement messages in response to said identification, said particular announcement message being selected from a plurality of different announcement messages associated with said given system subscriber.

4,996,705

USE OF TELECOMMUNICATIONS SYSTEMS FOR LOTTERIES

John K. Entenmann, Glendale Heights, Ill.; John A. Hooke, Rumson, N.J.; Eric E. Kampmeier, Naperville, and Barry L. Posterick, Batavia, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 1, 1987, Ser. No. 91,621
Int. Cl.[5] H04M *11/00;* **G06F** *15/28, 15/20*
U.S. Cl. 379—91 **2 Claims**



1. Telemarketing apparatus, comprising:

means connectable to a switched common carrier network for requesting a connection over said network to a telephone station;

announcement means, responsive to a continuance of a call-in-progress signal from said telephone station, for announcing a telemarketing message and a lottery prompt to said telephone station;

means for receiving information signals over said connection from said telephone station, said information signals representing data for a lottery entry;

processing means for determining whether said data for said lottery entry represents a winning entry, said processing means comprising means for determining a lottery target number, means for processing said information signals for said lottery entry to form a lottery comparison number, and means for matching said lottery target number and said lottery comparison number to determine whether said lottery entry is a winning entry;

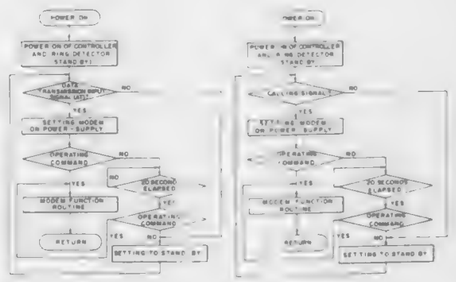
said announcement means further for notifying a customer at said telephone station of the winning entry.

4,996,706

METHOD OF CONTROLLING THE ELECTRIC POWER SUPPLIED TO A MODEM

Tae-Young Cho, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyonggi, Rep. of Korea

Continuation of Ser. No. 126,766, Nov. 30, 1987, abandoned. This application May 1, 1989, Ser. No. 345,617
Claims priority, application Rep. of Korea, Dec. 2, 1986, 86-10254
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 **15 Claims**



1. A method of controlling the supply of electrical power to a modem during those times in which data is being transmitted and received, said method including the steps of:

supplying electrical power to a controller adapted for detecting both a data transmission signal and a calling signal while said modem is at a standby mode of operation;

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terminating said standby mode of operation in response to detection of any of said data transmission signal and said calling signal by said controller; and thereafter

returning said modem to said standby mode of operation by determining the absence of an operating command associated with any of said data transmission signal and said calling signal at a predetermined time interval after detection of any of said data transmission signal and said calling signal by said controller.

4,996,707

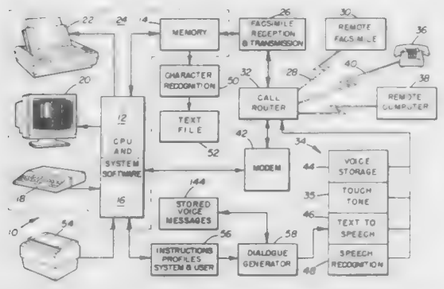
TEXT-TO-SPEECH CONVERTER OF A FACSIMILE GRAPHIC IMAGE

Sara O'Malley, New York, N.Y.; Michael H. O'Malley, and Elisabeth Peters, both of Berkeley, Calif., assignors to Berkeley Speech Technologies, Inc., Berkeley, Calif.

Filed Feb. 9, 1989, Ser. No. 308,792

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—100 **28 Claims**



1. A device for converting a graphic image of into spoken words, the graphic image represented by a single string of data composed of an ordered set of pixels, where each pixel may be represented by a binary bit, the device comprising:

computer data means for manipulating strings of data;

storage means for storing the graphic image in binary form as a single string of data, at least some of said graphic image representing written words;

recognition means for recognizing, assembling and processing at least portions of the graphic image into groups of coded characters each coded character represented by a plurality of more than one but less than nine binary bits and each coded character capable of being manipulated as a separate string of data by the computer data means; and

text-to-speech means for converting the groups of coded characters into spoken words.

4,996,708

KEY TELEPHONE SYSTEM ADAPTED TO RESPOND TO INFORMATION STORED IN A PORTABLE OUTPULSER

Katsuhiro Kakizawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1989, Ser. No. 389,981

Claims priority, application Japan, Aug. 9, 1988, 63-197179

Int. Cl.[5] H04M *1/26*

U.S. Cl. 379—156 **54 Claims**

6. A key telephone system comprising:

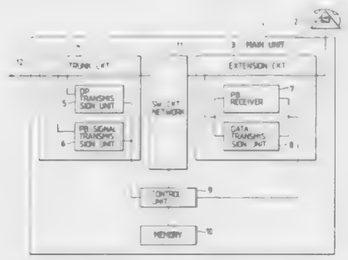
an electronic apparatus which can store a telephone number and from which the stored telephone number can be read out and used at any time;

an extension telephone;

a main unit;

receiving means for receiving information generated by said electronic apparatus;

calling means for calling in accordance with the information received by said receiving means; and



alarm means for generating an alarming when said receiving means does not receive the information within a predetermined period of time.

4,996,709

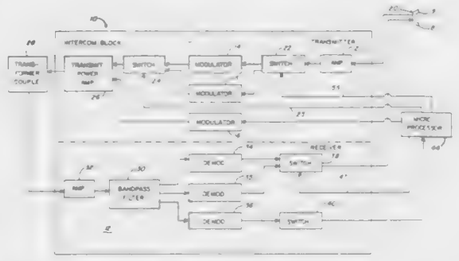
INTERCOM TELEPHONE

Jerry Heep, Weatherford, and James Henderson, Fort Worth, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Filed May 12, 1988, Ser. No. 193,517

Int. Cl.[5] H04J *1/14;* **H04M** *11/06*

U.S. Cl. 379—160 **27 Claims**



1. An intercom unit for supporting a multiplicity of frequency modulated intercom communication channels over a wire pair of a local telephone network, said intercom unit comprising a transmitter section and a receiver section, said transmitter section comprising;

a microprocessor,

microphone means for inputting said baseband audio signals,

a plurality of frequency modulation means, each modulation means tuned to a different carrier frequency for providing said multiplicity of communication channels,

first selection means under control of said microprocessor for selecting and coupling one of said modulation means to said microphone,

first means for coupling said frequency modulated communication channels to said wire pair of a local telephone network,

means, controlled by said microprocessor, for establishing a digital communication channel, and

means coupling said digital communication channel to said local telephone network,

and said receiver section comprising;

first means for coupling said wire pair of a local telephone network to said receiver,

frequency filter means connected to said coupling means adapted to separate signals from said wire pair into said multiplicity of frequency modulated communication channels,

a plurality of frequency demodulation means connected to said frequency filter means for extracting the baseband audio signal from each communication channel,

speaker means, and

second selection means coupled between said speaker and said frequency demodulation means for selectively connecting one of said frequency demodulation means to said speaker means, under control of said microprocessor, and

means for receiving said digital communication channel from said wire pair and for coupling said digital communication channel to said microprocessor.

4,996,710

SIDE-TONE ADJUSTING SYSTEM AND METHOD FOR KEY TELEPHONE SYSTEM ESTABLISHING A PLUREL KINDS OF SPEAKING PATHS

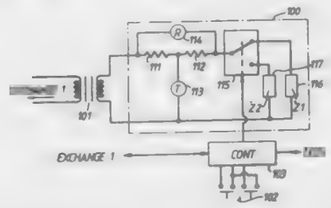
Toshiaki Takahashi, and Yasuji Sato, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 25, 1989, Ser. No. 411,378

Claims priority, application Japan, Sep. 28, 1988, 63-243178

Int. Cl.[5] H04M *1/00, 1/76, 3/56*

U.S. Cl. 379—202 **16 Claims**



14. In a switching system having an exchange with an exchanging switch coupled to a plurality of telephone lines, a plurality of telephone sets coupled to said exchange, wherein said exchange, responsive to a conference request from said telephone set, carries out a conference connection by a conference method, to establish communication paths between said selected telephone line and said telephone sets corresponding to the conference request, said conference method comprising the steps of:

(a) storing a plurality of impedance information for the conference connection between said telephone line and said telephone sets and one communication connection between said telephone set and said telephone line or other telephone set;

(b) generating the conference request in response to a predetermined manual key operation;

(c) determining said stored conference impedance information in response to the generated conference request and generating the determined impedance information:

(d) selecting a balanced impedance, corresponding to the generated impedance information, to obtain a suitable side-tone: and

(e) adjusting a side-tone in response to the selected balanced impedance.

4,996,711

SELECTED-EXPONENT SIGNATURE SYSTEMS

David L. Chaum, 14652 Sutton St., Sherman Oaks, Calif. 91403

Filed Jun. 21, 1989, Ser. No. 368,677

Int. Cl.[5] H04L *9/30*

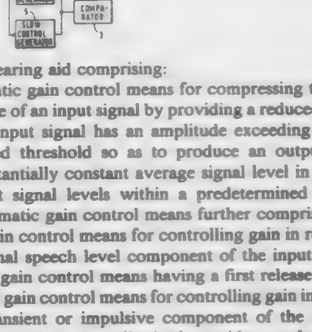
U.S. Cl. 380—30 **15 Claims**

1. A method for verifying public-key digital signatures, the method comprising the steps of:

determining an exponent from a first message by a first party using a procedure known to the first party and a second party, the exponent containing at least one prime factor uniquely determined by said message;

forming by said first party of a root based on a constant known to said first party and said second party, said root forming a part of said exponent;

communicating said root to said second party by said first party; and



checking the validity of said root by said second party computing said exponent, raising said root to said exponent to provide a result, and verifying that the result is said constant.

4,996,712

HEARING AIDS

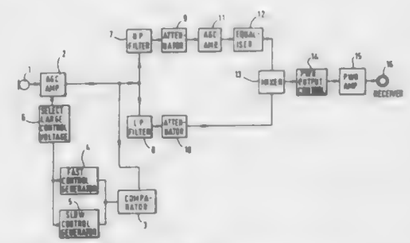
Roger F. Laurence, deceased, late of Camberley, and Leon R. Morgan, executor, London, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 72,475, Jul. 13, 1987, abandoned. This application Jan. 17, 1990, Ser. No. 465,523

Claims priority, application United Kingdom, Jul. 11, 1986, 8616959

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—68.4 **21 Claims**



1. A hearing aid comprising:

automatic gain control means for compressing the dynamic range of an input signal by providing a reduced gain when the input signal has an amplitude exceeding a predetermined threshold so as to produce an output signal of substantially constant average signal level in response to input signal levels within a predetermined range, said automatic gain control means further comprising,

first gain control means for controlling gain in response to a normal speech level component of the input signal, said first gain control means having a first release time,

second gain control means for controlling gain in response to a transient or impulsive component of the input signal having a larger amplitude than said normal speech level component, said second gain control means being set to reduce gain in response to said transient or impulsive component relative to said normal speech level component without suppressing low amplitude speech signals,

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and said second gain control means having a second release time which is shorter than said first release time;

a plurality of signal processing channels for providing processed output signals, each of said signal processing channels receiving the output signal from said automatic gain control means and including frequency dependent filtering means; and

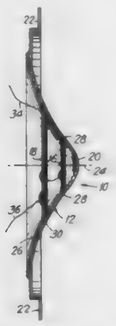
means for providing a combined output signal from the processed output signals and for supplying the combined output signal to an electro-acoustic output transducer.

4,996,713

ELECTROACOUSTIC PIEZOELECTRIC TRANSDUCER HAVING A BROAD OPERATING RANGE

Helio T. Bittencourt, Sao Paulo, Belize, assignor to S. Eletro-Acustica S.A., Belize

Filed Sep. 25, 1989, Ser. No. 411,650
Int. Cl.[5] H04R *17/00*; **H01L** *41/00*
U.S. Cl. 381—190 **10 Claims**



6. An electroacoustic transducer, comprising:

a concave diaphragm having a substantially central apex through which an axis extends along which vibrations occur when producing or receiving soundwaves, and an outer peripheral region about which said concave diaphragm can be mounted on a housing;

at least two planar bimorph elements having different respective resonance frequency characteristics, each of said planar bimorph elements being directly connected to said concave diaphragm; and

electric circuit means for coupling electrodes of said planar bimorph elements to a voltage source.

4,996,714

COMPUTERIZED FILING AND RETRIEVAL SYSTEM FOR SIGNATURE AND PICTORIAL DOCUMENTATION

Pierre Desjardins, Bellefeuille; Paul Trudel, Vimont, and Jean-Marc Leroux, Ste-Dorothée, all of Canada, assignors to Frisco Bay Industries of Canada Limited, St. Laurent, Canada

Filed May 23, 1990, Ser. No. 527,390
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—3 **8 Claims**

1. A computerized filing and retrieval system for signatures and pictorial documentation which comprises:

camera means;

a microcomputer having a memory means and being in communication with said camera means;

means for converting pictorial and signature information to coded data which is stored in said memory means at predetermined locations thereof;

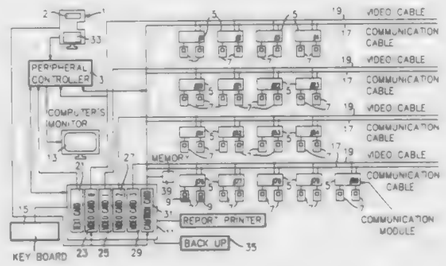
peripheral controller means in communication with said microcomputer;

a plurality of communication controller means in communication with said microcomputer;

a plurality of monitors for displaying said signature and pictorial documentation;

each said monitor being in communication with only one communication controller means, each said communication controller means being in communication with up to two monitors;

wherein, on receipt of a query signal by an nth communication controller means from an mth monitor, in communication with said nth communication controller means, said



query signal being associated with a pth signature or pictorial document, said nth communication controller means queries said microcomputer;

said microcomputer determining the location of the coded data associated with said pth signature or pictorial document in said memory means and decoding said coded data associated with said pth signature or pictorial document;

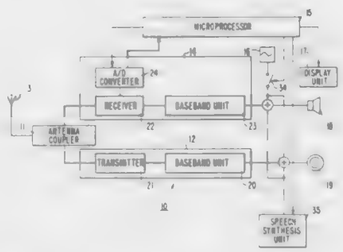
whereby, to provide, to said mth controller, the data for creating said pth signature or pictorial document through said nth communication controller means.

4,996,715

RADIO TELEPHONE APPARATUS

Kuniyoshi Marui, Saitama, and Kiyoshi Hattori, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 21, 1988, Ser. No. 248,921
Claims priority, application Japan, Sep. 29, 1987, 62-244621
Int. Cl.[5] H04Q *7/04*
U.S. Cl. 455—33 **24 Claims**



1. A cellular radiotelephone unit for use in a cellular radiotelephone system for serving one or more geographic areas formed of a plurality of cellular zones, the cellular radiotelephone unit comprising:

receiving means for receiving radio signals transmitted over a speech radio channel or a control radio channel;

measuring means, coupled to the receiving means, for measuring the strength of the radio signals received by the receiving means;

alarming means for alarming at least the user of the cellular mobile radiotelephone unit in response to the detection of a signal strength value measured by the measuring means at or below a first predetermined value after a communi-

cation link with a second party using the speech radio channel is established; and

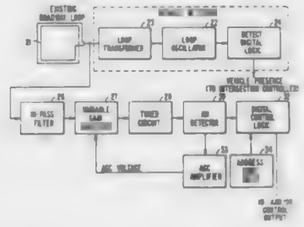
control means for controlling the receiving means to receive radio signals transmitted over the control radio channel, in stead of tne speech radio channel, in response to the detection of a signal strength value measured by the measuring means at or below a second predetermined value, the second predetermined value being no greater than the first predetermined value.

4,996,716

VEHICLE COMMUNICATION SYSTEM USING EXISTING ROADWAY LOOPS

Thomas Potter, Los Alamitos, and Thomas Seabury, Diablo, both of Calif., assignors to Detector Systems, Inc., Stanton, Calif.

Continuation of Ser. No. 138,122, Dec. 28, 1987, abandoned.
This application Dec. 28, 1989, Ser. No. 462,287
Int. Cl.[5] H04B *5/00*
U.S. Cl. 455—41 **14 Claims**



1. A communication system for enabling transfer of information between a vehicle and a stationary information location having a vehicle detector system with a loop antenna, said loop antenna comprising part of a circuit containing conventional vehicle detector system signals normally lying within a given frequency range, said conventional vehicle detector system signals normally being present within said loop antenna, said communication system comprising:

a vehicle mounted transmitter means for enabling transmission of a preselected information signal over a relatively small distance range; and

stationary receiver means for receiving said information signal transmitted by said transmitter means when within said distance range,

said vehicle mounted transmitter means including means for generating a carrier frequency signal lying within a transmitting frequency range different from the frequency range of the vehicle detector system loop signals and containing said preselected information signal,

said receiver means including the vehicle detector system loop antenna and means for distinguishing said preselected information signal from the conventional vehicle detector signals concurrently present in said vehicle detector system loop antenna.

4,996,717

RADIO RECEIVER NOISE SQUELCHING AND OPERATIONAL INDICATING ALARM

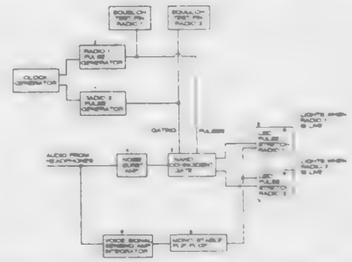
Robert H. Koening, Rd. 1, Coats Rd., Burdett, N.Y. 14818

Filed Oct. 26, 1989, Ser. No. 427,725
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—222 **12 Claims**

1. A radio receiver operational checking system comprising in combination:

(a) a radio receiver including an active radio noise squelch circuit, set at a level to eliminate ambient noise (atmospheric and receiver noise) when no radio signal is being received, and including a squelch control connection point where said squelch circuit can be disabled by the application of a voltage of appropriate magnitude,

(b) a clock-driven pulse source for said radio receiver providing repetitive short pulses for application to said



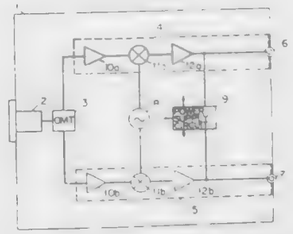
squelch control connection point to deactivate momentarily said noise squelch circuit at regular intervals to provide repetitive, short noise pulses in the audio output of said radio receiver indicating that said radio receiver is operational and awaiting a radio frequency signal.

4,996,718

FREQUENCY CONVERTER CIRCUIT

Yasufumi Shiomi, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/00535, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO88/10024, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 1, 1988, Ser. No. 309,730
Claims priority, application Japan, Jun. 2, 1987, 62-138525
Int. Cl.[5] H04B *1/26*
U.S. Cl. 455—323 **6 Claims**



5. A frequency converter circuit comprising: an input waveguide portion for receiving a satellite broadcast signal, separating means for separating an input signal outputted from said input waveguide portion in accordance with kinds of polarizations, a first mixer circuit including a mixer diode for receiving a first signal separated and outputted by said separating means, a second mixer circuit including a mixer diode for receiving a second signal separated and outputted by said separating means, a single local oscillator connected to said first mixer circuit and said second mixer circuit for distributing and supplying a local oscillation signal thereof to said first and second mixer circuits, a biasing power supply circuit for supplying a bias current to the mixer diodes of said first and second mixer circuits, and first and second diodes whose anodes are respectively connected to an output terminal to which an intermediate frequency signal converted by said first mixer circuit is outputted and an output terminal to which an intermediate frequency signal converted by said second mixer circuit is outputted and whose cathodes are connected to each other to provide a junction point thereof, and wherein said biasing power supply circuit are connected to the junction point of said cathodes of said first and second diodes, whereby a volt-

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age generated from said junction point of said cathodes is maintained as a constant voltage to supply the bias current to said mixer diodes.

4,996,719

OPTICAL COMMUNICATION APPARATUS FOR MOTOR VEHICLE

Kunio Okazaki, Hadano, and Kiyomitsu Ishikawa, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

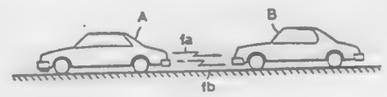
Filed Feb. 15, 1989, Ser. No. 311,532
Claims priority, application Japan, Feb. 26, 1988, 63-24903[U]
Int. Cl.[5] H04B *10/14;* **H04J** *14/02*
U.S. Cl. 455—606 **15 Claims**

1. An optical communication apparatus for vehicles, comprising:

at least one of a rear combination lamp and a marker lamp on a first vehicle, said at least one of a rear combination lamp and marker lamp including a light emitting means for emitting a visually observable light signal;

a source of optical communication signals, including said light emitting means of said at least one of a rear combination lamp and a marker lamp of said first vehicle for use also for generating optical communications signals;

light receiving means on said first vehicle and located in the vicinity of said light emitting means for receiving from a light source in a second vehicle optical communications signals related to an original signal;



transmitting means on said first vehicle and coupled to said light emitting means for causing said light emitting means to also emit said optical communications signals; and

receiver means coupled to said light receiving means for converting said received optical communications signals into substantially said original signal.

DESIGN PATENTS

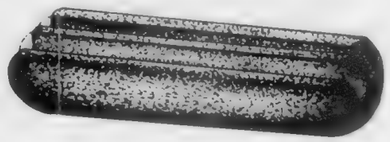
GRANTED FEB. 26, 1991

ERRATA

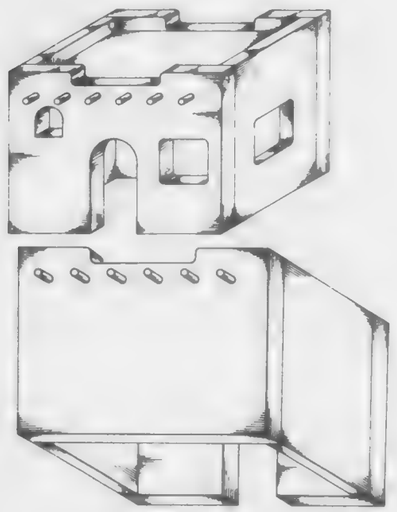
For CLASS	See PATENT NO.
D09-432	314,907
D14-118	314,931
D99-030	315,045

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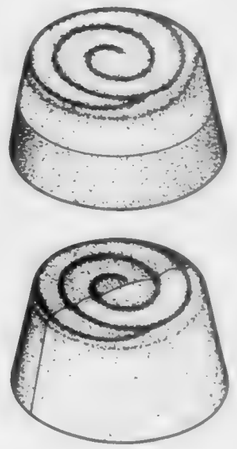
314,853
HOT DOG BUN FOR TWO HOT DOGS
Lamilis A. Garrett, 1239 Harden St., Columbia, S.C. 29204
Filed Jun. 25, 1987, Ser. No. 66,401
Term of patent 14 years
U.S. Cl. D1—101



314,854
GINGERBREAD HOUSE
Paula C. Brown, 14857 Olympic View Loop Rd., Silverdale, Wash. 98383
Filed Apr. 7, 1988, Ser. No. 179,897
Term of patent 14 years
U.S. Cl. D1—106



314,855
CONFECTION
Salvatore A. Puglisi, Wayne, and Carolina Calayan, Morris Plains, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed May 28, 1987, Ser. No. 56,210
Term of patent 14 years
U.S. Cl. D1—127

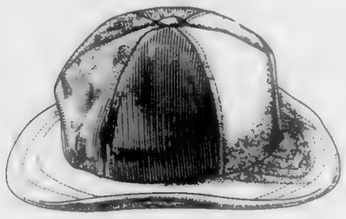


314,856
SHIRT
Hans-Georg Heffe-Sander, Gartenstrasse 19, 6057 Dietzenbach-Steinberg, Fed. Rep. of Germany, and Alfred Gruber, Deisten 19, 8125 Zollikerberg, Switzerland
Filed Oct. 28, 1987, Ser. No. 114,878
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 5 MR 10765
Term of patent 14 years
U.S. Cl. D2—215

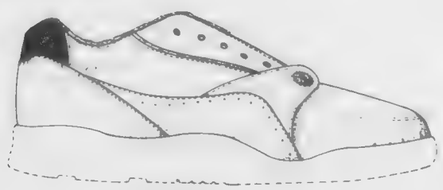


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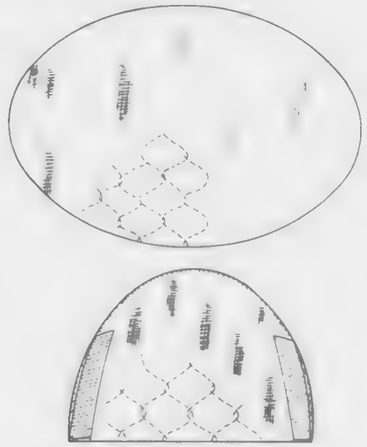
314,857
HAT
Roy L. Vossler, Box 1074, Redcliff, Alberta, Canada (T0J 2P0)
Filed Nov. 20, 1987, Ser. No. 123,652
Claims priority, application Canada, Aug. 5, 1987, 05-08-87-2
Term of patent 14 years
U.S. Cl. D2—257



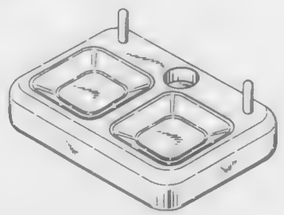
314,858
SHOE UPPER
Daniel Richard, Westlinn; K. Wayne Spinney, Oswego, and Miza Mourad, Portland, all of Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 14, 1990, Ser. No. 479,722
Term of patent 14 years
U.S. Cl. D2—314



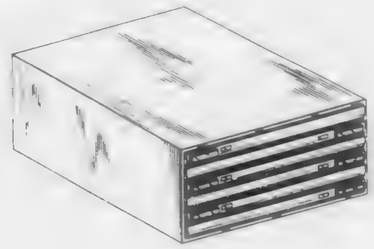
314,859
SHOULDER BELT COVER OR SIMILAR ARTICLE
Judy M. Weightman, and Andrew K. Mirikitani, both of 77 Mott-Smith Dr., #1500, Honolulu, Hi. 96822
Filed Jul. 11, 1986, Ser. No. 884,420
Term of patent 14 years
U.S. Cl. D2—639



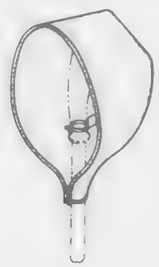
314,860
SEWING ACCESSORY HOLDER
Lloyd W. Austin, 1838 Lakeside, Bellingham, Wash. 98226
Filed Jan. 20, 1987, Ser. No. 5,139
Term of patent 14 years
U.S. Cl. D3—25



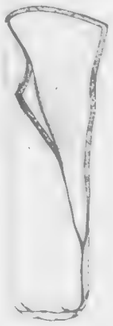
314,861
CONTAINER FOR DISKS
Peter A. Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland
Division of Ser. No. 935,579, Nov. 26, 1986. This application Jun. 7, 1990, Ser. No. 534,665
Claims priority, application World Int. Prop. O., May 30, 1986, DM/006989
Term of patent 14 years
U.S. Cl. D3—35



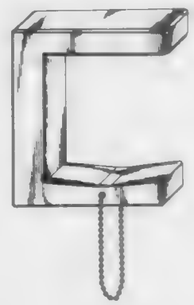
314,862
GLOVE COVER FOR ATTACHMENT TO A SKI POLE
Lovena M. Stevenson, 318 Cricket La., Woodbridge, N.J. 07095
Filed Feb. 29, 1988, Ser. No. 161,608
Term of patent 14 years
U.S. Cl. D3—36



314,863
HERMETICALLY SEALABLE COVER FOR GOLF CLUBS AND BAG
Wayne W. R. Brengel, 37 Plennert Rd., Flemington, N.J. 08822
Filed Oct. 13, 1988, Ser. No. 257,349
Term of patent 14 years
U.S. Cl. D3—37

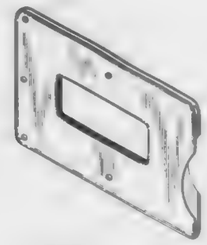


314,864
TABLE TOP HOOK FOR PURSE OR SIMILAR ARTICLE
Kenny D. Creed, Rte. 1, Box 198A, Moberly, Mo. 65270
Filed Sep. 28, 1988, Ser. No. 250,423
Term of patent 14 years
U.S. Cl. D3—54

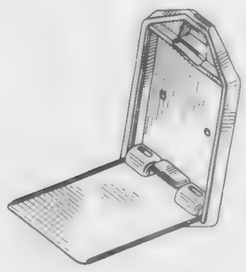


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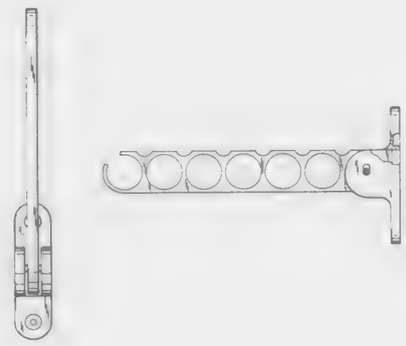
314,865
CREDIT CARD CASE
Jaakko Tuisku, Kauhajoki, Finland, assignor to Kauhajoen Mainostuote Oy, Finland
Filed Jan. 6, 1988, Ser. No. 141,465
Term of patent 14 years
U.S. Cl. D3—56



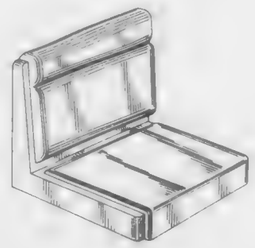
314,866
CAMERA STRAP ATTACHABLE NOTE PAD CONTAINER
Joel E. Scott, 1717 Spring Creek Dr., Sarasota, Fla. 34239
Filed Mar. 9, 1987, Ser. No. 23,467
Term of patent 14 years
U.S. Cl. D3—100



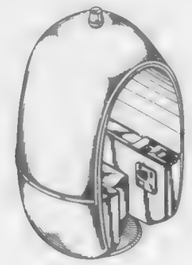
314,867
CLOTHES HANGER HOLDER
Sheldon Goodman, 4079 Princeton Blvd., South Euclid, Ohio, and Steven E. Greenhut, 2781 Belgrave Rd., Pepper Pike, Ohio
Filed Jul. 20, 1987, Ser. No. 75,311
Term of patent 14 years
U.S. Cl. D6—324



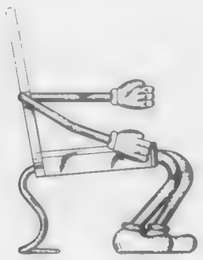
314,868
SEAT
Jeffrey F. Camacho, Naperville, Ill., assignor to Artifax Design International Corporation, Lombard, Ill.
Filed Nov. 10, 1987, Ser. No. 118,966
Term of patent 14 years
U.S. Cl. D6—334



314,869
COMBINED CHAIR AND AUDIO UNIT
Lynda G. Entratter, 6001 Savoy, #606, Houston, Tex. 77036
Filed Sep. 10, 1987, Ser. No. 94,858
Term of patent 14 years
U.S. Cl. D6—335



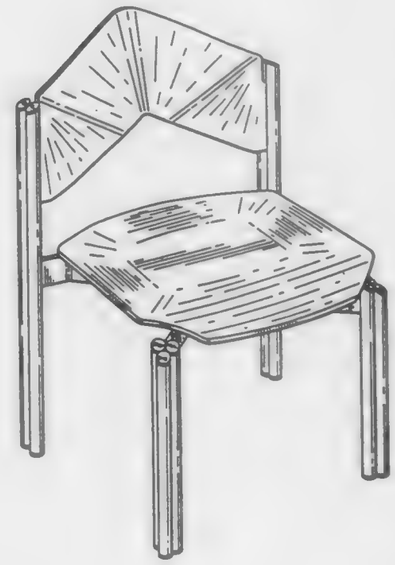
314,870
CHAIR
Catherine Walsh, 41-29 39th Pl., Sunnyside, N.Y. 11104
Filed Jun. 30, 1987, Ser. No. 68,053
Term of patent 14 years
U.S. Cl. D6—358



314,871
FOLDABLE CHAIR
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries Inc., Valley Forge, Pa.
Filed Jul. 13, 1987, Ser. No. 72,586
Term of patent 14 years
U.S. Cl. D6—368



314,872
CHAIR
Hartmut S. Engel, Freiberg, Fed. Rep. of Germany, assignor to August Fröscher GmbH & Co. K.G., Steinheim, Fed. Rep. of Germany, a part interest
Filed Apr. 3, 1987, Ser. No. 35,470
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 1535
Term of patent 14 years
U.S. Cl. D6—380



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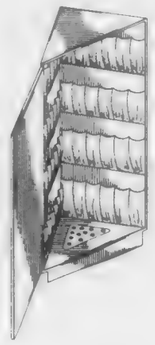
314,873
COLLAPSIBLE MUSIC STAND
Karl J. Wenger, Cincinnati, Ohio, and Eugene N. Reshanov, Golden Valley, Minn., assignors to Wenger Corporation, Owatonna, Minn.
Filed Jul. 16, 1987, Ser. No. 74,435
Term of patent 14 years
U.S. Cl. D6—419



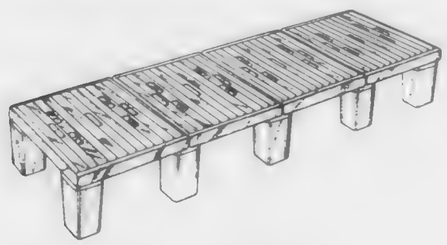




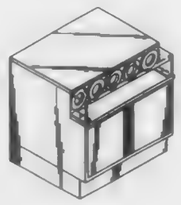
314,874
SHOE CABINET
Bonnie J. Quartermaine, Suite 5-221, P.O. Box 17135, Phoenix, Ariz. 85011
Filed Jul. 24, 1987, Ser. No. 77,323
Term of patent 14 years
U.S. Cl. D6—432



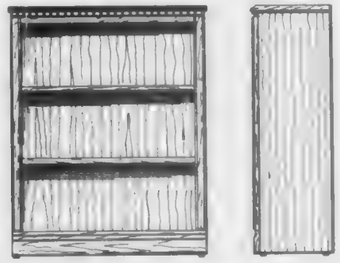
314,875
DUNNAGE RACK
David A. Juergens, Winchester, Va., assignor to Rubbermaid Commerical Products Inc., Winchester, Va.
Filed Jan. 14, 1988, Ser. No. 143,690
Term of patent 14 years
U.S. Cl. D6—449



314,876
COMBINED STORAGE AND CUP DISPENSER UNIT
J. Marshall Suttles, Elberton, Ga., assignor to Royston Corporation, Royston, Ga.
Division of Ser. No. 871,766, Jun. 9, 1986. This application Jul. 28, 1989, Ser. No. 395,452
Term of patent 14 years
U.S. Cl. D6—469



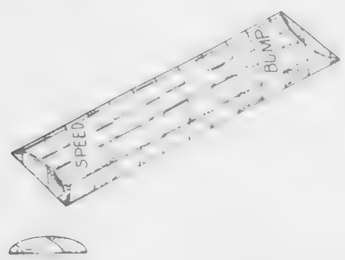
314,877
BOOKCASE
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed Apr. 29, 1988, Ser. No. 188,384
Term of patent 14 years
U.S. Cl. D6—479



314,878
TABLE
Richard S. Hart, Elgin, Ill., assignor to Soft Sheen Products, Inc., Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 71,043
Term of patent 14 years
U.S. Cl. D6—486



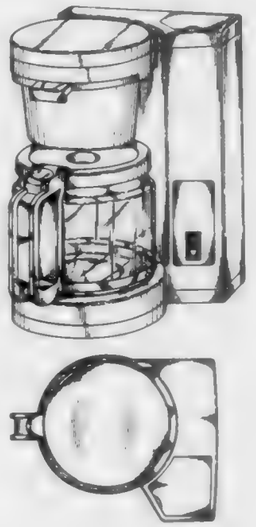
314,879
PILLOW
James B. Painter, 130 S. 13th St., Easton, Pa. 18042
Filed May 27, 1988, Ser. No. 199,595
Term of patent 14 years
U.S. Cl. D6—597



314,880
BEVERAGE STIRRER
Freddie F. Rentsch, 4141 Fox Run Trail, #11, Cincinnati, Ohio 45255
Filed Nov. 19, 1987, Ser. No. 122,664
Term of patent 14 years
U.S. Cl. D7—300.2



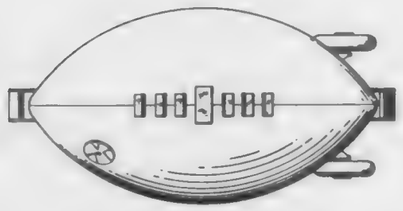
314,881
COFFEE MAKER
Martin J. Wondergem, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 16, 1988, Ser. No. 169,194
Term of patent 14 years
U.S. Cl. D7—309



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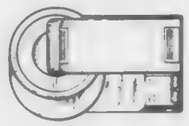
314,882
BARBEQUE GRILL
James A. Bethel, Jr., 355 Possum Ct., Capitol Heights, Md. 20743
Filed Oct. 14, 1988, Ser. No. 257,783
Term of patent 14 years
U.S. Cl. D7—334

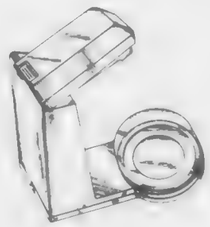




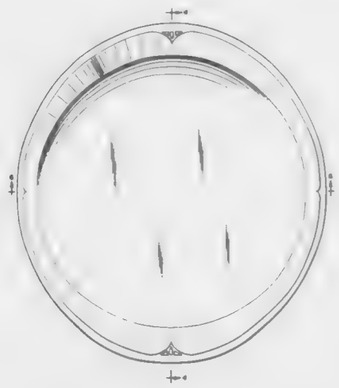


314,883
FOOD MIXER
Stuart Naft, Stratford, Conn., assignor to Black & Decker, Inc., Newark, Del.
Filed Aug. 25, 1988, Ser. No. 236,137
Term of patent 14 years
U.S. Cl. D7—379

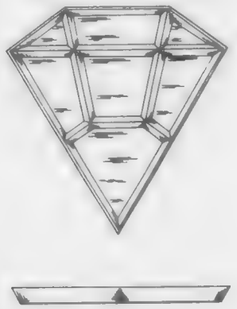




314,884
SERVING PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,931
Term of patent 14 years
U.S. Cl. D7—545



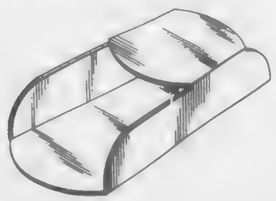
314,885
SERVING TRAY OR THE LIKE
Donald A. Brunner, 2073 Kratz Station Rd., Harleysville, Pa. 19438
Filed Mar. 7, 1988, Ser. No. 164,625
Term of patent 14 years
U.S. Cl. D7—554



314,886
FOOTED DESSERT CUP
Elliott N. Zivin, 8 Colony Rd., Westport, Conn. 06880
Filed Nov. 7, 1986, Ser. No. 929,145
Term of patent 14 years
U.S. Cl. D7—558



314,887
PITA SANDWICH HOLDER
Chris Tomaras, Evanston, Ill., assignor to Kronos - Central Products, Inc., Chicago, Ill.
Filed Nov. 14, 1988, Ser. No. 271,211
Term of patent 14 years
U.S. Cl. D7—601



314,888
VACUUM BOTTLE
Kaori Mano, and Nobuyuki Enomoto, both of Kyoto, Japan, assignors to Japan Oxygen Co., Ltd., Japan
Filed Sep. 6, 1988, Ser. No. 245,198
Claims priority, application Japan, Mar. 10, 1988, 63-9714
Term of patent 14 years
U.S. Cl. D7—605



314,889
TONGS
Bortolo Bonomi, Bedizzole, Italy, assignor to AGHIFUG S.p.A., Bedizzole, Italy
Filed Oct. 16, 1987, Ser. No. 109,847
Claims priority, application Italy, Sep. 7, 1987, 7090/87[U]
Term of patent 14 years
U.S. Cl. D7—687

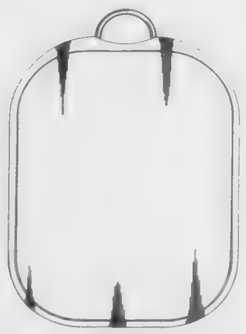


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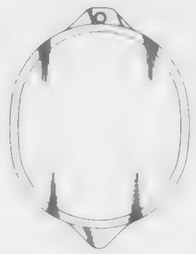
314,890
FISH SCALER
Allen P. Gilmer, 479 E. Paces Ferry Rd. NE, #822, Atlanta, Georgia 30315
Filed Mar. 30, 1989, Ser. No. 330,870
Term of patent 14 years
U.S. Cl. D7—693



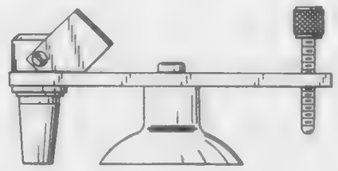
314,891
CHOPPING BOARD
Shigenori Sata, Osaka, Japan, assignor to Kobayashi Manufacturing Company, Ltd., Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,716
Term of patent 14 years
U.S. Cl. D7—698



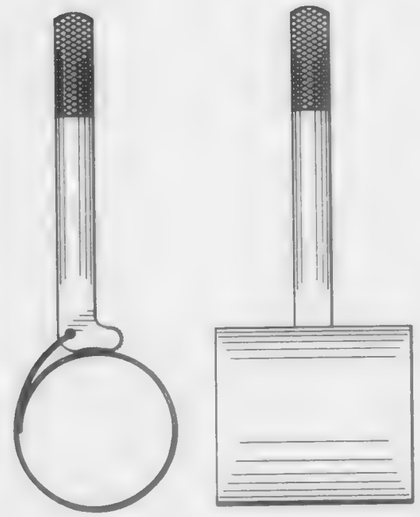
314,892
CHOPPING BOARD
Shigenori Sata, Osaka, Japan, assignor to Kobayashi Manufacturing Company, Ltd., Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,719
Term of patent 14 years
U.S. Cl. D7—698



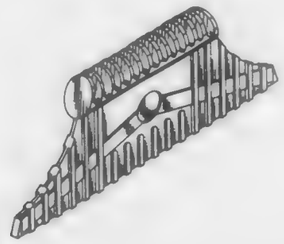
314,893
TOOL FOR REPAIRING A BREAK IN GLASS
William A. Jones, 7197½ NW. 16, Bethany, Okla. 73008
Filed Aug. 24, 1987, Ser. No. 88,902
Term of patent 14 years
U.S. Cl. D8—14



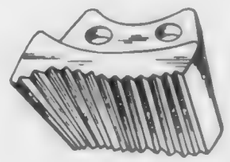
314,894
DRIVE BELT ADJUSTMENT TOOL
Harold L. Jacobs, 6095 Hillsboro Rd., Davisburg, Mich. 48019
Filed Nov. 7, 1987, Ser. No. 118,640
Term of patent 14 years
U.S. Cl. D8—14



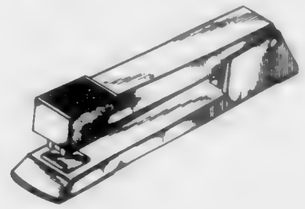
314,895
MASTIC SPREADER OR LIKE ARTICLE
Donald D. Rumpel, Smelterville, Id., assignor to Kellogg Plastics, Ltd., Smelterville, Id.
Filed Dec. 8, 1987, Ser. No. 129,973
Term of patent 14 years
U.S. Cl. D8—14



314,896
JAW INSERT FOR POWER TONGS
Charles W. Haynes, Marshall, Tex., assignor to Martin-Decker, Inc.
Filed Oct. 15, 1987, Ser. No. 108,881
Term of patent 14 years
U.S. Cl. D8—22



314,897
STAPLER
Jackson Hung, No. 162-1, Shan Geau Road, Dah Tuen Hsiang, Changhua Hsien, Taiwan
Filed May 25, 1988, Ser. No. 198,379
Term of patent 14 years
U.S. Cl. D8—50

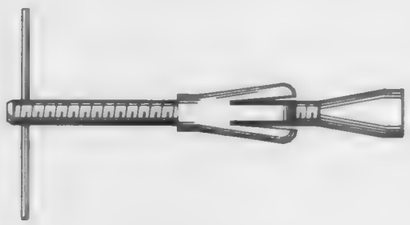


314,898
RAIN GUTTER RAKE
Robert R. Rust, 219 Sixth St., Marysville, Calif. 95901
Filed May 4, 1988, Ser. No. 190,302
Term of patent 14 years
U.S. Cl. D8—51

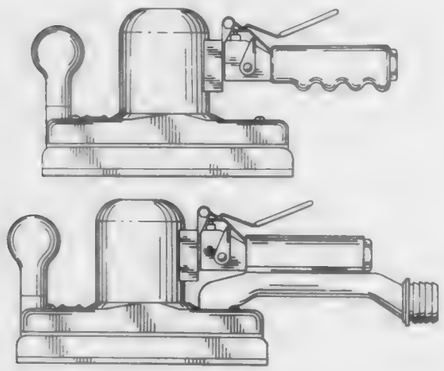


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314,899
ORIFICE TUBE EXPANDER
Don D. Young, P.O. Box 3522, Enloe, Tex. 75441
Filed Nov. 6, 1987, Ser. No. 117,652
Term of patent 14 years
U.S. Cl. D8—59



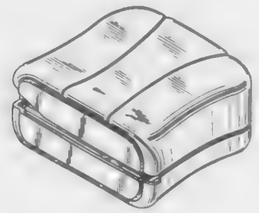
314,900
ABRADING MACHINE
Roger T. Hoffman, Winnebago, Ill., assignor to National-Detroit, Inc., Rockford, Ill.
Filed Oct. 19, 1987, Ser. No. 109,751
Term of patent 14 years
U.S. Cl. D8—62



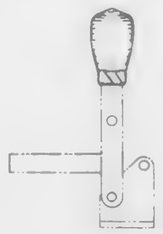
314,901
FENCE WIRE WINDING TOOL
Edd Tackett, Rte. 3, Box 200 A, Huntsville, Ark. 72740, and Yvonne K. Armstrong, P.O. Box 201, Kingston, Ark. 72742
Filed Jun. 10, 1988, Ser. No. 204,790
Term of patent 14 years
U.S. Cl. D8—89



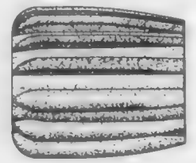
314,902
LETTER OPENER
Harrison Huang, No. 23, Lin Tsuo Road, Shenkang, Taichung Hsien, Taiwan
Filed Dec. 8, 1988, Ser. No. 282,343
Term of patent 14 years
U.S. Cl. D8—102



314,903
HANDLE FOR A CLAMP
Douglas Ruffley, Troy, and Gregory Midkiff, Ferndale, both of Mich., assignors to Delaware Capital Formation, Inc., Wilmington, Del.
Filed Apr. 4, 1988, Ser. No. 176,998
Term of patent 14 years
U.S. Cl. D8—310

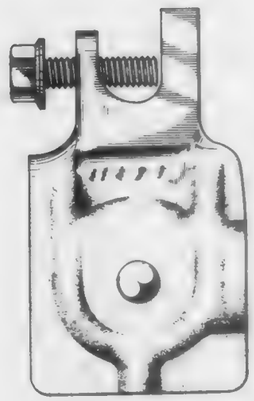


314,904
HANDLE FOR SCUBA EQUIPMENT VALVE OR THE LIKE
Joseph C. Trinkwalder, Jr., North Tonawanda, N.Y., assignor to Harsco Corp., Wormleysburg, Pa.
Filed May 11, 1988, Ser. No. 193,484
Term of patent 14 years
U.S. Cl. D8—312

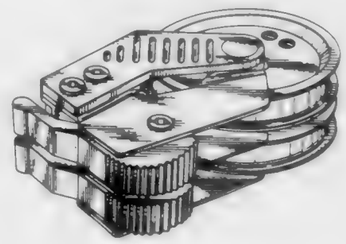




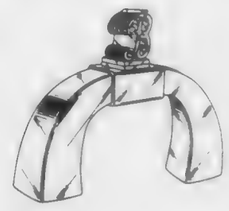
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RESIDENTIAL WATER WELL PUMP PULLEY
Bruce L. Kehm, R.D.#5, Steel City, Bethlehem, Pa. 18015
Filed Sep. 24, 1987, Ser. No. 105,197
Term of patent 14 years
U.S. Cl. D8—360



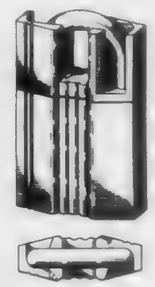
314,906
BOAT TURNING BLOCK
Peter W. Isherwood, Richmond-on-Thames, England, assignor to Offshore Instruments Limited, Cowes, England
Filed Oct. 9, 1987, Ser. No. 107,520
Claims priority, application United Kingdom, Apr. 14, 1987, 1041529
Term of patent 14 years
U.S. Cl. D8—360



314,907
PERFUME BOTTLE
Stefano Ricci, Florence, Italy, assignor to Battaglia Shops, Inc., Beverly Hills, Calif.
Filed Apr. 6, 1988, Ser. No. 178,081
Term of patent 14 years
U.S. Cl. D9—432

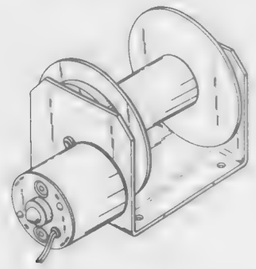


314,908
COMBINED PADLOCK AND HASP PROTECTOR
Jakob B. Pedersen, Hellerup, Denmark, assignor to A/S Ruko, Herlev, Denmark
Filed Nov. 3, 1988, Ser. No. 267,518
Claims priority, application Denmark, May 5, 1988, 589/88
Term of patent 14 years
U.S. Cl. D8—334

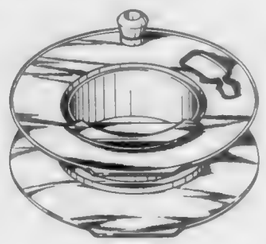


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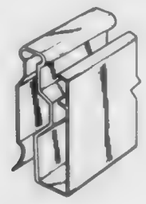
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SKI ROPE REEL OR THE LIKE
Walter A. Schmidt, 3221 Neilson Dr., Enid, Okla. 73703
Filed Sep. 4, 1987, Ser. No. 93,393
Term of patent 14 years
U.S. Cl. D8—358



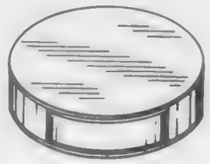
314,910
CORD STORAGE REEL
Ralph VanSkiver, Arlington, Tex., assignor to Doskocil Manufacturing Company, Inc., Arlington, Tex.
Filed Sep. 25, 1989, Ser. No. 411,609
Term of patent 14 years
U.S. Cl. D8—359



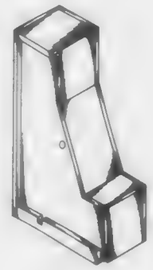
314,911
SUPPORT FOR SIGNAL FLAGS OR THE LIKE
Joseph P. Spica, Livonia, Mich., assignor to The 2500 Corporation, Farmington Hills, Mich.
Filed Jun. 16, 1988, Ser. No. 208,012
Term of patent 14 years
U.S. Cl. D8—373



314,912
MATCHBOX
Manuel E. Rey Pascual, Jerez de la Frontera, Spain, assignor to Phosphosherry Corporation S.A., Jerez de la Frontera, Spain
Filed Aug. 17, 1987, Ser. No. 86,671
Claims priority, application Spain, Jun. 9, 1987, 113253
Term of patent 14 years
U.S. Cl. D9—424



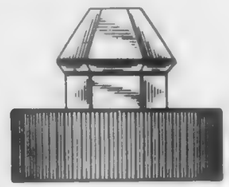
314,913
DECORATIVE BOX
Joseph W. Ferbrache, 990 S. 18th E., Mountain Home, Id. 83647
Filed Dec. 24, 1987, Ser. No. 137,652
Term of patent 14 years
U.S. Cl. D9—430



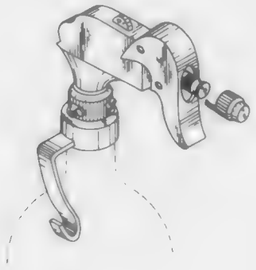
314,914
PACKAGE
Christopher J. Callinan, Centerport, N.Y., assignor to Regent Sheffield, Ltd., Farmingdale, N.N.Y.
Filed Dec. 29, 1987, Ser. No. 139,048
Term of patent 14 years
U.S. Cl. D9—432



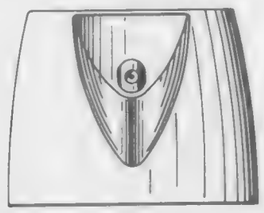
314,915
BOTTLE CLOSURE
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.
Filed Apr. 25, 1988, Ser. No. 186,072
Term of patent 14 years
U.S. Cl. D9—435



314,916
COMBINED SPRAY HEAD AND BOTTLE CLOSURE
Daniel W. Brooks, 601 N. "N" Pl., Tulare, Calif. 93274
Filed Feb. 19, 1988, Ser. No. 158,154
Term of patent 14 years
U.S. Cl. D9—448



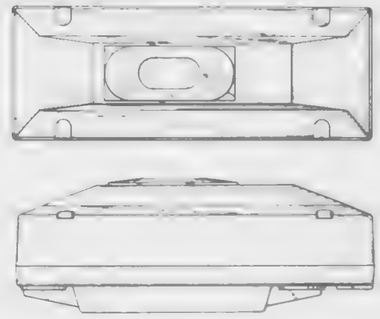
314,917
COMBINED OVERCAP AND AEROSOL ACTUATOR
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., Rensselaer, N.Y.
Filed Apr. 25, 1988, Ser. No. 186,071
Term of patent 14 years
U.S. Cl. D9—448



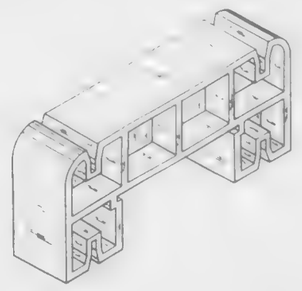
314,918
WRISTWATCH
Jean-Louis Dumas, 24, Rue du Faubourg St., Honore 75008 Paris, France
Filed Jan. 30, 1987, Ser. No. 9,407
Term of patent 14 years
U.S. Cl. D10—32



314,919
HOT BOX DETECTOR SCANNER HOUSING
Luis F. Villar, Westbury, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.
Filed Apr. 4, 1988, Ser. No. 178,071
Term of patent 14 years
U.S. Cl. D10—46

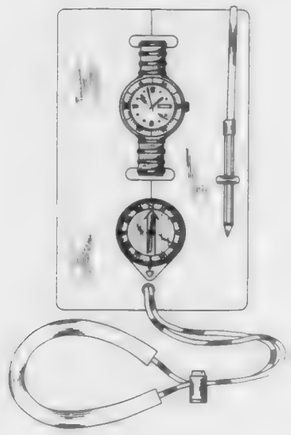


314,920
MASONRY LINE BLOCK
Robert J. Blazek, 4 Greenwood Trails N., Greenwood, Ind. 46142
Filed Nov. 17, 1988, Ser. No. 272,293
Term of patent 14 years
U.S. Cl. D10—61

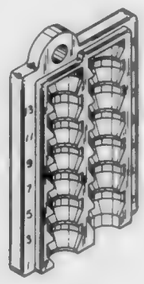


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314,921
NAVIGATIONAL AID
Michael C. Horowitz, 1015 Poplar Dr., Falls Church, Va. 22046
Filed Feb. 17, 1988, Ser. No. 156,561
Term of patent 14 years
U.S. Cl. D10—62



314,922
GOLF TEE DRIVING GAUGE
Robert G. Musillo, 5481 Wolf Dr., Pittsburgh, Pa. 15236
Filed Aug. 10, 1988, Ser. No. 230,502
Term of patent 14 years
U.S. Cl. D10—64



314,923
ULTRASONIC MEASURING INSTRUMENT
Raymond Chan, Hung Hom, Kowloon, Hong Kong, assignor to Integrated Display Technology Limited, Hung Hom, Kowloon, Hong Kong
Filed Jun. 28, 1989, Ser. No. 372,944
Claims priority, application United Kingdom, Jan. 9, 1989, 1056713
Term of patent 14 years
U.S. Cl. D10—70



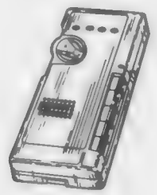
314,924
CALIPER
Timothy R. Abbott, 309 12th Street, N.E., Childersburg, Ala. 35044
Filed Aug. 15, 1988, Ser. No. 232,573
Term of patent 14 years
U.S. Cl. D10—73



314,925
CIRCUIT TESTER
Bernard J. Murphy, 2335 E. Norris St., Philadelphia, Pa. 19125
Filed Jul. 23, 1987, Ser. No. 76,935
Term of patent 14 years
U.S. Cl. D10—78



314,926
PORTABLE LINE TESTER OR SIMILAR ARTICLE
Leslie I. Sohay, Ventura, Calif., assignor to Harris Corporation, Melbourne, Fla.
Filed Apr. 14, 1989, Ser. No. 339,025
Term of patent 14 years
U.S. Cl. D10—78



314,927
WRIST WATCH DIAL
Gedalio Grinberg, New York, N.Y., and Hugo Berger, LeLocle, Switzerland, assignors to North American Watch Corporation, New York, N.Y.
Filed Mar. 25, 1987, Ser. No. 30,818
The portion of the term of this patent subsequent to Aug. 9, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—126



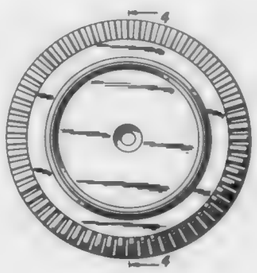
314,928
WATCH CROWN
Eddy Schoepfer, La Chaux-du-Milieu, Switzerland, assignor to Fabrique Ebel, Societe Anonyme, La Chaux-de-Fonds, Switzerland
Filed Oct. 19, 1987, Ser. No. 110,474
Claims priority, application Hague, May 13, 1987, DM008636
Term of patent 14 years
U.S. Cl. D10—131



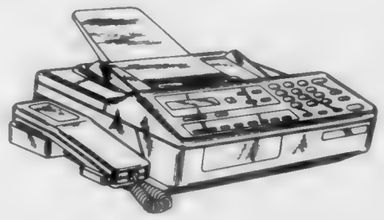
314,929
BRACELET OR THE LIKE
Meang Chia, and Cheo Chia, both of Chain & Charm Manufacturers, 412 W. 6th St., Suite #1104, Los Angeles, Calif. 90014
Filed Aug. 22, 1989, Ser. No. 397,094
Term of patent 14 years
U.S. Cl. D11—6



314,930
BADGE SHIELD
Thomas R. Freeman, Savage, Minn., assignor to Paragon Classics, Inc., Spring Lake Park, Minn.
Filed Dec. 19, 1988, Ser. No. 285,955
Term of patent 14 years
U.S. Cl. D11—96

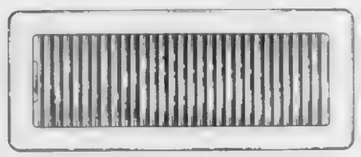


314,931
FACSIMILE TRANSCEIVER
Hajime Takayama; Hidenori Tomachi; Hiroshi Okano; Kiyoshi Asano, all of Kanagawa; Hironosuke Koda, and Munenori Fujimoto, both of Tokyo, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan
Filed Jun. 16, 1989, Ser. No. 367,514
Claims priority, application Japan, Dec. 20, 1988, 63-49517
Term of patent 14 years
U.S. Cl. D14—118



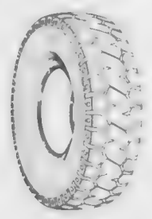
VOL 1123 ISS 4 FE 26 1991 UMI

314,932
MOTORCYCLE RADIO COVER
Fred O. Hoese, Bulverde, Tex., assignor to Hoese Corporation, Bulverde, Tex.
Filed Jan. 13, 1988, Ser. No. 143,599
Term of patent 14 years
U.S. Cl. D12—114

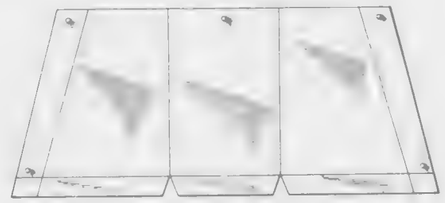




314,933
AUTOMOBILE TIRE
Akihito Goto, and Minoru Nakano, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 179,000
Claims priority, application Japan, Oct. 7, 1987, 62-40792
Term of patent 14 years
U.S. Cl. D12—146



314,934
FOLDABLE VEHICLE WINDSHIELD PROTECTOR
James P. Howes, 33 Cedar Hill, Wilton, Conn. 06897
Filed Apr. 25, 1988, Ser. No. 185,805
Term of patent 14 years
U.S. Cl. D12—155

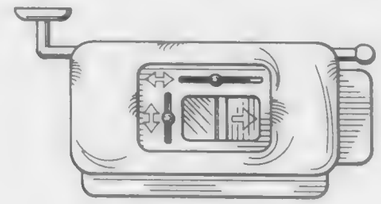


314,935
OFFSET WHEEL AXLE EXTENSION FOR VEHICLE
Roger B. Collins, 10 Kauri Ct., Palm Beach Qld., Australia
Filed Dec. 29, 1987, Ser. No. 139,712
Term of patent 14 years
U.S. Cl. D12—160

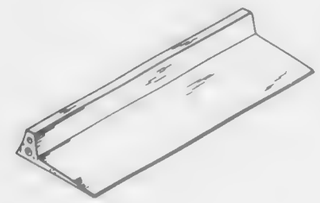
314,936
VISOR
Abdi R. Lawassani, Pontiac, and Mark J. Wasik, Alma, both of Mich., assignors to United Technologies Automotive, Dearborn, Mich.
Filed May 26, 1989, Ser. No. 357,441
Term of patent 14 years
U.S. Cl. D12—191



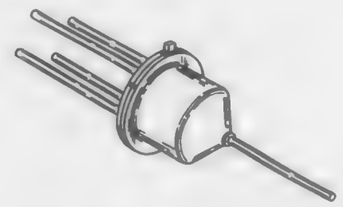
314,937
VEHICLE SUN VISOR
Kathleen D. Adam, P.O. Box 354, Stafford, Va. 22554
Filed Aug. 16, 1989, Ser. No. 394,508
Term of patent 14 years
U.S. Cl. D12—191



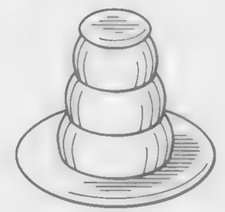
314,938
GARAGE FLOOR CAR STOP
Kenneth W. Anderson, Springfield, Ill., assignor to Anderson Seal Company, Rochester, Ill.
Filed May 12, 1988, Ser. No. 194,011
Term of patent 14 years
U.S. Cl. D12—217



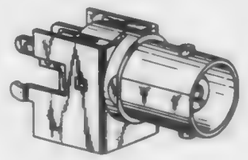
314,939
TILT SWITCH
Leonard P. Tetrault, Northport, and James R. Miller, Center Moriches, both of N.Y., assignors to Aerodyne Controls Corporation, Ronkonkoma, N.Y.
Filed Sep. 28, 1987, Ser. No. 101,765
Term of patent 14 years
U.S. Cl. D13—158



314,940
BATTERY CORROSION ELIMINATOR
Henry Lewis, 3636 Sharpe Ave., Memphis, Tenn. 38411
Filed Nov. 13, 1987, Ser. No. 126,685
Term of patent 14 years
U.S. Cl. D13—119



314,941
RF COAXIAL CONNECTOR
Ryusuke Amachi, Nishinomiya, and Masanori Tanaka, Osaka, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan
Filed Mar. 21, 1988, Ser. No. 171,519
Claims priority, application Japan, Sep. 25, 1987, 62-39214
Term of patent 14 years
U.S. Cl. D13—133

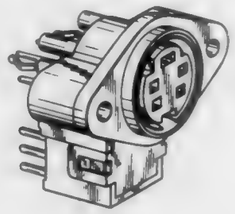


314,942
ELECTRICAL CONNECTOR HOUSING
Kensaku Sato, and Koichi Akiyama, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Sep. 15, 1987, Ser. No. 96,383
Claims priority, application Japan, Mar. 31, 1987, 62-11974; Mar. 31, 1987, 62-11975; Mar. 31, 1987, 62-11976; Mar. 31, 1987, 62-11977
Term of patent 14 years
U.S. Cl. D13—147

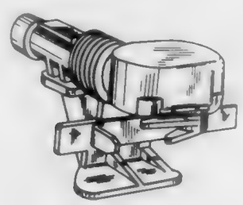


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314,943
CONNECTOR SOCKET
Kyousuke Tajima, Gunma, Japan, assignor to Hosiden Electronics Co. Ltd., Osaka, Japan
Filed Feb. 16, 1988, Ser. No. 155,936
Claims priority, application Japan, Aug. 19, 1987, 62-33738
Term of patent 14 years
U.S. Cl. D13—147



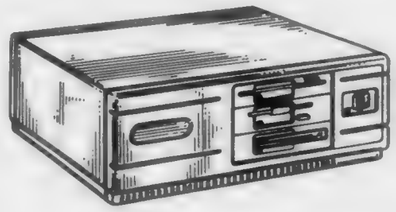
314,944
INTERRUPTER UNIT FOR A SWITCH ASSEMBLY
John Urbanek, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.
Filed Jun. 29, 1987, Ser. No. 67,906
Term of patent 14 years
U.S. Cl. D13—160



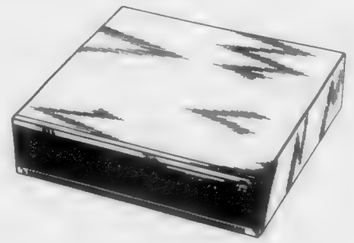
314,945
HEAT SINK
Alfred F. McCarthy, Belmont, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Dec. 9, 1988, Ser. No. 282,290
Term of patent 14 years
U.S. Cl. D13—179



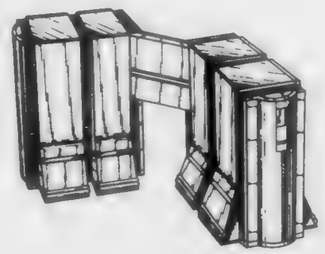
314,946
PERSONAL COMPUTER
Donald S. Goodrich, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Filed Jun. 17, 1988, Ser. No. 208,511
Term of patent 14 years
U.S. Cl. D14—100



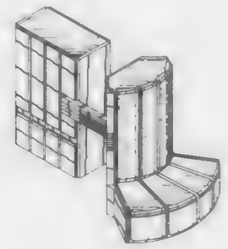
314,947
CENTRAL PROCESSING UNIT FOR A COMPUTER
Tetsuya Imamura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 15, 1990, Ser. No. 481,462
Claims priority, application Japan, Nov. 6, 1989, 1-40422
Term of patent 14 years
U.S. Cl. D14—100



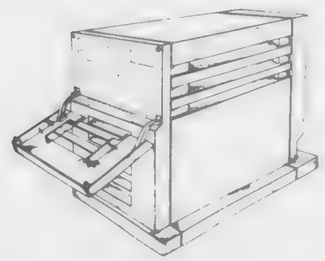
314,948
COMPUTER CABINET
Steven J. Dean, Chippewa Falls; David M. Morton, Eau Claire, both of Wis.; Eugene N. Reshanov, Golden Valley, and Eric J. Mueller, St. Paul, both of Minn., assignors to Cray Research, Inc., Minneapolis, Minn.
Filed Aug. 8, 1989, Ser. No. 391,371
Term of patent 14 years
U.S. Cl. D14—102



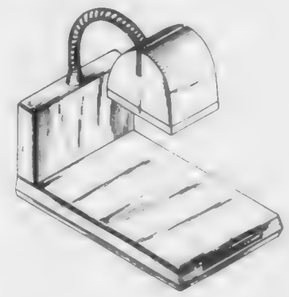
314,949
COMPUTER CABINET
Stephen Cermak, III; Manville A. Hoeft, both of Elk Mound; Lawrence C. Zylka, Menomonie, all of Wis.; Eugene N. Reshanov, Golden Valley, and Eric J. Mueller, St. Paul, both of Minn., assignors to Cray Research, Inc., Minneapolis, Minn.
Filed Oct. 25, 1989, Ser. No. 427,328
Term of patent 14 years
U.S. Cl. D14—102



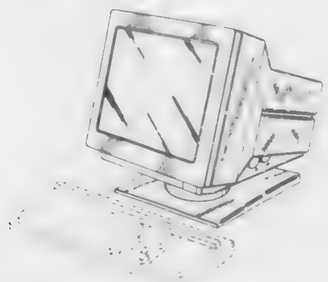
314,950
TWELVE SLOT COMPUTER HOUSING
Tuan T. Vu; Michael J. Lee, both of San Jose; Siamak Salimpour, Danville; Philip G. Yurkonis, Campbell; Herbert Pfeifer, San Jose; Nick Brawne, San Francisco, and Howell Hsiao, Mountain View, all of Calif., assignors to Sun Microsystems, Mountain View, Calif.
Filed Jan. 8, 1990, Ser. No. 461,779
Term of patent 14 years
U.S. Cl. D14—102



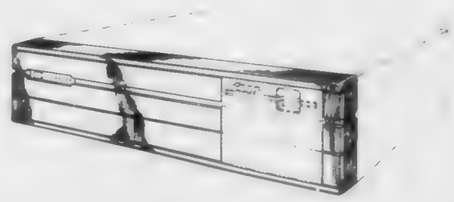
314,951
COUNTERTOP OPTICAL SCANNER WITH CREDIT CARD READER
Jerome Swartz, Old Field, N.Y., assignor to Symbol Technologies, Inc., Bohemia, N.Y.
Filed Mar. 20, 1989, Ser. No. 255,889
Term of patent 14 years
U.S. Cl. D14—107



314,952
VIDEO DISPLAY TERMINAL OR SIMILAR ARTICLE
Anthony R. Orchard, Wantagh; Paul Matwey, Mt. Sinai; Lloyd A. Samuels, Kew Garden Hills; Brian K. Fisher, Douglaston, and Robert G. Doherty, Massapequa Park, all of N.Y., assignors to NCR Corporation, Dayton, Ohio
Filed Oct. 21, 1988, Ser. No. 261,642
Term of patent 14 years
U.S. Cl. D14—113

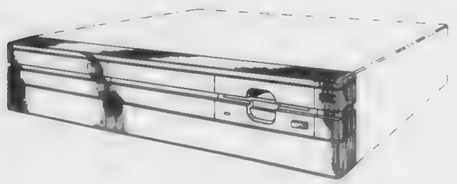


314,953
LARGE CHASSIS COMPUTER BEZEL
Robert A. Welch, Austin, Tex., assignor to Compuadd Corporation, Austin, Tex.
Filed Jul. 20, 1989, Ser. No. 382,574
Term of patent 14 years
U.S. Cl. D14—115

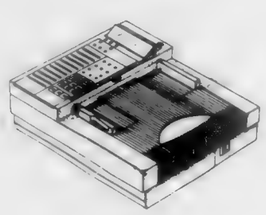


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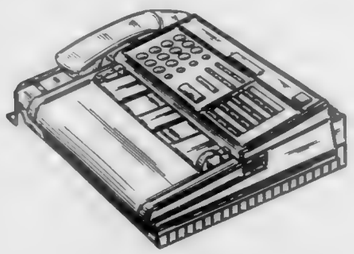
314,954
LOW PROFILE COMPUTER BEZEL
Robert A. Welch, Austin, Tex., assignor to Compuadd Corporation, Austin, Tex.
Filed Jul. 20, 1989, Ser. No. 382,575
Term of patent 14 years
U.S. Cl. D14—115



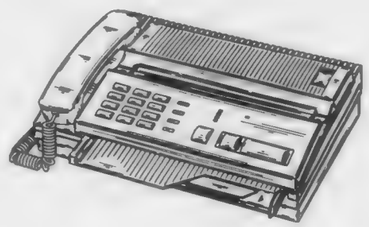
314,955
FACSIMILE TRANSMITTER/RECEIVER
Hiroaki Watanabe, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 8, 1989, Ser. No. 363,112
Claims priority, application Japan, Dec. 8, 1988, 63-47819
Term of patent 14 years
U.S. Cl. D14—118



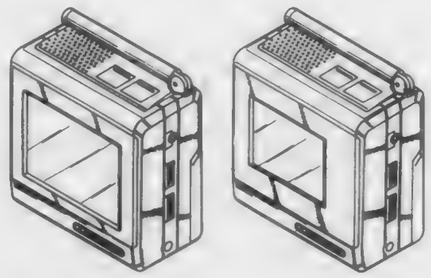
314,956
FACSIMILE
Akira Tsukada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 27, 1989, Ser. No. 372,258
Claims priority, application Japan, Dec. 28, 1988, 63-51355
Term of patent 14 years
U.S. Cl. D14—118



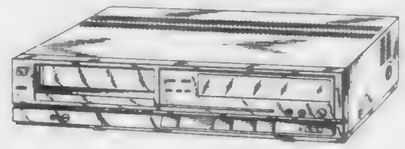
314,957
FACSIMILE
Akira Tsukada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 5, 1989, Ser. No. 403,149
Claims priority, application Japan, Mar. 8, 1989, 1-8649
Term of patent 14 years
U.S. Cl. D14—118



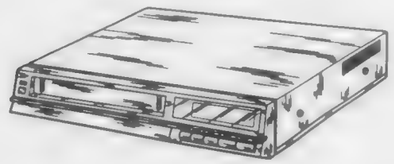
314,958
PORTABLE TELEVISION SET
Akihiro Miyahara, Kunitachi; Hiroshi Nakatsuka, Kokubunji, and Asao Sasaki, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Aug. 11, 1988, Ser. No. 231,541
Claims priority, application Japan, May 6, 1988, 63-17979; May 6, 1988, 63-17978; May 10, 1988, 63-18383; May 10, 1988, 63-18382
Term of patent 14 years
U.S. Cl. D14—126



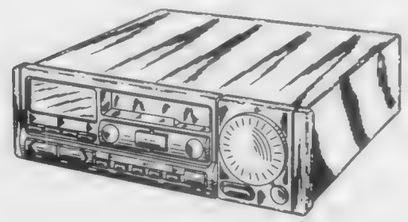
314,959
VIDEO TAPE RECORDER
Kenichiro Kohno, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed May 17, 1988, Ser. No. 195,016
Claims priority, application Japan, Nov. 30, 1987, 62-48966
Term of patent 14 years
U.S. Cl. D14—135



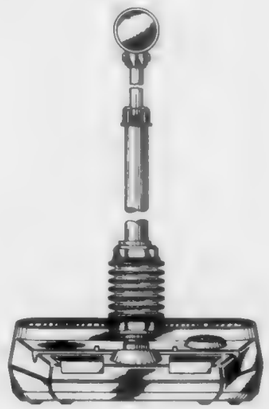
314,960
VIDEO CASSETTE RECORDER
Doo S. Yang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 10, 1988, Ser. No. 205,106
Claims priority, application Rep. of Korea, Dec. 29, 1987, 19605/1987
Term of patent 14 years
U.S. Cl. D14—135



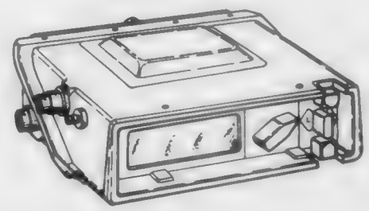
314,961
CAR RADIO RECEIVER
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 7, 1988, Ser. No. 216,743
Claims priority, application United Kingdom, Jan. 20, 1988, 1047818
Term of patent 14 years
U.S. Cl. D14—157



314,962
PUBLIC ADDRESS UNIT
M. Allyson Hilton, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 4, 1987, Ser. No. 128,563
Term of patent 14 years
U.S. Cl. D14—185

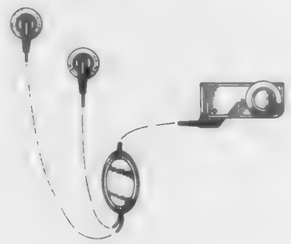


314,963
CABINET FOR A GLOBAL POSITIONING SYSTEM NAVIGATION RECEIVER
Melvin H. M. Best, Topanga; Valentine L. Denninger, Sunnyvale; John G. Tang, Redwood City; Lynn Weber, Saratoga; Paul K. Janowski, Simi, and Andrew Stavros, San Jose, all of Calif., assignors to Trimble Navigation, Ltd., Sunnyvale, Calif.
Filed Aug. 26, 1988, Ser. No. 237,002
Term of patent 14 years
U.S. Cl. D14—188

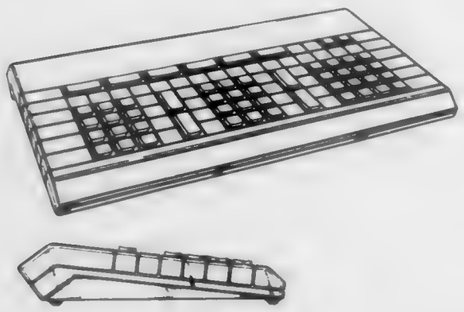


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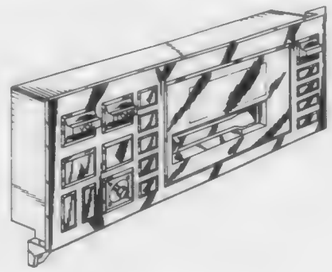
314,964
RADIO RECEIVER
Chanhong Chung, Seoul, Rep. of Korea, assignor to Myoung Jung Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Nov. 10, 1988, Ser. No. 269,950
Term of patent 14 years
U.S. Cl. D14—192



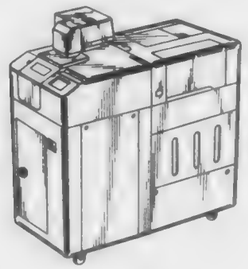
314,965
TELEPHONE CONSOLE
Carlton M. Langton, Nottinhham, England, assignor to GEC Plessey Telecommunications Limited, Coventry, England
Filed Jul. 13, 1989, Ser. No. 379,445
Claims priority, application United Kingdom, Jan. 19, 1989, 1056484
Term of patent 14 years
U.S. Cl. D14—241



314,966
CONTROL UNIT FOR A COMBINED CAR RADIO RECEIVER CASSETT PLAYER AND DIGITAL CLOCK
Andrew D. Magic, Livonia, Mich.; Frank H. Klein, Huntsville, Ala.; Gilbert L. McCauley, Detroit, and Thomas C. Slanec, Grosse Pointe Woods, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Apr. 14, 1988, Ser. No. 185,766
Term of patent 14 years
U.S. Cl. D14—258



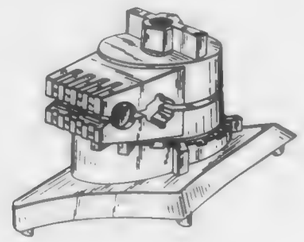
314,967
PRINTER PROCESSOR FOR MAKING PHOTOGRAPHIC PRINTS
Mikio Takahashi, and Masahiro Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 17, 1988, Ser. No. 169,356
Claims priority, application Japan, Sep. 18, 1987, 62-38091
Term of patent 14 years
U.S. Cl. D16—246



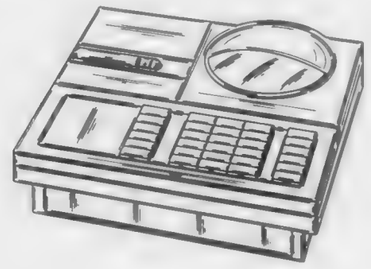
314,968
SOUND REVERBERATOR FOR STRING MUSICAL INSTRUMENT
Roberto Aspri; Claude Maufette, and Michel Dallaire, all of Montreal, Canada, assignors to Les Entreprises Roberto Aspri Ltee, Montreal, Canada
Filed May 16, 1988, Ser. No. 196,092
Term of patent 14 years
U.S. Cl. D17—20



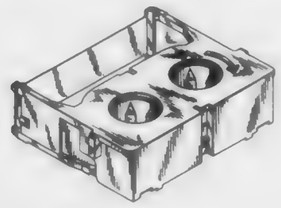
314,969
DRUM SPUR HOLDER
Masamichi Nakayama, Nagoya, and Yoshiki Hoshino, Owariasahi, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan
Filed Feb. 5, 1987, Ser. No. 11,229
Term of patent 14 years
U.S. Cl. D17—22



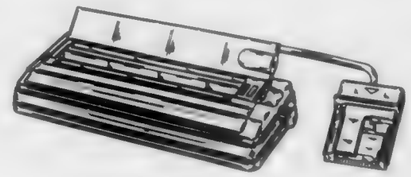
314,970
CASH REGISTER
Maki Tomoike, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 5, 1989, Ser. No. 334,117
Term of patent 14 years
U.S. Cl. D18—4



314,971
INK RIBBON CARTRIDGE
Osamu Nakamura; Masahiro Kamijo, and Masahiro Fujii, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed May 11, 1988, Ser. No. 192,818
Claims priority, application Japan, Nov. 30, 1987, 62-49064
Term of patent 14 years
U.S. Cl. D18—12



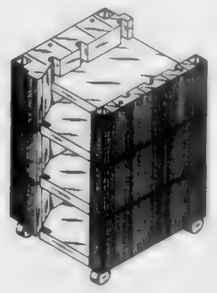
314,972
COMBINED PRINTER AND PLUG FOR WORD PROCESSOR
Kazumi Osaka; Shinsaku Hino, and Tatsumi Wada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 15, 1988, Ser. No. 271,771
Claims priority, application Japan, May 16, 1988, 63-19329
Term of patent 14 years
U.S. Cl. D18—13



314,973
INK CARTRIDGE FOR PRINTER
Ei Yamamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 19, 1988, Ser. No. 221,177
Claims priority, application Japan, Jan. 22, 1988, 63-2206
Term of patent 14 years
U.S. Cl. D18—22



314,974
PRINTER STAND
Stephen Peart, 21116 Locust Dr., Los Gatos, Calif. 95031
Filed Oct. 17, 1989, Ser. No. 423,122
Term of patent 14 years
U.S. Cl. D18—23

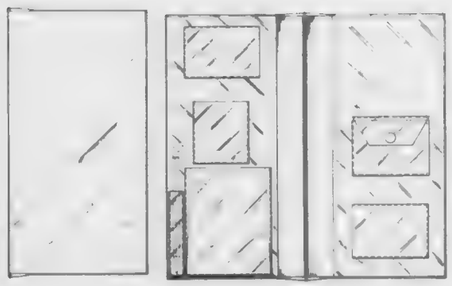


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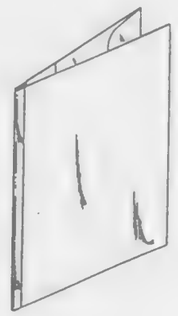
314,975
COPYING MACHINE
Yoshie Katada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 19, 1988, Ser. No. 158,152
Claims priority, application Japan, Aug. 21, 1987, 62-34245
Term of patent 14 years
U.S. Cl. D18—37

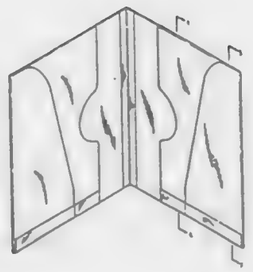


314,976
ORGANIZER FOR RACING FORM AND OTHER ITEMS
Isidoro Loredo, 1067 Parkside Ave., Manteca, Calif. 95336
Filed Dec. 28, 1988, Ser. No. 291,195
Term of patent 14 years
U.S. Cl. D19—26



314,977
FOLDER
Jon R. Wyant, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Mar. 6, 1989, Ser. No. 319,230
Term of patent 14 years
U.S. Cl. D19—27





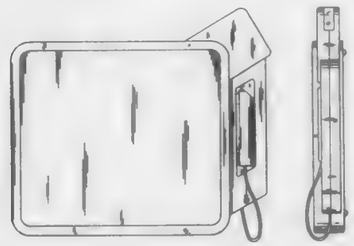
314,978
WRITING INSTRUMENT
Shigeo Oka, Numabukuro, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 22, 1987, Ser. No. 136,639
Term of patent 14 years
U.S. Cl. D19—48



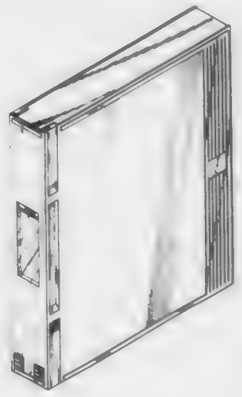
314,979
WRITING INSTRUMENT
Michael H. Gonzales, 806 Sladkey Ave., Mountain View, Calif. 94040
Filed Nov. 13, 1987, Ser. No. 119,987
Term of patent 14 years
U.S. Cl. D19—51



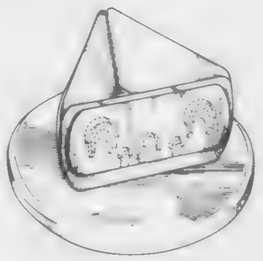
314,980
ELECTRONIC LEARNING AID
Donny Leung, Tai Koo Sing, Hong Kong, assignor to Video Technology Industries, Inc., Wheeling, Ill.
Filed Apr. 15, 1988, Ser. No. 182,316
Claims priority, application United Kingdom, Oct. 28, 1987, 1,045,904
Term of patent 14 years
U.S. Cl. D19—60



314,981
FILE BOX
H. Charles Hassel, Los Angeles, Calif., assignor to MicroComputer Accessories, Inc., Los Angeles, Calif.
Filed Nov. 5, 1987, Ser. No. 117,647
Term of patent 14 years
U.S. Cl. D19—75

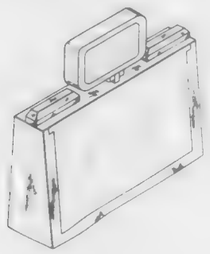


314,982
ROTATING BASE FOR A FILE ASSEMBLY
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Oct. 15, 1987, Ser. No. 108,976
Term of patent 14 years
U.S. Cl. D19—99

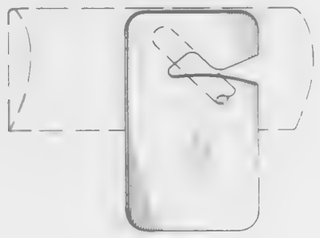


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314,983
EMERGENCY SIGN
Joe Cangianni, 306 5th St., Mamaroneck, N.Y. 10543, and Jesse L. Colodner, Pearl River, N.Y., assignors to Joe Cangianni, Mamaroneck, N.Y.
Filed Apr. 4, 1988, Ser. No. 176,993
Term of patent 14 years
U.S. Cl. D20—10



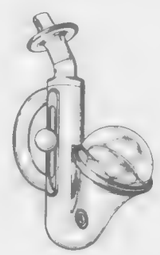
314,984
HANGTAG
David J. Hass, 9 Margret Ann La., Suffern, N.Y. 10901
Filed Feb. 4, 1988, Ser. No. 152,058
Term of patent 14 years
U.S. Cl. D20—22



314,985
GAME TABLE
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons-Le-Saunier, France
Filed Aug. 3, 1988, Ser. No. 227,916
Claims priority, application World Int. Prop. O., Feb. 12, 1988, DM/010,254
Term of patent 14 years
U.S. Cl. D21—11



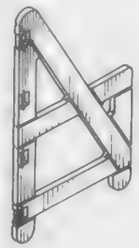
314,986
TOY SAXOPHONE
Takehiko Takahashi; Yoshiyasu Ishii, and Taira Hanashima, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jun. 29, 1988, Ser. No. 212,860
Claims priority, application Japan, Jan. 7, 1988, 63-214
Term of patent 14 years
U.S. Cl. D21—64



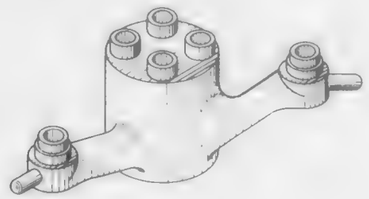
314,987
TOY KITE
John J. Kovats, Fernandina Beach, Fla., assignor to Space Adventures, Inc., Fernandina Beach, Fla.
Filed Dec. 27, 1988, Ser. No. 289,782
Term of patent 14 years
U.S. Cl. D21—89



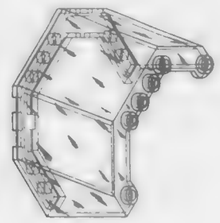
314,988
TOY GATE
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego AG, Switzerland
Filed Nov. 29, 1989, Ser. No. 442,923
Term of patent 14 years
U.S. Cl. D21—108



314,989
TOY TREE ELEMENT
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,926
Term of patent 14 years
U.S. Cl. D21—108



314,990
TOY BUILDING ELEMENT
Arne Refsing, Billund, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,927
Term of patent 14 years
U.S. Cl. D21—108



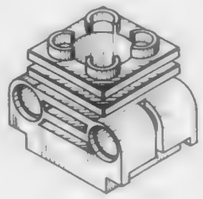
314,991
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Jan Ryaa, Billund, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,928
Claims priority, application Denmark, Sep. 28, 1989, MA11911989
Term of patent 14 years
U.S. Cl. D21—108



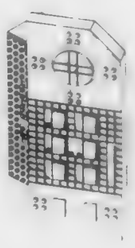
314,992
TOY GHOST
Stig Spangsberg, Vejle, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,929
Term of patent 14 years
U.S. Cl. D21—108



314,993
TOY BUILDING ELEMENT
Jan Hatting, and Ole V. Poulsen, both of Vejle, Denmark, assignors to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,930
Term of patent 14 years
U.S. Cl. D21—108

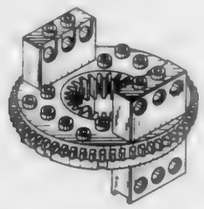


314,994
TOY CONTROL PANEL ELEMENT
Ole V. Poulsen, Vejle, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,931
Term of patent 14 years
U.S. Cl. D21—108

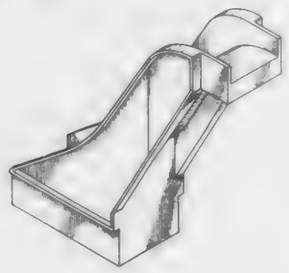


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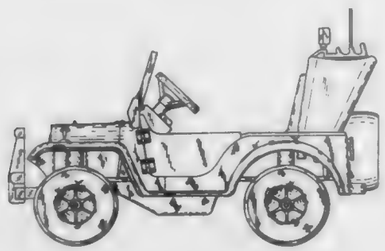
314,995
TOY BUILDING ELEMENT
Ole V. Poulsen, and Jan Hatting, both of Vejle, Denmark, assignors to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 442,932
Term of patent 14 years
U.S. Cl. D21—108



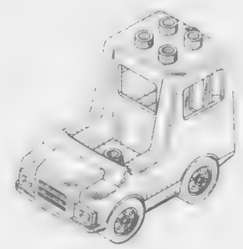
314,996
TOY CONSTRUCTION PIECE SIMULATING A CHUTE
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego AG, Switzerland
Filed Nov. 29, 1988, Ser. No. 277,917
Term of patent 14 years
U.S. Cl. D21—109



314,997
TOY VEHICLE WITH CANOPY
Lawrence R. Harrod, Fort Wayne, Ind., assignor to Kransco, San Francisco, Calif.
Filed Jul. 13, 1989, Ser. No. 379,532
Term of patent 14 years
U.S. Cl. D21—134



314,998
TOY TRUCK
Ib H. Berggren, Vedbaek, Denmark, assignor to Interlego AG, Switzerland
Filed Nov. 29, 1989, Ser. No. 442,925
Term of patent 14 years
U.S. Cl. D21—134



314,999
MOTOR DRIVEN TOY FLOWER
Isamu Kataoka, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 3, 1989, Ser. No. 318,355
Claims priority, application Japan, Dec. 27, 1988, 63-51444
Term of patent 14 years
U.S. Cl. D21—150



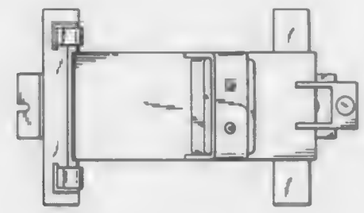
315,000
TOY MONKEY
Christian Stephensen, Marstal, and Jacob Nielsen, Copenhagen, both of Denmark, assignors to Interlego AG, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,225
Term of patent 14 years
U.S. Cl. D21—156



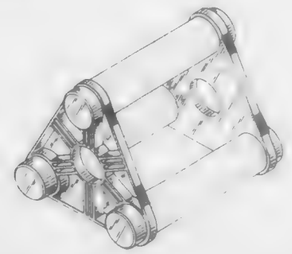
315,001
SNOWMAN ACCESSORY KIT
Earle C. Bennett, 48 N. Third Ave., Ilion, N.Y. 13357
Filed Mar. 11, 1988, Ser. No. 166,609
Term of patent 14 years
U.S. Cl. D21—189



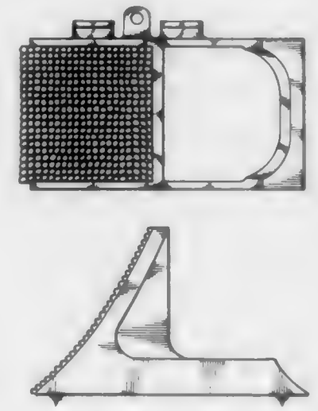
315,002
FOOT PRESS
Larry M. Ward, 331 S. Jasper St., Olney, Ill. 62450
Filed Mar. 14, 1988, Ser. No. 168,322
Term of patent 14 years
U.S. Cl. D21—191



315,003
DUMBBELL
David Huang, 424, Sec. 2, Yuan Lu Rd., Shi Szu Village, Fu Shin Hsiang, Changhua, Taiwan
Filed Mar. 3, 1988, Ser. No. 164,375
Claims priority, application Taiwan, Sep. 21, 1987, 76305752
Term of patent 14 years
U.S. Cl. D21—197



315,004
FOOT SUPPORT BLOCK FOR RUNNER
Milton A. Newton, Jr., 196 Prospect St., Desert Hot Springs, Calif. 92246
Filed Jan. 12, 1988, Ser. No. 143,144
Term of patent 14 years
U.S. Cl. D21—199



315,005
GOLF PUTTER HEAD
Karsten Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.
Filed Mar. 21, 1988, Ser. No. 170,460
Term of patent 14 years
U.S. Cl. D21—219

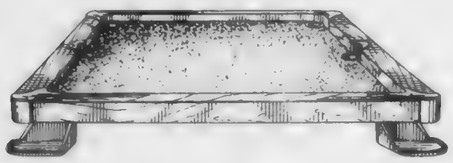


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315,006
GOLF CLUB GRIP
Karsten Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.
Filed Mar. 7, 1988, Ser. No. 164,989
Term of patent 14 years
U.S. Cl. D21—222



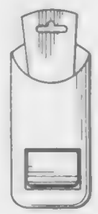
315,007
GAME TABLE
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons-Le-Saunier, France
Filed Aug. 3, 1988, Ser. No. 227,914
Term of patent 14 years
U.S. Cl. D21—232



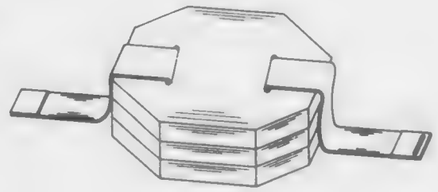
315,008
GOLF TEE HOLDING BAG TAG
Frank J. Popovits, 11707 South Carolyn La., Alsip, Ill. 60658
Filed May 26, 1988, Ser. No. 198,917
Term of patent 14 years
U.S. Cl. D21—234



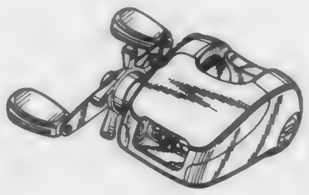
315,009
COMBINED GOLF TOOL AND COIN HOLDER
Albert A. Ingalls, 36 Rivermount Terr., Burlington, Vt. 05401
Filed Jun. 23, 1988, Ser. No. 210,122
Term of patent 14 years
U.S. Cl. D21—234



315,010
FLOTATION DEVICE
Debra A. Stevens, 523 Renny Ave., Idaho Falls, Id. 83401
Filed Oct. 11, 1988, Ser. No. 255,418
Term of patent 14 years
U.S. Cl. D21—238



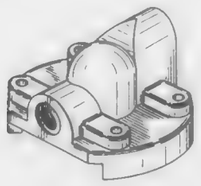
315,011
FISHING REEL
Yasuhisa Kameda, and Shinichi Asano, both of Musashino, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Dec. 20, 1988, Ser. No. 286,766
Claims priority, application Japan, Jun. 28, 1988, 63-25633
Term of patent 14 years
U.S. Cl. D22—140



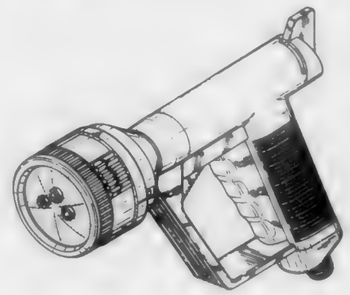
315,012
FISHING ROD HOLDER
Howard D. Koga, 2110 N. Poinsettia St., Santa Ana, Calif. 92706
Filed Nov. 28, 1988, Ser. No. 277,048
Term of patent 14 years
U.S. Cl. D22—147



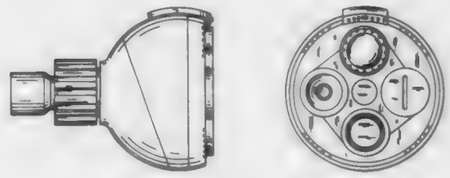
315,013
HEAD FOR A QUICK-CHANGE FILTER CARTRIDGE
Raymond M. Petrucci, Middlebury; Bruce G. Taylor, Kensington; Edward C. Giordano, Manchester, all of Conn.; James M. Padilla, Covina Heights, and Carl Palmer, La Habra Heights, both of Calif., assignors to Cuno Incorporated, Meriden, Conn.
Division of Ser. No. 128,505, Dec. 3, 1987, Pat. No. Des. 306,755, which is a continuation-in-part of Ser. No. 822,549, Jan. 27, 1986, abandoned. This application Sep. 26, 1989, Ser. No. 412,871
Term of patent 14 years
U.S. Cl. D23—209



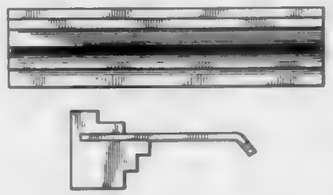
315,014
SPRAYER
Franco Clivio, Zurich, Switzerland, assignor to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Feb. 10, 1988, Ser. No. 155,000
Term of patent 14 years
U.S. Cl. D23—226



315,015
WALL MOUNTED SHOWER HEAD
Francois Geneve; Luc Heiligenstein, and Stephen Melamed, all of Chicago, Ill., assignors to Associated Mills, Inc., Chicago, Ill.
Filed Mar. 6, 1989, Ser. No. 319,647
Term of patent 14 years
U.S. Cl. D23—229



315,016
SPOUT
Regina Razumov, San Diego, Calif., assignor to Harden Industries, Inc., Los Angeles, Calif.
Filed Apr. 5, 1988, Ser. No. 178,079
Term of patent 14 years
U.S. Cl. D23—255

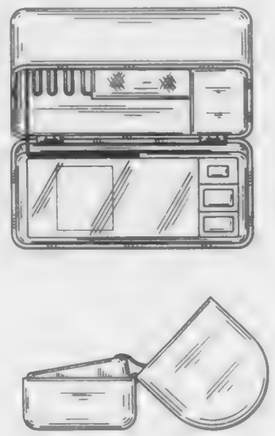


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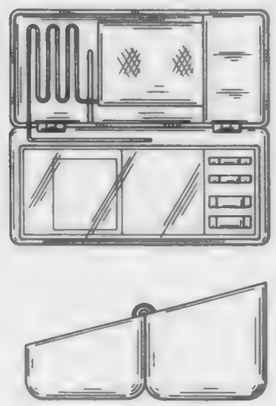
315,017
COMBINED WATER CLOSET AND SEAT
Jean-Philippe Lenclos, Paris, France, assignor to Produits Ceramiques de Touraine, Selles-sur-Cher, France
Filed Apr. 21, 1987, Ser. No. 41,741
Claims priority, application France, Oct. 21, 1986, 865.510
Term of patent 14 years
U.S. Cl. D23—301



315,019
SPHYGMOMANOMETER
Hiroshi Sakaguchi, and Masaki Kawamura, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 25, 1988, Ser. No. 160,491
Claims priority, application Japan, Aug. 27, 1987, 62-35004
Term of patent 14 years
U.S. Cl. D24—21



315,020
SPHYGMOMANOMETER
Hiroshi Sakaguchi, and Masaki Kawamura, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 25, 1988, Ser. No. 162,343
Claims priority, application Japan, Aug. 27, 1987, 62-35005
Term of patent 14 years
U.S. Cl. D24—21



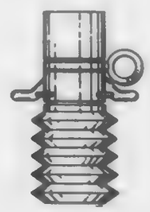
315,018
PORTABLE ELECTRICAL FAN
Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.
Filed Aug. 9, 1989, Ser. No. 390,992
Term of patent 14 years
U.S. Cl. D23—382



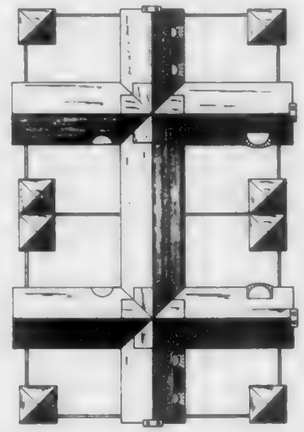
315,021
BABY BOTTLE
Michael A. Frosceno, 1447 SW. 32nd Ct., Ft. Lauderdale, Fla. 33315; Rolando Diaz, 9700 SW. 144 St., Miami, Fla. 33176, and Phillip D. Lucas, 10260 SW. 144 St., Miami, Fla. 33186
Filed Apr. 18, 1988, Ser. No. 182,747
Term of patent 14 years
U.S. Cl. D24—47



315,022
APPLICATOR FOR INJECTING MEDICAMENT INTO COW TEATS
Michael P. Corby, 19 Swinton Rise, Ravenshead, Nottinghamshire, England (NH15 9FS)
Filed Jun. 24, 1988, Ser. No. 213,971
Claims priority, application United Kingdom, Dec. 24, 1987, 1047389
Term of patent 14 years
U.S. Cl. D24—63



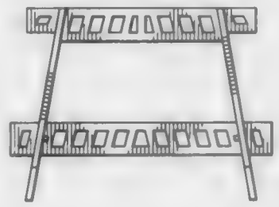
315,023
DUAL CRUCIFORM STRUCTURE
Louis J. Jean, Indianapolis, Ind., assignor to Atrium Structures, Inc., Indianapolis, Ind.
Filed Mar. 28, 1988, Ser. No. 172,782
The portion of the term of this patent subsequent to Feb. 13, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—17



315,024
DECORATIVE CEILING ARCH
Jonathan Grey, Midhurst, England, assignor to Smallbone plc, Reading, England
Filed Dec. 18, 1987, Ser. No. 134,894
Claims priority, application United Kingdom, Jun. 19, 1987, 1043006
Term of patent 14 years
U.S. Cl. D25—58

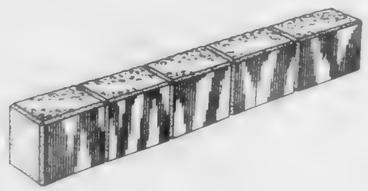


315,025
COLLAPSIBLE SAWHORSE
Craig Hall, 110 East Ave., Akron, N.Y. 14001
Filed Sep. 2, 1988, Ser. No. 239,975
Term of patent 14 years
U.S. Cl. D25—67

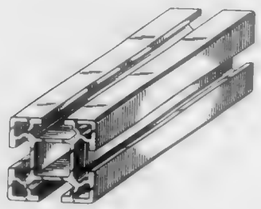


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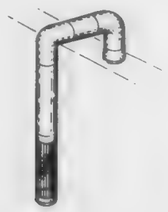
315,026
MOLDED CURB-STONE
Bertin Castonguay, Nuns' Island, and Alain Ratte, Terrebonne, both of Canada, assignors to Groupe Permacon Inc., Ville d'Anjou, Canada
Filed Jul. 21, 1989, Ser. No. 382,958
Claims priority, application Canada, Jun. 1, 1989, 01-06-89-2
Term of patent 14 years
U.S. Cl. D25—113



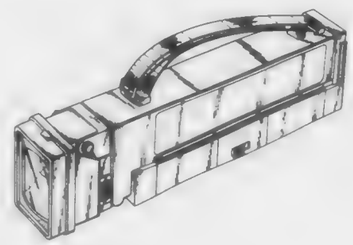
315,027
BEAM
Goran Abbestam, Gothenburg, and Leif Lachonius, Surte, both of Sweden, assignors to SKF Specialty Products AB, Gothenburg, Fed. Rep. of Germany
Filed Jun. 20, 1989, Ser. No. 368,527
Claims priority, application Sweden, Dec. 21, 1988, 882944
Term of patent 14 years
U.S. Cl. D25—124



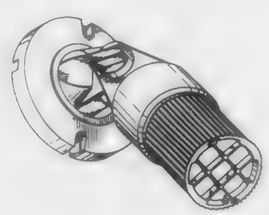
315,028
SUBMERSIBLE POOL LIGHT
Rick D. Grant, Vancouver; Wayne E. Moore, Yacolt; Tom J. Penman, Vancouver, and Ronald K. Truscott, Brush Prairie, all of Wash., assignors to O'Ryan Industries, Vancouver, Wash.
Filed May 14, 1987, Ser. No. 49,455
Term of patent 14 years
U.S. Cl. D26—24



315,029
PORTABLE FLUORESCENT LAMP
Cheng L. Kwan, Kowloon, Hong Kong, assignor to Hang Tjuk Industrial Co., Ltd., Kowloon, Hong Kong
Filed Mar. 20, 1987, Ser. No. 28,333
Claims priority, application United Kingdom, Dec. 3, 1986, 1038503
Term of patent 14 years
U.S. Cl. D26—42



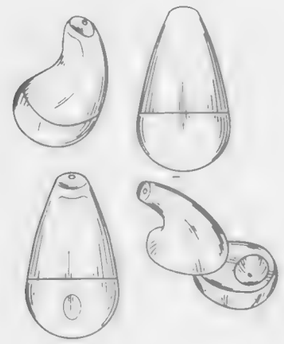
315,030
MINI-SPOTLIGHT
Richard H. Jacobs, Roseville; Ronald T. Keagle, Spring Park, both of Minn.; Gerald E. Peterson, Riverside, Calif., and Robert W. Beachy, St. Paul, Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Nov. 14, 1988, Ser. No. 271,147
Term of patent 14 years
U.S. Cl. D26—63



315,031
TORCHIERE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Mar. 7, 1989, Ser. No. 319,671
Term of patent 14 years
U.S. Cl. D26—105



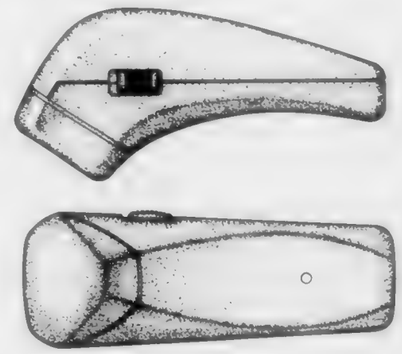
315,032
PIPE
Kiel R. Hayes, 17 Peyton St., Emporia, Kans. 66801
Filed Jun. 26, 1989, Ser. No. 371,595
Term of patent 14 years
U.S. Cl. D27—163



315,033
APPLICATOR FOR LOTIONS
Gloria A. Carugati, 21921 Elkwood St., Canoga Park, Calif. 91304
Filed Feb. 18, 1988, Ser. No. 156,947
Term of patent 14 years
U.S. Cl. D28—7



315,034
HOUSING FOR A DEPILATOR
Avner Platek, Tel-Aviv, Israel, assignor to Crestmoore Ltd., Jersey, Channel Islands
Filed Apr. 20, 1989, Ser. No. 340,595
Term of patent 14 years
U.S. Cl. D28—10

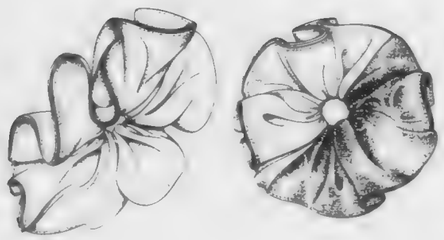


315,035
HAIR DRYER UNIT
Sharon D. Tucker, 3300 6th St., Apt. 201, Washington, D.C. 20032
Filed Aug. 9, 1988, Ser. No. 231,994
Term of patent 14 years
U.S. Cl. D28—12

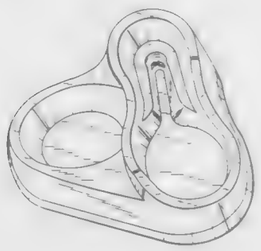


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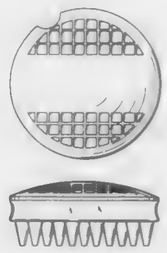
315,036
HAIRBAND
Lynnabeth Leopold, 390 Oak Ave. "DD" , Carlsbad, Calif. 92008
Filed Jun. 30, 1988, Ser. No. 214,101
Term of patent 14 years
U.S. Cl. D28—41



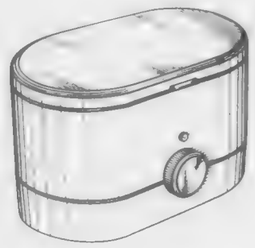
315,037
COMBINED AUTOMATIC PET WATERER AND FEEDER
Fred C. Clark, Arlington, Tex., assignor to Lot-A-Wata, Inc., Arlington, Tex.
Filed Mar. 14, 1989, Ser. No. 323,553
The portion of the term of this patent subsequent to Mar. 14, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—122



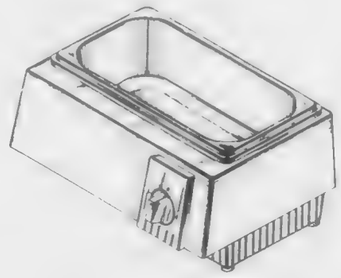
315,038
BRUSH FOR ANIMALS
Fletcher C. Strickler, 12610 LaGrange Rd., Louisville, Ky. 40245
Filed Sep. 5, 1989, Ser. No. 403,156
Term of patent 14 years
U.S. Cl. D30—158



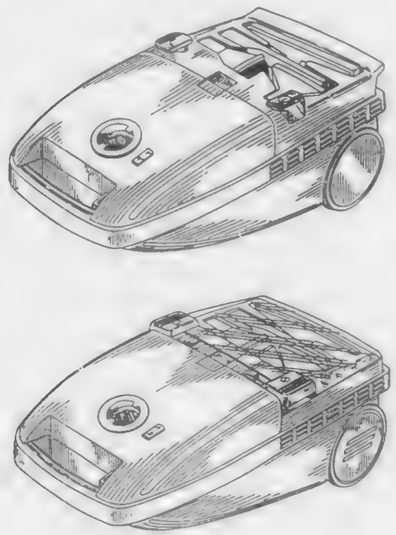
315,039
HOUSING FOR A MULTIPURPOSE ULTRASONIC CLEANER
Brent J. Wortham, 510 Pembrook Dr., Pasadena, Calif. 91107
Filed Apr. 25, 1988, Ser. No. 185,930
Term of patent 14 years
U.S. Cl. D32—1



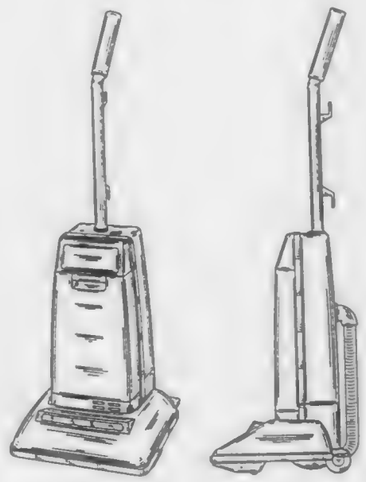
315,040
ULTRASONIC CLEANING MACHINE
Alan Miller, New York, N.Y., assignor to Ipco Corp., White Plains, N.Y.
Filed Dec. 20, 1988, Ser. No. 287,991
Term of patent 14 years
U.S. Cl. D32—1



315,041
VACUUM CLEANER
Sidney H. Bradd, Solon, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Jun. 28, 1989, Ser. No. 372,939
Term of patent 14 years
U.S. Cl. D32—21

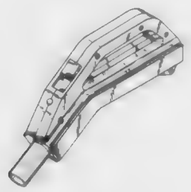


315,042
VACUUM CLEANER
Matafumi Ikeda, Osaka, Japan, assignor to Sharp Corporation. Osaka, Japan
Filed Oct. 24, 1989, Ser. No. 426,089
Claims priority, application Japan, Apr. 25, 1989, 1-15668
Term of patent 14 years
U.S. Cl. D32—22

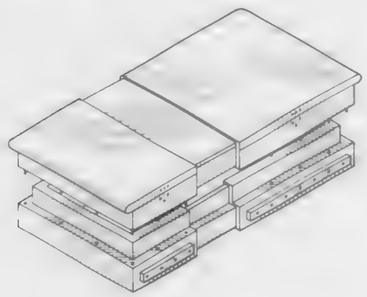


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315,043
CENTRAL VACUUM SYSTEM HOSE HANDLE
Theodore R. Hayden, 10291 Springhill Crescent, Richmond, British Columbia, Canada (V7E 1W7)
Filed Aug. 1, 1988, Ser. No. 226,959
Term of patent 14 years
U.S. Cl. D32—34



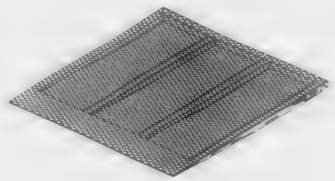
315,044
FRAME FOR HOLDING GARBAGE AND TRASH BAGS
Dale R. Hill, 1614 E. Cork St., Apt. 1A, Kalamazoo, Mich. 49001
Filed May 18, 1988, Ser. No. 195,174
Term of patent 14 years
U.S. Cl. D34—10



315,045
DATA BOX FOR A HOUSE FOR SALE
Cynthia L. Vanaman, 1091 Vessel La., Manahawkin, N.J. 08050
Filed Sep. 12, 1988, Ser. No. 242,502
Term of patent 14 years
U.S. Cl. D99—30



315,046
MODULAR WHEEL CHAIR RAMP UNIT
Lorne Abrams, 339 Wardlaw Avenue, Winnipeg, Manitoba, Canada (R3L 0L5)
Filed Jul. 21, 1987, Ser. No. 75,881
Term of patent 14 years
U.S. Cl. D34—32



LIST OF PATENTEES

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NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abel, Alan D.; Waldron, William E.; and Wells, Theodore F., to Air Products and Chemials, Inc. Control of product withdrawal from a sorptive separation system. 4,995,889, Cl. 55-21.000.

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Abrosimov, Vladimir A.; Luzev, Viktor F.; Lyapunov, Vladimir N.; Kuznetsov, Jury N.; Manerov, Vladimir B.; and Skuinsh, Leon M. Method of electromagnetic working of materials. 4,995,730, Cl. 366-273.000

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Adachi, Toshiaki, to Isuzu Motors Limited. Combustion chamber. 4,995,360, Cl. 123-262.000.

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Adamovsky, Grigory, to United States of America, National Aeronautics and Space Administration. Fiber optic sensing system. 4,995,697, Cl. 350-96.290.

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Aiken, Robert B., Sr. Scrolling sign with improved web guide. 4,995,183, Cl. 40-518.000.

Aikens, Wallace R., to Gulton Industries, Inc. Multi-color illuminating system. 4,996,632, Cl. 362-32.000.

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649 4,995,182

CLASS 42

50 4,995,179
70.07 4,995,180

CLASS 43

6 B1 4,685,239
8 4,995,187
23 4,995,188
42.31 4,995,189

CLASS 47

1.01 4,995,190
25 4,995,191
30 4,995,192

CLASS 48

197 R 4,995,193

CLASS 49

32 4,995,194
118 4,995,195
477 4,995,196

CLASS 51

7 Re.33,542
219 R 4,995,301
281 R 4,995,197
295 4,995,887
319 4,995,198
326 4,995,199
358 4,995,200
411 4,995,201
439 4,995,202

CLASS 52

6 4,995,203
126.1 4,995,204
189 4,995,205
200 4,995,208
210 4,995,207
238.1 4,995,209
297 4,995,206
391 4,995,210
582 4,995,211
646 4,995,212
656 4,995,213
657 4,995,214
747 4,995,215
770 4,995,605

CLASS 53

64 4,995,216
176 4,995,223
410 4,995,217
4,995,218
4,995,219
411 4,995,220
418 4,995,221
455 4,995,222
510 4,995,224
540 4,995,225
556

CLASS 54

49 4,995,226

CLASS 55

4,995,888
16 4,995,889
21 4,995,890
180 4,995,891
419

CLASS 56

249 4,995,227
255 4,995,228

CLASS 57

261 4,995,229
281 4,995,230

CLASS 60

203.1 4,995,231
243 4,995,232
324 4,995,233
648 4,995,234

CLASS 62

46.2 4,995,235
51.1 4,995,236
93 4,995,237
125 4,995,238
149 4,995,239
155 4,995,244
225 4,995,240
238.7 4,995,241
271 4,995,242
298 4,995,243
515 4,995,245

CLASS 65

12 4,995,892
18.2 4,995,893
19 4,995,894
60.2 4,995,895
260 4,995,896

CLASS 66

125 R 4,995,246

CLASS 68

12 R 4,995,247

CLASS 70

107 4,995,248
224 4,995,249
238 4,995,250

CLASS 71

64.11 4,995,897
90 4,995,898
92 4,995,899
4,995,900
93 4,995,901
94 4,995,902
121 4,995,903

CLASS 72

132 4,995,251
194 4,995,252
257 4,995,253
342.1 4,995,254
446 4,995,255

CLASS 73

31.04 4,995,256
38 4,995,271
116 4,995,139
4,995,257
118.2 4,995,258
593 4,995,259
632 4,995,260
702 4,995,263
4,995,264
4,995,265
706 4,995,266
767 4,995,261
800 4,995,267
842 4,995,262
861.05 4,995,268
861.22 4,995,269
863.85 4,995,270
865.6 4,995,272
4,995,273
865.8 4,995,274

CLASS 74

7 A 4,995,275
89.15 4,995,276
4,995,277
4,995,278
199 4,995,279
480 R 4,995,280
559 4,995,281
572 4,995,282
866 4,995,283
868 4,995,284
869 4,995,285

CLASS 75

244 4,995,905
445 4,995,904
502 4,995,906
561 4,995,907

CLASS 81

3.44 4,995,295
57.44 4,995,296
126 4,995,297
176.15 4,995,299

CLASS 82

12 4,995,300
101 4,995,286
127 4,995,298

CLASS 83

169 4,995,287
574 4,995,288
690 4,995,289

CLASS 84

160 4,995,290
237 4,995,291
726 4,995,292
733 4,995,293
738 4,995,294

CLASS 91

369.3 4,995,302

CLASS 92

5 R 4,995,303
92 4,995,304
138 4,995,305

CLASS 98

1 4,995,306
34.5 4,995,307
37 4,995,308
42.07 4,995,309

CLASS 99

295 4,995,310
4,995,311
411 4,995,312
467 4,995,313

CLASS 100

152 4,995,314

CLASS 101

96 4,995,315
123 4,995,316

CLASS 102

235 4,995,317
503 4,995,318

CLASS [illegible]

112 4,995,319
118 4,995,320

CLASS 105

397 4,995,321

CLASS 106

38.22 4,995,908
277 4,995,909
287.32 4,995,910

CLASS [illegible]

44 4,995,322
157 4,995,323

CLASS 110

234 4,995,324

CLASS 111

82 4,995,327
189 4,995,325

CLASS 112

453 4,995,328

CLASS 114

301 4,995,326
361 4,995,329

CLASS 116

175 4,995,330

CLASS 118

46 4,995,331
66 4,995,332
300 4,995,333
410 4,995,338
4,995,339
715 4,995,340
723 4,995,341

CLASS 119

5 4,995,334
15 4,995,336
18 4,995,337
4,995,342
53 4,995,343
[illegible] 4,995,344
98 4,995,335
160 4,995,345

CLASS 123

41.35 4,995,346
65 BA 4,995,347
65 V 4,995,354
65 VB 4,995,349
65 VC 4,995,350
65 VD 4,995,348
90.11 4,995,351
90.39 4,995,352
90.48 4,995,353
188 M 4,995,358
4,995,359
198 DB 4,995,355
198 DC 4,995,357
198 E 4,995,356
262 4,995,360
365 4,995,362
399 4,995,363
442 4,995,364
479 4,995,365
492 4,995,366
494 4,995,367
501 4,995,368
520 4,995,369
583 4,995,370

CLASS 124

7 4,995,371
25.5 4,995,372
25.6 4,995,373
54 4,995,374

CLASS 126

85 B 4,995,375
110 C 4,995,376
424 4,995,377

CLASS 127

48 4,995,911

CLASS 128

75 4,995,378
76 B 4,995,379
79 4,995,380
4,995,381
156 4,995,382
157 4,995,383
203.21 4,995,385
205.19 4,995,386
205.24 4,995,387
207.15 4,995,388
207.18 4,995,384
419 P 4,995,389
419 PG 4,995,390
635 4,995,391
639 4,995,392
648 4,995,393
653 A 4,995,394
653 R 4,995,395
654 4,995,396
661.09 4,995,397
668 4,995,398
680 4,995,399
725 4,995,400
748 4,995,401
771 4,995,402
776 4,995,403
777 4,995,404

CLASS 131

84.1 4,995,405
105 4,995,406
359 4,995,407

CLASS 132

320 4,995,408
324 4,995,361

CLASS 134

2 4,995,912
13 4,995,913
21 4,995,914
22.14 4,995,915
22.16 4,995,916
58 R 4,995,409
113 4,995,410
198 4,995,411

CLASS 135

67 4,995,412

CLASS 137

1 4,995,413
4,995,414
4,995,415
4,995,416
231 4,995,417
268 4,995,418
316 4,995,419
360 4,995,420
383 4,995,421
504 4,995,422
559 4,995,423
596 4,995,424
827 4,995,425

CLASS 138

39 4,995,426
155 4,995,427

CLASS 139

383 A 4,995,428
383 R 4,995,429

CLASS 141

98 4,995,430
116 4,995,431
130 4,995,432
312 4,995,433

CLASS 142

48 4,995,434

CLASS 144

363 4,995,435

CLASS 148

3 4,995,917
9 R 4,995,918
4,995,919
12.7 A 4,995,920
22 4,995,921
304 4,995,923
428 4,995,922
433 4,995,924

CLASS 149

2 4,995,925

CLASS 150

102 4,995,436

CLASS 152

209 R 4,995,437
518 4,995,438

CLASS 156

78 4,995,926
152 4,995,927
164 4,995,928
187 4,995,929
209 4,995,930
212 4,995,931
242 4,995,932
247 4,995,933
441.5 4,995,934
499 4,995,935
504 4,995,936
543 4,995,937
580.1 4,995,938
627 4,995,939
629 4,995,940
630 4,995,941
642 4,995,942

CLASS 157

1.17 4,995,439

CLASS 160

32 4,995,440
229.1 4,995,441
331 4,995,442

CLASS 162

63 4,995,943
199 4,995,944

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CLASS 164

34 4,995,443
97 4,995,444
305 4,995,445
437 4,995,446

CLASS 165

44 4,995,447
4,995,448
76 4,995,449
104.21 4,995,450
104.33 4,995,451
119 4,995,452
150 4,995,453
155 4,995,454
166 4,995,455

CLASS 166

51 4,995,456
70 4,995,457
85 4,995,458
176 4,995,459
267 4,995,460
295 4,995,461
304 4,995,462
308 4,995,463
382 4,995,464

CLASS 174

255 4,996,391

CLASS 175

27 4,995,465
61 4,995,466

CLASS 177

25.18 4,995,467
139 4,995,468

CLASS 178

18 4,996,392
19 4,996,393

CLASS 180

89.13 4,995,469
197 4,995,470
219 4,995,471
234 4,995,472
716 4,995,636

CLASS 181

137 4,995,473

CLASS 182

187 4,995,475
201 4,995,474
206 4,995,476

CLASS 187

1 R 4,995,477
115 4,995,478
135 4,995,479

CLASS 188

1.11 4,995,480
70 R 4,995,481
73.1 4,995,482
162 4,995,483
218 R 4,995,484
322.17 4,995,485
374 4,995,486

CLASS 190

18 A 4,995,487

CLASS 192

1.1 4,995,488
45 4,995,489
4,995,490
58 B 4,995,494
58 R 4,995,491
85 CA 4,995,492
107 R 4,995,500
150 4,995,493

CLASS 193

32 4,995,499

CLASS 194

205 4,995,498
318 4,995,497
350 4,995,496

CLASS 198

46 4,995,495

CLASS 199

341 4,995,501
346.1 4,995,502
392 4,995,503
408 4,995,504
468.4 4,995,505
814 4,995,506

CLASS 200

5 E 4,996,394
61.58 B 4,996,395
81.9 M 4,996,396
144 B 4,996,397
148 A 4,996,398
4,996,399
345 4,996,400
527 4,996,401

CLASS 202

177 4,995,945

CLASS 203

99 4,995,946

CLASS 204

1.5 4,995,947
4,995,948
15 4,995,949
91 4,995,950
129 4,995,952
129.3 4,995,953
129.75 4,995,954
129.95 4,995,951
157.3 4,995,955
182.4 4,995,956
182.8 4,995,957
298 200 4,995,958
411 4,995,959
418 4,995,960

CLASS 206

39.7 4,995,507
44 B 4,995,508
209.1 4,995,509
315.6 4,995,510
362.1 4,995,511
396 4,995,512
446 4,995,513
574 4,995,514

CLASS 208

108 4,995,961
110 4,995,962
111 4,995,963
112 4,995,964

CLASS 209

166 4,995,965
240 4,995,966

CLASS 210

94 4,995,967
108 4,995,968
150 4,995,969
167 4,995,970
168 4,995,971
179 4,995,972
209 4,995,973
247 4,995,974
266 4,995,975
4,995,976
321.69 4,995,977
474 4,995,978
521 4,995,979
602 4,995,980
603 4,995,981
634 4,995,982
639 4,995,983
670 4,995,984
679 4,995,985
717 4,995,986
754 4,995,987
784 4,995,988
788 4,995,989
793 4,995,990
797 4,995,991
803 4,995,992

CLASS 211

65 4,995,515
87 4,995,516

CLASS 212

146 4,995,517
178 4,995,518

CLASS 215

32 4,995,519
220 4,995,520
249 4,995,521

CLASS 219

10.41 4,996,402
10.493 4,996,405
10.55 B 4,996,403
10.55 E 4,996,404
69.12 4,996,406
121.54 4,996,407
130.01 4,996,408
4,996,409
432 4,996,410

CLASS 220

1.5 4,995,522
4.12 4,995,523
23.83 4,995,524
85 R 4,995,525
94 R 4,995,526
266 4,995,527
404 B1 4,094,432
445 4,995,528
475 4,995,529

CLASS 221

46 4,995,530
75 4,995,531

CLASS 222

43 4,995,532
54 4,995,533
132 4,995,540
511 4,995,534
607 4,995,535

CLASS 223

102 4,995,536

CLASS 224

273 4,995,537
329 4,995,538

CLASS 225

2 4,995,539

CLASS 226

174 4,995,541

CLASS 227

112 4,995,542
113 4,995,543

CLASS 228

2 4,995,544
119 4,995,545
123 4,995,546
124 4,995,547
131 4,995,548
147 4,995,549
175 4,995,550
177 4,995,551
179 4,995,552

CLASS 229

125.29 4,995,557

CLASS 235

488 4,996,411

CLASS 236

48 R 4,995,553
51 4,995,554

CLASS 239

43 4,995,555
57 4,995,556
226 4,995,558
493 4,995,559
708 4,995,560

CLASS 241

62 4,995,561

CLASS 242

35.6 DE 4,995,562
59 4,995,563
67.10 R 4,995,564
71.8 4,995,565
77.2 4,995,566
107 4,995,567
125.1 4,995,568
130 4,995,569
193 4,995,570
249 4,995,571

CLASS 244

2 4,995,572
3.24 4,995,573
17.17 4,995,574
216 4,995,575

CLASS 248

145 4,995,576
205.3 4,995,577
210 4,995,578
284 4,995,579
421 4,995,580
480 4,995,581
544 4,995,582
636 4,995,583

CLASS 249

10 4,995,584

CLASS 250

201.9 4,996,412
208.1 4,996,413
211 R 4,996,438
213 VT 4,996,414
221 4,996,415
225 4,996,416
226 4,996,417
227.11 4,996,418
227.18 4,996,419
227.24 4,996,420
252.1 4,996,437
255 4,996,421
281 4,996,422
4,996,423
288 4,996,424
325 4,996,425
330 4,996,426
332 4,996,427
4,996,428
336.1 4,996,429
339 4,996,430
343 4,996,431
370.01 4,996,432
443.1 4,996,433
492.2 4,996,441
492.3 4,996,434
551 4,996,435
560 4,996,436
561 4,996,439
4,996,440

CLASS 251

30.03 4,995,585
30.04 4,995,586
129.06 4,995,587
144 4,995,588
335.3 4,995,589

CLASS 252

25 4,995,993
28 4,995,994
4,995,995
42.7 4,995,996
49.5 4,995,997
61 4,995,998
62.55 4,995,999
92 4,996,000
99 4,996,001
181.6 4,996,002
301.40 F 4,996,003
314 4,996,004
512 4,996,005
550 4,996,006

CLASS 256

24 4,995,590
34 4,995,591

CLASS 260

410.9 R 4,996,007

CLASS 261

111 4,996,008

CLASS 264

5 4,996,009
22 4,996,010
28 4,996,011
40.1 4,996,012
86 4,996,013
113 4,996,014
177.11 4,996,015
229 4,996,016

CLASS 266

44 4,995,592
227 4,995,593
272 4,995,594
275 4,995,595
281 4,995,596

CLASS 267

64.15 4,995,597
293 4,995,598

CLASS 268

32 4,995,599

CLASS 270

45 4,995,600

CLASS 271

127 4,995,601
207 4,995,602

CLASS 272

18 4,995,603
122 4,995,604

CLASS 273

1 GG 4,995,606
26 R 4,995,607
73 E 4,995,608
80.2 4,995,609
85 F 4,995,610
123 R 4,995,611
169 4,995,612
183 C 4,995,613
201 4,995,614
292 4,995,615
312 4,995,616
346 4,995,617
367 4,995,618
417 4,995,619

CLASS 277

25 4,995,620
37 4,995,621
80 4,995,622
208 4,995,623
235 B 4,995,624

CLASS 279

1 C 4,995,625

CLASS 280

231 4,995,626
261 4,995,627
304.1 4,995,628
414.1 4,995,629
602 4,995,630
607 4,995,631
615 4,995,632
618 Re.33,544
673 4,995,633
682 4,995,634
707 4,995,635
727 4,995,637
731 4,995,638
735 4,995,639
804 4,995,640

CLASS 283

67 4,995,641
105 4,995,642

CLASS 284

4 4,995,643
41 4,995,644
127 4,995,645
137.1 4,995,646
161 4,995,647
406 4,995,648

CLASS 292

175 4,995,649
201 4,995,650
4,995,651
202 4,995,652
216 4,995,653
4,995,654
251.5 4,995,655
307 R 4,995,656
327 4,995,657
336.3 4,995,658

CLASS 293

107 4,995,659
132 4,995,660

CLASS 294

1.4 4,995,661
64.1 4,995,662

CLASS 296

109 4,995,663
165 4,995,664
213 4,995,665
216 4,995,666
4,995,667

CLASS 297

248 4,995,668
379 4,995,669
423 4,995,670
439 4,995,671
483 4,995,672

CLASS 301

5 R 4,995,679
37 P 4,995,673
4,995,674
63 PW 4,995,675

CLASS 302

9.63 4,995,676
113 4,995,677

CLASS 303

58 R 4,995,678

CLASS 307

10:100 4,996,442
264 4,996,443
269 4,996,444
272.3 4,996,445
296.2 4,996,446
304 4,996,447
351 4,996,448
446 4,996,449
449 4,996,450
468 4,996,451
475 4,996,452
4,996,453
480 4,996,454

CLASS 310

12 4,996,455
261 4,996,456
268 4,996,457

CLASS 312

7.1 4,995,680
242 4,995,681
311 4,995,682
348.4 4,995,683

CLASS 313

402 4,996,458
467 4,996,459
586 4,996,460

CLASS 315

8 4,996,461
209 R 4,996,462
250 4,996,463
289 4,996,464
358 4,996,465

CLASS 318

6 4,996,466
480 4,996,467
587 4,996,468
757 4,996,469
772 4,996,470

CLASS 323

241 4,996,471

CLASS 324

71.6 4,996,472
72 4,996,473
78 D 4,996,474
96 4,996,475
158 F 4,996,476
158 MG 4,996,477
158 P 4,996,478
248 4,996,479
309 4,996,480
318 4,996,481
4,996,482
321 4,996,483
334 4,996,484
415 4,996,485
545 4,996,486
549 4,996,487
613 4,996,488
639 4,996,489
4,996,490
644 4,996,491
687 4,996,492
699 4,996,493

CLASS 328

65 4,996,494
4,996,495
228 4,996,496

CLASS 330

151 4,996,497
258 4,996,498
264 4,996,499
279 4,996,500
4,996,501

CLASS 331

46 4,996,502

CLASS 332

104 4,996,503

CLASS 333

81 R 4,996,504
218 4,996,505
219.1 4,996,506

CLASS 335

195 4,996,507
216 4,996,508

CLASS 337

232 4,996,509

CLASS 338

21 4,996,510
114 4,996,511
306 4,996,512

CLASS 340

310 R 4,996,513
426 4,996,514
4,996,515
443 4,996,516
506 4,996,517
518 4,996,518
653 4,996,519
662 4,996,520
691 4,996,521
700 4,996,522
781 4,996,523
825.02 4,996,524
825.31 4,996,525
825.44 4,996,526

CLASS 341

83 4,996,527
110 4,996,528
118 4,996,529
120 4,996,530
157 4,996,531

CLASS 342

81 4,996,532
108 4,996,533
195 4,996,534

CLASS 343

786 4,996,535

912 4,996,536

CLASS 346

1.1 4,996,537
74.3 4,996,538
76 PH 4,996,539
108 4,996,540
4,996,541
4,996,542

CLASS 350

1.6 4,995,684
3.65 4,995,685
96 10 4,995,688
96 14 4,995,689
96 15 4,995,686
4,995,690
4,995,691
96 16 4,995,692
96 18 4,995,693
96.19 4,995,694
96 2 4,995,687
4,995,696
96 20 4,995,695
96.21 4,995,728
96.29 4,995,697
4,995,698
96 32 4,995,699
266 4,995,700
276 R 4,995,701
331 R 4,995,702
333 4,995,703
334 4,995,704
350 S 4,995,705
4,995,706
427 4,995,707
4,995,708
447 4,995,709
480 4,995,710
529 4,995,711
603 4,995,712

CLASS 351

113 4,995,713
161 4,995,714
4,995,715
212 4,995,716
224 4,995,717

CLASS 353

31 4,995,718
122 4,995,719

CLASS 354

5 4,996,543
64 4,996,544
70 4,996,545
76 4,996,546
81 4,996,547
149.11 4,996,548
173.11 4,996,549
420 4,996,550
432 4,996,551

CLASS 355

1 4,996,552
27 4,996,553
4,996,554
44 4,996,555
50 4,996,556
4,996,557
4,996,558
56 4,996,559
91 4,996,560
202 4,996,561
205 4,996,562
212 4,996,563
235 4,996,564
245 4,996,565
246 4,996,566
290 4,996,567
308 4,996,568

CLASS 356

5 4,995,720
152 4,995,722
305 4,995,721
318 4,995,723
319 4,995,724
334 4,995,725
349 4,995,726
402 4,995,727

CLASS 357

14 4,996,569
22 4,996,570
23.5 4,996,571
4,996,572
23.7 4,996,574
4,996,575
23.700 4,996,573
29 4,996,576
30 4,996,577
4,996,578
4,996,579
34 4,996,580
4,996,581
69 4,996,582
70 4,996,583
71 4,996,584
74 4,996,585
4,996,586
4,996,587
80 4,996,588
82 4,996,589

CLASS 358

74 4,996,590
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101 4,996,593
136 4,996,594
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158 4,996,596
181 4,996,597
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213.22 4,996,600
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457 4,996,602
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475 4,996,606

CLASS 360

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103 4,996,614
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105 4,996,617
106 4,996,618
109 4,996,619
121 4,996,620
126 4,996,621
135 4,996,622

CLASS 361

63 4,996,624
87 4,996,625
91 4,996,626
283 4,996,627
393 4,996,628
400 4,996,629
412 4,996,630
415 4,996,631

CLASS 362

32 4,996,632
35 4,996,633
82 4,996,634
267 4,996,635
431 4,996,636

CLASS 363

16 4,996,637
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CLASS 364

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CLASS 365

49 4,996,666
117 4,996,667
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225.7 4,996,672

CLASS 366

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CLASS 367

131 4,996,673
158 4,996,674
162 4,996,675

CLASS 368

73 4,996,676

CLASS 369

14 4,996,677
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275.4 4,996,682

CLASS 370

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100.1 4,996,684

CLASS 371

10.1 4,996,687
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CLASS 372

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66 4,996,693

CLASS 373

22 4,996,694

CLASS 374

43 4,995,731
139 4,995,732
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CLASS 375

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104 4,996,697
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CLASS 376

116 4,996,017
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313 4,996,020
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CLASS 377

49 4,996,699
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CLASS 378

145 4,996,700
146 4,996,701

CLASS 379

1 4,996,702
40 4,996,703
67 4,996,704
91 4,996,705
93 4,996,706
100 4,996,707
156 4,996,708
160 4,996,709
202 4,996,710

CLASS 380

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CLASS 381

68.4 4,996,712
190 4,996,713

CLASS 382

3 4,996,714

CLASS 384

38 4,995,734
276 4,995,735
448 4,995,736
607 4,995,737

CLASS 400

7 4,995,738
63 4,995,739
4,995,740
120 4,995,741
124 4,995,742
4,995,743
157.2 4,995,744
605 4,995,745
616.2 4,995,746
625 4,995,747
691 4,995,748

CLASS 401

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104 4,995,750
135 4,995,751

CLASS 402

34 4,995,752

CLASS 403

24 4,995,753
132 4,995,754
133 4,995,755

CLASS 404

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88 4,995,758
119 4,995,760

CLASS 405

43 4,995,759
154 4,995,761
195 4,995,762
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229 4,995,764

CLASS 406

117 4,995,765

CLASS 407

34 4,995,766
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CLASS 408

239 A 4,995,768

CLASS 410

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CLASS 411

361 4,995,777

CLASS 414

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732 4,995,782
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CLASS 415

148 4,995,786

CLASS 416

228 4,995,787
230 4,995,788

CLASS 417

360 4,995,789
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366 4,995,791
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403 4,995,793
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571 4,995,795

CLASS 418

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CLASS 419

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CLASS 420

554 4,996,025

CLASS 422

106 4,996,026
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CLASS 423

210 4,996,030
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328 4,996,034
386 4,996,035
388 4,996,036
447.4 4,996,037
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584 4,996,039

CLASS 424

3 4,996,040
9 4,996,041
54 4,996,042
61 4,996,043
64 4,996,044
70 4,996,045
71 4,996,059
78 4,996,046
79 4,996,047
80 4,996,048
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94.2 4,996,050
195.1 4,996,051
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410 4,996,053
422 4,996,054
442 4,996,055
443 4,996,056
451 4,996,057
462 4,996,058
473 4,996,060
475 4,996,061

CLASS 425

012 4,995,798
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238 4,995,804

CLASS 426

8 4,996,062
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72 4,996,065
77 4,996,066
96 4,996,067
234 4,996,068
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330.5 4,996,070
415 4,996,071
417 4,996,072
487 4,996,073
601 4,996,074

CLASS 427

12 4,996,075
38 4,996,076
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4,996,078
39 4,996,079
57 4,996,080
96 4,996,081
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108 4,996,083
133 4,996,084
140 4,996,085
421 4,996,086

CLASS 428

11 4,996,087
40 4,996,088
64 4,996,089
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113 4,996,091
157 4,996,092
212 4,996,093
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216 4,996,096
220 4,996,097
229 4,996,098
245 4,996,099
259 4,996,100
272 4,996,101
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304.4 4,996,109
305.5 4,996,103
323 4,996,104
336 4,996,105
343 4,996,106
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411.1 4,996,108
432 4,996,111
447 4,996,112
469 4,996,119
600 4,996,113
610 4,996,114
614 4,996,115
627 4,996,116
633 4,996,117
639 4,996,118

CLASS 429

153 4,996,128
194 4,996,129

CLASS 430

2 4,996,120
17 4,996,122
20 4,996,123
59 4,996,124
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106.6 4,996,126
109 4,996,127
264 4,996,130
276 4,996,131
286 4,996,132
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309 4,996,135
313 4,996,133
4,996,136
378 4,996,137
522 4,996,138
558 4,996,139
569 4,996,140
583 4,996,141

CLASS 431

9 4,995,807
10 4,995,805
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CLASS 432

72 4,995,808
118 4,995,809

CLASS 433

141 4,995,810
190 4,995,811
214 4,995,812

CLASS 434

96 4,995,813

CLASS 435

6 4,996,142
4,996,143
4,996,144
7.23 4,996,145
28 4,996,146
70.3 4,996,159
115 4,996,147
119 4,996,148
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240.241 4,996,154
252.3 4,996,155
252.5 4,996,156
254 4,996,157
280 4,996,158

CLASS 436

2 4,996,160
132 4,996,161

CLASS 437

5 4,996,163
31 4,996,164
4,996,165
4,996,166
40 4,996,167
164 4,996,168
209 4,996,169
219 4,996,170

CLASS 439

61 4,995,814
63 4,995,815
71 4,995,816
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74 4,995,818
79 4,995,819
157 4,995,820
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161 4,995,822
226 4,995,823
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328 4,995,825
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409 4,995,829
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557 4,995,831
578 4,995,832
596 4,995,833
620 4,995,834
668 4,995,835
675 4,995,836
863 4,995,837
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CLASS 440

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CLASS 441

11 4,995,841
22 4,995,842
74 4,995,843

CLASS 446

021 4,995,844
325 4,995,845
376 4,995,846

CLASS 450

71 4,995,847

CLASS 453

3 4,995,848

CLASS 455

33 4,996,715

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41	4,996,716	21	4,996,194		CLASS 523	226	Re 33,545		CLASS 549	683	4,996,371
222	4,996,717	23	4,996,195	136	4,996,244	230	4,996,289	229	4,996,331	717	4,996,372
323	4,996,718	53	4,996,196		4,996,245	272	4,996,290	285	4,996,332	727	4,996,373
606	4,996,719	54	4,996,197		4,996,246		4,996,291	328	4,996,333	814	4,996,374
	CLASS 464	157	4,996,198		4,996,247	328	4,996,292	364	4,996,334	853	4,996,375
134	4,995,849	167	4,996,199		4,996,248	352	4,996,293		CLASS 552	934	4,996,376
143	4,995,850	185	4,996,200	144	4,996,249	421	4,996,294	610	4,996,335		CLASS 570
144	4,995,853	212	4,996,201	500	4,996,250		CLASS 530		CLASS 556	141	4,996,377
	CLASS 474	213	4,996,202		CLASS 524	221	4,996,295	55	4,996,336	164	4,996,378
91	4,995,852	231.5	4,996,203	17	4,996,251	350	4,996,296	137	4,996,337	176	4,996,379
101	4,995,851	248	4,996,204	88	4,996,252	395	4,996,297	179	4,996,338	211	4,996,380
111	4,995,854	250	4,996,205	91	4,996,253		4,996,298	181	4,996,339		CLASS 585
167	4,995,855	258	4,996,206	104	4,996,254	409	4,996,299	190	4,996,340	413	4,996,381
	CLASS 475		4,996,207	112	4,996,256		CLASS 534	406	4,996,341	500	4,996,382
86	4,995,862	263	4,996,208	261	4,996,255	15	4,996,300	437	4,996,342	516	4,996,383
298	4,995,861	278	4,996,209	262	4,996,257	556	4,996,301	445	4,996,343	530	4,996,384
	CLASS 493	289	4,996,210	274	4,996,258	582	4,996,302	448	4,996,344	640	4,996,385
195	4,995,860	293	4,996,211	276	4,996,259	602	4,996,303	485	4,996,345	646	4,996,386
204	4,995,859	300	4,996,212	381	4,996,260	637	4,996,304		CLASS 558	654	4,996,387
445	4,995,858	311	4,996,213		CLASS 525		CLASS 536	392	4,996,346	828	4,996,388
	CLASS 501	316	4,996,214	131	4,996,261	17.5	4,996,305	411	4,996,347		CLASS 600
19	4,996,171	338	4,996,215	177	4,996,262	18.6	4,996,306	445	4,996,348	16	4,995,857
45	4,996,172	341	4,996,216	178	4,996,263	20	4,996,307		CLASS 560		CLASS 604
73	4,996,173	365	4,996,217	179	4,996,264	26	4,996,308	124	4,996,349	8	4,995,856
87	4,996,174	372	4,996,218	242	4,996,265	119	4,996,309	192	4,996,350	43	4,995,865
126	4,996,175	399	4,996,219	271	4,996,266	120	4,996,310	352	4,996,351	53	4,995,866
127	4,996,176	400	4,996,220	423	4,996,267		CLASS 540		CLASS 562	54	4,995,867
153	4,996,177	410	4,996,221	434	4,996,268	139	4,996,311	401	4,996,352	105	4,995,868
	CLASS 502	424	4,996,222	444	4,996,269	145	4,996,312	412	4,996,353	110	4,995,869
159	4,996,178	428	4,996,223	531	4,996,270	312	4,996,313	424	4,996,354		4,995,870
209	4,996,179	438	4,996,224	537	4,996,271	364	4,996,314	493	4,996,355	153	4,995,871
304	4,996,180	444	4,996,225		CLASS 526	454	4,996,315	587	4,996,356	195	4,995,874
414	4,996,181	450	4,996,226	62	4,996,272		CLASS 544	607	4,996,357	247	4,995,864
	CLASS 503		4,996,227	177	4,996,273	1	4,996,316	621	4,996,358	280	4,995,863
200	4,996,182	454	4,996,228	208	4,996,274	274	4,996,317		CLASS 564	391	4,995,872
208	4,996,183	467	4,996,229	245	4,996,275	295	4,996,318	50	4,996,359		4,995,873
226	4,996,184	474	4,996,230	927.5	4,996,276	330	4,996,319	90	4,996,360		CLASS 606
	CLASS 505	560	4,996,231		CLASS 528		CLASS 546	216	4,996,322	90	4,995,875
1	4,996,185	563	4,996,232	15	4,996,277	R	4,996,320	304	4,996,361	142	4,995,876
	4,996,186	649	4,996,233		4,996,280	194	4,996,321	315	4,996,362	180	4,995,877
	4,996,187	659	4,996,234	B1	4,742,142	250	4,996,323	470	4,996,363	194	4,995,878
	4,996,188	720	4,996,235	26	4,996,278	339	4,996,324	475	4,996,364		CLASS 623
	4,996,189	865	4,996,236	27	4,996,279		CLASS 548		CLASS 568	2	4,995,881
	4,996,190	873	4,996,237	73	4,996,281	132	4,996,325	33	4,996,367	6	4,995,879
	4,996,191		4,996,238	75	4,996,282	261	4,996,326	427	4,996,365		4,995,880
	4,996,192		4,996,239	80	4,996,283	373	4,996,327	454	4,996,366	8	4,995,882
	CLASS 514		CLASS 521	92	4,996,284	427	4,996,328	601	4,996,368	23	4,995,883
11	4,996,193	78	4,996,240	117	4,996,285	453	4,996,329	615	4,996,369		CLASS 800
		107	4,996,241	123	4,996,286	544	4,996,330	674	4,996,370	200	4,996,389
		131	4,996,242	125	4,996,287					220	4,996,390
			CLASS 522	220	4,996,288						
		99	4,996,243								

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D1—	101	314,853		558	314,886		46	314,919		113	314,952	D20—	10	314,983
	106	314,854		601	314,887		61	314,920		115	314,953		22	314,984
	127	314,855		605	314,888		62	314,921			314,954	D21—	11	314,985
D2—	215	314,856		687	314,889		64	314,922		118	314,931		64	314,986
	257	314,857		693	314,890		70	314,923			314,955		89	314,987
	314	314,858		698	314,891		73	314,924			314,956		108	314,988
	639	314,859			314,892		78	314,925			314,957			314,989
D3—	25	314,860	D8—	14	314,893			314,926		126	314,958			314,990
	35	314,861			314,894		126	314,927		135	314,959			314,991
	36	314,862			314,895		131	314,928			314,960			314,992
	37	314,863		22	314,896	D11—	6	314,929		157	314,961			314,993
	54	314,864		50	314,897		96	314,930		185	314,962			314,994
	56	314,865		51	314,898	D12—	114	314,932		188	314,963			314,995
	100	314,866		59	314,899		146	314,933		192	314,964		109	314,996
D6—	324	314,867		62	314,900		155	314,934		241	314,965		134	314,997
	334	314,868		89	314,901		160	314,935		258	314,966			314,998
	335	314,869		102	314,902		191	314,936	D16—	246	314,967		150	314,999
	358	314,870		310	314,903			314,937	D17—	20	314,968		156	315,000
	368	314,871		312	314,904		217	314,938		22	314,969	D28—	7	315,033
	380	314,872		334	314,908	D13—	119	314,940	D18—	4	314,970		191	315,002
	419	314,873		358	314,909		133	314,941		12	314,971		197	315,003
	432	314,874		359	314,910		147	314,942		13	314,972		199	315,004
	449	314,875		360	314,905			314,943		22	314,973		219	315,005
	469	314,876			314,906		158	314,939		23	314,974		222	315,006
	479	314,877		373	314,911		160	314,944		37	314,975		232	315,007
	486	314,878	D9—	424	314,912		179	314,945	D19—	26	314,976		234	315,008
	597	314,879		430	314,913	D14—	100	314,946		27	314,977			315,009
D7—	300.2	314,880		432	314,907			314,947		48	314,978		238	315,010
	309	314,881			314,914		102	314,948		51	314,979	D22—	140	315,011
	334	314,882		435	314,915			314,949		60	314,980		147	315,012
	379	314,883		448	314,916			314,950		75	314,981	D23—	209	315,013
	545	314,884			314,917					99	314,982		226	315,014
	554	314,885	D10—	32	314,918		107	314,951						

D20—	10	314,983		229	315,015									
	22	314,984		255	315,016									
D21—	11	314,985		301	315,017									
	64	314,986		382	315,018									
	89	314,987	D24—	21	315,019									
	108	314,988			315,020									
		314,989		47	315,021									
		314,990		63	315,022									
		314,991	D25—	17	315,023									
		314,992		58	315,024									
		314,993		67	315,025									
		314,994		113	315,026									
		314,995		124	315,027									
	109	314,996	D26—	24	315,028									
	134	314,997		42	315,029									
		314,998		63	315,030									
	150	314,999		105	315,031									
	156	315,000	D27—	163	315,032									
	189	315,001	D28—	7	315,033									
	191	315,002		10	315,034									
	197	315,003		12	315,035									
	199	315,004		41	315,036									
	219	315,005	D30—	122	315,037									
	222	315,006		158	315,038									
	232	315,007	D32—	1	315,039									
	234	315,008			315,040									
		315,009		21	315,041									
	238	315,010		22	315,042									
D22—	140	315,011		34	315,043									
	147	315,012	D34—	10	315,044									
D23—	209	315,013		32	315,046									
	226	315,014	D99—	30	315,045									

CLASSIFICATION OF PLANTS

P—	9	7,454	18	7,455	51	7,456	56	7,457	68	7,458	71	7,459

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,995,306	4,995,793	4,996,617		4,996,120		4,995,181		4,995,832		
	4,996,027	4,995,812	4,996,620		4,996,176		4,995,224		4,996,148		
	4,996,207	4,995,822	4,996,623		4,996,287		4,995,234		4,996,230		
04 :	4,995,414	4,995,827	4,996,626		4,996,336		4,995,240		4,996,235		
	4,995,698	4,995,856	4,996,627	11 :	4,995,626		4,995,307		4,996,245		
	4,995,718	4,995,862	4,996,631	12 :	4,995,182		4,995,315		4,996,246		
	4,995,828	4,995,864	4,996,635		4,995,186		4,995,361		4,996,247		
	4,995,841	4,995,879	4,996,666		4,995,205		4,995,412		4,996,248		
	4,995,927	4,995,897	4,996,689		4,995,217		4,995,500		4,996,400		
	4,995,941	4,995,958	4,996,690		4,995,300		4,995,627		4,996,597		
	4,995,953	4,995,963	4,996,697		4,995,327		4,995,642	19 :	4,995,314		
	4,996,170	4,995,975	4,996,716		4,995,374		4,995,652		4,995,422		
	4,996,237	4,996,010	4,685,239		4,995,389		4,995,682		4,995,507		
	4,996,420	4,996,060	08 :	4,995,122		4,995,408		4,995,734		4,995,876	
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	4,996,448	4,996,071		4,995,319		4,995,487		4,995,798		4,996,646	
	4,996,498	4,996,085		4,995,329		4,995,516		4,995,829	20 :	4,995,154	
	4,996,687	4,996,096		4,995,384		4,995,528		4,995,851		4,995,188	
05 :	4,995,225	4,996,101		4,995,461		4,995,587		4,995,948		4,995,618	
	4,995,584	4,996,122		4,995,547		4,995,616		4,995,965		4,996,628	
	4,995,605	4,996,128		4,995,637		4,995,629		4,996,063	21 :	4,995,179	
06 :	4,995,116	4,996,143		4,995,771		4,995,761		4,996,150		4,995,376	
	4,995,123	4,996,144		4,995,982		4,995,857		4,996,153		4,995,453	
	4,995,191	4,996,145		4,996,423		4,995,921		4,996,179		4,996,037	
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	4,995,282	4,996,169		4,996,661		4,996,292		4,996,249		4,996,629	
	4,995,293	4,996,193		4,996,704		4,996,335		4,996,260	22 :	4,995,189	
	4,995,308	4,996,199	09 :	4,995,118		4,996,389		4,996,282		4,995,295	
	4,995,318	4,996,221		4,995,137		4,996,407		4,996,306		4,995,379	
	4,995,322	4,996,238		4,995,524		4,996,412		4,996,367		4,995,530	
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	4,995,418	4,996,342		4,995,625	13 :	4,995,238		4,996,529		4,996,087	
	4,995,420	4,996,433		4,995,641		4,995,288		4,996,584		4,996,254	
	4,995,430	4,996,437		4,995,787		4,995,537		4,996,599	23 :	4,995,208	
	4,995,451	4,996,452		4,995,844		4,995,577		4,996,705	24 :	4,995,138	
	4,995,511	4,996,461		4,995,888		4,996,053	18 :	4,995,157		4,995,269	
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	4,995,589	4,996,480		4,996,047	15 :	4,996,229		4,995,309		4,996,065	
	4,995,607	4,996,495		4,996,204	16 :	4,995,260		4,995,330		4,996,159	
	4,995,609	4,996,500		4,996,242		4,995,410		4,995,343		4,996,261	
	4,995,613	4,996,503		4,996,345		4,995,914		4,995,377		4,996,430	
	4,995,614	4,996,510		4,996,393		4,995,916		4,995,390		4,996,579	
	4,995,617	4,996,515		4,996,396		4,996,531		4,995,481		4,996,692	
	4,995,644	4,996,521		4,996,419		4,996,655		4,995,503	25 :	4,995,149	
	4,995,651	4,996,525		4,996,497	17 :	Re.33,542		4,995,594		4,995,151	
	4,995,699	4,996,534	10 :	4,995,685		4,995,115		4,995,636		4,995,197	
	4,995,720	4,996,544		4,995,901		4,995,134		4,995,676		4,995,371	
	4,995,749	4,996,573		4,996,043		4,995,148		4,995,767		4,995,411	
	4,995,777	4,996,577		4,996,097		4,995,155		4,995,807		4,995,415	
	4,995,792	4,996,608		4,996,098		4,995,159		4,995,824		4,995,474	

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4,996,151 4,996,154 4,996,275 4,996,298 4,996,343 4,996,473 4,996,609 4,996,642 4,996,648 4,996,662
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26 : 4,995,167 4,995,178 4,995,200 4,995,202 4,995,219 4,995,220 4,995,222 4,995,258 4,995,281
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27 : 4,995,256 4,995,335 4,995,344 4,995,452 4,995,501 4,995,518 4,995,645 4,995,661 4,995,688 4,995,693 4,995,759 4,995,866 4,995,976
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29 : 4,995,125 4,995,324 4,995,475 4,995,882 4,996,035 4,996,038 4,996,355 4,996,369 4,996,481 4,996,513
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31 : 4,995,195 4,995,499 4,995,588 4,995,936
32 : 4,995,128
33 : 4,995,815 4,995,865 4,996,508
34 : Re.33,545 4,995,136 4,995,381 4,995,387 4,995,436 4,995,555 4,995,639 4,995,686 4,995,690 4,995,695 4,995,701 4,995,903 4,995,956 4,995,962 4,995,972 4,995,996 4,996,001 4,996,002 4,996,028 4,996,044 4,996,045 4,996,046 4,996,051 4,996,084 4,996,136 4,996,186 4,996,187 4,996,189 4,996,198 4,996,202 4,996,203 4,996,205 4,996,206 4,996,212 4,996,231 4,996,234 4,996,268
35 : 4,995,947 4,995,954 4,996,494
36 : 4,995,117 4,995,119 4,995,173 4,995,215 4,995,252 4,995,290 4,995,334 4,995,373 4,995,394 4,995,417 4,995,426 4,995,477 4,995,536 4,995,540 4,995,647 4,995,668 4,995,670 4,995,689 4,995,744 4,995,772 4,995,774 4,995,781 4,995,830 4,995,840 4,995,870 4,995,878 4,995,913 4,995,919 4,995,942 4,995,964 4,995,993 4,996,003 4,996,034 4,996,048 4,996,094 4,996,114 4,996,116 4,996,124 4,996,157 4,996,164 4,996,172 4,996,192 4,996,240 4,996,255 4,996,278 4,996,284 4,996,300 4,996,337 4,996,404 4,996,425 4,996,427 4,996,463 4,996,493 4,996,509 4,996,523 4,996,546 4,996,548 4,996,556 4,996,563 4,996,565 4,996,570 4,996,658 4,996,663 4,996,693 4,996,707 4,996,717
37 : 4,995,133 4,995,150 4,995,192 4,995,194 4,995,525 4,995,569 4,995,655 4,995,681 4,995,892 4,996,008 4,996,052 4,996,099 4,996,487
39 : 4,995,145 4,995,196 4,995,210
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40 : 4,995,228 4,995,450 4,995,457 4,995,459
41 : 4,995,460 4,995,466 4,995,510 4,995,758 4,995,961 4,996,383 4,996,387 4,996,421
42 : 4,995,124 4,995,176 4,995,398 4,995,548 4,995,672 4,996,175 4,996,478 4,996,654
43 : 4,995,152 4,995,158 4,995,190 4,995,213 4,995,226 4,995,257 4,995,289 4,995,336 4,995,392 4,995,400 4,995,423 4,995,509 4,995,572 4,995,663 4,995,716 4,995,770 4,995,786 4,995,814 4,995,816 4,995,817 4,995,819
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44 : 4,995,403 4,995,874
45 : 4,995,187 4,995,526 4,995,860 4,995,884 4,995,909
46 : 4,996,516
47 : 4,995,114 4,995,517 4,995,791 4,995,883 4,995,985 4,996,107 4,996,252 4,996,403 4,996,457
48 : 4,995,120 4,995,121 4,995,129 4,995,153 4,995,168 4,995,198 4,995,204 4,995,297 4,995,301 4,995,401 4,995,404 4,995,455 4,995,456 4,995,463 4,995,464 4,995,527 4,995,534 4,995,551 4,995,763 4,995,764 4,995,811 4,995,839 4,995,896 4,995,912 4,995,915 4,995,952 4,995,987 4,996,007 4,996,016 4,996,017 4,996,077 4,996,086 4,996,133 4,996,160 4,996,209 4,996,279 4,996,294
49 : 4,995,261 4,995,402 4,995,434 4,995,465 4,995,631 4,995,756 4,995,863 4,995,867 4,996,277
50 : 4,995,940
51 : Re.33,544 4,995,272 4,995,557 4,995,714 4,995,715 4,995,872 4,996,036 4,996,346 4,996,519 4,996,647 4,996,670 4,996,703
53 : 4,995,146 4,995,166 4,995,231 4,995,299 4,995,372 4,995,413 4,995,575 4,995,590 4,995,591 4,995,604 4,995,842 4,996,492 4,996,512 4,996,527 4,996,530 4,996,624
54 : 4,995,476 4,995,783 4,996,244 4,996,483
55 : 4,995,130 4,995,141 4,995,183 4,995,233 4,995,239 4,995,333 4,995,356 4,995,357 4,995,380 4,995,429 4,995,454 4,995,473 4,995,523 4,995,578 4,995,650 4,995,795 4,995,928 4,996,082 4,996,328 4,996,413 4,996,469 4,996,470
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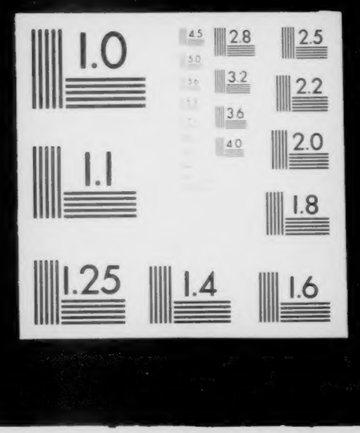
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